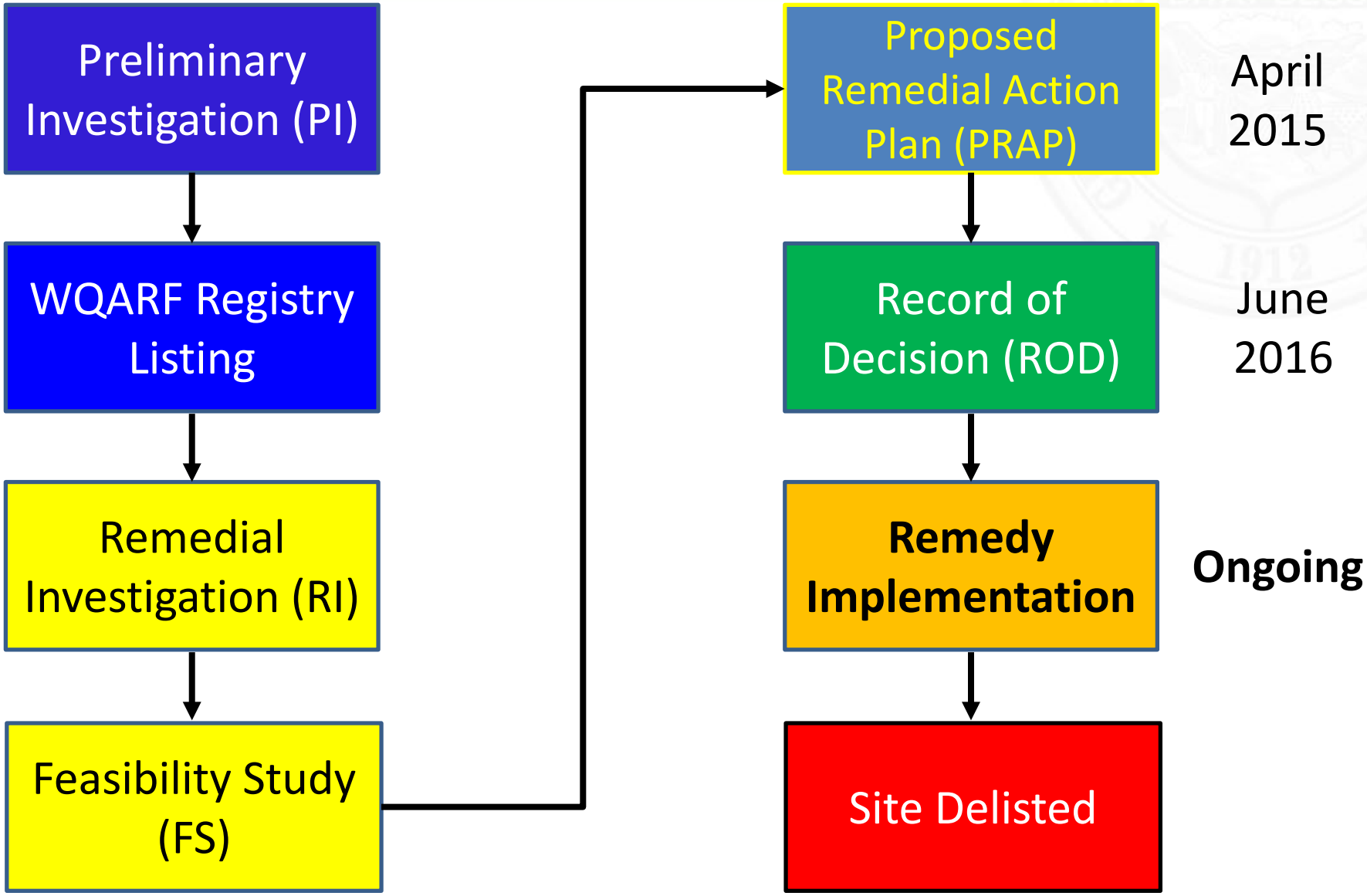
Project Update
7th Ave and Bethany Home Road WQARF Site

Tom Titus
CAB Meeting
June 11, 2020

ADEQ
Arizona Department of Environmental Quality

WQARF Process



Need For Remediation

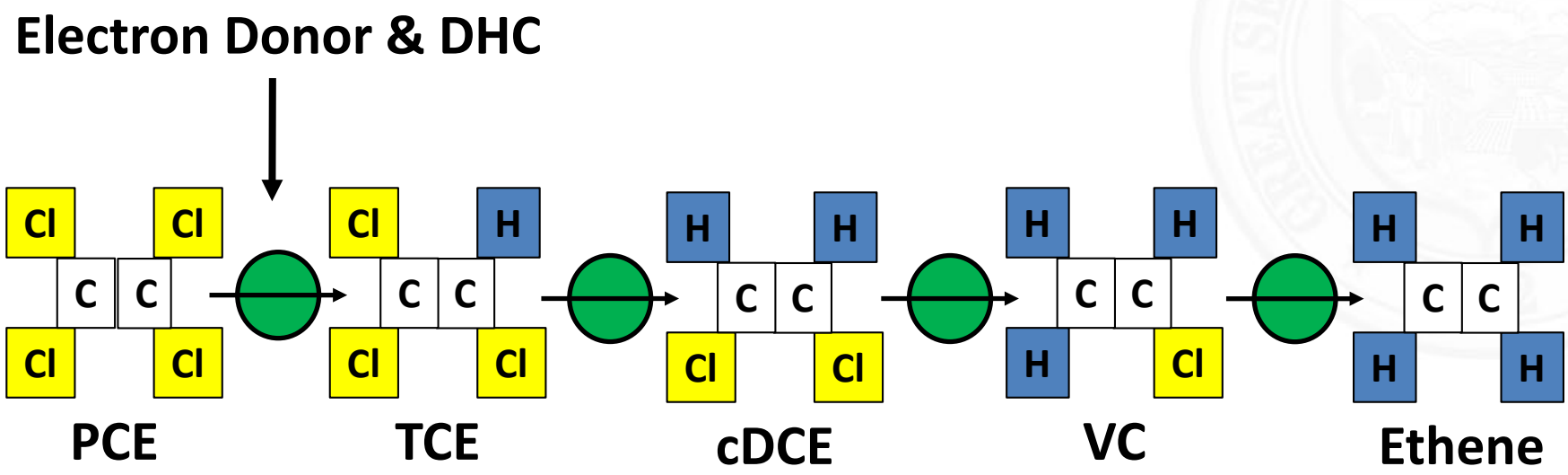
- Groundwater Impacted with Concentrations of Tetrachloroethene (PCE) above the Aquifer Water Quality Standard (AWQS)
- Groundwater Is Current Source of Irrigation Water and Future Source of Drinking Water

