June 27, 2012 File: 0400-80

Mr. Dan Byron, Environmental Health Officer
Interior Health
20 23rd Avenue South
Cranbrook, B.C.
V1C 5V1

Re: Town of Golden 2011 Annual Drinking Water Quality Report

Dear Sir,

Please find appended Golden's 2011 Annual Drinking Water Quality Report. The report will be delivered to Council through internal correspondence for formal receipt and will then be placed on the Town's website for public access.

I trust you will find the report in order, however if there are any questions I would be happy to discuss them with you at your convenience.

I would like to also extend an invitation for you to meet with myself and Systems Staff in Golden at your convenience to review the conditions of our Operating Permit and perhaps tour some of our facilities.

I anticipate that another Aquifer Protection Planning Committee meeting, similar to the last meeting held in 2010, will be scheduled later this year to update the Committee on progress made on the Town's Aquifer Protection Plan which is under development. I will advise when that meeting will be held in Golden, so you may plan to attend if doing so is of interest to you.

Best Regards,

Chris Cochran, AScT
Manager of Operations

Attachment

C. David Allen, CAO

Town of Golden
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2011 Drinking Water Quality Annual Report

Facility No. 12-098-00001

June 27, 2012

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Emergency Response Plan

1.0 Introduction

The purpose of this report is to provide information on the monitoring and maintenance of the Town of Golden's water distribution system over the course of the last calendar year, as is directed by Interior Health and mandated by the Drinking Water Protection Act.

The Drinking Water Quality Monitoring program generates data for the continuous trending of the community's water quality, as well as the performance of the entire distribution system in a reliable and systematic way. The program allows for potential health hazards to be quickly identified and corrected and for consumer enquiries to be accurately addressed in a timely manner.

Included in this document is a brief introduction to the Town of Golden's water distribution system, 2011 consumption information, the drinking water monitoring and testing program, and major improvements made to the system. A summary of all water sample analyses results collected in 2011 is also provided. The information contained herein collectively serves to confirm and verify the distribution system's continued performance in delivering a safe and sufficient supply of drinking water to the community.

2.0 Water Distribution System Overview

Groundwater Wells: There are 5 wells with a combined total pumping capacity of 1650 Imperial Gallons per Minute (Igpm) or 125 Litres per second (Lps) providing water to a common distribution system. Two wells are located on the north side of the Kicking Horse River and three are located on the south side.

Reservoirs: There are 5 reservoirs located at 3 distinct reservoir sites within the municipality. The total available reservoir storage capacity is 1,530,000 Igal or 6.96 Mega Litres (ML). The first site is located in the North East Bench, the second and third sites are both located on the South East Bench.

Pressure Zones: There are 4 pressure zones throughout the system. Two pressure zones service the NE Bench, one services the SE Bench and the remainder of the community comprises the fourth pressure zone.

Distribution System: Pipe sizes range from 150mm to 300mm. The pipe network includes asbestos cement (AC), polyvinylchloride (PVC), yellow jacket ductile iron (YJDI), ductile iron (DI), cast iron (CI) and polyethylene (PE) types. There are 140 fire hydrants included in an annual spring and fall maintenance program. Hydrant reports are forwarded on to operations staff each time a hydrant is used by the fire department. Hydrants are <u>not</u> used for filling tankards other than Fire Trucks.

13th Street Well: This well is not connected to the distribution system. It is used for non-potable water use by the municipality as well as authorized contractors.

Consumption Stats:

2011:

Total volume of water pumped - 208,623,333 Igal. (19.8% reduction over 2010)
Peak Day - July 6; 1,026,018 Igal (31.2% reduction over 2010)
Average Day Demand (Estimated) – 535,954 Igpd (25% reduction over 2010 estimate)

2010:

The total water pumped - 260,028,292 Igal.
Peak Day - July 25, 1,490,318 Igal
Average Day Demand (Estimated) - 714,406 Igal

The decrease in system demands are attributable to three main factors, including the repair of two system leaks, increased conservation stewardship (Columbia Basin Trust funded Water Smart Program), and a cooler, wetter irrigating season.

3.0 Testing and Monitoring Program

The water quality monitoring program includes source and distribution system monitoring.

Routine weekly samples are collected at each well head and the individual reservoir sites. These samples are collected by Town of Golden staff and forwarded to a private lab for microbiological testing. Lab results along with consumption and turbidity are reported to the Public Health inspector on a monthly basis.

In 2011 a total of 307 samples were analyzed for total coliforms and E.coli. Of the 307 samples analyzed three samples were positive with a 1-count of total coliforms, with one sample positive with a 7-count. One sample was reported as having overgrown cultures with no visible background colonies detected.

As per schedule B of the Drinking Water Protection Act the Town of Golden is required to analyze 4 samples per month. To emphasize the Town of Golden's commitment to providing safe drinking water the number of samples analyzed in 2011 was approximately 25 per month on average.

The Town of Golden also conducts full spectrum analyses on each source on an annual basis for physical and chemical parameters, as summarized in the appendix.

4.0 System Maintenance and Repairs

The Town of Golden has adopted an operations and maintenance (O&M) program that includes annual reservoir disinfections, reservoir draining and cleaning on an approximate 5-year cycle, annual hydrant inspections, maintenance and flushing, valve exercising, and dead end main flushing.

In 2011, two main leaks were discovered and repaired.

Current and historic maintenance records are available. Monthly operations reports on the water system are provided to Interior Health (IH). The Town of Golden has developed a GIS Mapserver which is currently under development and is intended to be used to access maintenance information by Systems staff. All of the Town of Golden's visible water infrastructure (i.e. water main valves, fire hydrant service valves and fire hydrants) were surveyed by a Global Position Satellite (GPS) in 2009. The data from this survey has been added to our mapping data base to improve the accuracy and reliability of our maps.

5.0 System Improvements

Sampling Locations:

Safety improvements to one reservoir test point in 2011 involved the construction of a sample port snow roof to increase operator safety.

Water Distribution System:

Reservoirs: The Gunite and Hypalon Reservoirs on the SE Bench were drained, cleaned, inspected, disinfected and returned to service.

La Fontaine Road Phase 1 Work (East Limit of 2010 Hill to Portal Improvements to the Gareb Road Intersection) : Approximately 88 m of 150mm PVC watermain was replaced with 250mm PVC. A trailer court service was installed complete with a back flow preventer.

12th Street South Phase 2 Work (8th Ave South to 7th Ave South): Approximately 115 m of 150mm PVC water main was installed to facilitate future system looping. Two new 150 mm service connections were installed to a vacant, developable property, one new 19 mm service was installed to a subdividable property and eight existing curb stops were replaced within the contract work zone.

