7.2

Preliminary Comments on NS Department of Environment
Discussion Paper - Water for Life
Halifax Regional Municipality
June 1, 2008

Introduction

To Members of the RPAC:

The following is a preliminary compilation of comments HRM staff is preparing on the Province's Water Resources Strategy Discussion Paper. The deadline for submissions to the Province is June 1, 2008. HRM staff wishes to present the preliminary list of opportunities/issues to the RPAC in order to obtain feedback and/or gain additional recommendations for inclusion in the submission.

General

The Strategy should define measurable outcomes for water resources, and provide an action plan and resource needs to accomplish the stated outcomes.

Ground Water

HRM needs the authority to determine if as-of-right developments have adequate (quality and quality) groundwater resources if used as drinking water supplies, prior to allowing development to proceed.

Inadequate baseline data exists for detailed delineation of aquifer extents, capacity and quality. While NSDoE has recently expanded the groundwater monitoring network in HRM by a few wells, there is a greater need for geographic coverage and more quality measurements.

Surface Water

The province has responsibility for discharges to surface water, and surface waters are provincial property. There is frequent confusion over mandates and authority when discharges occur (siltation is the most common issue). The Strategy must clearly define regulatory and legal roles and responsibilities, and identify for the public who the responders are for discharge incidents.

There is inadequate baseline and ongoing monitoring of surface water quantity and quality. The province should enter into a water quality monitoring agreement with Environment Canada, and devote adequate resources to establish and maintain a comprehensive water quality monitoring network across HRM and the province. Biological productivity and diversity should also be tracked over time.

The province should mandate undisturbed buffers around all waterbodies above a certain threshold size, to prevent clearing and development to the water's edge. A certain proportion of the buffer zone around each waterbody should be publically owned.

Waste Water

Performance of septic systems of varying ages should be studied and assessed, to establish those areas with inadequate septic performance due to unsuitable soils or system age and design. In line with improved performance requirements for municipal wastewater treatment systems under the CCME Municipal Wastewater Strategy, performance for old or malfunctioning septic systems should be regulated and improved by the province, including regulatory control on system use and maintenance.

Climate Change

Systems Approach to Sustainability

On page 18 of the Discussion Paper it references other ongoing strategies, i.e. Energy, Climate Change, Natural Resources, etc. We are very pleased to see the Province moving forward on these important issues.

We highly encourage the Province through comprehensive stakeholder discussions and feedback to take a systems approach to sustainability, i.e. integration of clean air, land, water and energy components. In essence demonstrated links to the various clean air, land, water and energy strategies and actions and incorporating meaningful stakeholder feedback.

It is also recommended that each sector include demonstrated performance measures that are publically reported annually, i.e. **Annual State of the Environment Report** This includes public reporting on water quality.

These types of measures will help show Nova Scotians progress being made towards the commitments in Bill #146 Environmental Goals and Sustainable Prosperity Act.

Climate Change Impacts

The greatest challenge facing every province, town, and city is sustainability. The greatest sustainability challenge is climate change.

HRM in partnership with the Province, Federal Government and the private sector has put in place Climate SMART, an integrated systems approach to climate change mitigation and adaptation.

A number of plans and tools have been developed and all are available on-line at: http://www.halifax.ca/environment/getinvolved.html.

One of the tools developed is the HRM Climate Change Risk Management Strategy which includes sector specific considerations, priorities and recommended actions. One of the sectors is water resources.

The following excerpts are taken from Section 4.2.3 Water Resources, pages 52 and 53:

Water Resources

Concern	Issue

Change in Surface Water Supply and Quality for Communities' Health and Economy, from Precipitation (i.e., Seasonal Patterns and Run-off Rates).	Potential for increased variability in the quality and quantity of municipal water sources. Possible increased variability in water supply, affecting energy production (hydropower), and agriculture. Variation in rainfall and run-off intensity may impact management of water supply and water control dams. Potential for increased incidents of aquatic pollution associated with runoff and flooding.
Change in Ground Water Supply and Quality for Communities' Health and Economy, from Precipitation (i.e., Seasonal Patterns and Run-off Rates).	Potential for increased incidents and distribution of environmental and waste contamination primarily related to well-head management. Changes in temperature and precipitation likely to alter recharge to groundwater aquifers, causing shifts in water table levels and water supply.
Change in Water Quality through Salt-Water Intrusion from Sea Level Rise and Extreme Events.	Possible increased incidents of salt-water intrusion in coastal aquifers affecting potable and agricultural/ horticultural groundwater supplies.
Change in Surface and Groundwater Supply and Quality on Agriculture from Precipitation (i.e., Seasonal Patterns and Run-off Rates).	Projected climate change likely to alter snow and rainfall patterns, resulting in less frequent, but heavier, precipitation earlier than present (April rather than May). Intense, heavy rainfall leads to more runoff and less groundwater recharge. Longer and warmer summers likely to result in more drought and greater need for irrigation. Longer and warmer summers and droughts likely to increase the demand on ground water and surface water resources to support agriculture.
Change in Temperature	Warmer waters will result in increased pathogens, new pests and diseases.

The HRM Climate Change Risk Management Strategy also contains sections and chapters specific to Coastal Zones; Communities, Infrastructure and Transportation; Human Health; Fisheries and Marine Resources; Forestry; Agriculture; and the Environment. HRM is recommending that the above climate change related concerns and issues be included in the Water Resources Management Strategy discussions.

Energy

Page 10 of the Provincial Discussion Paper talks about using water in new ways to create energy.

This is a key systems approach consideration. We want to develop renewable and sustainable energy opportunities and at the same time protect and sustain our water resources.

HRM Regional Council in December 2007 endorsed the HRM Community Energy Plan. This plan takes a holistic and comprehensive approach to energy sustainability, use, security, affordability, accessibility, etc. It is available on-line at:www.halifax.ca/environment/energyplan/index.html.

The HRM Community Energy Plan includes 40 priority recommendations including:

Goal 6 - Increase Energy Security and Diversify Energy Supply

Community Action 5- Assess feasibility for mini (run-of-the-river) hydro electric plants; examples - Musquodoboit River at Crawford Falls; Middle and Upper Musquodoboit; Sheet Harbour at Malay Falls; Half Way Brook and Little West River.

Community Action 7- District Cooling opportunities utilizing large bodies of water, i.e. Halifax Harbour Water Cooling for buildings; geo-thermal/ cooling opportunities with large lakes; etc.

Corporate Action 4 - Co-sponsorship of renewable energy projects with other Nova Scotia municipalities that have better access to renewable resources, i.e. tidal projects in West Hantz, Kings and Colchester.

These are examples of identified renewable energy opportunities utilizing our water resources, however a systems approach would put them through a sustainability filter from the get-go. In essence, ensure these renewable energy opportunities are captured in the water resource management strategy discussions as well as any sustainability/ environmental impacts.

Transportation
Although fully articulated in HRM's Transportation Plan, the HRM Community Energy Plan also identifies energy saving and emission reduction opportunities through use of water transportation.

In Goal 2 : Increase Transportation Choice and Efficiency Community Action 1- it recommends expanded ferry service, i.e. Bedford.

Other water transportation options exist throughout Nova Scotia where significant emission reductions are possible. However, and as noted above in the Energy comments, a systems approach would put them through a sustainability filter providing direction on the most sustainable approaches overall.

Brief Summary
Realizing this is just the start towards a Water Resource Management Strategy for Nova Scotia, we believe it is important to identify key considerations such as climate change impacts, energy and transportation opportunities as well as related efforts already underway by other levels of government, community and the private sector.

Further, to continue to apply integrated systems thinking to the sustainability of our fundamental resources such as water.

Discussion Paper Questions - HRM responses

Water is making headlines. On the news, in schools and everywhere around us people are talking about water. What are your biggest concerns when it comes to water in Nova Scotia?

