THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

BOARD ACTION

- **Board of Directors**
  Engineering and Operations Committee

12/11/2018 Board Meeting

7-1

Subject

Award $1,200,000 contract to J.F. Shea Construction, Inc. for urgent relining of prestressed concrete cylinder pipe on the Sepulveda Feeder; the General Manager has determined that the proposed action is exempt or otherwise not subject to CEQA

Executive Summary

This action awards a construction contract to reline recently discovered distressed prestressed concrete cylinder pipe (PCCP) segments on the Sepulveda Feeder. The construction will be performed during the upcoming January 2019 shutdown.

Timing and Urgency

The Sepulveda Feeder is an 84 to 96-inch diameter pipe line which was installed in the early 1970s. In August 2018, electromagnetic inspections of the Sepulveda Feeder identified ten distressed 20-foot-long PCCP segments. The ten segments are closely located within an approximately 400-foot reach of the feeder, along Del Amo Boulevard in the city of Torrance. Repair of these segments should proceed expeditiously to reduce the risk of pipeline failure, minimize repair costs, and prevent unplanned shutdowns. Based on the locations of damaged segments and their condition, the entire 400 feet of existing PCCP segments will be relined with steel liner. The repairs will be consistent with long-term rehabilitation work planned for the feeder. Staff recommends moving forward with the repairs.

This project has been reviewed with Metropolitan's Capital Investment Plan (CIP) prioritization criteria and is included in the PCCP Rehabilitation Program. Funds for this action are available within the appropriation for planned biennial CIP expenditures for fiscal years 2018/19 and 2019/20.

Details

Background

The Sepulveda Feeder conveys treated water from the Jensen plant in Granada Hills to an interconnection with the Second Lower Feeder in Torrance. The feeder is 42 miles long and was installed in the early 1970s. Approximately 36 miles of the feeder is comprised of PCCP in 20-foot-long segments. Its route follows major public streets as it extends through highly urbanized areas and the Sepulveda Pass. The feeder crosses several freeways, roads, and flood control channels. It operates at pressures up to 280 pounds per square inch and passes through areas with highly corrosive soils. In addition, there are numerous underground utility lines, including natural gas, and oil lines, along its route, which expose the feeder to significant stray current interference. The Sepulveda Feeder supplies treated water to the Central Pool portion of Metropolitan's distribution system and has six service connections for the cities of Los Angeles, Santa Monica, and Torrance, and the West Basin Municipal Water District.

Over the last several decades, water agencies throughout the United States and several other countries have found that under certain conditions, PCCP lines have a reduced service life and elevated risk of failure as compared with other types of pipe. PCCP failures can be catastrophic and can occur without forewarning, compromising system reliability and resulting in significant costs due to interruption of service, unplanned major repairs, and potential third-party damages. In response to this risk, Metropolitan initiated a comprehensive program in September 2011

to inspect, manage, and rehabilitate its 163 miles of PCCP lines. Background information on the PCCP Rehabilitation Program is included in **Attachment 1**, along with the current status and activities. The Sepulveda Feeder is one of the five priority pipelines to be rehabilitated under this comprehensive program due to this feeder's condition, its history of repairs, the presence of corrosive soils and third-party stray currents, and its high internal operating pressure.

In August 2018, an electromagnetic inspection was conducted on the southernmost 6.5 miles of PCCP on the Sepulveda Feeder. In September 2018, Metropolitan received the inspection report which identified seven pipe segments with new prestressing wire breaks and three pipe segments with significant increases in the number of wire breaks since this portion of the feeder was previously inspected in 2011. Each of the damaged pipe segments are 20 feet long and occur in a localized region within an approximately 400-foot long reach of the feeder along Del Amo Boulevard between Van Ness Avenue and Western Avenue in the city of Torrance. Staff has evaluated the potential impact of the prestressing wire breaks and concluded that that the entire 400-foot long reach should be repaired as expeditiously as possible.

