



**MWD**

METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

9-7

April 21, 1998

**To:** Board of Directors (Engineering and Operations Committee--Information)

**From:** *for* General Manager

**Submitted by:** Gary M. Snyder  
*in* Chief Engineer

*Edward J. Meawitt*  
*Gary Snyder*

**Subject:** Executive Summary of Inland Feeder Quarterly Status Report for January through March 1998

### RECOMMENDATION(S)

For information only.

### EXECUTIVE SUMMARY

This report summarizes progress and provides program highlights for the Inland Feeder Program for the quarter ending March 1998.

### DETAILED REPORT

The Inland Feeder Program continues on schedule to support an on-line date of early 2004. The program estimate remains unchanged at \$1.188 billion. In February, your Board appropriated \$762.77 million to bring the program to full funding. During the reporting period several significant milestones were achieved. The Arrowhead West and Riverside Badlands tunnel projects were advertised for construction bids in early January. Bids are scheduled to be opened in April.

Construction continued in the City Creek portal site area on the Arrowhead East tunnel. Installation of approximately 1,300 feet of pipeline south of the portal area, including an undercrossing at Highway 330, was completed. Pre-excavation activities continued including: assembly of the tunnel boring machine (TBM) in its launching cradle, refurbishment of locomotives and rail cars, and construction of the tunnel muck conveyor system which runs through the Highway 330 undercrossing and approximately 700 feet to the disposal site. These activities are nearly complete and excavation of the tunnel is currently scheduled to commence in late April. An open house featuring the assembled TBM and several project exhibits was held at the City Creek Portal site on March 28, and despite inclement weather, was attended by an estimated 2,100 members of the local community.

Construction of the Mentone-RUSD pipeline is essentially complete. Approximately 3,400 feet of 12-foot diameter pipe has been installed along Opal Avenue and the contractor is scheduled to complete the remaining road improvements and demobilize in April.

In January, construction began on the Riverside North and South Pipelines. The contractors primary focus has been on the initial construction activities prior to excavation including: installation of construction and environmental fencing; mobilization of contractor and management staff; and fabrication of 12-foot diameter welded steel pipe.

For further details see the attached report. If you require any additional information, please contact Dawn Chin at (213) 217-6291.

BSB/bm:rev2  
(Marqtrly)  
Attachment(s)

## SECTION 1 - BACKGROUND

The Inland Feeder alignment, which will extend from the foothills of the San Bernardino Mountains to the Colorado River Aqueduct in the Riverside community of San Jacinto, will be a vital link in Southern California's water delivery system. This 43.7-mile, 12-foot-diameter tunnel and pipeline system will traverse rugged terrain and involve construction of complicated crossings as a part of the system's infrastructure. Refer to Figure 1 for a general map of the Project.

Beginning at the Devil Canyon Power Plant's second afterbay in the San Bernardino Mountains, the first segment of the Inland Feeder will be an approximately 0.5-mile buried pipeline through Devil Canyon followed by a 3.8-mile tunnel through the San Bernardino Mountains to Waterman Canyon and Highway 18. Passing through Waterman Canyon is an 0.8-mile buried pipeline; the line will then enter another deep tunnel for 5.2 miles, 2,000 feet below the ridge line, and exit the mountains at a portal adjacent to Highway 330 north of the city of Highland.

From this portal site, the alignment will proceed as a 5.8-mile-long buried pipeline that will extend in a generally southeastern direction along City Creek, Boulder Avenue, and Abbey Way, before turning south on Cone Camp Road on the north edge of the Santa Ana River Wash.

The Inland Feeder will then be tunneled for 0.7 miles under the Santa Ana River Wash near Redlands Municipal Airport, and continue south for 2.5 miles as a buried pipeline along Opal Avenue in the community of Mentone. The alignment will then enter another tunnel and proceed for 8.2 miles in a southerly direction under the Crafton Hills and San Timoteo Badlands areas, exiting as a buried pipeline near Highway 60 and Gilman Springs Road in Riverside county.

