



City Council

Copper Pinhole Leak Investigation - Update

October 13, 2020



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Copper Pinhole Leaks



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- City database currently has 895 reported (as of 10/1/2020)
- Updated City's webpage with a copper pinhole leak page
 - www.folsom.ca.us/pinholeleaks
 - Includes map of where pinholes occurred
- Trends remain consistent
 - Mostly houses in the 1980s, 1990s and some early 2000s
 - Mostly on horizontal pipelines – **increase in vertical**
 - Mostly in cold water lines

Water Quality Sampling



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Willow Creek – BT Collins Park



Black Diamond – Mann Park



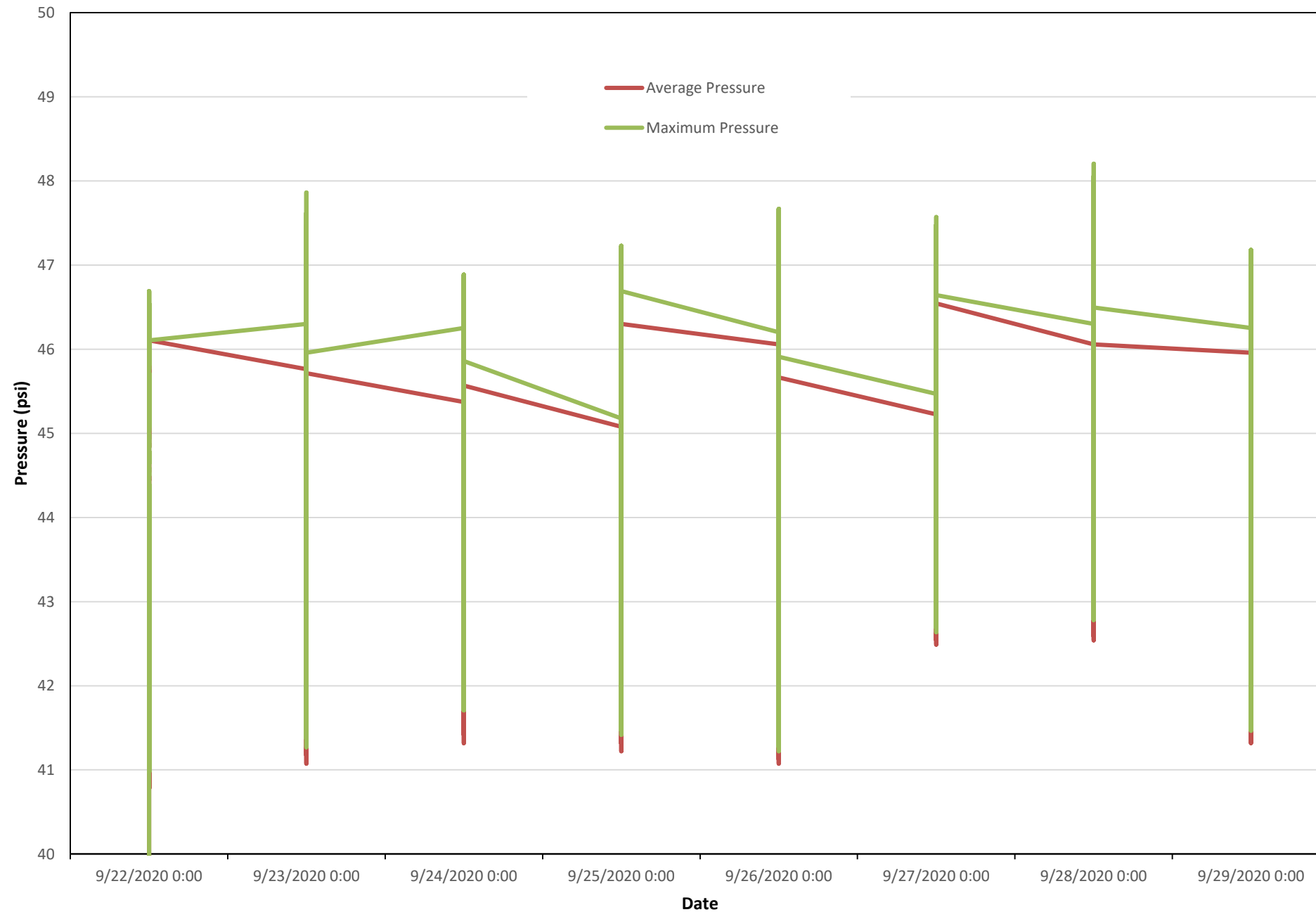
Misty Meadow/Horseshoe Glen



