

OPERATIONAL CONTINUITY OF THE DRINKING WATER PLANT

KEBAOWEK



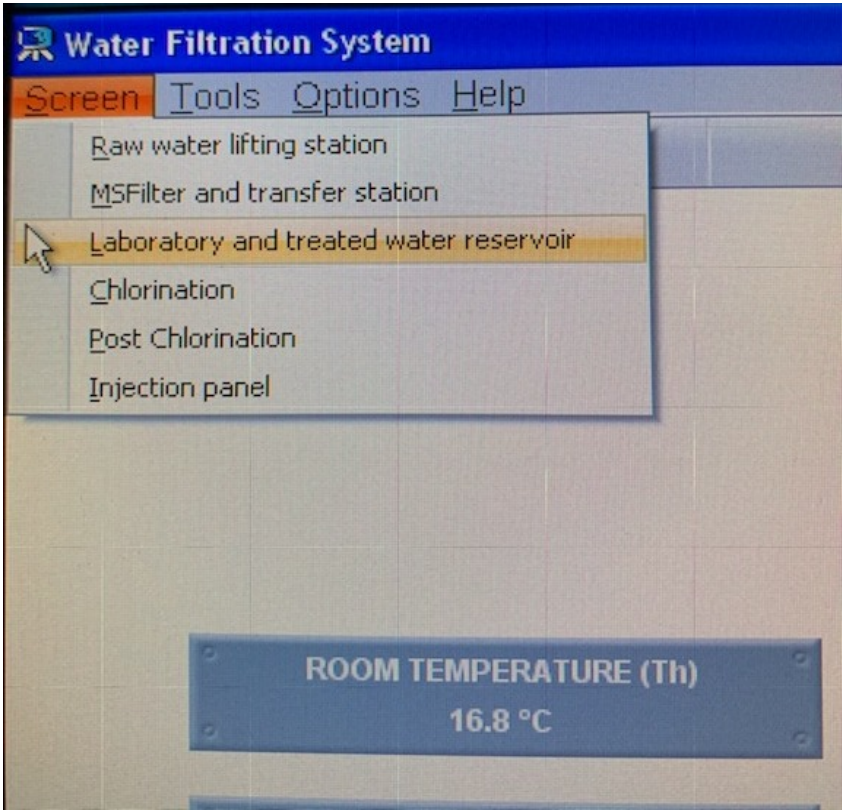
In an emergency, first call Emergency Services at ISC at 418-563-5499, the local Emergency Measures Coordinator (M. Patrick Prieur 418-563-5499), your Circuit Rider (M. Marc LeMay 418-882-7358) and your regional First Nations and Inuit Health Branch Officer (Mrs. Sonia Gavin 514-249-2548), or your local Community Based Water Monitor (Mitchell McMartin 819-627-6246) so that they can guide you in your communications, in the way you work and precautions to take.

