



## Utilities' Ability to Meet Quality Standards Surveyed

Arizona will be participating in a U.S. Environmental Protection Agency national survey of drinking water systems, set to begin this fall. The EPA study is to determine the investment needed to be made in the nation's drinking water systems to supply safe water and comply with current and future federal regulations.

The survey is looking ahead to the passage of the Safe Drinking Water Act expected later this year. With the passage of the act, Congress also is expected to authorize funding for the State Revolving Fund (SRF). The fund is to provide states with money for low-interest loans to drinking water systems for specific improvements.

In Arizona, the initial phase of the survey begins in November when forms are sent out to about 37 large- and medium-sized utilities chosen through a random sample selection. During the next phase of the study,

*continued on page 12*



*Riparian areas teem with life, including birds, fish, frogs, insects, deer and the occasional curious child. See Arizona Water map story, p. 7. (Photo by Peter Essick.)*

## ADWR Proposes CAP Reallocation

The Arizona Department of Water Resources, at the request of the Bureau of Reclamation, has developed methodologies and a recommendation for reallocating 66,000 acre-feet of Central Arizona Project Municipal and Industrial water (see May *AWR*, p. 6). ADWR received 51 applications requesting a total of 354,306 acre-feet, or over five times the amount allocated; the actual amount available might be less.

ADWR developed a series of allocation approaches based on written comments and a set of considerations that included: consistency with original M&I allocation criteria; availability of renewable supplies relative to demand; encouragement of early use of CAP water; applicants' ability to pay for and use CAP water; and applicants' need for a reliable water supply.

Three reallocation methodologies were evaluated, each based on future population projections for applicants. These provided allocation methodologies based on: 1) providing a full supply to subcontractors for as long as possible assuming a uniform gallons per capita per day (gpcd) demand rate of 180 for all applicants; 2) allocation based on population projections in the year 2040 and a uniform gpcd demand rate of 180; and 3) allocation based on providing a full supply to subcontractors for as long as possible assuming a demand which reflects maximum gpcd use rates set by the Second Management Plan in each Active Management Area.

Another methodology considered was one based on meeting regional demands by adjusting the projected needs of each applicant based on anticipated

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*CAP Reallocation, continued from page 1*

levels of groundwater overdraft in the particular region. This approach was rejected because of the speculative nature of projecting water demands by all water use sectors in a region.

In addition to the three reallocation methodologies, ADWR developed two options for determining which applicants should be excluded from the allocation process. Under Option A, applicants were excluded if they failed to identify the amount or purpose of use, if they proposed uses other than M&I uses, or if they were located within existing CAP service areas.

Option B excluded all applicants excluded under Option A; it also excluded developments with preliminary population projections and no approved plats, applicants with access to alternative supplies or who could use lower priority CAP supplies, and those located where direct delivery is not feasible and no specific exchange mechanism was identified. Option A reduced the number of applicants from 53 to 45; Option B further reduced the number to 26.

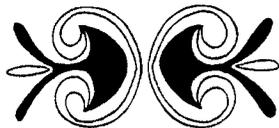
ADWR applied the three reallocation methodologies to each of the two options for excluding applicants to produce six reallocation alternatives. The recommended reallocation uses methodology (3) and option (B) (see Table at right). This "3B" reallocation provides 26 applicants with sufficient water to meet projected demands until the year 2023.

Twenty-seven applicants were excluded from the reallocation process, including all those classified as Industrial, Developers, or Miscellaneous. The eight basic reasons given by ADWR for excluding applicants, as indicated in the Reallocation column of the Table, are: a) direct delivery of CAP water not feasible and no information given on water exchange possibilities (7 applicants excluded); b) applicant can't afford the water (1 applicant); c) proposed use is recreation, turf irrigation or sand and gravel, and alternate supplies are available (8 applicants); d) proposed use is agricultural (1 applicant); e) proposed developments have no approved plats or population projections (3 applicants); f) proposed use on reservation is non-Indian M&I (1 applicant); g) amount and proposed use was not specified (1 applicant); and h) applicants are within existing CAP service area (5 applicants excluded).

Twenty-six applicants not excluded by ADWR were considered for the 66,000 acre-feet of uncontracted CAP M&I water. Based on methodology 3, five of these received no additional water; the remaining 21 received reallocations ranging from 30 acre-feet for Tonto Hills Water to 14,535 acre-feet for Goodyear. Other major reallocations include 13,765 acre-feet for the City of Mesa and 10,620 acre-feet for Scottsdale. Only seven of the 53 applicants received all or nearly all the water they requested.

