



REPLENISH
— *Big Bear* —

Presented by
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January 25, 2023

STATUS UPDATE // BBARWA Board Presentation



REPLENISH
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- **Pilot Study**
- **Environmental Review Process**
- **Regulatory Timeline**
- **Grant Funding**
- **Benefit Resources**
- **Program Schedule**



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Pilot Study



Pilot Plan - Goals



Demonstrate process performance for site-specific wastewater conditions to regulatory agencies



Confirm the proposed treatment process as a viable design approach to meet the target treatment levels

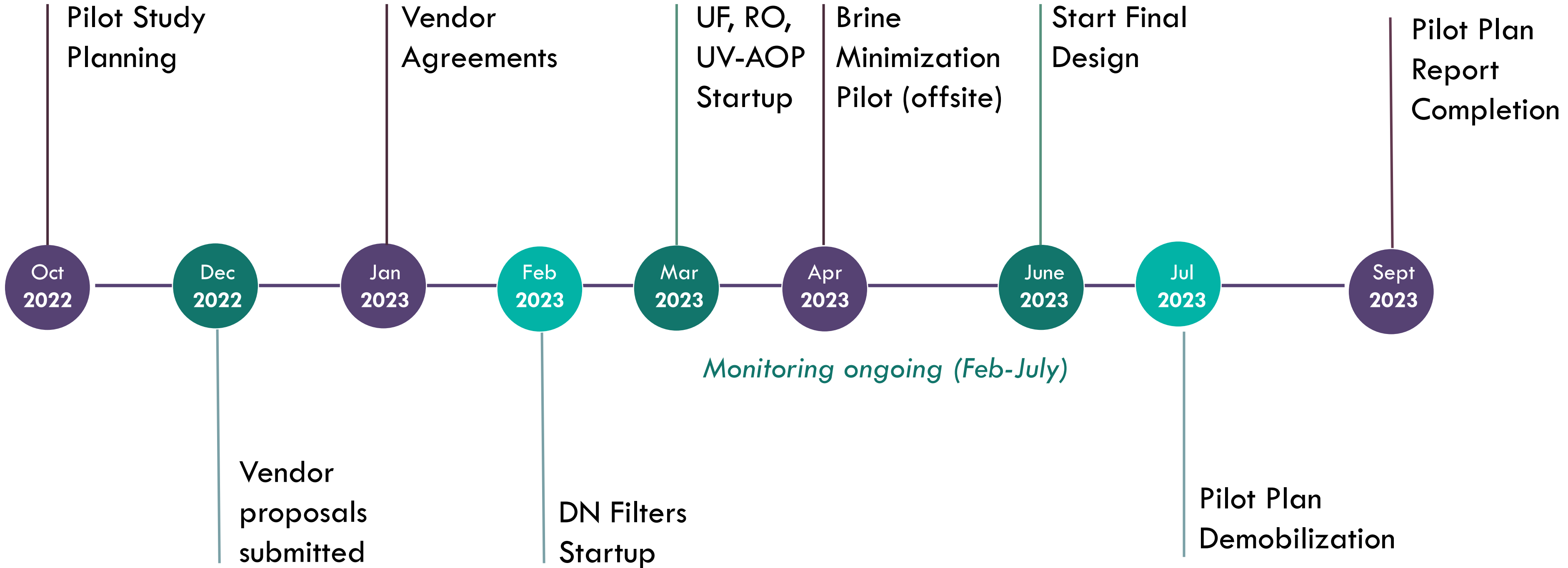


Quantify total system recovery for product water

Pilot Plan Timeline



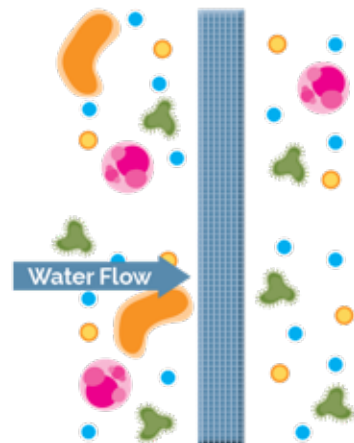
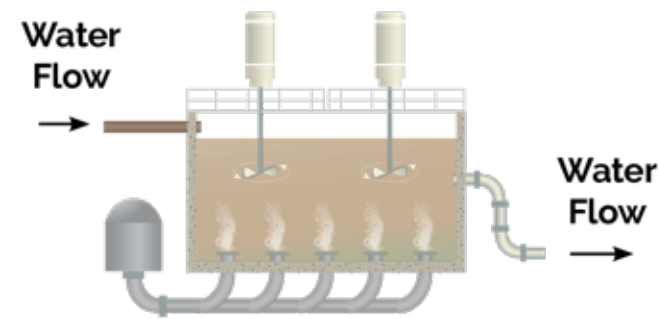
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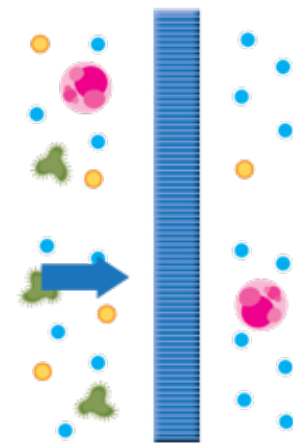
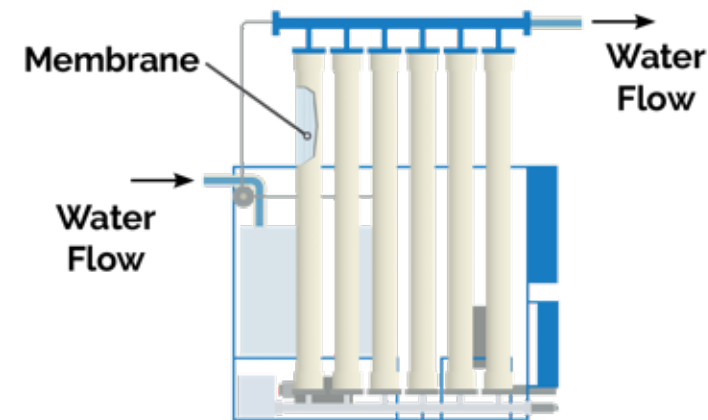
Advanced Purification Facility

The existing BBARWA Wastewater Treatment Plant (WWTP) will be supplemented with a full advanced treatment facility with a capacity of 2.2 MGD, capable of producing up to 2,210 AFY. Multiple treatment processes will use the best available technology to produce purified water that meets or exceeds all State and Federal water quality standards to protect public health and the environment.

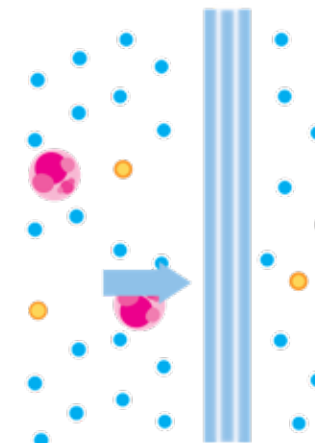
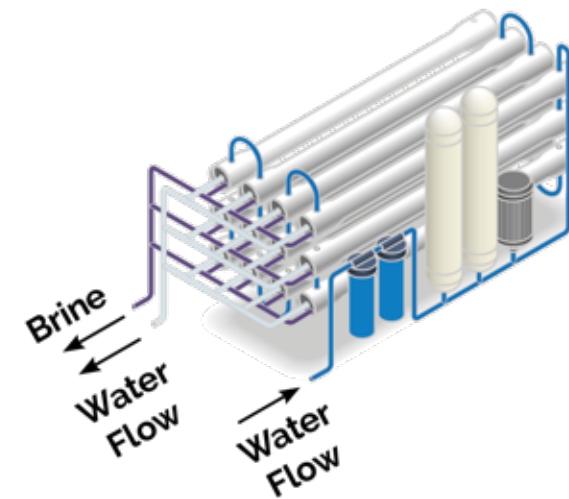
Nutrient Removal



