



TOWN OF LAKE COWICHAN WATER TREATMENT PLANT



February 2021 Operations Performance Report



Permit to Operate

Operated water treatment plant under Operate Permit dated September 21, 2020.

February Highlights

- Plant continued to achieve filtered water turbidity below 0.30 NTU. Two snow days (Feb 5 and Feb 25) and several rain events occurred during the month. Lower highs of raw water turbidity than occurred in January.
- Raw water samples collected to determine natural background aluminum.
- Electrical work conducted at the raw water pump house on Tuesday, Feb 2.
- Installation of flow meter at the raw water pump house on Thursday, Feb 11.

Timeline

Tuesday, February 2 – Electrical work at River road pumphouse. Plant off from 11:00 to 17:15.

Friday, February 5 – Zeta -12.9 mV. Reduced coagulant from 7 mg/L to 6 mg/L.

Wednesday, February 10 – Increased degassing interval on coagulant pumps from 15 min to 180 min.

Thursday, February 11 – Installation of raw water pumphouse flow meter. Plant off from 09:20 to 11:55.

Monday, February 15 – Snow fell overnight.

Tuesday, February 16 – Monthly sampling completed for nitrogen, phosphorus and aluminum. Raw water sampled for aluminum to continue monitoring natural background levels.

Wednesday, February 17 – Reduced soda ash correction factor from 0.9 to 0.8 to lower pH as less coagulant being used.

Thursday, February 25 – Snow fell overnight.



Performance Standards

The Operating Permit for the Town of Lake Cowichan Water System dated October 21, 2020 stipulates the following performance requirements:

PARAMETER	GUIDELINE
Turbidity	≤ 0.3 NTU in ≥ 95% of samples
	Never to exceed 1 NTU
<i>Giardia</i> and <i>Cryptosporidium</i>	2.5-Log (99.7%) removal coagulation, flocculation and filtration 1-Log (90%) inactivation via UV
Viruses	1-Log (90%) removal coagulation, flocculation and filtration
	3-Log (99.9%) inactivation via UV
Free Available Chlorine	Sufficient for CT _{CALC} and not to exceed 4.0 mg/L
Trihalomethane (THM)	≤ 0.100 mg/L
Haloacetic Acid (HAA)	≤ 0.080 mg/L
Total Aluminum	≤ 0.1 mg/L
pH	Be between 7.0 and 10.5
Microcystin-LR	≤ 1.5 µg/L

Water Quality Results

Monthly Testing Results

	Raw Al (mg/L)	Treated Al (mg/L)	TN (mg/L)	TP (µg/L)	Microcystin (µg/L)	THM (µg/L)	HAA (µg/L)
OG/MAC		0.10				100	80.0
Oct 27, 2020	-	0.049	0.047	4.70	0.06	20.4	10.71
Nov 24, 2020	-	0.157	-	-	-	-	-
Dec 08, 2020	-	0.264	0.380	2.47	-	-	-
Jan 05, 2021	0.190	0.196	0.175	3.70	0.00	27.3	10.9
Jan 19, 2021	0.104	0.129	-	-	-	-	-
Feb 16, 2021	0.095	0.136	0.111	4.50	0.00	-	-

Discussion on Aluminum

Aluminum results are increasing above the maximum operating guideline (OG) as stipulated in the Operating Permit. The coagulant used in the Town of Lake Cowichan water treatment plant is



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polyaluminum chloride (PAC) which uses aluminum as the positive charge in the coagulation process to achieve low turbidity.