ADWR is accepting written comments on the allocation, which must be submitted by December 1. For further information, contact Larry Linser at 602-417-2440 or Frank Barrios at 602-417-2442.

PROPOSED CAP REALLOCATIONS (AF)		
Applicant	Request	Reallocation
<b>WATER COMPANIES &amp; CO-OPS</b>		
AVRA Water Coop	1,284	1,265
Cañada Hills Water Co	3,191	1,085
Cave Creek Water Co	2,000	0
Chaparral City	5,000	0
Comm Water of Green Valley	3,413	2,115
Cottonwood Water Works	1,000	Excl. <sup>a</sup>
Del Lago Water Co	1,933	1,845
H2O Water Co	337	225
Litchfield Park Service Co	9,090	5,860
Rancho Vistoso Water	5,500	1,155
Shamrock Water Co	4,650	Excl. <sup>a</sup>
Tonto Hills Water Co	30	30
United Utilities, Inc.	1,000	Excl. <sup>a</sup>
Valley Utilities Water Co	250	250
Subtotal, 14 Applications	38,678	13,830
<b>CITIES, TOWNS, WATER DISTRICTS</b>		
Buckeye	409	295
Carefree	1,000	270
Chandler	10,000	2,655
El Mirage	520	520
Glendale	5,000	0
Globe	6,000	Excl. <sup>a</sup>
Goodyear	33,741	14,535
Marana	12,063	Excl. <sup>a</sup>
Mesa	15,000	13,765
Metro Dom Water Imprv Dist	8,700	1,945
Oro Valley Improvement Dist	450	450
Peoria	10,000	2,760
Phoenix	48,584	0
Prescott Valley	5,000	Excl. <sup>a</sup>
Scottsdale	40,000	10,620
Superior	1,500	815
Surprise	5,000	0
Tucson	36,116	3,540
Williams	600	Excl. <sup>a</sup>
Subtotal, 19 Applications	239,683	52,170
<b>DEVELOPERS &amp; MISCELLANEOUS</b>		
Apache-Sitgreaves Forest	368	Excl. <sup>c</sup>
DBA Box Canyon Farms	150	Excl. <sup>d</sup>
Del Webb Corp-Lakeview	10,000	Excl. <sup>e</sup>
Gila River Indian Community	44,828	Excl. <sup>f</sup>
Interchange Water Co.	2,800	Excl. <sup>e</sup>
Kaibab National Forest	2,000	Excl. <sup>e</sup>
Mogollon Conservation Assoc	9,500	Excl. <sup>a</sup>
Picacho School Dist. #33	35	Excl. <sup>e</sup>
Pima County	1,000	Excl. <sup>e</sup>
Salt River Project	?	Excl. <sup>g</sup>
The Park Co	1,200	Excl. <sup>e</sup>
Tonto National Forest	125	Excl. <sup>e</sup>
Villa Grande Home Owners	44	Excl. <sup>e</sup>
Subtotal, 13 Applications	72,050	0
<b>INDUSTRIAL</b>		
Augusta Ranch	400	Excl. <sup>h</sup>
DBA Dirt & Rock Co	60	Excl. <sup>e</sup>
Eagletail Mountain Ranch	1,000	Excl. <sup>e</sup>
Johnson International Inc	800	Excl. <sup>h</sup>
Sonoran Land Group	475	Excl. <sup>h</sup>
Tucson Estates Inc.	500	Excl. <sup>h</sup>
Viewpoint RV & Golf Resort	660	Excl. <sup>h</sup>
Subtotal, 7 Applications	3,895	0
<b>TOTAL, 53 APPLICATIONS</b>	<b>354,306</b>	<b>66,000</b>



## Water Vapors

This month brings the kind of letter we all dream about. Phil Briggs of Geraghty & Miller writes "I find your newsletter well written and informative, and we would like to do our part to help with its publication." Enclosed was a check.

Geraghty & Miller becomes our first private-sector sponsor. Contributions from sponsors (see box, p. 9) make possible subscription-free distribution of *AWR*. Our sincerest thanks.

