

NORTH CEDAR IMPROVEMENT DISTRICT



2015

Annual Drinking Water Report

The North Cedar Improvement District 2015 Annual Drinking Water Report

1. INTRODUCTION

The British Columbia Drinking Water Protection Act requires all water purveyors to provide customers (the public) with an annual report on the quality of their drinking water. The North Cedar Improvement District has compiled the following information to help all of its residents to better understand their drinking water.

The North Cedar Improvement District operates under permit by the Ministry of Health. This report is to be submitted to Island Health (IH) formerly known as the Vancouver Island Health Authority (VIHA), by the spring of 2016, and covers the period of January 1, 2015 to December 31, 2015.

2. NORTH CEDAR IMPROVEMENT DISTRICT

The North Cedar Improvement District was incorporated in 1959.

The District's water source comes from three (3) wells located just off of Cedar Road, along side the Nanaimo River and is chlorinated. The District has two (2) water storage reservoirs, one is located at the beginning of Barnes Road and is known as the Barnes Road reservoir, and the other is located on Glynneath Road, off of Ivor Road and is called the Glynneath Road reservoir. North Cedar Improvement District supplies water to approximately 1300 metered services.

The water distribution system is operated and managed by a Level III certified contractor who is responsible for the public water system.

District contact is: Heather Sarchuk – Administrator – 250-722-3711
Joe Woolls – Level III Operator/Contractor – 250-722-3711

Groundwater Wells

The District has three (3) groundwater production wells that provide water to the serviced area. It has been determined that the District's water supply is under the influence of surface water. Currently the only disinfection is Chlorination.

NCID Well Data

Well Name	Well Depth	Well Intake	Well Yield	Year	
				Drilled	Rehab
#1	10.1 m (33 ft.)	9.8 m (32 ft.)	315 US gpm (1,720 m ³ /d)	1960	2013
#3	12.8 m (42 ft.)	9.8 m (32 ft.)	340 US gpm (1,850 m ³ /d)	1979	2013
#6	13.4 m (44 ft.)	9.1 m (30 ft.)	340 US gpm (1,850 m ³ /d)	1992	2010

gpm = Gallons per minute
m³/d = Cubic meters per day

Well water is pumped from wells #1, #3 #6 and disinfected with CL₂ at the well site. The chlorinated water is then pumped to the Barnes Road Reservoir along with customers connected to the water system between the well field and reservoir. Water from the Barnes Road Reservoir is then pumped via the Barnes Road Booster Pump Station (along with customers connected to the water system) to the Glynneath Road Reservoir. Water in the Glynneath Reservoir is re-chlorinated for the Cedar by the Sea residents. Once the reservoirs are filled, the system is then gravity fed from both reservoirs for domestic use and firefighting purposes.

Reservoirs

The Barnes Road above ground concrete reservoir has a capacity of 900 cubic meters (200,000 Imperial Gallons), serves Pressure Zone 1 and has a top water level of 81.7 m. The Glynneath Road above ground steel reservoir has a capacity of 340 cubic meters (75,000 Imperial Gallons), serves Pressure Zone 2 and has a top water level of 117.9 m.

Distribution System

The North Cedar Improvement District water distribution system serves an area of approximately thirty (30) kilometers squared (km²) with approximately forty two (42) km of watermains of various sizes and types ranging from 50 mm to 300 mm in diameter and constructed of asbestos-cement (AC), ductile iron (DI), or polyvinyl chloride (PVC). The distribution system has been constructed over time with the oldest being more than fifty (50) years old. The system has 162 fire hydrants and 28 standpipes.

3. WATER SAMPLING AND TESTING PROGRAM

Water sampling and testing is carried out weekly throughout the distribution system. Three days a week samples are taken at various locations, as identified by Island Health (IH). The samples are taken, and then delivered to the Health Unit.

Attached to this report are the full test results from our regular water sampling throughout 2015. These results can also be viewed at:

http://www.viha.ca/mho/water/water_sampling_results.htm

The North Cedar Improvement District also completed the annual full spectrum analysis; these were taken to Maxiam Labs for testing. The results are attached to this report as well. This test is performed annually by the district on a voluntarily basis.

Microbiological testing completed during this period did not detect any adverse bacteriological results.

