FOLSOM WATER VISION WORKSHOP #4

Future Water Supply Portfolios

CITY OF FOLSOM
DISTINCTIVE BY NATURE

OCTOBER 15, 2024 | 6:30 – 8:30PM

WSC

Agenda

I. Brief Project Recap

II. Overview of Evaluation Criteria

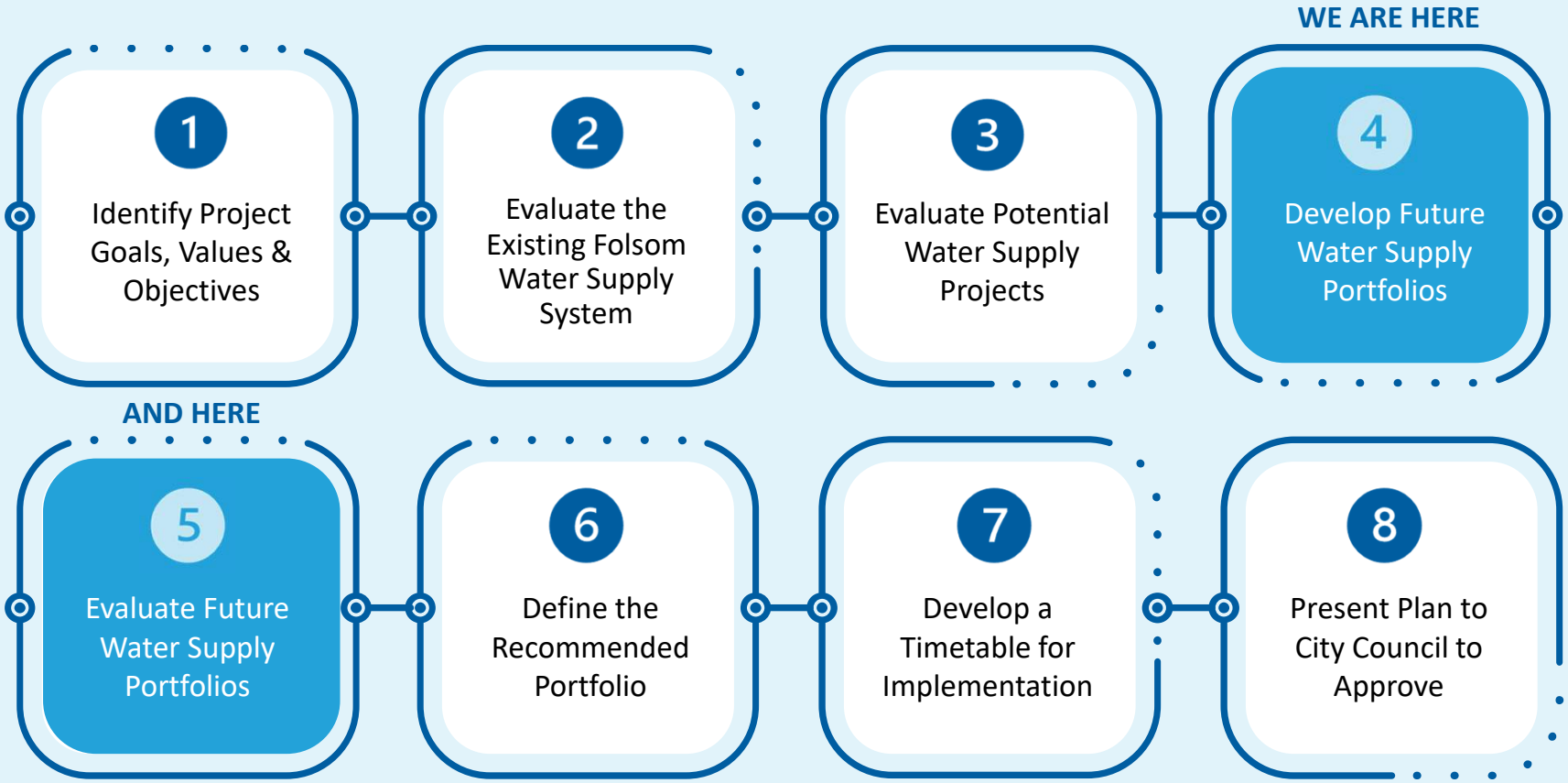
III. Future Portfolios Evaluations

IV. What's Next

A Brief Project Recap

Where have we been, where are we now, and where are we going?

Our Progress



Where have we been?

1 Identify Community Values & Objectives

- High-quality.
- Affordable.
- Reliable supply.
- Resilient system.
- Efficient water use.

2 Evaluate the Existing Water Supply System

- Sufficient water rights to meet buildout demand.
- Top risk to water supply is low Folsom Reservoir levels.
- Identified key water supply infrastructure.
- Identified infrastructure vulnerabilities at raw water pipeline & water treatment plant.

3 Screen New Potential Water Supplies

- WSC evaluated 18 potential supply alternatives.
- WSC/City eliminated 6 of those alternatives due to cost and feasibility.
- Feedback and discussion focused on the remaining 12 alternatives.

Since we last met, we have

- Reviewed your feedback.
- Groups project alternatives.
- Calculated lifecycle costs for alternatives.
- Created 4 preliminary water supply portfolios.
- Evaluated portfolios using criteria.

Tonight's Goal:

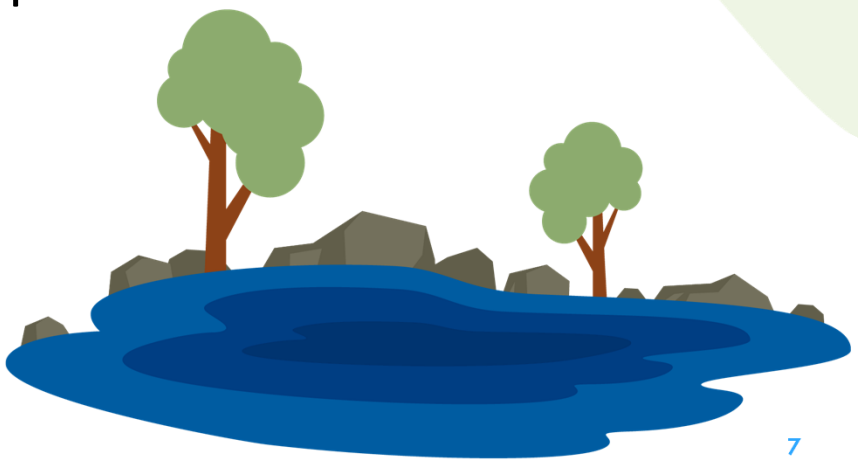
Identify the preferred future supply portfolio(s) and what refinements should be evaluated.

Our Task:

Communicate the portfolio evaluation process and the preliminary portfolios.

Your Task:

Share feedback on the preliminary portfolios.

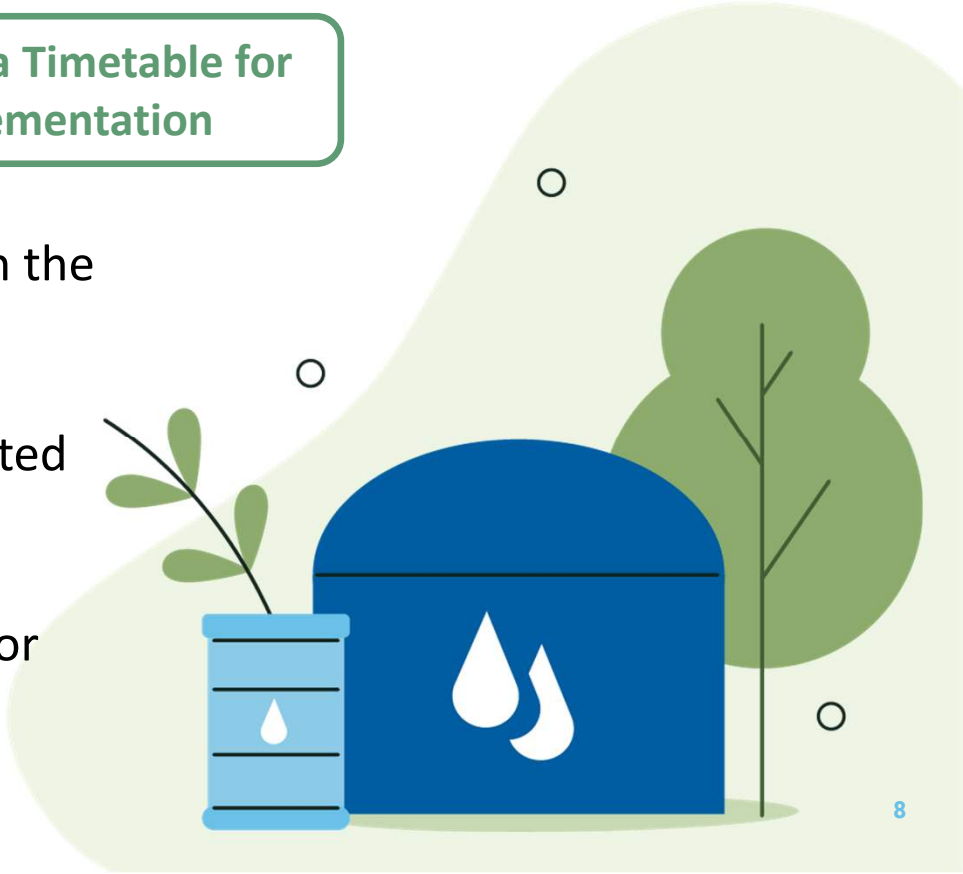


What Comes Next?

6 **Define the Recommended Portfolio**

7 **Develop a Timetable for Implementation**

- Refine the top one or two portfolios based on the feedback we hear tonight.
- Provide a more detailed analysis on the selected portfolio(s).
- Develop a preliminary implementation plan for selected portfolio(s).