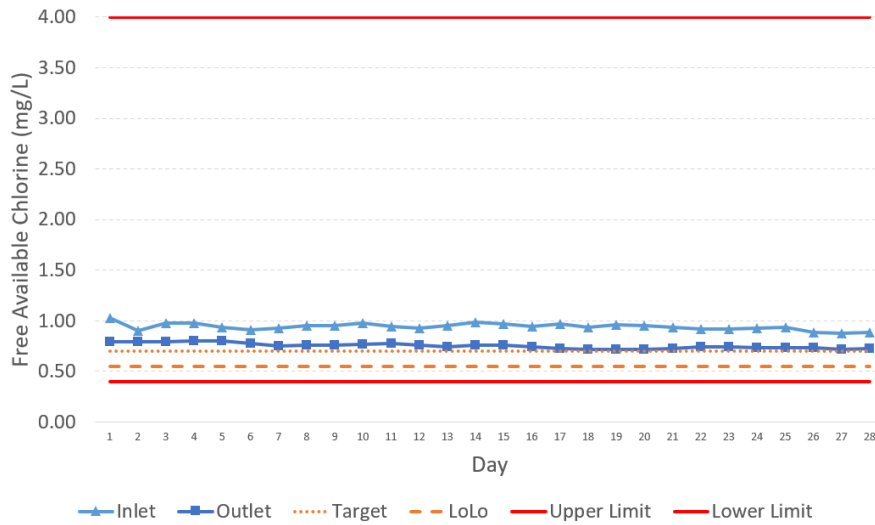
Zeta potential tests are used to maintain coagulation dosages at the low end of the effective curve. For the month of February a zeta potential of -16 mV was targeted. Attempts for lower zeta potential result in higher turbidity.

Two raw water samples were taken February to determine the background concentration of aluminum from Cowichan Lake. As can be seen in the table above, the water plant is only adding between 0.006 to 0.041 mg/L of aluminum.

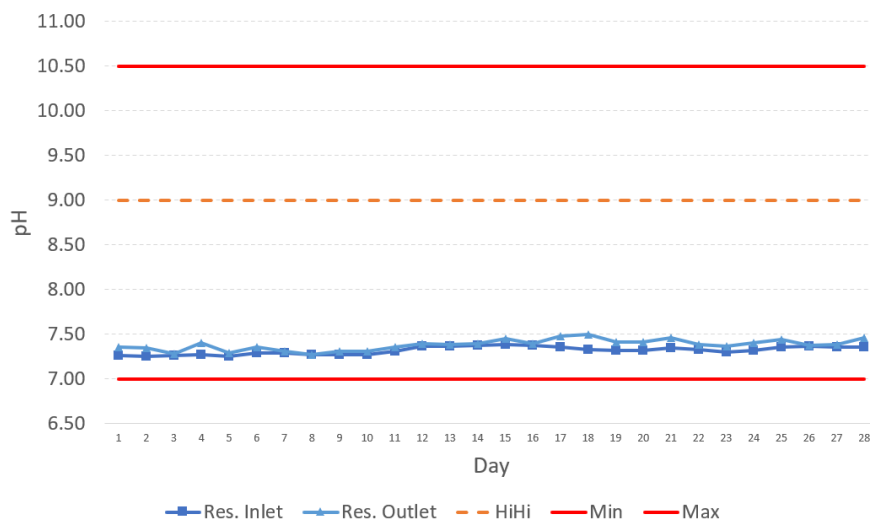


Individual Parameter Charts

Free Available Chlorine (Feb 2021)
Source: SCADA Daily Averages



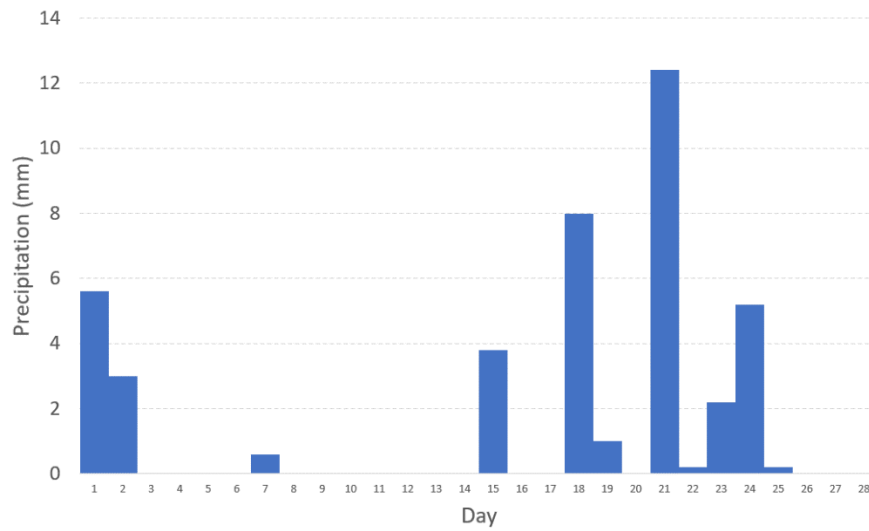
Reservoir pH (Feb 2021)
Source: SCADA Daily Averages