Final design to reline approximately 400 feet of the Sepulveda Feeder is now complete, and staff recommends moving forward with construction at this time.

Sepulveda Feeder PCCP, Urgent Relining – Construction

The scope of the contract includes lining approximately 400 feet of existing PCCP segments with a steel liner that will accommodate full internal and external pressures on the line. A single excavation will be required to access the existing pipeline along Del Amo Boulevard. The steel liner pipe will be supplied to the installation contractor as Metropolitan-furnished equipment via a change order under the General Manager's authority to an existing contract for pipe liner procurement for the Second Lower Feeder. New steel liner segments will be inserted at the excavation site, moved into position, and welded together. The annular space between the steel liner and the existing PCCP segments will then be filled with concrete grout. The access site will be located in public right-of-way where shoring is necessary, requiring close coordination with local agencies and the surrounding community. The planned three-week shutdown for a portion of the feeder begins in early January 2019.

Award of Construction Contract (J.F. Shea Construction, Inc.)

Specifications No. 1950 for urgent PCCP relining on the Sepulveda Feeder was advertised for bids on October 18, 2018. As shown in **Attachment 2**, two bids were received and opened on November 1, 2018. The low bid from J.F. Shea Construction, Inc, in the amount of $1,200,000, complies with the requirements of the specifications. The higher bid was $1,344,000. The engineer's estimate was $1,419,000. Due to the urgent nature of the work, no Small Business Enterprise participation level was established for this work. The subcontractors for this contract are listed in **Attachment 3.**

This action awards a $1,200,000 contract to J.F. Shea Construction, Inc. for urgent PCCP relining on the Sepulveda Feeder. A total of $3,660,000 has been budgeted for this work. In addition to the amount of the contract, other allocated funds include: $275,000 for final design, $885,000 for Metropolitan force support, which includes dewatering of the pipeline, water quality testing, and return of the line to service; $65,000 for utility exploration, geotechnical investigation, and temporary easement for construction access and storage; $285,000 for construction inspection; $90,000 for submittal review, and record drawings; $335,000 for permits, public outreach, contract administration, and project management; $200,000 for pipe fabrication; and $325,000 for remaining budget.

Metropolitan staff will perform inspection of the construction. The anticipated cost of inspection is approximately 12.4 percent of the total construction cost. Engineering Services' goal for inspection of projects with construction greater than $3 million is 9 to 12 percent. The total cost of construction for this project, which includes the construction contract ($1.2 million), Metropolitan force activities ($885,000), and Metropolitan-furnished liner pipe ($200,000), is $2.285 million.

The total estimated cost to complete the rehabilitation of the Sepulveda Feeder is $660 million.

This project has been evaluated and recommended by Metropolitan's CIP Evaluation Team, and funds are available within the capital expenditure plan for fiscal years 2018/19 and 2019/20. See **Attachment 1** for the

Background and Program Status, **Attachment 2** for the Abstract of Bids, **Attachment 3** for the listing of Subcontractors for Low Bidder, and **Attachment 4** for the Location Map.

A total of $3.66 million is required for this work. No appropriation of funds is required for work planned over fiscal years 2018/19 and 2019/20, as sufficient funds are budgeted and available within the Capital Investment Plan for Fiscal Years 2018/19 and 2019/20, within Appropriation No. 15509.

Project Milestone

March 2019 – Completion of PCCP repairs on the Sepulveda Feeder at Del Amo Boulevard

Policy

Metropolitan Water District Administrative Code Section 8121: General Authority of the General Manager to Enter Contracts

By Minute Item 48801, dated September 13, 2011, the Board authorized initiation of the PCCP Rehabilitation Program

By Minute Item 51072, dated January 9, 2018, the Board authorized preliminary design to rehabilitate PCCP portions of the Allen-McColloch Pipeline, Calabasas Feeder, Rialto Pipeline, and Sepulveda Feeder

