



Municipal  
Conservation

*BMP Program*  
BMP Program

System Audits,  
Metering, &  
Leak Detection

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# *Arizona Water Company's Leak Detection Program*



Tom Harrell  
Arizona Water Company



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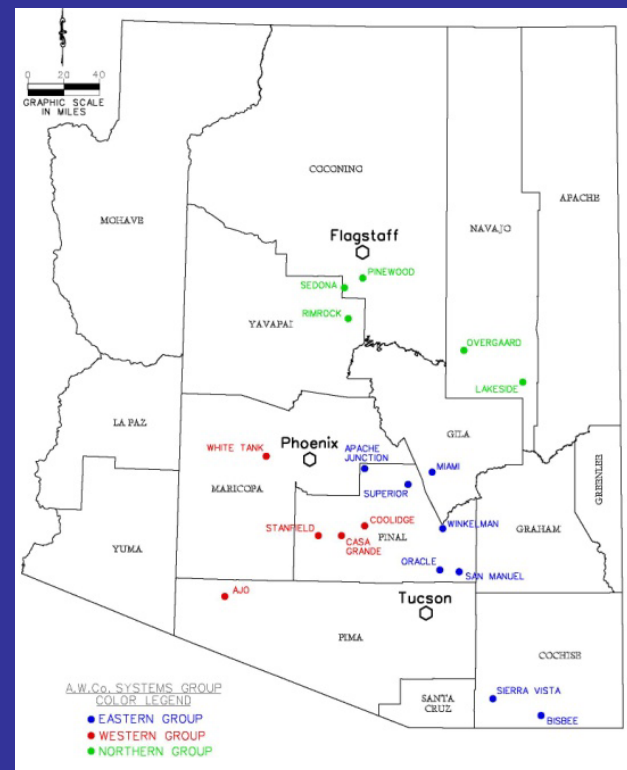
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# ARIZONA WATER COMPANY STATISTICS:



OVER 83,000 SERVICE  
CONNECTIONS

21 COMMUNITIES



LOST & UNACCOUNTED FOR WATER  
LESS THAN 8%



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# MOST LEAKS DO SURFACE







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# MOST LEAKS DO SURFACE





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# LEAK DETECTION EQUIPMENT



## LC-2500 LEAK NOISE CORRELATOR

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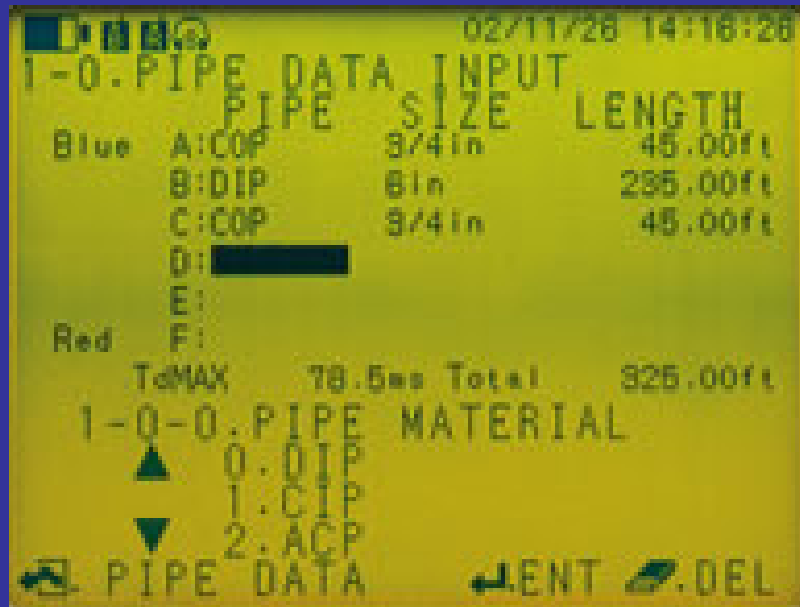
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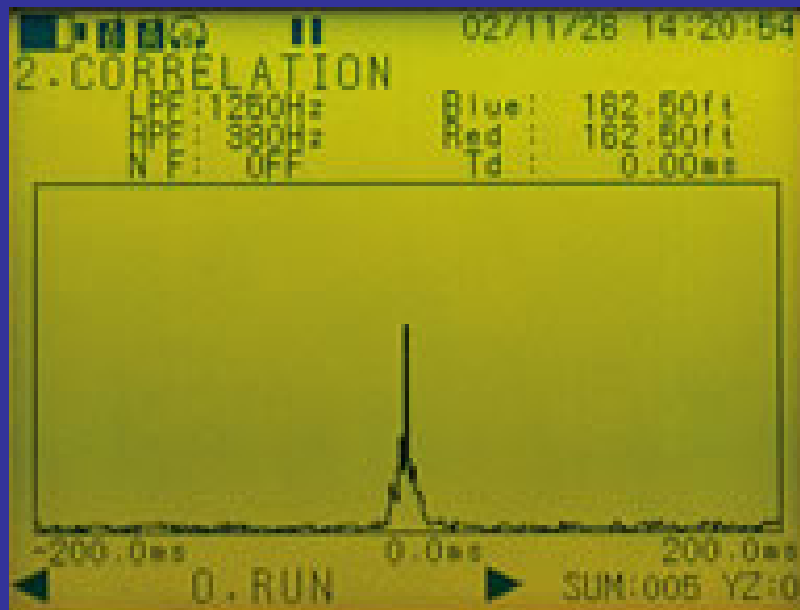
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INPUT PIPE  
DATA  
INFORMATION



