HYDROMETRIC NETWORK REQUIREMENTS FOR THE OKANAGAN BASIN

Photo: Belgo Creek at Highway 33

Prepared for

Okanagan Basin Water Board

British Columbia Ministry of Environment

Prepared by

The Okanagan Hydrometric Network Working Group

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Prepared for the Okanagan Basin Water Board and the Water Stewardship Division, BC Ministry of Environment

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Table of Contents

Section		Page No.
1.	Introduction	1
2.	Methodology	4
3.	Stations Proposed for Future Network	10
4.	Station Costs	11
5.	Conclusions	13
6.	Recommendations	14

Tables

Table 1.	Station Summary	11
Table 2.	Proposed Future Stations	16

Appendices

Appendix A…….. Terms of Reference

Appendix B…….. Tables

Appendix C…….. Maps

Hydrometric Network Requirements for the Okanagan Basin

1. Introduction

Water has been a concern in the Okanagan for more than 100 years. The first hydrometric stations were established in the valley about 1910. In Water Resources Paper No. 1 published by the Dominion Water Power Branch of the Department of the Interior, Ottawa, in 1914, the following statement was made.

> *"Having taken possession of this great resource, it behooves the Governments to administer it wisely and well. It is axiomatic that to do this one of the first things is to take stock; see how much there is; where it is distributed; and how it can be most beneficially used and conserved."*

Ninety-four years later this statement still holds true. The Okanagan Basin is experiencing increasing stress on its water resources. Development in the basin is imposing more demands for water while at the same time, the awareness of potential changes in climate has highlighted the need to plan for the potential of increased demands on what might be a diminishing supply. In addition, the impacts of water use on the basin's ecosystems and the instream flow requirements to sustain and/or restore the ecosystems must be addressed. To manage water resources in the basin effectively it is necessary to understand the following key hydrologic issues:

1. The spatial distribution of natural runoff, particularly the change in runoff with elevation and changes within the basin from north to south and west to east.

2. The variability of natural runoff: how runoff varies seasonally, monthly, weekly and annually. We must have sufficient information to estimate the probability of occurrence of a drought similar to the three consecutive years of drought from 1929 to 1931 and the more recent years of 2002 and 2003.

3. Changing climate. It is apparent from the review of climate trends in the Okanagan over the past 50 years that there has been a shift to warmer temperatures and in precipitation patterns. Does the reported change in climate in the Okanagan represent a long-term shift or does it reflect a climate oscillation over several decades? Annual Okanagan Lake inflows are projected to decline by up to 30% by the latter part of this century (Cohen and Neale, 2006), although it should be noted that estimates of changes in runoff connected with climate change have a high degree of uncertainty. How will the loss of the lodgepole pine in the upper elevations in the Okanagan Basin affect the basin hydrology?

Hydrometric data are fundamental to the future of the valley. Water is the essential element in every aspect of our society; from the water we drink, to our agricultural industry, to the sustainability of the natural ecosystems. The following is a list of some of the primary uses of hydrometric data in the basin:

- Water license management,
- Reservoir operations planning and implementation.
- Water supply planning and management,
- Regional flood and drought frequency analysis,
- Climate change assessment,
- Calibration and verification of hydrologic models, and
- Assessment of aquatic ecosystems.

Over the years since water quantity monitoring began in the Okanagan Basin in the early 1900s, a total of 181 hydrometric stations have been established by the Water Survey of Canada (WSC) and the province, but 156 stations have been discontinued. It must be noted that many stations were short-term and were useful at the time, but the data are of little or no use for hydrology or water management at this time. The maximum number of active WSC stations in the Okanagan was 94 stations in 1973 (refer to table and graph of active WSC stations in Appendix B). Many stations were discontinued in the 1980's and 1990's due to funding limitations, leaving just 25 active

WSC stations in the basin by 2007. Only eight active WSC stations are located on unregulated streams, which is not adequate to provide hydrologic data for water management in the basin.

At one point in the late 1970's the Okanagan Basin was the most intensively monitored watershed in Canada. This network of stations was developed in recognition of the importance of water in the basin and the need to understand the supply in order to be able to manage it properly.

In 1974 the governments of Canada and British Columbia released the results of the Okanagan Basin Study. A key finding of the study was that:

> *"under good water management there is enough water in the basin to supply all the projected withdrawals and meet fishery and recreational requirements in the main valley lakes and in the tributary sub-basins within the foreseeable future."*

The report projected a basin population of 283,000 by the year 2000 and 430,000 by the year 2020 based on "high economic growth" projections. The 2001 Census reported the basin population of nearly 274,000 and nearly 294,000 in 2006. If the present growth trends continue, it is conceivable that the basin population could exceed that projected in 1974 for 2020. To be able to manage the basin water resources in a sustainable manner to meet the range of competing demands and values will require comprehensive water data. Such data will only be available IF the hydrometric network in the basin is improved now to provide operational and long-term water management data.

The project to assess the hydrometric network requirements for the Okanagan Basin was initiated from a request made by Anna Sears, Executive Director, Okanagan Basin Water Board (OBWB), at the *Future of Water Quantity Information in the Okanagan*

Basin workshop held on June 28, 2007 by the OBWB in Kelowna. It was recommended that a technical water quantity work group be formed that would identify the "needs, gaps, priorities and recommendations" regarding water quantity data for the Okanagan Basin, and report the results to the OBWB.

The OBWB and the Ministry of Environment (ministry) agreed to jointly fund the project. Tony Cheong, Ministry of Environment Water Stewardship Division, Victoria provided the project management. The working group membership included:

- Tony Cheong, Ministry of Environment
- Don Dobson, Dobson Engineering Ltd. (chair)
- Phil Epp, Ministry of Environment
- Brian Guy, Summit Environmental Consultants Ltd.
- Bruce Letvak, Ministry of Environment
- Kari Long, Okanagan Nation Alliance
- Stu Mould, Mould Engineering Ltd.
- Bruno Tassone, Water Survey of Canada

The terms of reference for the working group, that also formed Schedule A for the project contract, were prepared by Tony Cheong and Don Dobson and are provided in Appendix A.

2. Methodology

The working group convened via a conference call in October 2007 to review the terms of reference and the proposed work plan. It was agreed that Letvak and Dobson would undertake the initial review work. The group was provided with maps indicating station locations and preliminary lists of stations for consideration in January 2008. In early March 2008 a one-day workshop was held in Kelowna where the group developed a

final list of proposed stations for the network to be recommended to the OBWB. This report summarizes the results of the work by the Technical Water Quantity Working Group over the period from October 2007 through March 2008.

The review involved the following steps:

Step 1: The review was initiated by Dobson and Letvak determining a map scale and area of interest for the Okanagan Basin. It was decided to consider all stations within the basin plus a 10 km wide buffer area around the basin so that active or discontinued stations that were outside the basin but representative of basin hydrology could be considered where necessary. This will be referred to as the “study area”.

Step 2: The next step was to identify the active and discontinued WSC hydrometric stations within the basin and the buffer area as well as those active hydrometric stations operated locally. The ministry had current listing from WSC for the active stations and discontinued stations for the province that were used to identify those stations within the study area. To determine what stations were being operated locally within the study area, a request was sent out to BC Environment in Penticton, Summit Environmental Consultants Ltd., the Oceola Fish and Game Club in Lake Country and to Geostream Environmental Consulting. Letvak and Dobson developed the format for an excel spreadsheet that would be used to list all the known stations. They patterned the spreadsheet on a format that the ministry used as part of an earlier network review in 2000. Lists were compiled for each station category based on the data from the WSC inventory and from data supplied by others. Copies of the spreadsheets are provided in Appendix B.

Active Stations

In 2007 the WSC operated 35 hydrometric stations within the study area of which 25 were within the Okanagan Basin. There were also 39 locally operated stations in the basin. Refer to “active stations” list in Appendix B.

Discontinued WSC Stations

The WSC has operated hydrometric stations in the Okanagan since about 1910. In the 1970s the Okanagan basin had the highest density of active hydrometric of any watershed in Canada. This extensive network was developed through the co-operation of the WSC and the BC Department of Lands, Forests and Water Resources in response to the need for water in the basin for irrigation and domestic use and the fact that the basin has a warm, dry climate. Over the last several decades the hydrometric network has been reduced to its current size due to ongoing budget and capacity issues. By 2007 there had been 209 stations discontinued within the study area of which 156 were within the basin. Refer to “discontinued stations” list in Appendix B.

Step 3: Once the station lists had been compiled, Letvak had the stations plotted on the study area map using ministry GIS support staff (refer to maps of Active and Discontinued Hydrometric Stations in Appendix C). Stations were identified as either active or discontinued and either operated by WSC or others. Dobson and Letvak reviewed the map initially to assess the spatial distribution of the active and discontinued stations.

Step 4: Dobson and Letvak then developed the following criteria to determine the station categories and the basis for the distribution of stations for the proposed future network:

- Criteria for stations recommended for future operations:
  a. The main goal is to support sustainable management of water and related resources (including fisheries, forest hydrology, etc).
  b. The two main categories of station purpose are: M - water management (operations), R - regional hydrology.

- Water Management (M) station criteria - a basic principle was that all watersheds with water resource development/operations should have the following monitoring

undertaken on an ongoing basis, for operations and management of water and related resources:

  - Reservoir level (i.e. storage) for significant reservoirs
  - Outflows from significant reservoirs (including spillway outflow)
  - Withdrawals by water purveyors

- Regional hydrology (R) station criteria - network coverage of regional hydrology stations should be adequate to monitor and understand the hydrology of watersheds at all elevations and latitudes. It is generally understood that the hydrology in the Okanagan is highly variable geographically: with latitude, east/west sides of the valley, longitude, south to north, and with elevation. Okanagan hydrology is also highly variable in time frames of months, years, and decades. The prospect of significant changes connected with climate change creates a need for an adequate monitoring network on an ongoing basis, to supply the knowledge base required for basin wide and local resource management. The ideal stream for a regional hydrology station is an unregulated stream with an undisturbed watershed (an ideal that is very difficult to find in the real world).

- The extensive development of Okanagan tributary watersheds with storage and diversions makes it difficult to locate watersheds that are suitable for regional hydrology. However, there is often overlap between the two main station categories (M and R). Water management stations can also frequently meet some of the uses for regional hydrology. For example a gauged reservoir with gauged outflow will provide reasonably accurate flow volumes down to a monthly (or possibly weekly) time frame, and be adequate for annual and longer time frames. Regional hydrology stations are almost always useful for reference purposes in the ongoing management and operation of developed systems.

Step 5: Dobson and Letvak reviewed the Okanagan sub-basin by sub-basin, to develop a list of stations proposed for future operation to support sustainable resource management. The process incorporated:

- the criteria for station use from Step 4 above
- information on active and discontinued stations from the spreadsheets
- maps and knowledge of Okanagan geography, hydrology, and stream systems (including reservoirs and diversions)
- knowledge of present and likely future resource management needs

Using their extensive experience in hydrology, water management, and hydrometrics in the Okanagan, Dobson and Letvak judged which active or discontinued stations were appropriate for the recommended future network. Where there was a need for a station and no active or discontinued station at that location, a new station was recommended. The recommended stations were designated either R or M according to the primary use.

Step 6: A new spreadsheet was then prepared that listed all the stations recommended for consideration for the future network and a new map was prepared that included only the proposed stations. Refer to “proposed future network” list in Appendix B and the “proposed future network” map in Appendix C.

Step 7: The spreadsheets along with the maps were provided to all the members of the working group for their review. The members were also provided with a summary of the selection criteria, as summarized in Step 4 and requested to review the proposed network with consideration of the overall intent of the network but also from their specific area of knowledge and use of hydrometric data. A conference call was scheduled that provided the group with an opportunity to ask questions and provide feedback to Dobson and Letvak. The results of this review, and feedback from the group were included in the preparation of materials for a subsequent workshop.

Step 8: In early March 2008 a one-day workshop was held in Kelowna that included not only the working group but representatives were invited from the Water Supply Association of BC, the Ministry of Forests and Range in Kamloops, the council of Forest Industries, and the Ministry of Transportation. The workshop focused on a review of the

process used to select the stations and the proposed network. The group spent considerable time reviewing each station that was proposed to confirm that it met the intent of the network. For those stations selected for consideration for the future network the group also completed the columns in the spreadsheet for station uses and identified if data was available in real time (refer to Proposed Future Stations list in Table 2 – columns AA to AK). Dobson and Letvak then used the results from these discussions to produce the final list of recommended stations and the network map that are provided in Appendix C. Letvak developed the final station list spreadsheets and arranged for ministry staff to produce the final maps.

