



Comox Valley Water System Emergency Response Plan

Update: August 2010

Table of Contents

Section No.	Event List	Page
1	Loss of Power - BC Hydro Power Supply	3
2	Chlorine Leak - Comox Valley Chlorination Station	4
3	Failure of Chlorination Equipment	6
4	Bacterial Contamination of the Water Supply	7
5	Contamination of the Water Supply	8
6	Loss of Water Supply	9
7	APPENDIX 'A' – Boil Water Notice	11
8	APPENDIX 'B' – Removal of Boil Water Notice	13
9	APPENDIX 'C' – Water Use Restriction Notice	14
10	APPENDIX 'D' – Removal of Water Use Restriction Notice	15
10	APPENDIX 'E' – Do Not Consume the Water Notice	16
10	APPENDIX 'F' – Removal of Do Not Consume the Water Notice	17
11	Emergency Contact List	18

1. Loss of Power – BC Hydro Power Supply

The loss of BC Hydro power will automatically activate the power generator to provide electricity to the Comox Valley chlorination station. The water on call person will receive a page from the alarm monitoring company advising that there has been a power failure alarm and a genset run, power transfer alarm.

- 1.1 Respond to alarm and assess the situation.
- 1.2 Contact BC Hydro and notify them of the situation. Request an estimate of the duration of the power outage. **BC Hydro 1-888-769-3766**
- 1.3 Ensure that the generator is running properly.
- 1.4 Ensure that the chlorination equipment is operating properly.
- 1.5 Refuel standby generator if the outage is expected to last for an extended period
- 1.6 Once BC Hydro power is back in service check equipment and refuel the generator.

Genset capacity is 80kw. Total run time with full fuel tank (120 gallons) is approximately 45 hours. Heaters are not on the generator supply. In the event of freezing temperatures additional heat sources may be required within the chlorination building. Stopping and starting of the booster pump may cause the ejector to vent chlorine solution causing a chlorine leak alarm. Staff will respond as per CVRD water services chlorine leak policy in the safety manual. The regional district pump stations have uninterruptible power supplies that would maintain data logging and limited control in the event of a power failure. In the event of an extended power failure a back up portable generator could recharge the battery units in these stations.

2. Chlorine Leak at Comox Valley Chlorination Station

The chlorination station gas storage room is equipped with a chlorine gas scrubber. This scrubber has the capacity to neutralize 2000 lbs. of liquid chlorine gas (under pressure). In the event of a chlorine gas leak in this room, the scrubber will activate automatically and an alarm will be sent to the water on call person. Leaks outside of the chlorine gas storage room would not activate an alarm from the chlorine leak sensors. Details of leak assessment and repair are covered in the department safety manual. Chlorine leaks require a response from CVRD waterworks personnel trained in chlorine cylinder leak repair.

Chlorine leak response

- 2.1 If waterworks personnel detect a chlorine leak during delivery, all personnel should immediately leave the area and meet at the BC Hydro gate at the end of Powerhouse Road. Stop public access into this area.
- 2.2 **Contact BC Hydro at VI Control 1-250-701-4611** to notify their employees. A manual BC Hydro notification and chlorine alarm button is installed in the West chlorine residual room by the emergency eyewash. When activated, this will immediately notify the alarm monitoring service and BC Hydro VI Control that there is a chlorine leak. This will also turn on the red strobe and warning siren at the station to notify anyone in the immediate area. This button also starts the gas scrubber. This alarm button should only be activated without endangering water personnel.
- 2.3 Contact either the manager of water services or the senior waterworks technician, then additional water services staff will be called out to respond to the leak. The chlorine leak alarm has two stages. The first stage at less than 1ppm only activates the chlorine leak alarm. The second stage is activated at 5ppm and this turns on the gas scrubber to neutralize the air in the chlorine room. Fire department staff only needs to be notified at the second stage (5ppm). BC Hydro will be notified through their monitoring equipment at this time. Staff should notify the Fish hatchery staff at the second stage and confirm that BC Hydro staff at the generating station are aware of the situation. Keep in mind that the air from the chlorine gas room is neutralized by the chlorine gas scrubber and that no chlorine gas will be present in the surrounding area. They may want to evacuate voluntarily. Any additional emergency notification may be initiated at this time or determined by assessment of the leak.
- 2.4 If emergency responders are called, arrange to meet them at the BC Hydro gate at the end of Powerhouse Road.
- 2.5 Advise the fire department and RCMP of the severity of the leak, if known. The repair plan will be determined after assessment by CVRD water services staff.
- 2.6 Leak repair will be completed by CVRD staff equipped with proper protective equipment. Level “A” chemical suits are located at the waterworks shop at 299 Puntledge Ave. Prior to attempting repairs, advise the Courtenay fire department that additional SCBA air bottles will be required.

