CSLC Prevention First 2016

Water Management

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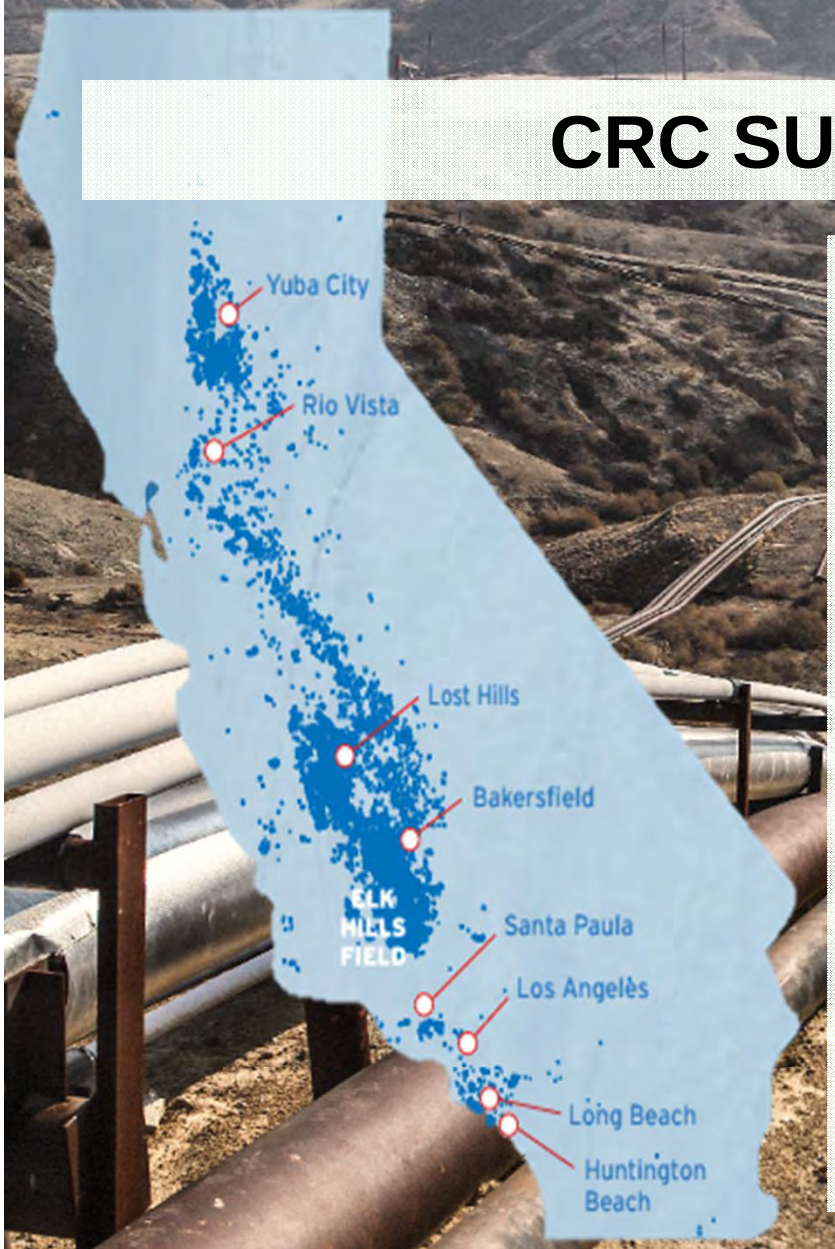
CRC SUSTAINABILITY



California Resources Corporation is California's largest oil and gas company on a gross-operated basis.

CRC's water management team of hydrologists, environmental scientists, engineers and operations personnel work to implement water conservation and recycling projects.

Objective: Actively identify pilot projects and implement fresh water replacement strategies to reduce fresh water use.

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OUTLINE

- Operational Overview
- Project Objective
- Measure & Benchmark
- Recommendations
- Results & Takeaways

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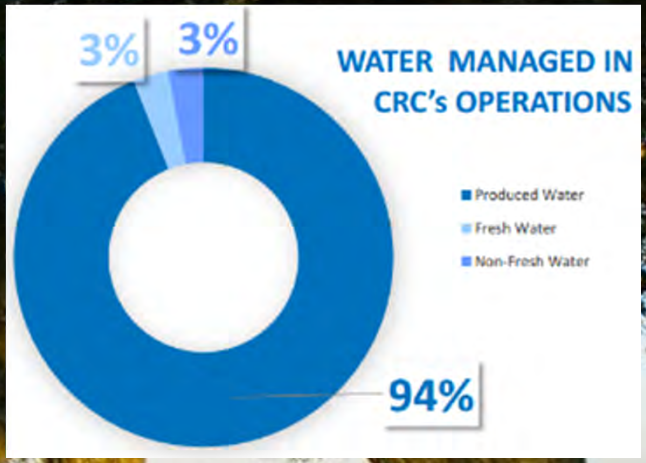
CRC OPERATIONAL OVERVIEW

Vast majority of water managed by CRC is produced water.

