Okanagan Water
The Introduction of an Eight-point Action Plan

Water supply is critical for the predominately dry Okanagan Valley. We live in a region where parts are very arid, and some areas form what is essentially a semi-desert.

Despite these facts, together with our rapid population growth and development expansions, often little regard is paid to the precious resource of water by some of our citizens. It may be only at those times when there is a particular problem or lack of water that its real value becomes impressed upon many of us. All too frequently the adequacy of our water supply is taken for granted. Clearly this is at odds with sustaining our cherished Okanagan lifestyle and preserving our fine environment - which are the factors that are attracting most of our population growth.

Let us look at the Okanagan Valley and its water supply in wider perspective.

The Okanagan Valley is an extensive feature cutting through the BC Interior Thompson Plateau. The Okanagan Valley is a unique micro-climate within Canada, being an arid water-deficient area, forming the headwaters of a south-flowing tributary to the Columbia River System of the United States.

Precipitation varies widely in this valley. Average precipitation is minimal in some of the valley bottom, at less than 300mm (12in.) pa., but increasing on either side of the valley with gain of elevation, to a maximum of about 1000mm (40in.) pa. on portions of the adjacent plateau.

The average precipitation for all of the Okanagan Basin is only 554mm (21.8in.) pa.

Okanagan Lake is the obvious main feature in the Okanagan Valley, but unfortunately this extensive body of water gives an erroneous impression of abundance of water within the arid surrounding area.

The actual available long-term water supply is more closely represented by as only a part of what water discharges from the outlet of the Lake, near Penticton.

Because of the naturally dry terrain within this valley basin, and relatively high average temperatures, 86% [76% + 10%] of all precipitation is lost to evaporation processes: -

(Average annual amounts)		
Okanagan Basin Total Precipitation	554mm (21.80 in.)	100%
Evapo-transpiration losses	-419mm (16.48 in.)	-76%
Okanagan Lake Evaporation	-54mm (2.14 in.)	-10%
Human Consumptive Use	- 19mm (0.76 in.)	- 3%
	(abstractions not directly returned to lake)	
Net Through-flow in the Okanagan Basin	62mm (2.42 in.)	11% (what is left as flow-through)

From this, it can be appreciated that the amount of effective flow-through is a modest proportion, with only an estimated 11% of total precipitation as freshening flow. Okanagan Lake is a large lake, with its contents retained in storage for an average of about 60 years, but in its deeper basins water may be stored for much longer periods. Thus, this lake is vulnerable to long-term potential contamination. Lake-

bed sediment studies demonstrate increased biological activity over the last century, which is since about the time of first major white settlement impact. During the last 50 years, the lake has shown signs of eutrophication with algal increases, lake-bed mercury build-up, and has suffered the dramatic collapse of kokanee fish stocks.

In recent years indications of climate change are producing a trend of milder winters, resulting in higher average annual temperatures. It is not clear how this trend will affect future precipitation, evaporation, and water availability in the Okanagan. Initial impressions are that higher average temperatures may increase rates of evaporation, and hence reduce water availability. This will require further careful monitoring and study.

The Okanagan Basin is developing very rapidly, and although for about 100 years has been a predominantly rural area, much is now being increasingly urbanised. Many irrigation systems devised over the last century continue to serve parts of this rapidly changing scene.

Apart from numerous individual private water supply arrangements, existing municipal water supply is by a disparate and fragmented large number of water undertakings spread across many points of the Okanagan Valley.

Water is obtained from three primary sources. Firstly, intersection of flows from various tributary streams that enter the valley off the adjacent plateaux. Secondly, abstraction directly from the main valley lakes. Thirdly, some localised groundwater systems. Generally the water is supplied after minimal treatment, usually only that of disinfection. However, some supply authorities do have more sophisticated processes, and it is likely that the recent Provincial Guidelines on water supply may result in further modification of several water systems.

It should be noted that an Okanagan Basin Water Board was established in the 1960's, and still is extant today. Unfortunately, this organisation has not achieved much effect in the general picture, and presently remains as a relatively powerless body of questionable purpose.

In March 1974 an inter-federal-provincial report was released on Water Supply for the Okanagan Basin. A primary recommendation of that voluminous report, was the setting up of one effective water authority for the entire Okanagan Basin. Clearly, the main thrust of this report has not been properly acted upon.

Now, let us reflect on where all of this leaves the important subject of “water” in the Okanagan.

First of all, there are large rates of urban development taking place, with minimal correlation to overall water availability, and yet there is also much waste of water in the present generally under-priced and under-appreciated water arrangements within this valley.

Various improvements can be identified for water supply in the Okanagan.

We must deal with the fact that water servicing capacity creates an eventual acceptable limit to development in the Okanagan Valley. Therefore this factor should be properly incorporated into the planning process. However, this can only be done effectively if the entire Okanagan Basin is looked at

as a whole, in a co-ordinated manner. It must be emphasised that municipal boundaries do not necessarily follow catchment area boundaries.

An assessment is required to determine what amount of water is available for consumptive use for the whole Okanagan, taking into account trends of climate change, all social requirements, and preservation of the quality of environment and desirable lifestyle that is the fundamental factor that has attracted most of the recent population growth. Such an assessment should recognise the permissible extent that water is used from the main lakes and their tributaries, especially Lake Okanagan with its long retention time, is a function of how much degradation of lake quality we consider to be acceptable in the long term. From this, a determination is required of what level of human activity can be sustainably supported. This should then be incorporated in to a comprehensive long-term development plan for the entire Okanagan Basin.