***FOR ASSISTANCE CALL
MARC LEMAY
418-882-7358***

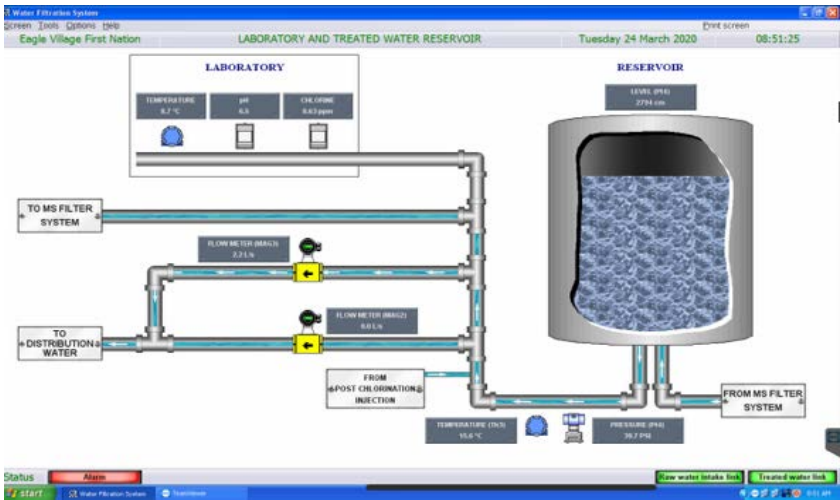
PRINCIPLE OF OPERATION

- Depending on the level of treated water in the reservoir, raw water is drawn from Kipawa lake by two (2) variable speed submersible pumps. The water is pumped to the plant, where it is ozonized and then flows through two (2) slow sand filters and into a transfer tank. From the transfer tank two (2) pumps transfer treated water into the water tower. Sodium Hypochlorite is dosed directly into the transfer tank via two (2) metering pumps. Treated water is gravity fed to the community from the water tower.
- In order to make things as easy as possible but still distribute quality water, we recommend shutting off the pre-ozonation system and concentrating only on the chlorine dosing system. The procedure will be explained further in this document.
- The raw water pumps turn on and off automatically depending on the level in the water tower. Only one (1) pump runs at a time and both pumps alternate after every pumping cycle.
- When the plant is off and level in the water tower is dropping, one (1) of the raw water pumps comes on when the level in the water tank reaches 2700 cm (in winter), 2750 cm (in summer). This automatically turns on the water plant. As the level in the water tank rises, the raw water pump shuts off when the level in the water tank reaches 2800 cm (in winter), 2850 cm (in summer). This automatically turns off the water plant. However, the transfer pumps and the chlorine metering pumps will continue until the head of water in the slow sand filters has drained.
- To monitor the level in the reservoir go to the plant computer and look on the main screen. Use the drop down menu to go to "**Laboratory and treated water**

reservoir"

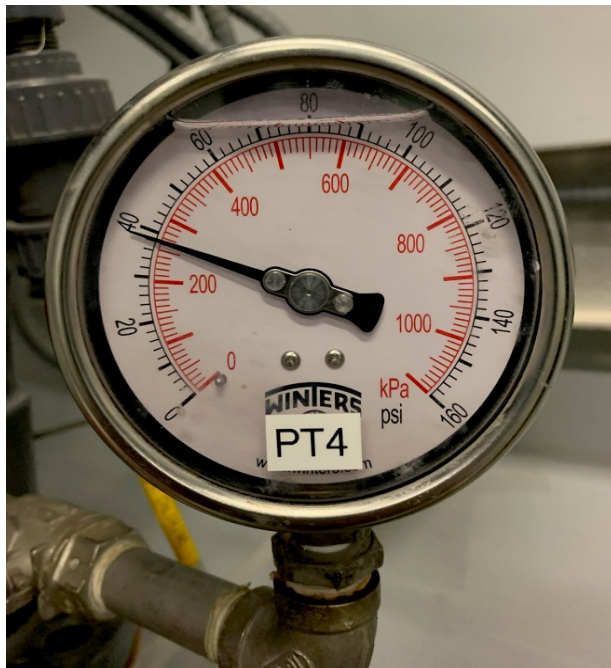


Drop down menu for main screen



main screen

- We can also monitor the level by converting the pressure read on the pressure gauge (PT-4) located in the transfer pump room. Use the conversion table located on the wall behind the pressure gauge to read height of water in reservoir. (1 psi equals 70,307 cm of water)



38 psi = 2672 cm of water

- If the level is between the normal operating levels (winter 2700 to 2800) and (summer 2750 to 2850), the reservoir might be filling or emptying depending on what point in the sequence we're at. If the level is higher than (winter 2800) or (summer 2850) and the pumps are still running we have a problem. If the level is below (winter 2700) or (summer 2750) and the raw water pumps are not running, we have a problem. You will have to run the raw water pumps manually.
- To manually run the raw water pumps you must go to the raw water lift station and use the instruction sheet located near the control panel



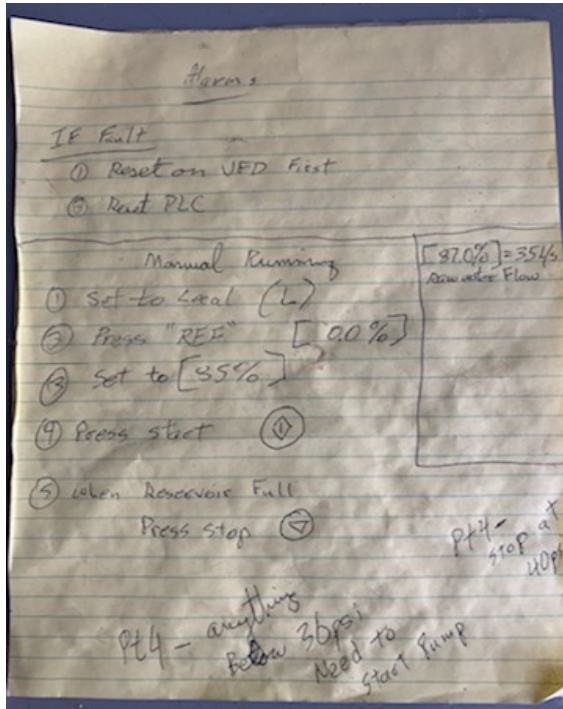
Raw water lift station



Raw water pumps contrôle panel



Raw pump drive (VFD)