- Coastal inundation & potential saltwater intrusion into coastal aquifers

- Water availability - groundwater supplies for private wells affected by aquifer depletion
- water quality: impact on urban receiving watercourses from the effects of urban runoff & stormwater flows
- Drought, flooding, and increase in local mean sea level due to impacts of climate change

The province of Nova Scotia is committed to sustainable development. What are your ideas about how we can ensure that development is undertaken in a way that does not put strain on the water available for the area or the surrounding natural environment?

- Ensure that development does not occur in areas that cannot support either

i) Further demand for input water sources, or

ii) Further impact from the effects of human activities (e.g., sedimentation, eutrophication, volume withdrawal, heat pollution, etc.

- Recycling water. Currently, in most if not all of the province, most municipal water supplies are drawn from surface waters, treated, distributed, used by a variety of end-users, treated again, and then disposed of in either freshwater or marine receiving waters. Relying on the rainwater capital, particularly in a period where many groups in the province are keen to bolster immigration and build our population base, will necessarily increase the demand on our water resources, possibly beyond their sustainable capacity.

Nova Scotia's economy relies on water: to provide food, to play outside, to provide habitat, to produce energy, to manufacture products, to remove sewage, to extract resources, and to drink. How do you think we can ensure that the water needs of the economy are met today without compromising the ability to provide those same services in the future?

- Measure and/or estimate the use of water more closely. Follow the lead of the Environment Agency of England and Wales, which has committed to regulate all water abstraction over 20 cubic metres a day. They require most licensed abstractors, as a condition of their licence, to measure the volume of water they take and submit that data to the agency. Introduce a web-based reporting system to reduce costs, unnecessary administration, and increase convenience for abstractors.
- Implement, through the NSUARB, a scheme of full-cost water pricing, so that consumers pay the full value of the water they use
- Eliminate, through the NSUARB, discounted rates for bulk water withdrawals by industry or other users
- Implement, through the NSUARB, a scheme of water use fees for frivolous (i.e. non-necessary) uses - e.g. spas,
- Prohibit the commercial sale or resale of fresh waters drawn from Nova Scotia lakes or groundwater sources, other than by registered utilities
- Invest in water recycling. Existing wastewater facilities in municipal environments could potentially be upgraded to produce high quality recycled water that could be used for industry, to water gardens and playing fields, as well as various agricultural producers such as wineries. The Australian government committed $34.5m to such a plan in April 2008.

What are your ideas about how we can provide landowners with the ability to develop their land while ensuring the conservation or restoration of wetlands and their natural functions?

Offer an aggressive conservation grant program that delivers a tiered system of incentives for

increasing levels of maintenance, support, and enhancement of onsite wetlands

Emergencies disrupt our lives and change what people, businesses and communities require to continue with their daily routines. During an emergency, such as a drought, who or what should have priority access to water?
Citizens for potable water purposes, and agricultural producers who provide food for local sale (ahead of producers of products for export)

People need information about water resources to increase their knowledge and make informed decisions. What kind of information about water do you want or need?
- How much water is typically used by different user groups: individuals, households, different industries, institutions,
- Sources of water for consumption (potable and otherwise), and available volume
- Cost of water service provision
- Cost of water as paid by users (i.e. established user rates by class and volume)
- Available water conservation measures (e.g. low-flow showerheads, toilets, sink aerators, under-sink hot water tanks, composting toilets)
- Cost of measures, explanation of how to employ, and the value of the savings
- Develop a suite of realistic estimates for how much water people should require to fulfill basic household and personal functions; promote these as targets for individuals and homeowners to reach

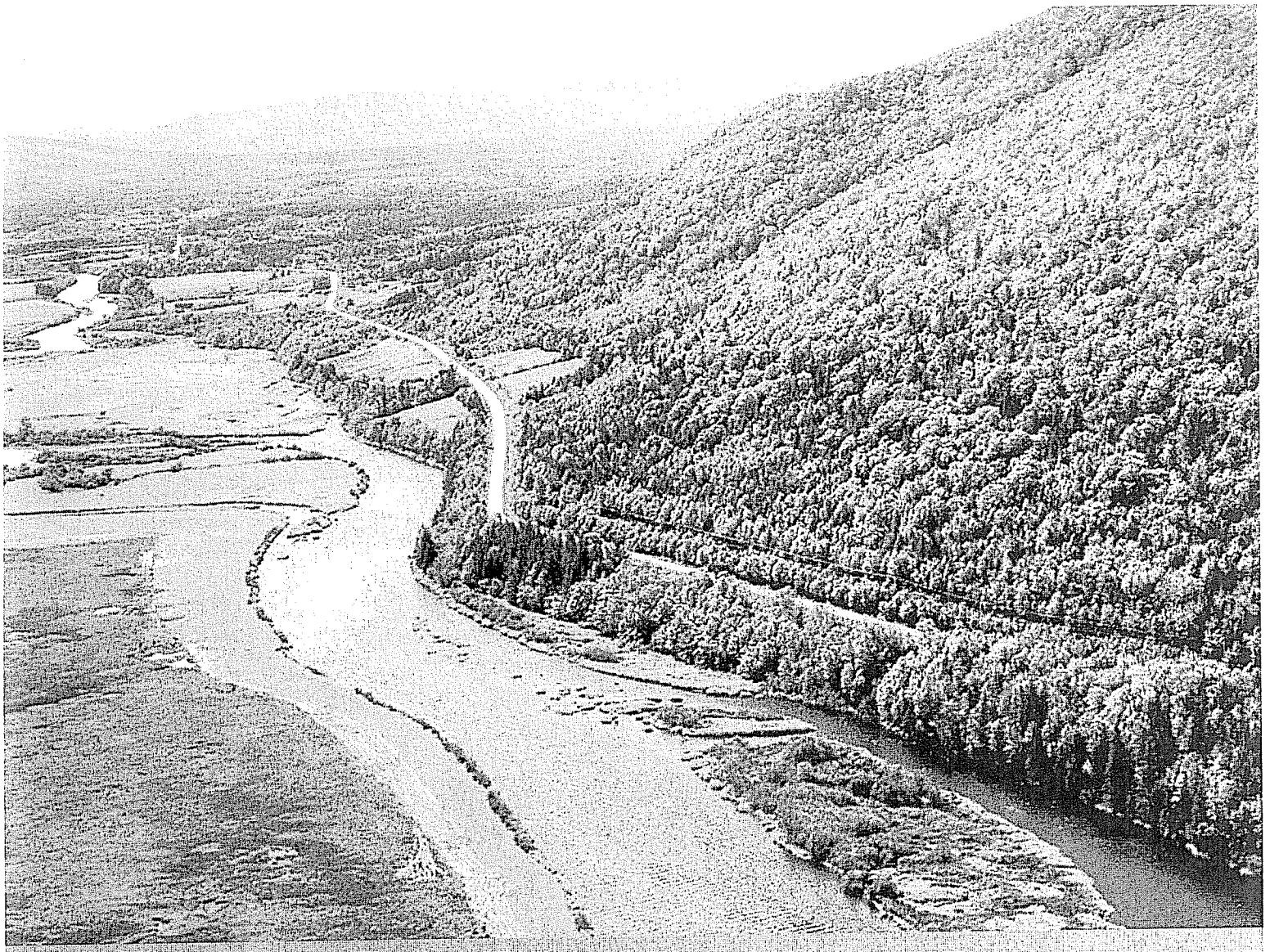
We need to protect our water resources, and this costs money. Once we have a water resources management strategy in place we will need to finance it. Where should this money come from? How do you think the money should be distributed and used? Why?
Funding should come from a mix of public and private sources. Public funds for infrastructure and water quality research, monitoring, assessment, and reporting; private funds for the water delivered (e.g. to registered Water Commissions) Funding must be established at satisfactory levels so that the strategy can be sustained indefinitely.

