Water Efficiency Strategy Workshops

Vol 5.0 - March 1992

Preview of Strategy Document

Revised Draft Guiding Principles

These are in no particular order. They are discussed in detail on pages 17 - 19.

1. Optimize the efficient use of water by employing measures that are sustainable environmentally, socially and economically
2. Adopt an ecosystem approach to the provision and management of water and wastewater
3. Improve and preserve water quality
4. Maintain sufficient supplies of water to meet the needs of future generations
5. Individual water users should pay in the water bill all of the costs of delivered water and treated wastewater
6. Revenues from water and wastewater charges should be dedicated to maintaining and upgrading the water and wastewater systems respectively
7. The social costs associated with implementing water efficiency measures should be distributed equitably
8. If a subsidy is to be provided, then incomes/taxes rather than water charges should be subsidized
9. Governments, institutions and public agencies should show leadership by being efficient water users, by promoting efficient water use and by managing wastewater generation
10. The public should be informed about water use and be consulted in water management decision making

Draft Long Term Goal

This goal is discussed in detail on pages 16 - 17.

To Sustain Water Quantity and Quality Through Efficient Use.

Draft Supporting Goals:

These are in no particular order. They are discussed in detail on pages 20 - 30.

A. To provide economic incentives that foster efficient water use

B. To promote efficient water use among all water users by informing and consulting them

C. To establish a research, development and manufacturing program that will make Ontario a leader in water efficient technology and management

D. To develop and monitor water efficiency targets based on a sound database that will ensure sustainable water supplies

E. To set standards, adopt regulations and establish legislation that will promote efficient water use

F. To control pollution so as to enhance and preserve water quality

G. To work with self supplied water users and wastewater treaters (farmers, cottagers, rural residents and small industries) so that they will become water efficient

H. To coordinate water management including water efficiency policies and programs

The Ontario Ministry of Natural Resources is taking a lead role, in cooperation with 11 other provincial Ministries and in consultation with the representatives of 95 organizations and the public, to develop a Water Efficiency Strategy for Ontario.

This working document has been designed to assist participants in preparing a water efficiency strategy and to aid the public to offer comments. The information contained in this document reflects the views of the participants and Ministry resource staff and does not represent the policies or positions of the Government of Ontario.

Table of Contents

Agenda for 4th Workshop

Day One - March 23, 1992

7:30-9:00AM.....**Registration & Coffee** (Huron Room, Macdonald Block, Queen's Park)

9:00-9:30 AM.....**Opening Remarks -Dr. Jim Robinson -Moderator**
9:30-12 noon.....**Plenary Session** Review of Draft Strategic Management Actions developed in the January Workshop
12:00-1:00PM.....**Lunch** -(in Huron Room)

1:00-2:30 PM.....**Plenary Session continued**
2:30-4:30 PM.....**Break-out Groups** To Resolve Issues Concerning Specific Strategic Management Actions
4:45-5:30 PM.....Cash Bar - Huron Room
5:30-7:00 PM.....Buffet Dinner - Huron Room

Day Two - March 24, 1992

8:30-10:30 AM.....**Break-out Groups** Identify High Priority Actions and High Priority Strategies
10:30-noon.....**Plenary Session** with presentations by the Break-out Groups. The purpose of this session is to review high priority actions and strategies
12:00-1:00 PM.....**Lunch** (Huron Room)
1:00-2:30 PM.....**Plenary Session** -Finalization of Priorities

The Strategy Development Process

Progress to Date

Four workshops have been organized to wrestle with the issues and develop a long term strategy for curbing the spiral of ever increasing consumption of water in Ontario. These workshops have brought together a cross-section of all user groups to share their information, views, and jointly work out a strategy.

Elements of a Strategy

The workshop participants have been discussing, debating and deciding on:

(a) what long term goal do we want to achieve on this issue of more efficient water use? Should we set some type of target to be achieved by some date?

(b)what underlying principles or beliefs do we need as guidelines to help us think about water efficiency in the context of ecosystems and sustainable prosperity?

(c)how should we break this long term goal down into its supporting goals? Should we break it down by categories of users, or by different uses of water, or by some other way?

(d)for each of these supporting goals, what mix of actions should we choose to achieve the goal-e.g. what combination of regulation, education, promotion, incentives, disincentives, etc. should we use?

(e) since we usually can't do everything at once, what are the short-term priorities - i.e. the things that should be implemented in the first 1 to 3 years of the Strategy?

1st, 2nd & 3rd Workshops Completed

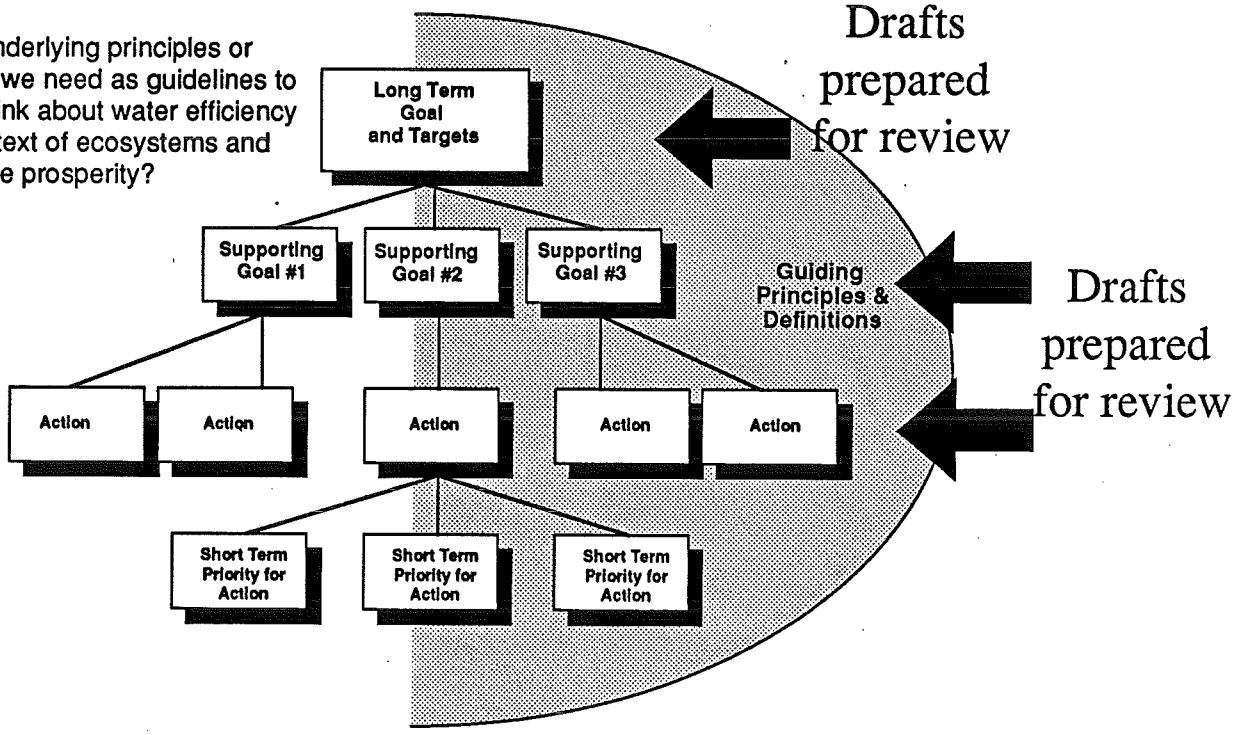
The 1st workshop identified the issues that the strategy must address and created a first draft of a possible long term goal, targets and principles.

The 2nd workshop revisited the long term goal, target and principles and began work on the supporting goals and actions.

The 3rd workshop finalized the long term goal, principles, supporting goals and actions, and developed short term priorities for actions.

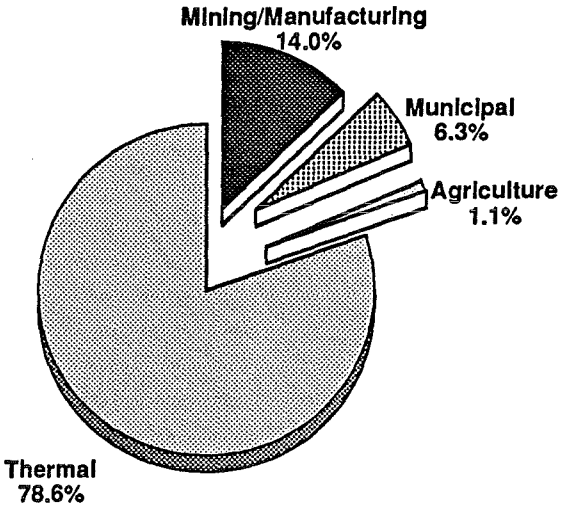
The 4th and final workshop will review the findings from the 3rd workshop, and, with input from the public, will finalize the elements of the draft strategy.

This workshop is scheduled for March 23 -24, 1992 in Queen's Park.



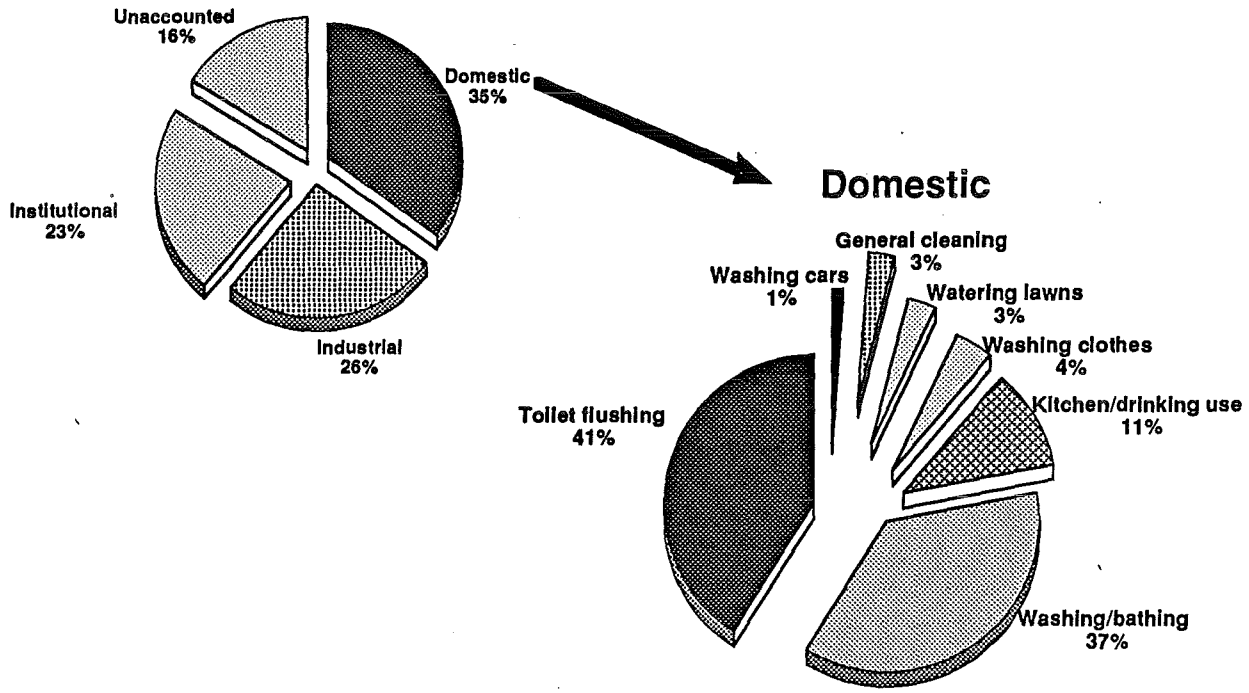
Elements of A Strategy

Figure 1
Water Use In Ontario
By Sector (In Per cent)



Source: Ontario Ministry of Natural Resources, (Toronto, 1991)

Figure 2
Municipal Water Use In Ontario



Source: Ontario Ministry of Natural Resources, (Toronto, 1990)
Tate, Water Demand Management in Canada, (Ottawa, 1988,9)

Ontario's Current and Future Water Use

Introduction

Even from earliest times, Ontario has been recognized as having a rich freshwater endowment. Ontario is an Indian word meaning "sparkling water".

Water is a finite, renewable resource constantly changing location or physical state. Water vapour is contained in the free-flowing atmosphere surrounding the earth. Under the proper conditions, it may fall as rain to the ground where it may run off to lakes and rivers, percolate downward to natural underground reservoirs (aquifers), or be absorbed and transpired by plants (as vapour). Surface waters are constantly evaporating to the atmosphere. Thus, water forms an indispensable and integral component of the natural environment and is part of the life-support system for both plants and animals, including humans.

Ontario's Current Water Uses

According to Figure 1, about 79 per cent of Ontario's water withdrawals (water taken from a well, pond, stream or a lake) are used to cool power plants, 14.0 per cent for manufacturing, 6.3 per cent for municipal use, with agriculture using only 1.1 per cent.

Thermal Electric Generation

About 79 per cent of Ontario's water withdrawals are used to cool spent stream used to produce electric power in fossil fuel and nuclear power (thermal) stations operated by Ontario Hydro. Cool water is withdrawn by the powerplant from a large water body, usually a Great Lake, passed through the power plant and immediately returned to the lake in a slightly warmer condition. Most of this water is immediately available for reuse with about 0.2 per cent of the withdrawn water lost due to increased evaporation from the lake surface associated with the heat supplied by the power plants.

Industrial Uses

Industrial water use in this document refers to water which is self-supplied by industry and not water supplied by a municipal utility. The most common end uses for water in industry are cooling and condensing, processing and sanitation. Cooling and condensing uses are concerned with conveying heat from process operations, and with the condensing of spent steam from power production. For the most part, water used for cooling and condensing is contained in separate circulation systems, and remains relatively pollution free, except for a rise in temperature. Process water consists of water which comes into contact with, or is incorporated into, intermediate or final products. It carries most of the polluting materials generated during production, and also may contain substantial amounts of heat. In 1981, cooling, condensing and process water accounted for nearly 98 per cent of total water intake by Ontario manufacturers. The remaining water is used for plant personnel sanitary uses.

There are about 3,200 industrial water users in Ontario; however, four user groups - - primary metals, chemicals, petroleum and paper industries - - account for 80 per cent of all water consumed by manufacturing. These four industries use water primarily for cooling, although the paper industry tends to use more process water than the other three.

Municipal (Tap water)

Residences (domestic uses) as shown in Figure 2 are the largest water users within municipalities accounting for 35 per cent of municipal supplies followed by industrial users at 26 per cent and institutions (hospitals, universities, etc.) at 23 per cent with upwards of 16 per cent unaccounted for.

Residential (domestic) uses, according to Figure 2, account for 35 per cent of total municipal water supply. The most common residential use is toilet flushing (41per cent) followed by washing and bathing (37 per cent) with food preparation accounting for about 11 per cent of domestic water use. Lawn watering accounts for a small portion of Ontario domestic water use.

Domestic per capita water use in Canada according to Figure 3 trails the United States but is about double that of European countries which have a similar standard of living.

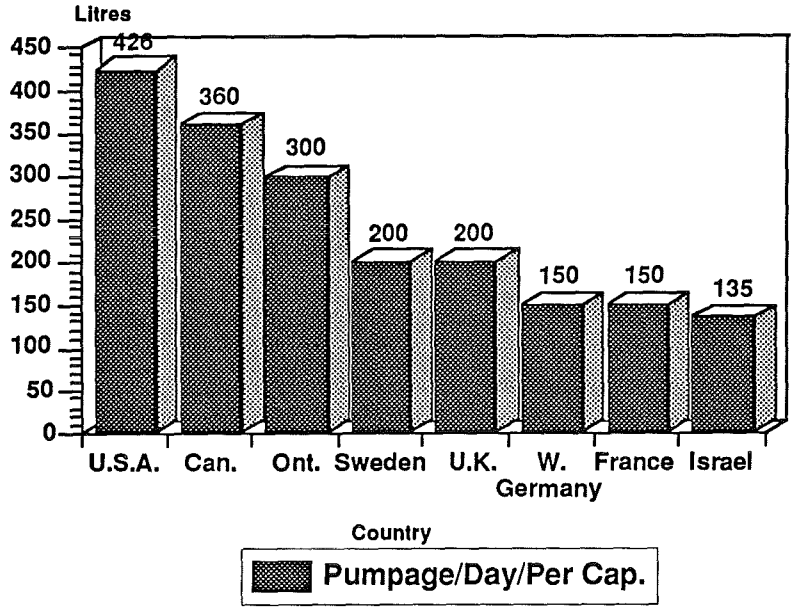
Figure 4 reveals that Canada generally enjoys lower municipal water rates than other developed countries, running at about three quarters U.S. rates and one-third to one-quarter European rates.

A key fact emerging from an analysis of municipal water pumpage is the substantial amount of unaccounted for water. This ranges from 10 to 30 per cent depending upon the municipality and may be caused by leakage, fire fighting, street cleaning and meter errors.

Agricultural Water Use

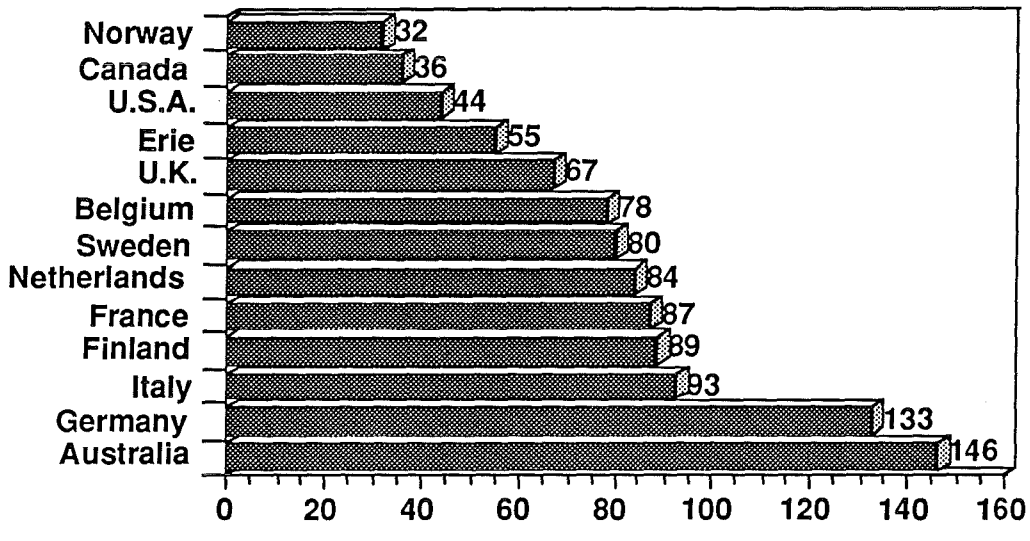
Agricultural water use is usually self-supplied and serves two primary purposes: irrigation and stock watering. Irrigation accounts for 43 per cent of agricultural water use with 57 per cent used for livestock watering in Ontario.

Figure 3
Municipal Domestic Water Use
By Selected Country (1983)



Source: Tate, Water Demand Management in Canada, 9.

Figure 4
International Municipal Water Rates



Based on 4,260 Sq.M. office space and 10,000 Cu.M. water/yr
Source: National Utility Services (1989)

There are about 4,000 water users involved in irrigation and 34,500 who water livestock.

Factors Which Will Affect Future Ontario Water Use

Several key factors will influence Ontario's future approach to water management.

Population Growth

Approximately 40 million people live in the Great Lakes basin and depend on its water. About nine million live on the Ontario side of the basin. Population is expected to increase substantially in the future rising to as much as 12 million in Ontario and a total of 50 million in the basin by the year 2011.

Increased Per Capita Water Use

Per capita water use is already higher in Canada than Europe and per capita water use is projected to increase at 2-3 per cent per year. This is faster than population growth. For example, in 1989, total municipal water use in Ontario was 10 per cent higher than in 1986. After adjusting for population, the increase was still about 8 per cent. This increase was consistent with the rest of Canada. Water withdrawals in Canada increased by over 50 per cent between 1972 and 1981, while population increased by only 5 per cent.

Climate Warming

If predictions of global warming come to fruition, then the climate in the Great Lakes area will be hotter and drier. Evaporation rates will increase and this will result in more irrigation, greater use of water for cooling, more swimming pools and other uses of water.

Costly Infrastructure Requirements

Ontario faces major expenditures totalling many billions of dollars for a variety of capital improvements to Ontario's water and sewage infrastructure. These include the need to upgrade plants to meet new safe drinking water standards, upgrading of sewage treatment plants to meet new pollution clean-up laws, new construction to prevent sewer overflow and contamination of beaches and general water and sewer rehabilitation. These expenditures are projected to occur as the Province ifaces difficult economic times.

Ecosystem Perspective being Adopted

Increasingly, all uses of water are being examined within the context of the larger ecosystem. Thus, water withdrawn from a well may not return to the aquifer and is no longer available to sustain fish in a nearby creek. Water drawn from a lake may be returned in an altered state or otherwise degraded with similar ecological implications. Increasingly, the emerging philosophy is one which holds that water users should not take any more than is needed. If water is used, then it should be returned to where it was taken in its original condition.

Lack of General Public Awareness of Water Quantity Issues

The public has generally become much more environmentally conscious over the past decade. With respect to water, people become aware of the phosphorous issue (foam) in the 70s, and more recently there has been much concern expressed about toxic substances in water. However, apart from people in a few areas such as Waterloo, there has been little concern with water supplies. Most people see the Great Lakes and Ontario's 228,000 lakes and simply assume that Ontario has unlimited supplies of clean water. This perception is reinforced by an annual water and sewer bill which will be lower than for any other household utility. It is probably safe to assume that people take the supply of water for granted and assume that all wastewater somehow simply disappears and is "looked after". There is no understanding of the hydrological cycle, the relationship between water quality and quantity and the linkages between the economics and the environmental aspects of water use.

Implications For a Water Efficiency Strategy

The key future developments will affect the major water uses in different ways and this will have implications for developing a Water Efficiency Strategy for Ontario.

Thermal Electric Generation

Population growth and a hotter climate could be expected to lead to more energy generation and as a consequence, the use of more water for cooling. However, Ontario Hydro's current strong emphasis upon the adoption of conservation technology, greater use of water power and co-generation to generate electricity plus a nuclear moratorium suggest that the thermal electric industry is unlikely to grow and that cooling water requirements, once Darlington is fully operational, should remain constant.

Industrial (Self Supplied Water)

Industrial self supplied water use could be expected to grow in response to the opportunities afforded by a larger population, and possibly in response to higher temperatures. In most areas,

industrial water withdrawals from streams or groundwater could be expected to affect the aquatic (fish, birds) ecosystems. However, the clean up mandated by the Ontario Government's Municipal Industrial Strategy for Abatement (MISA) program should reduce the water requirements of industry. This has been the experience in other jurisdictions where industries have undertaken water pollution clean-up. Consequently, the outlook for self supplied water users is steady or declining water use.

Municipal

Municipal water use will be influenced by all the factors mentioned above. Population increases, per capita increases and global warming will generate additional demand. This will put additional pressure on communities which rely on wells. Most communities will face a demand for additional infrastructure to meet public desires for safe drinking water and pollution clean-up. Overshadowing all of this will be an increasing demand to protect and enhance urban aquatic ecosystems.

Agriculture

Agricultural water use level will increase because of rising production and the possibility of a warmer climate. Agricultural water use will also attract attention as it will be drawn from small streams or wells which are closely linked to sensitive local aquatic ecosystems.

Summary

Several key developments will influence future water use patterns in Ontario. These are increased population, per capita increases in water use, climate warming, large future water infrastructure investment costs, the emergence of an ecosystem perspective on all resource use and a general lack of public awareness of water quantity issues. These developments will affect major water use patterns and influence the development of a Water Efficiency Strategy for Ontario.

Thermal electric water use is likely to remain constant over the next decade or so due to energy conservation.

Self supplied industrial water use should also remain constant as new mandated pollution clean-up efforts are undertaken. Local ecosystem impacts, if they exist, will persist. Municipal water use will rise. This will pose a number of problems for municipal water use: (1) shortages for some urban areas which rely on well water, and additional communities facing shortages; (2) the need for major expenditures on infrastructure; and (3) ecological impacts from additional aquifer drawdown and from surface water degradation. Agricultural water use can be expected to rise due to increased production and higher temperatures. This will result in local ecosystem impacts due to groundwater withdrawals or drawdowns from small streams.

Issues

The following were identified by participants as issues which must be considered in preparing a water efficiency strategy. They are listed in no special order.

1. GLOBAL CLIMATE CHANGE

Is the climate becoming warmer in Ontario? If so, what would this mean for water use? Should this be a source of concern to water managers?

In this decade, world attention has focused on the atmosphere around us as scientists, politicians, industrialists and environmentalists have expressed growing concern over the impact that increasing levels of carbon dioxide and other gases from combustion of fossil fuels will have on the earth's climate. This phenomenon, the "Greenhouse Effect" or global climate change, will result in wide-ranging changes to the world's climate patterns and the distribution of water, causing the warming of polar regions, a shift of productive agricultural and forest regions, and changes to water levels in oceans and lakes. Global climate change has been predicted to have the following consequences in the Great Lakes Region within the next century.

. Average annual temperature increases of as much as three degrees celsius leading to a reduction in net basin water supply to all the Great Lakes in the order of 15 per cent.
. Up to 20 centimetre reduction in Great Lakes water levels, which in turn increases shipping costs as well as reducing hydroelectric power production;
. An increase in soil moisture deficits leading to droughts, and subsequently a greater demand for irrigation water;
. An increase in per capita water use, as well as growing conflicts between water users, and possibly growing international pressure to engineer water diversions to supply water to other regions of North America.

2. COST OF WATER IN ONTARIO

How do Ontario water prices compare to other jurisdictions? Is there a difference in water rates depending on which municipality you live in Ontario? Should sewer surcharges be buried in municipal property taxes? How much does one pay for water and sewer services in Metropolitan Toronto?

Water in Ontario is quite inexpensive when compared to other jurisdictions. We are supplied with potable water at rates that are generally lower than U.S. rates, half western European rates, and a quarter of Australian rates.

When valuing the cost of water in Ontario, it is important to note that there is both a water component and a sewer component to the total cost of water. In some municipalities, the sewer component is included in the municipal tax base, so it is often difficult to compare water bills of these municipalities.

Household water bills in Ontario usually reflect a wholesale cost and a retail cost. For example, Metro Toronto will treat and deliver water to the six area municipalities at a wholesale rate. The area municipality will then add a retail component to the cost to deliver it to the household. Since Metro Toronto charges the same wholesale rate to its customers, water charges to households in the area municipalities are similar.

Household water rates in Ontario tend to be most expensive in small towns because there are fewer people to pay for the cost of the infrastructure (plants, pipes, etc).

3. QUALITY/QUANTITY INTER-RELATIONSHIPS

Is there a relationship between the amount of water used and its quality? How much clean water does Ontario have available for use? Is this adequate for our future needs? If less water is used, will this help with water clean up? Will sewage treatment plants work well if less water is used, and wastewater is more concentrated?

In the first half of this century, much of the pollution control technology was based on a simple philosophy: the solution to pollution is dilution. As a consequence, there are non-natural compounds detectable in Great Lakes water and estimates of rehabilitation costs for 43 Great Lakes Areas of Concern in Ontario and the U.S.A. are in the billions of dollars.