Well 3 Improvements: A variable frequency drive (VFD) was installed for improved well pump control.

Hydrants: An additional fire hydrant was installed on 8th Avenue South to improve hydrant coverage for that area.

Metering:

In 2011 work continued with the replacement of non-radio frequency (RF) compatible water meters. Meters were either retrofitted with new RF register heads or completely replaced in approximately 40 more industrial/commercial/institutional (ICI) facilities. Work continues with meter updating with priority given to meters which are difficult to access or where high hazard cross connection control can be addressed along with a meter update/retrofit.

Source Protection Plan:

The Aquifer Protection Planning Committee did not meet in 2011. However, considerable work has continued with Golder and Associates with effort put towards the investigation of Earth Energy (geothermal) Systems and the development of regulations for the professional design and installation of systems, well construction by licensed contractors, and submission reviews and approvals for construction by Town staff. From the work completed in 2011, well protection zones have been modeled, mapped and integrated into the municipal building by-law in order to define specific hydrogeological study requirements for these areas of the community. It is anticipated that the completed geothermal study will go before Council in summer of 2012 after which the Committee will meet to discuss the document.

Emergency Response Plan (ERP):

The ERP is reviewed annually and all contacts are updated as necessary. See attached

6.0 Operator Education and Training

The Town of Golden has established a training program that follows EOCP guidelines for required training. Operators have been qualifying to write exams as per EOCP guidelines on an ongoing basis.

Operators received the following training in 2011:

- Lorne Pickering: BCWWA Conference
- Al Taylor: BCWWA Conference
- Keefer Dondaneau: Water System Operator Course, Water Distribution 1

EOCP Current Certifications

Employee	Certification #	Level
Lorne Pickering	3879	WD-III CCC Tester
Alan Taylor	6101	WD-II CCC Tester
Keefer Dondaneau	7639	WD-I

7.0 Cross Connection Control (CCC)

In 2005 the Town of Golden along with Maintenance Training Systems (MTS) began a cross connection control program. A bylaw was introduced to allow the enforcement of a CCC Program. In 2005 the Town of Golden completed assessments on all Town owned facilities. Staff was trained during this process. The process of making our facilities compliant was started in 2005 and completed in early 2006. Two of our staff members are certified tester's and carry out tests on all municipal backflow assemblies.

In 2011 all Town of Golden facilities were tested and recertified. The Town of Golden currently tests and tracks 34 backflow assembly devices located on various Town owned/operated facilities. It is now policy that the Town of Golden specifies the proper device for any new construction. After construction the backflow devices installed on private buildings are added to our database so that we can track and record the testing history of each assembly installed within the Town of Golden. Currently the Town of Golden tracks all Town owned and maintained facilities. The Town of Golden is a client with Maintenance Training Systems and is using their software for our CCC program.

More information on this software can be found at:

http://www.mtsinc.ca/index.php?m=public&p=software&s=fast&v=features

In 2011 the Town of Golden advanced its CCC program and installed appropriate backflow devices on an additional 40 ICI service connections. Work continues with the CCC program with priority given to all high and prioritized medium-hazard service connections.

8.0 SCADA System

Within the Supervisory Control and Data Acquisition (SCADA) system numerous control parameters are in place allowing Town of Golden staff to make changes on an as-needed basis according to ongoing process changes. The following facilities listings itemize all currently in-place SCADA control parameters.

SE Booster Station

- Discharge flow in GPM's
- Discharge pressure
- Room temperature
- Flow Total in Gallons
- Reservoir Levels
- Reservoir Hatch Intrusion alarm
- Booster Pump Run Times
- Flood alarm

NE Booster Station

- Discharge flow in GPM's
- Room Temperature
- Suction Pressure
- Booster Pump Run Times
- Reservoir Levels
- Reservoir Hatch Intrusion alarm
- Discharge Pressure
- Flood alarm

Well Stations

- Flow totalizers in Gallons
- Pump Run Times
- Pressure Transducers in "psi" at all wells
- Room Temperatures
- Flood alarms

All trending is done on a daily basis and is in real time. Trending and reporting continues to be compiled into monthly and yearly reports.

9.0 Events/Emergency Response

In May a main leak was discovered and repaired on the SE Bench (Maple Crescent). In June a main leak was discovered and repaired in the west quadrant of the Town (7th Street South).

In May a failed line shaft bearing was discovered in Well 5. The Well was taken out of service except for testing and emergency standby for the remainder of the year.

In September the Gunite and Hypalon Reservoirs were cleaned and disinfected using AWWA C652-02 standards method 2. Lab reports for each reservoir were satisfactory prior to them being placed back on line.

10.0 Future Plans for 2012

- Continue to make improvements to SCADA system;
- Clean and inspect Bear's Paw reservoir (fall);
- Conduct night flow analysis for leak detection (spring/fall);
- Prioritize and carry-out leak repairs;
- Repair Well 5 and return to regular service;
- Continue with CCC Program and prioritize installs of back flow devices, concentrating first on those facilities with a high hazard rating. Remove and replace existing water meters with new meters that use e-coders for totalizing and billing;
- Continue with public education campaign relating to source-to-tap education, water conservation tips and tricks, education about and enforcement of sprinkling regulations. Include elementary school classroom visits by systems staff and newspaper advertising;
- Minor main upgrades and service repairs on an as-required basis;
- Continue to advance the Groundwater Protection Program under the facilitation of Golder and Associates.

11.0 Sample Analysis Results

DATE	WELL#2	WELL#3	WELL#4	WELL#5	WELL#6	NE RES (yellow)	NE RES	BEARS RES.
Jan 03	No Samples							
Jan 10	<1	<1	<1	<1	<1		<1	<1
Jan 17	<1	<1	<1	<1	<1	<1		<1
Jan 24	<1	<1	<1	<1	<1		<1	<1
Jan 31	<1	<1	<1	<1	<1	<1		<1
Feb 07	<1	<1	<1	<1	<1	<1		<1
Feb 14	<1	<1	<1	<1	<1		<1	<1
Feb 21	<1	<1	<1	<1	<1	<1		<1
Feb 28	off	<1	<1	<1	<1		<1	<1
March 07	<1	<1	<1	<1	<1	<1		<1
March 14	<1	<1	<1	<1	<1		<1	<1
March 21	<1	<1	<1	<1	<1	<1		<1
March 28	<1	<1	<1	<1	<1		<1	<1
April 04	off	<1	<1	<1	<1		<1	<1
April 11	<1	<1	<1	<1	OG		<1	<1
April 14					<1			
April 18	No Samples							
April 25	No Samples							
May 2	<1	<1	<1	<1	<1		<1	<1
May 9	<1	<1	<1	<1	<1	T-1 E<1		<1
May 16	<1	<1	<1	<1	<1	<1		<1
May 23	No Samples							
May 30	<1	<1	<1	<1	<1		<1	<1
June 6	<1	<1	<1	<1	<1		<1	<1
June 13	<1	<1	<1	<1	<1	<1		<1
June 20	<1	<1	<1	<1	<1		<1	<1
June 27	<1	<1	<1	<1	<1	<1		<1
July 4	<1	<1	<1	<1	<1		<1	<1
July 11	<1	<1	<1	<1	<1	<1		<1
July17	<1	<1	<1	<1	<1	<1		<1
July 25	<1	<1	<1	<1	<1		<1	<1
Aug 1	No Samples							