Pump operation instruction sheet

ALARMS

If fault

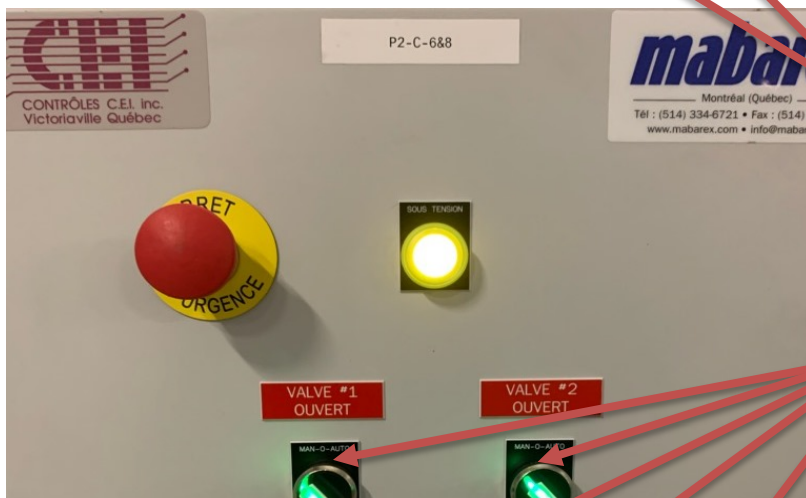
- 1- reset on VFD first
- 2- reset PLC

MANUAL RUNNING

- 1- set to local (L)
- 2- press "REF" (0,0 %)
- 3- set to (85 %) (85 % = 3,5 L/s of raw water flow)
- 4- press start
- 5- when reservoir (water tower) press stop

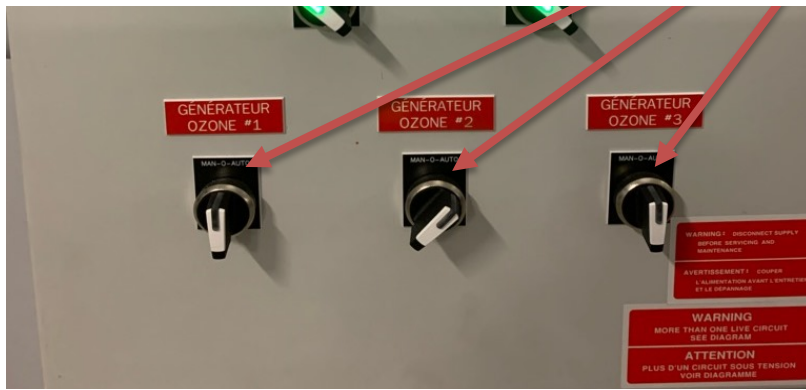
PT4 - anything below 36 psi need to start pump
PT4 - Stop at 40 psi

- Since, we want to concentrate on disinfection with Sodium Hypochlorite, we will turn off the ozonation system. To do so we need to go to the Ozone control panels and turn off the three (3) ozone generators and close all the stainless steel inlet and outlet ball valves.

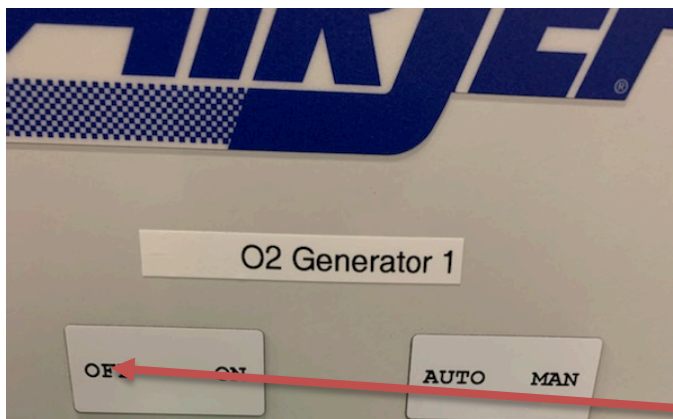


Close all stainless steel ball valves

Turn all switches to "O"



