



June 2, 2020

Faye Stewart
City of Cottage Grove
400 E. Main Street
Cottage Grove, OR 97424

**Re: Membrane Filtration Expansion (PR#119-2019)
Cottage Grove (PWS ID#00236)
Conditional Approval**

Dear Mr. Stewart:

Thank you for Cottage Grove's submittal to the Oregon Health Authority's Drinking Water Services (DWS) of plan review information for additional membrane filtration for the City of Cottage Grove. Our office received plans and specifications for the project and a plan review fee of \$3,300.

The project includes installing a third membrane filter skid in space left open for this project. The proposed skid is a Pall Aria 8" Transverse Filter Skid using Asahi Microza UNA-620A modules, which are LT-2 compliant and certified to NSF Standard 61 as a Pall Corporation product. The existing two skids use Microza UNA-620A modules. The maximum flux of the membrane filter is 48 gfd at 20°C. A pre-screen (Amiad SAF) is also included in the project. The capacity of the skid is 2 million gallons per day. The upper control limit (UCL) of skid 3 is 0.24 psi/min and represents an LRV of 4.0-log when the following apply in order to demonstrate performance at or above the log removal credit (LRC) of 4.0-log.

The membrane modules are granted log removal credits (LRCs) for pathogen removal as shown in Table 1. The LRCs are based on a verification of the challenge study for the installed modules. The LRCs are only valid if operations are within the limits addressed in this conditional approval. Please ensure SCADA/PLC programming accounts for the operating limits (i.e., ensure alarm set points are set appropriately given these limits).

Table 1 – Filter Log Removal Credit (LRC)

Pathogen	Removal Credit (log10)
Giardia lamblia	4.0
Cryptosporidium sp.	4.0
Viruses	0.0

The project will be granted final approval subject to Cottage Grove (or its designated representative) providing written verification that the project was completed per plans and met all applicable Oregon Administrative Rules (OAR) 333-061-0050 Construction Standards such as those described below.

- Each membrane filter system must have a turbidimeter installed after each filter unit/skid/rack/cell for continuous indirect integrity monitoring. Once operating, direct and indirect integrity testing must be conducted on each unit as described in OAR 333-061-0036(5)(d).
- The operation and maintenance manual must include a diagnosis and repair plan such that the ability to remove pathogens is not compromised.
- The UCL is monitored differently for skids 1 and 2 (0.06 psi/min) than it is for the proposed skid 3. The SCADA system alarms are programmed accordingly. To verify, DWP requests the following information: Air-to-liquid-ratio (ALCR) calculation using a backpressure of zero (0). Verify that is appropriate to water treatment plant conditions and manufacturer’s guidelines. The project will need to confirm manufacturer’s information with in plant testing that the backpressure value of zero will reflect the worst-case scenario regarding the ALCR calculation.
- The minimum final pressure during a direct integrity test (DIT) may go as low as 17.04 psi and still resolve a 3-micron breach though it is typically 25 psi based on Pall operational conditions.
- A log removal value using ambient conditions (LRV_{ambient}) is stored at least once every 15 minutes by the control system.
- Verify that when Excess Recirculation mode is active, the volumetric concentration factor (VCF) in the LRV equation is set to 1.08 per AWWA RF Report No. 91032 by Sethi et al., 2004.
- Wetted components other than stainless steel or glass are certified to NSF/ANSI Standard 61 or equivalent.
- Provisions are made for periodic calibration and/or verification of the pressure sensors used in completing the pressure decay direct integrity test. Thus, the spare parts and

special tools include a duty pressure transducer(s) used in monitoring trans-membrane pressure and DIT or a calibratable pressure transducer that fits each application.

Additionally, we have the following recommendations and observations:

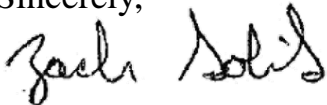
- Data should be tracked and trended for at least up to 1 year for normalized permeability, LRV_{ambient} , trans-membrane pressure, normalized flux, and DIT. A multi-year data set is of more utility to Cottage Grove.
- The LRV_{ambient} 's input values and underlying equations should be accessible to an operator and regulator through the SCADA human/machine interface.

Until we receive verification that the conditions have been met and final approval has been issued, the Membrane Filtration Expansion is not approved for final 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 #119-2019 and can be emailed to me at ZACHARIAH.CUNNINGHAM-GOLIK@dhsosha.state.or.us or mailed to:

Attn: Zach Golik
OHA-Oregon Drinking Water Services
444 A Street
Springfield, OR 97477

If you have any questions, please feel free to call me at 541-726-2587, ext. 22.

Sincerely,



Zach Golik, PE
Regional Engineer
Drinking Water Services

CC: Julie Wray, DWS Portland
James Macpherson, DWS Springfield