

Environmental Protection Service
Federal Department of Fisheries and Environment
Ontario Region
Government of Canada

**CONTROL OF WATER POLLUTION FROM
LAND USE ACTIVITIES
IN THE
CANADIAN GREAT LAKES BASIN:
AN EVALUATION OF LEGISLATIVE, REGULATORY
AND ADMINISTRATIVE PROGRAMS**

1977

J. F. Castrilli
Canadian Environmental Law Research Foundation
Toronto

ACKNOWLEDGEMENTS

This study was carried out as part of the Task A activities of the Pollution from Land Use Activities Reference Group, an organization of the International Joint Commission, established under the Canada/United States Great Lakes Water Quality Agreement of 1972. Findings and conclusions are those of the author and do not necessarily reflect the views of the Reference Group or its recommendations to the Commission.

The study was funded through the Environmental Protection Service, Environment Canada, Ontario Region, which also made space available to house the project.

The Scientific Authority for EPS was Garth E. Bangay.

Elizabeth Block of the Canadian Environmental Law Research Foundation reviewed earlier drafts of this report as did other colleagues at CELRF.

The assistance and cooperation received from representatives of federal, provincial and local agencies is also acknowledged.

INTRODUCTION

General

On April 15, 1972, the Governments of Canada and the United States signed the Great Lakes Water Quality Agreement. As an integral part of this agreement, the International Joint Commission was asked to establish a Reference Group to study pollution in the Great Lakes system from agricultural, forestry and other land uses.

Subsequently, the eighteen member Pollution From Land Use Activities Reference Group was formed with an equal number of Canadian and United States members to answer the following three questions:

- (1) Are the boundary waters of the Great Lakes System being polluted by land drainage (including ground and surface runoff and sediments) from agriculture, forestry, urban and industrial land development, recreational and park land development, utility and transportation systems and natural sources?
- (2) If the answer to the foregoing question is in the affirmative, to what extent, by what causes, and in what localities is the pollution taking place?
- (3) If the Commission should find that pollution of the character just referred to is taking place, what remedial measures would, in its judgement, be most practicable and what would be the probable cost thereof?

In order to provide an adequate response to this last question, the Reference Group proposed a series of studies to define all those remedial measures pertinent to the solution of the problem areas identified.

This study is specifically addressed to the review and the evaluation of the existing legislative/regulatory framework available for controlling pollution from land use activities.

The study is being undertaken jointly by both Canada and the United States and the respective study participants have been asked to provide information on the following tasks:

- (1) Describe the content of the existing legislation/regulation framework available at each level of government (Federal, Provincial and local) for controlling the non-point discharges of sediments, nutrients, pesticides and chemicals associated with the following land use categories:

	<u>Priority Rating*</u>
(a) Urban Areas	H.
(b) Transportation Corridors	M.
(c) Extractive Operations	L.
(d) Agriculture	H.
(e) Recreational Areas	L.
(f) Forested Areas	L.
(g) Liquid, Solid and Deepwell Disposal Areas	H.
(h) Shoreline Landfilling Activities	M.
(i) Lakeshore and Riverbank Erosion	L.

Special reference should be made to the provisions made at the local level for controlling these potential diffuse sources of pollution.

* Emphasis on the land use categories studies should be assigned according to the priority rating established by PLUARG. H=High; M=Medium; L=Low.

- (2) Describe the extent of the regulatory power, the commitment to develop and undertake programs and the degree of enforcement practised at each of the specified levels of government relative to pollution from land use activities.
- (3) Identify other relevant government and non-governmental programs and policies which would have an indirect bearing on the control of pollution from land use activities (i.e., sediments, nutrients, pesticides and chemicals).
- (4) Identify those land use categories for which the four major pollutants (sediments, nutrients, pesticides and chemicals) are least controlled.

- (5) In terms of the present jurisdictional framework (i.e., Provincial and local) outline what possibilities for future action are available to each level of government. This would include an analysis of the constitutional limitations operating at each level of government and the potential of the existing legislative/regulatory framework for controlling non-point sources of pollution.
- (6) Describe the alternatives for the future evolution of this legislative/regulatory framework based on discussions with those persons actively working with the present framework.
- (7) Work with the U. S. contractors who are undertaking a similar study to develop a standardized format for comparing the legislative and regulatory approaches taken in each country.*

This report addresses these tasks and presents the findings of the legislative review and interviews with federal, provincial and local officials in Canada, (Ontario).

* The Canada-U. S. comparative law report appears under separate cover.

SUMMARY

This report is a study of government activity with respect to controlling water pollution from non-point sources (or land uses) in the Canadian Great Lakes Basin. It examines the legislation, regulations and non-statutory programs which are being - or which could be - used to control this form of pollution. It identifies the principal agencies and government levels with roles in this area, and offers an evaluation of control efforts and policies to date.

Chapter One is an overview of the situation. It briefly reviews the technical/physical nature of the non-point pollution problem, and provides a summary analysis of the institutional arrangements available for controlling the various land use impacts to water quality and resources. Findings in this chapter are based on the more detailed institutional review which is provided on a land use by land use basis in Chapters Two through Ten.

Institutional mechanisms reviewed include planning, pollution control, fiscal and proprietary/management schemes, both legislated and non-legislated. The role of the public is considered as well as key judicial decisions affecting the nature and extent of legislation and its enforcement in this general area. Voluntary/advisory programs and educative initiatives are also noted.

In general, environmental legislation, particularly at the provincial level, was found to be sufficiently broad to prohibit pollution from diffuse or non-point sources.

However, at both provincial and federal levels, it is frequently the case that prior permits, licences or approvals - preventive controls - are not required for many of the land uses under consideration (e.g. agricultural drainage schemes, feedlot operations and animal wastes, application of fertilizers, transportation corridors generally, dredging). Thus, reliance is frequently placed on voluntary codes, in-house administrative procedures and non-environmental statutes to effectuate the equivalent of preventive environmental control. This general approach to non-point source pollution control can result in gaps in control effectiveness and unsystematic - if not arbitrary - abatement and enforcement.

Recently proclaimed environmental assessment legislation in Ontario may have some positive influence in reversing this situation, though its effective application to the myriad small, proposed and on-going, land disturbing activities is doubtful.

In the context of new urban development, planning legislation is the principal control instrument. The separation of planning and pollution control functions can only be bridged where there is great cooperation between agencies responsible for these two mandates. Frequently,

difficulties can be generated for effective non-point source control because of this institutional separation of functions.

On the other hand, land use activities such as extractive operations and waste management and disposal sites, were found to be dealt with through preventive environmental legislation, permits and approvals as a matter of course. However, a variety of factors, both external and internal to the responsible agencies, appear to influence regulatory effectiveness in these areas as well (e.g. increasing waste generation foreclosing certain approval and enforcement options, limited staff resources, conflicting policies, abandoned operations etc.)

Government use of fiscal tools was also found to be a mixed approach with both positive and negative initiatives emerging. Federal opportunities exist, for example, to fiscally stimulate non-point source controls as a condition of funding housing development. Provincial resource recovery efforts hold promise of positively, if indirectly, aiding water quality in future by reducing the need for waste disposal sites. On the other hand, federal/provincial agreements for fiscally stimulating agricultural soil conservation have generally been permitted to lapse.

**CHAPTER ONE:
OVERVIEW**

OVERVIEW

<u>CONTENTS</u>	PAGE
PART ONE: LAND USE AND WATER QUALITY --TECHNICAL BACKGROUND	6
I. THE NATURE OF THE NON-POINT SOURCE POLLUTION PROBLEM FOR GREAT LAKES WATER QUALITY	6
PART TWO: SUMMARY ANALYSIS OF INSTITUTIONAL CONTROLS	14
II. INSTITUTIONAL CONTROL MECHANISMS: DEFINITIONS AND SUMMARY TABLES	15
III. THE INSTITUTIONAL RESPONSE: SUMMARY DISCUSSION AND CONCLUSIONS	27
A. Federal Government	27
1. Fiscal Activity	28
2. Jurisdictional or Regulatory Activity	30
a. Preventive Pollution Controls	31
b. Reactive Pollution Controls	33
3. Proprietary Activity	33
a. Federal Land Management	33
b. Federal Facilities and Property	34
B. Provincial Government	35
1. Planning Function	35
2. Pollution Control Function	37
a. Preventive Pollution Controls	37
b. Reactive Pollution Controls	41
3. Direct Provincial Actions	44
4. Provincial Use of Financial Incentives	45
5. Provincial Acquisition of Hazard and Sensitive Land Areas	46

	Page
C. Regional Government	46
1. Planning	46
2. Regulation	47
3. Management	48
4. Conflicts with Other Government Levels	49
D. Conservation Authorities	50
1. Involvement in the Municipal Planning Process	50
2. Conservation Authorities as Regulators	51
3. Conservation Authorities as the Regulated	53
4. Other Conservation Authority Roles - Funding and Technical Assistance	53
E. Municipal Government	53
1. Official Plans, Zoning, Environmental Plans and Protection Areas	54
2. Subdivision and Related Controls	55
3. Other Municipal Regulatory Initiatives	56
4. Direct Municipal Actions and Practices	57
F. Public Participation and Court Action	58
1. Public or Administrative Hearings	58
2. Advisory Committees	59
3. Court Action	59
4. Private Prosecutions	59
a. Injunctions/Public Nuisance Actions and	60
b. Judicial Review	

PART ONE. LAND USE AND WATER QUALITY - TECHNICAL BACKGROUND

I. THE NATURE OF THE NON-POINT SOURCE POLLUTION PROBLEM FOR GREAT LAKES WATER QUALITY*

INTRODUCTION

The growing realization over the last decade that the control of point sources of water pollution would not provide the ultimate solution to the improvement in water quality for the Great Lakes has caused investigators to look to other areas where human activity has induced an imbalance with the natural environment. In the Great Lakes Basin these investigators have been supported by a variety of institutions and intergovernmental agreements, including the 108 and 208 programs under U.S. Public Law 92-500; the Corps of Engineers, Lake Erie Wastewater Management Study; the Canada/Ontario Agreement on Great Lakes Water Quality investigations of urban drainage and sewage sludge disposal, and the International Joint Commission's Pollution from Land Use Activities Reference Group.

DEFINITION

All of these programs are in one way or another addressing what has been termed the non-point or diffuse source pollution problem. Non-point or diffuse source pollution is usually defined as including all those sources of pollutant inputs to surface and groundwater, with the exception of discharges from industry and municipal sewage treatment plants (point source pollution). The importance of non-point sources of water pollution to the Great Lakes System has recently been emphasized by the preliminary findings of the Corps of Engineers Lake Erie Wastewater Management Study. The Corps indicated that approximately 44% of the tributary phosphorus loading to Lake Erie could be attributed to diffuse or non-point sources of pollution.¹ Therefore, despite treatment facilities in the Lake Erie Basin, the Lake Erie study objectives for phosphorus will not be met without a significant alteration to the present non-point loading.

CATEGORIES

Non-point source pollution can generally be subdivided into three major pollutant categories which are associated in varying degrees with a wide variety of land use activities. These three categories include sediments, nutrients and toxic substances. Each exerts a different impact which must be addressed in any discussion of the non-point problem.

* Part One of Chapter One, describing the nature of the non-point water pollution problem (exclusive of Table 1.1), was prepared by Garth E. Bangay. Mr. Bangay is the Co-ordinator for the Pollution from Land Use Activities Reference Group related activities of the Environmental Protection Service, Ontario Region, of the Federal Department of Fisheries and the Environment.

1. Corps of Engineers, Buffalo District, Lake Erie Wastewater Management Study. Preliminary Feasibility Report Vol. 1 Main Report. Buffalo, New York, December 1975.

Sediments

Over the years, the economic impact of erosion and sedimentation has been well documented. The loss of valuable topsoil from agriculture during the 1930's and the resultant loss in productivity experienced in those areas most severely effected is an important part of North American history. The sedimentation of reservoirs and harbours has been another negative impact of the sediments' movement from upland areas. It often results in expensive dredging to maintain the integrity of these facilities.

These fine grained materials may also create turbidity problems in streams and lakes which result in reduced light penetration with possible detrimental implications for the biological community.

Recently a number of studies have demonstrated that sediments not only constitute a physical problem but also can exert a significant water quality impact. Sediments, especially the smaller size fractions, i.e. clay, readily adsorb a wide variety of pollutants including nutrients, pesticides and toxic substances. In some instances, these materials form strongly cohesive bonds with the sediments and are unavailable to the aquatic environment, while in other cases the sediments merely act as a transport mechanism for these materials carrying them from upland areas to the Great Lakes, where they become available to the biological system.,

Nutrients

The two nutrients of primary concern in any discussion of water quality impacts are nitrogen and phosphorus. Excessive nitrogen levels are primarily a concern as they relate to the contamination of potable water supplies. In the nitrate form, nitrogen is extremely mobile and moves readily with water percolating through the soil profile to groundwater. This potential problem is of special concern in areas where groundwater constitutes the major source of water for human and livestock consumption.

In contrast, increasing phosphorus levels are more closely associated with the problem of over enrichment of receiving waters, leading to species alteration and increased levels of biological activity. The control of this natural aging process, which can be greatly accelerated by artificially increasing the supply of phosphorus, was a primary focus of the 1972 Canada/United States Agreement on Great Lakes Water Quality.² Unlike nitrogen, which more often moves through the soil profile, phosphorus is generally transported overland either in solution or attached to soil particles.

Toxic Substances

Organics

Pesticides

A good deal of early environmental concern focused on the residuals of the organochlorine pesticides which were widely used throughout North America. While it is true that significant residues of those earlier pesticides are still found in the aquatic environment, the banning of their use in most jurisdictions obviate this problem with time.