Aug 8	<1	<1	<1	<1	<1	T-7 E<1		<1
Aug 15	<1	<1	<1	<1	<1	<1		<1
Aug 22	<1	<1	<1	<1	<1		<1	<1
Aug 29	<1	<1	<1	<1	<1	<1		<1
Sept 5	No Samples							
Sept 12	<1	<1	<1	<1	<1		<1	<1
Sept 19	<1	<1	<1	<1	<1	<1		<1
Sept 26	<1	<1	<1	<1	<1		<1	<1
Oct 3	<1	<1	<1	<1	<1	T-1 E<1		<1
Oct 10	No Samples							
Oct 17	<1	<1	<1	<1	<1	<1		<1
Oct 24	<1	<1	<1	<1	<1		<1	<1
Oct 31	<1	<1	<1	<1	<1		<1	<1
Nov 7	<1	<1	<1	<1	<1		<1	<1
Nov 14	<1	<1	<1	<1	<1		<1	<1
Nov 21	<1	<1	<1	<1	<1	T-1 E<1		<1
Nov 28	<1	<1	<1	<1	<1	<1		<1
Dec 7	<1	<1	<1	<1	<1	<1		<1
Dec 12	<1	<1	<1	<1	<1		<1	<1
Dec 19	<1	<1	<1	<1	<1	<1		<1
Dec 26	No Samples							

12.0 Turbidity Analysis (NTU)

DATE	WELL#2	WELL#3	WELL#4	WELL#5	WELL#6
Jan 10	0.06	0.06	0.06	0.1	0.07
Jan 17	0.09	0.08	0.08	0.08	0.09
Jan 24	0.07	0.09	0.08	0.08	0.1
Jan 31	0.13	0.08	0.09	0.09	0.08
Feb 7	0.1	0.08	0.06	0.06	0.08
Feb 14	0.08	0.1	0.06	0.06	0.07
Feb 28	off	0.1	0.07	0.08	0.1
Mar 14	0.07	0.07	0.08	0.1	0.09
Apr 5	off	0.11	0.12	0.11	0.1
Apr 12	0.07	0.07	0.08	0.09	0.11
May 2	0.07	0.08	0.07	0.08	0.12
May 9	0.07	0.07	0.09	0.08	0.1
May 16	0.09	0.08	0.1	0.08	0.11
June 21	0.09	0.12	0.12	0.09	0.12
July 4	0.08	0.07	0.08	0.07	0.08
July 11	0.17	0.07	0.19	0.17	0.19
July 18	0.11	0.06	0.06	0.1	0.11
July 25	0.07	0.07	0.14	0.18	0.12
Aug 8	0.1	0.08	0.08	0.09	0.1
Aug 15	0.08	0.09	0.07	0.09	0.1
Aug 22	0.09	0.09	0.08	0.13	0.08
Aug 29	0.08	0.08	0.08	0.1	0.1
Sept 12	0.09	0.07	0.09	0.1	0.09
Sept 19	0.09	0.08	0.09	0.09	0.1
Sept 26	0.08	0.08	0.08	0.1	0.1
Oct 24	0.09	0.08	0.09	0.1	0.11
Nov 14	0.09	0.09	0.11	0.1	0.09
Nov 28	0.09	0.09	0.08	0.1	0.09
Dec 5	0.08	0.07	0.08	0.09	0.1
Dec 12	0.08	0.09	0.08	0.09	0.09
AVERAGE	0.087857	0.081667	0.088	0.096	0.099667
HIGH	0.17	0.12	0.19	0.18	0.19
LOW	0.06	0.06	0.06	0.06	0.07

13.0 Summary

The Town of Golden has worked with local Health Officials since 2002 to develop a water quality monitoring program that exceeds the Drinking Water Regulation. The Town will continue with this monitoring program as part of its commitment to deliver a safe potable water supply to consumers.

This report will be posted on the Town of Golden's website for public information after it has been received by Council for information.