Selected Remedial Action*

- In-Situ Enhanced Reductive Dechlorination (ERD)
  - Injections
  - Performance Monitoring
- Monitored Natural Attenuation (MNA)
  - Natural Degradation of Plume
- Contingency for Wellhead Treatment at SRP Well

*Record Of Decision (ROD) dated June 28, 2016

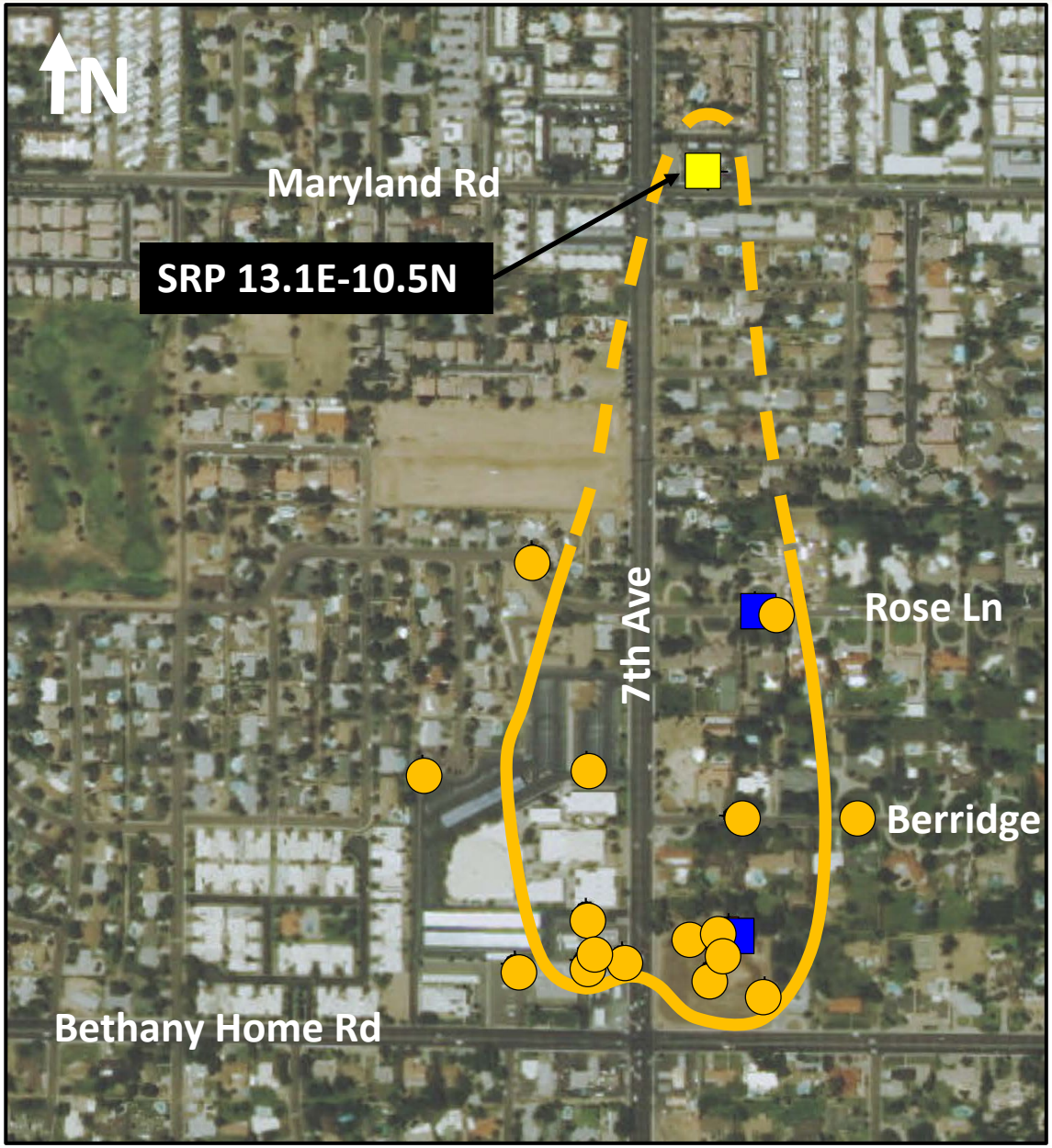
Enhanced Reductive Dechlorination



General Process:

- Carbon Substrate Addition (Food & Hydrogen) - "Electron Donor"
- Degradation/Fermentation Creates Anaerobic Conditions
- Specialized Anerobic Bacteria (DHC) Replace Cl with H
- Chlorinated Ethenes Act as "Electron Acceptors"
- Competition: Other "Electron Acceptors" (CO_2, SO_4, Fe, Mn, NO_3, O_2)

PCE in Groundwater (April 2019)



- Water Supply Well
- Shallow Monitoring Well (70 to 110 ft bgs)
- Deep Monitoring Well (175 to 225 ft bgs)
- Concentration Contour (5 ppb)

<u>April 2019</u>

PCE = <0.5 to 1,100 ppb

Depth to GW = 90 ft bgs

Groundwater Flow Direction = North

Remedial Activities

- November 2018
  - ERD Injections & Performance Monitoring at Bayless Property
  - Injection Fluid = Emulsified Vegetable Oil (EVO)
- Spring 2020
  - ERD Injections & Performance Monitoring Initiated along Berridge Lane
  - Injection Fluid = Corn Syrup