Overview of Evaluation Criteria

Evaluation Criteria

RELIABILITY

RESILIENCY

WATER QUALITY IMPACT

IMPLEMENTATION

LIFECYCLE COST

Reliability Rating

Addresses drought vulnerabilities

Description:

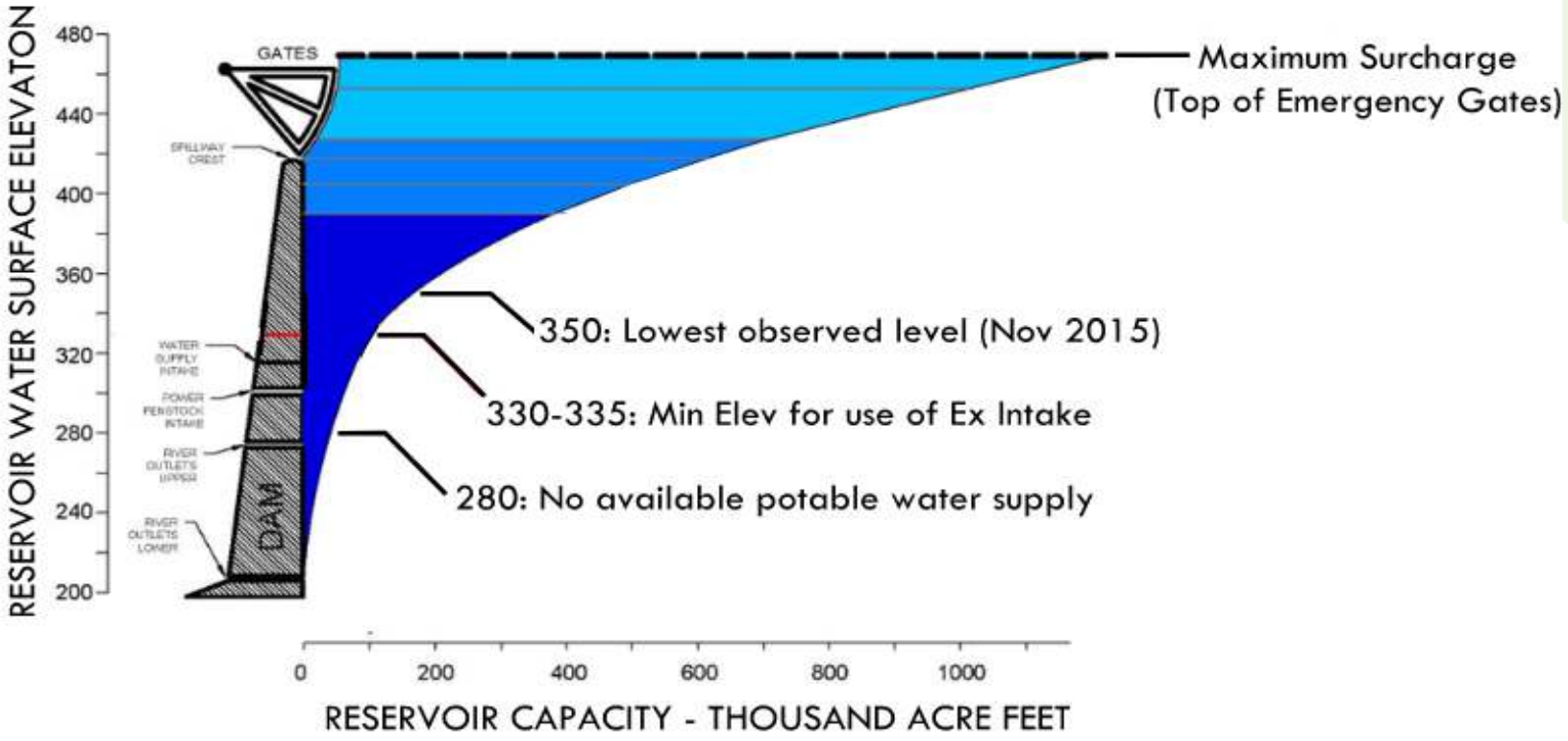
Scores the ability of the portfolio to consistently provide water in drought conditions.

Scoring & Scoring Criteria:

Based on the amount of demand the portfolio can provide at low water levels in Folsom Reservoir.

3-High	2-Medium	1-Low
Provides 100% of projected buildout demands during extreme drought events.	Provides more than 85% of projected buildout demands during extreme drought events.	Provides less than 85% of projected buildout demands during extreme drought events.

Reservoir Level Limitations



Resiliency Rating

Addresses infrastructure and catastrophic events

Description:

Measures the ability of the portfolio to provide drinking water in the face of catastrophic events and/or major infrastructure failures.

Scoring & Scoring Criteria:

Scoring is based on **the average risk scores for the 3 events** , which measures the impact to the system if a selected event were to occur.

3-High	2-Medium	1-Low
Portfolio has a low risk of the selected events having a significant impact on the system.	Portfolio has a medium risk of the selected events having a significant impact on the system.	Portfolio has a high risk of the selected events having a significant impact on the system.

Risk = Probability x Impact

Risk is the calculated as the probability that an event will happen times the impact that event will have on the system.

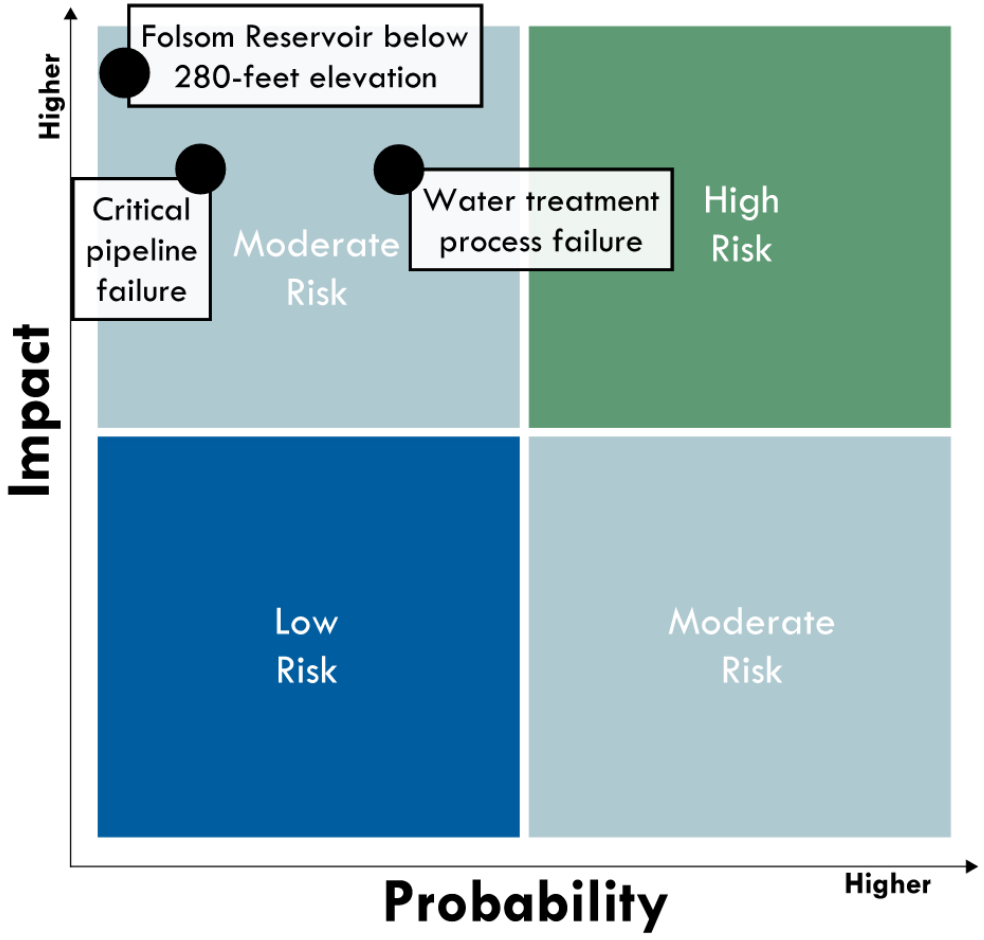
3 Selected Events:

- Critical pipeline failure
- Water treatment process failure
- Folsom Reservoir below 280-feet elevation

	3-High	2-Medium	1-Low
Probability	Event estimated to occur three times or more in a 50-year period.	Event estimated to occur 1-2 times in a 50-year period.	Event estimated to occur one time or less every 50 years.
Impact	Event affects more than 80% of the City's customers.	Event affects between 25% and 80% of the City's customers.	Event affects less than 25% of the City's customers.

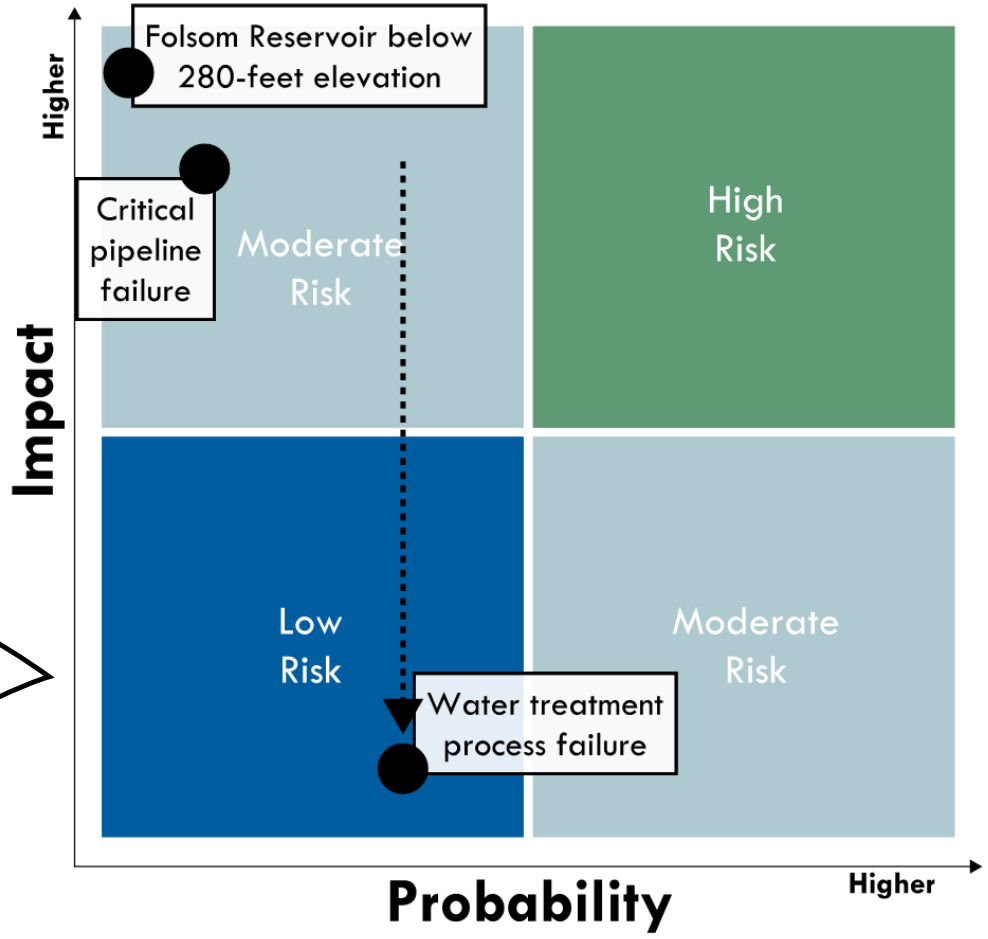
Risk Score Example

Using the Existing Supply Portfolio:



Risk Score Example

Adding *redundancy at the water treatment plant* ***lowers*** *the impact*



Water Quality Impact Rating

Description:

Evaluates the anticipated change in water quality.

Scoring & Scoring Criteria:

Categorized as no impact, minor impact, or major impact.

3-No Impact	2-Minor Impact	1-Major Impact
No new source of water (e.g., only water source is Folsom Reservoir)	New source(s) primarily has the same WQ as Reservoir (e.g., American River, Folsom South Canal)	New source with different WQ (e.g., Groundwater)

Lifecycle Cost Rating

Description:

Comparatively rates of the portfolio's total costs over its entire lifecycle to those of the most cost-effective alternative.

Scoring & Scoring Criteria:

Rating is calculated by taking the ratio of the total lifecycle cost of the water portfolio to the lifecycle cost of the lowest-cost portfolio available. A rating of 3 indicates that the portfolio is the most cost-effective option.

