MARIN WATER

Local Storage Improvement Project

BOARD MEETING

September 5, 2023

Overview

- Process to date and objective
- Development Steps for Water Supply Projects
- Managing Risk
- Work Plan Review
- Next Steps

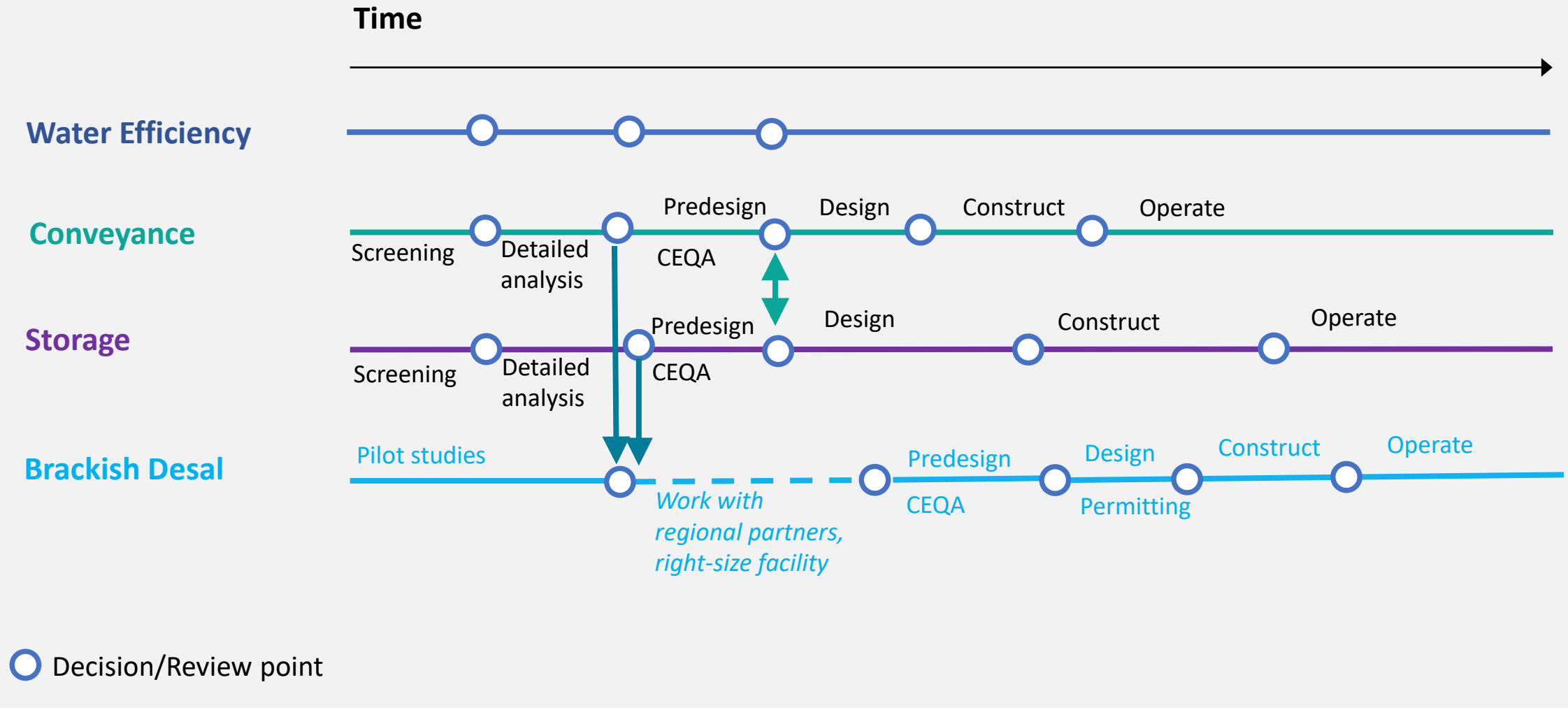
Objective and Process to Date

- Integrated Roadmap For Water Supply identified Local Storage and Conveyance of Supplemental water as priority projects
- Obtaining consulting resources to assist staff:
  - ✓Woodard and Curran – Program Management (March 2023)
  - Carollo – Engineering Services for Conveyance
  - Terra/Geopentech (TGP) – Engineering Services for Storage Improvement
- Conclusion of this work will result in a well defined and *defensible* project

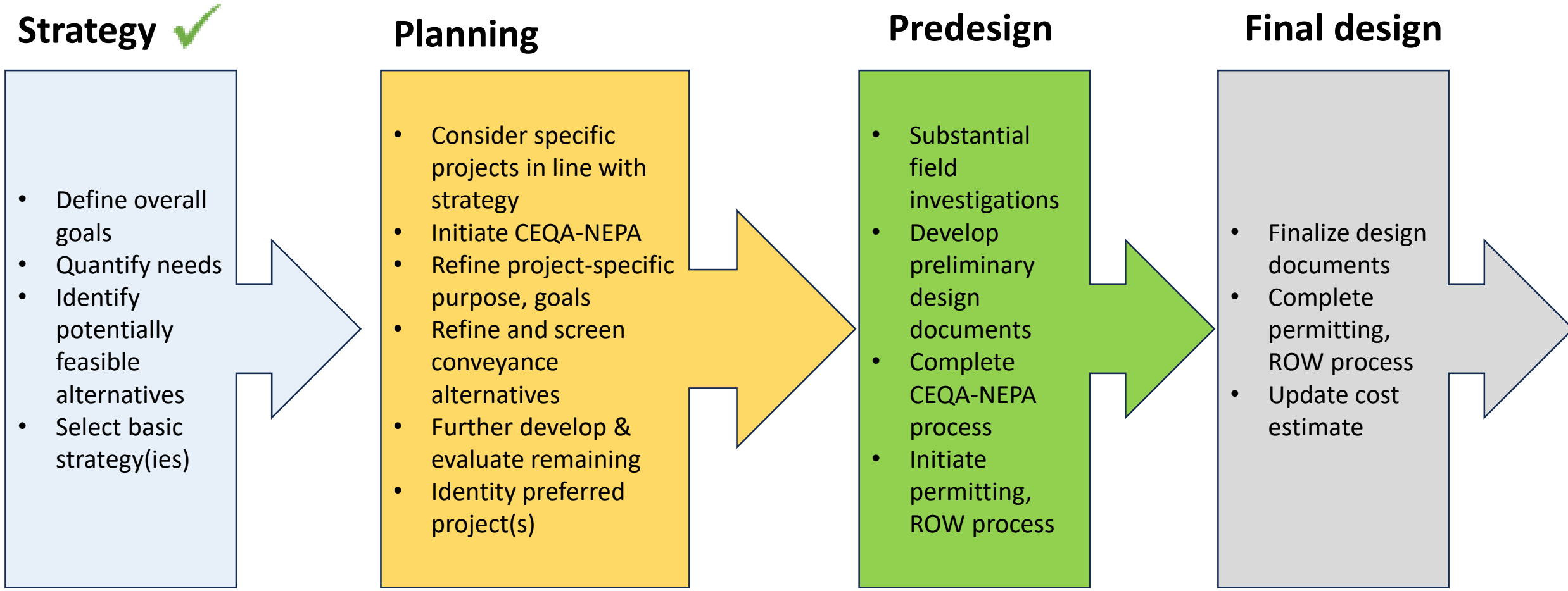
Moving Forward In Parallel Reduces the Time To Achieve Strategic Goals