By Minute Item 51353, dated October 9, 2018, the Board appropriated a total of $290 million from projects identified in the Capital Investment Plan for Fiscal Years 2018/19 and 2019/20

Metropolitan Water District Administrative Code Section 11104: Delegation of Responsibilities

California Environmental Quality Act (CEQA)

CEQA determination for Option #1:

The proposed action is exempt under the provisions of CEQA and the State CEQA Guidelines. The proposed action involves the repair of an existing pipeline less than one mile in length to prevent or mitigate an emergency. Accordingly, the proposed action qualifies for two statutory exemptions (Sections 21080.21 and 21080(b)(4) of the Public Resources Code and Sections 15282(k) and 15269(c) of the State CEQA Guidelines).

CEQA determination for Option #2:

None required

Board Options

Option #1

Award $1,200,000 contract to J.F. Shea Construction, Inc. for PCCP repairs on the Sepulveda Feeder.

Fiscal Impact: $3.66 million in capital funds from Appropriation No. 15509
Business Analysis: This project will protect Metropolitan's assets, enhance delivery reliability to member agencies, and reduce the risk of emergency repairs of PCCP lines.

Option #2

Do not proceed with the project at this time.
Fiscal Impact: None
Business Analysis: This option could lead to higher repair costs, more extensive repairs, and unplanned shutdowns, and would not repair the Sepulveda Feeder before the commencement of peak summer demands. The feeder would be at a greater risk of unplanned outages and disruption of deliveries to member agencies, and Metropolitan would forego an opportunity to enhance reliability and extend the service life of the Sepulveda Feeder.

Staff Recommendation

Option #1

11/20/2018
John V. Bednarski *Date*
Manager/Chief Engineer
Engineering Services

11/28/2018
Jeffrey Kightlinger *Date*
General Manager

Attachment 1 – Background and Program Status

Attachment 2 – Abstract of Bids

Attachment 3 – Subcontractors for Low Bidder

Attachment 4 – Location Map

Ref# es12663220

PCCP REHABILITATION PROGRAM
BACKGROUND AND PROGRAM STATUS

Metropolitan's water delivery system includes approximately 830 miles of large-diameter pipelines, of which 154.6 miles are currently comprised of prestressed concrete cylinder pipe (PCCP). The total original length of PCCP was 163 miles. There are PCCP reaches within 27 feeders, with diameters ranging from 54 to 201 inches. These PCCP lines were installed between 1965 and 1985, and are located in both dense urban regions and remote areas.

Over the last several decades, water agencies throughout the United States and other countries have found that under certain conditions, PCCP lines may have a reduced service life and elevated risk of failure versus other types of pipe. PCCP failures can be catastrophic and may occur without forewarning, which may compromise system reliability and result in significant costs due to interruption of service, unplanned major repairs, and potential third-party damages.

In September 2011, as a proactive measure to maintain overall system reliability, Metropolitan initiated a comprehensive program to inspect, manage, and rehabilitate its PCCP feeders. This effort included preparation of a risk analysis to assess the need and priority for rehabilitation of individual PCCP lines. Through this process, five of Metropolitan's 27 PCCP lines were identified to have experienced a disproportionate share of all prestressing wire breaks, repair length to date, and cost of repairs. The five priority lines are: (1) the Allen-McColloch Pipeline (AMP), (2) the Calabasas Feeder, (3) the Rialto Pipeline, (4) the Second Lower Feeder, and (5) the Sepulveda Feeder. The PCCP within these five lines is expected to continue to deteriorate, as indicated by a progression of wire breaks over time. While Metropolitan's other PCCP feeders contain prestressing wire breaks in some pipe segments, they do not exhibit the same trend of increasing wire breaks over time. These other feeders may eventually need to be rehabilitated, but appear to be stable at present. Their condition will be reevaluated on a regular basis, and adjustments will be made to the program if additional feeders are determined to be at risk in the future.