Chemical results for this reporting period are all within the Guidelines for Canadian Drinking Water Quality.

During flooding, the district operator increases the chlorine dosage and additional sampling is performed throughout the distribution system.

4. WATER QUALITY

Occasionally there is a complaint about the taste or smell of chlorine in the water. The operator when a chlorine related complaint is received, goes out and tests the water, all tests show that the district meets the requirements. Chlorine residuals are tested throughout the system and are kept at required levels.

There were a couple of complaints in 2015 regarding “brown, yellow or dirty water”. After inspection by operator most turned out to be caused by internal problems. Ie: old hot water tank, old copper pipe corroding, etc. One complaint in the summer was after a grass fire and was due to hydrant use at the end of Wilkinson Road. Operator checked quality in the area and everything was good.

Some complaints of pressure dropping, these were caused by faulty PRV in the homes.

5. MAINTENANCE AND FLUSHING PROGRAM

Production wells, reservoirs, chlorination stations and pump stations are inspected a minimum of three times a week to reduce or eliminate the risk of contamination and system failure, and to ensure the consistent application of chlorine for treatment purposes. Repairs and maintenance to the Districts distribution system and customers is ongoing.

Twenty four (24) hour on-call coverage is in place to respond to water system emergencies and alarms.

Unidirectional flushing is done every two years.

6. SCADA (Supervisory Control and Data Acquisition)

In 2015 NCID installed a SCADA system that monitors the water system. Operators can monitor reservoir levels, well levels, pumps, power outages, well meters, flows and turbidity. The operator can monitor the system remotely 24 hours a day, 7 days a week. Alarms automatically call out operators.

7. WATER SYSTEM PROJECTS

2015 Completed Studies & Projects

- Installed SCADA (Clear SCADA) System – monitoring, reservoir levels, well levels, well pumps, power outages, alarms, well meters, total flows and turbidity
- Disinfection (Chlorine) equipment upgraded
- New well pump in Well #6
- Data Loggers installed on the Wells (24 hours aquifer level monitoring & long term trending history.)
- PVR Chambers water proofed
- Barnes Road Reservoir hatch replaced
- Updated and amended Current Emergency Response Plan
- Well Meters Repaired
- Hydrant Maintenance completed

February 6, 2015 the Nanaimo River flooded the District Well Site. Our Level III Operator performed extra sampling and monitoring throughout the flooding period. The Level III Operator increased the Chlorine dosage as required by current standards.

December 7, 2015 the Nanaimo River flooded the District Well Site. The Level III Operator shut off Well #3 and Well #6 until flood waters receded.

The Level III Operator follows the procedure in accordance with the Emergency Response Plan for Flood conditions at the well field as submitted to Island Health.

2016 Proposed Projects & Upgrades

- Repairs and Maintenance on air valves
- Install two new hydrants
- Purchase Land for an additional Source of Water and treatment plant
- Begin Work on New Barnes Road Reservoir
- Monitor Hydrants to see effect on Residual Pressures to confirm that the Lazy Susan Pump Station needs to be reactivated
- Submit the preliminary design report to Island Health for treatment plant, submit a detailed design to Island Health and make application for a construction permit, and prepare tender documents and award contract.
- Emergency Water Connection with the City of Nanaimo

Future Works

- Install new treatment/disinfection plant (filtration, UV, Chlorination)
- Provide required Contact time
- Additional Wells
- Additional Reservoirs
- Replace/Upgrade distribution system

Island Health

The District had developed a plan of action with milestone dates for submission of Design Brief, preliminary and detail design; leading to the construction a dual disinfection facility (chlorine plus ultraviolet disinfection) as recommended in the Stage 3 Hydrogeology study.

On February 6, 2015 the District staff, consultants and Trustee met with Island Health to discuss and clarify why NCID needs filtration deferral if riverbank filtration has already been credited. Island Health was adamant that NCID apply for filtration deferral with supporting documents to Island Health by March 31, 2015. The Districts Hydrogeologist, Michael Payne emailed Island Health to obtain confirmation that the Stage 3 Hydrogeology Study dated March 20, 2012 had been accepted and that they agree with the report's conclusion. The Districts engineer, Oleh Dubek also emailed Island Health to request in writing what other data items would be required for Island Health for the filter deferral/exemption evaluation process, as this application was required to them by March 31, 2015.