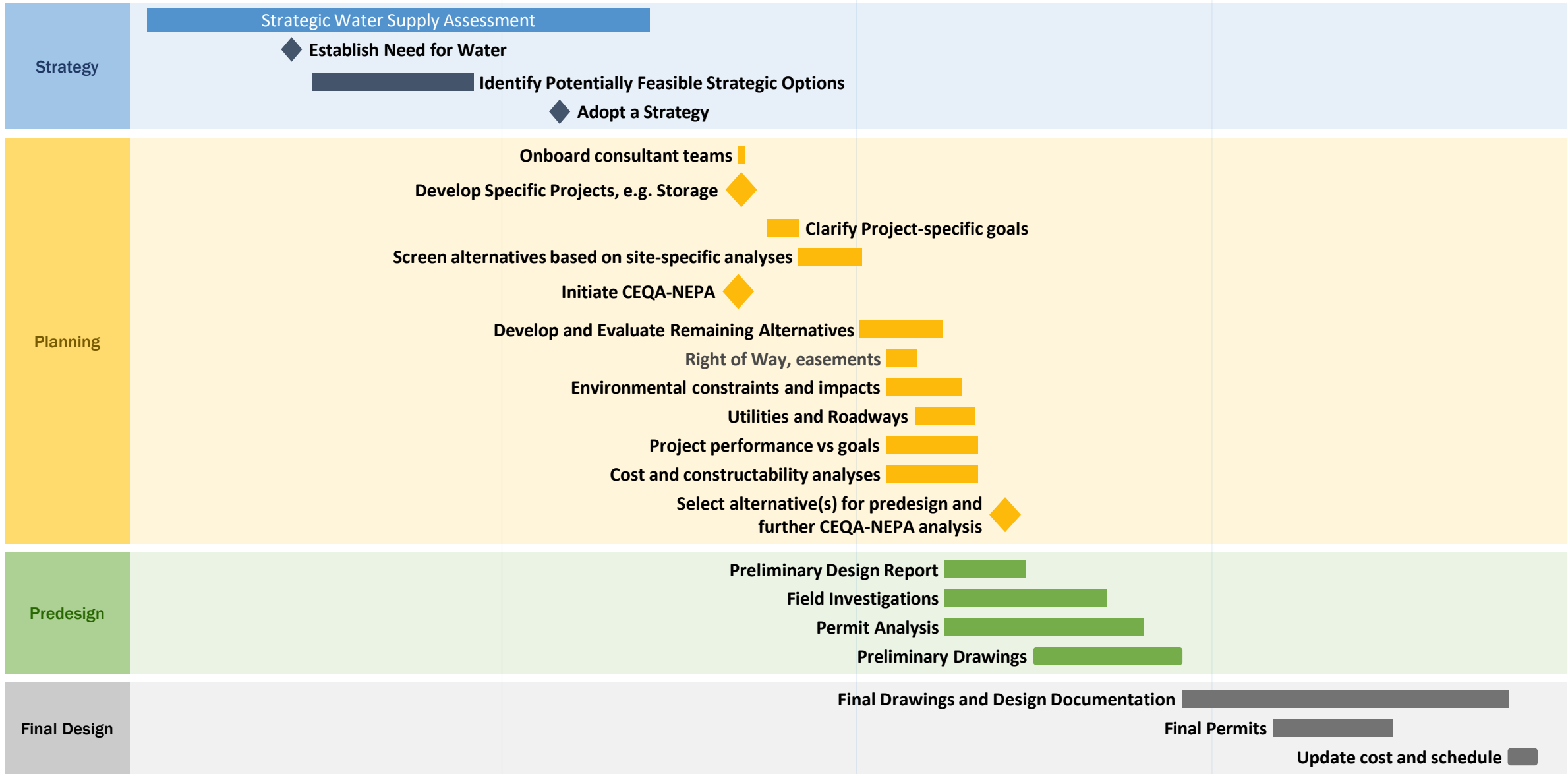
- Pursuing multiple projects in parallel provides options - a long term project may encounter an unforeseen critical point that changes the viability of the project
- Within a project parallel tasks are useful for breaking down one large task into smaller subtasks that are assigned to different workers for faster execution.
- Some analyses may be shared across projects for greater efficiency

Example of Each Roadmap Element Independent Utility, as well as Potential Synergies



Development Steps for Water Supply Projects




Strategy
Strategic Water Supply Assessment
Establish Need for Water
Identify Potentially Feasible Strategic Options
Adopt a Strategy
Planning
Onboard consultant teams
Develop Specific Projects, e.g. Storage
Clarify Project-specific goals
Screen alternatives based on site-specific analyses
Initiate CEQA-NEPA
Develop and Evaluate Remaining Alternatives
Right of Way, easements
Environmental constraints and impacts
Utilities and Roadways
Project performance vs goals
Cost and constructability analyses
Select alternative(s) for predesign and further CEQA-NEPA analysis
Predesign
Preliminary Design Report
Field Investigations
Permit Analysis
Preliminary Drawings
Final Design
Final Drawings and Design Documentation
Final Permits
Update cost and schedule