Chris Cochran, AScT
Manager of Operations

Drinking Water Package - Maxxam Analytical

Well #2									CDWQG
Year	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**RDL**	**Units**	**MAC**
Misc. Inorganics									mg/L
Fluoride (F)	0.09	0.1	0.1	0.11	0.11	0.09	0.01	mg/L	1.5
ANIONS									
Nitrite (N)	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.005	mg/L	1
Calculated Parameters									
Total Hardness (CaCO3)	160	149	139	138	143	154	0.5	mg/L	OG500
Nitrate (N)	0.25	0.22	0.17	0.18	0.19	0.24	0.02	mg/L	10
Misc. Inorganics									
Alkalinity (Total as CaCO3)		130	120	130	130	130	0.5	mg/L	
Alkalinity (PP as CaCO3)		<0.5	<0.5	<0.5	<0.5	<0.5	0.5	mg/L	
Bicarbonate (HCO3)		150	150	160	150	150	0.5	mg/L	
Carbonate (CO3)		<0.5	<0.5	<0.5	<0.5	<0.5	0.5	mg/L	
Hydroxide (OH)		<0.5	<0.5	<0.5	<0.5	<0.5	0.5	mg/L	
Anions									
Dissolved Sulphate (SO4)	14.2	16.2	18	16	18	17	0.5	mg/L	OG500
Dissolved Chloride (Cl)	11.4	8.6	1.8	4.7	4.7	10	0.5	mg/L	OG250
MISCELLANEOUS									
True Colour	<5	<5	<5	<5	<5	<5	5	Col. Unit	OG15 TCU
Nutrients									
Nitrate plus Nitrite (N)	0.25	0.22	0.17	0.18	0.19	0.24	0.02	mg/L	
Physical Properties									
Conductivity	307	290	260	282	282	298	1	uS/cm	
pH	8.2	8.2	8.1	8.2	8.3	7.94		pH Units	OG6.5-8.5
Physical Properties									
Total Dissolved Solids	132	180	140	130	160	150	10	mg/L	OG<500
Turbidity	<0.1	<0.1	0.4	0.1	0.1	<0.1	0.1	NTU	1
Total Metals by ICPMS									
Total Aluminum (Al)	<0.02	0.002	0.002	0.004	<0.003	<0.003	0.003	mg/L	OG0.1
Total Antimony (Sb)	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0005	mg/L	0.006
Total Arsenic (As)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	mg/L	0.01
Total Barium (Ba)	0.051	0.052	0.047	0.047	0.049	0.056	0.001	mg/L	1
Total Boron (B)	<0.008	<0.005	<0.05	<0.05	<0.05	<0.05	0.05	mg/L	5
Total Cadmium (Cd)	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	0.01	mg/L	0.005
Total Chromium (Cr)	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	mg/L	0.05
Total Cobalt (Co)	<0.005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0005	mg/L	
Total Copper (Cu)	<0.005	0.0085	0.001	0.0006	0.0005	0.0008	0.0002	mg/L	OG <1.0
Total Iron (Fe)	<0.005	0.006	<0.005	<0.005	<0.005	<0.005	0.005	mg/L	OG <0.3
Total Lead (Pb)	0.00028	0.0003	<0.0002	<0.0002	<0.0002	<0.0002	0.0002	mg/L	0.01
Total Manganese (Mn)	<0.01	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	mg/L	OG<0.05
Total Mercury (Hg)	<0.00005	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	0.00002	mg/L	0.001
Total Molybdenum (Mo)	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.001	mg/L	
Total Nickel (Ni)	<0.008	0.012	<0.001	<0.001	<0.001	<0.001	0.001	mg/L	
Total Selenium (Se)	<0.0005	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	mg/L	0.01
Total Silver (Ag)	<0.01	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	0.00002	mg/L	
Total Uranium (U)	0.00055	0.0005	0.0005	0.0005	0.0005	0.0005	0.0001	mg/L	0.02
Total Vanadium (V)	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.005	mg/L	
Total Zinc (Zn)	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.005	mg/L	OG<5.0
Total Calcium (Ca)	42.9	37.3	35.5	34.1	35.2	38	0.05	mg/L	
Total Magnesium (Mg)	13.9	13.5	12.4	12.9	13.4	14.3	0.05	mg/L	
Total Potassium (K)	<1	0.55	0.5	0.47	0.52	0.6	0.05	mg/L	
Total Sodium (Na)	6.59	5.94	2.04	3.4	3.92	6.23	0.05	mg/L	OG<200
Total Sulphur (S)		6	7	6	7	7	3	mg/L	

Well #3									CDWQG
Year	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**RDL**	**Units**	**MAC**
Misc. Inorganics									mg/L
Fluoride (F)	0.09	0.1	0.11	0.11	0.11	0.1	0.01	mg/L	1.5
ANIONS									
Nitrite (N)	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.005	mg/L	1
Calculated Parameters									
Total Hardness (CaCO3)	180	170	164	157	169	177	0.5	mg/L	OG500
Nitrate (N)	0.41	0.43	0.38	0.38	0.37	0.44	0.02	mg/L	10
Misc. Inorganics									
Alkalinity (Total as CaCO3)		150	150	150	150	140	0.5	mg/L	
Alkalinity (PP as CaCO3)		<0.5	<0.5	<0.5	<0.5	<0.5	0.5	mg/L	
Bicarbonate (HCO3)		180	180	180	180	180	0.5	mg/L	
Carbonate (CO3)		<0.5	<0.5	<0.5	<0.5	<0.5	0.5	mg/L	
Hydroxide (OH)		<0.5	<0.5	<0.5	<0.5	<0.5	0.5	mg/L	
Anions									
Dissolved Sulphate (SO4)	15	16.7	17	16	19	17	0.5	mg/L	OG500
Dissolved Chloride (Cl)	9.7	11.9	11	9.9	9.8	12	0.5	mg/L	OG250
MISCELLANEOUS									
True Colour	<5	<5	<5	<5	<5	<5	5	Col. Unit	OG15 TCU
Nutrients									
Nitrate plus Nitrite (N)	0.41	0.43	0.38	0.38	0.37	0.44	0.02	mg/L	
Physical Properties									
Conductivity	336	340	330	338	329	339	1	uS/cm	
pH	8.2	8.2	8.2	8.2	8.3	8.01		pH Units	OG6.5-8.5
Physical Properties									
Total Dissolved Solids	146	170	170	160	170	180	10	mg/L	OG<500
Turbidity	<0.1	<0.2	0.1	0.2	0.1	<0.1	0.1	NTU	1
Total Metals by ICPMS									
Total Aluminum (Al)	<0.02	0.002	0.003	0.002	<0.003	<0.003	0.003	mg/L	OG0.1
Total Antimony (Sb)	<0.00005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0005	mg/L	0.006
Total Arsenic (As)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	mg/L	0.01
Total Barium (Ba)	0.109	0.111	0.109	0.102	0.11	0.124	0.001	mg/L	1
Total Boron (B)	<0.008	0.006	<0.05	<0.05	<0.05	<0.05	0.05	mg/L	5
Total Cadmium (Cd)	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	0.01	mg/L	0.005
Total Chromium (Cr)	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	mg/L	0.05
Total Cobalt (Co)	<0.005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0005	mg/L	
Total Copper (Cu)	<0.005	0.0027	0.0014	0.0019	0.0015	0.0015	0.0002	mg/L	OG <1.0
Total Iron (Fe)	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.005	mg/L	OG <0.3
Total Lead (Pb)	0.00014	0.0003	<0.0002	<0.0002	<0.0002	<0.0002	0.0002	mg/L	0.01
Total Manganese (Mn)	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	mg/L	OG<0.05
Total Mercury (Hg)	<0.00005	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	0.00002	mg/L	0.001
Total Molybdenum (Mo)	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	mg/L	
Total Nickel (Ni)	<0.008	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	mg/L	
Total Selenium (Se)	<0.005	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	mg/L	0.01
Total Silver (Ag)	<0.01	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	0.00002	mg/L	
Total Uranium (U)	0.00074	0.0007	0.0007	0.0007	0.0007	0.0006	0.0001	mg/L	0.02
Total Vanadium (V)	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.005	mg/L	
Total Zinc (Zn)	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.005	mg/L	OG<5.0
Total Calcium (Ca)	37.9	34.2	33.1	30.6	32.7	34.3	0.05	mg/L	
Total Magnesium (Mg)	20.8	20.6	19.8	19.6	21.1	22.1	0.05	mg/L	
Total Potassium (K)	<1	0.7	0.75	0.62	0.66	0.85	0.05	mg/L	
Total Sodium (Na)	6.12	6.74	6.67	5.8	6.1	7.77	0.05	mg/L	OG<200
Total Sulphur (S)		6	7	6	7	7	3	mg/L	

