MOUNTAIN REGIONAL WATER

Initial Screening of Alternatives

Signal Hill Water Treatment Plant Optimization

Advisory Control Board Meeting | Thursday September 19, 2024

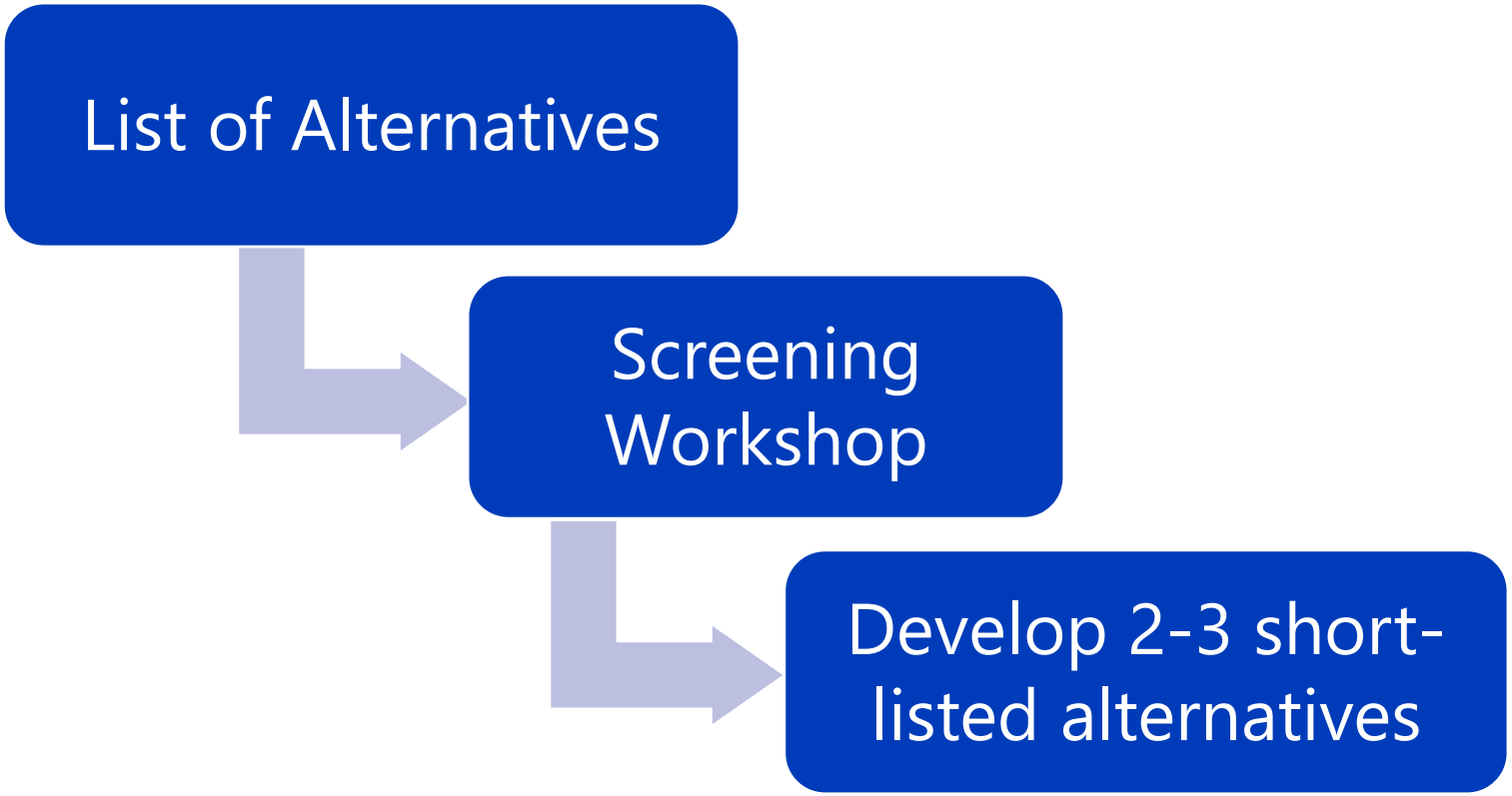
carollo

Agenda

- Introduction and Background
- Discussion of Big-Picture Alternatives
- Shortlisted Alternatives
- Summary
- Wrap up and Next Steps

Introduction and Background

Conceptual Design Workflow



Today's Meeting

- Discuss list of alternatives for future of SHWTP and use of Lost Canyon water
- Discuss how we screened alternatives to a shortlist for further evaluation

The initial screening has the following caveats:

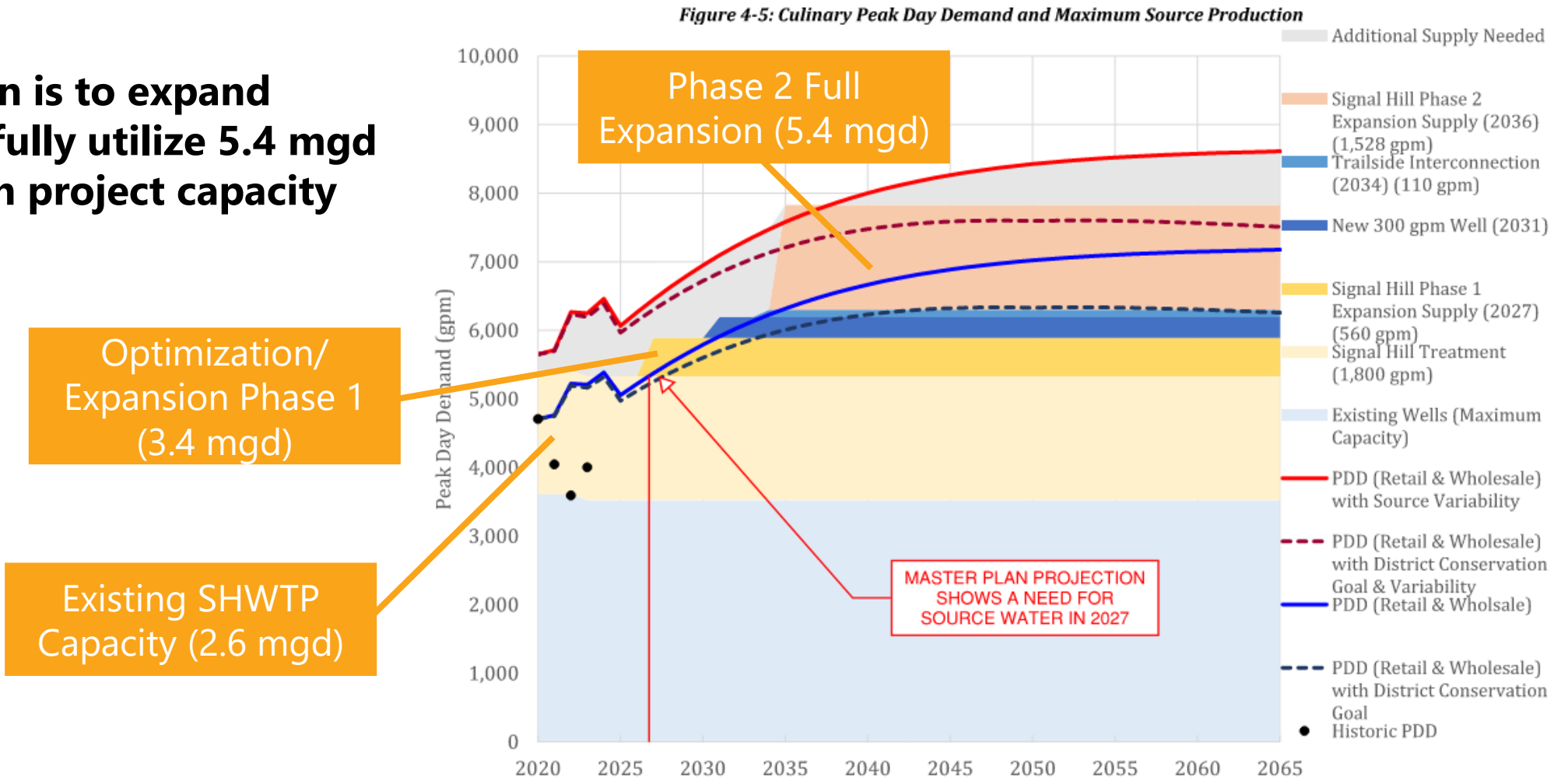
- Not based on in-depth analysis, detailed capital/O&M costs, etc.
- Rather, based on big-picture criteria, must-haves, pros/cons.
- Using Jacobs' previous costs as an anchor point and adding order-of-magnitude costs where needed.
- Does not include in-depth screening of individual process decisions (e.g., send residuals to SBWRD vs. mechanical dewatering).