Managing Risk - Level of Analysis Needed for Alternatives

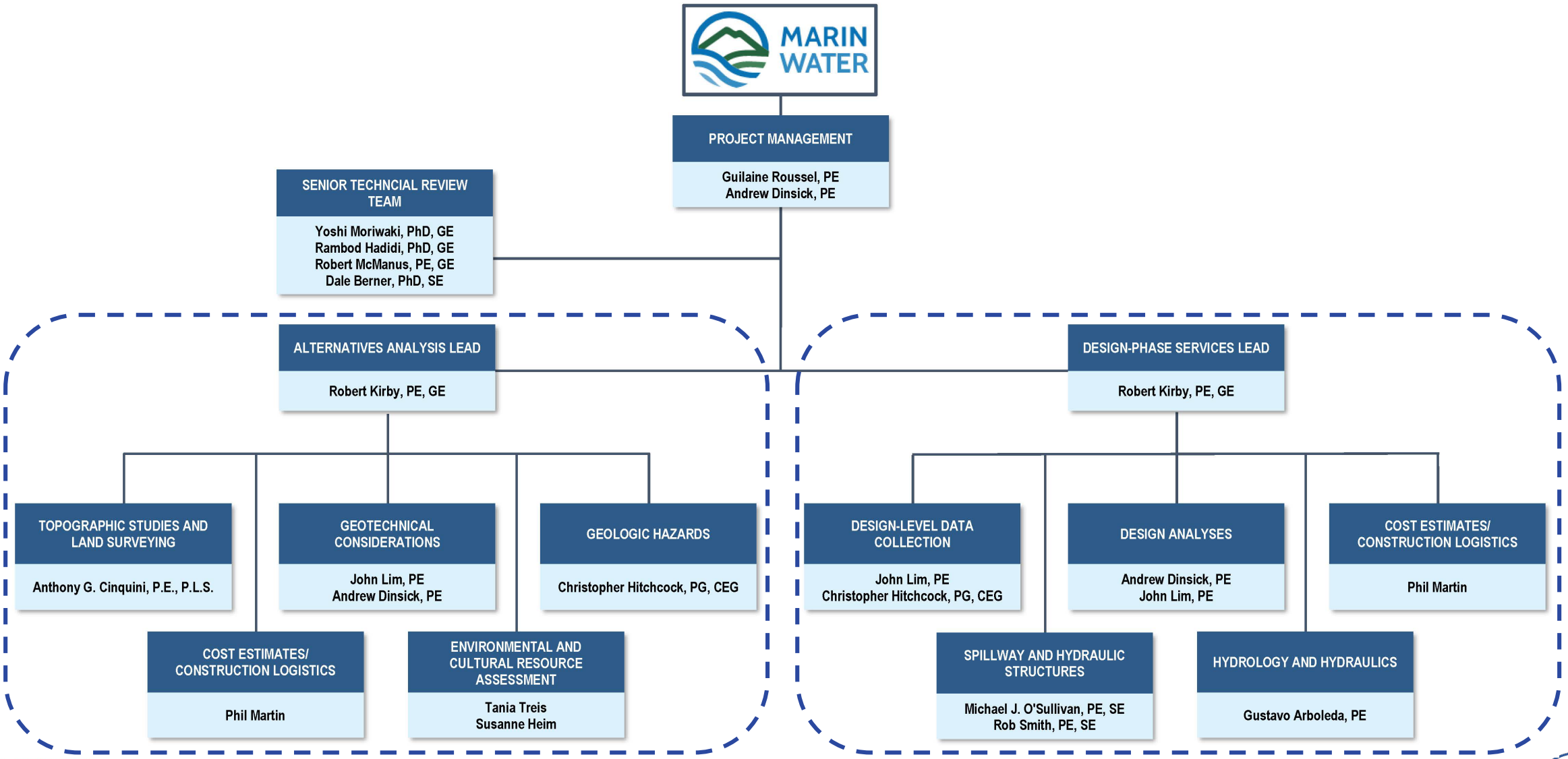
- Water supply projects typically generate considerable adverse stakeholder interest and can be vulnerable to legal challenges to the Environmental documentation and affect public opinion of the project
- The more perceived impacts a project has, the greater the level of scrutiny it will receive resulting in a need for a corresponding increase in the level of analysis to support screening of alternatives
- Selection of a preferred alternative must be done in a robust and defensible manner
- SWSA provided a high level analysis that confirmed the need for water supply and identified groups of projects that can provide the supply while not ruling out any specific options:
  - For storage and conveyance additional detail beyond SWSA's high level analysis is necessary to document alternative screening process and even deeper site specific analysis is needed to select a preferred project.

Cadiz pipeline did not follow a rigorous development process

Drivers for the Alternatives Analysis & Predesign

- Build on SWSA
- Define project-specific criteria to screen alternatives
- Further develop and evaluate remaining alternative using site-specific information
- Develop site-specific costs, key sizing thresholds
- Quantify impacts and benefits
- Support CEQA-NEPA process

TGP Team Organization Chart



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Integrated Project Management

Key to Successful Project Delivery

DEFINE OBJECTIVES AND SCOPE

- Identify technical issues
- Establish priorities and schedule
- Develop detailed technical approach
- Identify project risks and mitigation measures

PLAN

- Anchored on detailed WBS
- Level of effort by work item
- Detailed schedule
- Detailed staffing plan
- **Communicate to Team** (Project Plan)

MONITOR AND CONTROL

- Weekly schedule and cost updates
- Timely corrective action if necessary
- Monthly EVA
- Monthly report to District

Develop a sound plan, have the discipline to follow it, and the wisdom to adjust it as necessary.

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Work Breakdown Structure

- *In accordance with the RFP, the Scope of Work is divided into four main tasks as follows:*
  - Task 1 – Project Management
  - Task 2 – Develop Background data and Project Requirements
  - Task 3 – Evaluate Water Storage Improvement Alternatives
  - Task 4 – Preliminary (30%) Design
- *We have developed a work breakdown structure (WBS) for each of these tasks, with subtasks that are further subdivided by main activities, based on our understanding of the work.*
- *We will consider a wide range of potential solutions, thoroughly vet these alternatives, and clearly document the rationale behind the alternative selection between Tasks 2 and 3.*

TASK 1 PROJECT MANAGEMENT

1.1 Meetings with MMWD Program Team
- 1.1.1 Project Kick-Off Meeting
- 1.1.2 Bi-Weekly Progress Meetings with District's Project Admin Staff
- 1.1.3 Coordination Meetings with District Technical Staff and Other Consultants

1.2 Project Work Plan and Schedule
- 1.2.1 Initial
- 1.2.2 Periodic Updates

1.3 Project Monitoring and Control
- 1.3.1 Scheduling, Monitoring, and Control of Project Activities
- 1.3.2 Weekly Internal Status Meetings with Task Leaders
- 1.3.3 Monthly Progress Reports and Invoicing
- 1.3.4 Monitor and Control QA/QC Review Process
- 1.3.5 Document Control