Step 9: Letvak and Tassone provided data on the estimated costs to construct a new hydrometric station and also the current costs to operate the various categories of stations.

Step 10: Dobson then prepared a draft report for the group to review and subsequently the final report.

Step 11: Following the review of the report and the maps by the working group the final report was submitted to the Okanagan Basin Water Board and Ministry of Environment in Victoria for their consideration.

Step 12: Dobson and Letvak offered to meet with the OBWB Board and representatives from the Ministry of Environment to review the report and answer questions.

Step 13: The implementation of the recommendations by the Working Group, the assignment of station operation responsibility, and the operational costs for the proposed network were not part of the Terms of Reference of this project and are matters for the OBWB Board and the ministry to address.

3. Stations Proposed for Future Network

After extensive review and discussion 160 stations were identified as proposed for the future network. This list included the 25 active WSC stations, 32 locally operated stations, 73 currently discontinued WSC stations, and 28 new stations. The network would include 38 regional hydrology stations and 122 water management stations (refer to Table 1). A significant number of the proposed 122 water management stations are existing sites where water suppliers are currently collected data for operational purposes. These sites would be identified as hydrometric data stations and the data collected and archived to RISC standards. Refer also to the Proposed Future Stations list – Table 2, and the Proposed Future Hydrometric Network map in Appendix C.

Many of the water management stations would be operated only during the open water period of the year. For example stations on upland reservoirs would not have to operate over the winter period when the reservoir was ice covered. Similarly stations recording reservoir releases would only operate during the open water period when water was being released. These stations, along with the water diversions at intakes stations, would typically be operated by the water supplier, either by staff or under contract by a qualified contractor. There will also be water management stations that are required by OBWB and the ministry as part of the operation of the Okanagan Flood Control System that would be operated all year. The regional hydrology stations should be operated by WSC as part of the regional hydrometric network as all-year stations.

Table 1. Station Summary

	Okanagan Valley	Study Area	Study Area	
Active Stations 2007				
Operated by WSC	25	35		
Operated by others	39	39		
Sub-total	64	74		
Discontinued Stations 2007				
Operated by WSC	156	209		
Proposed Network			R	M
Currently active WSC	25	27	10	17
Active operated by others	32	32	1	31
Sub-total	57	59	11	48
Discontinued WSC	65	73	24	49
New (never existed)	28	28	3	25
Sub-total	93	101	27	74
Total Proposed	**150**	**160**	**38**	**122**

Notes:
1. Study area station counts include Okanagan Valley and 'buffer" area.
2. R - regional hydrology, M - resource management

4. Station Costs

Construction Costs

Construction costs for WSC stations are highly variable and dependent upon the site conditions as well as the seasonal operating period. Stations on small streams, e.g. typically less than 10 m wide, that are required to be operated only during the open water period, can range in cost from $10,000 – $20,000 to design and construct depending upon access to the site. Normally these stations will not require cableways or elaborate flow control structures. A cableway or metering bridge can cost from $15,000-$40,000 if needed, and a streambed flow control can cost $5,000-$20,000.

For locally operated stations, assumed to be a simple water level recording setup with no metering facility or flow control, installation cost would be in the range of $3,000 - $6,000.

Operating Costs

The annual operating cost for a WSC hydrometric station in the Okanagan ranges from $9,000 – $11,500. Stations that provide discharge data generally cost more than water level only stations (e.g. lake level). The additional annual cost of real-time data telemetry is $400-$700 per station. Operating costs vary based on the location of the station, the number of discharge measurements required to meet the national standards for the data, and the difficulty in working up the data. High elevation all-year stations where there is considerable period of ice cover require much more work to produce the discharge record than a station on the valley floor that never has ice cover. Water Survey of Canada will operate stations for outside parties that provide operations funding – this is managed through the provincial Ministry of Environment.

Operations costs for locally operated discharge stations (seasonal, open water conditions only) would likely be in the range of $3,000 – $6,000 per year, by local contractor. It should be noted that if local water supply agencies wish to compare contract costs vs. the cost of operating stations themselves, they should take care to include all costs.

Hydrometric Standards

WSC national standards for hydrometric operations are a detailed set of practices that include operational practices for field operations, data computations, review/approval, complete record keeping, and archiving/dissemination. These constitute a standards system, which makes it possible to "prove" the quality of WSC data.

B.C. provincial hydrometric standards at this time consist of a first version of a manual of operations procedures. There is no standard system that addresses data review and

approval. An updated manual is in development, along with a recommended standards system that will include data review/approval and professional accountability. If a fully functional provincial standards system is implemented and maintained, data collected by local parties should be collected in a provincial database.

5. Conclusions

a. The current WSC hydrometric network of 25 stations in the basin is not adequate for the existing and future water management needs and regional hydrology needs in the Okanagan basin.
b. To meet the long-term requirements for hydrometric data in the Okanagan basin, the network should be expanded to include most, if not all the stations 160 stations identified in the Proposed Future Stations table, Table 2.
c. The network should be an integrated network, including stations operated by WSC and locally operated stations. Locally operated stations should be constructed and operated to the provincial Resource Inventory Standards Committee (RISC) standards for hydrometric data, and data archived in a central database accessible to all users.
d. The network expansion should be directed by the OBWB with coordination by the Science and Information Branch (SIB) of Ministry of Environment. SIB has two roles connected with hydrometric data collection in BC. One role is the provincial side coordination of the Federal-Provincial Hydrometric Agreement under which the Water Survey of Canada network is operated. The other role of SIB regarding hydrometric is the development and implementation of a provincial standards system for hydrometric operations by other parties (non WSC) and operation of a provincial database.
e. The timeline for completing the network should be coordinated between the OBWB, the ministry and the water suppliers with the expanded network in full operation by 2013.

6. Recommendations

a. The Okanagan Hydrometric Network should be expanded to the 160 stations +/- proposed in this report as expeditiously as possible. Establishment of stations will require further investigation including field reconnaissance, etc. This may result in revisions to the proposed list.
b. As soon as this report has been accepted by the OBWB and the ministry, it should be made available through the OBWB website to all water suppliers and other interested parties.
c. The OBWB should consider scheduling a workshop for water suppliers, First Nations, fisheries groups, local governments, the agriculture, forestry and mining sectors, and the interested public to review the recommendations and develop an implementation plan.
d. It is strongly recommended that the province implement a complete hydrometric standards system so data collected by parties other than WSC can be shown to meet data quality.
e. The ministry and/or the OBWB should establish, as quickly as possible, a permanent, managed data warehouse such as the WIDM (Water Information Data Management) system that the ministry has been developing and encourage that the data from locally operated stations be submitted for archiving. There is a considerable volume of existing hydrometric data in private databases that should be collected and archived before it is lost. While it is clearly in the self-interest of water users to collect and archive data on their systems, it is noted that there are powers under the Water Act to require submission and collection of data in connection with water licenses.
f. Ancillary data collection – climate (air temperature and precipitation) and water temperature were not part of the scope of this report, but can be added to hydrometric stations. It is recommended that consideration be given to adding six climate stations on each side of the Okanagan valley at medium to high elevations, to attain better understanding of hydrologic parameters that have an impact on

runoff. Water temperature data collection may also be considered in connection with fisheries and water quality concerns.

D.A. Dobson, PEng, Chair, Okanagan Hydrometric Network Working Group

Table 2. Proposed Future Stations

	A	D	E	I	N	O	P	S	T	U	W	X	AA	AB	AC	AD	AE	AF	AG	AH	AI	AN
1			**Okanagan Hydrometric Review 2007/08**										**STATION USES:**									
2	Recc. Future ops. Primary use #1	Station Number	Station Name	Flow Regulation	Years (end - start)	Hydrometric Programs Start Date	Hydrometric End date	Program Operation: C=contin., S=seas.(open water)			Latitude	Longitude	Min	For	Pow	Fis	R	W	Tra	Res	Telemetry need	COMMENTS:
3	M = resource management; R= regional hydrology																					
4																						
5			**WSC STATIONS ACTIVE IN 2007 PROPOSED FOR FUTURE NETWORK**																			
6	R	08LC040	VANCE CREEK BELOW DEAFIES CREEK	NAT				C			50.28500	-118.94800		x			x					near Lumby, Silver Star. Good R stn.
7	R	08LC042	BESSETTE CREEK ABOVE LUMBY LAGOON OUTFALL	REG				C			50.25300	-118.96100		x		x	x		x			d/s of Duteau & Creighton. Good geog sample. Unregulated. Diverted into Okanagan lower d/s.
8	M	08NL022	SIMILKAMEEN RIVER NEAR NIGHTHAWK					C			48.98500	-119.61700						x				South Main Okanagan System Operation
9	M	08NM002	OKANAGAN RIVER AT OKANAGAN FALLS	REG				C			49.34200	-119.58000				x	x	x				Okanagan system operations.
10	R	08NM037	SHATFORD CREEK NEAR PENTICTON	REG				C			49.41600	-119.78900				x	x	x				Regional hydrology. First Nations. Fisheries. Regulated???
11	R	08NM041	TREPANIER CREEK NEAR PEACHLAND	REG				C			49.82500	-119.78600	x	x		x		x			x	Fisheries, Peachland ID
12	M	08NM050	OKANAGAN RIVER AT PENTICTON	REG				C			49.49900	-119.61500			x	x	x	x			x	Okanagan system operations.
13	M	08NM065	VERNON CREEK AT OUTLET OF KALAMALKA LAKE	REG				C			50.23700	-119.26800				x		x			x	Okanagan system operations.
14	M	08NM073	OSOYOOS LAKE NEAR OROVILLE					C			48.95700	-119.43800				x	x	x			x	Okanagan system operations.
15	M	08NM083	OKANAGAN LAKE AT KELOWNA	REG				C			49.88600	-119.50100				x	x	x			x	Okanagan system operations.
16	M	08NM084	SKAHA LAKE AT OKANAGAN FALLS	REG				C			49.42700	-119.57400				x	x	x			x	Okanagan system operations.
17	M	08NM085	OKANAGAN RIVER NEAR OLIVER	REG				C			49.11500	-119.56600				x	x	x			x	Okanagan system operations.
18	M	08NM116	MISSION CREEK NEAR EAST KELOWNA	REG				C			49.87800	-119.41300		x		x	x	x			x	Okanagan system operations.
19	M	08NM127	OKANOGAN RIVER AT OROVILLE					C			48.93100	-119.41900				x	x	x			x	Okanagan system operations.
20	R	08NM134	CAMP CREEK AT MOUTH NEAR THIRSK	NAT				C			49.72500	-120.01700		x		x	x	x	x		x	Regional hydrology. Summerland water supply operations.
21	R	08NM142	COLDSTREAM CREEK ABOVE MUNICIPAL INTAKE	NAT				C			50.25800	-119.08100				x	x	x			x	runoff from near Silver Star
22	M	08NM143	KALAMALKA LAKE AT VERNON PUMPHOUSE	REG				C			50.23000	-119.27300				x	x	x			x	Okanagan system operations.
23	R	08NM171	VASEUX CREEK ABOVE SOLCO CREEK	NAT				C			49.24900	-119.32000		x		x	x				x	Regional hydrology. High elev.
24	M	08NM173	GREATA CREEK NEAR THE MOUTH	NAT				C			49.79400	-119.85100				x	x	x	x			Peachland water supply ops. Will be regulated in 2008
25	R	08NM174	WHITEMAN CREEK ABOVE BOULEAU CREEK	NAT				C			50.21300	-119.53700		x		x	x	x	x		x	Regional hydrology. First Nations.
26	M	08NM200	INKANEEP CREEK NEAR THE MOUTH	REG				C			49.07800	-119.50100				x	x				x	First Nations. Fisheries. Some regulation
27	M	08NM232	BELGO CREEK BELOW HILDA CREEK	REG				C			49.99900	-119.07300		x		x	x	x				BMID ops.
28	R	08NM240	TWO FORTY CREEK NEAR PENTICTON	NAT				C			49.65100	-119.40000		x			x			x	x	Regional hydrology. MOFR
29	M	08NM241	TWO FORTY-ONE CREEK NEAR PENTICTON	NAT				C			49.64900	-119.39400		x			x			x	x	MOFR
30	M	08NM242	DENNIS CREEK NEAR 1780 METRE CONTOUR	NAT				C			49.62400	-119.38200		x		x	x			x		MOFR
31	M	08NM243	VASEUX LAKE NEAR THE OUTLET	REG				C			49.27400	-119.52300				x	x	x			x	Okanagan system operations.
32	R	08NN015	WEST KETTLE RIVER NEAR MCCULLOCH	NAT				C			49.70200	-119.09200		x		x	x					Regional hydrology.
33																						
34			**NEW STATIONS PROPOSED FOR FUTURE NETWORK**																			
35	M	OKPN1	TERRACE CREEK d/s OF BIG HORN RESERVOIR					S			50 01 59	119 45 59				x		x				
36	M	OKPN2	TADPOLE RESERVOIR, NORTH LAMBLY CREEK					S			50 04 21	119 40 06				x		x				
37	M	OKPN3	ALOCIN CREEK DIVERSION TO POWERS CREEK					S			50 01 00	119 47 17				x		x				
38	M	OKPN4	POWERS CREEK DIVERSION TO WESTBANK ID INTAKE					S			49 51 29	119 40 25				x		x				
39	M	OKPN5	LAMBLY RESERVOIR ON POWERS CREEK					S			49 57 29	119 33 27				x		x			x	
40	R	OKPN6	LACOMA CREEK d/s LACOMA LAKE					S			49 53 08	119 53 00		x		x	x			x		Unregulated
41	M	OKPN7	MILL CR. u/s OF GEID INTAKE					S			49 58 43	119 21 13						x			x	
42	M	OKPN8	MISSION CREEK DIVERSION TO BMID					S			49 51 15	119 16 00				x		x			x	
43	M	OKPN9	MCCULLOCH RESERVOIR ON HYDRAULIC CR.					S			49 46 58	119 11 06				x		x			x	
44	M	OKPN10	PEACHLAND CR. d/s OF MUNICIPAL INTAKE					S			49 45 08	119 47 57				x		x				
45	M	OKPN11	PENTICTON CREEK DIVERSION TO CITY OF PENTICTON INTAKE					S			49 29 36	119 32 51						x			x	
46	R	OKPN12	ELLIS CREEK HEADWATERS u/s OF ELLIS RESERVOIR					S			49 28 52	119 20 51					x	x				
47	M	OKPN13	ELLIS RESERVOIR					S			49 28 12	119 22 08				x		x				
48	M	OKPN14	ELLIS CR. DIVERSION TO CITY OF PENTICTON IRRIG.					S			49 28 30	119 32 56				x		x				
49	M	OKPN15	DARKE CR. NEAR THE MOUTH					S			49 36 47	119 46 51						x				
50	M	OKPN16	DARKE LAKE RESERVOIR					S			49 42 36	119 51 49						x				
51	R	OKPN17	RATNIP CR. u/s OF CHUTE LAKE					S			49 42 05	119 31 31				x	x					Unregulated
52	M	OKPN18	PINAUS LAKE RESERVOIR (EQUESIS CR.)					S			50 25 14	119 34 17				x	x	x				
53	M	OKPN19	ISINTOK RESERVOIR (TROUT CR.)					S			49 32 44	119 58 11				x		x				
54	M	OKPN20	WHITEHEAD LAKE RESERVOIR (TROUT CR.)					S			49 47 32	120 10 58				x		x				
55	M	OKPN21	CRESCENT LAKE RESERVOIR (TROUT CR.)					S			49 48 35	120 04 28				x		x				
56	M	OKPN22	HEADWATERS RESERVOIR (TROUT CR.)					S			49 48 38	120 00 27						x				
57	M	OKPN23	JACKPINE RESERVOIR (POWERS CR.)					S			49 55 02	119 48 22						x				
58	M	OKPN24	HORSESHOE-DOBBIN RESERVOIR (POWERS CR.)					S			49 59 26	119 48 39						x				
59	M	OKPN25	KING EDWARD LAKE RESERVOIR (DEER CR.)					S			50 09 15	119 13 04						x				