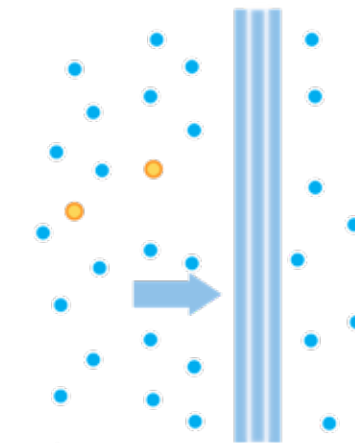
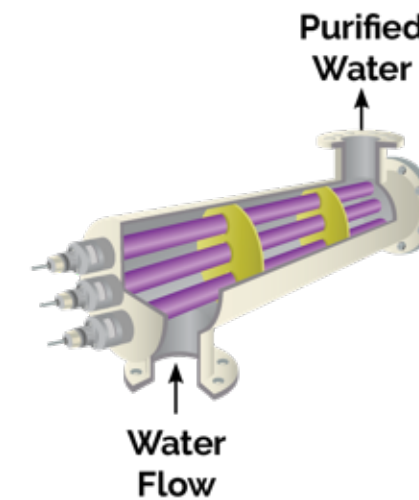
Ultra Filtration



Reverse Osmosis (RO)

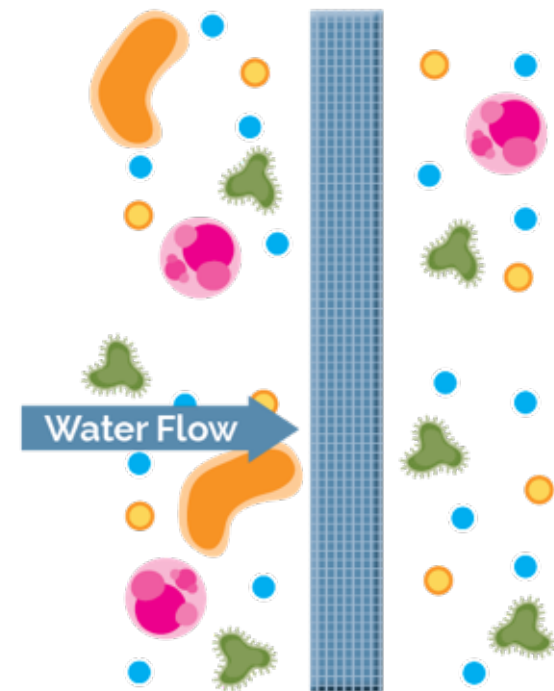
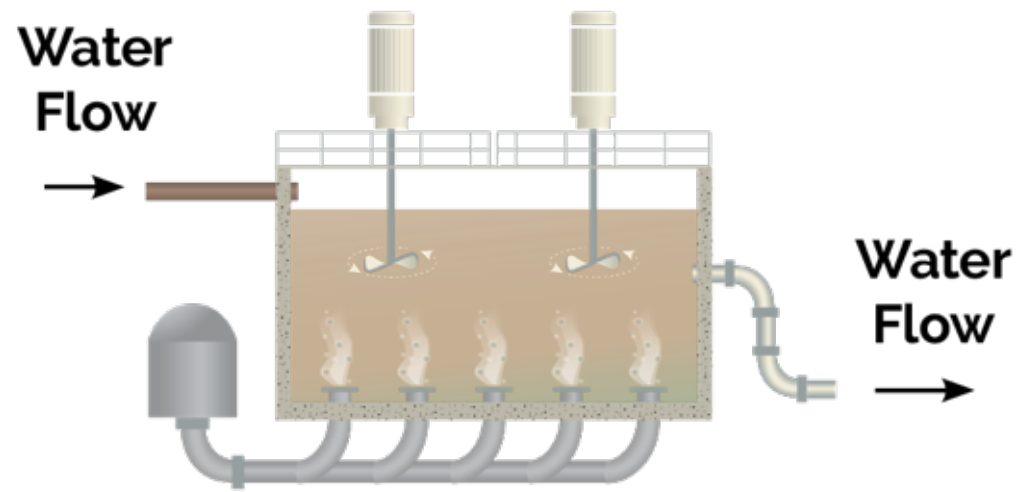


UV Disinfection & Advanced Oxidation Process



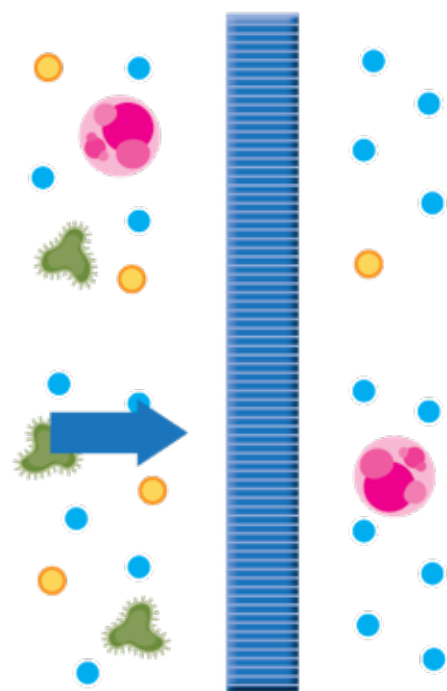
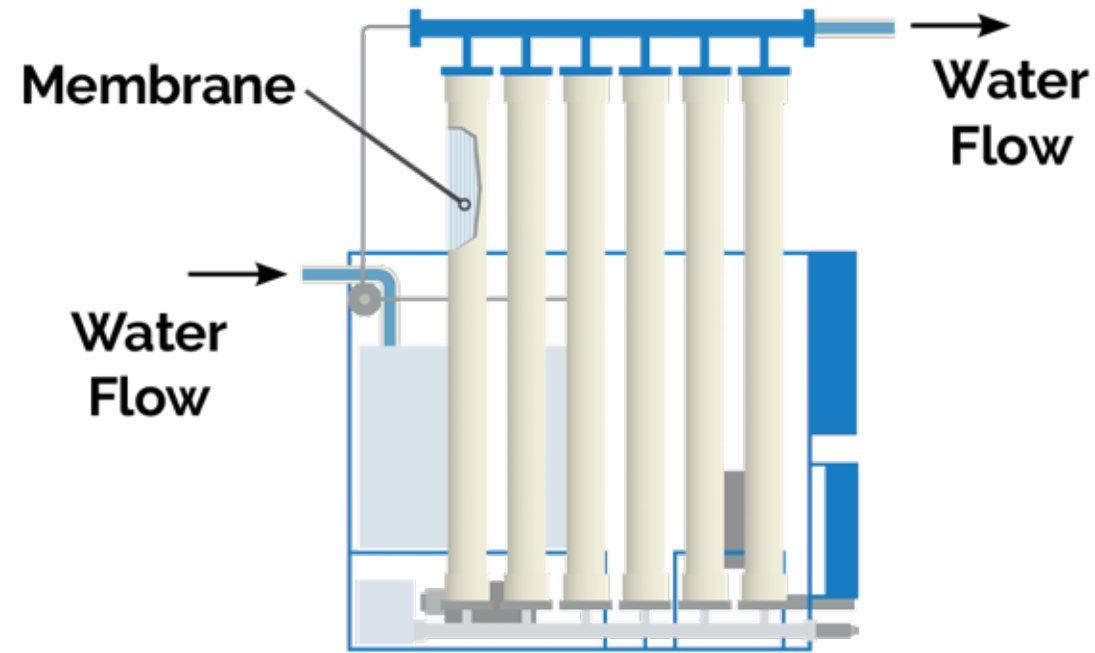
Nutrient Removal

Specialized biological, chemical and physical treatment processes remove most of the organics, nitrogen, and phosphorous from the water.