The pipeline will resume through open lands for 15.7 miles in the eastern portion of the city of Moreno Valley. It will pass the eastern edge of Lake Perris, and tunnel under the Ramona Expressway, continuing in a southeasterly direction to end at the junction of the Casa Loma and San Diego Canals, and connect to the Eastside pipeline - currently under construction - near the city of San Jacinto.

When the Inland Feeder is completed, it will nearly double the water delivery capability of the East Branch of the State Water Project. The Inland Feeder will also help replenish local groundwater basins, improve the quality of Southern California's drinking water, and provide a continuous source of water to supply Metropolitan's reservoirs.

Careful planning and analysis of the alignment requirements have enabled Metropolitan to minimize the Program's environmental impact. In addition to developing appropriate mitigation measures, such as setting aside and cultivating revegetation areas to compensate for construction impacts, Metropolitan has purchased a parcel of

approximately 75 acres that are partially surrounded by the California Department of Fish and Game's San Jacinto Wildlife Reserve, in southwestern Riverside county; this land will complement and enhance the overall wildlife habitat.

This land purchase and mitigation measure is part of the overall Inland Feeder Mitigation Monitoring Plan to ensure that the Program will avoid or reduce significant impacts to the environment and historical landmarks.

The Program has been broken into specific geographical reach areas for planning, management, and control purposes. For summary reporting, these reaches are grouped together as follows. Reaches 1 (Arrowhead West) and 2 (Arrowhead East) comprise the San Bernardino tunnels. Reaches 3/4 (Highland/Mentone pipeline) and 4T (Santa Ana River Wash tunnel) refer to the San Bernardino pipelines. Reach 5/6 defines the Riverside tunnels. Reaches 7 - 8 (Riverside North) and 9 (Riverside South) involve the Riverside pipelines. Figure 2, the Inland Feeder Program Characteristics Matrix, describes the length, size, project number, reach area and design consultant for each of the Program segments.

Specific Program activities have been divided into three execution phases that represent different timing elements and required activities in the performance of the Program. Phase I represents the preliminary planning, funding, and engineering portions of the Program and is effectively complete. Phase II, which began November 1994, and is scheduled through mid-1998, relates to the detailed engineering and all activities up to award of construction. Construction, as currently planned, will be 100% complete in the year 2004, although the southern portion of the Inland Feeder Program will be completed by the year 2000.

This quarterly report discusses the issues and accomplishments for the quarter ending March 1998. Future reports will provide the reader with progress updates, as well as the projected goals for the upcoming periods.





FIGURE 2 - PROGRAM CHARACTERISTICS MATRIX

REACH	DESCRIPTION	PROJECT	LENGTH (IN MILES)	DESIGN CONSULTANT
<b>SAN BERNARDINO TUNNELS</b>				
1	Arrowhead West Pipeline #1: Devil Canyon 2nd afterbay to Devil Canyon Portal.	100620-21	0.47	MWD
1	Arrowhead West Tunnel: Devil Canyon portal to west Waterman Canyon portal.		3.76	Bechtel Corp.
1	Arrowhead West Pipeline #2: Waterman Canyon portal to Strawberry Creek portal.		0.77	MWD
2	Arrowhead East Tunnel Pipeline.		0.21	MWD
2	Arrowhead East Tunnel: Strawberry Creek portal to City Creek portal.		5.18	Bechtel Corp.
2	Arrowhead East Tunnel Pipeline.		0.38	MWD
<b>SAN BERNARDINO PIPELINES</b>				
3/4	Highland/Mentone Pipeline: Pipeline parallel to Highway 330, City Creek Levee, and Boulder Ave. to Santa Ana Wash, and then to Opal Ave. portal	100622-23	8.33	MWD
4T	Santa Ana Wash Tunnel: Soft ground tunnel under Santa Ana Wash.	100623	0.72	Parsons Brinckerhoff Quade & Douglas
<b>RIVERSIDE TUNNELS</b>				
5/6	Riverside Badlands Tunnel: Opal Ave. portal to Gilman Springs portal, with potential access shafts located in Live Oak & San Timoteo Canyons	100624-25	8.19	Daniel, Mann Johnson & Mendenhall
<b>RIVERSIDE PIPELINES</b>				
7 - 8	Riverside Pipelines - North: Pipeline through San Jacinto Valley and parallel to Davis Road, through the city of Lakeview and including connection to PC-1 Facility.	100626	8.37	MWD
	PC-1 facility and connecting pipeline.		0.65	
9	Riverside Pipelines - South: Pipeline parallel to Colorado River Aqueduct and Casa Loma Canal with connections at the Colorado River Aqueduct and the Eastside Pipeline.	100628	6.7	MWD