Task 1 Deliverables
- *Project Work Plan and Schedule*
- *Kickoff Meeting Agenda, Notes, and Action Items*
- *Bi-Weekly Progress Meetings Agendas, Notes, and Action Items*
- *Monthly Progress Report and Invoice*

TASK 2 DEVELOP BACKGROUND DATA AND PROJECT REQUIREMENTS

2.1 Review of Existing Documents
- 2.1.1 2022 Water Supply Assessment Draft Report
- 2.1.2 Mapping Data
  - *Topography*
  - *Cadaster*
  - *Utility Networks*
  - *Biological and Cultural resources*
- 2.1.3 Geologic and Geotechnical Information
- 2.1.4 Record Drawings of District Assets

2.2 Project Goals, Design Criteria, and Alternatives Workshop
- 2.2.1 Review Alternatives, Clarify Descriptions, and Propose Other Alternatives
- 2.2.2 Conduct Workshop to Confirm Project Goals and Design Criteria
- 2.2.3 Document Workshop Outcomes

2.3 Develop Data for Alternatives Evaluation
- 2.3.1 Augment Data from Subtask 2.1 as Necessary
- 2.3.2 Prepare Background Data and Project Requirements Technical Memorandum (TM)
  - *Draft*
  - *Final*

Task 2 Deliverables
- *Workshop Presentation Materials, Agenda, Notes and Action Items*
- *Supplemental Data to Support the Alternatives Evaluation*
- *Background Data and Project Requirements TM* - Draft and Final

TASK 3 EVALUATE WATER STORAGE IMPROVEMENT ALTERNATIVES

3.1 Screen Alternatives and Select Top Four
- 3.1.1 Develop Draft Screening Criteria and Evaluation Framework Considering
  - *Storage Provided*
  - *Rough Order of Magnitude Capital Cost*
  - *Right of Way Issues*
  - *Geotechnical Considerations*
  - *Other Factors*
- 3.1.2 Conduct Screening Workshop with District
- 3.1.3 Document Workshop Outcomes
- 3.1.4 Prepare Alternative Screening TM
  - *Draft*
  - *Final*

Subtask 3.1 Deliverables
- *Workshop Presentation Materials, Agenda, Notes and Action Items*
- *Draft and Final Alternatives Screening TM*

3.2 Further Evaluate Alternatives and Select Preferred Alternative
- 3.2.1 Further Development of Top Four Alternatives
  - *Estimate Earthwork Quantities*
  - *Estimate Inundation Areas*
  - *Assess Borrow Sources*
  - *Assess Stie Staging and Access*
  - *Identify Haul Routes and Sources of Import Materials*
  - *Preliminary Investigation of Geotechnical Concerns*
  - *Develop Conceptual Plans, Profiles and Sections*
- 3.2.2 Provide Input to Woodard and Curran for Performance Analysis
- 3.2.3 Provide Input to ESA for Assessment of Environmental and Cultural Impacts
- 3.2.4 Assess Constructability
  - *Dam and Utility Construction Methods*
  - *Construction Impacts on District Operations*
  - *Construction Access*
  - *Adequacy of Staging and Stockpile Areas*
  - *Temporary Site Access/Road Grading/Brush Clearing*
  - *Construction Risk Assessment*
  - *Right-of-Way, Land Acquisition, and Conservation Easement Restrictions*
  - *Existing Utility Conflicts*
  - *Material and Earthwork Hauling*
  - *Electrical Power Requirements and Availability of Line Power*
  - *Permitting Requirements including Environmental, DSOD, and Encroachment*
  - *Construction Impacts due to Environmental Restrictions*
- 3.2.5 Estimate Life Cycle Costs
  - *Engineering Design*
  - *Construction*
  - *Annual O&M Costs*
  - *Right-of-Way and Property Acquisition*
  - *Permitting Costs*
  - *Environmental Mitigation*
- 3.2.6 Preferred Alternative Selection Workshop and TM
  - *Prepare Initial Draft of Preferred Alternative TM*
  - *Conduct Workshop to Review Draft TM and Solicit Input from District*
  - *Summarize Workshop Agenda and Notes*
  - *Prepare Final Draft of Preferred Alternative TM*
- 3.2.7 MMWD Board of Directors Presentation
  - *Present Findings of Draft TM to MMWD BOD for Approval*
  - *Incorporate BOD Feedback in Final Preferred Alternative Selection TM*

Subtask 3.2.6 Deliverables
- *Draft Preferred Alternative Selection TM*
- *Workshop Agenda, Presentation Materials, Notes and Action Items*
- *Preferred Alternative Selection TM Initial and Final Drafts*

Subtask 3.2.7 Deliverables
- *MMWD BOD Presentation and Supporting Materials*
- *Final Preferred Alternative Selection TM*

TASK 4 PRELIMINARY (30%) DESIGN - (SCOPE AND COST DEPENDS ON PREFERRED ALTERNATIVE SELECTION)

4.1 Design-Level Data Collection
- 4.1.1 Geotechnical Explorations and Site Characterization
- 4.1.2 Land Surveying

4.2 Preliminary Design Analyses and Reports
- 4.2.1 Provide Project Description and Concept-Level Schematics for CEQA/NEPA
- 4.2.2 Define Project Design Criteria and Constraints
- 4.2.3 Evaluate Storage vs Reservoir Stage Operational Assumptions
- 4.2.4 Develop Design Earthquake and Analyze Seismic Performance of Facilities
- 4.2.5 Define Probable Maximum Flood and Analyze Hydraulic Performance of Spillway
- 4.2.6 Dam-Break Inundation Analyses
- 4.2.7 Evaluate Construction Impacts on Water Supply Operations
- 4.2.8 Develop Risk Register with Proposed Mitigations
- 4.2.9 Planning-Level Cost Estimate and Construction Schedule

4.3 30% Design Documents
- 4.3.1 Drawings
- 4.3.2 Technical Specifications
- 4.3.2 Opinion of Probable Construction Cost
- 4.3.3 Project Schedule

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Storage Alternatives Analyses – Refinements

Selection of the preferred alternative requires detailed evaluations of the following:

- Site-specific Geotechnical Considerations and Geologic Hazards;
- Right-of Way Issues, Ownership of Future Inundated Areas, Utility and Roadway Conflicts;
- Environmental Impacts on Biological and Cultural Resources;
- Community Impacts;
- Public Acceptance; and
- Cost.