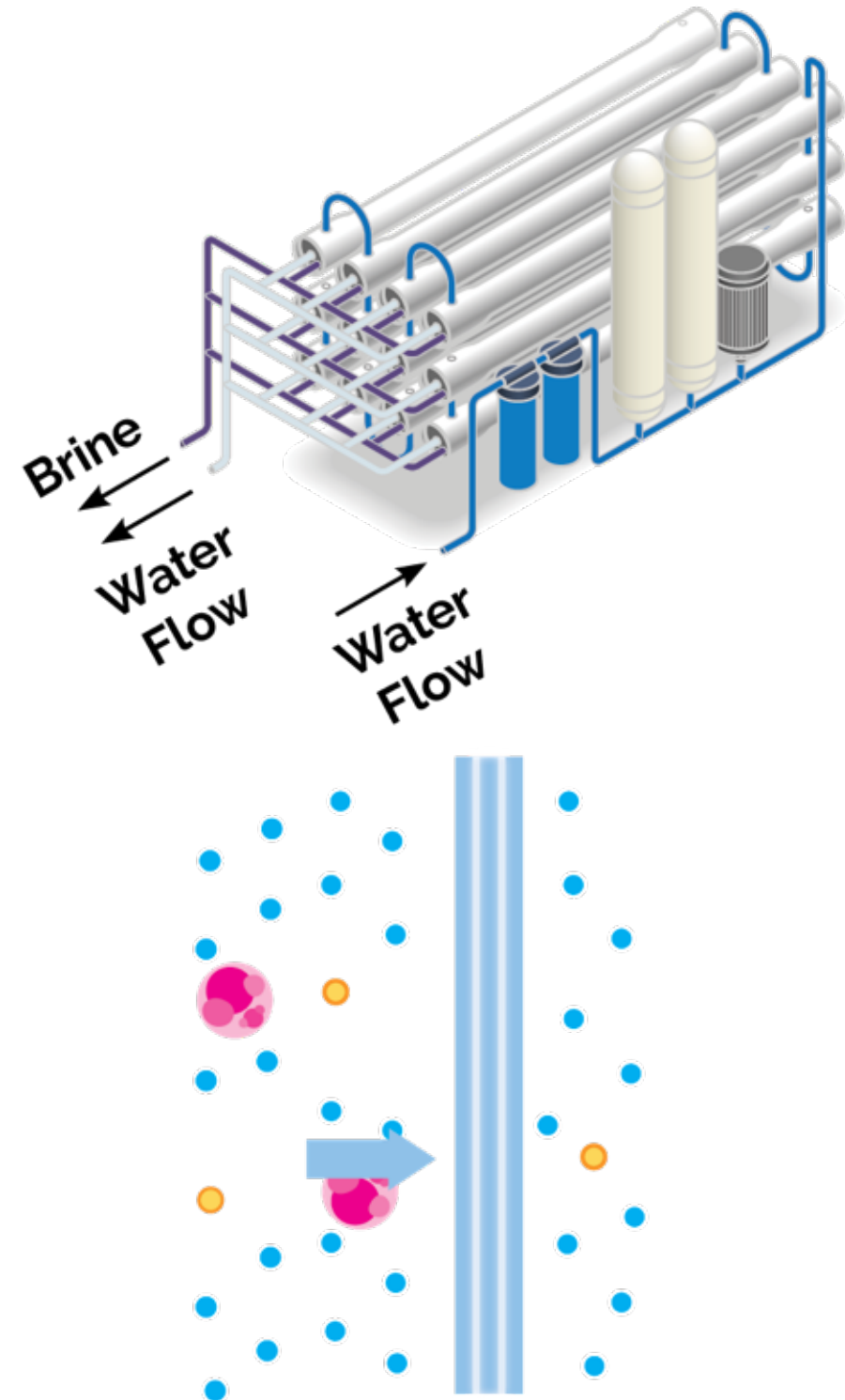


Ultra Filtration

An ultra filtration process uses permeable membranes to remove suspended solids and bacteria from the treated water as it passes through the filter.



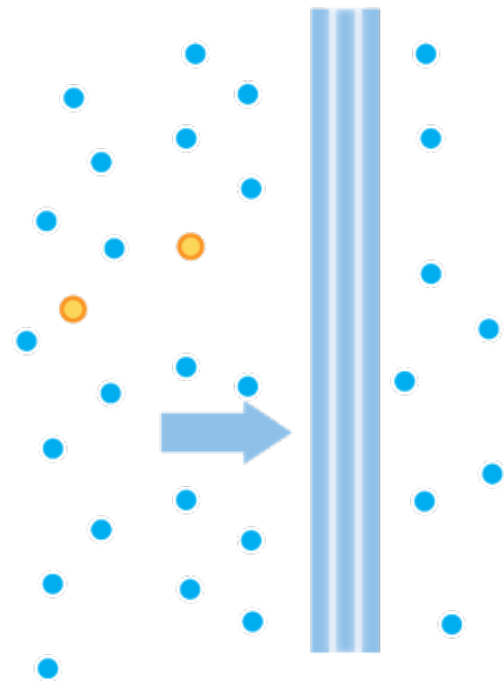
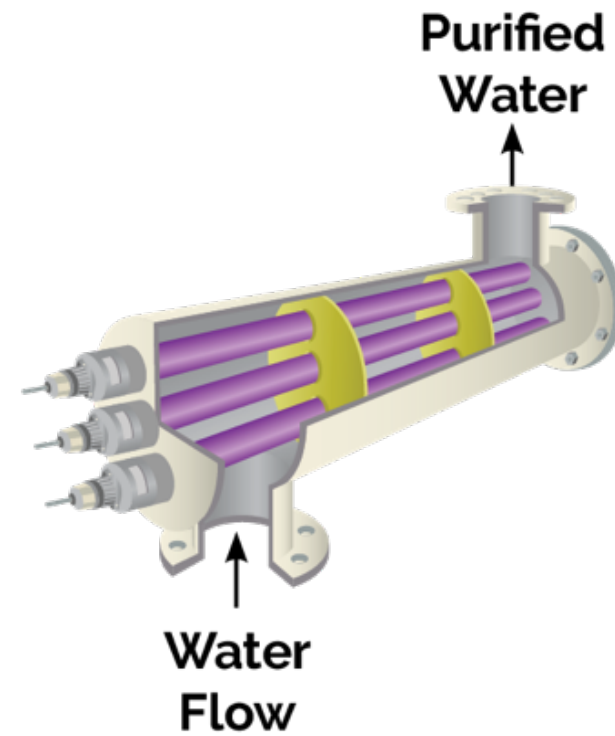
Reverse Osmosis (RO)



Water is forced under high pressure through reverse osmosis membranes to remove impurities, including salts, bacteria, viruses, pharmaceuticals, and personal care products.



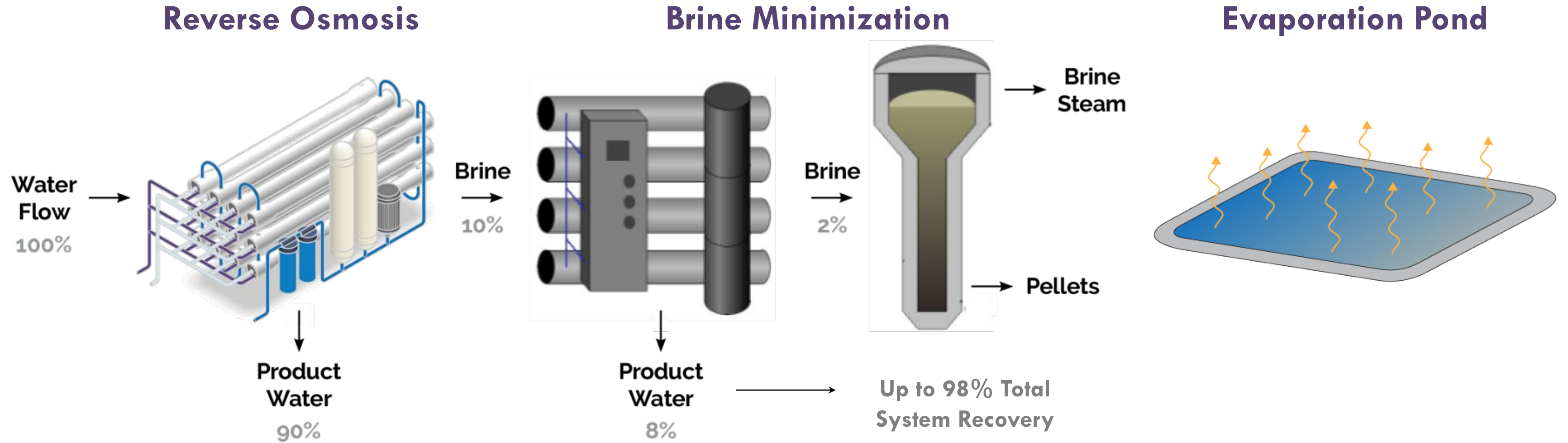
UV Disinfection & Advanced Oxidation



High-intensity UV light is combined with an oxidant to create oxidizing radicals that attack and decompose contaminants in the water so they are no longer harmful. At the same time, the UV light disinfects the water.