While pollution prevention and zero discharge are not new concepts, they are now receiving increasing attention. However, there are concerns that the implementation of water quality management may negatively affect water quality if quality and quantity approaches are not coordinated. For example, sewer separation programs which eliminate stormwater from sanitary sewer lines thus freeing up treatment capacity for more sewage, may cause erosion problems in local streams due to increased runoff. On the positive side, according to scientific research, municipal sewage treatment plants should become more efficient in meeting their quality objectives if the amount of water in the wastewater stream is reduced. Also, home and cottage septic systems should be more efficient and last longer if water flowing into the systems can be reduced by using water efficient fixtures.

Likewise, many industrial water efficiency programs such as water reuse and recirculation, separation of "waste"streams and alternate heat dissipating technologies can reduce or greatly eliminate the need to discharge water at all: clearly, a quality/quantity benefit. Black's Photography of Markham has installed a closed loop water recirculation system, which has reduced water use by 97 per cent and virtually eliminated the discharge of chemicals into the municipal system. If water efficiency measures can reduce demand on groundwater supplies, then base flows in local streams may increase, improving water quality and aquatic (fish, bird) habitats.

4. INFRASTRUCTURE

Is Ontario's water and sewer infrastructure being maintained adequately? If not, why? What are the implications of not adequately maintaining Ontario's infrastructure?

Ontario's infrastructure is aging, and a recent report prepared for the Ontario Sewer and Watermain Contractors Association indicates current annual expenditures are inadequate to maintain the systems. An improperly maintained system means an inefficient one. It has been shown that leakage in water supply and sewage collection systems results in only 80-90 per cent of treated water reaching the municipal water user and this leakage, when it enters the sewers, uses an additional 20 per cent of sewage treatment capacity.

Estimates of the replacement value of Ontario's water services infrastructure are in the order of $50 billion, and the demand for more infrastructure is increasing. It has been argued that this growing demand for increased water supplies has been artificially inflated by a self reinforcing supply management-driven cycle:

. users use excessive amounts of an under-valued resource
. excessive use creates artificially high demand
. high demand inflates operating and maintenance costs and argues for major expansion
. usage fees must be kept low to encourage use of expanded facilities

There is growing evidence that water conservation practices, education and demand management techniques break the supply management cycle and result in reduced water use which can delay or even eliminate the need for costly expansions. Such technologies have been shown to reduce total water use very substantially. Installation of water efficient fixtures can reduce residential water use by 30-50 per cent.

5. WATER EFFICIENT TECHNOLOGY

What is water efficient technology? Is it available in Ontario?

Water efficient technology uses less water. The EcoLogo program defines water efficiency as follows:

. showers less than 10L/min
. toilets 6 litres or less/flush

At the moment, there are ample supplies of faucets and showerheads available for sale in Ontario at costs comparable to conventional fixtures. Several models of toilets using 6 litre per flush can be ordered in Ontario at prices ranging from $125 - 350. They are not widely available in retail outlets as yet. About 1-2 million 6 litre toilets are in operation in the U.S.A.

6. RATE STRUCTURES - BILLING SYSTEMS

What type of water rate structures exist in Ontario? What types of structure are most prevalent in the province? Which rate structures offer an incentive to use water efficiently? Are water prices a factor in industrial development?

There are four main types of rate structures in Ontario:

(a) A flat rate system, whereby a fixed charge is levied regardless of the volume used. A total of 33.2 per cent of Ontario residents are under this structure.

(b) In a declining block rate system, the greater the volume of water used, the lower the price per unit. 34.1 per cent of Ontario residents are charged for their water under this system.

(c) A constant rate system in which the user pays a fixed amount per unit of water. The cost is exactly the same for each additional unit of water. In Ontario, 32.5 per cent of residents pay for their water in this manner.

(d) The increasing block rate billing system charges a higher price per unit, the greater the volume of water used. Only 0.3 per cent of Ontario residents pay their water bills using the increasing block rate.

The cost of water often varies depending on the rate structure. A flat rate billing system does not offer an incentive to be water efficient. Flat rate charges are usually based on an average family size of about three people with a corresponding average family use. In a metered block rate system, a value is assigned to each additional unit of water used. Therefore, it is usually advantageous for single or two person households to be on a metered system. The measured lower water use would result in lower water bills.

The decreasing block rate billing system, like the flat rate system, also offers a disincentive to use water efficiently because it promotes the use of large volumes of water to obtain lower per unit costs.

The decreasing block rate is often used by a municipality as an incentive to entice large industry. Large industrial companies are usually great water users. Under this billing system, economic benefits are accrued by large water users since they pay less per unit when they use more water. The constant rate and the increasing block system are consistent with efficient water management as users have an incentive to use water wisely.

Some municipalities have more elaborate billing systems. For example, Windsor charges a summer levy between June and November in excess of the winter average. This is intended to encourage efficient use during the summer when a great deal of water is used on lawns.

Most pricing experts favour water rate structures where price tracks the actual cost of water supplied, a marginal or increasing block approach. This recognizes that providing additional water costs more than current supplies, and that large volume users should bear their fair share of water supply expansions. Theoretical studies suggest that use of increasing block rate structures could reduce water use by 50 per cent. In 1986, only two Ontario municipalities had such rate structures.

Adoption of anything other than a flat rate structure requires the installation of meters.

7. METERING

How many households in Ontario are metered? Does metering reduce water use?

Nearly all commercial and industrial water users tied into municipal systems are metered. About 2,000,000 out of 3,000,000 household water users tied to a municipal system are metered. This leaves about 1,000,000 users who are unmetered.

Metering is generally credited with being a significant factor in promoting efficient water use because it enables municipalities to charge users for water based upon the amount that is actually used. For example, Edmonton meters its water and homeowners use about one half the amount consumed in Calgary which is generally unmetered. Residential areas in Calgary which are metered use one half of what residents in unmetered areas of Calgary use.

The chief disadvantage of metering is cost. The City of Toronto budgets $350 per meter installed in existing houses in Toronto. Accordingly, the cost of installing meters in all existing unmetered households in Ontario could be $350,000,000.

8. PLUMBING CODE

Should Ontario accept the U.S. evidence that 6 litre per flush (lpf) toilets can perform adequately? Should Ontario mandate the 6 lpf toilet from, say, 1994 onwards? Is there a risk of job losses if Ontario proceeds? Can fixtures and fittings producers alter their manufacturing processes to produce the water efficient devices? Which government agency, if any, should assist the manufacturers, the users such as hotels, etc.? Should CSA testing/approvals be mandatory?

The Ontario Plumbing Code does not reference water efficient devices such as toilets, which use only six litres of water per flush. Many states in the United States have mandated the use of 6 lpf toilets, and other devices, in new construction and renovations. A Task Force chaired by the Ministry of Housing is considering how Ontario should proceed.

9. WHO PAYS FOR WATER EFFICIENCY

Since water is a common property resource, should water efficiency program costs be added to the general tax base or be collected through a royalty on water use? Should economically disadvantaged people be limited in their access to water by their inability to pay? Should municipalities provide incentives for retrofitting buildings or installing water meters, or should the province require these changes through legislation? Should economically disadvantaged regions of the province receive a water or sewer subsidy to attract industry?

It could be argued that by not paying for water efficiency programming now, we are asking future generations to pay for the consequences of our wasteful uses.

In the long run, installation of water efficient fixtures, full cost pricing for water and use of water efficient technologies and processes will represent a cost savings. In the short run, however, the cost of retrofitting buildings with these fixtures, the installation of meters to allow accurate water auditing and pricing, and full cost pricing for water represent a new cost to all water users.

10. CANADIAN STANDARDS ASSOCIATION (CSA)

Should all water efficiency devices be CSA tested/approved? Should CSA accept test results from other jurisdictions?

CSA is a national organization of business, government, labour, consumers, and associations all working together voluntarily in their common interest to develop national consensus standards.

Standardization through the Canadian Standards Association is intended to be voluntary and self-regulating, using the consensus principle. CSA Standards are widely used by industry and commerce and are often adopted into regulations by municipal, provincial, and federal government, particularly in the fields of health, safety, and the environment.

Currently, only faucets, faucet aerators, showerheads and toilets are certified by CSA. Some manufacturers have requested certification for 6 litre per flush toilets.

11. WATER USE CHARGES

Would a water use charge promote the most efficient use of water? Should there be a charge for using water as there is for most other natural resources—i.e. timber, fish, gravel? Should it be based on withdrawal, consumption or degradation? To whom should it be applied?

In Ontario, royalties are collected on many natural resources including timber, petroleum and some mineral resources. Except for a charge on hydropower production, water in Ontario is free for the taking. Municipalities, industries, thermal power producers and farmers pay only for the infrastructure and facilities costs of withdrawing, treating, transporting and discharging water. Users also rarely pay for use of water as a waste or contaminant assimilator (although this may limit subsequent uses of this water for recreation, drinking supplies, etc.) Such costs are usually considered part of the cost of doing business. Because water is so ubiquitous, it is difficult to find an equitable basis on which to charge a fee and to establish a value for water. For example, Ontario Hydro would pay 80 per cent of a withdrawal-based charge, but only 8 per cent of a consumption-based charge: corresponding municipal figures are 6 per cent and 47 per cent respectively. Most strict economic estimates of the value of water are very low, because of its abundance. Some experts question whether a charge on water would cause users to reduce use or simply regard it as another tax. For example, about 40 per cent of the retail price of beer is taxes and a water charge would probably only add another 1-2 per cent to the cost of the product.

12. MUNICIPAL FULL COST PRICING

Should the users of municipal water pay the full cost of using water? If so, what should they pay for? What are the implications of a full cost pricing scheme?

The issue of full cost pricing arose as a result of a growing concern that the funding required for operation, replacement and expansion of water and sewer facilities/infrastructure was insufficient to meet the growing costs of producing to meet the demands for water. Canadian water use trends indicate that, during the past decade, water use far outstripped population growth.

Ontario's municipalities treat and supply water to 80 per cent of the population, and about 10 per cent of all industrial water use is municipally supplied (excluding power generation). Figures for the collection and treatment of wastewater by municipalities are similarly large. However, the way in which the cost of water treatment, distribution and wastewater treatment varies greatly across the province, and may be paid through property taxes, provincial/municipal subsidy arrangement or development levies. As a result, consumers do not pay all the water costs in their water bill. They pay these costs in other ways, accordingly, they have no concept of the cost of water use, which usually results in overuse/abuse. The impact on the environment of wastewater discharges which fail to meet provincial water quality standards (because of capacity or technological limitations) is not currently charged as part of the cost of water, although substantial public funds are devoted annually to water management and rehabilitative programs.

Full cost pricing refers to a pricing scheme which reflects the real economic cost of the resource in the water bill. Factors considered for inclusion are direct operating costs, costs of providing for peak demands, storm sewer separation costs, metering, public awareness and some other costs such as the cost of environmental assessments for new construction. A full cost pricing scheme would ensure that all resource costs are considered upfront, thus encouraging water conservation and reducing the need for costly, publicly funded remedial programs. It should also assess charges as much as possible to individual customers based on the customer's contribution to incurring the full costs.

13. IMPACT OF WATER EFFICIENCY MEASURES ON MUNICIPAL REVENUE

If everyone adopts water efficient technology, won't this adversely affect municipal revenues requiring a rate increase? Doesn't this punish the water user for adopting water efficient technology or better management practices?

Utilities have fixed costs which must be paid for, even if less water is used, or even if no water is used. If everyone suddenly reduces their water use, then rates may have to be raised. In practice, some people will reduce immediately and others will take longer. During this time, new customers will be connected to the system which will offset any decline in sales. Over time, there will be more customers paying less which will maintain revenues to the utility. The aim will be to hold demand at a constant level, thus holding revenues constant.

14. THE NEED FOR INTEGRATED MANAGEMENT

How should water be managed? Is new legislation required? Are new management mechanisms needed?

The management of water and related resources is a shared responsibility in Ontario, involving a number of provincial ministries, federal departments, municipalities and other agencies. Three federal statutes and at least eleven provincial acts relate directly to the use and management of water resources and there are in the order of 30 others which indirectly affect water. This multiplicity of agency involvement has often been viewed as an impediment rather than a strength in managing water. Legislation now in place provides a general framework for water resources management by defining rights and obligations regarding water use, and by laying out broad responsibilities for government bodies.

As the range and complexity of water issues continues to expand, however, it is becoming increasingly difficult to effectively manage on an ongoing basis. A more holistic or ecosystem approach is called for in order to cooperatively manage water proactively, by responding to water quality and quantity issues in an integrated way and managing water in the broader context of managing resource demands, sustaining environmental resources and maintaining economic stability. Steps toward an ecosystem approach are already occurring through initiatives such as Strategic Plan for Ontario Fisheries (SPOF II), Great Lakes Remedial Action Plans (RAPs), and new watershed planning initiatives.

15. POTENTIAL FOR URBAN INFILLING

Does the more efficient use of water and the resulting reduction in sewage volume lead to opportunities to build more residences/offices on a given piece of developed real estate? Would the introduction of water efficient devices permit the building of residences on presently unoccupied urban real estate?

If a sewage treatment plant has limited capacity and a community reduces the flow of sewage to the plant through water efficiency, then there should be an opportunity to put more people on the system until the flow returns to the level of the plant's capacity.

Within an existing built-up area, the introduction of water efficient fixtures amongst existing users would create some space capacity in existing pipes. Thus, development in the area could be intensified without having to incur the expense of installing additional infrastructure.

16. WASTE TRANSFER

If the adoption of water efficient devices or better management

practices results in less water used, isn't there a risk that toilets or drain pipes may clog? What has the U.S. experience with such fixtures been to date?

This topic has been raised over the past 10 years in the U.S. as 6 litre flush toilets and other low flow fixtures have been introduced. What research that has been done is positive. For example, a 250 home subdivision in Phoenix, Arizona was equipped with 3 litre flush toilets and a nearby subdivision was equipped with conventional 13 litre toilets. The characteristics of the people in the two subdivisions were similar. The 3 litre subdivision showed the following:

- 23 per cent less water use in winter months
- less double flushing
- significantly fewer homeowner complaints with toilet clogging
- no real difference with sewer clogging (both subdivisions rated very low)
- a greater need for additional bowl cleaning

No doubt, research of this nature should be continued. However, surveys of officials in communities where 6 litre per flush toilets have been installed, has failed to identify any significant concerns about toilet or sewer blockages.

17. WATER USE PERMITS

Is the existing permit system adequate? Should all water takers be required to obtain a permit? Should water users pay for this permit?

The Ontario Ministry of the Environment requires anyone who takes surface or well water in excess of 50,000 litres per day to obtain a permit. Excluded are household and farm uses (drinking, bathing, livestock). Permits are required for irrigation. The Ministry of the Environment has the authority to require permit holders to reduce their water taking in order to maintain minimum stream flows to protect fish and other aquatic life.

18. COMPETITIVENESS

If Ontario municipalities raise their water rates to promote efficiency won't this discourage industry from locating here and make local products more expensive? Within Ontario, if one municipality raises its rates to promote efficiency, won't it be less attractive to residents and industries in relation to nearby communities? Should the Ontario Government mandate that municipalities cannot give away free or underpriced water to attract industry as it now mandates that land costs to industry cannot be subsidized?

Ontario's water rates are generally lower than those in nearby states. They are certainly lower than those in other countries. Consequently, this should not be a major concern. Within the province, a different picture emerges. Water rates do range widely. There are legitimate reasons for this as some water supplies are more accessible, some require higher levels of treatment and some must spend more to clean their wastewater. In addition, some municipalities may be holding their water costs down by paying for water and wastewater services out of taxes in order to make the community more attractive. Should Ontario try to ensure a level playing field?

19. PUBLIC AWARENESS

Do members of the public see a water problem? Do they see an issue with water quantity? Should the public be made more aware of water issues? Do governments, public agencies and institutions have a role? What is it?

Most of Ontario's water is used by the general public - homeowners, owners of small business, corporate managers etc. Homeowners also use a lot of water to make their properties look good. People love their grass and their gardens. Only a tiny portion is used by government. At the moment there are some public water concerns with water quality - is my water safe for me or my children to drink? If any headway is to be made in dealing with either quantity or quality issues, then the cooperation and assistance of the public will be required. This is likely to be a long term effort. Accordingly, both adults and children should be involved in the awareness and educational effort.

20. GROUNDWATER (WELL) MANAGEMENT

What is the demand for groundwater? What is the supply? Is groundwater being adequately managed?

Groundwater is important in Ontario. About 25 per cent of all residents rely on wells including many large municipalities such as the Region of Waterloo. Historically, data is maintained by the Ministry of the Environment concerning all water wells in the province. However, with the exception of the work done by individual municipalities, there has been little systematic research to define how much groundwater exists, and whether or not the current and projected withdrawal rates are sustainable for long term use. Some changes are being made. The Centre for Groundwater Research at the University of Waterloo is becoming a focus for research.

21. EQUITY/HARDSHIP

If full cost pricing is adopted, won't prices rise and won't this hurt people on low or fixed incomes? Will small and northern municipalities be able to install and update water and wastewater systems if provincial grants are reduced or eliminated as is assumed in full cost pricing?

Full cost pricing, metering, etc. may not raise water rates for all users. Singles and couples may see decreases as may families and companies which do not have excessive summer use. For others, costs may be shifted from taxes to water bills with a corresponding decline in taxes. There are a variety of ways to deal with equity. One way is to provide a "lifeline" amount of water to all users at a low rate. Another is to adjust the rates for those receiving social assistance especially if they are in a situation where they are large water users such as a large family. For certain municipalities, a reduction in provincial grants will be a serious issue. If provincial grants are reduced, how will they cope with financing the

water and wastewater treatment costs? This is a question which will require a good deal of attention during the upcoming workshop.

22. STORMWATER (RUNOFF)

Should stormwater be considered as part of the Water Efficiency Strategy for Ontario Initiative?

Stormwater and the Water Efficiency Initiative have only one aspect in common combined storm sewers. In many municipalities, sanitary sewers carrying household wastewater also carry stormwater from residential downspouts and streets. When large rainstorms occur, then these sewers carry more water than the sewage treatment plants were designed to treat and as a result all of the excess water from such sewers is directed into a creek, river or lake. This pollutes the water and makes it unfit for swimming. Much money has been spent by governments to separate the sanitary from the stormwater systems. However, more money will be needed. Downspouts should be disconnected from sanitary sewers. In the opinion of government staff, other than with respect to the issue of combined sewers, there is no real need to focus upon stormwater as part of the Water Efficiency Strategy for Ontario. Stormwater is to be considered in other forums such as the watershed, subwatershed guideline development exercise, now underway within MNR and Ministry of the Environment (MOE).

23. DROUGHT MANAGEMENT

What is being done about drought management?

As a result of the 1988 drought, the province and other water partners prepared a booklet titled "Guidebook to Drought Management". This is available on request. The booklet suggests an action strategy for coping with a drought and recommends the creation of coordination task forces when it appears that a drought is imminent.

24. PUBLIC ACCEPTANCE OF TECHNICAL CHANGE

Will the public accept water efficient technology? What are the barriers to acceptance?

Water efficient toilets, showers and faucets on the market right now have the potential to reduce water use by 30%. The payback period for the investment would be less than three years. Potential reductions to industrial and commercial water demand use appear to be about the same magnitude with paybacks of 1-2 years. The key barriers are complacency about the small cost now associated with water and wastewater services and the lack of awareness about the technology available to reduce water use. However, this is a surmountable problem. Experience from many U.S. and some Canadian communities indicate that if the public is made aware of the need to use water wisely and if people are made aware of water efficient technology then they could accept it and install it. Thus, the problem lies in the area of raising public awareness and ensuring that water efficient products are available. At the moment there is a good supply of showers, faucets and toilet dams. However 6L toilets are in short supply due to a lack of consumer demand.

25. GREYWATER USE

Should greywater be used in place of treated drinking water for some uses such as lawn watering?

Greywater is water from sinks, showers, bathtubs, etc. It is not water from toilets. Greywater contains coliforms and therefore greywater presents some potential health problems if it is to be reused. There are some systems on the market to reprocess greywater for use in flushing toilets and watering lawns. However, these systems are expensive and do not enjoy a high level of reliability. Thus, use in the household does not appear feasible at this time. The main potential use of greywater appears to be turf watering. However, before any specific application could proceed, it would have to be scrutinized for its health considerations. If water supplies were severely constrained within a community then the whole issue of greywater use would be re-considered.

26. RETRAINING

Should workers be retrained to install water efficient devices?

Water efficient devices do not differ radically from current fixtures. However, plumbers and others in the industry will have concerns about the potential health impacts of water efficient fixtures using less water to transport the same amount of waste. This concern has been raised in the U.S. Research indicates that waste transfer can be performed safely with water efficient fixtures. Training sessions should be held with plumbers and others to discuss their concerns and make them aware of the potential for water savings associated with water efficient technology If greywater systems are eventually introduced then substantial training would be required as plumbers would have to become familiar with the use of two separate water systems in one residence or building.

27. PROMOTE WATER EFFICIENT TECHNOLOGY

Should the province, the municipalities and the utilities promote water efficient technology? If so, how?

Much of the water efficient hardware which could be utilized in a residence is already on the market in profusion. Public awareness programs (brochures, bill stuffers, ads, demos) could help.

28. ECOSYSTEM PERSPECTIVE

Should water efficiency be put in the big picture? What would this be? Should an ecosystem perspective be adopted?

Water is a renewable resource which should be managed based on the hydrological cycle. In this cycle, water is constantly falling on land, evaporating, running off or soaking into the ground. Water from the surface and groundwater ends up in a river or lake and then evaporates to start the cycle all over again. Along the way it meets

the needs of humans and other living things. Any change in these flows either from a quality or quantity standpoint will begin to have major environmental and economic implications. Increasing the efficiency of water has a number of positive consequences for the ecosystem. More water is available for fish. Less water is degraded. Less energy is used. Water use of all kinds must be looked at from an ecosystem perspective.

29. WATER MANAGEMENT

Who manages water in Ontario? Is there room for coordination?

The management of water and related resources is a shared responsibility in Ontario, involving a number of provincial ministries, federal departments, municipalities and other agencies such as the province's 38 conservation authorities. There are 15 federal and over 75 provincial statutes with direct or indirect pertinence to water.

Provincial responsibilities for water management are shared among a number of ministries, each with their own legislative mandate. The Ministry of Agriculture and Food is responsible for fostering the development of an economically viable, environmentally responsible agriculture and food sector in the economy. The Ministry does not directly develop policies on water but Ministry responsibilities have a water component.

The Ministry of the Environment is responsible for achieving and maintaining a quality of the environment, including water, that will protect human health and the ecosystem and will contribute to the well-being of the people of Ontario. Major responsibilities include the protection of drinking water supplies, regulation of communal sewage treatment facility discharges, the operation of water and wastewater treatment facilities plus other environmental protection initiatives.

The Ministry of Municipal Affairs (MMA) is responsible for providing a framework within which local governments can plan for their future. The Ministry does not directly develop programs or policies on water. However, some Ministry activities have a water component. Ministry responsibilities related to water involve policy development and plan review. While the Ministry financially assists municipalities, direct expenditures by individual municipalities are not included in MMA's budget.

The Ministry of Natural Resources is responsible for: the management and conservation of water quantity resources, the management and control of riverine and shoreline flooding and erosion hazards, fisheries, wildlife population and habitat management, protection and conservation as well as the coordination of water and related land use planning and management. The Ministry also enforces the federal Fisheries Act which has major implications for water management.

30. INDUSTRIAL WATER EFFICIENCY

What can industry do to use water more efficiently? Does it make economic sense?

Water audits performed for MNR and jurisdictions in the U.S. suggest that saving of about 30 per cent in municipal water use by individual companies is generally achievable. These savings are realized by recirculating cooling water and by reuse of water used for one purpose in a plant for some other purpose, e.g., use of cooling water for rinse water. These water savings can often be realized with a one to two year payback on capital cost investment. Similar savings appear possible in the commercial and residential sectors.

31. PRIVATE WATER USERS

How important is this group? Should it be included in the strategy?

About one quarter of Ontarians rely on well water. Many of these are people who rely on their own private wells and their own waste disposal systems (septic systems). The septic systems are a source of concern as they contaminate groundwater. Water efficiency improvements help these water users in two ways. They reduce the need to take water, meaning that more remains in the aquifer. In addition, reduced flows into the septic system enable it to work better and produce less pollution.

32. ZERO WATER USE INCREASE TO 2011

Is this goal feasible? By what means?

To achieve this, commercial and industrial water users tied to municipal systems should reduce their water use by 20-30 per cent. Residential water users can save 20-30 per cent through the installation of toilet dams, water efficient toilets, and water efficient showers. Based on a review of U.S. and Canadian experience, this seems feasible. Changes in water use behaviour resulting from education or water efficient pricing could add to this total.

33. BASELINE DATA AUDITS

Is there a need for additional water data? Do we know what water use takes place today?

The province has only a general database concerning water use in the province. This information is derived from a number of sources - i.e., surveys, estimates, etc. In order to gauge future progress towards more efficient water use, it will be necessary to improve the quality of the database.

34. INCENTIVES

Are incentives needed to bring about water efficient behaviour? Who should receive them?

Financial incentives may be able to produce results which have traditionally been achieved by regulation or legislation.

Draft Long Term Goal

To Sustain Water Quantity and Quality Through Efficient Use.

Several ideas are embodied in the goal. Both water quantity and water quality are central features of the provincial strategy. Achieving sustainable quantities of water will be a hollow goal if this water is polluted. Likewise, sustaining quality will require attention to quantity management, otherwise Ontarians will be faced with the task of trying to clean up even larger quantities of polluted water. Second, implicit in the use of the word sustaining is the idea that water quantity and quality will be available to meet the needs of future generations. Third, the concept of efficiency represents a very important philosophical approach to guide future water management in Ontario. Efficiency means the use of improved technologies and management approaches to deliver the same or better service with less water while sustaining quality.

Excluded from this definition are measures which people will find distasteful and abandon as soon as possible. These include such measures as permanent bans on lawn watering, bans on car washing or less frequent showering. Ontario does not face a critical water supply situation which would justify such approaches. These measures can be justified only for short periods of time to deal with emergencies such as severe summer drought, contamination of a well or a problem with the distribution system. Efficiency is aimed at maintaining or enhancing the quality of life by introducing water efficient devices and approaches utilized elsewhere, or by developing new ones to meet Ontario's needs.

More efficient use will require a change in water use thinking and behaviour by water users and water managers. For household and commercial users, it means purchasing new and much improved fixtures such as 6 litre per flush toilets, efficient showers, faucets and other fixtures as well as designing lawn layouts and plantings which are water efficient. For industrial users, it will mean better housekeeping such as leak reduction, recycling, reuse and ultimately changes to technological processes which require water. The result is less water use per unit of output.

For water managers, water efficiency means a change of outlook. Previously, whenever demand for water began to approach the limit of available supplies, a water manager compared the cost of several sources of supply and selected the one offering the greatest net benefit. This goal signals that water efficiency is now explicitly an alternative to adding new supply.

