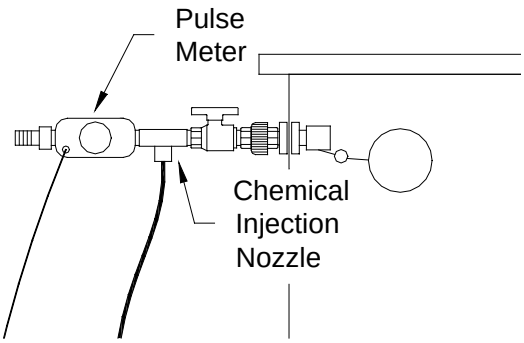
3. Chemical Oxidation & Granular Activated Carbon Water Filter

Chemical oxidation is required for surface water with difficult to remove organic material. Sodium hypochlorite or potassium permanganate are normally used for this application. The chemical is injected upstream of the contact tank. The contact tank provides the necessary time for the chemical to react with the water. The water flows by gravity to the BioSand filter where the particulate material is removed. A Granular Activated Carbon (GA Carbon) water filter is used to remove residual chemical oxidant and byproducts. The water may then be disinfected using Ultraviolet (UV) disinfection.

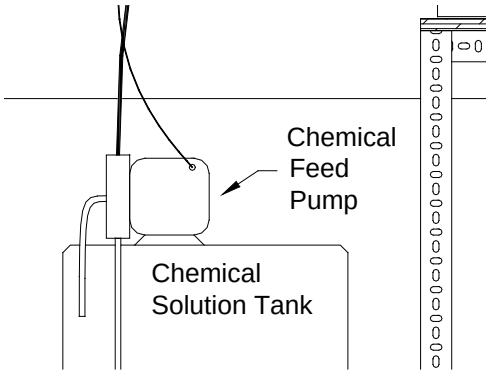
Important Notes:

- **All of the assembled components have been loosely fitted together. Use Teflon tape on all threaded connections and tighten. Do Not Over Tighten the PVC fittings. (They will crack if over-tightened)**
- **Refer to Figure 1 to find the locations for all system components.**
- **Heat the end of hose connections in hot water before installing. Use the gear clamps to fasten the hose to the barb fitting.**

Step 1. Attach the chemical feed pump to the chemical solution tank. Follow the chemical feed equipment manufacturers' instructions.
Step 2. Install the pulse meter and the chemical injection nozzle upstream of the head tank. Connect the pulse meter to the chemical feed pump. The pulse meter will signal the pump when to inject the chemical.
Step 3. Start the chemical injection once the system is completely installed and operating. There will be some trial and error to obtain the correct dosage of chemical for your particular water. Start with weak solutions of chemical, as it is easier to strengthen the solution than to dilute it. Adjustments can be made with the concentration of the solution and the frequency and length of the pump stroke. (See the manufacturer instructions regarding the pump adjustments).



Chemical Injection at the ContactTank



Chemical Feed Pump and Solution Tank

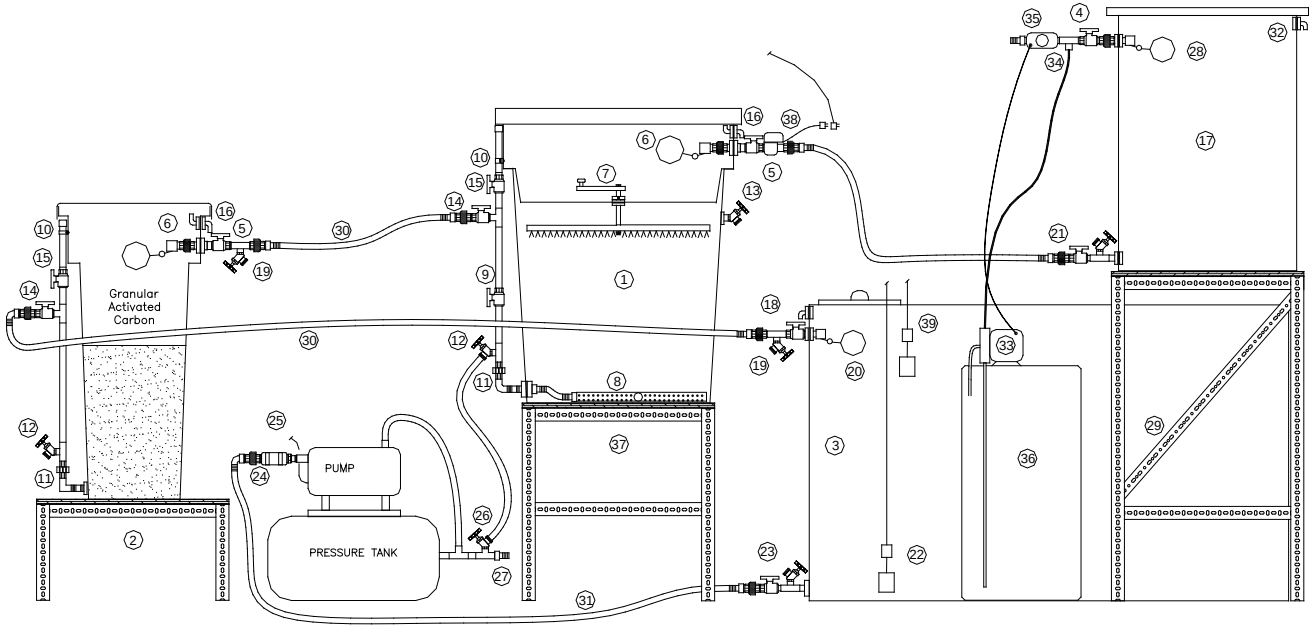


Figure 1 - Automated System Layout - Chemical Oxidation and GA Carbon Filter

1. BioSand Filter
2. GAC Stand
3. Storage Tank
4. Raw Water Inlet
5. Filter Inlet Valve
6. Filter Float Valve with Union Connection
7. Clean In Place (CIP) and Diffuser Basin
8. Underdrain
9. Flow Rate Control Valve
10. Standpipe
11. Standpipe Union Connection
12. Standpipe Lower Valve
13. Maintenance Drain Valve
14. Filter Outlet Valve
15. Anti-siphon Valve
16. Filter Overflow
17. Contact Tank
18. Storage Tank Inlet Valve with Union Connection
19. Sampling Valve
20. Storage Tank Float Valve
21. Contact Tank Outlet
22. Low Level Float Switch (to the pump)
23. Storage Tank Outlet with Union Connection, Shutoff Valve and Drain Valve
24. Check Valve
25. Pump Electrical Outlet (to the low-level float switch)
26. Clean In Place (CIP) Reverse Flow (attached to standpipe lower valve)
27. To Distribution or Further Treatment (softener, Reverse Osmosis, UV)
28. Contact Tank Inlet Float Valve
29. Contact Tank Stand
30. ¾" Braided PVC Hose
31. 1" Braided PVC Hose
32. Contact Tank Overflow
33. Chemical Feed Pump
34. Chemical Injection Nozzle
35. Pulse Meter
36. Chemical Solution Tank
37. Filter Stand
38. Solenoid Valve
39. High Level Float Switch (to solenoid)