## Item C-1 Review of Concept Design Report for the Water Conveyance Facilities Project and the Groundwater Modeling Technical Memorandum for the Water Reclamation Facility

Morro Bay, CA June 11, 2019



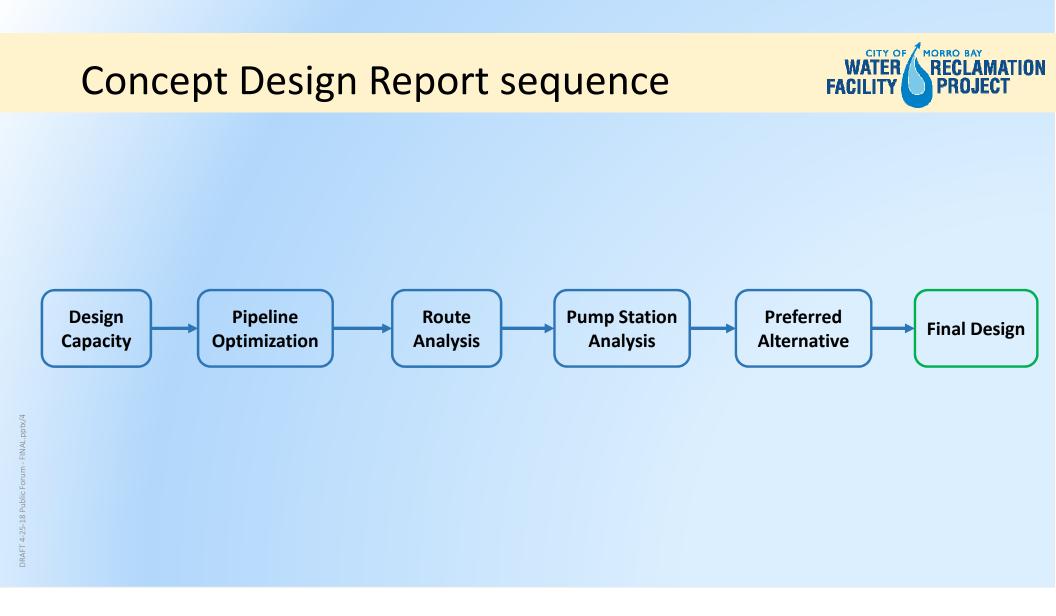
#### Recommendations

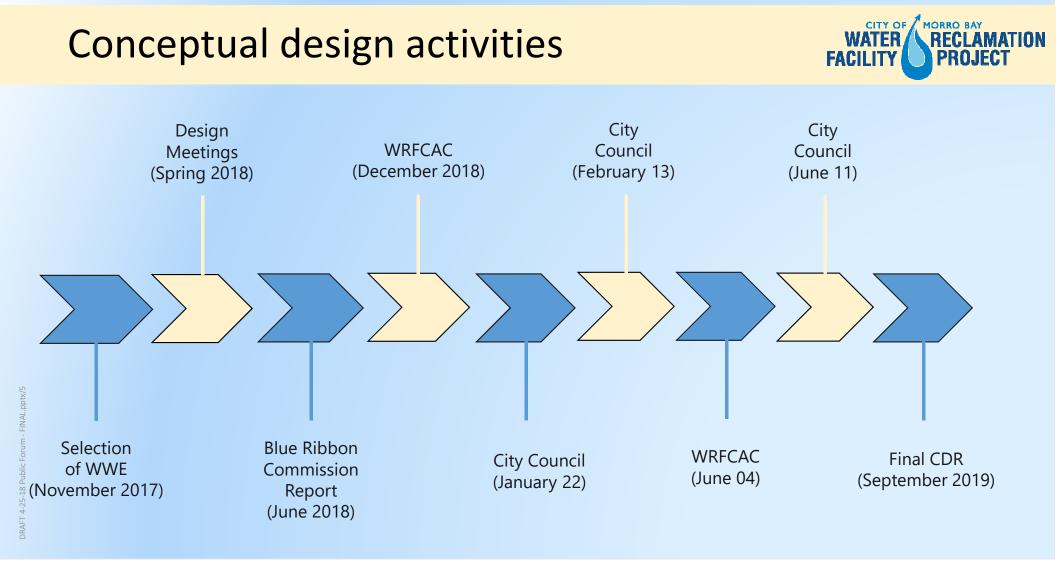


- Receive the Final Draft Concept Design Report
- Provide comments and input on the presentation for the Groundwater Modeling Technical Memorandum

