Water Update

Overview of Water System & Current Projects

Justin Shobe, PE – District Water Engineer

June 5, 2019

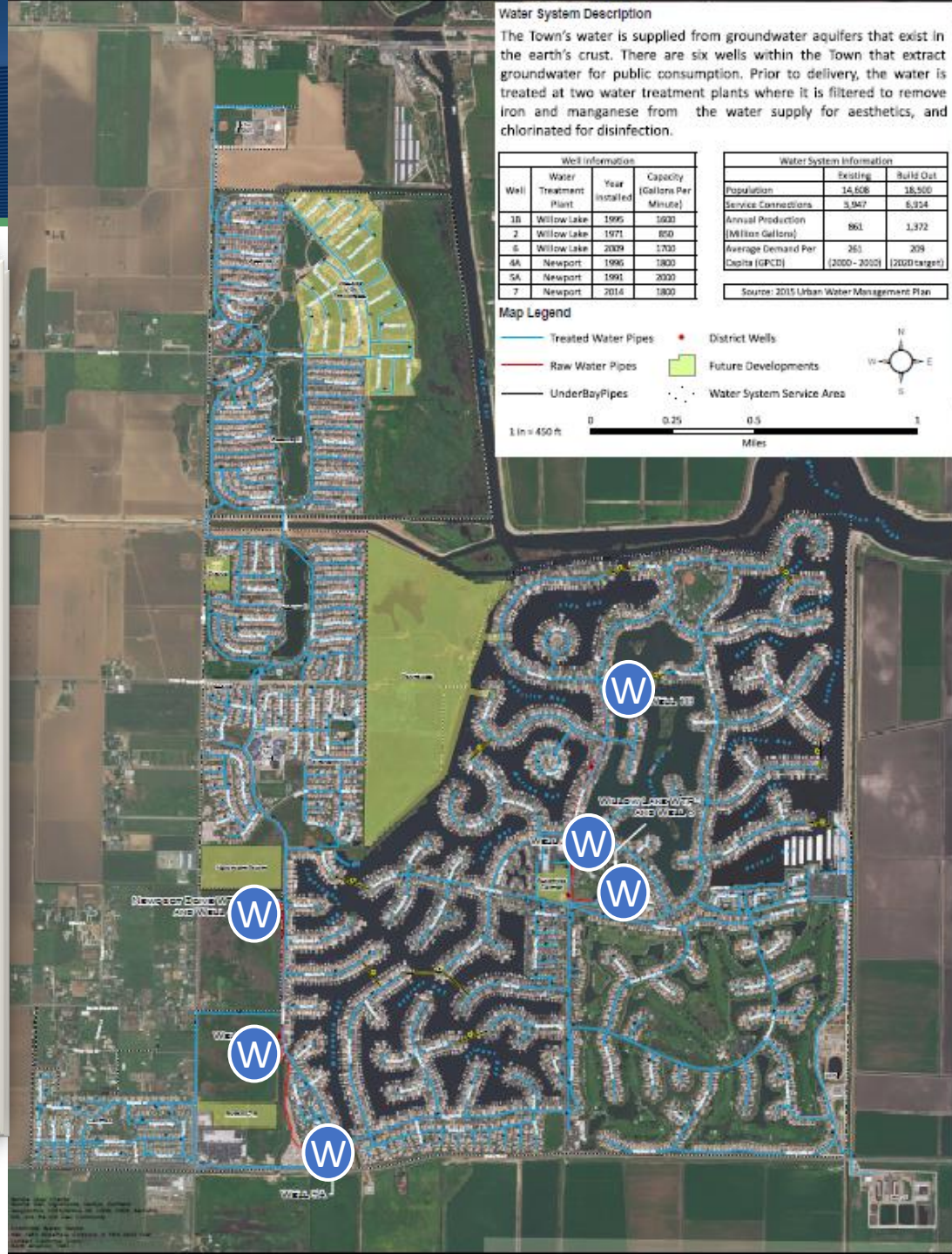
Luhdorff & Scalmanini
Consulting Engineers