Establish big-picture criteria for the initial screening

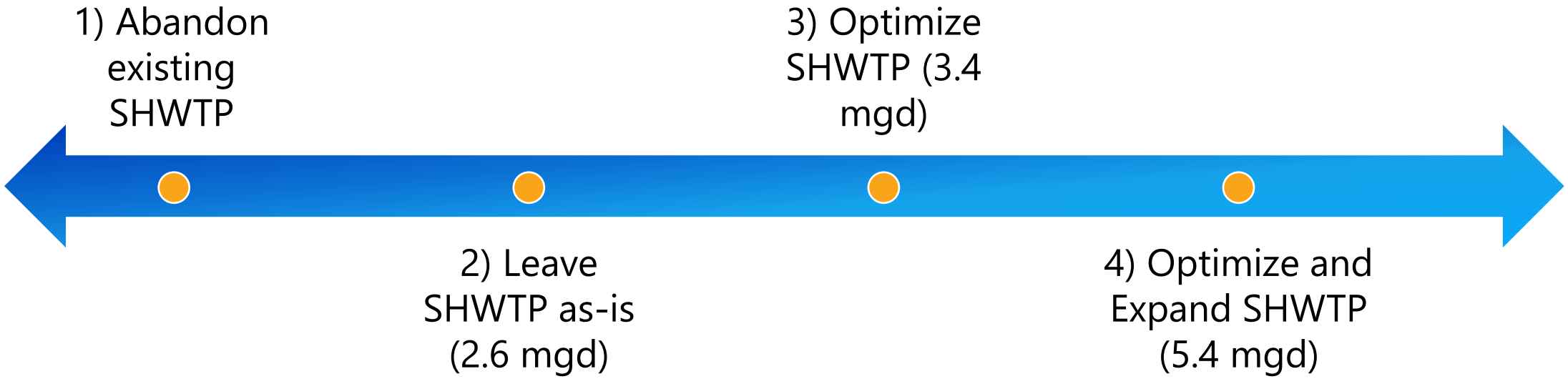
- Meet increased demand
- Fully utilize Lost Canyon water
- Meet water quality objectives
- Increase safety
- Improve operations & maintenance
- Provide reliability/redundancy
- Future resilience (e.g., regulatory changes, wildfire, etc.)
- Capital and O&M costs

MRW system demands are projected to increase

- **Current plan is to expand SHWTP to fully utilize 5.4 mgd Lost Canyon project capacity**



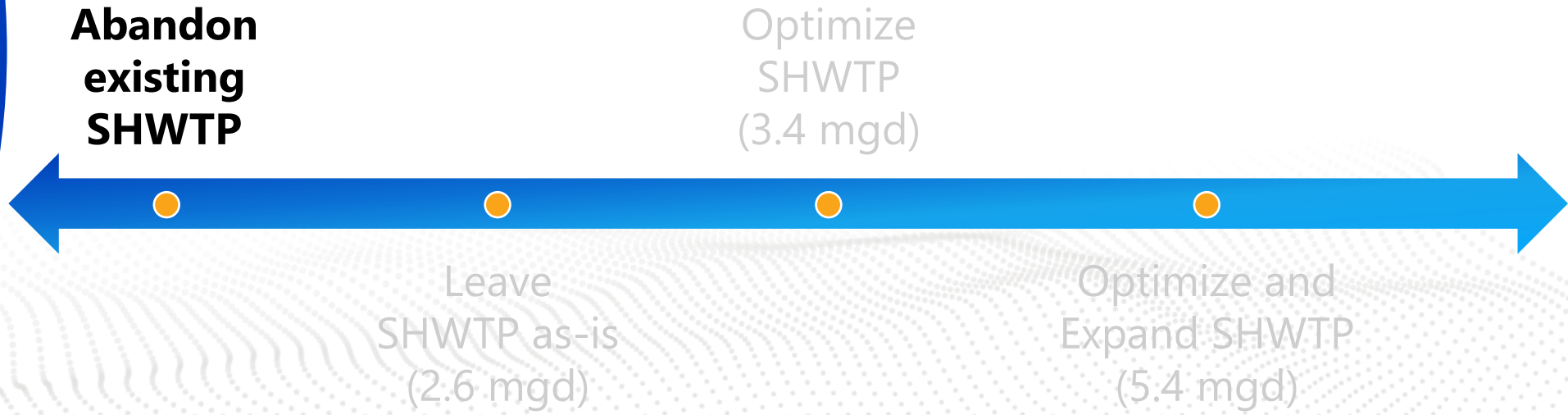
There is a range of big-picture alternatives



ALTERNATIVE

01

Abandon existing SHWTP



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1a) Purchase wholesale water (5.4 mgd)

Pros
- Avoid capital investment in SHWTP

Cons
- Stranded SHWTP assets
- Capital investment to convey finished water from PCMC to MRW
- Ongoing water fees paid to PCMC
- Lose control over rate increases
- Lose control over treatment operations
- Existing legal framework
- Trigger importation project earlier than otherwise
- Reassign treatment staff

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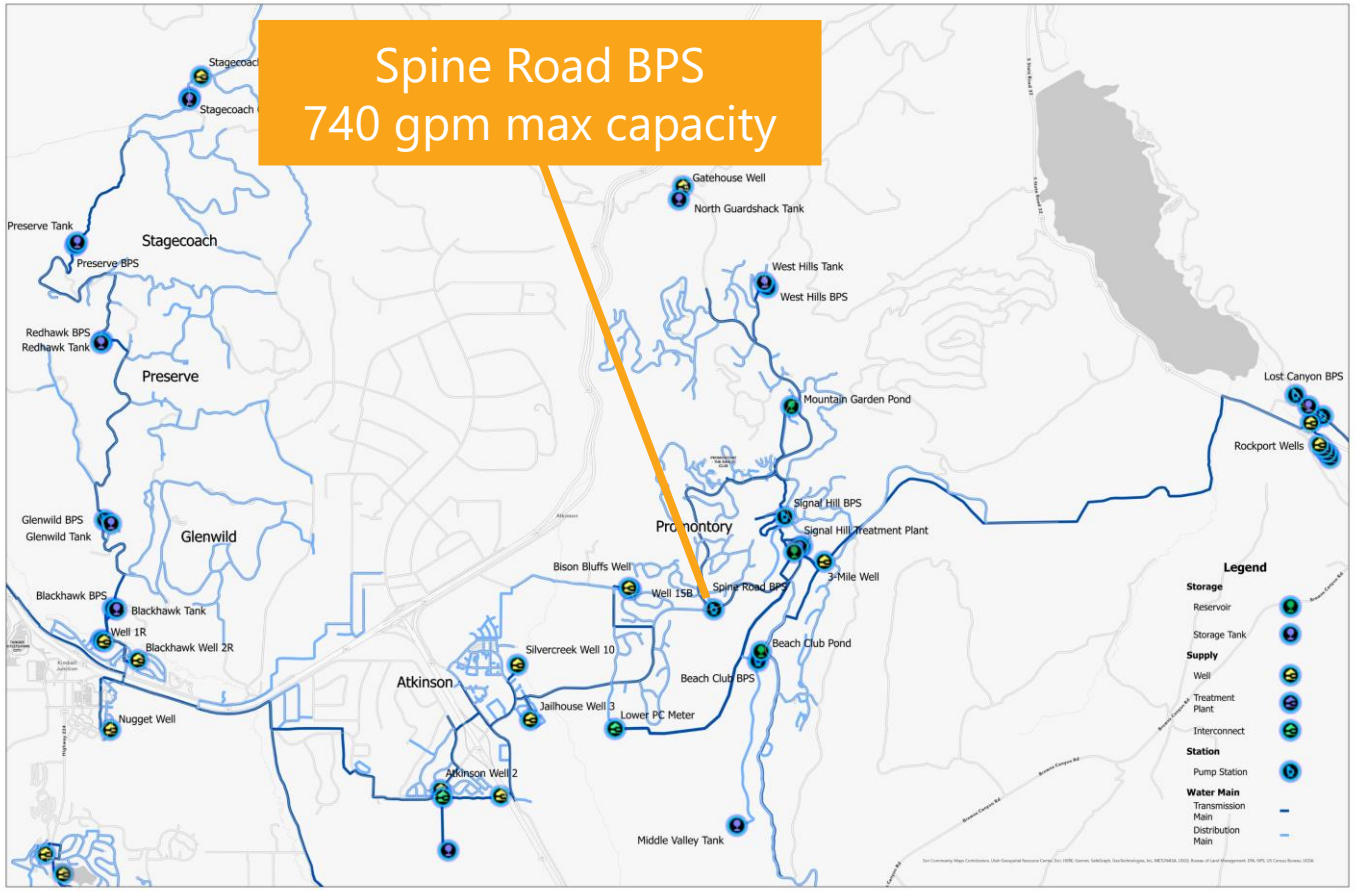