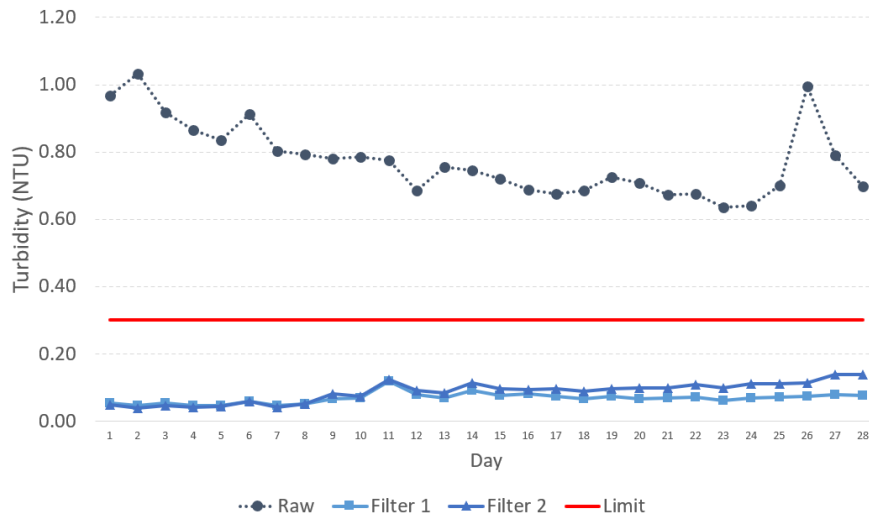
Total Precipitation (Feb 2021)

Source: Environment Canada - North Cowichan Station



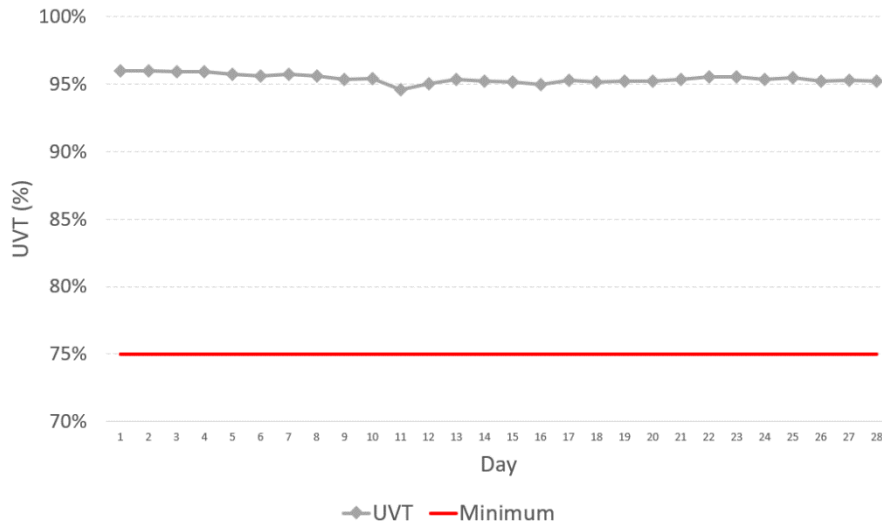
Turbidity (Feb 2021)

Source: SCADA Daily Averages





UV Transmittance (Feb 2021) Source: SCADA Daily Averages



UV Dosage (Feb 2021) Source: SCADA Daily Averages