2. Can/U.S. Agreement on Great Lakes Water Quality. Signed at Ottawa, April 15, 1972. Entered into force April 15, 1972.

Today the onus is on pesticide manufacturers to demonstrate that new pesticides will not exert a harmful impact and that they will be environmentally degradable. G. Chesters³ has indicated however, that "even with the use of less persistent pesticides, residue build up may occur through increasing use of repeated applications. The accumulation and impact of the degradation products of readily degraded pesticides in the environment are relatively unknown."

Other Organic Compounds

These substances which are often characterized by their minute quantities, their persistence and the danger of their eventual biomagnification are used in a wide variety of applications and uses throughout the Great Lakes Basin. PCB's and Mirex are only two of a larger number of organic compounds which have recently become a significant environmental concern. These materials may gain access to the Great lakes through atmospheric precipitation, direct effluent discharges, runoff from the land surface and through movement with water infiltrating to groundwater.

Inorganic

Metals

Problems in the aquatic environment associated with metals have most notably been associated with the harmful impacts of mercury and lead. However, other metals do enter the aquatic system from point source discharges and from runoff from a variety of land use activities including urban and agricultural areas.

Identification of problems associated with metals are hampered by a number of factors including some of those affecting organics, low concentrations at point of discharge, biological availability, problems of biomagnification and toxicity.

Radioactivity

Problems associated with radioactivity have been identified in Lake Huron and Lake Ontario.⁴ The primary sources of contamination are associated with atmospheric fallout of nuclear weapons testing debris and the discharge of radionuclides at power reactors and fuel production and reprocessing plants. Only a few localized problems have been associated with leachates from land fill sites or tailings piles.

-
3. G. Chesters, V. Simsiman. Pesticides, Agriculture and the Great Lakes. Great Lakes Basin Communicator, September 1975.
 4. Great Lakes Water Quality Board, Great Lakes Water Quality Fourth Annual Report to the International Joint Commission, July 1976.

LAND USE-POLLUTANT RELATIONSHIPS

In the Great Lakes Basin, the level of these potential pollutants generated by individual land use activities varies greatly. The following brief discussion will hopefully provide some appreciation of the potential problem associated with each.

In terms of the total land area in the Great Lakes Basin, forest land accounts for the largest portion - 59 percent, followed by agriculture -33 percent, and urban - 6 percent. Among these three dominant land use classes, which account for 98 percent of the total land area of the Basin, activities associated with urban and agricultural land use probably present the greatest potential for contributing significant levels of pollutants from non-point sources. Activities associated with forest land do have some potential for contributing pollutants, but this is primarily restricted under present practices to the disturbance of the soil vegetative cover during active harvesting operations and for a one or two year period prior to the reestablishment of this protective cover. In the Great Lakes Basin only a small portion of the available forest land is harvested in any one year, thus minimizing the impact of this activity.

Agriculture is the Basin's second largest land use component and, although approximately 56 percent of the Basin's agricultural land is in low intensity uses such as pasture and range land, the remaining 31,426 square miles is cultivated intensively. The increasing cost of land as an input to agricultural production coupled with improved production technology - inorganic fertilizers, pesticides, and crop hybridization, has encouraged farmers to concentrate their activities on a much reduced land base. Many of these new practices do hold the potential for exerting negative environmental impacts.

As a part of this intensification of agricultural activities, farmers are increasing their acreages of row crops such as corn and soybeans, which have the highest erosion hazard while reducing the acreages in crops such as forage and pasture, which present a much lower risk.⁵ These field crops also receive the heaviest inputs of pesticides and fertilizers, thus further enriching the eroded soil particles detached and transported from these areas.

The feeding of livestock and poultry also reflects the new emphasis on the intensification of agricultural production. Problems associated with these activities primarily relate to the mismanagement of animal wastes, including lack of sufficient and/or properly constructed storage facilities and the incorrect land application of wastes. Livestock and poultry wastes may contribute

5. W.T. Dickinson, G.J. Wall. Temporal Pattern of Erosion and Fluvial Sedimentation in the Great Lakes Basin. Geoscience Canada. Vol. 3, No. 3, August 1976:.

to water pollution in many ways, such as nutrient enrichment of receiving waters, the addition of pathogens some of which may be harmful to human health and the depletion of oxygen supplies.

Although urban areas occupy a significantly smaller portion of the Basin's total land area, they do support a disproportionate share of the Basin's total population. In 1971, approximately 80 percent of the Basin's population was classified as living in urban areas.

The two major non-point sources of pollution associated with urban areas are excessive sediment losses, especially during periods of construction, and discharges of complex wastes during periods of stormwater runoff. Most sediment losses associated with urban areas primarily occur during periods of large scale urban land developments. Often the construction practices used in these developments result in the destruction of the protective vegetation cover and the exposure of the lower mineral soil horizons less resistant to erosion. Sediment yields from land undergoing these development practices may be one thousand times greater than yields found on adjacent undeveloped land.⁶ Similar problems of accelerated erosion and sedimentation are also associated with other major land disturbances occurring outside urban areas, including construction of major transportation and utility corridors.

The relatively impervious nature of established urban areas (from 30 to 100 percent of the area may be classified as impervious depending on the specific use), results in the rapid runoff of precipitation and acceleration of downstream sedimentation and erosion. This runoff, especially during the period of first flush, may carry a wide range of pollutants due to the complex and often unregulated nature of the activities taking place in urban areas. Thus the problems of both quality and quantity must be addressed in providing any final solution to the problem of urban runoff.

In the Great Lakes Basin, extensive areas of land are used for the disposal of wastes generated by urban areas. These wastes include liquid sewage sludges, industrial effluents and sludges, wastewater from private residential treatment systems and solid wastes generated from residential, industrial and institutional sources.

The highly contaminated nature of these wastes, the large quantities produced on a daily basis, and the minimal control exerted on disposal practices in many jurisdictions, has resulted in these sources of non-point water pollution becoming a significant concern. In Ontario for example, 4.3 million gallons of sewage sludge are produced per day. Approximately 41% of this sludge is incinerated and of the remainder, about 70% is disposed of on farmers' fields., 20% into sanitary

6. R.L. Walker and Partners. Contribution of Sediments and Other Pollutants to Receiving Waters from Major Land Development: Activities. Environment Canada, April 1974.

landfills and 10% by other means.⁷ Problems associated with the disposal of sewage sludges have included the migration of heavy metals and other persistent polluting chemicals through the soil to the cultivated crops, from the soil surface during runoff events, and through the soil into groundwater supplies. These problems combined with those of nutrient runoff increase the risk of water pollution.

A significant number of the previously established solid waste sites in the Basin were located in areas where the risk of polluting both surface and groundwater exists. The quality and rate of movement of leachates from these sites is not well-known due to the relatively unknown nature of the inputs to these sites and the lack of knowledge concerning rates of degradation and methods of leachate movement.

In the Great Lakes Basin there are approximately 7.1 million people being served by private waste disposal systems⁸, thus creating the potential for significant water quality impacts. These problems have developed because of a lack of knowledge about the soil processes acting on these effluents, under-designed systems, poor site selection and a lack of ongoing system maintenance.

In the foregoing discussion of the impacts of a variety of land use activities on water quality, it has become apparent that some land use activities have created problems where none previously existed, while others have simply accelerated or modified a natural process. The contribution of pollutants from lakeshore and riverbank erosion would correspond most closely to this latter category.

In the lower Great Lakes (Erie and Ontario) fine grained sediments derived from shoreline erosion represent the most significant portion of the total fine grained sediment load to these waters⁹. Tributary loadings are less significant and preliminary data would seem to indicate that the material eroded from riverbanks represents only a small and variable portion of the total tributary load. Studies are still underway to ascertain the biological availability of those nutrients, pesticides and chemicals associated with these sediments. Until these studies are completed it will be difficult to assess the real impact of this input.

7. S.A. Black, N.W. Schmidtke. Overview of Canadian Sludge Handling and Land Disposal Practices and Research. Proceedings of the Sludge Handling and Disposal Seminar. Toronto, Ontario. September 18-19, 1974.

8. International Reference Group on Great Lakes Pollution from Land Use Activities. Joint Summary Report, Canada-United States on the Inventory of Land Use and Land Use Practices. International Joint Commission, September 1976.

9. A.L.W. Kemp, R.L. Thomas, C.I. Dell and J.M. Jaquet. Cultural Impact on the Geochemistry of Sediments in Lake Erie. Journal of the Fisheries Research Board. V. 33N.3, 1976. p. 440-462.

Much of our brief experience in the field of water pollution control has been related to point sources. These sources which can often be easily identified and monitored at the specific point of discharge have been relatively easy to deal with in comparison to the problems which face us in the field of non-point pollution control.

SUMMARY

Non-point sources of water pollution are characterized by their wide variety and large number of sources, the seemingly insignificant nature of their individual contributions coupled with the often damaging nature of their cumulative impacts, the intermittent nature of their inputs, the little understood natural processes acting to modify these inputs, and the variety of social and economic interactions which affect these sources and their inputs. All of those complex interactions mitigate against finding a simple solution to such problems.

For reference purposes, Table 1.1 has been developed to outline the various land use categories, activities and potential contaminants generated that have been described above.

Table 1.1: LAND USE CATEGORIES, ACTIVITIES AND POTENTIAL CONTAMINANTS TO THE GREAT LAKES SYSTEM

LAND USE CATCATEGORY	LAND USE ACTIVITY	CONTAMINANT TYPE
1. Urban Areas	<ul style="list-style-type: none"> - residential, commercial and industrial construction site runoff - stormwater runoff generally 	<ul style="list-style-type: none"> - primarily sediments, chemicals, nutrients and pesticides
2. Agriculture	<ul style="list-style-type: none"> - application of pesticides - application of fertilizers - feedlot operations /animal wastes - erosion from general farm practices - drainage 	<ul style="list-style-type: none"> - primarily nutrients, chemicals, pesticides and sediments
3. Transportation Corridor	<ul style="list-style-type: none"> - runoff from construction use and maintenance of - highways and roads - railroads - airports pipelines - hydro rights-of-way 	<ul style="list-style-type: none"> - primarily sediments, chemicals pesticides
4. Extractive Operations	<ul style="list-style-type: none"> - pits and quarries - mining - brines requiring disposal from oil and gas operations 	<ul style="list-style-type: none"> - primarily sediments and chemicals
5. Forested Areas	<ul style="list-style-type: none"> - timber production (including cutting operations, and construction, maintenance and use of roads) - woodland grazing - wildlife management - recreation (i.e. construction, maintenance and/or protection of recreation sites,forest roads and trails) 	<ul style="list-style-type: none"> - primarily sediments nutrients and pesticides
6. Liquid, Solid and Deepwell Disposal Areas	<ul style="list-style-type: none"> - solid wastes from residential, industrial, and institutional sources - liquid sewage sludges - private sewage disposal systems (i.e. septic tanks etc.) - liquid industrial wastes 	<ul style="list-style-type: none"> - primarily leachates from disposal sites and chemicals
7. Recreational Areas	<ul style="list-style-type: none"> - hiking - skiing - snowmobiling - riding - all-terrain vehicle use - pesticide use - private waste disposal systems associated with vacation homes 	<ul style="list-style-type: none"> - primarily sediments, nutrients, pesticides and chemicals
8. Shoreline Landfilling	<ul style="list-style-type: none"> - land or construction excavations - dredging activities 	<ul style="list-style-type: none"> - primarily sediments and chemicals
9. Lakeshore and Riverbank Erosion		<ul style="list-style-type: none"> - primarily sediments

PART TWO: SUMMARY ANALYSIS OF INSTITUTIONAL CONTROLS

Approach of this Part This Part of the Overview chapter is organized to serve two principal functions and audiences. First, Section II is designed for the reader interested in a particular land use activity (e.g. feedlot operations and animal wastes). The summary tables, which are organized by land use category (e.g. Agriculture), permit a quick review of the relevant institutional level's authority, organization and response to that specific land use activity when read in conjunction with Section III.

Second, Section III is designed for the reader interested in institutions and their authority, organization and response to land use/water quality problems generally. Section III can thus be read in its entirety for this purpose without reference to Section II. On the other hand, the Section II summary tables require the Section III conclusions in order to be properly utilized.

In general, however, II and III complement each other. For example, in Section III the land use categories are listed in the margins, where appropriate, so that cross-referencing from a table in Section II is facilitated.

Section II also defines the key types of control mechanisms and assigns a symbol to each (e.g. fiscal=F). In each land use category table, where appropriate, the symbol is linked to the land use activity, institutional levels) and Section III's substantive conclusions respecting the institutional level(s)' authority, organization and response to the particular problem. Each table also indicates the page in Section III where this review appears.

It should be emphasized that the identification of a land use activity with a control mechanism symbol does not necessarily mean that the area is adequately served by the mechanism. Reference to the Section III review is necessary. In a very few instances a judgement was made that a symbol should be used to draw to the attention of the reader, the Section III conclusion(s) respecting the lack of a particular type of control mechanism in relation to a land use activity. (e.g. lack of provincial preventive controls in relation to application of fertilizers).

In turn, the existence of a blank space for an institutional level and a land use activity usually implies (1) the lack of a substantive role because of constitutional/jurisdictional limitations (e.g. federal government and pits and quarries) or (2) that insufficient information was available to warrant a substantive finding under the Section III conclusions. Item 2 is the case mainly for Table 1.7 (Forested Areas) and Table 1.9 (Recreational Areas). In either case this does not necessarily mean that the activity has not been discussed in the background chapters (i.e. Chapters Two through Ten.)