There are several major benefits associated with the consideration of water efficiency. Water users may see higher water, energy and sewer bills in the future, however, if they adopt water efficiency measures, the bills will be lower than what they would have been. For those with septic systems, water efficient fixtures will reduce the flows into the system, improve the performance and life of the system and may require smaller fields. Water providers can extend the life of their existing treatment plants without having to undergo environmental assessments that would be required if a new plant were to be built. In addition, water efficiency can be added in stages which are under the control of the utility rather than having to bring a step increase in capacity associated with a new water plant. Lastly, since most water efficiency measures cost less to install than the cost of a new plant, the utility can enhance the competitiveness of the community and increase the purchasing power of its citizens by keeping down the cost of water.

Wastewater treaters will see the life of their existing facilities extended. Water efficiency can expand water service to more people without generating additional wastewater flows. In addition, there are operating efficiencies which arise from reduced per capita water flows. These include the reduced usage of chemicals, longer equipment life due to reduced backwashing and reduced energy use due to reduced pumping.

The environment is also a beneficiary of a water efficiency approach. Less raw water needs to be taken from wells or streams. This means that more water can be left in aquifers and streams to augment flows for aquatic creatures or meet

the needs of future generations. Reduced flows into wastewater treatment plants and septic systems improve the treatment and thus enhances the quality of the effluent returned to streams, lakes and aquifers.

Note: This report makes numerous references to efficient water management. Where this is not clearly spelled out, this should be read as efficient wastewater management as both water and wastewater management are two sides of the same coin.

Draft Guiding Principles

Ten principles, or beliefs, have been established to provide a guide to actions aimed at achieving the goals and subgoals for the Water Efficiency Strategy. They are listed in no particular order of importance.

1. Optimize the efficient use of water by employing measures that are sustainable environmentally, socially and economically

Efficiency is the use of technology and management schemes that use less water while maintaining or enhancing the level of service. Some additional tests are introduced in principle 1. This principle indicates that the accounting must include a range of environmental, social and economic considerations. Experience elsewhere suggests that when these criteria are applied to many current water uses, then major benefits can be achieved by applying water efficient technology. A decline in water use usually results.

However, this principle does not mean that all water uses in Ontario must be reduced. For instance, requiring Ontario Hydro to reduce its use of water for cooling would require major expenditures on cooling towers which would increase the rate of water loss, produce undesirable localized weather impacts and be aesthetically unsightly and costly. In this calculation, the disbenefits appear to outweigh the benefits. A similar calculation will have to be carried out to see if other water uses are efficient and pass the above tests.

2. Adopt an ecosystem approach to the provision and management of water and wastewater

In an ecosystem, "everything is related to everything else". In water management, we have witnessed an interrelated chain of events. Water and wastewater services have not been appropriately priced to reflect all of the normal economic costs. Some of these costs have been paid out of grants which means that funding is provided by provincial taxes. Others have been paid for out of municipal taxes. In addition, the environmental and infrastructure renewal costs have not been reflected in water and sewer bills. As a result of this inappropriate pricing, large quantities have been used and more and more plants have been built to provide this water, and more wastewater plants must then be built to cope with the additional flow. In many instances water and wastewater services are provided by different bodies and the scheduling of plant construction has not been harmonized. Throughout this process several other events have occurred. Aquifers have been drawn down which adversely affects pond levels and stream flows. This has harmed aquatic life. It may also deny adequate water supplies to future generations. Valuable open spaces near waterbodies have been used for water or wastewater plants. More energy and chemicals are being put into the systems. All of this costs ever increasing amounts of money. The public is de-

Guiding Principles continued

manding higher standards while water providers and wastewater treaters are facing financial difficulties in meeting existing standards.

Using an ecosystem approach, we begin by establishing a goal that we must ensure sustainable water supplies for future generations of Ontarians. We must also ensure that all living things receive sufficient supplies of water. We must also ensure that all components of the water and waste water system are seen as a whole contributing to our water goals. We must change our water management practices. Water efficient technology and management practices offer the potential to break the water use cycle that has characterized the past.. These measures offer the potential to expand services to water users without continuing the spiral of ever increasing demand referred to above. This provides an opportunity to meet public concerns about safe drinking water and about pollution. It also offers a means for accommodating the growth which appears inevitable, at least in the Golden Horseshoe.

New approaches are going to have to be undertaken within government agencies responsible for water management, under an ecosystem approach, some of the different government mandates should be harmonized so as to avoid duplication and institutional tunnel vision.

In order to successfully implement water efficiency, water utilities, municipalities, provincial ministries, water users, installers and manufacturers are going to have to work together. Each now holds part of the solution to the problem. A great deal of information will have to be shared. The development of this Water Efficiency Strategy by representatives of these key players, and the public is a first step.

3. Improve and preserve water quality

Sustaining water supplies means that Ontario must improve the water degraded by human activities and conserve existing supplies of high quality water. Past practices have treated water quality as if supplies were unlimited. Accordingly, streams have been treated like sewers and lakes have been seen as sinks capable of absorbing enormous quantities of biological and inorganic wastes. Over the past many years, the result has been a deterioration in the quality of Ontario's water resources, including the Great Lakes. Some progress has been made. Nutrient removal at sewage treatment plants has reduced the amount of algae growth especially in Lake Erie. Also, major expenditures on sewage treatment plants has reduced biological contamination. However, many problems remain. There are beaches where swimming is prohibited, wildlife which develop deformities and cannot reproduce, and waterbodies which support only the lowest forms of aquatic life. Humans are part of this biological process. They eat the fish and drink the water from these waterbodies. As a result, there is increasing concern about water quality.

4. Maintain sufficient supplies of water to meet the needs of future generations

Most Ontarians have access to one of the Great Lakes. Maintaining supplies of quality water for future generations, even though these future needs are very difficult to predict, means ensuring that water users now receive the appropriate economic and environmental message through full cost pricing. Measures which reduce demand such as the use of water efficient technology should be given the same consideration, in future planning, as measures to increase supply.

About one quarter of Ontarians rely on wells for their water. As population and development increase, the pressures on the aquifers will increase. The adoption of cost-effective efficiency measures can help ensure future water supplies as contemporary users can enjoy the same level of service while using significantly less water.

5. Individual water users should pay in the water and sewer bills all of the costs of delivered water and treated wastewater.

To prevent overuse and abuse, charges for both delivering water and treating wastewater should incorporate all environmental and social costs. They should include all costs associated with treating raw water, the cost of infrastructure including capital and replacement, the costs of administration and the costs of cleaning up the resulting wastewater to fully meet environmental standards. In addition, water

users demanding water in peak periods of the year should be charged the extra cost of providing the infrastructure to meet this need over and above the infrastructure needed for fire protection.

6. Revenues from water and wastewater charges should be dedicated to maintaining and upgrading the water and wastewater systems respectively.

Water and sewer charges should only cover the costs of these systems and not become a "cash cow" to finance other municipal expenditures. If water and sewer charges are raised above the cost of providing these services, then the municipality will be punishing all water users, especially large water users. The results could be a loss of industrial competitiveness.

7. The social costs associated with implementing water efficiency measures should be distributed equitably.

Currently, water and wastewater charges in Ontario do not reflect full cost accounting principles. Provincial grants to construct and operate municipal systems are not recovered through water/sewer rates, nor are the administrative costs of provincially owned and/or operated water or sewer systems included in the water/sewer bills. In addition, some municipalities recover a portion of their operating costs from taxes. Lastly many systems may not be setting aside sufficient financial resources to fully maintain their infrastructure.

As utilities move to full cost pricing, costs which were previously paid for by taxes will be shifted to the water and sewer bill. For many, water and sewer bills will increase as a result of this shift. Some who are now on flat rates and who use small amounts of water, may see a decline in their bills under full cost pricing. However, it is possible that people on fixed incomes, smaller municipalities, and northern Ontario communities, where construction costs are high, may be adversely affected. Some strategies will have to be developed to ensure that the impacts of water efficient strategies are shared equitably.

8. If a subsidy is to be provided, then incomes/taxes rather than water charges should be subsidized.

Social equity has been provided in the past by making water infrastructure grants to small municipalities or by offering low rates to big water users. This results in some water wastage in the sense that water users may be paying less than the full cost of water. Accordingly, they may use more than if all the costs were incorporated. In order to achieve full cost pricing on water, it is recommended that assistance be provided in some way other than providing cheap water. This could be a municipal tax rebate or an income subsidy which would achieve social equity without encouraging "wasteful" water use. Small municipalities, water and wastewater infrastructures should not be subsidized directly, but through general transfers.

9. Governments, institutions and public agencies should show leadership by being efficient water users, by promoting efficient water use and by managing wastewater generation.

Government and other large organizations must lead with the implementation of water efficiency. If savings are possible, then governments and other large organizations can realize them just as easily as the public. These early initiatives will be pilot tests of the technical feasibility and highlight the economics and the environmental impacts of water efficient technologies. Governments and public agencies should then publicize these early pilots to promote water efficient measures and practices among the general public and the private sector. Measures that will reduce wastewater generation, including prevention of the infiltration of clean water into wastewater collectors, are also important.

Special attention should be given to carrying out these demonstrations in areas that will be visible to the public - i.e. washrooms near public reception areas of city hall or gardens along a road or sidewalk with heavy traffic volumes. Governments, public agencies, institutions and corporations must lead, for example, by adopting water efficient purchasing policies.

10. The public should be informed about water use and be consulted in water management decision making.

Ontario's nine million plus residents are among the prime

actors accounting for Ontario's high water use. If this situation is to be altered, then the attitudes and water use behaviour of all major water users will have to undergo a change. Undertaking a public awareness program, which emphasizes the high levels of water use in Ontario and comparatively small water bills when viewed in a global context, is a key part of this change strategy. This is all the more important if new legislation or full cost pricing is to be introduced. It can be anticipated that user concerns may arise if legislation or regulations appear to be unjust or if water rate increases are seen as merely another form of tax. Public discussion and debate can defuse this and serve to channel water user behaviour into more efficient and sustainable practices.

Water users should also be consulted when water management concerns are being addressed. The consultation process is highly educational and will lead to increased dialogue between professional water managers and users. The aim is to motivate water users to accept responsibility for their water use.

Draft Supporting Goals

The following supporting goals were proposed by one or more discussion groups. They are listed in no particular order. The actions listed for achieving the goal are in the early stages of development. More work will be done on them by workshop participants. It is expected that they will be implemented over a period of years.

A. To provide economic incentives that foster efficient water use.

Water consumers in Ontario are currently being provided with incentives to use more and more water. About 33 per cent of Ontario households and 26 per cent of the commercial users are paying a flat rate for water meaning that they pay the same annual water bill regardless of the amount of water that is used. Consequently, it is not uncommon to see the owners of residences on a flat rate system operate their lawn sprinklers all night throughout the summer. Another 34 per cent of households and 43 per cent of commercial users are on a rate system in which each litre of water becomes cheaper, as more and more is used. Thus, about three quarters of Ontario's water users are receiving the message that water is limitless. There are other features of the current pricing system which encourage heavy water use. Taxes are used to cover wastewater costs in some municipalities and the province pays grants to municipalities out of general provincial tax revenue to cover the costs of water and wastewater infrastructure construction. Consequently, many consumers never see the real cost of providing and treating wastewater. Few users see disincentives to heavy water use. In addition, to these examples, there are more subtle ways in which all of the costs of providing water are not recovered. For example, the province does not apply any charge for water management. This is covered out of taxes. Utilities do not apply extra charges for the provision of water during peak periods for users such as lawn watering. Water used for lawns currently is charged at the same rate as any other time of the year in spite of the fact that purification plants are sized primarily to accommodate summer demand. This additional capacity represents a cost to the utility that is currently charged to all users rather than to those who are lawn waterers.

If water users are to see the true cost of using water and treating wastewater, then the pricing structure must be changed. People should be charged in accordance with the costs that their demand for water places upon the system.

A.1 a) To implement metering for all municipal water users

A.1 b) Legislate Mandatory Water Metering over 10 years.

Discussion

Metering is very important because it is a necessary first step if user pay is to be implemented. Metering is supportable because it promotes equity, it is a method of mea-

surement which fosters the creation of data bases, facilitates planning and promotes water efficiency. Metering costs would be included in water bills. There are several important issues to be considered:
. Cost effectiveness– metering is costly. Does it represent the best bang for the buck?
. Institutional mismatch– in a regional system of government, both the municipality and region benefit. But how are the benefits to be shared?
. Sub-metering– does it make sense to meter individual apartments in large residential and commercial buildings?

Should water metering be mandatory for new dwellings over a ten year period? In existing homes, the installation of a meter could be a condition of sale. This would mean that nearly all homes would be metered in twenty years. An alternative to this regulatory approach would be the use of incentives to bring about universal metering over a shorter time period.

A.2 Implement full cost pricing including the cost of issuing permits, the cost of environmental inspections, the supply of infrastructure costs and the cost of environmental clean up.
Discussion
General governmental clean up costs should be included in water bills, only when they can be directly attributed to those who benefitted from pollution. For example, the cost of cleaning up Windermere Basin in Hamilton Harbour should not be solely the responsibility of Hamilton residents because many of those who caused or benefitted from this pollution lived outside Hamilton.

A full cost pricing system should have separate water and sewage rates which include charges proportional to user demands placed upon the water and wastewater systems. The provider of the service should establish targets and a framework for implementation. Water and sewage costs should not be included in property taxes. The Municipal Act should be amended to prohibit such inclusion.

Issues
. Timing
. Implementation of public education/communications on Ontario's water costs to foster public acceptance of full cost pricing.

A.3 Eliminate flat rates and decreasing block rates.

A.4 Implement increasing block rates.
Discussion
The pricing structure should ensure water efficiency. This rules out flat rates. Alternatives to flat rates raise some issues. For example, industrial users may take large quantities of water but do not impose the same costs on the system as 1000 homes. Do such industries deserve a price break as is provided by a declining block rate structure? Increasing block rates should be implemented only in situations where full cost accounting is in place.

Issues Timing for removal of flat rates - 3 years.

A.5 Eliminate Grants and Subsidies
Discussion
Grants and subsidies should be eliminated because their use means that individual water and sewer bills do not reflect the true costs of water. In considering this action, it is recognized that many smaller communities may continue to require assistance if they are to offer water and wastewater services to their residents. This assistance should be given in such a way that it does not subsidize water and wastewater use charges.

A.6 Ensure that water/ wastewater revenues are dedicated to expenditures on water and wastewater systems respectively.
Discussion
The dedication of funds to each system is an important component of the user pay concept.

A.7 Separate water and sewer charges from the property tax. Property taxes to be reduced to reflect this.
Discussion
This is another important component of user pay. All costs related to water and wastewater services should be reflected in the water and sewer bill.

A.8 Encourage municipalities to monitor effluent discharges for quantity/quality and to ensure full cost recovery for treatment - adopt the polluter pays principle.

A.9 Implement a fee for the use of raw water.
Discussion
A royalty was not favoured by the group while a general tax received some reluctant support and a surcharge was seen to have both pros and cons. There is concern that revenues

generated by charging for the use of raw water may be diverted to other non water or wastewater uses. It was recognized that full cost pricing may impose hardships in some areas where servicing is expensive. A general tax or a surcharge could raise some revenue which could help to cushion these impacts. It may also be used to ensure a high level of discharge quality back into the environment.

A.10 Implement peak flow demand controls and charges.

Discussion

The intention is to reduce the summer peak and thereby avoiding building extra capacity at the water or wastewater plant to meet this peak.

A.11 Devise strategies for reducing peak demand, i.e. pricing structure.

Discussion

It was felt that pricing mechanisms should be used but they should not be punitive.

A.12 Consider a block of low cost water to meet people's basic living requirements.

Discussion

This is one means of protecting those on low or fixed incomes from higher water bills associated with the implementation of the user pay concept. However, it is inconsistent with the general thrust of this strategy.

A.13 Adopt a utility style of management. Look at both water and wastewater systems when carrying out a cost benefit analysis.

Discussion

It was pointed out that this would mean that depreciation may be included in the rates.

A.14 Governments should encourage municipalities to set up reserves to fund infrastructure renewal.

Discussion

It was felt that municipal governments should be putting money aside now, to cover future infrastructure upgrading. At the moment, there seems to be no mandate for this and it is not being done. The Provincial Government should tighten up its legislation to encourage municipalities to establish reserves. Reserve funds would be built into water rates.

A.15 Promote a water efficiency quota system for development.

Discussion

Under the quota system, a municipality permits a developer to build only one home for every, say, three existing homes where existing fixtures are fitted with water efficient devices and fixtures. The ratio depends upon the capacity which is needed. The quota system is permissible under the Planning Act, and there are a number of successful examples in U.S. cities.

A.16 Provide incentives to water users to exceed the by-law requirements pertaining to both quantity and quality of discharge.

B. To promote efficient Water use among all water users by informing and consulting them

Most Ontarians probably take their water supplies for granted unless they are the exception and live in a municipality such as the Region of Waterloo which has faced tight supplies in the past, or if they rely upon a shallow well which runs dry in a drought year. The major public concern in Ontario relates to water quality. Is the water safe for me and my family to drink? Most people probably assume that their water use is reasonable and is part of the Ontario way of life. People do not make a connection between the wastewater going down the drain and the quality of their drinking water.

There is a need to make the public more aware of the way in which individual homeowners, businesses, industries or farms affect the quantity and quality of available water. It will be important to involve young people in this awareness process and to begin educational programs in schools. There is also a need to inform individual homeowners and business operators and encourage them to become more efficient. Water audits should be done to highlight areas, in homes or businesses, where water is used and to provide a comparison of water use with similar situations elsewhere in Ontario or in the U.S.A. The audits should be followed up with demonstrations which would show what can be achieved if water efficiency measures are undertaken. The demonstrations should be monitored and publicized.

B.1 To build on information that already exists and ensure that a water efficiency educational program becomes part of the Ontario educational curriculum

Discussion

Many curricula have been developed in other jurisdictions. The American Water Works Association has developed a general package for use throughout North America. What needs to be done is take the best from some of these packages and adapt them to Ontario's needs. The package should be designed to introduce the information at the grade school level. It will be important to start early and follow through.

B.2 Undertake an Ontario-wide water efficiency public awareness program to reflect the overall strategy.

Discussion

An Ontario-wide public awareness program is needed immediately. The message in this program should stress the reasons why a water efficiency program is needed such as protection of water quality, preservation of a healthy environment and a deferral of capital expenditures needed to meet additional population growth.

B.3 Develop a relevant water efficiency promotion package to provide the basis for local promotion.

Discussion

In developing this package it will be important to take advantage of material already collected. There is no need to reinvent the wheel. The material should be generic with flexibility provided to add local flavour. It will be important to explain to the public that we are trying to preserve the environment while reducing the costs of our water and wastewater infrastructure. It will be important that the water efficiency initiative not be seen as a tax grab or a revenue generator for government.

B.4 Declare a specific week such as "Water Efficiency" or "Provincial Drinking Water Week". This is a good time for promotion to the public and to promote the education curriculum

Discussion

There is a need to give water efficiency a higher profile. Need to initiate some short term promotional activities. Launch drinking water week. This would be a focus for radio phone ins, contests, performances, etc. similar to Earth Day.

B.5 Promote voluntary water audits for industries, commercial establishments and institutions by developing and promoting water audit kits and best management practices training.

Discussion

We need to explain what water efficiency means. This is very important for industry. We need to make them aware of what has gone on elsewhere over the years, and what may be possible here in Ontario. We should not create concern by imposing water efficiency targets on them. One way to start would be through the promotion of water audits. Industrial, commercial and institutional staff should be educated concerning water audit methodology. The effectiveness of this approach should then be monitored. Successful initiatives should be publicized.

C. To establish a research, development and manufacturing program that will make Ontario a leader in water efficient technology and management

Water and wastewater management in Ontario is a major industry with annual expenditures totalling around $2 billion per year. A portion of this expenditure is on research and development. Research and development is needed in at least two areas. First, there is a need to carry out basic hydrologic research to determine the extent of Ontario's water resources, and there is a need to determine their role in supporting aquatic and other forms of life. This information will help the public and water managers make informed water management decisions. The second area concerns the development of technology. Much water efficient technology exists in the U.S. and Europe that can be applied in Ontario. However, if Ontario is to maintain its fair share of jobs in this industry, then it will be desirable to build expertise in the design, development and manufacturing of water efficient technologies.

If Ontario offers incentives that encourage efficient use and establishes codes to compel the use of certain water efficient products, then a very substantial demand for water efficient technology and management approaches will be created within the province. This represents an opportunity for manufacturing and management companies to establish a

Supporting Goals/Actions continued

presence in the market.

C.1 Compile and make available research reports and literature obtained world wide. This would include the creation and distribution of databases.

Discussion

We should not reinvent the wheel. The technology for much water use is very simple – showers, toilets, sprinklers, etc. The U.S. has done much of the research. We should try to find out what technology does not work very well and begin research to remedy this situation. The chief emphasis should be placed upon market oriented R & D rather than fundamental research.

C.2 Enact legislation regulation to make water efficient products mandatory and encourage the private sector to develop and manufacture them.

Discussion

Standards will create a climate for research and development in Ontario. They also guarantee a market and help the manufacturers of new technology to gain a foothold in the market.

C.3 Tailor existing government programs to assist in private sector investment and development leading to manufacturing

C.4 Collaboration among industry, universities and other research organizations in funding of applied market oriented research to ensure the commercial and industrial exploitation and export of developed technology and knowledge.

Discussion

The key aspect here is partnership – universities, governments and industries.

C.5 Establish a Provincial Centre for Excellence to coordinate and promote network linkages in the areas of research, technical development and government programs.

Discussion

A 5-year time period is needed to allow the Centre time to become established. A provincial grant would be needed to establish the Centre. It should be co-funded by the private and public sectors on an ongoing basis. It is also possible that some revenues for the Centre could be included in a full cost pricing scheme.

C.6 Undertake research on existing municipal water and wastewater system infrastructure to optimize renovation and rehabilitation programs. It should be recognized that crisis management is very expensive.

C.7 Develop marketable opportunities for implementation and application of existing research in:

- **reuse of grey water**
- **drought tolerant landscaping**
- **agricultural reuse of urban waste and solids**
- **residential, industrial, commercial retrofit**
- **system computerization, configuration, simulation, long term planning, monitoring and metering.**
- **leak detection/monitoring**
- **repair techniques**
- **non-disruptive electronic metering.**

C.8 Foster transfer of technologies which maintain service while reducing water use.

Discussion

This could be a program similar to the energy audit utilized by Ontario Hydro except that it will involve water audits.

C.9 Train operators in the most efficient approaches to operating water and wastewater systems.

Discussion

Researchers at the wastewater technology centre are spending a good part of their lives optimizing approaches for managing wastewater facilities. Yet there is no way for them to get this knowledge across to the operators of water and wastewater facilities as there is no certification program. A certification program would ensure the transfer of this information.

D. To develop and monitor water efficiency targets based on a sound database that will ensure sustainable water supplies

Ontario possesses a lot of water. It shares jurisdiction with the U.S. over four of the five Great Lakes which account for 18 per cent of the world's freshwater resources. Moreover, Ontario has 228,000 other lakes. However, this apparent bounty is somewhat misleading. All but 1 per cent of the Great Lakes is fossil water. Only 1 per cent is renewable and available for use on a sustainable basis. More than one half of Ontario's runoff flows to the James Bay through areas of the Province which have only a very small population. The areas of the

Province where most of the people live, have what might be characterized as reasonable amounts of water.

Ontario's per capita water use is about 300 litres/capita/day which is just below U.S. figures and much above European numbers. Demand for municipal water could rise by 25-40 per cent over the next 20 years.

Beyond these few tentative statistics, there is an absence of data concerning many features of water use including the relative efficiency of various classes of users as well as the availability of water supplies in many areas of the province. If Ontario's water use is to be made more efficient and if supplies are to be sustained for future generations, then a database will have to be established. Moreover, periodic measurements will have to be made to determine if Ontario's water use is becoming more efficient and its supplies are sustainable.

D.1 A Provincial Data-Base should be established and contain a range of information

Demand

Residential
- where water is used in-house
- how much water is used per application
- exterior use

Commercial
- by SIC categories

Industrial
- same as commercial

Institutional

Data on Source of Supply - Precipitation/Infiltration
. Groundwater
. Extent of Aquifers
. Capacity of Aquifers
. Sustainable yield
. Location of Recharge/Discharge Areas
. Environmental areas that depend on Aquifers
. Water Quality
. Present usage.

Surface Water

Watercourses
- streamflow
- water quality
- sustainable yield
- downstream supplies
- fisheries/aquatic
- recreation
- relationship to groundwater assimilative capacity
- ability of water to accept waste pollution susceptibility present usage

Lakes
- location of intakes
- variation in water quality
- seasonal and location
- currents (directional flows)
- aquatic life/fisheries
- bathometry
- inflow/outflow levels
- sustainable yield
- pollution susceptibility
- present usage.

Wastewater
- rate
- quality
- quantity

Efficiency Targets
- sector
- progress toward goals

Water Pricing
- levels
- trends

D.2 The database should be maintained by a provincial ministry/authority or university.

Discussion

The database could be maintained by a provincial coordinating office. There is concern that an agency established especially for this purpose would add an additional level of government and therefore it was unnecessary. Actual information would be obtained from operating authorities as well as departments of the provincial and federal government.

D.3 Information should be distributed through a number of channels.

Discussion

The data could be sold to agencies in report form, on an annual basis. Also, a future E-mail system might be established.

D.4 Government funding is needed to start the database.

Discussion

The Ontario government should provide seed money to establish the database. But who should provide the ongoing funding needs?

E. To set standards, adopt regulations and establish legislation that will promote efficiency in water use

Two aspects of regulations need to be examined. The first area concerns the regulations, legislation codes etc. that apply to the purchase and installation of fittings and fixtures. The Province has preeminence in the area of establishing plumbing codes. However, there are no explicit standards, regulations or legislation regarding water efficiency in Ontario. The use characteristics are determined primarily by the industry which manufactures fix-

Supporting Goals/Actions continued

tures in the U.S. and Canada. Toilets, for example historically used about 20-30 litres per flush. Ten years ago, U.S. legislation mandated the use of 13 litre per flush toilets in new construction. During the past five years, 11 states have mandated the use of 6 litre per flush toilets. As these changes have occurred, these fixtures find their way into Ontario. Recently, the federal Government specified that toilets must use 6 litres of water per flush or less in order to qualify for the Eco Logo. This is intended as a guide to consumers.

Standards may also be considered as a means of controlling other areas of water use such as landscaping. Setting standards, adopting regulations and establishing legislation has a number of benefits. First, it ensures that purchasers of new premises will have access to water efficient fixtures. Fixtures in new premises are provided by the builder. Since the builder does not plan to occupy the premises the builder will consider only the first cost of the fixture. Very low cost fixtures, in today's market, will not be water efficient. Secondly, the code creates a market for Ontario manufacturers to produce water efficient product lines which they may be able to export.

The second area concerns the ownership of water in Ontario. Ontario is the only province in which the Crown does not own the water. People living adjacent to water bodies have special rights to water. This makes some aspects of management very difficult. This is an area that needs to be examined further.