- Next go to the Oxygen generator and turn the switch off



Turn both Oxygen



generators to "OFF"

- Next turn off the compressors

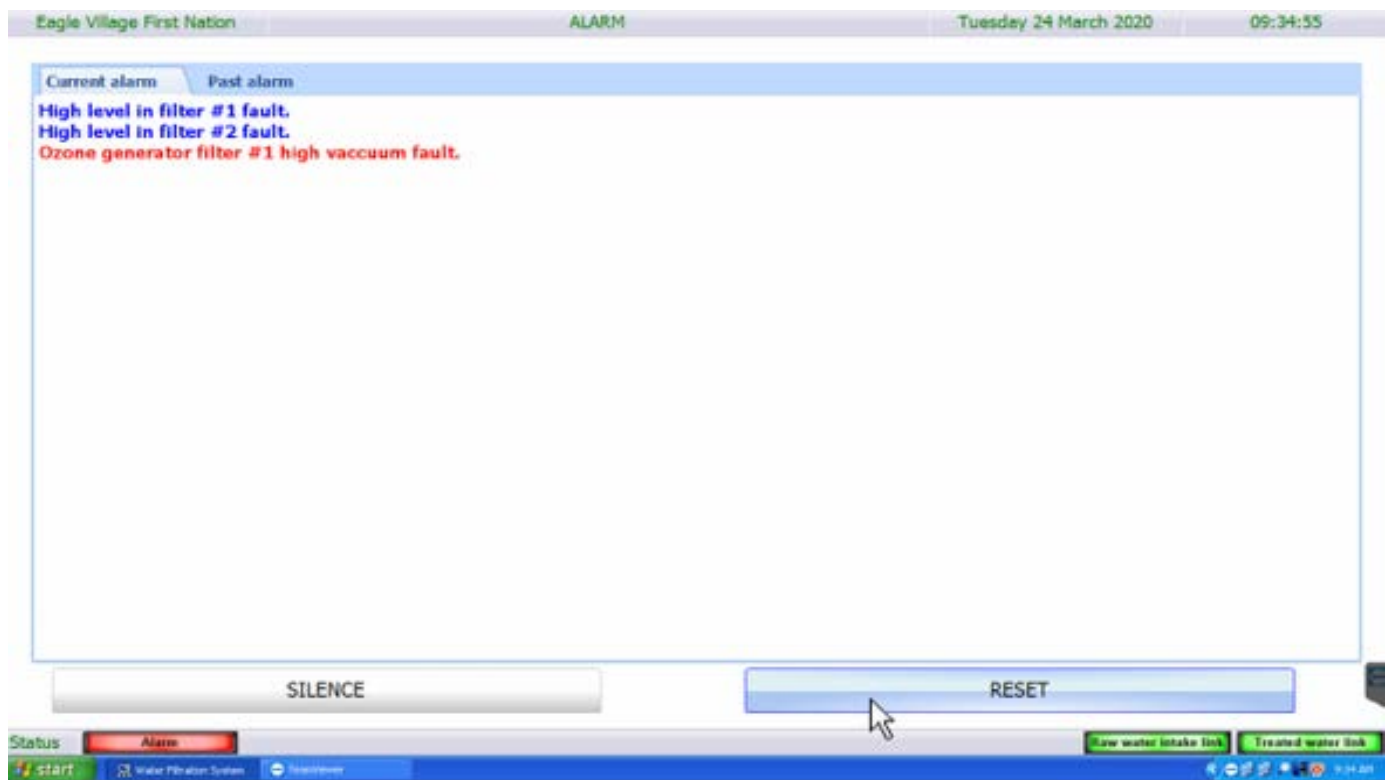


Press "O" button



- Raw water is being pumped from the lake to the filters. After filtration, water is stored in the transfer tank. Floats control the start and stop of the transfer pumps. Usually the pumps start on the High float and stop on the Low float. If the High float doesn't work, water will continue to rise until the High High level float at which point the plant and the raw water lift station will stop and an alarm will appear on the plant computer. If the High High level float doesn't work, water will continue to rise and overflow the tank via an overflow pipe and go to drain. If this is the case you will have to troubleshoot the float or work the transfer pumps manually. You can turn the transfer pump on using the control box located above the transfer tank.
- If the Low float doesn't work the level in the transfer tank will continue to drop until it reaches the Low Low float at which point the plant and the raw water lift station will stop and an alarm will appear on the plant computer. If the Low Low float doesn't work you will hear air being sucked into the transfer pump and you must stop the pump. If this is the case you will have to troubleshoot the float or work the transfer pumps manually.
- In the event of an alarm, whether a High High alarm or Low Low alarm the plant must be resorted. To do so you must first reset the alarm at the the lift station (see prior section on resetting faults at raw water lift station). Then and only

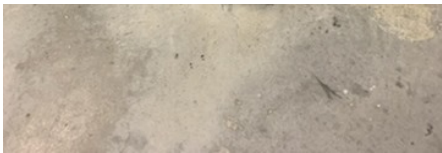
after you have reset the alarm at the lift station, you must reset the alarm on the plant computer. Use the drop down menu and go to the alarm page and press on "SILENCE" then "RESET"