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Example Alternatives for Storage Capacity Augmentation

- *Existing Dam Enlargement*
  - *Soulajule Reservoir by means of dam raise*
  - *Nicasio Reservoir by means of reservoir dredging*
  - *Nicasio Reservoir by means of dam raise*
  - *Kent Reservoir by means of dam raise*
- *New Dam Construction*
  - *Construction of new Halleck Reservoir*
  - *Construction of new Devil's Gulch Reservoir*
- *Spillway reconfiguration*
  - *Kent Reservoir*
  - *Nicasio Reservoir*
  - *Soulajule Reservoir*
  - *Alpine Reservoir*

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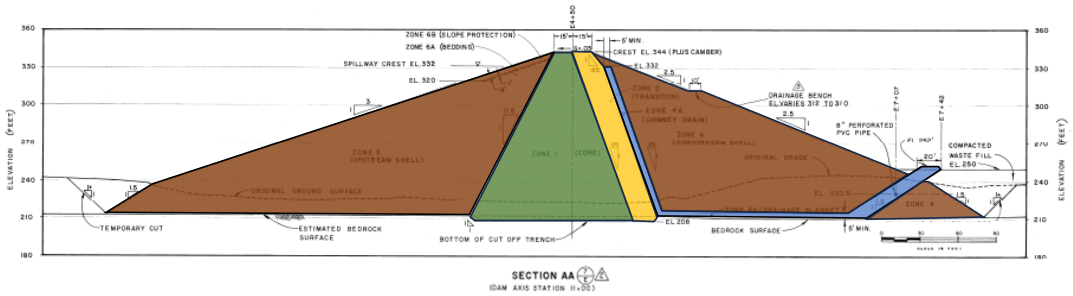
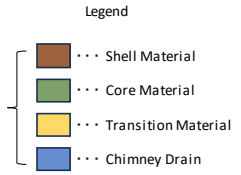
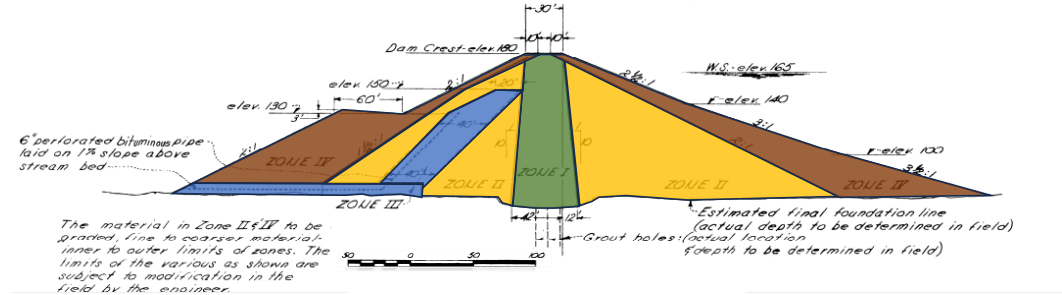
Each Reservoir Has Unique Characteristics