In another communication, Roger Klinger, General Manager of Scottsdale's Water Resources Department caught an error in our June/July issue. A page 5 story on water rate increases states that Scottsdale's water rates went up 15 percent. Actually, water rates were raised by 10 percent; it was the sewer rates that were hiked 15 percent.

Mr. Klinger also noted that an article on page 5 of the August/September *AWR* seems to imply that the EPA standard for TCE is 1.5 parts per billion, when it actually is 5 ppb. The statement is unclear; Tucson's City Council has adopted a policy of not delivering water with more than 1.5 ppb TCE.

### But It'll have Low-flow Toilets

Hoping to make the MGM Grand, Mirage, and Luxor look both shabby and water-frugal, Las Vegas developers have announced plans to construct the "single most extravagant hotel ever built on Earth." Extravagant describes the Beau Rivage's (that's French for "Beautiful Shore") nearly \$1 billion price tag, and its use of water — this megaresort will crown a 17-acre island in a 50-acre artificial lake.

### And it's Downhill all the Way!

Radio astronomers have found water clouds near the center of Markarian 1, a galaxy 200 light-years away, making this the most distant water ever detected in the universe. No

word yet on whether Clark County has drafted any importation plans.

### AWS Rules Slog Along

The seemingly endless process of adopting Assured Water Supply rules continues its deliberate pace. The latest round of reviews produced written comments from 23 sources, containing some 60 to 70 remarks. The Arizona Department of Water Resources has responded to these by making approximately 30 clarifications and other minor changes in the draft rules. Final adoption in 1995 still appears likely.

### What's in the Rain Barrel?

A study of roof runoff in Texas found that the types and levels of contaminants are strongly affected by roofing material. Wooden shingles, with their preservatives, produced the most contaminated runoff, with over 20 identified chemicals. Asphalt shingles produced somewhat cleaner runoff, but the best quality water came from tile, or terra-cotta roofs. Older, decomposing roofs produced more polluted runoff than newer roofs.

### Water Map Touted

For the past several months, the Water Center has been distributing its latest publication — *Arizona Water*, a large-format water map poster. Photos from the poster are featured on the front page of this and previous *AWR*'s.

This issue's Special Projects section describes the design and production of

the map poster, which rapidly is becoming haute de rigueur (French for "common as dirt") within Arizona's water community. If you don't have your copy yet, you'll be delighted to find an order form on page 7.

### Coming in Future Issues

Our next issue will review the results of November's general election for impacts on water issues and composition of water district boards. We also will take an in-depth look at a simmering controversy over increased use of plastic plumbing in construction and its potential for leaking.

Future issues also will lay out water-related legislative agendas. As of now, the Arizona Department of Water Resources appears to be considering a half-dozen bills. These include: establishing a state water bank; streamlining the Gila and Little Colorado River basins adjudication process; protecting riparian habitats; passing legislation needed for the Central Arizona Groundwater Replenishment District to operate more effectively; establishing a hybrid water resource management entity for the Upper San Pedro area with regulatory powers somewhere between that of an Irrigation Non-expansion Area (INA) and an Active Management Area (AMA); and passing an omnibus bill of non-controversial and mostly technical amendments to existing water law.

As always, your letters, faxes and e-mail on previous issues and new story ideas are welcome.



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## News Briefs

### ACC OK's Congress Water District Fee Hike

Congress Water Company customers are paying a 70 percent increase in a monthly emergency surcharge after the rate hike was approved by the Arizona Corporation Commission. The ACC's Utilities Commission ruling raises the present monthly surcharge of \$3.06 to \$4.27. The rate increase was effective beginning September 1 for one year.

In August the company filed an application for an emergency rate increase of \$6.27 a month, more than doubling the existing surcharge.

The increase is to replenish the company's total cash reserves that were depleted when the company's back-up well needed repairs, and to fix lightning damage to the pump and control box serving its primary well.

The Congress Water Company serves 434 customers in Congress, which is located 15 miles northwest of Wickenburg, in Yavapai County.

### CAWCD Reports Record Deliveries

The Central Arizona Water Conservation District reported at the beginning of October that thus far in 1994 the Central Arizona Project delivered 785,000 acre-feet of water, a record amount.

Larry Dozier, CAP assistant general manager, said the previous record was 745,000 acre-feet in 1990. Dozier said the CAP is looking forward to delivering even more water in 1995, between 800,000 and 850,000 acre-feet.

