



# FRIENDS *of the* RESERVOIRS

*Citizens joining to protect Portland's historic reservoirs and water system*

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The Friends of the Reservoirs oppose plans to add UV Radiation, Membrane Filtration or any other unnecessary additional disinfection to our system. We believe that the plan conceived and supported by the Portland Water Bureau, engineers, and consultants to add UV Radiation, Membrane Filtration, or other additional disinfection to our Bull Run system is a bad plan for Portland.

The following statements reflect years of research and investigation that are scientifically and documentarily supported:

- There will be no measurable improvement of water quality as a result of adding any additional disinfection.
- There will be no measurable improvement of public health benefit.
- Current data does not support Cryptosporidium as the public health risk previously assumed
- There is no evidence disease is endemic (no measurable low level disease)
- Our system has no sewage exposure and therefore the risk is too low to be measured
- The costs for these unnecessary projects are substantial
- The increased annual maintenance costs associated with these projects are unsustainable
- Unscrupulous engineering and consulting special interest groups long associated with our Water Bureau stand to reap windfall profits
- Turbidity concerns have been relatively insignificant and could be managed by decommissioning roads in Bull Run

- Both UV Radiation and Membrane filtration will add new potential public health risks where none existed before
- Additional summer drawdown of Bull Run to increase supply is not a certain benefit
- Adding these costly and unnecessary systems will not address the water quality issues associated with a backlog of deferred maintenance
- The addition of these costly plants will soon lead to the burial of the historic reservoirs at Mt. Tabor and Washington Park
- These projects may lead to our drinking contaminated Willamette and Columbia river water in a regional agency scheme

## **Discussion**

Portland Water Bureau Managers along with profiting consultants (including former Water Bureau Manager Joe Glicker) have long lobbied and negotiated for a federal mandate that would force Portland to add expensive additional treatment to combat a nonexistent drinking water cryptosporidium problem. For many years these same consultants have been the beneficiaries of numerous lucrative study and panel contracts related to plans for additional Bull Run drinking water treatment. Relationships between the consultants, Water Bureau management and their lobbying efforts have been outlined in the Friends of the Reservoirs Professional Connections paper, which has been updated, as new connections have become known. Further, the Portland Water Bureau has assisted consultants in setting up shop on public lands to profit from this proposed federal mandate.

Portlanders have been excluded from this hidden decision-making, public policy development process. These same Water Bureau managers with the assistance of consultants have signed agreements with the EPA knowing that it would force Portland to add expensive treatment despite the lack of scientific evidence supporting the need for enhanced disinfection.

Underlying, the proposed EPA Long Term 2 Enhanced Surface Water Treatment Rule (LT2) [FR 47639] regulation, released for public comment August 2003, is the premise that the presence of *Cryptosporidium* spp. is responsible for widespread municipal drinking waterborne illness. The EPA proposal estimates 140+ deaths each year and millions of endemic cases of illness from this organism. However, no deaths from *Cryptosporidium* spp. have been associated with municipal drinking water in over ten years, and endemic disease has never been demonstrated.

The outbreaks the EPA referenced in relation to *Cryptosporidium* spp. were associated with catastrophic sewage exposures of the respective municipal drinking water systems. The drinking water contained dozens of pathogenic organism species throughout the catastrophic sewage event that in some cases lasted for weeks. In the Milwaukee, WI event often cited by the Portland Water Bureau, sewage in the watershed, a costly state-of-the-art filtration plant, and a backflow problem were determined to be the reasons for the outbreak.

The inaccuracies of the EPA and Portland Water Bureau (PWB) projections can be attributed to the lack of “good science” or “best available science”. For example, PWB said that all *Cryptosporidium* are equally infectious. This is not true. It is now recognized *Cryptosporidium* from human origin (sewage) are highly infectious, while those from wildlife, the organism type found in nearly undetectable amounts in the Bull Run are extremely unlikely to infect humans.

**The pristine Bull Run drinking water system historically has no agricultural, municipal, or industrial sewage exposure. The Bull Run watershed has no cities, development, public access, and no public health issues.**

The EPA’s proposed rule on drinking water completed its official public comment period in January 2004 receiving strong challenges to the science of the rule from the Unfiltered Systems Working Group, New York City (NYC), and a consortium consisting of the American Water Works Association (AWWA), Association of Metropolitan Water Agencies, the National Association of Water Companies, and the National League of Cities among others.