3-High	2-Medium	1-Low
Lowest cost portfolio is given a rating of a 3.	Ratio of the portfolio's lifecycle cost to the lowest cost portfolio. Costs of portfolios in between are scored between 1 and 3 based on cost ratios.	Highest cost portfolio is rated as a 1.

Implementation

Description:

Assesses the expected ease of constructing the portfolio.

Scoring & Scoring Criteria:

Based on the permitting requirements, number of stakeholders required to complete the portfolio, and the anticipated implementation timeline.

3-Easy	2-Medium	1-Hard
No permitting required OR No additional stakeholders AND implementation timeline <5 years	State/local permitting OR 1 agency stakeholder AND implementation timeline of 5-10 years	Federal permitting OR 2+ agency stakeholder AND implementation timeline >10 years

Stakeholder Ranking

Stakeholders ranked the criteria from most to least important. A ranking of 5 was least important, while 1 was most important. Below is a summary of the results we received.

Ranking	1	2	3	4	5	Total
Resiliency	10	8	2	2	1	**23**
Implementation	0	1	2	11	9	**23**
Lifecycle Cost	0	2	4	7	10	**23**
Reliability	9	10	3	1	0	**23**
Water Quality Impact	4	2	12	2	3	**23**

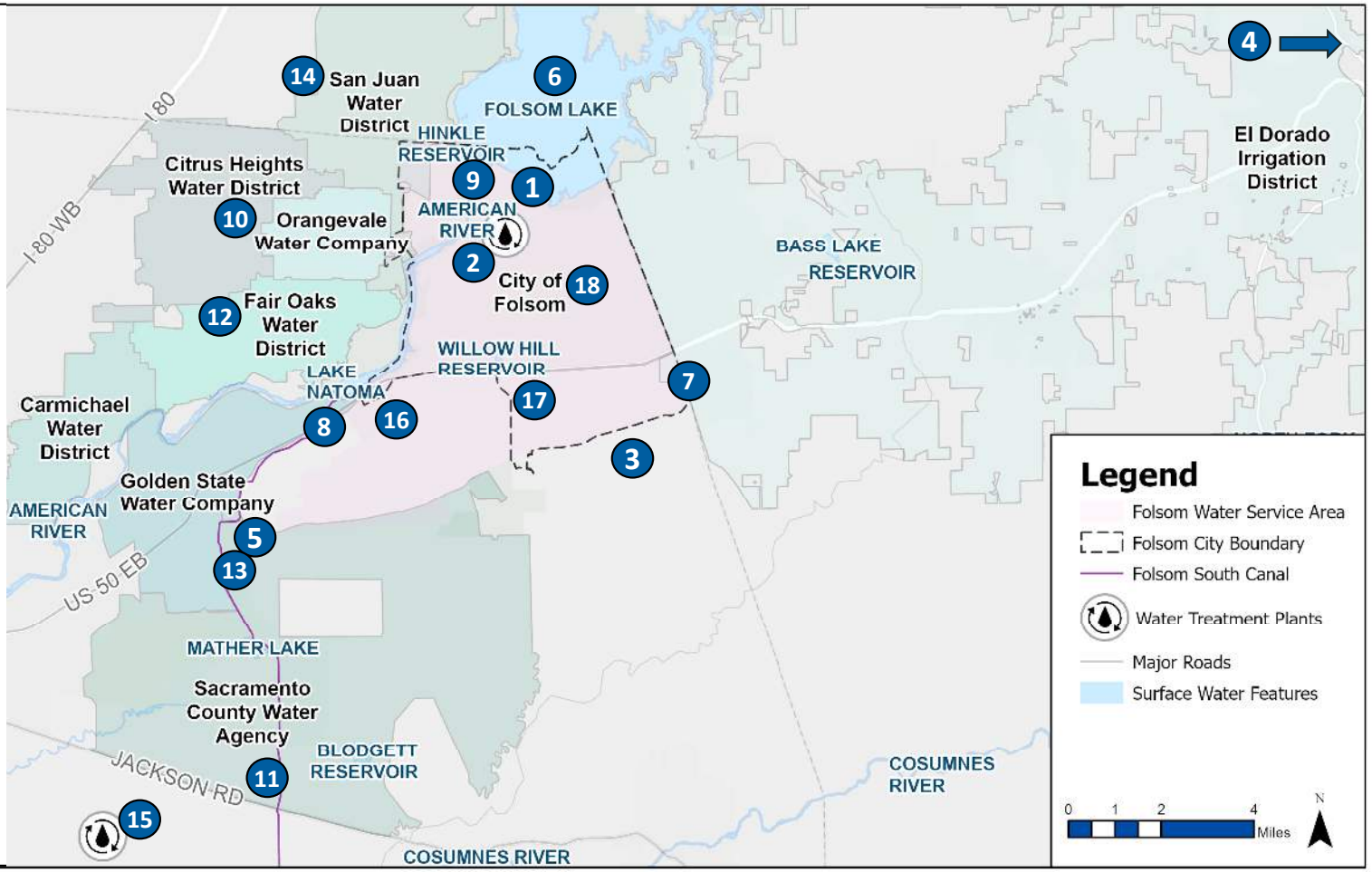
Evaluation Criteria Weighting

Criteria	Weighting	Description
RELIABILITY	**4.2**	Scores the ability of the portfolio to consistently provide water in drought conditions.
RESILIENCY	**4.0**	Measures the ability of the portfolio to provide drinking water in the face of catastrophic events and/or major infrastructure failures.
WATER QUALITY IMPACT	**3.1**	Evaluates the anticipated change in water quality.
LIFECYCLE COST	**1.9**	Comparatively rates of the portfolio's total costs over its entire lifecycle to those of the most cost-effective alternative.
IMPLEMENTATION	**1.8**	Assesses the expected ease of constructing the portfolio.

Future Portfolios Evaluations

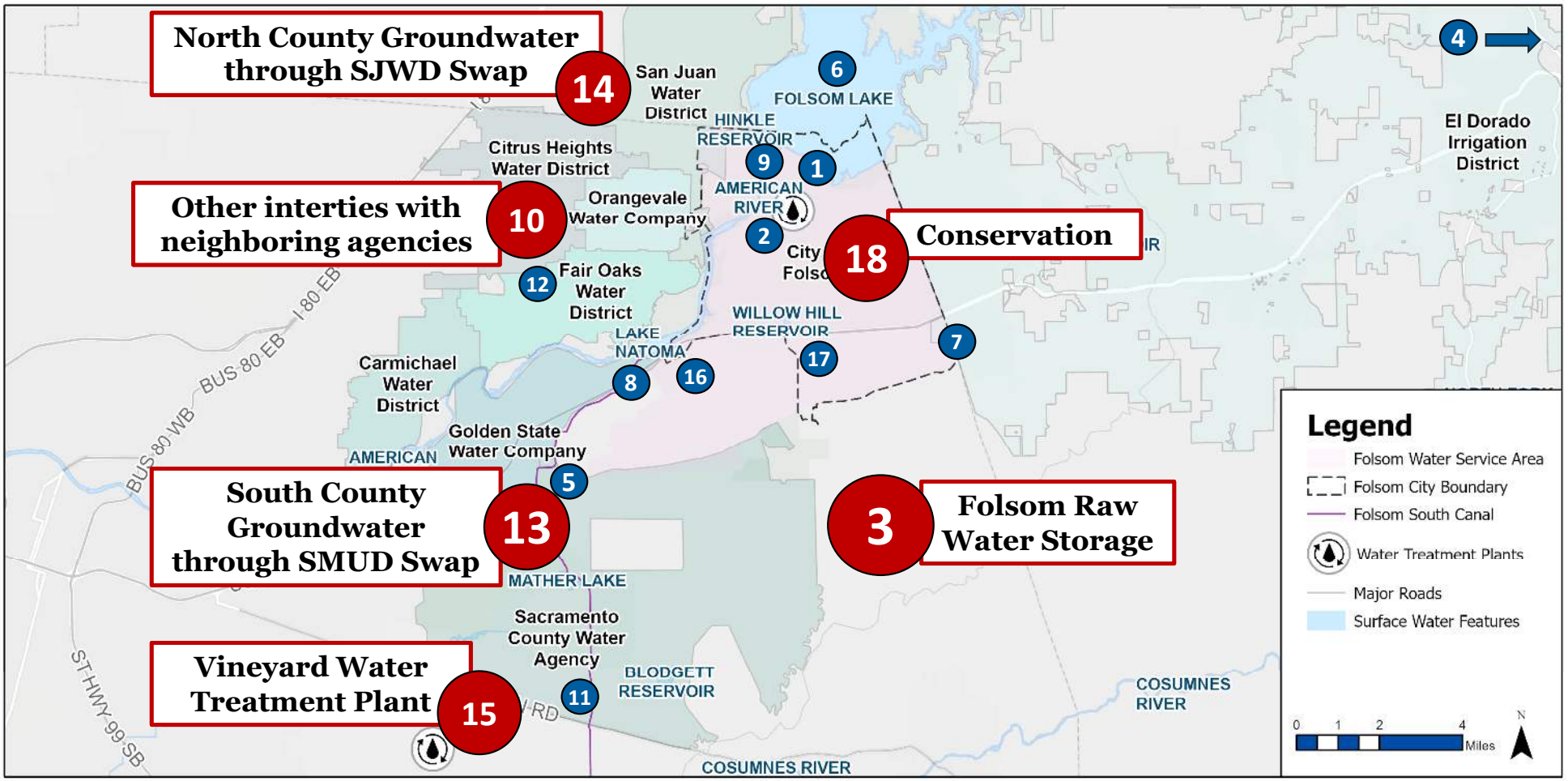
Supply Projects Evaluated

1	Redundant Raw Water Pipeline
2	Redundant Water Treatment Plant Pipelines
3	Raw Water Storage
4	Alder Reservoir
5	Folsom South Canal Diversion
6	USBR Raw Water Supply
7	El Dorado Irrigation District
8	Golden State Water Company
9	San Juan Water District or Partnering Agencies
10	Other interties with neighboring agencies (Citrus Heights Water District, Orangevale Water Company, Carmichael Water District)
11	South County Groundwater Supply
12	North County Groundwater Supply
13	South County Groundwater through SMUD Swap
14	North County Groundwater through SJWD Swap
15	Vineyard WTP in Elk Grove (Freeport intake) (SCWA)
16	Remediated Groundwater for Nonpotable Use
17	Sewer Scalping Plant for Nonpotable Reuse
18	Conservation