Water deliveries this year would have been higher, Dozier noted, but the CAP has been shut down since October 1 from the Salt River south because the U.S. Bureau of Reclamation is replacing the siphon under the river. The New River siphon closed

October 15, also for replacement.

The siphons are being replaced because of corrosion damage, but the CAP is scheduled to resume water deliveries December 15. Thus, before the year is out, CAP may deliver about 800,000 acre-feet.

Dozier said water deliveries for agricultural use this year reached 495,000 acre-feet, or 63 percent of the total. Municipal and industrial users took 212,000 acre-feet (27 percent) and Indians 77,000 acre-feet (10 percent).

Board member Ron Rayner credited the higher water use to the pricing policies adopted by the CAWCD board in October 1993. Water deliveries in 1993 totaled 670,000 acre-feet. Eventually, the CAP may deliver as much as 1.5 million acre-feet of water per year to customers.

### Tucson Buys K&V Water Company

The City of Tucson has purchased K & V Water, a private water company with some 600 connections. The utility serves a mostly-residential area with a population of 1,500 to 1,800 persons on the City's east side.

The purchase price is \$600,000, or \$1,000 per connection. Two years ago, Tucson Water offered \$1,200 per connect for Metropolitan Water.

The purchase is consistent with Tucson's new acquisition guidelines, in that K & V's service area lies entirely within city limits. K & V customers typically are low-volume users; most will see a reduction in their water bills under Tucson Water's conservation-oriented rates.

### Oro Valley Shifts Water Acquisition Focus

Oro Valley has halted condemnation proceedings against Rancho Vistoso Water, while initiating discussions on purchasing Cañada Hills Water. The Rancho Vistoso condemnation apparently fizzled due to lack of support from its Oro Valley customers, thereby eliminating most finance options

for the purchase.

The parties agreed to have the condemnation action dismissed, with each side paying costs and attorney fees. Oro Valley promised not to file another condemnation action for at least three years, and not to oppose Rancho Vistoso when it seeks a rate increase and extension of its service area from the Arizona Corporation Commission.

Undeterred by this setback, the Oro Valley Town Council authorized formation of an advisory committee to investigate whether the Town should enter negotiations on purchasing Cañada Hills Water, which has 5,000 customers and is experiencing rapid growth. An attorney representing Cañada Hills reports the company has been appraised at \$17 million.

In addition to Rancho Vistoso Water and Cañada Hills Water, Oro Valley is served by Metropolitan Water and Tucson Water. Located on Tucson's rapidly growing northwest side, the Town has been investigating purchase options to ensure a strategy to control growth and provide future safe water for residents.

### Replenishment Projects Moving Forward

Efforts to recharge Central Arizona Project water on Tucson's northwest side are progressing, with local water interests working together to secure resources for feasibility studies and a pilot project. The Northwest Water Alliance, with cooperation from Tucson Water, is looking at recharge in the Santa Cruz River in conjunction with a flood control project. Also being considered is recharge in the Cañada Del Oro Wash, which flows west out of the Santa Catalina Mountains and into the Santa Cruz.

The Bureau of Reclamation reportedly has committed a minimum of \$200,000 for a feasibility study, contingent on at least a one-to-one local match. Discussions are underway among the local interests regarding how much each will contribute in cash and in-kind services.

## Bacteria Detected in Rio Rico Water Supply

Routine water testing in mid-October detected the presence of fecal coliform in two samples taken from wells in Rio Rico. Subsequent samples drawn from the same wells tested negative for fecal coliform, but indicated elevated levels of total coliform, which indicated the possible presence of other bacteria. The presence of fecal coliform usually is associated with contamination from sewage or animal waste.

The wells, located near Rio Rico High School, are part of the Rio Rico Utilities water system, which serves some 6,000 persons on the west side of the community. Rio Rico is located a few miles north of Nogales in Santa Cruz County. Groundwater in the area is relatively shallow, but there was no indication of a possible contamination source.

Residents were urged to boil their water or switch to bottled water while officials attempted to either track down the source, or establish that the earlier test results may have been caused by water sampling errors. In the meantime, the utility was testing the wells daily and chlorinating the supply.

No outbreak of illness possibly linked to the water supply has been reported to public health officials. Common symptoms of drinking bacteria-contaminated water include diarrhea, cramps, headaches, nausea and fatigue.

