

Municipality of **NORTH COWICHAN**



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April 27, 2015

File No: 5630-55

Environmental Health Officer
Central Vancouver Island Health Region
1665 Grant Avenue
NANAIMO, BC V9S 5K7

Re: **South End Water System Water Quality Report**
Premises Number 1310818
Report for the Period Jan 1/14 to Dec 31/14

1 General

This report is comprised of two parts.

- The first part, provides a summary of the data along with a compliance assessment. This part is provided to the VIHA and is also published on the Municipality's website at www.northcowichan.ca on an annual basis.
- The second part includes all of the relevant data tables and charts that back up the summary report. Any data points that are non-compliant with the Canadian Drinking Water Quality Guidelines (CDWQGs) are flagged in red. This part is provided to the VIHA only but is available to the public upon request.

2 Operator Information

Contact Name	Clay Reitsma, M.Eng. P.Eng.
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Email	Clay.Reitsma@NorthCowichan.ca

3 System Description

This is a groundwater supply. Water is pumped from the Boys Road wells.

A UV disinfection system has been installed and has been operating since June of 2013. In addition a puck-type chlorination system was installed at the same time as the UV system to allow for chlorination of the system for periodic disinfection of the distribution system. This system is not operated with a chlorine residual in the distribution system.

Note A mixer has been installed in Maple Bay Reservoir #2. It went into operation on March 19, 2015. This is outside this reporting period but may be relevant to the discussion in this report.

4 Boil Advisories

None.

5 Discussion of Results

5.1 Turbidity

Compliance requires that 100% of samples are less than or equal to 5 NTU. For this reporting period the system met this standard 100% of the time.

Compliance requires that 95% of samples less than or equal to 1 NTU. For this reporting period the system met this standard 100% of the time.

5.2 Coliforms

Compliance requires that greater than 90% of samples must be less than 1 CFU/100mL. For this reporting period total coliforms were in compliance a total of 85% of the time. Compliance also requires that 100% of samples must be less than 10 CFU/ 100mL. For this reporting period total coliforms were in compliance a total of 95% of the time.

Compliance requires that 100% of samples for *Escherichia* coliforms are less than 1 CFU/100ml. For this reporting period the system was in compliance 100% of the time.

This system occasionally has total coliform counts that exceed the drinking water quality guidelines. The counts typically occur in Maple Bay Reservoir #2 and at the end of lines (typically Maple Bay Marina). A mixer is installed in Maple Bay Reservoir #2 to help turn over the water and hopefully reduce the TC counts at that location.

5.3 Cysts

The raw water is tested for *Giardia* and *Cryptosporidium*. For this reporting period no *Giardia* cysts were detected. Two samples were found to have 0.400 *Cryptosporidium* cysts/100L at Boys Rd Well #2 and #3 on April 24 and Jul 30 2014; respectively.

Note UV disinfection is highly effective at inactivating (treating) cysts. As the samples taken are of the raw water, before the water passes through the UV disinfection system, these results do not reflect the condition of the water in the distribution system.

5.4 pH

There are no Minimum/Maximum Acceptable Concentration (MAC) limits for pH. There is only Aesthetic Objectives (AO) to keep the pH between 6.5 and 8.5.

The pH was in compliance 100% of the time for Quarters 1, 2 and 3. Quarter 4 had 4 samples with low pH values of 6.4, 6.4, 6.34 and 6.3 resulting in a compliance rate of 67% for Quarter 4. For this reporting period the compliance rate was 87%.

5.5 Miscellaneous Parameters

Compliance requirements for miscellaneous chemicals and metals vary depending on the substance. For this reporting period miscellaneous metals and chemical parameters were in compliance 100% of the time with the exception of the low pH readings noted above. For this reporting period Polycyclic Aromatic Hydrocarbon (PAH) testing was not completed.

6 Future Improvements

N/A

7 Additional Comments

Should you have any questions regarding this report, please do not hesitate to contact the Municipality at (250) 746-3100.

