Bull Run TREATMENT PROJECTS

Bull Run Filtration

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

Visit
portlandoregon.gov/bullrunprojects

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Potential for Harmful Algal Blooms in the Bull Run Watershed

Cyanobacteria, also known as blue-green algae, are naturally-occurring bacteria that are found throughout the world in all types of surface water systems, including rivers, lakes, and oceans. When cyanobacteria rapidly multiply to form blooms and when these blooms are capable of producing toxins (aka. cyanotoxins), they are referred to as harmful algal blooms (HABs). The release of cyanotoxins from a bloom into the surrounding water occurs mostly when cyanobacteria cells die and break apart. The reason for cyanotoxin production and the environmental conditions that encourage it are not well known, though HABs are more likely to form in warm and stagnant water with high levels of nutrients like phosphorous and nitrogen.

- The Bull Run Watershed is naturally low in nutrients and has no human-caused sources that contribute additional nutrients due to strict watershed protections. As a result, the Bull Run Watershed does not have a history of cyanobacterial blooms.
- Seven (Aphanizomenon, Dolichospermum, formerly Anabaena; Lyngbya; Microcystis, Oscillatoria, Planktothrix, and Woronichinia) of the 19 cyanobacterial genera that have been observed in Portland Water Bureau's (PWB) source water between 2008-2018 can produce toxins.
- In addition to nutrients, high air temperatures are another potential driver to HABs but the hot and dry summers in 1992, 2015 and 2018 did not result in identified cyanobacterial blooms in the Bull Run Reservoirs. However, multiple other factors can contribute to HABs (e.g., light, cloud cover, lake stratification, rain, migratory birds).
- Algae in the Bull Run reservoirs and at the raw water intake are typical for oligotrophic (low nutrients and low biological productivity) temperate lakes.

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- In June 2018, Oregon Health Authority (OHA, 6/26/2018) filed temporary administrative rules (OAR 333-061-0510 to 0580) for cyanotoxin monitoring and testing at public drinking water systems. PWB collected 8 water quality samples between July and October 2018. All cyanotoxin results were below detection levels. In December 2018, OHA adopted permanent Cyanotoxin Rules, but the PWB is not on the list of susceptible sources and therefore not required to monitor for cyanotoxins. In 2019, PWB monitored for 10 cyanotoxins as part of the Unregulated Contaminants Monitoring Rule (UCMR 4, EPA 2016; 81 FR 92666). All cyanotoxin results were below detection levels.

- Previously, the only time when PWB has tested source water for cyanotoxins was during an algal bloom in the upper reaches of Bull Run Reservoir 2 in spring/summer 2005. Despite the lack of toxin-producing cyanobacteria, one sample tested positive for microsystin (0.020 µg/l) at a level below the World Health Organization guideline for drinking water (1.0 µg/L).

- If cyanotoxins are detected in Portland's drinking water in the future, the PWB will follow OHA's Cyanotoxin Rules for cyanotoxin monitoring, testing, and public notification.

- Currently, the PWB does not have a water filtration plant for the removal of algae and their potential toxins.

- While chlorine treatment can inactivate some cyanotoxins, it can also cause cyanobacterial cells to release their toxins and in turn increase toxin levels in the water. Development of HABs in the Bull Run Watershed would create risks for public health, especially without water treatment options that can remove the toxins.

- A warming climate could increase the frequency and severity of cyanobacterial blooms in temperate lakes where the conditions are conducive. Climate change will result in increased air temperatures and could increase the duration of dry weather, which both increase the likelihood of forest fires. Wildfires can increase transport of nutrients to downstream water bodies.

- Nutrient transport can also be increased by intense wet weather events, which may become more likely or more severe with climate change. Storms in Bull Run typically occur during the wet and colder fall and winter seasons. Colder weather would significantly reduce the possibility of algal blooms, and intense storms would tend to flush nutrients through the system more quickly.