## SECTION 2 - EXECUTIVE SUMMARY

During the quarter ending March, the Inland Feeder Program continued the design and construction effort necessary to support the 2004 Program completion date. Right of Way, Environmental and Public Awareness efforts also continued in parallel with engineering and field construction. An overview of the Inland Feeder Program Budget/Expenditures and Status of Progress for individual reaches can be found in Figure 3.

The Program estimate remains unchanged at \$1,188,000,000. During the reporting period, appropriations by your Board were as follows: \$5,200,000 for the procurement of pipe for the Waterman Canyon portion of the Arrowhead West Tunnel; \$9,500,000 for Construction Management Support Services for the Riverside Badlands Tunnel; and \$762,773,000 to provide the remaining funds to complete the Inland Feeder Program. Expenditures through March are \$138,917,000 or approximately 12% of the Program estimate.

The Program's anticipated levels of participation for Minority Business Enterprises (MBE) and Women Business Enterprises (WBE) for Board authorized design and consulting contracts are 15.2% and 7.0%, respectively. The program has exceeded these goals in total with actual participation levels through March of 14.9% MBE and 8.9% WBE (See Figure 4).

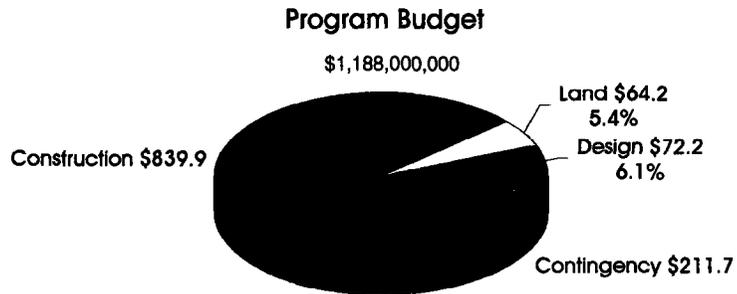
During the reporting period, construction was essentially completed on the Mentone Pipeline-Redlands Unified School District (RUSD) segment (Reach 4). Remaining minor street improvements, clean up work, and demobilization will be completed in April.

Construction on the Arrowhead East Tunnel (Reach 2) segment continues with work in and around the City Creek Portal site. The City Creek pipeline including an undercrossing at Highway 330 is complete. Final grading at the portal site is complete and assembly of the tunnel boring machine continues. Tunneling is expected to commence in April 1998.

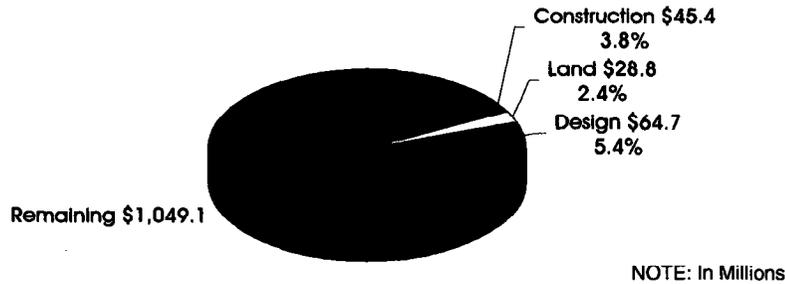
Notices-to-Proceed were issued in December 1997 for the Riverside Pipelines North and South (Reaches 7 - 8 and 9). Coordination and Partnering Meetings have been held with both contractors and included the topics of Owner Controlled Insurance Program, Project Labor Agreement, Environmental, and Right-of-Way restrictions and requirements and coordination with Metropolitan staff. Field work has been limited to the installation of temporary construction and environmental fencing, site clearing and fabrication of pipe.