8 Data Review

8.1 Water Consumption

Table 1: Average daily water consumption by month and quarter.

Item	Average Daily Consumption
Observed	
- Jan	4,461
- Feb	4,624
- Mar	4,643
- Quarter 1	4,587
Observed	
- Apr	4,999
- May	6,850
- Jun	11,340
- Quarter 2	7,621
Observed	
- Jul	12,674
- Aug	8,815
- Sep	6,652
- Quarter 3	9,410
Observed	
- Oct	4,712
- Nov	4,432
- Dec	4,624
- Quarter 4	4,591

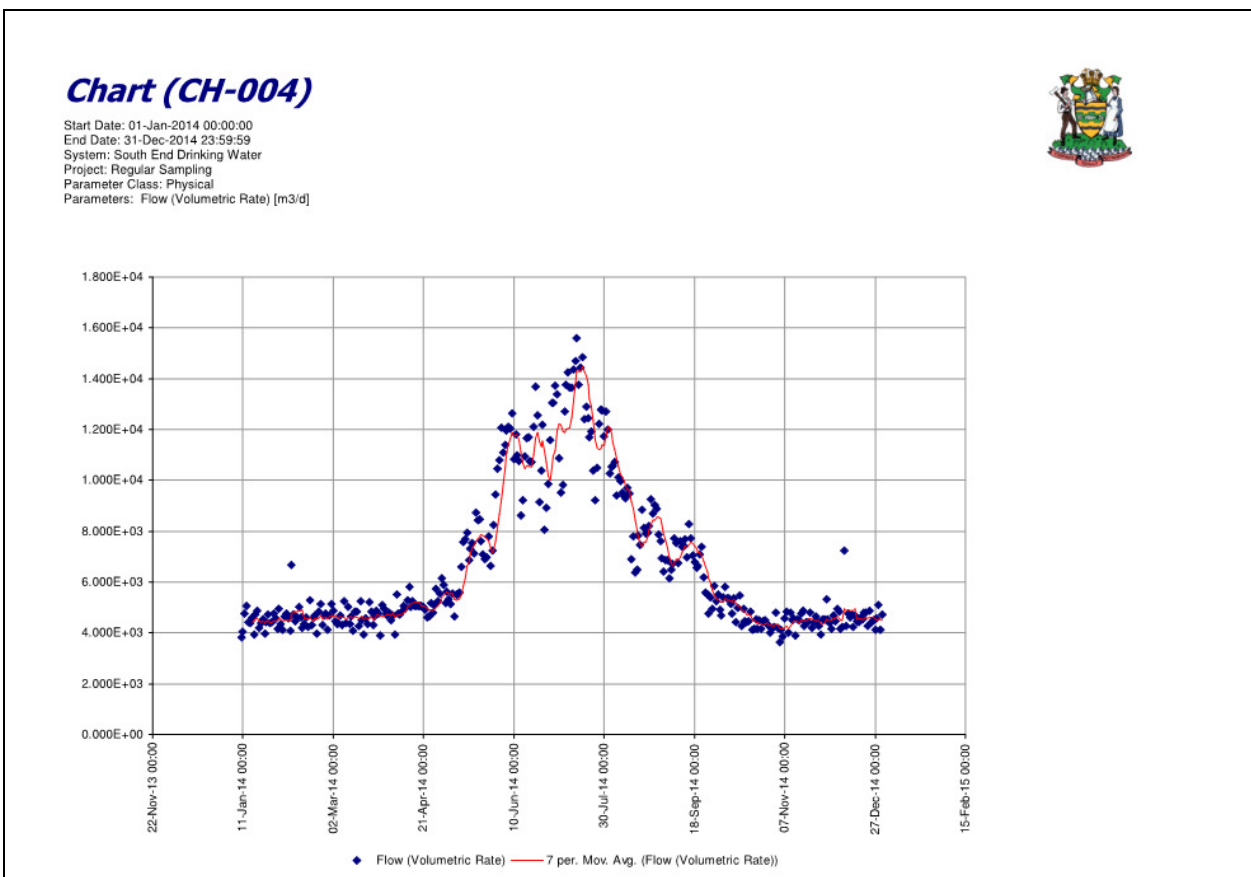


Figure 1: Average daily water consumption.

