



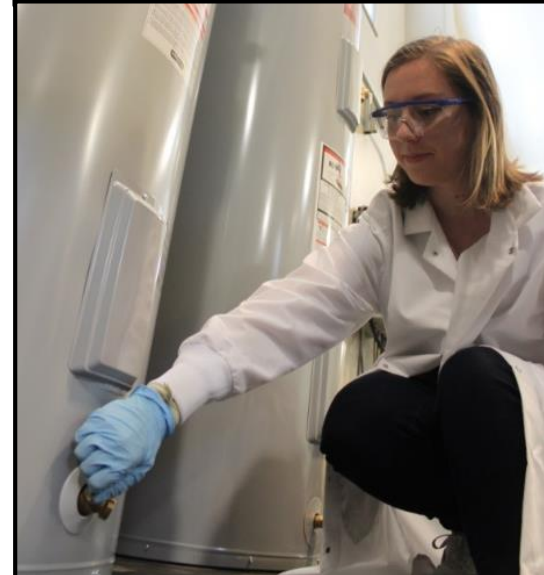
Smoke Gets In Your Eyes (And Everywhere Else): Wildfire and Public Health

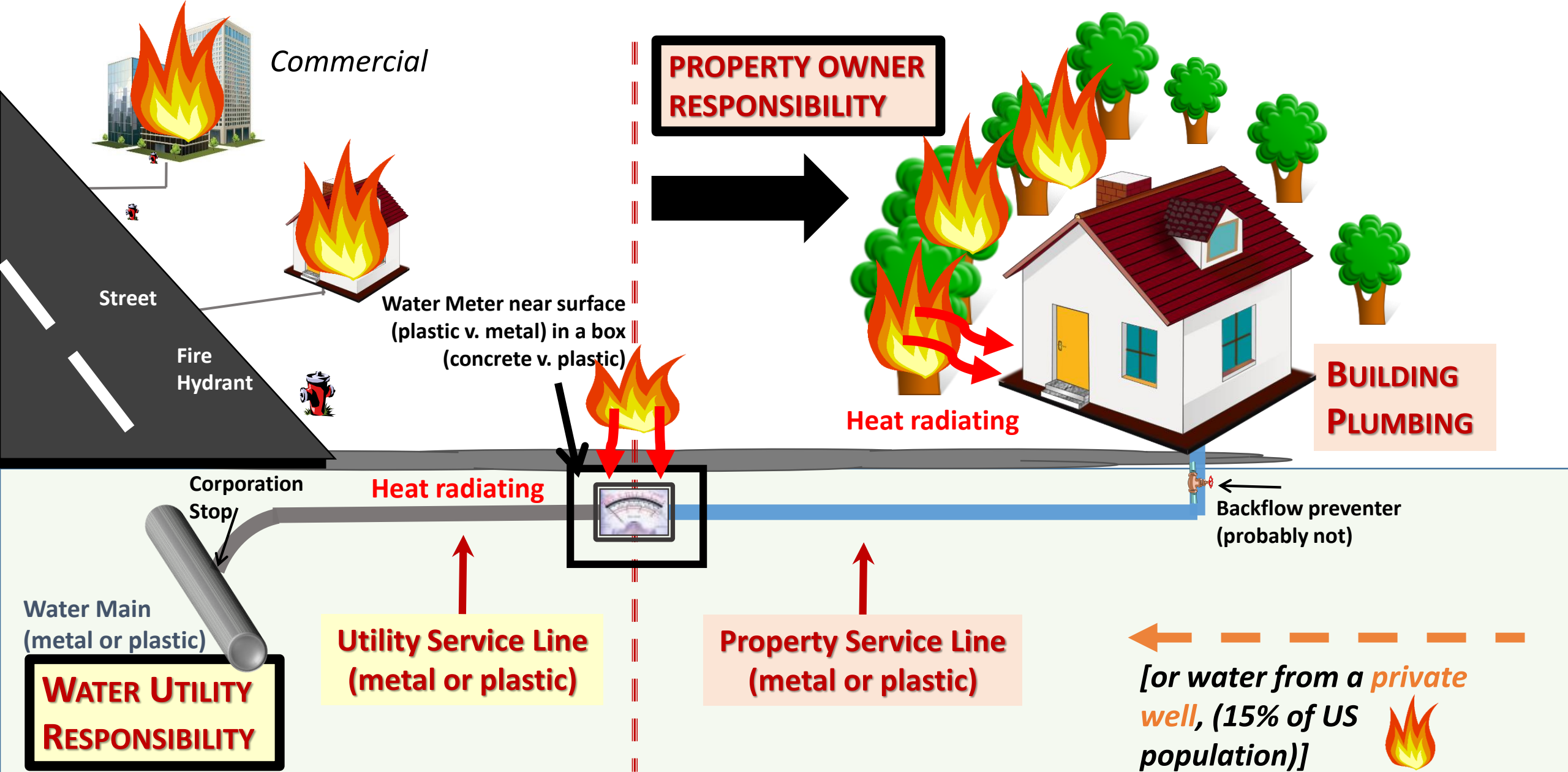