The construction bid package for the Arrowhead West tunnel segment was advertised in January. Bids will be opened in April with Board approval anticipated in May 1998. Ameron International was awarded a contract to fabricate approximately 3,400 feet of pipe for the Campus Crusade for Christ pipeline segment of this project. See Figure 5 for Program Schedule.

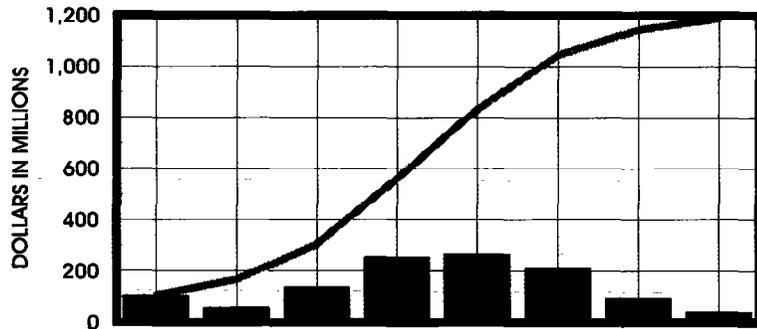
# PROGRAM STATUS



### Program Expenditures



### CASH FLOW



Thru -->	96/97	97/98	98/99	99/00	00/01	01/02	02/03	03/04
■ Year	105.1	61.0	138.8	257.8	269.4	215.0	96.9	44.0
— Cum	105.1	166.1	304.9	562.7	832.1	1,047.1	1,144.0	1,188.0