8.2 Turbidity

Table 2: Finished water maximum turbidity by month and quarter.

Item	Maximum (NTU)	Percent of Samples in Compliance (%)	
		100% <= 5 NTU	>95% <= 1 NTU (In A Month)
Permit Requirements			
Observed			
- Jan	0.143	100.00	100.00
- Feb	0.140	100.00	100.00
- Mar	0.150	100.00	100.00
- Quarter 1	0.150	100.00	100.00
Observed			
- Apr	0.160	100.00	100.00
- May	0.187	100.00	100.00
- Jun	0.210	100.00	100.00
- Quarter 2	0.210	100.00	100.00
Observed			
- Jul	0.990	100.00	100.00
- Aug	0.150	100.00	100.00
- Sep	0.110	100.00	100.00
- Quarter 3	0.990	100.00	100.00
Observed			
- Oct	0.100	100.00	100.00
- Nov	0.170	100.00	100.00
- Dec	0.180	100.00	100.00
- Quarter 4	0.180	100.00	100.00

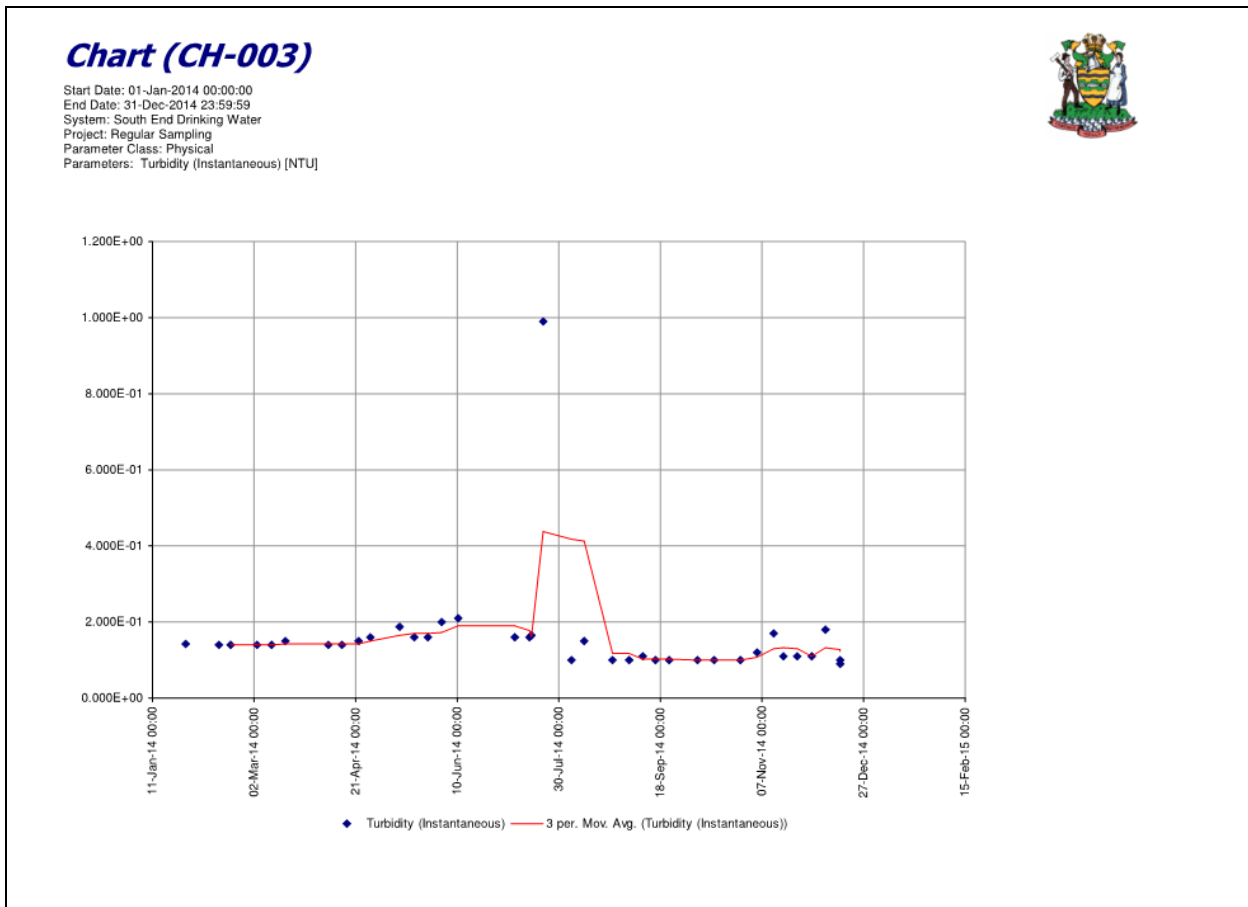


Figure 2: Finished water turbidity.

8.3 Coliforms

Table 3: Distribution system maximum total coliforms by quarter.

Item	Maximum (CFU/100 mL)	Percent of Samples in Compliance (%)	
Permit Requirements		100% < 10 CFU/100 mL	>90% < 1 CFU/100 mL
Observed			
- Quarter 1	35.00	90.91	80.00
- Quarter 2	520.00	94.23	88.46
- Quarter 3	14.00	97.78	86.67
- Quarter 4	3.00	100.00	87.80

