



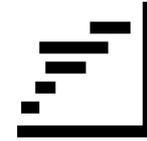
## A HOLE IN ONE: A WELL TRANSITIONS FROM GOLF COURSE IRRIGATION TO MUNICIPAL PRODUCTION

Zach Miles, BHC Consultants

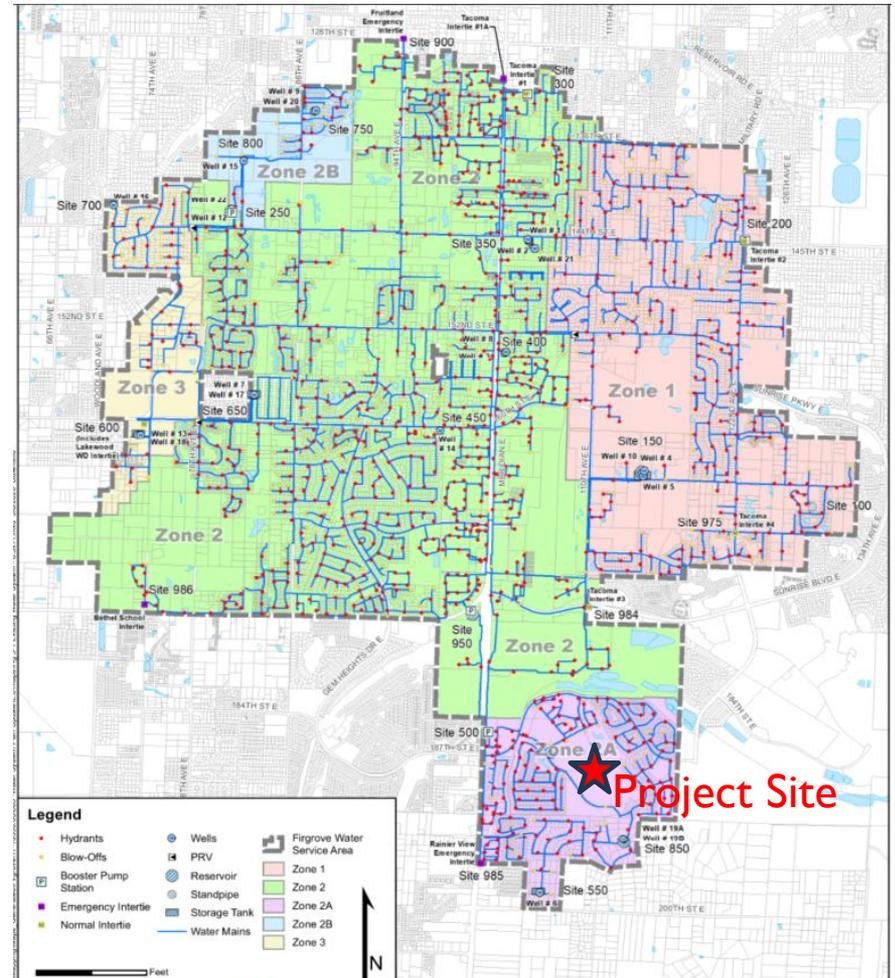
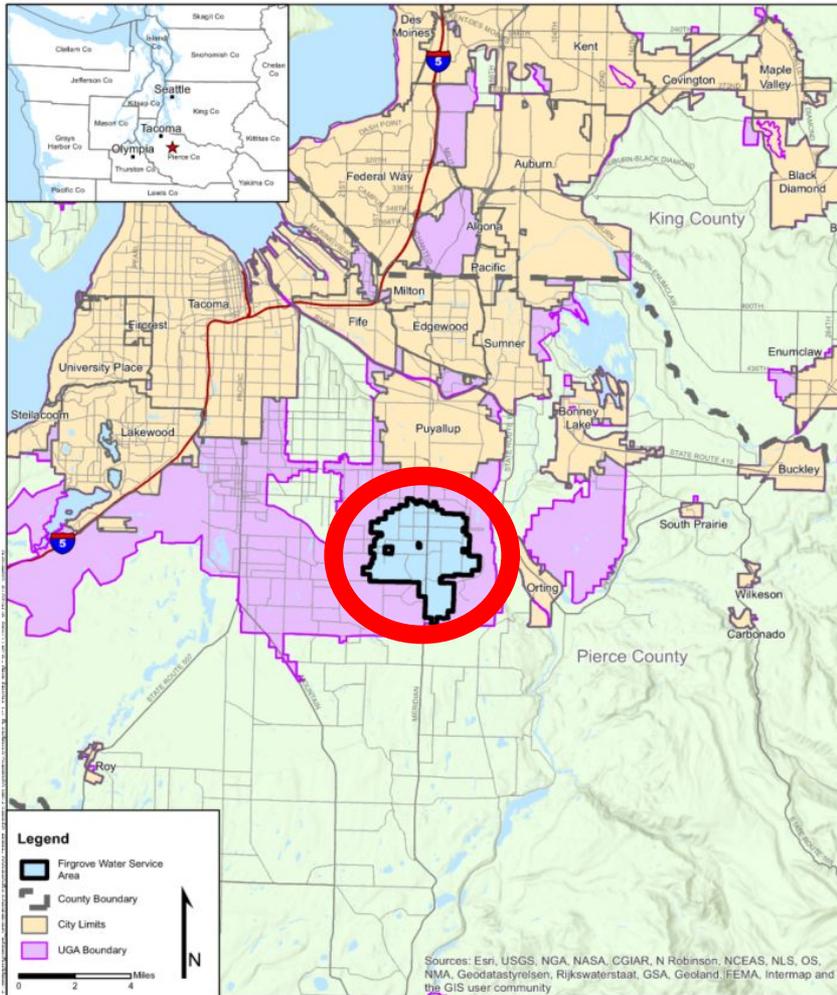
May 9, 2025

# PRESENTATION TAKEAWAYS

1. Responding to changing water system demands requires **LONG TERM PLANNING**
2. Look for opportunities for **RE-USE** of existing infrastructure
3. Develop mutually beneficial **PARTNERSHIPS**
4. Something else??