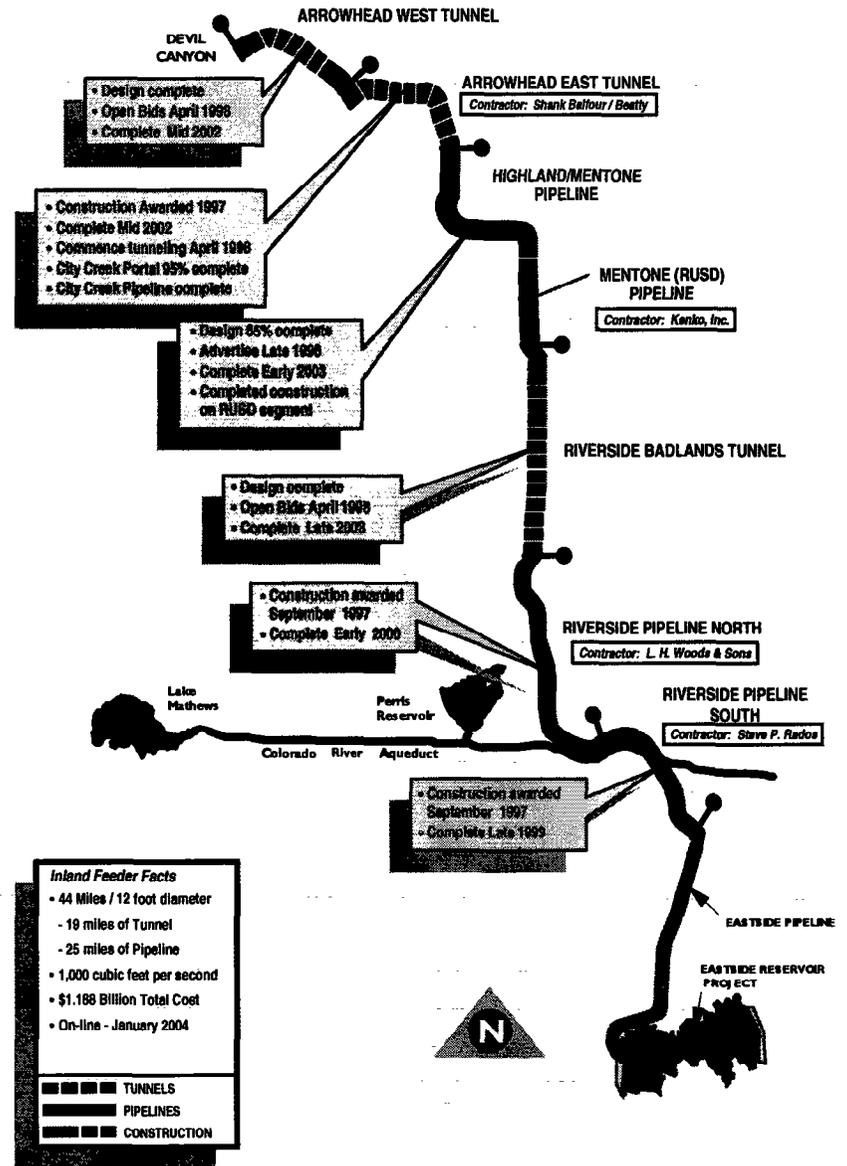


FIGURE 3 - PROGRAM STATUS

The following provides an update for each of the Program areas:

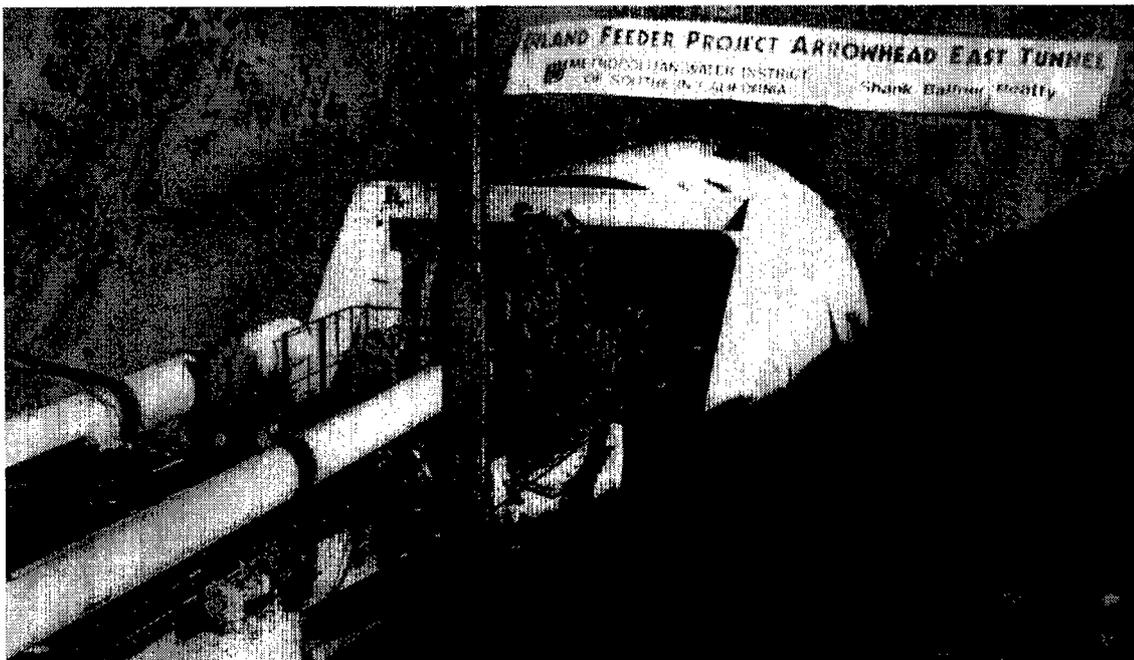
## SAN BERNARDINO TUNNELS

### ARROWHEAD WEST

- Design was completed and advertisement for construction bids occurred in early January. Bids are scheduled to be opened in early April.
- Pipe fabrication contract for pipe segment in Waterman Canyon adjacent to Campus Crusade for Christ property was awarded to Ameron International in January. Approximately 3,400 feet of 145-inch pipe will be required.
- Continued in the acquisition of Stubblefield, Campus Crusade, Arrowhead Springs Partners, and San Bernardino County Flood Control District (SBCFCD) properties or easements.

