

Portland State University

PDXScholar

---

Institute of Portland Metropolitan Studies  
Publications

Institute of Portland Metropolitan Studies

---

Summer 2012

# What Chlorine Can't Kill: Cryptosporidium and our Water Supply

Amanda Pampuro

Dylan Grimes

Follow this and additional works at: <https://pdxscholar.library.pdx.edu/metropolitianstudies>



Part of the [Urban Studies and Planning Commons](#)

Let us know how access to this document benefits you.

---

## Citation Details

Pampuro, Amanda and Grimes, Dylan, "What Chlorine Can't Kill: Cryptosporidium and our Water Supply" (2012). *Institute of Portland Metropolitan Studies Publications*. 77.

<https://pdxscholar.library.pdx.edu/metropolitianstudies/77>

This Article is brought to you for free and open access. It has been accepted for inclusion in Institute of Portland Metropolitan Studies Publications by an authorized administrator of PDXScholar. Please contact us if we can make this document more accessible: [pdxscholar@pdx.edu](mailto:pdxscholar@pdx.edu).



Photograph: Dylan Grimes

# What Chlorine Can't Kill:

## *Cryptosporidium* and our water supply

by Amanda Pampuro and Dylan Grimes

**P**icture the tap in your kitchen. When you turn it on, water flows from pipes connected to a network of pipes that ultimately come together to climb towards Mt. Hood and draw from the Bull Run. The Bull Run, a large open-air reservoir, is Portland's primary source of drinking water and pipes out to 900,000 residents. This set-up takes advantage of natural water collection and gravity for transportation, making Portland's water unique in that "from forest to faucet," water goes through no filtering and very little treatment. "Our wild water

is of such a quality that it needs no further filtering to be drunk," says Administrator for the Portland Water Bureau, David Shaff.

Still, the Safe Drinking Water Act (SWDA) of 1974 applies to all public water systems and has specific measures to "strengthen protection for microbial contaminants, including *Cryptosporidium*," through which the EPA's Long Term Enhanced Drinking Water Rule, or LTR, mandates open watersheds be closed by 2009. Because the Bull Run has been protected and properly maintained, the

**Portland is the only city nationwide to have sought and won an exception from the EPA regulations.**

Portland Water Bureau (PWB) challenged the Oregon Health Authority (OHA) and the Environmental Protection Agency (EPA) and after a thorough investigation and lengthy debate, Portland was granted a variance. Portland is the only city nationwide to have sought and won an exception from EPA regulations. This variance, however, only extends the deadline ten years and discussion continues as to whether the additional assurance against *crypto* outbreaks is worth the proposed \$400 million construction of underground water storage facilities.

With good reason, citizens are now wondering how vulnerable their open-air, freestanding water-source is to nasty contaminants, like the parasitic protozoa *Cryptosporidium*. For the record, no fatal amount of *crypto* has ever been detected in the Bull Run Oregon and Shaff insists that “*crypto* was never of any concern.” However since the 1993 outbreak in Milwaukee, Wisconsin, policy has erred on the side of caution. With 69 deaths and 400,000 illnesses, Milwaukee has been the poster child for neglected water supplies. Though Oregon has had its own outbreaks, including a ruined wedding party in 1992 Talent, Oregon, and a 1988 outbreak to which the state the responded with massive healthcare reform.

*Cryptosporidium* is a parasitic protozoa that latches onto its host’s intestines, irritating the gastrointestinal tract and for most, causing flu-like symptoms. But for the community with compromised immune systems, including the elderly, people with AIDS and chemotherapy patients, this contaminant may mean a fatal or elongated stay in the hospital. The protozoa are commonly found in the intestines of livestock in the oocyte or egg stage and relocate through the feces of natural grazing animals such as deer and

livestock. Methods of transfer between these species can occur rapidly, and travel across wide distances. While the Bull Run has been closed off to the public and livestock since 1892, grazing deer remain a potential source for *crypto*. Despite all precautions, any open air source poses some risk of contamination whether from wild animal runoff or bird droppings. Bull Run water can be vulnerable during the 1-4 days it sits in still, though it is constantly tested and monitored by PWB, under the EPA.

Statistically, *Cryptosporidium* poses a low threat, but government agencies scrupulously search for it because it escapes most other water filtration processes, and can even survive chlorine treatment. Chlorine is the chemical used to ward off bacteria and viruses, added to everything from drinking water to swimming pools, but remains “largely ineffective” against the parasite.

*Crypto* may be tough to kill, but it is not invincible to treatments of ultraviolet radiation (UV). Therefore one of the proposed alternatives to closing-in Bull Run has been to build a UV treatment facility. The UV rays would have protected against *crypto* and many other pathogens that might slip through the system, but would cost millions of dollar to implement.

While PWB does not dispute the benefits of UV treatment and covering water reserves, David Shaff says that Portland’s water already meets federal standards and, “Water quality will improve, but in way that is noticeable to the customer? Probably not.” Although the EPA and OHA have the city’s best interest in mind, SWDA has been criticized as providing a series of one-size fit all solutions, one of its assumptions being that all open-air facilities need improvement. In fact, Ju-

lia McGraw of Food and Water Watch empathizes with the EPA, because their standards ensure water quality across the board and “most water sources aren’t pristine [as Portland’s].”

“The planning and foresight for setting up the Bull Run was brilliant,” says McGraw. McGraw sees additional filtration measures as excessive and unnecessary and she credits the citizens of Portland for demanding very good water, and the city water bureau for providing it, without having to be pushed by higher government authority.