## CAP Terminal Storage Plans Progressing

Plans for terminal storage of Central Arizona Project water for users in the Tucson Active Management Area are progressing. A draft Preliminary Impact Statement calls for above-ground storage of 15,000 acre-feet (not including dead storage) in a 650-acre reservoir. The PIS is scheduled to go to the Environmental Protection Agency in March 1995.

## September Rain Salvages Monsoon

Heavy precipitation in September throughout Arizona salvaged what otherwise would have been one of the driest monsoons on record in southern and central Arizona (see bar chart). July and August precipitation in Tucson measured a scant 0.96 inches; Phoenix and Yuma were bone-dry with 0.27 and 0.06 inches, respectively. All three cities received less than 25 percent of normal precipitation for the two-month period.

The dry weather was matched by record heat as well, with temperatures hitting triple digits for weeks on end. Many municipal water providers reported summer demand well above average.

Roughly 1.5 inches of rain in September brought Phoenix and Yuma to near-normal levels for the three-month period, but left Tucson with less than half its normal monsoon precipitation. Further north, Flagstaff enjoyed near-normal precipitation throughout the summer.

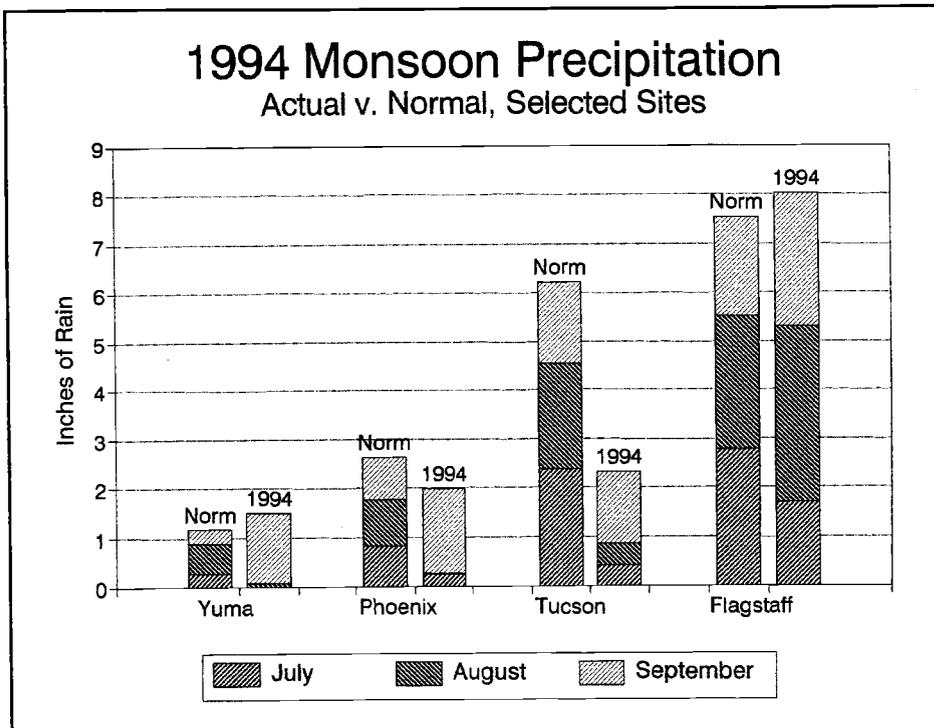


## Accuracy of U.S. Rain Gauges Questioned

Rain gauges across the country may be significantly under-recording precipitation, according to two researchers. David Legates, professor of meteorology at the University of Oklahoma, and Pavel Groisman of the State Hydrological Institute in St. Petersburg, Russia, describe factors that cause rain gauges to lose water in an article in the *Bulletin of the American Meteorological Society*. Losses include evaporation, droplets clinging to the sides of gauges, and precipitation missed by tipping bucket gauges while they tip.

More serious losses are associated with measuring snowfall. Heated gauges designed to melt snow increase evaporation, and most gauges are not designed to trap blowing snow.

Legates and Groisman estimate average precipitation losses of nine percent across the U.S., with up to 20 percent under-recording in snowy high elevations. The lowest errors, about six percent, are found in Florida and the desert Southwest. Researchers at the National Climatic Data Center in Asheville, N.C. are developing a method to correct historic rainfall data.