Findings in this Part are based on the more detailed institutional review which is provided on a land use by land use basis in Chapters Two through Ten. Where necessary recourse should

be had to the relevant Chapter.

II. INSTITUTIONAL CONTROL MECHANISMS: DEFINITIONS AND SUMMARY TABLES

Definitions

The following are definitions for the key types of control mechanisms discussed in this study. Symbols that appear after each underlined phrase are meant for use in Tables 1.2 through 1.10.

- Pollution Control (PC) includes the control of specific projects or activities through legislation or regulations by Preventive (P)* or Re-active (R) means. Preventive control includes a situation where a proposed or continuing activity must receive an approval, permit or licence etc. from a designated agency prior to project implementation, or at periodic intervals. Reactive control includes a situation where an activity may proceed without prior approval, but is subject to control retroactively if pollution prohibitions or standards are violated. An example of a preventive control would be a certificate of approval prior to the establishment of a waste disposal site. An example of a reactive control would be a prosecution and fine for a fish kill from a feedlot operation.

- Planning (P)* includes a situation where a plan of a specific activity must be submitted prior to implementation of the activity, or where a municipal/regional government or the province develops a general or specific plan, which must be followed in approving and/or implementing subsequent specific activities. Examples would include a subdivision plan showing the stormwater and site runoff control measures to be employed during and after development and an official land use plan for a local area showing where, and what type of activities may be undertaken within the planning area.

- Fiscal (F) activity includes loans, grants, subsidies, taxing incentives or other funding measures or monetary assistance from a public agency to individuals, the private sector or groups or to other government levels or agencies to assist in improving or stimulating pollution abatement.

- Proprietary or Management (PM) responsibility for public lands property or facilities. This includes the guidelines adopted by a public agency on how it will maintain such lands, property or facilities, as well as how it views its responsibilities in relation to the controls of other public agencies. An example would be a harbour commission's expansion plans and practices and its response to environmental planning and sensitive area designations or constraints.

- Other Statutory Control (OS) includes an Act or regulation that has been implemented for another major purpose, but will have an indirect impact on environmental control. An example would be environmental constraints arising out of pipeline legislation.

- Non-Statutory Control (NS) includes programs, codes, guidelines that are not in direct response to a legislative mandate, but which are designed to reduce pollution. This includes educational and technical assistance programs and in-house administrative procedures. An example would be the voluntary *Agricultural Code of Practice* program or the federal Environmental Assessment and Review Process.

It should be noted that definition symbols may be combined. For example PCP = Pollution Control Preventive; or PNS = Planning but Not-Statutorily authorized.

*P when used alone means "Planning".

Summary Tables

Tables 1.2-1.10 have been developed for purposes that have previously been outlined above.

P - Planning *
 PC - Pollution Control
 F - Fiscal
 PM - Proprietary or Management
 responsibility

Table 1.2
LAND USE CATEGORY
URBAN AREAS

R - Reactive
 P - Preventive *
 OS - Other Statutory Control
 NS - Non- Statutory activity
 *P - When used alone means "Planning"

INSTITUTION

Land Use Activity	Federal Government		Ontario Government		Regional Government		Conservation Authorities		Municipal Government			
	Mechanism	Page	Mechanism	Page	Mechanism	Page	Mechanism	Page	Mechanism	Page		
Construction site runoff	F	128	P	35	P	46	PNS	50	P	54		
		29		36		47		51		55		
				PC		41		PC		47	52	56
						42				48	53	
Stormwater runoff generally	F	28	P	35	P	46	PNS	51	P	54		
		29		36		47		51		55		
						47		PC		47	56	
						48				48		

NOTE: "Identification of a land use activity with a control mechanism symbol does not necessarily mean that the area is adequately served by the mechanism. Reference should be had to the pages cited."

P - Planning *
 PC - Pollution Control
 F - Fiscal
 PM - Fiscal or Management responsibility

Table 1.3
LAND USE CATEGORY
AGRICULTURE

R - Reactive
 P - Preventive *
 OS - Other Statutory Control
 NS - Non- Statutory activity
 *P - When used alone means "Planning"

INSTITUTION

Land Use Activity	Federal Government		Ontario Government		Regional Government		Conservation Authorities		Municipal Government		
	Mechanism	Page	Mechanism	Page	Mechanism	Page	Mechanism	Page	Mechanism	Page	
Application of pesticides	PC	31	PC	39							
			NS	40							
Application of fertilizers	F OS	30 31 33	PC	39							
				42							
				43							
			NS	40							
Feedlot operations and animal wastes	F PC	29 30 31 32	P	36					PC	57	
				37							
			PC	39							
				42							
				43							
			NS	39							
Erosion from general farm practices	F	29 30	PC	39			PC	52			
				42				53			
				43							
			NS	40			NS	53			
			P								
Drainage	F	29	P	36							
			PCF	49							

NOTE: "Identification of a land use activity with a control mechanism symbol does not necessarily mean that the area is adequately served by the mechanism. Reference should be had to the pages cited."

P - Planning *
 PC - Pollution Control
 F - Fiscal
 PM - Proprietary or Management
 responsibility

Table 1.4

LAND USE CATEGORY

LIQUID, SOLID, DEEPWELL DISPOSAL AREAS

R - Reactive
 P - Preventive *
 OS - Other Statutory Control
 NS - Non-Statutory activity
 *P - When used alone means
 Planning

INSTITUTION

Land Use Activity	Federal Government		Ontario Government		Regional Government		Conservation Authorities		Municipal Government	
	Mechanism	Page	Mechanism	Page	Mechanism	Page	Mechanism	Page	Mechanism	Page
Solid wastes from residential, industrial and institutional sources	PM	34	PCP	37	PM	48			PC	57
				38						
			PCR	42 45						
Liquid sewage sludges	OS	31	PCP	38	PM	48				
	PM	34		39 42				49		
Private sewage disposal systems			PC	43						
Liquid industrial wastes			PC	38						

NOTE: "Identification of a land use activity with a control mechanism symbol does not necessarily mean that the area is adequately served by the mechanism. Reference should be had to the pages cited."

P - Planning *
 PC - Pollution Control
 F - Fiscal
 PM - Proprietary or Management
 responsibility

Table 1.5
LAND USE CATEGORY
TRANSPORTATION CORRIDORS

R - Reactive
 P - Preventive *
 OS - Other Statutory Control
 NS - Non-Statutory activity
 *P - When used alone means
 Planning

INSTITUTION

Land Use Activity	Federal Government		Ontario Government		Regional Government		Conservation Authorities		Municipal Government	
	Mechanism	Page	Mechanism	Page	Mechanism	Page	Mechanism	Page	Mechanism	Page
Runoff from construction, maintenance and use of Highways and Roads - Construction and upgrading			PC	40	PM	49	PC	57	PM	57
			PM	44				58		
- Salt use and storage			F	45						
			NS	57					PM	57
Railways	NS	32					PC	52		
	OS	32								
Airports	PC	32								
	NS	32	PC	40						
	OS	32								
	PM	34								
	PC	32								

NOTE: "Identification of a land use activity with a control mechanism symbol does not necessarily mean that the area is adequately served by the mechanism. Reference should be had to the pages cited."

P - Planning *
 PC - Pollution Control
 F - Fiscal
 PM - Proprietary or Management
 responsibility

Table 1.5 (cont.)

USE CATEGORY

TRANSPORTATION CORRIDORS

R - Reactive
 P - Preventive *
 OS - Other Statutory Control
 NS - Non-Statutory activity
 *P - When used alone means
 Planning

INSTITUTION

Land Use Activity	Federal Government		Ontario Government		Regional Government		Conservation Authorities		Municipal Government	
	Mechanism	Page	Mechanism	Page	Mechanism	Page	Mechanism	Page	Mechanism	Page
Pipelines	OS	32								
		33								
	NS PC	32 32								
Hydro rights-of-way			PC	40						

NOTE: "Identification of a land use activity with a control mechanism symbol does not necessarily mean that the area is adequately served by the mechanism. Reference should be had to the pages cited."

P - Planning *
 PC - Pollution Control
 F - Fiscal
 PM - Proprietary or Management
 responsibility

Table 1.6
LAND USE CATEGORY
EXTRACTIVE OPERATIONS

R - Reactive
 P - Preventive *
 OS - Other Statutory Control
 NS - Non-Statutory activity
 *P - When used alone means
 Planning

INSTITUTION

Land Use Activity	Federal Government		Ontario Government		Regional Government		Conservation Authorities		Municipal Government	
	Mechanism	Page	Mechanism	Page	Mechanism	Page	Mechanism	Page	Mechanism	Page
Pits and quarries			PC	43	P	49			P	49
				44		50				50
Mining	PC	33	PC	42					PC	57
				43						
				44						
Brines requiring disposal from oil and gas operations			PC	41						

NOTE: "Identification of a land use activity with a control mechanism symbol does not necessarily mean that the area is adequately served by the mechanism. Reference should be had to the pages cited."

P - Planning *
 PC - Pollution Control
 F - Fiscal
 PM - Proprietary or Management
 responsibility

Table 1.7
LAND USE CATEGORY
FORESTED AREAS

R - Reactive
 P - Preventive *
 OS - Other Statutory Control
 NS - Non-Statutory activity
 *P - When used alone means
 Planning

INSTITUTION

Land Use Activity	Federal Government		Ontario Government		Regional Government		Conservation Authorities		Municipal Government	
	Mechanism	Page	Mechanism	Page	Mechanism	Page	Mechanism	Page	Mechanism	Page
Timber production (i.e. cutting operations, construction, maintenance and use of roads, and regeneration)			PC	40						
Woodland grazing										
Wildlife										
Recreation sites, roads, trails										

NOTE: "Identification of a land use activity with a control mechanism symbol does not necessarily mean that the area is adequately served by the mechanism. Reference should be had to the pages cited."

P - Planning *
 PC - Pollution Control
 F - Fiscal
 PM - Proprietary or Management responsibility

Table 1.8
LAND USE CATEGORY
SHORELINE LANDFILLING

R - Reactive
 P - Preventive
 OS - Other Statutory Control
 NS - Non-Statutory activity
 *P - When used alone means "Planning"

INSTITUTION

Land Use Activity	Federal Government		Ontario Government		Regional Government		Conservation Authorities		Municipal Government	
	Mechanism	Page	Mechanism	Page	Mechanism	Page	Mechanism	Page	Mechanism	Page
Landfill and construction excavation	NS	32	PCP	40	P	49	PC	51		
			PCR	43				52		
Dredging	OS	32					PM	52		
		33								
	PM	34								
	NS	33								
	PCR	33								
	OS	33								
	PM	34								

NOTE: "Identification of a land use activity with a control mechanism symbol does not necessarily mean that the area is adequately served by the mechanism. Reference should be had to the pages cited."

P - Planning *
 PC - Pollution Control
 F - Fiscal
 PM - Proprietary or Management responsibility

Table 1.9
LAND USE CATEGORY
RECREATIONAL AREAS

R - Reactive
 P - Preventive *
 OS - Other Statutory Control
 NS - Non-Statutory activity
 *P - When used alone means "Planning"

INSTITUTION

Land Use Activity	Federal Government		Ontario Government		Regional Government		Conservation Authorities		Municipal Government	
	Mechanism	Page	Mechanism	Page	Mechanism	Page	Mechanism	Page	Mechanism	Page
Hiking										
Skiing										
Snowmobiling										
Riding										
All-terrain vehicle use										
Pesticide use										
Private waste disposal systems from vacation homes			PC	43						

NOTE: "Identification of a land use activity with a control mechanism symbol does not necessarily mean that the area is adequately served by the mechanism. Reference should be had to the pages cited."

P - Planning *
 PC - Pollution Control
 F - Fiscal
 PM - Proprietary or Management
 responsibility

Table 1.10
LAND AND USE CATEGORY
LAKESHORE AND RIVERBANK EROSION

R - Reactive
 P - Preventive *
 OS - Other Statutory Control
 NS - Non-Statutory activity
 *P - When used alone means "Planning"

INSTITUTION

Land Use Activity	Federal Government		Ontario Government		Regional Government		Conservation Authorities		Municipal Government	
	Mechanism	Page	Mechanism	Page	Mechanism	Page	Mechanism	Page	Mechanism	Page
Natural sources and human accelerated			PM	46	P	49	PC	52	P	49
			P	52			F	53		52

NOTE: "Identification of a land use activity with a control mechanism symbol does not necessarily mean that the area is adequately served by the mechanism. Reference should be had to the pages cited."

III. THE INSTITUTIONAL RESPONSE: SUMMARY DISCUSSION AND CONCLUSIONS

Constitutional powers The British North America Act of 1867, though not explicitly addressing water quality/land use matters, distributes the basis for legislative control over water pollution and land use between the provincial and federal levels of government.

The enumerated powers of the federal government include jurisdiction over navigation and shipping, certain harbours and canals, the public debt and federal property, lands reserved for Indians, fisheries, works declared by Parliament to be for the general advantage of Canada (e.g. nuclear facilities), interprovincial works and undertakings such as railways, trade and commerce, defense establishments, the criminal law and, under a residual clause, competence to enact legislation for the "peace, order and good government" of Canada in relation to all matters not coming within the subjects assigned exclusively to the provinces.

The enumerated powers of the provincial government include property and civil rights, matters of a merely local or private nature, local works and undertakings (pertaining to transportation and related systems), municipal institutions, the management and sale of public lands and, natural resources.

Both levels of government may legislate with respect to agriculture.

The allocation of legislative powers gives the province the principal authority and scope for land use and water pollution control. However, federal authority for several matters (e.g. navigation and shipping, fisheries, certain harbours and transportation matters such as airports, pipelines and railways of an interprovincial nature) makes it evident that land use/water quality decision-making can be influenced by federal responsibilities.