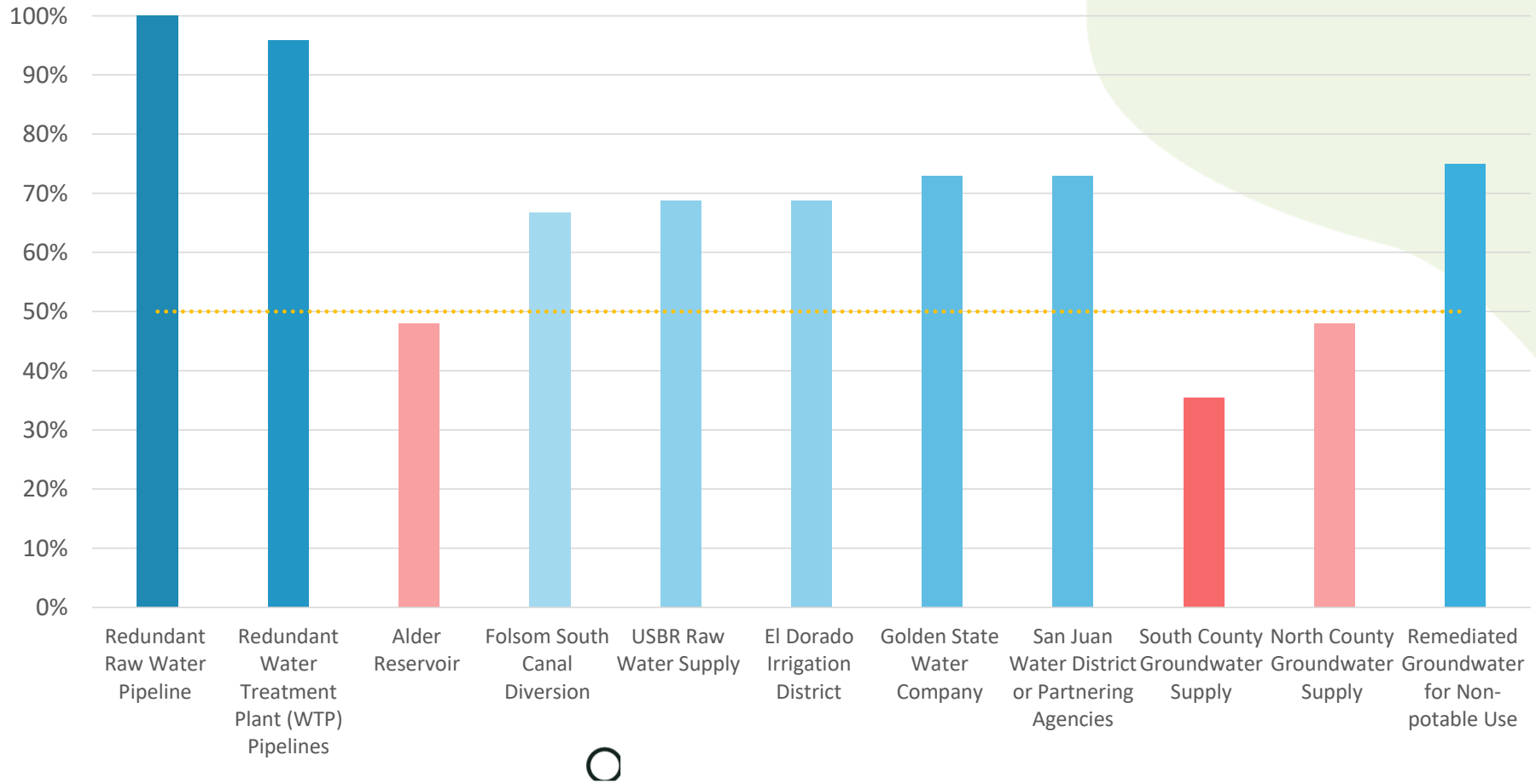


Screened Out

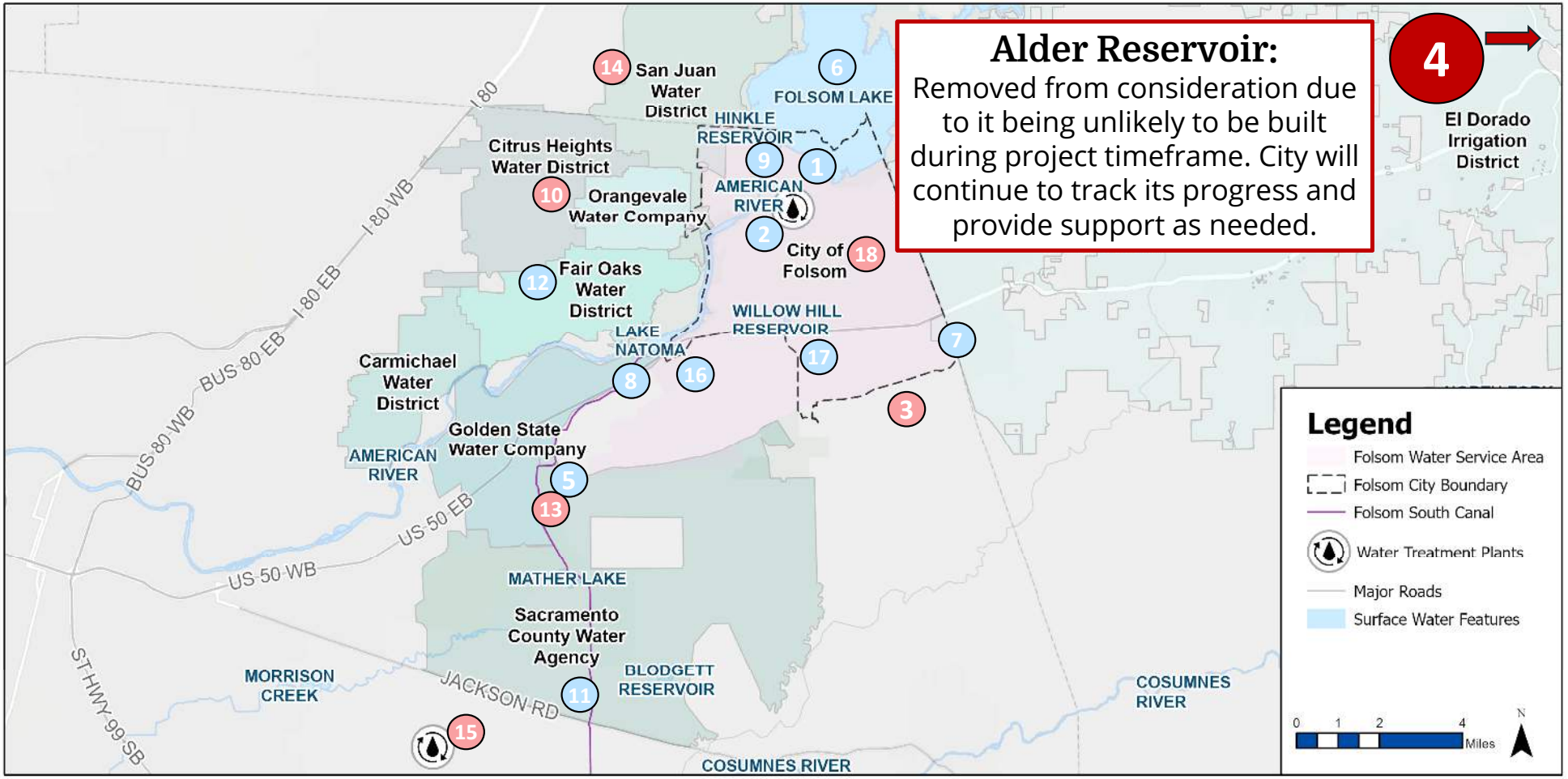
due to high costs, feasibility issues, or because they do not address system vulnerabilities.