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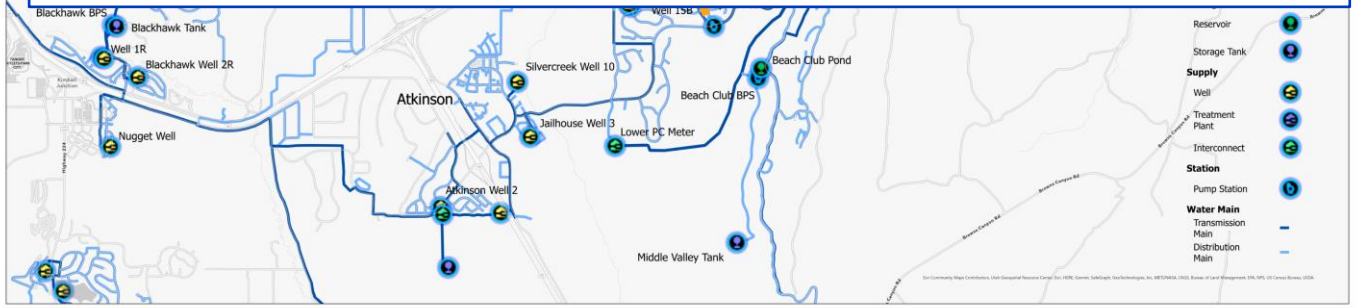
SHWTP Expansion to 5.4 mgd Project	$0	$5,676,000
Park City Interconnect Project	$1,878,000	$0
Annual O&M Costs and Water Fees		
Annual Average SHWTP Production, mgd	2.6	2.7
Annual SHWTP Operational Cost	$620,000	$623,000
Annual Average Interconnect Flow, gpm	399	0
Annual Park City Interconnect Water Fees	$2,477,000	$0
25-year Net Present Value[a]	$47,058,000	$32,325,000

[a]Net Present Value is based on the construction cost plus a discount rate of 5.0% for a 25-year period for O&M cost.



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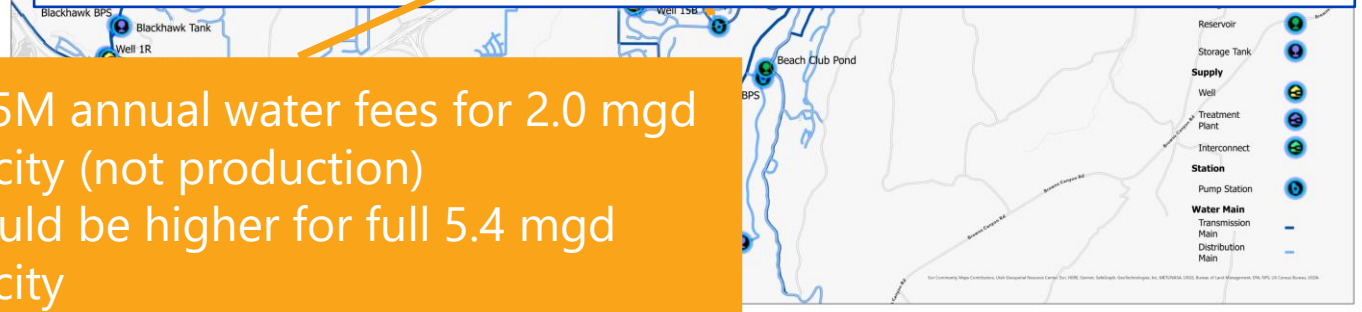

- $2.5M annual water fees for 2.0 mgd capacity (not production)
- Would be higher for full 5.4 mgd capacity

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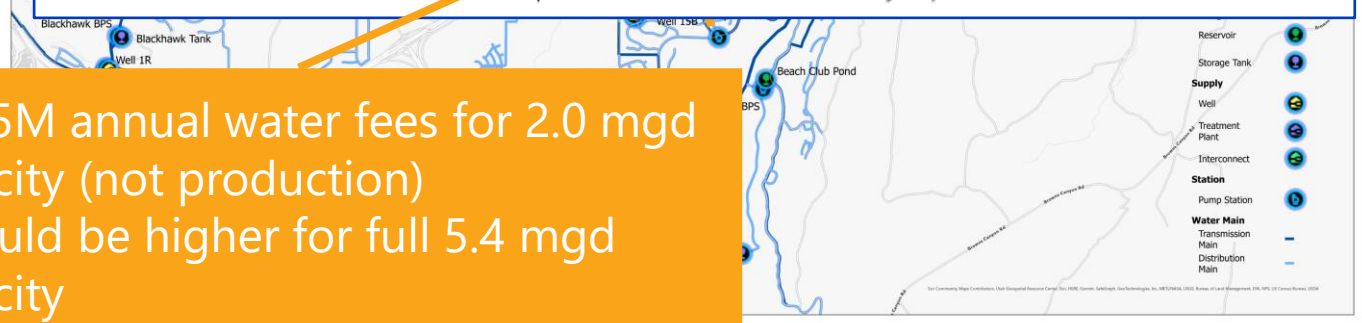


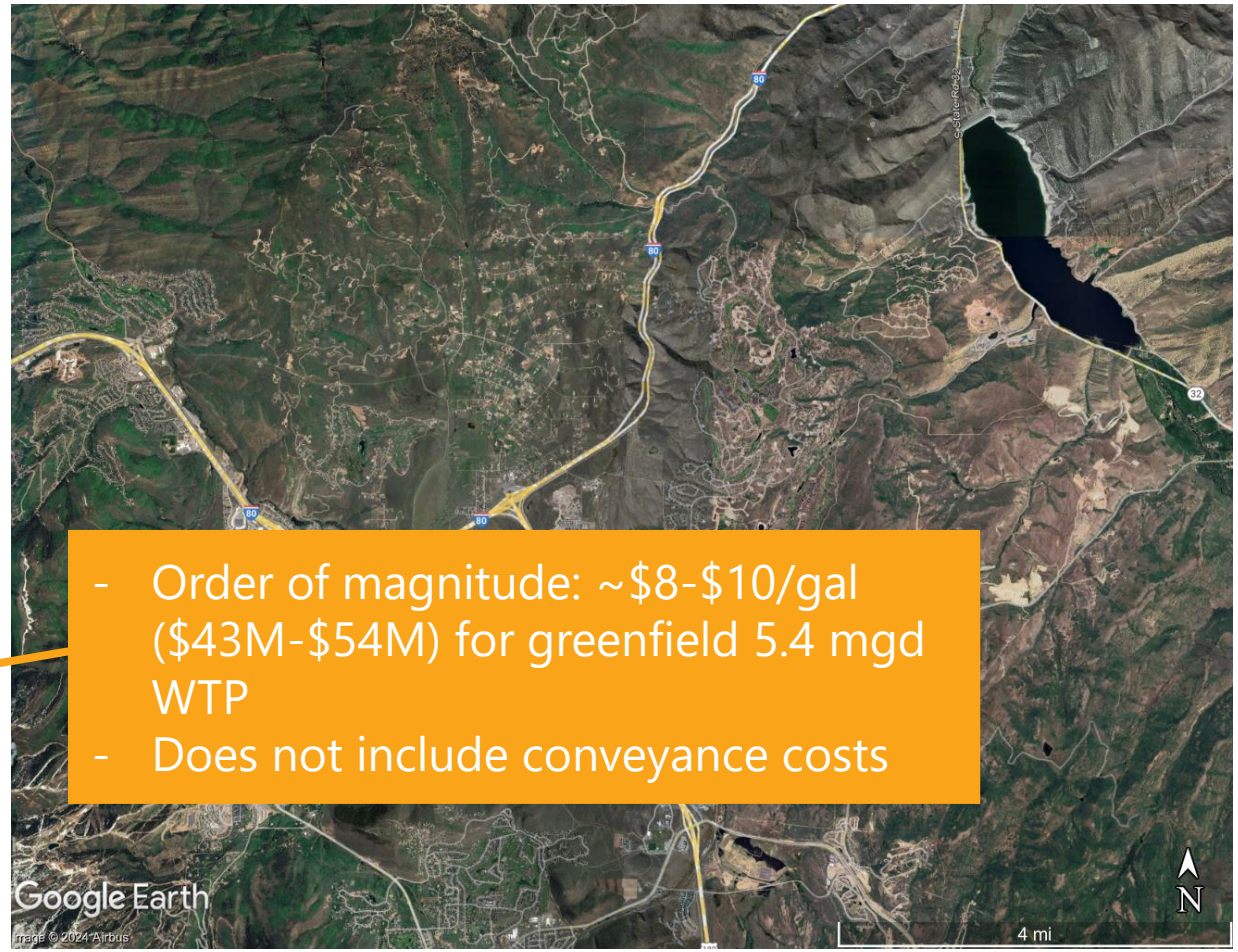
- $2.5M annual water fees for 2.0 mgd capacity (not production)
- Would be higher for full 5.4 mgd capacity