Improved economy of water use is fundamental in all of this. It is necessary to encourage a greater ***water-saving ethic*** by all users. This means not only our citizens as direct consumers, but also developers, local authorities, and politicians, too.

Establishment of such a conservation ethic could be by public education and general informational campaigns, statements in the media, brochures directly to consumers, and instruction in the schools. This would include the encouragement of appropriate watering practices, installing domestic and commercial water-use reducing fixtures, more efficient irrigation (drip irrigation?), more extensive "dry" landscaping and gardening (xeriscaping), the avoidance of wasteful road, yard, and house washing practices. Not only is it desirable that municipal by-laws be reviewed to take these principles into account, but also that they be considered for incorporation into new construction proposals and municipal subdivision agreements. Official Community Plans should require that all development is regulated so as not to exceed sustainable long-term water servicing capacity. Planning processes should normally avoid allowing developers to plant grass where water is a commodity in short supply (which essentially means the whole Okanagan). All Official Community Plans should require developers and municipalities to use suitable layouts, lot finishes, and landscape treatments that minimize water demands.

A most relevant mechanism for public water supply conservation is that of proper pricing. It is this very issue that underlines the need for a full understanding of the true value of water, both as a precious resource, and the social and economic repercussions of establishing an appropriate costing structure on it.

Flat-rate charges are not effective for public water supply conservation (*example: charging $xx per month for an undefined amount*). Raising the price as a flat-rate charge is not effective either (*some consumers have been observed to then even use more water "to get their money's worth"*). Experience confirms that cost incentives are only effective if the cost is based on the amount of water that a consumer uses. This means water metering. Unfortunately, water metering has a cost to set it up. This cost must be looked at in the perspective of long-term gain. Meters have to be installed for each existing consumer connection, and for all new connections. There is the cost of the meter, its installation, and of properly reading and maintaining it. Further, the supply authority must set an appropriate rate for water

use (*example: so many $xx per month per cubic metre per connection)*. Also, fair categories of cost/use must be determined (*example: domestic, commercial, agricultural, industrial etc.*) To provide the most conducive arrangement for conservation, it has been determined that a "block-pricing" system is necessary. This is imposing a base-cost rate (say, so many $xx per cubic metre per billing period) that an average connection of that category uses. Any connection that uses more than that amount per billing period is charged for the excess at a higher rate. In this way, average-use consumers pay at the base-cost rate, but more extravagant users are paying for their excess at a higher rate. That is the supply conservation principle, with the actual costs being determined by the water supply authority. Capital costs for installing meters to existing connections may be covered by a levy on water taxes to affected consumers, and a development charge made on new connections. Although water metering may appear an extra complication, it is the only way to go to provide a proper cost incentive arrangement for conservation of public water supplies.

Now referring back to the larger perspective.

Water supply and its control are far too fragmented throughout the Okanagan Valley. There is no way that the present multiplicity of suppliers can effectively deal with the overall compounding issues anticipated to emerge from the rapidly increasing water supply demands in this arid valley.

Although some existing water undertakings may be models of individual efficiency, the setting up of one effective water supply authority to serve the entire Okanagan Basin is required. The creation of a unified water authority does not necessarily imply hydraulic unification, but the setting up of one managerial and administrative body. This would have the advantage of scale as its foundation, permitting proper professional management expertise, and co-ordination necessary to better deal with other jurisdictions, and to effectively handle the looming water supply planning and demand stresses that will increase in the future.

The setting up of a single water authority was recommended in the previously mentioned March 1974 inter-federal-provincial report. Why this has not been implemented for thirty years is unclear, but it may be necessary to break through certain barriers of politics and bureaucracy, in order to implement desired modernisation to the water supply arrangements in the Okanagan Valley. The establishment of an effective valley-wide water authority is envisaged to be geographically extensive, autonomous yet not isolated, as not being subservient to existing regional district, and municipal jurisdictions, replacing the functions of irrigation districts, and to incorporate all the aspects of water use, including completely taking over water supply, conservation, pricing, and all waste-water treatment and disposal.

It is essential that the operation and policies of such a unified water authority be fully co-ordinated with the other local government bodies within the Okanagan Valley and within the Province, to ensure that complete integration of social and economic factors are continuously maintained in a comprehensive long-term development plan for the well-being of the entire Okanagan Basin. Whether this makes a case for critical changes in Provincial legislation, further local government regionalisation, or if the existing regional district/municipal structures can adapt to the proposed unified water supply authority, is matter requiring further immediate debate.

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Summary of recommendations : The present need is to promote a radical change in thinking regarding our water supply in the Okanagan.

Action is summarised in the following **Eight Items**:-

1. Assess sustainable water availability for the entire Okanagan Basin and incorporate this into a comprehensive long-term development plan.
2. Set up of one unified water supply authority, to replace the existing multiplicity of water undertakings around the valley, with the new authority having the power and the facilities to adequately and efficiently provide sustainable water supplies.
3. Establish and encourage a greater general water-saving ethic by all.
4. All municipal water supply to be properly metered.
5. All municipal water supply to be appropriately priced.
6. Make water conservation an integral part of the planning process in the Okanagan.
7. All Official Community Plans to accept that water servicing capacity is eventually a limiting factor for development in the Okanagan, and that all development be regulated so as not to exceed sustainable long-term water servicing capacity.
8. Planning processes to normally avoid allowing developers to plant grass where water is a commodity in short supply, with all Official Community Plans to require developers and municipalities to use suitable layouts, lot finishes, and landscape treatments (such as encouraging Xeriscaping) that minimize water demands.

by **John Huby** **768 - 0421** January 30, 2004

E-mail: huby@okanagan.net