



PUBLIC HEALTH DIVISION  
Drinking Water Services

Kate Brown, Governor

Oregon  
**Health**  
Authority

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October 7, 2020

Peter Olsen, PE  
Keller Associates  
245 Commercial Street SE, Suite 210  
Salem, OR 97301

**Re: Amity WTP Improvements (PR#79-2020)  
City of Amity (PWS ID#00041)  
Conditional Approval**

Dear Mr. Olsen:

Thank you for your submittal to the Oregon Health Authority's Drinking Water Services (DWS) of plan review information for the water treatment plant improvements for City of Amity. On May 19, 2020, our office received plans and specifications. A plan review fee of \$4,125 was received on June 5, 2020. The land use compatibility statement was received on June 6, 2020. I apologize for the long review period.

The project includes upgrades to the existing water treatment plant. These include the installation of an intake at a new location along the South Yamhill River with a wet well and control platform. A new raw water pipeline will be installed that leads to a new pretreatment building. The pretreatment building includes two trains each with flash mixer, 3-stage paddle mixer flocculation with VFDs and inclined plate settler basins. There will be storage and chemical injection points for Pass-C, soda ash, sodium hypochlorite and zinc orthophosphate in the building. Backwash and finished water pumps are located in the building along with a 65,000-gallon buried baffled concrete clearwell. The existing filtration building houses the existing Keystone package plant.

The upgraded water treatment plant is granted 2.5-log removal of *Giardia* and 3-log removal of *Cryptosporidium*. The water system must meet the 4-log inactivation of viruses through appropriate contact time with chlorine at the entry point (i.e. after the treatment plant, in the clearwell prior to the first user).

With a hydraulic detention time of 29.53 minutes and a combined volume of 18,898 gallons,

the 3-stage flocculation trains have a maximum capacity of 640 gpm, or a maximum of 320 gpm per train. The inclined plate settler trains have a surface overflow rate of 0.37 gpm/ft<sup>2</sup> and a surface area of 1720 ft<sup>2</sup>, which gives a maximum capacity of 640 gpm, or a maximum of 320 gpm per train.

The capacity of the filtration portion of the plant is 400 gpm, unchanged from previous evaluations. With two filter trains, this means a maximum of 200 gpm per train. This is an important constraint when one filter is down for backwashing, although this capacity is likely not exceeded given the known production rates for the current plant.

The new intake location is on the South Yamhill River, which is the current source for the existing water system's treatment plant. Some raw source water monitoring data was provided via email in 2018. The source water assessment conducted in 2018 is considered sufficient to meet the requirement of a sanitary survey of the watershed. Additional E. coli sampling will be required once the water treatment plant is operational and is briefly discussed in the comment section at the end of this letter.

Based on email correspondence, the zinc orthophosphate is a backup emergency option for corrosion control. If the City chooses to use zinc orthophosphate, then it must always remain in use. Use of zinc orthophosphate is enough to bump up the City's water treatment plant rating, requiring a WT-3 certification.

Individual filter effluent turbidimeters and a combined filter effluent turbidimeter were noted on the plans. The combined filter effluent turbidimeter location was noted to be prior to the clearwell.

### **The plans are approved with the following conditions:**

#### General Items

- All items in contact with potable water must meet NSF Standard 61 or equivalent. Chemicals must meet NSF Standard 60 or equivalent.

#### Intake

- Under OAR 333-061-0050(3)(d)(D), provisions must be made to restrict swimming or boating in the vicinity of the intake.

#### Water Treatment Plant

- A filter profile must be developed for each filter once each calendar quarter, beginning

with plant startup if the water system is not already conducting profiles. The 2017 survey called out the lack of filter profiles.

- SCADA screenshots must be submitted showing high and low alarms (both call-out and automatic shutdown/backwash/filter to waste/etc.) setpoints for chlorine and turbidity. These must be provided when seeking final approval for the treatment plant.
- Operations and maintenance manuals must be updated for the new and modified treatment processes. These manuals must include SOP's for calibration and maintenance of instruments used for compliance monitoring or process control. These must be submitted for review when seeking final approval.
- Chemical piping must be designed to prevent contamination of the potable supply by backflow of untreated water or water having excessive chemical concentrations. An air gap is often used for this requirement.

### Clearwell

- Ground-level reservoirs (clearwell) must be constructed on undisturbed soil, bedrock or other stable foundation material capable of supporting the structure when full. A geotechnical report is generally submitted to demonstrate how the reservoir meets this rule. This condition must be addressed prior to construction of the clearwell.
- Footing drains are required and must discharge to daylight to carry away ground water which may accumulate around the perimeter of the structure.
- A drain to daylight is required. The plans noted a sump pump. If seeking a waiver for this rule, please submit a construction standard waiver request.
- The outlet end of the drain/overflow must be fitted with an angle-flap valve or equivalent protection and must discharge with an airgap to a watercourse or storm drain capable of accommodating the flow.
- A flow meter is required on the effluent line of the clearwell.
- Bypasses around the clearwell are not allowed without a physical separation of the piping. No bypass piping was noted on the plans.
- The access hatches must have curbing around the openings and lockable watertight covers that overlap the curbing.
- Disinfection of the clearwell prior to use must be accomplished according to AWWA Standard C652.
- Coliform bacteria sample result(s) must be submitted after disinfection of the clearwell is complete.
- Clearwell calculations were provided with the submittal to demonstrate 4-log inactivation of viruses. Once construction is complete, an estimated contact time can be used in the short term, however, a tracer study to determine actual contact time in the clearwell must be completed. A proposal for conducting the tracer study must be

submitted to Nicole Alfafara (DWP- Portland) prior to the tracer study. Nicole can be reached at [Nicole.H.Alfafara@dhsoha.state.or.us](mailto:Nicole.H.Alfafara@dhsoha.state.or.us).

### Finished Water Pipeline

- Disinfection of the waterline must be completed according to AWWA C651. Results from the coliform sampling must be provided to our office.

**Until we receive verification that the conditions have been met and final approval has been issued, 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 #79-2020 and can be emailed to me at [Carrie.L.Gentry@state.or.us](mailto: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, I have the following comments:

- I assume that the City's existing water rights will be used for the new intake site. If that is not correct, please provide updated water rights information.
- Once the treatment plant changes have been made and final approval issued, the water system will be required to conduct 2 six-month rounds at the original number of customer sample sites (20).
- Based on the proposed treatment changes, without adding zinc orthophosphates, the water treatment plant's current rating remains at a WT-2 certification. Adding zinc orthophosphate would raise that requirement to a WT-3 certification. The current DRC fulfills either requirement.
- Water quality parameters would need to be set if zinc orthophosphate is added. Nicole Alfafara would work with the water system on setting these parameters.
- LT2 monitoring will be required once the project receives final approval. This will consist of source water (intake to the treatment plant) E. coli monitoring twice per month for 12 consecutive months. This schedule will be set up during the final approval process.

If you have any questions, please feel free to call me at (971) 673-0191.

Sincerely,

A handwritten signature in black ink, appearing to read 'C. Gentry', with a stylized flourish at the end.

Carrie Gentry, PE  
Regional Engineer  
Drinking Water Services

cc: Nicole Alfafara, OHA/DWS  
Gary Mathis, City of Amity