1) Abandon existing SHWTP and…

1b) Rebuild at another location (5.4 mgd)

Pros
- Start from scratch, can build well-configured treatment facility resilient to future changes (e.g., wildfire)
- Can keep existing plant online during construction

Cons
- High capital cost for new WTP
- Capital costs to convey raw water to new site and convey finished water back to Signal Hill site where system needs it.
- Signal Hill stranded assets



- Order of magnitude: ~$8-$10/gal ($43M-$54M) for greenfield 5.4 mgd WTP
- Does not include conveyance costs

1) Abandon existing SHWTP and…

1c) Demo and rebuild at the Promontory location in *existing* footprint

Pros

- Start from scratch, can build robust treatment facility resilient to future changes (e.g., wildfire)
- No need to reconfigure raw water conveyance.

Cons

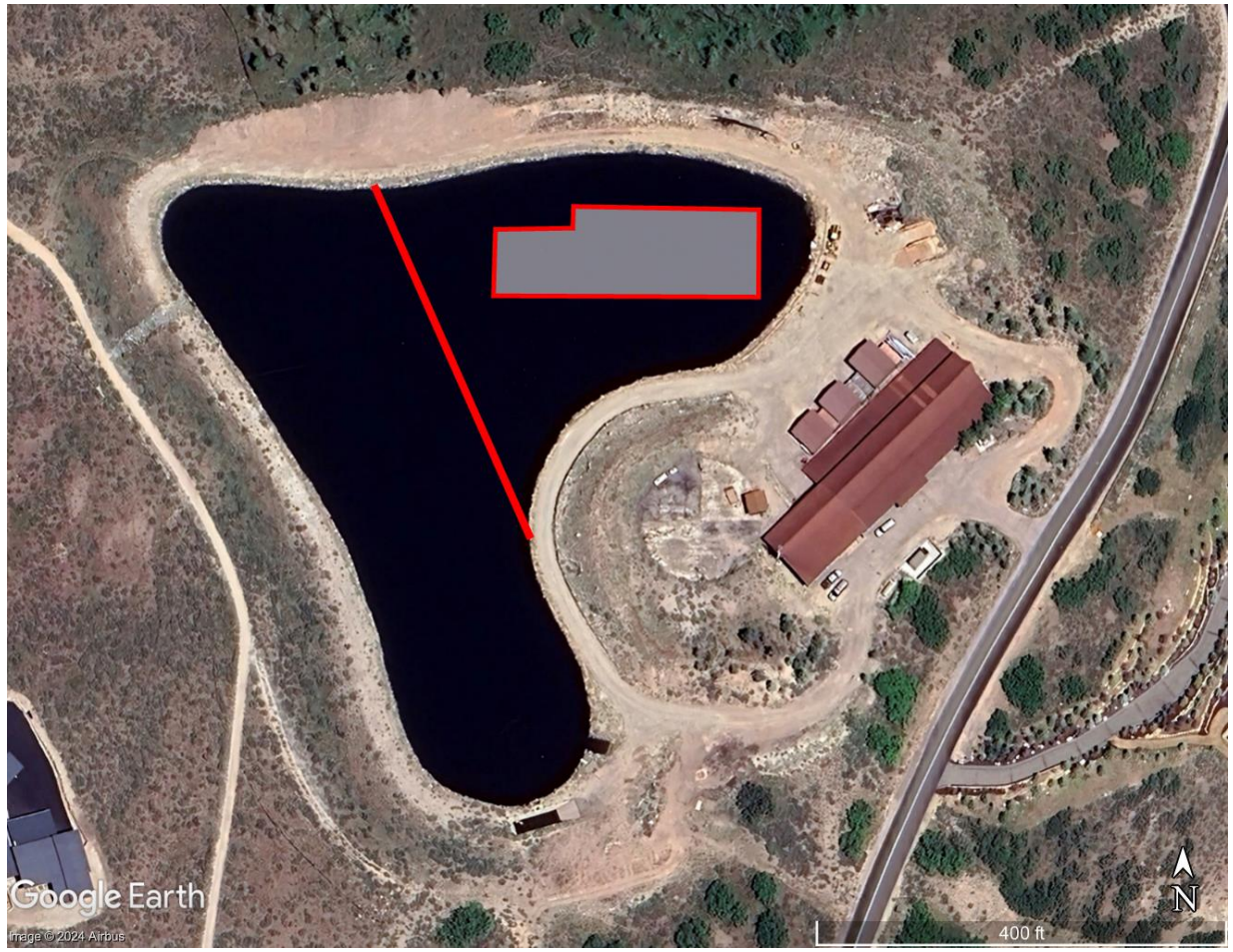
- High capital cost for new WTP
- Capital investment to convey finished water from PCMC to MRW during construction

1) Abandon existing SHWTP and…

- **1c) Demo and rebuild at the Promontory location in *pond* footprint**

  Pros
  - Start from scratch, can build robust treatment facility resilient to future changes (regulator and/or wildfire)
  - Build new WTP while existing remains online.
  - No need to reconfigure raw water or finished water conveyance.

  Cons
  - High capital cost for new WTP
  - High capital cost to reconfigure Signal Hill pond.



1) Abandon existing SHWTP and…

1d) Build new on an "Adjacent" Property

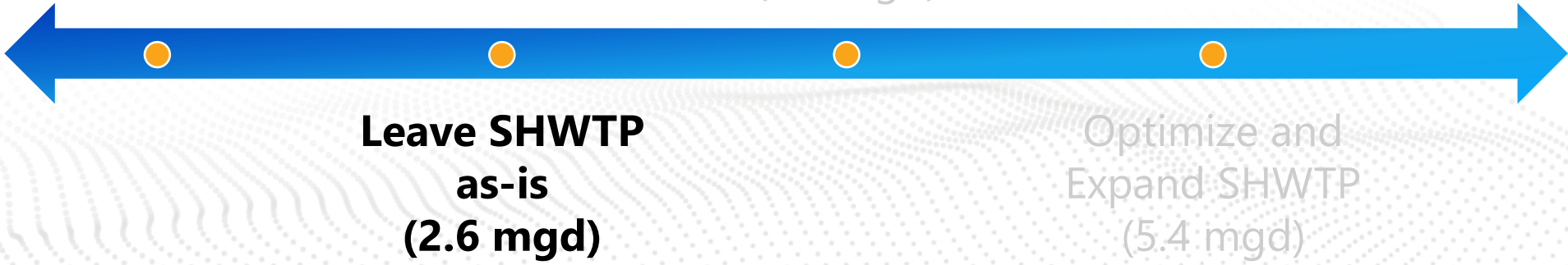
Pros
- Start from scratch, can build robust treatment facility resilient to future changes (regulator and/or wildfire)
- Build new WTP while existing remains online.
- Only small reconfiguration of raw water and finished water conveyance.