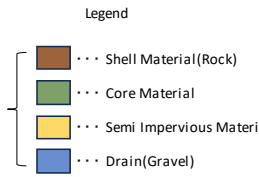
Soulajule Reservoir
Capacity: 10,570 AF



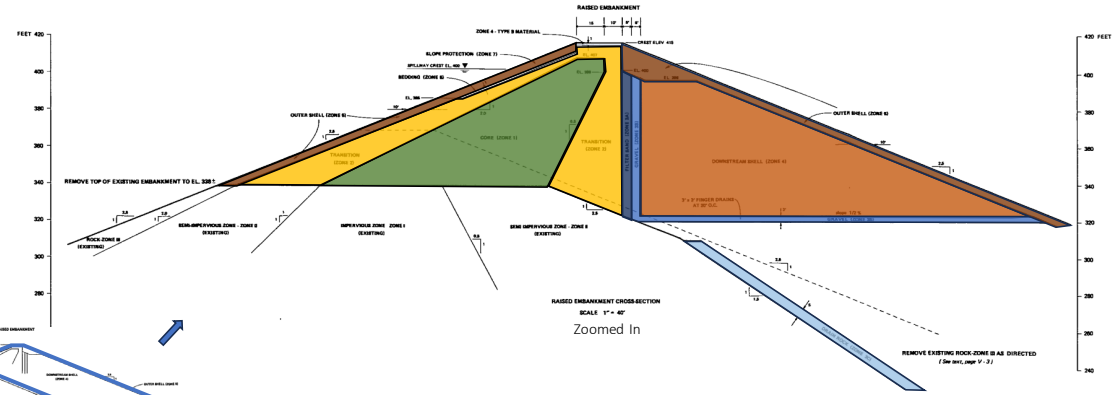


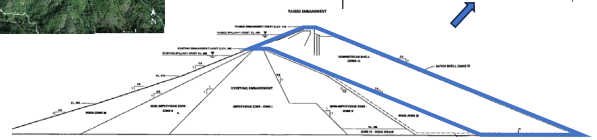
Nicasio Reservoir
Capacity: 22,430 AF

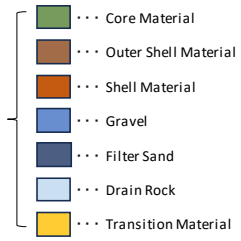




Kent Reservoir
Capacity: 32,895 AF







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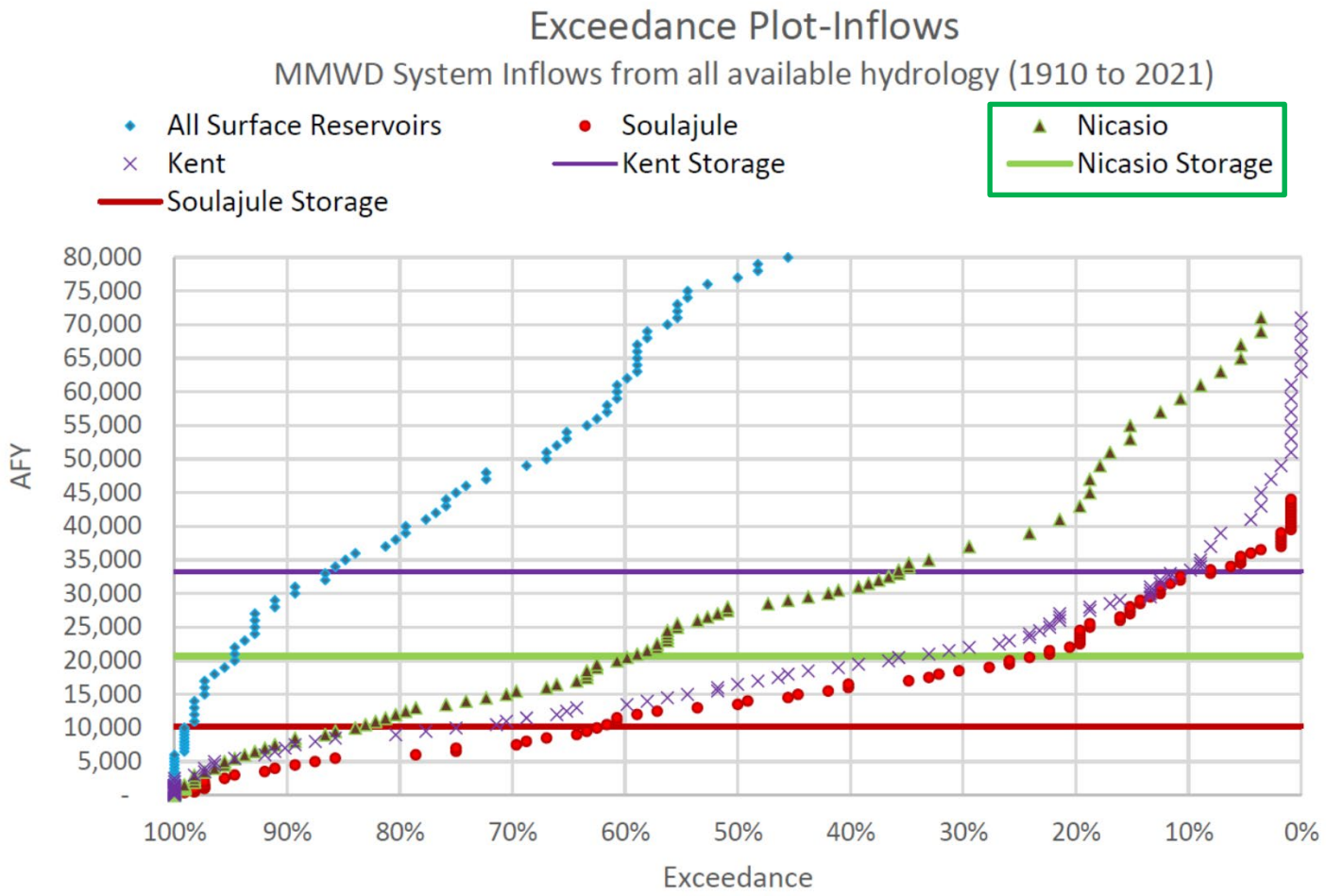
Potential Storage Improvement Benefits May Vary

Soulajule Reservoir
Capacity: 10,570 AF

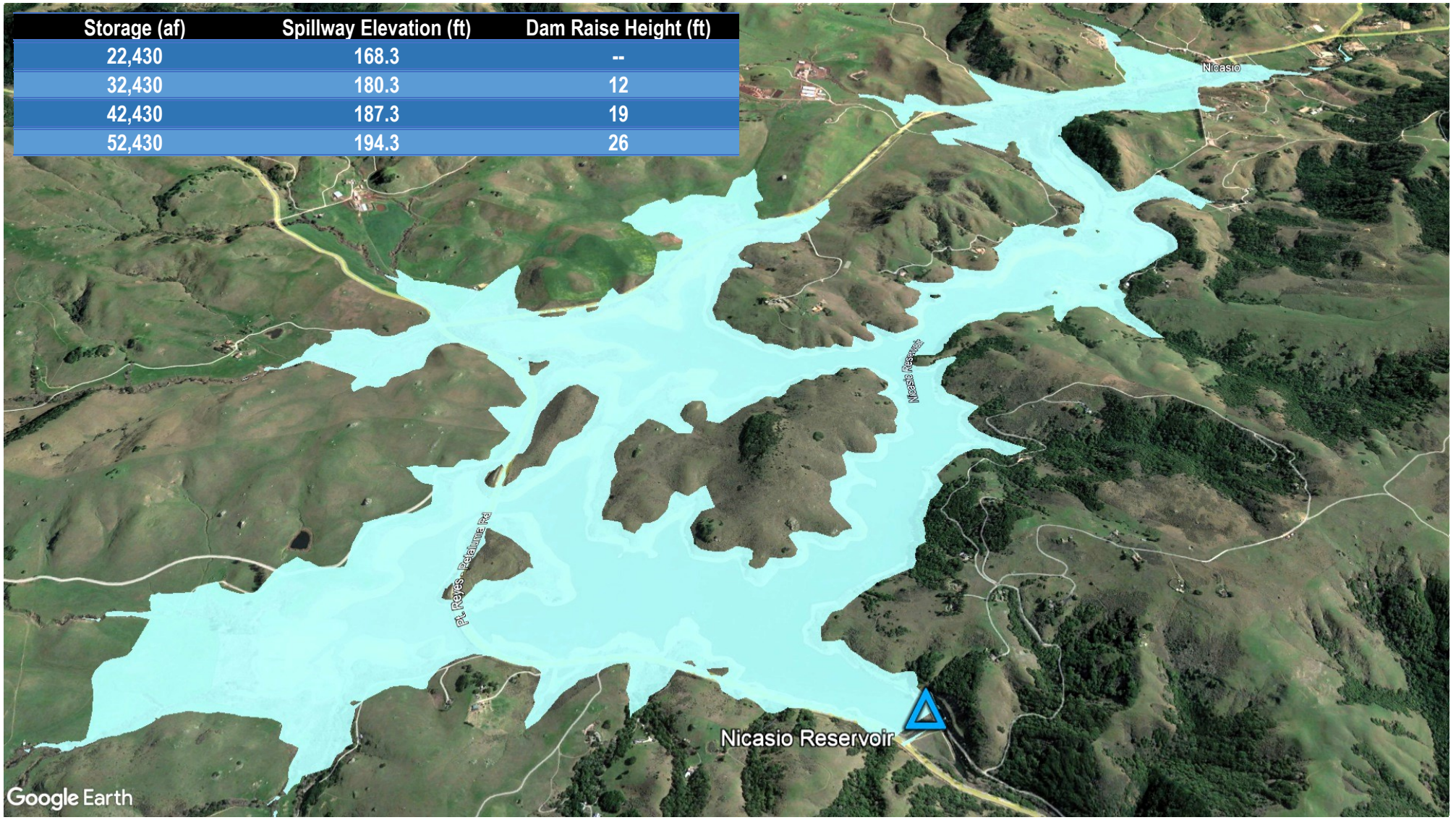
Nicasio Reservoir
Capacity: 22,430 AF

Kent Reservoir
Capacity: 32,895 AF



Nicasio Reservoir Storage Potential

Storage (af)	Spillway Elevation (ft)	Dam Raise Height (ft)
22,430	168.3	--
32,430	180.3	12
42,430	187.3	19
52,430	194.3	26