On April 20, 2015 the District received Island Health's response to the Districts request for confirmation that the Stage 3 report of March 20, 2012 had been accepted and what other data items would be required for Island Health for the filter deferral/exemption application process has yet to be received. Island Health response was that the Stage 3 report did not meet their requirements, they also recommended that NCID not pursue filter deferral and that NCID provide additional filtration as part of the operating permit.

On May 5, 2015 NCID staff, several Board members, Level III contractor and consultants met to discuss Island Health's letter. The consultants were directed to draft a reply to Island Health describing what the District plans to do as far as addressing the CT, UV and filtration issues. The consultants all commented regarding the District's disappointment with the April 20, 2015 response on Island Health's inability to accept the finding of the Stage 3 report that was submitted 3 years ago. This letter was sent to Island Health on June 5, 2015.

The draft Water Treatment Facility Design Brief was prepared and emailed to Island Health on June 30, 2015. The brief included descriptions of the pressure filters, ultraviolet reactors, chlorine injection options and chlorine contact time facility.

On September 2, 2015 the District met with Island Health to discuss the works required and the acceptability of the facilities proposed in the Water Treatment Facility Design Brief. At this meeting the District was advised that the pressure filter system proposed would not be acceptable as there is no accreditation that the filter will be able to provide any log credits for removal of viruses and protozoa. The rest of the proposed works outlined in the Design Brief were acceptable. Correspondence from Island Health was received on September 24, 2015 confirming the results of our meeting on September 2, 2015.

The District engineer investigated and gathered information for filtration systems ranging from slow sand filtration to Membrane Ultra Filtration. He reported that the most promising filtration package is either an Absorption Clarifier followed by filtration or a Direct Filtration package that uses a mechanical flocculator followed by filtration. The literature for the various systems was submitted to Island Health on November 4, 2015 to confirm if these filtration systems would be acceptable to them. The footprints of all the filter packages are similar in size and will require a clear well and new distribution pumps to pump the filtered water through the UV units to the Contact Time pipe bank and then to the Barnes Reservoir. The well pumps will also need to be replaced as the pumping head is much lower to the treatment building than to the Barnes Reservoir.

As at December 31, 2015, the District has not received a response to our November 4, 2015 correspondence.

Also noted is that the District's current water system does not meet the minimum standards for chlorine contact time (C·T) for the water users located closest to the wells. Currently, Island Health has requested that the existing chlorination process be upgraded to meet present C·T standards. At this time, they have not told the District to increase the Chlorine Dose.

To deal with the contact time issue, the District has opted to review system modifications to increase contact time and implement them with the construction of the treatment facility.

8. EMERGENCY RESPONSE PLAN

The Safe Drinking Water Regulation of the Health Act requires that all purveyors of water systems have an emergency response plan (ERP) which we can refer to in case of an emergency. The ERP was reviewed and updated in 2015.

The NCID Emergency Response Plan (ERP) includes;

- A list of contacts that would be called in the event of an emergency. Regular review and updating of this contact list is undertaken at least every six months. This list include: Personnel; Government Agencies; Contractors/Repair Services; Technical Resources; Parts Supply; Bulk Water Suppliers; and Media Contacts.
- List of potential emergency response situations, with action plans. This is in additional to our standard operating procedures and preventive maintenance programs. Emergency Procedures include: Contamination of Source-Spills, Accidents, Vandalism, Tampering; Los of Source-Loss of Reservoir or Supply Lines; Minor Vandalism/Tampering; Flood Conditions at Well Site and/or Turbidity; Broken Water Main; Chlorination Failure; Pump Failure; Power Failure; Backflow or Back Siphonage; Chlorine Leak or Spill; Fire; Earthquake; and Extended Hot Weather.
- Maintaining maps that show the location of mains, critical control points (i.e. pump stations, shut-off valves, pressure zones, etc.), access routes and high risk facilities such as schools.

9. AVAILABILITY OF THE REPORT

This report is available at the District office as well a copy is also posted on our website at <http://ncid.bc.ca>. There is no charge for a copy of this report.