A. Federal Government

The federal government can address problems of land use and water quality through its capacity to financially stimulate sound land use practices in the private sector, by regulating certain products and land disturbing practices under federal jurisdiction and by undertaking exemplary management of federal lands, properties and facilities.

Review of federal fiscal, regulatory and proprietary action suggests that while some positive initiatives are in place, developing or under consideration, federal programs are also marred by conflicting goals and objectives. These conflicts are illustrated by the discontinuance or absence of fiscal incentives for promoting certain land management techniques for water quality protection; inadequate federal preventive legislative strategies where provincial authority may be in doubt and; lack

of co-ordination between agencies brought about, in part, because responsibility and authority for environmental protection is fragmented at the federal level.

Such conflicts may also contribute to land use/water quality planning problems at the regional or local level. Eliminating conflicting objectives at the federal level could improve land use/ water quality planning and control at other levels of government as well.

1. Fiscal Activity

Federal fiscal activity can consist of loans, grants, taxing policies, subsidies or other funding measures to the private sector or to other government levels for improving land use techniques to control water pollution.

Some federal fiscal initiatives or opportunities appear promising. A number of federal incentive approaches offer only partial solutions or address some land use concerns but not others. Still other federal programs are silent, vague or unsystematic as to what environmental criteria are being applied before federal monies are dispensed.

Urban
Areas

* Some federal programs, which could be construed as permitting funding for non-point controls are not being used to do so. For example, under the National Housing Act, the Central Mortgage and Housing Corporation (CMHC) could require, as a condition precedent to financial assistance, that recipients of funding for land assembly and new communities adopt appropriate sediment control plans and laws. This option is not under consideration by CMHC.

* Recent amendments to the National Housing Act appear to permit financial assistance for quantity control of stormwater. Several CMHC research studies respecting on-site retention of storm water are being undertaken. Moreover, 8-10% of the monies made available for such projects can be used for design and supervision. It is conceivable, according to CMHC officials, that some of these funds could be made available for monitoring and related matters, during certain phases of construction activity. (Monitoring and inspection by local agencies, are frequently the heart of effective non-point controls.) However, loan forgiveness of more than the current 25% authorized by the Act may be needed if monitoring during the construction phase is to be financially viable for some local agencies.

* Funding for quality or treatment control of stormwater is not authorized under the National Housing Act. (Research is being undertaken by CMHC to determine what the costs to CMHC could be on a national scale, if stormwater treatment is required.)

* The CMHC's funding of pollution control goes largely - and until the recent amendments went exclusively - for the point source pollution aspects associated with sewerage projects. To the extent that this funding encourages, or makes possible, new urban developments, with little or no funding available for control of non-point source pollution, the CMHC might be said to encourage the more diffuse aspects of water pollution associated with new urban development.

Agriculture * Some federal fiscal programs provide assistance for certain types of non-point controls but not others. This approach suggests either a federal preference for technical/structural solutions (e.g. abatement equipment or processes) as opposed to non-structural alternatives (e.g. re-vegetation), or federal budgetary constraints, or both. For example, federal income tax regulations respecting accelerated capital cost allowances (ACCA) permit farmers to write-off over a two-year period the total cost of equipment or processes installed for the prime purpose of controlling water pollution from animal wastes associated with feedlot operations or other farm structures. However, re-vegetation of stream-banks or fence emplacement to control cattle stream-watering and bank erosion are not eligible for tax allowances under the ACCA program.

* Federal fiscal programs with soil and water conservation elements have been discontinued in Ontario under federal/provincial agreements, though the statutory base for such projects continues to exist. This is the case with post-1970 Canada-Ontario Agricultural and Rural Development Agreements (ARDA). Soil and water conservation was previously eligible for federal-provincial cost sharing assistance. Currently, no funds are provided under the ARDA program for control of soil erosion from general farm crop production practices. ARDA monies allocated in Ontario by the federal Department of Regional and Economic Expansion (DREE) go exclusively for outlet and tile drainage schemes.

* Other federal programs are silent, vague or confusing as to when they will apply environmental criteria - and the nature of such criteria - as a pre-condition to the issuance of a loan or grant. The result, in some instances, may be federal funding that subsidizes water pollution. For example, DREE is providing partial funding for agricultural drainage schemes that would appear to be receiving inadequate pre-environmental scrutiny at the provincial level. (See Provincial Government.)

Similarly, before the Farm Credit Corporation (FCC) will issue a loan for a farm building improvement, including a livestock operation, the FCC may require that the applicant have his proposal reviewed pursuant to the voluntary Agricultural Code of Practice certificate of compliance program established by the province. However, the FCC does not outline its criteria for when it will deem it necessary, as a pre-condition to a loan, that a proposal should be so evaluated. Moreover, the FCC indicates that because of the unclear legal status of the Code compliance

certificate, the failure to be granted one is never the reason given by the FCC for turning down a loan application. The FCC may still turn down the application on pollution grounds, though it itself has no expertise in such matters.

* Some federal programs could be better oriented to fostering agricultural water pollution control goals. However, whether the farm community would utilize these programs more so than now is problematic. For example, the purposes for which the FCC can make loans to farmers include the purchase of fertilizers. In future, such loans could be made on condition that the farmer undertake not to exceed recommended rates of fertilizer application, as disclosed in a soil test or crop needs analysis.

Similarly, under the Farm Credit Act, control of soil erosion might be encouraged by fiscal incentive. The Act permits loans for "permanent improvements" on the applicant's farm which could include erosion and sediment control measures. Under a related Act, the Farm Syndicates Credit Act, funds could be made available for purchasing equipment or erecting structures related to erosion and sediment control. A syndicate must be made up of three or more farmers, and the loan purpose must be for their mutual benefit. FCC officials indicate, however, that no funds have ever been approved for such purposes and they do not anticipate a significant demand in future.

2. Jurisdictional or Regulatory Activity

Federal regulatory or jurisdictional control may be either preventive or reactive. Preventive controls normally require either the prior government registration of a product before use or prior government approval before a land/water activity may take place. These controls may be exercised under legislation specifically directed to environmental control or else as ancillary measures arising out of legislation directed to the facilitation of certain types of development (e.g. pipelines).

The federal government has also developed a number of strategies that are not based on legislation but, are meant to serve as substitutes for preventive legislative control. These include administrative arrangements and guidelines. While of no legal effect these approaches may be viewed as transitional tools between no legislative control and future preventive legislative options.

Reactive controls are the application of sanctions (frequently prosecutions and fines) arising from the breach of statutory prohibitions or prior approvals. In some land use activities under federal jurisdiction, reactive strategies may constitute the principal, if not, exclusive, federal legislative control instrument. Where preventive legislative strategies for certain land/water activities are not employed under federal law, federal reactive tools appear less effective in exercising the desired environmental control.

a. Preventive Pollution Controls

Agriculture * Both pesticide and fertilizer products are subject to prior constraints respecting registration, labelling and ingredients by the Canada Department of Agriculture. The CDA can also control pesticide use by limiting product availability for certain uses and prohibiting pesticide use that is inconsistent with labelling directions. But once pesticides and fertilizers have been bought by the farmer, CDA has no licence, permit or approval control over how he actually uses them, and in what quantity or rates of application.

Agriculture and Disposal areas * Where sewage sludge is first sold, it would appear to be open to the Canada Department of Agriculture (CDA) to regulate its market availability under the Fertilizer Act, if it is intended to be applied to agricultural lands as a fertilizer or fertilizer supplement.

Agriculture * Unlike the Pest Control Product Act, the Fertilizer Act does not legislatively authorize the CDA to refuse to register or continue to register a product if its use, in CDA's opinion, would lead to an unacceptable risk of harm to the environment alone. However, environmental review does occur under current CDA administrative arrangements.

* It would appear that future regulation of pesticides and fertilizers by CDA will continue to emphasize controlling their market availability but not regulating the ultimate users, farmers, *per se*. This would appear to be a function of constitutional/jurisdictional and administrative constraints.

* There is no regulation of water pollution from feedlot operations or animal waste handling or land spreading under federal legislation. A framework for such control could be adopted pursuant to the federal Fisheries Act. The Fisheries Act prohibits the deposit of deleterious substances of any type in water frequented by fish. It also authorizes the federal Minister of Fisheries and Environment to require plans of any operations which are likely to result in the deposit of deleterious substances of any type in water frequented by fish. Such plans may be modified or the operation prohibited by the Minister with Cabinet approval. Regulations prescribing substances and classes of substances in fish frequented water could be promulgated by the Minister with cabinet approval.

The Environmental Protection Service (EPS) of the Department of Fisheries and Environment (DFE) is developing national effluent standards for intensive feedlot operations. It has not been determined whether such standards will be enforceable in the sense of regulation pursuant to the Fisheries Act specifying allowable amounts and constituents of effluents and a schedule for achieving compliance or whether such standards will be a non-enforceable code of practice for the livestock industry to observe if it so desires. First expected in 1975, budget constraints and planning have delayed promulgation of any standards until 1979 or 1980.

Shoreline
Land-filling
and
Transportation
Corridors

* The recently amended Fisheries Act while giving DFE greater authority to protect fish frequented waters and aquatic habitat still suffers from serious preventive control flaws. These preventive control gaps and inadequacies are of concern especially where comprehensive provincial legislative authority may be in doubt because of constitutional/jurisdictional constraints. For example, the Minister's capacity to require plans and specifications from an operator is not, and is evidently not intended to be, used systematically, as though it were a permit system. It is rarely invoked for projects in Ontario which are otherwise under federal jurisdiction such as dredge and fill operations associated with navigation, shipping or certain harbours or construction associated with airports, pipelines or railways of an interprovincial nature. (This may in part be due to the fact that a Ministerial order under the Fisheries Act would have to relate to the protection of fish or aquatic habitat, not to water quality *per se*: though in practice there may well be few instances where this limitation would prevent the Act from being effective to protect water quality.)

* Other federal statutes do not provide adequate environmental constraints. For example, it is not possible to develop a water pollution control program for shoreline landfills under the Navigable Waters Protection Act (NWPA) whose sole purpose is protection of navigation. Thus, while exemptions to NWPA permit requirements for the dumping of fill have, at times, contained environmental conditions, where an application for a fill permit exemption has negative environmental implications, but would not infringe on navigation, the Ministry of Transport would have no authority to deny the granting of such an exemption.

* There are serious handicaps in using non-statutory administrative procedures as substitutes for preventive regulatory controls. This problem is best exemplified by the federal Environmental Assessment and Review Process. The EARP developed as part of a federal cabinet directive to control pollution from existing federal facilities and to prevent pollution from proposed federal works. It is intended to apply to projects that are initiated by federal departments and agencies, for which federal funds are to be made available, and where federal property or federal Crown lands will be used. Federal proprietary crown corporations (e.g. CNR) and regulatory agencies (e.g. NEB) are invited, not required, to participate.

* The problems with such an administrative process include the question as to which federal bodies the process applies to (e.g. harbour commissions appear unaffected by the process); EARP can be limited by conflicts with other cabinet directives and with laws that are silent on environmental matters, as well as by a tendency it has developed to concentrate on large development proposals and not the many smaller ones. The cumulative effects of such limitations can serve to make EARP neither a comprehensive nor a preventive planning non-point pollution control strategy.

* Environmental protection may frequently suffer because environmental control

responsibility and authority are fragmented between agencies at the federal level. For example, under the National Energy Board Act, the National Energy Board (NEB) and not the Environmental Protection Service of DFE, has the authority to decide what environmental measures must be carried out by companies during pipeline construction. While the NEB is knowledgeable with respect to environmental matters, environmental agencies have recorded subsequent in-the-field departures from NEB approved environmental requirements, which resulted in water quality problems.

Extractive Operations * Control regulations are more quickly made applicable to new operations than to existing operations - though the latter are frequently the reason the regulations were developed in the first place. While this process is understandable because it is designed to create a situation of fairness for the existing operator asked to meet standards arising from concerns evolving subsequent to the development of his enterprise, it also creates some difficulties. For example, frequently existing mining operations may considerably out-number prospective new, expanded or re-opened mines. The result is that the actual application of the regulations is initially quite narrow. To speed up the broader application of the regulations, compliance schedules are negotiated by the government and the individual mining operator, taking into account local diversity in both environmental conditions and mining operations. However, public consultation is not authorized in the development and approval of local timetables for compliance. These problems are exemplified in the recent base metal mining regulations promulgated by the EPS pursuant to the Fisheries Act.

b. Reactive Pollution Control

Shoreline Land-filling * Proposed dredging projects are entered into the EARP process, where they are subject to either environmental assessment or environmental design review. Recommendations from such reviews are incorporated into contracts between the Department of Public Works (DPW) and the dredging companies. However, limitations on staff and resources make it difficult for EPS to know if its recommendations are being followed - or, if they are being followed, whether they are effecting the desired results. The result is that frequently EPS cannot refine and improve upon its recommendations to DPW in future dredging proposals. Moreover, this difficulty may also result in the inability to enforce Fisheries Act pollution prohibitions, since insufficient on site review may result in insufficient evidence to prosecute a case.

Agriculture * Current and prospective CDA staffing and resource levels were also felt to militate against the effectiveness of periodic inspections of certain agricultural activities such as fertilizer use techniques and application rates.

3. Proprietary Activity

a. Federal Land Management

Shoreline
Landfilling

* Federal agency goals for federal land may sometimes result in the frustration of regional or local planning goals respecting minimization of water pollution and protection of significant marsh or wetland areas. For example, representations by a harbour commission to a regional government have in at least one case had the effect of changing the intended designation of federal land in a regional official plan from an environmental protection category to an industrial use category.

b. Federal Facilities and Property

A 1972 federal cabinet directive requires control of environmental pollution generated from federal facilities and property. A central fund was created for clean-up of existing federal sources of pollution.