# SYSTEM MAPS

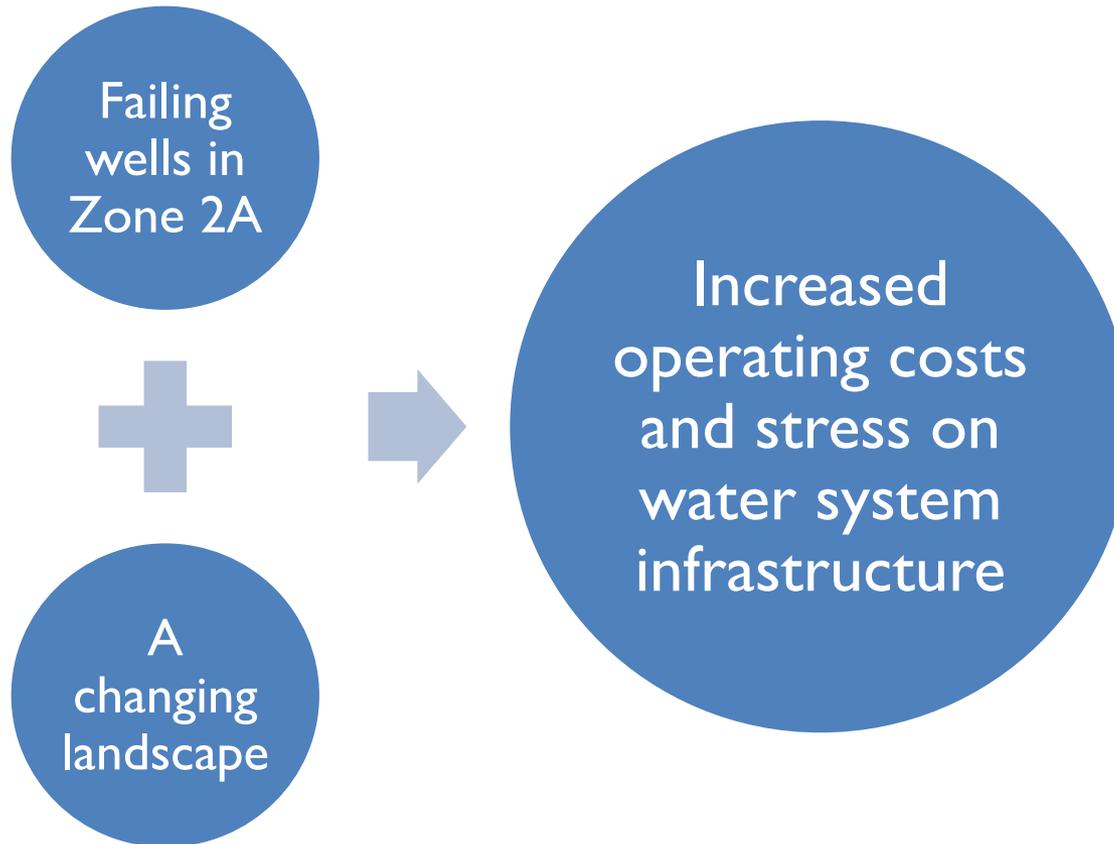


# FIRGROVE SYSTEM BACKGROUND

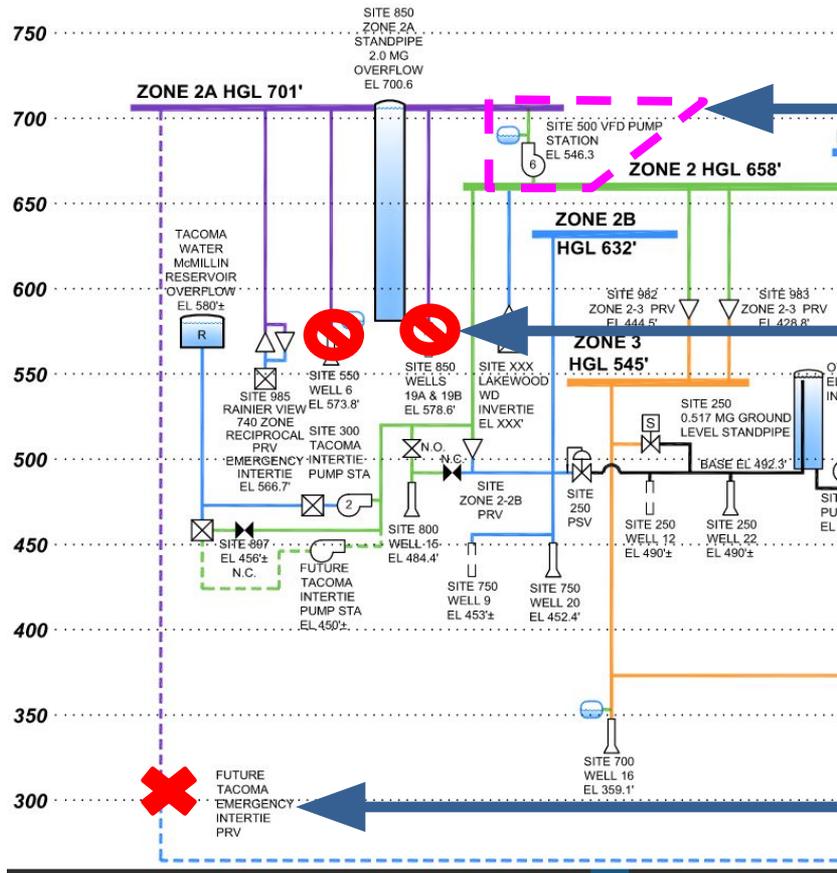
- Started by a group of ~50 farmers in 1952
- ~34,000 People Served
- ~13,000 Connections
- 16 wells
- Interties (Tacoma Water & Lakewood Water District)
- ~80% groundwater wells and ~20% wholesale purchase supply