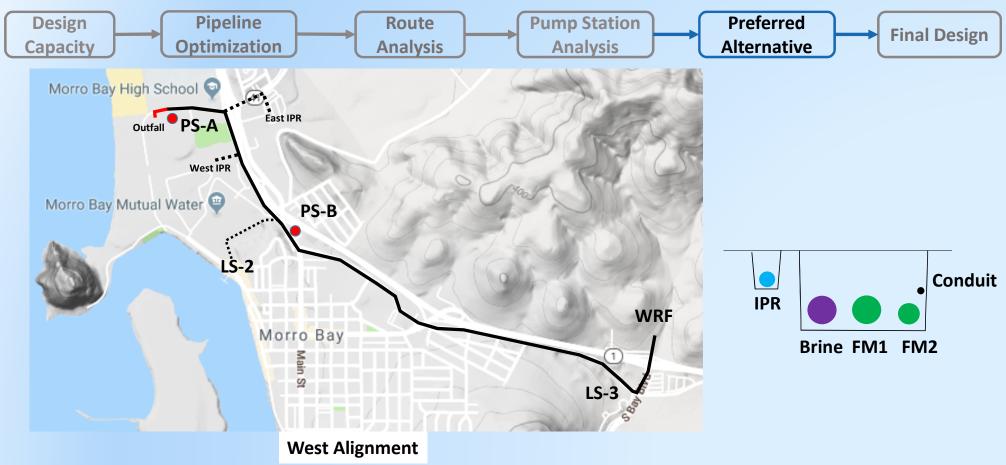
# Final Draft Concept Design Report







#### **Preferred Alternative**



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#### Schedule changes since initial draft

**Milestone Initial Draft Final Draft Activities** (November 2018) (May 2019) **60-Percent Design Submittal** July 09, 2019 August 30, 2019 October 15, 2019 90 Percent Design Submittal December 20, 2019 Production (PRIOR to receipt of Survey, Geotech, Utility Locating) Mon 3/11/19 60 days Tue 12/18/18 Production (AFTER receipt of Survey, Geotech, Utility Locating) 30 days Mon 7/8/19 Fri 8/16/19 Fri 8/30/19 Internal QA/QC and Revisions Mon 8/19/19 10 days 0 days Fri 8/30/19 Submit to City Fri 8/30/19 April 03, 2020 **Bid Opening** June 17, 2020 **Contractor Notice to Proceed** May 11, 2020 July 22, 2020 **Construction Substantial** September 17, 2021 November 26, 2021 Completion

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#### Input from WRFCAC

- Use of plastic versus metal pipe
  - Cost
  - Daily production rates
- Detailed design questions
  - Isolation valves
  - Minimum cover requirements
  - Pressure testing
- Traffic impacts from pipeline realignment
  - South Bay Boulevard overpass