Federal facilities and property pollution abatement has included studies, corrections and closures of solid and liquid waste disposal sites at defense establishments and stormwater control at airports.

Whether the original total amount allocated for the clean-up fund is sufficient to finish the clean-up effort at federal facilities is currently being evaluated. The cabinet directive does not authorize controlled allotment funds for preventing pollution from new federal proposals, though pollution control funds are expected to be included in the costs of new facilities themselves.

B. Provincial Government

Through its jurisdiction over planning and pollution control, the provincial government can control non-point source pollution to a far greater extent than can other levels of government. It can also wield considerable influence through the manner in which it conducts its own activities such as highway building and land acquisition. In addition, its use of fiscal techniques can make an important contribution in this area.

1. Planning Function

Legislation that regulates land use, such as the Planning Act or that introduces an element of environmental planning into develop-proposals, such as the Environmental Assessment Act, can indirectly and directly control non-point sources of water pollution because of the limitations that can be placed on where and in what manner human activities may take place.

The province can influence non-point water pollution control through its review of municipal official plan development and related matters; policies and conditions it insists be placed in municipal subdivision and redevelopment controls; and the province's own overall planning strategies.

The province's planning function is a complex one. However, a number of both positive and negative influences emerge, suggesting that with respect to planning for control of non-point source water pollution, the province has yet to develop a comprehensive, non-conflicting strategy. For example:

Urban
Areas

* The influence of the provincial Ministry of Environment respecting non-point concerns is evident in the development of recent area municipal and regional government official plans in Mississauga, Ottawa-Carleton and Sudbury. These draft plans include respectively references to controlling stormwater runoff (Mississauga and Ottawa-Carleton) and curbing bad land use practices that lead to water quality degradation (Sudbury).

* The across the board acceptance in subdivision agreements of stormwater runoff and sediment controls by the Ministry of Housing, however, would appear to be predicated on such controls not contributing to increased housing costs or to development delays. Legislation that would establish a permit system for controlling topsoil removal, erosion and ensuring rehabilitation has previously been rejected by the Housing Ministry to the extent it would apply to subdivision control under the Planning Act. Because such legislation has many of the same elements as a bill directed to sediment control, it is arguable that the Housing Ministry response would be the same to such a proposal.

* The development policies of the province, as set out in the Toronto-centred Region Plan and subsequent planning documents, will have a very significant effect

on the quality of water entering the Great Lakes system from the region's drainage basins. Key conservation authorities have commented to the province that the impact of the land development necessary for the very large population which is being planned for in the Toronto-Centred Plan, on the area's stream valleys and water resources, does not seem to have been accounted for. Complicating the question of where and how much development is appropriate, say these authorities, is the policy enunciated by the province in the North Pickering Development to preserve, as much as possible, the good agricultural land and develop for urban purposes the poorer agricultural lands. Environmental studies that were carried out, say these authorities, indicated that the greatest impact on the streams by urban development came from development located on the poorer agricultural soils.

Urban areas and Agriculture * The Environmental Assessment Act could conceivably introduce the rudiments of a systematic approach to planning for non-point source pollution controls in new development. However, perhaps to complement the above noted provincial development policy, new town developments when carried out by the Ministry of Housing have been exempted from the provisions of the Act. As an instrument for systematically planning for non-point source pollution controls the Act also has potential benefit in other areas of provincial planning activity such as agricultural outlet drainage schemes. However, such activities when carried out by the Ministry of Agriculture and Food have also been exempted from the provisions of the Act.

Agriculture * As a planning strategy for animal waste management, much attention has been devoted to the development of an Agricultural Code of Practice in conjunction with extant provisions of the Planning Act for authorizing municipal by-law control. The Code was originally developed primarily in response to air and odour problems where residential areas were permitted to encroach on still operating farm operations. In order to be acceptable for municipal by-law incorporation, however, a series of sophisticated separation distance formulae between residences and farm operations respecting air quality has been developed so that municipalities adopting such a by-law would be providing the proper guidance to farm operators. Such a scheme is workable for air quality under the terms of section 35 of the Planning Act because air quality control is principally a matter of location. As a systematic strategy for water pollution control from animal waste operations, however, the use of the Code in conjunction with by-laws authorized under the Planning Act is open to doubt because the by-laws and section 35 are silent on water quality.

First, the development of detailed separation distances for air quality between residences and farm operations was regarded as important if municipal by-laws were to be able to successfully withstand court challenge of their limitations of the use of private property. No such separation distances to watercourses for farm structures have been developed under the Code, however. Municipal zoning by-laws could, and many do, stipulate setback distances from watercourses. Separation distances from watercourses could also be utilized through conservation authority flood and fill line mapping. However, in both these cases the separation distance would usually be an arbitrary or fixed setback for all structures.

While of value in some cases, an inflexible or fixed setback may frequently be inadequate for farm operations in relation to water quality. This is itself suggested by the fact that different distances based on size and type of farm operation are themselves regarded as necessary to the success of the Code air quality separation distance formulae.

Second, with some exceptions, animal waste in relation to water quality is regarded as a management problem, not a problem of location. As such, section 35 of the Planning Act, a tool relating principally to location, may be wholly inappropriate for authorizing municipal by-law incorporation of an agricultural Code directed to waste management considerations.

Given the above, a municipality might be legally constrained in denying a building permit to a farmer for water quality/waste management reasons based on application of the Code where the farmer otherwise met the by-law separation distance formulae for air/odour considerations.

2. Pollution Control Function

Provincial pollution control strategies may be grouped into two categories; preventive and reactive. Preventive strategies include approvals, licences, permits and the like, employed before land use or management activities take place. Some preventive strategies may be of no legal effect, such as voluntary codes, publications and guidelines, though they may point to future government policy or regulation options. Reactive strategies include prosecutions, stop orders, control orders, program approvals and other remedial measures employed to an existing activity or operation that is or may be contributing to environmental degradation. Some reactive strategies may also be of no legal effect such as advisory committees on pollution abatement, though they may lead to other enforcement options.

Both the province's preventive and reactive tools contain gaps as to what they apply to and how they are applied. Some of the preventive gaps may be filled by the new Environmental Assessment legislation. The Act's application to the myriad smaller land use activities, particularly those in agriculture, is more problematic however. A number of important provincial preventive and reactive responses and problems are highlighted below.

a. Preventive Pollution Controls

Disposal
areas

* The provincial government is presently moving from merely approving and upgrading waste disposal operations, to fiscally encouraging various reclamation techniques (see Fiscal Incentives discussion below) which, if technically and economically viable, will reduce the quantities of waste to be disposed of.

* However, until such time as reclamation initiatives make a significant dent in the amount of waste, the province will continue to be in the position of approving waste disposal operations which, though better designed than they were in the past, still

have the potential for causing water quality (leachate etc.) problems. Provincial approvals therefore, at times, appear to authorize prima facie violations of statutory water quality impairment prohibitions.

* The province may grant an approval to an application for a waste disposal site expansion, even though there is the possibility of leachate contamination developing. Approval in these situations appears to be predicated on the notion that if and when the leachate problem develops, the operator, not the public, will have to take steps to correct the situation.

In apparent recognition of this problem, the province has begun to require private waste disposal operators in selected instances to post a bond or fund where leachate contamination may subsequently impair drinking water supplies of local residents.

* While provincial approval of waste disposal sites is normally based on their ability to operate with minimal pollution, such approvals may occasionally conflict with decisions of municipalities or provincial planning tribunals whose policies are based on the compatibility of land uses. Evidence on water pollution arising from operation of a site may also be heard by the latter planning bodies who may come to different and, ironically, more restrictive conclusions than the environmental tribunal.

* Toxic liquid industrial waste disposal regulation and policy may be found to be internally inconsistent in certain instances. Provincial government policy calls for reducing disposal of toxic liquid industrial wastes in deepwells, and also in surface landfill sites. However, in the face of currently insufficient industrial reclamation of liquid wastes and annually increasing quantities of such wastes, the two policies cannot be carried out simultaneously.

* The application of sewage sludge to agricultural lands is subject to prior government site approval through regulations and guidelines. However, the large volumes of land spreadable sludge that are generated by treatment plants and the relatively small number of Ministry of Environment approved sludge spreading sites suggests that operators may be spreading or dumping sludge in environmentally inappropriate places in some instances.

* While sewage sludge transfer stations are subject to environmental hearing board review before government approvals are given, the application of sewage sludge to agricultural lands is not subject to environmental board pre-scrutiny. One result of this is that the board has not adequately evaluated the sufficiency of recent provincial sewage sludge spreading guidelines and the soil conservation practices of farmers accepting sewage sludge. The guidelines are regarded as principal tools in ensuring environmental and water quality protection. However, the guidelines are silent about the need for certain soil conservation measures, such as terracing and strip cropping, by those farmers expected to accept sludge.

Agriculture * Ministry of Environment officials estimate that approximately 75% of all pesticides used in the province are applied on agricultural lands. Approximately 15% of this total

is understood to be applied by pesticide businesses and applicators. Both pesticide businesses and applicators must be licensed under Ontario law. The remaining 60% of pesticides are applied to agricultural lands by farmers or farmers helping neighbors. (This latter category is described as the "custom-sprayer". To be exempt from permit or licence requirements the custom-sprayer must have only one spray rig in operation at a time). Neither farmers nor farmers helping neighbors (as defined above) require licences or permits for pesticide applications, except for Schedule 1. (normally prohibited) pesticides.

* No prior approvals at the provincial level are required for fertilizer use and application on agricultural lands.

* No prior approvals are required for animal husbandry operations (feedlots) or generally for animal wastes disposal. Prospectively, large new, expanded or altered feedlots may require prior approval under the Environment Assessment Act, 1975. However, to date no feedlot proposals have been made subject to the Act.

* No prior approvals or permits are required for control of soil erosion and sedimentation from general farm crop production practices.

* No prior approvals are required for control of outlet drainage construction or operation. Drainage activities have generally been exempted from the provisions of the Environmental Assessment Act. Under the Drainage Act drainage proposals are not automatically subject to prior environmental review. However, if a local municipality, conservation authority or the Minister of Natural Resources requests that an "environmental appraisal" (not defined in the Act) be performed, it must be undertaken. The cost of such an environmental appraisal, however, must be paid for by the party who requested it. This provision is in contrast to the Environmental Assessment Act where the proponent of a proposal must pay for its assessment. The Drainage Act provision may provide a serious constraint to the systematic review of drainage proposals where agencies lack sufficient funds to request an appraisal.

* Voluntary and advisory programs or publications have been developed for a number of the above noted agricultural activities. These include the Agricultural Code of Practice, Ministry of Agriculture extension services, fertilizer and pesticide use publications, calendars, and demonstration programs and University of Guelph soil needs analysis services. While it is difficult to evaluate these activities as comprehensive substitutes for preventive regulatory controls, a number of observations may be drawn.

General recommendations in a Code of Practice respecting water quality protection are not necessarily adhered to by the agricultural community. For example, the Agricultural Code of Practice recommends that manure not be spread in winter. However, an Agriculture Ministry - University of Guelph sub-committee on environmental quality notes that it is its impression that winter manure spreading is extensively done in Ontario, and is seen to contribute significantly to nutrients to surface waters.

Government publications may sometimes fail to give appropriate instruction to the farmer where unnecessary pesticide use could otherwise be avoided. Commentators note that in some instances the Agriculture Ministry "Spray Calendar" will tell farmers when it is time to spray for a particular pest, but will neglect to tell them to be certain that the pest is actually on the crop before they spray.

Specific recommendations in a soil needs analysis are not necessarily adhered to by the individual farmer. One University of Guelph study found that 56% of farmers canvassed in one county made changes in soil test report recommendations that the Agriculture Ministry and the university researchers regarded as ill-advised.

* Little evidence was found of provincial advisory programs respecting agricultural soil erosion control.

Shoreline landfilling activities * No prior approvals or permits are required under the Environmental Protection Act for shoreline landfilling activity where the fill is clean or inert. Prospectively, such activities may require prior approval under the Environmental Assessment Act.

Transportation corridors * Provincial mechanisms designed to prevent or minimize sedimentation to streams and watercourses from highway and transmission line construction are in a period of transition. Highway agencies and utilities currently have voluntary programs to control soil and water pollution from such activities. They will, in future, with some important exceptions, be required to meet individual environmental assessment requirements and approvals before being permitted to proceed. Exceptions will include large projects deemed to be in an advance state of planning, and many smaller road upgrading and related activities for which generic or nonspecific assessments will be required. Because the environmental assessment requirement has only recently become law, it is not possible to tell whether it is a practical substitute for a statute directed to control of sedimentation from many smaller activities where individual site specific environment assessments have not been performed.

Forested areas * The first environmental assessment in the private sector under the Environmental Assessment Act is to be performed on a recent proposal involving 19,000 square miles of timber rights in Northern Ontario. ** The province has approximately 97,000 square miles of timber rights under licence. It is expected that general conclusions resulting from a generic environmental assessment will be incorporated into forest management plans and annual operating plans of individual licensees on these lands. It may be problematic at this early stage of the Environmental Assessment Act's evolution to ascertain whether general conclusions

** The province recently decided to review this proposal under The Public Inquiries Act as well.

under generic assessments are adequate and enforceable substitutes for site specific sediment controls.