# THE PROBLEM



# FAILED WELLS MEANS PUMPING INTO ZONE 2A



Site 500 (Meridian BPS) currently supplying all of Zone 2A

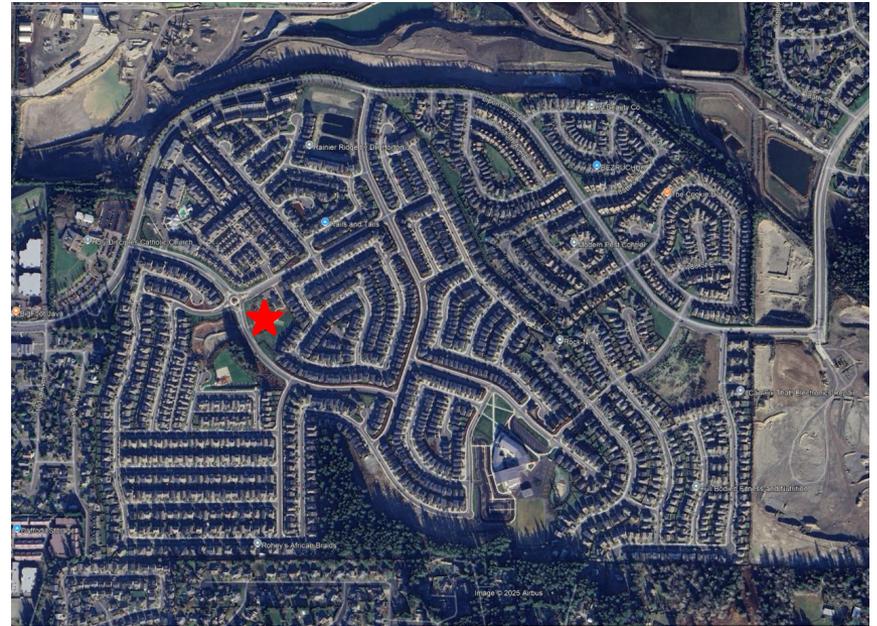
Well 6 & 19B not active

Not yet built

# A CHANGING LANDSCAPE



2002

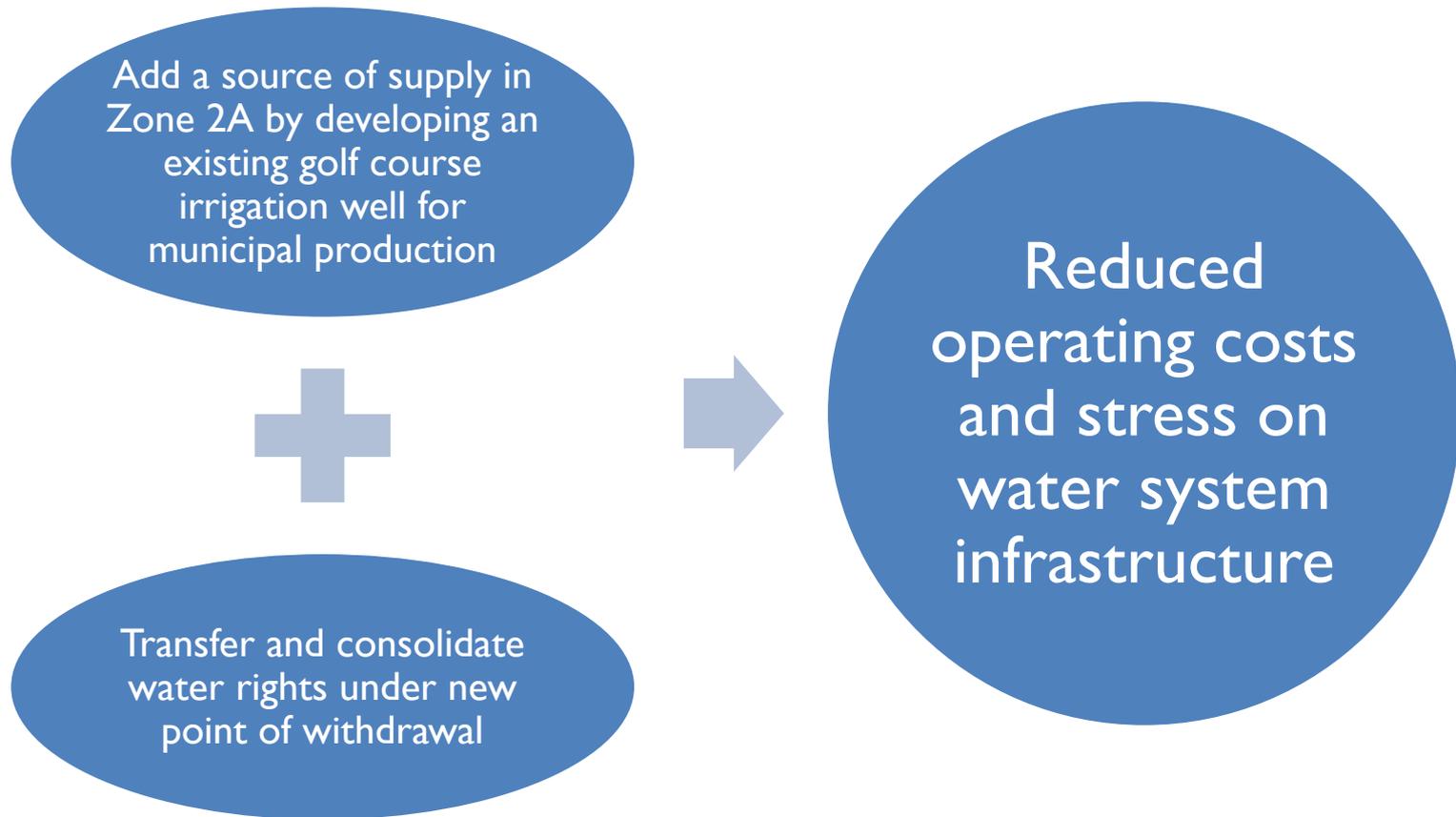


2025



★ Well 23 Site

# THE SOLUTION



# CONSOLIDATING WATER RIGHTS

- Well 23 (Lipoma Firs Well 3) Water Rights (April 15 to October 15)

$$Q_i = 205 \text{ gpm} + Q_i = 200 \text{ gpm} = Q_i \text{ Total} = 405 \text{ gpm}$$

