Water, Air and Climate Change Branch

WATER QUALITY

A Freshwater Strategy for British Columbia

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Introduction

British Columbians clearly recognize values in water that go far beyond domestic, industrial and agricultural uses. We appreciate its spiritual, aesthetic and recreational values, and understand its fundamental importance to the natural environment and all life. Of all our natural resources, water is the most precious.

With a growing population and increasing development, BC's water resource is under stress.

British Columbia is blessed with some of the cleanest and most abundant water supplies in the world. But, contrary to our perception, this resource is neither pristine nor endless. With a growing human population and increasing development, BC's water resource – both its quality and quantity – is under stress. Without a collective commitment, by water users and water managers, British Columbia's freshwater resource is vulnerable.

A commitment to ensure clean, reliable, sustainable water.

The Ministry of Environment, Lands and Parks (now called Ministry of Environment) considers water protection and management to be top priorities. We are committed to ensuring clean, reliable, sustainable water to protect public health, the environment and the economy.

The Stewardship of the Water initiative focused on eight key areas.

The discussion paper, *Stewardship of the Water of BC*, released in July 1993 focused on certain key water policy and legislative actions: groundwater management, water pricing, managing activities in and about water, water management planning, water allocation, floodplain management, water quality management, and water conservation. The Stewardship paper was widely distributed, written comments received and consultation meetings held throughout the province.

Several initiatives have been completed, others are underway, and new actions have been identified.

Over the past several years, the provincial government has made major changes in water resource policies, legislation and guidelines. Many of these have had direct and positive impacts on the quality and sustainability of water resources. Nevertheless, there is still much to be done on specific water issues.

This document, *A Freshwater Strategy for British Columbia*, provides an overview of the future direction of water management in BC. The strategy: outlines some of the key challenges in water management, identifies the principles which will guide decisions, presents the ministry strategic goals and the linkages to the freshwater strategy, discusses the freshwater strategic goals, and describes the initiatives developed to accomplish those goals, the accomplishments to date in each initiative or program and the priority actions to be completed over the next three years.

Key Challenges

Any comprehensive undertaking, such as *A Freshwater Strategy for BC*, faces complex and often multi-layered challenges that must be identified and addressed before meaningful progress can be achieved.

Sustaining ecosystems while meeting the demands of society.

BC is blessed with a spectacular range of landscapes, each of which supports an integrated system of plant and animal life. Our primary challenge is sustaining the integrity of these diverse ecosystems. How do we preserve ecological integrity in the face of competition for the use of natural resources? How do we meet the needs of a growing society without irreparably damaging the environment upon which we all depend? There are a number of other factors which make this fundamental challenge even more difficult — structural issues, fiscal restraint, societal beliefs, and global trends.

A complex array of federal, provincial and local agencies that each have roles in managing water issues.

At present, there is a complex array of federal, provincial and local agencies that each have roles in managing water resources, through a wide range of legislative and regulatory tools. There is a public expectation that all levels and agencies of government coordinate their activities to ensure that water is adequately protected. How can efforts between agencies best be coordinated to reduce duplication and overlap? Can responsibilities be harmonized across jurisdictions? Which agencies are best positioned to perform these activities?

Fiscal restraint and sensitivity to the regulatory burden on business.

For years the public has demanded smaller, more streamlined government and regulation which does not unduly impair the competitiveness of businesses. How can water be managed more efficiently and effectively? Which initiatives should be legislated, regulated or voluntary?

The need to change deeply-ingrained beliefs and perceptions about our water resource.

In many respects, societal challenges are the more difficult ones to overcome. We are asking individuals to change deeply-ingrained beliefs, perceptions and practices related to our water resource. We tend to believe that our water resource is abundant and endless, even when faced with frequent or seasonal water shortages in many parts of the province. Some feel that water should be free — or at least very cheap — despite the costs of management and delivery. And many people feel that responsibility for clean, healthy water lies solely with governments, without considering the serious impacts their own daily activities can cause, or the positive benefits they and their communities can achieve.

National and international competitive pressures, and global warming.