Topics

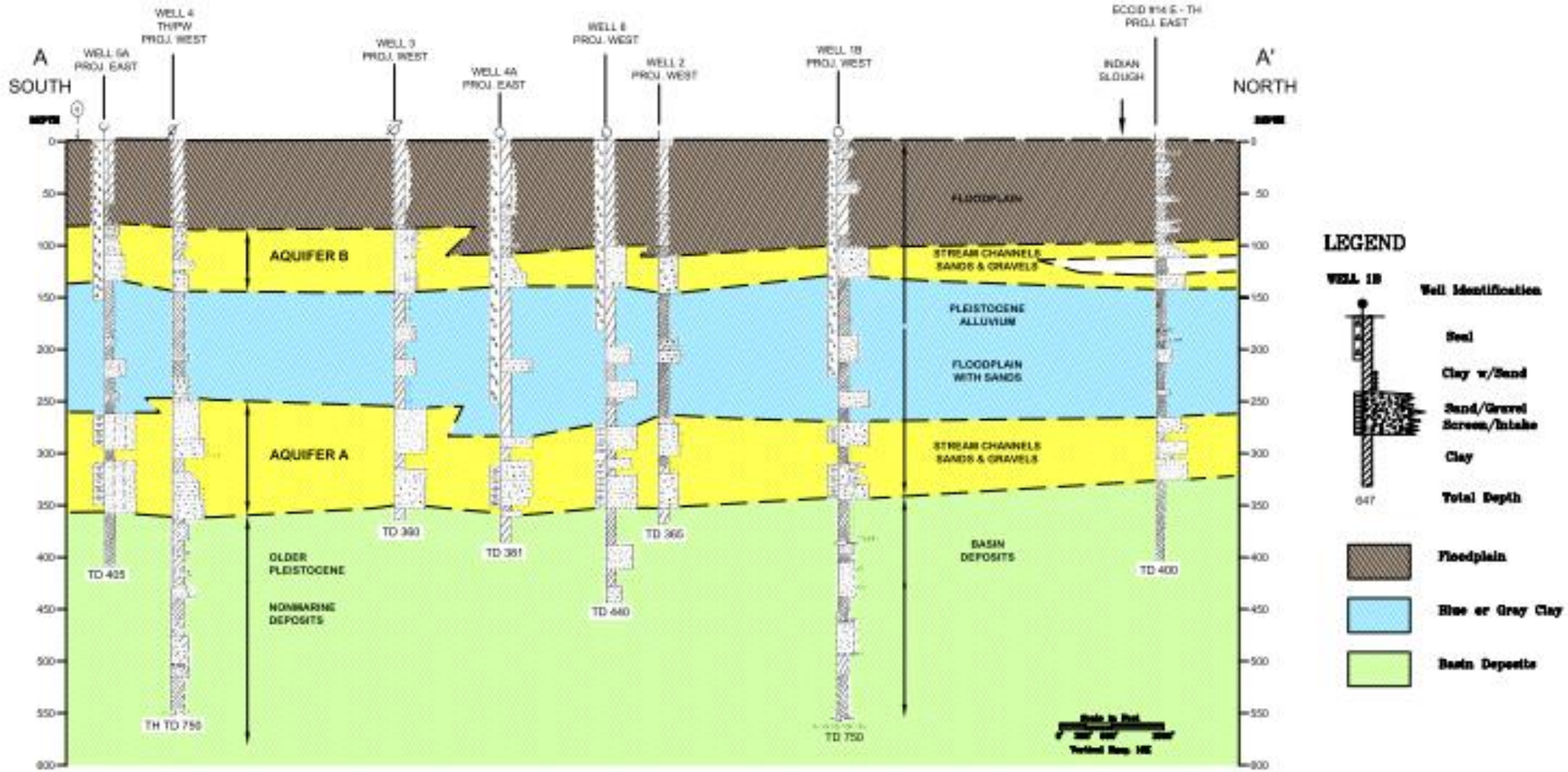
1. **Water System Overview**
2. **Well 2 and Well 4A Rehabilitations**
3. **Well 8 Alternatives Study**
4. **Laguna Court Pipeline Crossing Break**
5. **PLC and SCADA Upgrades for Newport Drive WTP**