Bayless Property Injection Summary

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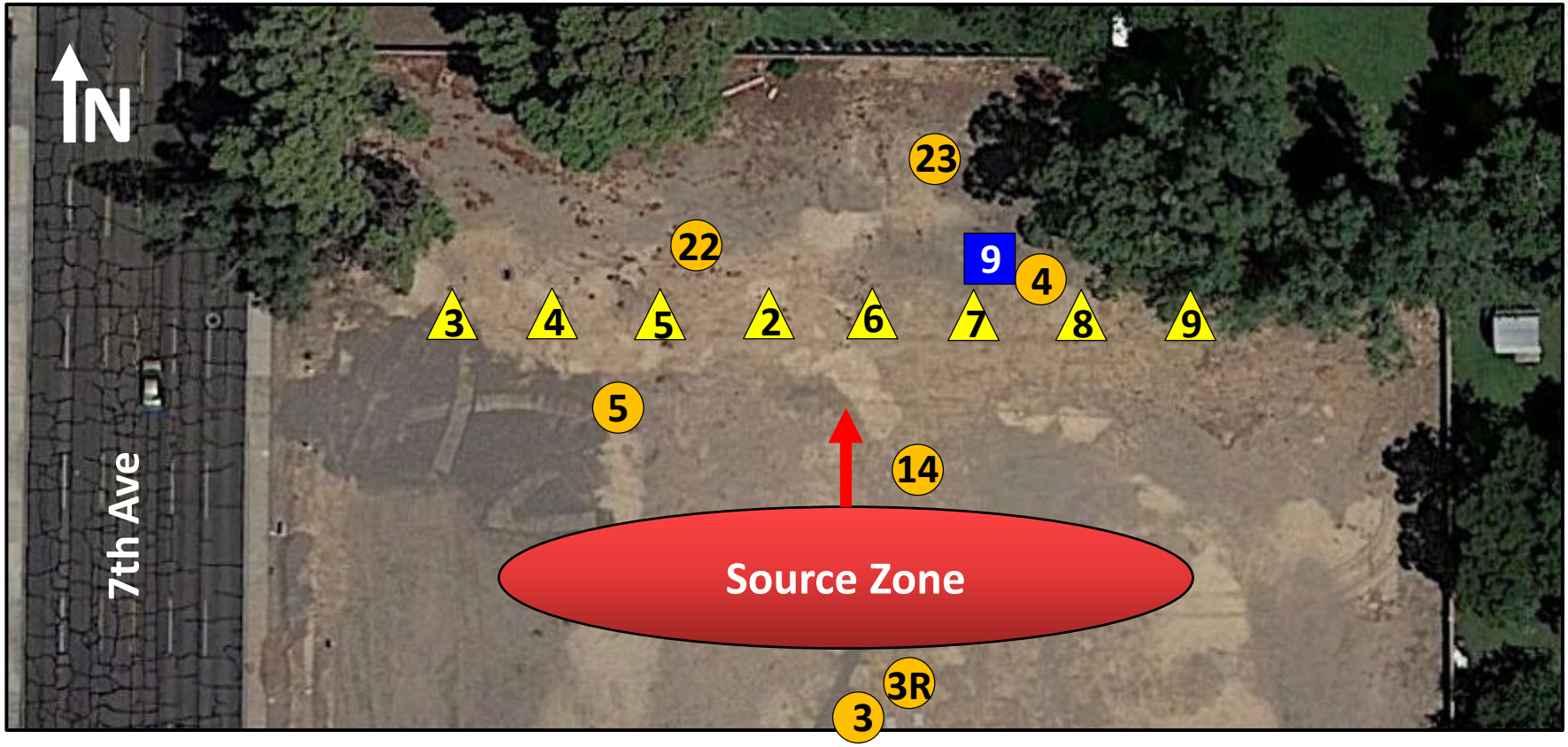
Bayless Property Detail Map

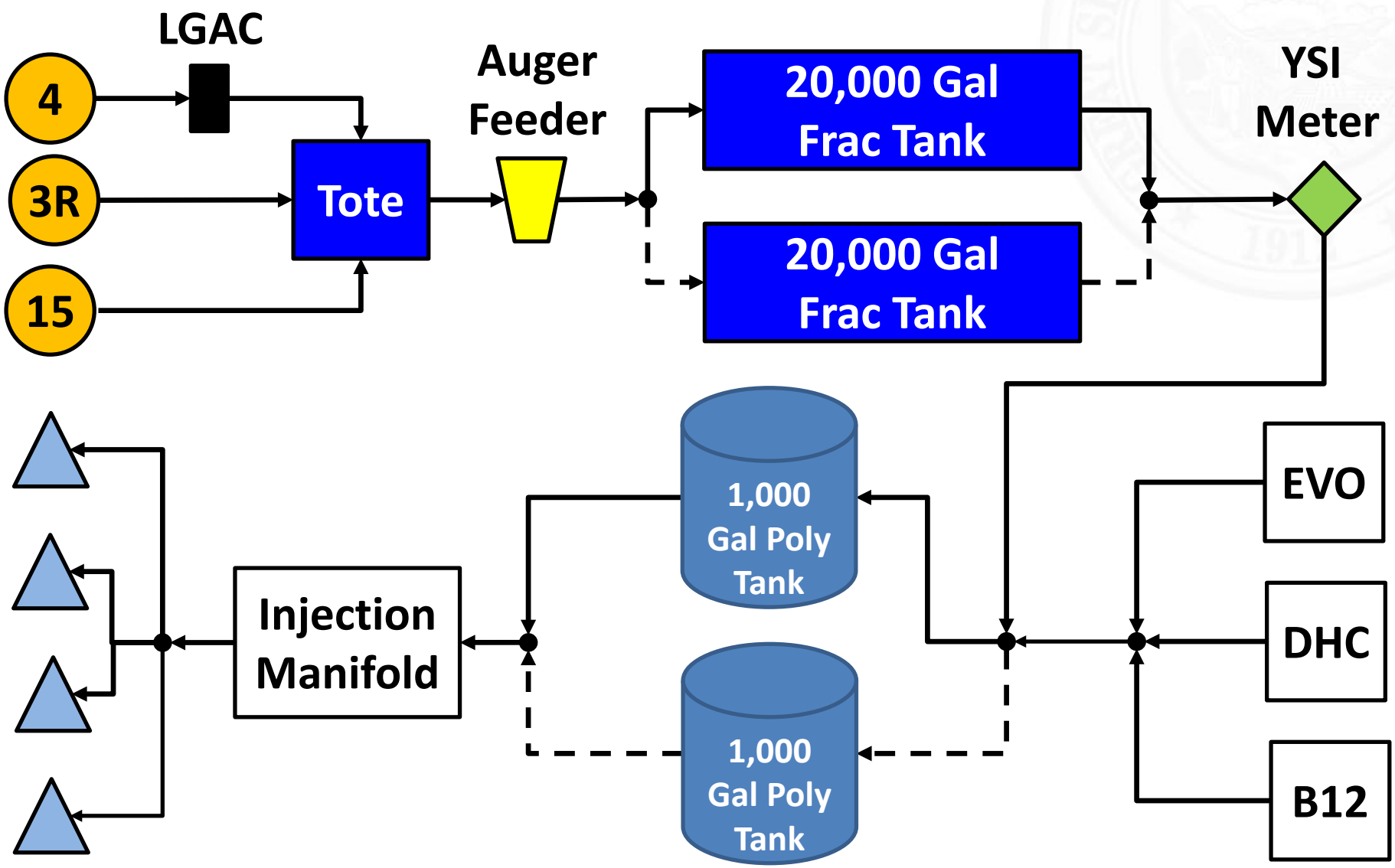


Injection Well (85 to 100 and 107 to 122 ft bgs)