Table 2. Proposed Future Stations

	A	D	E	I	N	O	P	S	T	U	W	X	AA	AB	AC	AD	AE	AF	AG	AH	AI	AN
2	Recc. Future ops. Primary use #1	Station Number	Station Name	Flow Regulation	Years (end - start)	Hydrometric Programs Start Date	Hydrometric End date	Program Operation: C=contin., S=seas.(open water)			Latitude	Longitude	Min	For	Pow	Fis	R	W	Tra	Res	Telemetry need	COMMENTS:
60	M	OKPN26	BIG MEADOW RESERVOIR (CHUTE CR.)					S			49 40 45	119 27 51						x				
61	M	OKPN27	ELINOR RESERVOIR (ROBINSON CR.)					S			49 39 19	119 32 06						x				
62	M	OKPN28	NARAMATA RESERVOIR (ROBINSON CR.)					S			49 39 18	119 32 07						x				
63																						
64	**LOCALLY OPERATED STATIONS PROPOSED FOR FUTURE NETWORK**																					
65	M	OKPL1	ESPERON RESERVOIR AT THE OUTLET			2007		S			50°04'47" N	119°44'56" W						x				operated for LID
66	M	OKPL2	MISSION CREEK d/s BMID INTAKE			2004		S			49°51'0" N	119°17'0" W				x	x	x				operated for BMID
67	M	OKPL3	GRAYSTOKE RESERVOIR AT THE OUTLET			2007		S			49°59'8" N	118°52'15" W				x	x	x				operated for BMID
68	M	OKPL4	FISH HAWK RESERVOIR AT THE OUTLET			2007		S			50°01'45" N	118°51'46" W				x	x	x				operated for BMID
69	M	OKPL5	LOCH LONG RESERVOIR AT THE OUTLET			2007		S			49°58'15" N	118°54'15" W				x	x	x				operated for BMID
70	M	OKPL6	IDEAL RESERVOIR AT THE OUTLET			2007		S			50°00'38" N	119°05'52" W				x	x	x				operated for BMID
71	M	OKPL7	JAMES RESERVOIR AT THE OUTLET			2007		S			49°57'06" N	119°14'47" W						x				operated for BMID
72	M	OKPL8	LAMBLY CREEK DIVERSION TO ROSE VALLEY LAKE			2001		S			49°54'38" N	119°33'18" W				x		x				operated for LID
73	M	OKPL9	NORTH LAMBLY CREEK d/s TADPOLE RESERVOIR			2007		S			50°02'12" N	119°45'30" W						x				operated for LID
74	M	OKPL10	BIGHORN RESERVOIR			2007		S			50°04'17" N	119°40'08" W						x				operated for LID
75	M	OKPL11	POOLEY CREEK u/s POOLEY DITCH			2004		S			49°44'51" N	119°20'14" W					x	x				operated for SEKID
76	M	OKPL12	MYRA DITCH near KLO CREEK			2004		S			49 44 49	119 16 28						x				operated for SEKID
77	M	OKPL13	STIRLING CREEK DIVERSION TO MCCULLOCH RESERVOIR			2004		S			49°43'50" N	119°12'59" W						x				operated for SEKID
78	M	OKPL14	CANYON CREEK DIVERSION TO MCCULLOCH RESERVOIR			2004		S			49°44'38" N	119°16'28" W						x				operated for SEKID
79	M	OKPL15	HYDRAULIC CREEK u/s of STIRLING DITCH			2004		S			49°44'53" N	119°13'09" W		x			x	x				operated for SEKID
80	M	OKPL16	POSTILL RESERVOIR AT THE OUTLET			2005		S			49°59'43" N	119°12'48" W					x	x				operated for GEID
81	M	OKPL17	MILL CREEK d/s of POSTILL RESERVOIR			2005		S			49°59'44" N	119°12'49" W						x				operated for GEID
82	M	OKPL18	ELLIS CREEK NEAR THE MOUTH			2007		S			49 28 36 N	119 35 49 W				x		x				operated for City of Penticton
83	M	OKPL19	PENTICTON CREEK AT VAN HORNE			2007		S			49 30 00 N	119 35 28 W				x		x				operated for City of Penticton
84	M	OKPL20	UPPER DUTEAU CR. u/s of GRIZZLY RESERVOIR			2008		S			50 02 48 N	119 04 23 W		x		x	x	x				operated for Greater Vernon Services
85	M	OKPL21	CURTIS CREEK u/s of ABERDEEN RESERVOIR			2008		S			50 06 46 N	119 01 30 W		x		x	x	x				operated for Greater Vernon Services
86	M	OKPL22	HEART CREEK u/s of ABERDEEN RESERVOIR			2008		S			50 05 44 N	119 02 50 W		x		x	x	x				operated for Greater Vernon Services
87	M	OKPL23	TROUT CREEK d/s of CANYON			2004		S			49°34'14" N	119°39'00" W				x						operated by MoE
88	M	OKPL24	TREPANIER CREEK AT HWY 97			2006		S			49°47'03" N	119°42'52" W				x						operated by MoE see old WSC stn
89	M	OKPL25	TREPANIER CREEK d/s HWY 97C			2006		S			49°48'25" N	119°44'36" W				x						operated by MoE
90	M	OKPL26	TREPANIER CREEK u/s HWY 97C			2006		S			49°48'45" N	119°44'53" W				x						operated by MoE
91	M	OKPL27	POWERS CREEK AT GELLATLY RD			2004		S			49°48'51" N	119°37'48" W				x						operated by MoE needs to be replaced by upstream stn
92	M	OKPL28	MISSION CREEK u/s of GORDON DR			2006		S			49°50'31" N	119°28'51" W				x						operated by MoE
93	M	OKPL30	MISSION CREEK u/s of E. KELOWNA RD			2007		S			49°51'51" N	119°23'23" W				x						operated by MoE
94	R	OKPL29	PEARSON CREEK NEAR THE MOUTH 08NM172			2006		S			49°53'12" N	119°03'42" W		x		x	x	x				operated by MoE
95	M	OKPL31	PARADISE CR. NEAR LUMBY			2008		S			50°05'31" N	118°56'27" W						x				to be operated by Greater Vernon Water. Near, but not at old WSC stn.
96	M	OKPL32	MILL CR.DIVERSION TO G.E.I.D.			2006		S			49°55'55"N	119°20'38"W						x				
97																						
98	**DISCONTINUED WSC STATIONS PROPOSED FOR FUTURE NETWORK**																					
99	R	08LC005	BESSETTE CREEK NEAR LUMBY	REG	65	1/1/1919	12/31/1983	C									x					Natural. Restart. U/s of Duteau, Creighton
100	M	08LC014	DUTEAU CREEK AT OUTLET OF HADDO LAKE	REG	70	1/1/1910	12/31/1979	S								x		x				Water management station. Must capture spill
101	M	08LC035	FORTUNE CREEK NEAR ARMSTRONG	REG	74	1/1/1911	12/31/1984	C										x				"reg" not much. Quite natural. Rev 204
102	M	08LC043	ABERDEEN LAKE AT THE OUTLET	REG	19	1/1/1968	12/31/1986	S										x				
103	M	08LC044	HADDO LAKE AT THE OUTLET	REG	19	1/1/1968	12/31/1986	S								x		x			x	operated by GVS
104	M	08LC047	GRIZZLY SWAMP NEAR HADDO LAKE	REG	9	1/1/1978	12/31/1986	S										x				
105	R	08NL014	KEREMEOS CREEK ABOVE MARSEL CREEK	NAT	17	1/1/1912	12/31/1928	C									x					Do we want this or Horn Creek 08NM147 or 049???
106	R	08NL048	SHINISH CREEK NEAR PRINCETON	NAT	1	1/1/1973	12/31/1973	C									x					
107	R	08NM005	MCLEAN CREEK NEAR OKANAGAN FALLS	NAT	6	1/1/1921	12/31/1926	C									x					Low elevation watershed
108	R	08NM006	SHUTTLEWORTH CREEK NEAR OKANAGAN FALLS	REG	44	1/1/1921	12/31/1964	C								x	x					need station near mouth of canyon
109	M	08NM010	HYDRAULIC CREEK NEAR THE MOUTH	REG	73	1/1/1910	12/31/1982	C								x		x				Hydraulic Cr near mouth (d/s Sekid intake)
110	M	08NM011	HYDRAULIC CREEK AT OUTLET OF MCCULLOCH RESERVOIR	REG	68	1/1/1919	12/31/1986	S										x				Hydraulic Cr d/s McCulloch Reservoir (Move d/s of Fish, Browne, Long Meadow inflow??)
111	R	08NM012	INKANEEP CREEK NEAR OLIVER (LOWER STATION)	NAT	40	1/1/1911	12/31/1950	C									x					
112	M	08NM014	MCDOUGALL CREEK NEAR WESTBANK	REG	10	1/1/1920	12/31/1929	S									x					Natural flow WSC, 3 reservoirs
113	R	08NM015	VASEUX CREEK ABOVE DUTTON CREEK	NAT	72	1/1/1911	12/31/1982	S									x					
114	R	08NM020	B.X. CREEK ABOVE VERNON INTAKE	REG	79	1/1/1921	12/31/1999	C									x					
115	M	08NM022	VERNON CREEK AT OUTLET OF SWALWELL LAKE	REG	78	1/1/1921	12/31/1998	S								x		x				Vernon Ck below Swalwell (d/s spillway)
116	M	08NM028	OYAMA CREEK OYAMA DIVERSION	REG	12	1/1/1920	12/31/1931	C										x				Oyama Cr diversion
117	M	08NM030	PEACHLAND CREEK MUNICIPAL IRRIGATION DIVERSION	REG	8	1/1/1919	12/31/1926	S								x		x				Peachland Municipal intake

