

The background of the slide is a light gray gradient with several realistic water droplets of various sizes scattered across it. The droplets have highlights and shadows, giving them a three-dimensional appearance. The text is centered on the slide.

# HARD WATER

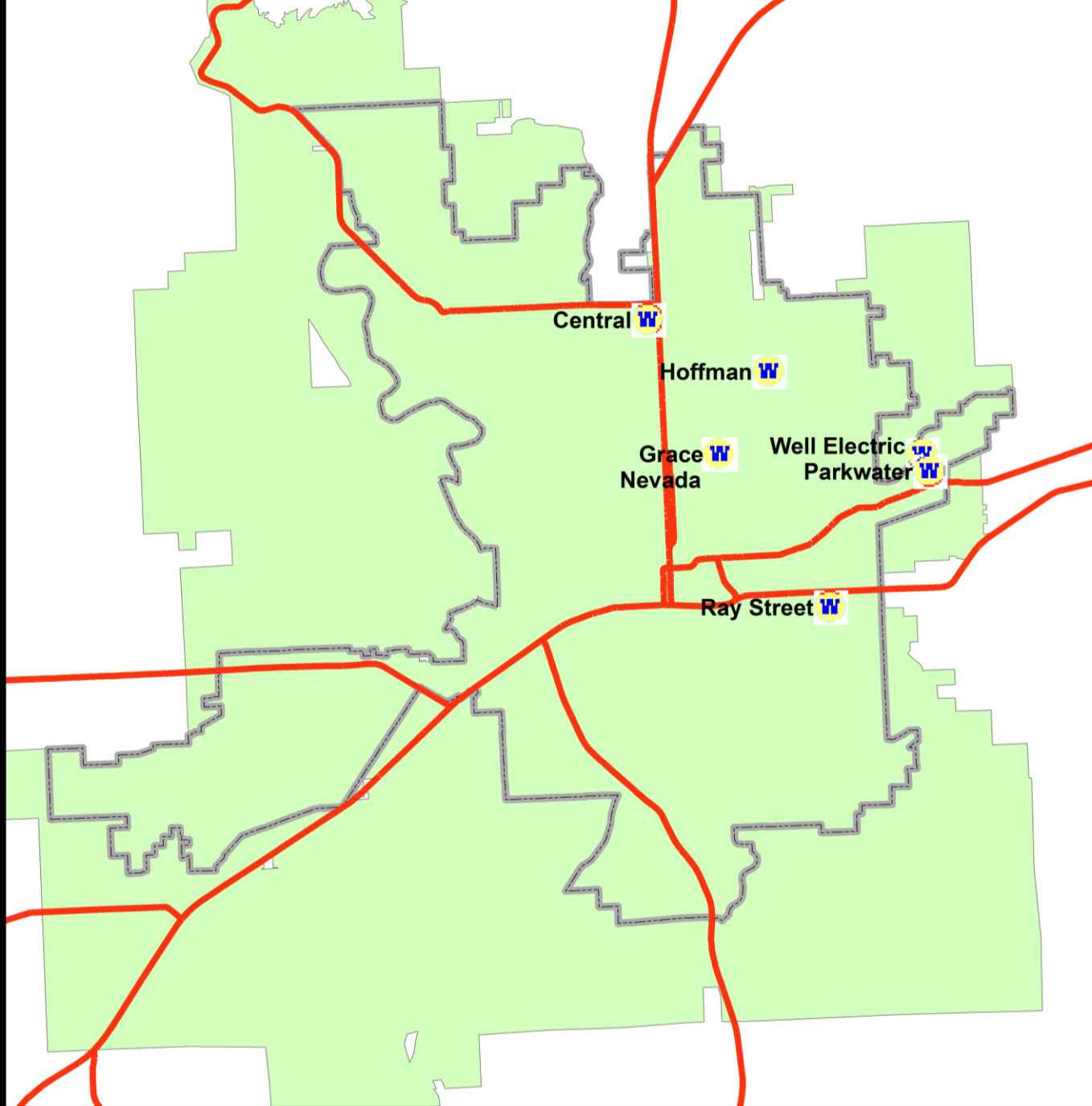
2024 PNWS ANNUAL CONFERENCE

MAY 3, 2024

DOUG GREENLUND

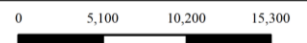
CITY OF SPOKANE

WATER QUALITY COORDINATOR

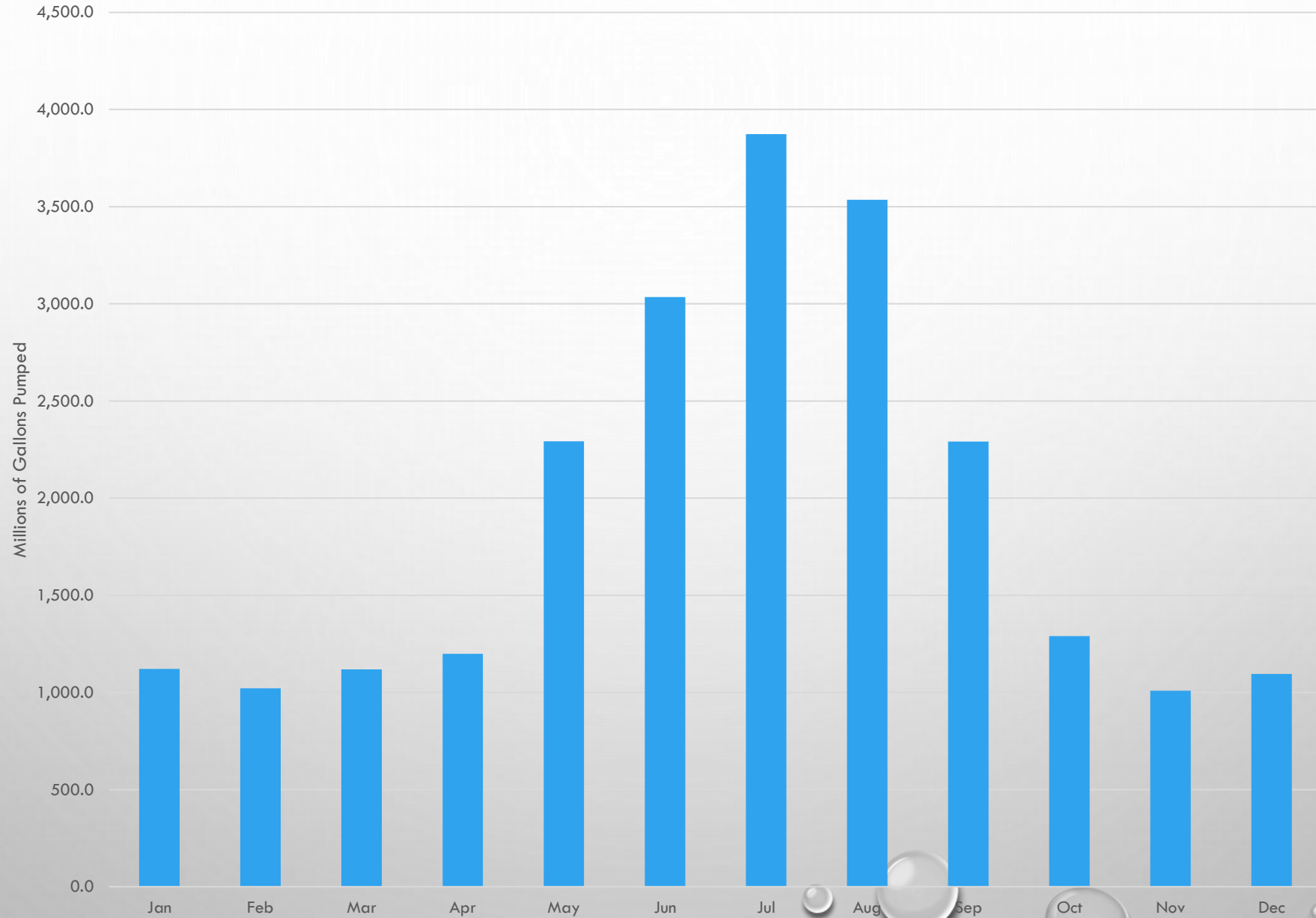