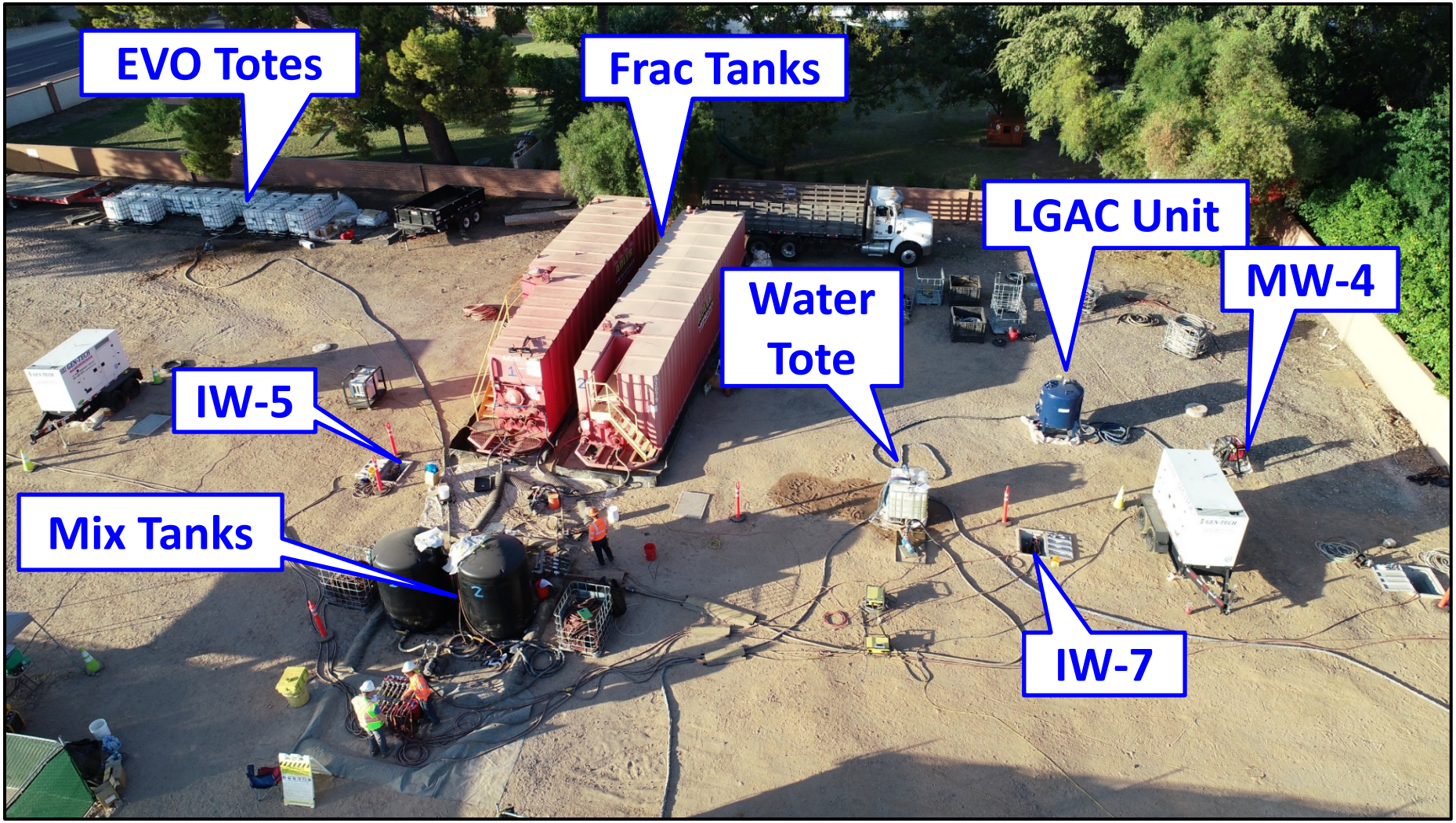
Shallow Monitoring Well (70 to 110 ft bgs)

Deep Monitoring Well (175 to 225 ft bgs)