Well #4									CDWQG
Year	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**RDL**	**Units**	**MAC**
Misc. Inorganics									mg/L
Fluoride (F)	0.06	0.06	0.06	0.06	0.06	0.05	0.01	mg/L	1.5
ANIONS									
Nitrite (N)	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.005	mg/L	1
Calculated Parameters									
Total Hardness (CaCO3)	410	414	420	380	405	399	0.5	mg/L	OG500
Nitrate (N)	1.42	1.32	1.3	1.19	1.12	1.29	0.02	mg/L	10
Misc. Inorganics									
Alkalinity (Total as CaCO3)		330	340	340	270	310	0.5	mg/L	
Alkalinity (PP as CaCO3)		<0.5	<0.5	<0.5	<0.5	<0.5	0.5	mg/L	
Bicarbonate (HCO3)		400	410	410	330	380	0.5	mg/L	
Carbonate (CO3)		<0.5	<0.5	<0.5	<0.5	<0.5	0.5	mg/L	
Hydroxide (OH)		<0.5	<0.5	<0.5	<0.5	<0.5	0.5	mg/L	
Anions									
Dissolved Sulphate (SO4)	36.9	40.2	39	37	40	32	0.5	mg/L	OG500
Dissolved Chloride (Cl)	59.5	73.6	67	74	78	120	0.5	mg/L	OG250
MISCELLANEOUS									
True Colour	<5	<5	<5	5	<5	<5	5	Col. Unit	OG15 TCU
Nutrients									
Nitrate plus Nitrite (N)	1.42	1.32	1.3	1.19	1.12	1.29	0.02	mg/L	
Physical Properties									
Conductivity	831	870	860	902	824	841	1	uS/cm	
pH	8.1	8.1	7.9	8	8.1	7.87		pH Units	OG6.5-8.5
Physical Properties									
Total Dissolved Solids	448	490	510	480	460	440	10	mg/L	OG<500
Turbidity	<0.1	0.2	0.1	0.2	0.1	<0.1	0.1	NTU	1
Total Metals by ICPMS									
Total Aluminum (Al)	<0.02	0.001	<0.001	0.004	<0.003	<0.003	0.003	mg/L	OG0.1
Total Antimony (Sb)	<0.00005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0005	mg/L	0.006
Total Arsenic (As)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	mg/L	0.01
Total Barium (Ba)	0.182	0.197	0.205	0.182	0.199	0.199	0.001	mg/L	1
Total Boron (B)	<0.008	0.017	<0.05	<0.05	<0.05	<0.05	0.05	mg/L	5
Total Cadmium (Cd)	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	0.01	mg/L	0.005
Total Chromium (Cr)	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	mg/L	0.05
Total Cobalt (Co)	<0.005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0005	mg/L	
Total Copper (Cu)	<0.005	0.0021	0.0011	0.0007	0.0008	0.0011	0.0002	mg/L	OG <1.0
Total Iron (Fe)	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.005	mg/L	OG <0.3
Total Lead (Pb)	0.00032	0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.0002	mg/L	0.01
Total Manganese (Mn)	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	mg/L	OG<0.05
Total Mercury (Hg)	<0.00005	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	0.00002	mg/L	0.001
Total Molybdenum (Mo)	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	mg/L	
Total Nickel (Ni)	<0.008	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	mg/L	
Total Selenium (Se)	<0.0005	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	mg/L	0.01
Total Silver (Ag)	<0.01	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	0.00002	mg/L	
Total Uranium (U)	0.00132	0.0013	0.0013	0.0013	0.0013	0.0011	0.0001	mg/L	0.02
Total Vanadium (V)	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.005	mg/L	
Total Zinc (Zn)	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.005	mg/L	OG<5.0
Total Calcium (Ca)	104	103	103	90.2	96	95.9	0.05	mg/L	
Total Magnesium (Mg)	36.6	38	39.4	37.5	40.2	38.8	0.05	mg/L	
Total Potassium (K)	1	1.66	1.89	1.69	1.82	1.88	0.05	mg/L	
Total Sodium (Na)	34.9	41.2	41.3	42.6	44.5	41.6	0.05	mg/L	OG<200
Total Sulphur (S)		14	15	12	16	15	3	mg/L	

Well #5									CDWQG
Year	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**RDL**	**Units**	**MAC**
Misc. Inorganics									mg/L
Fluoride (F)	0.09	0.1	0.09	0.10	0.10	0.09	0.01	mg/L	1.5
ANIONS									
Nitrite (N)	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.005	mg/L	1
Calculated Parameters									
Total Hardness (CaCO3)	210	189	200	180	183	190	0.5	mg/L	OG500
Nitrate (N)	0.58	0.47	0.52	0.50	0.41	0.36	0.02	mg/L	10
Misc. Inorganics									
Alkalinity (Total as CaCO3)		160	170	170	160	150	0.5	mg/L	
Alkalinity (PP as CaCO3)		<0.5	<0.5	<0.5	<0.5	<0.5	0.5	mg/L	
Bicarbonate (HCO3)		200	200	200	200	190	0.5	mg/L	
Carbonate (CO3)		<0.5	<0.5	<0.5	<0.5	<0.5	0.5	mg/L	
Hydroxide (OH)		<0.5	<0.5	<0.5	<0.5	<0.5	0.5	mg/L	
Anions									
Dissolved Sulphate (SO4)	17.3	19.3	20	21	19	20	0.5	mg/L	OG500
Dissolved Chloride (Cl)	19.7	18.3	17	15	12	13	0.5	mg/L	OG250
MISCELLANEOUS									
True Colour	<5	<5	<5	<5	<5	<5	5	Col. Unit	OG15 TCU
Nutrients									
Nitrate plus Nitrite (N)	0.58	0.47	0.52	0.50	0.41	0.36	0.02	mg/L	
Physical Properties									
Conductivity	404	390	390	395	355	357	1	uS/cm	
pH	8.1	8.2	8.1	8.2	8.3	7.85		pH Units	OG6.5-8.5
Physical Properties									
Total Dissolved Solids	214	210	220	200	190	190	10	mg/L	OG<500
Turbidity	<0.1	0.3	0.1	0.2	<0.1	0.2	0.1	NTU	1
Total Metals by ICPMS									
Total Aluminum (Al)	<0.02	0.002	<0.001	0.005	<0.003	<0.003	0.003	mg/L	OG0.1
Total Antimony (Sb)	<0.00005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0005	mg/L	0.006
Total Arsenic (As)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	mg/L	0.01
Total Barium (Ba)	0.075	0.075	0.078	0.068	0.07	0.076	0.001	mg/L	1
Total Boron (B)	<0.008L	0.016	<0.05	<0.05	<0.05	<0.05	0.05	mg/L	5
Total Cadmium (Cd)	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	0.0002	0.01	mg/L	0.005
Total Chromium (Cr)	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	mg/L	0.05
Total Cobalt (Co)	<0.005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0005	mg/L	
Total Copper (Cu)	<0.005	0.0009	0.0017	0.0014	0.0007	0.0023	0.0002	mg/L	OG <1.0
Total Iron (Fe)	<0.005	<0.005	<0.005	<0.005	<0.005	0.0021	0.005	mg/L	OG <0.3
Total Lead (Pb)	0.00007	<0.0002	<0.0002	<0.0002	<0.0002	0.0003	0.0002	mg/L	0.01
Total Manganese (Mn)	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	mg/L	OG<0.05
Total Mercury (Hg)	<0.00005	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	0.00002	mg/L	0.001
Total Molybdenum (Mo)	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	mg/L	
Total Nickel (Ni)	<0.008	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	mg/L	
Total Selenium (Se)	<0.0005	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	mg/L	0.01
Total Silver (Ag)	<0.01	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	0.00002	mg/L	
Total Uranium (U)	0.00067	0.0006	0.0006	0.0006	0.0006	0.0006	0.0001	mg/L	0.02
Total Vanadium (V)	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.005	mg/L	
Total Zinc (Zn)	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.005	mg/L	OG<5.0
Total Calcium (Ca)	54.5	46.8	49.6	43.2	43.8	46.8	0.05	mg/L	
Total Magnesium (Mg)	18	17.6	18.4	17.6	17.9	17.7	0.05	mg/L	
Total Potassium (K)	1	0.95	0.97	0.91	0.92	0.96	0.05	mg/L	
Total Sodium (Na)	11.4	9.97	10.4	9.45	8.36	8.27	0.05	mg/L	OG<200
Total Sulphur (S)		7	8	8	7	8	3	mg/L	