Fresh water and Non-Fresh water sources are used to support operations such as cleaning, dust control, and cooling.



DEFINITIONS

Produced Water

- Water that originates in oil and gas reservoirs and is brought to the surface during production of oil and gas.

Fresh Water

- Water typically purchased from municipal sources.

Non-Fresh Water

- Water from sources such as reclaimed municipal wastewater, collected storm water or agricultural runoff.

Recycled Water

- Water that is treated to remove solids and impurities for reuse.

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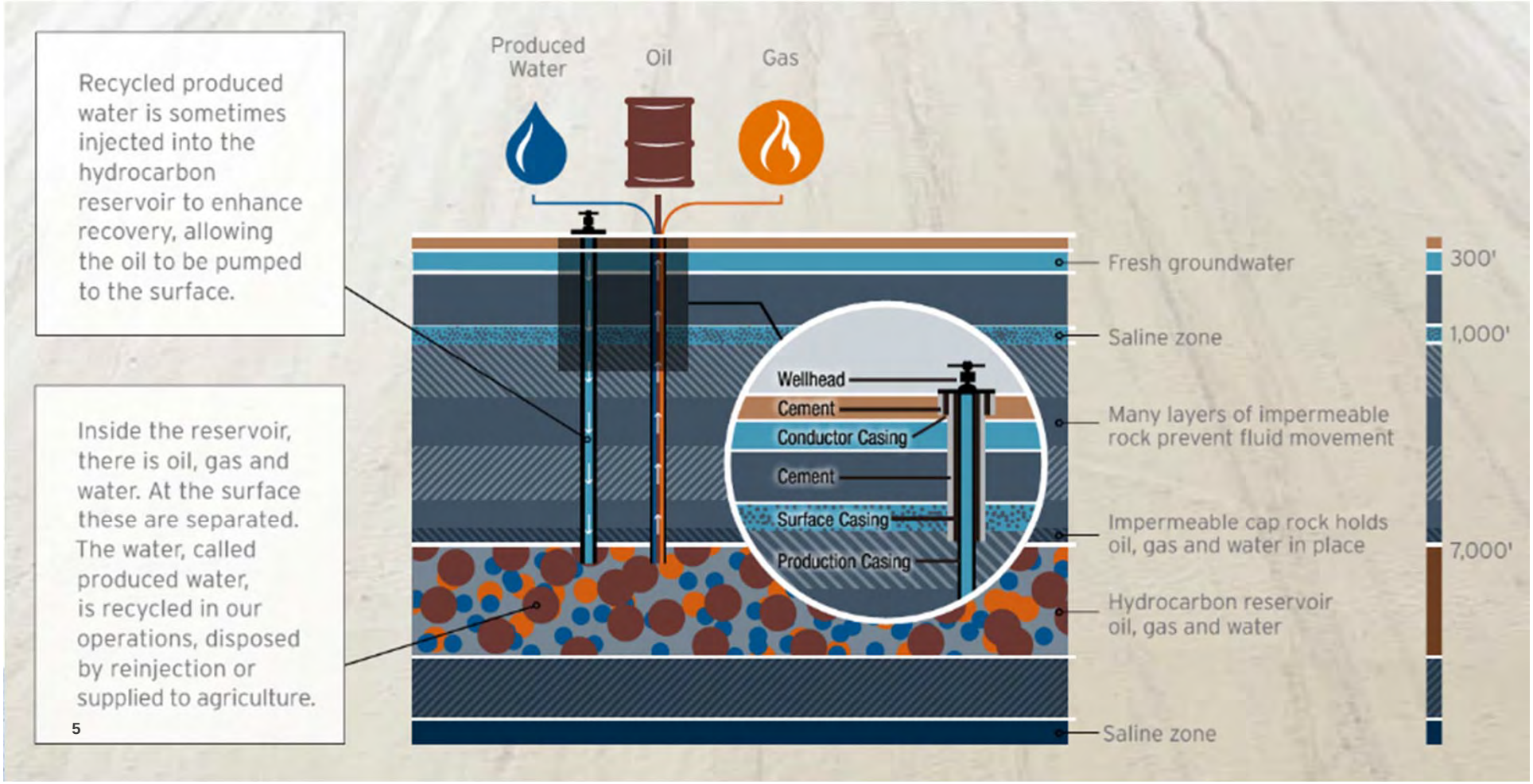
GENERAL USES OF WATER