Water System Pressure Data

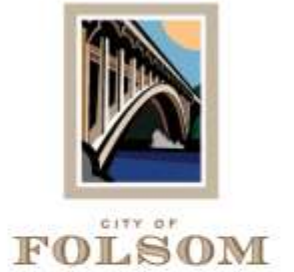


514 Mormon Street Pressure Readings

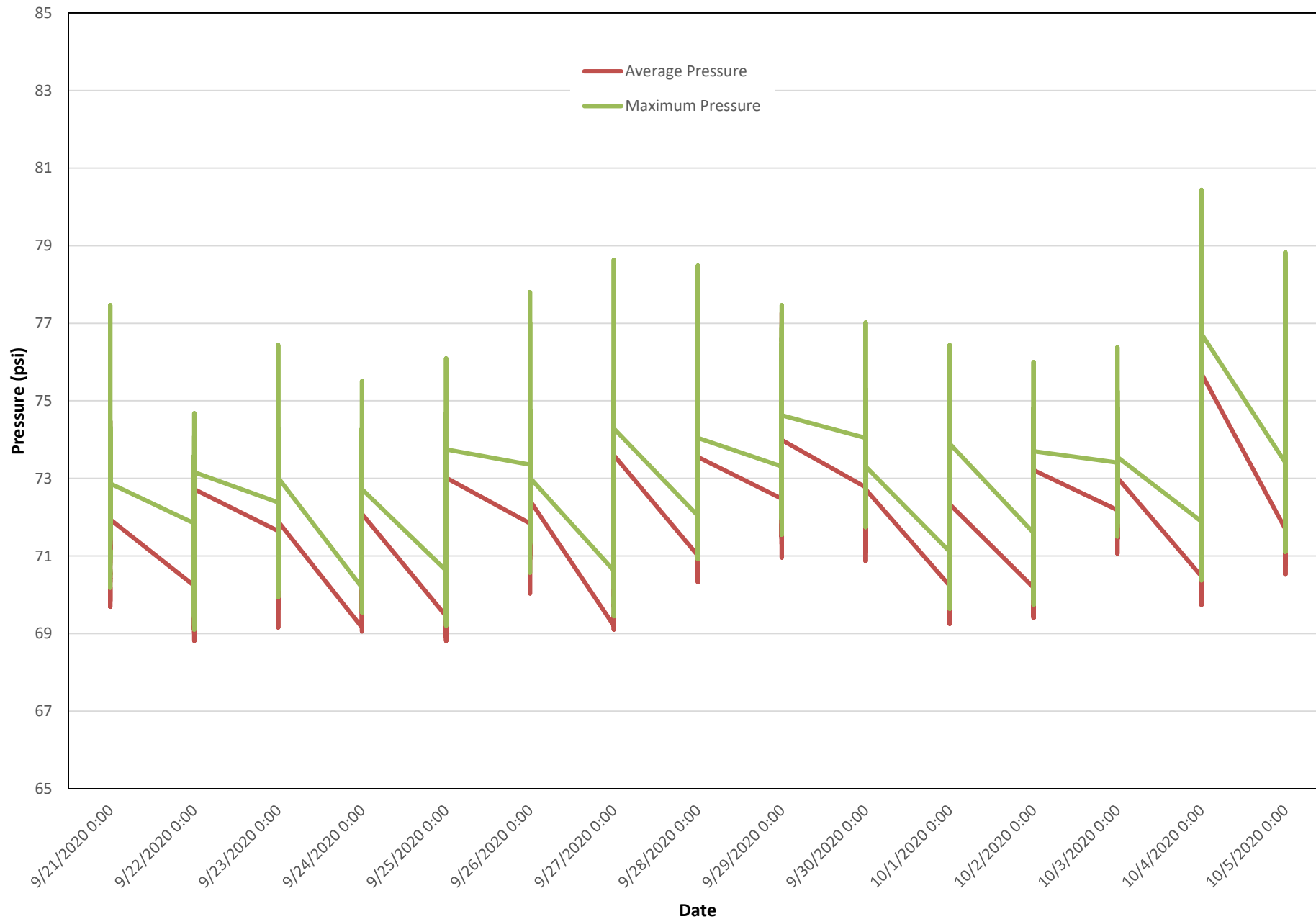


Pressure Zone 1

Water System Pressure Data

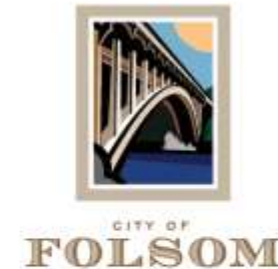


Turnpike at John Henry Pressure Readings

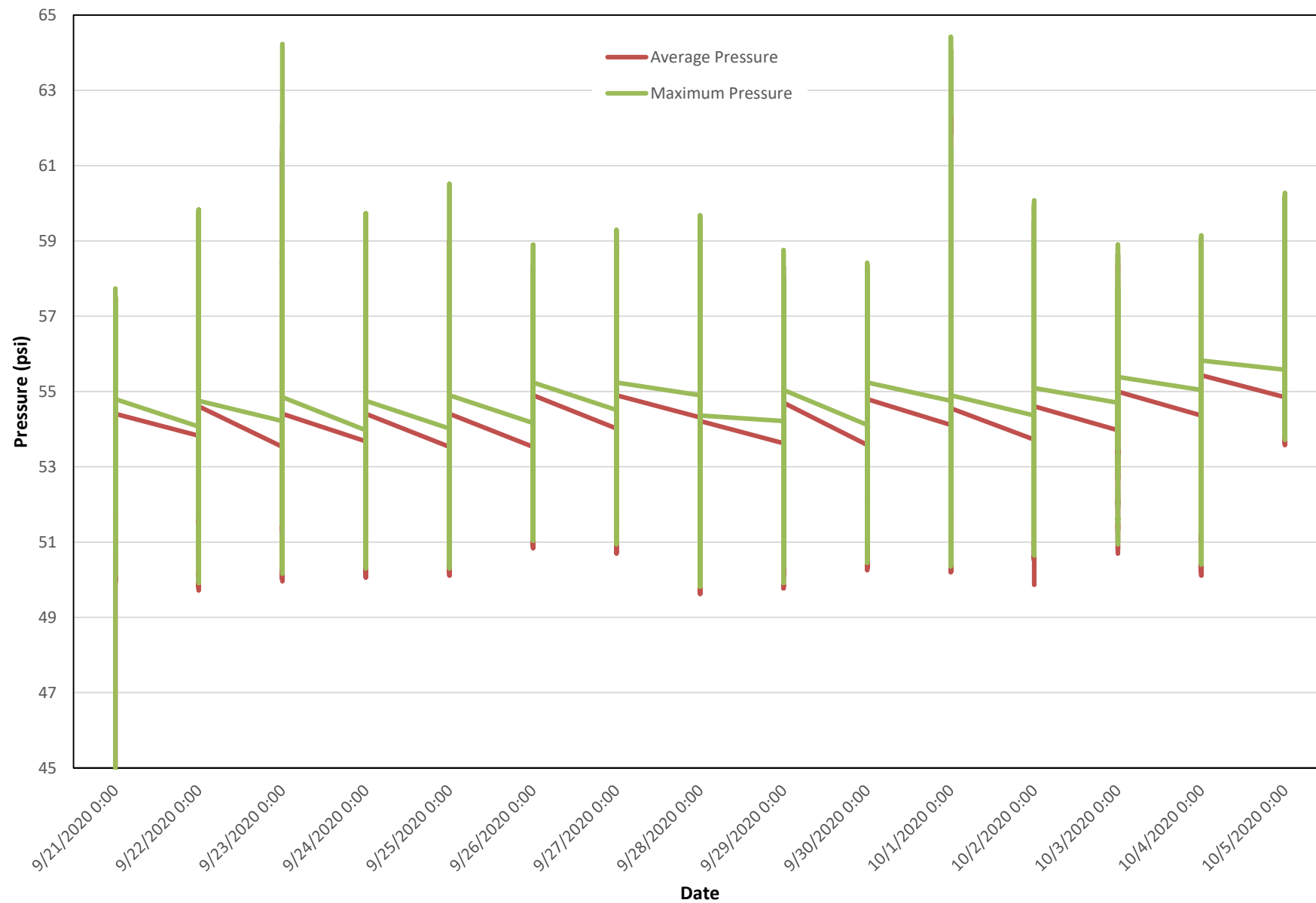


Pressure Zone 1

Water System Pressure Data

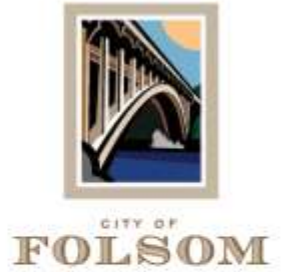


520 Willow Creek Drive Pressure Readings

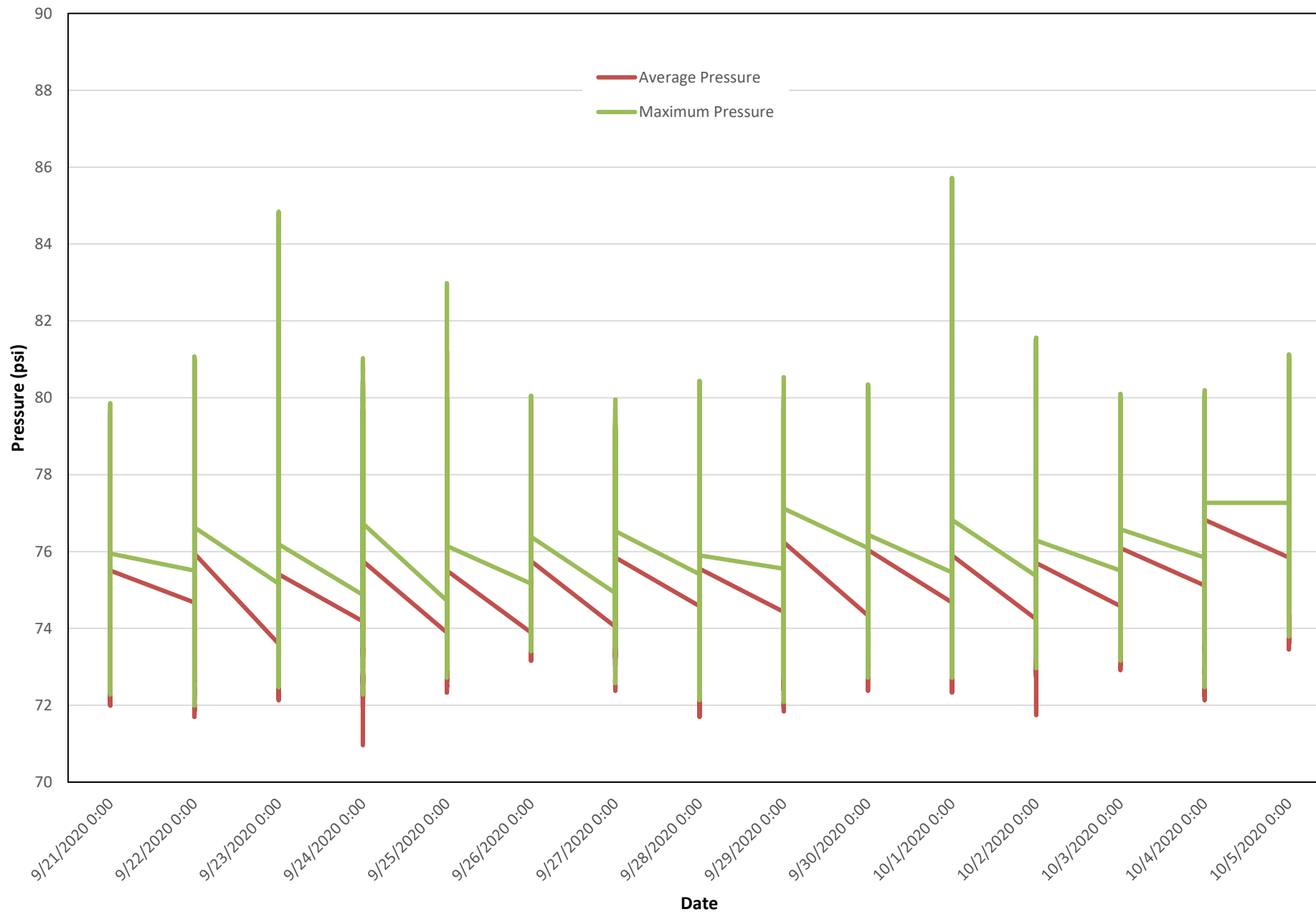


Pressure Zone 2

Water System Pressure Data

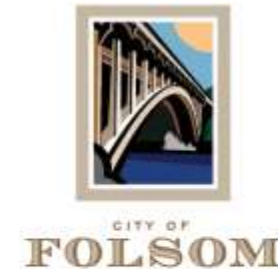


108 Crossing Way Pressure Readings

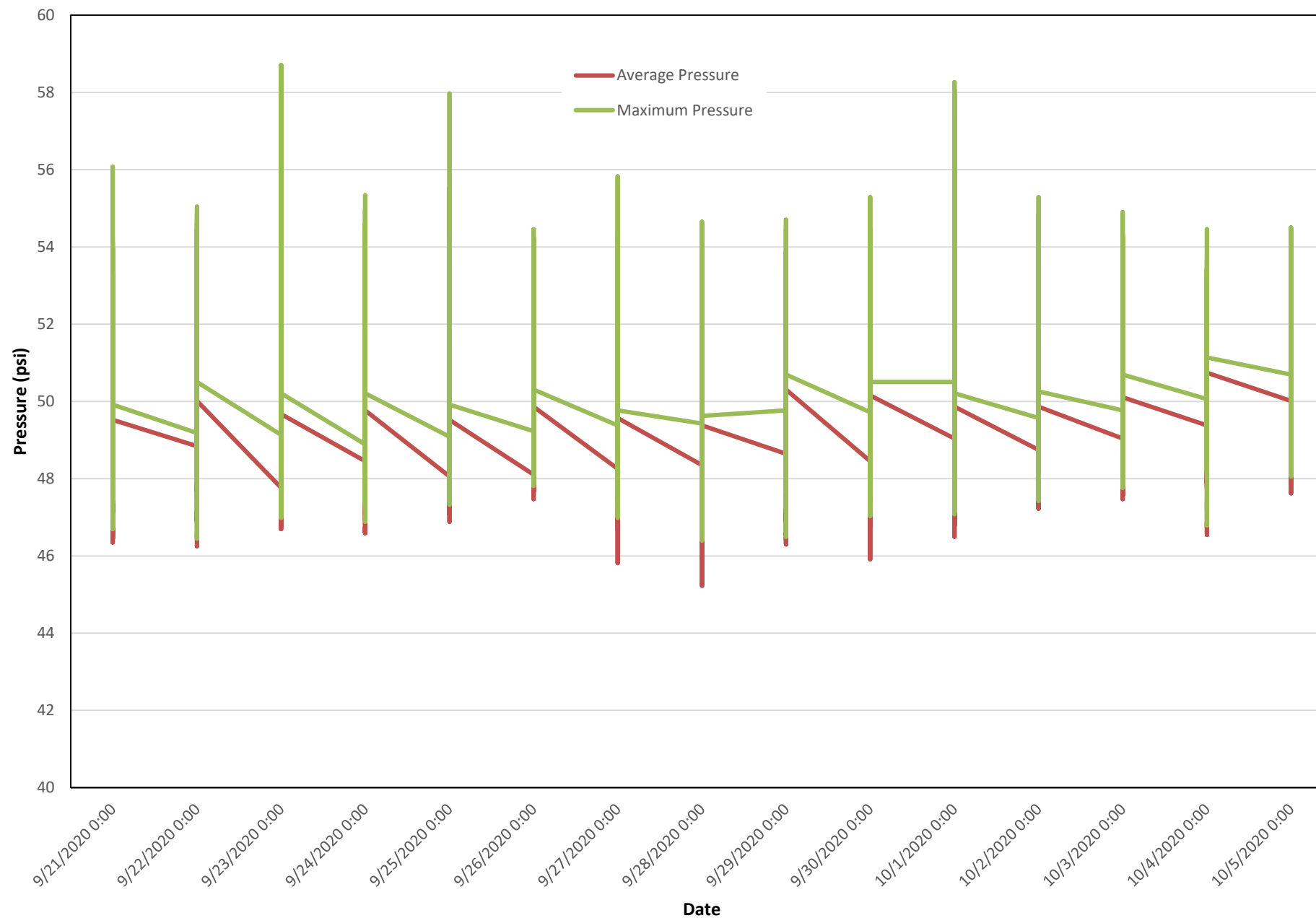


Pressure Zone 2

Water System Pressure Data

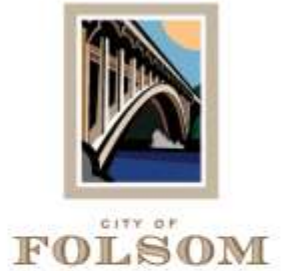


