Freshwater System



Figure 1. This level sensor has three probes that are of different lengths. When the water in the vat gets too low, and the second probe is not submerged in water, the level sensor triggers the solenoid on figure 3 to open.

Figure 2. When the sensor level triggers the solenoid to open, city water starts filling in the vat. Make sure to keep the valve open so water can get into the vat.

Figure 3: You don't need to touch the solenoid for it to work. It will work automatically. If for some reason the level sensor is not working and the solenoid is not being triggered, fill the vat with city water from any hoes located around the lab, be careful with overflowing the vat.

Figure 4

Water moves from the vat to the pressure pump





Figure 5 Switch to turn on pressure pump. Switch should always be pointing upwards, unless there's an emergency and the pump needs to be turned off



Figure 4. Water comes out of vat and goes towards pressure pump. If vat wants to be drained, open valve circled on purple. Turn off pump if vat is being emptied.

Figure 5. Switch should always be pointing upwards so pump can turn on whenever is needed. Pump will not be necessarily working if switch is up, it turns on only when pushing water into the laboratory. The pump should not be on if there is no water in vat, it will run dry and it will burn.

Figure 6. Water moves from pressure pump to pressure cylinder.





Figure 7. Water moves from the pressure cylinder to the first mechanical filter. This filter should be changed every 6 months. The laboratory is responsible for changing this, NOT EVOQUA.

Figure 8. Water moves from the first mechanical filter to carbon filtration #1 and then carbon filtration #2. EVOQUA carbon tanks should be changed every 4 months or so. If the freshwater starts turning yellowish, it's also time to change the carbon filters. To do this, a PO has to be created with the help of Milagros Timiraos. Evoqua workers normally come the next business day.



Figure 9. The water then flows into the second and last mechanical filter. This filter should be changed every 4 months by EVOQUA.

Figure 10. Finally the water is pushed into the inside of the building.



Inside the lab, next to the big mixing vat:



Figure 11. The level sensor cables connect to this box. This box should be ON at all times in order for the sensor levels to work correctly. This is also the same case for the SW sensor level.

Figure 12. This piece should always be connected to the inside of the control box. And light should be on.

Figure 12. FW Blow-off Vat. This should always be plugged in and light should be on.





Figure 13. Freshwater goes into the building and is pushed by the pressure cylinder to different parts of the building. Make sure the valve is open so pressure can actually build up.

Figure 14. The FW can then go to two different places. It can shoot up to fill up the mixing water vat (IF you are using the estuarine system). Or it can keep going straight to then be further filtered by UV light. This water eventually goes to the 1) front culture room 2) back culture room 3) into the FW recirculating system in the back culture room 4) outside to fill up the 75 gal or 100 gal recirculating systems.



Figure 15. The water then will go up and go through the UV sterilizer (2 UV bulbs). Bulbs should be changed as soon as they don't work anymore.



Figure 16. Make sure to plug in the UV sterilizer cable that comes out of the control box. Also, if for some reason the FW pump is turned off. This should be disconnected as well.



Figure 17. After going through UV sterilizers, the water is transferred to other parts of the laboratory

Figure 18. Water can go 1) to the front culture room where it can be used to fill the systems up front. 2) to the back-culture room, to the sink 3) outside to then be used in the recirculating systems in the back-culture room, or 4) outside to fill up the 75 gal/ 100 gal recirculating tanks.

Back Culture Room



Flow of water inside the back-culture room. This water can be used to fill up tanks. So far, FW has gone through carbon filtration, mechanical filtration and UV sterilization.

OUTSIDE



Fig 22. Water being pushed out of the building

Fig 23: Water can either be used to fill up the recirculating systems outside (follow the pvc that the purple circles) or go down into further filtration and sterilization to go back into the recirculating system in the BCR.

Fig 24. When the water is low in the underground vat, the solenoid triggers and calls water to fill in the vat.



Figure 25. In order for the solenoid to work, the switch has to be pointing upwards. If the pressure pump located on the front part of the building is off, this solenoid should be turned off as well.

Fig 26. Once the underground holding vat is full, the pressure pump at the other end will suck in the water from the vat.

Fig 27. This is the pressure pump that will push the water to the FW recirculating system in the BCR. It's very important that the underground holding vat is ALWAYS full, so this pump doesn't run dry. The pump will push the water through the sand filter. The sand should be change around every 6 months. When changing the sand, be careful with the center piece. The sand should be poured around the center piece, since the center piece will have to perfectly fit with the top cover. When changing the sand, disconnect the connections circled on purple.



Fig 28. In order for the pressure pump to work, this switch has to be pointing upward. In case the pressure pump from the front building is turned off, this switch should be flipped off as well. Along with the UV light switch and the solenoid switch.

Fig 29. The sand filter should always be set to filter, unless doing a backwash.

Fig 30. When doing a backwash 1) turn off the pump 2) move to backwash as displayed in fig. 30 3) turn on the pump 4) wait for about 30-45 seconds 5) turn off the pump 5) move back to filter as in figure 29. Backwashes should be done once every week, to get rid of all the waste that gets caught up in the sand.

Always keep an eye on the water level in the underground holding vat, you don't want to run the pump dry.



Fig. 31. After the water is filtered through sand it either 1) goes inside the bio-media filtration and then eventually back into the underground holding vat OR 2) goes through some further UV filtration (pic 32).

Bio media should be changed every 6 months or so.

Fig 32: Water goes through UV sterilization and then back into the back-culture room to be used in the FW recirculating systems.



Back Culture Room



Fig 33. The water comes back into the back culture room and into the tanks through the black lines.

Fig. 34. Once the tanks get full, they overflow, and the water gets out through the overflows into the drainage of the through and then back outside (fig. 35) to then go through the filtration/sterilization again.





Fig 35 & 36. Water comes out from the troughs in the back-culture room, and then is transferred to the underground holding vat, which then goes back into the pressure pump and re-starts the process from figure 24.