# SERVICE AREA

2024



City of Spokane Gallons Pumped per Month




# CITY HAS HARD WATER

- WE HAVE HARD WATER BY USGS DEFINITION
  - USGS DEFINES HARD AS GREATER THAN 121 MG/L OF  $\text{CaCO}_3$
  - OURS DOES VARY BUT IN GENERAL IS ABOVE 131 MG/L OF  $\text{CaCO}_3$
  - ALSO REFERRED TO GRAINS PER GALLON
    - 131MG/ L IS 7.7





# HARD WATER DEPOSITS

- SEE THEM IN YOUR TEA KETTLE
  - HOT WATER
  - EFFECTS HOW SOAP FOAMS
  - LEAVES SCUM ON GLASS WARE
  - DEPOSITS IN YOUR DISHWASHER
- 

# CALCIUM CARBONATE

- NOT A HEALTH CONCERN
  - ACTIVE INGREDIENT IN ANTI ACIDS
- AESTHETICS
- CAN FLOAT – CALCITE RAFTS
- HARD WATER IS FROM BOTH CALCIUM AND MAGNESIUM SALTS
  - SVRP WATER IS PREDOMINANTLY CALCIUM CARBONATE



# CUSTOMER CASE STUDY

- BACTERIA
- EXCESSIVE DEPOSITS
- RUST







# HARD WATER DEPOSITS

- CUSTOMER CALL
  - WATER TASTES OFF AND SMELLS BAD
  - ICE CUBES TASTE WEIRD – DIRTY
- COLIFORM BACTERIA SAMPLE FROM KITCHEN FAUCET WAS TOTAL COLIFORM POSITIVE