## Groundwater Modeling Technical Memorandum



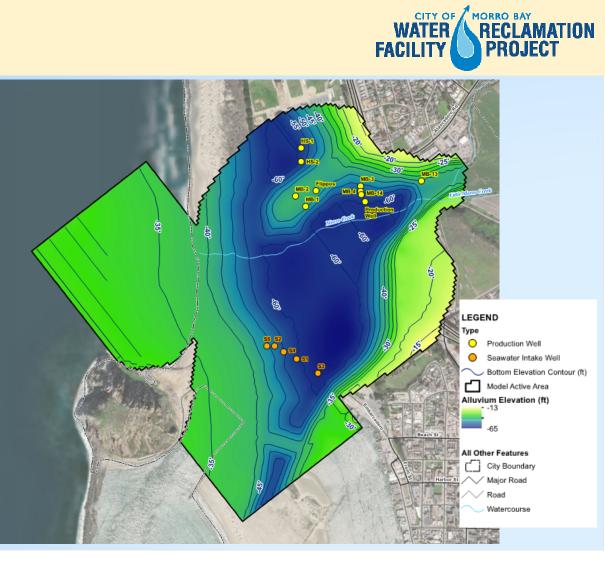
#### Phase 1 scope of work



- Investigate pumping of the City's full permitted allotment of 581 AFY without injection
- Analysis of possible groundwater nitrate levels under different injection scenarios
- Analysis of potential changes in groundwater chemistry due to potential salt water intrusion

## Phase 1 approach

- Pumping data between 1965 and 2018 from 7 wells
- TDS and nitrate data to early 1980s
- Combination of **MODFLOW and MODPATH**

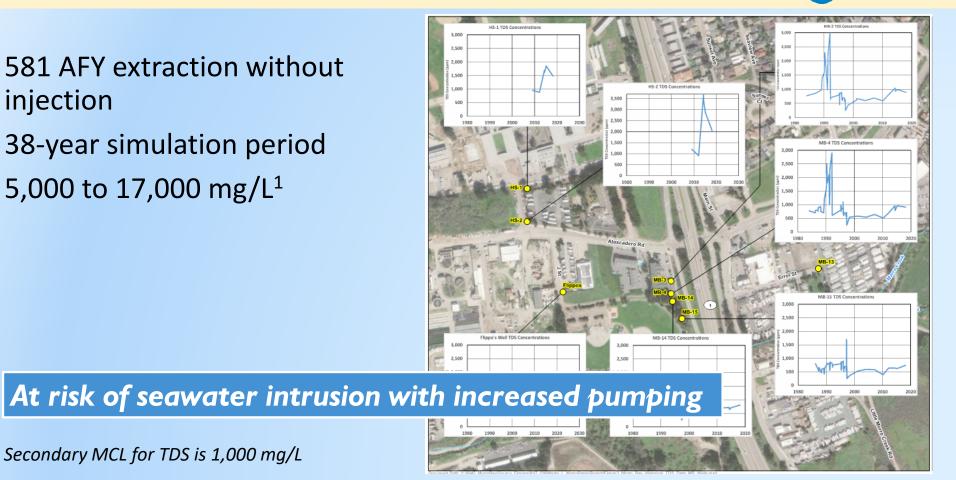


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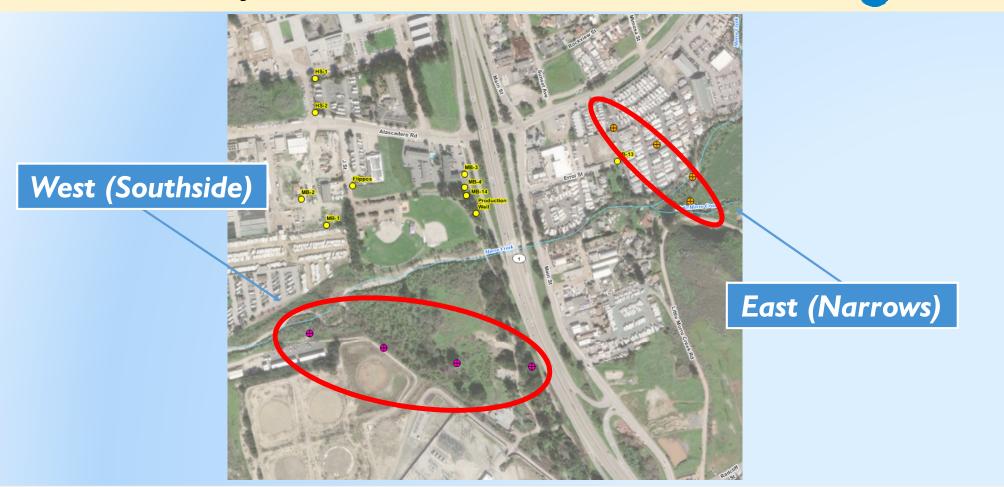
#### CITY OF MORRO BAY Impacts of pumping on seawater intrusion FACILITY