Cons
- High capital cost for new WTP
- High to purchase new property.

ALTERNATIVE

02

Leave SHWTP as-is



2) Leave SHWTP as-is (2.6 mgd) and…

2a) Purchase wholesale water (2.8 mgd) and no capital investment

Pros
- No capital investment in SHWTP

Cons
- Does not address safety, operations, and maintenance concerns of the existing SHWTP
- Capital costs to convey finished water from PCMC to MRW system
- Ongoing PCMC water fees
- Still needs investment (e.g., membrane replacements, GAC replacements, etc.
- Existing legal framework
- Trigger importation project earlier than otherwise

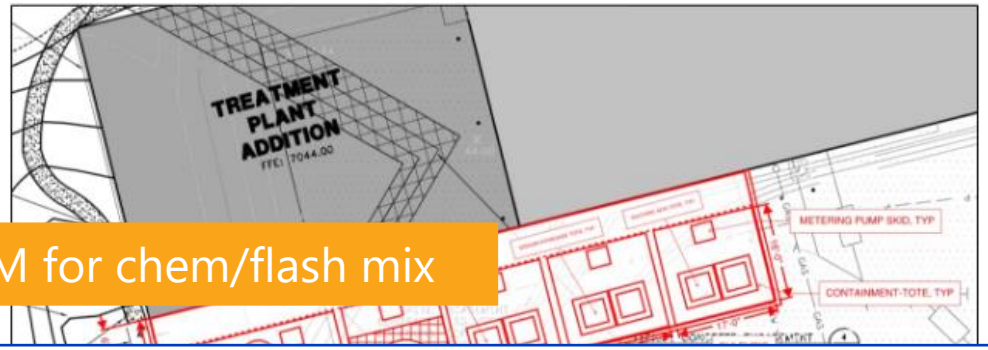
This feels like a non-starter

2) Leave SHWTP (2.6 mgd) as-is and…

- **2b) Purchase wholesale water (2.8 mgd) and minimal investment in SHWTP**

Pros
- Minimizing investment in SHWTP
- Address essentials, e.g., chemical bldg., flash mix

Cons
- Does not address all safety, operations, and maintenance concerns of the existing SHWTP
- Capital costs to convey finished water from PCMC to MRW system
- PCMC water fees
- Still needs investment (e.g., replace membranes periodically, GAC replacements, etc.)



~$5M for chem/flash mix

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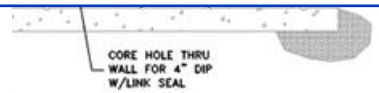
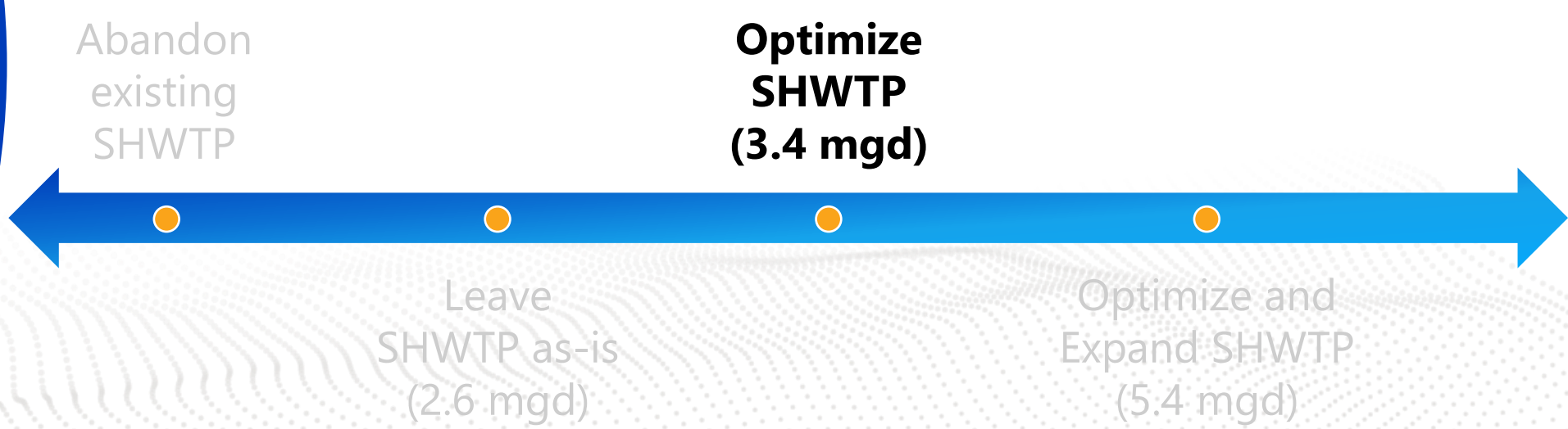
>$2.5M annually



ALTERNATIVE

03

Optimize SHWTP at current capacity



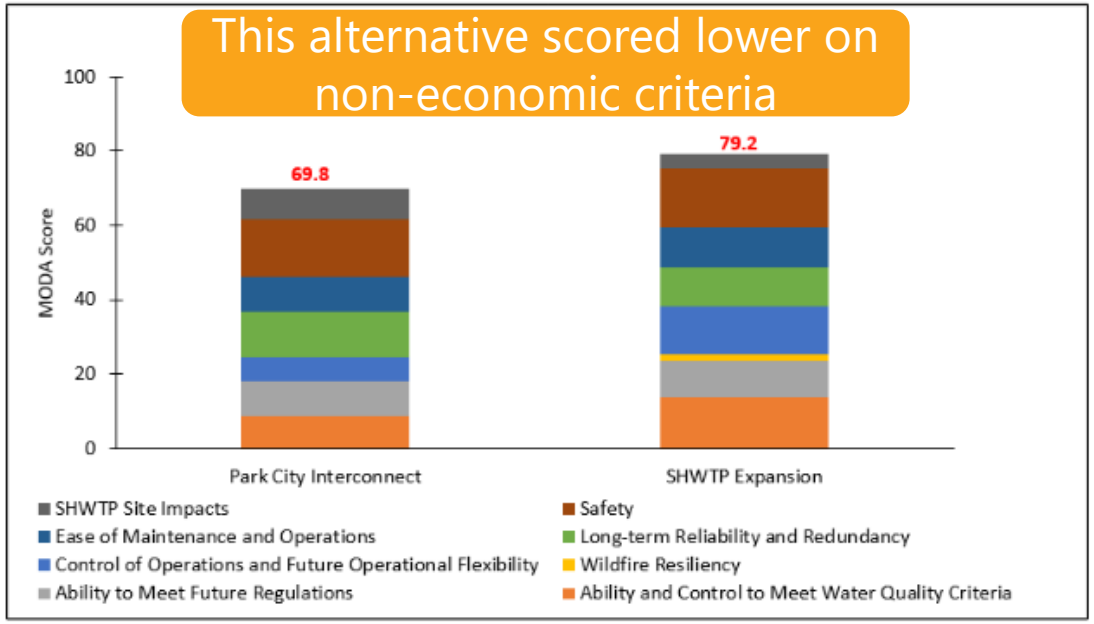
3) Optimize SHWTP at 3.4 mgd capacity and…

- **Purchase wholesale water (2.0 mgd)**
  - Optimize SHWTP to 3.4 mgd capacity

Jacobs already did this analysis, comparing this to full 5.4 mgd expansion

Figure 5-4. Comparison of Non-Cost Scores for the Alternatives

This alternative scored lower on non-economic criteria



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This alternative had a higher 25-year NPV

ALTERNATIVE

04

Modify SHWTP to meet Lost Canyon capacity

Abandon existing SHWTP

Leave SHWTP as-is (2.6 mgd)

Optimize SHWTP (3.4 mgd)

Optimize and Expand SHWTP (5.4 mgd)

4) Modify SHWTP to meet Lost Canyon capacity…

Fully optimize and expand SHWTP to 5.4 mgd

- 4a) In a phased approach vs. 4b) In a single project

Jacobs phased approach:

Phase 1 (2.6 mgd -> 3.4 mgd)	Phase 2 (3.4 mgd -> 5.4 mgd)
▪ Pretreatment - Reclaim 2nd floc/sed train - Install mechanical mixers ▪ Membrane Filtration - Add 1 Pall AP-8 skid ▪ GAC - New building addition - Add 2 GAC vessels ▪ Chemicals - New chemical facility ▪ Residuals Handling - GAC backwash EQ basin - Gravity Thickener - Sewer Connection with SBWRD	▪ Membrane Filtration - Add 1 Pall AP-8 skid ▪ GAC - Add 2 GAC vessels

4) Modify SHWTP to meet Lost Canyon capacity…

4a) In a phased approach

Pros
- Rate increases can be smoothed out over time.
- Addresses safety, O&M, etc.
- Fully utilizes Lost Canyon water.