- 2.7 Technical support is available through the chlorine supplier: Brenntag Canada
Emergency Contact phone 1-604-685-5036.
- 2.8 After repairs have been completed, emergency response personnel will determine when the area is safe to allow anyone that has been evacuated to return to their home or workplace.
- 2.9 Any equipment used (Repair Kit) would need to be serviced and any repair materials restocked.
- 2.10 A leak of this nature would require a report to be filed with the WorkSafe BC outlining the cause and procedures followed.
- 2.11 A post incident investigation would need to be arranged to ensure the appropriate actions were followed. Any changes in procedure would be implemented.

3. Failure of Chlorination Equipment

The Comox Valley Chlorination Station is divided into two chlorination systems, West and East. Each of these systems has an online backup system. In the event of failure of one of the two operating chlorination systems the operator on call can close the valve on the supply main that is in need of repair. This will force all the water through the operating chlorination equipment.

- 3.1 The on call water personnel will receive a “Low Chlorine Alarm” from the alarm monitoring service. The operator can close the main valve (in the station) on the system that is in need of repair.
- 3.2 It may be necessary to bypass the alarms (Low Chlorine residual, Booster fail) until repair is made and the equipment is returned to service.

In the event that the chlorination station is unable to function entirely

The reason for this would be a major component failure either due to fire or electrical overload or natural disaster.

- 3.3 The on call person would be the first response to any of these events. If it is found that the system does not have the ability to chlorinate, the manager of water services shall be contacted immediately. The manager will decide if the public health authority will need to be advised of any potential contamination.
- 3.4 A boil water notice (see APPENDIX ‘A’) may need to be issued if there has been any unchlorinated water that has entered the distribution system.
- 3.5 The two main valves in each of the West and East pipe galleries can be closed. This will stop unchlorinated water from entering the water system.
- 3.6 The repair of failed equipment or an alternate chlorination method needs to be implemented.
- 3.7 Bacterial water samples and free chlorine residuals should be taken throughout the distribution area.
- 3.8 Assess the volume of unchlorinated water entering this system. This can be back flushed to the chlorination station. Test the chlorine residual at the flushout outside the chlorination station. Test chlorine levels at all stations to ensure levels are adequate.
- 3.9 When repairs are made and sufficient sampling has been done to prove 0.6 mg/l chlorine in the supply system and the main valves in the pipe galleries can be opened to allow water back into the distribution system.
- 3.10 Subject to approval of VIHA the boil water notice may be rescinded. (See APPENDIX ‘B’.)

4. Bacterial Contamination of the Distribution System

The Comox Valley Water System is sampled weekly. Consult with VIHA regarding **E. Coli** presence in water samples. If there is **E. Coli** detected in any of these samples proceed as follows:

- 4.1 Test for free chlorine levels present at sample site. Determine that adequate levels are present.
- 4.2 Flush the sample tap and ensure there is no local contamination of the site. Resample the site that had the presence of Total Coliform.
- 4.3 Results of these samples will show any indication of growth in 24 hours. Complete test takes 48 hours. If there is any indication of Total Coliform in further samples, flushing of the affected area and resampling will be required.
- 4.4 Continue flushing and sampling until no presence of Total Coliform is indicated.

