

1. Chemical Oxidation

Chemical oxidation is required for ground water with difficult to remove iron and manganese, and hydrogen sulfide (rotten egg smell). Chemicals such as sodium hypochlorite or potassium permanganate are normally used for this application. The chemicals are injected upstream of the head tank. The head tank provides the necessary contact time for the chemicals to react with the water and allow oxidation to occur. The water flows by gravity to the BioSand filter where the iron and/or manganese are removed.

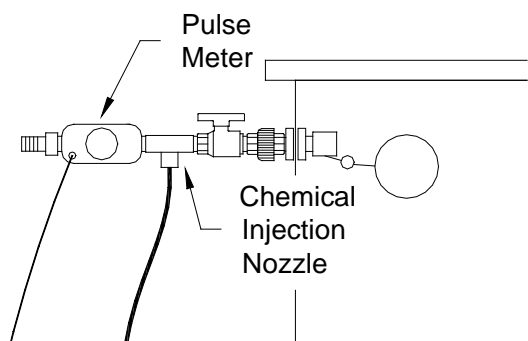
Important Notes:

- **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.**

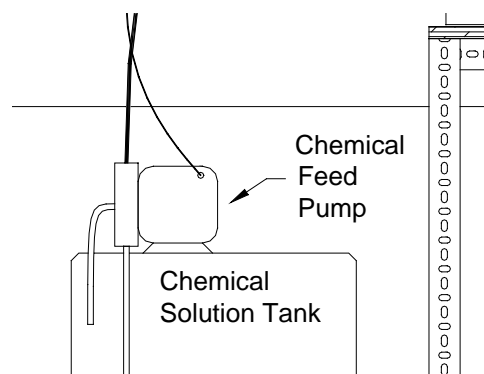
Step 1. Attach the chemical feed pump to the chemical solution tank. Follow the chemical feed equipment manufacturers' instructions.

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 Head Tank



Chemical Feed Pump and Solution Tank

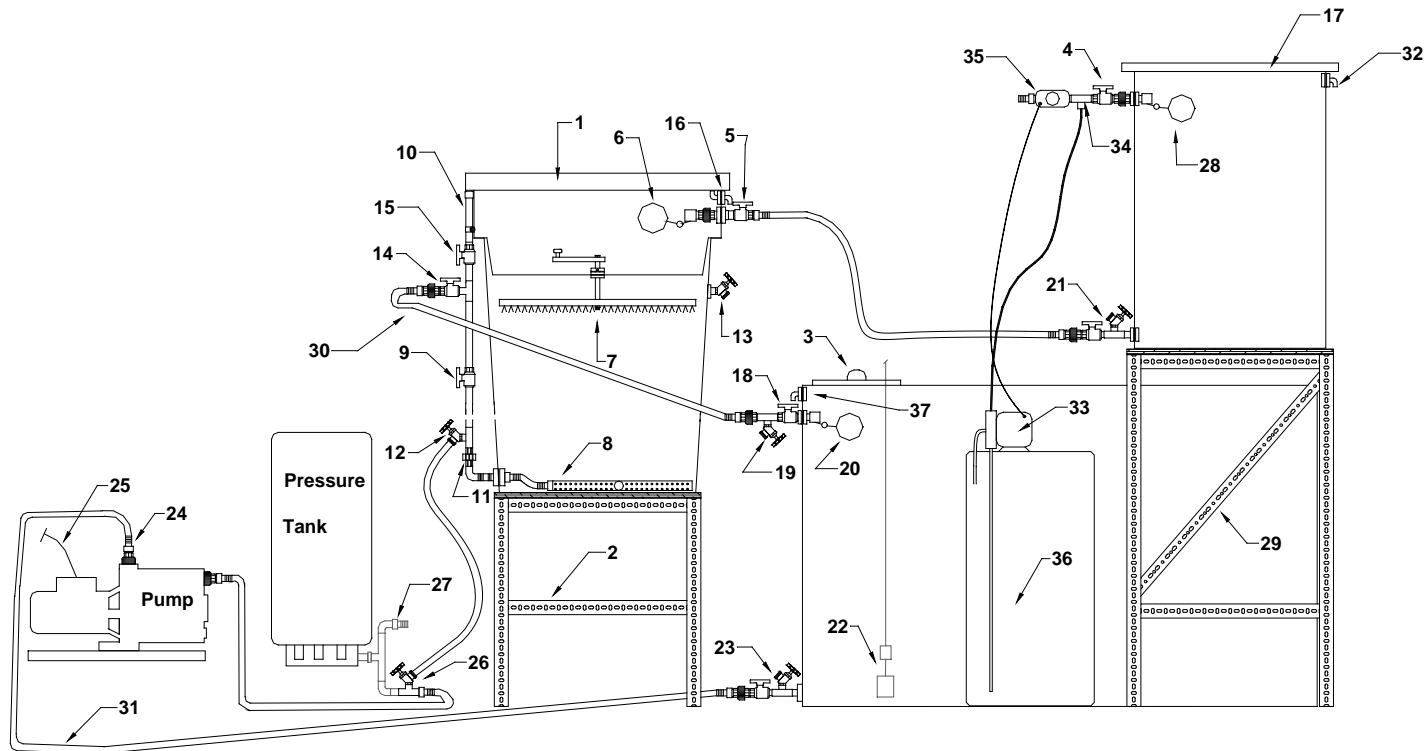


Figure 1 - Automated System Layout - Chemical Oxidation

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