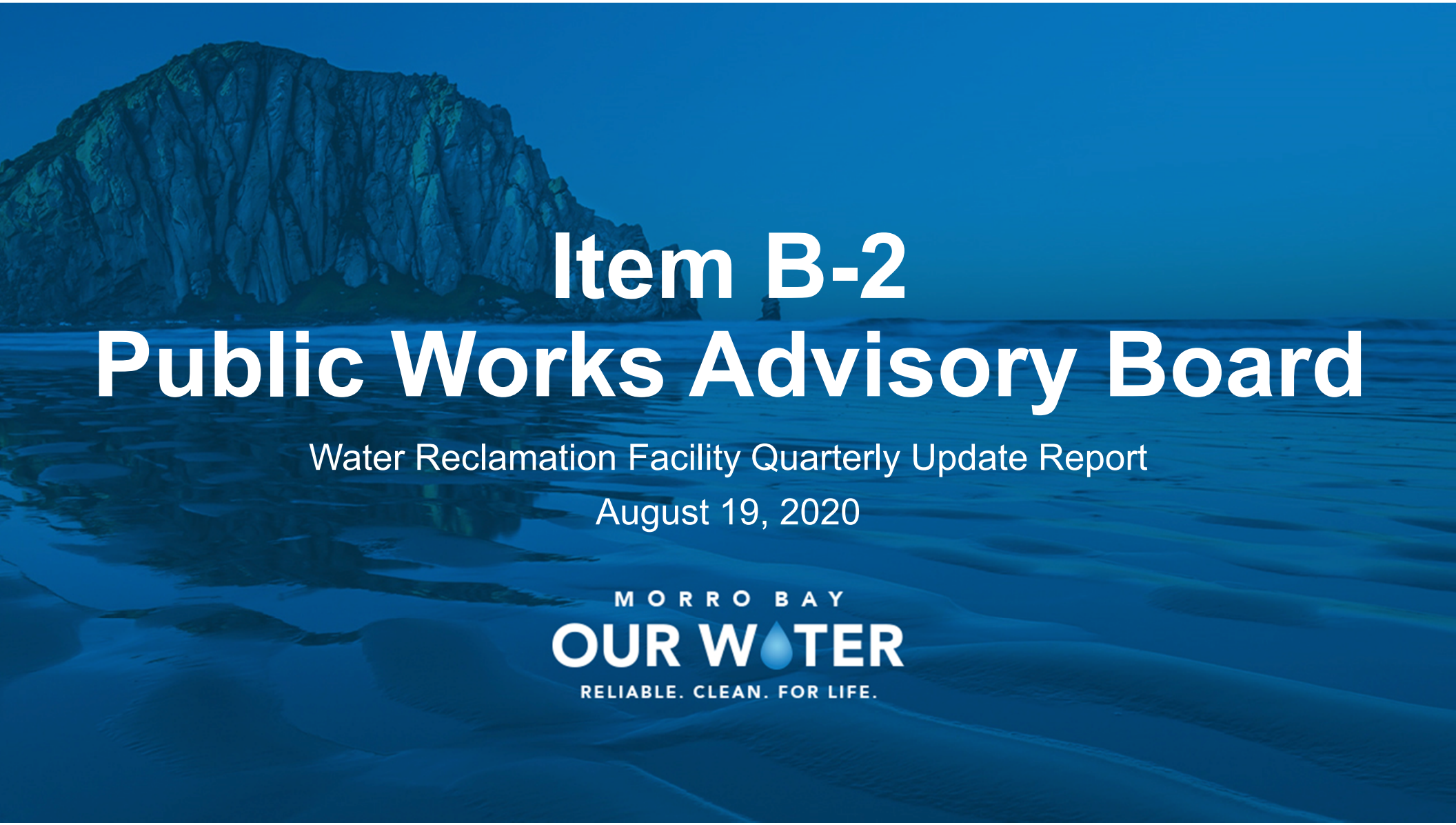

Item B-2
Public Works Advisory Board

Water Reclamation Facility Quarterly Update Report

August 19, 2020

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Background

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City's phased approach to hydrogeologic work to support potable reuse