Everyone (individuals, communities, businesses) can contribute to the conservation and protection of water, but this means recognizing that water is not an unlimited resource in Nova Scotia. What are you willing to do to conserve and protect Nova Scotia's water?
- Employ water-saving practices in the home and workplace
- Reduce water consumption to reach and exceed consumption performance targets (i.e. consume less water than the targeted maximum)

Additional Items:
- Update and expand all provincial floodplain mapping
- Extend municipal authorization to control stormwater flow through amendment to the Municipal Government Act
- Extend floodplain legislation to make tributaries and feeder brooks subject to its control
- Legislate Total Maximum Daily Loads (TMDL) for pollutants in stormwater as per US EPA regulations
- Make all water-related guidelines (e.g. NS TIR Sedimentation and Erosion Control

Guidelines) mandatory

- Add construction activities as an undertaking under Part IV of the Environment Act
- Create mandatory provincial standards for the adoption of municipal by-laws regarding sedimentation and erosion, within municipal jurisdiction.
- Create a provincial Daylighting Policy to support the reversion of buried piped systems and culvert systems back to natural, open-water systems. Make funding available to municipalities and/or regulated water commissions to undertake these works.
- Conduct a province-wide inventory of all lakes to assess the existing or pre-development background levels of phosphorus and nitrogen. Develop and/or adopt a suite of mitigation techniques to be employed by developers or other responsible parties for lakes found to be above natural background levels.
- Work with federal government to enable municipalities to develop more comprehensive by-laws regarding the sale and use of pesticides within their jurisdictions.
- Develop a program through which watershed management plans will be developed for all watersheds throughout the province, and a highly collaborative, cooperative, transparent, accountable governance framework to manage the plans
- Put a much greater emphasis on conservation of water resources and prevention of pollution from entry into water supplies
- Clearly distinguish between urban and rural issues (i.e. Stormwater pollution in urban areas, leaking septic beds in rural areas)
- Incorporate Best Practices as developed and used in other jurisdictions.
- Address private wells as an extremely important component of sources of drinking water. The provincial drinking water strategy overlooked private wells because it does not have regulatory jurisdiction over them, but knowing about and protecting aquifers that supply these wells is a function that only provincial government can undertake. In addition, the use of wells and aquifers, their availability and quality, can have an impact on regulated municipal water services and vice-versa, so this component must not be overlooked a second time.
- Adopt ecological integrity of aquatic resources as the overarching goal of the strategy - not drinking water, not water for economic pursuits
- Adopt or substantially support an ongoing, systematic monitoring program that includes biological, chemical, and physical parameters to provide baseline and post-development assessments of ecological conditions
- Adopt and disseminate clear timelines and frameworks for achieving ecological integrity
- Identify and address areas where legislation and policies overlap, where there are gaps, and where conflicts exist (e.g. between the Environment Act and the Municipal Government Act)
- Use full-cost accounting to establish a monetary value for water and to set water use fees
- Provide critical education for key decision makers and stakeholders, including municipal councillors, municipal planners, and developers, at a minimum
- Establish an annual water education campaign on and around World Water Day March 22)



Towards a Water Resources Management Strategy for Nova Scotia

WATER *for* LIFE

NOVA SCOTIA
Environment and Labour

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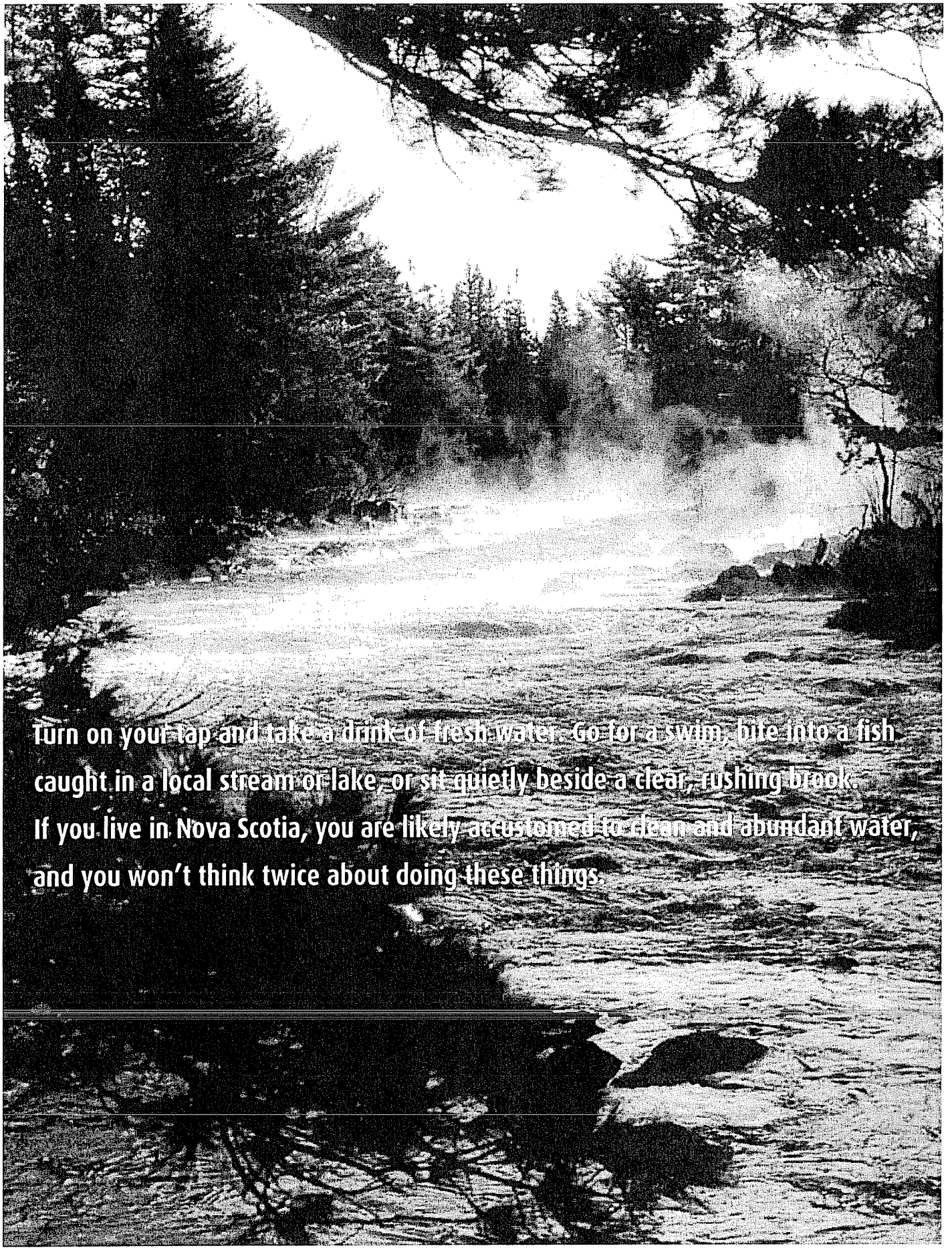
Front Cover: Margaree Watershed, Cape Breton. Credit: Lenn Wagg

Front inset: Fish River, Eastern Shore. Credit: Oliver Maass

Back inset: Wetland complex along the Tidney River, Queens/Shelburne County. Credit: Lenn Wagg

Back Cover: Moose Cove Lake, Eastern Shore. Credit: Oliver Maass



Turn on your tap and take a drink of fresh water. Go for a swim, bite into a fish caught in a local stream or lake, or sit quietly beside a clear, rushing brook. If you live in Nova Scotia, you are likely accustomed to clean and abundant water, and you won't think twice about doing these things.

There are many reasons why we value water. It is essential for the health of people and communities. It is also the life-blood of the natural environment. Water has been fundamental to the heritage of our province, it is central to our daily quality of life, and it will sustain our future prosperity.

Nova Scotia's water resources include over seven thousand kilometres of coastline, more than six thousand lakes larger than one hectare in size, numerous watersheds containing river systems, wetlands, and extensive groundwater resources. Despite this seeming abundance, Nova Scotia is not immune to water-related problems. Protecting our water resources takes care and planning, and all Nova Scotians have an important role to play.

Water is making headlines. On the news, in schools and everywhere around us people are talking about water. What are your biggest concerns when it comes to water in Nova Scotia?