The PCCP Rehabilitation Program has been organized to provide flexibility in the timing and priority of the work. In January 2015, final design commenced to rehabilitate the initial pipeline, the Second Lower Feeder. -In August 2018, the initial construction contract under the program was completed, rehabilitating 4.4 miles of the Second Lower Feeder.

The comprehensive strategy for managing Metropolitan's PCCP lines and maintaining their reliability is comprised of four coordinated elements. The following describes these elements and summarizes the status of activities for each.

No.	Element	Status
1	**Continued Assessment and Monitoring of PCCP Lines –** Metropolitan currently inspects all PCCP lines within the distribution system every three to seven years. In order to increase knowledge of the pipelines' baseline condition to track prestressing wire breaks over time, and to identify distressed PCCP segments, staff will continue to aggressively inspect PCCP lines using state-of-the-art inspection techniques.	At present, electromagnetic inspection continues to be the industry's primary technique for identification of wire breaks. A complete cycle of inspections of Metropolitan's feeders takes approximately five to seven years to complete. To date, four cycles of electromagnetic inspections have been performed on most of the PCCP feeders. Inspections of portions of the AMP, the Jensen plant's Balboa Outlet Tunnel, the La Verne Pipeline, Orange County Feeder, Second Lower Feeder, and Yorba Linda Feeder were completed in November 2017. Inspections of portions of the Box Springs Feeder, Foothill Feeder, Lake Perris Bypass Pipeline, and Rialto Pipeline are scheduled to be completed during the 2018/19 shutdown season. In August 2018, an electromagnetic inspection was conducted of the southern portion of the 84-inch Sepulveda

No.	Element	Status
		Feeder from Station 1927+65 to 2270+35.
2	**Monitoring of Stray Currents and Installation of Cathodic Protection** – Metropolitan will continue to perform corrosion surveys and monitor stray currents on a one to two-year cycle. Where indicated by corrosion monitoring, staff will install stray current drain stations or impressed current systems to minimize continued deterioration from stray current interference, which is a major cause of corrosion damage.	To date, stray current protection has been installed in 31.5 miles of PCCP lines. This protection includes both current drain stations and impressed current systems. In November 2017, current drain stations were installed in PCCP portions of the AMP.
3	**Near-Term Repair of Distressed PCCP Segments** – Metropolitan will continue to prioritize and repair PCCP segments with elevated numbers of prestressing wire breaks, broken-back cracks, or other indications of risk or distress. During the course of the PCCP Rehabilitation Program, individual PCCP segments may be identified as distressed prior to the scheduled rehabilitation of an entire feeder. If needed, staff will recommend moving forward with near-term repairs to those individual PCCP segments.	To date, over 14,400 feet of distressed PCCP segments have been repaired. Most recently, urgent repairs of distressed PCCP on the Second Lower Feeder were completed in 2013, 2014, and 2016, and on the Sepulveda Feeder in 2016. **Sepulveda Feeder urgent repairs for approximately 400 feet of distressed PCCP segments. This action awards a construction contract to reline Sepulveda Feeder.**
4	**Long-Term Rehabilitation –** The PCCP Rehabilitation Program will complete the rehabilitation or replacement of all PCCP segments within the five priority feeders.	For the Second Lower Feeder, following is a summary of work to date: • Preliminary Design – Reach 9, which crosses the Newport-Inglewood Fault zone: Geotechnical investigations and seismic studies are underway. • Final Design – Reaches 2 and 3: Design is underway. – The procurement process for large-diameter conical plug valves is underway. • Procurement – Pipe liner fabrication for Reaches 2 and 4 is underway**.** • Construction – Reach 1: Rehabilitation of 23,100 feet of PCCP is complete. – Reach 4: Construction to rehabilitate 10,000 feet of PCCP is underway. • Outreach – Currently underway with member agencies to address construction phasing, isolation points, shutdown durations, and water quality-related issues. – Currently underway with local agencies to minimize traffic and other potential impacts to the public. For the AMP, Calabasas Feeder, Rialto Pipeline, and Sepulveda Feeder, following is a summary of work to date: • Preliminary design activities are underway.