Any discussion of regulations raise some major philosophical discussions about the most effective approach to making Ontario's water use more efficient. Regulation is one such approach that has a substantial appeal. Regulations are relatively inexpensive to implement and the enforcement mechanisms are likely to be already in place. The chief disadvantage of regulations is the public backlash that can result if they are introduced without proper explanation. The framers of the following regulatory strategies did not favour the big stick approach. They recognized that we must begin to change the culture and use educational and voluntary approaches as much as possible. Regulatory approaches should be used with care.

E.1 Standard codes should be enacted so that water efficient fittings/fixtures should be put in place which maintain fixture performance without impairing health and safety while using less water. This is proposed to be achieved in two ways:
(a) changing the plumbing code so that all fixtures/fittings installed in new development or those used to replace fixtures/ fittings in existing buildings which require a building permit should have the following water use characteristics– showers - 9.5 litres/minute or less; faucets -; toilets - 6 litres/flush or less.
(b) Legislating that only water efficient fittings/fixtures (described above) shall be sold in Ontario.

Discussion

Such codes are in place in many U.S. States. Effective January 1, 1992 New York State enacted legislation that only fixtures which meet the criteria set out above shall be sold or installed. Such a change would have a very dramatic effect in Ontario. These changes are to be implemented without the need to police do-it-yourselfers.

Issues:

Timing
(a) enacting the water efficient plumbing code. Proposal - January 1, 1993.
(b) restrictions on sale. Proposal - January 1, 1994.

E.2 All fittings/ fixtures to contain CSA certification concerning performance and compliance with the water efficiency standards referred to above.

Discussion

When codes require that water efficient fixtures have been sold, then testing becomes an important issue to determine which product complies and which does not. CSA has traditionally tested fixtures to determine if they meet safety criteria such as effective waste removal. This recommendation would require CSA to certify that the fixture complies with the water efficiency standards while ensuring that safety standards are maintained.

E.3 Municipalities shall pass by-laws which will place restrictions on lawn watering, swimming pool filling and car washing.

Discussion

The intent of such regulations is to require consumers to reduce their water use in summer when water demand is greatest.

E.4 In order to resolve water use conflicts in time of drought, establish a mandatory hierarchy of use priorities to be applied across the Province.

Discussion

Many jurisdictions have established a hierarchy of uses which should receive priority in the event of a drought. Household water use for drinking, bathing, etc. are usually at the top of the list, while water used for lawns is much further down. Ontario does not have such a hierarchy.

E.5 Eliminate the use of municipally treated water for once-through cooling.

Discussion

The Region of Waterloo has passed a by-law banning the use of once through cooling water. The aim is to encourage the recycling of cooling water or the use of air cooling.

E.6 Eliminate municipally treated water cooled air conditioners.

Discussion

The aim is to encourage the use of air-cooled air conditioners.

F. To control pollution so as to enhance and preserve water quality

Population growth, urban development, industrial and agricultural practices and old waste dump leachate pose a continued threat to the maintenance of water quality.

This threat comes in the form of biological and chemical contamination. Since the 1970s, when water pollution emerged as a public issue, millions of dollars have been spent on nutrient removal and conventional pollution clean up. However, we have a long way to go. By the year 2011, municipal water use will increase 25-40 per cent unless water efficient strategies are adopted and this will all return as wastewater. Many of Ontario's wastewater plants now fail to comply with current standards. More than 100 municipal sewage systems contain significant sections of combined sanitary and storm sewers meaning that during rainstorms, raw sewage is diverted to a nearby waterbody.

The Municipal Industrial Strategy for abatement (MISA) has a key role to play in improving water quality. It will require industrial users to clean up pollution at the source thus removing substances that may now be passing through wastewater plants because they are not designed to remove them. There is also a need to protect groundwater recharge areas from sources of pollution such as dump leachate, petroleum products, pesticides and other such threats. A water efficiency strategy also contributes to water quality. The use of water efficient technology will hold constant or reduce wastewater flows. Research has shown that sewage treatment plants perform better when flows are reduced. Thus, the quality of the effluent will be improved. The same finding applies to the operation of septic systems. Reduced flows enables them to perform a better job of treating waste.

Water efficiency assists in other ways by improving customer service without increasing wastewater flows, utilities will be better able to focus on achieving present and future pollution cleanup targets. Full cost pricing could provide the necessary financial resources.

F.1 Municipalities must meet water efficiency targets as a condition for acquiring a certificate of approval for their wastewater plants.

Discussion

Reducing or holding constant wastewater flows is an important component of a clean up strategy. Consequently, water efficiency should be an important component of a certificate for approval. Explicit targets should be established for each municipality and this should be regulated.

F.2 Provincial grants for infrastructure, if they remain, should be conditional on planning and meeting water efficiency targets within a specified time.

Discussion

This action is intended to link the development by a municipality of water efficiency targets with the receipt of a provincial grant.

F.3 Subdivision approvals should be subject to water efficiency compliance.

Discussion

Subdivisions represent an additional demand upon the water and sewer system. If subdivisions are added incrementally then ultimately new water and wastewater plants will be needed. The use of water efficiency fixtures and appliances in new subdivisions will reduce the level of demand required and will greatly extend the life and improve the performance of existing wastewater facilities. If subdivision devel-

opers do not adopt water efficiency measures, then their proposals should be rejected.

F.4 All municipal sewage treatment plants should immediately incorporate secondary treatment.

F. 5 Need to streamline the Environmental Assessment Process to ensure timely upgrades to sewage treatment plants.

Discussion

There is a recognized need to upgrade sewage treatment plants to provide secondary or tertiary treatment in order to comply with water clean-up standards. These upgrades should not be held up by long procedural requirements which were originally designed to help protect the environment. There is a need in many cases to proceed now.

Issue

Should capacity expansions be fast-tracked? How does this fit with the need to promote water efficiency which would reduce wastewater flows?

F.6 Develop a watershed ecosystem based plan for water use and for stormwater management.

Discussion

Municipal boundaries do not coincide with natural ecosystem boundaries. As a consequence, decisions that make sense from a municipal perspective such as diverting certain acceptable volumes of wastewater or stormwater into a river may prove ecologically harmful when the cumulative impacts of the discharges of several municipalities in a watershed are taken into account. An overall framework is needed which places the health of the watershed in a paramount position and then coordinates the water management actions of each municipality so that the ecosystem health is maintained. An ecosystem based sewage treatment master plan is needed to guide decisions concerning municipal pollution limits, etc.

Issue

Who does these plans? How are these plans to be paid for? By whom?

F.7 Watershed stormwater management plans should be developed to improve quality and reduce quantity flows.

Discussion

Stormwater is a source of concern because it becomes contaminated as it flows over the surface from fertilizers, pesticides, oil from roadways, dog droppings, etc. The quantities of stormwater are also a concern because increased flows erode the banks of existing streams and creeks and cause property damage. The degradation in quality and increase in quantity has adverse implications for aquatic ecosystems and humans.

Issue

Who should pay for these plans? Who should carry them out?

F.8 Municipalities should adopt a pollution prevention plan that identifies sources of pollution and prescribes actions for eliminating them. (adopt a sewer use by-law).

Discussion

Wastewater plants are not designed to cope with the multiplicity of substances entering the wastewater stream. As a result, many of these substances are entering the environment and persisting. The only solution is to have them cleaned up at the source. The municipal Industrial Strategy for abatement (MISA) should be implemented to prevent pollution at the source.

F.9 Sewage treatment plants should comply with both local criteria as well as ecosystem water quality guidelines established by the Province.

F.10 There is a need for improved enforcement of the quality standards agreed to in the Certificates of Approval, including the use of penalties for noncompliance.

Discussion

Many wastewater treatment plants do not meet the standards set out in their certificates of approval. This must be rectified through improved enforcement including the imposition of penalties for noncompliance.

F.11 Reduce groundwater infiltration into sewer systems.

Discussion

In some municipalities, as much as 30-35 per cent of the wastewater entering a sewage treatment plant is clean groundwater which has leaked into sanitary sewers. This places a heavy burden on the plant. By fixing leaks, the plant could have capacity freed up to treat contaminated wastewater.

F.12 Measures should be developed and implemented to protect groundwater quality.

Discussion

There is widespread concern

opers do not adopt water efficiency measures, then their proposals should be rejected.

F.4 All municipal sewage treatment plants should immediately incorporate secondary treatment.

F. 5 Need to streamline the Environmental Assessment Process to ensure timely upgrades to sewage treatment plants.

Discussion

There is a recognized need to upgrade sewage treatment plants to provide secondary or tertiary treatment in order to comply with water clean-up standards. These upgrades should not be held up by long procedural requirements which were originally designed to help protect the environment. There is a need in many cases to proceed now.

Issue

Should capacity expansions be fast-tracked? How does this fit with the need to promote water efficiency which would reduce wastewater flows?

F.6 Develop a watershed ecosystem based plan for water use and for stormwater management.

Discussion

Municipal boundaries do not coincide with natural ecosystem boundaries. As a consequence, decisions that make sense from a municipal perspective such as diverting certain acceptable volumes of wastewater or stormwater into a river may prove ecologically harmful when the cumulative impacts of the discharges of several municipalities in a watershed are taken into account. An overall framework is needed which places the health of the watershed in a paramount position and then coordinates the water management actions of each municipality so that the ecosystem health is maintained. An ecosystem based sewage treatment master plan is needed to guide decisions concerning municipal pollution limits, etc.

Issue

Who does these plans? How are these plans to be paid for? By whom?

F.7 Watershed stormwater management plans should be developed to improve quality and reduce quantity flows.

Discussion

Stormwater is a source of concern because it becomes contaminated as it flows over the surface from fertilizers, pesticides, oil from roadways, dog droppings, etc. The quantities of stormwater are also a concern because increased flows erode the banks of existing streams and creeks and cause property damage. The degradation in quality and increase in quantity has adverse implications for aquatic ecosystems and humans.

Issue

Who should pay for these plans? Who should carry them out?

F.8 Municipalities should adopt a pollution prevention plan that identifies sources of pollution and prescribes actions for eliminating them. (adopt a sewer use by-law).

Discussion

Wastewater plants are not designed to cope with the multiplicity of substances entering the wastewater stream. As a result, many of these substances are entering the environment and persisting. The only solution is to have them cleaned up at the source. The municipal Industrial Strategy for abatement (MISA) should be implemented to prevent pollution at the source.

F.9 Sewage treatment plants should comply with both local criteria as well as ecosystem water quality guidelines established by the Province.

F.10 There is a need for improved enforcement of the quality standards agreed to in the Certificates of Approval, including the use of penalties for noncompliance.

Discussion

Many wastewater treatment plants do not meet the standards set out in their certificates of approval. This must be rectified through improved enforcement including the imposition of penalties for noncompliance.

F.11 Reduce groundwater infiltration into sewer systems.

Discussion

In some municipalities, as much as 30-35 per cent of the wastewater entering a sewage treatment plant is clean groundwater which has leaked into sanitary sewers. This places a heavy burden on the plant. By fixing leaks, the plant could have capacity freed up to treat contaminated wastewater.

F.12 Measures should be developed and implemented to protect groundwater quality.

Discussion

There is widespread concern

E.4 In order to resolve water use conflicts in time of drought, establish a mandatory hierarchy of use priorities to be applied across the Province.

Discussion

Many jurisdictions have established a hierarchy of uses which should receive priority in the event of a drought. Household water use for drinking, bathing, etc. are usually at the top of the list, while water used for lawns is much further down. Ontario does not have such a hierarchy.

E.5 Eliminate the use of municipally treated water for once-through cooling.

Discussion

The Region of Waterloo has passed a by-law banning the use of once through cooling water. The aim is to encourage the recycling of cooling water or the use of air cooling.

E.6 Eliminate municipally treated water cooled air conditioners.

Discussion

The aim is to encourage the use of air-cooled air conditioners.

F. To control pollution so as to enhance and preserve water quality

Population growth, urban development, industrial and agricultural practices and old waste dump leachate pose a continued threat to the maintenance of water quality.

This threat comes in the form of biological and chemical contamination. Since the 1970s, when water pollution emerged as a public issue, millions of dollars have been spent on nutrient removal and conventional pollution clean up. However, we have a long way to go. By the year 2011, municipal water use will increase 25-40 per cent unless water efficient strategies are adopted and this will all return as wastewater. Many of Ontario's wastewater plants now fail to comply with current standards. More than 100 municipal sewage systems contain significant sections of combined sanitary and storm sewers meaning that during rainstorms, raw sewage is diverted to a nearby waterbody.

The Municipal Industrial Strategy for abatement (MISA) has a key role to play in improving water quality. It will require industrial users to clean up pollution at the source thus removing substances that may now be passing through wastewater plants because they are not designed to remove them. There is also a need to protect groundwater recharge areas from sources of pollution such as dump leachate, petroleum products, pesticides and other such threats. A water efficiency strategy also contributes to water quality. The use of water efficient technology will hold constant or reduce wastewater flows. Research has shown that sewage treatment plants perform better when flows are reduced. Thus, the quality of the effluent will be improved. The same finding applies to the operation of septic systems. Reduced flows enables them to perform a better job of treating waste.

Water efficiency assists in other ways by improving customer service without increasing wastewater flows, utilities will be better able to focus on achieving present and future pollution cleanup targets. Full cost pricing could provide the necessary financial resources.

F.1 Municipalities must meet water efficiency targets as a condition for acquiring a certificate of approval for their wastewater plants.

Discussion

Reducing or holding constant wastewater flows is an important component of a clean up strategy. Consequently, water efficiency should be an important component of a certificate for approval. Explicit targets should be established for each municipality and this should be regulated.

F.2 Provincial grants for infrastructure, if they remain, should be conditional on planning and meeting water efficiency targets within a specified time.

Discussion

This action is intended to link the development by a municipality of water efficiency targets with the receipt of a provincial grant.

F.3 Subdivision approvals should be subject to water efficiency compliance.

Discussion

Subdivisions represent an additional demand upon the water and sewer system. If subdivisions are added incrementally then ultimately new water and wastewater plants will be needed. The use of water efficiency fixtures and appliances in new subdivisions will reduce the level of demand required and will greatly extend the life and improve the performance of existing wastewater facilities. If subdivision devel-

about the quality of Ontario's groundwater. The major threats come from a variety of sources located on the surface such as landfill sites, septic systems, chemical dumps, etc. We must begin by identifying recharge areas and protecting them from development which could impair groundwater quality.

Issues
Who should take responsibility for these actions?

F.13 Disconnect all extraneous water flows to the sanitary sewer system, eavetrough downspouts, weeping tiles, sump pumps, etc.
Discussion
Eavestroughs, weeping tiles, sump pumps are contributing perfectly clean water to sanitary sewer systems. During rainstorms this water causes sanitary overloading at sewage plants and the diversion of untreated sewage into nearby streams or lakes. This results in water pollution and beach closings. Water from roofs when directed into stormsewers causes excessive flows in ravines and creeks where the storm sewers empty. This excessive flow causes erosion resulting in damage to property and harm to aquatic ecosystems.

In many cases, by disconnecting down spouts from sanitary sewers, beneficial results could be obtained as water would infiltrate the topsoil and foster tree and shrub growth. In some cases, where clay soils are common, some landscaping would be required to ensure that water is drained away from the house.

Issue
How should this be implemented? Regulation, education?

F.14 Municipalities should implement best management practices such as more frequent street cleaning, catch basin cleaning, etc. in these operations in order to protect and enhance water quality.
Discussion
Water running off municipal property picks up many pollutants which find their way into healthy lakes and streams. These include dog droppings, oil from roadways, rubber particles, etc. The accumulation of these pollutants can be arrested by more frequent municipal maintenance, new by-laws, etc.

Issue
How will the additional costs be recovered?

F.15 Separate sanitary and storm sewers.
Discussion
Over 100 Ontario municipalities have combined sanitary and storm sewers. When heavy rainfall occurs, the sudden surge of stormwater when combined with regular sewage often exceeds the capacity of the treatment plant. Rather than flood the plant in such situations, the sewage is sent through a separate pipe directly to a lake or stream. The result is severe water pollution followed by lengthy periods of beach closing. Building new storm sewers or special holding tanks for rainfall events reduces the risk of overloading the wastewater plant during a heavy rain.

Issue
Should current water users or taxpayers pay for sewer separation?

F.16 Promote good water management at home, in industry and at the office.
Discussion
Educate the public and employees concerning the proper handling of pesticides, fertilizers, paints, solvents, chemicals, etc. to avoid having them flushed down the drain or placed in a sewer. Encourage the installation and proper maintenance of greasetraps.

Issue
Education, regulation.

G. To work with self supplied water users and wastewater treaters (farmers, cottagers, rural residents and small industries) so that they will become water efficient

About one quarter of all Ontario residents supply their own water, usually from wells. They are the closest to paying full cost for their water as they pay for it themselves without the benefit of provincial grants. Accordingly, as a group they have an interest in water efficiency as it will assist them to better manage their water costs and protect their sources of supply.

G.1 Implement best management practices aimed at promoting efficient use and the protection of water quality among self supplied users.
Discussion
Self supplied water users pay all the costs of providing water and treating wastewater. They have a strong motivation to use

water efficiently.

G.2 Self suppliers should pay the cost of any environmental clean up associated with their activities.

Discussion

Preservation of water quality is important to all self supplied water users. Consequently, each user must be made to clean up the resulting wastewater.

G.3 Self suppliers should test for water quality bacteria in their distribution system at least twice per year.

G.4 Stream monitoring should be undertaken to monitor diffuse effluent discharge.

Issue

There is diffuse pollution in rural areas. This can result from the misuse of fertilizers, pesticides, etc. that are applied to fields, from animals kept near streams and other such general sources. It is important to monitor these sources in order to protect overall water quality. Currently, water quality is monitored at about 600 stations across Ontario. Water quality is monitored every month at 70 or so stastions and about twice per year at the rest.

G.5 Self supplied water users should meter/monitor raw water use to provide data to evaluate progress toward efficiency.

Discussion

Not much information is available about water use by self supplied users. If use is to be made more sustainable, then the collection of water use data is a necessary first step.

H. To coordinate water management including water efficiency policies and programs

A clearinghouse will be needed to coordinate water efficiency activities among Provincial Ministries, Federal agencies and Municipalities. It will promote water efficiency through public information programs, provide direction concerning major policy issues (full cost pricing, rate structures, water and sewer rates) and it would compile and share information about studies and demonstrations carried out within Ontario and elsewhere. It will also convene workshops involving practitioners of water efficiency. And, it will promote and report progress towards the achievement of provincial water efficiency targets.

H.1 A non profit independent organization should be established to coordinate water efficiency actions in Ontario.

Discussion

Water management responsibilities are spread through several provincial ministries and some federal agencies. Water use results from the actions of hundreds of municipalities, thousands of companies and millions of individual users. There is a need to coordinate water efficiency on a full time basis. This organization's responsibilities would be to coordinate the collection and distribution of information, the provision of technical assistance, the achievement of progress towards goals and the identification needed for legislation/ regulations and coordinate research.

Issues

What type of organization is needed? How should it be funded?

Plenary Session on Management Actions

Water Efficiency Strategy For Ontario - Work Plan

Action	Lead*	Timing	Cost
A.1 a) To implement metering for all municipal water users	Prov/Assn. Prov. Prov. Prov/Munic. Munic.	Year 1 Year 2 Year 2 Year 1 Year 2 onwards	nil nil nil $150K(000) $350 Million
A.1 b) Legislate mandatory water metering over 10 years			
A.2 Implement full cost pricing including the cost of issuing permits, the cost of environmental inspections, the supply of infrastructure costs and the cost of environmental clean up.	Prov/Assn. Prov. Prov. Prov/Munic. Munic.	Year 1 Year 2 Year 2 Year 2 Year 3	$100K nil nil $40K
A.3 Eliminate flat rates and decreasing block rates.	Prov/Assn/Munic. Prov. Prov. Munic.	Year 1 Year 2 Year 2 Year 3	$100K
A.4 Implement increasing block rates.	Prov/Assn. Prov/Assn/Munic.	Year 1 Year 2	A.1 -A.3 $80K
A.5 Eliminate Grants and Subsidies.	Prov/Assn.	Year 1	No net change
A.6 Ensure that water/ wastewater revenues are dedicated to expenditures on water and wastewater systems respectively.	Prov. Prov./Munic.	Year 1 Year 1	Staff
A.7 Separate water and sewer charges from the property tax. Property taxes to be reduced to reflect this.	Prov./Assn.	Year 1 Year 1	Staff
A.8 Monitor effluent discharges for quantity/quality and to ensure full cost recovery for treatment - adopt the polluter pays principle.	Prov./Mun./Assn.	Year 1	$20 - 40 million/yr.

* Only some principal groups listed - others likely to be involved as well in various project stages

Draft For Discussion

Benefit	Implementation	Other Comments
3 - 7%** water reduction	1. Education 2. Condition of Cert of Approval 3. Condition of grant 4. Demo 5. Full Scale imp. across Ontario See A.1a)	
10 - 30%	1. Education/workshops/seminars 2. Condition of Cert. of Approval 3. Condition of Grant 4. Demo 5. Impl. across Ontario	
2 - 6%	1. Education/workshops/demos 2. Condition of Cert. of Approval 3. Condition of Grant 4. Impl. across Ontario	
2%	1. Education (as in A.1-A.3) 2. Demos	
Covered in A.2	1. Study impacts - identify hardship situations	
Full cost	1. Education 2. Study	
Full cost	1. Education	
Quality	1. Municipalities currently monitor effluent -additional costs dependent on parameters monitored and increased frequency of testing.	

**Water savings expressed as a % of Municipal use. The savings refer to the implementation of a particular measure by itself. Total savings cannot be found by adding the individual measures.

Water Efficiency Strategy For Ontario - Work Plan

Action	Lead	Timing	Cost
A.9 Implement a fee for the use of raw water.	Prov./Assn. Prov. Prov.	Year 1 Year 1 Year 2	Internal -depends on fee
A.10 Implement peak flow demand controls and charges.	Munic.	Year 1	Staff
A.11 Devise strategies for reducing peak demand, i.e. pricing structure.	See A.10	See A.10	See A.10
A.12 Consider a block of low cost water to meet people's basic living requirements.	Prov./Assn.	Year 1	Staff
A.13 Adopt a utility style of management. Look at both water and wastewater systems when carrying out a cost benefit analysis.	Prov./Assn.	Year 1 - 2	$75K
A.14 Governments should encourage municipalities to set up reserves to fund infrastructure renewal.	Prov./Assn.	Year 1 - 2	See A.13
A.15 Promote a water efficiency quota system for development.	Prov./Assn. Prov./Munic.	Year 1 Year 2	Staff $25K
A.16 Provide incentives to water users to exceed the by-law requirements pertaining to both quantity and quality of discharge.	Prov./Assn.	Year 1	Not known
B.1 To build on information that already exists and ensure that a water efficiency educational program becomes part of the Ontario educational curriculum	Prov./Bd. of Ed./ Assn. Prov./Bd. of Ed./ Assn. Prov./Assn./Bd. of Ed.	Year 1 Year 1 Year 1?	$75K $50K/Municipality

Draft For Discussion

Benefit	Implementation	Other Comments
1 - 2%	1. Impact Study 2. Change Legislation/establish fee 3. Implement	
up to 4% in summer	1. Implement	
See A.10	see A.10	
Hardship	1. Policy study	
Full Cost	1. Policy study	
Indirect	1. Policy Study as per A.13	
Water Saving in situations where water supplies tight	1. Study/Education 2. Demo/monitor	
Quality	1. Review feasibility/policy/implications	
Change attitudes Quality Quantity	1. Develop curriculum 2. Pilot 3. Implement in fall, 1992?	