Cons
- Less efficient (two designs, two contractors, two mobilizations, etc.).
- Higher net present value compared to single project.
- Less redundancy in supply
- Is there really time to wait?

Phase 1:
Optimize and expand to firm 3.4 mgd

Phase 2:
Expand to 5.4mgd

4) Modify SHWTP to meet Lost Canyon capacity…

4b) In a single project

Pros
- One design, one contractor.
- Lowest net present value of all alternatives

Cons
- Largest near-term capital investment.

One Project to Rule Them All

Shortlisted Alternatives

Modify SHWTP to meet Lost Canyon capacity…

- **Fully optimize and expand SHWTP to 5.4 mgd (whether phased or in one project)**

ALTERNATIVE 1

Convert to direct filtration

Add membrane skids

GAC expansion in existing building

Send solids to SBWRD

New chemical building

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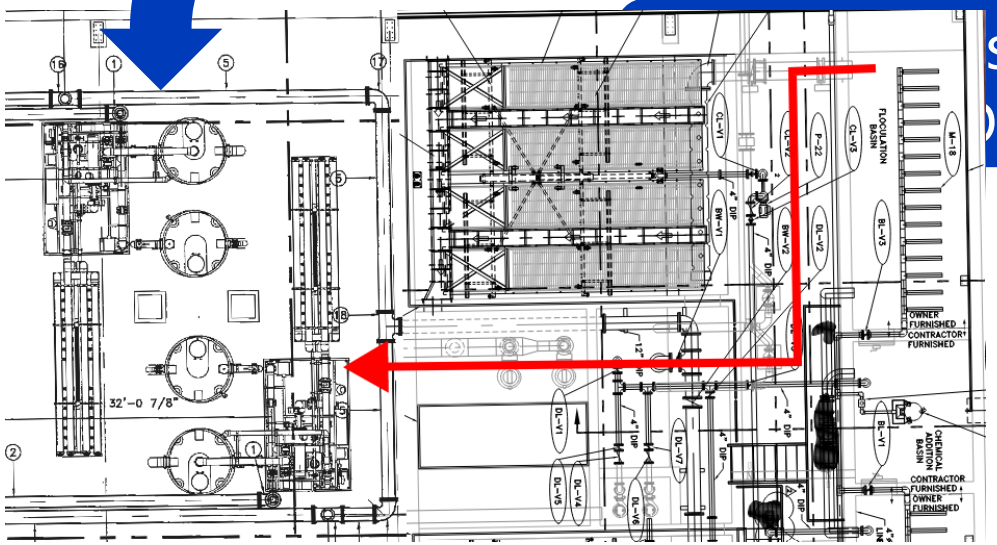

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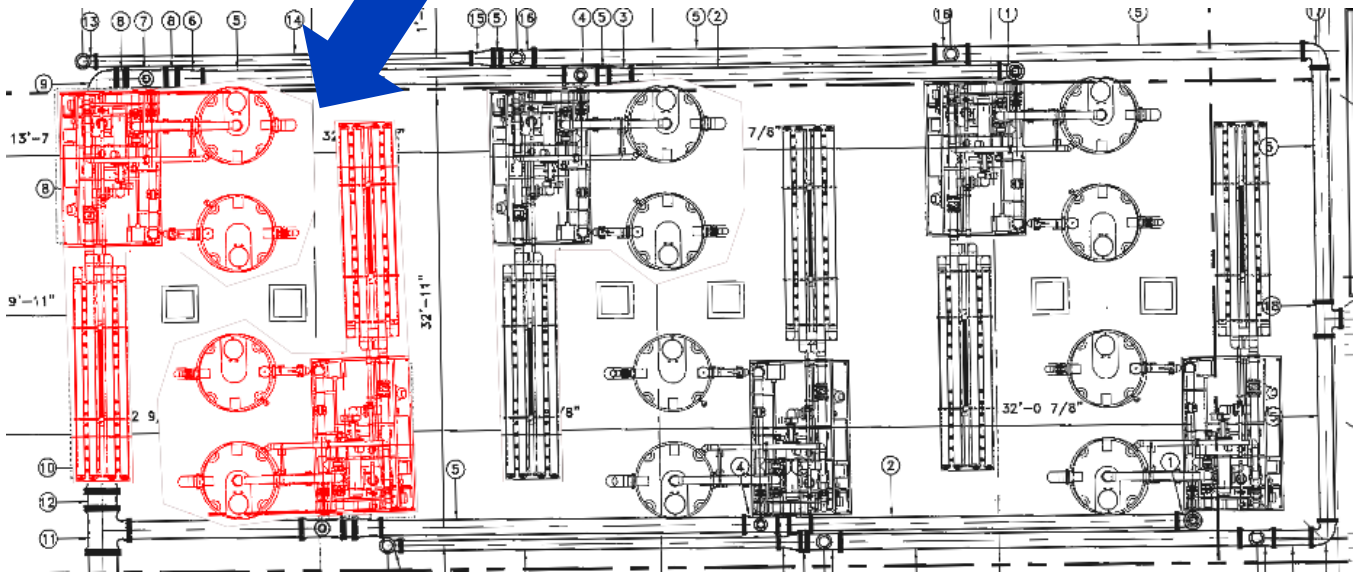

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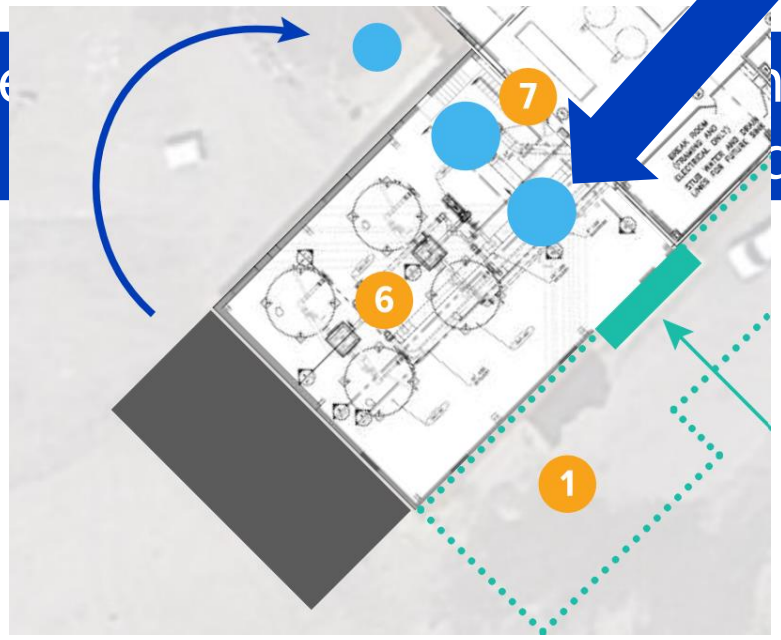

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Snyderville Basin Water Reclamation District