RESULTS OF  
CORRELATION





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# LEAK DETECTION EQUIPMENT



## ZCORR DIGITAL CORRELATING LOGGERS



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**Automatic Analysis of Zone**  
*My Zone*

No. of loggers processed: 2  
No of correlations detected: 14

100%

Time Remaining: [ ]

Auto Analyze Cancel

Corr. Results Listen  
Summary Close

RESULTS FROM  
LOGGERS

**Correlation Analysis**

Correlation Analysis

Z1 North Pine\_4th St Z2

233.3 ft 101.7 ft

Pipe  
 Ductile Iron  
 Cast Iron  
 Cast Iron (cement-lined)  
 Cast Iron (> 60 yrs)  
 Steel (Cement-lined)  
 PVC  
 LDPE (low-density poly)  
 MDPE (mid-density poly)  
 HDPE (high-density poly)  
 Multiple sections  
 Reinforced Concrete  
 Concrete  
 Asbestos Cement  
 Copper  
 Steel  
 Lead  
 Cast Iron (> 60 yrs)

Sensor Distance:  
Pipe Diameter: 8 inches  
Sound Velocity: 4118 ft/s

Correlate Advanced Analysis Close

INPUT PIPE  
INFORMATION  
TO PINPOINT  
LEAK





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## GEPHONES



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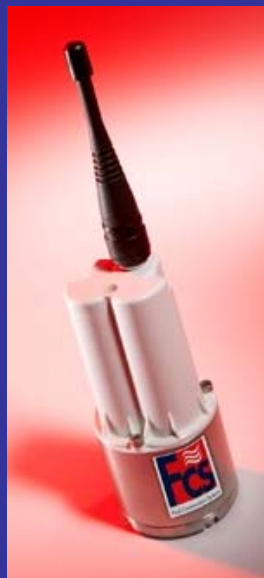
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# ADDITIONAL LEAK DETECTION EQUIPMENT/MEASURES



## PERMALOG



## UPDATED/ IMPROVED SENSAPHONES



## LEAK SURVEY COMPANY





# SYSTEMATIC EVALUATION OF A WATER SYSTEM

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## PINEWOOD WATER SYSTEM

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# SYSTEMATIC EVALUATION OF A WATER SYSTEM

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## WHERE TO START:

- ✓ AREA(S) OF KNOWN/PRIOR LEAKS
- ✓ OLDER PARTS OF THE SYSTEM
- ✓ AREA(S) WITH TERRAIN NOT CONDUCTIVE TO SURFACING LEAKS