Table 2. Proposed Future Stations

	A	D	E	I	N	O	P	S	T	U	W	X	AA	AB	AC	AD	AE	AF	AG	AH	AI	AN
2	Recc. Future ops. Primary use #1	Station Number	Station Name	Flow Regulation	Years (end - start)	Hydrometric Programs Start Date	Hydrometric End date	Program Operation: C=contin., S=seas.(open water)			Latitude	Longitude	Min	For	Pow	Fis	R	W	Tra	Res	Telemetry need	COMMENTS:
118	M	08NM033	POWERS CREEK ABOVE WESTBANK DIVERSION	NAT	55	1/1/1920	12/31/1974	S								x		x				U/s of Westbank diversion. Use this one or 8NM059
119	R	08NM035	BELLEVUE CREEK NEAR OKANAGAN MISSION	NAT	76	1/1/1911	12/31/1986	C									x					Near Okanagan Mission
120	M	08NM036	SCOTTY CREEK NEAR RUTLAND	NAT	54	1/1/1911	12/31/1964	S								x		x				ONLY IF above BMID intake
121	R	08NM038	SHINGLE CREEK ABOVE KALEDEN DIVERSION	NAT	58	1/1/1920	12/31/1977	C									x	x				
122	M	08NM042	TROUT CREEK NEAR SUMMERLAND	REG	9	1/1/1920	12/31/1928	S								x		x				Is this being operated by Phil Epp???
123	R	08NM047	NASWHITO CREEK NEAR EWING'S LANDING	NAT	10	1/1/1912	12/31/1921	C									x					
124	M	08NM048	OYAMA CREEK ABOVE WOOD LAKE IRRIGATION INTAKE	REG	67	1/1/1921	12/31/1987	S										x				Oyama Cr above diversion (wsc) better to msr belwo diversion
125	R	08NM049	HORN CREEK NEAR KALEDEN	NAT	1	1/1/1920	12/31/1920	C									x					Review station history. Do we want this or 08NM147?? Or what about 08NL014 Keremeos C abv Marshall C??
126	M	08NM054	TROUT CREEK NEAR FAULDER	REG	34	1/1/1921	12/31/1954	S								x		x				
127	M	08NM055	TROUT CREEK SUMMERLAND DIVERSION	NAT	10	1/1/1922	12/31/1931	C								x		x				Summerland Municipal intake
128	M	08NM059	POWERS CREEK BELOW WESTBANK DIVERSION	REG	76	1/1/1912	12/31/1987	S								x		x				below WID diversion. Use this on or 8NM033
129	M	08NM062	SWALWELL LAKE NEAR OKANAGAN CENTRE	REG	69	1/1/1926	12/31/1994	S										x				Swalwell
130	R	08NM082	INKANEEP CREEK NEAR OLIVER (UPPER STATION)	NAT	37	1/1/1941	12/31/1977	C									x					
131	M	08NM114	OLIVER CANAL NEAR OLIVER	REG	39	1/1/1934	12/31/1972	S								x		x				operated by the town of Oliver
132	M	08NM119	DEEP CREEK AT ARMSTRONG	REG	32	1/1/1951	12/31/1982	S								x	x					?? Urban influence. Relatively natural re regulating. Watershed mostly farms. 2nd priority. Do we need the stn at the mouth??
133	R	08NM120	PARK RILL NEAR OLIVER	REG	20	1/1/1951	12/31/1970	C									x					
134	R	08NM121	WOLFCUB CREEK NEAR OLIVER	REG	1	1/1/1952	12/31/1952	C									x					
135	M	08NM122	ELLIS CREEK NORTH MAIN DIVERSION	REG	3	1/1/1955	12/31/1957	C								x		x				need stn for present diversion
136	R	08NM126	HAYNES CREEK NEAR OSOYOOS	NAT	53	1/1/1912	12/31/1964	C									x					
137	M	08NM129	JOE RICH CREEK NEAR RUTLAND	REG	24	1/1/1964	12/31/1987	S								x	x	x				
138	R	08NM130	TESTALINDEN CREEK NEAR OLIVER	REG	58	1/1/1911	12/31/1968	C									x					Review history, choose this one or 08NM164
139	R	08NM133	BULL CREEK NEAR CRUMP	NAT	22	1/1/1965	12/31/1986	C								x	x	x				
140	M	08NM136	LAMBLY LAKE DIVERSION TO POWERS CREEK	REG	8	1/1/1965	12/31/1972	S								x		x			x	Lambly reservoir WID SCADA
141	R	08NM137	DAVES CREEK NEAR RUTLAND	NAT	22	1/1/1965	12/31/1986	C									x					
142	M	08NM138	TERRACE CREEK NEAR KELOWNA	REG	28	1/1/1965	12/31/1992	S										x				
143	R	08NM146	CLARK CREEK NEAR WINFIELD	NAT	15	1/1/1968	12/31/1982	C								x	x					Clark Ck . Low elevation (WSC) Oyama Lake spills into Clark Creek - need to monitor
144	R	08NM147	HORN CREEK NEAR OLALLA	NAT	10	1/1/1968	12/31/1977	C									x					Review this station and also 08NM148. Do we want one of them?
145	R	08NM148	TWIN LAKES NEAR OLALLA	REG	10	1/1/1968	12/31/1977	C									x					Check also 08NM147. Do we want either?
146	M	08NM150	SHINGLE CREEK AT THE MOUTH	REG	14	1/1/1969	12/31/1982	S								x	x	x				Shingle at mouth
147	M	08NM161	EQUESIS CR. NEAR THE MOUTH	REG		1/1/1969	12/31/1982	S									x					
148	M	08NM163	CROOKED LAKE AT THE OUTLET	REG	12	1/1/1970	12/31/1981	S										x				Crooked
149	R	08NM164	TESTALINDEN CREEK IN CANYON	NAT	18	1/1/1969	12/31/1986	C									x					Review history, choose this one or 08NM130
150	M	08NM166	LAMBLY CREEK BELOW BALD RANGE CREEK	REG	13	1/1/1970	12/31/1982	S								x		x				Lambly below Bald Range
151	M	08NM168	PENTICTON CREEK ABOVE DENNIS CREEK	REG	30	1/1/1970	4/1/1999	S										x				outflow from Greyback Reservoir
152	M	08NM169	GREYBACK LAKE AT THE OUTLET	REG	18	1/1/1970	12/31/1987	S								x		x				Greyback Reservoir
153	R	08NM176	EWER CREEK NEAR THE MOUTH	NAT	16	1/1/1971	12/31/1986	C								x	x	x				Some logging
154	M	08NM202	PEACHLAND LAKE RESERVOIR OUTFLOW	REG	10	1/1/1973	12/31/1982	C								x		x				Peachland Reservoir outflow
155	M	08NM205	HYDRAULIC CREEK DIVERSION TO S.E.K.I.D.	REG	5	1/1/1976	12/31/1980	C										x			x	SEKID intake (Active SCADA)
156	M	08NM207	MYRA DITCH BELOW KLO CREEK	REG	13	1/1/1973	12/31/1985	S										x				Myra ditch d/s of Canyon Creek inflow. DEL operates
157	M	08NM213	MCCULLOCH RESERVOIR AT MCCULLOCH DAM	REG	14	1/1/1973	12/31/1986	C										x			x	Reservoir (SEKID operates)
158	M	08NM215	FISH LAKE AT THE OUTLET	REG	5	1/1/1973	12/31/1977	S										x				Too small to bother?
159	M	08NM216	BROWNE LAKE RESERVOIR ABOVE THE DAM	REG	5	1/1/1973	12/31/1977	S										x				Too small to bother?
160	M	08NM217	LONG MEADOW LAKE RESERVOIR ABOVE THE DAM	REG	5	1/1/1973	12/31/1977	S										x				Too small to bother?
161	M	08NM220	PEACHLAND LAKE NEAR PEACHLAND	REG	12	1/1/1973	12/31/1984	S								x		x				Peachland Reservoir
162	M	08NM224	OYAMA LAKE AT THE OUTLET	REG	26	1/1/1961	12/31/1986	S										x				Oyama Lake
163	M	08NM227	GARNET LAKE NEAR SUMMERLAND	REG	9	1/1/1973	12/31/1981	S										x				Garnet Res (Summerland)
164	M	08NM228	ENEAS CREEK NEAR SUMMERLAND	REG	2	1/1/1974	12/31/1975	S										x				Eneas Cr (d/s Garnet res) near Summerland
165	M	08NM229	LOCH KATRINE CREEK AT OUTLET OF GRAYSTOKE LAKE	REG	23	1/1/1977	1/1/1999	S								x	x	x				out flow from Graystoke Reservoir
166	M	08NM230	GRAYSTOKE LAKE AT THE OUTLET	REG	23	1/1/1977	1/1/1999	S								x	x	x				Reservoir
167	M	08NM231	IDEAL LAKE NEAR THE OUTLET	REG	18	1/1/1963	12/31/1980	S								x		x				Reservoir
168	M	08NM233	MISSION CREEK ABOVE PEARSON CREEK	REG	6	1/1/1977	12/31/1982	S								x	x	x				above Pearson (if OK site can be ????)
169	M	08NM236	VERNON CREEK DIVERSION TO W.O.C.I.D.	REG	6	1/1/1973	12/31/1978	S							x	x		x				WOCID Diversion (now Lake Country)
170	M	08NM237	TROUT CREEK BELOW THIRSK LAKE	REG	9	1/1/1978	12/31/1986	S								x		x				Trout Ck R/S Thirsk
171	M	08NM238	THIRSK LAKE NEAR THE OUTLET	REG	9	1/1/1979	12/31/1987	S								x		x				
172																						
173																						

Appendix A

Terms of Reference

(Schedule A)

SCHEDULE A – SERVICES
Okanagan Sustainable Hydrometric Network

The contractor will lead and complete a Hydrometric Needs Assessment for the Okanagan by:

- Acting as Chair for the Technical Water Monitoring Working Group (TWMWG) meeting as required.
- Assigning staff or sub-contractors to participate on the TWMWG as required
- Identifying currently active WSC and non-WSC hydrometric stations in the Okanagan, as well as discontinued WSC stations
- Determining the most appropriate criteria to use to determine the proposed hydrometric network for the Okanagan
- Proposing number and location for stations in the proposed network.
- Estimating costs for the optimum network
- Preparing a draft report (MS Word format) by February 29, 2008. The report will include:
  - maps, tables and diagrams summarizing existing and proposed hydrometric stations
  - the process, criteria and considerations used to determine numbers and locations of new hydrometric monitoring
  - the criteria and considerations for identifying whether a new station should be WSC operated or to RISC standards
  - Recommendations for next steps.
- Submitting a final report (MS Word and PDF format) by March 21, 2008.
- Presenting project or report details and recommendations as required.

