



## TOWN OF LAKE COWICHAN WATER TREATMENT PLANT



### March 2021 Operations Performance Report



## Permit to Operate

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

## March 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, March 2** – Quarterly sampling for THM/HAA and monthly compliance.

**Monday, March 8** – Took photo of drain spouts along north side of building for Stantec.

**Friday, March 12** – Switched lead raw water pump from #3 to #2.

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

**Tuesday, March 16** – Additional sampling completed for aluminum. Raw water sampled for aluminum to continue monitoring natural background levels.

**Thursday, March 18** – SCADA update for Slopes Reservoir and pumps.

**Tuesday, March 30** – Additional sampling completed for aluminum. Raw water sampled for aluminum to continue monitoring natural background levels.

## 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



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MARCH 2021

Free Available Chlorine	Sufficient for $CT_{CALC}$ and not to exceed 4.0 mg/L
Trihalomethane (THM)	$\leq 0.100$ mg/L
Haloacetic Acid (HAA)	$\leq 0.080$ mg/L
Total Aluminum	$\leq 0.1$ mg/L
pH	Be between 7.0 and 10.5
Microcystin-LR	$\leq 1.5$ $\mu$ g/L

## Water Quality Results

### Monthly Testing Results

	Raw Al (mg/L)	Treated Al (mg/L)	TN (mg/L)	TP ( $\mu$ g/L)	Microcystin ( $\mu$ g/L)	THM ( $\mu$ g/L)	HAA ( $\mu$ g/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	-	-
Mar 02, 2021	0.136	0.242	0.069	23.5	0.00	29.6	2.29
Mar 16, 2021	0.129	0.171	-	-	-	-	-
Mar 31, 2021	0.125	0.352	-	-	-	-	-

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

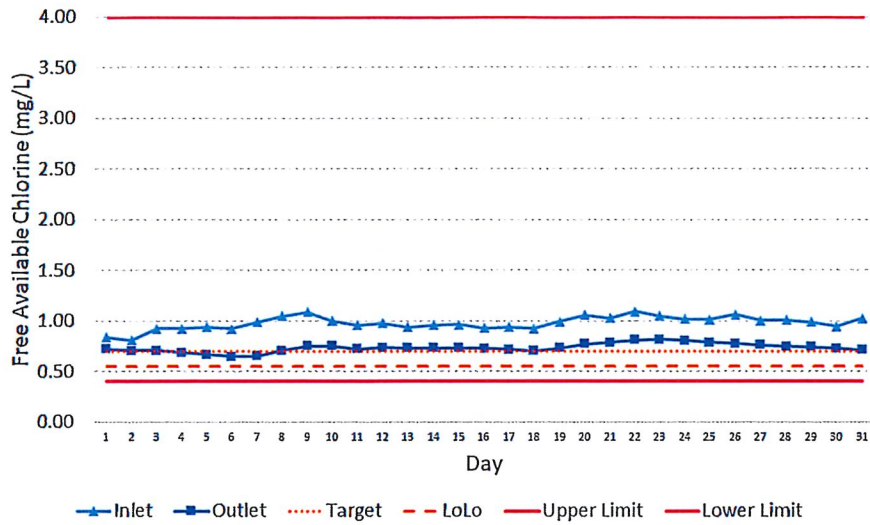
Zeta potential tests are used to maintain coagulation dosages at the low end of the effective curve. For the month of March a zeta potential of -16 mV was targeted. Attempts for lower zeta potential result in higher turbidity.

Two raw water samples were taken March to determine the background concentration of aluminum from Cowichan Lake. As can be seen in the table above, the water plant is adding between 0.006 to 0.227 mg/L of aluminum.