Well #6									CDWQG
Year	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**RDL**	**Units**	**MAC**
Misc. Inorganics									mg/L
Fluoride (F)	0.06	0.06	0.06	0.07	0.06	0.05	0.01	mg/L	1.5
ANIONS									
Nitrite (N)	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.005	mg/L	1
Calculated Parameters									
Total Hardness (CaCO3)	310	336	349	293	317	346	0.5	mg/L	OG500
Nitrate (N)	0.63	1.14	0.93	0.76	0.88	1.17	0.02	mg/L	10
Misc. Inorganics									
Alkalinity (Total as CaCO3)		280	290	280	290	280	0.5	mg/L	
Alkalinity (PP as CaCO3)		<0.5	<0.5	<0.5	<0.5	<0.5	0.5	mg/L	
Bicarbonate (HCO3)		340	350	340	350	340	0.5	mg/L	
Carbonate (CO3)		<0.5	<0.5	<0.5	<0.5	<0.5	0.5	mg/L	
Hydroxide (OH)		<0.5	<0.5	<0.5	<0.5	<0.5	0.5	mg/L	
Anions									
Dissolved Sulphate (SO4)	19.5	24.4	24	22	27	25	0.5	mg/L	OG500
Dissolved Chloride (Cl)	16.3	31	27	22	22	32	0.5	mg/L	OG250
MISCELLANEOUS									
True Colour	<5	<5	<5	<5	<5	<5	5	Col. Unit	OG15 TCU
Nutrients									
Nitrate plus Nitrite (N)	0.63	1.14	0.93	0.76	0.88	1.17	0.02	mg/L	
Physical Properties									
Conductivity	544	640	630	612	575	644	1	uS/cm	
pH	8.1	8.1	8	8	8.1	7.88		pH Units	OG6.5-8.5
Physical Properties									
Total Dissolved Solids	278	340	360	300	310	350	10	mg/L	OG<500
Turbidity	<0.1	0.2	0.2	0.3	0.2	0.1	0.1	NTU	1
Total Metals by ICPMS									
Total Aluminum (Al)	<0.02	0.001	<0.001	0.001	<0.003	<0.003	0.003	mg/L	OG0.1
Total Antimony (Sb)	<0.00005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0005	mg/L	0.006
Total Arsenic (As)	<0.0001	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	mg/L	0.01
Total Barium (Ba)	0.115	0.142	0.138	0.116	0.128	0.143	0.001	mg/L	1
Total Boron (B)	<0.000008	<0.000005	<0.00005	<0.00005	<0.00005	<0.00005	0.05	mg/L	5
Total Cadmium (Cd)	<0.00001	<0.00001	0.00002	<0.00001	<0.00001	<0.00001	0.01	mg/L	0.005
Total Chromium (Cr)	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	mg/L	0.05
Total Cobalt (Co)	<0.005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0005	mg/L	
Total Copper (Cu)	<0.005	0.0003	0.0023	0.0003	0.0004	0.0007	0.0002	mg/L	OG <1.0
Total Iron (Fe)	0.012	0.015	0.008	0.015	0.016	0.025	0.005	mg/L	OG <0.3
Total Lead (Pb)	<0.00002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.0002	mg/L	0.01
Total Manganese (Mn)	0.002	0.001	0.001	<0.001	<0.001	<0.001	0.001	mg/L	OG<0.05
Total Mercury (Hg)	<0.00005	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	0.00002	mg/L	0.001
Total Molybdenum (Mo)	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	mg/L	
Total Nickel (Ni)	<0.008	0.001	<0.001	<0.001	<0.001	<0.001	0.001	mg/L	
Total Selenium (Se)	<0.0005	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	0.0001	mg/L	0.01
Total Silver (Ag)	<0.01	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	0.00002	mg/L	
Total Uranium (U)	0.00104	0.0012	0.0011	0.0011	0.0012	0.001	0.0001	mg/L	0.02
Total Vanadium (V)	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.005	mg/L	
Total Zinc (Zn)	<0.005	0.005	<0.005	<0.005	<0.005	<0.005	0.005	mg/L	OG<5.0
Total Calcium (Ca)	87.2	92.7	95.2	77.8	84.3	91.6	0.05	mg/L	
Total Magnesium (Mg)	22.3	25.4	27.1	23.9	25.9	28.6	0.05	mg/L	
Total Potassium (K)	<1	0.86	0.96	0.79	0.87	1.01	0.05	mg/L	
Total Sodium (Na)	9.63	13.3	15.1	12.2	13	16.3	0.05	mg/L	OG<200
Total Sulphur (S)		8	9	8	9	9	3	mg/L	