Water Efficiency Strategy For Ontario - Work Plan

Action	Lead	Timing	Cost
B.2 Undertake an Ontario-wide water efficiency public awareness program to reflect the overall strategy.	Prov./Munic.	Year 1	$200K/yr.
B.3 Develop a relevant water efficiency promotion package to provide the basis for local promotion.	Prov./Assn./Munic.	Year 1	$50K
B.4 Declare a specific week such as "Water Efficiency" or "Provincial Drinking Water Week". This is a good time for promotion to the public and to promote the education curriculum	Prov./Assn./Munic.	Year 1	see B.2
B.5 Promote voluntary water audits for industries, commercial establishments and institutions by developing and promoting water audit kits and best management practices training.	Prov./Assn. Prov./Assn. Prov.	Year 1 Year 1 - 2 Year 2 - 5	$150K $100K Multimillion
C.1 Compile and make available research reports and literature obtained world wide. This would include the creation and distribution of databases.	Prov./Univ.	Year 1	$50K
C.2 Tailor existing government programs to assist in private sector investment and development leading to manufacturing	Prov.	Ongoing	Existing
C.3 Collaboration among industry, universities and other research organizations in funding of applied market oriented research to ensure the commercial and industrial exploitation and export of developed technology and knowledge.	Prov.	See C.4	See C.4

Draft For Discussion

Benefit	Implementation	Other Comments
1 - 2% saving see B.1	1. Develop and launch program in summer, 1992	
See B.1	1. Work with municipalities to develop a package	
see B.1 and B.2	1. Include in above mentioned program	
15%	1. Develop water audit methodology using existing manuals 2. Hold 50 seminars/workshops 3. Province wide audit program?	
Info Jobs	1. Feasibility	
Jobs	Existing Programs	
Jobs	see C.4	

Water Efficiency Strategy For Ontario - Work Plan

Action	Lead	Timing	Cost
C.4 Establish a Provincial Centre for Excellence to coordinate and promote network linkages in the areas of research, technical development and government programs.	Fed/Prov./Assn./ Univ./Industry	Year 1 - 3	$1.0Million/Year
C.5 Undertake research on existing municipal water and wastewater system infrastructure to optimize renovation and rehabilitation programs. It should be recognized that crisis management is very expensive.	Fed./Prov./Assn.	Year 1	$3M/yr
C.6 Develop marketable opportunities for implementation and application of existing research in: **. reuse of grey water** **. drought tolerant landscaping** **. agricultural reuse of urban waste and solids** **. residential, industrial, commercial retrofit** **. system computerization, configuration, simulation, long term planning, monitoring and metering.** **. leak detection/monitoring** **. repair techniques** **. non-disruptive electronic metering.**	Fed./Prov./Assn./ Industry	Year 1 - 5	See implementation
C.7 Foster transfer of technologies which maintain service while reducing water use.	Prov./Assn./Industry	Year 1	See B.5
C.8 Train operators in the most efficient approaches to operating water and wastewater systems.	Prov./Assn Prov.	Year 1	Staff

Draft For Discussion

Benefit	Implementation	Other Comments
Info Saving Quality Jobs	1. Identify concept/costing/develop program	
5 -10% Jobs Quality	Funding required will depend upon the desired level of effort. The Lifelines Infrastructure Rehab. Program has a budget of $3M/yr for studies and $15 M for rehab work	
Jobs 2 -3% 1% Quality 30% Quality 5 - 10% Cost Reduct	1. Identify what research is now underway to fill gaps 2. Develop research program 3. Develop prototype 4. Demos	
30%	Integrate into Water Audit Program See B.5	
Quality Cost	1. Review of Certification requirements 2. MOE Decision on Certification	

Water Efficiency Strategy For Ontario - Work Plan

Action	Lead	Timing	Cost
D.1 A Provincial Data-Base should be established and contain a range of information.	Fed/Prov./Univ.	Year 1	$1Million
D.2 The database should be maintained by a provincial ministry/authority or university.	Fed./Prov./Univ. Fed./Prov./Univ.	Year 2 Year 2	$50K $200K/yr
D.3 Information should be distributed through a number of channels.	Prov./Univ.	Year 2	See D.1,D.2
D.4 Government funding is needed to start the Data-Base	Prov.	Year 3	See D.1
E.1 Standard codes should be enacted so that water efficient fittings/fixtures should be put in place which maintain fixture performance without impairing health and safety while using less water.	Prov.	Year	Staff Private sector retooling
E.2 All fittings/fixtures to contain CSA Certification concerning performance and compliance with the water efficiency standards referred to above.	Prov./CSA	Year 1	CSA/Manufacturing
E.3 Municipalities shall pass by-laws which will place restrictions on lawn watering, swimming pool filling and car washing.	Munic.	Year 1 Year 2	Staff Staff
E.4 In order to resolve water use conflicts in time of drought, establish a mandatory hierarchy of use priorities to be applied across the Province.	Prov./Assn. Prov.	Year 1 Year 2	Staff $5K

Draft For Discussion

Benefit	Implementation	Other Comments
Indirect	1. Survey Data availability/set up Centre	
Info Targets Savings	1. Assess feasibility of establishing a data-base in university 2. Centralize data-base from existing sources	
Info	See above	
Info	See above	
10 - 14% Jobs	Change Code to 6 litre toilets	
Info to consum-ers	1. CSA forms team/develops standard	
Less than 1%	1. Education 2. By-laws	
Protect essential uses Protect ecosystem	1. Form government/non-gov't Task Force 2. Publicize report/revise	

Water Efficiency Strategy For Ontario - Work Plan

Action	Lead	Timing	Cost
E.5 Eliminate the use of municipally treated water for once-through cooling.	Prov./Assn./Munic Munic.	Year 1 Year 2	Staff
E.6 Eliminate municipally treated water cooled air conditioners.	Prov./Munic. Munic.	Year 1 Year 2	Staff
F.1 Municipalities must meet water efficiency targets as a condition for acquiring a Certificate of Approval for their wastewater plants.	Prov.	Year 1	Staff
F.2 Provincial grants for infrastructure should be conditional on planning and meeting water efficiency targets within a specified time.	Prov.	Year 1	Staff
F.3 Subdivision approvals should be subject to water efficiency compliance.	Prov./Assn./Munic.	Year 1	Staff
F.4 All municipal sewage treatment plants should immediately incorporate secondary treatment.	Prov./Munic.	Year 1 - 10	V. Large
F.5 Need to streamline the environmental assessment process to ensure timely upgrades to sewage treatment plants.	Prov.	Year 1	Savings
F.6 Develop a watershed ecosystem based plan for water use and for stormwater management.	Prov./Assn./CAs Prov./Assn./CAs Prov./Assn./CAs CA/Munic.	Year 1 -2 Year 2 Year 3 Year 3 - 4	$30K $250K $100K Developer/ Munic. -Large
F.7 Watershed stormwater management plans should be developed to improve quality and reduce quantity flows.	Prov./Assn./CAs	Year 1	see F.6

Draft For Discussion

Benefit	Implementation	Other Comments
8% Less than 1%	1. Information/Demos/draft model By-law 2. Implement By-law 1. Information/develop model By-law 2. Pass By-law	
Progress toward Water Efficiency	1. Review Policy/make policy decision	
Progress	1. Review Policy/implications/announce policy	
Progress	1. Identify Legislative options	
Quality Jobs	1. Build plants	
Quality	Minister's exemption/streamline process	
Groundwater repl. Quality	1. Develop prototype 2. Undertake 3 pilots of prototypes 3. Develop watershed ecosystem planning guide 4. Implement	
Quality -may replace groundwater	1. Require developers to apply BMP at subdivision stage	

Water Efficiency Strategy For Ontario - Work Plan

Action	Agency	Timing	Cost
F.8 Municipalities should adopt a pollution prevention plan that identifies sources of pollution and prescribes actions for eliminating them. (Adopt a sewer use By-law).	Municipal		?
F.9 Sewage treatment plants should comply with both local criteria as well as ecosystem water quality guidelines established by the Province.	Prov./Munic.	Year 1	?
F.10 There is a need for improved enforcement of the quality standards agreed to in the Certificates of Approval, including the use of penalties for non-compliance.	Prov.	Year 1	?
F.11 Reduce groundwater infiltration into sewer systems.	Prov./Assn./Prov./ Munic.	Year 1	Major
F.12 Measures should be developed and implemented to protect groundwater quality.	Prov. Prov. Prov.	Year 1 Year 2 Year 3?	$1-3M/yr
F.13 Disconnect all extraneous water flows to the sanitary sewer system, eave-trough downspouts, weeping tiles, sump pumps, etc.	Municipal	Year 1	Enforce Cost
F.14 Municipalities should implement best management practices such as more frequent street cleaning, catch basin cleaning, etc. in these operations in order to protect and enhance water quality.	Prov./Assn. Prov./Assn./Munic. Prov./Assn. Municipal	Year 1 Year 1-2 Year 2 Year 3	Staff $50K $50K ?
F.15 Separate sanitary and storm sewers.	Munic.	Ongoing	Major
F.16 Promote good water management at home, in industry and at the office.	Prov./Assn. Prov./Assn.	Year 1 Year 2	$25K

Draft For Discussion

Benefit	Implementation	Other Comments
Quality		
Quality	Ongoing	
Quality		
Cost/ Quality Save Up to 30% of wastewater plant capacity	1. Assess feasibility/identify options 2. Undertake demos	
Protect supply	1. Develop policy options paper/ identify costs benefits 2. Form office/implement policy 3. Implement Protection measures	
Quality	1. Implement	
Quality	1. Identify options 2. Undertake demos 3. Produce best Management guide-lines 4. Implement	
Quality	Ongoing	
Quality	1. Develop written material/print 2. Distribute prototype to municipali-ties/associations	

Water Efficiency Strategy For Ontario - Work Plan

Action	Agency	Timing	Cost
G.1 Implement best management practices aimed at promoting efficient use and the protection of water quality among self supplied users.	Prov. Prov./Assn. Prov./Assn.	Year 1 Year 2 Year 3	$25K $100K $200K
G.2 Self suppliers should pay the cost of any environmental clean up associated with their activities.	Prov.	Ongoing	?
G.3 Self suppliers should test for water quality bacteria in their distribution system at least twice per year.	Prov./Assn.	Year 1 -2 Year 3	?
G.4 Stream monitoring should be undertaken to monitor diffuse effluent discharge.	Prov.	Ongoing	?
G.5 Self supplied water users should meter/monitor raw water use to provide data to evaluate progress toward efficiency.	Prov./Assn.	Year 1	?
H.1 A non-profit independent organization should be established to coordinate water efficiency actions in Ontario	Prov. Prov.	Year 1 Year 2	Staff $350K/Year

Draft For Discussion

Benefit	Implementation	Other Comments
Quality	1. Link with F.16/Develop material 2. Distribute through existing networks 3. Education/workshops	
Quality Health		
Quality	1. Education 2. Enforce	
Quality	1. Continue monitoring -increased level of effort would require additional costs.	
Saving	1. Identify options/feasibility	
Coordination	1. Identify options 2. Start up organizational -3 person	

Wrap-Up & Next Steps

Water Efficiency Strategy Advisory Group

Purpose

An Advisory Group added a steering element to manage the process. It broadens the ownership of the process and increase the number of people at workshop events who can monitor reactions and help support the project. The Group also acts as a sounding board for the Ministry and allied ministries as it will reflect major viewpoints and offer sound water advice.

Procedures

The Group is composed of eleven individuals representing a number of groups interested in water management. It will meet five times - before and after the first meeting and after each subsequent meeting to review documents being considered and/or documents which reflect the deliberations of the meeting. The Advisory Group is chaired by David Balsillie, Assistant Deputy Minister of the Policy Division, Ministry of Natural Resources (MNR).

Duties

1. To provide advice to the government on the process and content of the stakeholder involvement process. This will involve vetting resource materials or proposals before implementation/introduction.

2. To monitor the progress and effectiveness of water efficiency strategy development process.

3. To offer advice on the content of the water efficient strategy at various stages in its development.

Members Appointed

The following people sit on the Advisory Group:

Dr. Jim Ashman
Director
Water Resources Branch
Ministry of the Environment
Toronto, Ontario

Mr. Leo Calderone
Director of Plant and Engineering
The Sheraton Centre Hotel and Towers
Toronto, Ontario

Mr. Rick Coronado
Ontario Federation of Labour
Windsor, Ontario

Mr. Brad Erhardt
Waste & Environmental Control Dept..
J.M. Schneider Inc.
Kitchener, Ontario

Mr. Glenn D. Harrington, OALA
Principal
Harrington and Hoyle Ltd.
Landscape Architects
Markham, Ontario

Mr. Ross Irwin
Box 1263
Guelph, Ontario

Ms. Maureen McCauley
Land Group, Bramalea Ltd.
Toronto, Ontario

Mr. James MacLaren
Ontario Water Services Secretariat
Toronto, Ontario

Mr. Paul Muldoon
Pollution Probe
Toronto, Ontario

Mr. M. G. Thorne, P. Eng.
Deputy Commissioner
Metropolitan Works Department
The Municipality of Metropolitan Toronto
Toronto, Ontario

Workshop Participants

The workshop participants represented approximately 95 individuals and organizations. A check mark indicates those who were able to attend the 1st and/or 2nd and/or 3rd workshops:

Sponsoring Ministries & Agencies

- ✔ Natural Resources (Lead Ministry)
- ✔ Agriculture and Food
- • Education
- ✔ Energy
- ✔ Environment
- ✔ Government Services
- ✔ Housing
- • Industry, Trade and Technology
- ✔ Municipal Affairs
- ✔ Northern Development & Mines
- ✔ Ontario Water Services Secretariat
- ✔ Tourism and Recreation
- ✔ Treasury and Economics

Participants

- ✔ American Water Works Association -Ontario Chapter
- ✔ Association of Conservation Authorities of Ontario
- • Association of International Automobile Manufacturers of Canada
- ✔ Association of Municipalities of Ontario
- • Attractions Ontario
- ✔ Automotive Parts Association of Canada
- • Brewer's Association of Canada
- • Building Operators and Managers Association
- ✔ Canadian Chemical Producers' Association
- ✔ Canadian Golf Superintendents Association
- ✔ Canadian Institute for Environmental Law and Policy
- ✔ Canadian Institute of Plumbing and Heating

Participants continued

- ✔ Canadian Irrigation Association
- ✔ Canadian Meat Council
- ✔ Canadian Soft Drink Association
- ✔ Canadian Standards Association
- ✔ Canadian Steel Environment Association
- • Canadian Steel Producers' Association
- ✔ Canadian Textiles Institute
- ✔ Canadian Union of Public Employees
- ✔ Canadian Water Resources Association
- ✔ Canadian Water and Wastewater Association
- • Chiefs of Ontario
- • Christian Farmers Federation of Ontario
- ✔ City of Etobicoke
- ✔ City of Guelph
- ✔ City of London
- ✔ City of Niagara Falls
- ✔ City of Sault Ste. Marie
- ✔ City of Toronto
- ✔ City of Toronto Housing Corporation
- ✔ City of Windsor
- ✔ Conservation Council of Ontario
- ✔ Consulting Engineers Association
- ✔ Council of Ontario Universities
- ✔ Ecological Farmers Association of Ontario
- ✔ Environment Canada
- • Federation of Metro Tenants Association
- • Friends of the Earth
- • Glass Molders, Pottery, Plastics and Allied Workers International Union
- ✔ Great Lakes United
- ✔ Greencare Horticultural Association
- ✔ Greenpeace
- ✔ Institute for Groundwater Research
- ✔ International Joint Commission
- ✔ Kapuskasing
- • Metro Toronto Housing Corporation
- ✔ Metro Toronto RAP Committee
- ✔ Metro Toronto Region PAC (MISA)
- ✔ MISA Advisory Committee
- • Motor Vehicle Manufacturers' Association
- ✔ Municipality of Metropolitan Toronto
- ✔ National Farmers Union
- ✔ Niagara Escarpment Commission
- • Ontario Association of Landscape Architects
- • Ontario Federation of Agriculture
- ✔ Ontario Federation of Labour
- ✔ Ontario Food Processors' Association
- • Ontario Forest Industries Association
- ✔ Ontario Home Builders Association
- • Ontario Housing Corporation
- • Ontario Hospital Association
- ✔ Ontario Hotel and Motel Association
- ✔ Ontario Hydro
- • Ontario Metis and Aboriginal Association
- ✔ Ontario Mining Association
- ✔ Ontario Municipal Water Association
- • Ontario Non-Profit Housing Association
- • Ontario Nursing Home Association
- ✔ Ontario Parks Association
- ✔ Ontario Private Campground Association
- • Ontario Provincial Planners Institute
- ✔ Ontario Public Advisory Council
- ✔ Ontario Public Service Employees Union
- ✔ Ontario School Trustees Council
- ✔ Ontario Sewer and Watermain Contractors Association
- ✔ Pollution Probe
- ✔ Rawson Academy of Aquatic Science
- ✔ Regional Municipality of Durham
- ✔ Regional Municipality of Halton
- ✔ Regional Municipality of Hamilton-Wentworth
- ✔ Regional Municipality of Ottawa-Carleton
- ✔ Regional Municipality of Waterloo
- ✔ Resorts Ontario
- • Rubber Association of Canada
- • United Association of Journeymen and Apprentices of the Plumbing and Pipefitting Industries of the United States and Canada
- • United Steelworkers of America
- ✔ Urban Development Institute
- ✔ Village of Wellesley

Workshop Coordinators

The Lands & Water Policy Branch of the Ministry of Natural Resources, on behalf of 11 sponsoring ministries and one provincial agency is coordinating this process to develop a Water Efficiency Strategy. If you have any questions, please contact any of the following individuals:

- Ken Sharratt
  Manager, Water Policy

- Bill Wardle
  Coordinator, Water Efficiency Strategy

- George Fiotakis
  Research Coordinator
  Water Efficiency Strategy

All three individuals can be reached at the following:

Water Efficiency Strategy for Ontario
Ministry of Natural Resources
Room 5620
Whitney Block
99 Wellesley Street West
Toronto, Ontario
M7A 1W3
Fax: 416-314-2427

Notes from the Sub-Groups to the 3rd Workshop

Doug Green/John Johnston

Definition of Self Suppliers:
- provide water for their own use
- provide their own pump
- non-municipally supplied
- responsible for their own quality and quantity
- provide for their own waste water treatment

Self Suppliers are different from "supplied" users because:
- they are responsible for ensuring the quality and quantity of their supply
- they already pay full cost of development of supply
- they already pay full cost of waste water treatment
- there is greater potential for conflict and impact by other users of supply
- there are equity questions (eg. subsidies vs. user pay)

Self suppliers should be included in the water efficient strategy recognizing that the self supply group requires separate consideration with regard to the strategy due to the above differences.

Because of these differences, we should not develop a strategy based solely on the interests/concerns of those on a municipal supply and then apply it to self suppliers without appropriate review and, when necessary, modification in terms of self supply.

A review of Work Book Vol. 3.3 from the perspective of self supply led to the following comments on some of the proposed strategic management actions (SMA) of the draft sub-goals:

Sub-Goal A:
SMA A2:
- Implement full cost pricing - including the cost of environmental clean-up...

Group Comments:
- Self suppliers already pay full cost for supply and most pay full cost for waste water treatment.
- For self supply the costs of environmental clean up, inspections and permits is all that would apply.
- No inexpensive method for inspection of septic tanks is available so inspections should not take place until the methodology is available.

SMA A8:
- Encourage municipalities to monitor...adopt the "polluter pays" principle.

Group Comments:
- Appears to be written for pipe discharges. It is more difficult to apply to diffuse sources.
- If applied to rural septic systems, need to develop an inexpensive inspection method to determine if the system is working properly before implementing any type of required septic system monitoring or inspection program.
- Inspection ports for septic tanks and a test to determine if the system is working should be developed. The technology for this test and inspection may need research and development for this to be implemented.

SMA A9:
- Implement a fee for the use of raw water.

Group Comments:
- Water is necessary to sustain life and therefore should not be taxed. Charging the full cost of delivery and treatment to users is appropriate.
- Delete fee for raw water.
- All sectors are raw water users - municipalities may be a "middle man".

SMA A10:
- Implement peak flow demand controls.

Group Comment:
- Should apply to pipe supplied water only. Current regulations and permit requirements provide for peak flow demand control of self suppliers.

Sub-Goals B:
SMA B2:
• Institute a comprehensive public education program...

Group Comments:
• The benefits of green space appears to be lost in the pursuit of water efficiency. Net benefit to lifestyle quality and water quality - as water use needs to be evaluated.
• Before promoting "xeriscaping", make sure all implications are explored. Recent literature out of Texas shows the issues have not all been looked at (i.e., micro-climate, cooling, infiltration of rainfall).
• Remove the term "xeriscaping" and insert "water efficient landscape management".

SMA B4:
• Providing technical support, demonstrations and water audits...

Group Comment:
• Add self suppliers to list of users.

Sub-Goal E: .
SMA E4:
• Develop a strategy to resolve water use conflicts.

Group Comments:
• Include list of conflicts, eg.:
• interference for groundwater and surface supplies
• who owns the water or the right to use the water
• priority of use, i.e. human, livestock, fish
• riparian rights for groundwater
• urban over pumping of rural aquifers (London, Cambridge)

Sub-Goal G:

SMA G2:
• Treat self suppliers as we do others...

Group Comment:
• We are not recommending they be treated the same in all instances.

SMA G3:
• Communicate the goals and objectives...

Group Comment:
• This SMA is already included under sub-goal B and self suppliers are the same as municipal supply users in this regard.

Sub-Goal H:
SMA H3:
• Common costs/water discharge/effluent fees...

Group Comments:
• For equity among users should self suppliers be treated differently than municipal suppliers as they are paying full cost for their supply and effluent treatment?
• If the strategy is based on concerns of fully serviced community then this can impose significant costs that are not economical for the self suppler.
• This SMA needs to be reworded to require the application of the principle of "equity" before implementation. A further bullet point under sub-goal C should be written to encourage the development of economic testing procedures for water quality (pesticide etc). The tests should then be promoted to be done on a routine basis and the test results provided to the coordinating body for the data base analysis of water quality.
• Use a systems approach to monitoring water quality from diffuse sources, eg:
- coordination of test results from both groundwater and surface water testing
- database analysis to predict trends in water quality
- coordination by the "Provincial body"

The group proposes the following material to replace that for Sub-Goal G in the work book:

Sub-Goal G: To work with self supplied water users (those who access raw water for their own supply and/or treat their waste water, regardless of quantities) to foster efficient water use.

The following strategic management actions should be included under sub-goal G:

• Implement good water management practices among self supplied users.
• Self suppliers already pay the full cost of developing the supply, distribution permits etc., but they should also pay the cost of environmental cleanup, inspections and permits.
• Self suppliers should test for water quality in their distribution system at least twice per year.
• For diffuse discharges, stream monitoring should be undertaken for effluent discharge quality (eg. biota monitoring for bioassessment).
• Self suppliers should

meter/monitor raw water use to provide data to evaluate progress towards efficiency.

Short Term Priorities
Monitoring
• guidance for metering/ monitoring methods
• monitor quantities by use
• guidance for quality monitoring

Research
• improved/new, and where possible economical, water testing methods (raw water and waste water)
• water efficient technology

Education
• access available information on Best Management Practices and disseminate
• information on how to interpret test results and apply them
• explain the acceptable standards, what they mean and the risks involved (environmental and personal)
• ground water protection (quality and quantity)
• for large uses (ie., municipalities) the cost of treating water is relatively small so they can treat as they use it; while the individual self supplier may not be able to afford treatment costs so they and all others should protect the aquifer so that water drawn from it does not require treatment.
• surface water protection (quality and quantity)

Provincial Infrastructure
• Who pays for what? Where does "user pay" end and "social benefit" take over? Is society prepared to pay?
• Must resolve equity questions re. self supply:
  - subsidy
  - user pay
  - testing costs
• $ to implement the policy??

All of the above short term priorities are important but the group thought immediate emphasis should be put on monitoring.

Ian Cameron/Norm Goldstein

SUB-GOAL "D"
- To develp and monitor efficiency, targets based on a sound database that will ensure sustainable water supplies.
• Establish "where we are" currently
» Who is the existing source of water data
• Establish what information we need
• Why is this data required?
• How should this data be collected?
» Standards & format of collection
» Is every user accounted for?
. 0-50,000 l/day
• What type of databases are required?
» Water in/water out
» Groundwater inventory
» Extent and capacity of acquifer

Categories of Information Needed:
- What decisions will be needed?
- Quantity of water in.
- What is it used for - measure/unit (per capita) - (how much should have been used?)
- How much water out
- Quality of water

Resource Information
- Where the water is (resource)
- How much is there?
• What are the limits of the resource?

Technology Database
Municipal Information - Total Production
- Yearly production
- Monthly production
- Average day
- Maximum peak day
- Daily
- Hourly
- Every 3 minutes

_____Total Metered Usage
_____Unmetered
_____Loss

- Evaluation of Program Effectiveness
• Use sample municipalities to evaluate efficiency
- Evaluate Water resource data

Municipal Data Presently Being Collected
Production
- Yearly
- Monthly
- Average day
- Maximum peak day
- Daily
- Hourly
- Every 3 minutes

_____Total Metered Usage
_____Unmetered
_____ Loss

Databases
Supply (by Municipality)
- How much is available - Extent of surface (streamflow) & groundwater (acquifer)
- Where is it (location)?

- Quality
- How much can be sustainably withdrawn

Demand (by Municipality)
- Residential (quantity in # of people)
- Individual
- Commercial
- Institutional

Demand (Pilot Area)
-Residential
» Where water is used in house
» How much water is used per application
- Commercial
» By categories (SIC)
» Diverse
- Individual
» By categories
- Institutional
» By categories

Data on Source of supply - Precipitation/Infiltration

1. Groundwater
- Extent of aquifer
- Capacity of aquifer
- Sustainable yield
- Location of recharge areas
- Environmentally areas that depend upon aquifer
- Water quality of aquifer
- Present usage

2. Surface Water
A) Streamflow
- Water Quality
- Sustainable yield - downstream supplies - fisheries/aquatic - recreation
- Relationship to groundwater system
- Assimulative capacity - ability of water to accept waste
- Pollution susceptibility
- Present usage

B) Lakes
- Location of lakes
- Variation in water quality
  » Seasonal & location
- Currents (directional flows)
- Aquatic life/fisheries
- Bathometry
- Inflow/Outflow
- Sustainable yield
- Pollution susceptability
- Present usage

SUB-GOAL "D"

1. MANAGEMENT ACTIONS
- Utilize the provincial authority to establish and monitor a database
- Decide what is needed
- Use what is available
- Generate what is not needed
- Standardize criteria and collect and disseminate information

2. DEVELOP STRATEGIES TO UTILIZE THE DATABASE
- Fund from water revenues

3. ESTABLISH DATABASE ON SUPPLIES
- Grondwater
- Surface (rivers)
- Lakes

4. ESTABLISH DATABASE ON DEMAND
- Residential
- Commercial
- Institutional
- Industrial

5. ESTABLISH DATABASE ON QUALITY AND QUANTITY OF WASTEWATER GENERATED

6. IDENTIFY COST OF ABOVE TO DETERMINE FULL COST PRIORITY

SUB-GOAL "B"

To promote efficient water use amongst all water users by informing and consulting them.

Who is involved? (suppliers)
- Governments
  - Federal
  - Provincial
  - Municipal
  - P.U.C.'s
- Industries
- Producers
- Lobby groups
- Associations
- Media
- Politicians
- All levels
- Schools
- Research groups
- Environmentalists

Who are the users?
- Residential
- Commercial
- Industrial
- Institutional

WHAT IS THE MESSAGE?

Benefits

Sustainable protects water quality, healty environment, energy savings, delay capital expenditures.

Available of resource should be considered before taking any political or social decisions to use the resource industry location considerations - inform industrial developments.

MANAGEMENT ACTIONS:

Ranking
- Link incentive programs with results and then publicize
- Demo programs
- Encourage best use of water between water authorities in a co-op basis.

1. USE THE PROVINCIAL AUTHORITY TO COLLECT AND DISSEMINATE INFORMATION
- Involvement with political

groups (environmental)
2. SCHOOLS
3. PROVIDE TECHNICAL SUPPORT.
4. PUBLIC AWARENESS
5. ENCOURAGE BEST USE
6. TRAINING GOVERNMENT
7. PARTNERSHIPS
8. LINK INCENTIVE PROGRAMS

Peter Beyak/Louisa Vatri

Our Sub-Goal (B)
To promote efficient water use amongst all water users by informing and consulting them.

DISCUSSION:
. must provide municipalities with the tools to develop their own communities.
. must ask, why are we looking at this?
. why? tailor it to the individual
. who pays?
. every municipality has their own problems, therefore, give the municipalities a chance to develop their education program accordingly
. Need Province-wide series of messages, however, does not substitute what we need at a Municipal level
. will be a "shock factor" for small municipalities when it comes to the idea of full-cost pricing, therefore, there should be some tools could be provided to familiarize that shock will be useful
. must craft the "program" very carefully
. should be a general overall Provincial education package that would apply to everyone, then you should have regional and local concerns addressed as well
. the question is "who will be doing the general stuff etc."
. may need a decentralized type of campaign, therefore, we really need a "coordinating-type action". A Central group to cover all municipalities
. need central coordination! A core of liaison people. A Board of Liaison Officers etc.
. education is portable
. be careful that you don't confuse education with promotion. Education is long-term
. There are therefore, three thrusts: Long-term is education, short-term is a public awareness programs (perhaps Provincial), thirdly, you prepare material to allow communities to develop their own programs
. perhaps the education component could be part of the environmental studies program.
. Let the educators decide where it should go in the curriculum

ACTION ITEM #1a)
To build on information that already exists and develop a component within an existing Province-wide curriculum to deal with water efficiency. (Long-term impact).
WHO? The Water Agency

ACTION ITEM #1b)
ENSURE that the Water Efficiency component becomes part of the curriculum.
WHO? The Water Agency

Discussion
. must target the right audiences
. next we must discuss, "immediate action" for the promotion of a Water Efficiency campaign
. Ontario-wide Immediate action

ACTION ITEM #2
Ontario-wide Water Efficiency Public Awareness Program to reflect over-all Strategy. Successive campaign by Water Agency (Immediate Action)
Who? The Water Agency

DISCUSSION
. need to get the general message out to people about water efficiency. Or do we hold back and put on a more "concentrated" campaign.
. may not be great timing to launch a program as at this time it may seem as a "tax-grab" by the government
. must therefore, have a really clear ideas as to what we are going to do and what we are trying to explain
. must try to correct the public's perception of what we are doing here
. therefore, it is very much "not what you do" but how you do it!
. we need to develop generic support material
. or collect information, once again, you do not have to reinvent the wheel
. try to give this package a somewhat "local flavour"

ACTION ITEM #3
Develop area relevant Water Efficiency promotion package to provide a basis for local promotion. (utilize available programs)
Who? Municipalities/Water Agency/Stakeholders

Discussion
. need to give Water Efficiency a higher profile
. need to do a short-term promotional thing

. like "Drinking Water Week" in the U.S.
. have contests, radio call-ins, do some advertising etc
. like "Earth Day"

ACTION ITEM #4
Declare a specific week such as; "Provincial Drinking Water Week". This is a good time for promotion to public and to promote the education curriculum.
Who? Water Agency/ CWWA/Environment Canada/ MNR/MOE

Discussion
. what does the terminology in the strategy mean? We should clarify this. What do we mean by Water efficiency?
. get through to the people as to what we mean.
. training and education for industrial and commercial and utility staff
. what are we going to do for industry and manufacturing?
. should we not set targets on a municipal and provincial basis
. we will need awareness for industry etc. as to what the options are
. demonstrations and water audits?
. should we promote a water audit right at the outset and then check back and see if they are water efficient or not
. audit kits??