Appendix B

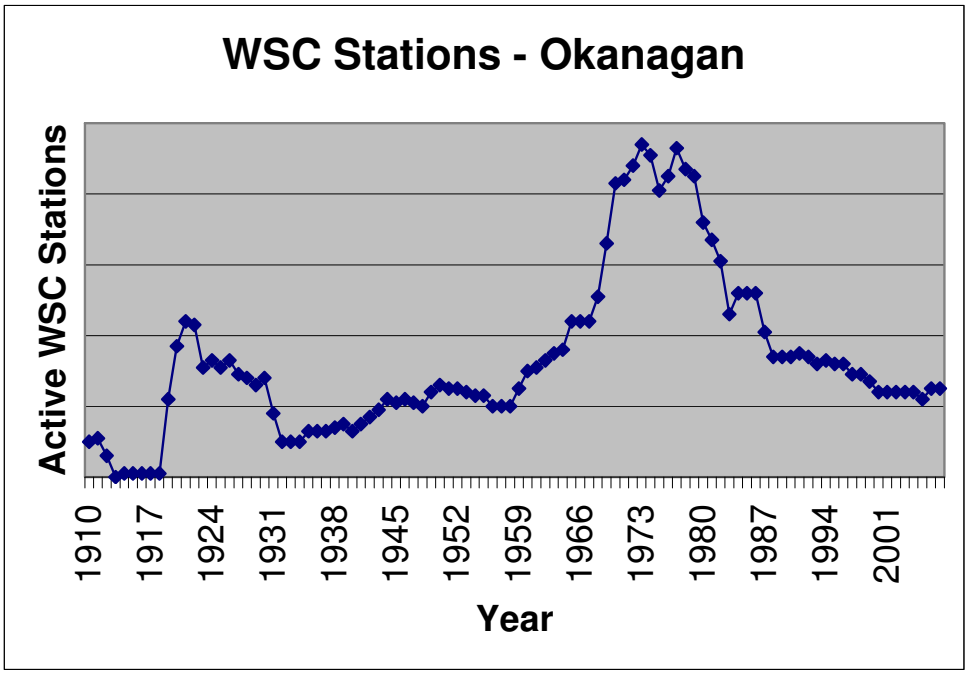
History of Active WSC Stations in Okanagan

Active Stations 2007

Discontinued WSC Stations

History of Active WSC Stations in Okanagan

Year	WSC Stations	Year	WSC Stations	Year	WSC Stations	Year	WSC Stations
1910	10	1935	13	1960	30	1985	52
1911	11	1936	13	1961	31	1986	52
1912	6	1937	13	1962	33	1987	41
1913	0	1938	14	1963	35	1988	34
1914	1	1939	15	1964	36	1989	34
1915	1	1940	13	1965	44	1990	34
1916	1	1941	15	1966	44	1991	35
1917	1	1942	17	1967	44	1992	34
1918	1	1943	19	1968	51	1993	32
1919	22	1944	22	1969	66	1994	33
1920	37	1945	21	1970	83	1995	32
1921	44	1946	22	1971	84	1996	32
1922	43	1947	21	1972	88	1997	29
1923	31	1948	20	1973	94	1998	29
1924	33	1949	24	1974	91	1999	27
1925	31	1950	26	1975	81	2000	24
1926	33	1951	25	1976	85	2001	24
1927	29	1952	25	1977	93	2002	24
1928	28	1953	24	1978	87	2003	24
1929	26	1954	23	1979	85	2004	24
1930	28	1955	23	1980	72	2005	22
1931	18	1956	20	1981	67	2006	25
1932	10	1957	20	1982	61	2007	25
1933	10	1958	20	1983	46		
1934	10	1959	25	1984	52		



Active Stations 2007

	A	D	E	I	N	O	P	S	T	U	W	X	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ
1			**Okanagan Hydrometric Review 2007/08**										**STATION USE AND PRIORITY:**									
2	Recc. Future ops. Primary use #1	Stn. No.	Station Name	Flow Regulation	Years (end - start)	Hydrometric Programs Start Date	Hydrometric End date	Program Operation: C=contin., S=seas.(open water)			Latitude	Longitude	Min	For	Pow	Fis	R	W	Tra	Res		COMMENTS:
3	M = resource management; R=regional hydrology																					
4																						
5		**WSC STATIONS ACTIVE IN 2007 WITHIN 10KM BUFFER**																				
6	R	08LC040	VANCE CREEK BELOW DEAFIES CREEK	NAT				C			50.28500	-118.94800		x		x	x					near Lumby, Silver Star. Good R stn.
7	R	08LC042	BESSETTE CREEK ABOVE LUMBY LAGOON OUTFALL	REG				C			50.25300	-118.96100		x		x	x		x			d/s of Duteau & Creighton. Good geog sample. Unregulated. Diverted into Okanagan lower d/s.
8		08LE020	SALMON RIVER AT FALKLAND	REG				C			50.49800	-119.55800										not useful for Okanagan
9		08LE021	SALMON RIVER NEAR SALMON ARM	REG				C			50.69300	-119.32900										not useful for Okanagan
10		08LE108	EAST CANOE CREEK ABOVE DAM	NAT				C			50.69500	-119.19700										not useful for Okanagan
11		08LG016	PENNASK CREEK NEAR QUILCHENA	NAT				C			49.96700	-120.13500										not useful for Okanagan
12	M	08NL022	SIMILKAMEEN RIVER NEAR NIGHTHAWK					C			48.98500	-119.61700						x				South Main Okanagan System Operation
13		08NL039	SIWASH CREEK NEAR PRINCETON	REG				C			49.66400	-120.33500										not useful for Okanagan
14		08NL045	KEREMEOS CREEK BELOW WILLIS INTAKE	REG				C			49.25900	-119.82600										not useful for Okanagan
15	M	08NM002	OKANAGAN RIVER AT OKANAGAN FALLS	REG				C			49.34200	-119.58000				x	x	x				Okanagan system operations.
16	R	08NM037	SHATFORD CREEK NEAR PENTICTON	REG				C			49.41600	-119.78900				x	x	x				Regional hydrology. First Nations. Fisheries. Regulated???
17	R	08NM041	TREPANIER CREEK NEAR PEACHLAND	REG				C			49.82500	-119.78600	x			x		x				Fisheries, Peachland ID
18	M	08NM050	OKANAGAN RIVER AT PENTICTON	REG				C			49.49900	-119.61500			x	x	x	x				Okanagan system operations.
19	M	08NM065	VERNON CREEK AT OUTLET OF KALAMALKA LAKE	REG				C			50.23700	-119.26800				x		x				Okanagan system operations.
20	M	08NM073	OSOYOOS LAKE NEAR OROVILLE					C			48.95700	-119.43800						x				Okanagan system operations.
21	M	08NM083	OKANAGAN LAKE AT KELOWNA	REG				C			49.88600	-119.50100					x	x				Okanagan system operations.
22	M	08NM084	SKAHA LAKE AT OKANAGAN FALLS	REG				C			49.42700	-119.57400				x		x				Okanagan system operations.
23	M	08NM085	OKANAGAN RIVER NEAR OLIVER	REG				C			49.11500	-119.56600				x	x	x				Okanagan system operations.
24	M	08NM116	MISSION CREEK NEAR EAST KELOWNA	REG				C			49.87800	-119.41300		x		x	x	x				Okanagan system operations.
25	M	08NM127	OKANOGAN RIVER AT OROVILLE					C			48.93100	-119.41900				x	x	x				Okanagan system operations.
26	R	08NM134	CAMP CREEK AT MOUTH NEAR THIRSK	NAT				C			49.72500	-120.01700				x	x	x	x			Regional hydrology. Summerland water supply operations.
27	R	08NM142	COLDSTREAM CREEK ABOVE MUNICIPAL INTAKE	NAT				C			50.25800	-119.08100				x	x					runoff from near Silver Star
28	M	08NM143	KALAMALKA LAKE AT VERNON PUMPHOUSE	REG				C			50.23000	-119.27300				x	x	x				Okanagan system operations.
29		08NM149	SHUTTLEWORTH CREEK AT THE MOUTH	REG				C			49.33800	-119.58300				x						To be discontinued in 2008.
30	R	08NM171	VASEUX CREEK ABOVE SOLCO CREEK	NAT				C			49.24900	-119.32000		x			x					Regional hydrology. High elev.
31	M	08NM173	GREATA CREEK NEAR THE MOUTH	NAT				C			49.79400	-119.85100					x	x	x			Peachland water supply ops. Will be regulated in 2008
32	R	08NM174	WHITEMAN CREEK ABOVE BOULEAU CREEK	NAT				C			50.21300	-119.53700				x	x	x	x			Regional hydrology. First Nations.
33	M	08NM200	INKANEEP CREEK NEAR THE MOUTH	REG				C			49.07800	-119.50100				x	x					First Nations. Fisheries. Some regulation
34	M	08NM232	BELGO CREEK BELOW HILDA CREEK	REG				C			49.99900	-119.07300		x		x	x	x				BMID ops.
35	R	08NM240	TWO FORTY CREEK NEAR PENTICTON	NAT				C			49.65100	-119.40000		x			x			x		Regional hydrology. MOFR
36	M	08NM241	TWO FORTY-ONE CREEK NEAR PENTICTON	NAT				C			49.64900	-119.39400		x			x			x		MOFR
37	M	08NM242	DENNIS CREEK NEAR 1780 METRE CONTOUR	NAT				C			49.62400	-119.38200		x			x			x		MOFR
38	M	08NM243	VASEUX LAKE NEAR THE OUTLET	REG				C			49.27400	-119.52300						x				Okanagan system operations.
39		08NM246	VASEUX CREEK NEAR THE MOUTH					C			49.24500	-119.52500				x						To be discontinued in 2008.
40	R	08NN015	WEST KETTLE RIVER NEAR MCCULLOCH	NAT				C			49.70200	-119.09200					x					Regional hydrology.
41																						
42			**LOCALLY OPERATED STATIONS 2007**																			
43			**Stations Operated by Dobson Engineering Ltd**																			
44	M	OKPL1	ESPERON RESERVOIR AT THE OUTLET			2007		S			50°04'47" N	119°44'56" W						x				operated for LID
45	M	OKPL2	MISSION CREEK BELOW B.M.I.D. INTAKE			2004		S			49°51'0" N	119°17'0" W				x	x	x				operated for BMID
46	M	OKPL3	GRAYSTOKE Reservoir AT THE OUTLET			2007		S			49°59'8" N	118°52'15" W				x	x	x				operated for BMID
47	M	OKPL4	FISHHAWK Reservoir OUTLET			2007		S			50°01'45" N	118°51'46" W				x	x	x				operated for BMID,
48	M	OKPL5	LOCH LONG Reservoir AT THE OUTLET			2007		S			49°58'15" N	118°54'15" W				x	x	x				operated for BMID
49	M	OKPL6	IDEAL Reservoir AT THE OUTLET			2007		S			50°00'38" N	119°05'52" W				x	x	x				operated for BMID
50	M	OKPL7	JAMES Reservoir AT THE OUTLET			2007		S			49°57'06" N	119°14'47" W						x				operated for BMID
51	M	OKPL8	LAMBLY CREEK DIVERSION TO ROSE VALLEY LAKE			2001		S			49°54'38" N	119°33'18" W				x		x				operated for LID
52	M	OKPL9	North Lambly CREEK BELOW TADPOLE Reservoir			2007		S			50°02'12" N	119°45'30" W						x				operated for LID
53	M	OKPL10	BIGHORN RESERVOIR AT THE SPILLWAY			2007		S			50°04'17" N	119°40'08" W					x	x				operated for LID
54	M	OKPL11	POOLEY CREEK ABOVE POOLEY DITCH			2004		S			49°44'51" N	119°20'14" W						x				operated for SEKID

