

Water Management Plan for the Trepanier Landscape Unit in BC's Okanagan Valley

**A STRATEGY FOR SUSTAINING THE ECONOMY,
THE ENVIRONMENT AND THE COMMUNITY**



February 2005





Why a Water Management Plan?

Living in one of BC's driest regions, BC's Okanagan valley residents understand the importance of water, and the need to maintain the natural systems that provide life-giving water. Yet, growing population and land base demands have meant that water issues continue to mount in the Okanagan.

The pressures are significant in the fast-developing Westbank and Peachland areas where the population has doubled in the last 20 years.

In 2003, the Central Okanagan Regional District and the Ministry of Sustainable Resource Management decided that a forward-looking plan was needed for this area – to address threats to environmental quality, as well as the area's long-term economic future. A water management planning process was initiated and in 2004 a water management plan was completed for the area known as the Trepanier landscape unit, named after one of the larger creek drainages in the plan area.

Summit Environmental Consultants of Vernon, BC prepared the plan, in cooperation with the area's many stakeholder organizations that have an interest in sustainable water management.

The Plan Area

The area covered by the Water Management Plan encompasses almost 100,000 hectares on the west side of Okanagan Lake, opposite Kelowna, and includes the watersheds of five major Creeks that drain into Okanagan Lake:

- Lambly Creek
- Powers Creek
- McDougall Creek
- Trepanier Creek and
- Peachland Creek

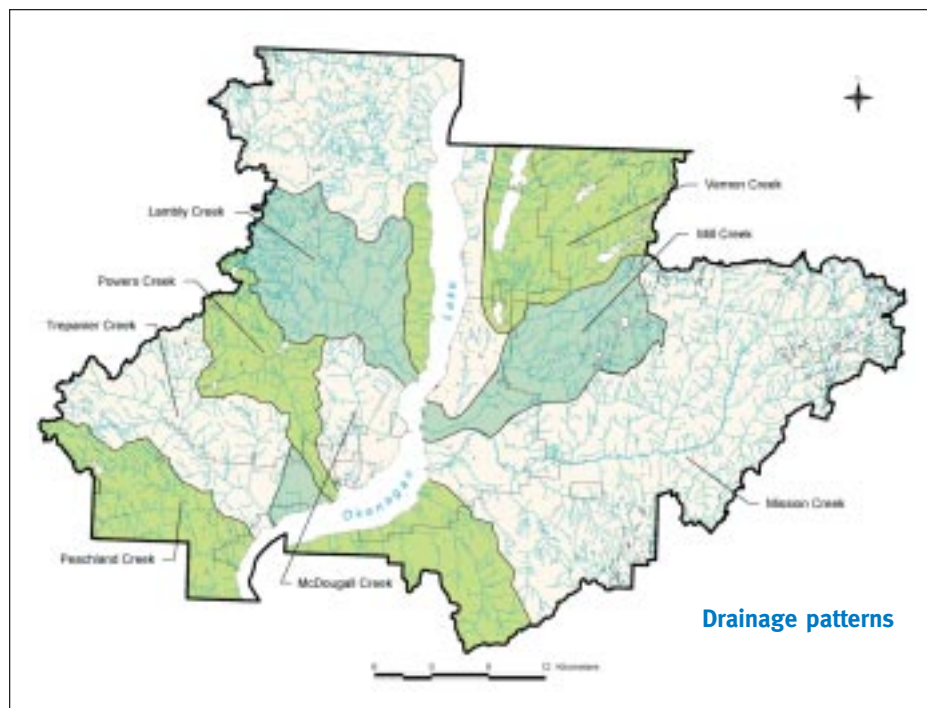
The majority of the Plan area is provincial Crown land that is used for forestry, grazing, recreation and mining. Most of the privately-owned land in Westbank and Peachland is located at lower elevations, within a few kilometres of Okanagan Lake. This is where most of the area's 41,000 residents live.

Summers are warm and winters cool. Precipitation falls mainly in winter and spring, and varies with elevation and from year to year. Average annual precipitation is only about 600 mm per year, making this area one of BC's most arid environments.

