Public Health Division – Drinking Water Services
John A. Kitzhaber, MD, Governor

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July 25, 2013

Thomas Headley, PE
Century West Engineering Corporation
1020 SW Emkay Drive
Suite 100
Bend, OR 97702

Re: **Membrane Treatment Plant (PR#30-2013)**
Young Life Wash Family Ranch (PWS ID#01246)
Conditional Approval

Dear Mr. Headley:

Thank you for your submittal to the Oregon Health Authority's Drinking Water Services (DWS) of plan review information for the new membrane treatment plant for Young Life Washington Family Ranch. On April 3, 2013, our office received a set of plans. A plan review fee of $600 was also received. On May 20, 2013, we received answers to initial questions regarding the treatment plant. On July 3, 2013, we received chemical and radionuclide sample results for the Currant Creek source.

The project includes a Westech/Toray HFS-2020 membrane filter plant with 8 modules in two trains and a design flow of 100 gpm per train, two ATG SP-25-6 UV units with a 200 gpm capacity per unit, and a chlorinator (sodium hypochlorite).

The water system must meet the following requirements: 3-log removal/inactivation of *Giardia*, 5.5-log removal/inactivation of *Cryptosporidium*, and 4-log inactivation of viruses. The membrane treatment plant is granted 4-log removal of *Giardia* and 4-log removal of *Cryptosporidium*. The UV units are granted 3-log inactivation of *Giardia* and 3-log inactivation of *Cryptosporidium*. The water system intends to meet the 4-log inactivation of viruses through appropriate contact time with chlorine.

The plans are approved with the following conditions:

- A spill plan is required for potential UV lamp breakage.
- The UV units must have:

    - An auto water shut-off to prevent the UV intensity/dose dropping below a minimum level,
    - A flow restrictor or alternative to assure that the maximum flow of 200 gpm is not exceeded,
    - Visual verification (indicator light or SCADA display) of operation of lamps, and
    - Accessibility for cleaning and replacement of lamp sleeves and sensor.
- The water system must be able to calculate/totalize off-spec water volume produced.
- The system plans to collect filtered water UVT data weekly for 12 months.
- For the chlorine contact time, the proposed time at maximum flow is only 8 minutes. Additional calculations or piping adjustments must be presented to show how the water system will meet the requirement for 4-log inactivation of viruses, keeping in mind the required CT values in Tables 27-34 of OAR 333-061-0036.

Until we receive verification that the conditions have been met, the facility is not approved for use. Upon completion of the project, the engineer must verify in writing that construction was completed according to the submitted plans. If substantial changes are made, a set of as-built drawings must be submitted. Documentation demonstrating how the above conditions were met should reference Plan Review #30-2013 and can be emailed to me at Carrie.L.Gentry@state.or.us or mailed to:

Attn: Carrie Gentry
OHA-Oregon Drinking Water Services
PO Box 14450
Portland, OR 97293-0450

In addition to the above requirements, I have the following comments:

- For DWS' records, please specify a trans membrane pressure (TMP) that triggers a chemical clean-in-place (CIP) cycle. Westech's response noted that "As the skid approaches 29 psi…" which is subjective. A specific value should be set to alarm for a CIP. (This value should not be the maximum TMP specified by the manufacturer.)
- DWS does not require that the membrane unit be automatically taken off-line in the event of a direct integrity test failure. However, if the treatment plant is being run while unmanned, we recommend that when the upper control limit (UCL) is exceeded and an integrity test fails, the unit should be programmed to be taken off-

line automatically.

- DWS recommends that the pressure transducers be installed such that they can be easily removed to check for accuracy. A pressure gauge is an inadequate backup for a transducer reading since the resolution of a gauge is far more coarse than a transducer.
- DWS does not require that resistance be measured.
- Sampling schedules for VOC, SOC, IOC and radionuclide sampling will be created after installation of treatment plant.
- When reviewing the sampling results, I noted that the radionuclide results for Currant Creek included a Gross Alpha result of 12.04 pCi/L. The maximum contaminant level (MCL) is15 pCi/L. This result does not change (or increase) the standard monitoring schedule for a new surface water source of 4 quarters of monitoring, however, the water system should be aware that the raw water shows a result somewhat close to the MCL.

If you have any questions or would like this in an alternate format, please feel free to call me at (971) 673-0191.

Sincerely,

Carrie Gentry, PE
Regional Engineer
Drinking Water Services

cc: Michelle Byrd, OHA/DWS
Brad Daniels, OHA/DWS
Bill Palmaymesa, Young Life Washington Family Ranch