# Oregon Wildfires: Impacts on Drinking Water Systems and Water Quality

## Key Findings

This document is a companion to the larger, more detailed technical report of the same title. It is intended to summarize key findings from the 2020 volatile organic compound (VOC) sampling efforts in selected drinking water systems impacted by wildfires, and important takeaways from conversations with operators of sampled water systems (WS) and emergency response staff that contributed to the 2020 Oregon wildfire response.

Links to products developed for this project are included here:

- Oregon Wildfires: Impacts on Drinking Water Systems and Water Quality – Report
- Wildfire and Drinking Water – Esri ArcGIS StoryMap
- 2020 Oregon VOC Sampling: Quick Statistics – Esri ArcGIS Web Experience
- 2020 Oregon VOC Sampling: Web Map – Esri ArcGIS Web Mapping Application

## Background

- One million acres burned by 229 fires.
- 40,000 people evacuated; 11 lives lost.
- 4,129 homes destroyed.
- 37 drinking water systems with Drinking Water Services identified damage or loss of distribution system pressure.
- Oregon Office of Emergency Management places conservative estimate at 380 million dollars in damage caused by the 2020 wildfires.
- Drinking Water Services developed a plan to sampled select wildfire impacted water systems for VOCs at no cost to systems with service populations at or less than 3,300 people.

## Summarizing VOC Contamination in Drinking Water Systems

- 20 of 25 drinking water systems sampled for VOCs had detections.
- Seven unique water systems with at least one VOC detection that exceeded the EPA maximum contaminant level (MCL) or health advisory level (HAL).
- 1,767 total water system samples, 866 samples with at least one detection and 66 with at least one MCL or HAL exceedance.
- Benzene the most common exceedance with 31 MCL exceedances, two 1-day HAL exceedances, two 10-day HAL exceedances and 45 Lifetime HAL exceedances.

- Top ten VOCs detected across all sampled water systems:

| | |
|---|---|
| Benzene | Chloromethane |
| Bromodichloromethane | Dibromochloromethane |
| Bromoform | Methyl-tert-butyl ether |
| 2-Butanone | Styrene |
| Chloroform | Toluene |

## Insights from WS Operators and Emergency Response Staff

### Preparedness:

- Concrete, affordable and realistic water system emergency response plan.
- Protection of critical water system infrastructure to increase resilience to wildfire.
- Water system investment in additional assets, like generators for backup power.

### Funding:

- Water system operator challenges identifying available resources and understanding application processes.
- Water system operator challenges clearing paperwork hurdles while juggling emergency repair and water system damage evaluation.
- Importance of documentation and record keeping for financial assistance.

### Communication – with emergency response staff and partner agencies:

- Water system operators felt as though organizations and agencies were operating in silos.
- Identification of the need to develop official channels of communication between all water system operators, agencies, partners and staff.
- Important that messaging be clear and concise, so core message is not lost.

### Communication – with the public:

- Operators confident issuing drinking water advisories under normal conditions
- Specific need to assist small communities with emergency messaging
- Emergency situations introduced numerous sources of complexity:
  - Adapting delivery methods for those with no power or that had evacuated
  - Continually changing conditions
  - Battling misinformation

### Teamwork

- Operators credited a wide variety of groups and individuals like local firefighters, National Guard and FEMA, and county and state agencies with valuable help.
- Water system operators valued free VOC testing, guidance and technical assistance by county and state partners.
- Additional hands-on assistance by those familiar with drinking water systems to reduce workload on overtaxed water system operators would improve response.

### Coordination

- Local community members and staff of impacted water systems were key to a successful response.

- Smaller scale, regional emergency response approaches to wildfire response may be beneficial according to water system operators.
- Developing and maintaining partnerships that include organizations like Oregon Association of Water Utilities (OAWU), Oregon Water/Wastewater Agency Response Network (ORWARN) and local water boards would improve response.
- Partnering with Oregon Department of Transportation and the U.S. Forest Service to help clear roads would improve access to water treatment plants and source water intakes to evaluate damage and begin emergency repair.

## Other Key Points

- Need for additional research to better identify specific VOCs associated with wildfires and cement list of VOCs to test for following wildfire damage.
  - Important to note that research shows BTEX or benzene testing alone is not a good indicator of more widespread VOC contamination.
- Establish Drinking Water Services wildfire response plan to clarify messaging to impacted water systems and reduce confusion and course changes.
- Need for standardized sample collection and analysis methods.
- Electronic method of collecting and storing information about samples, like precise location, structure damage level, and pipe type.
- Need for more accurate water system boundaries to improve identification of disaster impacted water systems.

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