- Well 6 and Well 19B Water Rights

$$Q_i = 60 \text{ gpm} + Q_i = 160 \text{ gpm} = Q_i \text{ Total} = 220 \text{ gpm}$$

- Original pump design  well pump capable of 220 – 405 gpm
- Revised pump design after pump testing  well pump capable of 220 – 350 gpm

# WATER RIGHTS TRANSFER

- Change in Purpose and Place of Use from “irrigation/domestic” to “municipal supply” and “200-acre golf course property” to “Firgrove Pressure Zone 2A”

State of Washington  
DEPARTMENT OF ECOLOGY  
REPORT OF EXAMINATION FOR WATER RIGHT CHANGE  
Change in Purpose and Place of Use

File NR G2-27328  
WR Doc ID 6802212

PRIORITY DATE: April 6, 1998

WATER RIGHT NUMBER: G2-27328

MAILING ADDRESS: Firgrove Mutual, Inc., 10408-144th Street East, Puyallup, WA 98374

Quantity Authorized for Withdrawal			
WITHDRAWAL RATE	UNITS	ANNUAL QUANTITY (AF/YR)	
205	gpm	97.2	

Purpose	WITHDRAWAL RATE		UNITS	ANNUAL QUANTITY (AF/YR)		PERIOD OF USE (mm/dd)
	ADDITIVE	NON-ADDITIVE		ADDITIVE	NON-ADDITIVE	
Municipal Supply Purposes	205		GPM	97.2	--	04/15 to 10/15

State of Washington  
DEPARTMENT OF ECOLOGY  
REPORT OF EXAMINATION FOR WATER RIGHT CHANGE  
Change in Purpose and Place of Use

File NR G2-28388  
WR Doc ID 6802313

PRIORITY DATE: April 6, 1998

WATER RIGHT NUMBER: G2-28388

MAILING ADDRESS: Firgrove Mutual, Inc., 10408-144th Street East, Puyallup, WA 98374

Quantity Authorized for Withdrawal			
WITHDRAWAL RATE	UNITS	ANNUAL QUANTITY (AF/YR)	
200	gpm	97.2	

Purpose	WITHDRAWAL RATE		UNITS	ANNUAL QUANTITY (AF/YR)		PERIOD OF USE (mm/dd)
	ADDITIVE	NON-ADDITIVE		ADDITIVE	NON-ADDITIVE	
Municipal Supply Purposes	200		GPM	97.2	--	04/15 to 10/15

**PRIORITY DATE  
April 6, 1998**

Long Term Planning

- Change Point of Withdrawal from Wells 6 and 19B to Well 23

State of Washington  
DEPARTMENT OF ECOLOGY  
Final REPORT OF EXAMINATION FOR WATER RIGHT APPLICATION

File NR G2-30758  
WR Doc ID 6802953

PRIORITY DATE: 1/30/2020

WATER RIGHT NUMBER: G2-30758

MAILING ADDRESS: Firgrove Mutual, Inc., 10408-144th Street East, Puyallup, WA 98374

Quantity Authorized for Withdrawal			
WITHDRAWAL OR DIVERSION RATE	UNITS	ANNUAL QUANTITY (AF/YR)	
60	GPM	48	

Purpose	WITHDRAWAL RATE		UNITS	ANNUAL QUANTITY (AF/YR)		PERIOD OF USE (mm/dd)
	ADDITIVE	NON-ADDITIVE		ADDITIVE	NON-ADDITIVE	
Municipal	60		GPM	48		01/01-12/31

State of Washington  
DEPARTMENT OF ECOLOGY  
Final REPORT OF EXAMINATION FOR WATER RIGHT APPLICATION

File NR G2-30769  
WR Doc ID 6802960

PRIORITY DATE: 4/23/2020

WATER RIGHT NUMBER: G2-30769

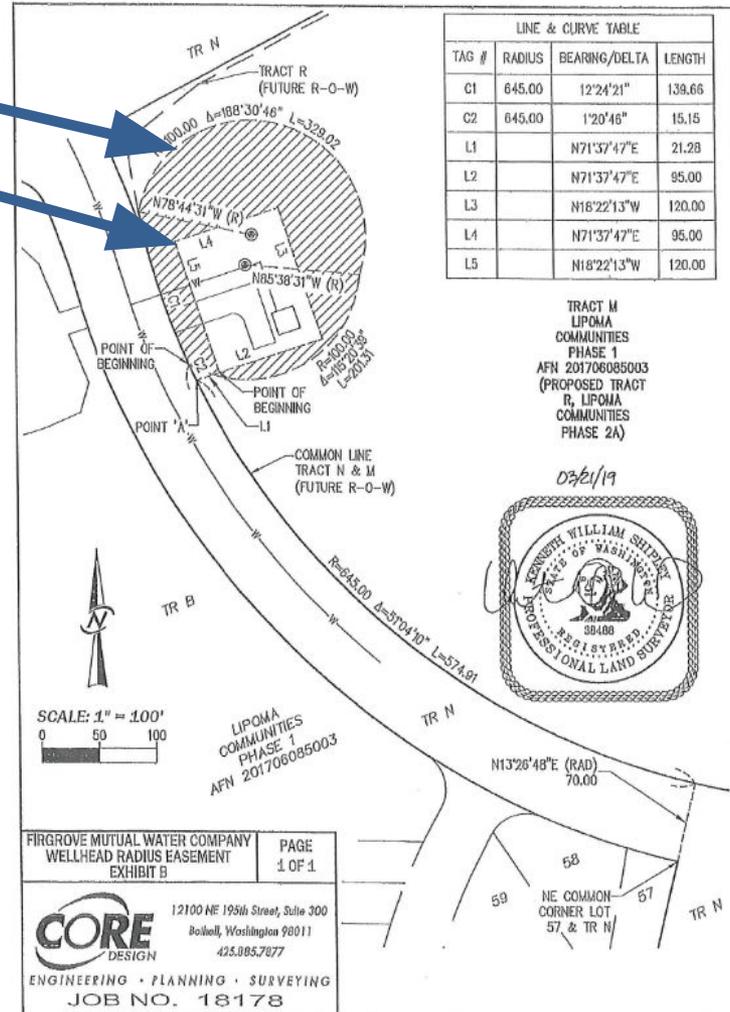
MAILING ADDRESS: Firgrove Mutual, Inc., 10408-144th Street East, Puyallup, WA 98374