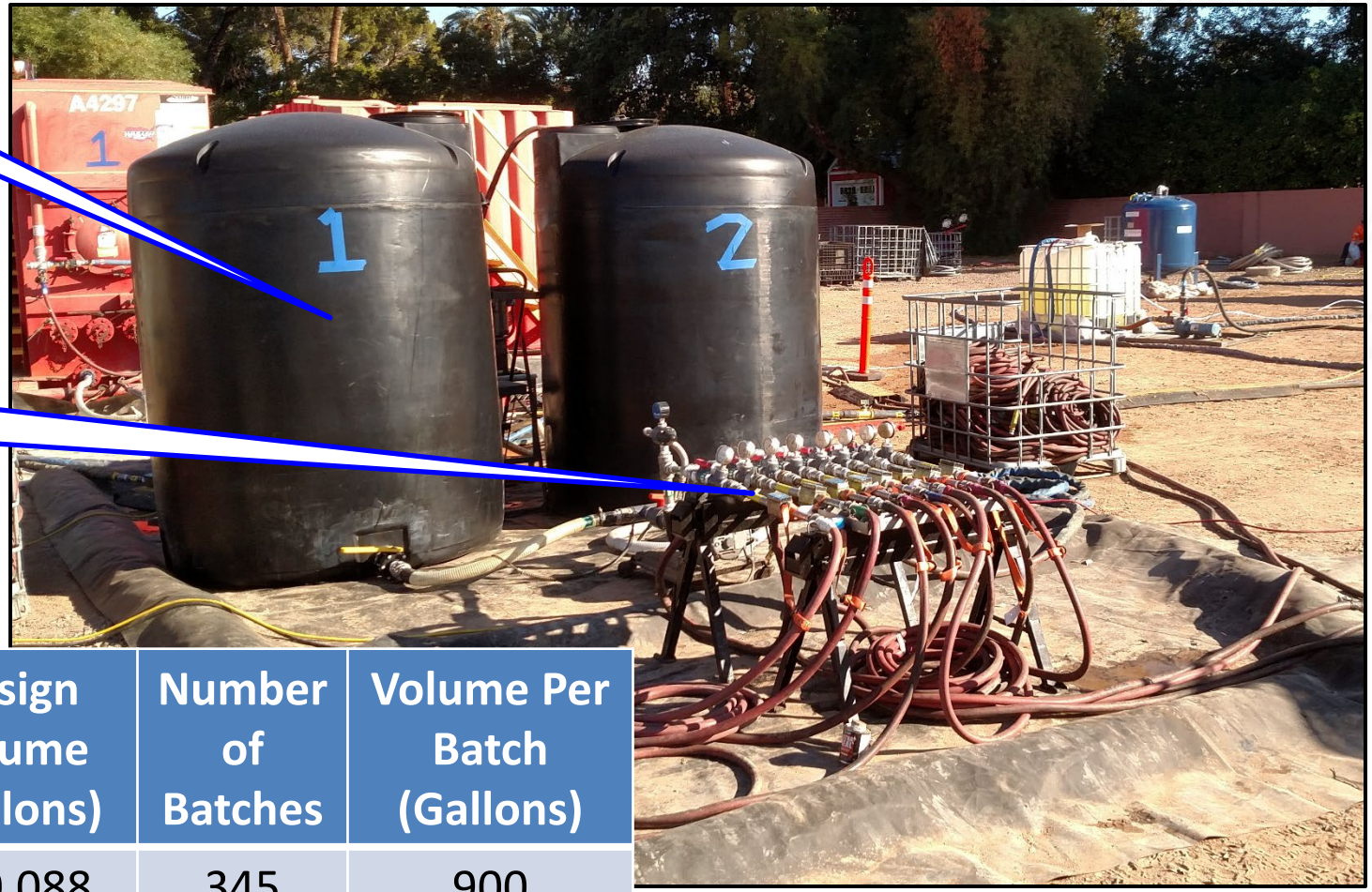
Process Flow Diagram



Equipment Set-Up

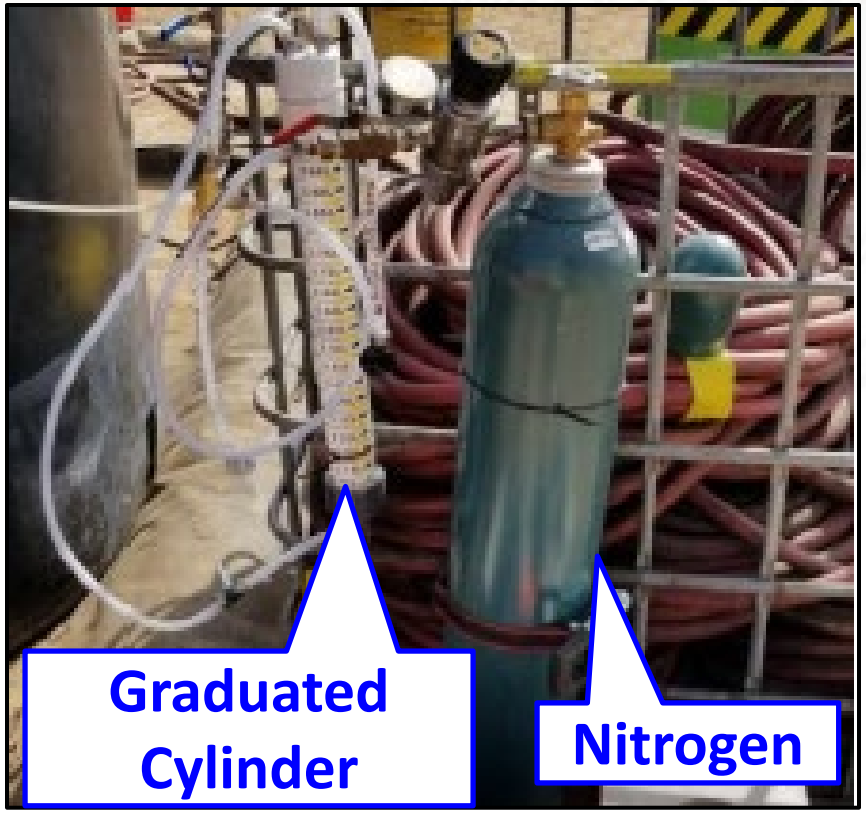


Mix Tanks & Injection Manifold



Ingredient	Design Volume (Gallons)	Number of Batches	Volume Per Batch (Gallons)
Water	310,088	345	900
EVO	7,088	345	20.5
DHC	10	345	110 mL
B12	1,120 oz	345	6 oz

