



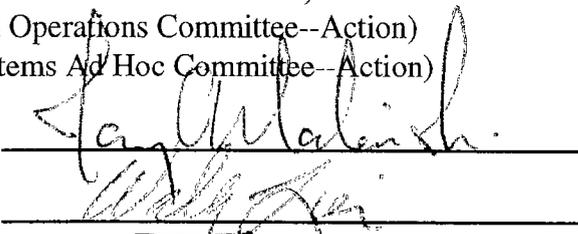
**MWD**

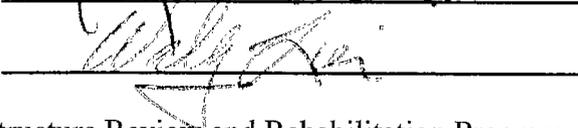
METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

8-5

October 28, 1997

**To:** Board of Directors (Budget and Finance Committee--Action)  
(Engineering and Operations Committee--Action)  
(Information Systems Ad Hoc Committee--Action)

**From:** <sup>Fek</sup> General Manager 

**Submitted by:** Chief Engineer 

**Subject:** Appropriate \$2,290,000 for the Infrastructure Review and Rehabilitation Program

**Reference:** Appropriation No. 15312 / Initial Funding

**RECOMMENDATION(S)**

To upgrade dam monitoring systems, improve the accuracy of facility data, and conduct water discharge studies for the Infrastructure Review and Rehabilitation Program, it is recommended that your Board:

- o Appropriate \$2,290,000 in budgeted funds, and;
- o Authorize the General Manager to have all work performed, except that involving contracts of \$250,000 or more.

**EXECUTIVE SUMMARY**

In January 1995, staff completed a study which assessed the condition of the District's infrastructure. Although the current overall condition of the infrastructure was good, the study identified areas of concern that should be addressed to reduce the future risk of excessive dam seepage and pipeline failures, which could cause loss of life, serious injury, damage to adjacent properties, disruption to water deliveries, or loss of public confidence. Some of the areas of concern identified in the study have been addressed in previous Board actions. This item seeks authority and funding to address other areas of concern by upgrading monitoring systems, improving the accuracy of facility data, and studying the impacts of potential water discharges into unimproved drainage systems. The estimated cost to accomplish these recommendations is \$2,290,000.

**JUSTIFICATION**

Although the proposed action will reduce labor costs associated with dam monitoring by over \$130,000 per year, the primary justification for this action is to reduce risks and liabilities associated with pipeline breaks and uncontrolled water discharges which could

cause loss of life, serious injury, damage to adjacent properties, disruption to water deliveries, or loss of public confidence. Even breaks in small diameter pipelines like the Santa Monica Feeder can cause millions of dollars in damage, disrupt local businesses, and restrict service to our member agencies. Although it is not possible to precisely quantify how much the proposed actions reduce the District's risk and liabilities, staff believes it is prudent to implement these recommendations.

**ALTERNATIVE(S) TO PROPOSED ACTION**

**Do not approve recommendations**

Not approving recommendations to authorize and fund this work would delay or eliminate capital expenditures. However, this alternative would not reduce the risk and potential liability associated with uncontrolled water discharges.

**Conduct additional risk assessment by an outside consultant**

This alternative could be done in concert with the proposed recommendation or as a substitute for the proposed recommendation. Outside consultants could help to better quantify the risks and liabilities of infrastructure failures. However, this alternative would delay implementation of essential dam monitoring systems and infrastructure data collection.

**FUNDING REQUEST**

<b>Program Name:</b> Infrastructure Review and Rehabilitation			
<b>Source of Funds:</b> Pay-As-You-Go Fund			
<b>Appropriation No.:</b> 15312	<b>Authorization No.:</b> Initial	<b>FY 97/98 Budget:</b> \$334,200	
<b>Requested Amount:</b>	\$2,290,000	<b>Capital Program No.:</b>	97807-A
<b>Total Appropriated Amount:</b>	\$2,290,000	<b>Capital Program Page No.:</b>	E-45
<b>Total Program Estimate:</b>	\$2,290,000*	<b>Program Category:</b>	Asset/System Integrity

\* The program estimate is an increase of \$98,000 from the FY 1997/98 Capital Program Budget.

**ACTIONS AND MILESTONES**

- o Complete modifications and testing of dam monitoring systems by December 1999
- o Complete infrastructure data collection and implement on-line data base by September 2000

- o Complete the water discharge study and propose corrective actions by November 1998

## **CEQA COMPLIANCE / ENVIRONMENTAL DOCUMENTATION**

The proposed project qualifies for a categorical exemption under the California Environmental Quality Act (CEQA) in that it involves the modifications of existing facilities to meet current standards or for the protection of public health and safety, involving no expansion of use beyond that previously existing (CEQA) Guidelines Section 15301). No other environmental documentation is required for this program.

## **DETAILED REPORT**

Following a catastrophic failure of the Department of Water Resources Mojave Siphon and a blind flange on our Santa Monica Feeder in 1994, staff initiated a study to assess the condition of the District's infrastructure and to make recommendations to reduce the risk of pipeline breaks or uncontrolled water discharges which could cause loss of life, serious injury, damage to adjacent properties, disruption to water deliveries, or loss of public confidence. The study was completed in January 1995. The study team concluded that the overall condition of the distribution system was good and that on-going programs for pipeline inspection, seismic strengthening, chemical containment, and cross connection elimination were progressing well. However, the study team identified a number of areas of concern that it felt should be addressed to reduce the potential for pipeline failures and excessive dam seepage and to improve access to accurate information to prevent future problems and better respond to emergencies.