Table 4: Distribution system maximum *Escherichia* coliforms by quarter.

Item	Maximum (CFU/100 mL)	Percent of Samples in Compliance (%)
CDWQG Requirements		100 % < 1 CFU/100 mL
Observed		
- Quarter 1	0.00	100.00
- Quarter 2	0.00	100.00
- Quarter 3	0.00	100.00
- Quarter 4	0.00	100.00

8.4 Cysts

Table 5: Raw water maximum number of *Giardia* cysts by quarter.

Item	Maximum (Cysts/100 L)	Percent of Samples in Compliance (%)
Permit Requirements		100% = 0
Observed		
- Quarter 1	0.00	100.00
- Quarter 2	0.00	100.00
- Quarter 3	0.00	100.00
- Quarter 4	0.00	100.00

Table 6: Raw water maximum number of *Cryptosporidium* cysts by quarter.

Item	Maximum (Cysts/100 L)	Percent of Samples in Compliance (%)
Permit Requirements		100% = 0
Observed		
- Quarter 1	0.000	100.00
- Quarter 2	0.400	0.00
- Quarter 3	0.400	0.00
- Quarter 4	0.000	100.00

8.5 pH

Table 7: Finished water minimum and maximum pH by quarter.

Item	Minimum	Maximum	Percent of Samples in Compliance (%)
CDWQG Requirements			100 % \geq 6.5 100 % \leq 8.5
Observed			
- Quarter 1	6.60	7.50	100.00
- Quarter 2	6.50	7.20	100.00
- Quarter 3	6.50	7.61	100.00
- Quarter 4	6.30	7.40	66.67