Active Stations 2007

	A	D	E	I	N	O	P	S	T	U	W	X	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ
2	Recc. Future ops. Primary use #1	Stn. No.	Station Name	Flow Regulation	Years (end - start)	Hydrometric Programs Start Date	Hydrometric End date	Program Operation: C=contin., S=seas.(open water)			Latitude	Longitude	Min	For	Pow	Fis	R	W	Tra	Res		COMMENTS:
55	M	OKPL12	MYRA DITCH BELOW KLO CREEK			2004		S			49 44 49	119 16 28						x				
56	M	OKPL13	STIRLING CREEK DIVERSION TO MCCULLOCH RESERVOIR			2004		S			49°43'50" N	119°12'59" W						x				operated for SEKID
57	M	OKPL14	CANYON CREEK DIVERSION TO MCCULLOCH RESERVOIR			2004		S			49°44'38" N	119°16'28" W						x				operated for SEKID
58	M	OKPL15	HYDRAULIC CREEK ABOVE STIRLING DITCH			2004		S			49°44'53" N	119°13'09" W		x			x	x				operated for SEKID
59	M	OKPL16	POSTILL RESERVOIR AT THE OUTLET			2005		S			49°59'43" N	119°12'48" W					x	x				operated for GEID
60	M	OKPL17	MILL CREEK/POSTILL RESERVOIR SLUICEWAY			2005		S			49°59'44" N	119°12'49" W						x				operated for GEID
61	M	OKPL18	Ellis Creek near the Mouth			2007		S			49 28 36 N	119 35 49 W				x		x				operated for City of Penticton
62	M	OKPL19	Penticton Creek at Van Horne			2007		S			49 30 00 N	119 35 28 W				x		x				operated for City of Penticton
63	M	OKPL20	Upper Duteau above Grizzly			2008		S			50 02 48 N	119 04 23 W		x		x	x	x				operated for Greater Vernon Services
64	M	OKPL21	Curtis Creek above Aberdeen			2008		S			50 06 46 N	119 01 30 W		x		x	x	x				operated for Greater Vernon Services
65	M	OKPL22	Heart Creek above Aberdeen			2008		S			50 05 44 N	119 02 50 W		x		x		x				operated for Greater Vernon Services
66		OKL 1	MILL CREEK D/S GEID INTAKE			2005		S			49°58'40" N	119°21'10" W						x				operated for GEID
67		OKL 2	POWERS CREEK AT BEAR MAIN			2007		S			49°56'52" N	119°44'50" W						x				operated for WID
68		OKL 3	POWERS CREEK UPSTREAM FROM JACKPINE CREEK			2007		S			49°56'08" N	119°44'00" W						x				operated for WID
69																						
70			**Stations Operated by MOE Penticton**																			
71		OKL 4	Ellis Creek at Atkinson St			2006		S			49°28'45" N	119°35'18" W				x						operated by MoE - To be discontinued in 2008
72	M	OKPL23	Trout Creek at the Canyon mouth (d/s of canyon)			2004		S			49°34'14" N	119°39'00" W				x						operated by MoE
73	M	OKPL24	Trepanier Creek at Hwy 97			2006		S			49°47'03" N	119°42'52" W				x						operated by MoE
74	M	OKPL25	Trepanier Creek ds Hwy 97C			2006		S			49°48'25" N	119°44'36" W				x						operated by MoE
75	M	OKPL26	Trepanier Creek us Hwy 97C			2006		S			49°48'45" N	119°44'53" W				x						operated by MoE
76	M	OKPL27	Powers Creek at Gellatly Rd			2004		S			49°48'51" N	119°37'48" W				x						operated by MoE
77	M	OKPL28	Mission Creek us Gordon Dr			2006		S			49°50'31" N	119°28'51" W				x						operated by MoE
78	M	OKPL30	Mission Creek us E. Kelowna Rd			2007		S			49°51'51" N	119°23'23" W				x						operated by MoE
79			Mission Creek ds Belgo Ck			2005		S			49°52'01" N	119°09'27" W										operated by MoE
80			Pearson Creek '@ FSR			2004		S			49°53'14" N	119°03'49" W										operated by MoE
81	M	OKPL29	Pearson Creek '@ WSC 08NM172			2006		S			49°53'12" N	119°03'42" W				x	x	x				operated by MoE
82																						
83			**Stations Operated for Oceola Fish and Game Club**																			
84		OKL 5	Ellison/Duck Lake			2004		S			50 00 14 N	119 23 57 W				x						operated by Oceola F&G
85		OKL 6	Middle Vernon Creek at the Remiche Road Bridge Crossing			2004		S			50 02 50 N	119 24 21 W				x						operated by Oceola F&G
86	M	OKL 7	Vernon Creek at outflow Swalwell/Beaver Lake			2004		S			50 02 38 N	119 15 20 W				x						operated by Oceola F&G
87		OKL 8	Vernon Creek downstream from DLC intake			2004		S			50 00 51 N	119 22 45 W				x						operated by Oceola F&G
88		OKL 9	Vernon Creek downstream from old Hiram Walker spillway			2004		S			50 00 21 N	119 23 14 W				x						operated by Oceola F&G
89																						

Discontinued Stations

	A	D	E	I	N	O	P	S	T	U	W	X	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ
1			**Okanagan Hydrometric Review 2007/08**										**STATION USE AND PRIORITY:**									
2	Recc. Future ops. Primary use #1	Stn. No.	Station Name	Flow Regulation	Years (end - start)	Hydrometric Programs Start Date	Hydrometric End date	Program Operation: C=contin., S=seas.(open water)			Latitude	Longitude	Min	For	Pow	Fis	R	W	Tra	Res		COMMENTS:
3	M = resource management; R= regional hydrology																					
4																						
5	**DISCONTINUED STATIONS (Group A) - FOR FURTHER CONSIDERATION**																					
6	M	08LC043	ABERDEEN LAKE AT THE OUTLET	REG	19	1/1/1968	12/31/1986															
7		08NM125	B.X. CREEK ABOVE SWAN LAKE CONTROL DAM	REG	21	1/1/1959	12/31/1979															
8		08NM020	B.X. CREEK ABOVE VERNON INTAKE	REG	79	1/1/1921	4/14/1999															
9		08NM123	B.X. CREEK BELOW SWAN LAKE CONTROL DAM	REG	69	1/1/1910	12/31/1978															
10	R	08NM035	BELLEVUE CREEK NEAR OKANAGAN MISSION	NAT	76	1/1/1911	12/31/1986															Near Okanagan Mission
11	R	08LC005	BESSETTE CREEK NEAR LUMBY	REG	65	1/1/1919	12/31/1983															Natural. Restart. U/s of Duteau, Creighton
12		08NM019	BLACK MOUNTAIN IRRIGATION DIVERSION NEAR KELOWNA	REG	11	1/1/1920	12/31/1930															
13		08LE001	BOLEAN CREEK AT FALKLAND	NAT	54	1/1/1911	12/31/1964															
14		08NM152	BRANDTS CREEK NEAR THE MOUTH	REG	7	1/1/1969	12/31/1975															Urban
15	R	08NM133	BULL CREEK NEAR CRUMP	NAT	22	1/1/1965	12/31/1986															
16		08NM145	BULMAN CREEK AT THE MOUTH	REG	37	1/1/1968	12/31/2004															
17	R	08NM146	CLARK CREEK NEAR WINFIELD	NAT	15	1/1/1968	12/31/1982															Clark Ck . Low elevation (WSC)
18	M	08NM163	CROOKED LAKE AT THE OUTLET	REG	12	1/1/1970	12/31/1981															Crooked
19	R	08NM137	DAVES CREEK NEAR RUTLAND	NAT	22	1/1/1965	12/31/1986															
20	M	08NM119	DEEP CREEK AT ARMSTRONG	REG	32	1/1/1951	12/31/1982															?? Urban influeance. Relatively natural re regulating. Watershed mostly farms. 2nd priority
21		08NM153	DEEP CREEK AT THE MOUTH	REG	7	1/1/1969	12/31/1975															at mouth - no good
22		08NM075	DEEP CREEK NEAR VERNON (STATION NO. 3)	REG	38	1/1/1930	12/31/1967															urban influence, d/s of Otter Lake
23	M	08LC014	DUTEAU CREEK AT OUTLET OF HADDO LAKE	REG	70	1/1/1910	12/31/1979															Water management station. Must capture spill
24		08LC006	DUTEAU CREEK NEAR LAVINGTON	REG	78	1/1/1919	12/31/1996															Below VID intake. Not needed for water mgnt, or DFO? Min flow augmentation in place. Other gauges of use
25		08NM074	ELLIS CREEK NEAR PENTICTON	NAT	23	1/1/1933	12/31/1955															
26		08NM056	ELLIS CREEK SOUTH MAIN DIVERSION	REG	57	1/1/1910	12/31/1966															need station for current diversion
27		08NM067	ELLISON LAKE NEAR WINFIELD	REG	13	1/1/1968	12/31/1980															
28		08NM161	EQUESIS CREEK NEAR THE MOUTH	REG	14	1/1/1969	12/31/1982															Regulated
29		08NM024	EQUESIS CREEK NEAR VERNON	REG	16	1/1/1911	12/31/1926															Regulated
30		08NM139	ESPERON CREEK NEAR KELOWNA	REG	17	1/1/1965	12/31/1981															
31	R	08NM176	EWER CREEK NEAR THE MOUTH	NAT	16	1/1/1971	12/31/1986															Some logging
32		08LC031	FORTUNE CREEK AT STEPNEY	REG	13	1/1/1949	12/31/1961															
33	M	08LC035	FORTUNE CREEK NEAR ARMSTRONG	REG	74	1/1/1911	12/31/1984															"reg" not much. Quite natural. Rev 204
34		08LE067	FOWLER CREEK NEAR FALKLAND	NAT	38	1/1/1927	12/31/1964															
35	M	08NM227	GARNET LAKE NEAR SUMMERLAND	REG	9	1/1/1973	12/31/1981															Garnet Res (Summerland)
36		08LE044	GORDON CREEK NEAR SALMON ARM	REG	65	1/1/1911	12/31/1975															
37	M	08NM230	GRAYSTOKE LAKE AT THE OUTLET	REG	23	1/1/1977	1/1/1999															Reservoir
38	M	08NM169	GREYBACK LAKE AT THE OUTLET	REG	18	1/1/1970	12/31/1987															Greyback Reservoir
39	M	08LC044	HADDO LAKE AT THE OUTLET	REG	19	1/1/1968	12/31/1986															
40		08NL051	HAYES CREEK BELOW SHINISH CREEK	REG	14	1/1/1973	12/31/1986															
41	R	08NM126	HAYNES CREEK NEAR OSOYOOS	NAT	53	1/1/1912	12/31/1964															
42	M	08NM011	HYDRAULIC CREEK AT OUTLET OF MCCULLOCH RESERVOIR	REG	68	1/1/1919	12/31/1986															Hydraulic Cr d/s McCulloch Reservoir (Move d/s of Fish, Browne, Long Meadow inflow??)
43		08NM039	HYDRAULIC CREEK DIVERSION NEAR KELOWNA	REG	50	1/1/1919	12/31/1968															
44	M	08NM010	HYDRAULIC CREEK NEAR THE MOUTH	REG	73	1/1/1910	12/31/1982															Hydraulic Cr near mouth (d/s Sekid intake)
45		08NM040	HYDRAULIC CREEK SOUTHEAST KELOWNA DIVERSION	REG	11	1/1/1920	12/31/1930															
46	M	08NM231	IDEAL LAKE NEAR THE OUTLET	REG	18	1/1/1963	12/31/1980															Reservoir
47		08LE008	INGRAM CREEK NEAR THE MOUTH	NAT	68	1/1/1911	12/31/1978															
48	R	08NM012	INKANEEP CREEK NEAR OLIVER (LOWER STATION)	NAT	40	1/1/1911	12/31/1950															
49	R	08NM082	INKANEEP CREEK NEAR OLIVER (UPPER STATION)	NAT	37	1/1/1941	12/31/1977															
50	M	08NM129	JOE RICH CREEK NEAR RUTLAND	REG	24	1/1/1964	12/31/1987															
51		08NM053	KELOWNA CREEK NEAR KELOWNA (LOWER STATION)	REG	77	1/1/1922	12/31/1998															Kel Crk near Kel
52	R	08NL014	KEREMEOS CREEK ABOVE MARSEL CREEK	NAT	17	1/1/1912	12/31/1928															Do we want this or Horn Creek 08NM147 or 049???
53		08LE091	KERNAGHAN CREEK ABOVE DIVERSIONS	NAT	14	1/1/1974	12/31/1987															
54		08NM226	KLO CREEK AT MCCULLOCH ROAD	REG	7	1/1/1976	12/31/1982															
55		08NM165	LAMBLY CREEK ABOVE TERRACE CREEK	REG	29	1/1/1970	12/31/1998															
56	M	08NM166	LAMBLY CREEK BELOW BALD RANGE CREEK	REG	13	1/1/1970	12/31/1982															Lambly below Bald Range
57		08NM141	LAMBLY CREEK BELOW TERRACE CREEK	REG	5	1/1/1967	12/31/1971															
58	M	08NM167	LAMBLY CREEK DIVERSION TO ROSE VALLEY LAKE	REG	9	1/1/1970	12/31/1978															LID div. from Lambly Ck. To Rose Valley. Check to see if Fisheries OK with no Q meas at intake