Proposed Brine Management Facilities



Brine Reduction and Evaporation

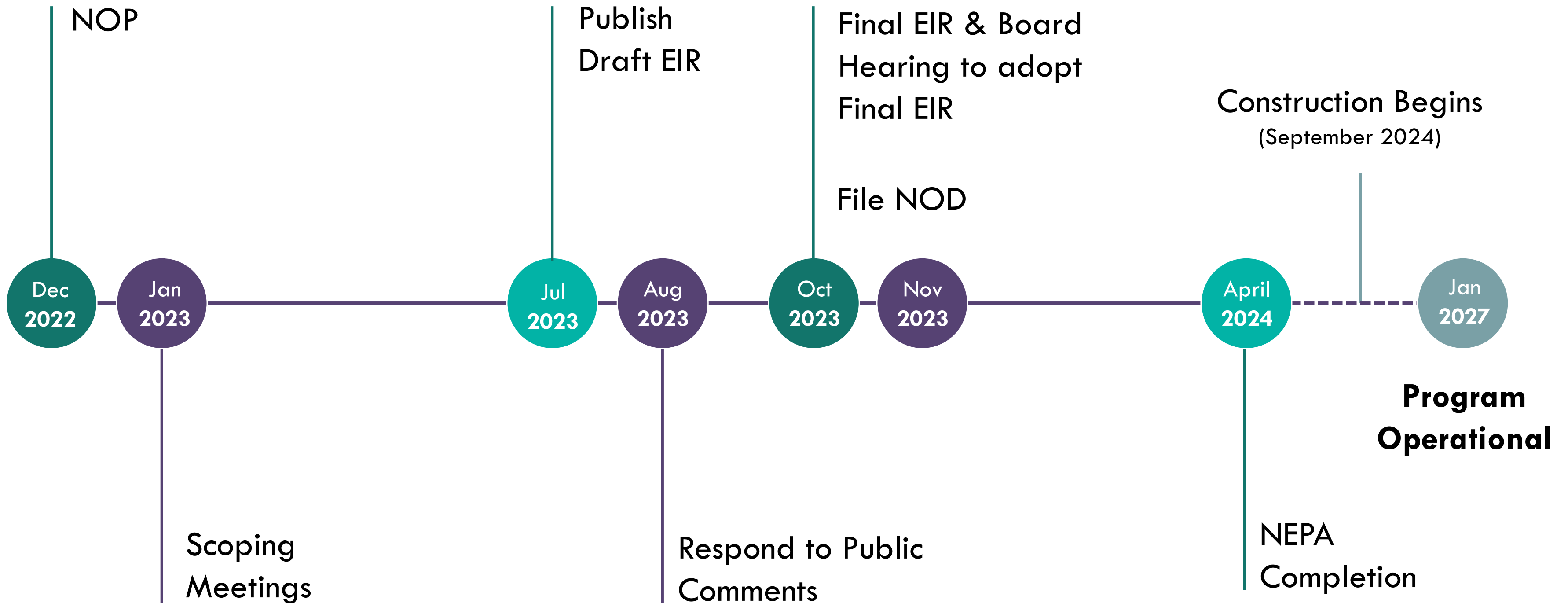
The Reverse Osmosis process produces a liquid brine concentrate that requires disposal. A Desalter system will use an additional RO process to reduce the liquid brine volume and a Pellet Reactor that will produce solid pellets for disposal or reuse. The remaining brine will be evaporated onsite using solar evaporation ponds.



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Environmental Documentation

Environmental Documentation Milestones





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Environmental Review Scoping Comments

Water quality impacts in Big Bear Lake and downstream

Reduced flow to Lucerne Valley

Consistency with the 1977 Judgment for Big Bear Lake

Letters of support (three from local residents)