CDWQG – Canadian Drinking Water Quality Guidelines

MAC - Maximum Acceptable Concentration
OG - Operation Guideline

Water Operations Emergency Response Plan
May 2012
Golden Public Water System, Facility 12-098-00001

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(updated May 14, 2012)

1.0 Loss of Source

In the event a well has exhausted its' supply or the yield has dropped significantly:

Actions:
- -Turn off pump and supply power
- -Isolate from distribution system
- -Ensure adequate supply from alternate sources

Contacts:
- -Notify Operations (Contact List page 17)
- -Notify DWO – if unavailable, contact On-Call MOH (Contact List page 17)

2.0 Flood Conditions

If flooding occurs near a well source the following steps should be followed:

Actions:
- -In the case of advanced notice prior to flooding turn off pump and supply power
- -Sandbag area around well house or wellhead
- -Isolate well from distribution system
- -If flooding occurs turn off pump and supply power (observe all safety precautions when approaching facility if power is live). Contact BC Hydro if power needs to be disconnected to facility.
- -Isolate well from distribution system using isolation valves
- -Ensure that alternate sources are adequate and operational
- -Notify and wait for further instruction from DWO

Contacts:
- -Notify Operations (Contact List page 17)
- -Notify DWO – if unavailable, contact On-Call MOH (Contact List page 17)
- -BC Hydro (contact list page 17)

****Prior to placing the well back into operation:
- -contact the DWO
- -disinfection may be required as per AWWA Standards
- -further lab analysis may also be required

3.0 Main Breaks

In the event of a main break or leak the following actions should be observed:

Actions: -Isolate affected section of distribution system allowing ample water flow to maintain positive pressure.
-Notify all users in the area
-Repair couplings and pipe sections must be swabbed with a chlorine solution
-Dose section as per calculations (Page 13)
-Obtain samples at each end of repair and test for chlorine residual.

Contacts:-Notify Operations (Contact List Page 17)
-Notify DWO – if unavailable, contact On-Call MOH (Contact List page 17)
-Notify Fire Department if fire hydrants are out of service

****Report occurrence on the monthly water report to DWO

4.0 Pump Failure

A pump failure will be defined as any mechanical failure that would not allow the pumping facility to operate under normal conditions other than a power failure.

Actions: -Turn off pump and supply power
-Isolate from distribution system
-Ensure alternate sources are adequate

Contacts: -Notify Operations (Contact List Page 17)

5.0 Power Failure

In the event of a power failure localized or entire Town the following procedures should be followed:

Actions:
-Call BC Hydro and enquire about the duration of the disruption
-Observe all Reservoir levels and pressures via the SCADA screen
-Depending on time of year and consumption start Generator at #3 Well and manually pump water at both #3 Well and #6 Well
-Winter conditions will warrant close observation of building temperatures at all facilities
-Summer conditions may warrant close observation of reservoir levels. Wells #3 and #6 can be placed on hand with the generators running

Contacts:
-Notify Operations (Contact List Page 17)
-Notify DWO – if unavailable, contact On-Call MOH (Contact List page 17)

****Report occurrence on the monthly water report to DWO

6.0 Backflow Condition

Refer to Section 13

7.0 Contamination of a Well

Actions:
-Shutoff pump and power supply
-Isolate from Distribution System
-Notify DWO – if unavailable, contact On-Call MOH (Contact List page 17)
-Obtain samples throughout Distribution System and send to Lab for analysis

Contacts:
-Notify Operations (Contact List Page 17)
-Notify DWO – if unavailable, contact On-Call MOH (Contact List page 17)

8.0 Contamination of a Reservoir

Actions:
- Shut off inlet and outlet piping (maintaining water supply via alternate Reservoir through valve chamber bypass valves)
-Notify all users (Phone tree, media, handouts and posting signs)
-Obtain samples from Reservoir and downstream samples throughout the Distribution System) and send to Lab for analysis
-Notify Fire Department of situation and make them aware that flows may be less and closely watch all pressures to avoid negative pressures and possible backflow conditions
-Notify DWO – if unavailable, contact On-Call MOH (Contact List page 17)

Contacts:
-Notify Operations (Contact List Page 17)
-Notify DWO and await further instructions

9.0 Tampering/Vandalism

Whether it be Source or Reservoir or Fire Hydrant Tampering/Vandalism apply the following procedures:

Actions: -Contact Local RCMP Detachment
-Isolate the suspected Source/Reservoir where applicable
-Samples of Distribution System may have to be sent to Lab for analysis
- Notify DWO – if unavailable, contact On-Call MOH (Contact List page 17)

Contacts: -Notify Operations (Contact List Page 17)
-Notify DWO – if unavailable, contact On-Call MOH (Contact List page 17)

10.0 Earthquakes

In the unusual event of an Earthquake it will depend on the severity of the damage to apply specific procedures. One emergency or any combination of events may be experienced.

Actions: -Apply any action that is applicable to the degree of the damage or interruption
-Notify Operations and account for all staff if work was being performed at the time of the earthquake
-Physically visit each facility and inspect for damage
- Ensure all facilities are operating properly and remove any from service if necessary and possible

Contacts: -Notify Operations (Contact List Page 17)
-Notify DWO – if unavailable, contact On-Call MOH (Contact List page 17)

11.0 Fire

If system water is being used to fight a major structure or brush fire apply the following procedures:

Actions: -Maintain close communication with the Fire Command to ensure adequate water supply and make the Fire Department aware of maintaining proper pressures in the Distribution System
-Regularly observe all Pumping Facilities and alter operating parameters where necessary to facilitate the Fire Department.
-If a Pumping Facility is in danger of becoming engaged in a Fire or not accessible make Fire Commander aware of the situation and any possible hazards that may be encountered.

Contacts: -Notify Operations (Contact List Page 17)
-Notify DWO – if unavailable, contact On-Call MOH (Contact List page 17)

12.0 Formulas for Disinfection

Water Main Disinfection

Volume = (r)2(l) r-radius l-length

lft3=28.317 liters

lft3=6.24 Imp Gallons

Use attached AWWA standards when disinfecting a water main

Disinfecting at Wells (utilizing existing Alldos chemical pumps)

Place a twenty liter pail of Hypochlor 12 underneath the existing Alldos injection pumps at all wells. Follow the directions listed at each well in order to achieve the desired residual.

Also refer to the attached AWWA chlorine dosages to check feed rate.

