



## EXECUTIVE SUMMARY

### The Need for a Sustainable Water Strategy

Water is one of the most precious and important natural assets in the Okanagan Basin. Even though the Basin is endowed with several large lakes, the supply of clean, reliable water is inherently limited by the semi-arid climate, which produces minimal precipitation and high evaporation and evapotranspiration rates. According to Statistics Canada, the Okanagan Basin has the smallest, per-capita availability of freshwater in Canada. Water shortages have already occurred in some areas of the Basin, and are expected to occur more widely and frequently in the future.

Balancing the often competing water requirements of the environment, basic human needs, irrigation, tourism, recreation, industry, and cultural values has become increasingly difficult as more and more people live, work, and play in the Basin. Large seasonal fluctuations in water availability occur naturally. Climate change is expected to bring more intense storms, increased drought cycles, higher lake evaporation rates, greater evapotranspiration in vegetation and crops, and a longer growing season resulting in increasing irrigation demand. Changes in forest cover (due to mountain pine beetle infestation and associated salvage harvesting operations) will also alter the timing and quantity of runoff of water in the Okanagan Basin.

Given climate change, rapid population growth, and the fact that most water in the Basin has already been allocated to some use, conflicts over water are likely to intensify. How do we plan for a future with enough water for all priorities, including ecosystems? What happens in drought years — where is water allocated and in what proportions? What can we do to reduce our demand and use water more efficiently? How do we develop the required storage needed to capture water in the spring for use later in the year? How can we ensure high water quality is maintained and sensitive riparian and wetland ecosystems protected? What is the best structure for water

governance in the Basin? These are critical questions that the Sustainable Water Strategy explores.

Sustainable use means accommodating the needs of the present without compromising the needs of the future. The Sustainable Water Strategy seeks to ensure water resources are managed in a broader sustainability framework – working towards a future for the Okanagan where water quality or quantity does not compromise human health and well-being, the environment, or the economy.

The Sustainable Water Strategy is designed to build on the 1974 Okanagan Basin Study, a joint Federal/Provincial initiative to develop a comprehensive plan for the development and management of water resources in the Basin. The 1974 study is the only Basin-wide study completed to date for the Okanagan. A subsequent Basin-wide study of surface water and groundwater resources – the Water Supply and Demand Project – was initiated in 2004 and is expected to be completed in late 2009. The goal of the Water Supply and Demand Project is to provide the best estimate of present and future water need and availability, taking into account present water use, population growth, climate change, land use change, preservation of the environment, and other factors. Once complete, the Water Supply and Demand Project will be complementary to the Sustainable Water Strategy. The Strategy articulates the vision and provides direction whereas the S&D Project provides the data needed to develop and implement strong water management practices.

The Sustainable Water Strategy is grounded in action. Twelve high-level Guiding Principles for water management and policy provide a framework for the Strategy. The key action items in the Strategy were developed respecting these Guiding Principles. It is important to note that although the Principles are presented as a list and may appear distinct from one another, they are in fact interwoven and must be considered concurrently in order for the Strategy to be successful.