Quantity Authorized for Withdrawal			
WITHDRAWAL OR DIVERSION RATE	UNITS	ANNUAL QUANTITY (AF/YR)	
160	GPM	54	

Purpose	WITHDRAWAL RATE		UNITS	ANNUAL QUANTITY (AF/YR)		PERIOD OF USE (mm/dd)
	ADDITIVE	NON-ADDITIVE		ADDITIVE	NON-ADDITIVE	
Municipal	160		GPM	54		01/01-12/31

# EASEMENTS

- Sanitary control area easement
  - Well site easement acquisition
- Partnerships



# OTHER STEPS ALONG THE WAY...

- Water quality testing
  - IOCs, SOCs, VOCs, PFAS
- Wellhead protection plan
- Pump testing
  - Step rate completed
  - Issues handling discharge of constant rate pump test
  - Constant rate with new well pump installed during construction

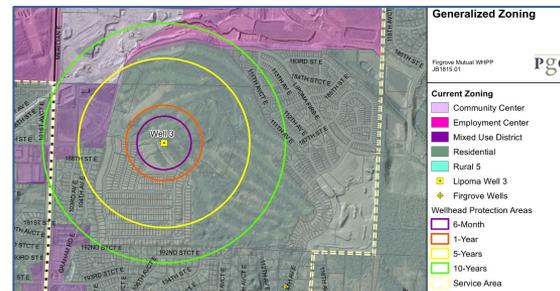
Please Print Plainly  
USE HEAVY PENS  
DO NOT WRITE IN SHADDED AREAS

WATER MANAGEMENT LABORATORIES INC. 1515 80th St. E. Tacoma, WA 98404 (253) 531-3121

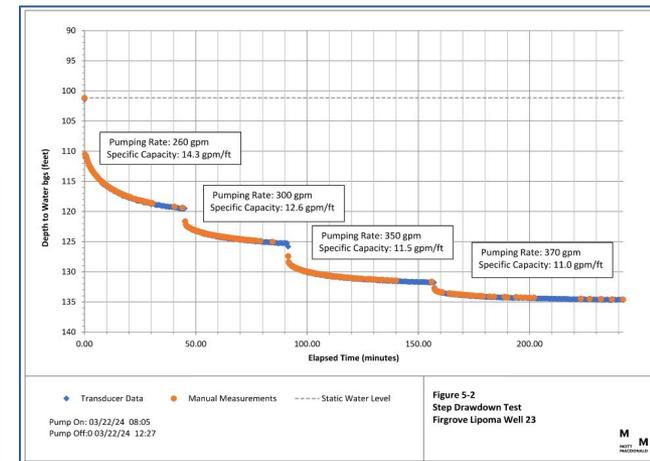
### INORGANIC CHEMICALS (IOCS) REPORT

System ID No: *NA* System Name: *Lipoma Well*  
 Lab Sample No: *0896241* Date Collected: *05-19-16* DOH Source No: *N/A*  
 Multiple Source Nos: *N/A* Sample Type: *B* Sample Purpose: *I*  
 Date Received: *05-19-16* Date Reported: *05-28-16* Supervisor: *LR*  
 County: *Pierce* Date Digested: *NA* Group: A B *Other PWT*  
 Sample Location: *Wellhead*  
 Send Results & Bill To: *Firgrove Mutual Water 104108 144th Street E Puyallup, WA 98374* Remarks:

DOH#	ANALYTES	RESULTS	UNITS	SRL	TRIGGER	MCL	EXCEEDS	Method/Analyst
EPA REGULATED								
4	Arsenic	<0.001	mg/L	0.001	0.01	0.01	N/D	200.8 <i>OK</i>
5	Barium	<0.1	mg/L	0.1	2	2		200.8 <i>OK</i>
6	Cadmium	<0.001	mg/L	0.001	0.005	0.005		200.8 <i>OK</i>
7	Chromium	<0.007	mg/L	0.007	0.1	0.1		200.8 <i>OK</i>
11	Mercury	<0.0002	mg/L	0.0002	0.002	0.002		200.8 <i>OK</i>
12	Selenium	<0.002	mg/L	0.002	0.05	0.05		200.8 <i>OK</i>
110	Beryllium	<0.0005	mg/L	0.0005	0.004	0.004		200.8 <i>OK</i>
112	Antimony	<0.003	mg/L	0.003	0.006	0.006		200.8 <i>OK</i>
113	Thallium	<0.001	mg/L	0.001	0.002	0.002		200.8 <i>OK</i>
117	Cyanide	<0.01	mg/L	0.01	0.2	0.2		4500-CNF <i>OK</i>
119	Fluoride	<0.2	mg/L	0.2	2	4		300.0 <i>OK</i>
114	Nitrite - N	<0.2	mg/L	0.1	0.5	1		300.0 <i>OK</i>
20	Nitrate - N	<2.1	mg/L	0.2	5	10		300.0 <i>OK</i>
161	Total Nitrate/Nitrite	<2.1	mg/L	0.5	5	10		300.0 <i>OK</i>
EPA REGULATED (Secondary)								
8	Iron	<0.1	mg/L	0.1	0.3	0.3	N/D	3111B <i>OK</i>
10	Manganese	<0.01	mg/L	0.01	0.05	0.05		200.8 <i>OK</i>
13	Silver	<0.01	mg/L	0.1	0.1	0.1		200.8 <i>OK</i>
21	Chloride	4	mg/L	20	250	250		300.0 <i>OK</i>
22	Sulfate	6	mg/L	50	250	250		300.0 <i>OK</i>
24	Zinc	<0.2	mg/L	0.2	5	5		200.8 <i>OK</i>
STATE REGULATED								
14	Sodium	5	mg/L	5				200.8 <i>OK</i>
15	Hardness	57	mg/L	10				2540C <i>OK</i>
16	Conductivity	127	umhos/cm	20		700		2510B <i>OK</i>
17	Turbidity	<0.1	NTU	0.1				2130B <i>OK</i>
18	Color	<5	color units	15				2120B <i>OK</i>
26	Total Dissolved Solids	NA	mg/L	100				2540C <i>OK</i>
111	Nickel	<0.005	mg/L	0.005				200.8 <i>OK</i>
STATE UNREGULATED								
9	Lead	<0.001	mg/L	0.001				200.8 <i>OK</i>
23	Copper	<0.02	mg/L	0.02				200.8 <i>OK</i>