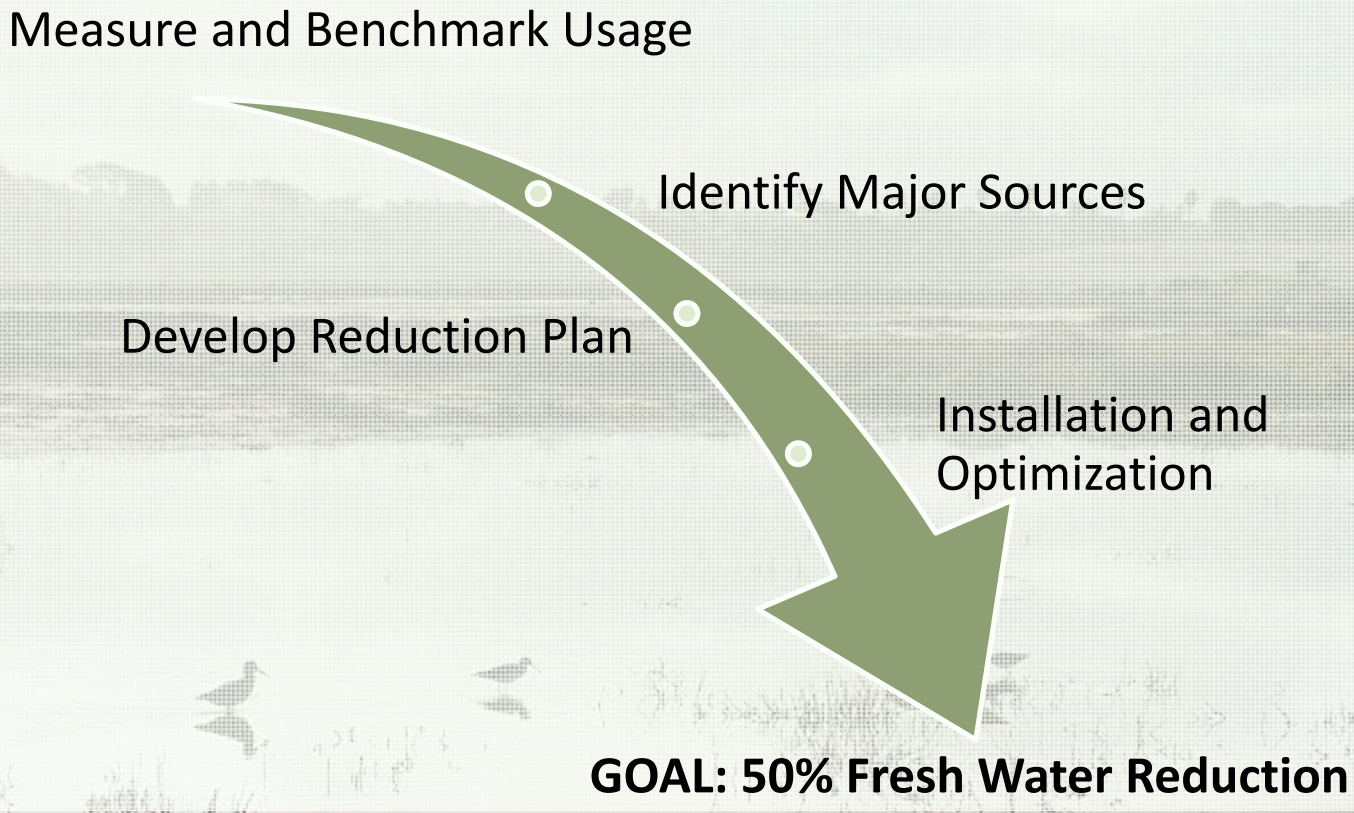
Produced water, typically salty and not suitable for drinking, is separated and recycled in a closed loop by reinjection into mature oil and gas reservoirs as part of enhanced oil recovery operations.

In Wilmington, the produced water and non-fresh water is also used for subsidence control.



PROJECT OBJECTIVE

Identify the uses of Fresh Water in the Wilmington and Huntington Beach Assets and implement solutions to reduce usage by 50%.