Brine impacts

Energy use and renewable energy sources

Consultation with Native American Tribes

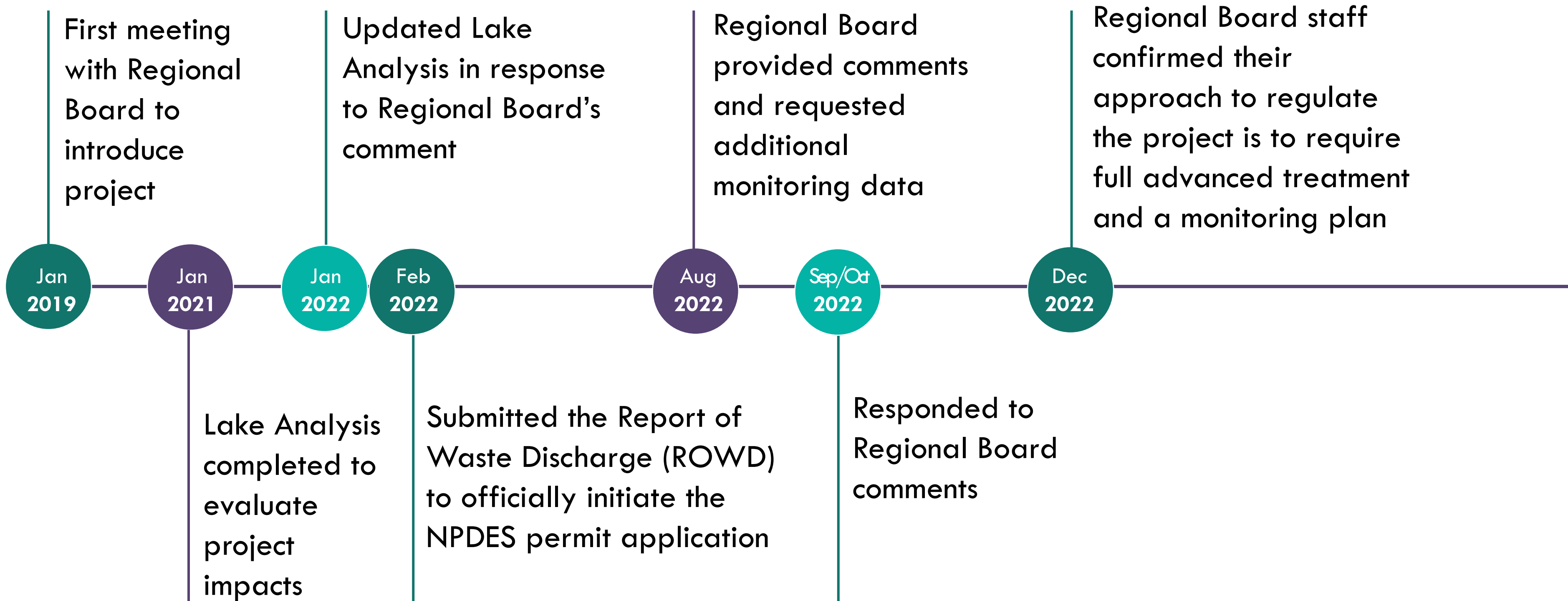


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Regulatory

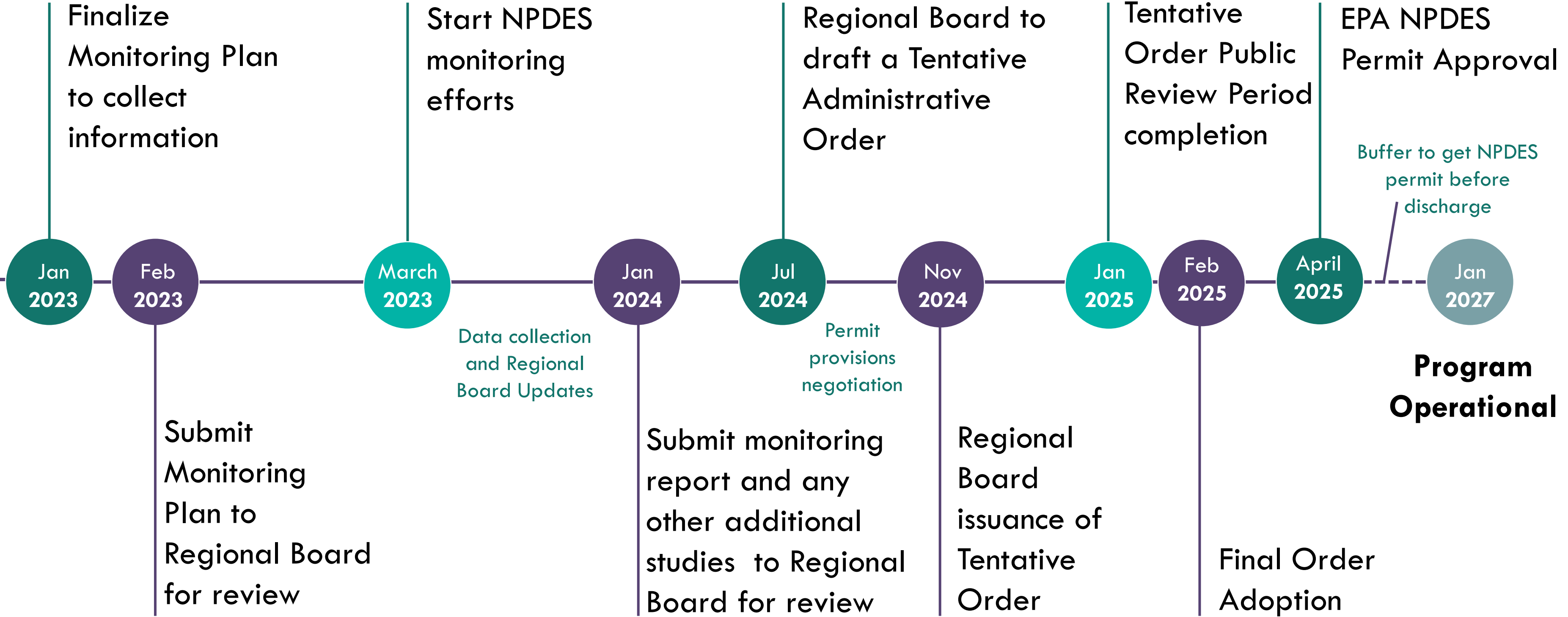


NPDES Permitting Process Milestones



Note: The Environmental documents must be completed before an NPDES permit can be adopted

NPDES Permitting Process Timeline



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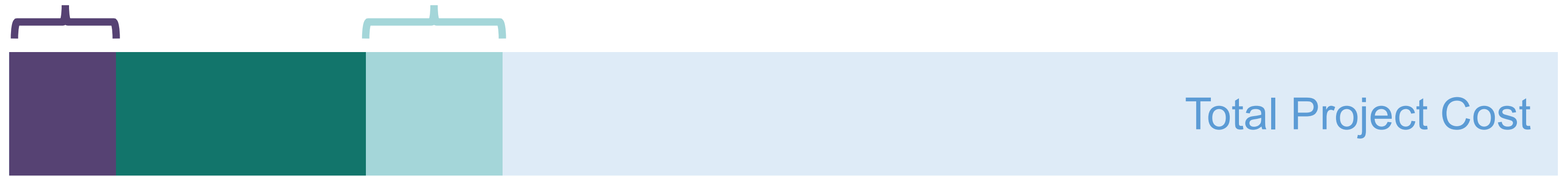
Grant Funding



Grants

7% State Grants

9% Federal Grants Potential



16% Federal Grants

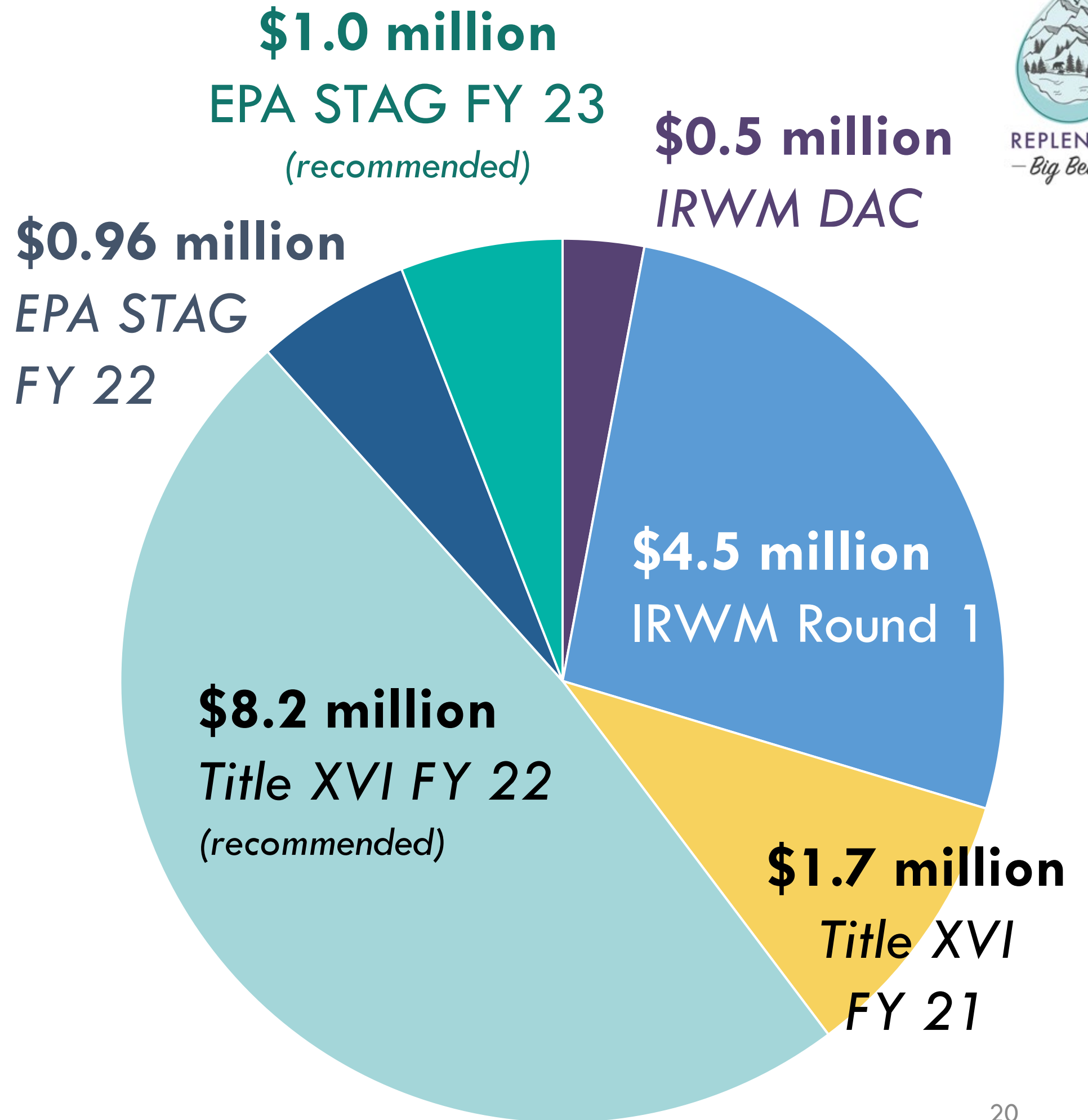
68% Other Financing Sources and State Grants

Federal grants can cover up to 25% of the total project cost

Grants to Date



Replenish Big Bear has been successful on over \$16.9 million in grants!





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Additional Grant Opportunities