## Long Term Planning



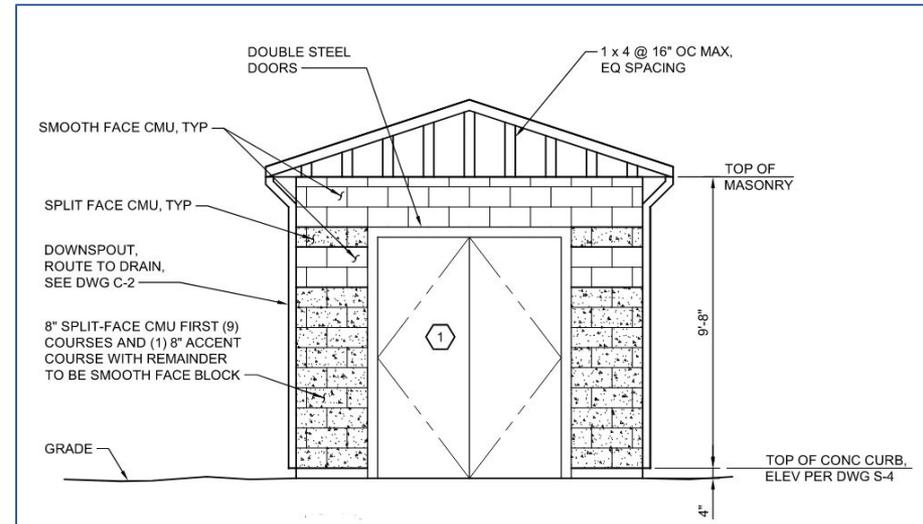
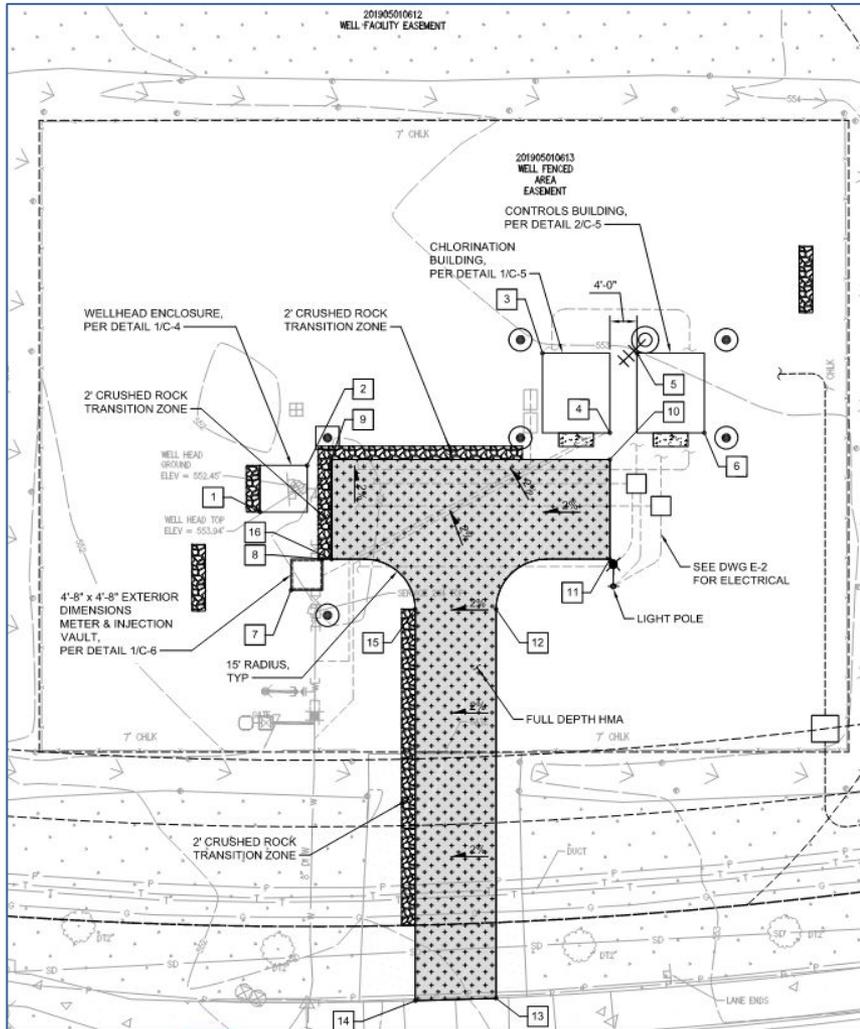
# EXISTING SITE CONDITIONS I OF 2