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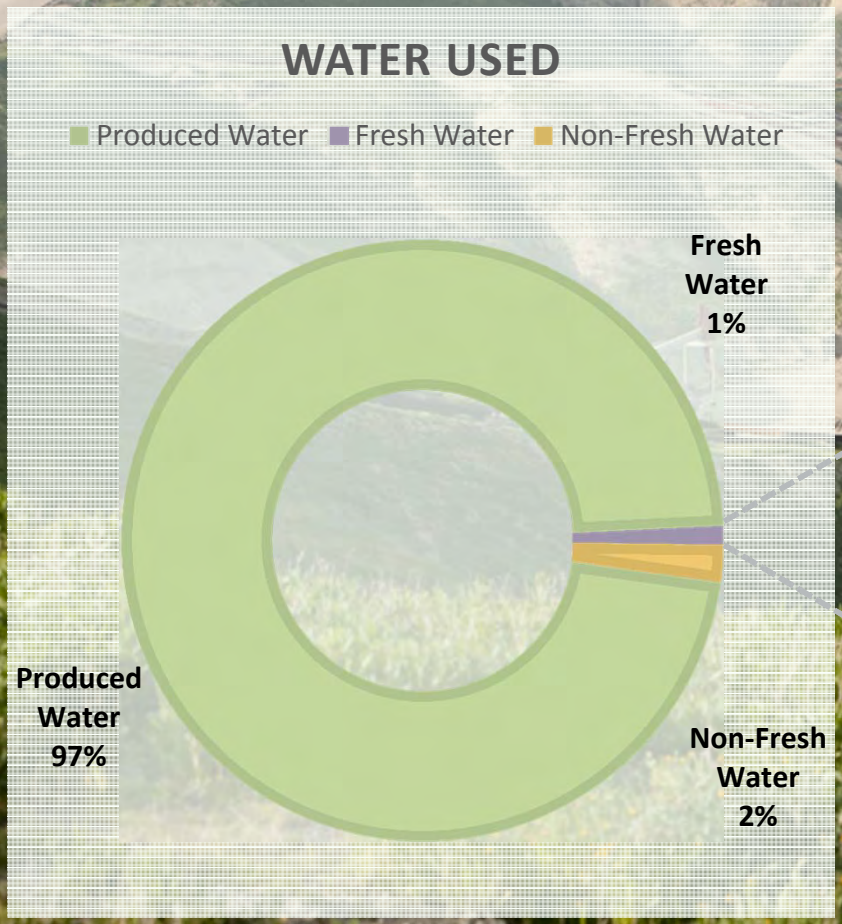
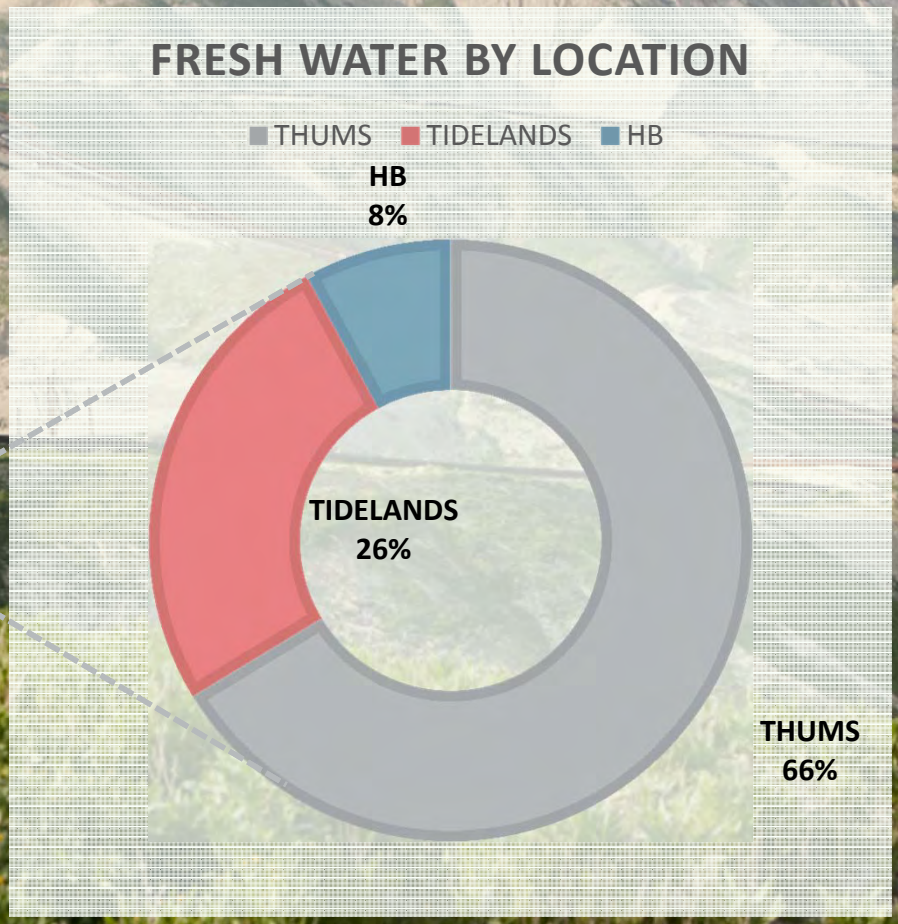
OPERATIONAL OVERVIEW