Water System

Booster

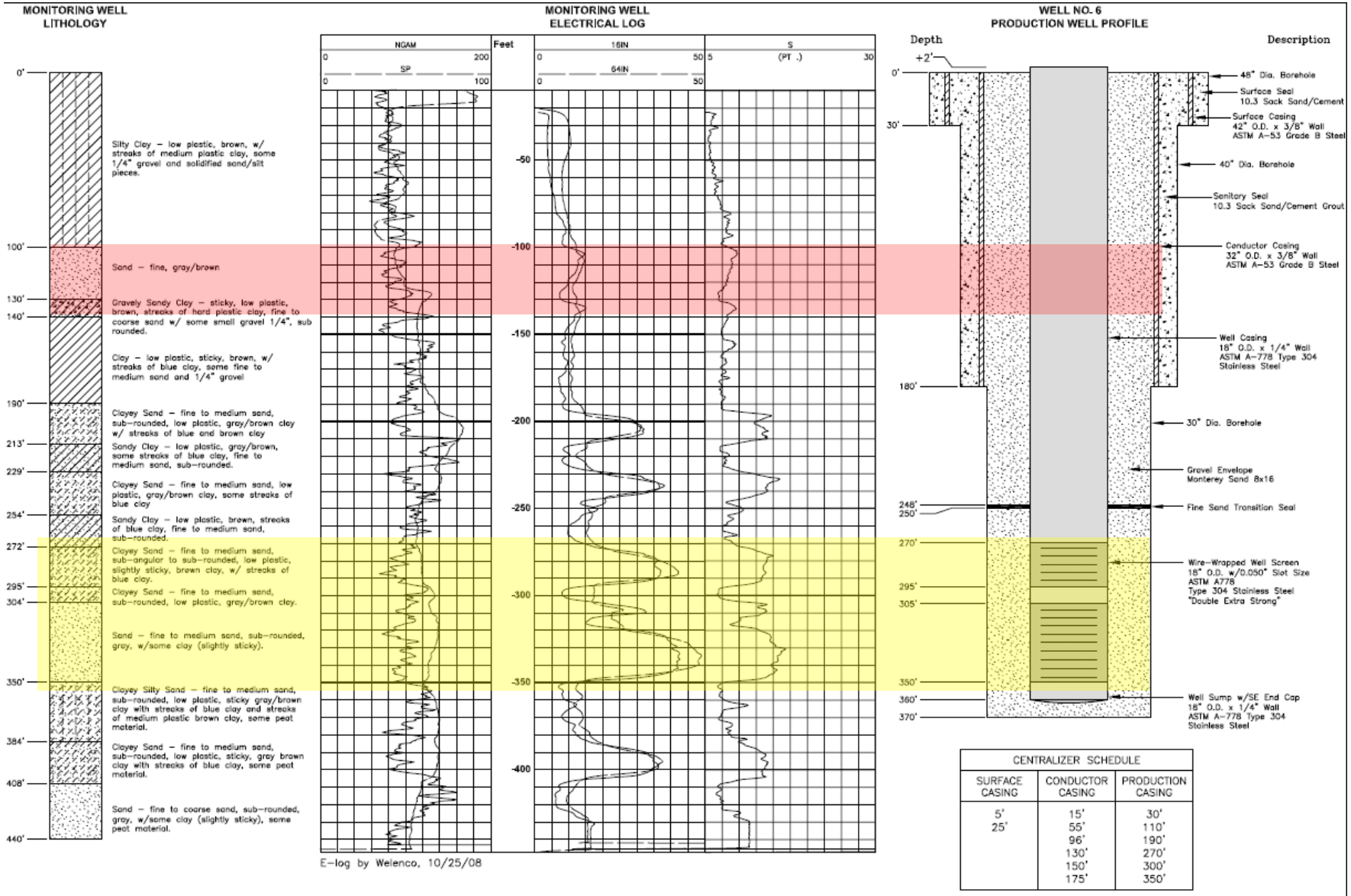


Groundwater in Discovery Bay



Groundwater in Discovery Bay

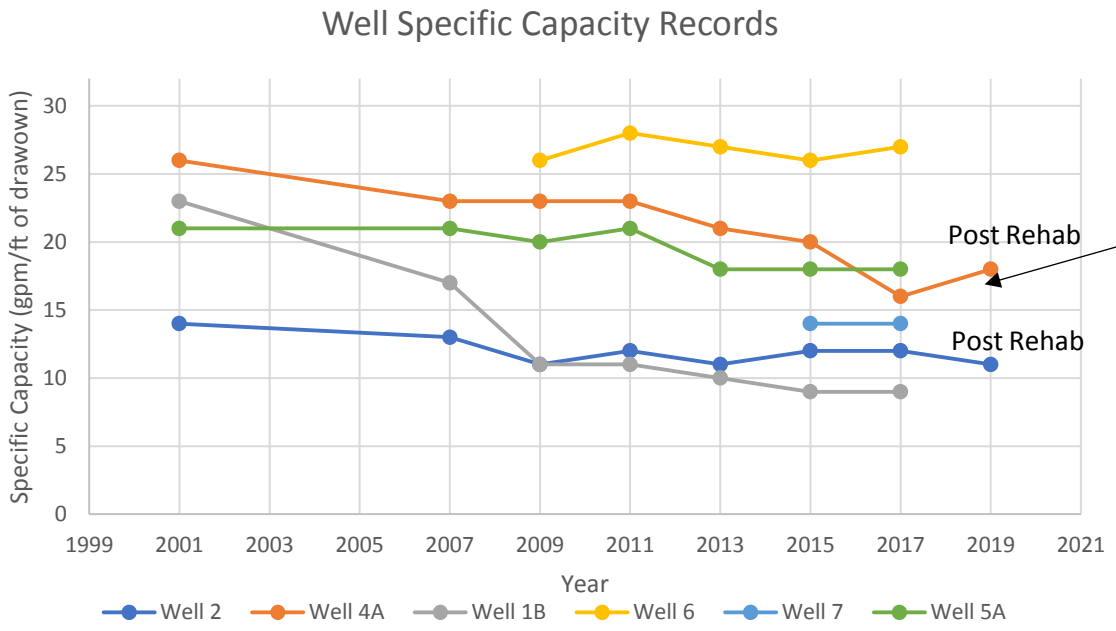
Well Design Criteria



Wells in Discovery Bay

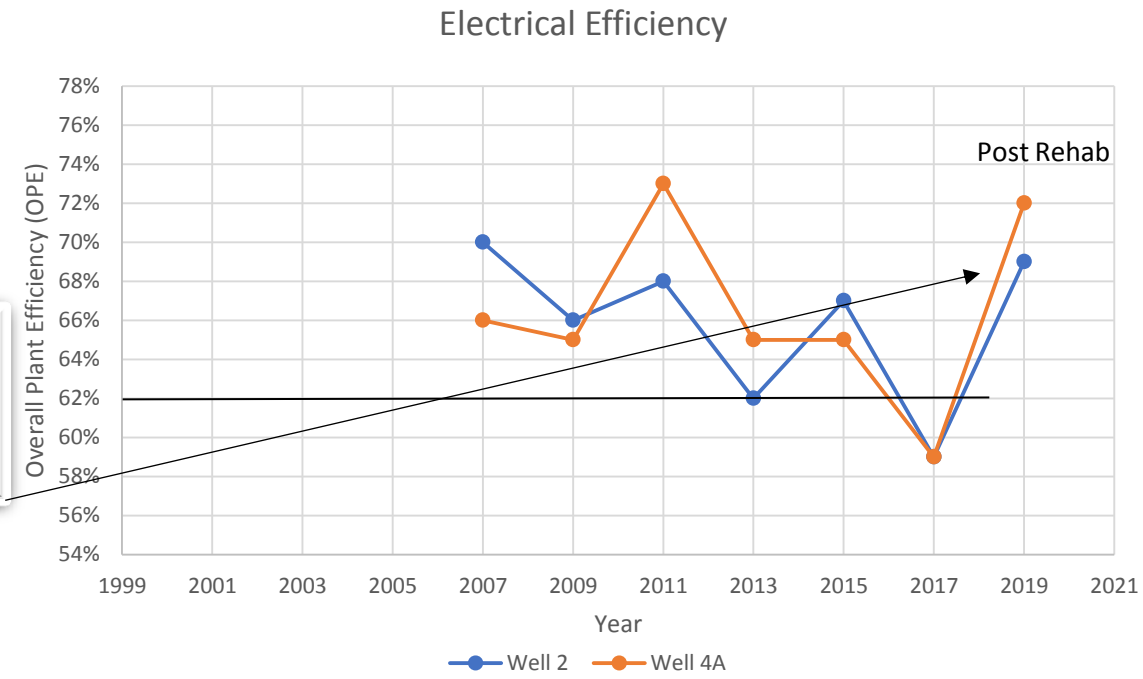
	Well 1B	Well 2	Well 6	Well 4A	Well 5A	Well 7
Year Well Drilled (age)	1995 (24 yrs)	1971 (48 yrs)	2009 (10 yrs)	1996 (23 yrs)	1991 (28 yrs)	2014 (5 yrs)
Year Pump Installed (pre-rehab)	2012	2003	2010	2001	2004	2015
Well Depth (ft)	350 ft	348 ft	360 ft	357 ft	357 ft	346 ft
Pump Design Flow	1600 gpm	850 gpm	1700 gpm	1800 gpm	2000 gpm	1800 gpm
Type	Submersible	Oil Lube	Submersible	Submersible	Water Lube	Submersible
WTP Serviced	Willow	Willow	Willow	Newport	Newport	Newport