E. Coli Contamination or High Turbidity Levels

- 4.5 Contact the Vancouver Island Health Authority. Any water samples that indicate the presence of **E. Coli** or **High Turbidity Levels** could require a boil water notice (see APPENDIX 'A') to the users of the Comox Valley water system.
- 4.6 Evaluate operational adjustments designed to reduce turbidity levels (i.e. temporarily isolate the water system from the source (river) and supply water from reservoirs only, etc).
- 4.7 Commence daily turbidity sampling and testing at all reservoirs to measure turbidity levels in the system, as well as the incoming turbidity from the source. (If turbidity results acceptable to VIHA, and not trending higher, then daily testing required only on week-days. Terminate daily testing after turbidity drops below 1 NTU.)
- 4.8 Determine the area affected and flush the system until acceptable chlorine or turbidity levels are found. Resample throughout the area.
- 4.9 Evaluate a communication strategy. It may be necessary to notify specific sites by hand delivering or faxing notices. i.e. hospitals, long-term care facilities and schools etc. Key communication issues – boil water notice, higher chlorine taste, water colour, etc.
- 4.10 Once the cause of the problem has been determined and corrected, three consecutive negative tests must be received. Consult with VIHA to determine when the boil water notice may be rescinded. (See APPENDIX 'B'.)
- 4.11 Evaluate need for a communications strategy.

5. Contamination of the Water Supply

In the event that there is contamination or suspected contamination of the water system occurs, including suspected reservoir intrusion:

- 5.1 Contact the manager of water services or other supervisor and advise the Vancouver Island Health Authority that contamination of the water supply has occurred.
- 5.2 Assess the source and the extent of the contamination within the water system. It may also be necessary to issue a boil water notice (APPENDIX 'A') or other restrictive use notices such as water use restriction notice (APPENDIX 'C') and/or do not consume the water notice (APPENDIX 'E') to the users of the water system through the media. Additional advisories may be required after determining the cause of contamination.
- 5.3 If the contamination is from the source, close the penstock valves to isolate the water system from contamination. If the distribution system is contaminated, isolate the affected area. If the contamination is determined to be hydrocarbons leaking into the water source, the risk to the water supply must be assessed as soon as possible. This assessment will determine the appropriate response.
- 5.4 Water staff, in consultation with the Vancouver Island Health Authority, will need to determine a sampling strategy for hydrocarbons and assess the threat to the water supply.
- 5.5 If the source is contaminated, contact the **Provincial Emergency Plan (PEP)** and advise them of the nature of the emergency. **Phone 1-800-663-3456.**
- 5.6 If the source contamination can be contained with absorbent floating booms, there is one available at the Comox Valley Regional District Puntledge pump station.
- 5.7 BC Hydro may need to be contacted to stop water flow into the penstock (to prevent contamination of the penstock). It may be necessary to install a protective boom at the entrance to the penstock to divert contaminants.
- 5.8 In all cases sampling and testing of the water will be needed to determine the extent of the contamination.
- 5.9 It may also be necessary to flush the system if it is determined that there is contamination of the water supply.
- 5.10 After flushing, resample and determine that there is no contaminated water in the system. When the Vancouver Island Health Authority is satisfied that the water meets the drinking water standards, the system can be put back into normal operation.
- 5.11 Issue a removal of boil water notice (APPENDIX 'B') a removal of water use restriction notice (APPENDIX 'D') and/or a removal of do not consume the water notice (APPENDIX 'F') through the media
- 5.12 Clean up equipment and restock any supplies used.
- 5.13 Contact all agencies involved to ensure that proper controls are in place to prevent future events and that the procedures for controlling contamination are adequate.

6. Loss of Water Supply, Including Earthquakes

The response to the loss of supply is dependant on the cause and extent of the damage to the source or supply system.