# SYSTEMATIC EVALUATION OF A WATER SYSTEM

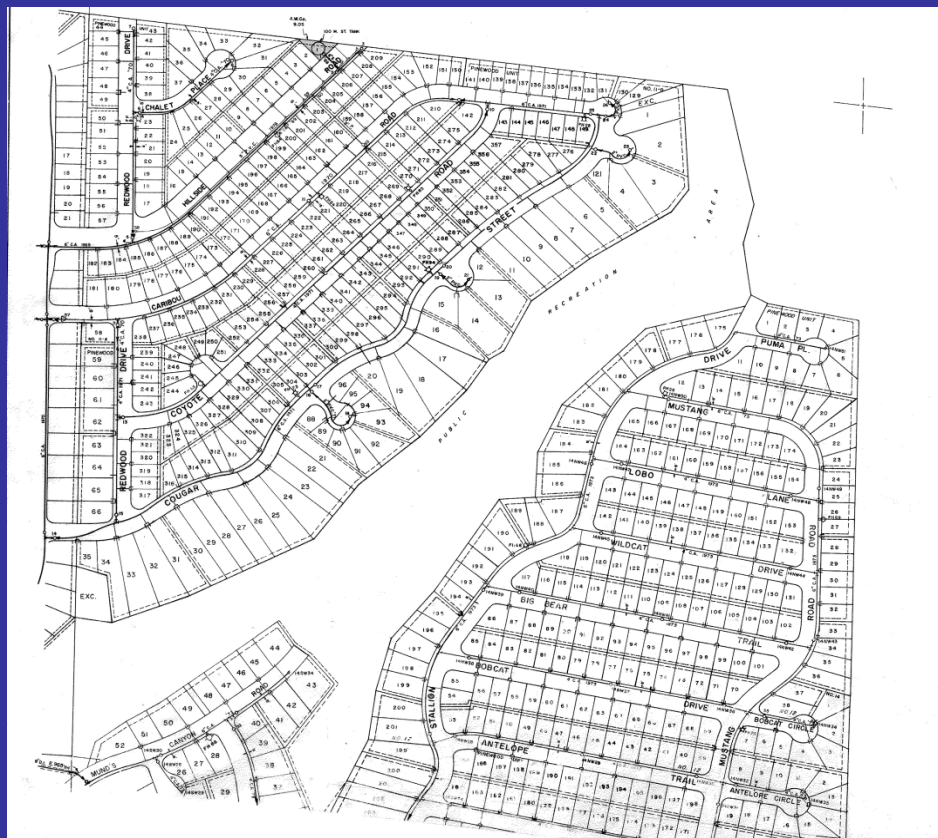
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WHAT TO USE:

✓ ¼-SECTION MAPS



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# SYSTEMATIC EVALUATION OF A WATER SYSTEM