- 581 AFY extraction without injection
- 38-year simulation period
- 5,000 to 17,000 mg/L<sup>1</sup>



1. Secondary MCL for TDS is 1,000 mg/L

#### Modeled injection well locations

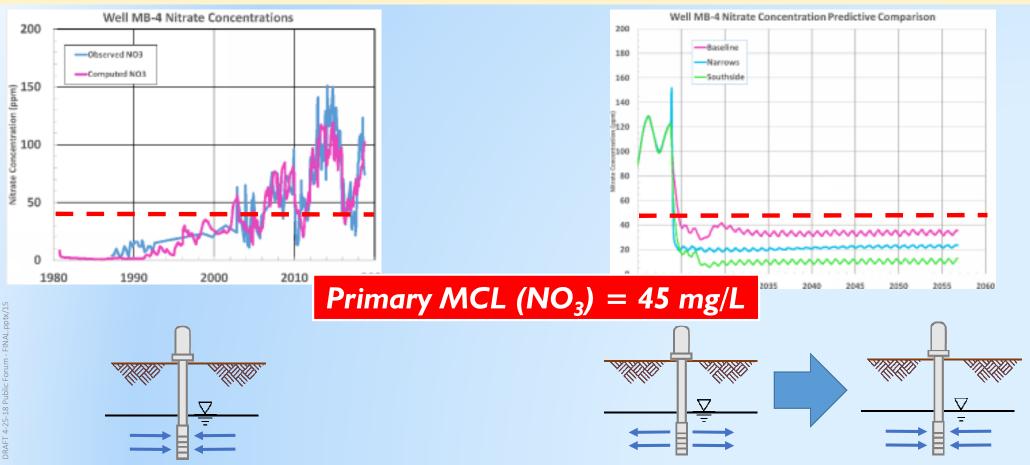


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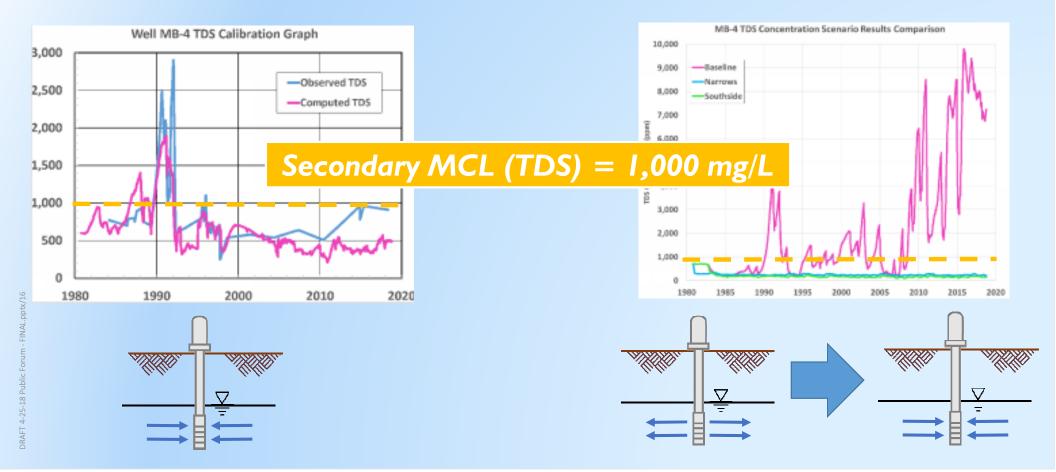
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#### Impacts of injection on nitrates





#### Impacts of injection on nitrates



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#### Phase 2 status update



- Evaluation of injection locations
  - CPT for the East Area Completed
- Prepare test well design and permitting
  - East Area
    - Install piezometer on Errol Street June 13, 2019
    - Pump testing for MB-13 well June 2019
  - West Area
    - Work Plan sent to Vistra June 04, 2019
  - Perform seawater intrusion monitoring Ongoing (December 2018)
  - Perform groundwater level monitoring Ongoing (December 2018)