Water Usage in Wilmington and Huntington Beach Properties





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MEASURE AND BENCHMARK

Overall fresh water usage measured by location.

Challenge:

- Measured individual uses to develop reduction plan
- Installed turbine meters on the industrial water lines on all Islands
- Installed clamp on ultrasonic meter
  - Seal flush/bearing cooling water common line
  - Vapor Recovery Unit cooling water line
- Used new meter data to evaluate primary uses of water and prepare water usage breakdown.

Main Fresh Water Utility Meter

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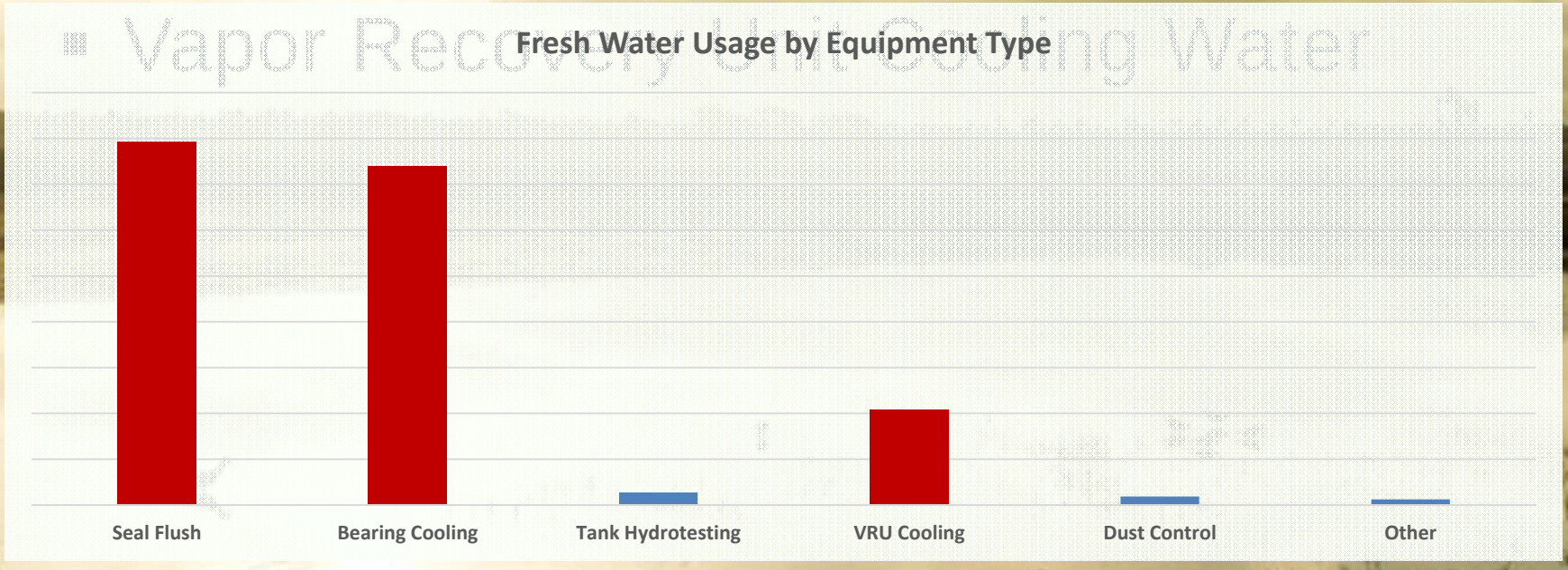
RESULTS - MAJOR USES

- Inj Pump Seal Flush
- Inj Pump & Motor Bearing Cooling Water
- Vapor Recovery Unit Cooling Water