Alarm page

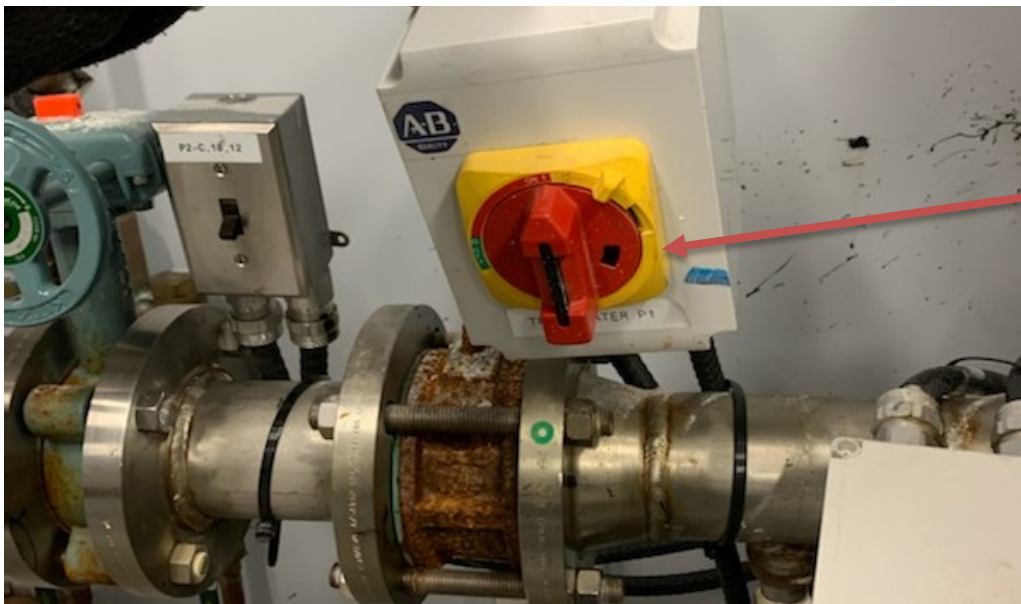


Overflow pipe



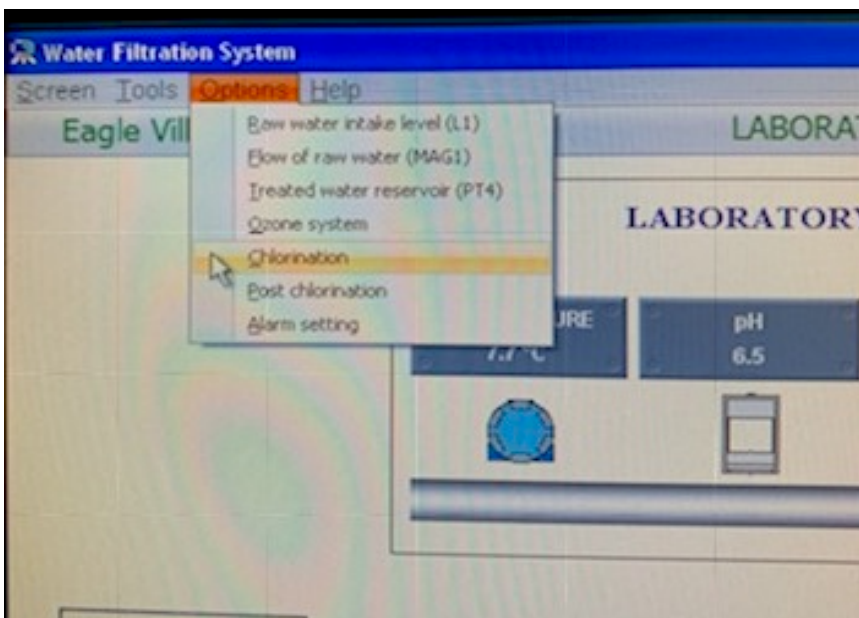
Transfer pump



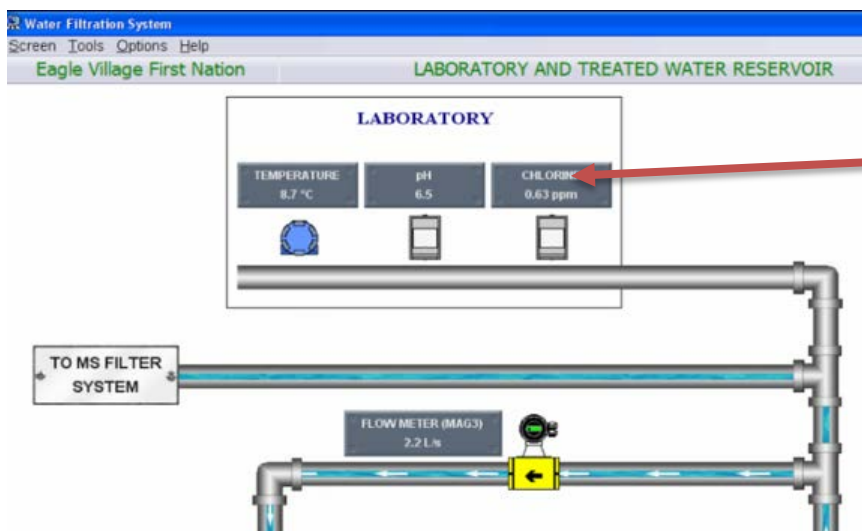


Control box for transfer pump

- **Now we must maintain disinfection using Sodium Hypochlorite (Chlorine).** The chlorine pumps run when water is flowing out of the filters. You can read this flow on the magnetic flowmeter located on the side filter n° 2 (MAG-4). Therefore, if the raw water pump is running water should be going through