Workshop 3 Feedback

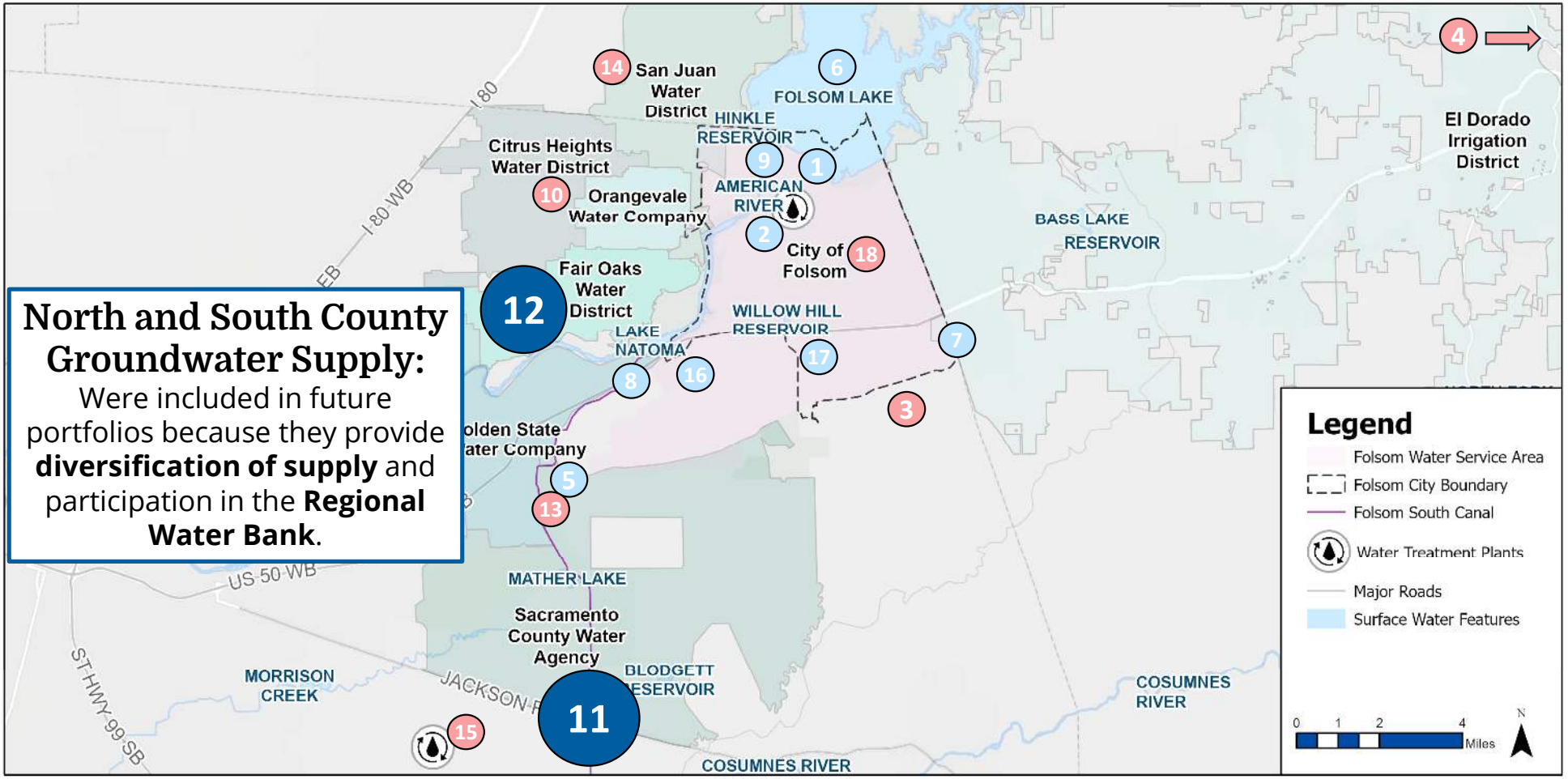


Incorporating Your Feedback

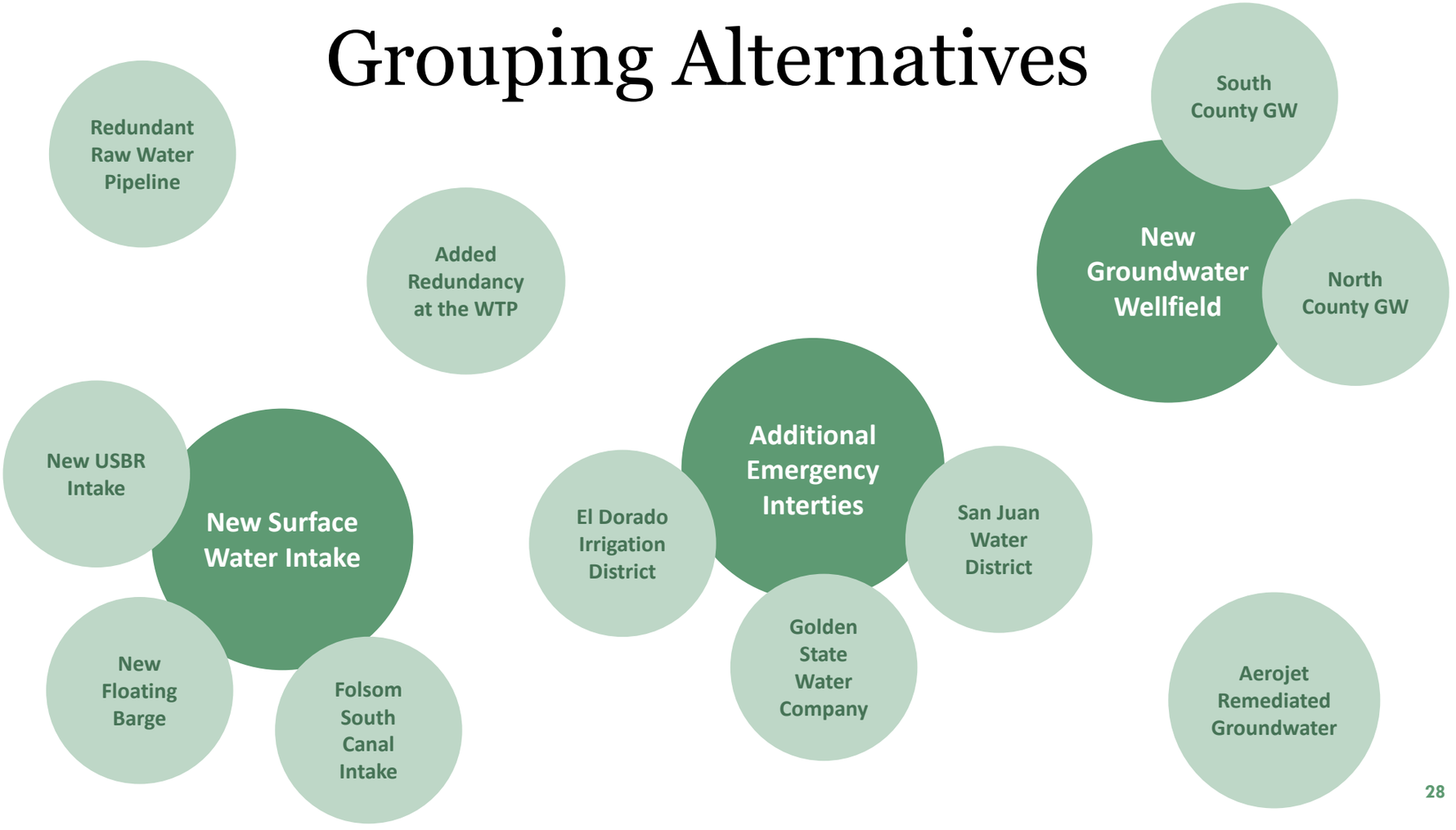


Incorporating Your Feedback

North and South County Groundwater Supply:
Were included in future portfolios because they provide **diversification of supply** and participation in the **Regional Water Bank**.



Grouping Alternatives



Developing Portfolios

	SURFACE WATER FOCUSED	GROUNDWATER FOCUSED
BASE	**IMPROVED INFRASTRUCTURE** • Additional Emergency Interties • Aerojet Remediated Groundwater • Redundant Raw Water Pipeline • Added Redundancy at the Water Treatment Plant	**GROUNDWATER** • New Groundwater Wellfield
ENHANCED	**ENHANCED SURFACE WATER** • New Surface Water Intake • Aerojet Remediated Groundwater • Added Redundancy at the Water Treatment Plant	**ENHANCED GROUNDWATER** • New Groundwater Wellfield • Aerojet Remediated Groundwater • Added Redundancy at the Water Treatment Plant

Share Your Feedback

Comment Cards:

- Use your comment card to indicate if you are supportive of each recommendation.

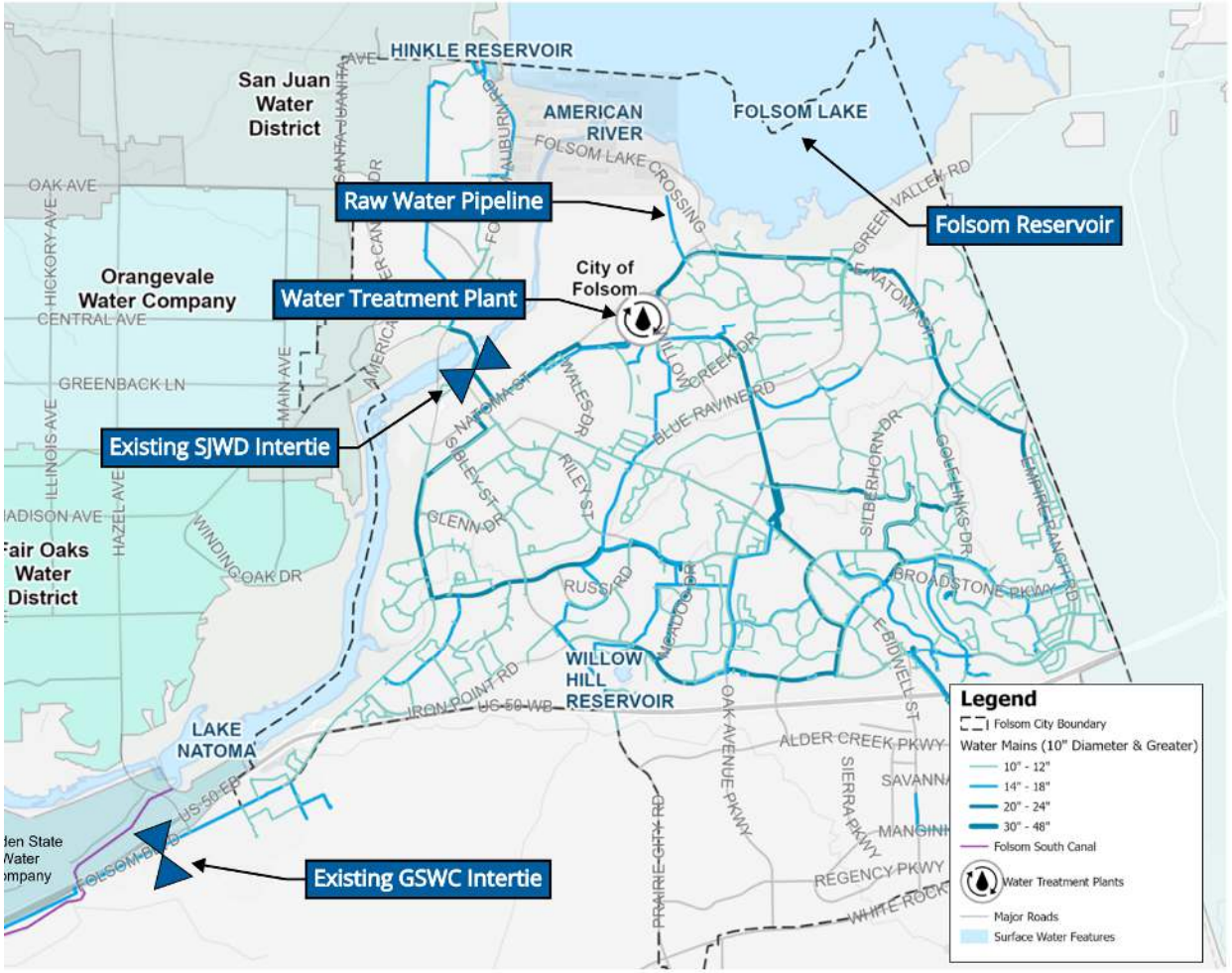
- Give the City feedback or ask us questions.

Baseline (Existing) Portfolio

Description:

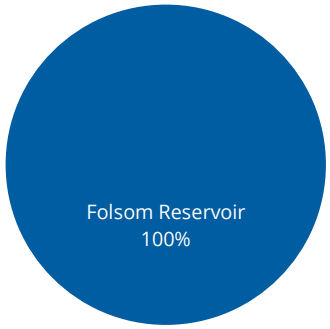
Water is drawn from the lake at Folsom Dam, after which it is treated at the treatment plant and then enters the distribution system.

The non-potable water from Aerojet's GET A-B wells is not in use in the existing portfolio.

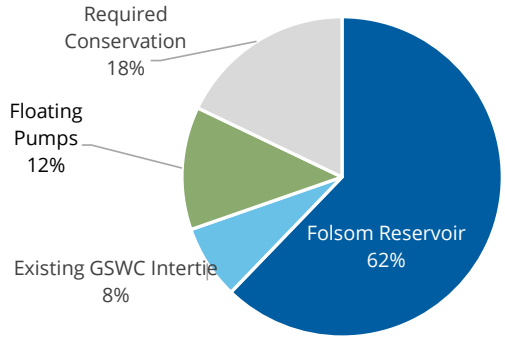


Baseline (Existing) Portfolio

Supply Yield Estimates:



Normal to Moderate Drought



Extreme Drought Year

Evaluation Criteria:

Criteria	Rating	Weight	Score
Reliability	1	4.2	4.2
Resiliency	1	4	4.0
Water Quality Impact	3	3.1	9.3
Implementation	3	1.8	5.4
Lifecycle Cost	3	1.9	5.7
Average Evaluation Score			**5.7**

Additional Considerations:

Relies on a single primary supply source and is vulnerable to future lake levels.