#### Input from WRFCAC



The potential sources of nitrate contamination to ground water at the City's Highway 1 well field include agricultural and turffertilizers, private septic system discharges, sewer exfiltration, animal operations, and miscellaneous sources. Of these, turffertilizers, private septic system discharges, animal operations, and miscellaneous sources are not considered capable of significant contributions to nitrate contamination at the well field. The rationale for eliminating these sources are:

Sewer exfiltration is the leakage of raw wastewater from a sewer system into the ground. The potential for sewer exfiltration as the source of nitrate contamination in ground water has been evaluated based on a review of the local sewer system, the general mineral quality of local wastewater and the isotope results. These evaluations, detailed below, indicate that sewer exfiltration is not a major source of nitrate contamination in ground water at the City well field.

The results of this study indicate that the main source of nitrate contamination in ground water at the City's Highway 1 well field is from nitrogen fertilizer applications associated with vegetable farming operations in the lower Morro Valley. Historical land use trends, water quality trends, and recharge

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Morro Basin Nitrate Study (Cleath & Associates, 2007)

#### Recommendations



- Receive the Final Draft Concept Design Report
- Provide comments and input on the presentation for the Groundwater Modeling Technical Memorandum

## Questions and Discussion







#### Purpose of the Concept Design Report

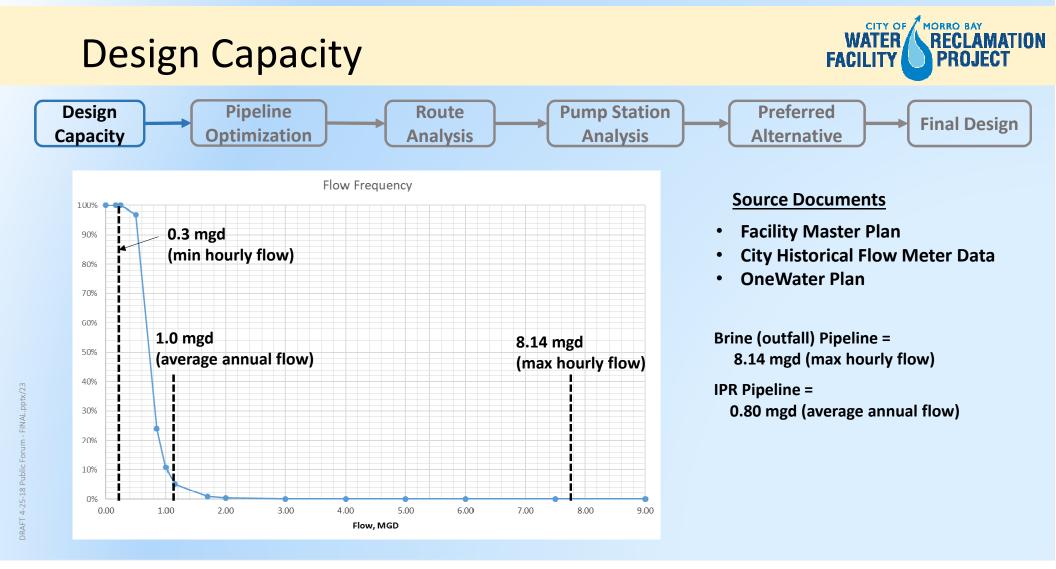
 Siting, design criteria, and project constraints for the WRF lift station(s)

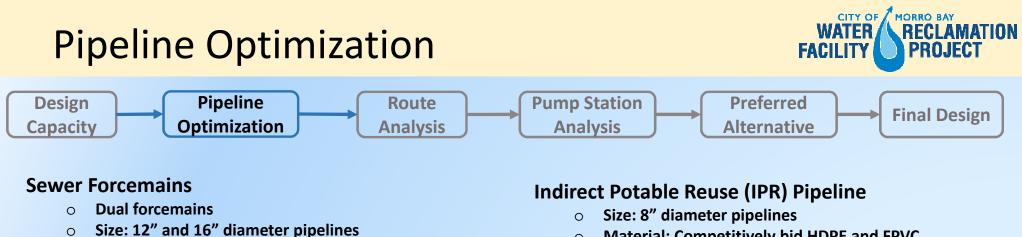
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 Alignment, design criteria, and project constraints for the offsite pipelines (sewer forcemains, brine/effluent line, communication conduit, and IPR line)





