Clearwater Program Objectives

- System Capacity
- System Reliability
- Emerging Reuse Opportunities
- Water Quality Requirements
Wastewater Conveyance System

33 Miles of Trunk Sewer Relief Work
Wastewater Treatment System

Plant Expansion at one WRP
Process Optimization at four WRPs

Long Beach WRP  Pomona WRP  Los Coyotes WRP  San Jose Creek WRP
WRP Effluent Management

Beneficial Reuse at Over 700 Sites
Solids Processing

Centralized processing at JWPCP and 6 new digesters
Biosolids Management

Diverse disposal options and beneficial uses
JWPCP Effluent Management
Existing Ocean Discharge System

Royal Palms Beach

8-ft Tunnel (1937)

12-ft Tunnel (1958)
Project Alternatives

<table>
<thead>
<tr>
<th>Alternative</th>
<th>Length</th>
<th>Cost</th>
</tr>
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<tbody>
<tr>
<td>Alternative 1</td>
<td>14.4 miles</td>
<td>$1,360M</td>
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<tr>
<td>Alternative 2</td>
<td>9.2 miles</td>
<td>$980M</td>
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<tr>
<td>Alternative 3</td>
<td>8.6 miles</td>
<td>$910M</td>
</tr>
<tr>
<td>Alternative 4</td>
<td>6.9 miles</td>
<td>$550M</td>
</tr>
</tbody>
</table>
Preliminary Engineering

Hydraulic Analysis

Concrete/Metal Coring

Laboratory Analysis
Evaluation Process

FOUR FEASIBLE ALTERNATIVES

- Environmental Impacts
- Public Input
- Operational Considerations
- Constructability
- Long-Term Uncertainty
- Cost Effectiveness

RECOMMENDED PROJECT
Alternative 4 was the highest ranked alternative because it would be lowest in cost, would have the least environmental impacts, and would be safest to construct.

Alternative 4 goes beneath Figueroa Street, Harbor Regional Park, North Gaffey Street, Capitol Drive, and Western Avenue (through Dodson Avenue) to Royal Palms Beach.

NOTE: Where the tunnel passes Rancho LPG, it is 600 feet west of the two large butane tanks and 100 feet deep.

NOTE: Alternative 4 has only two shaft sites, the shortest overall tunneling distance, the least amount of construction air emissions, the fewest number of truck trips, the least
• Construction for the Alternative 4 tunnel would originate at the JWPCP West Shaft Site, which would be on Districts’ property near the corner of Lomita Blvd and Figueroa St. Throughout the tunneling project, this working shaft site would serve as the entry point for all construction equipment and materials and the exit point for all excavated soil and rock. [CLICK]

• NOTE: An average of 30 trucks (65 max) during shaft construction and an average of 57 trucks (111 max) during tunnel construction.
Instead of open trenching, which is highly disruptive to traffic and businesses, a tunnel boring machine (TBM) would be utilized. Beginning at the JWPCP West shaft site on the far left, the 18-ft diameter tunnel would run underground for about 7 miles to Royal Palms Beach on the far right. The TBM would operate at subsurface depths ranging from 70 to 450 feet.

(Beneath Western Avenue, the tunnel would vary between 240 and 450 feet below ground surface.)
Royal Palms Shaft Site

Exit Shaft Site

- At Royal Palms Beach near the access road off of West Paseo Del Mar
- Shaft diameter of 25 to 35 feet
- Shaft depth of approximately 50 feet
- Shaft construction for 6 to 9 months
- Underground manifold structure interconnection work for approximately 1.5 years
Existing Ocean Outfalls Rehabilitation

- Rehabilitation on 72-inch, 90-inch, and 120-inch outfalls
  - Re-Ballasting
  - Joint Repairs
  - Cathodic Protection
- Ocean depths of 20 to 50 feet
- Construction for approximately 9 months
Environmental Impacts

Resources Evaluated

- Aesthetic
- Air Quality
- Biological
- Cultural
- Geology/Soils/Mineral
- Greenhouse Gas Emissions
- Hazards/Hazardous Materials
- Hydrology
- Land Use
- Marine Environment
- Noise/Vibration
- Public Services
- Recreation
- Transportation and Traffic
- Utilities/Service Systems/Energy
- Cumulative/Growth-Inducing
- Employment/Housing/Socioeconomics/Environmental Justice
Environmental Impacts

Significant Unavoidable Impacts

- Aesthetic
- Air Quality
- Cultural
- Greenhouse Gas Emissions

Clean-diesel tunnel locomotive

Construction barrier

Diesel particulate matter traps
## Rate Impacts

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>JWPCP West Shaft Site</td>
<td>$33,000,000</td>
<td>$24,750,000</td>
<td>$8,250,000</td>
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<tr>
<td>Tunnel</td>
<td>$478,000,000</td>
<td>$358,500,000</td>
<td>$119,500,000</td>
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<td>Royal Palms Shaft Site</td>
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<td>$18,000,000</td>
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<tr>
<td>Existing Ocean Outfalls Rehabilitation</td>
<td>$15,000,000</td>
<td>$15,000,000</td>
<td>$0</td>
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<tr>
<td><strong>Total Capital Costs</strong></td>
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<td><strong>$416,250,000</strong></td>
<td><strong>$133,750,000</strong></td>
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<td><strong>Equivalent Annual Capital Cost</strong></td>
<td><strong>$37,000,000</strong></td>
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### JOS Service Charge Rate Impacts

<table>
<thead>
<tr>
<th>Description</th>
<th>Per Sewage Unit</th>
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<tr>
<td>Current Average Annual Service Charge (2011 Dollars)</td>
<td>$146</td>
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<tr>
<td>Estimated Annual Service Charge Increase (2021 Dollars)</td>
<td>$20</td>
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</tbody>
</table>
Questions?

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