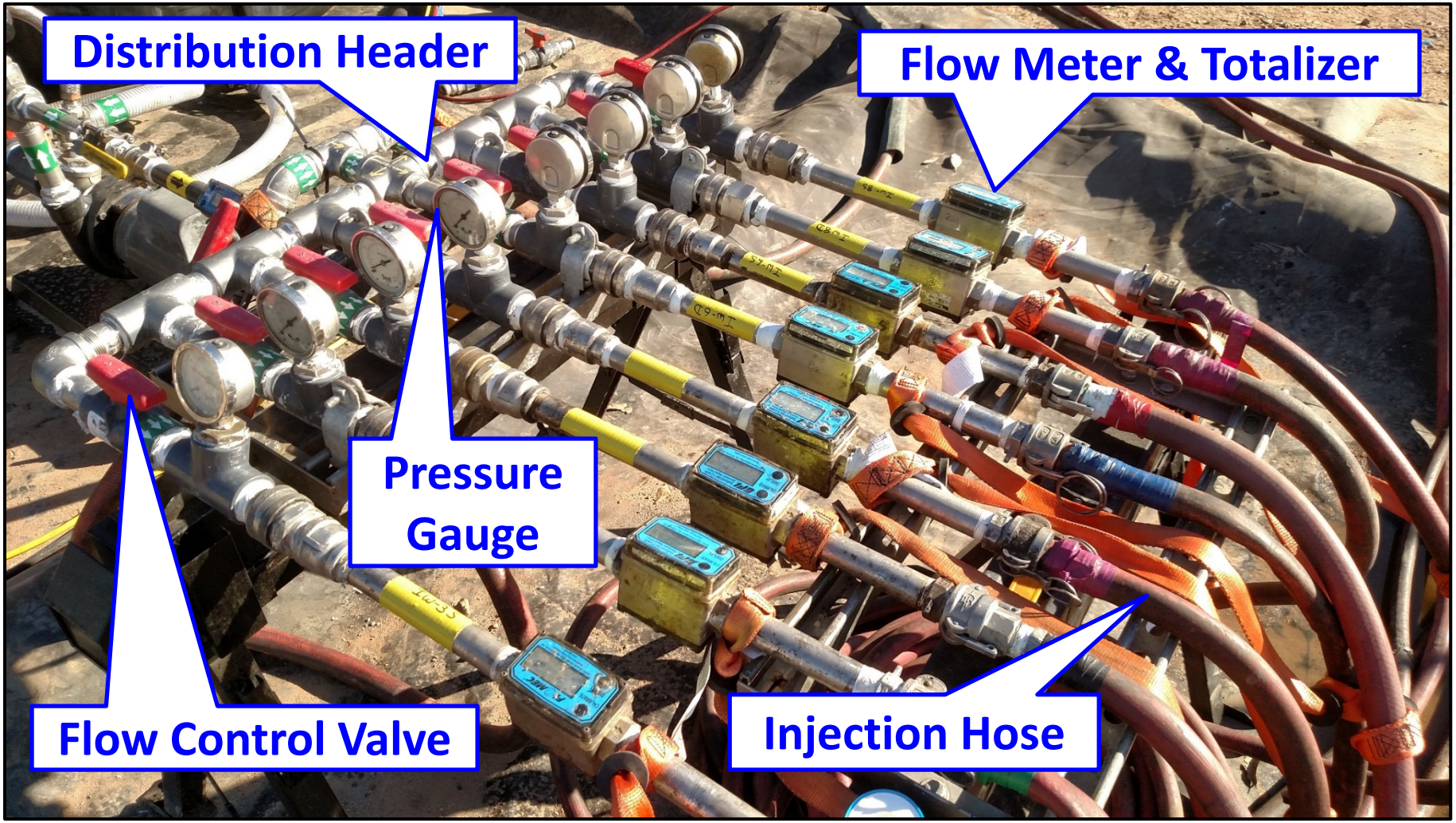
Bioaugmentation



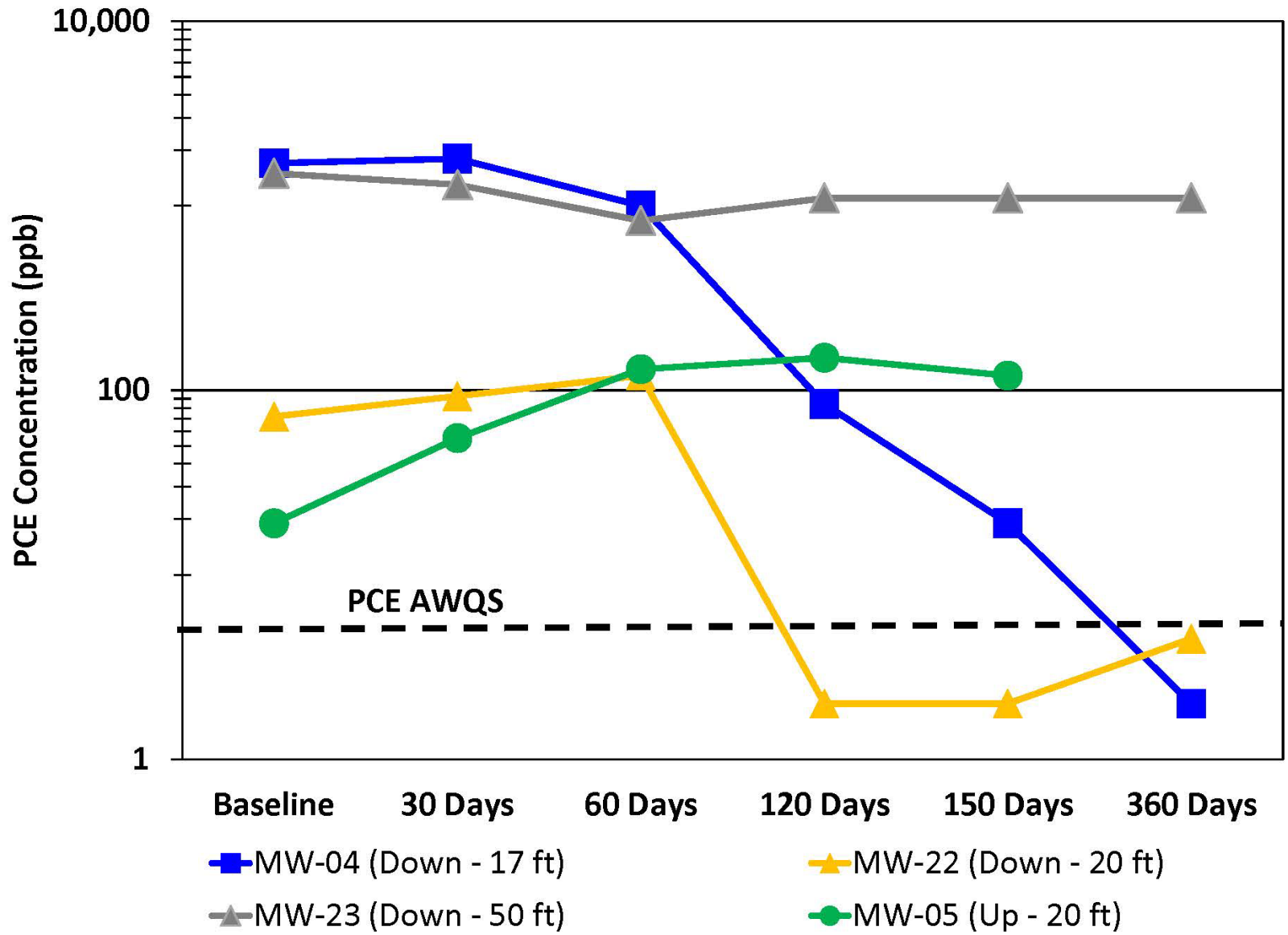
<u>DHC Dosage</u>

DHC @ 110 mL/Batch

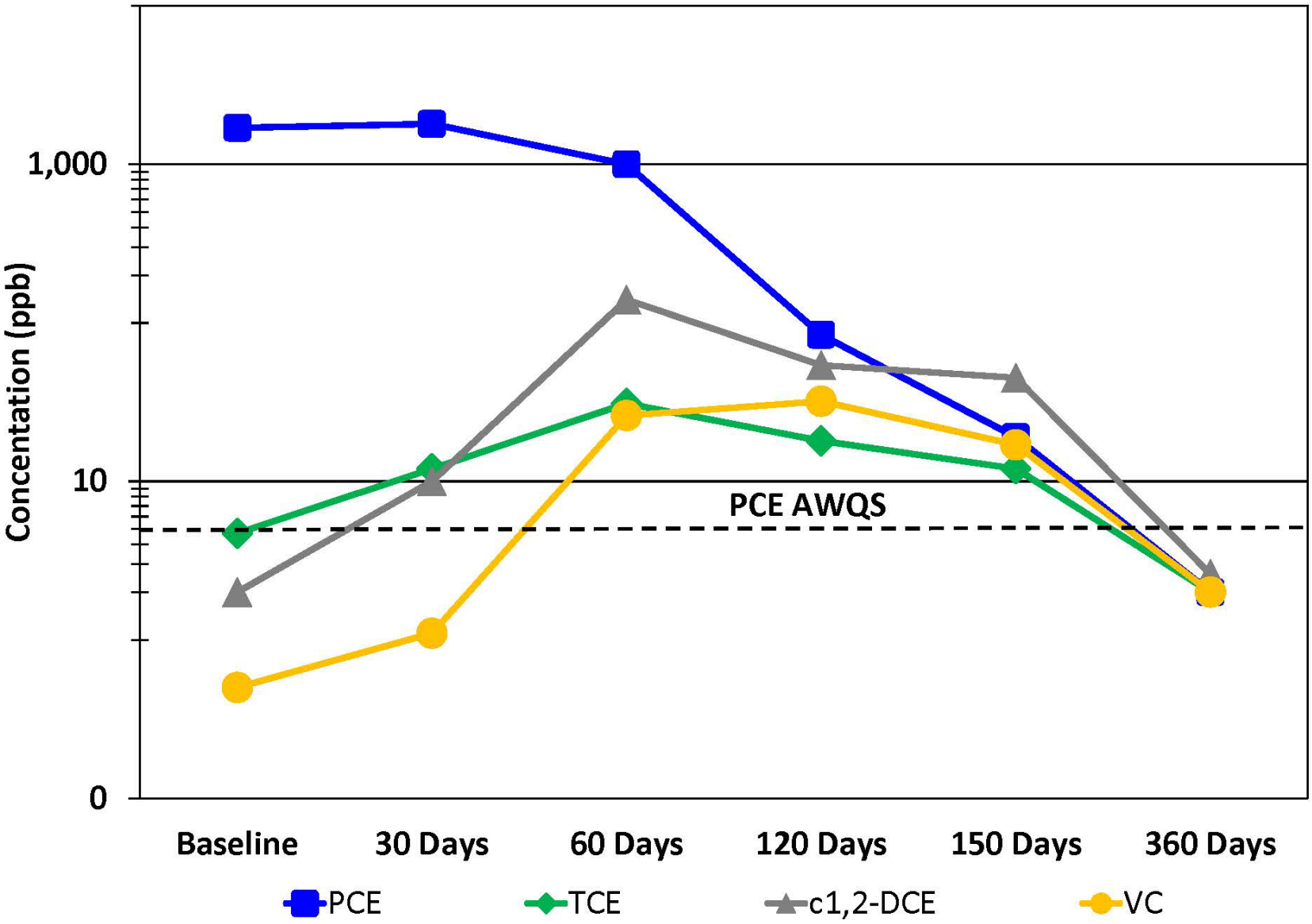
Injection Manifold



PCE Concentration Trend



MW-04 – VOC Concentration Trend



Bayless Injection Summary

- Injections Successful!!!!