# KITCHEN FAUCET SCALE



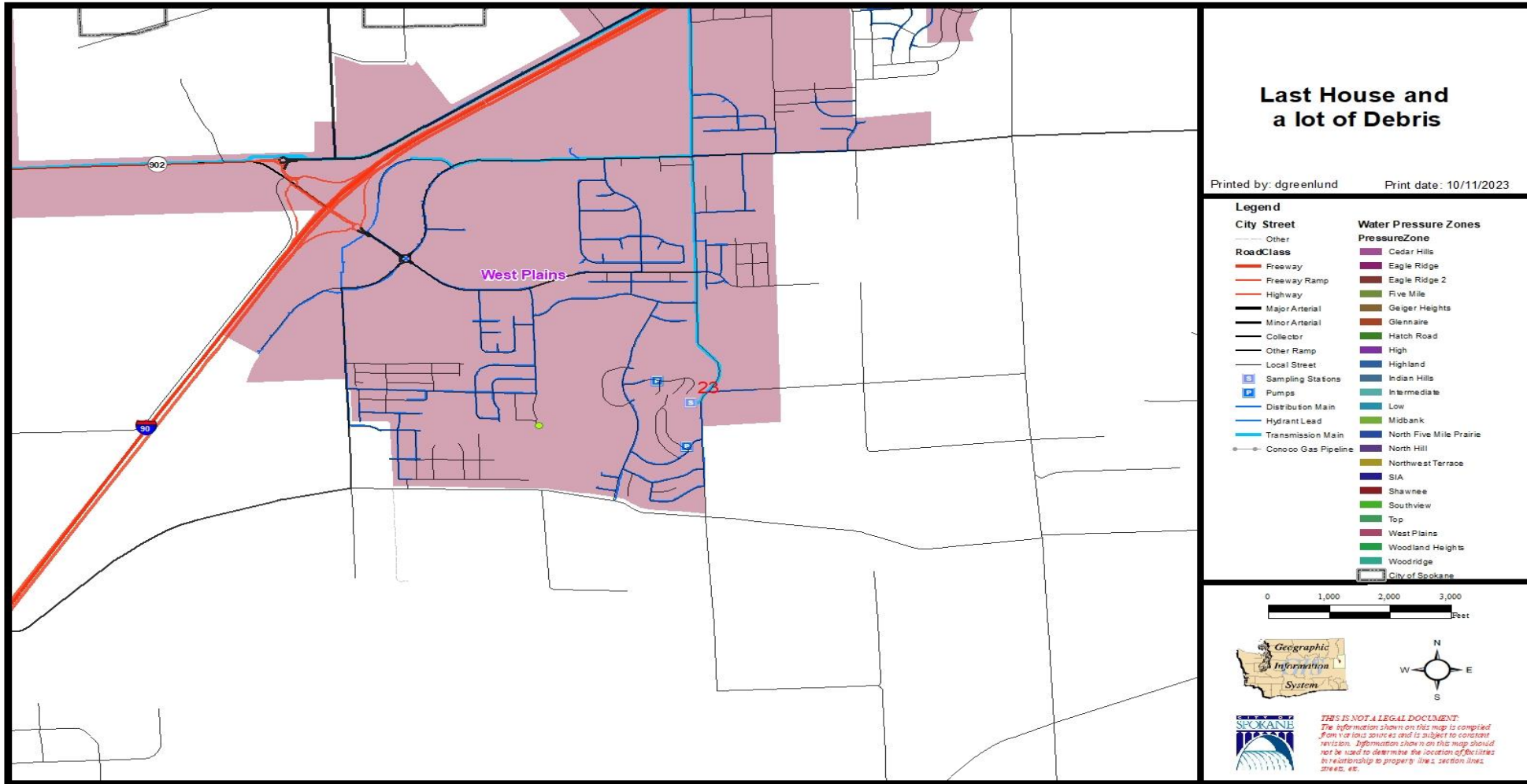
# DEPOSITS

- ALL OF THOSE DEPOSITS GIVE PLENTY OF HOMES FOR BACTERIA TO GROW
- IT IS VERY INEXPENSIVE AND EASY TO SOLVE
  - CLEAN WITH VINEGAR
    - FILL A PLASTIC BAG WITH VINEGAR
    - SUBMERGE FAUCET IN BAG AND SECURE END WITH A RUBBER BAND
    - SOAK 30 MINUTES
    - REMOVE FAUCET AND CLEAN OFF SCALE WITH SOFT BRUSH
- VINEGAR IS AN ACID DISSOLVING THE SCALE AND ANTI-BACTERIAL TO DISINFECT

# ON DEMAND HOT WATER HEATER

- RECEIVED A CALL FROM A CUSTOMER OF A LOT OF DEPOSITS IN AERATOR
- HAD MATERIAL PACKED INTO THE KITCHEN SINK AERATOR
- WASHING MACHINE LINE WAS SO PACKED THE UNIT BARELY FILLED
- MATERIAL LOOKED LIKE DRY WALL
- TWO PEOPLE LIVED IN HOME ABOUT 2 YEARS