- *If the lake drops below the intake level (335-ft), it requires 10 floating pumps to deliver supply.*
- *If the lake were to ever drop below elevation 280-ft, City could lose its water supply.*

Improved Infrastructure Portfolio

Description:

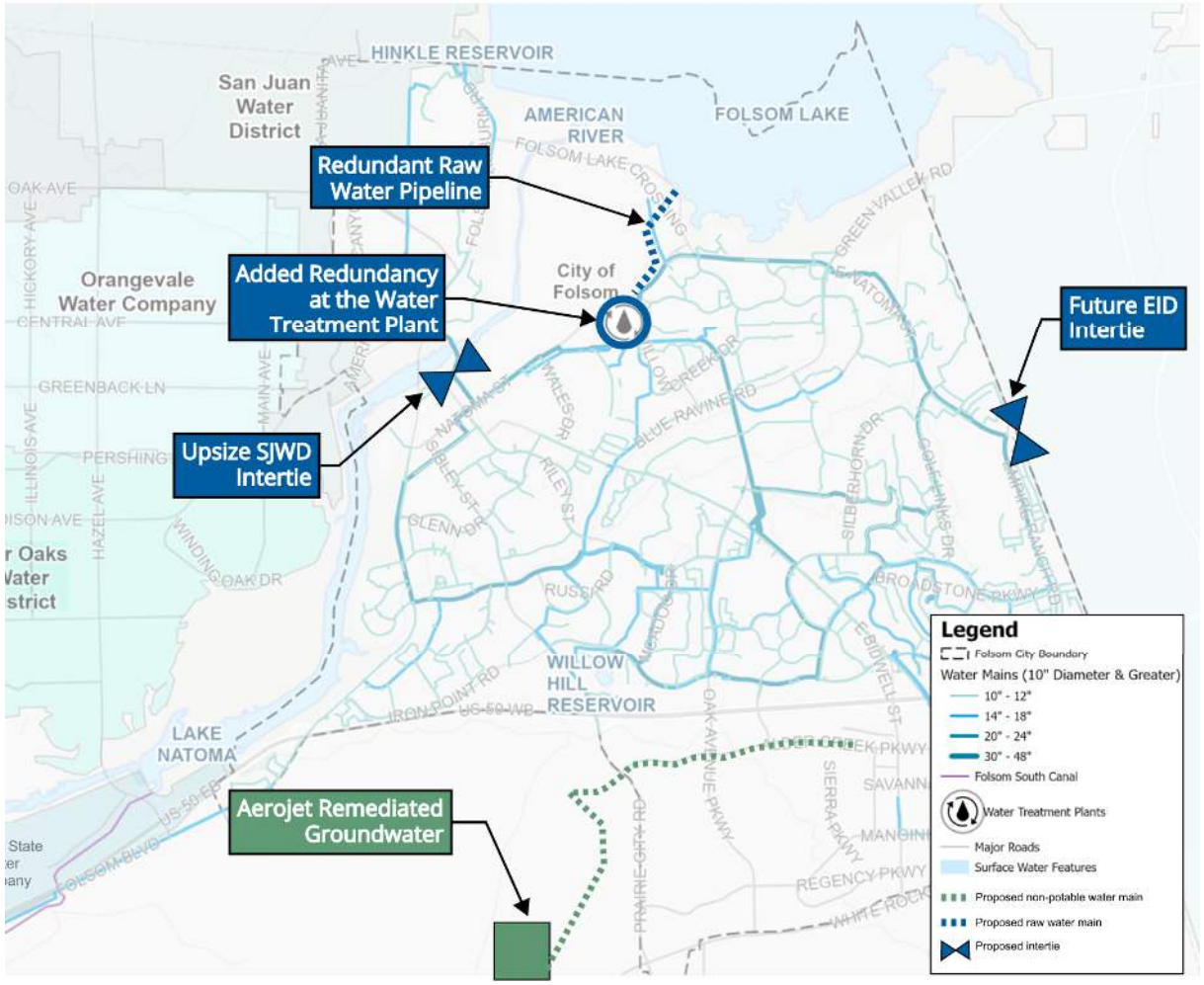
Focuses on infrastructure improvements by adding new interties, a redundant raw water pipeline, and redundancy at the water treatment plant.

Aerojet's GET A-B wells is also established as a non-potable water source.

Lifecycle Cost:

Capital Cost	Lifecycle O&M	Total Lifecycle
$55.2	$25.0	$80.2

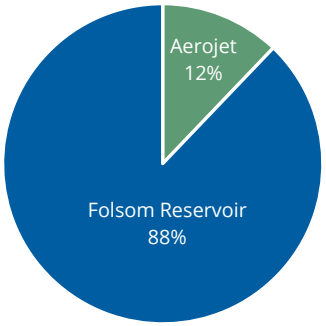
**Cost are in millions of 2024 dollars.*



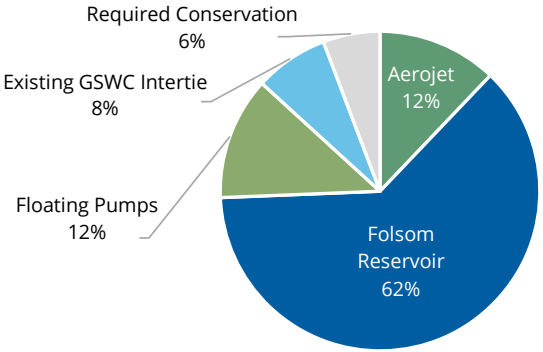
Concept Rate Impact of Portfolio: $15/month

Improved Infrastructure Portfolio

Supply Yield Estimates:



Normal to Moderate Drought



Extreme Drought Year

Evaluation Criteria:

Criteria	Rating	Weight	Score
Reliability	2	4.2	8.4
Resiliency	2.7	4	10.9
Water Quality Impact	3	3.1	9.3
Implementation	2	1.8	3.6
Lifecycle Cost	3	1.9	5.7
Average Evaluation Score			**7.6**

Additional Considerations:

Still reliant on a single primary supply source and is vulnerable to future lake levels.

Future considerations could include:

- *Evaluate which interties to upsize or add that provide the most value to the City.*

Enhanced Surface Water Portfolio

Description:

Focuses on bolstering the City's surface water supply by adding a new surface water intake and redundancy at the water treatment plant.

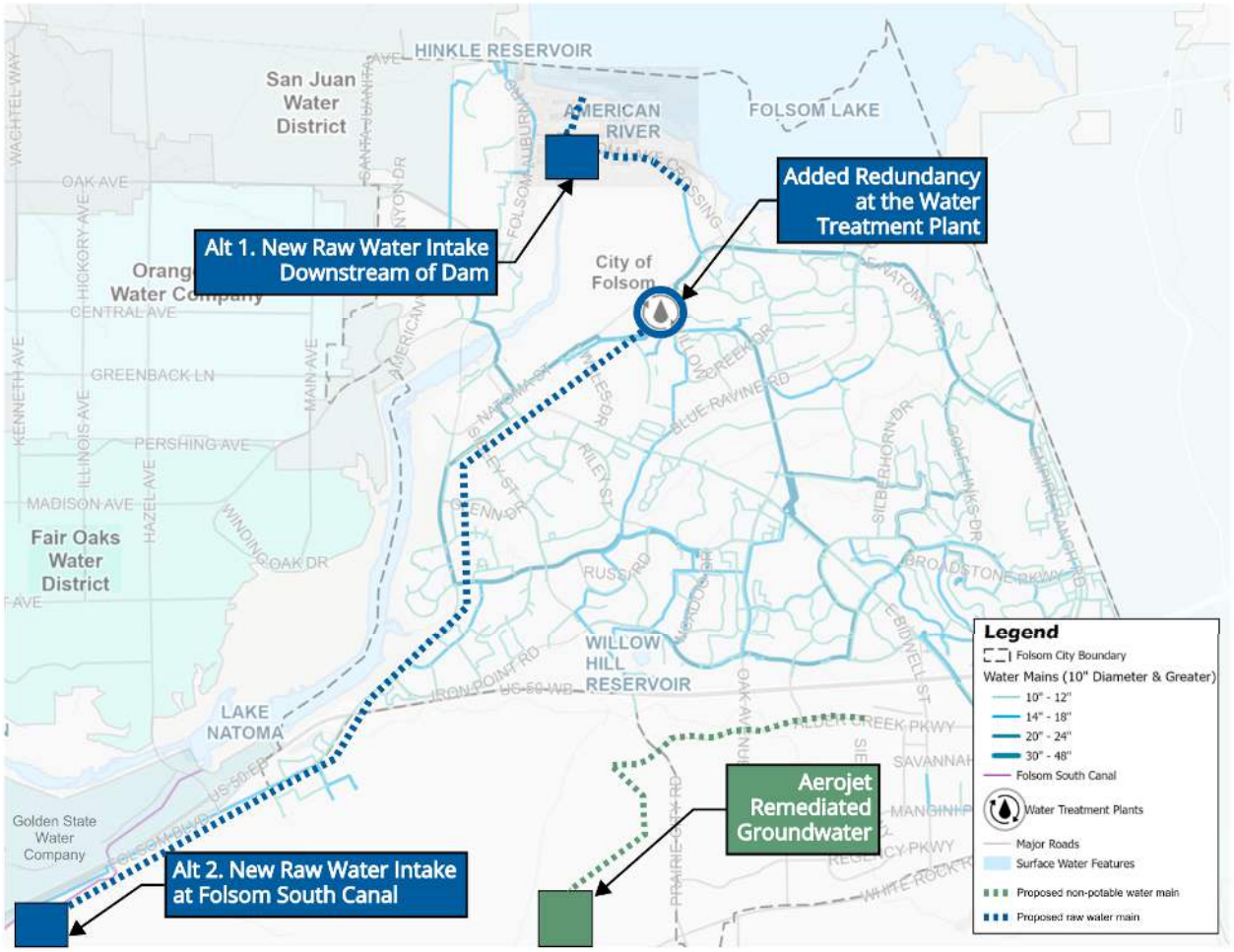
Aerojet's GET A-B wells is also established as a non-potable water source.

Lifecycle Cost:

Capital Cost	Lifecycle O&M	Total Lifecycle
$95 to $169	$43 to $45	$138 to $214

**Cost are in millions of 2024 dollars.*

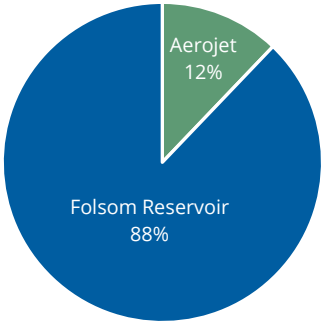
*** Alt 1 is higher cost and Alt 2 is lower cost.*



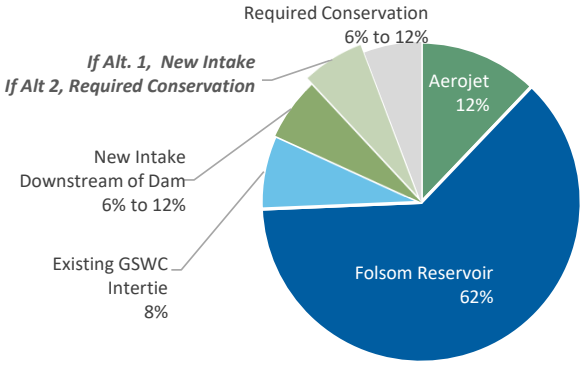
Concept Rate Impact of Portfolio: $25 to $45/month

Enhanced Surface Water Portfolio

Supply Yield Estimates:



Normal to Moderate Drought



Extreme Drought Year

Evaluation Criteria:

Criteria	Rating	Weight	Score
Reliability	2	4.2	8.4
Resiliency	2.4 – 2.7	4	9.7 – 10.9
Water Quality Impact	2	3.1	6.2
Implementation	1 – 2.0	1.8	1.8 – 3.6
Lifecycle Cost	1.4 – 2.3	1.9	2.6 – 4.4
Average Evaluation Score			**6.0 – 6.5**

Additional Considerations:

Still reliant on a single primary supply source and is vulnerable to future lake levels.

