



**N A K U S P**



# **2013 Annual Water Report**

**Public Works Department**

## Introduction:

Under the terms of the Village of Nakusp Operating Permit for Facility #211995, the Village is required to provide an annual report to users of the system. This report is to provide a summary of the water system operation, maintenance, upgrades and testing procedures and is submitted to Interior Health.

## Water Distribution System:

The Village water system is comprised of 756 residential connections, 103 Commercial services and 27 Institutional/Industrial services. Currently, the distribution system runs approximately 26.7 kms and has both surface source water and ground well water.

## Source Water:

Surface water sources consist of Halfway Creek, Upper Brouse Creek and Lower Brouse Creek. The piping network consists of 3.5 kms of pipe to the Upper Brouse intake and an additional 3.5 kms to the Halfway intake.

Surface water undergoes course filtration in the Filter Sock Chamber, which houses six perforated PVC pipes covered with mesh filter media (socks). Each pipe is approximately 12" in diameter and 8' long.

Course filtration removes large debris, such as leaves, sticks, pine needles, frogs, etc. These filter socks become clogged, especially during the freshet and require monitoring and cleaning. Course filtration is not technically considered a treatment process, as fine materials and micro-organisms are not removed, therefore, chlorination is required.





Chlorine is combined with surface water and then stored in the million gallon reservoir. The reservoir has a polyvinyl chloride cover to keep out debris and wildlife. Towers and weights around the perimeter allow the cover to move with the water level, The reservoir is 14' deep.

The Village also has a 200,000 gallon reservoir, which stores treated water for the lower grid system and works in concert with Well #1 & #2.

Well#1 and Well#2 have the same water quality, as they draw from the same aquifer, only about 100 meters horizontally apart. The water is very good, very clear, and requires no treatment. The hardness, at 90 ppm, while higher than the surface water, is still considered excellent.

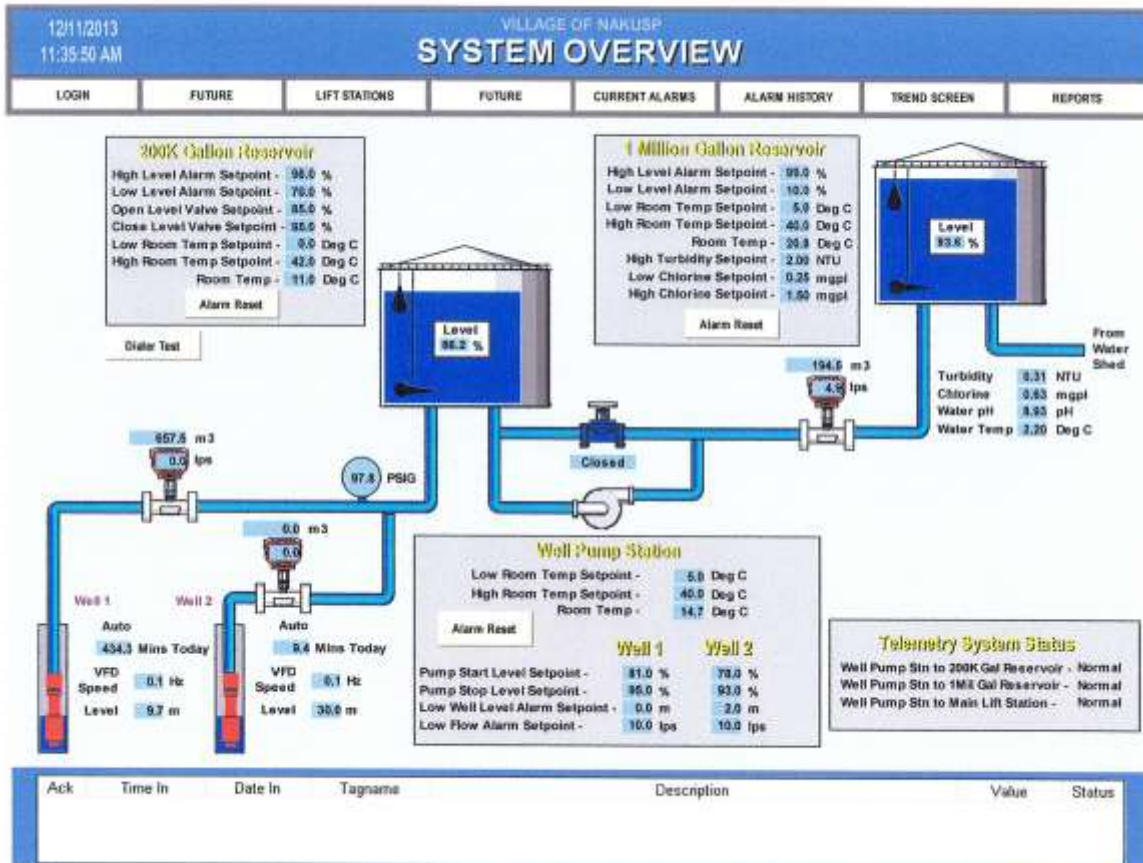
Well#1 (8") consistently produces 25 L/s (330 IGPM), taking the demand off the surface water system in summer, and operating up to 24 hours/day. This flow, combined with the 70 L/s from the surface system (during peak daily demand), provides 95 L/s summer flows, and is adequate for the present Village needs. A single well, however, is at risk to mechanical breakdown.