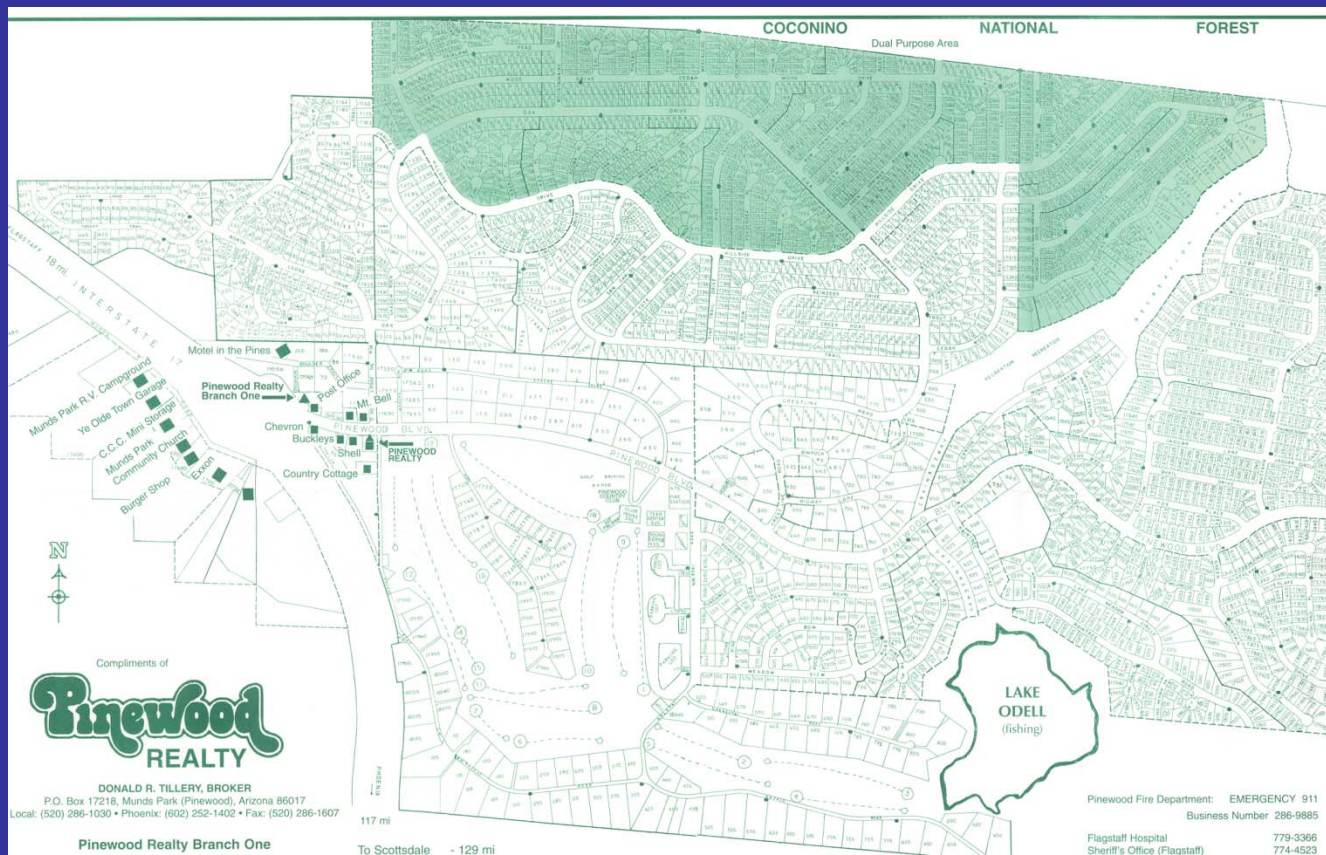
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WHAT TO USE:

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✓ OTHER MAPS

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# SYSTEMATIC EVALUATION OF A WATER SYSTEM