Well 2 and Well 4A Rehabs

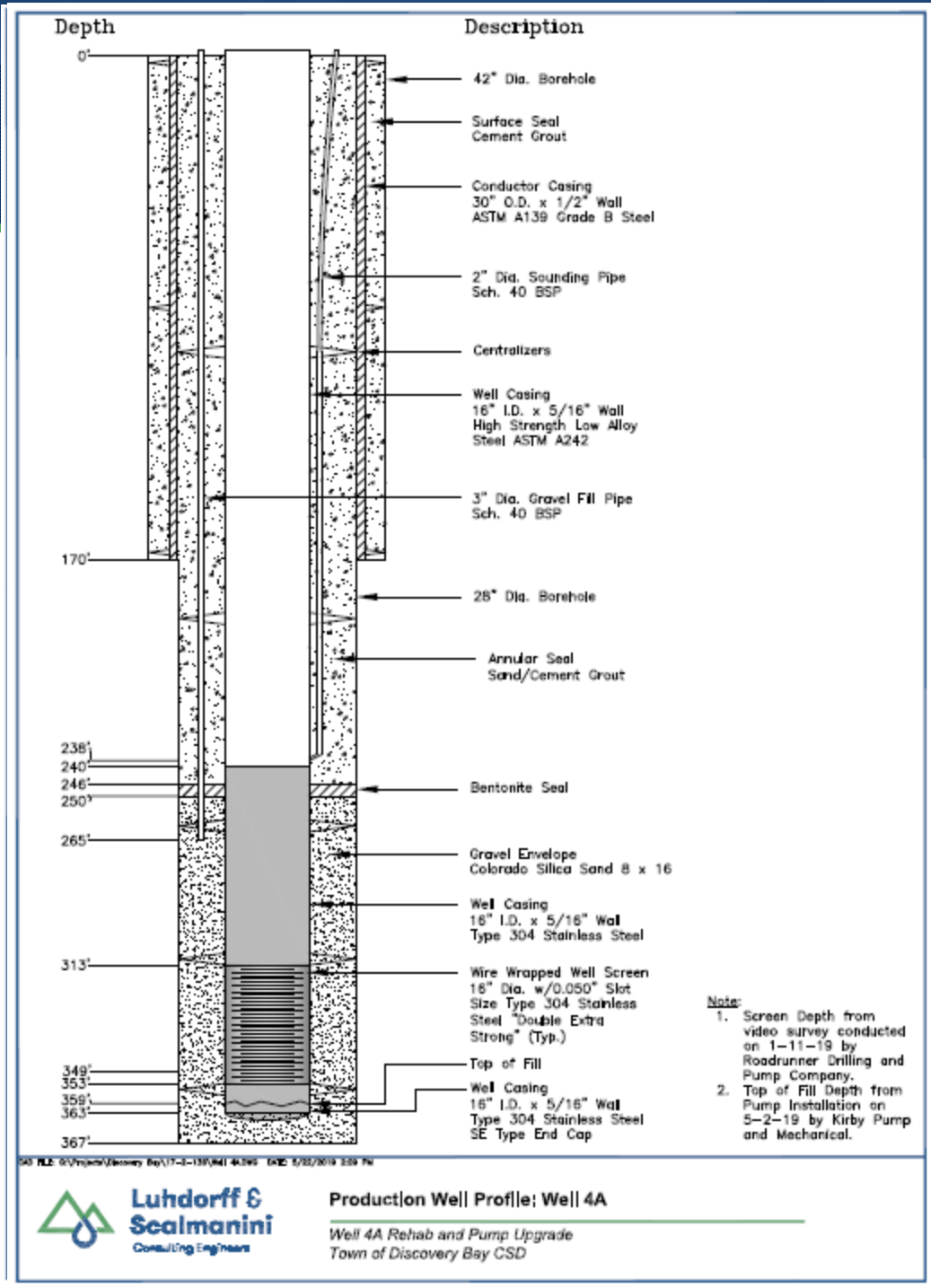


Well 4A had consistent decline, 40% reduction over life.
Post-Rehab capacity restored by 10%.

Well 2 and Well 4A efficiencies dropped below safe levels.
Indicates age and wear of pumps.
Post-Rehab efficiencies brought to “new pump” conditions.



Well 2 and Well 4A Rehabs



Well 8 Alternatives

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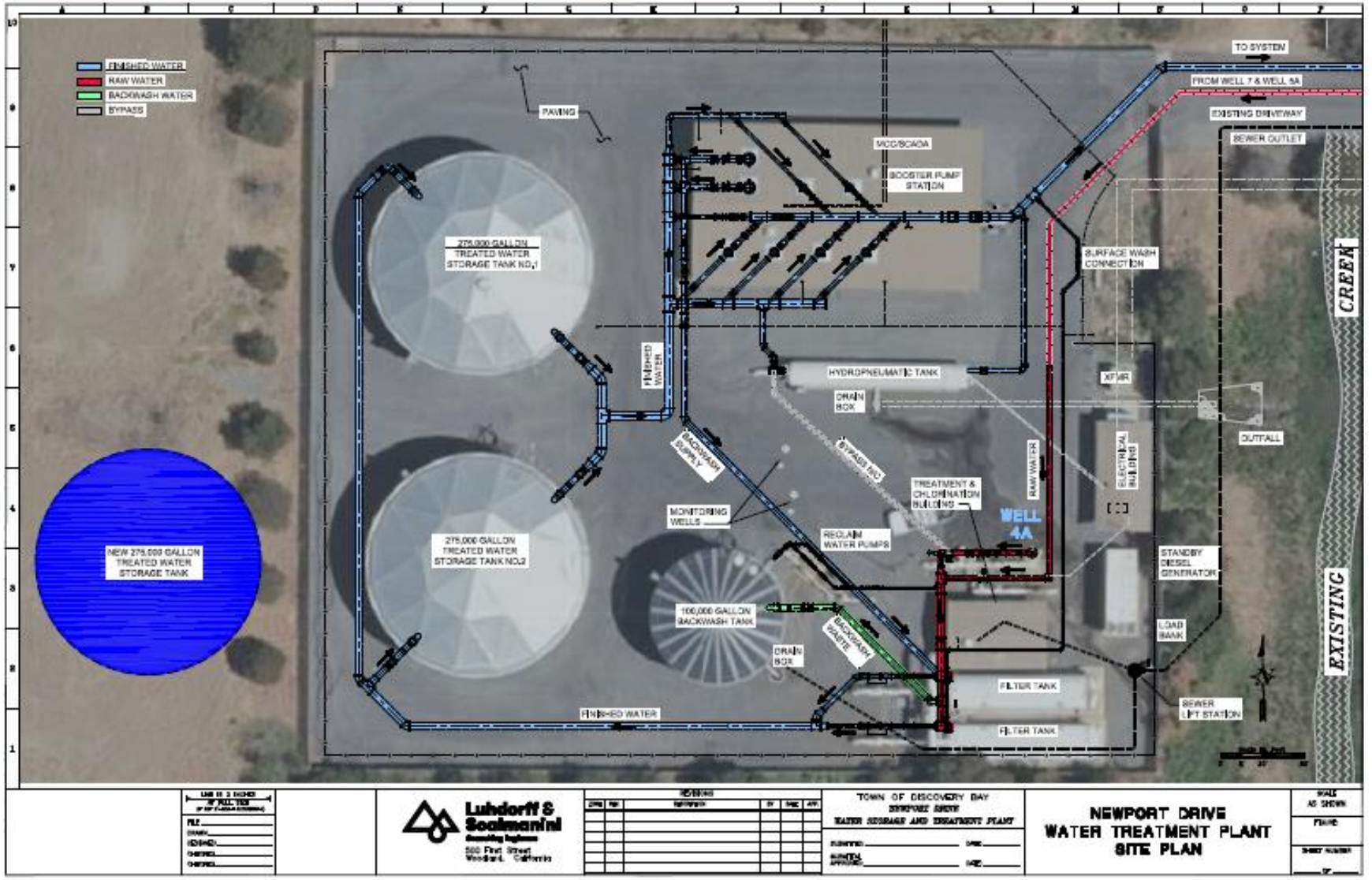
Well 8 Alternatives