13.0 Water Quality Issue or Emergency

In the event of a water quality issue or emergency;

-Notify the DWO Dan Byron (250) 420-2240 (office) or (250) 421-3471 (cell) if he is unavailable then contact the Emergency on call Medical Health Officer @ 1-866-457-5648

-Contact the Manager of Operations Chris Cochran (250) 344-8531 or Jon Wilsgard (250) 344-0155 (cell) or the 24 hour on call duty phone (250) 344-8340 or David Love (250) 230-0877

There are three criteria outlined by the Interior Health Authority that each require different levels of action to be initiated.

Outlined below are the three levels of public notification and the specific actions required by operators in each instance:

1) **Water Quality Advisory**
   Used in situations in which the public health threat posed by the water supply system is modest, and actions can be taken to reduce the risks through means other than requiring a Boil Water Notice or Do Not Use Water Notice.

   Actions:
   - Resample and determine the cause and rectify if possible.
   - Issue the notice to the public (Using the Town of Goldens Public Alert System that is currently under development)
   - When a water quality advisory is in place, people with weakened immune systems such as the elderly, young children, those with diabetes, kidney problems or other chronic disease should consider boiling their water or using a different source of water.

2) Boil Water Notice

Used in situations in which the public health threat posed by the water supply system is significant and the nature of the threat is one that can be effectively addressed through boiling of the water.

The following actions will need to be taken in the event of lab results resulting in IHA issuing a Boil Water Notice:

1) A positive E. coli is detected at any sample location
2) A Total Coliform count of greater than 10 is detected at any sample location.
3) Total Coliforms are detected at more than one sample location.

Actions:

-Immediately begin the disinfection process as follows:

- Start the emergency chlorine injection pumps located at all wells. This requires 20 liter pails of Hypochlor 12 to be distributed to each well and placed under the chlorine injection pumps. The injection pumps should be set as per the instruction sheets posted above injection pumps.
- Begin the process of emergency disinfection of each reservoir. The disinfection is introduced via the inspection hatches on the top of the reservoirs. Use the following table:

	Bears Paw	Gunite*	NE Green	NE yellow
Hypochlor 12%	2 Liters	6 liters	3 Liters	1.5 Liters
Bleach 5.25%	6 liters 1.5 jugs	12 Liters 3 jugs	8 Liters 2 jugs	4 Liters 1 jug

*There is no access point to introduce the disinfection directly into the Hypalon reservoir. The Gunite reservoir is the only fill point for the Hypalon therefore the Gunite is dosed at a higher rate.

-Resample as directed by the DWO

- Test for Chlorine residuals at various representative points in the distribution system and reservoirs for free chlorine residual. The target is 0.5 mg/L unless directed otherwise by the DWO

4) **Do Not Use Water Notice**

Used in situations where a significant public health threat exists in relation to the water supply system and the threat cannot be adequately addressed through a Water Quality Advisory or Boil Water Notices.

Actions

-Provide alternate potable water sources at specific areas in town. Identify these stations in the public notice.

-Remedy the cause

Town of Golden

Emergency Response Contact List

C.A.O	David Allen	344-0323 Wk cell	344-5660 Hm Ph
Operations Mgr.	Chris Cochran	344-8531 Wk cell	344-5779 Hm Ph

Operations Standby/Manwatch Staff

Forman – Dave Poland	344-8218 Wk Cell	
Lorne Pickering	344-8558 Wk Cell	344-7622 Hm Ph 439-9420 Hm Cell
Al Taylor	344-1488 Wk Cell	344-3945 Hm Ph
Keefer Dondaneau	344-1375 Wk Cell	344-0235 Hm Ph
Darlene (Darci) Dolan	344-1604 Wk Cell	344-2038 Hm Ph
Robert Drummond		344-2543 Hm Ph
Matt Nichol		439-1189 Hm Ph
Wade Persson	344-4901 Wk Cell	344-7921 Hm Ph
Bill Sadler	344-8279 Wk Cell	344-7033 Hm Ph
Sterling Larabee	344-6868 Wk Cell	344-2275 Hm Ph
Blair McAllister	439-9478 Wk Cell (Shared)	344-7347 Hm Ph 344-1592 Hm Cell
Reeves Pedley	439-9478 Wk Cell (Shared)	344-2757 Hm Ph
Dave Rousseau	439-9478 Wk Cell (Shared)	344-2550 Hm Ph
Bill Soles	344-1123 Wk Cell	344-2095 Hm Ph 272-2095 Hm Cell

Emergency Contact

Drinking Water Officer (DWO) Dan Byron
(250) 420-2240 cell 250-421-3471 Toll Free 1-866-457-5648
(Mon-Fri 8:30 - 4:30 if after hours call the following number)
On-call 24-Hour Medical Officer of Health 1-866-457-5648

Public Health Engineer	Curtis Neville	250-851-7320
PEP	Kyle Hale	344-8495c
PEP Nelson		250-354-6395
Spills/Dangerous Goods		1-800-663-3456
Forest Fire/Wildfire		1-800-663-5555
Police		911
Fire		911
Fire Chief		344-8264c
Deputy Fire Chief		344-8265c
Ambulance		911

Hospital	344-5271
BC Hydro (Power Outage/Repair Line)	1-888-769-3766
Vacuum Truck-Jet Vac (Kootenay Pumping)	344-6410
Four Star (working alone)	1-866-951-7449
BC One Call	1-800-474-6886
Town Office Emergency after hours(duty phone)	344-8340
Town Office Standby Cell	344-1458
Superior Propane	1-877-873-7467

Excavation Services

Weatherall	344-2962
Gottler Bros.	344-6480
Pederson & Sons	344-6027
Chatter Creek	344-1094
Brisco Rocks & Excavating	250-346-3395
Kicking Horse Adventures	344-8317
Jackson Contracting & Excavating	344-0574c

Plumbing Services

Weatherall	344-2962
Kardash	344-6887
Blaeberry Valley Plumbing	344-7209
T Williams Plumbing	344-0116

Electrical Services

Golden Installations	344-5566

Lab Services

BCCDC (Public Health Emergency Mgt)	604-707-2496/2495
CARO Analytical Services	250-765-9646
Consulting Services-Urban Systems (Calgary)	403-291-1193

Media Services

Newspaper	STAR	344-5251
Radio	CKGR	344-7177

SCADA

Interior Instruments Tech Services		717-8813
	Ken Hanson	469-0577c
	Garth Ink	469-0583c
Town of Golden IT	Dave Hedges	344-5630res 344-8222c

Traffic Control

Crossroads Traffic Control Marilyn Thorn	344-0271c
Kanyon Ridge Karen	344-0694c

Water Hauling

Kootenay Pumping - Golden	344-6410
Cal-portisan - Calgary	403-279-5115
Alpine Water Hauling - Vernon	250-938-4149
SE Contracting Cranbrook	250-417-3607