Discontinued Stations

	A	D	E	I	N	O	P	S	T	U	W	X	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ
2	Recc. Future ops. Primary use #1	Stn. No.	Station Name	Flow Regulation	Years (end - start)	Hydrometric Programs Start Date	Hydrometric End date	Program Operation: C=contin., S=seas.(open water)			Latitude	Longitude	Min	For	Pow	Fis	R	W	Tra	Res		COMMENTS:
59		08NM058	LAMBLY CREEK NEAR KELOWNA	REG	18	1/1/1910	12/31/1927															
60		08NM003	LAMBLY CREEK NEAR THE MOUTH	REG	66	1/1/1910	12/31/1975															Not needed. Fish flow from Lakeview ID
61	M	08NM136	LAMBLY LAKE DIVERSION TO POWERS CREEK	REG	8	1/1/1965	12/31/1972															Lambly reservoir
62	M	08NM229	LOCH KATRINE CREEK AT OUTLET OF GRAYSTOKE LAKE	REG	23	1/1/1977	1/1/1999															out flow from Graystoke Reservoir
63	M	08NM213	MCCULLOCH RESERVOIR AT MCCULLOCH DAM	REG	14	1/1/1973	12/31/1986															Reservoir (SEKID operates)
64		08NM218	MCDONALD CREEK DIVERSION TO PEACHLAND CREEK	REG	7	1/1/1973	12/31/1979															Diversion to Peachland Cr
65	M	08NM014	MCDOUGALL CREEK NEAR WESTBANK	REG	10	1/1/1920	12/31/1929															Natural flow WSC
66	R	08NM005	MCLEAN CREEK NEAR OKANAGAN FALLS	NAT	6	1/1/1921	12/31/1926															Low elevation watershed
67	M	08NM233	MISSION CREEK ABOVE PEARSON CREEK	REG	6	1/1/1977	12/31/1982															above Pearson (if OK site can be ????)
68		08NM234	MOORE LAKE RESERVOIR AT THE DAM	REG	14	1/1/1973	12/31/1986															Too small to bother gauging
69	M	08NM207	MYRA DITCH BELOW KLO CREEK	REG	13	1/1/1973	12/31/1985															Myra ditch d/s of Canyon Creek inflow. DEL operates
70		08NM047	NASWHITO CREEK NEAR EWING'S LANDING	NAT	10	1/1/1912	12/31/1921															
71	M	08NM114	OLIVER CANAL NEAR OLIVER	REG	39	1/1/1934	12/31/1972															
72	M	08NM048	OYAMA CREEK ABOVE WOOD LAKE IRRIGATION INTAKE	REG	67	1/1/1921	12/31/1987															Oyama Cr above diversion (wsc)
73	M	08NM028	OYAMA CREEK OYAMA DIVERSION	REG	12	1/1/1920	12/31/1931															Oyama Cr diversion
74	M	08NM224	OYAMA LAKE AT THE OUTLET	REG	26	1/1/1961	12/31/1986															Oyama Lake
75		08LE072	PALMER CREEK NEAR SALMON ARM	REG	69	1/1/1911	12/31/1979															
76	R	08NM120	PARK RILL NEAR OLIVER	REG	20	1/1/1951	12/31/1970															
77		08NM140	PEACHLAND CREEK ABOVE DIVERSIONS	REG	17	1/1/1966	12/31/1982															
78		08NM159	PEACHLAND CREEK AT THE MOUTH	REG	14	1/1/1969	12/31/1982															Peachland Cr @ mouth
79		08NM219	PEACHLAND CREEK DIVERSION TO PEACHLAND LAKE	REG	7	1/1/1973	12/31/1979															Diversion around Brenda Mine to Peachland Reservoir
80	M	08NM030	PEACHLAND CREEK MUNICIPAL IRRIGATION DIVERSION	REG	8	1/1/1919	12/31/1926															Peachland Municipal intake
81	M	08NM220	PEACHLAND LAKE NEAR PEACHLAND	REG	12	1/1/1973	12/31/1984															Peachland Reservoir
82	M	08NM202	PEACHLAND LAKE RESERVOIR OUTFLOW	REG	10	1/1/1973	12/31/1982															Peachland Reservoir outflow
83	R	08NM172	PEARSON CREEK NEAR THE MOUTH	NAT	18	1/1/1970	12/31/1987															Pearson ACTIVE (Phil E)
84	M	08NM168	PENTICTON CREEK ABOVE DENNIS CREEK	REG	30	1/1/1970	4/1/1999															outflow from Greyback Reservoir
85		08NM076	PENTICTON CREEK ABOVE DIVERSION	NAT	32	1/1/1910	12/31/1941															
86		08NM118	PENTICTON CREEK AT THE MOUTH	REG	23	1/1/1950	12/31/1972															
87		08NM170	PENTICTON CREEK BELOW HARRIS CREEK	REG	12	1/1/1970	12/31/1981															
88	M	08NM210	POOLEY CREEK ABOVE POOLEY DITCH	NAT	7	1/1/1973	12/31/1979															Pooley Cr above ditch. DEL operates
89	M	08NM033	POWERS CREEK ABOVE WESTBANK DIVERSION	NAT	55	1/1/1920	12/31/1974															U/s of Westbank diversion. Use this one or 8NM059
90	M	08NM059	POWERS CREEK BELOW WESTBANK DIVERSION	REG	76	1/1/1912	12/31/1987															belwo WID diversion. Use this on or 8NM033
91		08NL040	RICHTER CREEK NEAR OSOYOOS	NAT	12	1/1/1966	12/31/1977															
92	M	08NM036	SCOTTY CREEK NEAR RUTLAND	NAT	54	1/1/1911	12/31/1964															ONLY IF above BMID intake
93	R	08NM038	SHINGLE CREEK ABOVE KALEDEN DIVERSION	NAT	58	1/1/1920	12/31/1977															
94	R	08NM150	SHINGLE CREEK AT THE MOUTH	REG	14	1/1/1969	12/31/1982															Shingle at mouth
95		08NM151	SHORTS CREEK AT THE MOUTH	REG	14	1/1/1969	12/31/1982															Probably not
96	R	08NM006	SHUTTLEWORTH CREEK NEAR OKANAGAN FALLS	REG	44	1/1/1921	12/31/1964															need station near mouth of canyon
97		08LE043	SILVER CREEK NEAR SALMON ARM	NAT	38	1/1/1911	12/31/1948															
98	M	08NM062	SWALWELL LAKE NEAR OKANAGAN CENTRE	REG	69	1/1/1926	12/31/1994															Swalwell
99	M	08NM138	TERRACE CREEK NEAR KELOWNA	REG	28	1/1/1965	12/31/1992															
100	R	08NM164	TESTALINDEN CREEK IN CANYON	NAT	18	1/1/1969	12/31/1986															Review history, choose this one or 08NM130
101	R	08NM130	TESTALINDEN CREEK NEAR OLIVER	REG	58	1/1/1911	12/31/1968															Review history, choose this one or 08NM164
102	M	08NM238	THIRSK LAKE NEAR THE OUTLET	REG	9	1/1/1979	12/31/1987															below Thirsk Reservoir
103		08NM155	TREPANIER CREEK AT THE MOUTH	REG	13	1/1/1969	12/31/1981															Trepanier at mouth
104		08NM158	TROUT CREEK AT THE MOUTH	REG	14	1/1/1969	12/31/1982															
105	M	08NM237	TROUT CREEK BELOW THIRSK LAKE	REG	9	1/1/1978	12/31/1986															Trout Ck R/S Thirsk
106	M	08NM054	TROUT CREEK NEAR FAULDER	REG	34	1/1/1921	12/31/1954															d/s of Summerland intake
107	M	08NM042	TROUT CREEK NEAR SUMMERLAND	REG	9	1/1/1920	12/31/1928															Is this being operated by Phil Epp???
108	M	08NM055	TROUT CREEK SUMMERLAND DIVERSION	NAT	10	1/1/1922	12/31/1931															Summerland Municipal intake
109	R	08NM015	VASEUX CREEK ABOVE DUTTON CREEK	NAT	72	1/1/1911	12/31/1982															
110		08NM162	VERNON CREEK AT INLET TO ELLISON LAKE	REG	6	1/1/1969	12/31/1974															
111		08NM009	VERNON CREEK AT INLET TO WOOD LAKE	REG	69	1/1/1919	12/31/1987															at inlet to Wood Lake
112	M	08NM022	VERNON CREEK AT OUTLET OF SWALWELL LAKE	REG	78	1/1/1921	12/31/1998															Vernon Ck below Swalwell (d/s spillway)
113		08NM175	VERNON CREEK BELOW ARDA DAM	REG	8	1/1/1972	12/31/1979															urban influence, d/s Otter Lake
114	M	08NM236	VERNON CREEK DIVERSION TO W.O.C.I.D.	REG	6	1/1/1973	12/31/1978															WOCID Diversion (now Lake Country)

Discontinued Stations

	A	D	E	I	N	O	P	S	T	U	W	X	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ
2	Recc. Future ops. Primary use #1	Stn. No.	Station Name	Flow Regulation	Years (end - start)	Hydrometric Programs Start Date	Hydrometric End date	Program Operation: C=contin., S=seas.(open water)			Latitude	Longitude	Min	For	Pow	Fis	R	W	Tra	Res		COMMENTS:
115		08NM043	VERNON CREEK NEAR OKANAGAN CENTRE	REG	45	1/1/1919	12/31/1963															
116		08NM160	VERNON CREEK NEAR THE MOUTH	REG	31	1/1/1969	5/1/1999															
117		08NM044	VERNON CREEK OKANAGAN CENTRE DIVERSION	REG	45	1/1/1919	12/31/1963															
118		08LC007	VERNON IRRIGATION DISTRICT DIVERSION NEAR LAVINGTO	REG	48	1/1/1919	12/31/1966															
119		08NM046	WHITEMAN CREEK NEAR VERNON	REG	57	1/1/1911	12/31/1967															
120																						
121	**DISCONTINUED STATIONS (Group B) - SHORT PERIOD OF RECORD, OR OTHERWISE LIMITED INTEREST**																					
122		08NM017	BELGO CREEK NEAR RUTLAND	REG	2	1/1/1920	12/31/1921															
123		08NM225	BELGO CREEK NEAR THE MOUTH	REG	7	1/1/1976	12/31/1982															
124		08NM156	BELLEVUE CREEK AT THE MOUTH	REG	4	1/1/1969	12/31/1972															
125		08LE038	BLAIR CREEK NEAR FALKLAND (LOWER STATION)	NAT	2	1/1/1921	12/31/1922															
126		08LE094	BOLEAN CREEK NEAR THE MOUTH	NAT	13	1/1/1974	12/31/1986															
127	M	08NM216	BROWNE LAKE RESERVOIR ABOVE THE DAM	REG	5	1/1/1973	12/31/1977															Too small to bother?
128		08LE074	CANOE CREEK ABOVE EAST CANOE CREEK	NAT	10	1/1/1965	12/31/1974															
129		08NL052	CHAIN LAKE AT THE OUTLET	REG	14	1/1/1973	12/31/1986															
130		08NM007	CHUTE CREEK NEAR NARAMATA	NAT	3	1/1/1920	12/31/1922															
131		08NM179	COLDSTREAM CREEK ABOVE KALAVISTA DIVERSION	REG	13	1/1/1970	12/31/1982															
132		08NM154	COLDSTREAM CREEK AT THE MOUTH	REG	2	1/1/1969	12/31/1970															
133		08NM124	COLDSTREAM CREEK NEAR LAVINGTON	REG	70	1/1/1910	12/31/1979															
134		08NM025	DARKE CREEK AT MEADOW VALLEY	REG	2	1/1/1921	12/31/1922															
135		08NM023	DARKE CREEK NORTHWEST FORK	NAT	2	1/1/1921	12/31/1922															
136		08NM177	DEEP CREEK AT YOUNG ROAD	NAT	6	1/1/1970	12/31/1975															
137		08LC017	DERMONT CREEK NEAR LAVINGTON	REG	1	1/1/1921	12/31/1921															
138		08LE054	EAST CANOE CREEK NEAR SALMON ARM	NAT	19	1/1/1931	12/31/1949															
139	M	08NM135	ELLIS CREEK AT PENTICTON	REG	15	1/1/1965	12/31/1979															Fisheries requested. DEL operates
140	M	08NM122	ELLIS CREEK NORTH MAIN DIVERSION	REG	3	1/1/1955	12/31/1957															need stn for present diversion
141	M	08NM228	ENEAS CREEK NEAR SUMMERLAND	REG	2	1/1/1974	12/31/1975															Eneas Cr (d/s Garnet res) near Summerland
142	M	08NM215	FISH LAKE AT THE OUTLET	REG	5	1/1/1973	12/31/1977															Too small to bother?
143		08LE096	FOWLER CREEK AT 640 M CONTOUR	NAT	13	1/1/1974	12/31/1986															
144		08LC036	GARDOM CREEK NEAR GRINDROD	NAT	5	1/1/1960	12/31/1964															
145		08LE092	GORDON CREEK ABOVE DIVERSIONS	NAT	6	1/1/1974	12/31/1979															
146		08LE045	GRIER CREEK NEAR SALMON ARM	NAT	2	1/1/1930	12/31/1931															
147	M	08LC047	GRIZZLY SWAMP NEAR HADDO LAKE	REG	9	1/1/1978	12/31/1986															
148		08NM018	HILDA CREEK NEAR RUTLAND	NAT	1	1/1/1920	12/31/1920															
149	R	08NM049	HORN CREEK NEAR KALEDEN	NAT	1	1/1/1920	12/31/1920															Review station history. Do we want this or 08NM147?? Or what about 08NL014 Keremeos C abv Marshall C??
150	R	08NM147	HORN CREEK NEAR OLALLA	NAT	10	1/1/1968	12/31/1977															Review this station and also 08NM148. Do we want one of them?
151		08NM068	HOWARD CREEK NEAR PENTICTON	REG	1	1/1/1930	12/31/1930															
152	M	08NM205	HYDRAULIC CREEK DIVERSION TO S.E.K.I.D.	REG	5	1/1/1976	12/31/1980															SEKID intake (Active SCADA)
153		08NM052	IRISH CREEK NEAR VERNON	NAT	1	1/1/1922	12/31/1922															
154		08NM013	JACK CREEK AT THE MOUTH	REG	1	1/1/1919	12/31/1919															
155		08NM183	KALAMALKA LAKE AT OUTLET OF OYAMA CANAL	REG	9	1/1/1971	12/31/1979															
156		08NM117	KELOWNA CREEK AT RUTLAND STATION	REG	26	1/1/1950	12/31/1975															
157		08NM061	KELOWNA CREEK NEAR RUTLAND	REG	8	1/1/1924	12/31/1931															
158		08NM026	KELOWNA CREEK NEAR RUTLAND (UPPER STATION)	REG	12	1/1/1911	12/31/1922															
159		08NL044	KEREMEOS CREEK AT MIDDLE BENCH ROAD	REG	7	1/1/1971	12/31/1977															
160		08NL010	KEREMEOS CREEK NEAR OLALLA	REG	53	1/1/1919	12/31/1971															
161		08LE046	KERNAGHAN CREEK NEAR SALMON ARM	NAT	2	1/1/1930	12/31/1931															
162		08NM060	KLO CREEK DIVERSION NEAR KELOWNA	REG	47	1/1/1922	12/31/1968															
163		08NM004	KLO CREEK NEAR KELOWNA	NAT	4	1/1/1919	12/31/1922															
164	M	08NM217	LONG MEADOW LAKE RESERVOIR ABOVE THE DAM	REG	5	1/1/1973	12/31/1977															Too small to bother?
165		08NM239	MISSION CREEK BELOW B.M.I.D. INTAKE	REG	1	1/1/1980	12/31/1980															below BMID intake. DEL operating
166		08NM016	MISSION CREEK NEAR RUTLAND	REG	37	1/1/1910	12/31/1946															
167		08NM057	MISSION CREEK RUTLAND DIVERSION	REG	9	1/1/1922	12/31/1930															
168		08NL065	NICKEL PLATE LAKE NEAR HEDLEY	REG	5	1/1/1975	12/31/1979															
169		08NL068	NICKEL PLATE RESERVOIR OUTFLOW	REG	2	1/1/1975	12/31/1976															
170		08LC008	NICKLEN CREEK NEAR LUMBY (LOWER STATION)	NAT	1	1/1/1920	12/31/1920															