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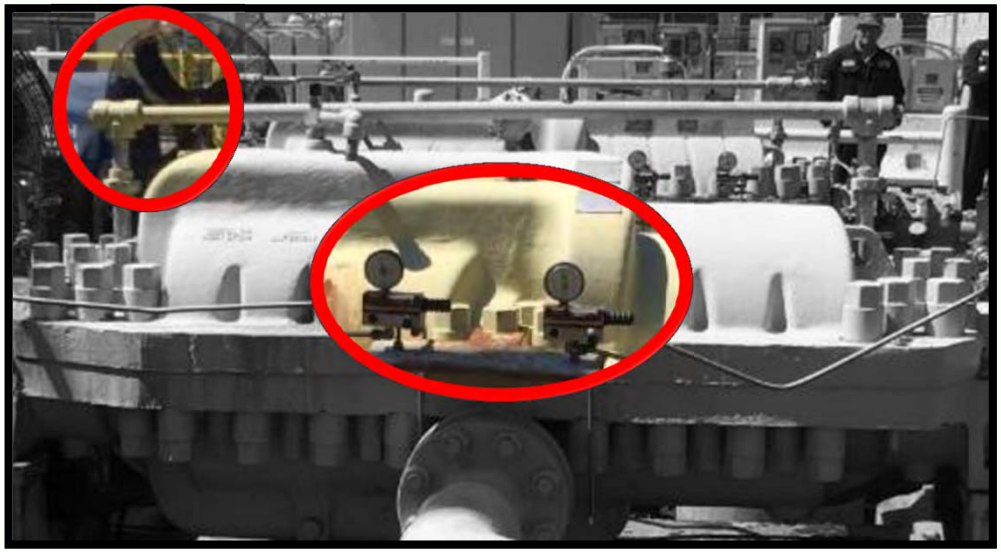
INJECTION PUMP SEAL FLUSH

Seal flush used to maintain hydro film on seals and to wash away debris on seal face of the injection pumps.

Project: Replace fresh water seal flush system with produced water recycled seal flush



Injection Seal Flush Hook-up

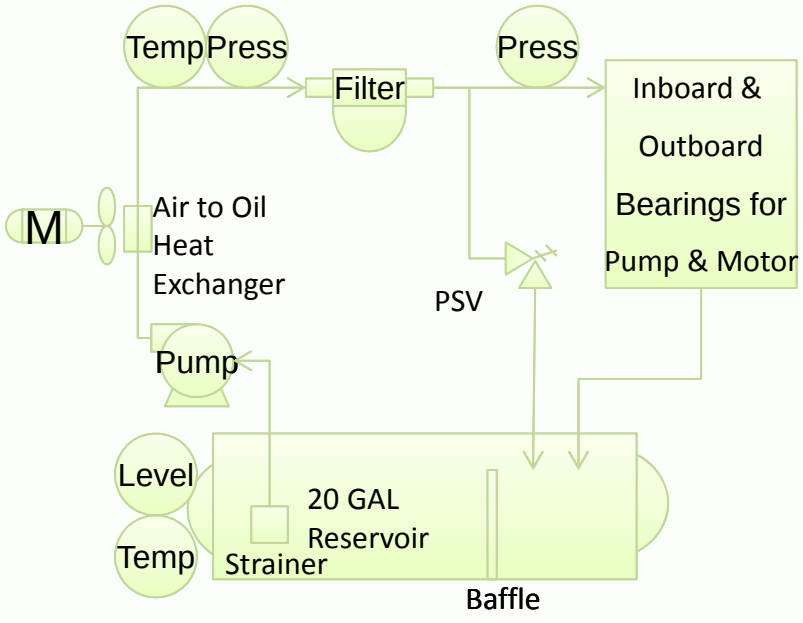
Injection Seal

INJ. PUMP & MOTOR BEARING COOLING WATER

Fresh water is used to cool the bearings of the injection pumps.

Project: Replace entire bearing with a lube oil bearing kit and use a lube oil pump and cooling fan.

Old Style Bearing Housing



Exposed Bearing

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VAPOR RECOVERY UNIT COOLING

Fresh water keeps the vapor recovery compressors shell cool and also cools the discharge gas.

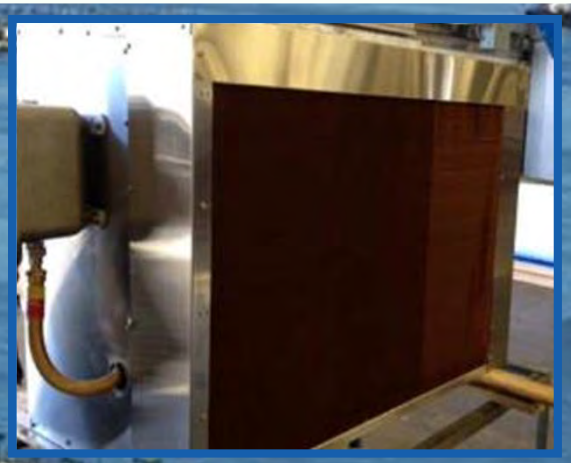
Project: Install closed loop radiator system