the filters and into the transfer tank via the MAG-4 flowmeter and one (1) chlorine pump should be on. We want to maintain a concentration of free chlorine between 0,3 mg/L (ppm) and 1,0 mg/L (ppm). You can monitor the concentration on the main page of the plant computer or directly on the analyzer located in the lab.

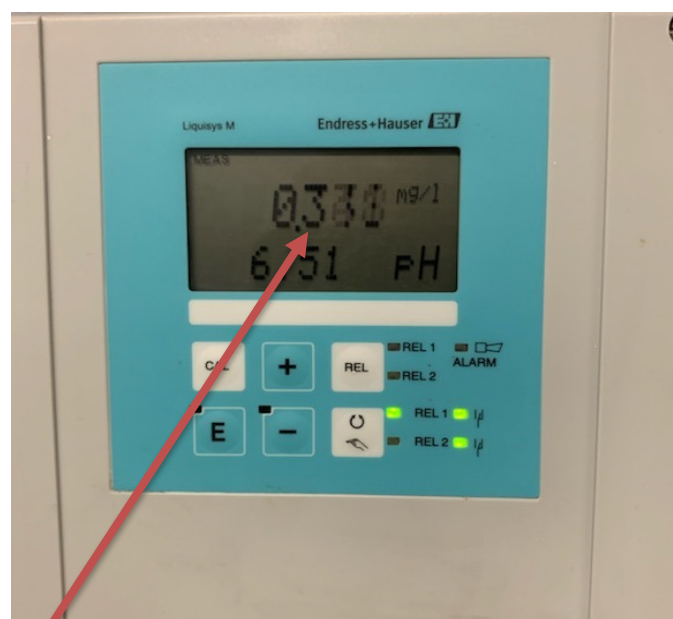


Drop down menu for Chlorination



Between 0,3 mg/L and 1,0 mg/L

Analyzer screen



Chlorine analyzer (maintain between 0,3 mg/L and 1,0 mg/L)