Water running out in Margaretsville

(The Spectator, Annapolis County, September 18, 2007)

Coastal development hot issue

(Chronicle Herald, July 10, 2007)

Sewage treatment costs worry residents

(The Advance, Queens County, July 1, 2007)

A Message from the Minister

To help keep Nova Scotia clean, beautiful, and prosperous we must wisely manage our natural water resources. That's why Nova Scotia Environment and Labour is coordinating the development of a comprehensive water resource management strategy for the province. Although the department is taking the lead, the work calls for a collaborative effort. Water is an important concern to our communities, businesses, industries, First Nations, other departments and levels of government, and individuals. In developing a water resources strategy, we will be working together toward environmental and sustainable prosperity. Planning a strategy to better manage our province's water resources will bring forward some complex issues and exciting opportunities. We look forward to working cooperatively and closely with Nova Scotians.

Nova Scotia Environment and Labour has already taken important steps in water management. The Province's Drinking Water Strategy, also achieved through collaboration with many groups, was released and implemented in 2002. Working together, we will continue to build and share the knowledge needed to make sound decisions for our future - decisions that help to protect our water resources while ensuring Nova Scotia remains an attractive place to live, work, play, and visit.

Honourable Mark Parent

A discussion about Nova Scotia's water resources

Nova Scotia has demonstrated leadership in protecting water resources to date, and it only makes sense to continue to be proactive about preventing problems for the future. This booklet identifies some of the key issues and challenges involved with this task. The purpose is to start a discussion that will shape the development of a water resources management strategy for Nova Scotia.

In April 2007, the Nova Scotia legislature passed the Environmental Goals and Sustainable Prosperity Act. This act charts a course towards a province that is economically and environmentally sustainable, as well as socially prosperous, by 2020. One of its twenty-one targets is a commitment by the government of Nova Scotia to develop a comprehensive water resources management strategy by 2010.

For this discussion, four key issues have been framed as follows:

1) **Human Health** - safe, secure water for consumption, recreation, livelihoods and general well-being;

2) **Economic Prosperity** - sustainable and prudent use of water resources;

3) **Ecosystem Integrity** - systems and biodiversity conserved and protected; and

4) **Emergency and Hazards Preparedness** - minimization of health, safety, socio-economic impacts.

Our discussion then turns to ideas about valuing and conserving water, building our knowledge about water resources, and moving towards a shared responsibility for water.

Throughout each of these sections, you will find a number of questions posed. We want to know what you consider to be of greatest importance for the immediate future and for the long term. Your thoughts, ideas and responses to the issues raised are vital to the development of a water resources management strategy for Nova Scotia. You will find more information about opportunities to be involved in this process in the final pages of this document. You can submit your ideas and responses online or by filling out the feedback form included with this booklet. Working together, we can ensure that Nova Scotia's water resources are managed sustainably for the future.

Water use in Nova Scotia

Because of the quantity of water in our province, it might seem as if we will never run out. Although most people in Nova Scotia do have reasonable access to clean water, there have been periodic problems with the supply, as well as the quality, of water in the province. Water resources are not always located near the people who need them. There can be an enormous cost involved with developing a new water supply and transporting it to users.

Agriculture in the Annapolis Valley has already experienced water shortages in four of the six summers between 1995 and 2000, and has estimated that water use in this area will increase by some 75 per cent in the next two decades.

While the population of Nova Scotia is declining in general, this does not mean a corresponding decline in pressure on water resources. Domestic, industrial, agricultural and recreational uses for water are intensifying in parts of Nova Scotia. It is currently estimated that by 2026, the Halifax Regional Municipality and counties within a 90-minute commute of downtown Halifax, will be home to almost 70 per cent of Nova Scotia's population[1]. These areas will be under increasing pressure to provide water and waste disposal services as well as open spaces where people from urban centres can connect with the natural environment. Meanwhile, as populations in other rural areas and small towns decline, communities will be harder pressed to finance their water infrastructure. Properly managing these challenges is essential for the well-being of Nova Scotia's communities and the environment.

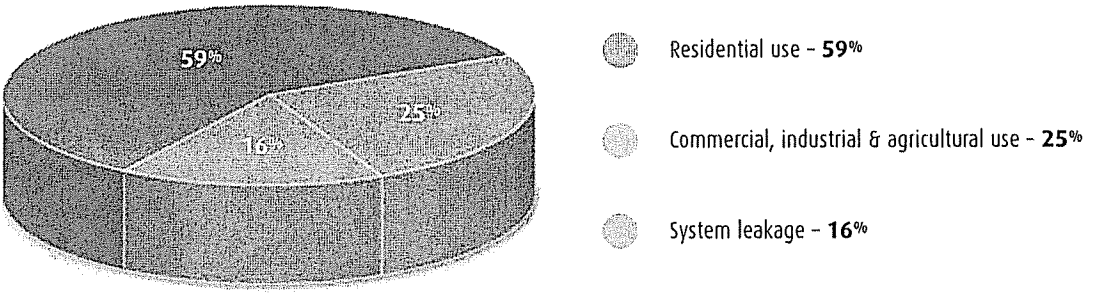
The province of Nova Scotia is committed to sustainable development.

What are your ideas about how we can ensure that development is undertaken in a way that does not put strain on the water available for the area or the surrounding natural environment?

The water we use either comes from a surface water supply such as a stream, river or lake, or it comes from groundwater. Sixty per cent of Nova Scotians rely on a municipal water system for their drinking water, while the other 40 per cent get their water privately – from a drilled or dug well, or a surface water source. Nova Scotia has one of the highest percentages of households in Canada relying on groundwater sources for their water[2].

Groundwater refers to all water that is underground. Groundwater acts quite differently than water on the surface. It moves through the soil and/or rock, like water through a sponge. An aquifer is an underground source that yields a reasonable, but finite, amount of water.

Municipal Water Use, by sector[3]



Keeping water clean, healthy and safe

Continuous improvements to drinking water and sanitation have played an important role in our increased life expectancy today. The availability of high quality drinking water resonates most strongly with people when it comes to water resources.

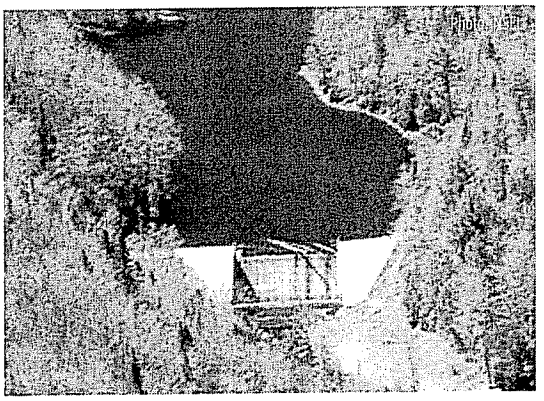
Water, whether on the surface or in the ground, contains natural elements which, in some circumstances, could make it unsuitable for drinking without treatment. When not handled properly, a range of other contaminants including sewage, animal manure, industrial waste, petroleum products, chemicals and pesticides from industry and household use, road salt and silt can impair water quality. These contaminants can all make their way into water systems, either by seeping into groundwater or being washed into a surface water supply through run-off. Long-term exposure to certain chemical contaminants may have human health implications at the same time as posing risks to aquatic systems, particularly where those chemicals bioaccumulate (increase in quantity up the food chain).

• Protecting drinking water

Nova Scotia has long been proactive about protecting drinking water sources. Under the Province's 2002 Drinking Water Strategy, programs and regulations concerning drinking water quality have been strengthened. Over 1600 Public Drinking Water Supplies have been registered with Nova Scotia Environment and Labour. As with municipalities, they must complete regular testing, notify Nova Scotia Environment and Labour when problems are detected and take corrective action to remedy the problems.

Municipalities in the province have made many upgrades to their water treatment facilities and training programs, and there has been greater protection of the water sources for municipal drinking water systems. Standards for well construction have been strengthened. All municipal public drinking water supplies must meet the Province's treatment standards by 2008.