McAdoo at Moonlit Pressure Readings

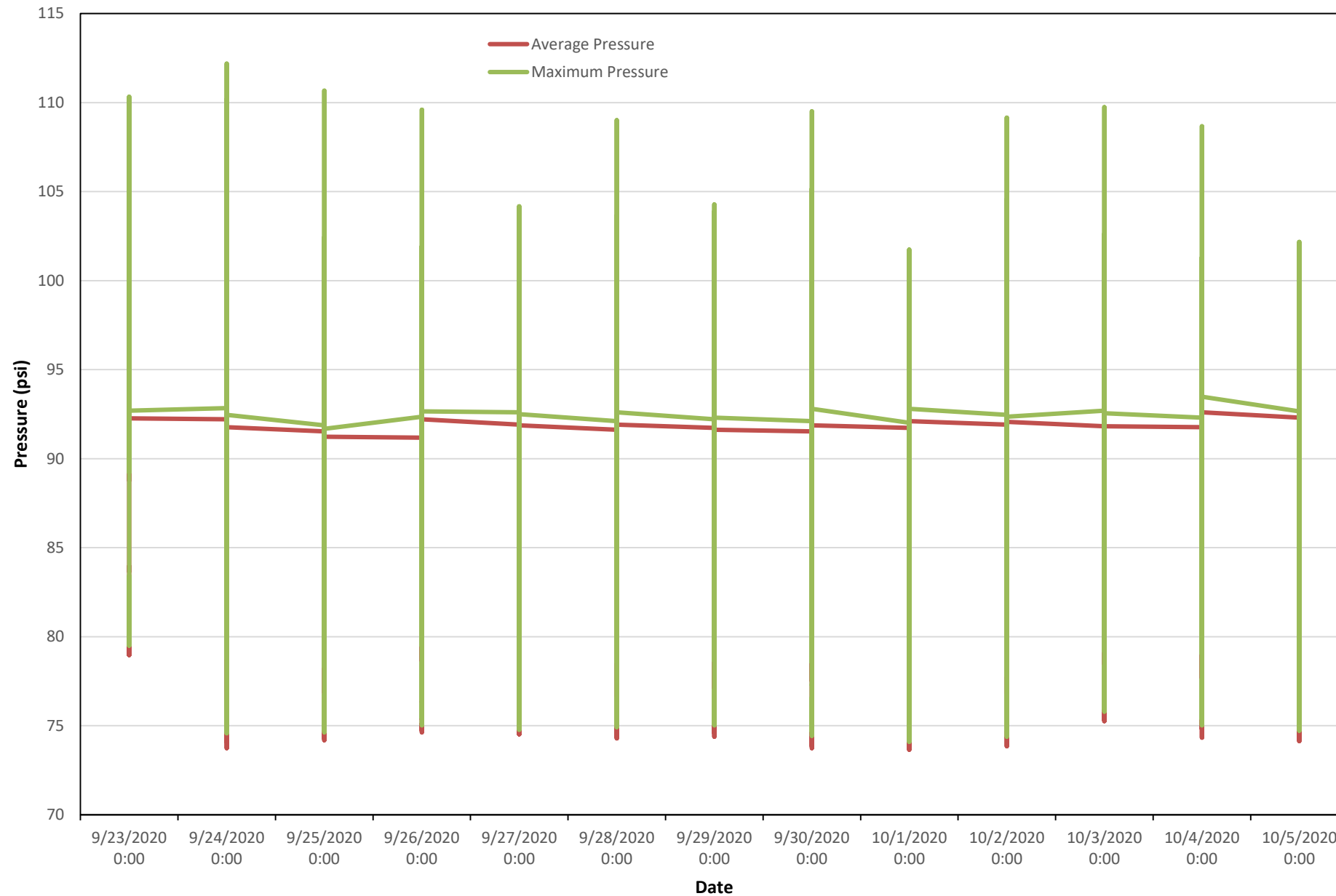


Pressure Zone 2

Water System Pressure Data



305 Willow Creek Drive Pressure Readings



Pressure Zone 3
Cimarron

Consultant Analysis



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- **Water Quality Analysis – Black & Veatch**
 - Examined 10 years worth of City data
 - Chlorine, pH, sulfates, alkalinity, water hardness, metals
 - Regulatory compliance – State and Federal Drinking Water Standards
 - Specifically Lead and Copper Rule (LCR)
- **Pipe Forensics Analysis – Virginia Tech**
 - Pipe scale imagery
 - Associated elemental composition of the pipe scale
 - Percent composition of the scale

Consultant Results



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- Corrosion control treatment, based on LCR, is doing well