ACTION ITEM #5
Promote water voluntary audits by developing and promoting "water audit kits" and best management practises training for ICI (industry, commerce, institution)
Who? MNR/MOE/M of Labour/MITT/Pollution Prevention Centre

General Premise
How?
. Use the appropriate stakeholders
. Build on information gained over the years
. Encourage partnerships

Sub-Goal (F)
To control pollution so as to exchange and preserve water quality

Discussion
. where do we start with this one?
. should we define the pollutants
. link discharge with water use
. link the certificate of Approval with water conservation in the municipalities
. set targets within the various municipalities
. must meet these targets
. make it more than a policy, make it regulatory
. we should be tough

ACTION ITEM #1
Ministry of the Environment establish policy that municipalities meet water efficiency target as a criteria for their Certificate of Approval for wastewater plants.
Who? Water Agency/MOE

ACTION ITEM #2
Any Provincial grants for infrastructure be conditional on planning and meeting water efficiency targets within a specified time.
Who? Water Agency/MOE

DISCUSSION
. look at subdivision plans and see if that subdivision could be accommodated within the Certificate of Approval
. possibly reject the subdivision that does not
. link up the subdivision approval with water efficiency targets

ACTION ITEM #3
Subdivision approvals subject to water efficiency compliance.
Who? MOE

DISCUSSION
. upgrade Sewage Treatment Plants (STP's)
. should there be mandatory secondary treatment?

ACTION ITEM #4(a)
All Municipal STP's without secondary treatment immediately incorporate secondary treatment.
Who? MOE

DISCUSSION
. all municipalities should have a master water-use sewage treatment plan
. each municipality is doing all these little bits without an overall framework
. need an ecosystem-based water use sewage treatment master plan to guide decisions that are made

ACTION ITEM
Develop municipal/watershed ecosystem based water use and discharge Master Plan (Stormwater Management and Water Efficiency Policy will be intertwined)
Who? Local Municipalities

DISCUSSION
. we will be influenced by other water systems
. pollution must be stopped at the sources

ACTION ITEM
Municipal Pollution Prevention Plan (reduce or stop pollution at the source). Identify sources and take appropriate action.
Who? Municipalities/Retail Market

DISCUSSION
. the EA process is very complex
. perhaps we could look at ways of streamlining the process
. all STP's have a primary system
. we are also looking at farms etc. not just urban
. point-source pollution
. try not to make it sound like we are only talking about Toronto. Some sewage systems, especially in rural areas, are not nearly as complex

ACTION ITEM #
All local STP's comply with local community criteria as well as Provincial Ecosystem Water Quality Guidelines.

DISCUSSION
. what happens when municipalities do not meet the effluent guidelines??
. do we fine them?
. how do we enforce it?
. do we levy a fine?
. maybe we should say something specific about enforcement

ACTION ITEM #
Improved enforcement. Significant penalties (financial and penal) for non-compliance to Certificate of Approval.
Who? MOE

DISCUSSION
. stormwater is another major source of pollution
. municipalities should develop watershed based stormwater management plans
. perhaps stormwater utilities should be established

ACTION ITEM #
Watershed, stormwater management plans should be developed to included reduction in quantity and improvement in quality of flows to watersheds and STP's (urban and rural)
Who? Municipalities/Retail Market

DISCUSSION
. the question of EA's
. streamlining the EA process? for timing sewage treatment upgrades

ACTION ITEM #
Streamline EA process to ensure timely sewage treatment upgrades. (make it more efficient)
Who? MOE

DISCUSSION
. reducing infiltration into sewage systems
. need to develop and implement MISA regs for sewer use

ACTION ITEM #
Must develop and implement MISA Regulations for sewer use (pre-treatment for industry)
Who? MOE

DISCUSSION
. quality of Ontario's groundwater
. groundwater pollution comes from the surface (landfill sites etc)
. should we develop groundwater protection strategies
. a process to identify recharge areas and discharge areas
. protect against development
. prevent the dumping of chemicals in landfill sites etc.

ACTION ITEM #
To develop measures to protect groundwater quality. (ie. septic tanks, landfills and other leachates)

ACTION ITEM#
Disconnect all sources of extraneous flows and reduce infiltration to sanitary sewage systems ie. eavetrough drainage, sump pumps.
Who? MOE, in conjunction with Building Codes

SUB-GOAL (H)
Co-ordinate Water Management including water efficiency policies and programs.

DISCUSSION
. should municipality take the lead
. they need some agency to turn to to give them a hand
. do they need a coordinated agency?
. who? where? when? why? How? Costs?
. crate from existing staff and resources
. good idea because now it is confusing as to what Ministry/Agency is looking after water
. should be made part of existing agency duties
. who has the real authority for water efficiency
. someone has to monitor or enforce the program to ensure that the work is getting done?
. we want "zero" cost

. difficultly is to have sufficient authority within this advisory or whatever
. coordinate/network
. do they need authority?
. is there just a coordinating role?
. can't it just be an ad hoc committee?
. not policy/authority or should they have implementing authority or if you have implementing should you also have financial authority?
. hotline/advisory service?
. who? (Water Efficiency Program people)
. need a profile, an advisory board
. you need a PR type person
. perhaps organize similar to "blue-box" program
. need a person to coordinate all of the information on water
. need someone to work on a full-time basis
. perhaps we could have membership from the member agencies
. is there an existing agency that can do this?
. we need someone to run this
. this committee/agency would be supplying information and getting information

ACTION ITEM
Establish the Agency/ organization means of doing so, (options)
. expand the existing MNR Water Efficiency Section
. create a new agency drawing form existing Departments that deal with water (MNR/MOE/Government Services etc...)
. contract responsibilities to outside agencies ie; CWWA/ Universities
. establish this agency as a non-profit autonomous organization

Recommendation
A non-profit independent organization

Please Note:
The audiences served will be:
. municipalities (technical use)
. retail market (residential consumer)

Phasing
1) Initially serve the residential
2) Secondly, the municipalities
A. Implementation
B. Monitoring
C. Progress review every 2 years

Potential Activities
1) Establish a data base
2) hotline
3) research branch
4) monitoring

Funding
Alternatives: 1) Provincially funded 2) Municipally funded (Municipal contributions through water bills) 3) User fees

Wolfgang Scheider/ Paul Norris

Draft Goal - **To Sustain Water Quantity and Quality through efficient use**

Draft Sub-goal "E" - **To set standards, adopt Legislations and establish legislation which promote efficiency in water use.**

SMA's
- implement a water efficient plumbing code
- 6 litre or less flush toilets

1. adopt most stringent of EcoLogo or US codes
2. CSA all new water efficient plumbing fixtures to be CSA approved
3. set standards and regulate water efficient appliances (washing machines, dishwashers, etc.)
4. develop water use by-laws to control lawn watering, swimming pool filling, car washing
5. stormwater drainage should be onto lawn rather than to sanitary sewer
- rainwater leaders should drain to surface
6. voluntary water audits of large water users
7. establish a hierarchy of water use to be used to resolve water use conflicts in times of drought
- province basis
8. adopt MOE Model sewer use by-law
- take charge drainage legislation measures to eliminate use of once-through cooling water in industry
9. propose legislation which standardizes methods of calculating full cost pricing (what should be included?)
10. legislation to direct water/sewage funds to be used for water/sewage systems or controlling water related pollution
11. legislation to meter all municipal water users within 10 years (10% per year)
12. municipalities must undertake leach detection programs if unaccounted for water is greater than 10%

Draft Sub-goal "F" -**To control pollution so as to enhance and preserve**

water quality

TASKS:
- Review sub goal
- Develop Strategic Management Actions
- Address who, where, when, why, how, and cost implications
- Priorize Strategic Management Actions

The group preceded its development of Strategic Management Actions (SMA's) by discussing questions dealing with the incorporation of water quality issues into an overall water efficiency strategy:

We should recognize that there are mechanisms currently in place or being developed which may help to achieve the sub-goal (eg. MISA)

Can/should we wait for these measures or should interim approaches be pursued?
We should recognize that water pollution has multi-media origins.
We must consider the potential impacts on other media of water pollution control measures.
Actions taken must demonstrate water efficiency promotes water quality?

In general, the group recommends universality in the applicability of actions which support the sub-goal (control at source, reduction and/or elimination of toxins, effluent monitoring).

In the development of SMA's, the group decided to focus on pollution sources, and to develop a matrix of pollution control measures.

Sources considered included the Municipal, Industrial, Residential, Commercial and Utility sectors. The Agricultural sector is included in the sub-goal addressing self-supplied users, and was not pursued, except in that agricultural water efficiency must also consider water quality.

Municipal Sector
1. Accelerate the implementation of the MISA program in the Municipal sector.
2. All municipalities should adopt the MOE Sewer Use Bylaw. Enforce Bylaw limits.
3. Municipalities within a (Region/Watershed) should have water and sewage master planning processes to address the next 25 years. (currently no integration; piecemeal)
4. Implement Best Management Practices (catch-basin cleaning, leak detection etc.)
5. Implement Improved technologies for sewage systems (e.g. reuse of effluent)
6. Undertake systems audits in STP's and water treatment plants.
7. Upgrade all treatment plants to meet secondary treatment standards.
8. Establish separate sanitary and sewer systems.
9. Speed up E.A. approval process for treatment plant upgrades.

Industrial Sector
1. Control pollution at the source.
2. Reduce once-through cooling (additives)
3. Implement Best Management Practices (reduce and reuse wash-down water, properly store chemicals, ensure existence of facilities for spill contaminant management)
4. Develop process changes to use less water.
5. Improve recapture of product.
6. Invoke applicable Municipal measures (e.g. zero discharge for certain contaminants)
7. Combine water and sewer charges to approach fuller cost pricing.

Residential Sector
1. Educate the public as to the value of water quality and its relationship to water efficiency.
2. Promote/provide for/ ensure the proper use and disposal of pesticides, herbicides, and other chemicals.
3. Control pollution at the source (e.g. ban on certain substances)
4. Introduce Best Management Practices (partial fill of washing machines, modification of lawn watering practices etc.)

Commercial Sector
(Hotels, restaurants, plazas, laundries, garages etc.)
1. Invoke all applicable management actions from other sectors (e.g. source control)
2. Introduce Best Management Practices (e.g. improved grease traps & interceptors)

Utility Sector
(Primarily Ontario Hydro)
1. Control Pollution at the source.

Ralph Luhowy / Christine Goertzen's Group

DRAFT SUB-GOAL:
TO PROVIDE ECONOMIC INCENTIVES THAT FOSTER EFFICIENT WATER USE

DRAFT STRATEGIC MANAGEMENT ACTION PLANS:
1.IMPLEMENT METERING FOR ALL MUNICIPAL WATER USERS.
There was lengthy discussion on this topic in both group sessions because subsequent SMAs could only be done if metering was in place.

WHY
• rational behind metering was that it promotes equity, a method of measurement, and re-enforces the user-pay principle.
• metering allows for a control of costs
• also promotes database information gathering
• and promotes water efficiency
METERER - the municipality
METEREE -the user

After two days of discussion, there was a general consensus that metering for all users was an accepted SMA. Metering remains the responsibility of each municipality (or utility) to implement.

Other discussion on metering
- concern was raised over the cost effectiveness of metering. e.g, could better "bang for the buck" be put into infrastructure improvements?
- problem of institutional mismatch. e.g. if the area municipality installs meters, both municipality and region benefit, but how should costs be divided?
- Responsibility is parcelled out differently in the various Regions. e.g. In Waterloo Region, the Region is the water wholesaler to the area municipalities who then are water retailers to their city or township's customers. Wastewater treatment plants are managed by the MOE. In another example, the Region of Peel is both the water wholesaler and retailer with the wastewater treatment plants operated by the MOE.
- because the water is now expensive enough, metering was viewed as a necessary evil.
- metering was viewed in light of the full user pay principle. The situation where all homes are charged the flat rate regardless if the home has only one resident or five residents would be eliminated through metering.

2. IMPLEMENT FULL COST PRICING - INCLUDING THE COST OF ENVIRONMENTAL CLEANUP, THE SUPPLY COSTS, INFRASTRUCTURE COSTS, THE COST OF ENVIRONMENTAL INSPECTIONS AND THE COST OF ISSUING PERMITS.

WHO
- end user

WHAT
- items as stated but include environmental cleanup only when costs can be directly attributed to who benefitted from the polluting. e.g. The cost of cleaning up Windemere Basin in Hamilton Harbour should not be the sole responsibility of the Hamilton residents because those who benefitted extend beyond Hamilton.
• the full user pricing system should include the cost of future pollution abatement. (Workshop A handout booklet page 109: Traditional Water and Wastewater System Costs Used in Rate Setting) e.g. Waterloo Region practices Fund Accounting and currently charges $1.95 per 1,000 gallons of water and $1.95 per 1,000 gallons for sewage. Ottawa-Carleton Region also practices fund accounting and includes depreciation.

HOW
- Have separate water and sewage rates
- The provider of the service to establish targets and a framework for implementation

Group discussed but eliminated:
- need for a co-ordinating agency. Felt strongly about not creating yet another governmental body.
- amending the Municipal Act so that water and sewage costs would not be included in the property tax.

3. ELIMINATE FLAT RATES AND DECREASING BLOCK RATES.

4. IMPLEMENT INCREASING BLOCK RATES.
WHO
- Municipality should consider uniform rates, decreasing and increasing block rates. (some clarification was needed regarding definition of flat rates vs uniform rates)
WHY
- So that the price structure ensures water efficiency
HOW

- Eliminate flat rates.
- Look at past, present, and anticipated costs, and consumption patterns.

General Group Discussion:
- Supply or infrastructure constraint inevitable for all.
- Increasing blocks should only be implemented once full cost accounting is in place.
- Is it desirable to move to marginal cost pricing of producing the water and treating it?
Note: Definition of Marginal Cost - looks only at cost of producing future supplies (past and present costs not considered)
- need to distinguish between accounting (marginal cost?) and pricing ???.
- "Historical Perspective" in some municipalities the more water used the less it costs, and in other municipalities the more water used the more it costs. Therefore have a rate structure developed accordingly. This <u>may</u> result in declining block rate pricing structure. As long as full cost pricing is implemented.

5. ELIMINATE GRANTS AND SUBSIDIES
<u>WHY</u>
- Because the true costs of water and wastewater are not reflected in individual bills.

<u>HOW</u>
- Establish alternatives to grants and subsidies consistent with principles 7 and 8. (refer to pg 11)

Elimination of grants and subsidies is already occurring. Increasingly each municipality must rely on their own resources.
Note: discussion was quick and decisive since time was running out.

6. ENSURE THAT WATER/ WASTEWATER REVENUES ARE DEDICATED TO EXPENDITURES ON WATER AND WASTEWATER SYSTEMS RESPECTIVELY.
Add "respectively" at the end to keep water and wastewater revenues separate.

7. SEPARATE WATER AND SEWER CHARGES FROM THE PROPERTY TAX. PROPERTY TAXES TO BE REDUCED TO REFLECT THIS.

8. GROUP ACCEPTED SMA AS STATED

9. IMPLEMENT A FEE FOR THE USE (OR DRAW) OF RAW WATER.
Group discussion led to no general consensus except that all were against a royalty fee.
- A Provincial surcharge to be established on the user's water bill.
- No fee for the use of raw water.
- Recognized full cost pricing will cause hardship in certain areas where servicing is expensive. Various mechanisms to redistribute this were considered but no agreement could be reached.
- Group discussed having: a general tax (reluctant yes), a royalty fee (definitely no), a surcharge (yes and no)

10. IMPLEMENT PEAK FLOW DEMAND CONTROLS
Yes

11. SUBSIDIZE INCOMES FOR FINANCIAL ASSISTANCE, NOT WATER BILLS.
This was not considered a SMA and group felt it should be deleted from the list.

12. CONSIDER A BLOCK OF LOW COST WATER TO MEET PEOPLE'S BASIC LIVING REQUIREMENTS.

13. ADOPT A UTILITY STYLE OF MANAGEMENT - LOOK AT BOTH WATER AND WASTEWATER SYSTEMS WHEN CARRYING OUT A COST/BENEFIT ANALYSES.
Yes. e.g. In Waterloo Region this means depreciation would be included. (refer to SMA 6.)

14. PROMOTE A WATER EFFICIENCY CREDIT/QUOTA SYSTEM FOR DEVELOPMENT.
Group liked quota system and would encourage municipalities to consider the option.
Quota system definied: e.g. municipality permits a developer only to build one new home for every, say, three existing homes that are retrofitted with water efficient devices. Whatever the required ratio of existing homes to new homes is necessary to increase the capacity of the water system to accommodate the new development.

The quota system is permissible under the Planning Act. There are number of successful example in U.S. cities.

The credit system was not discussed.

15. PROVIDE INCENTIVES TO WATER USERS TO EXCEED THE BY-LAW REQUIREMENTS FOR INDIRECT DISCHARGE.
Group agreed with SMA but incentives should apply to both water quantity and

quality.

16. DEVISE STRATEGIES FOR REDUCING PEAK DEMAND, I.E. PRICING STRUCTURE.
Group agreed but strategies should not be punitive.

OVERALL CONCLUDING STATEMENTS:

PRIORITIZING OF STRATEGIC MANAGEMENT ACTIONS
Concentrate on list as presented on page 18 - except for the SMA that was deleted.

IMPLICATION
The redirection of costs from general taxes to water bills will have a significant impact on the user's bill.

DRAFT SUB-GOAL:
TO DEVELOP WATER EFFICIENT TARGETS BASED ON A SOUND DATABASE THAT WILL ENSURE SUSTAINABLE WATER SUPPLIES

a) SHOULD WATER UTILITIES INCLUDE WATER EFFICIENCY AMONG THE OPTIONS FOR SUPPLY PLANNING? HOW SHOULD THIS BE ENCOURAGED? SHOULD A MODEL STUDY BE DEVELOPED?
_ Yes.
_ Education.
_ Yes.

b) WHAT INFORMATION SHOULD BE INCLUDED IN THE DATABASE?
- General parameters for water and wastewater information to be: quality, quantity, and costs.
- Important to note why changes occur. e.g. track efficiency programs.
- Since database is a coordinated provincial effort, the information gathered should be straight forward, a bare minimum of information items. Each municipality would still have the option of maintaining indepth records of their own. Asking for too detailed information would make the database too cumbersome, it would not be used, and would be too expensive to maintain. KEEP IT SIMPLE!
- Database information included by municipality:
- production of water and wastewater
- demand for water
- unit demand by sector (e.g. residential, industrial, commercial)
- unmetered but accounted for water
- application to water and wastewater systems

d) HOW SHOULD INFORMATION BE DISSEMINATED?
- Information could be sold to agencies in report form on annual basis to retrieve costs associated of information gathering.
- Initially the information could be collected manually, (or use a software package) but in the future an email-system could be established.

e) HOW SHOULD THE ESTABLISHMENT AND OPERATION OF THE DATABASE BE FUNDED?
- The database should be funded by MNR Liaison Committees to establish database funding and continual updating.
- Startup funding to come from general revenue. Estimate, $500 000. After initial startup, innovative funding for continual update to be obtained (e.g. revenues from annual reports generated by database)

Brian Opitz/Roman Kaszczij's

ISSUES
• Quality vs. Quantity
- It was stated by Resorts Ontario that the perception Americans have of Canadian waters is that they are clean. Example given was Lake Simcoe. Lake Simcoe is an important resource, it provides recreation and is a source of income. Agricultural runoff has greatly damaged Lake Simcoe. An add on T.V stated that Lake Simcoe is dying. Someone added that every lake in Ontario is polluted.
- It was then stated that quantity was the issue of this workshop. Some expressed their opinion that water quality was the problem not water quantity. Ontario Food Processors Assoc. stated that "We are far away from a water crisis - only 1% of 1% of the great lakes is being used." Ontario Hotel and Motel Assoc. agreed and stated that Sudbury was undergoing a major land reclamation and that people loved their grass and gardens. Their municipality encouraged the people to use water. People are worried about their properties and will break water restriction laws. This is where our group started their debate.

• Education
- We then discussed the importance of education. OPA stated that kids are being sent to workshops on manicured landscape vs. naturalization. Is it fact or fiction - is

a dandelion a weed or a wildflower. Fertilizers and pesticides became a topic of concern and it was stated that only qualified people should be allowed to use it.
- Is water a problem? How do we educate the public? Where do we get the information?
- We must talk to the teachers today and we need immediate results, was one statement. We must give guidance. Education is a short term goal leading to long term results as was the blue box program. Communication is needed for the public and we must build on people's consciences. But will water conservation mean sacrificing one's lifestyle. We do not want to punish the people.

• Costs
- Simply put, there is no money for such programs as retrofitting and education. Where do we get the funding? It was stated that costs should be internalized. Full cost pricing and user pay was mentioned. There was mixed emotions on that statement. Some said it was cheaper to do it than not to since the more you use the more you pay. One comment was to price water high to see if people really wanted it. Subsidies were mentioned but were not accepted since this system could reward the water wasters. Competitiveness became an issue. If it's too expensive and if the standards are too strict will provide an additional incentive to relocate.

PRINCIPLES
The following principles were discussed:
- Competitiveness
- Conservation
- Sustainability/Responsibility
- Availability

We then wanted to know what was meant by sustainable and we compiled a list of definitions:
- Indefinite use
- Responsible use
- Global Leadership
- Protection
- Investment
- Environmentally stable
- Ecosystem management
- Healthy environment
- Cost effectiveness (social and economic)

At this stage in time our group was beginning to NORM. One person asked if we were willing to go to extremes to pay for the water one uses. Would a person be willing to take out a loan to have healthy water. The answer was YES. We all realized that residential was tameable but that industry was the real problem. It was asked that industry should bring a solution to the government on saving water. This is where our group began storming and spent half the time setting out our principles.

Final Principles:
1. Maintain the quantity and improve quality of water.
2. Live off the interest of the naturally occurring supply. Can't afford to sink into the principle.
3. Maximize education and information availability to the public. Education and information must be available, attainable and accessible.
4. All costs of water supply and wastewater treatment, including social and environmental costs, which can be attributed to water users should be paid solely by water users. Cost meaning social, financial environmental. If ecosystem costs are associated with the water system then we should pay through water bills. Do not use water revenue for other funding such as welfare, child care etc.
5. Users pay in accordance to the costs incurred to the system. A user who uses water in the middle of summer during peak pumping hours should pay more for his water. Time of day and season are important criteria.
6. Public institutions should provide leadership in responsible water use. Governments should practise what they preach.

Is money generated going to where it's suppose to go. Must establish a code of acceptable practice for budgets.

The discussion turned to goals. Many thoughts prevailed:
- license the sale and use of chemicals for horticultural purposes
- encourage more R&D to investigate what the impacts of our existing and new technologies and processes were
- to encourage R&D into environmentally friendly products

We were then asked to determine what we were trying to accomplish here. We agreed that we were too specific in our goal statement. We required something more general. We then read the goal of Metro Toronto and we

all seemed to like it. With modifications to it we came up with this goal.

Goal
To increase efficiency and promote environmentally and economically sustainable prosperity through water conservation practices and measures; to reduce community demand and costs for water, wastewater, energy and chemicals.

But we all concluded that there was more and so we established a few sub-goals.

Sub-goals
To build a comprehensive understanding by the public regarding water demand and water use.

To investigate and evaluate traditional water management practices to develop new or improved technologies and practices to ensure a healthier environment for future generations.

To identify the carrying capacities (input=output) of critical surface and subsurface ecosystems to determine what is sustainable.

Targets
So much time was spent on establishing principles and goals that we didn't spend much time on our targets. But we manage to split targeting into 3 groups; Residential, Industry/Manufacturing/Commercial, and Agriculture.

Residential
1. Restrict installation and sales of energy and water efficient fixtures for toilets, showers and faucets by January of 1994.
2. Initiate comprehensive water conservation education programs by January 1993. Its nice to see the implementation of educational programs before the retrofitting programs. Funding is still an issue - who will pay?
3. Implement metering and water rates related to cost. Require metering to determine the actual water consumption in order to have a successful water conservation program. Municipalities should support water conservation through appropriate by-laws and official plan statements.

Industry/Manufacturing/ Commercial
1. Must encourage application of MISA program.
2. Enforcement of municipal by-laws and provincial codes and regulations.
3. Eliminate once-thru cooling. Recycling

All to be implemented asap.

Agriculture
1. To encourage and assist in the implementation of better management practices

Pat Lachmaniuk/Pat Sharma

STANDARDS / REGULATIONS / LEGISLATION
1. BUILDING CODE/PLUMBING CODE REVISIONS
- Without impairing Health & Safety
- New developments/retrofits requiring permits (by 1/1/93)
- Legislate fixtures for sale: only CSA approved to efficient standards (by1/1/94)
- No legislation on do-it-yourselfer and no "Toilet Police"

2. MISA
- Directed at seven industrial sectors
• Ensure collection of water quantity
- need to promote water conservation as part of MISA
• For indirect dischargers, limits must be chantged from concentration basis

3.MUNICIPALITIES
3.1 **Legislate** municipalities to create utility to operate & maintain water and sewer services (FC)
• Dedicated revenues, **respectively**
• Realization of political difficulties
3.2 **Encourage** municipalities to introduce by-laws for:
i) Metering (FCA)
ii) Define any industrial subsidies
iii) Water demand:
» lawn watering
» certain agricultural practices
iv) Conduct water audits:
» large industrial users
» unaccounted for water

4. STILL TO ADDRESS:
- Agricultural practices in rural areas
• Water quality and quantity
- Boaters - grey water
- Canada/U.S. Great Lakes Agreement
- Ultimate responsibility/ jurisdiction
• Possible Federal-Provincial agreements
- Revenues/**royalties**

5. RESEARCH AND DEVELOPMENT
- Implemented through coordinating body?
- Reference: Science Council document

a) Database development/ data collection use, inventories, etc.
b) Leak detection methods
Repair techniques
]— — — Technical
Non-disruptive electronic metering]
Easily utilized, widely acceptable pricing mode
c) Technology Transfer
• Program similar to DRECT but for water reduction technologies
• Program similar to Hydro's for water audits

Notes from the Sub-Groups to the 2nd Workshop

Kevin Loughborough /Patricia Lachmaniuk

1. Draft Goal Statement

Achieve sustainable water resources in Ontario

2. Draft Principles

1. Adopt an ecosystem perspective.
2. Maximize efficiency in the use of water.
3. Minimize use of energy.
4. Preserve and enhance source water quality
5. Establish programs that are sustainable economically, socially and environmentally.
6. Establish and dedicate user-pay revenues for water resources.