Extractive operations

* Brines requiring disposal from oil and gas operations are subject to prior permit and regulatory control by the Ministry of Natural Resources under the Petroleum Resources Act to ensure that fresh water horizons or bodies of water are not contaminated. At the same time oil field brines, though designated as wastes under the Environmental Protection Act, are exempt from Ministry of Environment regulatory control under the EPA. This separation of authority is in contrast to related areas of mutual concern and regulation by the two ministries, such as deepwell disposal of liquid wastes and brines (other than oil field brines).

b. Reactive Pollution Controls

Examples of enforcement of environmental legislation in relation to non-point pollution problems can be found for several land use categories. Indeed, in a number of instances the enforcement action (normally a prosecution), is the first government exercise of reactive pollution control for the particular land use activity or private sector actor (e.g. the construction or land development industry). In this regard, the enforcement exercise establishes a precedent for reactive control which must be realized by other private sector actors engaged in similar uses of land.

However, the unique nature of such enforcement tools as applied to the land use area also suggests their limitations. The province, with some exceptions, has not developed an enforcement policy for non-point source pollution activities that treats them as systematic recurring problems. Provincial enforcement policy can best be described as fragmentary and oriented to responding to dramatic instances of pollution. The lack of a program approach to non-point pollution enforcement results in a failure to see the limits, if not inadequacy, of an enforcement strategy devoted to isolated problem solving.

Some longer-term provincial enforcement initiatives in relation to certain land use activities may be constrained by insufficient staff and funding resources, technology limitations, narrow judicial determinations, or operative gaps in existing legislation.

Urban areas

* There are no Ontario examples of prosecutions for sedimentation arising from construction site activities and runoff. However, a recent Supreme Court of Ontario decision (currently under appeal) has held that sand is a contaminant, under the meaning of the Environmental Protection Act, when human activity disturbs it from its natural state causing it to become airborne. (In this case, the human activity was topsoil removal during subdivision development). By analogy, the Ministry of Environment could probably prosecute construction activity that resulted in sedimentation to streams. However, where the construction of sewage works is done in accordance with an approval under the Ontario Water Resources Act, but still results in sedimentation problems, the Ministry would be statutorily barred from

prosecuting for pollution under the OWRA. The Ministry, in such instances, would have to prosecute under the EPA.

Disposal areas

* The province took over responsibility for control of waste disposal sites in 1970. Since then over 500 substandard sites have been closed. Some sites with water quality problems continue to operate under Ministry approval. The authorization for the continued operation of these sites, and others with potential for developing water quality problems (e.g. leachate), appears to be a function of the transitional nature of provincial reclamation techniques and the increasing wastes generated by the public and industry.

* Enforcement options including prosecutions, control and stop orders are rarely invoked respecting water quality concerns arising from waste disposal operations. Use of clean-up orders have occasionally been applied in one or two Ministry of Environment regional offices, although these orders more frequently relate to air quality and aesthetic concerns. Because most waste disposal operations are under provisional certificates of approval (as opposed to regular certificates of approval), the lifting of the provisional certificate is a Ministry option. Because of the exigencies of waste generation and the state of reclamation techniques described above, this option has its limitations.

Disposal areas and extractive operations

* The use of the program approval or other abatement scheme based on a time-table for compliance has been used in several land use areas. This process involves negotiation between the operator and the Ministry of Environment, in which such factors as the availability of technology and the economic position of the company are considered. Extensions to abatement compliance time-tables are also granted by the Ministry. Such extensions normally run from a few weeks to periods in excess of one year. Public involvement or consultation is not authorized or permitted, in the establishment of such compliance time-tables or in their extension.

Disposal areas

* The aims of certain enforcement techniques, such as prosecutions, would appear on occasion to be uncoordinated. In at least one case, a waste disposal area air pollution prosecution and subsequent clean-up resulted in the creation of a water pollution problem.

* Control of disposal area activities such as sewage sludge spreading on agricultural lands would appear to be undercut by insufficient field personnel. The large discrepancy between records of where sludge is going versus the total amounts of sludge that are generated by all sewage treatment plants in the province that have land spreadable sludge also indicates inadequate controls.

Agriculture

* Because of the lack of prior environmental approvals in most agriculturally related areas (e.g. fertilizer use, soil erosion, drainage activities, feedlots and animal wastes generally), subsequent systematic enforcement becomes highly important. There is little evidence, however, of the systematic use of enforcement tools in most

of these areas. This may be explained, in part, by the fact that frequently runoff from agricultural lands is so diffuse in nature, that identifying the main farm source from among many similar sources becomes impossible. This may also, in many instances, militate against effectively utilizing traditional remedies, such as prosecutions, against sources of land runoffs. (Identifying a feedlot operation as a polluter, especially where a stream ran through the operation, would not necessarily present comparable enforcement problems to land runoffs.) Given scant field resources, abatement efforts tend to concentrate on the more dramatic pollution instances, such as fish kills.

* The combination of no prior approval requirements and unsystematic enforcement makes it evident that agriculture, with some exceptions, is essentially unregulated, and is dependent on voluntary compliance with good farm practices and farm codes.

Shoreline landfilling activities

* The effectiveness of provincial enforcement options in relation to controlling clean fill dumping on private property wetlands has been constrained by judicial determinations that have strictly construed such options in relation to the use of private property.

Recreational areas and disposal areas

* The Ministry of Environment conducts annual surveys of existing private home sewage systems in selected recreational areas. These surveys indicate that many such systems are inadequate. While remedial and enforcement activity is undertaken where problems are identified, the great number of cottages in the province (estimated at 250,000) and the relatively small number of cottages surveyed annually (approximately 5,000), suggests that, given current funding, it will be the year 2020 before all existing cottage systems are reviewed and deficiencies corrected.

Extractive Operations

* The Ministry of the Environment has the principal responsibility for controlling water pollution from mining, pits and quarries, and related activities. However, administrative and statutory responsibility for control of some aspects of these activities with water pollution implications, such as rehabilitation, is vested in the Ministry of Natural Resources. There are some problems along the dividing line between the two Ministries - including overlaps, gaps covered by neither of them, and areas where the MOE is responsible for the ends, but the MNR controls the means.

* Under the Mining Act the MNR has the authority to require that a bond or security deposit be posted by the mining operator in an amount necessary to complete rehabilitation. However, security deposits for rehabilitation of mine tailings areas have rarely been required by the Ministry of Natural Resources.

* Abandoned mines are regarded as the principal environmental problem in the mining industry. There are approximately 30,000 such mines in Ontario, though no

more than 30 to 50 are regarded as contributing to significant environmental degradation. A multi-million dollar program has been initiated by the provincial government to identify and clean up abandoned mine tailings. The Ministry of Environment is also attempting to ensure that future mine operations observe Ministry guidelines for the post abandonment control of contaminants. However, techniques for ensuring post abandonment control of contaminants (e.g. re-vegetation) can only be required through the Mining Act.

* The principal provincial statute in relation to pits and quarries control and rehabilitation, administered by the Ministry of Natural Resources, does not apply to large numbers of such operations in the northern, southwestern and eastern portions of the province.

* Rehabilitation of pits and quarries sites, under the Pits and Quarries Control Act, has been found to be inadequate according to a provincial working party report. Gaps in the legislation and its enforcement respecting rehabilitation, have been compounded by insufficient staff resources.

3. Direct Provincial Actions

Provincial agencies are directly involved in land use activities that can have an adverse impact on water quality, These include road and highway construction and upgrading, development of public housing and related matters.

Trans-
portation
corridors

* The Ministry of Transportation and Communication (MTC) has developed an environmental program that includes erosion and sediment controls that are incorporated into its contracts for construction of provincial roads and highways. The agency has also sponsored studies into the effectiveness of its sediment control measures on specific construction projects.

* The MTC program is not based upon, or required by any statute. Because of this, while the program is of precedential and experiential value, there may be wide fluctuations from project to project, in the types of controls which are applied and in their effectiveness, due to economic and other factors. Moreover, even when the control measures required by the contract between MTC and the construction contractor are adequate, field enforcement of their provisions may present a problem. This difficulty arises from the fact that the relationship developed by this type of program is contractual, not regulatory. If environmental provisions are violated by the construction contractor, effective enforcement options, such as stop or control orders, are not possible under a contractual relationship as they would be under a regulatory one. Moreover, as the owner of the facility being built, the MTC is unlikely to resort to such enforcement techniques in any case.

* The transition to regulation under the Environmental Assessment Act is regarded as likely to alleviate this problem for the new provincial highway projects undertaken in future. However, the effectiveness of the Act for controlling sedimentation from

smaller MTC upgrading and related activities that are not subject to individual environmental assessments, may be doubtful.

4. Provincial Use of Financial Incentives

Fiscal techniques can be used to promote sound land use practices for water quality protection. There are a number of provincial financing, funding or other incentive activities affecting land use that may have both positive and negative impacts on water quality.

- | | |
|----------------------------------|--|
| Disposal areas | <ul style="list-style-type: none">* Since 1972, the province has been encouraging county and regional waste management area planning studies by the provision of a 50% provincial grant. Consolidation of a large number of landfill disposal sites into a few central treatment facilities is expected to result from this process. These facilities will be designed to be converted in stages to resource recovery, rather than remain merely disposal sites, as reclamation processes and equipment become practicable.
* The companion 15-year, \$500 million resource recovery program enables the province to provide the entire capital funding for the construction of transfer stations and front-end resource recovery plants, excluding the cost of land. Fifty per cent of this cost is recovered by the province as an annual charge spread over forty years. Commitments have been made to six regional municipalities or cities for the establishment of front-end plants and centralized facilities. Participation in such programs is at the discretion of municipalities. A projected development of subsequent stages of the resource recovery program over the next 10-15 years is the anticipated reduction in the need for sanitary landfill sites. This result is contingent on the satisfactory development of back-end resource recovery processes. |
| Trans-
portation
corridors | <ul style="list-style-type: none">* However, other provincial funding and subsidy mechanisms have not been utilized to steer recipients (e.g. municipalities) toward environmentally sound land use practices. For example, the MTC annually subsidizes municipal road construction with approximately \$300 million. MTC does not require, though, that as a condition precedent to a municipality receiving a grant, that the municipality undertake to ensure that appropriate sediment control measures are used in all such provincially assisted activity. MTC has not environmentally audited municipalities to determine which, if any, of those receiving provincial road building funds are undertaking such environmental measures on their own. |
| Agriculture | <ul style="list-style-type: none">* Some provincial programs have not been used to subsidize control of non-point pollution, though they could be authorized to do so. For example, under the Woodlands Improvement Act, the Ministry of Natural Resources could enter into agreements with farmers for the planting of windbreaks which, by reducing wind erosion, could assist in water quality protection. However, as a matter of policy, MNR does not enter into agreements for the planting of trees on private lands unless the |

landowner wishes to plant at least ten acres. The policy was instituted because it was not believed to be economically viable for the Ministry to plant trees on less than ten acres at a time. This policy effectively eliminates the Act as a tool for the planting of windbreaks on farmlands, since to be effective, windbreaks must be planted as a single stand of trees 1,000 feet to a half mile long. The policy has been understood to adversely affect some agricultural counties subject to wind erosion.

5. Provincial Acquisition of Hazard and Sensitive Land Areas

Where land areas are hazardous (generally defined as erosion or flood prone) acquisition of them for non-development purposes can aid in minimizing water pollution (i.e. accelerated erosion and sedimentation) as well as costs associated with property protection and damage compensation. Uses to which some of these lands may subsequently be put by the province or some conservation authorities can, however, have adverse water quality implications.

Lakeshore
and river
bank
erosion

* The provincial government has recently undertaken a five-year \$17.6 million program of acquisition of shorelands for use as future open space. However, in conjunction with conservation authorities management, some of these lands are assigned for subsequent recreational development. Recreational development of such lands can include landfilling of these areas. Landfilling can lead to a diminution of local water quality as well as to the expenditure of shore protection funds to protect such landfill projects.

C. Regional Government

Regional municipalities are relatively new governmental units located mainly in southern Ontario. They are large geographic planning units encompassing smaller or area municipalities. Created by provincial enabling legislation, these large units are authorized to provide land use planning on a wide regional basis, to consolidate the provision of various utility services such as waste disposal and at least nine of them are now delegated authority to approve subdivision and redevelopment proposals.

Regional government planning, regulation and management to date can be described as having both positive and negative implications for water quality. However, the relative infancy of regional government responsibility in most of these areas tends to militate against anything other than tentative conclusions respecting their ultimate influence on land use/water quality decision-making.

1. Planning

Urban Areas
and other
uses

* Regional governments can plan and designate land use areas. Because regional governments are broad geographic areas they are normally better situated than municipalities to identify and articulate an official plan policy for preserving regionally

significant environmental features.

Sensitive environmental areas tend to include the significant land/ water formations in the region. As a result their identification in a regional official plan appears to create watercourse/land buffer zones where, if development is not restricted it will at least be subject to much stricter scrutiny and performance. In the Waterloo Region Plan, for example, development that might impinge on the integrity of an environmentally sensitive area, would be subject to an environmental assessment prior to approval. In such circumstances, implications for water quality from construction site and stormwater runoff can be highlighted for the public and decision-makers.

* However, regional plans are sometimes not sufficiently specific in forbidding certain land uses in particular places, including environmental areas. This deficiency, combined with antiquated local zoning, can sometimes defeat efforts to prevent certain facilities, such as disposal operations, from being located in environmental areas where water quality may also be adversely affected.

* With only one or two exceptions, regional official plans examined tended to be silent on the interrelationship between the various land uses in their region and the implications for water quality. In a typical draft official plan one might find general goals compartmentalized into such categories as agriculture, housing and environment. However, rarely was there comment on, for example, the effect of agriculture or housing respectively on water quality in the region.