Drinking Water & Public Health

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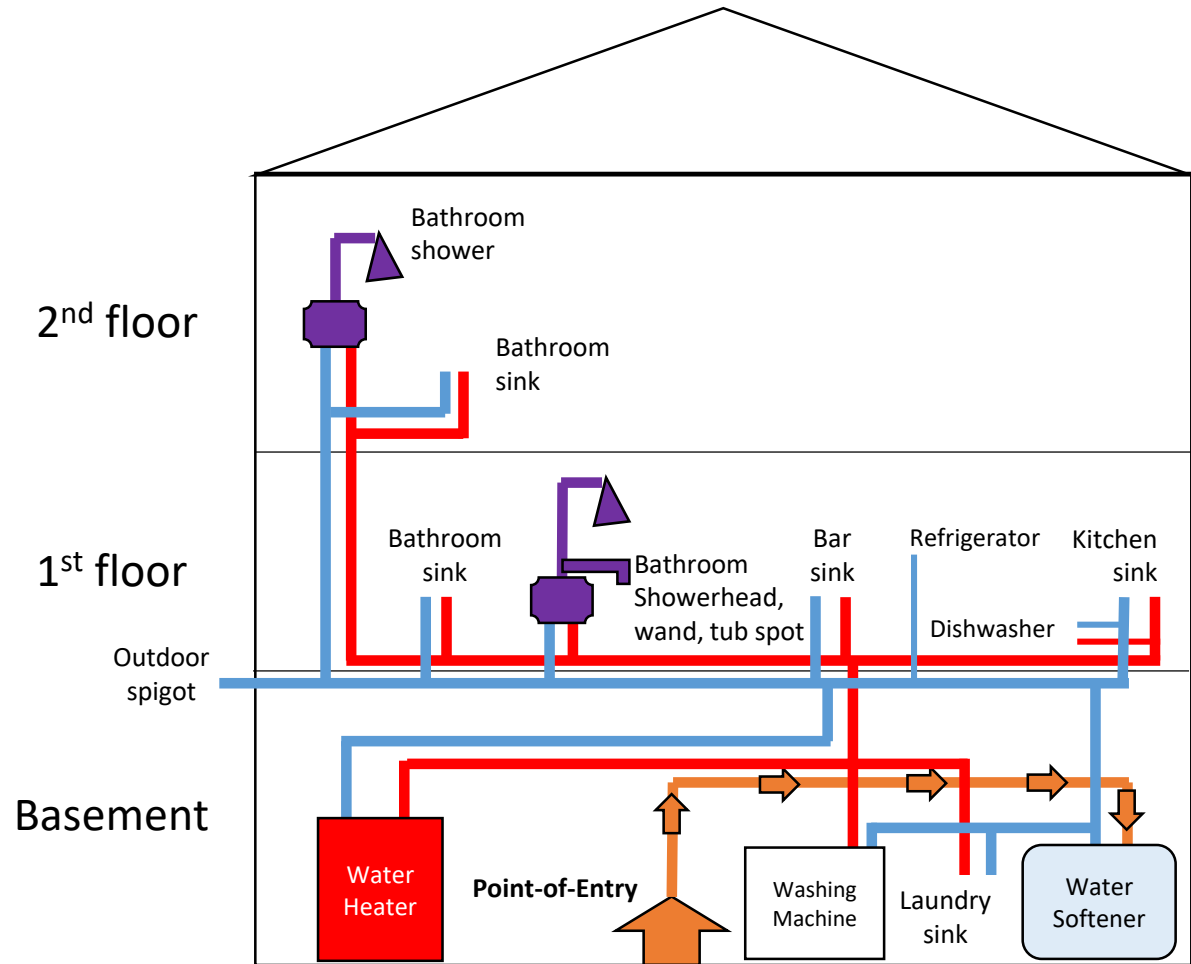
awhelton@purdue.edu