## Guiding Principles for the Okanagan Sustainable Water Strategy

1. **Recognize the value of water.** Water is a common good that is essential to the survival of people and ecosystems. The consumptive and non consumptive values of water will be recognized and respected in all water management decisions.
2. **Control pollution at its source.** Water quality in lakes, streams, and aquifers will be protected for the benefit of healthy ecosystems and to help ensure clean, safe, and reliable drinking water is available to all residents of the Okanagan Basin.
3. **Protect and enhance ecological stability and biodiversity.** Natural processes in healthy watershed ecosystems are the most effective and cost-efficient means to maintain instream water quality and quantity. Water management will commit to protecting and restoring ecosystems and will ensure that local and cumulative impacts on sensitive habitats are considered in land and water management decisions. A watershed based approach will be taken to identify the natural features that are essential to protecting water quality and quantity (e.g., wetlands, waterways, adjacent uplands, and riparian areas).
4. **Integrate land use planning and water resource management.** Integrated water resource management means recognizing the interrelationship between land use and water quantity and quality. Land use decisions will work to minimize the impact of urbanization and reduce the human footprint on the environment, which will in turn reduce impacts on water resources.
5. **Allocate water within the Okanagan water budget in a clear, transparent, and equitable way.** Identifying how and when water will be allocated is critically important to prepare for the possibility of increasing drought conditions in the Okanagan. Sufficient water must be available for the environment, agriculture, basic human needs, and economic development now and in the future. Existing historical inequities of water supply in the Basin need to be addressed and policies should be developed to prevent the emergence of new inequities as a result of increasing competition over water.
6. **Promote a Basin-wide culture of water conservation and efficiency.** Reducing water waste and promoting water use efficiency is central to sustainable water management. Water saved through improved water use efficiencies by a water use sector should be held for that sector
7. **Ensure water supplies are flexible and resilient.** Even with improved Basin-wide water conservation and efficiency, water storage capacity will need to be increased in some sub-basins to meet the joint challenges of population growth and climate change.
8. **Think and act like a region.** Local decisions must consider watershed and aquifer interconnections with the larger Basin. Work towards a governance system that integrates existing institutions from the sub-basin level to the Basin as a whole, and provincial and federal governments. Specific types of decisions are appropriate at each level of this nested system of governance institutions and a reasonable balance of authority must be achieved.
9. **Collect and disseminate scientific information on Okanagan water.** The best available technology and science will be used to inform water management decision-making. Information will be managed in an integrated manner that is readily available to stakeholders Basin-wide.
10. **Provide sufficient resources for local water management initiatives.** Sufficient financial resources will be allocated to support better use of supplies of water that we have already developed, to employ new technology and infrastructure, to improve and refine management practices, and to draw on better information.
11. **Encourage active public consultation, education, and participation in water management decisions.** Transparent decision-making processes and opportunities for information sharing and open communication are essential to a collective understanding and acceptance that we are part of the environment and our activities have implications on clean available water. A culture of accountability needs to inform everything from high level planning to individual perceptions and patterns of consumption.
12. **Practice adaptive water and land management.** Continuous learning, innovation, and improvement are essential to effective and efficient implementation of the Sustainable Water Strategy. An on-going monitoring and reporting program will be developed for the Strategy. In addition, a comprehensive review of the Strategy needs to be conducted every five to seven years.



## Protecting our Lakes, Rivers, Wetlands, and Aquifers

Water shapes lands, transports materials, and transforms the environment. It has incredible power—through intense storm events and slow but steady erosion. Because of this power, water also has an enormous ability to transfer contamination from a source to a much larger area. Source water protection, which encompasses land use, ecosystem protection, and the entire hydrological cycle, is fundamental to reducing or preventing contaminants from entering lakes, rivers, and aquifers.

Ecosystem processes in healthy watersheds are the most natural, effective, and cost-efficient means to keeping contaminants out of source water. Channelization of the Okanagan River in the 1950s, rapid urban development, road building, forestry, agricultural activities, livestock grazing, off-road recreation, wildlife, and natural events like storms and fires have resulted in the loss and fragmentation of over 85 percent of wetlands and riparian areas in the Basin. The loss of these natural purification systems has increased the risk of contamination for drinking water supplies and has harmed aquatic ecosystems. Protection and restoration of ecosystems is critical to maintaining clean water.

The health of our waters is directly affected by how we live on the land. The vast majority of land in the upper watersheds of the Okanagan Basin is Crown land designated for “multiple uses”, meaning that forestry, development, recreation, mining, and livestock grazing are permitted and often encouraged in community watersheds that are the source areas for public drinking water. Local water suppliers do not have regulatory control over Crown land use in their source watersheds, and must rely on decisions made by other multiple levels of government. To ensure water quality is maintained now and in the future, local water purveyors must have more influence over what activities occur in source watersheds.

The amount of land in the Okanagan consumed by development has grown rapidly in recent decades. Historically, growth in the Okanagan has been accommodated through patterns of highly dispersed development; know as urban, suburban, and exurban sprawl. This type of development can lead to a number of negative environmental, economic, and public health outcomes. In contrast, development that uses land efficiently and protects undisturbed natural lands allows a community to grow and still protect its water resources.

This Strategy recognizes that source protection does not replace the need for adequate drinking water treatment. The benefits associated with drinking water treatment are of a local scale (i.e., customers of the utility), whereas source water protection provides benefits on a regional (i.e., Basin-wide) scale. All downstream uses, including non-consumptive uses such as ecosystem function, water-based recreation, and aesthetic values, benefit from clean source water. For this reason, the Strategy focuses on source water protection as a key principle of sustainable water management.