There are many other, perhaps less tangible challenges which must be recognized and acknowledged in any water initiatives. Factors such as increasing national and international pressures for BC to share its water with nations and regions where clean water is scarce. The uncertain impacts of global warming on rainfall patterns and temperatures, and their impacts on ecosystem integrity, are difficult to predict and even harder to affect, yet must be considered in any actions.

Principles for Action

As the Ministry of Environment, Lands and Parks proceeds with the *Freshwater Strategy for BC*, the following over-arching principles are being used to guide activities and initiatives:

Ecosystem Integrity

Ecosystems are complex, inter-dependent communities of plants and animals which have adapted to a specific set of environmental conditions. The quality and relative abundance or scarcity of water is an integral part of an ecosystem. Any changes in that water can impact the entire ecosystem by weakening one or more species within the ecosystem, which in turn endangers the ability of each of the other species to survive. Ecosystem integrity requires taking a long-term, holistic approach to water management, to conserve and protect it for all its many uses and values.

Sustainability

Water resources should not be used beyond their capacity to be naturally replenished, both in quality and quantity.

Stewardship

Stewardship implies a commitment to shared responsibility for the resource by all levels of government, communities and individuals. This requires a thorough understanding of natural water systems and human impacts upon them. Stewardship means taking personal responsibility for resource use and getting involved in area-based planning, local stream clean-up activities, and other grass-roots initiatives.

User Pays

User pays acknowledges the intrinsic social and environmental values of water. Users of water resources should pay fair value for the use of this natural capital and should exercise this privilege with care and consideration for other living things.

Precautionary Principle

The precautionary principle holds that where there is a possibility that a practice may cause serious or irreversible damage to the environment the practice should be modified or curtailed.

Pollution Prevention

Reduction or elimination of water pollutants at their source, rather than clean up and remediation after environmental damage has been done.

Public Education / Awareness

Promote knowledge and awareness about water issues and water management in BC, and encourage individual and community involvement in water conservation, re-use, protection, and stewardship activities.

Context for the Freshwater Strategy

The Ministry of Environment, Lands and Parks is responsible for the management, protection and enhancement of BC's environment. This includes the protection, conservation and management of provincial air, land and water resources, wildlife and habitat, and the management of Crown Land and provincial parks, recreation areas and ecological reserves.

Ministry Vision

The Ministry of Environment, Lands and Parks vision is **an environment that is naturally diverse and healthy, and enriches people's lives.** The vision recognizes the intrinsic value of a naturally diverse and healthy environment, along with the benefits to society which can be derived from it.

The ministry has three strategic goals which reflect this vision statement and are critical to its achievement, plus a fourth strategic goal which reflects the changing environment in which the ministry works.

Ministry Strategic Goals

The ministry's strategic goals are:

Natural Diversity — Protection, conservation and restoration of a full range of biological and physical diversity native to British Columbia.
Healthy and Safe Land, Water and Air — Clean, healthy and safe land, water and air for all living things.
Sustainable Social, Economic and Recreational Benefits — Provision of social, economic and outdoor recreational opportunities consistent with maintaining a naturally diverse and healthy environment.
Responsive and Adaptive Organization — Achievement of the ministry's three goals through innovative and responsive ministry programs and staff who seek the best results and service for the public.

The Freshwater Strategy

The *Freshwater Strategy for BC* builds on the ministry's strategic goals by adapting them to management of the water resource.

The Freshwater goals are:

Healthy Aquatic Ecosystems, Assured Human Health and Safety, Sustainable Social, Economic and Recreational Benefits of Water

The goals are inter-related in that progress towards the achievement of any one goal will have a positive impact on the achievement of the others. The goals represent targets which will be a challenge to achieve and will require continuous efforts to work towards.

Healthy Aquatic Ecosystems

Aquatic ecosystems are the communities of plants and animals which inhabit bodies of water, such as lakes, rivers, streams, wetlands and estuaries, and the riparian zones around them. A healthy aquatic ecosystem is one which is teeming with natural diversity and abundance of life. Aquatic ecosystems are barometers of the health of the environment as a whole, as many of the impacts of human activities (e.g. release of contaminants into the air, land and water and development activities which change the natural flows, sediment loads and water temperatures) concentrate in the aquatic ecosystems.