Well#2 (12"), drilled for redundancy and to provide further flows for growth, has been tested up to 63 L/s (800 IGPM). This well was commissioned with the same pump and motor as Well #1 and, therefore, has the same capacity.

## **Monitoring:**

As part of the Well#1 project in May 2007 the Village installed a Supervisory Control and Data Acquisition (SCADA) system, where much of the remote water and sewer system was connected with wireless modem radios, and sensing equipment. This SCADA system allows Public Works operators to log onto the system remotely to view and/or manipulate reservoir levels, well pump

operations, turbidity and chlorine levels, and system flows. The system also logs this data into an archive, for reporting purposes. The system is very valuable for allowing operators to manage the water supplies, and view problems on a color graphics screen. In the past, regular checks using pickup trucks was needed at least daily. Now operators can check the system over the Internet from home, which is useful during night alarms and holidays. New infrastructure such as the Brouse WTP, Well #2, and Reclaimed water system will be added to the SCADA.



## Routine Maintenance:

Maintenance of the system is conducted as follows:

**Daily:** Visual checks are conducted of the various facilities to ensure that the equipment is functioning properly and no problems are evident. Filter Sock cleaning is done as required. The system is also monitored 24/7 by the SCADA system, which can be accessed remotely by Operators. The system is monitored for: Flow Rate; Total Flow; Free

chlorine; chlorine pump settings, pH, temperature; well levels & turbidity.

**Weekly:** Every Tuesday the Village conducts facility inspections and bacteriological water sample testing at various end-line locations throughout the municipality.

**Monthly:** Flow rate information is compiled for the Million Gallon Reservoir and the wells. The surface water intakes are monitored. Monthly samples are taken to monitor Trihalomethane levels reports are submitted to Interior Health.

**Annually:** Waterlines are flushed in the Spring and Fall. This removes debris and stale water that may have accumulated in the piping network.

Fire hydrants are also flushed and inspected. Any repairs necessary are made and two new hydrants are installed each year.

A valve exercising program is conducted each year to ensure that valves remain in good working order.

Halfway water intake is back-flushed annually to remove settled debris and improve flow.

As part of the Village's Cross Connection Control Program, Backflow preventer devices are inspected and tested to prevent any cross contamination of the potable water system.

An annual report is submitted to the Interior Health Authority summarizing the conditions of the Operating Permit.

**On-going:** Data is constantly monitored to assist with identifying leaks in the system. Repairs are made immediately.

The Million Gallon Reservoir cover is pumped off regularly, to remove any precipitation and debris.

# Capital Projects & Improvements – 2013:

## Water Treatment Plant

The Village is currently working on the construction, installation and implementation of a new water treatment plant facility and Micro Hydro generation station. These facilities should be up and running in the new year.



## Fire Hydrants

Each year the Village purchases and installs two new fire hydrants annually. These new hydrants are to replace obsolete/defective hydrants and improve fire suppression coverage. Currently, the Village has 102 hydrants.

## Well No. 2

This project is now complete.

## **Million Gallon Reservoir Liner**

During the Village of Nakusp night flow analysis of water consumption, it was determined that the reservoir itself is leaking. In order to mitigate this loss of treated water, Capital funding has been set aside to line the reservoir, in the amount of \$140,000. This will effectively stop the leakage and extend the life of the reservoir.

## **Source Protection Plan**

The Village is working towards the development of a source protection plan that would encompass both the surface and ground water sources – Halfway Creek; Upper Brouse Creek; Lower Brouse Creek; Well #1 and Well #2. Council has set aside \$21,500 for this purpose.