Adequate wastewater treatment is also essential to clean water in the Okanagan Basin since treated effluent is discharged regionally into mainstem lakes and the Okanagan River. Wastewater treatment plants in the Okanagan are currently designed to treat nutrients and pathogens effectively and efficiently. However, there is continual need for public reinvestment in this infrastructure to maintain the highest standards of treatment and to bring areas with old, failing septic systems onto community sewer systems where it is beneficial to do so. New information on emerging contaminants, such as endocrine disrupting chemicals and pharmaceuticals and personal care products require further study and may necessitate further wastewater treatment plant upgrades.

## Key Actions

- Work cooperatively to protect, restore, and enhance riparian and wetland areas.
- Undertake individual source water assessments and prepare joint source water assessments where feasible in order to develop a regional (Basin-wide) source protection strategy.
- Manage livestock through the installation of fencing and off-stream cattle watering stations.
- Develop and implement well protection plans.
- Create bylaws and best management practices for geothermal energy.
- Consider water in community design by promoting development that is high-density and uses existing infrastructure.
- Improve stormwater management.
- Enact or amend land use policies and tools to protect water and the surrounding land.
- Develop and harmonize groundwater protection bylaws.
- Support appropriate sewerage system regulation and application.
- Support research on emerging water contaminants.
- Complete Basin-wide wetland, foreshore, and sensitive habitat inventory mapping to support water and land management.
- Streamline data reporting for water quality and supplies.

## Securing our Water Supplies


Identifying how and when water will be allocated is critically important to prepare for the possibility of increasing drought conditions in the Okanagan. Accurate and rigorous water accounting is important for developing an Okanagan water budget. Water must be reserved within this budget for appropriate

uses. Groundwater and surface water are connected resources. It is essential to consider them as such when determining allocation and use.

Water allocations for the environment are not optional or discretionary. Conservation flows need to be established, groundwater environmental baseflows preserved, and Environmental Water Reserves designated to protect natural systems during drought periods. "Conservation" licensing must be considered on all creeks requiring conservation flows.

Water is also needed to maximize food production in the Basin. The development of an Agricultural Water Reserve would provide for the appropriate water allocation to land that is viable to grow food for residents of the Okanagan and beyond. Reserving water for these lands will also encourage farmers to invest in water-efficient farming practices by providing assurance that water saved will be available during water shortages, and not allocated irretrievably to downstream developments. "Irrigation" designated licences must be adjusted to match the land they irrigate and the availability of water from the sources.

An adequate portion of water must be designated for drinking, food preparation, hygiene, and sanitation. Water is also necessary to support economic development in the Basin – virtually all economic sectors are water dependent. Just as water is set aside for the environment and for agriculture, water must be set aside within the Okanagan water budget for domestic, industrial, commercial, and institutional uses. Most of the larger utilities in the Basin are licensed for annual water volumes much greater than what they currently use or require. An accounting of water licensing and water uses for each larger water supplier in the Basin needs to be conducted. "Waterworks Local Authority" (domestic) designated licences must be validated to realistic levels for each of the water utilities in the Basin.



Reducing water waste and promoting the efficient use of water is central to ensuring water supplies are adequate now and in the future. Many communities in the Basin have implemented water conservation programs, but are working independently of one another. Sharing knowledge and experience between communities would be invaluable to improving water conservation in the Basin. Implementing measures that reduce irrigation will result in the greatest water savings in the Basin since approximately 70 percent of water used is for agriculture and an additional 15 percent is used for irrigation of parks, boulevards, golf courses, and residential landscapes.

Even with improved Basin-wide water conservation and efficiency, water storage capacity will need to be increased in some sub-basins to meet the joint challenges of population growth and climate change. Water storage must be strategically developed in the Okanagan Plateau and mainstem lakes to build flexibility and resiliency in the water supply. Most of the accessible and lower cost upstream storage sites have already been developed, resulting in higher development costs for municipalities and irrigation districts. Funding strategies must be identified to support the construction of new upstream storage reservoirs.

### Key Actions

- Establish conservation flows, preserve environmental baseflows, and designate environmental water reserves.
- Establish an agricultural water reserve.
- Extend the date on irrigation licences to allow for irrigation later in the season (October) without increasing the allocation of water. Allow part-season licensing to maximise beneficial use of water.
- Ensure sufficient potable water is available in each community for domestic, industrial, commercial, and institutional use.
- Review Basin water licensing and water uses.
- Prepare and implement drought management plans for individual utilities and the Basin as a whole.
- Develop Water Use Plans for all major fish-bearing watercourses in coordination with a Basin-scale water use agreement.
- Develop an Okanagan Water Management Plan (or plans) that includes groundwater licensing and monitoring, source water protection, and Basin-wide drought management planning.
- Develop a collaborative Okanagan water conservation strategy.
- Reduce outdoor water use by using certified irrigation designers, implementing bylaws, and improving scheduling.
- Implement universal metering.
- Conduct a basin-wide domestic water pricing assessment.
- Maintain affordable agricultural water rates by splitting systems, increasing use of treated wastewater, implementing education and incentive programs, and other mechanisms where appropriate.
- Develop a watershed storage reserve fund.
- Implement policies that support coordinated water storage.
- Measure and monitor water use, storage, and availability.