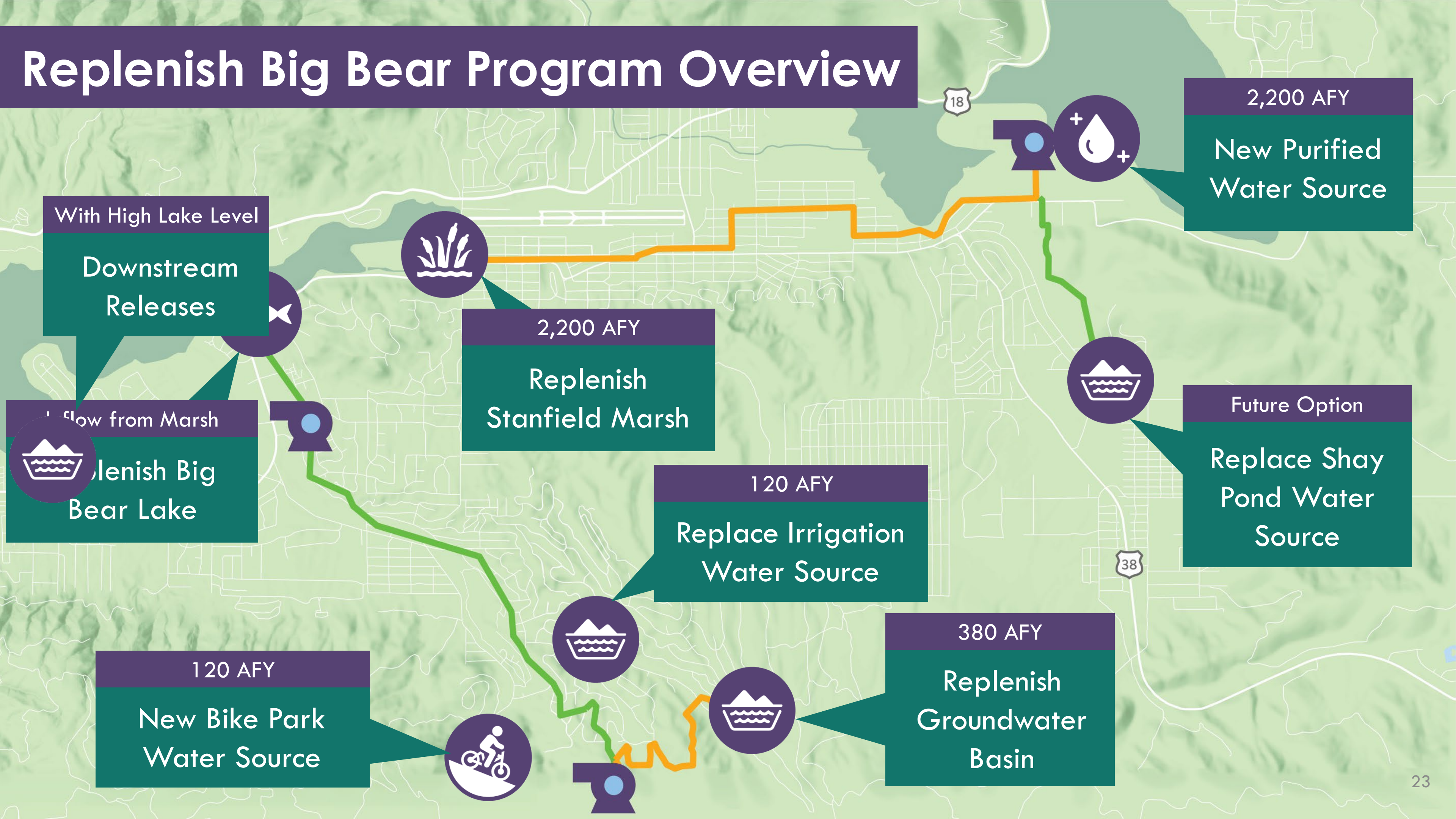
- Title XVI FY 23
- Actively evaluating additional State grant opportunities
- Investigating the Clean Water State Revolving Fund (CWSRF) loan for loan forgiveness opportunities



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Project Benefit Resources

Replenish Big Bear Program Overview



2,200 AFY

New Purified Water Source

With High Lake Level

Downstream Releases

2,200 AFY

Replenish Stanfield Marsh

Flow from Marsh

Replenish Big Bear Lake

Future Option

Replace Shay Pond Water Source

120 AFY

Replace Irrigation Water Source

120 AFY

New Bike Park Water Source

380 AFY

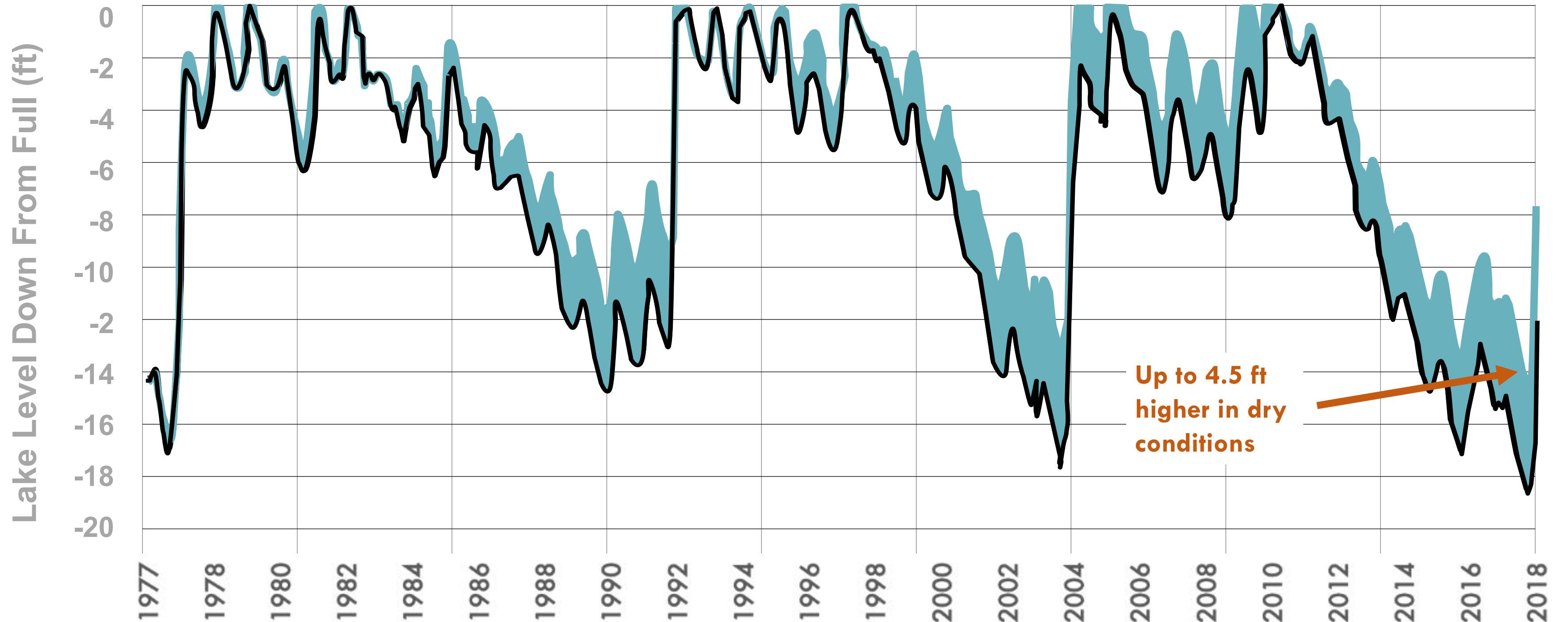
Replenish Groundwater Basin

New water source mitigates drought impacts to the Lake



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- Historic Lake Level
- Estimated Project Lake Level

