

The Bull Run Filtration Project will remove *Cryptosporidium* and other contaminants from the Bull Run water supply, producing cleaner, safer water for the nearly one million people who use our water today and for future generations. The project is required by the federal Safe Drinking Water Act and must be completed by September 30, 2027, per a bilateral compliance agreement with the Oregon Health Authority.

Learn More

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Contact

Bonita Oswald
Portland Water Bureau
Project Communications
503-865-6039
bullrunprojects@portlandoregon.gov

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Ground Movement and Resiliency in the Bull Run Watershed

Much of the Bull Run supply infrastructure is located along the Bull Run river which includes areas of unstable geology, areas at greater risk of landslides, and conduit in shared alignments. Infrastructure in shared alignments are at greater risk of being damaged by the same event, generally increasing the consequence of an outage or repair response.

- There is a growing recognition of earthquake hazard in Oregon. The most significant hazard to Portland is from a major earthquake on the Cascadia Subduction Zone (CSZ). Recent studies show a 16 to 22 percent probability of an earthquake with magnitude greater than 8.5 on the CSZ in the next 50 years (Goldfinger et al., 2016).
- An earthquake has the potential to cause permanent ground deformation and trigger landslides. This can lead to infrastructure damage. Damage to critical infrastructure such as the Bull Run supply, Groundwater, and water distribution system could mean Portland has reduced supply or a supply outage.
- Recognizing the potential earthquake risk, the Oregon House of Representatives passed House Resolution 3 (April 2011), which directed the Oregon Seismic Safety Policy Advisory Commission (OSSPAC) to prepare the Oregon Resilience Plan (ORP). The purpose of the ORP is to help agencies set internal policy direction that will protect lives and maintain economic and commercial activity following a Moment Magnitude (Mw) 9.0 CSZ earthquake and tsunami.



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- Re-establishing water service is a crucial element in the overall recovery of communities after a CSZ earthquake and is considered a top priority by OSSPAC, which set goals, referred to as target states of recovery (TSoR), for the time required to achieve different levels of service for the water system.
- The TSoR identified in the ORP require a high degree of reliability from the backbone water system (e.g., a backbone system consists of key supply, treatment, transmission, distribution, and collection elements). According to ORP, the backbone should be 80 to 90 percent operational within 24 hours following the earthquake.
- The WSSS shows that the existing system's projected performance and damage estimates for a Mw 9.0 CSZ scenario earthquake (which is expected to produce strong ground shaking and long duration ground motions for between 60 to 180 seconds) are such that the system cannot be restored within the time frame identified in the ORP.
- PWB monitors ground movement occurring along the conduits and has undertaken efforts to reduce these risks. Redundancy is a strategy to provide resiliency for critical pipe systems. PWB uses this strategy for the conduit system and also for the Willamette River pipeline crossings that provide water to the west side of the river.
- There have been numerous occasions when unplanned outages have occurred on Portland's supply and transmission piping. The following is a short sample. In these cases, pipeline redundancy allowed PWB to continue supplying water to customers without interruption:
 - Clay Street Willamette River Crossing – pipeline failure under the Willamette River (2014-2015)
 - Conduits 2 and 4 – Bridge Crossing destroyed by landslide near Headworks (1995)
 - Conduits 2 and 4 – Damaged by flooding at Dam 2 Spillway (1964)
 - Conduit 3 – Failure due to pipeline corrosion (2014)
- Ground movement due to saturated soils has occurred near the Lusted Treatment Facility near the location where Conduits 2 and 4 cross over the top of Lusted Hill. Redundancy facilitated restoration of the area without interrupting supply.
- Ground movement can occur from seismic, flooding, heavy rainfall, and landslide events.
- A combination of pre-event hardening of assets and post-event repair is recommended to meet the desired performance goals (TSoR) in the ORP and close the gap between the existing performance and the desired performance goals of the ORP.



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