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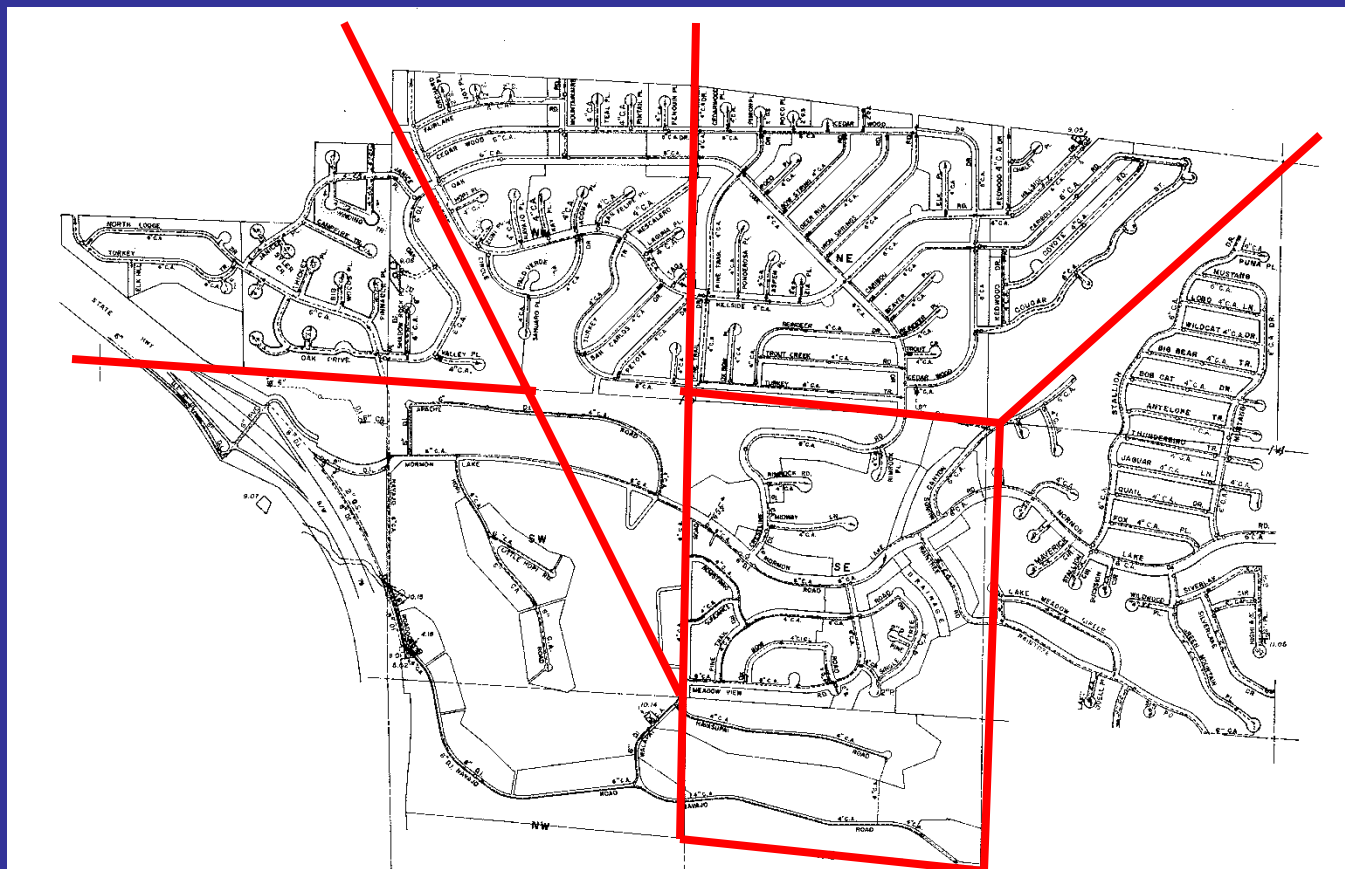
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HOW TO USE THE MAPS:

✓ GRID THE SYSTEM





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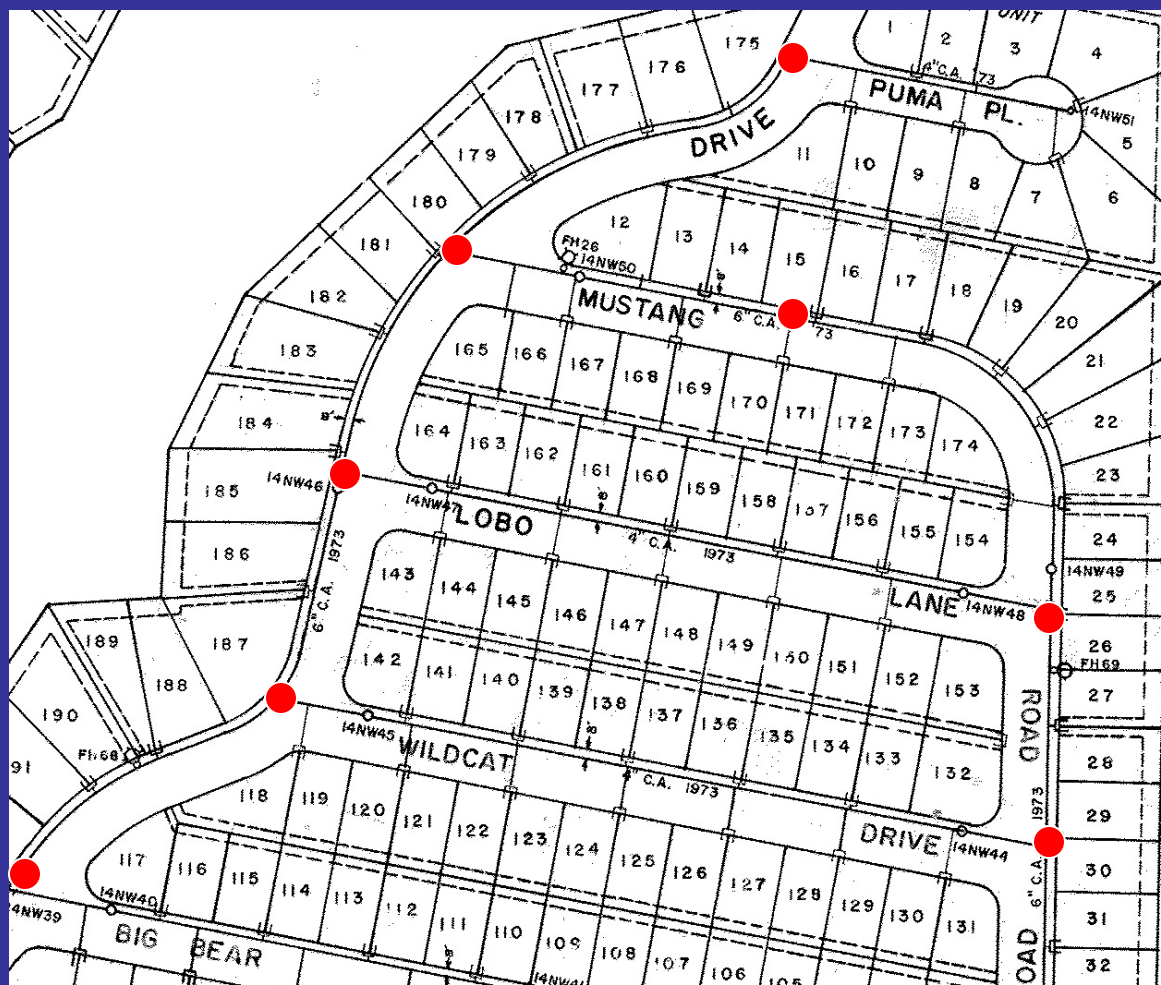
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# SYSTEMATIC EVALUATION OF A WATER SYSTEM

## UTILIZATION OF THE ZCORR LOGGERS







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# SYSTEMATIC EVALUATION OF A WATER SYSTEM

## DOWNLOAD DATA FROM LOGGERS







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# SYSTEMATIC EVALUATION OF A WATER SYSTEM

## CONFIRMATION/PINPOINT WITH THE CORRELATOR







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## REPAIR THE LEAK







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# SYSTEMATIC EVALUATION OF A WATER SYSTEM

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## RESULTS:

- ✓ OVER 50 LEAKS DISCOVERED DURING AN 8 WEEK PERIOD
- ✓ 3 LEAKS  $>10$  GPM
- ✓ LOST & UNACCOUNTED FOR WATER REDUCED BELOW 10%





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Tom Harrell  
Arizona Water Company





## Municipal Conservation

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## Tom Harrell, Water Resources Coordinator, Arizona Water Company.

Tom Harrell is a 1995 graduate of Arizona State University with a B.S. from the School of Agribusiness and Environmental Resources. He worked 4 years for the Arizona Corporation Commission, handling customer complaints and meter testing.

Since 2001, he has worked for Arizona Water Company. His current title is Water Resources Coordinator. Some of his duties include overseeing the Company's conservation and leak detection programs, reporting water usage information to the Department of Water Resources and the Groundwater Replenishment District, and managing the Company's vehicles and equipment fleet.