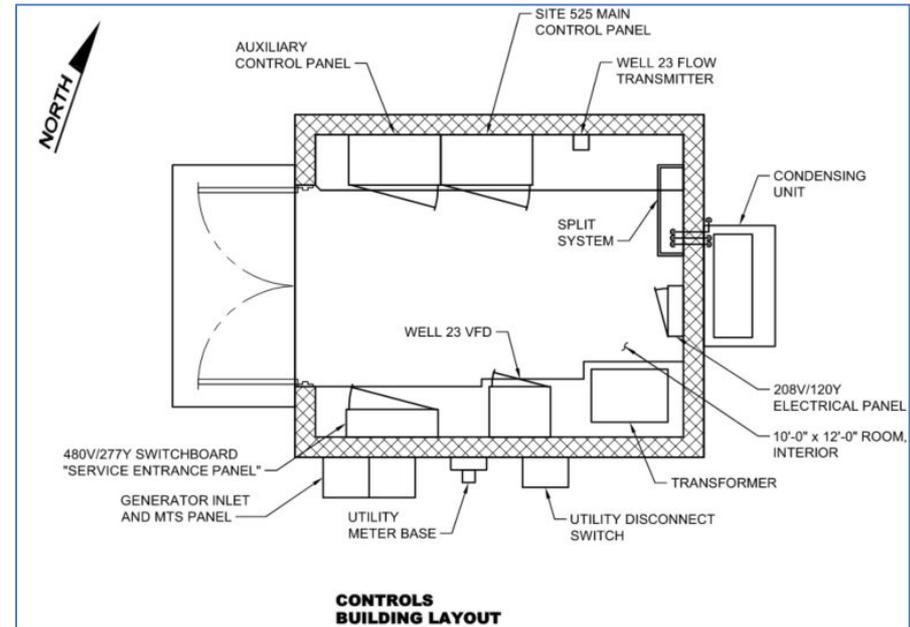
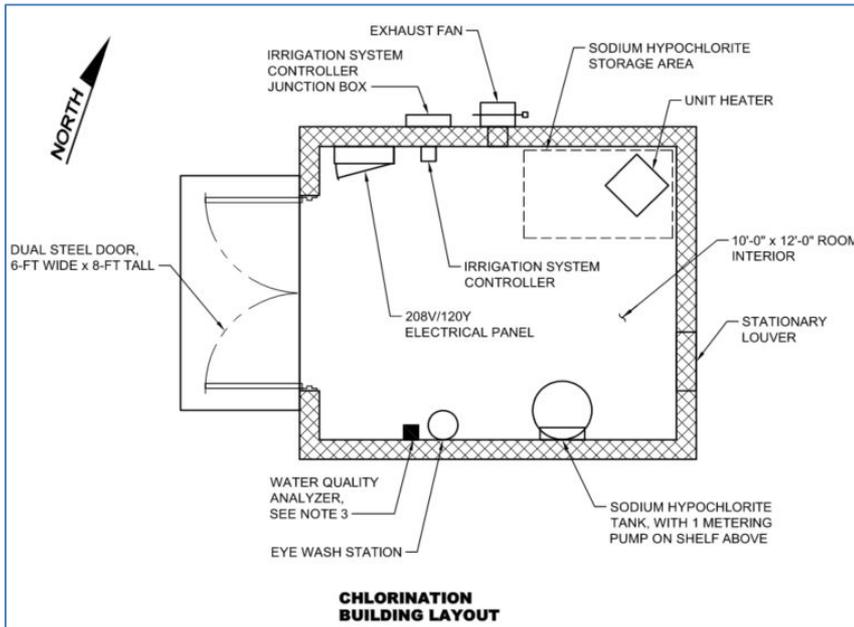
# EXISTING SITE CONDITIONS 2 OF 2



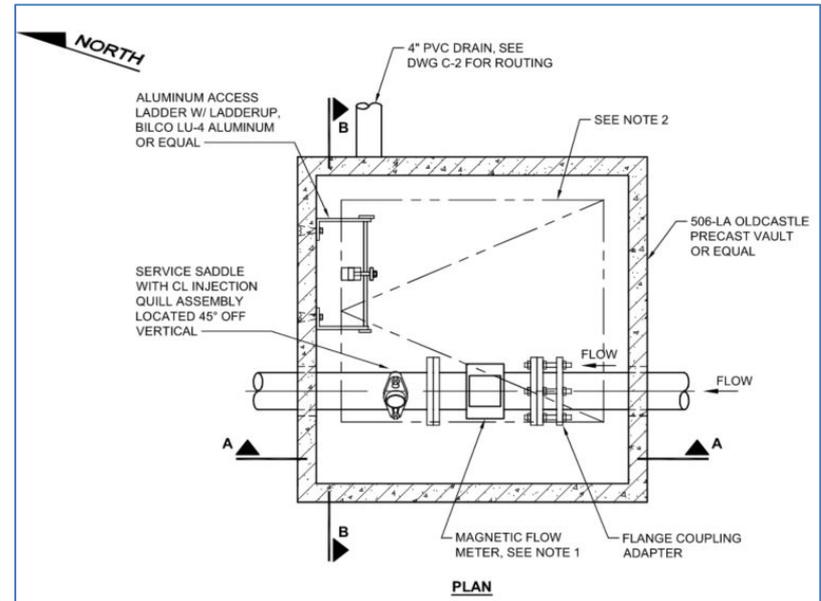
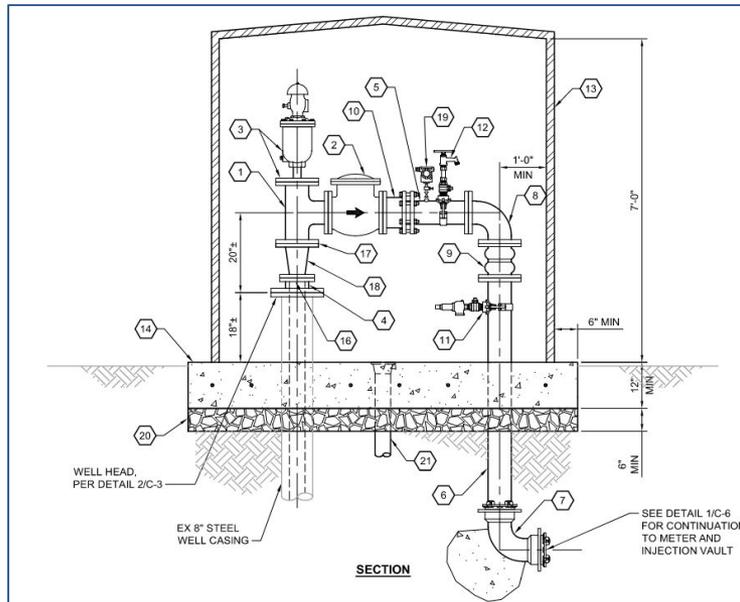
# THE DESIGN – SITE PLAN AND BUILDING ELEVATION