- Phase 0 – Feasibility
- Phase 1 – Additional Modeling
- Phase 2 – Selection of Injection Area
- Phase 3 – Basis of Design and Permitting

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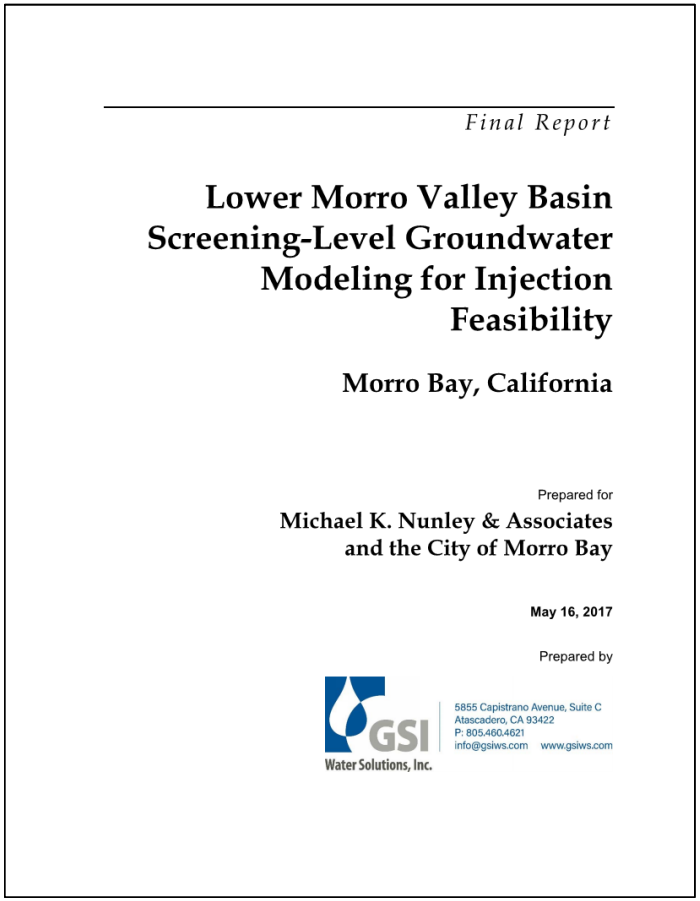
Phase 0 focused on establishing feasibility of potable reuse

- Phase 0 – Feasibility (May 2017)
  - Groundwater model developed
  - Potable reuse feasible
  - 825 acre-feet per year (AFY) injection capacity
  - Up to 1,200 AFT extraction capacity
  - Feasible sites both west and east of Highway 1



Final Report

Lower Morro Valley Basin Screening-Level Groundwater Modeling for Injection Feasibility