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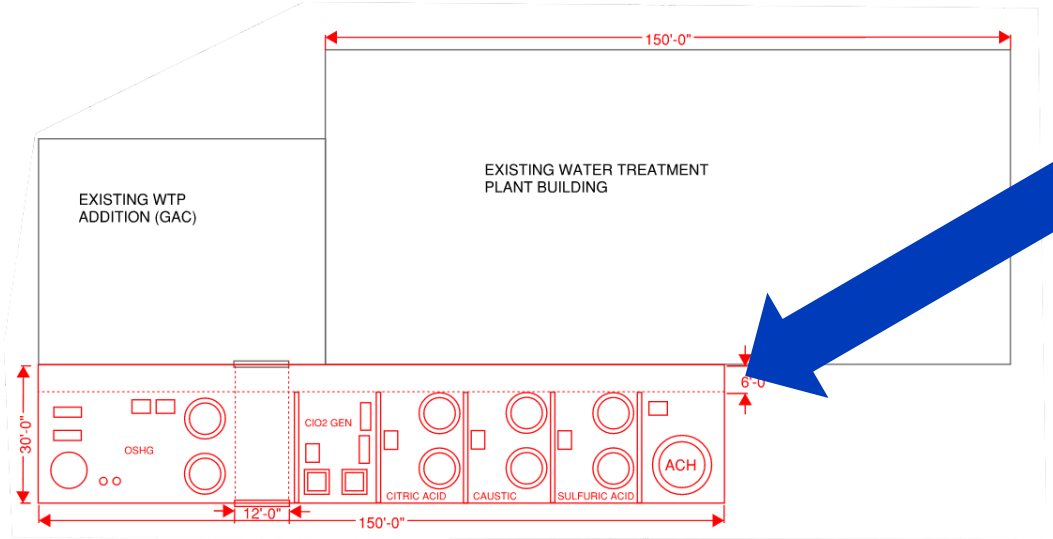

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ALTERNATIVE 2

New sed adjacent to existing floc

Quinns-style membranes

Expand GAC for new contactors

Mechanical Dewatering

New chemical building

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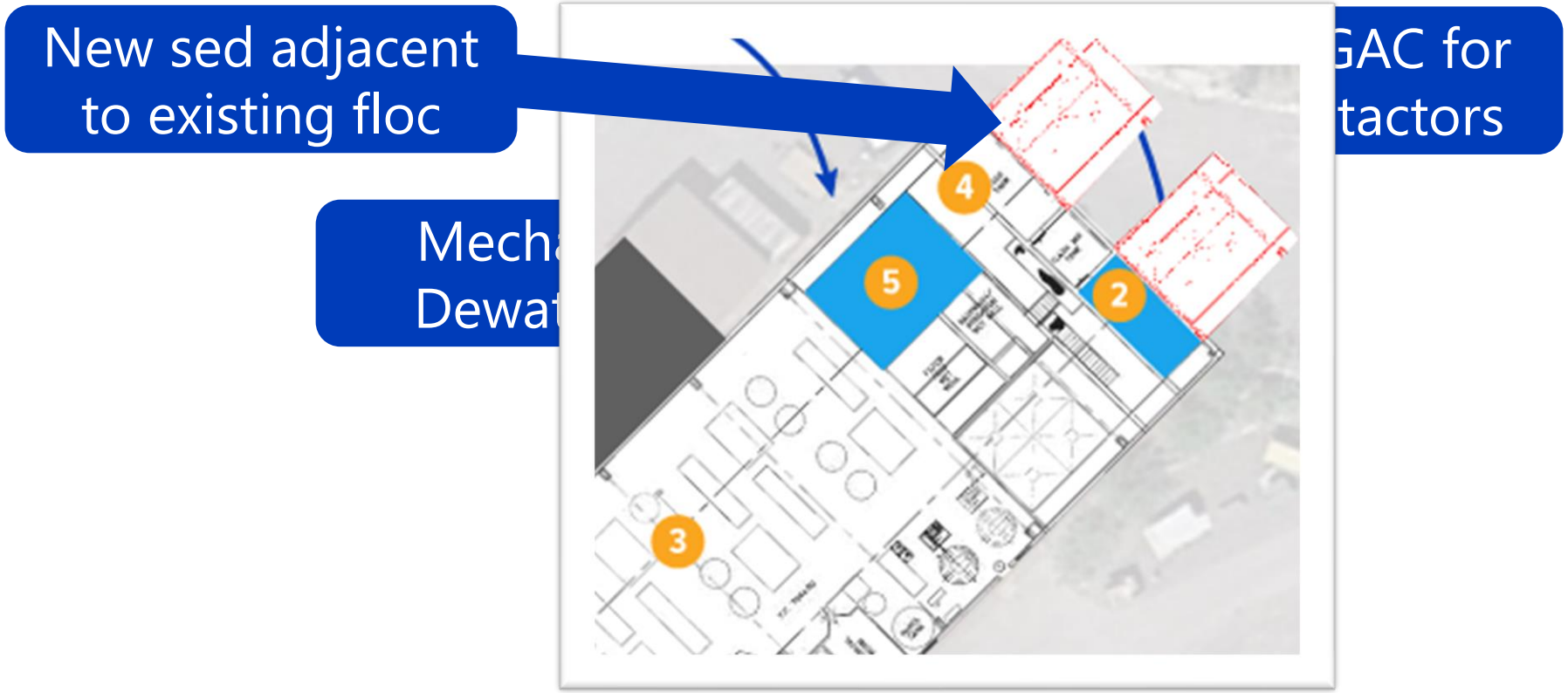

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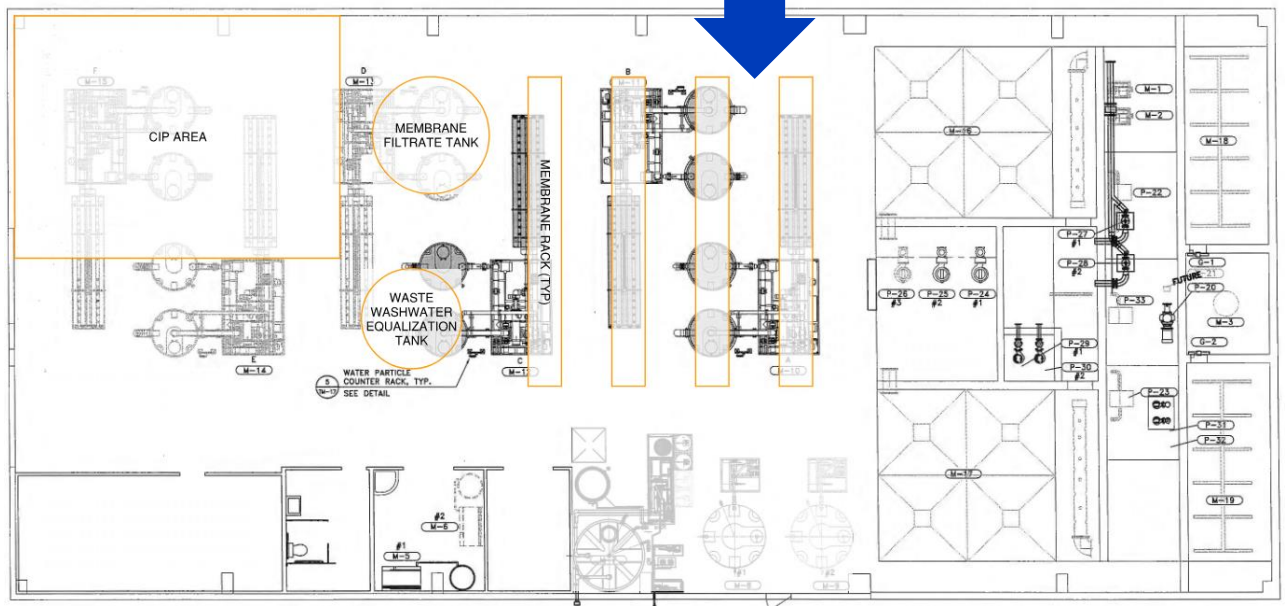