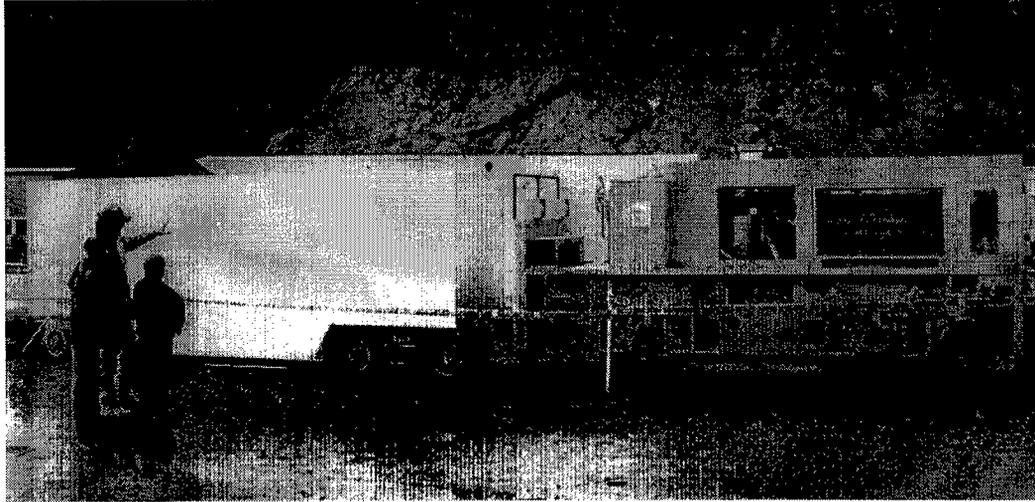
### ARROWHEAD EAST

- Completed the City Creek Pipeline including the Highway 330 undercrossing southeast of the portal site.
- Assembly of the TBM's main bearing and cutter head was completed, and is in its launch cradle. Tunneling is expected to commence in late-April.



*Tunnel Boring Machine (TBM) in launch cradle.*

- Continued refurbishing and rebuilding locomotives, muck and personnel transport cars.

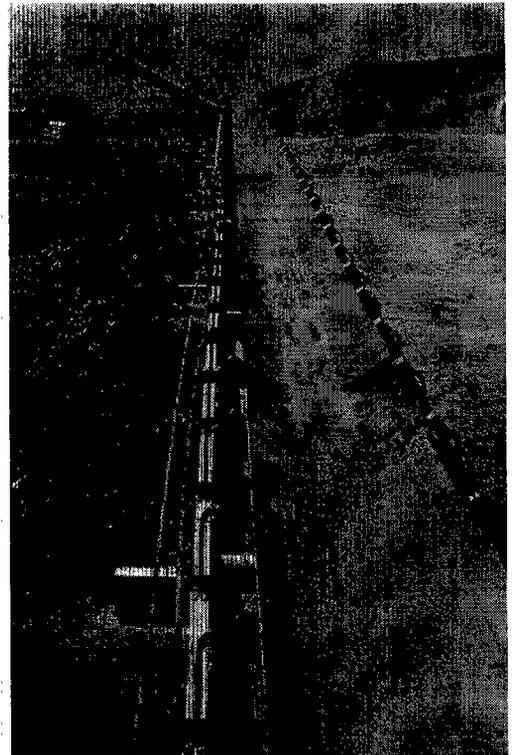


*Muck car and locomotive.*

- Completed construction of tunnel muck conveyor systems that runs from the portal site through the Highway 330 undercrossing to the spoils site (approximately 700 feet).