Morro Bay, California

Prepared for
Michael K. Nunley & Associates and the City of Morro Bay

May 16, 2017

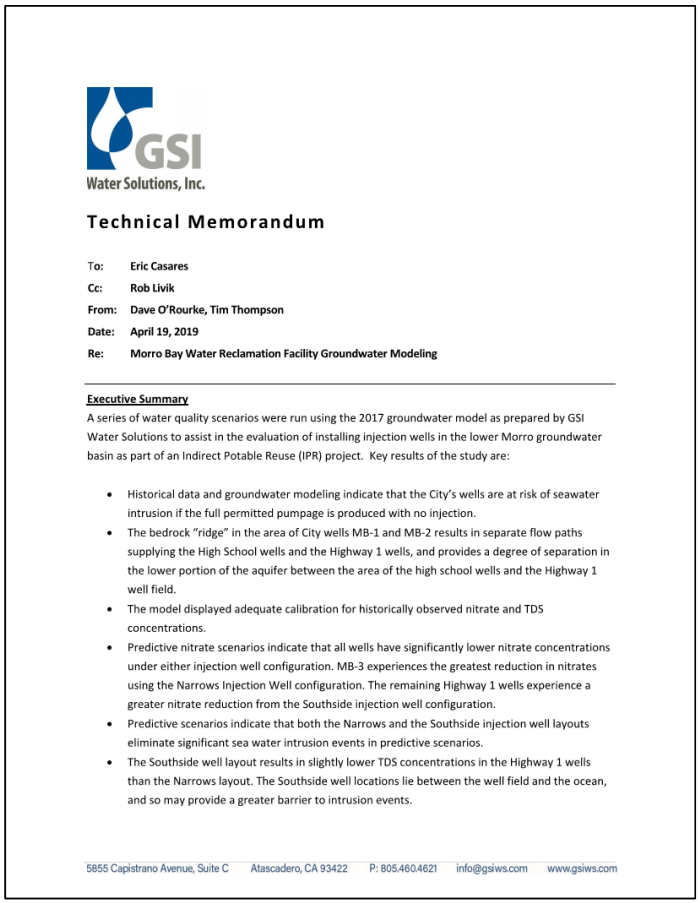
Prepared by

GSI Water Solutions, Inc.

5855 Capistrano Avenue, Suite C
Atascadero, CA 93422
P: 805.460.4621
info@gsiws.com www.gsiws.com

Phase 1 focused on long-term groundwater quality

- Phase 1 – Additional Modeling (April 2019)
  - No sustained pumping without extraction (seawater intrusion)
  - Injection and extraction improves groundwater quality



GSI Water Solutions, Inc.

Technical Memorandum

To: Eric Casares
Cc: Rob Livik
From: Dave O'Rourke, Tim Thompson
Date: April 19, 2019
Re: Morro Bay Water Reclamation Facility Groundwater Modeling

Executive Summary

A series of water quality scenarios were run using the 2017 groundwater model as prepared by GSI Water Solutions to assist in the evaluation of installing injection wells in the lower Morro groundwater basin as part of an Indirect Potable Reuse (IPR) project. Key results of the study are:

- Historical data and groundwater modeling indicate that the City's wells are at risk of seawater intrusion if the full permitted pumpage is produced with no injection.
- The bedrock "ridge" in the area of City wells MB-1 and MB-2 results in separate flow paths supplying the High School wells and the Highway 1 wells, and provides a degree of separation in the lower portion of the aquifer between the area of the high school wells and the Highway 1 well field.
- The model displayed adequate calibration for historically observed nitrate and TDS concentrations.
- Predictive nitrate scenarios indicate that all wells have significantly lower nitrate concentrations under either injection well configuration. MB-3 experiences the greatest reduction in nitrates using the Narrows Injection Well configuration. The remaining Highway 1 wells experience a greater nitrate reduction from the Southside injection well configuration.
- Predictive scenarios indicate that both the Narrows and the Southside injection well layouts eliminate significant sea water intrusion events in predictive scenarios.
- The Southside well layout results in slightly lower TDS concentrations in the Highway 1 wells than the Narrows layout. The Southside well locations lie between the well field and the ocean, and so may provide a greater barrier to intrusion events.

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Current Work Efforts

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Summary of Phase 2 tasks

- Gather additional information
- Update the existing groundwater model
- Select the preferred injection location
- Better define project feasibility

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Field work completed to better characterize the aquifer

- East “Narrows” Area
  - Cone penetration tests (CPT) conducted in April 2019
  - Piezometer installation
  - Monitoring well installation
  - Pump testing
- West Injection Area
  - Piezometer installation
  - Pump testing