ISSUES AFFECTING WATER MANAGEMENT IN THE WESTSIDE AREA

- Increasing competition for water
- Unregulated ground water use
- Over-licensed streams
- Reductions in flow affecting fish
- Urban development near streams
- Water quality impacts associated with land use





Water Use and Supply on the Westside

Westside communities use an estimated 24.5 million cubic metres of water per year.

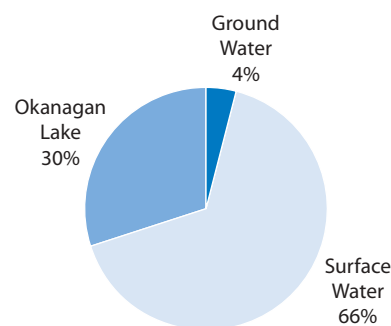
The five major creeks in the area that supply water have all been modified with storage reservoirs to provide water supply throughout all seasons and during periods of drought.

Lake water sources are pumped from Okanagan Lake. Groundwater sources come from six groundwater aquifers located along the periphery of Okanagan Lake near Westbank.

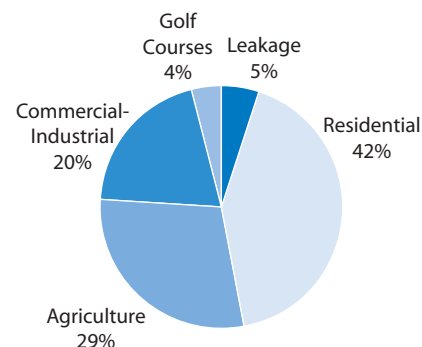
Almost three-quarters of the water used in the Trepanier landscape unit is distributed by the area’s 16 water purveyors, the largest being:

- District of Peachland
- Westbank Irrigation District
- Lakeview Irrigation District
- Regional District of Central Okanagan
- Westbank First Nation.

The remaining amount of water use is authorized under water licences to individual water users.

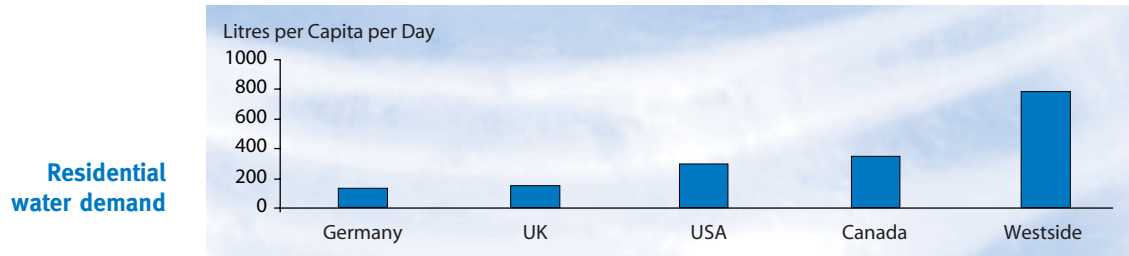


Sources of community water on the Westside



Where the water goes

Residential water use averages 789 litres per person per day, including both personal and outdoor use. This is almost double the BC average, more than double the Canadian average, and more than five times the level of demand in the United Kingdom.



In-stream Flows and Fish Requirements

Streams on the Westside support a variety of fish species, including rainbow trout and Kokanee salmon. Fish have faced significant pressures in recent decades due to water withdrawals from tributaries and habitat impacts, particularly in the lower reaches of the area's creeks.

The Ministry of Water, Land and Air Protection has identified minimum stream flow targets that are recommended for conserving fish. Most of the area's streams experience flows that fall below the target levels during some late summer periods when flows are lowest. Under one-in-five year drought conditions, the fish flow targets are regularly not met during low-flow periods.

Water Quality in the Plan Area

All of the major streams that serve as sources of domestic and irrigation water occasionally do not meet BC's water quality guidelines for raw water and, therefore, require chlorination by water purveyors. The lack of detailed sampling data makes it impossible to say precisely what causes the water quality guidelines to be exceeded, but it is likely a mix of natural factors and land use effects.