* Exceptions to the failure to cross-reference land uses and water quality impacts can be found in Ottawa-Carleton and Sudbury draft official plans. The Ottawa-Carleton plan notes that stormwater can contribute a substantial pollution load to a stream or river and further notes the concern of the Ontario Ministry of Environment that stormwater from new developments, that will discharge into certain regional rivers, receive some form of treatment. The Sudbury draft plan notes that among the contributors to water quality degradation in the Sudbury region are poor land use and soil conservation practices. These two draft plans make it evident that it is feasible for all regional official plans to address more specifically the interrelationships between land use and water quality as a foundation and pre-condition for requiring greater control in certain areas.

2. Regulation

Urban Areas * At least nine of the eleven regional governments have been delegated subdivision and redevelopment approval powers under the Planning Act. Regional governments, therefore, can regulate new urban development so as to control those aspects of water pollution associated with subdivision development. (Generally, regional legislation makes storm drainage *per se* a prime responsibility of area municipalities).

In relation to selected new urban developments, some regional governments,

such as Ottawa-Carleton, have engaged in pilot studies on stormwater runoff treatment in anticipation of more comprehensive controls for all new developments.

* Other regional governments have been more hesitant to systematically undertake urban storm runoff control. One region, in responding to a conservation authority recommendation that it control storm runoff, argued that development proposals were already reviewed by the conservation authority; that the regional legislation makes storm drainage the prime responsibility of area municipalities; and that the effect of designing storm systems to attain "zero runoff" may have substantial impact on the "degree of service" that may be rendered to subdivision developments.

Another regional government disagreed with a local conservation authority conclusion that foundation drainage discharged to storm sewers increases storm runoff volumes into watercourses and results in earlier peak flows leading to further local flooding and greater erosion problems. The region contended that the amount of water from foundation drains, although very significant with respect to flows in sanitary sewers is not a significant factor with regard to flows in creeks because of the relatively larger volume of flows in creeks from rainfall and spring runoff. The conservation authority conclusions had been made in a report and recommendations on alternatives to current foundation drainage practices.

3. Management

Regional governments can also construct, manage, operate and maintain certain public works and facilities such as waste disposal facilities or regional roads. In these situations, regional governments are the regulated rather than the regulators, in relation to water quality concerns. They are therefore unlikely to develop standards - which would be applied mainly to themselves - which are stricter than those, if any, imposed by senior government.

Disposal
Areas

* Under regional legislation, regional governments normally own all waste disposal sites within their geographic area and are responsible for their management, operation and maintenance.

* Most regional governments have undertaken studies to determine their short and long-term solid waste management options. Several regions are currently participating with the province in considering or undertaking aspects of resource recovery. However, because the financial aspects of waste management are currently seen to favor landfill over resource recovery, most regional governments, before making further commitments to reclamation options, are looking to senior government to develop the technology and to secure markets for reclaimed materials.

* Regional governments do not retain any responsibility for how and where

sewage sludge is land applied after they contract with a sludge hauler for its removal or transfer from regional facilities. In regions where large volumes of sludge are land applied, this may increase an already heavy burden on provincial agencies charged with regulating and inspecting sludge haulage and land application.

Trans-
portation
Corridors

* Regional road department construction techniques generally emphasize protection of streams during watercourse crossings and post-construction re-vegetation measures. However, regional road department contract specifications, with some exceptions, do not contain specific provisions requiring sediment and erosion control especially with respect to the use of interim or temporary soil stabilization techniques during construction unrelated to stream crossings. Some regional road departments acknowledge that interim and temporary soil stabilization techniques are proven, but too expensive to use on a systematic basis. Other regional road departments do not regard the lack of interim and temporary soil stabilization as a problem, because most of their road construction contracts are completed within a fiscal year.

4. Conflicts With Other Government Levels

Shoreline
Landfilling

* Conflict with the jurisdiction of senior levels of government may result in environmental policies in a regional plan not being realized. For example, a regional policy of minimization of water pollution and protection of marshes and environmentally sensitive areas may conflict with federal ownership and plans for the commercial or industrial development of such lands.

Urban Areas
and All uses

* While land use planning is a regional responsibility (and area municipal plans and zoning by-laws must conform to a provincially approved regional plan) implementation of the regional plan remains largely in the hands of area municipalities. This may have implications for protection of environmentally sensitive areas and water quality. Regional governments indicate that the date by which area municipal zoning amendments must conform with a regional plan is not stated in regional legislation. Some regional governments have argued that, as a result, there can be a substantial time lag between the approval of the regional official plan and its actually being put into practice through area municipal zoning by-laws. One regional government further notes that unless zoning by-laws are in place it may be possible to circumvent, at least in part, the intent of an approved regional official plan.

Extractive
Operations

* A provincial working party's proposals to facilitate aggregate extraction would allow such operations to take place in an area designated within a regional official plan regardless of whether an area municipality approved or not. Such overriding authority wouldn't necessarily preclude a regional government from adopting a local government's conditions for location and operation of such activities, as long as the conditions didn't amount to a prohibition of the extractive activity. Such conditions could include measures respecting water quality protection.

D. Conservation Authorities

Conservation authorities are local autonomous bodies established under provincial enabling legislation for purposes of conservation and flood control on a watershed basis.

The Authorities have a number of different roles in relation to land use activities and water quality considerations. They are involved in the municipal planning process in a manner that is partly advisory, partly regulatory. They are regulators of other land use practices and they are themselves the regulated in a number of their own land management undertakings. In still other land use areas they provide limited technical and funding assistance.

Authority initiatives with respect to land use/water quality issues are influenced by a variety of factors. These include jurisdictional and operative constraints on the extent of the Authority regulatory mandate to control the full range of land use practices that may affect water quality; limitations of staff and funding and; differing priorities that Authorities assign to program development.

Gaps in legislation, inadequate funding and differing Authority program priorities suggest that the Authority role in relation to water quality protection is a mixed one, exhibiting both positive and negative dimensions.

1. Involvement in the Municipal Planning Process

Urban Areas

Conservation authority involvement in the municipal planning process though not acknowledged in the Planning Act, includes reviewing official plan, zoning, subdivision applications and related matters. The role is both advisory and regulatory.

* Some authorities note that they are frequently asked by developers to purchase lands which have been barred from development by official plans and zoning regulations because of environmental or related constraints. The value of this property is often calculated on the basis of the proposed development, and the resulting cost to the community is likely to be prohibitive. Because small portions of environmentally sensitive areas may be developed by amending the zoning by-law, while an individual parcel may not have a detrimental effect on the sensitive area, the cumulative effect of similar changes, argue these Authorities, will eventually destroy the area.

* Conflicts between. Conservation Authority regulations and municipal zoning by-laws and building code by-laws result in problems for environmental protection. For example, a property might be correctly zoned to permit development according to the municipality's building requirements, but at the same time may be identified as floodplain lands, and therefore, unacceptable for development under Authority

regulations. In order to overcome conflicts previously experienced with municipalities in this regard, some Authorities have set up a system whereby any development proposal which falls into an area over which the Authority has control, will first be sent to the Authority for approval before the municipality issues any form of construction permit. The greatest conflicts arise where some form of approval has been granted to a development proposal before the Authority has received its floodline mapping. In these situations, the Authority is torn between living up to its prior agreements and approvals and enforcing updated floodline information. A compromise of some sort is likely in this latter type of situation.

* Conservation Authority regulations and municipal building code by-laws are reportedly in conflict with respect to grading plans in many instances. Municipalities quite frequently will leave inspection of grading following completion of development to the conservation Authority. Since Authority objectives may differ from site to site, the Authority may request revisions to the grading plan which the municipality had originally approved. This general area of development control is regarded as a difficult one requiring extensive manpower and time outlay for enforcement.

* Some Authorities have adopted stormwater drainage recommendations to be made to member municipalities concerning the conservation aspects of their official plans. These recommendations include committing the municipality to use its subdivision and redevelopment control powers to prevent unnecessary changes in the character of the pre-development landscape, including topography, vegetative cover and drainage.

* Conservation authority success in getting municipalities and regional government to adopt appropriate stormwater and related controls has been mixed. (See Regional Government and Municipal Government).

* Some Authorities report that they are severely restricted with respect to funds and staffing in attempting to control non-point sources of water pollution. This is especially the case in watersheds undergoing rapid urbanization.

2. Conservation Authorities as Regulators

The principal regulatory tool of conservation authorities is their Fill, Construction and Alteration to Waterways Regulation. This regulation permits Authorities to control the placing or dumping of fill in three areas; floodplain areas that have been so mapped; scheduled areas as identified and attached to an Authority's regulation. (these generally include all floodplain areas) and; areas where fill could or would potentially affect the existing state of a watercourse. Methods of construction of building or structures in floodplain areas may be stipulated.

However, a number of jurisdictional and operational constraints influence the effectiveness and comprehensiveness of Authority regulations.

Trans- portation Corridors	* Conservation Authority regulations may be of no legal effect in relation to several transportation corridor activities that are arguably under exclusive federal jurisdiction. For example conservation authority dump and fill regulations have been held to be inapplicable to the activities of an interprovincial railway.
Shoreline Landfilling	* The jurisdiction of conservation authorities with respect to the Great Lakes shoreline appears to extend only to the high watermark. * It is regarded as doubtful whether Conservation Authorities could apply their regulation to federally owned land. Authorities have been unable to control the dump and fill activities of some harbour commissions within their harbour jurisdiction in the past.
Urban Areas and Lakeshore and Riverbank Erosion	* Conservation Authority regulations sometimes conflict with some aspects of municipal planning (see above) and with provincial policies in relation to construction in floodplain areas. (The province, on the one hand, supports the defining of hazard lands - generally defined as erosion and flood prone areas - and their incorporation into municipal official plans and zoning by-laws. On the other hand, it also states that in the past it may have been too restrictive respecting development in flood plain areas.) * In response to this problem some Authorities have attached a save harmless agreement to their approvals. These agreements make explicit to the owner and all subsequent owners that the construction is taking place in a flood prone area. This agreement is registered on title. Other Authorities have sometimes sought injunctions where development was taking place in flood plain areas contrary to Authority regulations.
Urban Areas	* Conservation Authority regulations would appear to be both conceptually and geographically narrow with respect to permit control of erosion and sedimentation <i>per se</i> . That is to say, conservation authority regulations would not appear to authorize permit approval and control for erosion and sedimentation arising from new development that did not occur in a flood plain; or could not be said to be or arise from the placing or dumping of fill within or without a scheduled area so as to affect the existing state of a watercourse. To the extent that this is the case, municipal cooperation under the municipal planning and subdivision control process is essential to the success of conservation authority efforts to control erosion and sedimentation from new development. (See Municipal Government).
Agriculture	* The same conclusion appears warranted for erosion and sedimentation arising from agricultural crop production practices, though Authorities are in a position to undertake remedial programs where farm properties contain watercourses of any size or are contained within an area scheduled under the Authority's regulation.

3. Conservation Authorities as the Regulated

Some activities of conservation authorities may themselves affect water quality. These include recreational landfilling projects, stream channelizations, and dams for flood control purposes.

- Shoreline Landfilling
- * Some conservation authorities along the Great Lakes are undertaking shoreline landfilling projects for recreational area purposes. Some of these projects can have adverse local water quality impacts. According to senior environmental agencies, some conservation authorities have not always exercised the best management and construction control in limiting water quality contamination by these projects.
 - * In future conservation authority activities such as landfill projects, stream channelizations and flood control projects will be subject to prior scrutiny under the Environmental Assessment Act.

4. Other Conservation Authority Roles - Funding and Technical Assistance

- Urban Area and Lakeshore and Riverbank Erosion
- * Most Authorities provide erosion control assistance to private landowners on request and where budgets permit, though a minority of Authorities do not regard water pollution control as one of their functions. (Some Authorities see flood control as their central task.)
 - * Funding for emergency flood and erosion measures has sometimes been difficult for Authorities to provide because of budget constraints.
- Agriculture
- * Some Authorities on mini-rural watersheds have developed pilot projects to assist farm owners with serious bank erosion problems caused by livestock access to streams. Such techniques as vegetative buffers along banks and fencing have been used on a limited basis. Lack of broader funding appears to limit the wider development of such programs.
 - * Shifts in some watersheds from rural to predominantly urban accounts for the elimination of some Authority agricultural soil erosion control assistance programs. Some Authority farm reforestation programs are still operational.

F. Municipal Government

Municipalities derive their authority to control land use activities from provincial enabling legislation. They plan, zone, engage in the day-to-day regulation of subdivision development and related control measures subject to provincial and, in some areas, regional government overview. Each of these control instruments can have positive implications for water quality. However, because the environmental

problems associated with land use frequently exceed local boundaries, resources and expertise, municipal instruments can often be frustrated by the diversity and dynamics of the various land uses sought to be controlled. Municipal control initiatives can also be facilitated or inhibited by provincial policy or law or the lack thereof. Some direct municipal practices, despite provincial guidance, can have adverse water quality impacts.

1. Official Plans, Zoning, Environmental Plans and Protection Areas

Urban Areas * Older municipal official plans are normally silent on environmental issues or land use designations. Municipalities currently revising their official plans are the most likely local governments considering new options for protecting water quality from new development. This is in part due to the information that is currently provided during the municipal planning process by senior environmental agencies and conservation authorities familiar with local environmental problems.

* The City of Mississauga's draft Official Plan, for example, commits the city to establishing guidelines in co-operation with appropriate public agencies to regulate and minimize, where feasible, the quality and rate of flow of surface run-off from new developments.

As companion approaches to minimizing aquatic damage from new urban development, the City's draft official plan also commits the city to prohibiting development along a watercourse unless appropriate floodlines have been established. It also requires conveyance to the city or local conservation authority for public purposes and protection, those lands in a development proposal within the established floodplain.