Future considerations could include:

- *Invest in a new intake downstream of the dam or a Folsom South Canal intake?*

Groundwater Portfolio

Description:

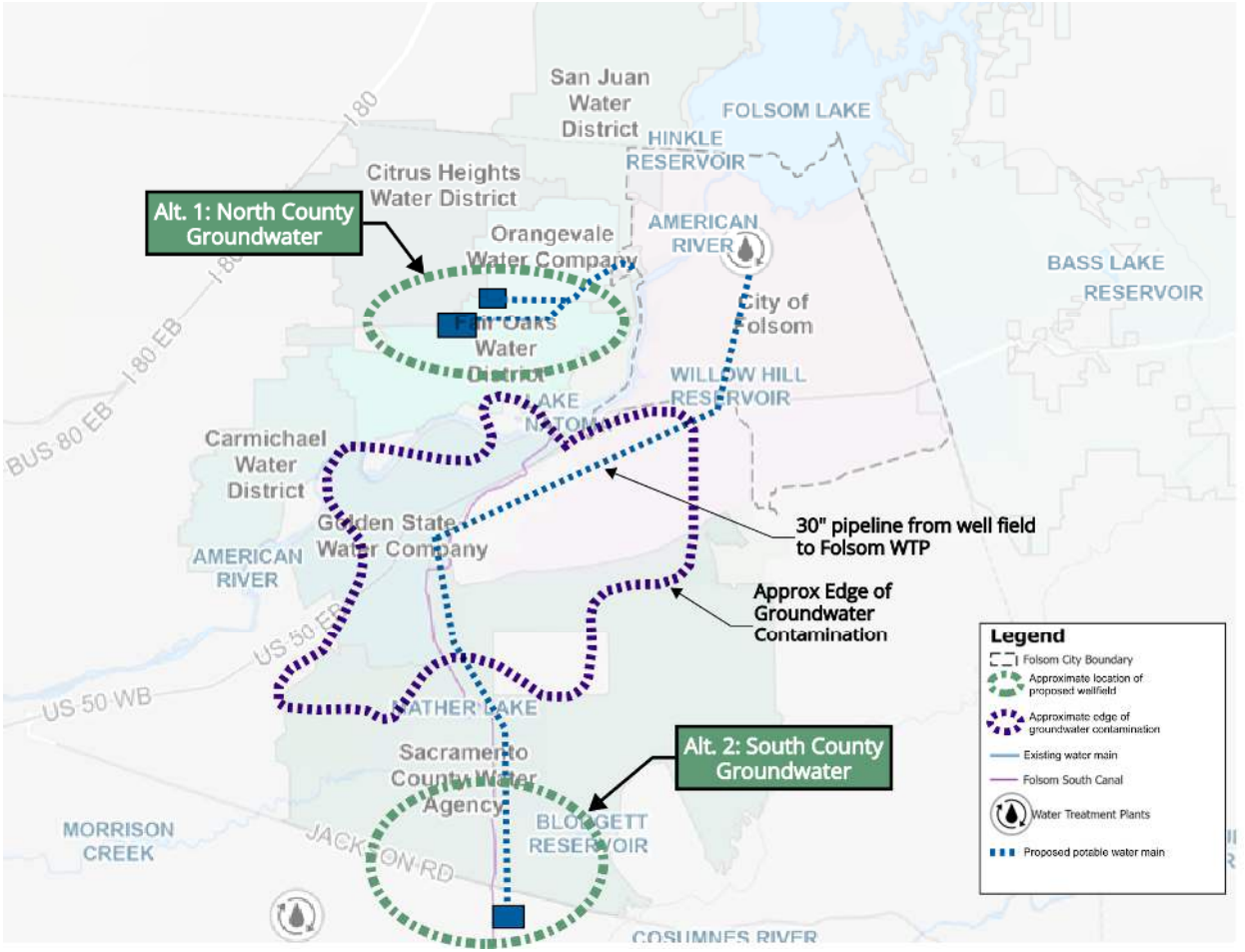
Adds groundwater to the City's water supply portfolio. This independent source of supply adds both reliability and resiliency to the City's supply portfolio.

Lifecycle Cost:

Capital Cost	Lifecycle O&M	Total Lifecycle
$72 to $173	$14 to $39	$86 to $213

**Cost are in millions of 2024 dollars.*

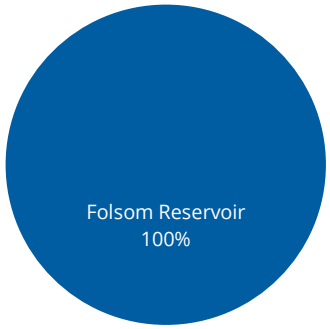
*** Alt 1 is lower cost and Alt 2 is higher cost.*



Concept Rate Impact of Portfolio: $20 to $45/month

Groundwater Portfolio

Supply Yield Estimates:



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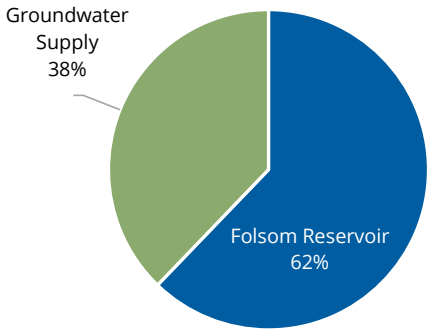


Extreme Drought Year

Evaluation Criteria:

Criteria	Rating	Weight	Score
Reliability	3	4.2	12.6
Resiliency	2.15	4	8.6
Water Quality Impact	1	3.1	3.1
Implementation	1	1.8	1.8
Lifecycle Cost	1.4 – 2.9	1.9	2.7 – 5.6
Average Evaluation Score			**5.8 – 6.3**

Additional Considerations:

Groundwater provides a separate source of supply

Future considerations could include:

- *Analysis of North County vs. South County wellfields.*
- *Study potential locations to connect the wellfield to the existing water system.*
- *Evaluate system isolation alternatives for key businesses.*

Enhanced Groundwater Portfolio

Description:

Adds groundwater to the City's portfolio and resiliency to the City's existing supply sources by building redundancy at the water treatment plant.

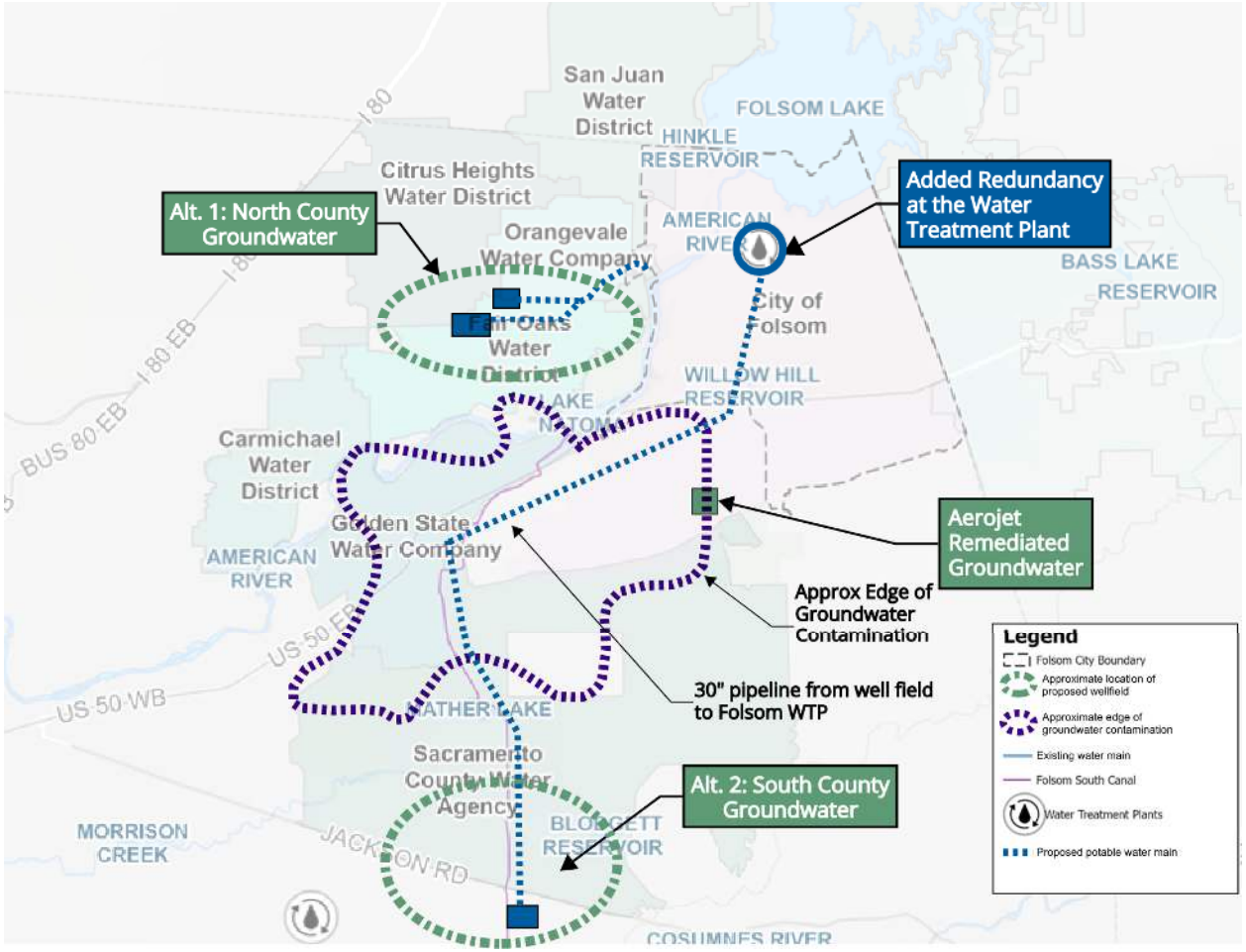
Aerojet's GET A-B wells is also established as a non-potable water source.