#### Brine (Outfall) Pipeline

0

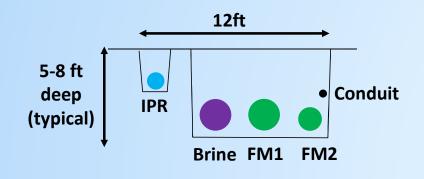
- Size: 16" diameter pipelines 0
- Material: Competitively bid HDPE and FPVC 0

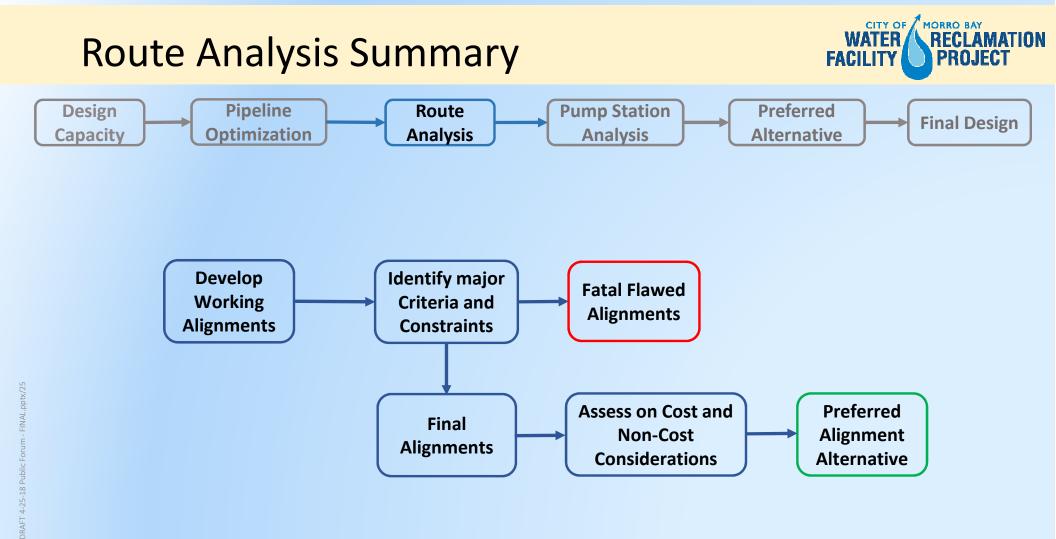
Material: Competitively bid HDPE and FPVC

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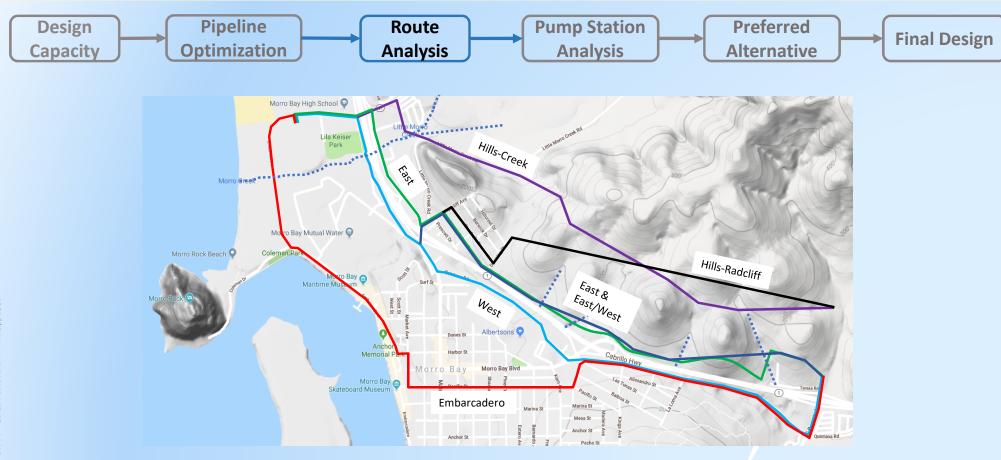
#### **Communication Conduit (Fiber Optic)**