## Delivering the Strategy

Water should be managed as a collective resource in Canada, shared by people and the environment, supporting food production, and underpinning the economy. Current water governance and management structures will be tested in the future as climate change and a growing population put pressure on water quality and supply. More than thirty-five Acts, Regulations, and policies directly or indirectly govern water and aquatic and riparian ecosystems in the Basin. Many of the critical tasks laid out in this Strategy require a focused governance structure that can form strong partnerships with local and senior governments as well as with landowners, developers, farmers, scientists, homeowners, recreational groups, and other constituents in the Basin. A regional water governance institution is ideal for conflict resolution, enhanced communication, and harmonizing and making more equitable and uniform policies among jurisdictions. Basin-scale governance should focus on issues that have distinct regional benefits and do not duplicate efforts of local or national governments.

Long-term, stable organizational and funding support is essential for maintaining a functional water management institution in the Basin. There are a range of options available to support the water governance, including volume-based water use fees, water licence rentals, recreational user fees, and sales taxes. Each funding option has strengths and weaknesses and operational costs.


Partnerships and active dialogue between non-aboriginal water managers and aboriginal peoples are essential for sustainable water management in the Basin. Aboriginal peoples have a rich heritage regarding the land and water in the Okanagan Basin. Aboriginal title, aboriginal rights, and treaty rights to water are recognized, but not well defined, under the Constitution Act of 1982. Where an Indian Reserve allotment does not explicitly include water, it is understood to include a sufficient supply of water for full and beneficial use of the land, including economic purposes. In the absence of treaties, there

are great uncertainties regarding future claims to land and water by aboriginal peoples in the Basin. The success of this Strategy depends on the extent to which services are planned and implemented in an open, transparent, and accountable manner based on broad consultation, citizen engagement, and consensus on the need to practice sustainability. Ongoing stakeholder involvement like that provided by the Okanagan Water Stewardship Council is essential for creating workable water policy and reducing conflict in the Okanagan. This Strategy supports the premise that every individual in the Basin shares the water resource; therefore, decisions and actions made in one part of the Basin have impacts throughout the watershed.

The Okanagan is a centre for water science in Western Canada. Partnerships with universities, government, and independent research institutions provide leadership on important questions regarding adaptation to climate change, understanding the next generation of pollutants, restoring wetlands and waterways for healthy water and ecosystems, and defining groundwater and surface hydrology.

Although large quantities of technical and planning information are available for water resources in the Okanagan Basin, the challenge is that much of the data are collected for site-specific (not Basin-wide) purposes, and some are historical, discontinuous, or collected in a form that is not useful for current studies or modeling. In addition to data gaps and inconsistencies, access to information is hindered because isolated databases are housed at many locations, and different databases contain fundamentally distinct and somewhat incongruous elements. Many of the action items in this Strategy require the support of specific data collected on a Basin-wide, long-term basis and increased accessibility to data now and in the future.

The Sustainable Water Strategy is meant to be a living document that will change with time under the principle of adaptive management. Monitoring



and reporting tools that incorporate benchmarking and results-oriented focus need to be developed to support the measuring, tracking, management and accountability of water resources in the Okanagan. Continuous reassessment and improvement of the Strategy will be conducted in order to manage uncertainties and allow new knowledge to be incorporated as it emerges.

### Key Actions

- Support and foster collaboration through partnerships.
- Partner with aboriginal people in the development of Basin water management strategies.
- Develop a community engagement strategy that highlights water conservation and pollution prevention.
- Obtain local government representation on the Southern Interior Regional Drinking Water Team.
- Identify knowledge gaps and encourage focused research to fill those gaps.
- Develop web-based water management monitoring and reporting tools.
- Create an Okanagan Basin Information Network.
- Undertake an economic analysis of funding mechanisms for Okanagan water governance.
- Create an Okanagan Water Fund.
- Revisit and reassess the Sustainable Water Strategy every five to seven years.