Vapor Recovery Unit Compressor Skid

An example of a radiator cooler

FINISHED INSTALLATION

Seal Flush	Bearing Cooling	Vapor Recovery Unit cooling



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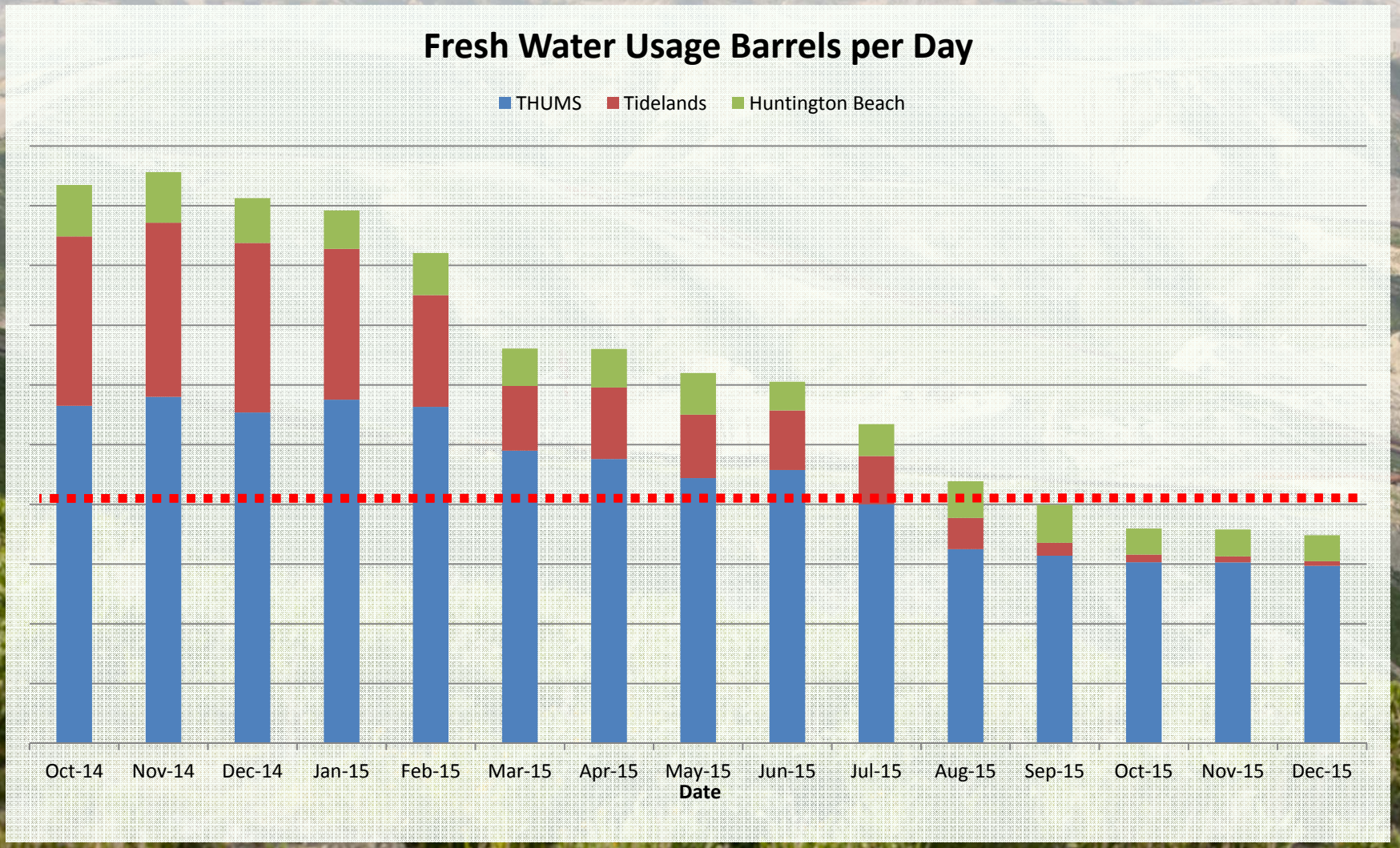
OVER 50% FRESH WATER REDUCTION!



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TAKEAWAYS

Project Objective

- Reduced 50% of the fresh water usage in Wilmington and Huntington Beach within one year of project kick-off.