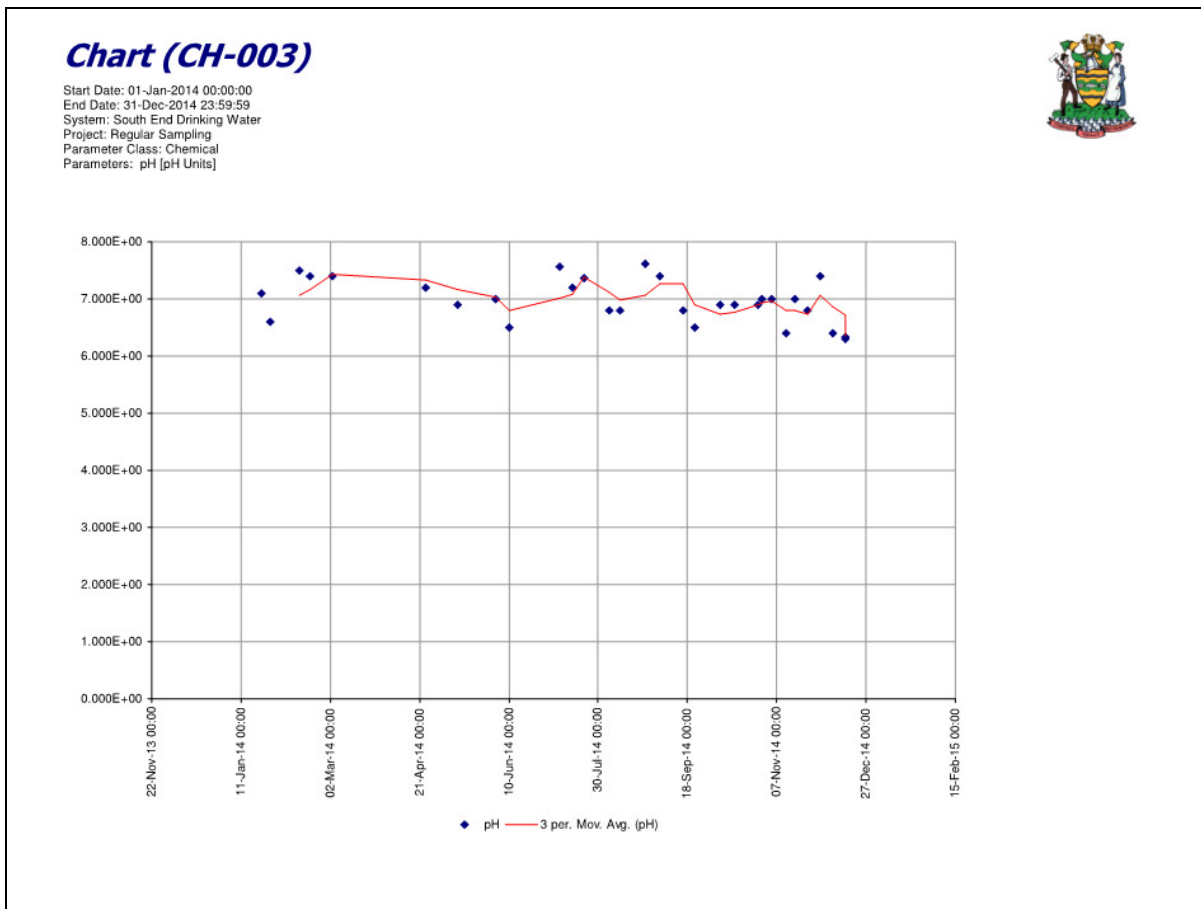


Figure 3: Finished water pH.

8.6 Miscellaneous Items

Table 8: Finished water miscellaneous parameters.

Item	Compliance Assessment
Metals	All parameters meet CDWQG limits. Data is attached.
Microorganisms	No limits exist. Data is attached.
Algae	No limits exist. Data is attached.
PAH	No data collected.
Chemical	All parameters meet the CDWQG with the exception of pH noted above. Data is attached.

9 Additional Comments

Should you have any questions regarding this report, please do not hesitate to contact the Municipality at (250) 746-3100.

Sincerely



Clay Reitsma, M.Eng., P.Eng.
Manager of Engineering (Infrastructure & Environment)

cc. Robert Bell, Assistant Manager of Operations

CR/cr
Enclosures