3. Targets

1. Adopt legislation to establish water quality standards.
2. Province to assemble a baseline database on consumption supply sources including groundwater treatment/pollution processes and costs within two years.
3. Measurable results to be achieved within a given time period. Targets must be realistic, achievable and based on adequate knowledge. (Form of target could be by application, i.e. 50% reduction in average flush volume of new toilets for sale)
4. Public awareness and education program to be initiated in 1992 and fully implemented within three years.
5. Introduce legislation in 1992 change the plumbing code to prohibit the sale of inefficiency new and replacement plumbing fixtures and fittings after a certain date.

Sub Goals and Strategic Management Action

1. True Cost Pricing

- Review and audit price structure to identify a baseline and then apply models to develop future rate structures.
- Accurately monitor user consumption through continuous metering.
- Dedicate water and sewer revenues to water and wastewater for capital works, repair, replacement, infrastructure rehabilitation, operation and maintenance (discuss issue of development charges as another source of water revenue)
- Determine and publicize the pay-back on investment in water efficient fixtures and consider whether the cost of additional incentives is justifiable.

2. Management and Efficient Utilization of Sources of Supply

- Each water source should be developed and managed with careful attention to the hydrologic and ecologic systems of which the particular source is a part.
- Provide an adequate supply of high quality water for users.
- Identify the water resources inventory re: quantity and quality
- Responsibility for water resource management should rest with the agency close to the people benefitted with respect to operation and maintenance.
- Master plans to address supply and demand management.

3. Wise and Responsible Use of Water for Efficiency

- Adopt policies and procedures that result in the efficient use of water
- Establish water-use efficiency standards for new plumbing fixtures, fittings and appliances, e.g. through plumbing code changes.
- Encourage conversion of existing high water use plumbing fixture designs to more efficient ones.

- Encourage change to efficient methods or applications of water use.
- Identify unaccounted for water and take remedial action.

4. An Informed and Aware Public on Water Efficiency
- Devise public education and information program to promote water efficient practices.
- Develop and use educational materials on water conservation
- Document and publish benefits of user pay approach to cost recovery.

5. High Quality Water Resources
- Information promotion and enforcement through legislation and regulations
- Municipal Industrial Strategy for Abatement
- industrial effluent discharge
- sewage treatment plant upgrades
- non-point source control
- Groundwater protection strategy
- Monitoring
- Pollution prevention at source
- Commercial
- Institutional
- Industrial
- Recreational
- Residential

6. Research and Development
- Continue research on more efficient water use/reuse techniques and practices.
- Research techniques for remediation of groundwater and surface water.
- Develop sources and adopt guidelines for stormwater quality management
- Develop alternatives to septic systems
- Collect data on conservation efforts, techniques and practices
- Review performance data every five years.
- Review sub goals and strategic management actions every five years.

Ian Cameron / Norm Goldstein's Group

1. Draft Goal Statement
. Felt that there should be revised statement.
. Affordable - felt dealing with % only - financial when dealing with public.
. Need to be more simple.

' Water Efficiency Strategy
. use of water by people
. general public

Revised Goal Statement:
"Sustain water quantity and quality for future generations by optimizing efficiency in the use of water".

2. Comments on Drafted Principles
1. Maximize the efficient use of water using measures that are affordable economically, socially and environmentally. (includes Drafted Principles 2,8,9, and 12).

. Water is a renewable resource.
. Water degraded today will have to be cleaned up for use tomorrow.

2. Present and future generations are entitled to a good supply of water (Drafted Principles 1 & 3)
3. Water Efficiency will also save energy.
4. Water Efficiency will reduce capital, operating and maintenance costs.
5. All costs associated with the use of water should be paid by the user and the resulting revenues dedicated to maintaining and upgrading water and wastewater systems.
6. Everyone should be knowledgeable and responsible for maximizing the efficient use of water with elected officials providing the lead role.
7. All costs associated with the use of water should be paid by the user and the resulting revenues dedicated to maintaining and upgrading water and wastewater systems
8. Everyone should be knowledgeable and responsible for maximizing the efficient use of water with elected officials providing the lead role.

3. Targets
. Establish a provincial database that includes availability and consumption by year X.

SUB GOAL STATEMENT
Assumptions
. Efficiency means elimination or reduction of waste
. Reduction comes automatically with efficiency but through understanding and technology, but not doing without.

The efficient wise use of water means reduction with benefits.

1. Establish Information Base on the quality quantity and the efficiency in the use of water and analysis
. Provide guidelines to establish measurable targets to achieve efficiency in various

sectors (different parts of Ontario and types of industry)
. Evolving and ongoing process to set targets
. Determine by customer type acceptable standard and set target for that customer
. Water Plant and WasteWater, etc.
. water in, water out
. unit cost
. quality in, quality out
i.e. by customer type
. consumption by residential
. customer, by volume, by month, etc.

2. Implement Incentives
. Evolving and ongoing process to set targets
. Establish initiatives at the provincial level that encourage water quality, water quantity and water efficiency by:
. metering
. full cost pricing
. implementation of MISA program
. retrofit and pilot project

3. Communicate and Educate General Public
. Establish a public communication and education plan to encourage water quality, water quantity and water efficiency
. bulletins
. presentations
. AWWA section meetings
. customer targets through industry associations
i.e.
. public participation in the development (use success stories)
. communicate above
. demos, media
. school programs

4. Establish Research Program for Future (Technology)
. Review work completed to date (elsewhere)
. Encourage a Research and Development Program (lead by the province) to improve water quality, reduce water quantity and increase water efficiency
. better equipment
. operations audit
. integration of systems

Peter Beyak / Louisa Vatri's Group

1. Draft Goal Statement
. Achieve sustainable water resources in Ontario through efficient use of water.

2. Drafted Principles
1. Concept is acceptable.
2. Maximize the efficient use of water.
3. Concept is acceptable with one change:
"Preserve water quality for future generations with special emphasis placed upon preventing pollution at the source."

4. This principle was deleted as the group felt it was redundant.
5. This principle was deleted as the group felt this concept was covered in principles #s 1, 10, 11
6. This concept is acceptable.
7. Was acceptable with two small changes:
"Revenues from water and wastewater charges must be dedicated to maintaining and upgrading the water and wastewater systems respectively.
8. This principle was deleted.
9. This concept was accepted.
10. This concept was accepted with the following changes:
"Governments and public agencies should be wise water users and show leadership by coordinating conservation programs.
11. The concept was accepted with a few small changes.
"The public must be educated about sustainable water use.
12. This principle was deleted.

3. Draft Targets
1. Reduce per capita non-residential water use by X in Y years.
2. Reduce per capita residential water use by X in Y years.
3. Accepted.
4. Accepted (clarify MISA's quality standards)
5. Accepted (should clarify zero discharge)
6. Add (from our original Targets).
7. To have a full cost pricing policy for all of Ontario by 1996.
8. Rehabilitate the infrastructure to an acceptable level by the year 2011.

Sub Goal Statements
1. To provide economic incentives for wise water use

. Industry incentives to promote Water Efficiency
. Full cost pricing (user pay)
. Reduce property taxes to reflect transfer of responsibility to water bill
. Eliminate grants
. Dedicate funding
. Mandatory metering
. Incentives to exceed by-law requirements for indirect discharge

. Eliminate decreasing block rates
. Utility style management (combines sewerwater)

2.To educate and train the public, politicians, providers, and water users on efficient water use

. Educate on new efficiency technology
. Develop education programs for students (MNR/MOEduc/ Bd of Ed)
. Education programs for commercial/industrial users
. Multi-media promotion programs
. Establish local data banks for consumption comparisons
. Train utility staff
. Promote low water demand landscaping (xeriscaping)

3. To establish a single authority to coordinate the Water Efficiency Policy (Water Efficiency Board -W.E.B.)
. Create via legislation
. Create from existing staff resources - municipalities/ ministries (MNR, MOE, MMA)
. Common costs/water discharge/effluent fees (quantity, quality)

4. To establish water/sewer utilities within municipalities removed from property tax support
. Full cost pricing, dedicated revenue to operations/ infrastructure respectively
. Property and income taxes to reflect the property tax reduction due to transfer to utility
. Legislation/revisions to establish utility

5. To curb spiral of ever increasing demand
. Revise plumbing code
. Provide incentives for voluntary retrofit
. Set standards for manufacturers of water efficient products
. Create water efficiency testing agency

Wolfgang Scheider/Doug Green's Group

Draft Goal Statement

There is a need to define, or at least be sure everybody understands, the meanings of the key words used in the statement:

- "sustainable"
  - maintain quality while minimizing use
  - must mean both quality and quantity

- "water resources"
  - does this include quality, quantity and aquatic resources?

- "affordable"
  - may be redundant if "efficiency" is used
  - maybe should use "appropriate efficient measures"
  - define efficiency as "greatest benefit at least cost in social, environmental and economic terms"

The basic concept described by the goal should be to use less water by reaching an optimum level of use. Maximizing efficiency of water use may not necessarily reduce water use.

The goal must be action oriented.

The draft goal statement was revised to:
"Sustainable water resources by minimizing water use ~~of water in Ontario through affordable efficiency measures.~~"

The portion removed from the draft goal statement is covered in Draft Principle #12.

Draft Principles

1. The proposed draft provides information not needed in a principle statement.

"Adopt an ecosystem approach to the provision and management of water resources ~~and wastewater treatment, recognizing that water is a renewable resource, is part of the hydrologic cycle and that water degraded today is water which will need to be cleaned for use tomorrow.~~"

2. Again, this draft includes too much information for a principle.

"Minimize the use of water ~~even in situations where there may be abundant supplies~~"

3. There are really two principles expressed here and they should be split.

"Preserve and improve water quality for future generations ~~with special emphasis placed upon controlling pollution at the source.~~"

New principle: "More emphasis should be placed on preventing pollution at the source."

4. Minimizing the use of energy is a by-product of minimizing water use (Principle #2). This is not really a principle for a water strategy. The group agrees with the prin-

ciple but could not agree on whether is should be part of this strategy.

5. This is a very general principle that generally goes unwritten but it would be useful to leave in to remind us. It should be split with the last part being included in Principle #11.
"Water management decisions should be based on sound information ~~including knowledgeable and informed water users.~~"

6. Again, this principle is too wordy.
"Water users should be metered and pay all the costs of delivering water and treating wastewater ~~including any extra costs associated with the provision of services in the peak season or peak time of day.~~"

7. Draft principle is fine as is.

8. This principle is not needed because of Principle #12.

9. The concept is fine but one word should be changed.
"The social costs associated with implementing water efficiency measures should be distributed equitably ~~equally.~~ If a subsidy is to be provided, then incomes rather than water rates should be subsidized."

10. Draft principle is fine as is.

11. Public participation should be added to this draft.
"The public should be informed and participate in decisions regarding ~~about~~ wise water use and water efficiency."

12. The use of the word "measures" should be qualified.
"All measures aimed at minimizing water use should be affordable economically, socially and environmentally."

Draft Targets

The group did not spend much time discussing targets. Some members express some discomfort with the targets proposed. It was also observed that many of the draft targets are quality related while the draft goal statement focuses on minimizing water use.

The group thought that the discussion of targets might be more appropriate after the subgoals and strategic management actions have been developed.

Sub-Goals and Strategic Management Actions

The group attempted to develop sub-goals that would serve to focus attention on key aspects of the goal proposed by the group. Each sub-goal had to focus on either "sustainable" and/or "minimize", as used in the goal statement.

Draft strategic management actions were developed for each sub-goal

1. To reduce the use of water

- institute a comprehensive public information / education program
- meter all municipal water users
- revise water rate structure to promote reduced use of water by implementing increasing block rates
- devise strategies to reduce peak demand, for example:
  - pricing structure
  - education
  - by-laws
  - change the plumbing code to only allow water efficient devices

2. To enhance and protect water quality.

- develop and enforce by-laws to control discharge of pollution into municipal sewer systems
- regulate and enforce pollutant discharges to all waterways, including groundwater systems
- pollution prevention at the source
- best management practices
- zero discharge of selected toxics
- ensure quality of private sewage disposal systems
- implement improved technologies for sewage systems
- better inspection and enforcement
- implement good water management practices in agriculture
- review process for upgrade of water and sewage treatment and pumping facilities, for example:
  - do environmental impacts statements only, exempting facilities from being "bumped up" under the Environmental Assessment Act
  - speed up the EA process for such facilities
  - have an EA for a total water and sewage master plan, allowing future expansion within the plan to proceed without further EA review
- develop watershed based stormwater management systems, including for example:

- management practices to reduce peaking factor (eg. landscaping to reduce stormwater runoff)
- impoundments to improve quality
- while consensus was not reached, the group discussed treating the agricultural industry as we do other users of water and apply the same strategies to them

3. To maximize the efficient use of water in terms of the greatest benefit at least cost in social, environmental and economic terms.

- revise water rate structure to include a base rate that allows for basic living requirements (eg. bathing, washing, cooking, fire fighting) and apply increasing block rates on volumes above base rates
- implement public information and education
- promote the use of water efficient technologies (eg. fixtures)
- establish technical support programs for efficient water use
- minimize the amount of once through uses of water, such as for cooling (group opinion was divided on whether this should apply to all once through water discharges or only those to sewer systems)
- implement recycling and reuse of water, for example:
  - counter current cooling and industrial sanitation
  - recycle car wash water
- advocate Ontario's water resources as an attraction to industries and tourists
- ensure efficiency of use of industrial process water
- while consensus was not reached, the group discussed charging for water at least to cover the cost of environmental inspections and attaching fees to Permits to Take Water and Certificates of Authorization

4. To have an informed ,educated and participating public in matters of water efficiency.

- develop educational programs for schools
- publicize the "crisis" in water use and tie water efficiency to environmental improvement ("crisis" is in the cost of infrastructure and in environmental degradation, including health, for example drinking water and beach closings)
- target public information to maximize water efficiency during peak use periods (eg. summer uses)
- the following two strategic management actions are located under this subgoal because it appears the best place to put them at this time:
  - develop a data base on water, including for example: use, supply, demand, cost and financing
  - undertake a review of water resource conflicts in the province and develop a strategy to resolve them, with due consideration given to a unified agency or unified legislation

5. To implement full cost pricing

- implement full cost pricing to include, for example:
  - cost of environmental clean-up
  - supply establishment
  - associated government inspections, licensing, permits, etc.
  - infrastructure management costs
- meter all municipal water users
- implement user pay through revising rate structures
- implement peak flow demand controls
- while consensus was not reached, the group discussed a user fee to be charged for raw water

6. To have Ontario on the leading edge of water efficient technology.

- establish incentive programs to develop/create new technologies
- establish a provincial Centre of Excellence for Water Efficiency encourage the manufacture of water efficient technologies/devices in Ontario

Ralph Luhowy/Paul Norris' Group

1. Draft Goal Statement

. No mention of water quality

. Qualifier "by" speaks to how rather than what

. Prefer our original statement. "To maintain and enhance an undiminished, healthy and sustainable water resource.
"

2. Draft Principles

. Adopt an ecosystem approach to water management, recognizing that water is a renewable resource.

. Optimize the use of water, even in situations where there is an abundance of water

. Revenues from water and wastewater charges should be dedicated to water.

. The costs associated with implementing water efficiency measures should be distributed equitably. (social implications are beyond the scope of this strategy).

. Governments and public agencies should show leadership as wise water users.

. The public should be informed about wise water use to achieve a conserver ethic.

. All measures should be affordable economically, socially and environmentally.

. Ontario should be a model for other jurisdictions which share our water.

3. Draft Targets

. Premature at this stage, our targets have become management strategies, prefer to proceed with them.

. The blanket statement "Reduce water use" is unacceptable, quantitative statements of this nature are unreasonable.

. Targets will become apparent after SMA's are finalized.

Sub Goal Statement

1. Residential Education
To have a well informed citizen on the value of a healthy, sustainable water resource)

. Educational Program for use in schools

. Public Service announcements

. Participation on Stakeholder's- ' Committee

. Demonstration Projects

. Education for Media, Post-Secondary Students, Professionals

2. Residential Financial
To introduce financial mechanisms which encourage healthy and sustainable water use

. Separate sewer charges from the Property Tax

. Eliminate flat rates and declining block rates

. Dedicated revenues

. Metering

. Water rates related to full costs

. Promote a Water Efficiency Credit/quota system for development

3. **Residential Legislation**
To review and enhance legislation to ensure consistency with the main core

. Plumbing Code review/ amendment

. Develop Water Use Bylaws

4. Residential technologies
To assure Water Efficient technologies, techniques/ products are accessible in the residential market in Ontario

. Provide incentives for Water efficiency technologies, research and development

5. Industrial Education
To have a well informed industrial sector on the value of a healthy sustainable water resource

. Create a partnership program involving industry, government and the public

. Promote industrial education with seminars sponsored by government

. Educate industry on the method and advantages of conducting water audits

. Provide education methodology to industry to promote employee awareness of water efficiency

6. Industrial Financial
To introduce financial mechanisms which encourage healthy and sustainable water use

. Ensure full cost pricing is applied to the industrial sector

. Encourage municipalities to monitor effluent discharges for quantity and quality to ensure full cost recovery for treatment

. Polluter Pays

. Promote a Water Efficiency credit/quota system for development

7. Industrial Legislation
To review and enhance legislation to ensure consistency with our main core

. Once-through cooling

. Not a preferred option

8. Industrial technologies
To stimulate the development

and use of innovative technologies which promote Water Efficiency

. Promote university based research in these areas

. Promote industry/government partnerships

. Compile available technologies

. Government to coordinate/ facilitate industry to finance

9. Government Education
To have a well informed government (bureaucratic/ political) on the issues of Water Efficiency
. Provide educational materials for employees

. Continue with internal demonstration projects, audits

10. Governmental Financing
To establish a provincial framework for full cost recovery (environmental, infrastructure, etc.) for the water resource

. Eliminate grants and subsidies

11. Government legislation
. There should be a "water conservation" coordinating agency in Ontario (Natural Resources, Conservation Authorities, another agency?)

Brian Opitz/Roman Kaszczij's Group

1. Draft Goal Statement
. To achieve sustainable water resources by minimizing use of water in Ontario through affordable efficiency measures.

2. Draft Principles
. Adopt an ecosystem approach to the provision and management of water and wastewater treatment recognizing that water degraded today is water which will be used tomorrow.

. Promote responsible use of water even in situations where there may be an apparent abundant supply.

. Ensure water quality and quantity for future generations.

. Water management decisions should be based on sound information including knowledgeable and informed water users.

. Individual water users should be metered and each pay all of the costs of delivering water and treating wastewater, including any extra costs associated with the provision of services of peak times.

. Revenues from water and wastewater charges should be dedicated to maintaining and upgrading the water and wastewater systems.

. The social costs associated with implementing water efficiency measures should be distributed equitably. If a subsidy is to be provided, then incomes rather than water rates should be subsidized.

. Governments, public agencies, institutions should be wise water users and show leadership by coordinating other government programs to minimize water use and wastewater generation.

. The public should be informed about wise water use and water efficiency.

. Measures should be affordable economically, socially and environmentally.

3. Goal Targets
. Reduce per capita water use by X in Y years.
. Reduce per capita residential water use by X in Y years.
. Reduce peak non-residential use by X in the year Y.
. Meet MISA quality standards by the year Y.
. Zero discharge of persistent toxic substances by the year Y.
. Reduce wastewater discharges in X uses by Y% in year Z.
. Are the targets to be implemented provincially, or on a more localized basis.

Sub Goal Statement
Secure financial commitment for the production of information packages and educational curriculum for use by educational systems and voluntary organizations.

. Apportion percentage of water billing to fund communication/education packages

. Encourage changes to school

curriculum to include general resource conservation education (Ministry of Education)

. Comprehensive public information and promotion campaign (waterrates, changing habits, purpose of program, what is the problem, money savings)

. Co-opt press and media.

2. Support the implementation of residential water reduction initiatives through the dissemination of educational information and amend existing legislation to require the residential installation of water and energy efficient fixtures and appliances in new construction.

. Technology and information transfer by gathering, documenting and disseminating of case studies.

. Identify opportunities for cost savings (water audits)

. Coordination of public information among various sectors

. To implement universal metering, full cost pricing on water/waste water rate structures

3. Develop internal sector wide controls and measures to achieve water efficiency and water reduction by industrial, commercial and institutional users.

. Ensure comprehensive public information and promotion campaign (co-opt local media/press and flyers)

. Implement universal metering and full cost pricing.

. Change building code to reflect the need for water efficient fixtures and appliances (Eco-logo)

4. Encourage and assist in implementation of better agricultural water management practices.

. Clearly enunciate the goals and objectives of the Provincial water efficiency strategy, intended financial commitment and time frames

. Province and local municipalities to be involved in ensuring that user pay water revenues be adequate and dedicated to the respective systems that generated these revenues (capital planning process)

. The national water committee be encouraged to implement a nation-wide water efficient strategy and establish a liaison with Ontario.

5. Provide on-going government leadership for the implementation of the water management program.

. Technology and information transfer by gathering, documenting and disseminating case studies.

. Ministries of Agriculture and Food, Natural Resources, Environment to identify and address the problems of drainage and ground seepage (leachates) water quality

Workshop 1 Summary Results

Synthesis of Findings from Oct. 21 -22nd Workshop

Following is a composite goal, principle, targets, etc. based on the work of the six groups at the October 21 and 22 session in the Macdonald block.

The methodology employed to develop the composite involving taking the ideas presented by each group at the closing plenary session and then clustering them. The key ideas were then reflected in a composite statement. Very little editorial license has been taken during this process, and the original wording has been preserved as much as possible. Many items were proposed that in the analyst's view were strategic management actions. These have been captured in the section entitled "Strategic Management Actions". You are invited to continue the process of refining any or all of the following sections.

DRAFT GOAL STATEMENT:

Sustainable water resources by minimizing use of water in Ontario through affordable efficiency measures.

DRAFT PRINCIPLES

1. Adopt an ecosystem approach to the provision and management of water and wastewater treatment recognizing that water is a renewable resource, is part of the hydrologic cycle and that water degraded today is water which will need to be cleaned for use tomorrow.

2. Minimize the use of water even in situations where there may be abundant supplies.

3. Preserve water quality for future generations with special emphasis placed upon controlling pollution at the source.

4. Minimize the use of energy in the provision and use of water and the treatment of wastewater.

5. Water management decisions should be based on sound information including knowledgeable and informed water users.

6. Water users should be metered and pay all of the costs of delivering water and treating wastewater, including any extra costs associated with the provision of services in the peak season or peak time of day.

7. Revenues from water and wastewater charges should be dedicated to maintaining and upgrading the water and wastewater systems.

8. All measures aimed at minimizing water use should be financially responsible.

9. The social costs associated with implementing water efficiency measures should be distributed equally. If a subsidy is to be provided, then incomes rather than water rates should be subsidized.

10. Governments and public agencies should be wise water users and show leadership by coordinating other government programs to minimize water use and wastewater generation.

11. The public should be informed about wise water use and water efficiency.

12. Measures should be affordable economically, socially and environmentally.

DRAFT TARGETS

- Reduce water use by x in y years.
- Reduce residential water use by x in y years.
- Reduce peak outside residential use by x in the year y.
- Meet MISA quality standards by the year y.
- Zero discharge of persistent toxic substances by the year Y.
- Reduce wastewater discharges in x uses by y% in year z.

Notes from the 1st Workshop

Kevin Loughborough / Patricia Lachmaniuk's Group

Issues

1. Baseline -Water Audit

In order to gauge the success of a Water Efficiency Strategy one must first establish a baseline from which to begin. The current state of the supply as well as current demand must be established. The current ecological condition must be studied and documented in order to evaluate change.

2. Ground Water

A ground water management strategy must be developed. The limits of the resource must be researched, especially where ground water is the resource. Options for ground water recharging must be evaluated.

3. Public Awareness/Education

Is it a public issue? Starting with institutions, the public must be educated.

4. Storm Water Management

Combined sewers are a problem, a study should investigate the options and benefits of combined sewers versus separate sewers. Downpipes should not go into the sewers. Storm water runoff increases with increasing development, therefore, this must be considered as future development is approved.

5. Incentives

For industry, there should be incentives to provide effluent water of a better quality than imposed in by-laws and regulations. Such regulations may inhibit the initiative to strive for better. Rural landowners should be encouraged by incentives to use less water and to eliminate the use of pesticides thereby reducing the loading of pesticides into ground water. Tax rebates could be given to landowners who preserve and protect the wetlands and forests.

6. Projected Growth

Availability of water, distribution of potable water, access to sewers all must be considered in the approval process for new development, residential and industrial. Developers may also add environmental options in new houses.

7. Competitiveness

Ontario's strategy must be developed in coordination with other jurisdictions. The aim is to acquire an edge in the competitive market as opposed to forcing industry and growth out of the province.

The group discussed most of the issues presented in the handout and agreed that all were important issues. The consensus of the group was to generate issues that were not addressed.

8. Water Costs

The group felt that with the present system, people may in fact be rewarded for over use of water. Metering is a definite answer but even with metering is the actual cost of the water being paid? Consideration should be given to a royalty on water. Those people and/or industries drawing water from the sources, whether surface or ground water should pay a surcharge.

Goal (Vision Statement)

To achieve sustainability in the sue of water resources in Ontario, recognizing its availability as a fundamental necessity to sustain life.

(sustainable- the ability to forge links between the environment and the economy that can support an enhanced quality of life now and in the future.)

Principle 1: Ownership of the Resource

It is necessary to establish that the water resource is owned by the public and legislated by the province.

Targets

1. The principles and policies of ownership for both surface and ground water need to be reviewed.

2. legislation and regulations developed for enforcement.

Principle 2: User of the resource pay for cause
This would include not only the water consumed but also for water use when the water is deemed to be returned or rendered inferior in quality.

Targets
1. Full cost accounting to include capital, depreciation, subsidy and operations. Money would therefore be available to improve and upgrade infrastructures.

2. Inventory of current cost recovery systems.

3. Implement metering in all municipalities.

4. Document advantages of user pay.

Principle 3: Good water quality is fundamental

All principles for water efficiency must be reviewed with respect to water quality to ensure that no degradation results.

Targets
1. Establish water quality guidelines.
2. Introduce standards that will ensure enhancement of water quality i.e. MISA.
3. The ecosystem must be maintained and hopefully enhanced.

Principle 4: Wise use of the renewable resource (water)

Fossil water cannot be renewed and therefore is not available for consumption. The renewable water must therefore be used wisely.

Targets.
1. To maintain a balance in the watershed basin.

2. Develop a water audit program.

3. Identify the top users of water.

Principle 5: Move toward a more efficient use of water

Targets
1. Develop a new rate structure.

2. Research, develop and apply new technology for water efficiency/conservation.

3. Review and reduce the amount of energy used.

4. Develop an ecological tracking program.

5. Develop incentives for industries/municipalities/public to ensure water efficiency is practiced.

6. Review current standards, revise and/or rewrite new standards. i.e. plumbing code.

Principle 6: Move towards the most efficient use of energy in the supply of water.