- To change the dosing rate, click on **options** from any page on computer and go to the **chlorination tab**. You increase the on time to increase the concentration and you decrease the on time to lower the concentration. **However, when you make the change to the on time you also change the off time so that the total**

equals 180 s

EXAMPLE :

INITIAL SETTINGS

Chlorination on : 100 s

Chlorination off : 80 s

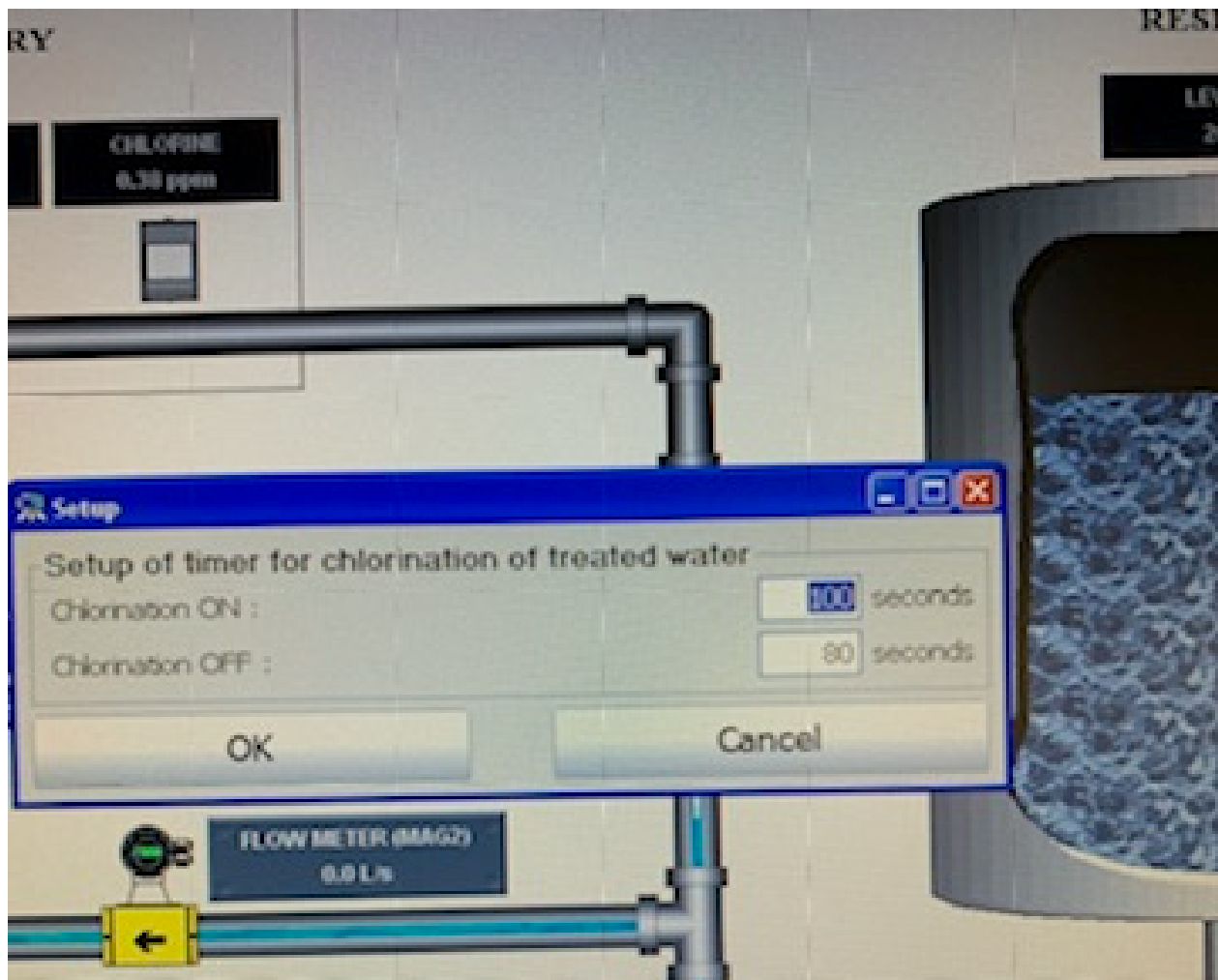
***TOTAL MUST ALWAYS
EQUAL 180 s***

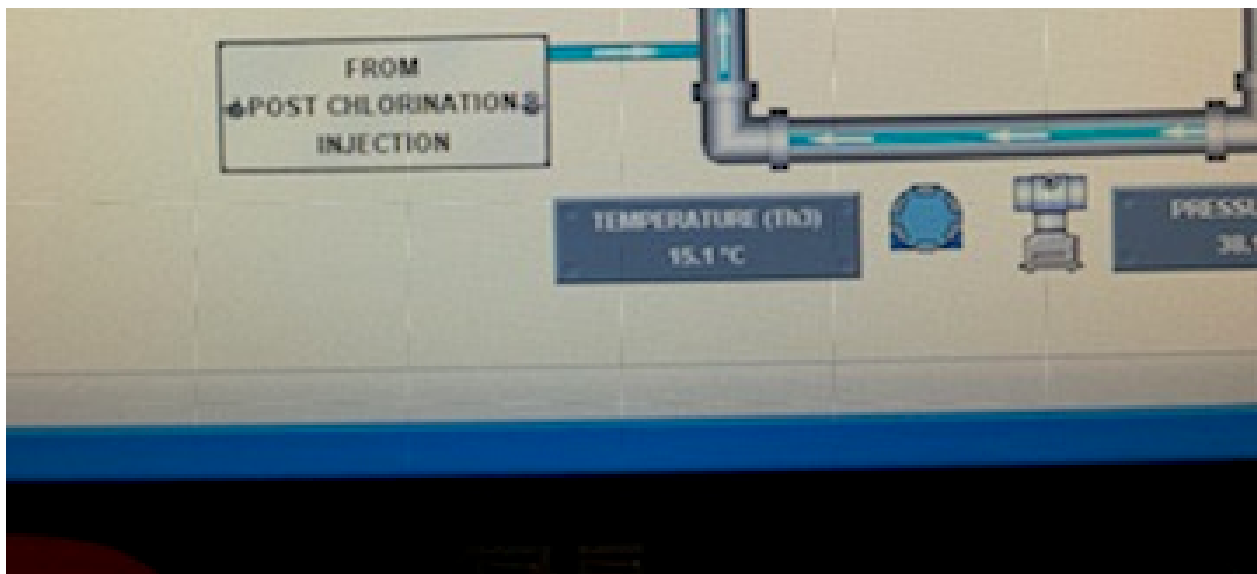
INCREASE DOSING BY 20 SECONDS

Chlorination on : 120 s

Chlorination off : 60 s

***TOTAL MUST ALWAYS
EQUAL 180 s***



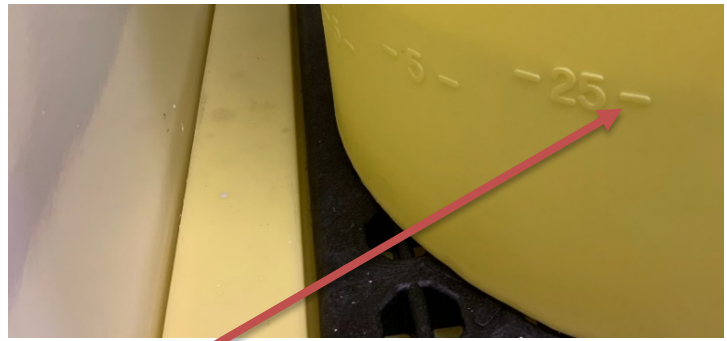


Drop down menu for changing chlorine dosing rate

- In the chlorination room, there are jugs of chlorine. Using these jugs, you must maintain the level in the chlorine tub daily. Try to keep level in tub around 25 liters

WARNING ! GLOVES, EYE PROTECTION AND A RUBBER BIB MUST BE WORN WHILE HANDLING CHLORINE





Maintain level of Sodium Hypochlorite around 25 liters

If the metering pumps are not working, you will have to manually dose Sodium Hypochlorite directly into the transfer tank. Start by pouring 500 mL of 6% Hypo twice a day once in the morning and once at night directly into the transfer tank. Make small adjustments (50 mL) according to your readings on the chlorine analyzer. Remember we want to maintain the concentration between 0,3 mg/L and 1,0 mg/L.

FOR ASSISTANCE CALL

MARC LEMAY

418-882-7358