The goal of this comprehensive strategy for managing PCCP lines is to maintain reliable deliveries to Metropolitan's member agencies while optimizing the remaining useful life of PCCP lines. The effort includes development of a multi-year schedule and conceptual-level cost estimates with a long-term rehabilitation and replacement plan for the five priority PCCP lines. The overall schedule, cost estimates, and sequencing of work will be reassessed regularly during the development of Metropolitan's biennial capital budget.

While the Second Lower Feeder is the initial pipeline to be addressed under the PCCP Rehabilitation Program, staff's strategy for the four other priority feeders is to complete preliminary design of the rehabilitation work for the entire length of each feeder at an early stage of the program. This approach will provide flexibility to adjust construction sequencing of individual reaches if priorities change. The sequencing for rehabilitation will be determined by several factors, including: (1) updated assessments of risk; (2) Metropolitan's water supply availability and the operational needs for specific feeders; (3) impacts to member agency service connections; and (4) readiness for construction.

System-wide hydraulic analyses are underway to assess hydraulic impacts of the PCCP rehabilitation work on Metropolitan's distribution system. The results of the analyses have been used to develop alternatives to minimize the loss of hydraulic capacity, to evaluate impacts of extended shutdowns on individual service connections, and to identify options for maintaining deliveries. The replacement of small-diameter sectionalizing valves and meters with larger units is an example of an approach for maintaining feeder hydraulic capacity.

Preliminary design to rehabilitate the AMP, Calabasas Feeder, Rialto Pipeline, and Sepulveda Feeder has been authorized and is underway.

The Metropolitan Water District of Southern California

Abstract of Bids Received on November 1, 2018 at 2:00 P.M.

Specifications No. 1950
Sepulveda Feeder PCCP Urgent Relining at Del Amo Boulevard

The work consists of lining approximately 400 feet of prestressed concrete cylinder pipe (PCCP) within the Sepulveda Feeder, including excavating access portals and removing portions of existing PCCP by sawcutting; installing Metropolitan-furnished steel can liner cylinders; welding the steel cylinders; grouting the pipe annular space; applying cement mortar lining; disinfecting; restoring the site; and providing traffic control.

Engineer's estimate: $1,419,000

Bidder and Location	Total[1]
J.F. Shea Construction, Inc. **Walnut, CA**	**$1,200,000**
Kiewit Infrastructure West Co. Santa Fe Springs, CA	$1,344,000

[1] Due to the urgent nature of the repairs, no Small Business Enterprise (SBE) participation was established for this contract.