Targets
1. Research and development of energy reducing technology.
2. Training of all to reduce.

Principle 7: Develop a public awareness program to unsure informed decision making

Targets
1. Public education of stakeholders. This will include homeowners, renters, landowners, industries and municipalities.

2. Public education in schools as part of the curriculum.

3. Public service announcements.

4. Demonstrations as a persuasion tool to get stakeholder buy-in.

5. Principles of water conservation to be defined and distributed.

Ian Cameron / Norm Goldstein's Group

Issues
Education
Change of public perception - use of less water does not mean a reduction in the standard of living.

. We are trained to consumer "de-train".

. Options to conserve - what are these options?
. upgrade regulations
. evaluate options
. groups - schools
. continuing education

2. User Pay - Leadership - same for everyone

3. Competition (between Regions)
. What is best (fair) for each Region?
. How should rates be calculated?

4. Dedicated Revenues

. Apply resources from water efficiency to water efficiency water treatment, etc.

5. Link Eco System
. Pollution and efficiency (water quality)
. Awareness of everything that is involved in water efficiency
. Cost/benefit analysis of efficiency programs.

6. Pricing & Metering
Rate Design
. Require knowledge about industrial uses and how it is returned and how much is returned.

7. Supply of Water
. Regulations/Restrictions
, State of water source
. Knowledge of groundwater source
. Approval process for permits/uses
. "Recycle" as a conservation measure

8. Starting Point
. How do you start?
. Who starts?
. Who pays?
. How do we get the message out?

9. Hardship Case
. Should water be the method to subsidize communities?
. How can you implement water efficiency if there are subsidies?

10. Involvement/Availability

. Participation - pride in contribution
. Delivery of conservation programs - utility
. Target small uses to identify how they use services and how they can save.

Methods of Supply
11.Can we change our current methods of supplying and the uses (e.g. grey water uses and separate supply systems).

12. Improve Skills of Trades
. Simple to add new product (i.e. toilet) to existing system but difficult to implement new concept (i.e. separate supply system).

13. Social Impacts
. Unemployment - retraining of workers
. Health care

Goal

Achieve a level of Water Management that is sustainable within ecological limits

Interim Goals (sub-goals) Objectives

1. Zero increase in water usage to 2011/50% reduction by 2020
2. Zero discharge of persistent toxic chemicals
3. Better understanding of the entire issue
4. Define how much water is available
5. To use existing information channels more efficiently
6. Review interim (sub-goals) within 5 years

Principles

1. Dedicated Revenues

2. Cost for water to include all costs (pumping, treatment, operation, capital, lost opportunity cost and future costs, closing the loop).

3. Subsidy not on commodity (water) but on income.

4. Pricing mechanism should be specific to regional conditions

5. Adequate legislation/enforcement mechanism

6. Conserve water despite supply

7. Must have public cooperation- education, program delivery, quality and quantity

8. Enhanced Research and Development - technological innovation

9. Act on a sound information base -gather more information on the availability of water.

10. Measure all water uses

11.Everyone has the right to clean, adequate water supply

12. Social costs to be distributed equitably

13. Water strategy must consider all aspects of the ecosystem

14. Strategy must integrate with other government programs

Strategic Actions (targets)

1. Identify municipalities that require assistance/pilot projects first.

2. Province to establish data base on consumption, supply sources and treatment/pollution processes within 5 years (MNR - lead of 12 other ministries)

3. Introduce water conservation at the public school level

4. Tighten-up approval process for new water supplies, i.e. demonstrated water management program in place.

5. Mandatory plumbing regulations - enforced by municipalities under the Public Utilities Act

6. Industrial/Commercial water audits
- develop model audit
- administer utility/industry, municipality

7. Apply MISA program to indirect dischargers as soon as possible

8. Measure quantity of discharge

9. Each municipality to develop local strategy to implement water conservation within their municipality (buildings)

10. Design rate structure to reflect full cost pricing and conservation

11. Establish water reserve fund and change legislation to permit this

12. Implement metering of 100% of accounts

13. Retrofit 100% of residential accounts with Low Flow Shower Heads, restrictors, toilet dams throughout municipalities

14. Develop and deliver low water-use landscaping - encourage consumer use.

Peter Beyak / Louisa Vatri's Group

Issues:

1. There should be a study conducted to discern the population growth versus total consumption. For example, geographic / financial versus available supply of water.

2. There should be an extensive public awareness campaign with an emphasis on education.

3. Politically, it is desired to have zero growth in water consumption. Is this realistic?

4. There should be low flow devices put on all new construction.

5. Ensure that all infrastructure is maintained.

6. The rate structure should be overhauled to reflect the true cost of the resource. For example, metering/block 'rates.

7. The revenue collected from the sale of water should be dedicated to ensure water supply is sustained.

8. The responsibility of the Water Efficiency Strategy should be a multi-agency commitment. For example, MNR/MOE/Crown Corp. This would avoid duplication of cost and effort.

9. There should be a commitment to Storm Water Management. For example, treatment, inflow filtration.

10. There should be a set of standards for acceptable water uses, particularly during critical demand periods. For example, lawn watering during summer months.

11. Who is responsible for implementing the Water Efficiency Strategy?

12. There should be more information included in your water bills in regards to consumption.

13. Should utilities be combined. For example, Hydro, Water, Sewers.

14. There is a good possibility to perhaps introduce incentives for the public. For example, subsidies for installing water devices, rewards for reduction, public recognition.

15. There should be international cooperation. For example, the IJC

Problems

1. There is a definite lack of funding within the government to provide water demanded and subsequently treatment of it to fill the demand. Therefore, the way we use water is inefficient and mismanaged.

- there is too high a demand
- wasteful use of water
- poor planning and no attention to maintenance of the infrastructure
- government has no means of funding to address these problems. What is the

mechanism to raise revenue?
. lack of incentives for people to change their water use habits
. environmental effects
. are we truly short of water? How do we convince the public?

Definitions

Goal:
Specified statements of the end results desired or to be achieved over the long term.

Targets:
Measurable results to be achieved over a given time period.

Principles:
Parameters within which the goals and actions will be designed. (ie: Page 6 in the "Challenge Paper" by the Round Table)

Goals - Points
. Sufficient water supply
. Maintain lifestyle
. Use Water efficiently
. Educate public users
. Dependable water supply
. Water quality (in and out)

Goal Statement:
To promote the responsible, economic and environmental use of water in the Province of Ontario, taking into consideration the following:

. efficient and economic use of water
. adequate, dependable and affordable supply of water to meet the needs and quality of life for present and future generations
. adequate quality of water to meet all present and future uses
. public recognition and acceptance of this strategy

Targets
1. To reduce the Provincial per capita consumption by "X" % over the next 5 years.

2. To have a full cost pricing policy for all of Ontario.

To be implemented immediately - sewage costs off tax base and added to water bill

Definition of Full Cost Pricing:
. The utility be sold to consumers at its true cost, including operations, maintenance and renewal
. The consumers be charged for what they consume (metering)
. The revenue so derived, be dedicated to operation, maintenance and renewal
. To be applied to both clean and wastewater systems.

3. Plumbing Code changes (1992). New construction installations and replacements - immediately

4. Provide incentives for voluntary retrofits units 1995

5. Provide educational curriculum for teaching water efficiency by 1995

6. Legislate metering of all single and low density residences by 1995

7. Building Code to be amended to install meters in each unit of multiple dwelling complex

8. Amend appropriate Legislation

9. Zero discharge of persistent toxic substances

10. Rehabilitate the infrastructure to an acceptable level by 2011

11. Establish a utility based system to manage and set rates for a water sewer and storm sewer independent of other municipal services by 1994. For example, the revenue generated from water should not be allocated to another Provincial/ Municipal service.

Principles
1. The goals and targets must be achieved consistent with the quality of life presently enjoyed by the people of Ontario.

2. Preserve water quality for future generations in a responsible manner

3. Promote sustainable water resource use and conservation practices by treating the resource as capital wealth and live off the interest.

4. Protect the water resource in a proactive and remedial manner with emphasis on anticipation and prevention.

5. All actions will be carried out in a fiscally responsible manner.

6. Style of Management - All aspects of water management be centralized with particular respect to conservation, quality, and economics. For example, Ontario

Ralph Luhowy / Brian Hindley's Group

Issues:

Session began with participants throwing out ideas that may or may not be issues. List of first reactions:

. poor information base and a need for research to produce good data.
- also a need for uniformity in data collection, e.g. Great Lakes Water Use Database.

. pollution is a major water user - intentionally or otherwise, pollution os water limits other uses or raises the cost to other users through treatment needs, reduced use, e.g. swimming beach closures limit recreational use.

. fragmented jurisdictions over water management
- need for greater coordination or a coordinating body

. water revenues are inadequate to meet costs, e.g. infrastructure replacement.

. water revenues support a narrow range of water management activities
- largely water and sewer
- some feeling that rehabilitation of aquatic environments should be part of cost, e.g. cleaning beaches fouled by Sl~ discharges.

. poor linkages between water revenues and expenditures, need for user pay Ontario must remain competitive, water efficiency must not drive industry away.

. municipal rate setting is complex
- fixed costs, operating costs, infrastructure replacement, metering, administration

. metering is an important issue
- necessary to provide information/data
- necessary to have effective pricing structures

We did not choose to delete, modify the issues covered in the "colouring book" in fact we ignored them. Participants tended to use them in coming up with their own list of issues. In this regard, I suggest that we might infer that they should remain "on the table" as issues.

Participants developed the following issues list:

. need for awareness/education
- in particular, a high profile "event"or focus such as a blue box program was seen as a good medium.

. metering and conservation are inseparable
- we discussed installation costs, pros and cons of ways of getting meters installed / paid for but in the end, agreed that we had to have them
- ways to implement included:
. regulations and by-laws
. retrofit programs
. retrofit programs
. a requirement on purchasers of resale homes to pay for installation
. tax
. emphasis on industry
. need for "water conscious" rate structures
- we have done a poor job here and although establishing a rate may be complex, it may be more important initially to send out a message first and work on setting a "value"for the rate later.

. need to focus more on industrial users
- push for reuse, recycling
- control discharge quality
- thermal pollution may also be a concern (some disagreement because of uncertainty re once through cooling vs. cooling tower impacts)

. need to resolve jurisdictional confusion/overlap for example who should charge?

. groundwater
- we don't know where to begin here because our lack of knowledge/information is extreme

. need to define scope
- some felt that it must go beyond drinking water supply and wastewater treatment, e.g. stormwater management should be included, others were comfortable with a narrow focus
- there was some agreement that we needed something stronger than a strategy such as a series of statements and positions on water that addresses the full range of water issues, need for a policy first to ensure provincial commitment, then a strategy which outlines the "do-ables",this policy needs to be more comprehensive and broad ranging than efficiency
- need to define "efficiency"vs. "conservation"

. need for changes to Plumbing Code and standards
. need for strong links between costs, rate setting, true user pays
. must address combined sewer overflow(s) issue in strategy, in other words, there was agreement that there are some links to stormwater management.

Goals, Targets, Principles
In reacting to the plenary, participants generally agreed that there was a message that the efficiency strategy is much broader than perhaps was being suggested or implied, i.e. municipal water.

We used the following definitions:

Goal:
Specific statement(s) of the end result(s) desired or to be achieved over the long term.

Target:
Measurable results to be achieved over a given time period

Principle:
Fundamental truth or proposition on which many others depend; a fundamental assumption forming the basis of a chain of reasoning - the parameters within which the goals will be designed.

These were posted on the wall.

We discussed goals in several ways. First, several people took a stab at writing goal statements which we then flung arrows at:

1. Ecologically sound and sustainable water/wastewater management program
- **substitute: conservation** policy

2. Maintenance of clean water and healthy aquatic environments for continued human and ecosystem benefits
- substitute: habitats

3. Maintain and promote/ enhance an undiminished, healthy and sustainable water resource.

The third goal was most preferred.

We also came up with a list of adjectives or characteristics describing what we want in a goal:

healthy, sustainable, protection, conserver, ethic, fairness, accessible, equitable, ecosystem context, enhance, promote, provincial uniformity, limited resource.

We then talked about some possible subgoals that may end up as part of the goal or principles or even targets:

1. To achieve a conserver ethic in all water users in Ontario
2. Something focused around fairness, accessible, equitable.

We ended by discussing principles:

. user pay and polluter pay
. provincial uniformity
. conservation policy
. decisions on water uses will be based on good data, informed decision-making
. live off the interest
. protection of the integrity of water resources is the first consideration in regulating water withdrawals and setting wastewater standards.

We touched on a number of other issues related to principles and targets.

. some disagreement about economic incentives and whether they are contrary to user pay principle - point was raised in the context of - how do we reward users who go beyond our expectations.

. we seem to need a mix (suite) of measures that apr responsive to change and are also capable of are a minimum standard of performance" and rewards/ incentives/encouragements to strive for something better.

. we talked about the need to combine quality/quantity by establishing integrated targets that dealt with concentration and volume. In the same way, it was thought that we need to combine withdrawal and consumption in the same fashion rather than deal with them separately.

Goals, Targets, Principles

Goals:
Maintain and enhance an undiminished, healthy and sustainable water resource.

Sub Goals:
These might also be cast as principles or targets.

. achieve a conserver ethic in all users, defined to some extent in Round Table report

. decisions on water uses will be based on good data - informed

. protection of the integrity of the water resource is the first consideration in regulating water withdrawals and setting wastewater standards

. the last preferred way to effect a change in habits (use patterns)is through regulation
- however, regulation may be necessary to achieve short term/immediate benefits

Principles:

. user pay and polluter pay
- both quantity and quality must be factored into the equation

. informed decision -making

. prioritize implementation according to the greatest benefit at the least cost (benefit in the broad sense of social, economic, environmental)

. control of pollution at source deserves high priority in framing a water efficiency strategy
- not able to set standards nor were we comfortable with zero discharge or "minimize" so we opted for source control (i.e. prevention)

. options for reduction, reuse and reclamation should be comprehensively addressed in attaining water efficiency in specific projects
- we could not agree that blanket statements like a 50% reduction in withdrawals would ensure achievement of our goal, but rather the best strategy was tailored to the individual case. For example, if Hydro was forced to cut withdrawals and did so by switching to cooling towers, we were not sure it this ensured an undiminished, healthy and sustainable resource.

. live off the interest - Round Table.

. conserver ethics and water stewardship
- we felt that the real progress to be made in water efficiency would occur when water users recognized and accepted their responsibilities/obligations in achieving our goal.

Targets:

We individually came up with the following targets which I suggest each of us felt were consistent with the goal and principles. However, we did not discuss them fully as a group, nor did we carefully scrutinize whether they achieved our goal. We did generally agree that these targets were wide enough to table for further discussion.

. By, we need an ongoing provincial water and water use inventory

. Commence a province-wide education/awareness program promoting the need for more efficient water use.

. Create voluntary groups of water efficiency partners to implement water efficiency
- this could be based on sectors or local municipal jurisdictions, for instance.

. Reduce unmetered water services by 10% per annum.

. Utilities without metered services consider implementing metering within 2 years.

. Discourage the use of potable water for non-agricultural water use.

. Develop a model water use by-law to control non-essential water use
- lawn watering, etc.

. Encourage industrial water audits for all industry. Achieve a 30-50% reduction in water use by:

. Plumbing code changes requiring use of water efficient fixtures.

. Finalize performance and testing standards for water efficient fixtures by 1992.

. Provide incentives for research and development of water efficient technologies/techniques/products and industry retooling to make Ontario a global leader in water efficient product lines.

By 1994, reduce once through cooling water industrial use by 80% for industries on municipal supplies.

. In 5 years develop local rate structures that reflect the full cost of water expenditures

. Province to provide leadership and guidance to municipalities to implement

water efficiency measures

. Initiate some locally based water efficiency promotion pilot projects in a year, e.g. hotel and restaurant sector in Niagara Falls, 25,000 accom units plus 800 restaurants.

. The group generally felt that it would prefer to stay together for the next workshop.

. Some also felt that the facilities and scribes need to sit down and go through a debriefing and review the products generated.

. Also, there was a suggestion that before the next workshop, some small tasks forces should sit down and push some of these thoughts and ideas a bit further.

. There was concern, however, that individuals wanted to be able to identify with what they or their group said, when they see the materials for the next workshop, i.e. do not over-massage the products from this workshop.

These notes fully reflect the content of the flip charts.

Brian Opitz / Roman Kaszczij's Group

Issues

• Quality vs. Quantity - It was stated by Resorts Ontario that the perception Americans have of Canadian waters is that they are clean. Example given was Lake Simcoe. Lake Simcoe is an important resource, it provides recreation and is a source of income. Agricultural runoff has greatly damaged Lake Simcoe. An add on T.V stated that Lake Simcoe is dying. Someone added that every lake in Ontario is polluted.

- It was then stated that quantity was the issue of this workshop. Some expressed their opinion that water quality was the problem not water quantity. Ontario Food Processors Assoc. stated that "We are far away from a water crisis - only 1% of 1% o~ the great lakes is being used." Ontario Hotel and Motel Assoc. agreed and stated that Sudbury was undergoing a major land reclamation and that people love~ their grass and gardens. Their municipality encourage the people to use water. People are worried about their properties and will break water restriction laws. This is where our ~roup started their debate.

• Education - We then discussed the importance of education. OPA stated that kids are being sent to workshops on manicured landscape vs. naturalization. Is it fact or fiction - is a dandelion a weed or 2 wildflower. Fertilizers and pesticides became a topic o~ concern and it was stated that only qualified people should be allowed to use it.

- Is water a problem? How do we educate the public? Where do we get the information?

- We must talk to the teachers today and we need immediate results, was one statement. We must give guidance. Education is a short term goal leading to long term results as was the blue box program. Communication is needed for the public and we must build on people's consciences. But will water conservation mean sacrificing one's lifestyle. We do not want to punish the people.

Costs

- Simply put, there is no money for such programs as retrofitting and education. Where do we get the funding? It was stated that costs should be internalized. Full cost pricing and user pay was mentioned. There was mixed emotions on that statement. Some said it was cheaper to do it than not to since the more you use the more you pay. One comment was to price water high to see if people really wanted it. Subsidies were mentioned but were not accepted since this system could reward the water wasters. Competitiveness became an issue.

If it's too expensive and if the standards are too strict will provide an additional incentive to relocate.

Principles

The following principles were discussed:
- Competitiveness
- Conservation
- Sustainability/Responsibility
Availability

We then wanted to know what was meant by sustainable and we compiled a list of definitions:

-Indefinite use
- Responsible use
- Global Leadership
- Protection
- Investment
- Environmentally stable

- Ecosystem management
- Healthy environment
- Cost effectiveness (social and economic)

At this stage in time our group was beginning to norm. One person asked if we were willing to go to extremes to pay for the water one uses. Would a person be willing to take out a loan to have healthy water. The answer was YES. We all realized that residential was tameable but that industry was the real problem. It was asked that industry should bring a solution to the government on saving water. This is where our group began storming and spent half the time setting out our principles.

Final Principles:

1. Maintain the quantity and improve quality of water.
2. Live off the interest of the naturally occurring supply. Can't afford to sink into the principle.
3. Maximize education and information availability to the public. Education and information must be available, attainable and accessible.
4. All costs of water supply and wastewater treatment, including social and environmental costs, which can be attributed to water users should be paid solely by water users. Cost meaning social, financial environmental. If ecosystem costs are associated with the water system then we should pay through water bills. Do not use water revenue for other funding such as welfare, child care etc.
5. Users pay in accordance to the costs incurred to the system. A user who uses water in the middle of summer during peak pumping hours should pay more for his water. Time of day and season are important criteria.
6. Public institutions should provide leadership in responsible water use. Governments should practise what they preach.

Is money generated going to where it's suppose to go. Must establish a code of acceptable practice for budgets.

The discussion turned to goals. Many thoughts prevailed:

- license the sale and use of chemicals for horticultural purposes
- encourage more R&D to investigate what the impacts of our existing and new technologies and processes were
- to encourage R&D into environmentally friendly products

We were then asked to determine what we were trying to accomplish here. We agreed that we were too specific in our goal statement. We required something more general. We then read the goal of Metro Toronto and we all seemed to like it. With modifications to it we came up with this goal.

Goal

To increase efficiency and promote environmentally and economically sustainable prosperity through water conservation practices and measures; to reduce community demand and costs for water, wastewater, energy and chemicals.

But we all concluded that there was more and so we established a few sub-goals.

Sub-Goals

To build a comprehensive understanding by the public regarding water demand and water use.

To investigate and evaluate traditional water management practices to develop new or improved technologies and practices to ensure a healthier environment for future generations.

To identify the carrying capacities (input=output) of critical surface and subsurface ecosystems to determine what is sustainable.

Targets

So much time was spent on establishing principles and goals that we didn't spend much time on our targets. But we manage to split targeting into 3 groups; Residential, Industry/Manufacturing/ Commercial, and Agriculture.

Residential

1. Restrict installation and sales of energy and water efficient fixtures for toilets, showers and faucets by January of 1994.

2. Initiate comprehensive water conservation education programs by January 1993. Its nice to see the implementation of educational programs before the retrofitting programs. Funding is still an issue - who will pay?

3 Implement metering and water rates related to cost.

water efficiency measures

. Initiate some locally based water efficiency promotion pilot projects in a year, e.g. hotel and restaurant sector in Niagara Falls, 25,000 accom units plus 800 restaurants.

. The group generally felt that it would prefer to stay together for the next workshop.

. Some also felt that the facilities and scribes need to sit down and go through a debriefing and review the products generated.

. Also, there was a suggestion that before the next workshop, some small tasks forces should sit down and push some of these thoughts and ideas a bit further.

. There was concern, however, that individuals wanted to be able to identify with what they or their group said, when they see the materials for the next workshop, i.e. do not over-massage the products from this workshop.

These notes fully reflect the content of the flip charts.

Brian Opitz / Roman Kaszczij's Group

Issues

• Quality vs. Quantity - It was stated by Resorts Ontario that the perception Americans have of Canadian waters is that they are clean. Example given was Lake Simcoe. Lake Simcoe is an important resource, it provides recreation and is a source of income. Agricultural runoff has greatly damaged Lake Simcoe. An add on T.V stated that Lake Simcoe is dying. Someone added that every lake in Ontario is polluted.

- It was then stated that quantity was the issue of this workshop. Some expressed their opinion that water quality was the problem not water quantity. Ontario Food Processors Assoc. stated that "We are far away from a water crisis - only 1% of 1% o~ the great lakes is being used." Ontario Hotel and Motel Assoc. agreed and stated that Sudbury was undergoing a major land reclamation and that people love~ their grass and gardens. Their municipality encourage the people to use water. People are worried about their properties and will break water restriction laws. This is where our ~roup started their debate.

• Education - We then discussed the importance of education. OPA stated that kids are being sent to workshops on manicured landscape vs. naturalization. Is it fact or fiction - is a dandelion a weed or 2 wildflower. Fertilizers and pesticides became a topic o~ concern and it was stated that only qualified people should be allowed to use it.

- Is water a problem? How do we educate the public? Where do we get the information?

- We must talk to the teachers today and we need immediate results, was one statement. We must give guidance. Education is a short term goal leading to long term results as was the blue box program. Communication is needed for the public and we must build on people's consciences. But will water conservation mean sacrificing one's lifestyle. We do not want to punish the people.

Costs

- Simply put, there is no money for such programs as retrofitting and education. Where do we get the funding? It was stated that costs should be internalized. Full cost pricing and user pay was mentioned. There was mixed emotions on that statement. Some said it was cheaper to do it than not to since the more you use the more you pay. One comment was to price water high to see if people really wanted it. Subsidies were mentioned but were not accepted since this system could reward the water wasters. Competitiveness became an issue.

  If it's too expensive and if the standards are too strict will provide an additional incentive to relocate.

Principles

The following principles were discussed:
- Competitiveness
- Conservation
- Sustainability/Responsibility
  Availability

We then wanted to know what was meant by sustainable and we compiled a list of definitions:

-Indefinite use
- Responsible use
- Global Leadership
- Protection
- Investment
- Environmentally stable

- Ecosystem management
- Healthy environment
- Cost effectiveness (social and economic)

At this stage in time our group was beginning to norm. One person asked if we were willing to go to extremes to pay for the water one uses. Would a person be willing to take out a loan to have healthy water. The answer was YES. We all realized that residential was tameable but that industry was the real problem. It was asked that industry should bring a solution to the government on saving water. This is where our group began storming and spent half the time setting out our principles.

Final Principles:

1. Maintain the quantity and improve quality of water.
2. Live off the interest of the naturally occurring supply. Can't afford to sink into the principle.
3. Maximize education and information availability to the public. Education and information must be available, attainable and accessible.
4. All costs of water supply and wastewater treatment, including social and environmental costs, which can be attributed to water users should be paid solely by water users. Cost meaning social, financial environmental. If ecosystem costs are associated with the water system then we should pay through water bills. Do not use water revenue for other funding such as welfare, child care etc.
5. Users pay in accordance to the costs incurred to the system. A user who uses water in the middle of summer during peak pumping hours should pay more for his water. Time of day and season are important criteria.
6. Public institutions should provide leadership in responsible water use. Governments should practise what they preach.

Is money generated going to where it's suppose to go. Must establish a code of acceptable practice for budgets.

The discussion turned to goals. Many thoughts prevailed:

- license the sale and use of chemicals for horticultural purposes
- encourage more R&D to investigate what the impacts of our existing and new technologies and processes were
- to encourage R&D into environmentally friendly products

We were then asked to determine what we were trying to accomplish here. We agreed that we were too specific in our goal statement. We required something more general. We then read the goal of Metro Toronto and we all seemed to like it. With modifications to it we came up with this goal.

Goal

To increase efficiency and promote environmentally and economically sustainable prosperity through water conservation practices and measures; to reduce community demand and costs for water, wastewater, energy and chemicals.

But we all concluded that there was more and so we established a few sub-goals.

Sub-Goals

To build a comprehensive understanding by the public regarding water demand and water use.

To investigate and evaluate traditional water management practices to develop new or improved technologies and practices to ensure a healthier environment for future generations.

To identify the carrying capacities (input=output) of critical surface and subsurface ecosystems to determine what is sustainable.

Targets

So much time was spent on establishing principles and goals that we didn't spend much time on our targets. But we manage to split targeting into 3 groups; Residential, Industry/Manufacturing/ Commercial, and Agriculture.

Residential

1. Restrict installation and sales of energy and water efficient fixtures for toilets, showers and faucets by January of 1994.

2. Initiate comprehensive water conservation education programs by January 1993. Its nice to see the implementation of educational programs before the retrofitting programs. Funding is still an issue - who will pay?

3 Implement metering and water rates related to cost.

Require metering to determine the actual water consumption in order to have a successful water conservation program. Municipalities should support water conservation through appropriate bylaws and official plan statements.

Industrial/Manufacturing/ Commercial

1. Must encourage application of MISA program.
2. Enforcement of municipal by-laws and provincial codes and regulations
3. Eliminate once-thru cooling. Recycling

All to be implemented asap.

Agriculture

1. To encourage and assist in the implementation of better management practices

Notes, Doodles, Ideas, etc....