4" diameter PVC Conduit 0





#### Working Alignments

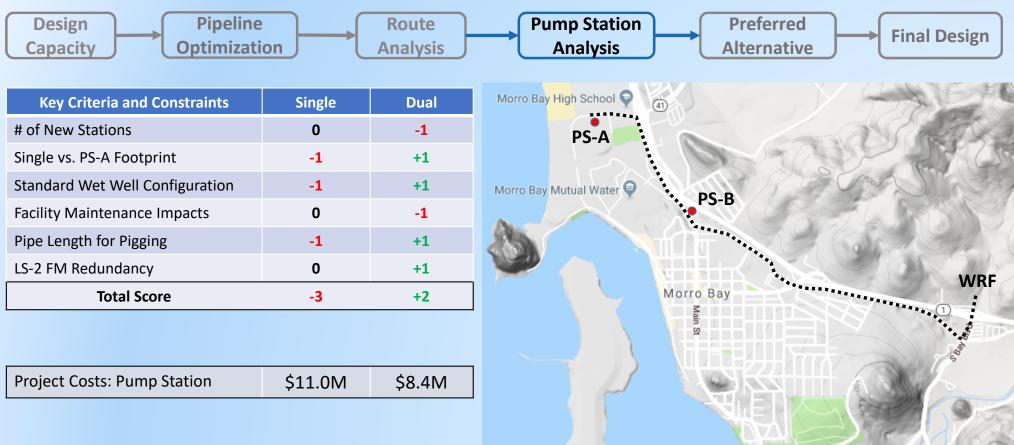


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#### **Pump Station Analysis**



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#### Summary of hydrogeological activities



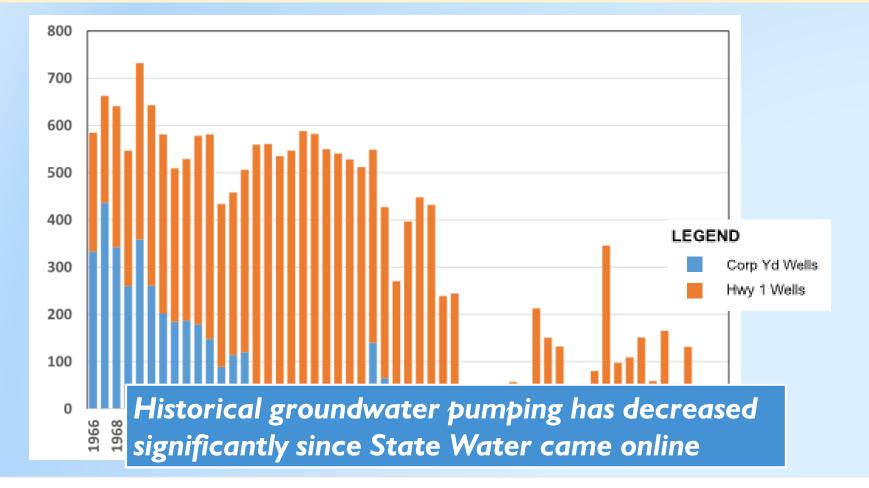
- Feasibility Study
- Phase 1
- Phase 2
- Phase 3
- Recycled Water Facilities Final Design

## Feasibility Study findings

- Feasible for aquifer to accept injection
- A minimum of four injection wells needed
- Approximately 1,200 acre-feet-per year (AFY) of groundwater could potentially be produced using IPR
- Minimum 2-month subsurface retention time likely



#### Historical Lower Morro basin pumping



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#### Phase 2 objectives

- Prepare test well design and permitting
- Evaluate two potential injection well locations and recommend preferred area for testing
- Secure permitting for injection testing
- Conduct pilot injection testing
- Update groundwater model
- Perform travel time analysis and clogging analysis
- Perform seawater intrusion monitoring
- Perform groundwater level monitoring