Watershed sign - marking boundary of protected water area for Town of Bridgewater



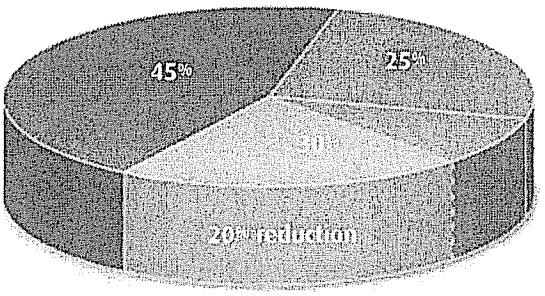
James River - source of drinking water for the Town of Antigonish

- **Ensuring adequate wastewater collection and treatment**

Inadequately treated or untreated sewage can contaminate drinking water, impact aquatic systems, and diminish the recreational and tourism values of streams, lakes, estuaries and coastal waters. Closures to shellfish harvesting areas, for example, are closely linked to sewage contamination. Septic systems are of particular concern in terms of contaminating nearby groundwater and surface water bodies if they are not maintained properly or malfunction.

Nova Scotia has made substantial progress in addressing the need for management of wastewater collection and treatment systems, but there is still work to be done. One target of the ***Environmental Goals and Sustainable Prosperity Act*** is to provide at least primary treatment to all wastewater discharges by 2017. The Halifax Regional Municipality's Harbour Solutions Project, which is underway and expected to be completed by September 2008, will reduce the untreated sewage discharge in the province by approximately 20 per cent.

Wastewater Management in Nova Scotia by Population



- Home (septic) systems - **45%**
- Central treatment facilities - **25%**
- Untreated sewage discharge - **30%**

A draft Municipal Wastewater Effluent Strategy was released in October 2007 by the Canadian Council of Ministers for the Environment. This is an important step towards the development of a Canada-wide strategy that will set national standards for municipal wastewater. It is anticipated that this strategy will be implemented starting in the spring of 2008. The Nova Scotia component will be developed once the Canada-wide Strategy is approved.

The Environmental Home Assessment Program (EHAP) was launched by the Province in October 2006 to educate Nova Scotians about maintaining their septic systems, private water wells and heating oil tanks, while providing financial support to low-income homeowners to repair malfunctioning septic systems.

Supporting sustainable economic prosperity

Access to an abundant supply of safe, clean water gives businesses and industry the confidence to make long-term investments in the province. It also attracts new investors to the region. Industries in Nova Scotia that rely on water resources include:

- **pulp and paper**
- **manufacturing**
- **agriculture**
- **energy production**
- **agri-foods**
- **mining**
- **aquaculture**
- **fish processing**
- **tourism**
- **recreation**

Companies representing many business sectors in Nova Scotia are finding various ways to innovate and implement new technologies, not only as cost-saving measures, but also to reduce water use and water contamination. Other industries are looking for new ways to use existing water sources, or seeking new knowledge to aid in decision-making about water use. Such innovations could have a significant impact on the future of Nova Scotia's water resources. The following are some examples:

Keeping water clean

Maritime Paper Products Limited installed a self-contained water treatment system for its Dartmouth facility. The treatment system cleans all wastewater created during the manufacturing process so only clean water is released into the HRM system. This technology makes the company fully compliant under the municipality's new wastewater bill. Wilf Steve MacDonald, VP Finance for the company, comments that, "Being environmentally conscious is not only company policy but it's the right thing to do."

Recycling water and protecting the environment

The federal Pulp and Paper Effluent Regulations, under the Fisheries Act, aim to prevent pollution for the protection of fish and their habitat. Nova Scotia's Minas Basin Pulp and Power was the first mill in the province, and one of the first in Canada, to begin total compliance with these regulations. The company has substantially reduced the release of effluent to the environment by recycling and reusing water throughout their mill process.

Nova Scotia's economy relies on water: to produce food, to play outside, to provide habitat, to produce energy, to manufacture products, to remove sewage, to extract resources, and to drink. How do you think we can ensure that the water needs of the economy are met today without compromising the ability to provide those same services in the future?

Improving knowledge about water sources

The Pereau River Project (Kings County) is an interesting partnership between the provincial government, the Nova Scotia Federation of Agriculture and the farming community. The project uses gauges to continuously measure the volume of water flowing in a stream. Farmers are able to use precise data to make decisions about how much water to withdraw for irrigation, and how often, without putting too much pressure on the waterway.

Using water in new ways to create energy

Nova Scotia Power operates the only tidal power plant in the western hemisphere and one of three in the world on the Bay of Fundy. New technologies are under development to harness the power of the tides, while minimizing impacts to marine life and habitat.

Industrial and commercial activities can negatively affect water resources at times. The volume of water withdrawn can have an impact on the environment. Current regulation in Nova Scotia requires anyone using more than 23,000 litres of water per day from a groundwater or surface water source to apply for an approval. Forestry, construction, agriculture and other land development activities can negatively affect aquatic ecosystems as well as the aesthetic and recreational enjoyment of lakes and streams. These activities, and associated watercourse alterations such as culverts, bridges and dams, can cause changes to the way water flows, increased erosion, siltation, or a build-up of contaminated sediments. Industries like forestry and farming often use pesticides and fertilizers, which can seep or run off into water systems, as can manure from livestock.

A set back or buffer zone is an area of natural vegetation which provides protection for vulnerable areas from land use activities. These can help prevent problems like soil erosion.

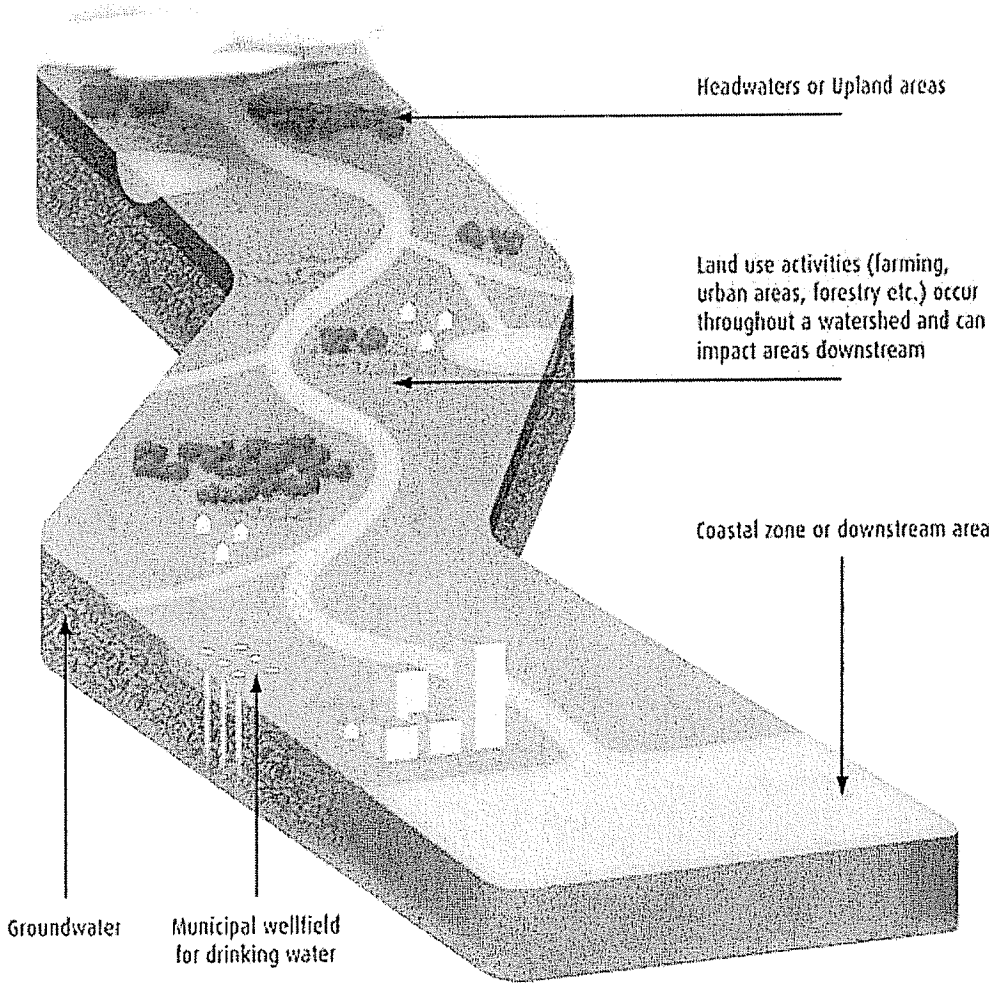
Maintaining and protecting healthy ecosystems

Because water connects and runs through all ecosystems, it can transport elements over great distances. Just as arteries transport oxygen to the cells in our bodies, rivers, streams and groundwater can transport minerals, nutrients, sediments and living creatures throughout an entire ecosystem. All living things, including insects, fish, wildlife and vegetation, depend on the quality and quantity of water in the ecosystem.