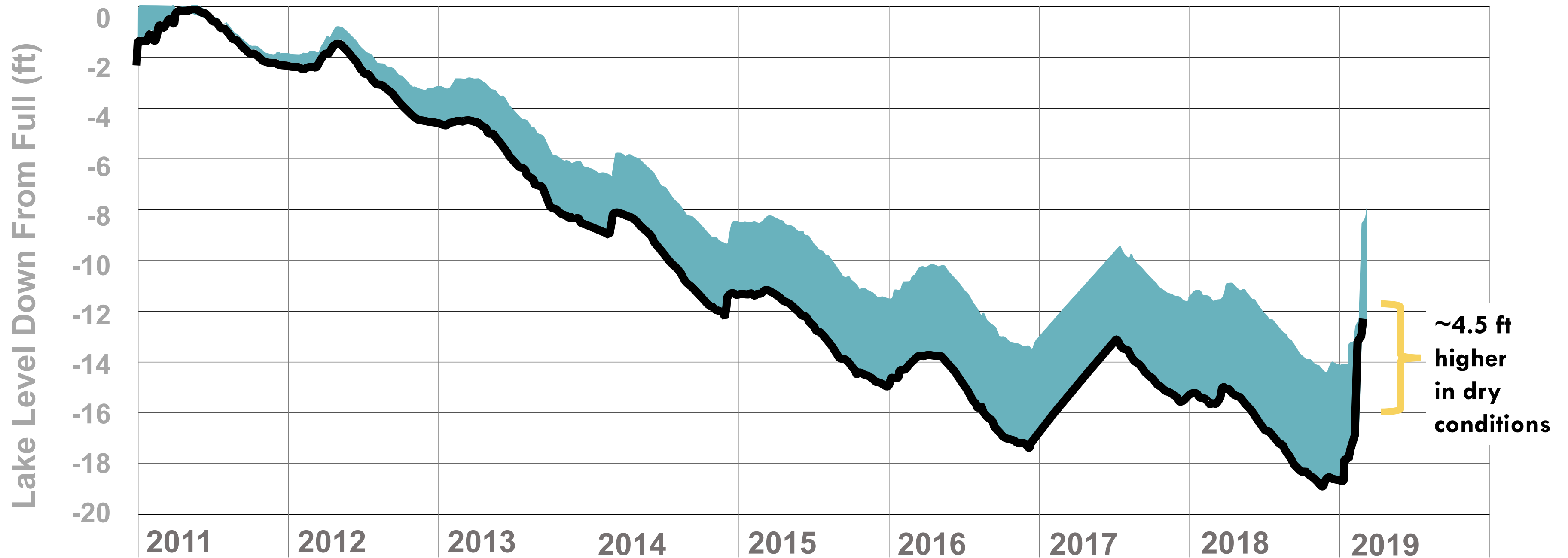


Lake level benefits are greatest during dry periods

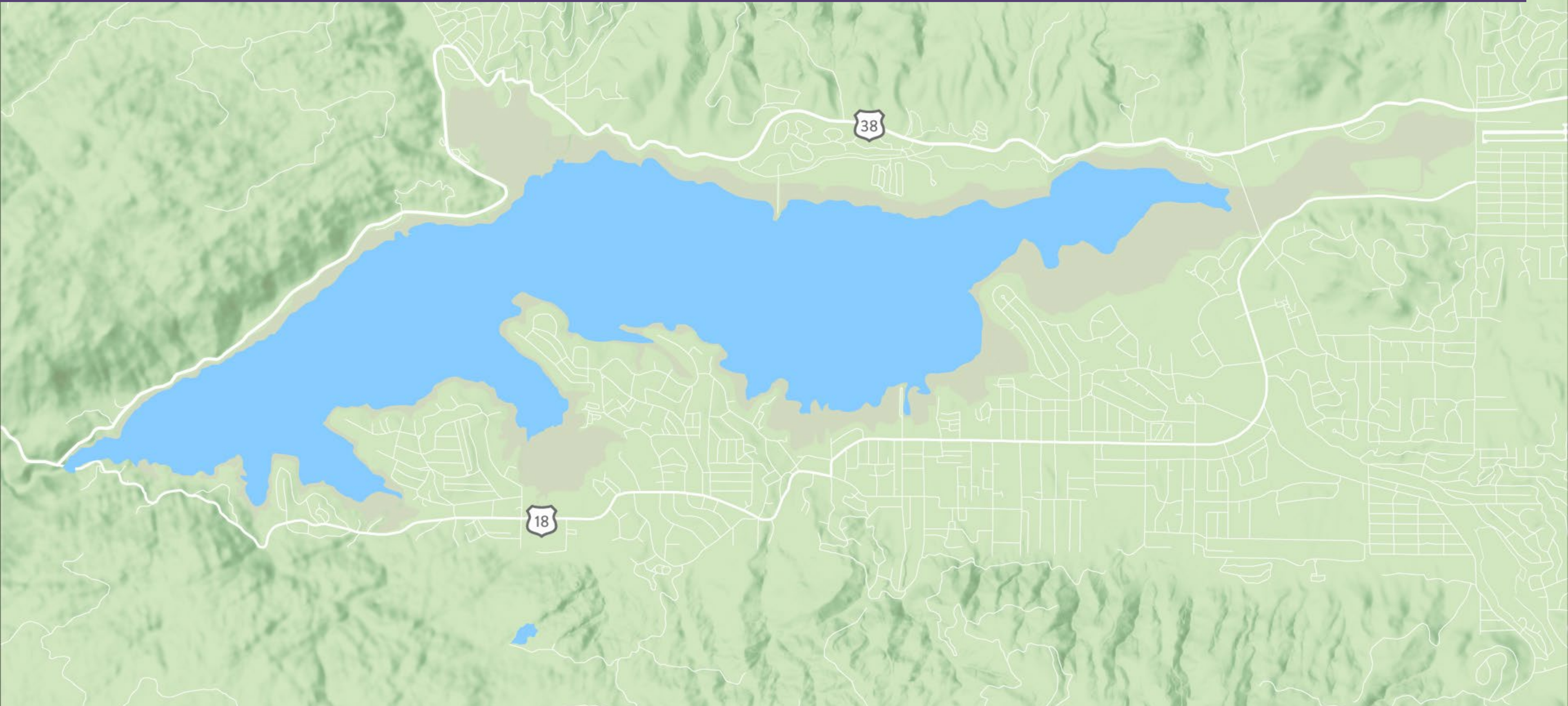
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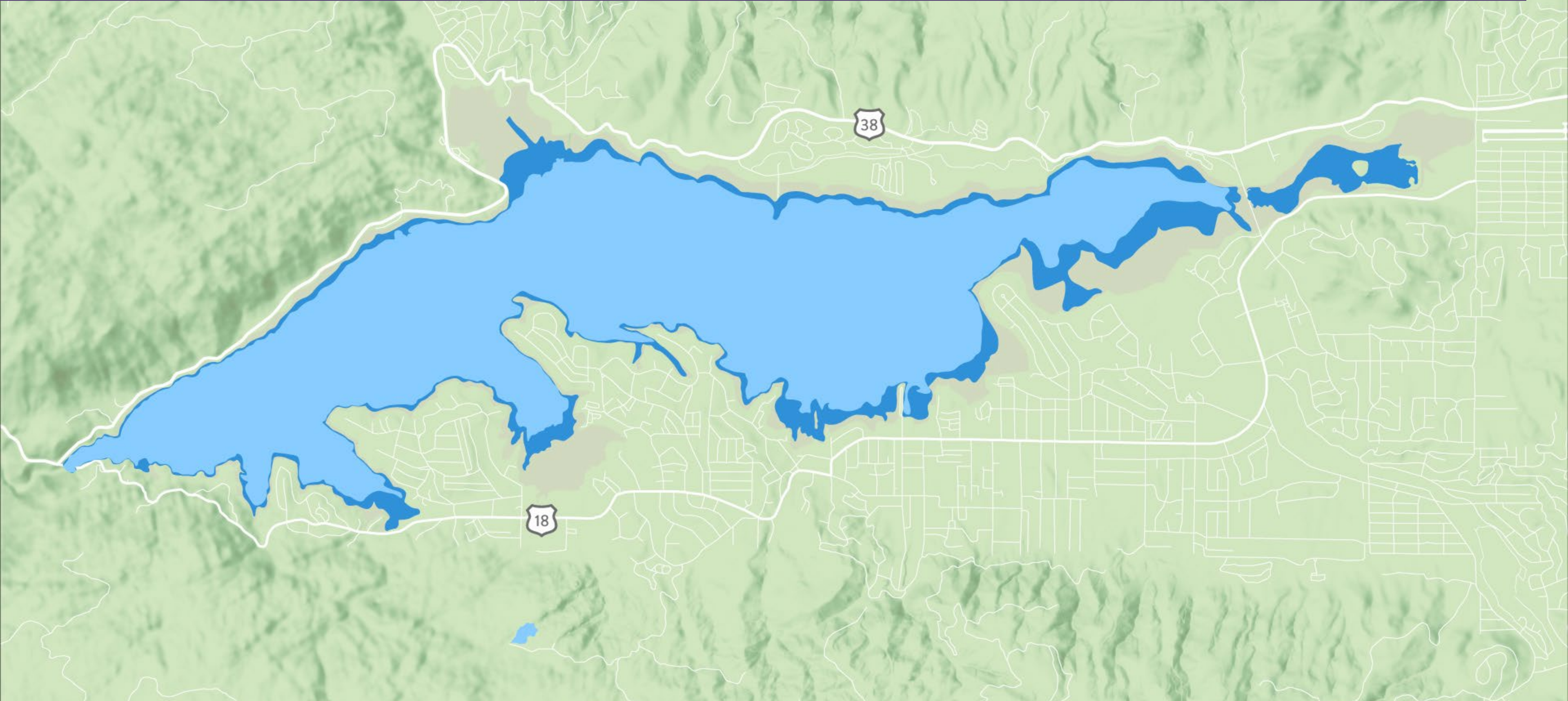