Project #	Description	CIP Budget
CIP#52	**Well 8** - new 1,800 gpm supply well to replace Well 5A	$2.2M
CIP#61	**Water Storage at Newport WTP** – a third 275,000-gallon tank to meet peak flows at Build Out.	$1.0M
CIP#55/ 57	**Filter at Willow WTP** – a fourth filter increasing treatment by 850 gpm to meet maximum day demand at Build Out.	$0.7M
Total		**$3.9M**

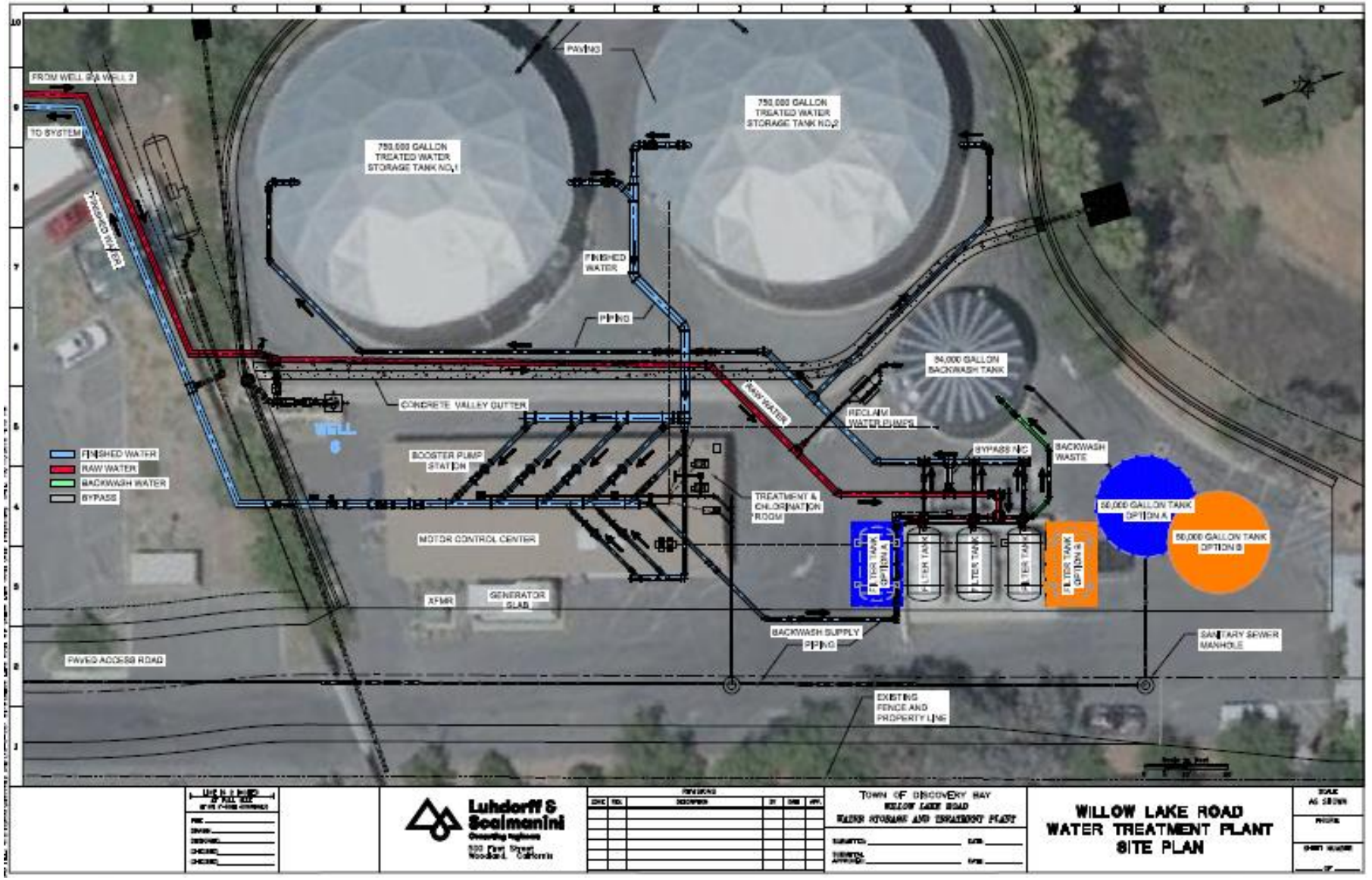
Well 8 Alternatives

Storage at Newport WTP



Well 8 Alternatives

Filter at Willow WTP



Well 8 Alternatives

Well 8 "Stand-Alone" Concept:

- Treats water onsite using a filter.
  - ➢ Eliminates the Filter CIP at Willow Lake.
- Delivers straight to the distribution system.
  - ➢ Could eliminate the Storage CIP at Newport, (modeling is underway to study this).
- Provides a third source of water to the system.
  - ➢ Increases WTP redundancy.
- Anticipating a savings to the current CIP. Cost Estimate feasibility are under investigation.