Water quality in Okanagan Lake is strongly influenced by stream discharges into the lake. For example, between 1973 and 1998, the lake experienced higher concentrations of phosphorus in years with higher stream inflows. Total nitrogen concentrations in Okanagan Lake have been trending slightly up. Water clarity improved significantly in the 70s and 80s in response to improvements in sewage treatment in the Okanagan Basin, but has been declining in recent years.

Water Pricing

Almost all Westbank, Lakeview and Peachland water consumers pay a fixed amount per month for their water. This is called 'flat rate' pricing and is known to result in

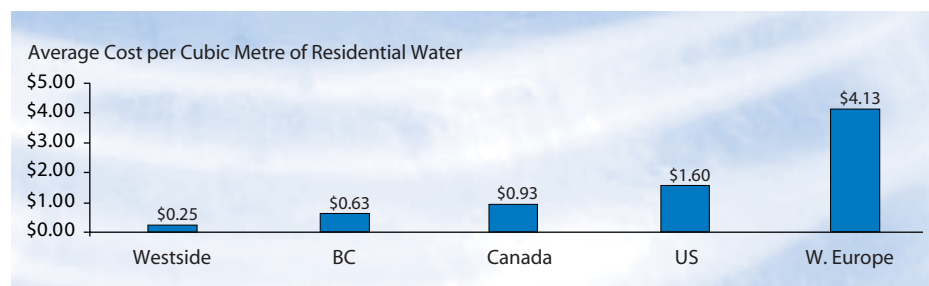


higher water use than ‘volume-based’ pricing, where water cost is based on amount used. Environment Canada reports that, in 1999, Canadian residential water customers on flat rate pricing systems used almost 60% more water than volume-based customers.

Volume-based pricing systems require the ability to measure the amount of water that individual customers use – in other words, water meters. At present, only a very small number of water consumers on the Westside are connected to meters. After Kelowna installed meters in some areas, water use dropped from 775 litres per capita per day to 570 litres – over 25% saving.

Water is very inexpensive on the Westside, ranking amongst the lowest in BC, Canada, and even the world. The average Westside cost for residential water is approximately \$0.25 per cubic metre. Water for agriculture costs about \$0.03 per cubic metre.

Flat rate water pricing and the dry climate are considered significant factors in why the average Westside resident uses so much water. If water meters were installed, it would be possible to use water pricing to encourage conservation and measure the effectiveness of different landscaping and irrigation techniques. Pricing strategies must, however, consider the potential impact for short- to mid-term impacts on the local economy.



Looming Water Issues

Although forecasting the future is always tricky, it’s a necessary part of water management planning. The Trepanier water management planning process made a number of estimates, using best available information, about population growth and associated water use. The process also looked at the probable impacts of climate change on water demand and supply, as predicted in Okanagan climate change research commissioned by Environment Canada.

Climate change will increase residents’ demand for water because, based on what the climate change models tell us, summers will be longer, warmer and drier. Evaporation and snow melt rates will generally increase. Winter precipitation will increase, but less will fall as snow. Climate change will also affect stream hydrology. Reservoirs will fill earlier; late summer flows will be much reduced.

RESIDENTIAL WATER DEMAND UNDER DIFFERENT PRICING STRUCTURES

789 litres per day

Average per capita use on the Westside under a flat rate pricing structure

526 litres per day

Average per capita use in BC under a flat rate pricing structure

459 litres per day

Average per capita use in BC under a volume-based pricing structure

269 litres per day

Average per capita use in Canada under a volume-based pricing structure

Average cost per cubic metre of residential water





It’s projected that the area’s annual average stream flows will gradually decrease – by 15% in 2020 and 35% in 2050. This doesn’t account for stream flow reductions associated with growing demand for water withdrawal that can be expected to accompany warmer and extended summers.