Aquatic ecosystems are complex. Researchers are just beginning to understand how a change in any of the natural components can have a detrimental effect on the health of the system as a whole. Declining fish stocks in our lakes and rivers are a prominent indicator of aquatic ecosystems under stress.

The ministry is taking actions to eliminate the stresses on aquatic ecosystems. This includes meeting the needs of fish and other aquatic life when making water allocation decisions, preventing the transfer of species from one ecosystem into another, reducing the contaminants which enter aquatic ecosystems, promoting better development practices, and supporting education and community stewardship activities, as well as monitoring and assessing our progress.

Assured Human Health and Safety

Human life depends on the availability of clean, healthy drinking water. Water of poor quality can seriously impair human health. In recent years there have been several indications that drinking water sources cannot be taken for granted. Outbreaks of water-borne disease have occurred in a number of communities, and contamination of wells is becoming a concern in some parts of the province. Although the ministry does not have direct responsibility for the delivery of drinking water, a number of our programs contribute to the protection of water quality.

Assured human health means that ground and surface drinking water supplies are suitable for use, after appropriate treatment. The ministry works to ensure that water supplies for human consumption are protected from degradation by undertaking activities such as providing advice and standards for well and aquifer protection, participating in land use planning processes, and coordinating our activities with those of other ministries and agencies.

Just as poor water quality can impact on human health, excessive quantities of water can affect human safety. The unusually heavy snowpacks in much of the province over the winter of 1998/99 and the associated high potential for flooding emphasized for many British Columbians the need for protection from flood hazards. A sinkhole discovered in one of the major dams in the province also served to highlight the importance of monitoring such structures to ensure the safety of people living downstream. Achieving this aspect of the goal of assured human health and safety means minimizing the loss of human life and property due to flooding.

The ministry will work with local governments to ensure that settlements are properly located, adequately warned of potential flood events and protected from flooding. This requires an integrated approach to flood hazard management which includes structural measures (regulating channel modifications, dyking, dams and reservoirs) and non-structural measures (planning, floodplain development controls, flood forecasting and warning, and public education).

Sustainable Social, Economic and Recreational Benefits of Water

Water is a renewable resource. Water evaporates from the oceans, falls over land as rain and snow, flows into creeks, rivers, lakes, and recharges underground aquifers before eventually making its way back to the sea. Because the supply of water is constantly being refreshed, it may seem that there is an endless amount to meet our needs.

However, water is not evenly distributed across the province, and is not consistently available throughout the year. There are regions where water is naturally scarce, and there can be seasonal shortages of water in even the wettest regions. In addition, the upstream uses of water can affect the downstream uses. For example, significantly reducing the flow of water at one location or introducing toxins into the water limits the uses further downstream. Preventing the over-allocation or degradation of water resources is always easier and less costly than trying to reverse the damage.

The ministry believes that current and future generations of British Columbians should all be equally enriched by our common water resource, so that we all fully enjoy the aesthetic, spiritual, ecological, recreational, and economic benefits associated with water.

Initiatives associated with achieving sustainable benefits include the prudent allocation of water, promoting the conservation and re-use of water, assessing and balancing the supply and demand for water, and improving our knowledge about the occurrence and flow of surface and groundwater.

Freshwater Action Plan

The Freshwater Action Plan is outlined on the following pages. Under each goal is a listing of key initiatives and a description of how each works towards the achievement of that goal. As noted earlier, the three goals, and the initiatives to achieve them, are inter-related, and therefore some initiatives are listed under more than one goal.

The Action Plan also provides a brief summary of the accomplishments in each program or initiative to date, and a description of the priority activities to be completed over the next three years.

While the Ministry of Environment, Lands & Parks has, or shares, responsibility for the activities and initiatives described in the Action Plan, we greatly rely on the support and cooperation of our many partners including the Ministry of Employment and Investment, Ministry of Fisheries, Ministry of Forests, Ministry of Health, Ministry of Municipal Affairs, BC Hydro, regional and municipal governments, First Nations, the federal Department of Environment, the Department of Fisheries and Oceans, professional associations, industry representatives, environmental stewardship organizations and the public.

Stakeholder consultations have been conducted on a number of the initiatives listed in the Action Plan, and further consultations will be undertaken prior to implementing priority activities.