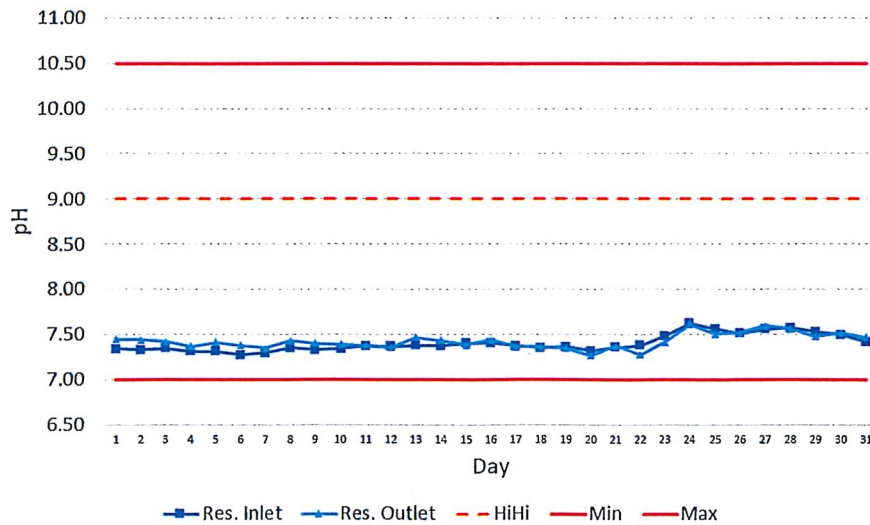


Individual Parameter Charts

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



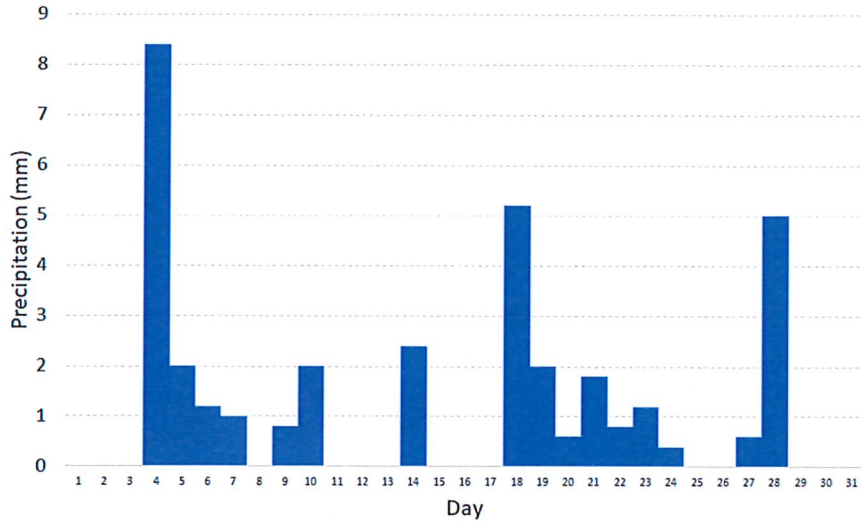
Reservoir pH (Mar 2021)  
Source: SCADA Daily Averages





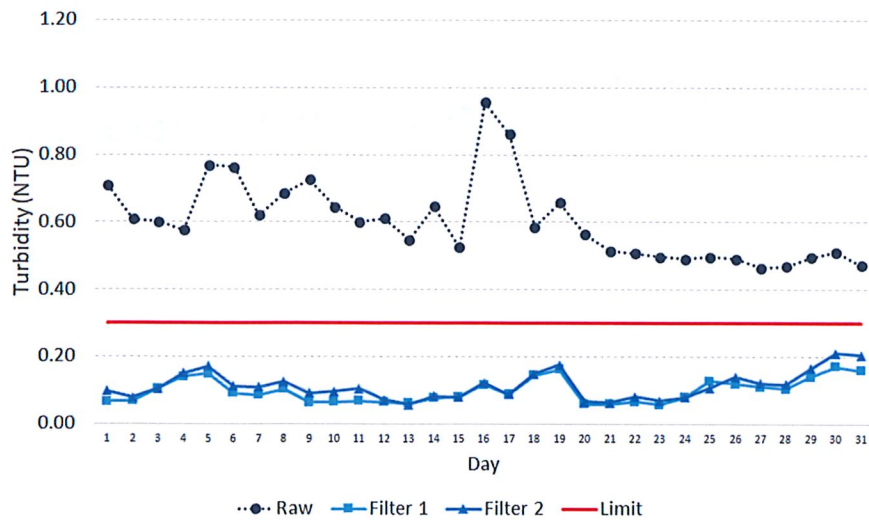
### Total Precipitation (Mar 2021)

Source: Environment Canada - North Cowichan Station



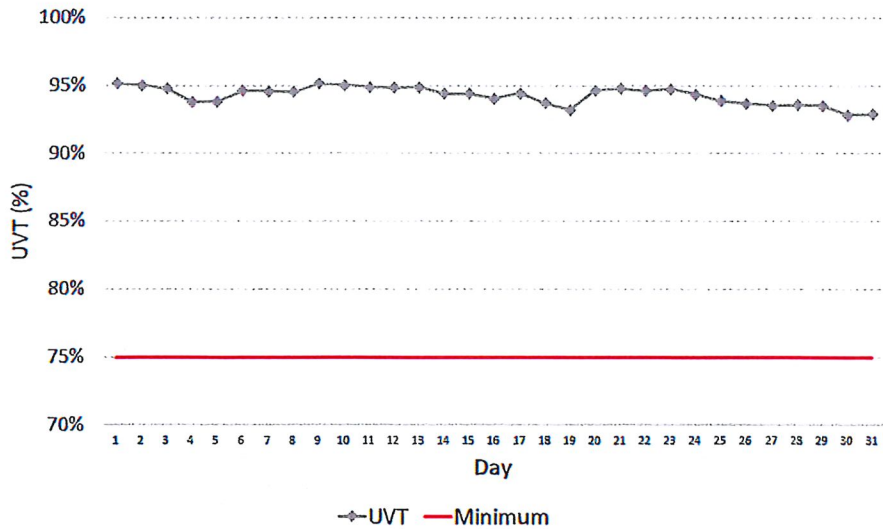
### Turbidity (Mar 2021)

Source: SCADA Daily Averages





### UV Transmittance (Mar 2021) Source: SCADA Daily Averages



### UV Dosage (Mar 2021) Source: SCADA Daily Averages