  - Reducing Environment Established
  - Injection Radius of Influence = 20 feet
  - PCE Concentrations Reduced
  - Full Dechlorination at MW-04

Berridge Lane Injection Summary

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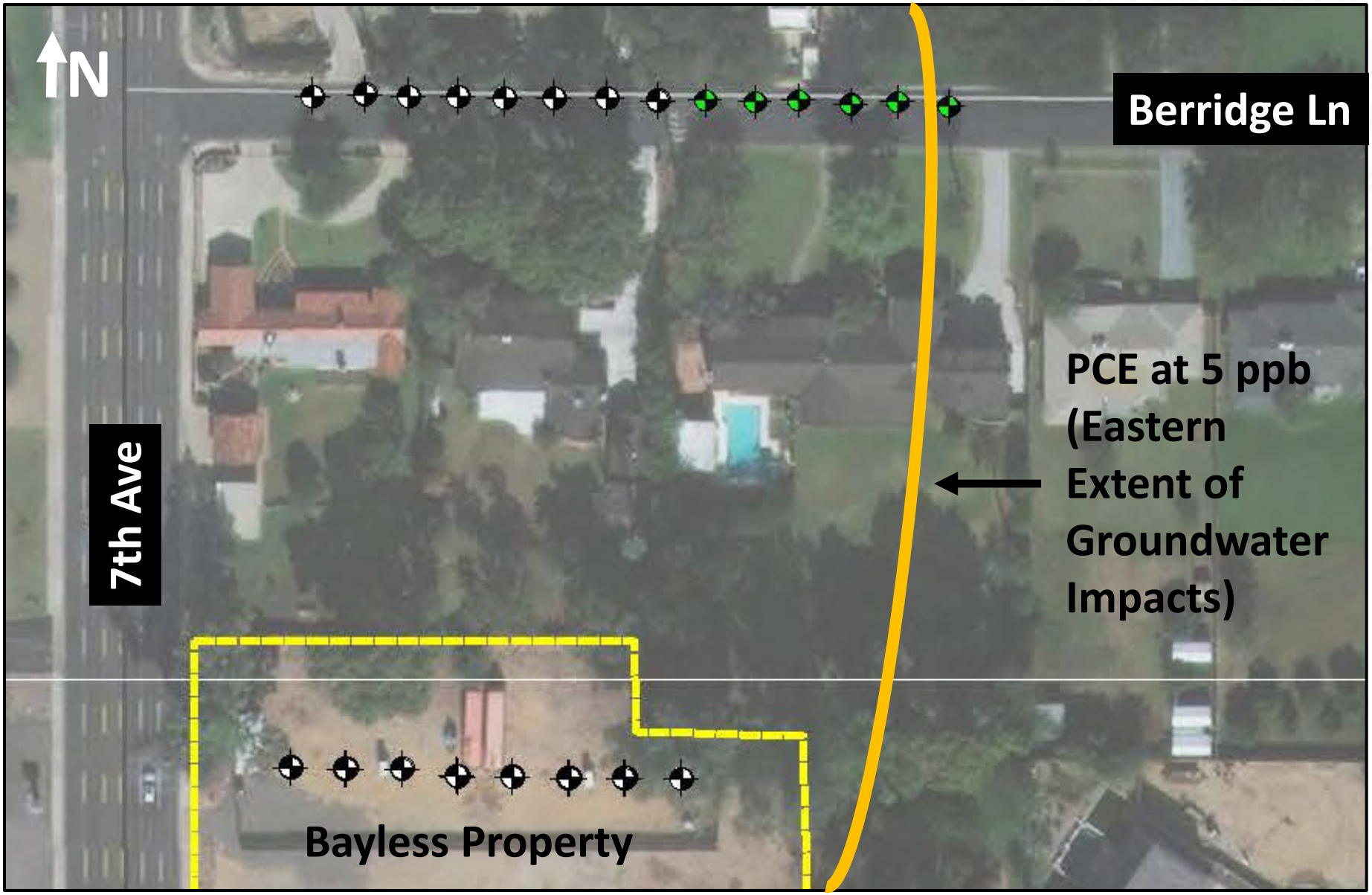
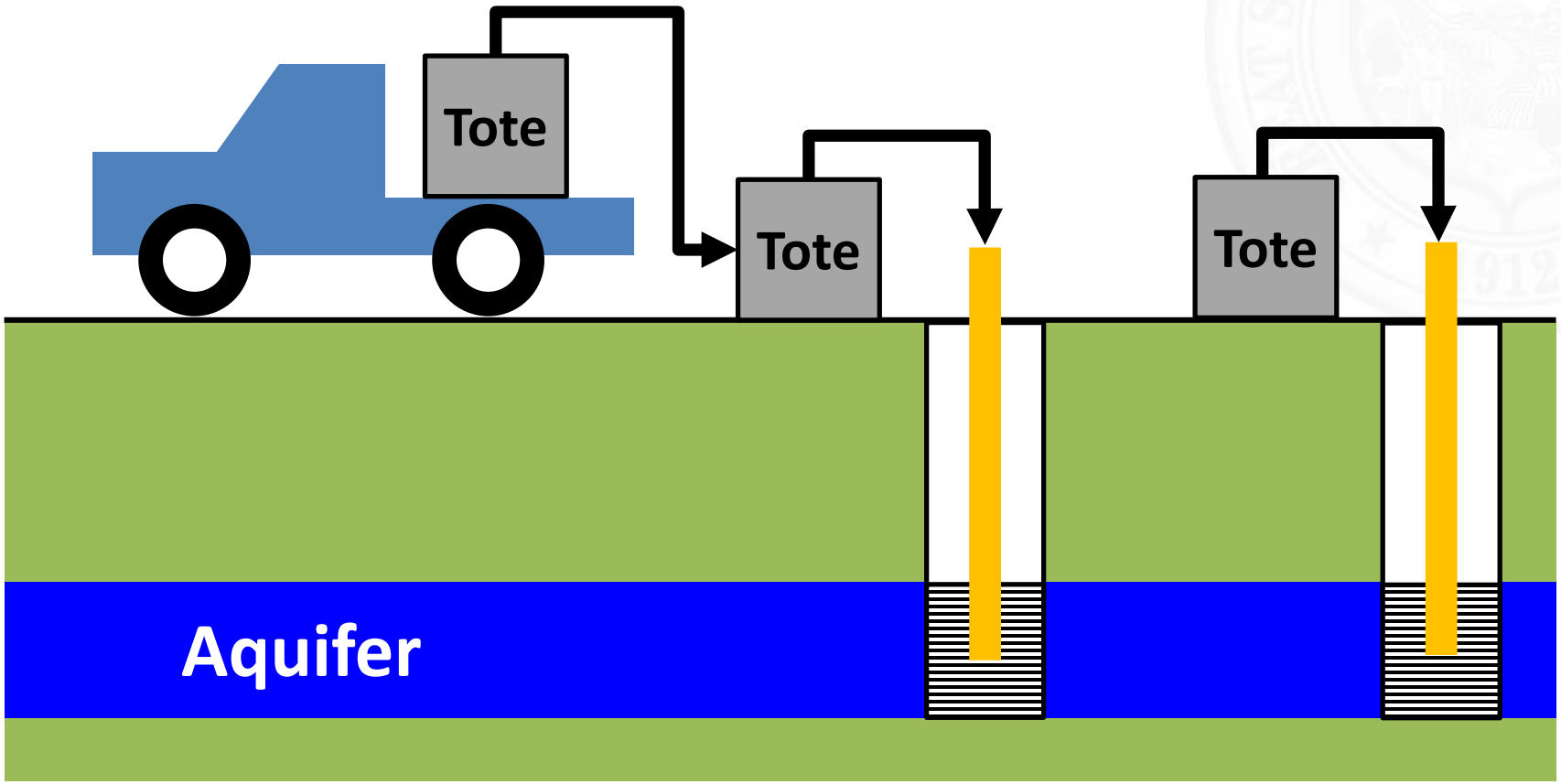
Berridge Lane Detail Map