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Healthy Aquatic Ecosystems		
Water Initiatives Programs	**Accomplishments**	**3 Year Priority Activities**
***Fish Protection Act* (FPA) implementation** - The FPA ensures that fish and fish habitat will be protected and sustained for future generations by providing comprehensive and practical tools to protect water flows and habitat needs for fish.	- Enacted FPA provision for no new bank to bank dams on specified provincially protected rivers - Released discussion papers addressing designation of sensitive streams and rules for water allocation under the *Water Act*	- Develop Streamside Protection Policy Directives - Designate Sensitive Streams - Develop a Recovery Plan template - Prepare policies and procedures for consideration of fish and fish habitat in water allocation and licensing decisions

Forest Practices Code - The Forest Practices Code (FPC) provides a broad set of regulations encompassing all aspects of forestry operations which are designed to minimize the impacts of forestry on aquatic ecosystems.	- Developed regulations under the FPC requiring: * forest development plans in community watersheds jointly approved by MOF/MELP; * mandatory watershed assessments in all community watersheds or if there are significant fisheries values, licensed domestic water users or significant watershed sensitivity; * established water quality objectives be met; * no harvesting 100m upslope of a community water supply intake	- Continue watershed assessments for community watersheds - Establish water quality objectives in priority designated community watersheds - Develop monitoring strategy for community watersheds to determine licensee compliance with regulations - Establish Integrated Watershed Management Plan objectives as higher level plans under the Forest Practices Code.
Water Use Planning - Water use planning is a multi-party process, involving Min. of Employment & Investment, BC Hydro, Min. of Fisheries, the federal Dept. of Fisheries & Oceans and the public, to resolve conflicts between the needs of fish and aquatic habitat, and water for power generation needs.	- Completed, published and distributed Water Use Plan (WUP) Guidelines - Established interim minimum flows for fish at seven hydro-electric facilities - With BC Hydro, completed two WUPs with four additional WUPs underway - Involved First Nations in management of the WUP program	- Complete 12 WUPs, with remaining 10 underway, covering all major hydro-electric facilities - Issue licence amendments as a result of completed WUPs - Continue monitoring biological response to new water management regimes - Prepare guidelines for preparing WUPs for other major water licensees
Pollution Prevention and Remediation - The ministry has many programs aimed at the reduction and clean-up of substances harmful to aquatic ecosystems. These include efforts to reduce municipal waste, improve sewage treatment, identify and clean-up contaminated sites and industrial operations, and promote recycling.	- Developed a performance-based Sewage Regulation, encouraging innovative technology, water re-use, and requiring tougher treatment standards - Implemented Industry Stewardship Regulations for more than 90% of substances classified as Household Hazardous Waste - Implemented Contaminated Sites cleanup standards - Developed requirements for Liquid & Solid Waste Management Plans by local	- Develop Pollution Prevention Plans in partnership with large industry and small business - Develop Integrated Pest Management Plans - Develop Performance Based Regulations for industrial discharges and composting - Work with local governments in developing more comprehensive liquid waste management plans - Conduct research to identify substances that affect reproductive capability of aquatic species