• Watersheds

A watershed describes an area of land that drains down to the lowest point. A watershed acts like a funnel, guiding all water into a river system and finally to the ocean. Components of a watershed include streams, rivers, lakes, wetlands, estuaries, upland areas such as forests and meadows, and downstream areas such as shorelines.

Activities in the upper parts of a watershed can be felt downstream. For example, oil and gasoline, dripped onto roadways from cars, can wash off into ditches, make its way into nearby streams and lakes, and eventually into the ocean. Managing our water resources is a complex task because although everyone lives, works and plays within one, a watershed's boundaries are not the same as the boundaries of a municipality or county.



- **Protected areas**

Protected areas are essential for maintaining natural ecosystems. They also provide safe and clean water, and offer many opportunities for water-related recreation and public enjoyment. Significant water resources such as lakes, rivers, wetlands and coastal areas are contained within our system of provincial wilderness areas and nature reserves, as well as federal, provincial and municipal parks. Nova Scotia's designated wilderness areas make up just over eight per cent of the province. The ***Environmental Goals and Sustainable Prosperity Act*** sets a goal of increasing the protected areas in Nova Scotia to 12 per cent of the province's land mass by 2015.

- **Wetlands**

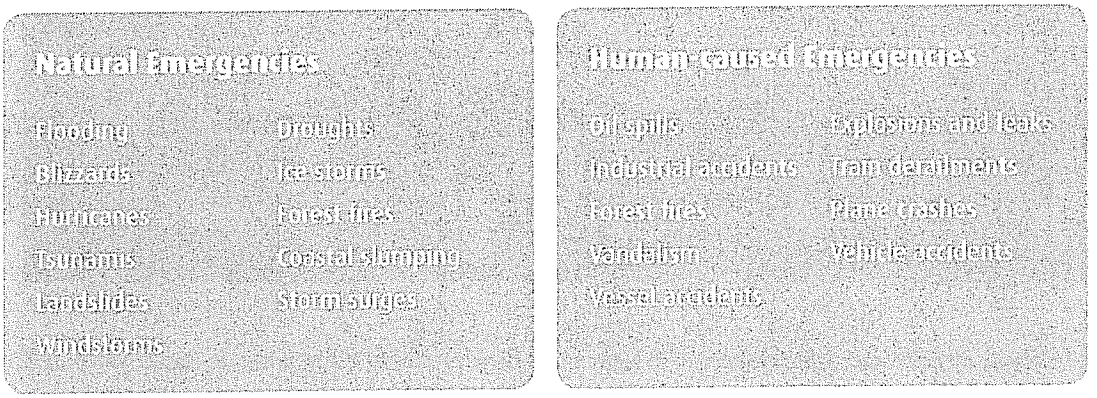
Wetlands are considered to be some of the most productive ecosystems in the world. They provide a rich natural habitat for wildlife and are home to many endangered plants. Wetlands also act as a natural filtering system and filter out pollutants that enter our watercourses and contaminate our groundwater supplies. Wetlands can also control flooding by providing water retention capacity. This regulates water flow, serves to reduce erosion and provides water to streams under drought conditions. These are invaluable ecological services.

It is estimated that 17 per cent of Nova Scotia's fresh water wetlands and 62 per cent of the salt water wetlands have disappeared since colonization[4]. Historically, urban and agricultural development has been the main cause of wetland loss. High demand for land along the coast, around waterways and in urban centres is currently impacting remaining wetlands. Most of Nova Scotia's wetlands are on privately-owned land. Landowners require an approval from the Province if they plan an activity that is likely to disrupt a wetland. All landowners and industries are encouraged to consider conservation of wetlands in their planning activities. The ***Environmental Goals and Sustainable Prosperity Act*** aims to establish a policy to prevent net loss of wetlands by 2009.

What are your ideas about how we can provide landowners with the ability to develop their land while ensuring the conservation or restoration of wetlands and their natural functions?

Preparing for water-related emergencies and hazards

Perhaps you have spent the night without power because of a blizzard or storm. Or perhaps you have encountered unexpected flooding, or a washed-out bridge somewhere in the province. Emergency or hazardous situations related to water do occur in Nova Scotia. Sometimes they are spontaneous and random in nature requiring an immediate and coordinated response. Other times, disaster events are reoccurring and symptomatic of a much larger trend, such as extreme weather patterns linked to climate change. In those cases, there is a need and an opportunity to be gained by working early to ensure that the event doesn't catch us off guard. Preventative planning reduces the risk and severity of an emergency situation.



When water resources are under pressure, emergency situations tend to exacerbate problems of supply and demand as well as water safety. In such cases, preparedness and effective management is all the more important. Plans can be implemented by governments, business, and in communities to ensure the health and safety of people and to limit damage to property and the environment.

• Climate Change in Nova Scotia

The climate is changing. The scientific community agrees that warming is clearly occurring. Impacts to Nova Scotia are expected to include sustained periods of warmer tempertures especially in the winter, extended hot spells and extended dry periods. Such conditions are projected to cause a reduction in water tables and stream flows which may result in water shortages. We can also expect changes to the spring and winter run off patterns and the rates at which groundwater supplies are replenished. Other anticipated impacts of climate change in Nova Scotia include stronger winds, sporadic periods of heavy precipitation and rising seas which increase the risk of storm surge and flooding, particularly in low lying and coastal areas of Nova Scotia. This may create new means for salt water to contaminate freshwater aquifers. These and other impacts of climate change will pose new implications for water users.

Emergencies disrupt our lives and change what people, businesses and communities require to continue with their daily routines. During an emergency, such as a drought, who or what should have priority access to water?

Building knowledge about water resources

There are many reasons to gather information about water quality and quantity. And there are many different organizations - municipal, provincial, community, academic, and business - that undertake monitoring activities to assess water quality or quantity of a particular area, watershed, aquifer, stream, lake or wetland. Reasons for gathering information can range from seeking to understand the natural environment, to identifying changes as a result of a particular land-use or activity, to ensuring that public health and safety standards are being met.

A challenge in gathering information is to determine how to make it accessible to those who need it to inform their programs, activities and decisions. The following are a few examples of water monitoring information that is gathered by Nova Scotia Environment and Labour and is available on our website **(www.gov.ns.ca/enla/water).**

- The Groundwater Observation Well Network has been running since 1965 and currently has 24 wells province-wide that are used for monitoring water levels and water quality. Data is used to assess drought conditions, evaluate the impact of human activities on groundwater, and to look at long-term water level trends.
- As part of the national Hydrometric Program, a partnership between the province of Nova Scotia and Environment Canada provides for the collection, interpretation, and dissemination of surface water quantity data and information. There are currently 24 hydrometric stations operated under a federal/provincial agreement between Nova Scotia Environment and Labour and Water Survey of Canada (Environment Canada). The Water Survey also operates three stations with other partners.
- The Municipal Water Supply Program, instituted in 1998, involves municipal and provincial governments. It involves daily or weekly testing of drinking water, and has resulted in a much more thorough knowledge of the municipal water quality and an immediate response to potential problems.

People need information about water resources to increase their knowledge and make informed decisions. What kind of information about water do you want or need?

Valuing Nova Scotia's water

"There are some places where a barrel of water costs more than a barrel of oil."