## **Water Consumption:**

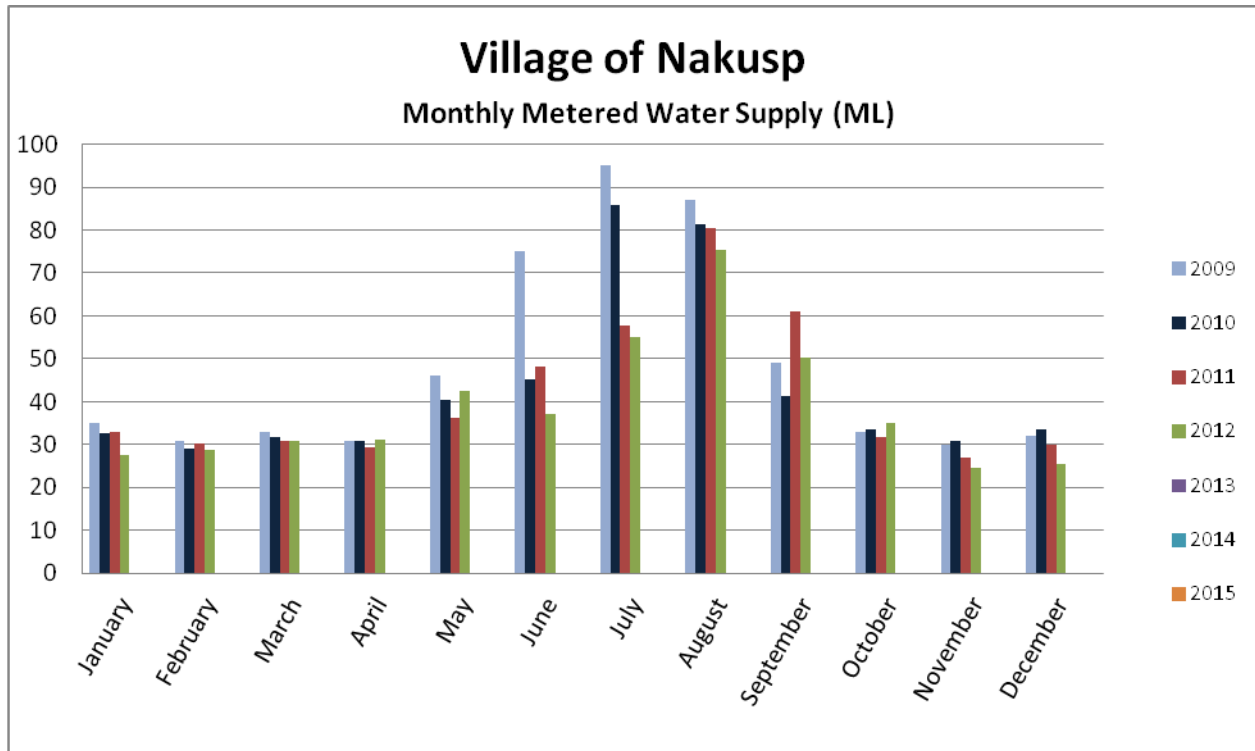
In an effort to reduce water consumption, the Village of Nakusp is participating in the Columbia Basin Trust Water Smart Program. This is a basin-wide initiative involving 22 communities. The cumulative goal is to reduce overall water consumption by 20% by the year 2015.

The Village has adopted a Water Smart Action Plan, outlining strategies to reduce the baseline consumption (577 ML), through the following objectives:

1. Investigate and address Unaccounted-for Water/Leakage;
2. Amend the existing OCP Bylaw regarding underground irrigation systems;
3. Implement proven strategies for reducing outdoor residential water demands – beginning with municipally owned infrastructure;
4. Investigate water metering options

During the period from 2009-2012, a basin-wide reduction of 14% has been achieved. Nakusp has already achieved its 20% reduction goal, but is moving

forward with: a Water Loss Management Plan; a Water Meter Assessment; an initiative to install rain sensors on all irrigation systems; installation of a liner on the Million Gallon Reservoir to stop leaking; continued leak detection and line repairs; the implementation of the recovered water system; and, various infrastructure upgrades. Once these objectives have been achieved, a substantial water consumption reduction will be realized.



## Water Sampling and Testing:

As a condition of the Village Operating Permit, water samples are collected weekly and submitted for coliform testing. Samples are collected from seven different sites, on a rotational basis. See Appendix A for 2013 results.

Monthly samples are also submitted for trihalomethane levels. Trihalomethanes are bi-products of the reaction between chlorine and organic materials. See Appendix B for 2013 results.



## **Cross Connection Control Program:**

The Village of Nakusp has developed a Cross Connection Control Program, as required by the Drinking Water Protection Act. The purpose of this program is to protect public health, by preventing potential non-potable water sources from cross-contaminating the domestic water supply. This is achieved through the installation, maintenance and inspection of back-flow prevention devices.

Mike Pedersen is currently our certified Cross Connection Control Administrator and Wes Coleman is our certified Backflow Assembly Tester. Testing of backflow prevention devices is done annually.