 [@TheWheltonGroup](https://twitter.com/TheWheltonGroup)
Web: PlumbingSafety.org

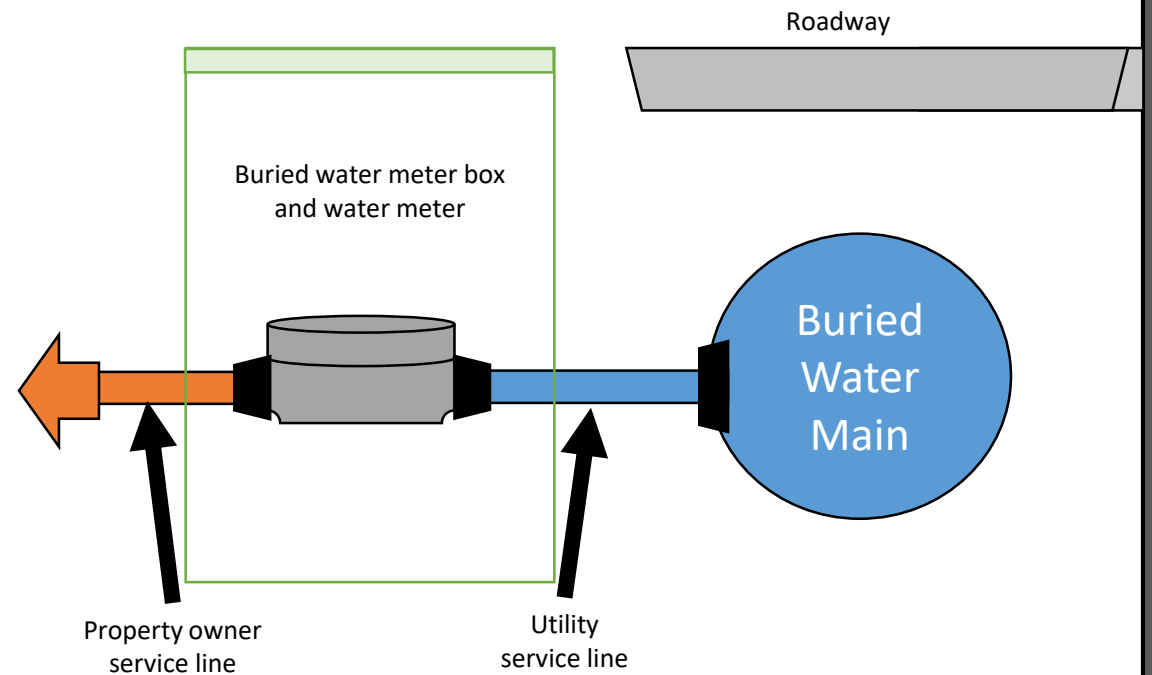




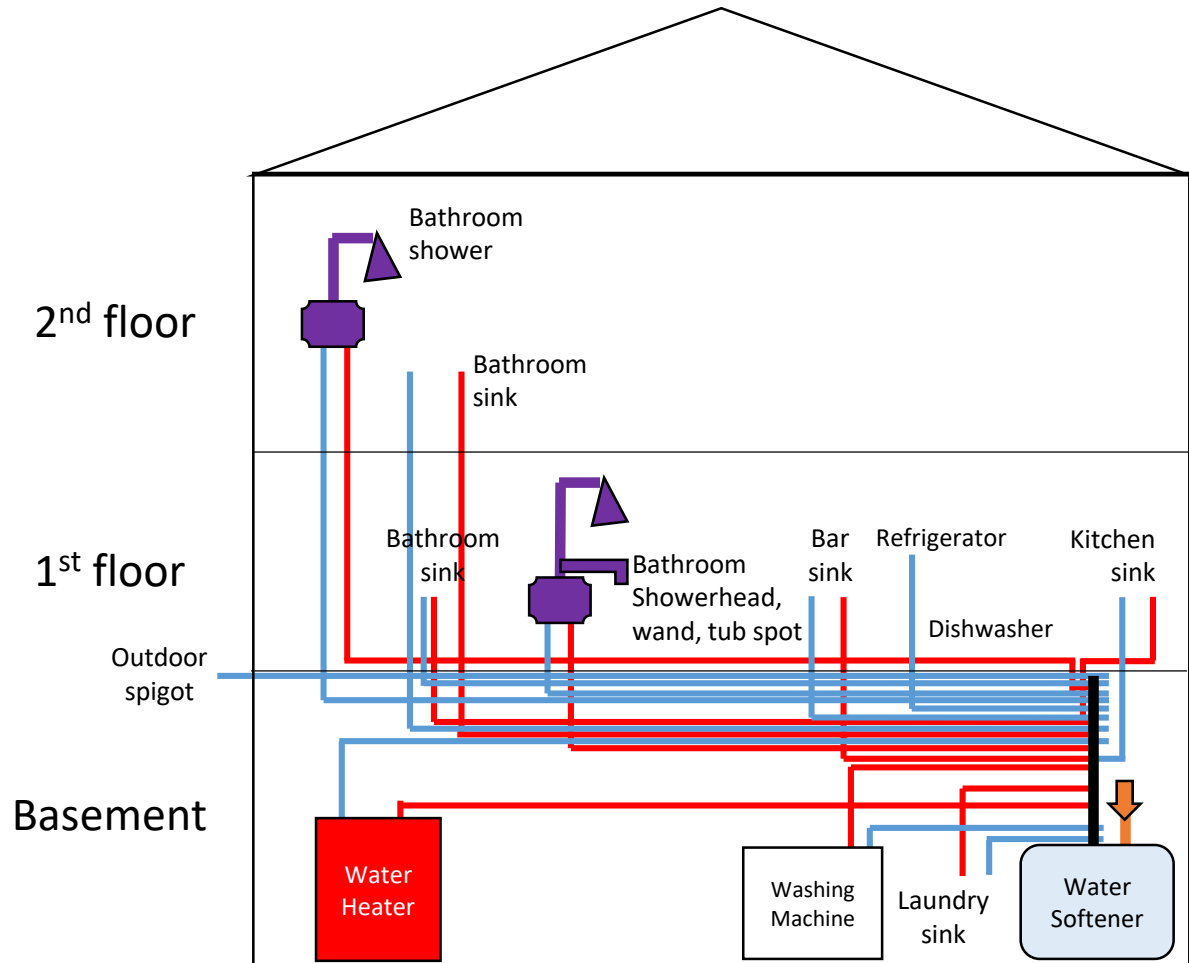
Single family home trunk and branch