# THE LAST HOUSE



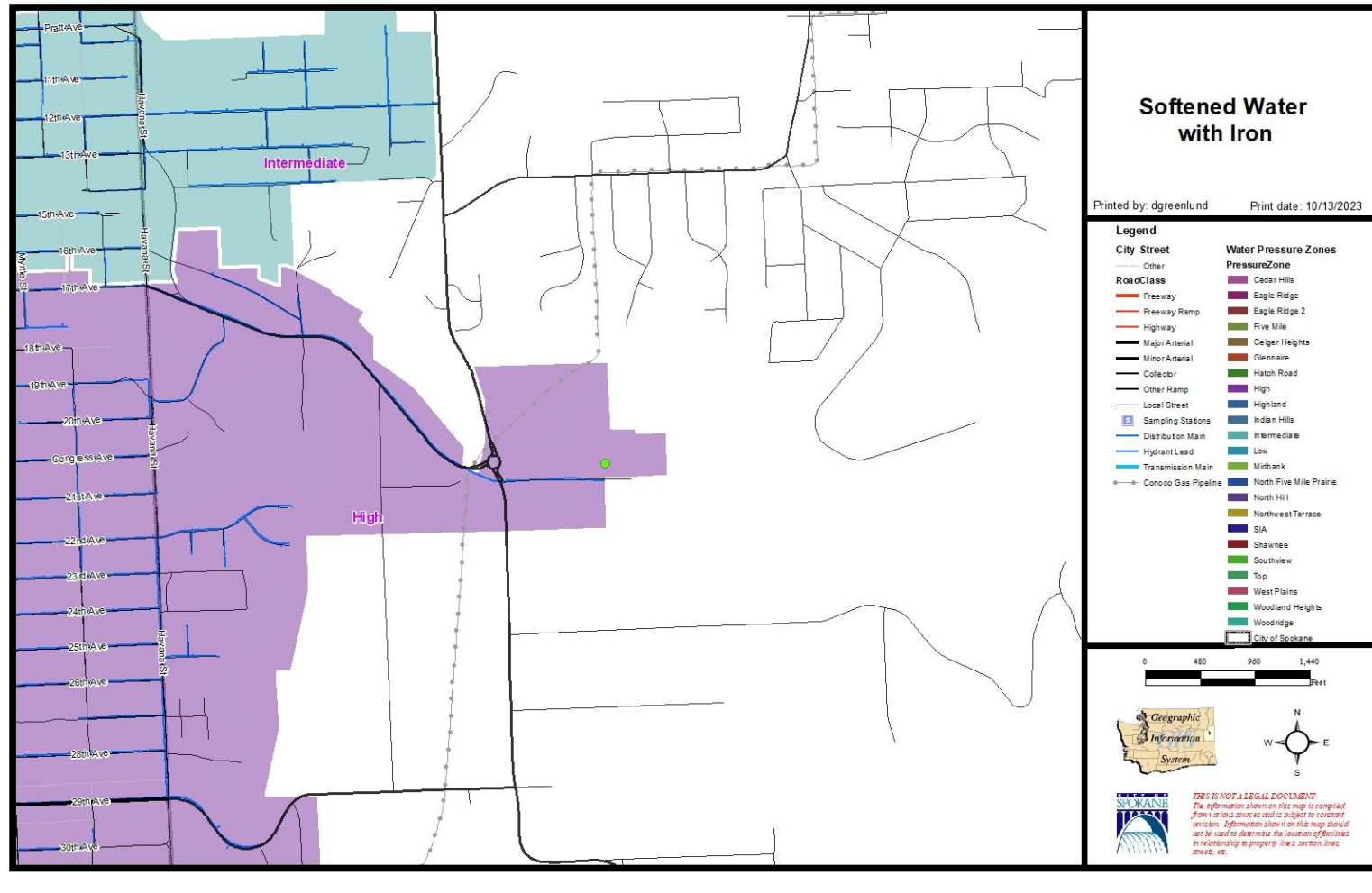
# COMMON ISSUE WITH TANKLESS



# RUST

- CUSTOMER CALLED AND SAID THEY HAD RUST IN THEIR WATER
- HYDRANT CREW RESPONDED AND FLUSHED NEAR THEIR HOME
- CALLED A WEEK LATER AND SAID IT WAS STILL RUSTY
- MID JANUARY

# LONG SERVICE LINE





# RUSTY LINES

- WINTER TIME - LOW WATER USE LONG RESIDENCE TIMES
- LONG SERVICE LINE AND NOT A LOT OF CUSTOMERS IN THE AREA
- RUST DID NOT SEEM OUT OF THE QUESTION
- THE HYDRANT CREW THAT FLUSHED REPORTED THE WATER WAS PRETTY GOOD

# CUSTOMERS HOME

- STARTED TO SAMPLE THE WATER AND FOUND NO CHLORINE RESIDUAL
- ASKED ABOUT A WATER SOFTENER
- THEY HAD ONE AND IT WAS WORKING NO BUILD UP ON TEA KETTLE, GLASS WARE OR INSIDE OF DISHWASHER
- THE RUST WAS PROBABLY WATER SOFTENER BEADS – I DID NOT TEST THEM
- CONTACT WATER SOFTENER COMPANY FOR MAINTENANCE
- THIS CAN BE COMMON