Discontinued Stations

	A	D	E	I	N	O	P	S	T	U	W	X	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ
2	Recc. Future ops. Primary use #1	Stn. No.	Station Name	Flow Regulation	Years (end - start)	Hydrometric Programs Start Date	Hydrometric End date	Program Operation: C=contin., S=seas.(open water)			Latitude	Longitude	Min	For	Pow	Fis	R	W	Tra	Res		COMMENTS:
171		08LC010	NICKLEN CREEK NEAR LUMBY (UPPER STATION)	NAT	1	1/1/1921	12/31/1921															
172		08NM071	OKANAGAN LAKE AT PENTICTON	REG	55	1/1/1920	12/31/1974															
173		08NM197	OKANAGAN RIVER BELOW THE S.O.L.I.D. CANAL	REG	1	1/1/1972	12/31/1972															
174		08NM001	OKANAGAN RIVER NEAR FAIRVIEW	NAT	1	1/1/1914	12/31/1914															
175		08NM131	OKANOGAN RIVER AT BRIDGE STREET AT OROVILLE	REG	54	1/1/1939	12/31/1992															
176		08NM132	OKANOGAN RIVER AT ZOSEL MILLPOND AT OROVILLE	REG	48	1/1/1939	12/31/1986															
177		08NL011	OLALLA CREEK AT OLALLA	NAT	10	1/1/1912	12/31/1921															
178		08NM113	OSOYOOS LAKE NEAR OSOYOOS	REG	59	1/1/1946	12/31/2004															
179		08LC015	PARADISE CREEK NEAR LUMBY	NAT	1	1/1/1921	12/31/1921															
180		08NM201	PEACHLAND CREEK BELOW DIVERSION TO PEACHLAND LAK	REG	1	1/1/1973	12/31/1973															Above Peachland Reservoir
181		08NM029	PEACHLAND CREEK NEAR PEACHLAND	REG	4	1/1/1919	12/31/1922															u/s of Municipal intake
182		08NM031	PENTICTON CREEK BELOW DIVERSION	REG	3	1/1/1919	12/31/1921															
183		08NM063	PENTICTON CREEK LOT 19 DIVERSION	REG	29	1/1/1926	12/31/1954															
184		08NM032	PENTICTON CREEK MAIN DIVERSION	REG	48	1/1/1919	12/31/1966															
185		08NM157	POWERS CREEK AT THE MOUTH	REG	14	1/1/1969	12/31/1982															
186		08NM034	POWERS CREEK WESTBANK DIVERSION	REG	13	1/1/1919	12/31/1931															
187		08NM069	REED CREEK NEAR PENTICTON	REG	20	1/1/1911	12/31/1930															
188		08NM235	RIBBLEWORTH CREEK NEAR OYAMA	NAT	7	1/1/1973	12/31/1979															
189		08NM070	RIDDLE CREEK NEAR WEST SUMMERLAND	NAT	2	1/1/1930	12/31/1931															
190		08LE019	SALMON RIVER ABOVE ADELPHI CREEK	REG	68	1/1/1911	12/31/1978															
191		08LE089	SALMON RIVER ABOVE FOWLER CREEK	REG	13	1/1/1974	12/31/1986															
192		08LE088	SALMON RIVER ABOVE KERNAGHAN CREEK	NAT	7	1/1/1973	12/31/1979															
193		08LE065	SALMON RIVER AT GLENEMMA	NAT	26	1/1/1951	12/31/1976															
194		08LE090	SALMON RIVER BELOW SILVER CREEK	REG	4	1/1/1974	12/31/1977															
195		08LE064	SALMON RIVER NEAR FALKLAND	REG	28	1/1/1951	12/31/1978															
196		08LE097	SALMON RIVER NEAR GLENEMMA	REG	3	1/1/1974	12/31/1976															
197		08LE059	SALMON RIVER NEAR WESTWOLD	NAT	2	1/1/1946	12/31/1947															
198	R	08NL048	SHINISH CREEK NEAR PRINCETON	NAT	1	1/1/1973	12/31/1973															
199		08LE070	SHUSWAP LAKE AT SALMON ARM	NAT	35	1/1/1951	12/31/1985															
200		08LE042	SPA CREEK ABOVE COWPERSMITH DIVERSION	NAT	9	1/1/1923	12/31/1931															
201		08LE060	SPA CREEK BELOW COWPERSMITH DIVERSION	REG	4	1/1/1945	12/31/1948															
202	M	08NM212	STIRLING CREEK DIVERSION TO MCCULLOCH RESERVOIR	REG	1	1/1/1984	12/31/1984															Stirling ditch diversion to Hydraulic Cr. DEL operates
203		08LC048	TRINITY CREEK ABOVE DIVERSION	NAT	4	1/1/1981	12/31/1984															
204	R	08NM148	TWIN LAKES NEAR OLALLA	REG	10	1/1/1968	12/31/1977															Check also 08NM147. Do we want either?
205		08NM199	UNNAMED DITCH ABOVE PACKING HOUSE OUTFALLS IN OLI	REG	2	1/1/1972	12/31/1973															
206		08NM178	UNNAMED DITCH AT OLIVER	REG	3	1/1/1970	12/31/1972															
207		08NM008	VERNON CREEK ABOVE DIVERSIONS	REG	1	1/1/1919	12/31/1919															
208		08NM182	VERNON CREEK AT OUTLET OF ELLISON LAKE	REG	4	1/1/1971	12/31/1974															
209		08NM021	VERNON CREEK AT VERNON	REG	40	1/1/1921	12/31/1960															
210		08LE023	WARREN CREEK NEAR SALMON ARM	NAT	2	1/1/1911	12/31/1912															
211		08NM198	WESTBANK CREEK AT THE MOUTH	REG	4	1/1/1972	12/31/1975															
212		08NM180	WHITEMAN CREEK AT THE MOUTH	REG	3	1/1/1970	12/31/1972															
213		08NM181	WINFIELD CREEK AT INLET TO WOOD LAKE	REG	3	1/1/1971	12/31/1973															
214	R	08NM121	WOLFCUB CREEK NEAR OLIVER	REG	1	1/1/1952	12/31/1952															
215		08NM066	WOOD LAKE AT INLET TO OYAMA CANAL	REG	46	1/1/1928	12/31/1973															
216		08NL047	YELLOW LAKE NEAR KEREMEOS	REG	9	1/1/1973	12/31/1981															
217																						

Appendix C

Maps

Okanagan Hydrometric Review

Discontinued Stations

Province of British Columbia
Ministry of Environment
Water Stewardship Division
Science & Information Branch

0 5 10 15 20 km

Projection: UTM Zone 11 Datum: NAD83

Legend

- Discontinued Water Survey of Canada Station
- Study Area
- Contour (100 m)
- Indian Reserve
- Watershed Boundary

120°W 119°30'W 119°W

50°30'N 50°N 49°30'N 49°N

08LE070 08LE072 08LE074 08LE054 08LE092 08LE044 08LE046 08LE088 08LE091 08LE045 08LE090 08LE043 08LC036 08LE042 08LE060 08LE067 08LE096 08LE089 08LE097 08LC031 08LE038 08LE094 08LE001 08LE023 08LE059 08LE008 08LE064 08LE065 08NM177 08NM119 08LC035 08LE019 08LC048 08NM176 08NM052 08NM075 08NM153 08NM024 08NM047 08NM161 08NM125 08NM020 08NM123 08NM160 08NM021 08NM124 08LC005 08NM046 08NM180 08NM179 08NM154 08LC006 08LC007 08LC008 08NM151 08LC010 08NM028 08NM048 08NM066 08NM183 08NM224 08LC017 08LC043 08LC014 08LC044 08LC047 08NM139 08NM138 08NM235 08LC015 08NM009 08NM181 08NM146 08NM163 08NM062 08NM022 08NM008 08NM182 08NM043 08NM044 08NM175 08NM236 08NM234 08NM231 08NM018 08NM162 08NM165 08NM141 08NM067 08NM026 08NM061 08NM145 08NM017 08NM229 08NM230 08NM058 08NM136 08NM166 08NM003 08NM036 08NM167 08NM117 08NM152 08NM053 08NM172 08NM233 08NM014 08NM033 08NM034 08NM057 08NM019 08NM137 08NM225 08NM129 08NM218 08NM201 08NM219 08NM202 08NM220 08NM059 08NM198 08NM016 08NM239 08NM060 08NM010 08NM205 08NM040 08NM039 08NM216 08NM013 08NM157 08NM156 08NM004 08NM226 08NM215 08NM217 08NM155 08NM035 08NM011 08NM213 08NM030 08NM029 08NM140 08NM159 08NM207 08NM210 08NM212 08NM238 08NM237 08NM023 08NM227 08NM228 08NM007 08NM025 08NM133 08NM169 08NM168 08NM068 08NM055 08NM054 08NM069 08NM158 08NM042 08NM038 08NM070 08NM118 08NM063 08NM170 08NM071 08NM031 08NM032 08NM076 08NM135 08NM150 08NM074 08NM056 08NM122 08NM049 08NL065 08NL068 08NM005 08NM006 08NL047 08NL014 08NM148 08NM147 08NM114 08NM197 08NM015 08NL011 08NL010 08NM120 08NL044 08NM178 08NM199 08NM121 08NM001 08NM164 08NM130 08NM012 08NM082 08NL040 08NM113 08NM126 08NM131 08NM132

CANADA
USA

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Okanagan Hydrometric Review

Proposed Future Network

BRITISH COLUMBIA

Province of British Columbia
Ministry of Environment
Water Stewardship Division
Science & Information Branch

0 5 10 15 20 km

Projection: UTM Zone 11 Datum: NAD83

Legend

Stations Proposed for Future Network:

- Existing Water Survey of Canada Station
- Discontinued Water Survey of Canada Station
- Existing Locally Operated Station
- Proposed Locally Operated Station
- Study Area
- Contour (100 m)
- Indian Reserve
- Watershed Boundary

120°W 119°30'W 119°W

50°30'N 50°N 49°30'N 49°N

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