	governments	
Prohibiting Bulk Water Removal and Transfer - The *Water Protection Act* helps prevent the spread of contaminants and non-indigenous species from one watershed to another by prohibiting large-scale diversions between major watersheds in BC. The prohibition on bulk water removals ensures adequate water for fish and other aquatic life.	- Passed *Water Protection Act* in 1995 - Prohibited issuing new licences for bulk water removal - Prohibited new projects to divert water between major watersheds	- With Min. of Employment & Investment, work through CCME to address trade issues associated with *Water Protection Act*
Non-point Source Pollution Action Plan - The major threat to aquatic ecosystems is non-point source pollution associated with human land use (agriculture, urbanization and land development). The NPS Action Plan identifies the Province's role in addressing non-point source pollution and the priority initiatives.	- Completed and publicly released Provincial NPS Action Plan - Conducted 8 NPS Action Plan pilot projects - Conducted additional 15 pilot projects through the Georgia Basin Ecosystem Initiative - Participated in the 10-Point Action Plan on Agriculture and the Environment	- Publish NPS Best Management Practices Compendium - Build and maintain NPS web site to provide information for stakeholders - Deliver the provincial NPS Action Plan at local gov't level - Prepare septic maintenance toolkit for local government
Water Quality - Water quality is an important element of a healthy aquatic ecosystem. The quality of ground and surface water in BC is maintained by monitoring and assessment, and the use of water quality guidelines and water quality objectives for specific water bodies.	- Produced 50 trend assessment reports, the 1996 BC Water Quality Status Report, & the 1996 & 1997 Objectives Attainment reports - Produced 1998 Approved & Working Guidelines for BC - Assisted with development of 1999 Canadian Water Quality Guidelines - Set guidelines for 8 substances affecting water quality and set quality objectives for 5 waterbodies - Initiated the Columbia River Integrated Environmental Monitoring program to monitor	- Publish status reports on the quality of BC water (Georgia Basin Water Quality Status report with Environment Canada, 1998-2000 Objectives Attainment report, & Water Quality Trends in Selected BC Waterbodies) - Publish next editions of Approved & Working Guidelines for BC - Develop guidelines for 8 additional substances and set objectives for 8 waterbodies - Monitor & assess 30+ long-term trend stations with Environment Canada

	water quality in the lower Columbia	
Water Education and Stewardship Support - The ministry promotes broad understanding of water resource issues and the importance of healthy and functioning aquatic ecosystems through programs directed at schools, communities and stewardship groups.	- Established Water Crew (part of Eco-Ed Program) in schools - Supported Project Wet (Wet BC) to train educators on water issues - Provided support and advice to 25 community stewardship groups to conduct water quality monitoring - In partnership with the Habitat Conservation Trust Fund, established the province-wide BC Lake Stewardship Society	- Publish 2 watershed management guidance documents for communities - Continue to support Water Crew and Wet BC - Continue to support stewardship groups to manage their watersheds - Continue to provide technical advice to BC Lake Stewardship Society

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Human Health and Safety

Water Initiatives Programs	Accomplishments	3 Year Priority Activities
Drinking Water Strategy - The ministry is coordinating government actions, and is leading specific studies and projects, to enhance protection of drinking water sources in BC. These actions respond to the Auditor General's 26 recommendations to government to improve the protection of drinking water sources.	- Established and chaired 9 agency committee to coordinate actions to address Auditor General's recommendations - Signed Memorandum of Understanding between Min. of Health and MELP to improve coordination and develop complementary measures to protect drinking water sources and improve water treatment	- Complete second phase of study on impact of recreation on drinking water sources - Support Provincial Health Officer in preparing annual drinking water report - Publish water purveyors operating manual and training seminars - Report on gov't accomplishments in responding to Audit completed - Prepare Well Protection Toolkit, in partnership with Min. of Health and Min. of Municipal Affairs, to guide private & community well users in

		protecting groundwater sources (See "Groundwater Management" for more activities relating to drinking water)
Flood Safety Strategy - integrates proactive flood hazard management, the maintenance of dikes by their owners, appropriate flood planning and response, and monitoring of river conditions to reduce flood risks to people and property.	- Prepared the Flood Safety Strategy, the Flood Planning and Response Guide, Guidelines for Dyke management, and Environmental Guidelines for Vegetation Management on Dikes - Responded to provincial flood risk related to dykes and dams and supported flood response activities - Administered the $3 million Flood Protection Assistance Fund - Directed construction of $7 million in pre-flood Urgent Mitigative Works - Forecast flood risks with information on river levels and data collected through hydro-metric and snow survey network	- Implement ministry Flood Safety Strategy - Respond to provincial flood risks related to dikes and dams and support flood response activities - Prepare manuals and guides to improve safety of protection works - Complete approved projects under Flood Protection Assistance Fund - Improve floodplain mapping and use of the information for local governments zoning decisions - Improve hydrometric and snow survey data network - Develop emergency response plans for local government - Acquire additional resources for a climate-change hydrologist to conduct scenario planning
Dam Safety Strategy - regulates dams in regard to public safety, setting policies and procedures, providing and enforcing standards, and providing technical expertise and support to dam owners.	- Oversaw assessments of 67 major dams - Implemented the Dam Safety Renewal project which includes: * Dam Inspection and Maintenance Manual (completed) * Dam Safety Regulation (consultation complete) * applying the Risk Based Classification system for most dams	- Complete the Dam Safety Renewal project including: * proclaiming and implementing the Dam Safety Regulation * undertaking regulatory inspections of dams as required according to the Risk Based Classification System - Review dam designs and issue approvals for construction - Update Dam Emergency Response Plan - Prepare Plan Submission Guidelines