- Water meets all State and Federal regulations for public consumption
- Copper pitting may occur in drinking water with some of the following characteristics:
 - Low alkalinity, low pH, low sulfates, and low water hardness – leads to a lower “buffering” capacity
 - Presence of chlorine in the water
- Corrosion control options for the City:
 - pH adjustment with low alkalinity water
 - Add orthophosphate to the treatment process

Consultant Recommendations



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- Decrease likelihood of copper pitting by adding orthophosphate to the treatment process
- Strive to maintain target pH of 8.5
- Start with small increments of orthophosphate
 - 0.1 parts per million (ppm) in the first week
 - 0.2 ppm the second week (if needed)
 - 0.3 ppm the third week (if needed)
- Samples from households in each pressure zone
- Maintenance dose based on results of sampling

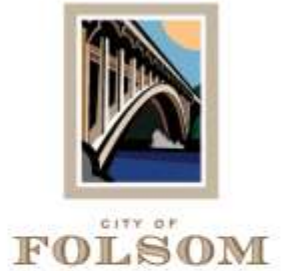
What is Orthophosphate?



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- Food grade additive used as a corrosion inhibitor in the form of phosphorous
- Forms a coating in copper pipes that does not dissolve in water
- Approved for use in drinking water systems by:
 - Environmental Protection Agency
 - U.S. Food and Drug Administration
- Not classified as environmentally hazardous

Phosphorous in Foods



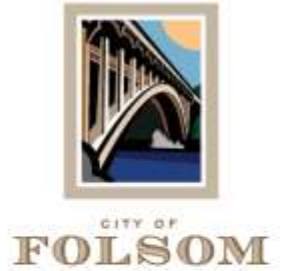
- The following is a list of foods containing phosphorous¹:

Food	Milligrams/serving
Low Fat Yogurt (6 ounces)	245
Salmon (3 ounces)	214