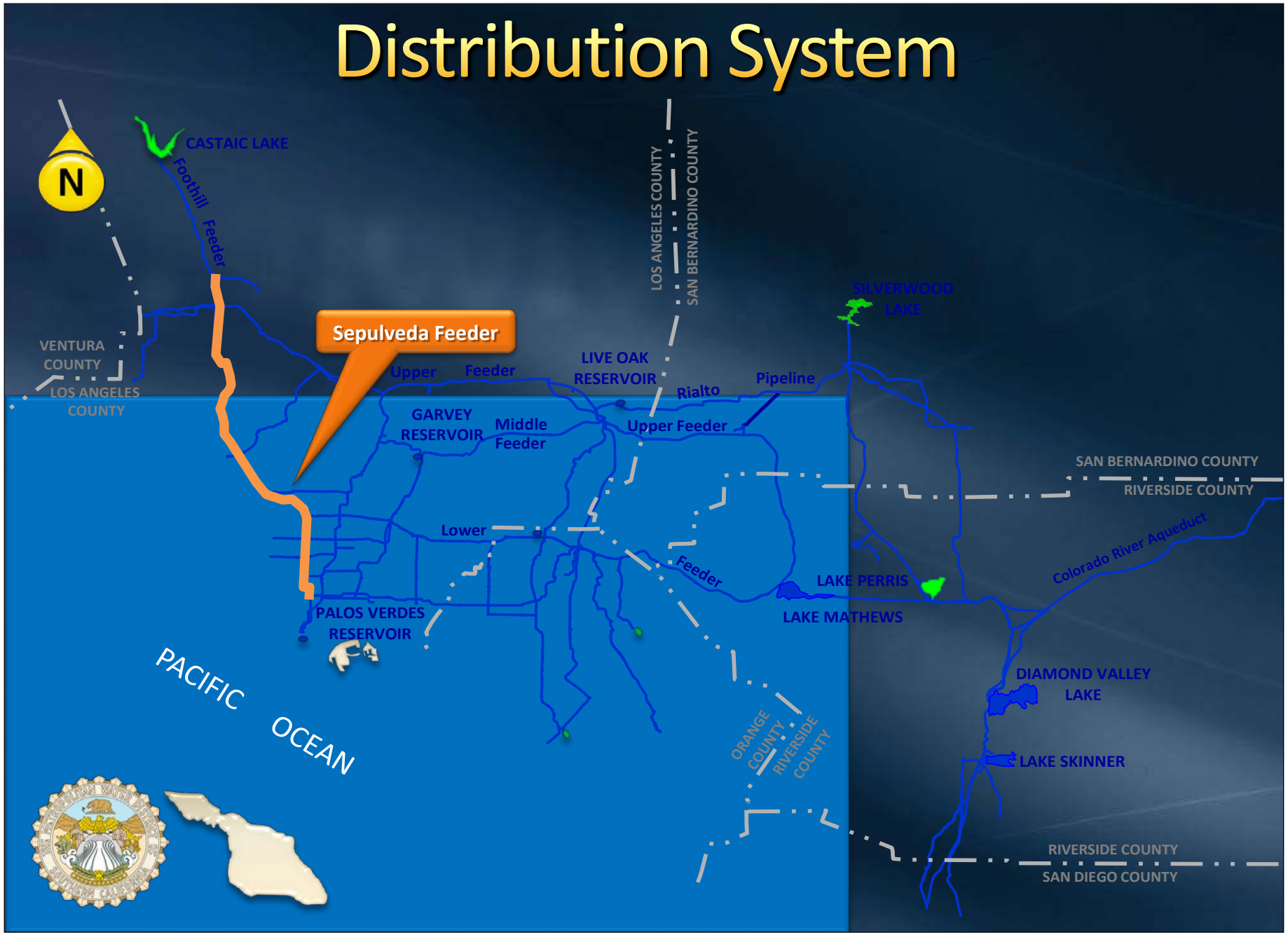
The Metropolitan Water District of Southern California

Subcontractors for Low Bidder

Specifications No. 1950
Sepulveda Feeder PCCP Urgent Relining at Del Amo Boulevard

Low bidder: J.F. Shea Construction, Inc.

Subcontractor and Location
Rouch Rebar Long Beach, CA
Dean's Welding Temecula, CA
Throop Lightweight Fill, Inc. Pasadena, CA
Matt-Chor, Inc. El Monte, CA


Distribution System
N
CASTAIC LAKE
Foothill Feeder
VENTURA COUNTY
LOS ANGELES COUNTY
LOS ANGELES COUNTY
SAN BERNARDINO COUNTY
Sepulveda Feeder
Upper Feeder
LIVE OAK RESERVOIR
Rialto Pipeline
SILVERWOOD LAKE
GARVEY RESERVOIR
Middle Feeder
Upper Feeder
SAN BERNARDINO COUNTY
RIVERSIDE COUNTY
Lower Feeder
Colorado River Aqueduct
LAKE PERRIS
LAKE MATHEWS
PALOS VERDES RESERVOIR
PACIFIC OCEAN
DIAMOND VALLEY LAKE
ORANGE COUNTY
RIVERSIDE COUNTY
LAKE SKINNER
RIVERSIDE COUNTY
SAN DIEGO COUNTY