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Sustainable Social, Economic and Recreational Benefits of Water		
Water Initiatives Programs	**Accomplishments**	**3 Year Priority Activities**
Water Allocation - Licence surface water for a variety of domestic, agricultural, industrial, conservation and power production uses.	- Developed regulations for working in and around streams, removing the need for a formal approval for low impact activities - Maintained records of all water rights in the province (over 44,,000 licences) and collected rentals from licensees	- Implement streamlined licensing requirements for low-impact and low-volume uses (quick licensing) - Improve water supply (hydrologic) and demand (usage) information - Improve data sharing (Water Information Sharing project) - Implement FPA provisions for water management planning
Water Use Planning - Water use planning is designed to create a better balance among the environmental, social and economic values of water managed at large water-control facilities. Values include fish and aquatic habitat, power generation, recreation, First Nations values, and public safety.	- See accomplishments under "Healthy Aquatic Ecosystems"	- See priorities under "Healthy Aquatic Ecosystems"

Water Conservation - Water tends to be viewed as an endlessly abundant resource, a belief leading to wasteful usage which does not account for the cost of water supply, treatment and disposal. Water conservation measures include education, industry standards, and economic incentives to reduce waste and to ensure that water is appropriately valued as a good.	- Published A Water Conservation Strategy for BC and the Water Use Efficiency Catalogue. The Strategy describes economic "tools" to promote wise water use, including appropriate pricing - Enacted Municipal Sewage Regulation, authorizing re-use of highly treated wastewater for a broad range of purposes	- Develop incentives to encourage re-use and recycling of water
Ground Water Management - More than fifth of the province's population and many industries rely on groundwater to supply their water needs, requiring actions to resolve conflicts among groundwater users, to mitigate non-point sources of contamination, remediate salt-water intrusion and to impose safeguards to prevent health and safety problems.	- Confirmed ownership of groundwater by Crown with *Water Protection Act* - Drafted Code of Practice for the Construction, Testing, Maintenance, Alteration and Closure of Wells - Developed State of Environment Indicator on Groundwater (1997 & Revision 98) - Released groundwater protection video - Developed aquifer classification system for BC - Review of large capacity wells, >75L/s under the *Environmental Assessment Act*	- Pursue groundwater protection legislation - Deliver Groundwater Protection Planning Workshops for water purveyors, in partnership with Min. of Health, Min. of Municipal Affairs, BC Groundwater Assn., and BC Water & Waste Assn. - Enhance aquifer and well record inventory, database processing and accessibility - Provide technical assistance to communities - Pilot groundwater protection program on Hornby Island with Islands Trust - Publish guides for well testing, hydrogeologic assessments and aquifer map interpretation

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Conclusion

In many parts of the world the availability of fresh, clean water is the most critical factor in assuring human health, environmental protection and continuing economic prosperity. The importance of water cannot be over-estimated or over-stated. British Columbia is indeed fortunate to have some of the richest supplies of freshwater of any area around the globe, but that supply is neither infinite, nor impervious to human influence. Our activities as a society *are* impacting the water resource, and in some cases those impacts are becoming severe.

There has been great progress in recent years with legislation and regulations to clean up many of the major industrial sources of water pollution, and those efforts are continuing. The focus now is turning towards addressing the less tangible challenges that affect our water resource: reducing non-point source pollution; efficient and effective water management; harmonization of efforts across the different levels of government; groundwater management; and conservation. Above all, we must create an enhanced awareness and understanding of the importance of water,and the impact we, as individuals and as a society, have upon it.

British Columbia's water is everyone's concern. We all have a stake in maintaining this precious resource and we all have a role to play as environmental stewards. The ministry is committed to working with our many partners to make progress towards achieving our goals of healthy, clean, and sustainable water.