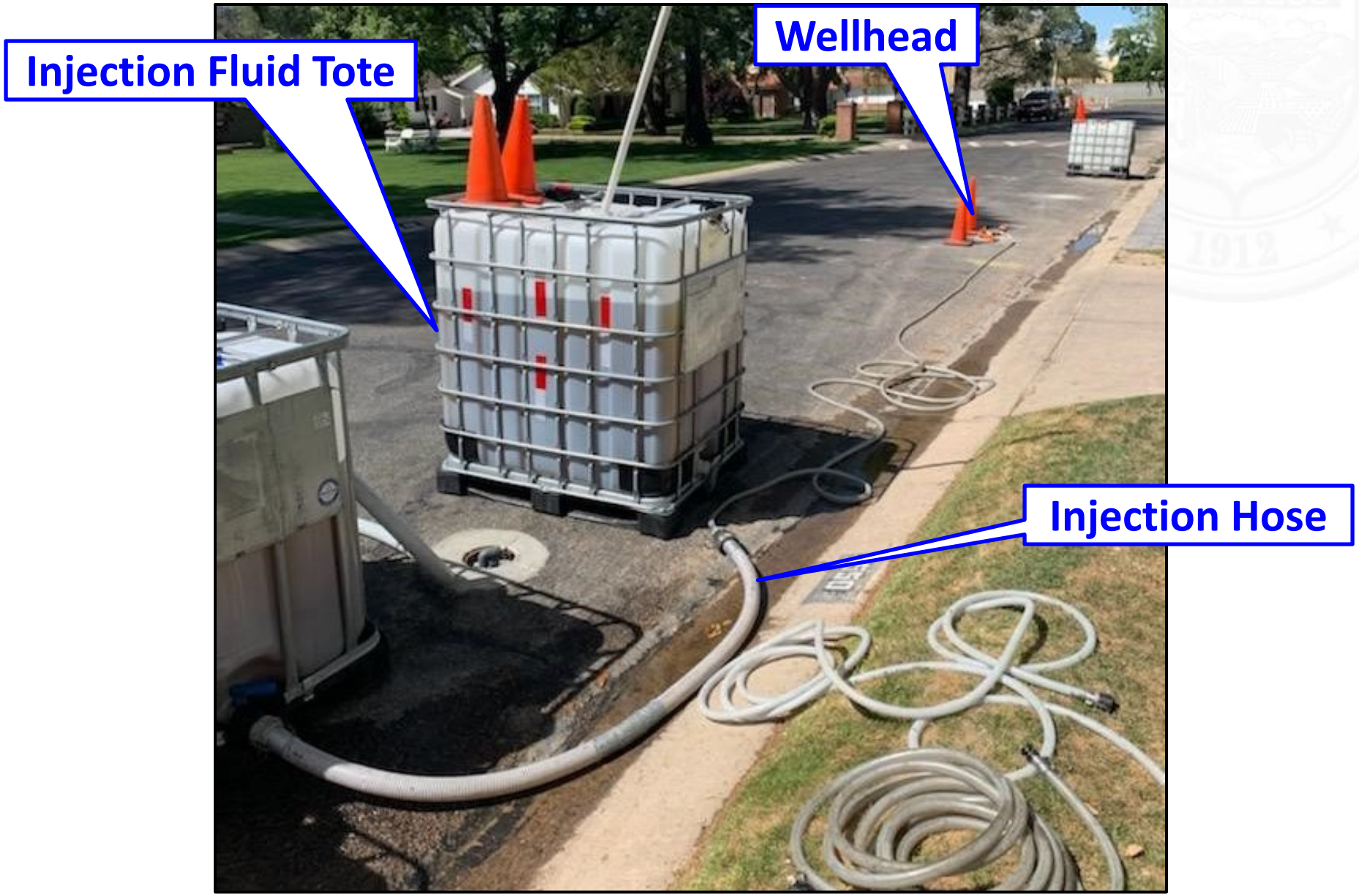


Process Flow Diagram



Injection Fluid = 175 Gallons of Corn Syrup and 1,000 Gallons of Water Per Screen Interval

Berridge Lane Injection



Next Steps

- Bayless Property
  - 1 More Performance Monitoring in Nov 2020
  - Additional Injections (TBD)
- Berridge Lane
  - Injections & Performance Monitoring (July 2020, Nov 2020, & March 2021)

Questions/Contact Information

Contact Information:

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