Laguna Court Underwater Crossing Break

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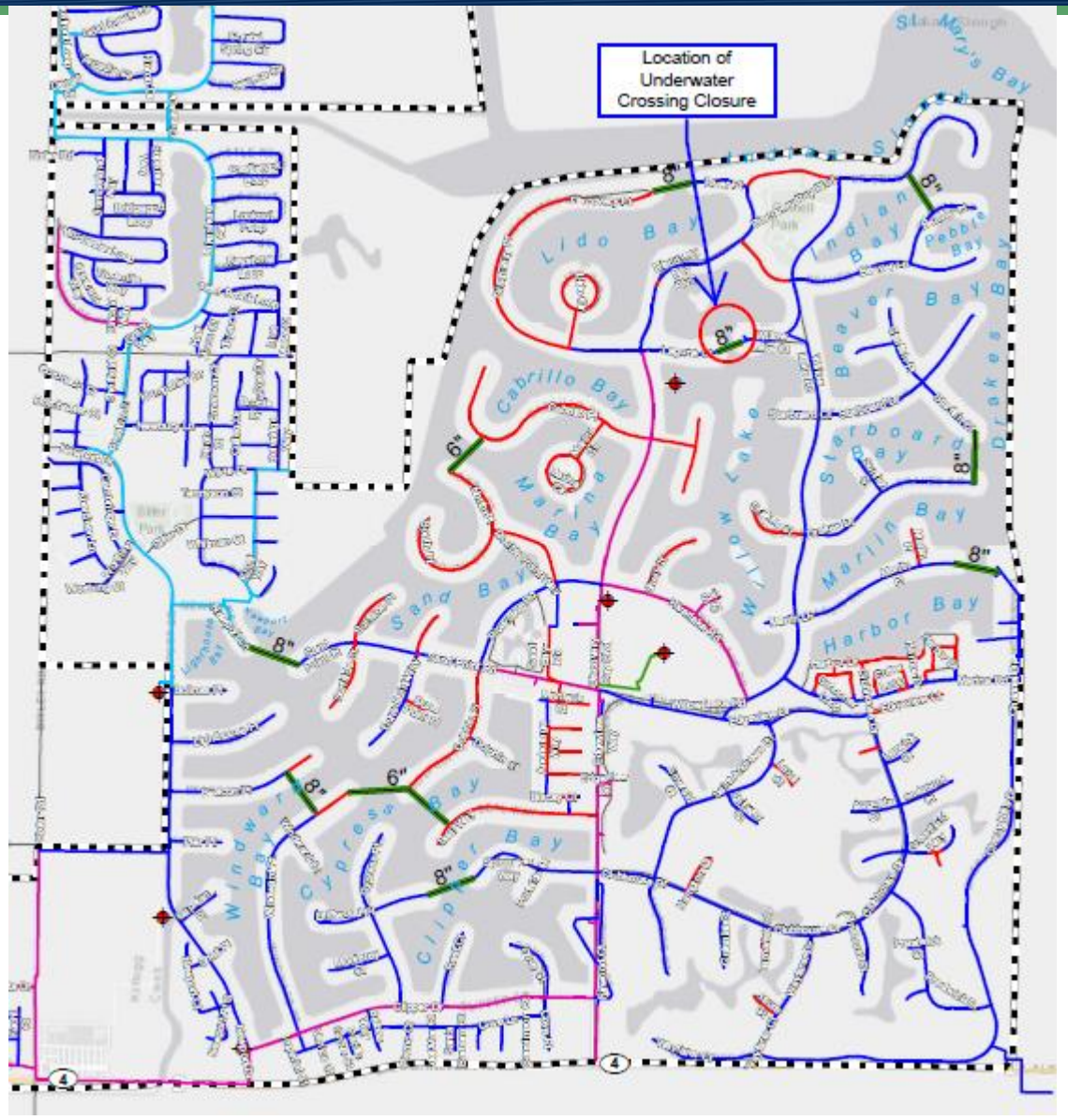
Laguna Court Crossing Break