- Lloyd Axworthy, former Canadian Minister of Foreign Affairs (News Conference, 1999)

People using private wells face the costs of drilling and digging these systems, and then pumping, testing and maintaining them. People receiving drinking water from their municipality pay a quarterly bill. This includes a charge for the service delivery plus a nominal fee for the actual amount of water used. This cost varies among municipalities in Nova Scotia. For example, Middleton charges homeowners $0.58 per cubic metre (1000 litres) of treated drinking water, whereas Bridgewater and the Cape Breton Regional Municipality both charge $0.83 per cubic metre[5].

A 600 ml bottle of water that sells for $1.00 is the equivalent of $1,700 per cubic metre!

It is sometimes easy to lose sight of the fact that water has intrinsic value. While there is a significant cost involved with the infrastructure needed to provide water services (drinking water and sewage disposal), natural ecosystems provide invaluable natural services that we do not pay for such as filtering water, preventing erosion and providing flood protection.

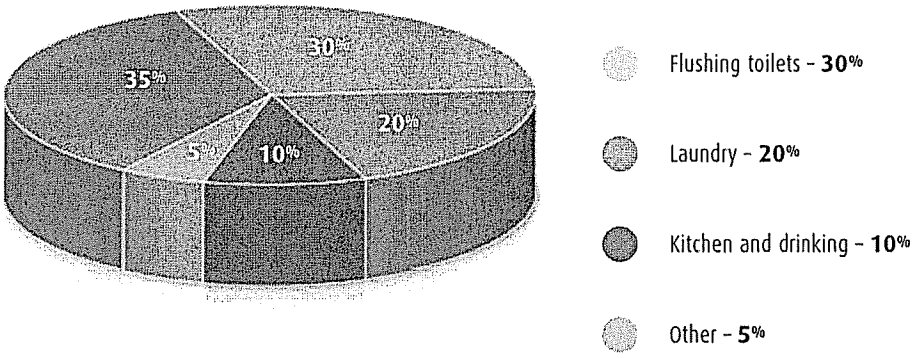
If we lose ecosystems such as wetlands and forested areas we will be facing significant costs to replicate those processes through engineered solutions, where possible. For example, infilling wetlands for development results in increased erosion, often leading to costs associated with road repair, property damage and shoreline stabilization.

We need to protect our water resources, and this costs money. Once we have a water resources management strategy in place we will need to finance it. Where should this money come from? How do you think the money should be distributed and used? Why?

Reducing water consumption

Canadians use more water per person than most other countries in the world[7]. An average household, with two to four people, uses 680 to 1360 litres of water per day. Visualize a two-litre pop bottle, and imagine that an average Canadian household uses the volume of water contained in 340 – 680 of these per day. Thirty-five per cent of this water is used for showers and baths, and 30 per cent is flushed down the toilet[8].

Average Water Use in Canadian Homes (indoor use only)[9]



There are many relatively easy things that individuals can do to conserve water at a household level. Collecting rainwater to use on lawns, growing native plants that require less watering, or using a broom instead of a hose to clean patios and driveways – are just a few small things we can do to reduce the amount of water we use.

Certain products and new technologies can make a significant difference to the volume of residential water used. Installing low flush toilets and showerheads, and a faucet aerator can reduce individual water use by up to 35 per cent. Front load washing machines use up to 40 per cent less water and 70 per cent less energy than traditional washing machines.

Sharing the responsibility for managing water

Stewardship of our water resources means taking care of them and sustaining their natural processes. While the Province has a mandate to protect our environment, government is only one part of the equation in managing water resources. Water is a shared resource that is affected by each and every one of us. We all must accept responsibility for the water we use and for making decisions about how we use it and protect it for future generations.

Water stewardship can take place at many levels. It involves joint effort as well as individual action. Everyone has the responsibility to care for water resources and to consider the impact of their actions on downstream users and ecosystems. Homeowners have a responsibility to maintain their wells and septic systems. An individual's everyday decisions and efforts to conserve water can have a tremendous impact when habits begin to change across our society.

The Mahone Harbour Watershed Stewardship Planning Project is being undertaken by a group of community volunteers concerned about ecological health and sustainable development in the Mahone Harbour area. A stewardship plan for the area's watersheds is under development with a focus on water quality.

The Collaborative Environmental Planning Initiative (CEPI) is comprised of the Nature Trust, provincial, federal and municipal governments and local organizations partnering in pursuit of conservation and restoration of the Bras d'Or Lakes watershed. CEPI amalgamates First Nations traditional knowledge, values and culture with ecosystem science in a two-eyed seeing, ecosystem approach to sustainable ecosystem management.

Everyone (individuals, communities, businesses) can contribute to the conservation and protection of water, but this means recognizing that water is not an unlimited resource in Nova Scotia. What are you willing to do to conserve and protect Nova Scotia's water?

The way forward – a strategy for water resources management in Nova Scotia

This booklet provides a snapshot of the key issues and challenges involved with managing water resources in the province. It was developed in order to provide information and to stimulate discussion about issues of concern related to water.

In the preceding pages we have raised many questions about water in Nova Scotia. We don't intend for your comments and suggestions to be limited to these. They are just a place to start.

Your ideas are an important part of the next step in this process – the development of a comprehensive water resources management strategy for Nova Scotia. The provincial government will be conducting a public consultation process for this strategy over the first half of 2008.

Currently there are several other strategies being developed across government that connect to the discussion about water:

- A Climate Change Action Plan/Energy Strategy (Department of Energy)
- A Coastal Management Framework (Department of Fisheries and Aquaculture)
- A Natural Resources Strategy (Department of Natural Resources/Community Planning)

All of these initiatives present opportunities to make changes in how Nova Scotia moves forward into the future.

For more information on these strategies and other initiatives – www.gov.ns.ca

Footnotes

[1] **Isaacman, Lisa and Graham Daborn.** A Water Soft Path for the Annapolis Valley, Nova Scotia: A Case Study of Sustainable Freshwater Management at a Watershed-Scale. Arthur Irving Academy for the Environment, Acadia University. 2006

[2] **Statistics Canada 1996.** Percentage of population reliant on groundwater. **www.ec.gc.ca/water/images/nature/grdwtr/a5f6e.htm**

[3] **Environment Canada.** 2004 Municipal Water Use Report - Municipal Water Use 2001 Statistics. **www.ec.gc.ca/WATER/en/info/pubs/sss/e_mun2001.pdf**

[4] **GPI Atlantic.** The GPI Water Quality Accounts Summary Report. Author: Wilson, Sara. July 2000. **www.gpiatlantic.org/publications/summaries/watersumm.pdf**

[5] **Nova Scotia Utility and Review Board,** December 2007

[6] **Source:** Horizons: Policy Research Initiative, Public Works and Government Services Canada, 2006

[7] **Pacific Institute.** Data Tables: The World's Water 2006-2007. **www.worldwater.org**

[8] **Environment Canada.** Water Use in the Home. **www.ec.gc.ca/water/images/manage/effic/a6f7e.htm**

[9] **Environment Canada.** Water Use in the Home. **www.ec.gc.ca/water/images/manage/effic/a6f7e.htm**

We want your ideas

You can provide your feedback to us in a variety ways – through the mail, via email, by fax, or in person at your local Nova Scotia Environment and Labour office.

You can also submit your feedback online through our website: www.gov.ns.ca/enla/water/waterstrategy.asp

Mail

c/o Water Strategy Coordinator

Water and Wastewater Branch

Nova Scotia Environment and Labour

P.O. Box 697

5151 Terminal Road, 5th Floor

Halifax, NS B3J 2T8

Telephone

For more information or to request additional copies, please call:

Toll free: **1.877.9ENVIRO (936.8476)**

This number will direct you to the nearest local office.