Loss of a large supply main

- 6.1 Contact the manager of water services or supervisor and advise them of the nature of the emergency. The manager will determine which agencies will require notification.
- 6.2 Isolate the affected area. Depending on which water main is closed, this may create an alarm at one of the reservoirs due to loss of supply while filling.
- 6.3 It may be necessary to restrict water use through radio announcements and contact to the users of the water system.
- 6.4 Arrange to make the necessary repairs to the system.
- 6.5 Flush the system after repairs.
- 6.6 Ensure that there are adequate chlorine levels in the water prior to putting the supply main into service.
- 6.7 Remove any restrictive water advisories through the media.
- 6.8 Replace materials used for the repair.

Earthquake

The response to emergencies created by an earthquake would be dependant on the severity. It would be necessary to assess the nature of the damage to the water system. For this scenario it is assumed that this is a severe earthquake. It is also assumed that the earthquake has created multiple broken water mains and that the Comox Valley water system is losing water at a high rate. The objective is to preserve clean stored water for use as potable drinking water.

- 6.8 Contact the manager of water services or other supervisor and co-ordinate a response plan. Utilize available staff to perform the assessment of the infrastructure. Prioritize the work needed, based on damage to the system and supply options that may still be intact. Notify any agencies that would be affected by disruption of service. A boil water or restrictive water use notice may need to be issued through the media.
- 6.9 In the event that the supply system cannot fill the reservoirs, the water that they hold may be needed for an interim supply. This would be accomplished by closing the inlet (on those reservoirs that fill from the bottom) and the outlet valves. The distribution zones that are supplied by these reservoirs would immediately be put out of water.

This is an extreme measure and would be a last resort to hold some potable water for the Comox Valley water system.

- 6.10 The priority for repairs would be to first establish the supply system and chlorination station. This would also include supply either from the BC Hydro penstock or the CVRD Puntledge pump station on the Puntledge River. If neither of these sources are available, water hauling and bottled water would be needed to meet the domestic water requirements of the Comox Valley.
- 6.11 As repairs are made to the infrastructure, areas that had been out of water would be put back into service through standard testing and bacterial certification processes.
- 6.12 As supply and water quality are assured, boil water and restrictive use advisories would be removed in consultation with VIHA.
- 6.13 Any materials that were used for repair would need to be restocked.

APPENDIX 'A'
BOIL WATER NOTICE

Press release from the Comox Valley Regional District

Date: _____

To:	Phone	Fax
Shaw Cable	250-334-0888	
The Eagle 97.3 FM	250-703-0199	
Jet 98.9 FM	250-334-2421	
Global TV	1-250-383-2435	
A-Channel Victoria	1-250-381-2484	

The Comox Valley Regional District, in consultation with the Vancouver Island Health Authority, has issued a **boil water notice** for the Comox Valley water system. This notice is effective immediately and covers all Comox Valley water system customers in the City of Courtenay, the Town of Comox, Comox Valley, Arden, Marsden Camco, Greaves Crescent and England Road water local service areas and those who obtain water from *[list any secondary distributors that receive water from the water system]*.

Until further notice, water from the Comox Valley water system should be held at a rolling boil for one minute and cooled before it is consumed. For your safety, only boiled or bottled water should be used for drinking, making ice or fountain drinks, washing dishes, brushing teeth, or preparing foods that will not be cooked.

[Briefly describe the situation that triggered the notice using one of the following statements and delete the others. If none is appropriate, please consult VIHA for approval of alternate wording prior to issuing the notice:]

- Recent water tests show the presence of unacceptable level of bacteria. Boiling the water will make it safe to drink.
- Turbidity in the water system has risen to unacceptable levels as a result of *[heavy rains, mudslide, rapid snowmelt, etc.]*. High turbidity can interfere with disinfection and may signal the presence of disease causing organisms. Boiling the water will make it safe to drink.
- The water system recently experienced a *[line break/power failure/loss of disinfection/possible source contamination, etc.]* which may have made the water unsafe to drink. Boiling the water will make it safe to drink.

The Comox Valley Regional District and the Vancouver Island Health Authority are working together to resolve the situation. Once the water is safe to drink, the boil water notice will be rescinded.