## **Emergency Response Plan:**

The Village has an Emergency Response Plan for the domestic water system. The plan identifies a number of potential emergency situations and sets out guidelines and procedures on how to deal with each issue. The plan is kept current and updated annually.

## Appendix A – Bacteriological Testing Results

SITE FLOWING SUPPLY	DATE	Residual Cl ppm	TC COUNT /100 ML	EC COUNT /100 ML
<b>Carson's Corner</b>	Dec. 18/12	0.80	L1	L1
	Feb. 5/13	0.77	L1	L1
	Mar 19/13	0.57	L1	L1
	Apr. 23/13	0.51	L1	L1
	June 25-13	1.00	L1	L1
	Aug 6/13	0.53	L1	L1
	Sept. 17/13	0.89	A	A
	Oct. 29/13	0.70	L1	L1
	Dec. 10/13	0.91	L1	L1
<b>Sports Complex</b>	Mar. 5/13	0.52	L1	L1
(well running)	Apr. 16/13	0.07	L1	L1
(well running)	May 14/13	0.06	L1	L1
(no courier pick up)	June 11/13	1.00	-	-
	June 18/13	0.75	L1	L1
	July 2/13	0.62	L1	L1
(well running)	Aug 13/13	0.04	L1	L1
	Sept. 24/13	0.37	L1	L1
	Nov. 12/13	0.60	L1	L1
	Dec.17/13	0.32	L1	L1
<b>Crescent Bay Construction</b>	Feb. 12/13	0.55	L1	L1
	Apr.2/13	0.44	L1	L1
	Apr. 30/13	0.20	L1	L1
	May 7/13	0.05	L1	L1
	July 9/13	0.16	L1	L1
	Aug. 20/13	0.09	L1	L1
	Oct. 1/13	0.12	L1	L1
	Nov. 19/13	0.08	L1	L1
<b>852 Alexander Rd.</b>	Jan. 15/13	0.44	L1	L1
	Feb. 26/13	0.47	L1	L1
	Mar. 26/13	0.05	L1	L1
	May 28/13	0.13	L1	L1
	July 16/13	0.51	L1	L1
	Aug 27/13	0.34	L1	L1
	Oct. 8/13	0.07	L1	L1
	Nov. 5/13	0.22	L1	L1
<b>Overwaitea</b>	Jan. 22/13	0.64	L1	L1
	Feb. 19/13	0.68	L1	L1
	Apr. 9/13	0.27	L1	L1
	June 4/13	0.35	L1	L1

<b>SITE FLOWING SUPPLY</b>	<b>DATE</b>	<b>Residual Cl ppm</b>	<b>TC COUNT /100 ML</b>	<b>EC COUNT /100 ML</b>
<b>Overwaitea</b>	July 23/13	0.13	L1	L1
	Sept.3/13	0.74	L1	L1
<b>No courier p/u</b>	Oct. 15/13	0.60	-	-
	Nov. 26/13	0.78	L1	L1
<b>Esso Station</b>	Jan. 29/13	0.57	L1	L1
	Mar. 12/13	0.61	L1	L1
	May 21/13	0.22	L1	L1
	June 18/13	0.45	L1	L1
	July 30/13	0.06	L1	L1
	Sept. 10/13	0.34	L1	L1
	Oct. 22/13	0.44	L1	L1
	Dec. 3/13	0.57	L1	L1

## Appendix B – Trihalomethane Results

Each water sample is tested for: Bromodichloromethane; Bromoform; Chloroform; and Dibromochloromethane. Results are reported in mg/L. The method reporting limit for each compound is less than 0.001 mg/L. Only results exceeding 0.001 mg/L are shown below:

DATE	SITE	BROMODI- CHLOROMETHANE	CHLOROFORM	TOTAL
Jan/13	Overwaitea Foods	<0.001	0.019	0.019
Feb/13	Carson's Corner	<0.001	0.018	0.018
Mar/13	Sports Complex	<0.001	0.026	0.026
Apr/13	Crescent Bay Construction	<0.001	0.067	0.067
May /13	Crescent Bay Construction	0.001	0.067	0.068
June/13	Overwaitea Foods	<0.001	0.036	0.036
July/13	Sports Complex	<0.001	0.038	0.038
Aug 6/13	Carson's Corner	<0.001	0.023	0.023
Sept.3/13	Overwaitea Foods	<0.001	0.021	0.021
Oct. 1/13	Crescent Bay Construction	<0.001	0.042	0.042
Nov	Alexander Rd.	<0.001	0.039	0.039
Dec	Esso Station	<0.001	0.025	0.025