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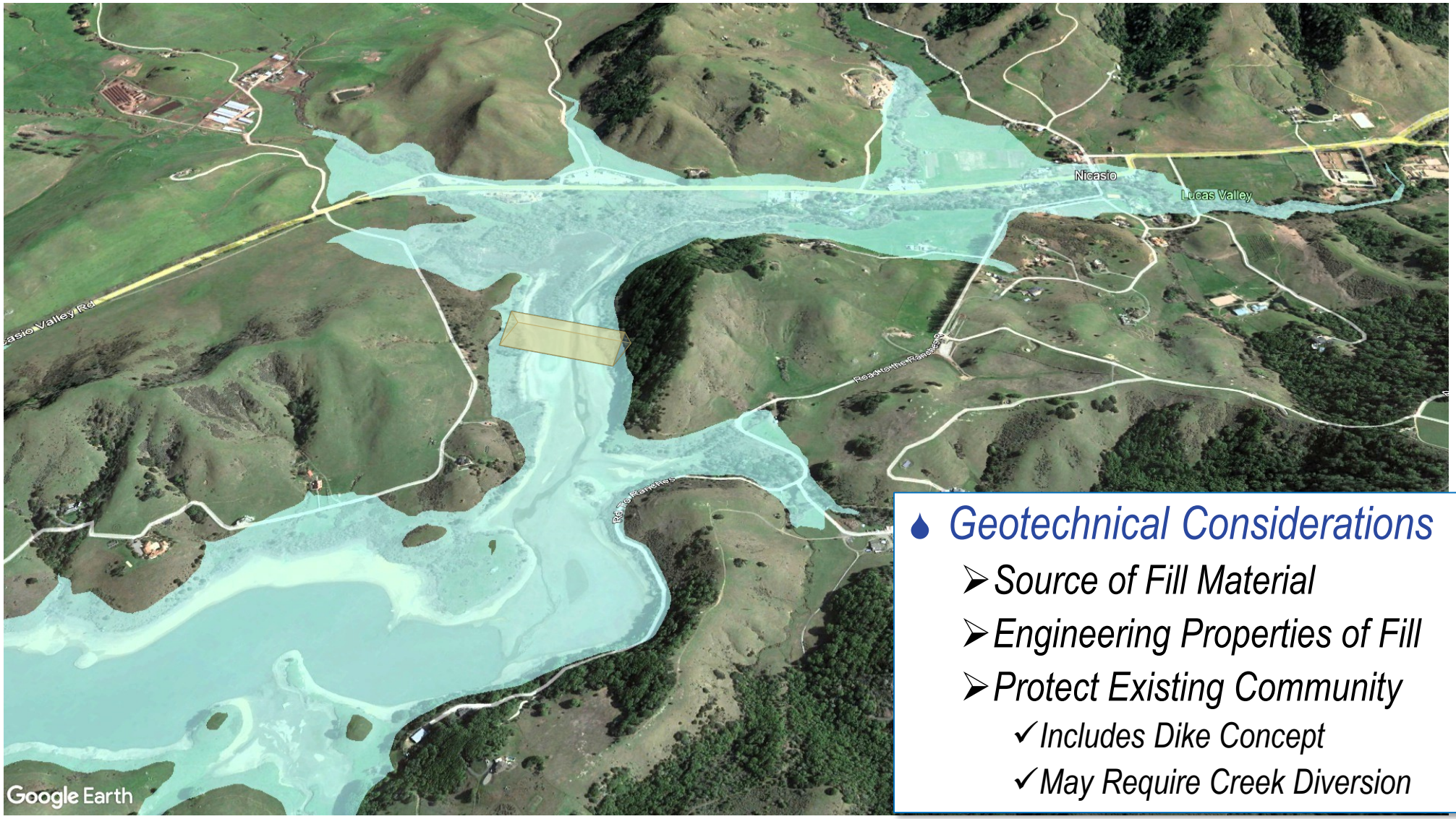
Nicasio Raise – Geotechnical Considerations



- *Geotechnical Considerations*
  - *Source of Fill Material*
  - *Engineering Properties of Fill*
  - *Protect Existing Community*
    - ✓*Includes Dike Concept*
    - ✓*May Require Creek Diversion*

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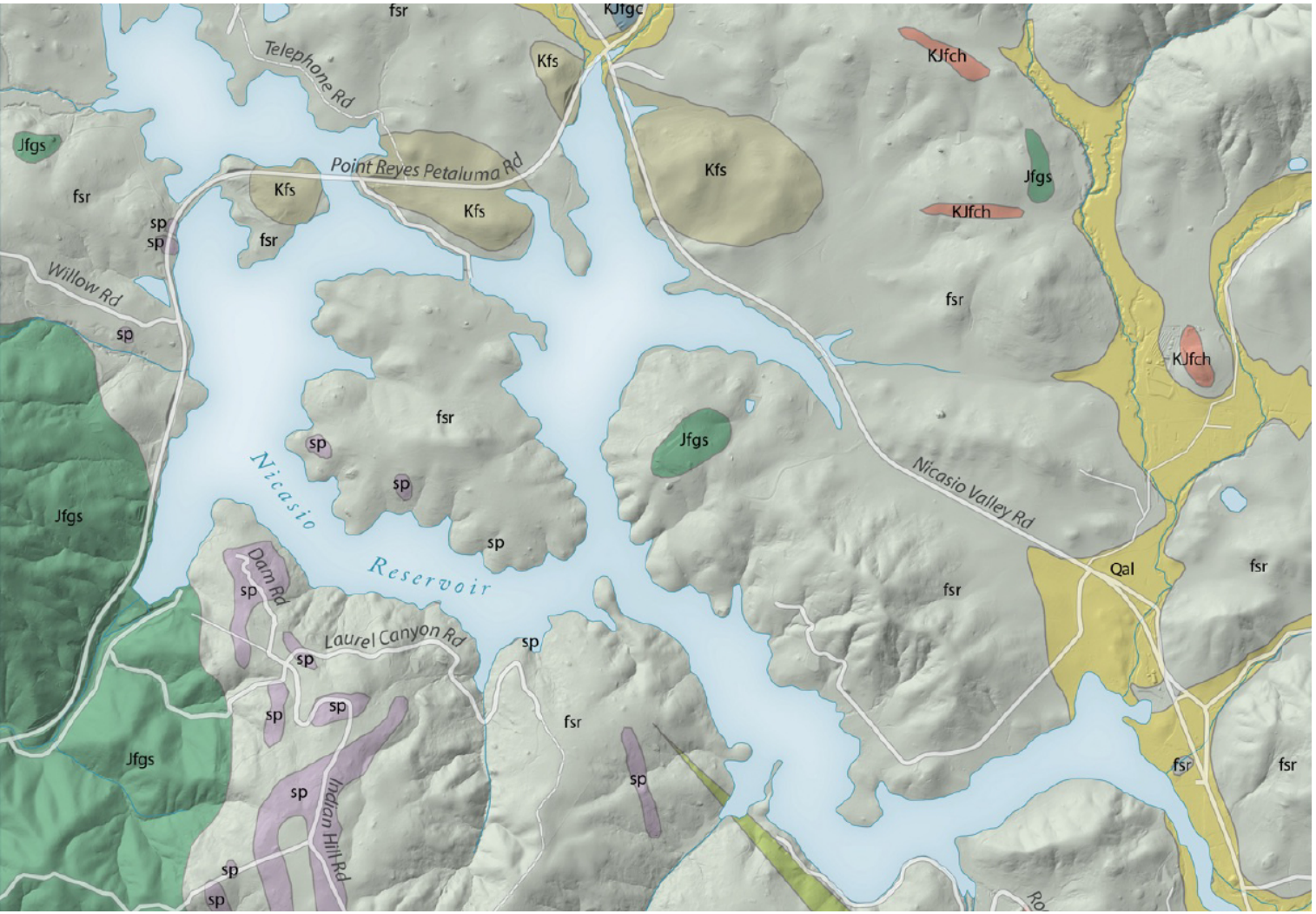
Geologic Hazard Considerations