Other City official plan environment proposals include identification and protection of Environmental Areas so that their natural functions may be permitted to continue. Also city programs may be established and implemented, in cooperation with other agencies, for preserving and maintaining the natural condition and functions of those watercourses, forested areas, steep slopes, and wetlands which have a high level of environmental significance and ecological sensitivity.

* The Town of Oakville is developing an Environmental Plan which will result in a comprehensive ecological inventory and a series of policy directives which may be incorporated into its amended Official Plan. The approach of the Environmental Plan is to develop a number of policies (e.g. density, vegetation, growth, open space, land use) and implementing by-laws (e.g. cluster housing, ecological zoning, and impact zoning by-laws) which will determine the impact of growth and the social and economic limitations and costs of development which are not compatible with the maintenance of a healthy natural environment. Background papers preparatory to the final Environmental Plan will consider local issues of stormwater runoff, erosion and related matters surrounding development.

2. Subdivision Controls

- Urban Areas
- * Under the terms of the Planning Act, a municipality may, for the purposes of controlling development, enter into agreements imposed as a condition to the approval of a plan of subdivision. Such agreements may be registered against the land to which it applies and the municipality or the Minister of Housing are entitled to enforce its provisions against the owner or subsequent owners. The municipality may include any special requirements peculiar to the municipality subject to provincial and, where applicable, regional government approval.
 - * Some municipalities, such as the City of Mississauga, have investigated the feasibility of systematically implementing stormwater runoff controls on present and future plans of subdivisions. The city has already begun to incorporate some stormwater detention features into several subdivision developments, and recently has generally approved stormwater control. Where such features are intended to be included in the subdivision agreement, it is normally indicated in the agreement that the developer's engineering plans respecting stormwater, control of stream siltation and erosion must be found acceptable to the local conservation authority.
 - * While the above initiatives indicate that some municipalities are beginning to deal with the issue of controlling stormwater runoff, a number of serious problems do arise.
 - * First, it is by no means evident that all or even most municipalities are considering or implementing stormwater runoff controls. For example, one municipality, requested by a local conservation authority to adopt stormwater runoff control measures, responded that no similar request had been received from the municipality's other conservation authority with whom it is involved for most of its storm drainage; that several detention methods for controlling runoff, such as roof, parking lot, ditches, and ponds, run counter to present practices, and acceptance of them by the public might be difficult to obtain; that *too* little is still known about detention ponds, and more research is necessary; and that "zero runoff increase" is too high an ideal, and "controlled runoff" is a more practical objective.
 - * Second, even in municipalities where stormwater runoff control is supported, serious financial and other constraints may exist to minimize the effectiveness of such policies and procedures. In Mississauga, for example, while the city approved stormwater control, the major conclusion of the report upon which the approval was based indicated that due to the high space requirements for major detention facilities detention should only be considered for minor stormwater runoff events in combination with flood plain management - unless a detailed engineering study of a watershed can economically justify a higher degree of protection. In effect, the amount of land necessary to institute major upstream detention devices and the cost involved could make that approach difficult, if not impossible, in many instances.

* Third, the subdivision control process requires great cooperation between municipalities, environmental agencies and other public agencies. The subdivision agreement is between the municipality and the developer. Only the municipality and not the Conservation Authority can enforce breaches of the subdivision agreement. While in practice each condition of the draft subdivision plan approval must be released in writing by the agency which requested or recommended the condition, this process takes place at the end of subdivision development when damage such as improper sediment control may have already occurred. Moreover, the systematic use of the provincial power of non-registration of a plan of subdivision because of inadequate sediment control appears doubtful. While the subdivision control process may be convenient, it raises numerous difficulties, especially in the absence of overall provincial policy on the issue of non-point source pollution control.

Some conservation authorities indicated that obstacles to getting more systematic municipal consideration of non-point controls included the growth-development pressures on many local governments and municipal by-laws and/or engineering practices which are or may be contrary to stormwater control (i.e. storm water detention on sites is reported as contrary to municipal by-laws which state that all lots must drain to the road allowance and all surface waters must be transferred through the storm sewer system).

* Fourth, where provision for stormwater and silt control is incorporated into a subdivision agreement at the request of a Conservation Authority, the Authority is frequently responsible for ensuring that the provision is met by the developer. While Conservation Authorities, in conjunction with senior environmental agencies, have the expertise in this area, they may not have adequate field resources for on-site review, especially in areas undergoing heavy urbanization. As a result, many subdivision sediment controls become pro forma exercises. Municipal agencies, though somewhat better staffed, are less well versed in sediment control techniques.

3. Other Municipal Regulatory Initiatives

Urban Areas * A few municipalities, such as the City of Sault Ste. Marie, have sought and obtained special legislation from the province to protect topsoil in their jurisdiction. Once enacted as by-laws these instruments permit the municipality to regulate the stripping of topsoil and to require rehabilitation. While not as comprehensive as legislation controlling sediment from construction activities, topsoil preservation by-laws can be of benefit.

However, provincial enabling legislation does not envisage or authorize topsoil preservation or sediment control by-laws. They must be sought individually by each municipality from the provincial legislature. Because there are over 800 municipalities in the province, the systematic adoption of such by-laws does not appear likely.

Disposal Areas * One or two municipalities have attempted modest initiatives in the direction of solid waste reduction, by enacting by-laws prohibiting the sale within their jurisdictions of carbonated soft drinks in non-returnable containers. However, the City of London has had its by-law judicially quashed on the grounds that it is contrary to provincial environmental legislation.

Agriculture * Development of a municipal by-law utilizing the Agricultural Code of Practice and extant provisions of the Planning Act has been undertaken in Grey Township, Huron County. The by-law attaches a number of separation distance formulae for suburban residences and agricultural operations respecting air/odour quality. To obtain a building permit a farm operation must normally meet one of the formulae. But neither Code nor by-law contains separation distances between farm operations and watercourses.

Reference is not made to the Code of Practice in the by-law because it is understood that even when an operation is evaluated on the basis of the formulae in the Code, a permit could still be arbitrarily awarded in situations of non-compliance with the formulae, or denied in cases of compliance with the formulae. Interference with a watercourse would be an example of the latter.

However, because of the lack of watercourse separation distances in the by-law (flexible separation distances are the heart of the validity of the by-law for regulating private property for air/odour quality pursuant to the Planning Act) and questions as to whether animal waste management for water quality purposes may be authorized by an instrument such as section 35 of the Planning Act, the systematic use of the Grey Township model by-law for water pollution control may be doubtful.

It would appear that a municipality might be legally constrained in denying a building permit to a farmer for water quality/waste management reasons (i.e. for criteria that are not outlined in the by-law) where the farmer otherwise met the by-law separation distance formulae for air/ odour considerations. Also, section 35 of the Planning Act is silent on water quality.

Extractive Operations * Enforcement of municipal pits and quarries by-laws can be a valuable supplement to regional and provincial measures. Fines upon conviction, however, were found to be quite small. A small fine may not change an operator's management practices, but the conviction may result in greater local public awareness and scrutiny of the problems presented by such activities.

4. Direct Municipal Actions and Practices

Trans-
portation
Corridors * Some municipalities' road construction and highway de-icing and salt storage practices appear to be contrary to Conservation Authority recommendations and provincial agency salt application and storage guidelines.

Some Conservation Authorities indicate that where Authority regulations are not in place, municipalities are less apt to incorporate appropriate sedimentation in their

road construction projects.

Provincial highway and environment agencies indicate that some municipalities apply road de-icing salts at rates two to three times as great as provincial guidelines recommend. However, sixty per cent of Ministry of Environment regional offices responding to a survey did not know whether municipalities, in their region, were adhering to provincial guidelines respecting highway de-icing application rates. Road de-icing agents are defined as contaminants under the EPA, but exempt from its provisions.

F. Public Participation and Court Action

1. Public or Administrative Hearings

Public hearings can be important forums where proponents of various land use projects can outline the nature of their proposals and their implications for water quality. Similarly, government agencies can explain details of their policies of approval and enforcement in relation to such land uses.

Hearings may reveal, for example, information about the Ministry of Environment's approval and enforcement policy in relation to waste disposal site operations that might not otherwise have been available. Hearings may also reveal the level of pre-scrutiny that the MOE devotes to the soil conservation practices of farmers expected to accept sewage sludge on their lands. MOE field experience with operator adherence to its sludge guidelines may also be better understood through the hearing process.

* Public hearings under Ontario environmental legislation do not cover the full range of land use activities that may be water quality problems. For example, under the Environmental Protection Act, public hearings are only required for waste management facilities which will service the waste of more than 1,500 people.

* Public hearings under most Ontario environmental legislation only result in recommendations, not decisions. Where hearing boards are authorized to make a decision, Ontario law requires that certain basic procedures be provided to protect the rights of individuals. These protections include a right to be present; to be heard; to be heard by impartial persons; and to have a decision with reasons, made by the persons hearing the evidence. Where hearing boards only make recommendations, these basic procedural protections do not apply. This sometimes leads to board practices being instituted that can result in the public losing confidence in the hearing board and its process.

For example, in one recent sludge transfer station hearing, members of the hearing board who heard the evidence recommended against the issuance of an approval for the waste station. They felt that the evidence indicated that an industrial area would have been preferable to the site under consideration, which was located

in a regionally designated environmentally sensitive area. The Board report that was released, however, had been reviewed by the full board (i.e. including members who had not heard the evidence). This report deleted the reference to the preferred industrial site and recommended approval of the waste station in the environmentally sensitive area. The released report did not mention the existence of the earlier recommendation, or the fact that members who had not heard the original evidence amended a recommendation of those members who had heard the evidence.

* The Environmental Assessment Act hearing process will remedy some of the problems noted above. It will likely authorize hearings for a larger variety of land use activities and its hearing board will be a decision-making body. However, certain key land use activities have already been exempted from the application of the Act by regulations not involving prior public consultation. These activities include construction of outlet drainage schemes and new townships.

2. Advisory Committees

Advisory committees of citizens, academics, etc. can provide expertise to local decision makers on land use water quality implications of development proposals. Such committees exist, for example, in Mississauga and Waterloo. The Waterloo Region Ecological and Environmental Advisory Committee investigates and develops background discussion papers on selected local issues, stimulates public debate on these issues, and advises regional government on development proposals that should be environmentally assessed where significant local and regional environmental assets may be affected. The role of the Waterloo advisory committee is recognized in the regional official plan which gives the committee's activities greater local legitimacy.

3. Court Action

Citizen groups have utilized the courts, both to prosecute violators of environmental legislation and to seek injunctions halting particular activities where government agencies, for whatever reasons, have failed to act.

a. Private Prosecutions

* Citizens may prosecute violators of legislation unless that common law right has been altered by the particular legislation sought to be invoked. Most environmental legislation does not interfere with that common law right. However, the Mining Act, the Pits and Quarries Control Act and the Beach Protection Act, all administered by the Ministry of Natural Resources, have eliminated the citizen's right to prosecute violations under those statutes.

* Private prosecutions, though occasional, can be instructive. For example, a citizen recently successfully prosecuted a waste disposal site operator for permitting leachate and untreated drainage to enter a watercourse contrary to provincial regulations. The

prosecution followed the operator's failure to comply with Ministry of Environment recommendations to improve the operation of his site.

* A private prosecution may stimulate a higher public profile for those prosecuted, as well as for the relevant administrative agency. Fines levied, however, may frequently be an insufficient economic deterrent to the convicted. Moreover, one may only obtain a fine with a private prosecution, not an injunction, to stop unlawful activity. Frequently, under a private prosecution, unlawful activity continues while charges are being processed through the courts.

b. Injunctions/Public Nuisance Actions and Judicial Review

While private prosecutions are limited in their effect, injunctive actions and judicial review by citizens may provide a valuable supplement in halting potentially harmful activity. Experience in Ontario, however, suggests that several barriers exist to citizen's groups effectively using these injunctive and related remedies. These barriers include standing, discretionary agency powers, and costs.

Standing

In Green v. Her Majesty the Queen in Right of Ontario a citizen attempted to enjoin commercial sand removal from land adjacent to a provincial park, arguing that the operations endangered unique sand dunes that were within the park boundaries. The court held that the citizen as citizen had no "special interest" in the activity and therefore he had no standing to seek a declaration from the court.

In Rosenberg v. Grand River Conservation Authority two authority members sought to enjoin a decision of the authority to transfer a parcel of land to the county for extension of a county road and construction of a bridge over the Elora Gorge, arguing the bridge would, among other things, introduce automotive and roadway pollution (e.g. use of highway road salt) to this unique natural feature. The Ontario Court of Appeal held that a member of the Authority has no standing - i.e., no right to go to court to stop an activity - unless he or she has a financial or proprietary interest in protecting a natural feature or in stopping pollution. The court ruled that only the Attorney General can launch legal action against public body to stop it from acting beyond its legal powers where public rights are infringed.

Agency discretion

In S.E.A.P. (Save the Environment from Atomic Pollution) v. Atomic Energy Control Board and Eldorado Nuclear Ltd. a citizens group sought judicial review of an AECB decision granting renewal of a licence for a radioactive waste storage site at Port Granby on Lake Ontario. The Federal Court of Appeal held that the Atomic Energy Control Act and regulations do not require the AECB to sit in public, hold a hearing, give notice of the application, or follow judicial procedures. The AECB decision is administrative and not judicial. In short, there is no statutory duty for the Court to enforce.

Costs

Even where citizens are granted standing to challenge agency or private sector activity, they would, if they lost, likely have to pay the court costs of all parties. Since these costs can be considerable, they can be an effective obstacle to citizens attempting to utilize the courts for purposes of environmental protection.