Each of these agencies maintains that the EPA vastly overstates the risk of contracting cryptosporidiosis in systems with unfiltered water, and underestimates the cost of compliance. With regard to the risk of disease, the Unfiltered Systems Working Group notes that EPA’s conclusions are based on estimates, which are contradicted by actual data. They state that if EPA estimates were applied to the NYC and Metro Boston’s population of about 10 million, the proposed Rule would avert 145,000 to 455,000 cases of cryptosporidiosis per year. However, the actual number of cases reported in these two areas served by these two systems, both of which have active surveillance systems, have combined averages of only about 150 cases per year from all sources, none of which are directly attributable to the treated municipal drinking water. EPA estimates suggest that the number of deaths averted in the NYC and Metro Boston area would be 23-75 cases per year. Yet, over the last 6 years, there has been only 1 death attributed to crypto in NYC, and 0 deaths in Metro Boston. Again, this single death was not directly attributable to the treated municipal drinking water in NYC.

The NYC comment also criticizes EPA for basing its rule on estimates of disease rates rather than looking at actual published research. A national effort mandated by Congress and led by the Center for Disease Control and EPA to quantify the amount, if any, of disease caused by water across the country, is years overdue.

Several university-based studies have found negligible crypto disease rates among HIV patients. NYC further states: "It is also interesting to note that efforts to study cryptosporidiosis have been limited by the fact that it is too difficult to find people with the illness to conduct the needed studies." NYC concludes that the public health benefit from complying with the proposed rule is vastly overestimated, and at the same time the costs are vastly underestimated.

The Unfiltered Working Group states its concern regarding the cost/benefit inaccuracies as follows, "this may cause harm to the regulated community". The group further notes that "an overestimate of risk reduces the consumer's confidence in public water supply and may be misused by less scrupulous interest groups" (page 8 Unfiltered Systems Working Group Comments on LT2SWTR).

As stated by the AWWA, et. Al. consortium in their comment to the EPA, the rule as proposed discourages use of Watershed Protection Credit, "Systems that presently have watershed protection programs should be rewarded for their proactive stance rather than penalized by increased requirements."

We support a rule that is based on the best science available as is presumably required by the Scientific Advisory Committee. A rule based on science would first validate that a public health problem actually exists, and that resources required to address the problem produce a benefit that outweighs the cost. Such a rule would not mandate treatment for our Bull Run system for a non-existent problem.

### **New Potential Health Risks related to Additional Treatment**

We have significant concerns regarding the potential for long-term health problems resulting from the use of membranes, additional chemicals or UV mercury bulbs. Unwanted byproducts can be anticipated with the additional treatment of Bull Run drinking water.

- Membrane filtration - Membranes are made from a variety of petrochemicals and synthetic / organic compounds. These include polypropylene, polyvinyl difluoride, polyethersulfone, and cellulose acetate. The long-term health effects of leaching, even when certified to industry standards are unknown. One chemical associated with public health concerns with petrochemicals is DEHP. It is used as a plasticizer added to make the structure more flexible. In animal studies it has been linked with cancer. The metabolite MEHP is the most toxic. The problem is not only with the petrochemicals outlined above, but with the unknown petrochemical structural polymers that connect the membrane components together. It is these potential leachates that are of concern, and some may also be hormone disruptors. These "proprietary" structural components remain undisclosed to the public by the manufacturer.

Additionally, there are practical and operational considerations that add to the overall concerns of membrane filtration. Imperfections in the construction of the

membrane module or degradation of the membrane system over time can lead to day to day, passage of microorganisms into the treated water. Microorganisms that are concentrated at the membrane wall, may be released from breaches, imperfections, or operator error at the same time to travel through the system en masse. This bolus of microorganisms creates a public health hazard where none existed before. These imperfections can include broken fibers, scratches in the membrane surface, pores larger than normal size, O-rings that do not seal properly and glue joints that can be cracked. Oocysts have been shown to be compressible and may slip through filters with pore sizes smaller than their 4-6 micron diameter.

