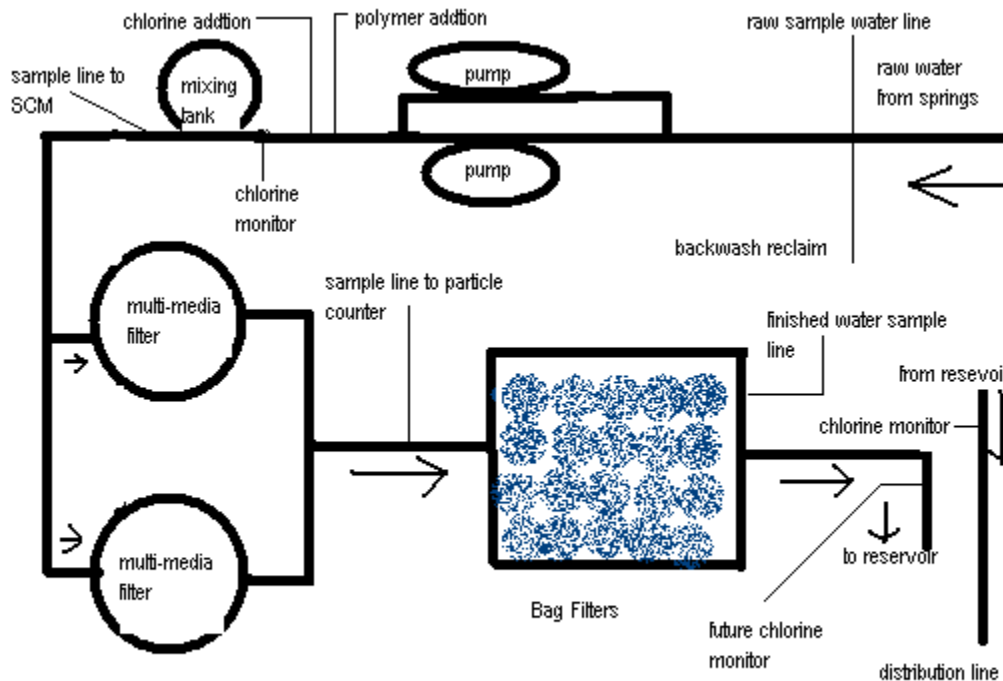


Attachment B

Summary of Huntsville Town Water Treatment Plant Process and Facilities

by Dee Jette, January, 2015

The first part below is a diagram of our plant and a little on the multi-media filter configuration. I had prepared this for a peer review (Northern Utah Water Quality Alliance) in 2004, so it is dated, but will give a general idea. Since this time we have added another bank of filters. The filters shown on the diagram are Strainrite filters, using HPM97-A-2SS bags. After this bank of filters we now have 5 of the Harmsco filters. They use the YO72 HC/170-LT2 1266-275 cartridges. We produced very good quality water prior to the addition of these filters, but in order to get the log removal needed to meet newer requirements, these were added just over a year ago.



Below is a narration of how our plant works:

1. Description of unit process elements: Huntsville Town's water treatment plant is a direct filtration plant. It is a pressurized system; all components of the system are "closed". The following are steps through the plant with any challenges as noted:
 - Raw water from the springs enters the plant
 - The computer picks up the raw water turbidity and adds polymer according to preset levels applied to changing turbidity levels
 - Chlorine is added

- “Treated” water enters a 2200 gallon mixing tank
 - Water passes through 2 multi media filters in parallel.
 - Water passes through 20 bag filters (strainrite)
 - Water passes through 5 Harmsco cartridge filters
 - On to the reservoir (1,000,000 Gallons) positioned up on the hill. This elevation is close to that of the springs.
 - Back wash water is collected in 2 ponds just outside the plant. A back wash reclaim pump allows this water to be introduced at the head of the plant for treatment at 10 GPM. I have not had a lot of luck recycling the backwash. Previously I think it was due to the location of the raw water sample line. We changed this location with the upgrade in an attempt to get a better mixed read of the spring water and backwash water mixed, but when I tried it last spring, our effluent water quality was not as good, so have not tried it again)
2. Chemicals used: gas chlorine and coagulant (Nalcolyte 8100, “polyamines”).
 3. Polymer doses: Anywhere from about .06 PPM to .9 PPM.
 4. The plant source water comes from 3 springs: Upper Bennett, Peterson, and Lower Bennett. Upper Bennett is shared with the Abby of the Holy Trinity Monastery. This spring has been determined to be under the influence of surface water. About half of our total water comes from this spring. During the snowmelt we get increased levels of turbidity. The pilot plant was being operated before the lower 2 springs were redeveloped and when there was more snowmelt and moisture (spring of 2000?). Reviewing last year’s data our raw water turbidity ran from about 4 to 5 NTU beginning at the end of February (our typical runoff begins), to in March running close to about 3 to 4 NTU through March into June. Towards the end of June we were about 2 NTU, July around 1 NTU. By the end of August we are about .5 NTU and this is about where we remain for the rest of the year. I have seen 8 NTU which is more typical of a higher snowfall year. I have seen quite high turbidities momentarily (like above 15 NTU). Our plant seems to handle this higher turbidity water well, but I have never seen these higher turbidity events last very long. We had a set point of 15 NTU to shut the plant down, but I know the plant can handle it; at least short term.
 5. Alkalinity and hardness tests were done with the pilot plant, but I have not been able to find the results of those tests.
 6. The filter media configuration as described in the general specifications for each filter (I believe we are fairly close to the specifications, but have not measured all layers) are as follows:
 - 8th Layer: 18” Anthracite
 - 7th layer: 8” Silica
 - 6th layer: 4” garnet
 - 5th Layer: 3” Quartz gravel (3/4” x 1/2 “)
 - 4th layer: 3” Quartz gravel (1/2” x 1/4”)
 - 3rd layer: 3” Quartz gravel (1/4 “ x 1/8”)
 - 2nd layer: 3” garnet No 8
 - 1st layer: 3” Underbed Gravel, round hard river run gravel

7. Description of the filter underdrain type and configuration: The filter vessels are 96 inches in diameter, 72 inches high with a cross sectional surface area of 50.27 square feet. The internal data, again from the specifications are as follows:
- Upper distributor size: 6 inches
 - Upper distributor design: Header/Lateral with drilled holes
 - Lower distributor size: 6 inches
 - Lower distributor design: Header/Lateral with drop strainers

Our filter media has not been evaluated since the beginning operations of the plant.

Overall we produce very good water, easily achieving under .1 NTU in our effluent water. As noted above, our water is fairly clean most of the year. I did a lot of E. coli sampling 2004 to 2007. I will attach that data in the lab provided excel spread sheet.