



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

1/10/2017 Board Meeting

7-2

Subject

Adopt CEQA determination and appropriate \$960,000; and authorize: (1) installation of internal seals within Casa Loma Siphon Barrel No. 1; and (2) preliminary investigations for long-term repairs to the Casa Loma Siphon (Appropriation No. 15480)

Executive Summary

This action authorizes Metropolitan forces to perform interim repairs at Casa Loma Siphon No. 1 on the Colorado River Aqueduct (CRA) to control leakage at the pipe joints. This action also authorizes preliminary investigations to identify a permanent solution to prevent leaks from that siphon.

Timing and Urgency

On November 8, 2016, a leak was detected on Barrel No. 1 of the Casa Loma Siphon. The leak does not immediately jeopardize the structural integrity of the aqueduct. However, if repairs are not performed, the continued leakage over time could erode soil, undermine the siphon, and cause structural damage.

The work will be conducted in two stages. Under Stage 1, internal seals will be installed on 13 joints as an interim measure to address the current leaks. These repairs will be completed in February 2017 during a planned shutdown of the CRA. Under Stage 2, staff will evaluate options to permanently repair the pipe joints within the siphon. The potential repairs may include installation or replacement of the existing sleeve-type couplings, or installation of recently developed earthquake-resistant pipe joints.

These projects have been reviewed with Metropolitan's Capital Investment Plan (CIP) prioritization criteria and are included within the Distribution System Reliability Program. Funds for this action are available within Metropolitan's capital expenditure plan for fiscal year 2016/17.

Details

Background

The initial barrel of the Casa Loma Siphon was constructed in 1941 as part of the CRA system. The siphon is comprised of 148-inch-diameter concrete pipe that extends five miles west from the San Jacinto Diversion Structure to the Bernasconi Tunnel. In the early 1960s, cracks and leakage developed in the pipe as a result of earth movement where the siphon crosses the Casa Loma Fault. In 1968, 300 feet of the concrete pipe was replaced with 148-inch-diameter steel pipe joined by sleeve-type couplings. This type of flexible joint was installed across the fault to permit minor movement of pipe segments without leaks or rupture. Since that time, there has been continuing ground movement, intermittent leaks, and repairs. In November 1996, internal seals were installed at several locations along the steel pipe portion of the siphon due to leakage at the joints.

In November 2016, a new leak was observed on the ground surface above the steel pipe portion of Casa Loma Siphon Barrel No. 1. The leak may be the result of deterioration of the existing sleeve-type couplings, recent fault movement, or subsidence due to groundwater extraction in the area. The leakage does not immediately jeopardize the structural integrity of the siphon. However, continued leakage over time could erode soil, undermine the siphon, and cause structural damage.

Repair of the siphon leak is recommended to proceed without delay. The work will be accomplished in two stages. Under Stage 1, internal seals will be installed at 13 pipe joints as an interim measure to address the current leak. Under Stage 2, staff will evaluate options and perform permanent repairs to prevent future leaks. The potential permanent repairs include replacement of the existing sleeve-type couplings, installation of new sleeve-type couplings at additional joints, or installation of recently developed earthquake-resistant pipe joints that can absorb relatively large displacements. The latter joints are being investigated for potential use during the rehabilitation of other Metropolitan pipelines as they cross faults or traverse liquefaction zones.

Project No. 1 - Casa Loma Siphon Joint Repairs, Stage 1 – Design and Construction (\$630,000)

The planned work includes conducting field surveys; shutdown planning; preparation of environmental documentation; preparation of construction drawings; procurement of internal seals; installation of seals on approximately 13 joints along a 300-foot-long reach of the siphon; and dewatering, establishment of access and safety clearances, and return of the aqueduct to service. The procurement contract for the seals is planned to be awarded under the General Manager's Administrative Code Authority to award contracts of \$250,000 or less. All work will be performed by Metropolitan staff.

This action appropriates \$630,000 for installation of internal seals along the CRA's Casa Loma Siphon Barrel No. 1. The requested funds include \$371,000 for construction by Metropolitan forces; \$125,000 for procurement of the internal seals; \$29,000 for design; \$17,000 for technical support and preparation of record drawings; \$33,000 for environmental monitoring and project management; and \$55,000 for remaining budget. For this project, the anticipated cost of final design is approximately 5 percent of the estimated construction cost. Engineering Services' goal for design of projects with construction cost less than \$3 million is 9 to 15 percent. The total estimated cost of construction for this project is \$496,000.

Project No. 2 - Casa Loma Siphon Joint Repairs, Stage 2 – Preliminary Investigations (\$330,000)

To mitigate long-term ground settlement and fault-crossing risks, staff will develop alternatives to stabilize the existing siphon and improve seismic resilience. Planned activities include conducting soil deformation surveys; reviewing geologic, geotechnical, and seismic data; developing alternatives to increase flexibility at pipe joints; and conducting an internal three-dimensional survey. All activities will be performed by Metropolitan staff.

This action appropriates \$330,000 and authorizes preliminary investigations for permanent repairs to the Casa Loma Siphon. The requested funds include: \$240,000 for technical engineering studies and a three-dimensional survey; \$56,000 for environmental review and project management; and \$34,000 for remaining budget. Staff will return to the Board to authorize preliminary design of the recommended permanent repairs.

These projects have been evaluated and recommended by Metropolitan's CIP Evaluation Team and funds are available within the fiscal year 2016/17 capital expenditure plan. See [Attachment 1](#) for the Financial Statement and [Attachment 2](#) for the Location Map.