Economic Benefit

- Installed systems provide economic benefit by improving equipment reliability and reducing fresh water cost.

Sustainability

- Supports CRC Sustainability initiative and California's Fresh Water Reduction Efforts

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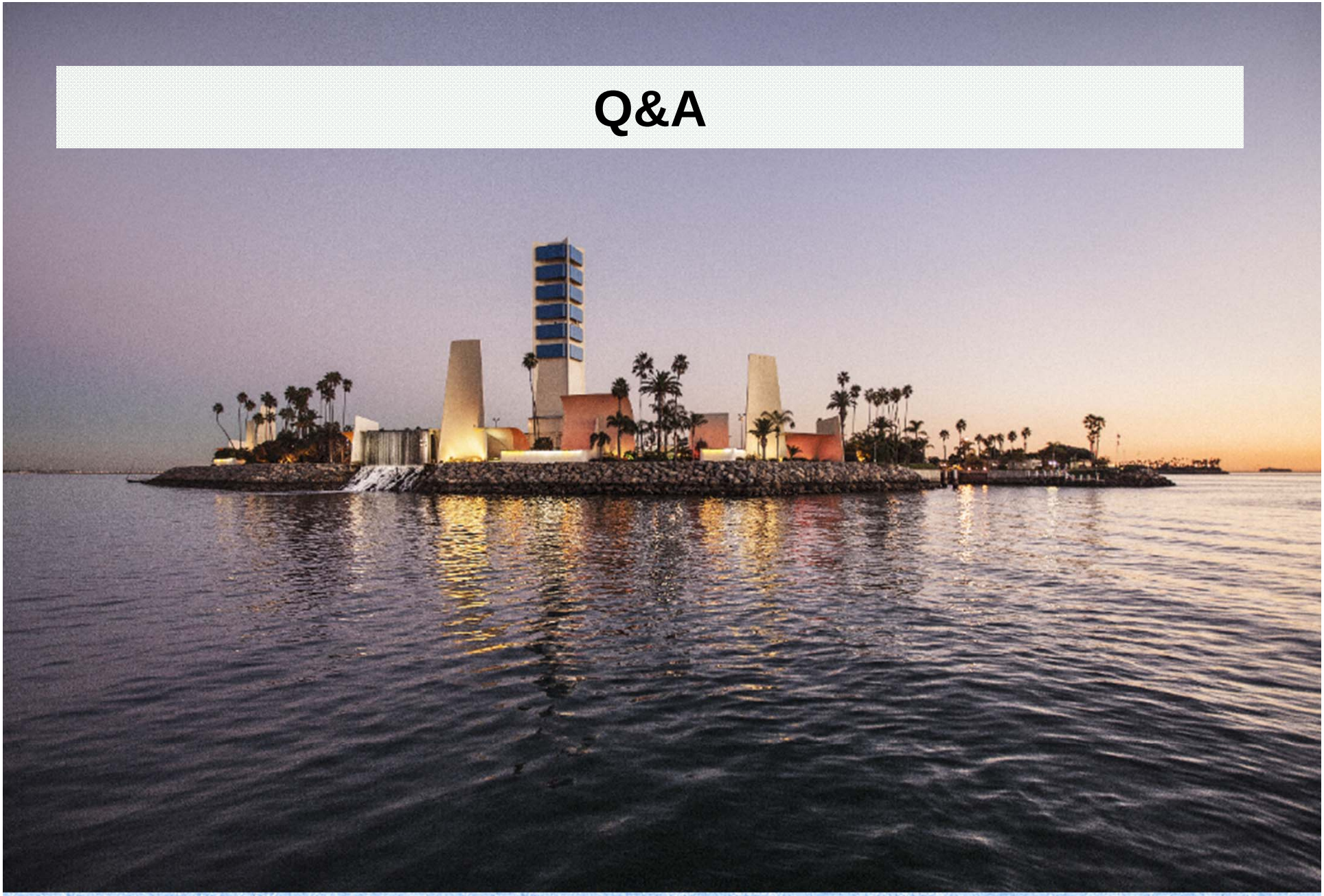
Q&A



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BIOGRAPHY – DAVID NGUYEN

David Nguyen has been a Facilities Maintenance Engineering Team Lead for California Resources Corporation since 2014. The Facilities Maintenance Engineering Department optimizes operational performance and ensures technical standards and regulatory compliance for the surface facilities.

Previously, Mr. Nguyen worked in the Project Management and Facilities Maintenance Engineering teams at CRC. He received his Bachelors of Science Degree in Mechanical Engineering from the University of Southern California and is currently completing a MBA degree at the University of California, Los Angeles.