# THE DESIGN – BUILDING LAYOUTS

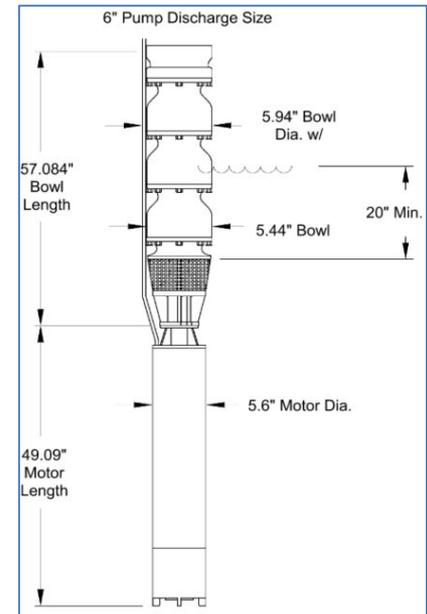
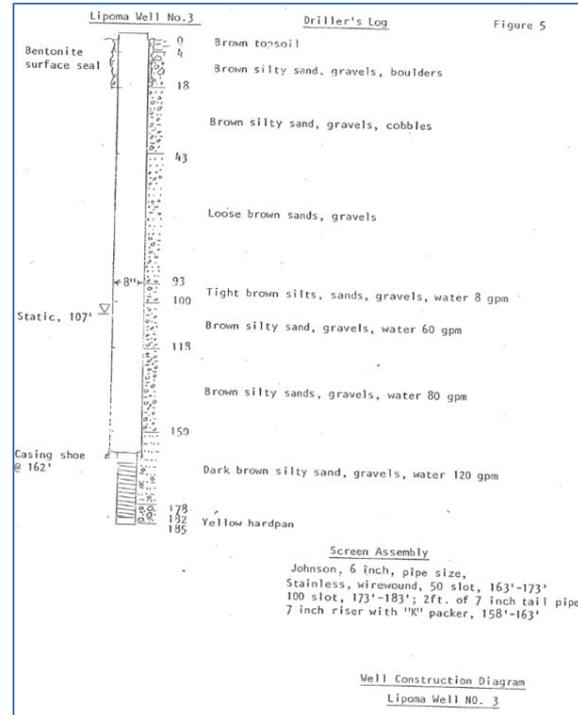


# THE DESIGN – WELLHEAD ENCLOSURE & VAULT



# WELL CHALLENGES

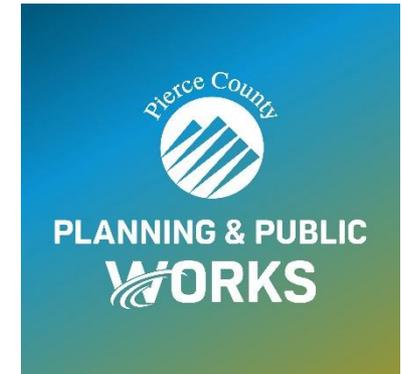
1. Inaccurate well records
  1. Discrepancies between well log and video inspection
  2. Private well for irrigation not under the same scrutiny as a public well for municipal supply
2. 8-inch well casing size a challenge for submersible pumps
  1. Smaller diameter bowls and longer pump assembly
3. Limited water over pump when operating



Re-Use

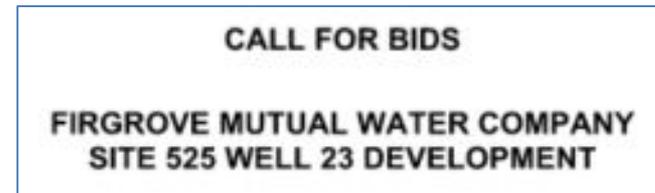
# PERMITTING

1. Pierce County Site Development, Mechanical, & Plumbing
2. No building permit required because not over 120 sq. ft.
3. Landscape screening requirements waived
  1. Waived due to existing shrubs already planted and
  2. Federal Bio Terrorism Preparedness and Response Act of 2002
    1. Advocates for open sight lines to above-grade water facilities to dissuade trespassing, vandalism, and potential contamination of public water supply



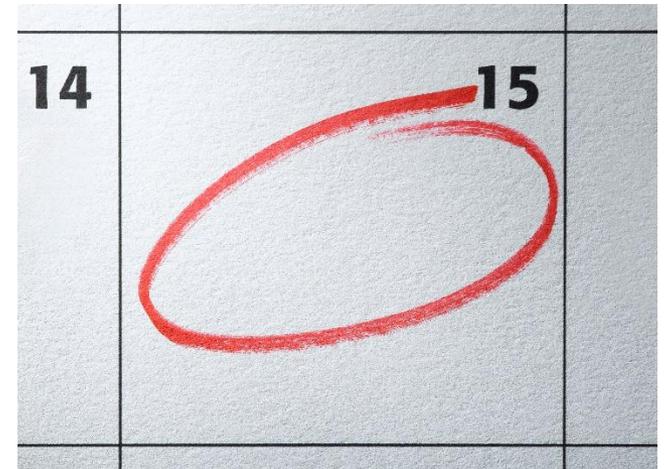
# CURRENT PROJECT STATUS

1. Received Conditional Source Approval from WA DOH in April
  1. Full source approval once constant rate pump test completed and reviewed after new pump installed
2. Preparing to bid project in May



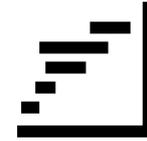
# ANTICIPATED CONSTRUCTION SCHEDULE

1. June 2025 – Notice to Proceed
2. November 2025 – Substantial Completion
3. December 2025 – Physical Completion



# PRESENTATION TAKEAWAYS

1. Responding to changing water system demands requires **LONG TERM PLANNING**
2. Look for opportunities for **RE-USE** of existing infrastructure
3. Develop mutually beneficial **PARTNERSHIPS**
4. Something else??



# ACKNOWLEDGMENTS



## Project Owner:

Larry Jones, Ryan Lantz, and Kristen Best



## Civil, Structural, & Electrical:

Chris Kelsey, Jordan Zier, Gustavo Franco, and Nate Palmatier

The logo for PSOMAS consists of the letters "P S O M A S" in a white, all-caps, sans-serif font, centered within a dark blue rectangular box.

P S O M A S

## Survey:

Mike Bowen



## Mechanical:

Ola Jarvegren and Soheil Vafa

# QUESTIONS?