Shaff says modestly that, “the whole reason you have public water systems is to protect public health.” Blanket federal regulation, he says, doesn’t necessarily offer the city the chance to prove that it has been doing its job. Rather SWDA operates under the assumption that all water systems face the same problems, which is accurate according to Gail Shibley, OHA Administrator for Environmental and Public Health. The EPA determines risk on a national level and figures out what can be done about it. Overall Shibley sees this as beneficial, stating that because Bull Run is an open-air reserve, it is at risk for *Cryptosporidium* and subject to federal law.

The EPA’s LT2 applies to Portland’s watershed in two major ways. At the source, LT2 mandates that all public water companies treat for *crypto*. The second part of LT2 addresses uncovered, storage reservoirs, and mandates that facilities be covered or treated for a suite of microbes including a number of viruses, *crypto*, and giardia. Among options for complying with this section of LT2 was the proposed UV treatment plant. Rather than go in for this, however PWB closed in the Washington Park and Mount Tabor reserves, and is currently building underground water holds for Bull Run.

In 2007 PWB attempted, but failed to get an exemption from the EPA for covering all open-air reservoirs. This ruling mandated that all open-air reservoir water holding tanks be covered in five-to-eight years.

In addition, LT2 requires PWB to submit monthly *Cryptosporidium* tests from more than eight hotspots in and around the Bull Run. Testing ran from December 2002 until November 2009, and regularly collected data show that contaminants have remained at safe levels without any filtering or additional treatment since 2002. When “Zero *Cryptosporidium* oocysts [had] been found,” PWB filed for a variance with OHA and EPA. In December 2011, however, just one month after the LT2 testing concluded, a single *Cryptosporidium* egg was discovered in the Bull Run. This positive test prompted concerned members of the public to question whether conditions in the reservoir had changed. David P. Spath, the chief of the EPA’s division of drinking water and environmental management, believed that the detection is not of large concern. While the results were “unsettling,” he explains in a letter to the Portland Water Bureau that the “health risk associated with consuming the Bull Run water has not changed.”

This positive test did not derail the progress of the variance, and OHA approved the variance on March 14, making Portland the only open-air reserve granted one. The variance gives Portland until 2022 to complete construction, although PWB is still trying to buy more time. Rather than set a precedent that open-air reservoirs are okay, OHA clarifies that Portland was granted an extended deadline, not an exception to LT2.

The EPA’s “National Primary Drinking Water Regulations,” lists the primary

***This positive test prompted concerned members of the public to question whether conditions in the reservoir had changed.***



**... as of 2008, the EPA has not granted any other variances to any major cities nationwide.**

rules and regulations for all U.S. drinking water supplies, and as of 2008, the EPA has not granted any other variances to any major cities nationwide. In a letter to David Shaff, an EPA representative even acknowledged that, “[the EPA] has not granted any variances before,” and that Portland was granted a variance, Shaff says, is indicative of the water quality PWB has been able to maintain.

SWDA and LT2’s one-size fits all attitude does not just apply to cities, but to the parasite itself. *Cryptosporidium* is a genus name, and there are many species within this classification, each affecting specific organisms. Mammal strains like *C. bovine* which infect cows can transmit to humans, but other species like *C. baileyi* and *C. meleagridis* infect only birds and *C. serpentis* is only a risk to snakes. Because intestinal tracts differ by the animal, so does their brand of *crypto*. However the only way to tell one species from another is to run DNA analysis, and the EPA’s current detection method 1623 identifies *crypto* eggs, but does not distinguish between species harmful to humans and species that are not. This means that when *crypto* is detected, it may or may not actually be a threat to public health. PWB’s scientists have been working to conduct more specific testing, and David Leland, OHA Manager of the Drinking Water Program says he is delighted that Portland tests beyond EPA recommendation. The extra data will be beneficial to science and future policy adjustment, but OHA prohibits the enforcement of any policy that would be below EPA standards, like only acknowledging human-threatening species of *crypto*.

All agencies agree that their top priority is to maintain public health and provide safe drinking water. For some, mitigating concern over the possibility of a worst-

case scenario is justification enough to maintain the current timeline. For others, spending more money to further treat Portland’s already clean water-sources seems unnecessary. In case of contamination or any increase in *Cryptosporidium*, the current warning systems in place will notify Portlanders to drink only bottled or boiled water. Recall the November, 2009 west-side *E.coli* water-boil notification sent out because of the possible contamination of the Washington Park reservoir. The warning system efficiently notified the public through perpetuated by local news reports and notifications by landlords, and builds a sense of open-communication between the public and the city.

Still, Leland enjoys watching as healthy debate unfolds around water. It’s good to see citizens care about where their water comes from, he says, “If you look at this whole issue, and you know I’ve been saying this for years, what it all comes down to is that water matters.” Although getting water seems easy—turn on the faucet and fill a glass—getting it there isn’t always so simple. Providing quality water takes the combined efforts of local activists, the government on all levels, and of course, citizens at their taps. **M**

*Amanda Pampuro and Dylan Grimes are Portland area freelance writers.*

- **Clean Water Act of 1972: addresses water pollution and protects surface water for recreation.**
- **Drinking Water Safety Act of 1974: concerns all public water systems and includes measures to treat for *Cryptosporidium* and other hazardous microbes.**
- **LT2: Addresses *Cryptosporidium* in open-air water sources and treatment in uncovered reserves.**
- **Variance: Extends timeline 10 years for completing construction on building underground storage facilities or implementing *Cryptosporidium* treatment facility.**