- **Slope Stability**
  - Reactivation of slides along reservoir rim
- **Earthquake-Induced Liquefaction**
  - Saturation elevates hazard
- **Sedimentation/Erosion**
  - Inflow into reservoir
- **Mercury Mobilization**
  - Soulajule Reservoir
  - Dredging – potential for contamination

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The Information Developed Will Differentiate the Alternatives

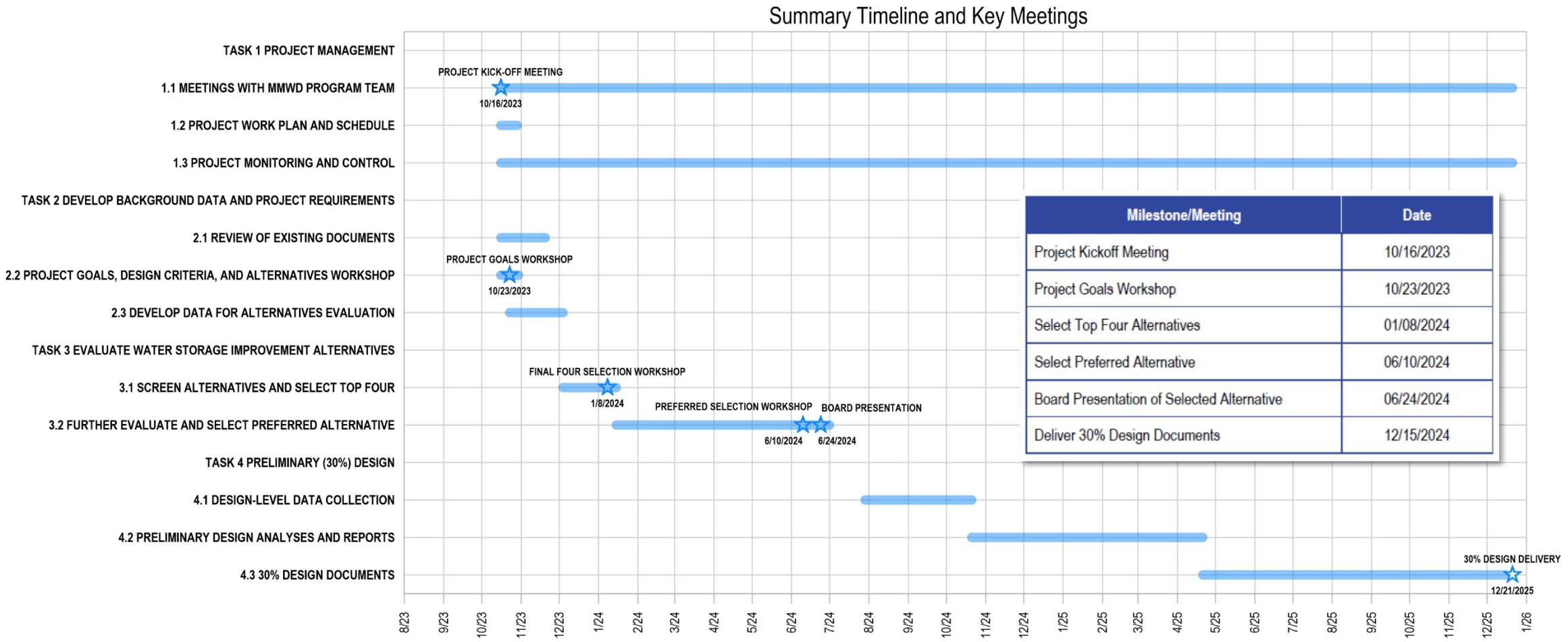
- Less promising options can be screened out early
- Remaining alternatives will be analyzed using site-specific information, to:
  - Refine costs, accounting for factors such as earthwork
  - Quantify impacts
  - Quantify water supply benefits
  - Identify important thresholds

Summary

- Storage Capacity Improvement is a key element of the Integrated Roadmap selected by the Board.
- Analysis of alternatives for this type of major water supply project must be robust to ensure that the selection of a preferred alternative is defensible.
- TGP have the necessary experience and technical ability to successfully carry out this work.
- Staff plans to bring an item for approval of a professional services agreement with TGP to the September 19, 2023 Board Meeting for the Board's consideration.

Extra Slide

Proposed Project Schedule



Milestone/Meeting	Date
Project Kickoff Meeting	10/16/2023
Project Goals Workshop	10/23/2023
Select Top Four Alternatives	01/08/2024
Select Preferred Alternative	06/10/2024
Board Presentation of Selected Alternative	06/24/2024
Deliver 30% Design Documents	12/15/2024

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