Updates will be available through the regional district website <http://comoxvalleyrd.ca> as well as the following social media channels, <http://www.facebook.com/comoxvalleyrd>, <http://www.twitter.com/comoxvalleyrd> or by calling the property services branch of the Comox Valley Regional District at 250-334-6006.

The Vancouver Island Health authority has additional information about boil water notices at http://www.viha.ca/mho/environment/water_quality_boil_water/.

Thank you for your patience and cooperation.

APPENDIX 'B'
REMOVAL OF BOIL WATER NOTICE

Press release from the Comox Valley Regional District

Date: _____

To:	Phone	Fax
Shaw Cable	250-334-0888	
The Eagle 97.3 FM	250-703-0199	
Jet 98.9 FM	250-334-2421	
Global TV	1-250-383-2435	
A-Channel Victoria	1-250-381-2484	

Effective _____ (Date) _____ the Comox Valley Regional District and the Vancouver Island Health Authority are removing the boil water notice for the users of the Comox Valley water system. Those areas affected by the removal of the boil water notice are the City of Courtenay, the Town of Comox, Comox Valley, Arden, Marsden Camco, Greaves Crescent, and England Road water local service areas.

Updates will be available through the regional district website <http://comoxvalleyrd.ca> as well as the following social media channels, <http://www.facebook.com/comoxvalleyrd>, <http://www.twitter.com/comoxvalleyrd> or by calling the property services branch of the Comox Valley Regional District at 250-334-6006.

Thank you for your patience and cooperation.

APPENDIX ‘C’
STAGE 3 WATER RESTRICTIONS

Press release from the Comox Valley Regional District

Date: _____

To:	Phone	Fax
Shaw Cable	250-334-0888	
The Eagle 97.3 FM	250-703-0199	
Jet 98.9 FM	250-334-2421	
Global TV	1-250-383-2435	
A-Channel Victoria	1-250-381-2484	

A disruption of the water supply system is preventing the Comox Valley Regional District (CVRD) from supplying adequate volumes of drinking water. To ensure enough water for fire fighting and domestic needs, the CVRD is implementing STAGE 3 WATER RESTRICTIONS effective immediately. This level of water restrictions prohibits the use of water for sprinkling lawns, washing vehicles and water operated toys. Hand watering of gardens is permitted. The Comox Valley Regional District is requesting that users of the Comox Valley water system limit their use to essential needs only.

Updates will be available through the regional district website <http://comoxvalleyrd.ca> as well as the following social media channels, <http://www.facebook.com/comoxvalleyrd>, <http://www.twitter.com/comoxvalleyrd> or by calling the property services branch of the Comox Valley Regional District at 250-334-6006.

Thank you for your patience and cooperation.

APPENDIX ‘D’
REMOVAL OF STAGE 3 WATER RESTRICTIONS

Press release from the Comox Valley Regional District

Date: _____

To:	Tel	Fax
Shaw Cable	250-334-0888	
The Eagle 97.3 FM	250-703-0199	
Jet 98.9 FM	250-334-2421	
Global TV	1-250-383-2435	
A-Channel Victoria	1-250-381-2484	

Effective (Date) the Comox Valley Regional District is reducing sprinkling restrictions to STAGE 2 water restrictions. STAGE 2 restrictions allow for sprinkling two days a week for even numbered houses on Tuesday and Saturday from 4:00 am to 9:00 am and 7:00 pm to 10:00 pm. Odd numbered houses can sprinkle on Wednesday and Sunday from 4:00 am to 9:00 am and 7:00 pm to 10:00 pm. .

Updates will be available through the regional district website <http://comoxvalleyrd.ca> as well as the following social media channels, <http://www.facebook.com/comoxvalleyrd>, <http://www.twitter.com/comoxvalleyrd> or by calling the property services branch of the Comox Valley Regional District at 250-334-6006.

Thank you for your patience and cooperation.