Lifecycle Cost:

Capital Cost	Lifecycle O&M	Total Lifecycle
$84 to $185	$36 to $61	$120 to $247

**Cost are in millions of 2024 dollars.*

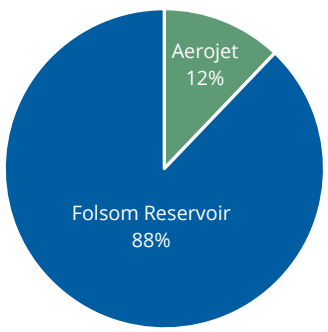
*** Alt 1 is lower cost and Alt 2 is higher cost.*



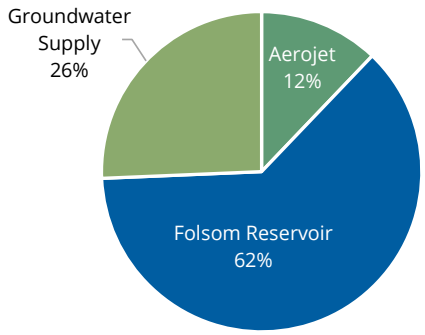
Concept Rate Impact of Portfolio: $25 to $50/month

Enhanced Groundwater Portfolio

Supply Yield Estimates:



Normal to Moderate Drought



Extreme Drought Year

Evaluation Criteria:

Criteria	Rating	Weight	Score
Reliability	3	4.2	12.6
Resiliency	3	4	12.0
Water Quality Impact	1	3.1	3.1
Implementation	1	1.8	1.8
Lifecycle Cost	1 – 2.5	1.9	1.9 – 4.8
Average Evaluation Score			**6.3 – 6.9**

Additional Considerations:

Groundwater provides a separate source of supply

Future considerations could include:

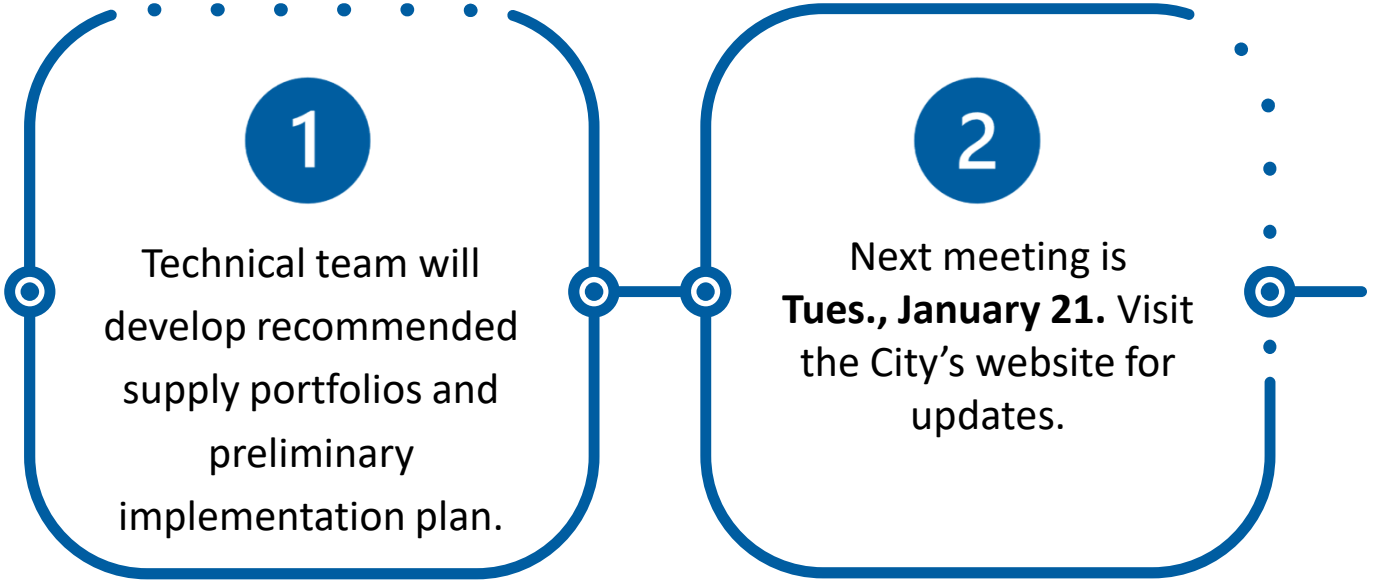
- *Analysis of North County vs. South County wellfields.*
- *Study potential locations to connect the wellfield to the existing water system.*
- *Evaluate system isolation alternatives for key businesses.*

Summary Slide

Portfolio	Baseline (Existing)	Improved Infrastructure	Enhanced Surface Water	Groundwater	Enhanced Groundwater
Lifecycle Cost	N/A	$ 80 million	$ 215 million	$ 86 to 213 million	$ 120 to 247 million
Extreme Drought Supply Yield	82% of buildout demand	94% of buildout demand	94% of buildout demand	100% of buildout demand	100% of buildout demand
Evaluation Score	5.7	7.6	6.0 – 6.5	5.8 – 6.3	6.3 – 6.9
Benefits	No rate or water quality impacts.	No water quality impacts. Increased reliability and resiliency.	Same as Improved Infrastructure with greater resiliency.	Groundwater provides a separate, drought resistant supply source and allows for water banking during wet/average years.	Same as Groundwater portfolio, plus added resiliency to existing surface water system.
Detractors	Relies on a single supply source that is vulnerable in droughts.	Still relies on a single supply source that is vulnerable in droughts.	Still relies on a single supply source that is vulnerable in droughts.	Groundwater supplies would change water quality but can use valve to limit where groundwater is used.	Groundwater supplies would change water quality but can use valve to limit where groundwater is used.

What's Next?

Next Steps


1
Technical team will develop recommended supply portfolios and preliminary implementation plan.
2
Next meeting is **Tues., January 21.** Visit the City's website for updates.

Thanks for Attending!

CITY OF
FOLSOM
DISTINCTIVE BY NATURE

Supply Assumptions

Moderate drought = drier water year type as defined by the Water Forum Agreement (WFA).

- *Folsom Reservoir usage reduced to between 22,000 and 27,000 acre-feet*

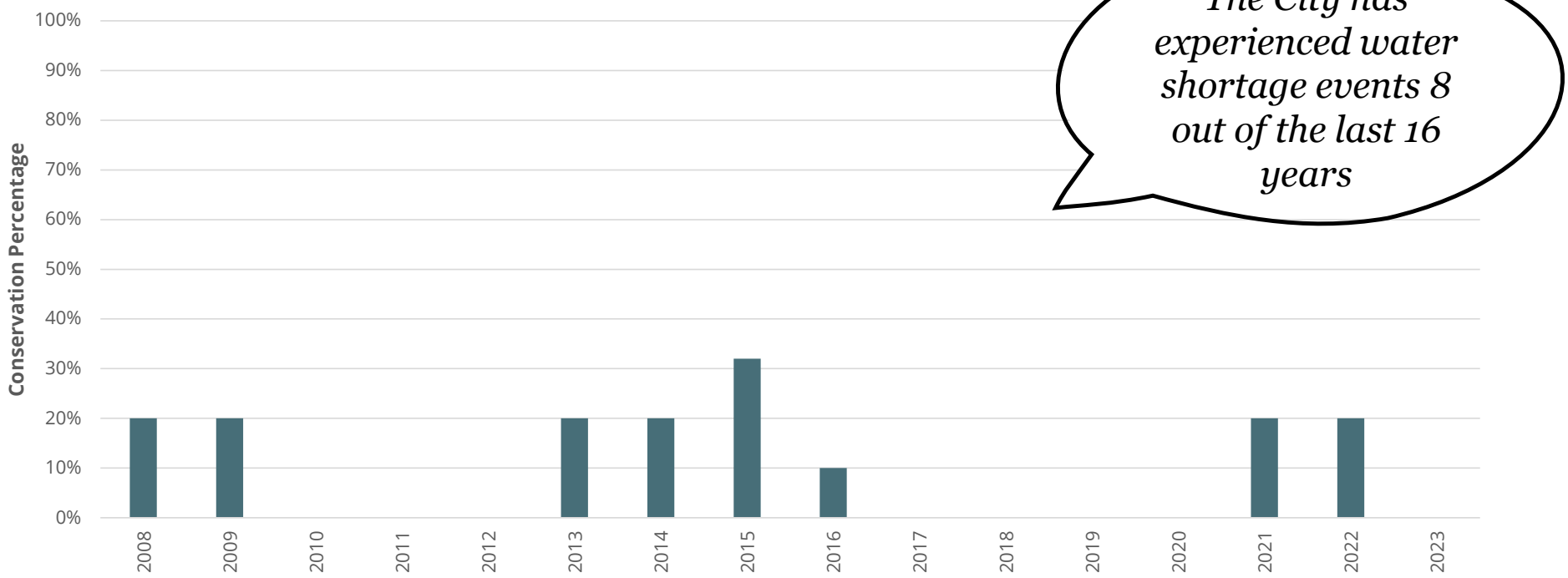
Extreme drought = driest water year type as defined by the Water Forum Agreement.

- *Folsom Reservoir usage reduced to 20,000 acre-feet during a driest year.*
- *Folsom Reservoir may to drop below minimum existing intake level for a couple months, requiring the barge or an alternative intake to draw water.*

- Our analysis assumes that regional cutbacks and USBR management will keep Folsom Reservoir above its deadpool elevation of 280 (when essentially no water can be pulled from the lake) during extreme drought years.

- Existing Golden State Water Company intertie has a capacity of up to 2,000 acre-feet per year even during drought conditions.

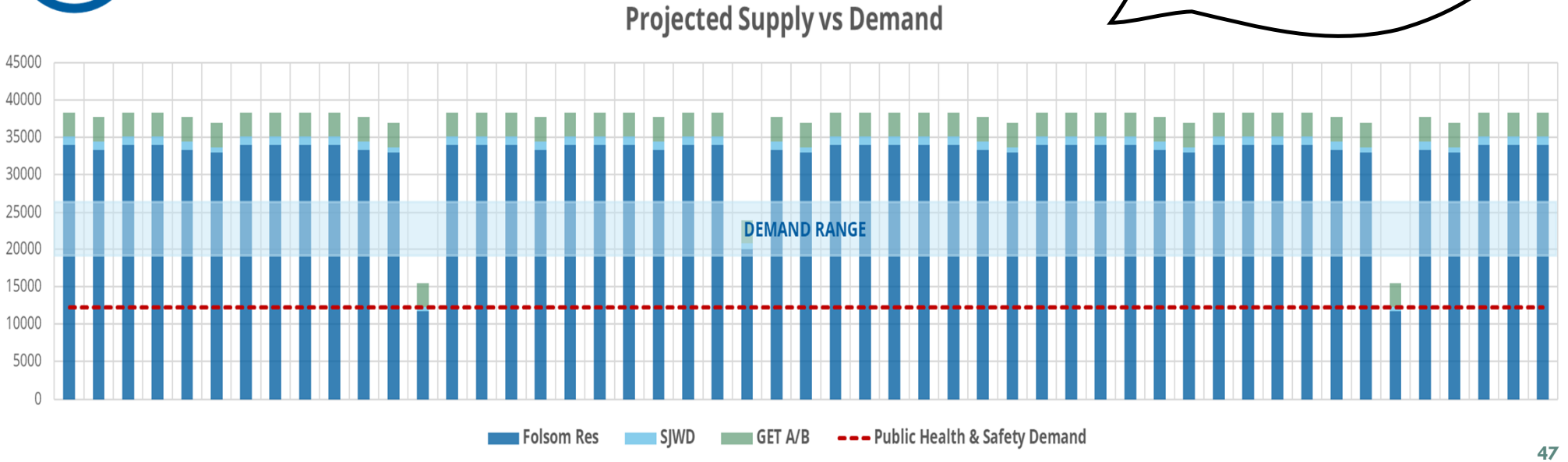
Historical Water Shortage Events



Expected Frequency of an Extreme Drought Year

CENTRAL TENDENCY SCENARIO

Driest Water Year expected 3 out of every 50 years



Rate Impact Costs Assumptions

These calculations are conservative and do not take into account existing rates, grants, or other taxes that offset rate increases.

$$RI = {(C_a + O\&Ma)} / {(nconnections\ x\ 12\ months)}$$

where:

C_a = Estimated Capital Cost, annualized

$O\&M_a$ = Expected average annual operations and maintenance cost

$n_{connections}$ = Number of customer connections in the City's system