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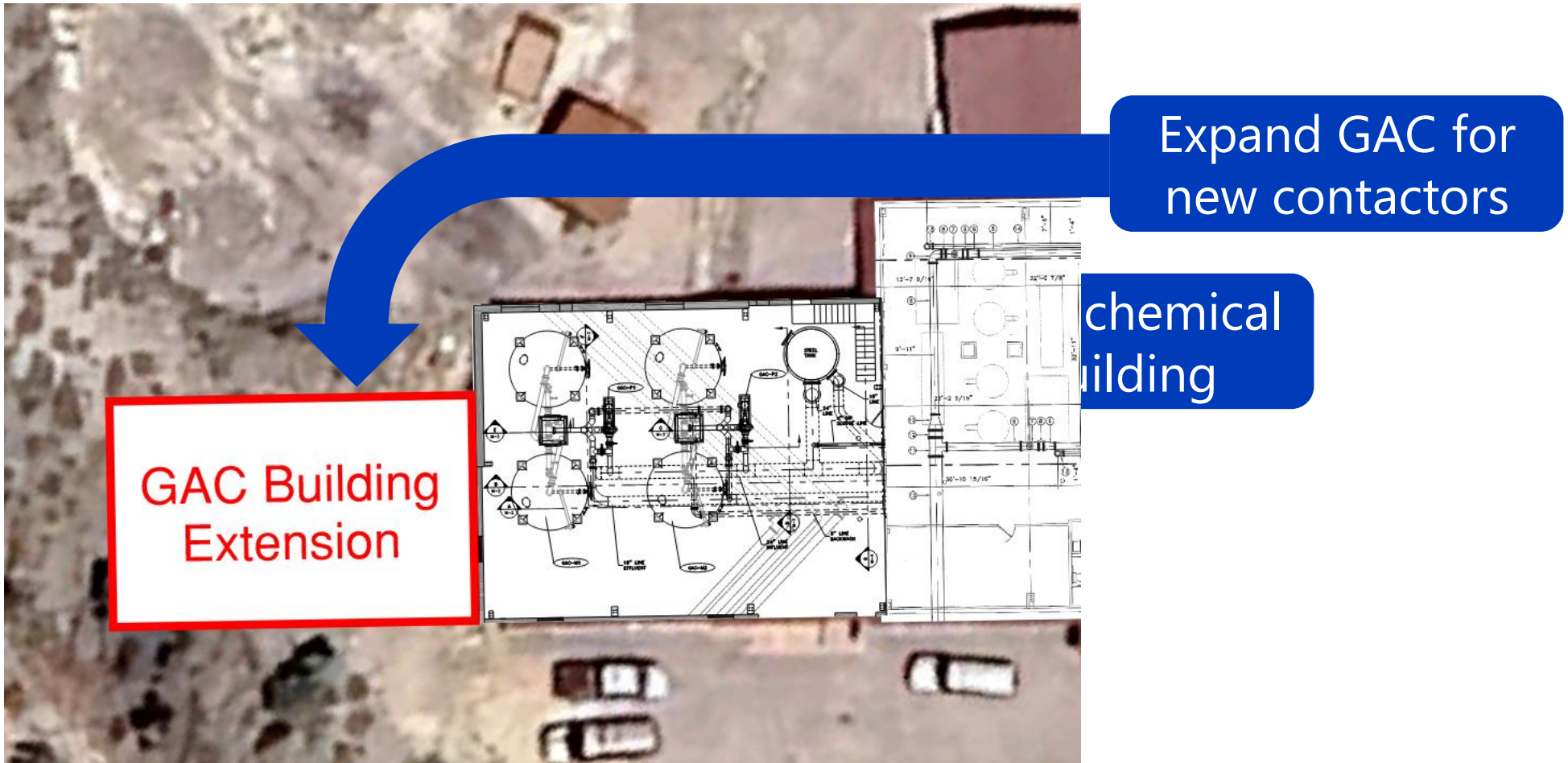

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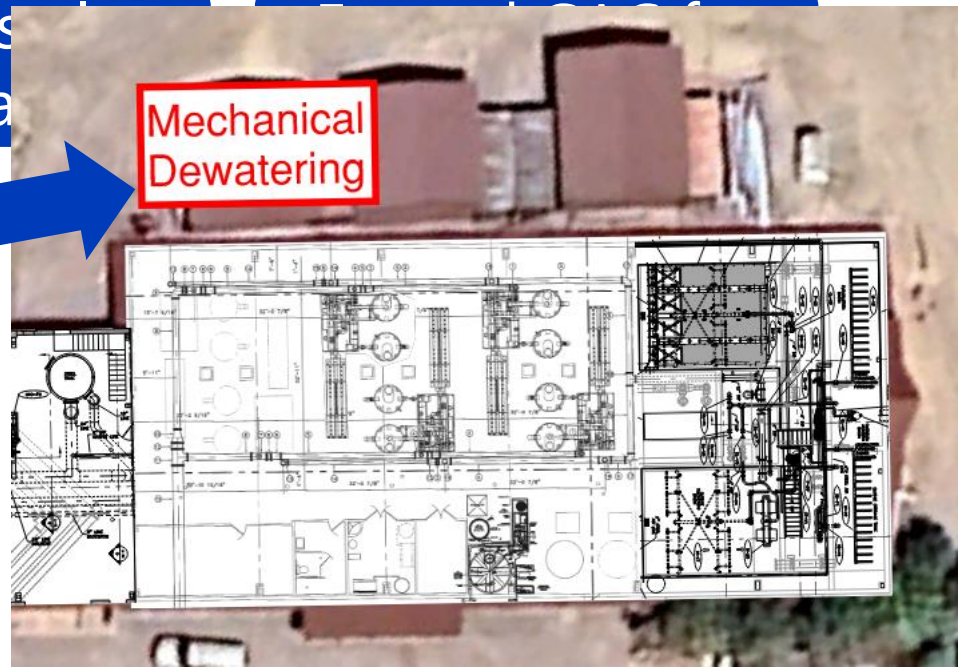

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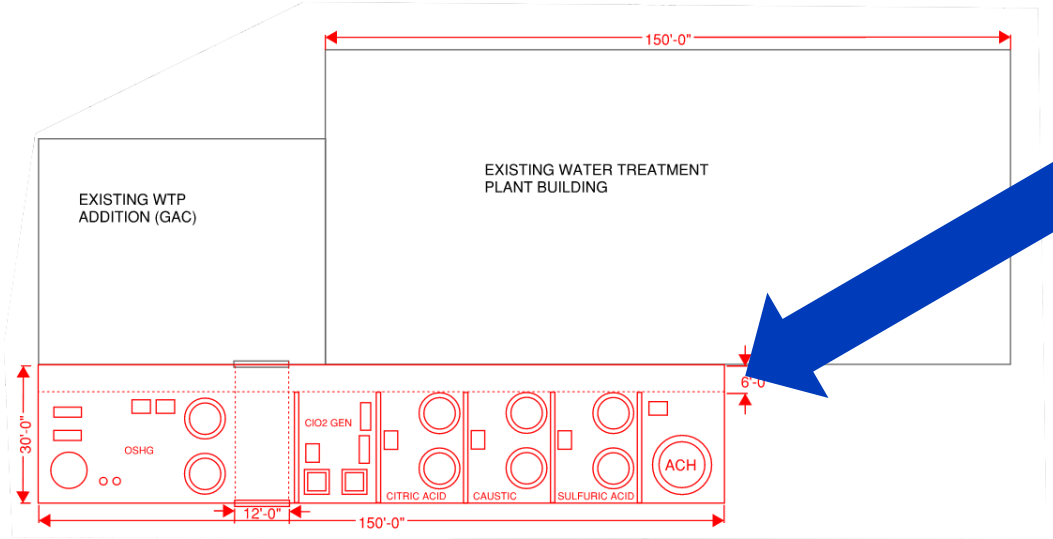

Summary

Summary of alternatives

Alternative	Key Pros	Key Cons	Capital Costs	O&M Costs
Abandon SHWTP	+ Avoid capital investment in SHWTP	- Lose control (if purchase from PCMC) - High capital (if rebuild) - Stranded SHWTP assets and reassign staff - Trigger importation project earlier	Very High	High
Leave SHWTP as-is (2.6 mgd)	+ Minimize capital investment in SHWTP	- Does not address key objectives (e.g., safety) - Infrastructure capital costs	Low	Medium
Optimize SHWTP only (3.4 mgd)		- High NPV - Lower non-economic benefit per Jacobs' analysis	Medium	Medium
Optimize and Expand SHWTP (5.4 mgd)	+ Stay in control + Meet key objectives + Lowest NPV	- Large near-term capital	High	Low

Wrap up and Next Steps

Next Steps

- Develop shortlisted alternatives
- Finish bench testing and begin full-scale testing