design with a centralized water heater



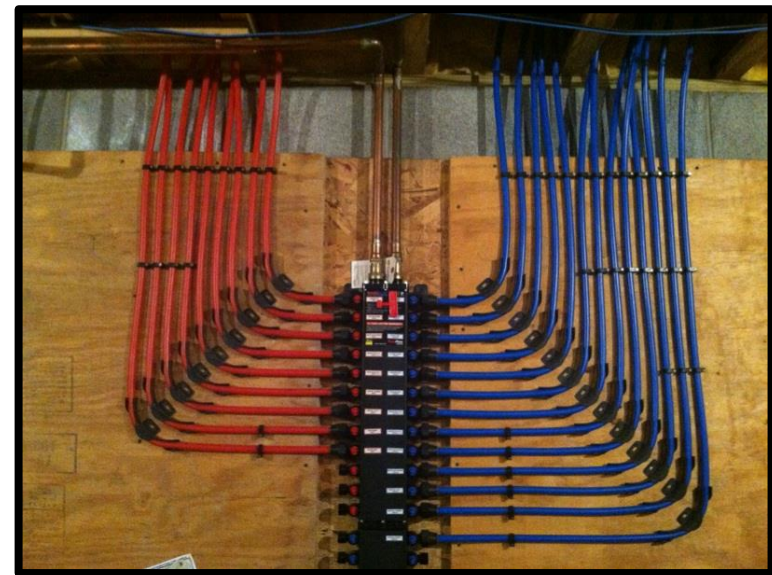
Cold and hot water flow through separate pipes
Some locations are downstream from others,
but branch off into separate pipes