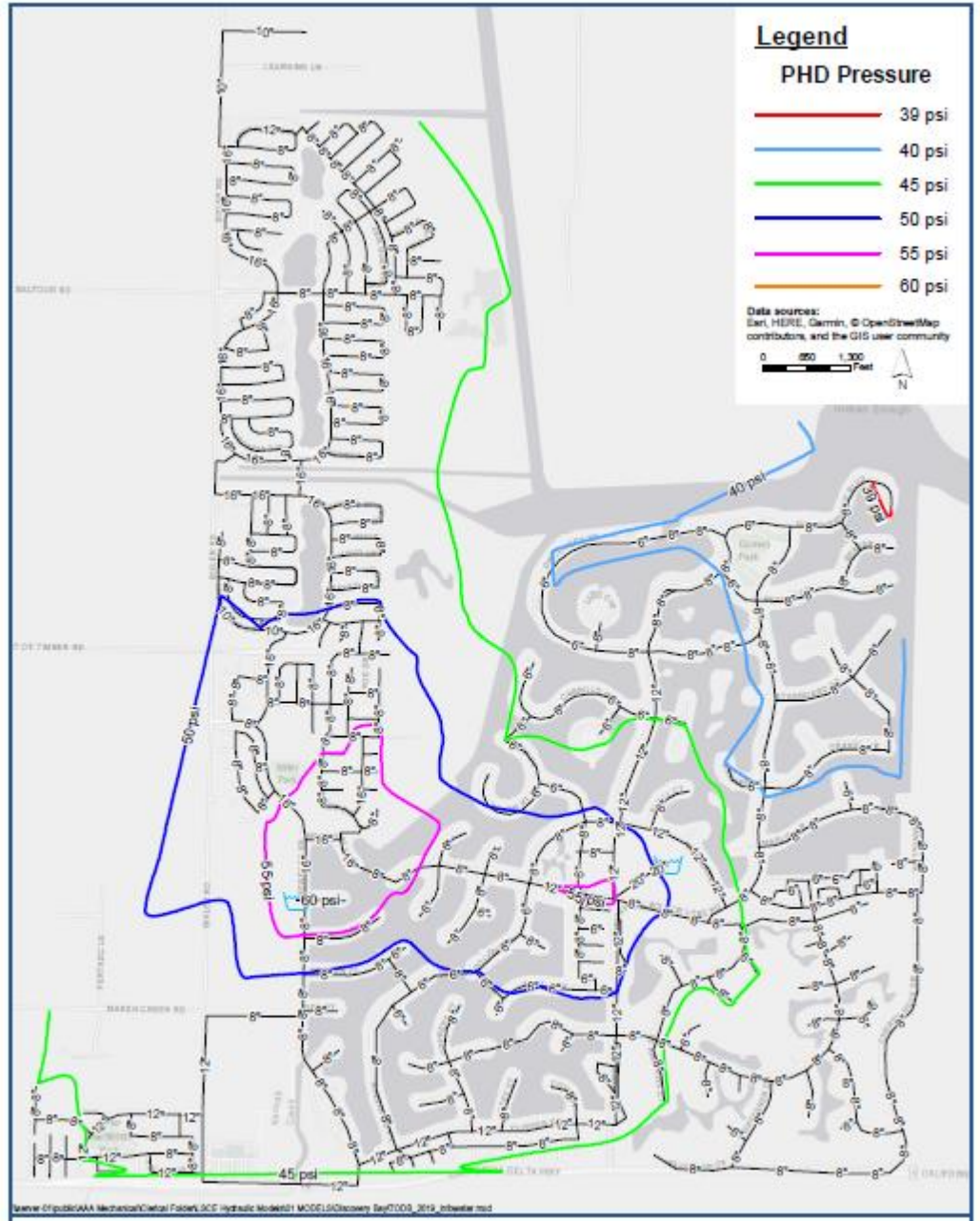
- **On February 20 the underwater crossing on Laguna Court broke.**
- **The crossing was isolated on both sides, no services were impacted.**
- **There are 11 underwater crossings in the system.**
- **They provide hydraulic “looping” to meet Fireflows and avoid dead-ends.**
- **Modeling was conducted to study the hydraulics of this crossing out-of-service.**
- **Staff are currently investigating the cause of the leak and logistics for repair or replacement.**



Laguna Court Crossing Break

Modeling Study Findings:

- Crossing is located in the low-pressure part of the system.
- Decreases minimum system pressures from 39 to 36 psi.
- Reduced fireflow capacities by approximately 10% on average in the area (reductions range from 100-800 gpm).
- The system can still supply 1,000 gpm reliably, but more hydrants are now less than 1,500 gpm than were before.
- Closing the crossing adds dead-ends and maintenance.
- Should investigate cause and condition for all crossings.



Laguna Court Crossing Break

Staff are exploring options to investigate the crossing and determine repair or replacement strategy and cost.

1. Diver inspections – buried pipe has challenges.
2. Corrosion inspections from surface pothole.
3. Pipe camera inspections.
4. In-situ repairs either underwater clamps or internal lining.
5. Trenchless methods such as pipe bursting, horizontal drilling.
6. Cofferdam open trench replacement.
7. Install on lakebed (no trench).

PLC and SCADA Upgrades at Newport WTP

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PLC and SCADA Upgrades for Newport WTP

ON BUDGET

ON SCHEDULE

NO ISSUES

Status: final retention will be released pending approval of final programming and O&M documentation.