- Ultraviolet Radiation - this form of treatment uses high-energy bulbs filled with mercury gas, and the risk of exposure to drinking water is always present. Mercury is a toxin that can cause birth defects and other health problems. The mercury filled lamps develop a film during usage. To reduce the film, the industry is using Teflon sleeves around the bulbs. Teflon has also been shown to have toxic chemical properties.
- Ozone - this form of disinfection produces chemical byproducts such as formaldehyde, acetaldehyde, methylglyoxal, etc. Charcoal filtration would be needed to remove some of these cancer-causing compounds.

## **Costs**

Costs related to adding a treatment plant are excessive particularly in light of the lack of measurable benefit and potential harm from these new technologies. The Infrastructure Master Plan produced by MWH and CH2MHILL in October 2000 recommends UV as the Interim Treatment and Membranes as the Final Treatment

- UV - \$137 million per 2004 WB presentation to PURB; up 700% from 2000 MWH Infrastructure Master Plan estimate of \$15 million
- Membrane Filtration - \$202 million; up from 2000 MWH Infrastructure Master Plan estimate of \$150 million

Plus:

- Rarely mentioned "out-of-box costs", supply and transmission- \$99 million

Total-\$ 438 million

Debt service will cause these figures to double

- Annual O &M costs - \$6- \$10 million

Operating costs alone will raise rates by 12-20 % per year using the OMF standard that water rates increase 1% for every \$500,000 in operating costs.

## **Turbidity**

Turbidity events in Bull Run have been relatively few with only 5 incidents resulting in shutoff in the last 20 years. It is our understanding that the most recent event in January 2004 was a preemptive action, otherwise there has not been a turbidity event resulting in Bull Run shut off since 1999.

Decommissioning old logging roads in Bull Run, with a one-time cost of less than \$2 million, will all but eliminate turbidity at Bull Run.

## **Backlogged Maintenance Issues**

Backlogged maintenance issues that affect water quality such as biofilms that remain in pipes and valves if not routinely flushed, will still be problematic even after costly unnecessary treatment plants are built. Biofilms are a collection of microorganisms surrounded by the slime they secrete, which attach to pipes, valves and other inert or living surfaces. Besides being reservoirs of bacteria that can affect health, biofilms can also cause corrosion in piping. Furthermore, leaky pipes can actually imbibe contaminated water from the groundwater surrounding the pipe. Delayed maintenance can have a significant detrimental effect on water quality, downstream from any proposed treatment plant.

Even less public money will be available to address the huge backlog of needed maintenance if annual costs rise significantly as they will with the addition of treatment plants.

## **Bull Run Drawdown Uncertain**

Drawdown of Bull Run in order to increase water supply is not certain with the addition of a Membrane Filtration plant as this may result in higher water temperatures due to late summer sunlight intensity, which is undesirable and will mean that there is less water available to support endangered species.

## **Burial of Historic Reservoirs**

Statements from Water Bureau Managers during reservoir discussions support that demolition and burial of the historic reservoirs at Mt. Tabor and Washington Park would follow the addition of expensive treatment plants, “ it would make no sense to build a \$250 million filtration plant at Powell Butte and then send this costly filtered water to an open reservoir storage.”

## **Contaminated Source Waters Added to System**

A beltway of blended water including contaminated Willamette River and Columbia river water is a part of the regional scheme advocated for in various documents

and negotiations including the Regional Transmission and Storage Strategy report produced by MWH. The regional agency or wholesale contract plan providing for use of blended water has been repeatedly referenced by Water Bureau management to limited groups over a number of years.

### **Conclusion**

Evidence exists that our Water Bureau along with industry officials (i.e. American Water Works Association, AWWA) were aware years ago that the scientific evidence did not exist to support the promulgation of regulations that would require changes in treatment. Yet with the assistance of consultants our Water Bureau forged ahead and actively lobbied for and signed on to such a rule.

We believe that it is time for Portland to step back and reassess its position. Portland must distance itself from the efforts of its Water Bureau employees to promote or support language in the proposed Rule that would mandate building a treatment plant. Portland must now vigorously challenge this proposed rule that benefits engineering companies to the detriment of Portland ratepayers. The time to act is now.

Portland must assertively negotiate with the EPA before this rule is finalized (August 2005), or barring costly litigation, we will be committed to build an expensive treatment plant despite the lack of measurable benefit.

A culture change at the Portland Water Bureau will be needed before watershed protection can be recognized here as the best way to protect Portland water and ratepayers and to maximize the benefit of scarce resources.