A home with PEX manifold plumbing and central water heater



Cold and hot water flow through separate pipes
Each fixture has its own isolated pipe
No 2 pipes convey the same water
Co-located shutoff location for all each fixture
Smaller diameter pipes compared to T/B design



Since 2017 people started paying attention

2017 Tubbs Fire, CA (1 water system)

2018 Camp Fire, CA (3 water systems)

2020 CZU Lightning Complex Fire, CA (2 water systems)

2020 Echo Mountain Fire, OR (2 water systems)

2020 Alameda Fire, OR (2 water systems)

Water Use Exposure Routes:

Inhalation, Dermal, and Ingestion

Drinking Water Health Concerns:

Quickly identify what's present and magnitude

Acute (immediate) exposure risk - most important

Chronic exposure risk - next concern

States are not invoking the PNR to warn populations

Max. benzene data

40,000 ppb - Tubbs Fire

>2,217 ppb - Camp Fire

7.1 ppb - CZULC Fire

76 ppb - Alameda Fire

11.3 ppb - Echo Mt Fire

Much more than benzene
present....

Benzene Limits

Fed water limit = 5 ppb

CA water limit = 1 ppb

Short-term CA limit = 26 ppb

RCRA hazwaste = 500 ppb



Wildfire caused widespread drinking water distribution network contamination

Download FREE here:

<https://doi.org/10.1002/aws2.1183>

VOCs and SVOCs present, levels can exceed hazardous waste limits (40,000 ppb benzene, etc.)

Do Not Use water order should be issued

Protect homeowners and their plumbing

Drinking water contamination from the thermal degradation of plastics: implications for wildfire and structure fire response

Download FREE here:

<https://doi.org/10.1039/D0EW00836B>



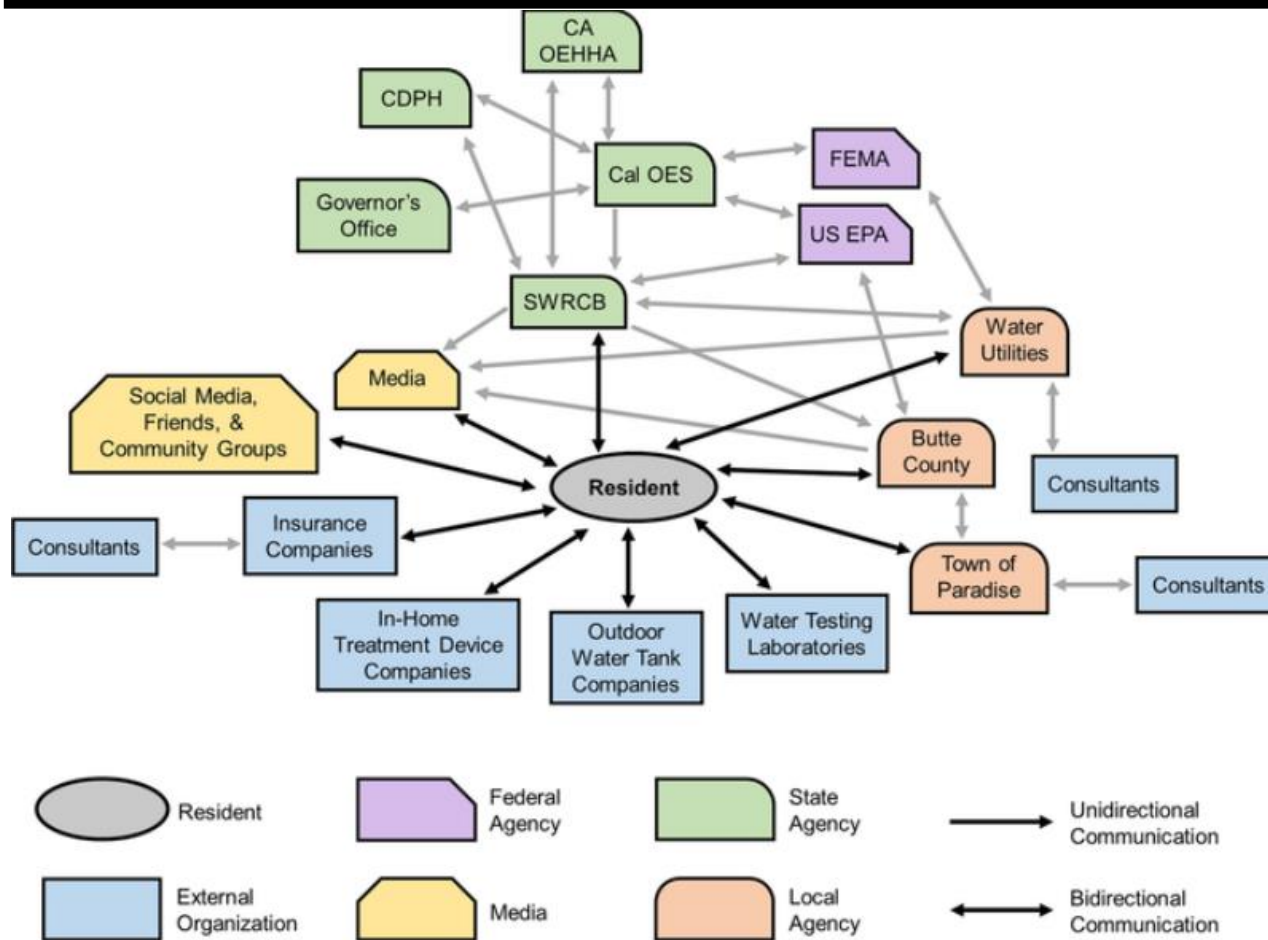
Heating new PE, PEX, PVC, CPVC, and PP pipes < Tdeg generated VOCs and SVOCs

Benzene generated by all pipes except PP

Once plastic cooled, chemicals leached into water

Water safety attitudes, risk perception, experiences, and education for households impacted by the 2018 Camp Fire

Download here, *Natural Hazards (coming Apr 2021)*: <https://doi.org/10.1007/s11069-021-04714-9>



Critical Public Health Issues

- 1) Water use restrictions,
- 2) Water sampling and testing,
- 3) Plumbing decontamination methods and validation,
- 4) Water tank selection and maintenance,
- 5) In-home treatment device selection and maintenance, and
- 6) Plumbing design and material selection for property repairs and new construction.

Thank you.

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Household Water Quality Study Watch later

News

- [The coronavirus pandemic might make buildings sick, too \(The Conversation\)](#)
- [Coronavirus impact: Experts warn against using water from shut buildings immediately after lockdown \(The New Indian Express\)](#)
- [Water may be unsafe in buildings closed during pandemic \(Weather Channel\)](#)
- [COVID-19: What happens to piping in unused buildings? \(Radio Public\)](#)
- [COVID-19 closures could make water unsafe in offices, schools \(WFYI\)](#)
- [Water contamination risks lurk in plumbing of idled buildings \(Circle of Blue\)](#)

[COVID-19 Response](#)

[Camp Fire Response](#)

Thank you for visiting. This website is designed to provide information to persons who drink water in buildings, as well as building construction, plumbing, water utility, education, and public health sectors. Together, we are working to understand how to make certain the water you use at home, at work, and at schools is safe. Please contact us if you have any questions at awhelton@purdue.edu.

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10 hr, 1 CEU, Self-paced, Online Building Water Essentials Short-Course:
<https://engineering.purdue.edu/online/certifications/building-water-essentials>

www.PlumbingSafety.org