The study resulted in 20 recommendations of which 15 became projects that were prioritized and included in the capital program or Operations and Maintenance (O&M) budget for Fiscal Year 1997/98. Funding for ten projects have been approved by your Board. This funding request is to complete three of the five remaining projects. A request to fund the remaining two projects will be brought to your Board as appropriate.

This item requests authority and funding to implement study recommendations to upgrade dam monitoring systems, improve the accuracy of facility data, and perform water discharge studies. Each is discussed below:

### **Upgrade Dam Monitoring Systems**

Metropolitan dams, under the jurisdiction of the Department of Water Resources Division of Safety of Dams, are required to have instruments which record earthquake motions, water surface elevations, and dam seepage rates. Existing instrumentation at most of these sites is older, non-digital equipment which cannot be remotely monitored and which provide only limited data. Moreover, current instruments require considerable manual monitoring and

adjustment. Since reservoirs are increasingly being remotely operated, there is a need to upgrade and automate dam monitoring instruments and systems.

It is proposed to upgrade existing film recorder seismographs with strong motion digital recorders which can store data, be remotely accessed, and provide alarms when dam embankment acceleration limits are exceeded. It is also proposed to develop software to remotely monitor changes in reservoir surface elevations. In addition, existing seepage sensors will be replaced with more reliable sensors capable of recording seepage flow rates. All systems will be equipped to provide audible and/or visual alarms if problems occur. Data will be relayed through The Supervisory Control and Data Acquisition System (SCADA) remote terminal units for use by the system operators.

### **Improve Accuracy of Facility Information**

The District's existing mapping of facilities, like pipelines and tunnels, is not accurate enough for most users. The data was digitized years ago from large scale maps and is only accurate to plus or minus 45 feet. Although this level of accuracy is sufficient for some planning studies, it is not accurate enough to meet most engineering and operational needs, such as encroachment monitoring and interference checking. Moreover, the existing data does not provide a satisfactory cross-reference between geographic location and pipeline station. This is a major deficiency because geographic location is a common reference for external data, whereas much of the data and many of the documents used within the District are referenced via pipeline stations. This impedes access to information which could help prevent problems or enable us to better respond to emergencies.

To improve the usability of data, it is proposed to increase the accuracy of pipeline data to plus or minus 1.5 feet by performing field surveys to determine accurate geographic locations for key points along the alignments. The field survey data will be used in conjunction with other map information, survey data, and aerial photos to perform adjustment calculations to more accurately locate facilities and provide cross references between geographic location and pipeline station. The data will be standardized and stored in an Oracle database. This database is a fundamental link to bridge gaps between internal and external data that have location as a key attribute. In the future, this database will be integrated with data in other systems, like the document management, facility planning, and maintenance management to provide location-based queries and access to information.

### **Water Discharge Studies**

A number of District facilities discharge water into unimproved channels or creeks during emergency shutdowns of our distribution system. The unimproved channels may not have capacity to carry the unscheduled flows, which could result in flooding of neighboring properties. It is proposed to conduct hydraulic studies to identify facilities that discharge into unimproved channels, quantify the potential discharges, determine the capacity of the existing

channels, and assess the probability of flooding and potential damage to adjacent properties. Where potential hazardous conditions exists, staff will propose corrective measures and seek further funding from your Board to implement them. It is not possible to estimate the cost of corrective measures until the studies have been completed.

The total estimated costs to accomplish the recommendations contained herein is \$2,290,000. A breakdown of all costs is contained in the Financial Statement on Attachment A.

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Attachment(s)

FINANCIAL STATEMENT  
(Capital Program No. 97807-A)

The total estimated cost breakdown for Appropriation No. 15312 for the Infrastructure Review and Rehabilitation Program is as follows:

## Program Summary

	<b>Initial Funding</b>
<b>Labor:</b>	
Engineering	
Engineering Support/Project Management	\$ 25,000
Hydraulics	35,000
Safety of Dams	240,000
Survey Engineering	400,000
Right of Way Engineering	10,000
Information Systems	17,500
Operations/SCADA	<u>77,500</u>
<b>Total Labor</b>	<b>\$ 805,000</b>
Materials and Supplies	\$ 650,000
Incidental Expenses	10,000
Professional and Technical Services	155,000
Operating Equipment	13,000
Administrative Overhead	420,000
Contingency	<u>237,000</u>
<b>Program Total</b>	<b>\$2,290,000</b>
<b>Source of Funds: Pay-As-You-Go Fund</b>	
Capital Program for FY 1997/98	
Total Program Estimate:	\$2,192,000
<b>Program Estimate for FY 1997/98</b>	<b>\$ 334,200</b>
<b>Project Expenditure of Funds:</b>	
Through FY 1997/98	\$ 600,000
FY 1998/99	753,000
FY 1999/00	700,000
Contingency	<u>237,000</u>
<b>Total</b>	<b>\$2,290,000</b>