

Fauquier Water Treatment Plant

British Columbia, Canada

Treatment of creek water - Pretreatment for UV disinfection

MEL type filters as polishing sand filters (PSF's)



Fauquier Water Treatment Plant



Creek water source

Design constraints and objectives

- Small isolated community.
- Water source is local creek – subject to significant variations in turbidity and TOC.
- Turbidity to be reduced by MEL filters to less than 1 NTU.
- TOC to be removed by MEL filters (increasing UV transmittance and reducing production of THM).
- Cryptosporidium to be removed by MEL filters
- Cryptosporidium to be deactivated using UV disinfection (second process).
- 4 filters each with minimum operating capacity of 12,000 L/h or 288,000 L/day. (Maximum operating capacity of each filter is 16,000 L/h or 384,000 L/day).
- Creek water is gravity fed to filters which gravity feed to treated water storage.
- Community supplied with treated water by gravity from treated water storage.
- No chemical requirements (apart from chlorination).
- Manual operation.
- Minimum complexity – Local operator with minimum training or experience.
- Operation and performance monitored using SCADA system.
- Minimum backwash - Wastewater disposed of in local stream (bank infiltration).
- No media replacement.
- Performance capable of being verified using pilot testing on site.

Treatment Process

Creek to MEL polishing filters to UV disinfection to Chlorination to Treated water storage.
(All by gravity – no pumps.)

After more than five years of operation the UV disinfection system had not been installed. All disinfection was provided by post filtration chlorination prior to storage and distribution. The only period where there were boil water orders was during the spring freshet (lasting a few weeks as expected and originally approved) when the turbidity of the filtered water was too high.

Even though the filters have been operating at almost three times that specified for slow sand filters (and certainly twice) the filters have been removing cryptosporidium and giardia. Simple chlorination to kill or deactivate any viruses or bacteria remaining in the filtered water was effective. This is consistent with MEL independent testing.

This is the first project to rely on this treatment capability.



Front of filters #1 and #2

- Four (prefabricated stainless steel 4m x 4m x 2m) MEL-PF filters.
- Each filter can treat a maximum of 16,000 L/h. (Surface loading of 1000) L/m²/h).



**Pilot filter pre- valuates
MEL-PF performance**



**Filters sitting on flatbed ready for transport to site
(800km/16hr road journey)**