American Cheese (1 ounce)	182
Potato (medium)	123
Corn tortilla	82
Bread (whole wheat slice)	68
Tomato (1 cup)	44
Soda (1 cup)	24
Apple (1 cup)	14

One liter of City water = 0.1 milligrams

1. According to U.S. Department of Health & Human Services - National Institutes of Health

Recommended Phosphorous Amounts



- Recommended daily phosphorous intake²:

Life Stage	Recommended Amount
Birth to 6 months	100 mg
Infants 7–12 months	275 mg
Children 1–3 years	460 mg
Children 4–8 years	500 mg
Children 9–13 years	1,250 mg
Teens 14–18 years	1,250 mg
Pregnant and breastfeeding teens	1,250 mg
Adults 19 years and older	700 mg
Pregnant and breastfeeding women	700 mg

2. According to U.S. Department of Health & Human Services - National Institutes of Health

Additional Consultant Analysis



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- Second, independent analysis by HDR
- Expected completion by end of October
- Similar scope of analysis to Black & Veatch and Virginia Tech
 - Review of City's treatment process
 - Review of City's water quality data
 - Water quality sampling
 - Copper scale analysis

Report a Leak, Learn More



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- For questions or to report a pinhole leak:
 - Call 916-461-6190, or
 - Email waterquality@folsom.ca.us
- Pinhole Leak Webpage:
 - www.folsom.ca.us/pinholeleaks
- Community outreach:
 - News media
 - NextDoor
 - Facebook
 - Twitter
 - E-newsletter
 - City website
 - **Direct mailer survey**



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QUESTIONS?