Email

waterstrategy@gov.ns.ca

Fax

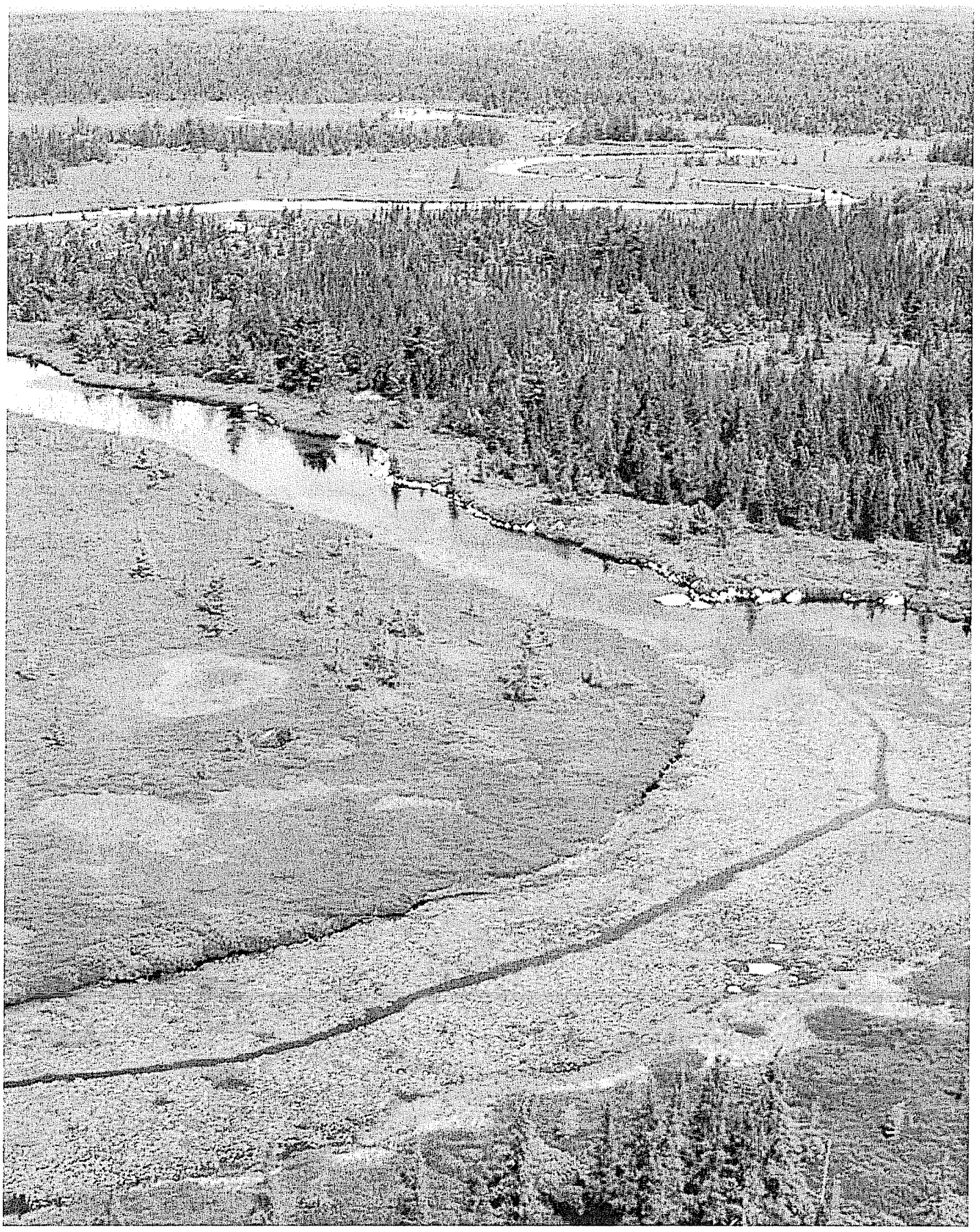
c/o Water Strategy Coordinator

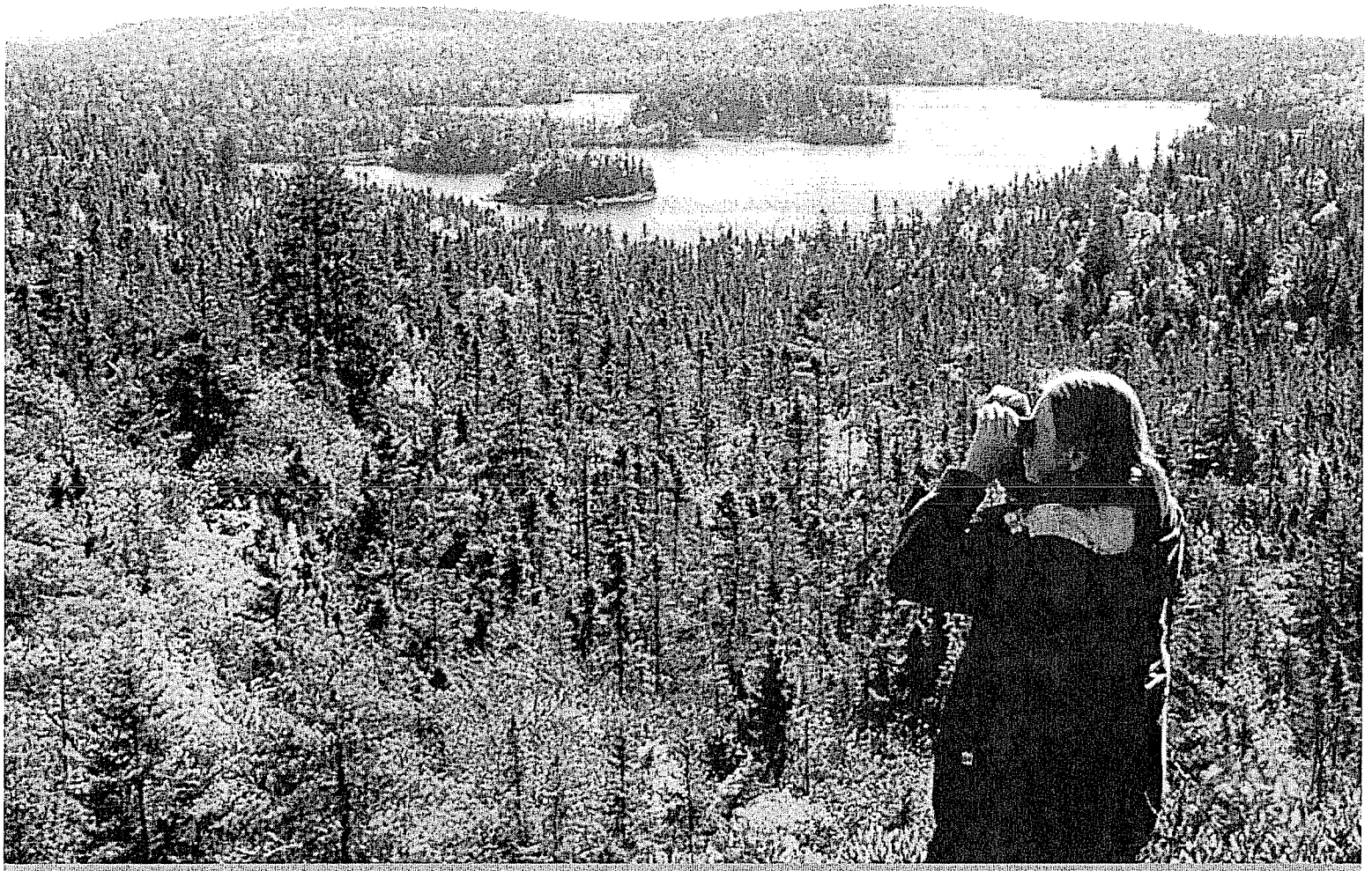
902.424.0503

Ce document est aussi disponible en français, ici: www.gov.ns.ca/enla/water **ou sur demande par courriel, téléphone ou télécopieur.**

Submission Deadline: **June 1st, 2008**

All submissions will be considered to be public documents and may be published on the government website. Any personal information is subject to the provisions of the Nova Scotia Freedom of Information and Protection of Privacy (FOIPOP) Act and will only be disclosed in keeping with the privacy provisions of that Act. Should you wish any of the information provided on this form to be held in confidence, please clearly indicate this.





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