This project is included within capital Appropriation No. 15480, the Conveyance and Distribution System Rehabilitation Appropriation – FY 2012/13 Through 2017/18. With the present action, the total funding for this appropriation will increase from \$44.26 million to \$45.22 million.

Project Milestones

March 2017 – Completion of construction

July 2017 – Completion of preliminary investigations

Policy

Metropolitan Water District Administrative Code Section 5108: Appropriations

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

California Environmental Quality Act (CEQA)

CEQA determination for Option #1:

Project No. 1 – Casa Loma Siphon Joint Repairs, Stage 1 – Design and Construction

The proposed action is categorically exempt under the provisions of CEQA and the State CEQA Guidelines. The proposed action involves minor modifications to existing public facilities with negligible or no expansion of use and no possibility of significantly impacting the physical environment. In addition, the proposed action consists of basic data collection and resource evaluation activities which does not result in a serious or major disturbance to an environmental resource. This may be strictly for information gathering purposes, or as part of a study leading to an action which a public agency has not yet approved, adopted, or funded. Accordingly, the proposed action qualifies for both Class 1 and Class 6 Categorical Exemptions (Sections 15301 and 15306 of the State CEQA Guidelines).

The CEQA determination is: Determine that pursuant to CEQA, the proposed action qualifies under two Categorical Exemptions (Class 1, Section 15301 and Class 6, Section 15306 of the State CEQA Guidelines).

Project No. 2 – Casa Loma Siphon Joint Repairs, Stage 2 – Preliminary Investigation

The proposed action is categorically exempt under the provisions of CEQA and the State CEQA Guidelines. The proposed action consists of the funding of a study, basic data collection, and resource evaluation activities which do not result in a serious or major disturbance to an environmental resource. This may be strictly for information gathering purposes, or as part of a study leading to an action which a public agency has not yet approved, adopted, or funded. Accordingly, the proposed action qualifies as a Class 6 Categorical Exemption (Section 15306 of the State CEQA Guidelines).

The CEQA determination is: Determine that pursuant to CEQA, the proposed action qualifies under a Categorical Exemption (Class 6, Section 15306 of the State CEQA Guidelines).

CEQA determination for Option #2:

None required

Board Options

Option #1

Adopt the CEQA determination that the proposed actions are categorically exempt, and

- a. Appropriate \$960,000;
- b. Authorize installation of internal seals in Casa Loma Siphon Barrel No. 1 on the Colorado River Aqueduct; and
- c. Authorize preliminary investigations for long-term repairs to the pipe joints on the Casa Loma Siphon.

Fiscal Impact: \$960,000 in capital funds under Appropriation No. 15480

Business Analysis: This option will enhance CRA reliability and reduce the risk of unplanned outages and costly emergency repairs.

Option #2

Do not proceed with the projects at this time.

Fiscal Impact: None

Business Analysis: This option would forgo an opportunity to repair the siphon during a scheduled shutdown. Deferral of the repairs could result in additional leakage and damage to the siphon.

Staff Recommendation

Option #1



Gordon Johnson
Manager/Chief Engineer
Engineering Services

12/20/2016
Date



Jeffrey Kightlinger
General Manager

12/27/2016
Date

Attachment 1 – Financial Statement
Attachment 2 – Location Map

Ref# es12656102

Financial Statement for Conveyance and Distribution System Rehabilitation Appropriation – FY 2012/13 Through 2017/18

A breakdown of Board Action No. 28 for Appropriation No. 15480 for repairs at Casa Loma Siphon Barrel No. 1¹ is as follows:

	Previous Total Appropriated Amount (Oct. 2016)	Current Board Action No. 28 (Jan. 2017)	New Total Appropriated Amount
Labor			
Studies & Investigations	\$ 1,802,000	\$ 240,000	\$ 2,042,000
Final Design	7,094,000	29,000	7,123,000
Owner Costs (Permitting & program mgmt.)	3,651,779	89,000	3,740,779
Submittals Review & Record Drwgs	900,000	-	900,000
Construction Inspection & Support	2,742,000	17,000	2,759,000
Metropolitan Force Construction	3,510,000	348,000	3,858,000
Materials & Supplies	1,586,000	125,000	1,711,000
Incidental Expenses	139,000	23,000	162,000
Professional/Technical Services	2,555,000	-	2,555,000
Right-of-Way	280,000	-	280,000
Equipment Use	5,000	-	5,000
Contracts	16,564,705	-	16,564,705
Remaining Budget	3,430,516	89,000	3,519,516
Total	\$ 44,260,000 ²	\$ 960,000	\$ 45,220,000

Funding Request

Appropriation Name:	Conveyance and Distribution System Rehabilitation – FY 2012/13 Through FY 2017/18		
Source of Funds:	Revenue Bonds, Replacement and Refurbishment or General Funds		
Appropriation No.:	15480	Board Action No.:	28
Requested Amount:	\$ 960,000	Budget Page No.:	214
Total Appropriated Amount:	\$ 45,220,000	Total Appropriation Estimate:	\$ 332,500,000

¹ This is the initial action for the repair of joints on Casa Loma Siphon Barrel No. 1. The total estimated cost to complete the Stage 1 repairs of 13 joints is \$634,000.

² In October 2016, the Board appropriated \$1.6 million and authorized preliminary investigations and preparation of environmental documentation for dewatering of the Foothill Feeder. It has been determined that these activities do not meet the criteria to be classified as capital work and will be performed using Operations & Maintenance (O&M) funds. As a result, the total appropriated amount reflects the reduction of \$1.6 million.

Distribution System