Lake area was at a record low in 2018 and Marsh was dry



Actual Lake Area in December 2018

Replenish Big Bear would increase area and wet the Marsh

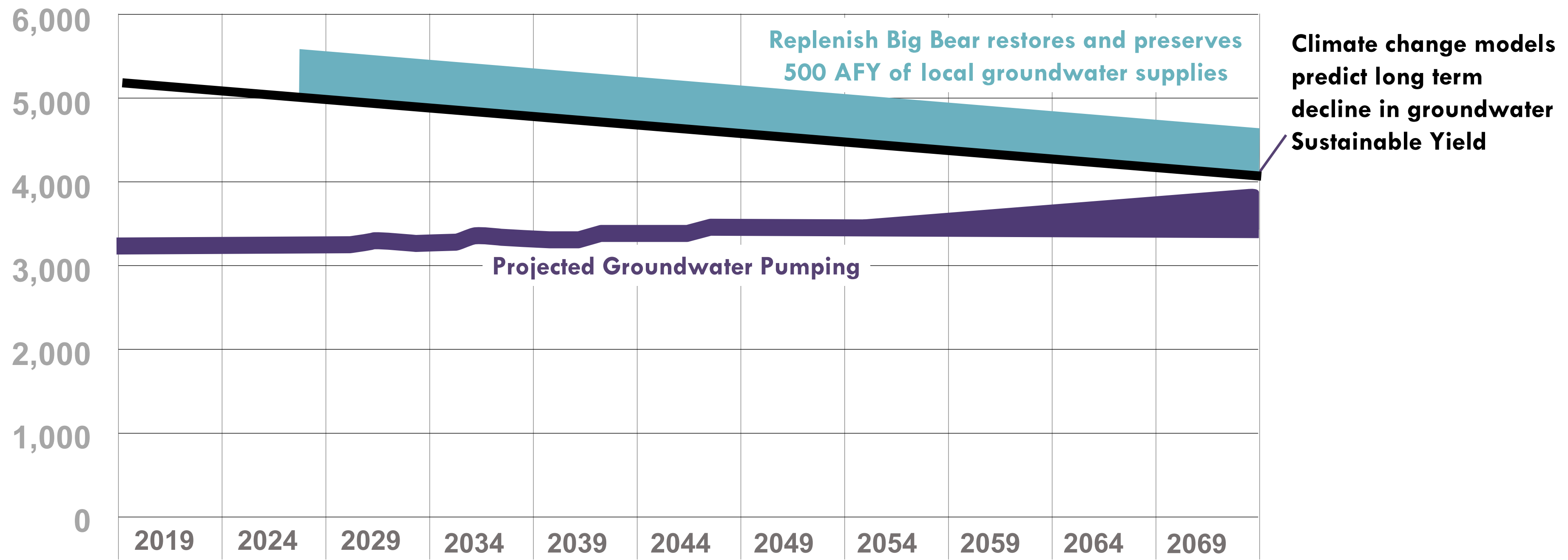


Projected Lake Area under December 2018 conditions with Replenish Big Bear

New Water Source Enhances Groundwater Sustainability



- Projected Sustainable Yield
- Sustainable Yield with Project



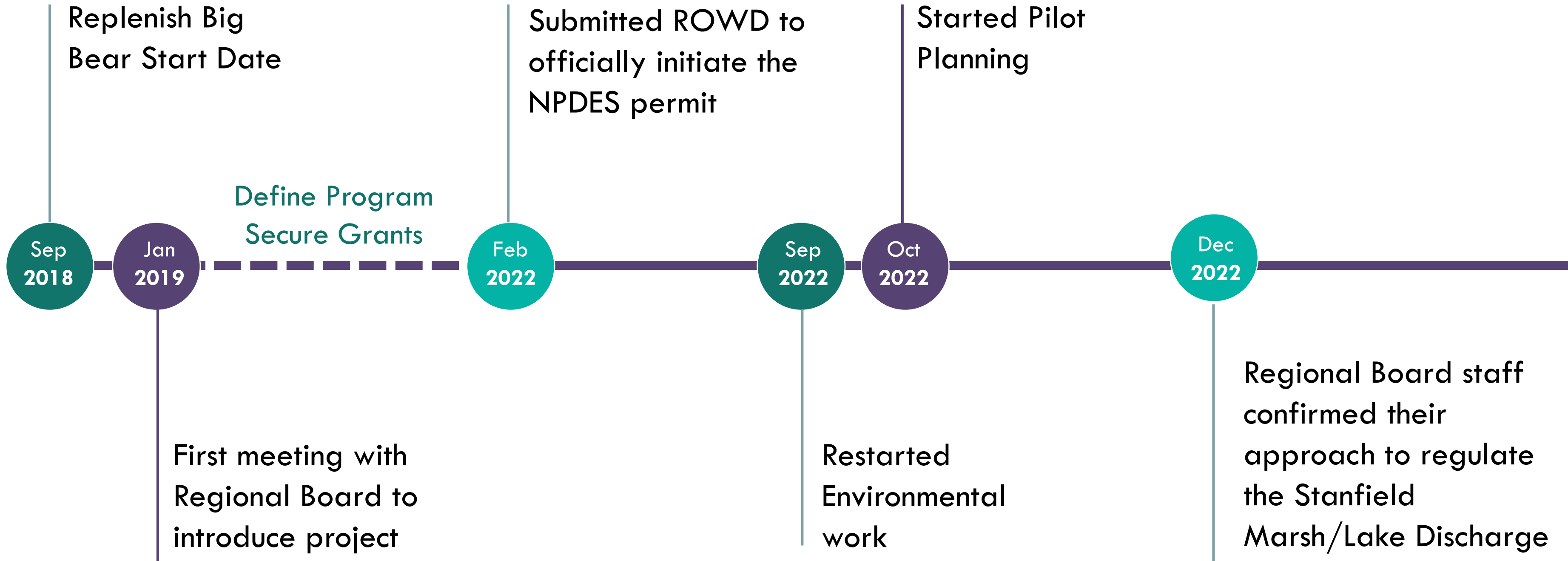


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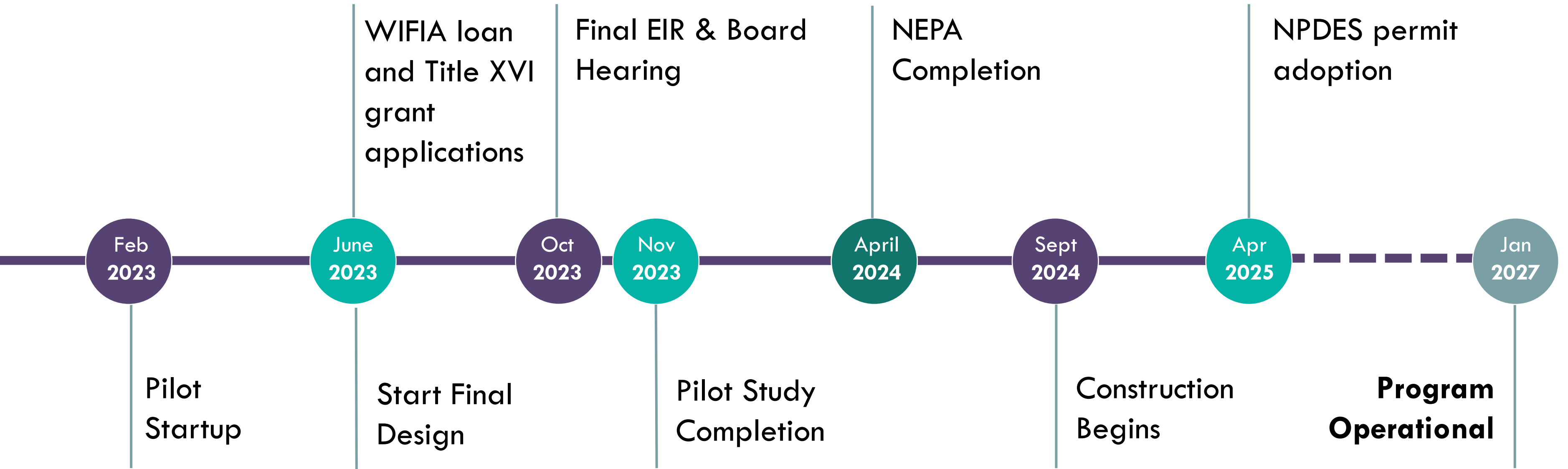
Schedule



Program Milestones



Program Milestones





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Questions?