Injection rates higher in the West Area

Existing model was updated based on field work

Injection Project Area	Figure	Scenario	Total Pumping (AFY)	Total Injection (AFY)	MB-3	MB-4	MB-14	MB-15	MB-1	MB-2	HS-1	HS-2	Flippos
Narrows project area	Figure 9	Base+75% Inj.	1200	825	1.5	1.5	2.5	2.5					
	Figure 10	Base+75% Inj.	1200	825					6	6	3.5	3.5	3.5
Western project area	Figure 11	Base+25% Inj.	787	825	3.5	3.5					>6	5.5	3
	Figure 12	Base+75% Inj. (Dry)	995	825	3	3					7.5	4	2.5
	Figure 13	Base+75% Inj. (Wet)	1200	825	3.5	3.5					4	>4	2.5

Retentions times significantly greater

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West injection area preferred

- Higher injection rates (transmissivity)
- Great retention times
- Greater mitigation between seawater intrusion
- Easier implementation (non-residential)
- Lower cost (potable reuse pipeline)

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Additional modeling nearly completed

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Model Run	Climatic Conditions	Minimum Retention Time (months)	Total Injection (AFY)	Total Pumping (AFY)	Pumping Wells		
					HS-1	HS-2	New Well #1*
Run1A	Dry	10	400	400	180	220	
	Wet	14	400	400	180	220	
Run1B	Dry	7	600	600	180	220	200
	Wet	8	600	600	180	220	200
Run1C	Dry	7	400	600	180	220	200
	Wet	9	400	600	180	220	200

Phased implementation could improve permittability

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Next Steps

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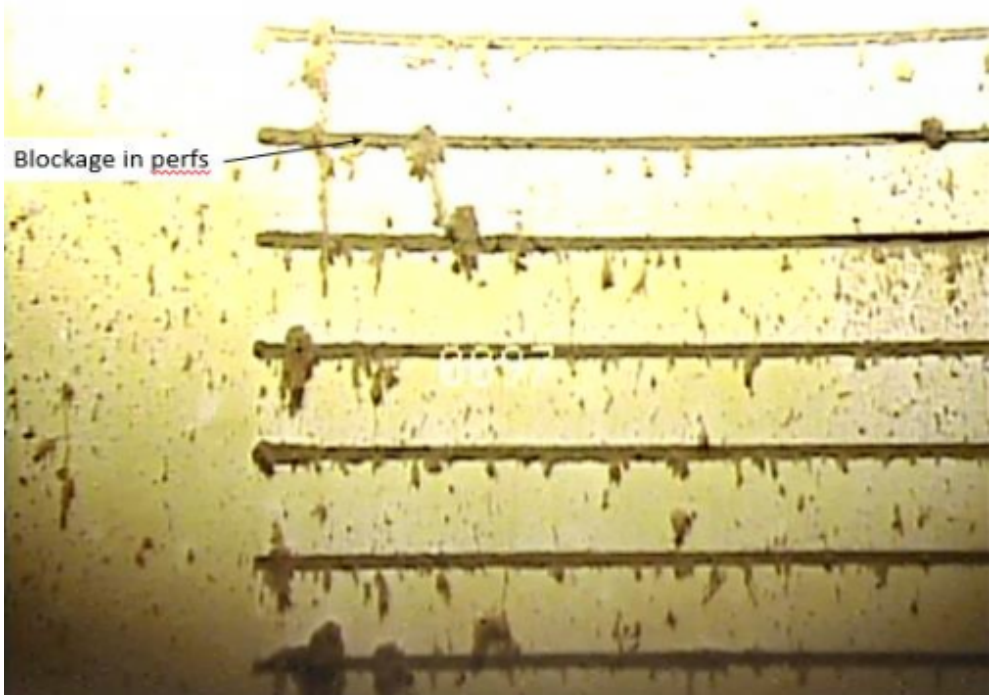
Phase 3 is ready to begin

- Full-scale injection well construction (initially used for pilot testing)
- Permitting support for Title 22 Engineering Report
- Design criteria for injection well system



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Questions and Discussion