*Muck conveyor exiting Highway 330 undercrossing and continuing on to spoils site.*



*Muck conveyor to spoils site.*

- Production of approximately 30,000 precast concrete segments used for the initial tunnel support continues. Approximately 6,500 of the required 30,000 segments are complete.

- Conducted an open house at the City Creek portal site which was attended by over 2,100 guests despite a cold and rainy day.



*Visitors viewing TBM at open house.*

## **SAN BERNARDINO PIPELINES**

### **HIGHLAND/MENTONE PIPELINE**

- Design is approximately 85% complete and is scheduled to advertise for construction bids in late-1998.

### **MENTONE PIPELINE - RUSD**

- Completed construction adjacent to the new school (Site 1) prior to the September 1997 opening of the new Redlands East Valley High School as requested by the RUSD and San Bernardino Traffic and Flood Control Department.
- Installation, mortar lining and hydrotesting of the 145-inch diameter steel pipe is complete as are the street improvements and site grading. Only minor work remains.

### **SANTA ANA RIVER WASH**

- Submitted Supplemental Environmental Impact Report for Review and comment by State/local agencies and general public for the revised crossing of the Santa Ana River Wash from a tunnel to a less costly "cut-and-cover" pipeline. Comments are due to Metropolitan in June and the design has been initiated.

## RIVERSIDE TUNNEL

- Design was completed in December and advertisement for construction bids occurred in January. It is anticipated that a request for Board approval to award a construction contract will be in June 1998.
- A pre-bid meeting attended by approximately 50 contractors and subcontractors was held for Specifications No. 1365.
- Received Board approval to enter into an agreement with Parsons-Brinkerhoff (PB) for Construction Management Support Services (RFP 286). Contract negotiations have been initiated and an MWD pre-award audit of PB has been performed by Metropolitan's Audit Department.

## RIVERSIDE PIPELINES

### RIVERSIDE PIPELINE - NORTH

- Notice-to-Proceed for construction was issued to L. H. Woods & Sons, Inc. in December and mobilization is continuing along with transmittal of contractual submittals.
- Site work is limited to installation of temporary construction and Stephens' Kangaroo Rat fencing, utility identification, and clearing of the right-of-way.
- Continued fabrication of the welded steel pipe.

### RIVERSIDE PIPELINE - SOUTH

- Notice-to-Proceed for construction was issued to Steve P. Rados, Inc. in December and mobilization was completed in February.
- Clearing of the right-of-way and construction fencing is underway. Contract submittals are being transmitted for Metropolitan's review.
- Continued the fabrication of the welded steel pipe.

## RIGHT OF WAY

- Acquisition of Right-of-Way is on schedule to support construction activities. A total of 109 parcels have been procured to date.
- Entry permits have been obtained from property owners to allow access to private wells for monitoring during the construction phase of the Riverside Badlands Tunnel.



- Completed surveys of environmental sites. Located existing power poles, and prepared cross-sections and existing ground profile as needed by the designer to establish new power pole locations for the Riverside Pipeline North (Reach 7 - 8).

## ENVIRONMENTAL

Environmental efforts continued in parallel with engineering and construction activities to support Program milestones and comply with the requirements of the Final Environmental Impact Report (FEIR). Significant environmental activities accomplished during the quarter are:

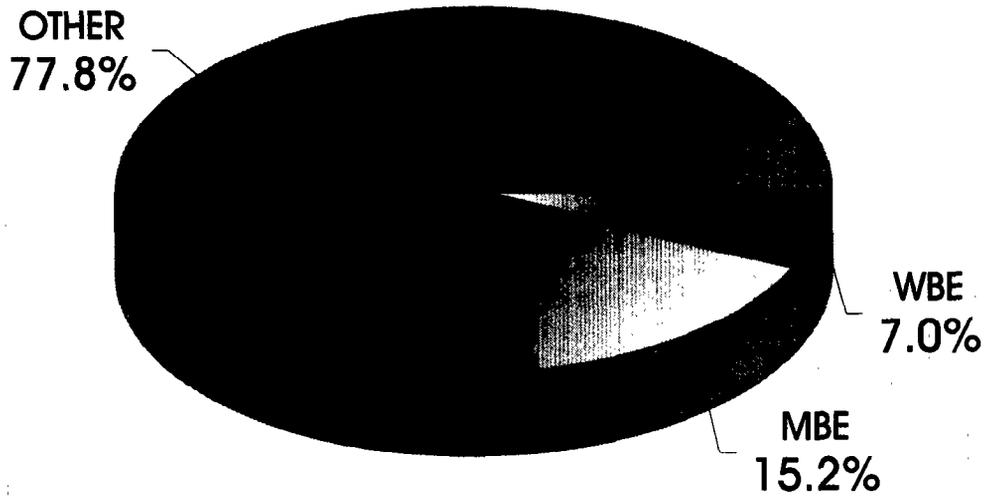
- Prepared site to be used for Stephens Kangaroo Rat (SKR) relocation program in the Riverside Pipeline North (Reach 7 - 8) area. SKR trapping and relocation was initiated.
- The Office of Historic Preservation submitted their concurrence with the *Buried Site Sensitivity Model and Testing Plan*. This plan allows for the implementation of buried site testing before construction to reduce the amount of construction monitoring needed.
- Continued Buried Site Testing on Riverside Pipeline North and South (Reaches 7 - 8 and 9). Treated three additional archaeological sites. After treatment of sites was completed, one additional archaeological site was found on both the Riverside Pipeline North and South segments.

## OCIP/SAFETY

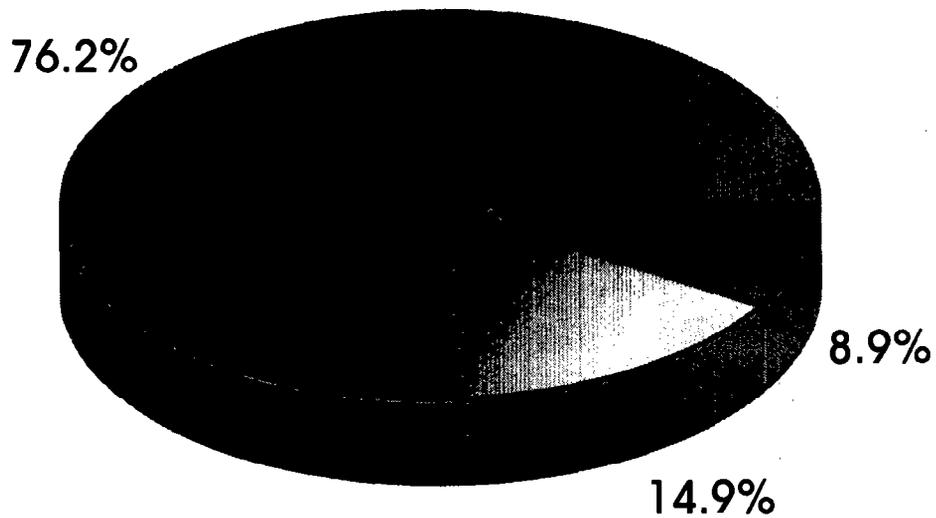
A comprehensive safety program has been implemented on the Inland Feeder Program that will facilitate a safe working environment and promote a successful Owner Controlled Insurance Program (OCIP). The safety program is organized and directed by representatives from Sedgwick/Dickerson, the OCIP administrator. Monthly safety audits were performed for the on-going construction sites at the Arrowhead East Tunnel (Reach 2), Mentone-RUSD Pipeline (Reach 4), Riverside Pipelines North (Reach 7 - 8) and South (Reach 9) to ensure compliance with established safety policies and procedures. Site inspections are also performed on a daily basis. There have been (508) Field Safety surveys conducted on the Inland Feeder Program to date.



**Anticipated Levels  
of Participation**



**Actuals To Date**



**FIGURE 4 - MBE/WBE PARTICIPATION**



FIGURE 5 - PROGRAM SCHEDULE