Predicted Reductions in Annual Stream Flow Due to Climate Change

	year 2020	year 2050
Lambly Creek	11%	30%
McDougall Creek	11%	36%
Powers Creek	17%	34%
Trepanier Creek	20%	39%
Peachland Creek	18%	34%
Average	15%	35%

The rapid population growth that Westside communities have experienced in recent years is expected to continue. Population is forecast to grow from 41,000 in 2004 to 60,000 in 2020.

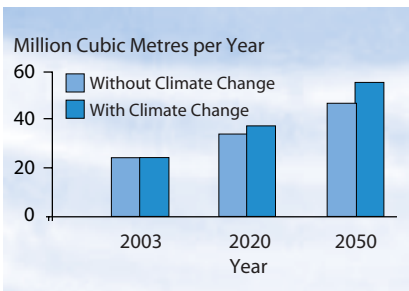
Assuming that water demand continues at current levels, population and economic growth will cause total water requirements, for all uses combined, to increase by 41% by 2020. This is without factoring-in climate change. If a longer growing season results from climate change, total water use could increase by 55% by year 2020.

If climate change occurs as predicted, the average runoff year in 2020 will be similar to that experienced now during the one-in-five year drought. The one-in-five year drought will look like today’s one-in-twenty year drought.

By 2020, increased demand and reduced supply will cause annual flows to be 25% less at Westside creek mouths. At the mouth of both McDougall and Lambly Creeks in August, there will be no water in the average year. If future water demands are satisfied from sources other than the area’s streams (i.e., groundwater or Okanagan Lake), the predicted stream impacts will be smaller, but nonetheless significant.

Streamflows could be maintained at current average levels if there was a 30% reduction in water use by 2020, provided the climate does not change. If it does, augmentation of the water supply from Okanagan Lake and groundwater will be needed before 2020, along with reduced water demand, to prevent stream flow reductions compared to today’s levels.

By 2050, even without climate change, both reduced water demand and alternative supplies will be needed to prevent stream flow reductions relative to today’s levels.



Total projected water use

What Can Be Done?

In short, two approaches are possible to address the impending water issues:

1. increase water *supply*
2. reduce water *demand*.

Both approaches are likely needed to assure the area's economic and environmental future. As a community, however, the *number one priority* is demand management – given the current high per capita water use and low per unit cost.

Adopting three or four key water demand management measures could achieve a 30% water saving. If a broad and comprehensive demand management strategy was adopted, even greater savings are possible.

Main Recommendations for Water Management on the Westside

1. By 2010, implement demand side water management measures, including

- public education
- install water meters
- introduce volume-based water pricing
- regulate water use
- promote water-wise land use and agricultural practices
- implement water recycling and reuse
- investigate water savings from combining water systems

2. By 2020, increase water supplies by:

- making operational improvements (fix leaks, reduce water pressure)
- constructing additional upstream storage
- pumping water from Okanagan Lake
- increasing groundwater use

3. Do not issue new water licenses on creeks without equivalent increases in upstream water storage

4. Protect water quality and streamside corridors

5. Improve availability of and access to information on water resources

6. Confirm and establish water flow targets for fish conservation

A Proposed New ‘Leadership Group’

Needed changes to water management on the Westside will not likely materialize without a shift in the area’s governance structure for water management. To put the Trepanier Landscape Unit Water Management Plan recommendations into action, the Regional District of Central Okanagan will bring together a “Leadership Group”, made up of agencies with a role in water management. The Group’s role will be to champion improved water management and oversee implementation of the Plan.

The Leadership Group will direct public and stakeholder consultation to develop a consensus on water management goals and measurable water conservation targets. It will develop a detailed strategy for putting Plan recommendations into action on the ground.

It is not overstating it to say that the future of the area’s economy and environment depends on successfully addressing the looming water management issues. The Trepanier Landscape Unit Water Management Plan provides a blueprint for action that must start now.

FOR MORE INFORMATION . . .

The complete Trepanier Landscape Unit Water Management Plan report is available online at <http://www.regionaldistrict.com/> by following the links through Planning Department, Environmental Planning, Information, Documents and Report.

Questions about the Water Management Plan should be directed to the Regional District of Central Okanagan at (250) 763-4918.

Photographs and map supplied by the Regional District of Central Okanagan.