APPENDIX ‘E’

DO NOT CONSUME THE WATER NOTICE

Press release from the Comox Valley Regional District

Date: _____

To:	Phone	Fax
Shaw Cable	250-334-0888	
The Eagle 97.3 FM	250-703-0199	
Jet 98.9 FM	250-334-2421	
Global TV	1-250-383-2435	
A-Channel Victoria	1-250-381-2484	

The Comox Valley Regional District, in consultation with the Vancouver Island Health Authority, has issued a do not consume the water notice for the Comox Valley water system. This notice is effective immediately and covers all Comox Valley water system customers in the City of Courtenay, the Town of Comox, Comox Valley, Arden, Marsden Camco, Greaves Crescent and England Road water local service areas.

Until further notice, do not drink the water from the Comox Valley water system. Boiling the water will not make it safe to drink.

[Briefly describe the situation that triggered the notice. Please consult with VIHA regarding this wording prior to issuance of the notice.]

The Comox Valley Regional District and the Vancouver Island Health Authority are working together to resolve the situation. Once the water is safe to drink, the do not consume the water notice will be rescinded.

Updates will be available through the regional district website <http://comoxvalleyrd.ca> as well as the following social media channels, <http://www.facebook.com/comoxvalleyrd>, <http://www.twitter.com/comoxvalleyrd> or by calling the property services branch of the Comox Valley Regional District at 250-334-6006.

Thank you for your patience and cooperation.

APPENDIX ‘F’

REMOVAL OF THE DO NOT CONSUME THE WATER NOTICE

Press release from the Comox Valley Regional District

Date: _____

To:	Phone	Fax
Shaw Cable	250-334-0888	
The Eagle 97.3 FM	250-703-0199	
Jet 98.9 FM	250-334-2421	
Global TV	1-250-383-2435	
A-Channel Victoria	1-250-381-2484	

Effective ____ (Date) ____ the Comox Valley Regional District and the Vancouver Island Health Authority are removing the do not consume the water notice for the users of the Comox Valley water system. Those areas affected by the removal of the do not consume the water notice are the City of Courtenay, the Town of Comox, Comox Valley, Arden, Marsden Camco, Greaves Crescent, and England Road water local service areas.

Updates will be available through the regional district website <http://comoxvalleyrd.ca> as well as the following social media channels, <http://www.facebook.com/comoxvalleyrd>, <http://www.twitter.com/comoxvalleyrd> or by calling the property services branch of the Comox Valley Regional District at 250-334-6000.

Thank you for your patience and cooperation.

Emergency Contact List

Agencies	Emergency Numbers
Comox Volunteer Fire Department	911
Courtenay Volunteer Fire Department	911
Black Creek/Oyster Bay Volunteer Fire Department	911
Courtenay Fire Department	911
R.C.M.P.	911
Brenntag Canada Emergency (Office 1-800-661-1830)	1-604-685-5036
St. Joseph's Hospital	250-339-2242
Campbell River Hospital	1-250-287-7111
Vancouver Island Health Authority:	
Environmental Health Officer: David Cherry dave.cherry@viha.ca	Office: 250-331-8518 Fax: 250-331-8596
Environmental Health Officer: Josh Moran josh.moran@viha.ca	Office: 250-331-8518 Fax: 250-331-8596
Public Health Engineer: Murray Sexton	Office: 250-755-6215 Fax: 250-755-3372
Medical Health Officer (MHO): Dr. Charmaine Enns	Office: 250-331-8592 Fax: 250-331-8513
After Hour Vancouver Island Health Authority MHO Emergency Contact	1-800-204-6166
Provincial Emergency Plan (PEP)	1-800-663-3456
Ministry of Environment (MOE)	1-800-663-3456
Center for Disease Control (CDC)	1-604-661-7033
North Island Labs	250-338-7786
BC Hydro Vancouver Island Control	1-604-455-1714
BC Hydro Loss of Power	1-888-769-3766
WorkSafe BC	1-866-922-4357
Priority Alarm Monitoring	1-888-844-8425
Comox Valley Regional District	250-334-6000
City of Courtenay	250-334-4441
City of Courtenay Works Yard	250-338-1525
Town of Comox	250-339-2202
Town of Comox Works Yard	250-339-2485
K'ómoks First Nation	250-339-4545