## Legislation & Law

### Congress Cuts Salinity Forum Funding

Congressional approval of a \$4.5 million budget for fiscal year 1995 for the Colorado River Basin Salinity Control Forum represents an \$8.5 million reduction from its previous year's funding of \$13 million. Established under the 1974 Salinity Control Act, the program brings together the Soil Conservation Service, the Agricultural Stabilization Service, and cooperative extension services to work at solving salinity problems in the seven Colorado River basin states.

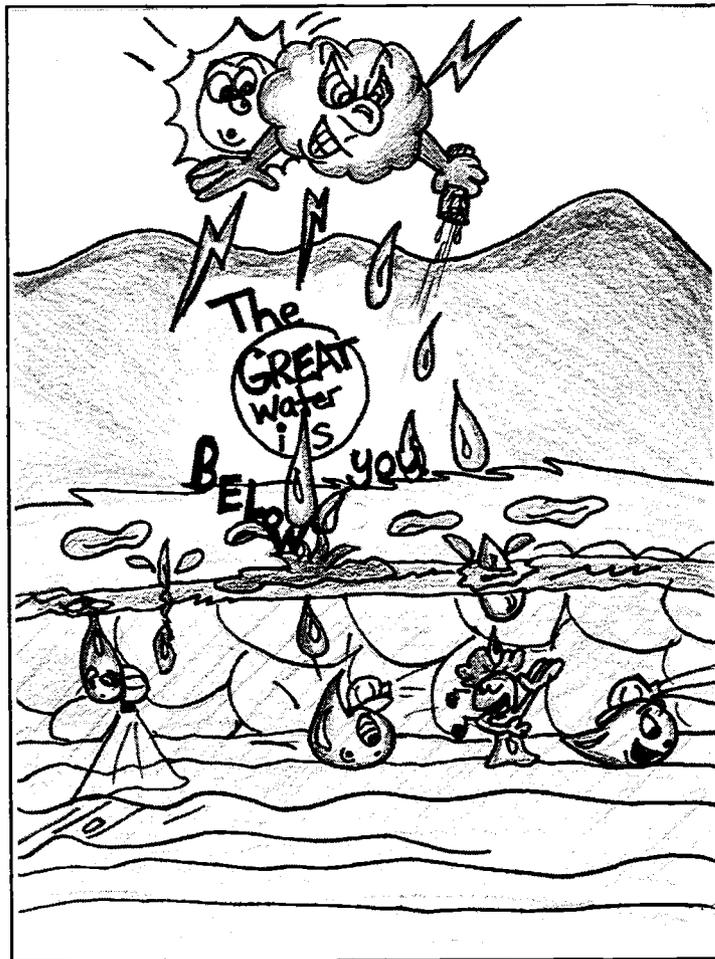
The reduced program funding likely will mean that fewer farmers will receive cost-share dollars to install better irrigation facilities. Also, the number of new contracts awarded to farmers likely will be cut back. Irrigation runoff greatly contributes to the Colorado River salinity problem.

There is a time lag in the funding of those contracts already approved by the forum, says Tim Henley, chairman of the forum's work group. So the funding cuts this year probably will not have an immediate impact on the Colorado's River salinity.

But Henley says if funds are not restored next year, backlogs could catch-up, causing a reduction in salinity control practices and potential consequences for everyone in the basin who uses the Colorado River as a water source.

Since first implemented in 1979, the program has been credited with reducing salt loading to the Colorado River by 261,700 tons per year, and is projected to remove 1.4 million tons by the year 2015.

The Salinity Control Forum is composed of no more than three governor-appointed representatives from each of the seven Colorado River Basin states.



*Danny Handke's entry in the Water Education Poster contest earned special distinction by appearing on the front cover of the 1994-95 Water Education Calendar. Handke, a fifth grade student at Cochise School, Scottsdale, competed with students from six western states in submitting art work depicting groundwater.*

### Court Seeks Goodfarb Replacement

The Arizona Supreme Court is in the process of naming a replacement to Judge Stanley Z. Goodfarb, the presiding judge in the Gila River adjudication. Judge Goodfarb recently retired in the face of disciplinary action involving the use of profanity and a racial slur. The Court is expected to take several months, possibly until the end of the year, to assign a new judge to the Gila River adjudication.

The Salt River Project filed a motion with the Supreme Court to allow individual parties to suggest judges for consideration by the Court. In response to SRP's motion the Court allowed claimants until October 24 to provide names of no more than five Maricopa County Superior Court Judges to be considered for the Gila River adjudication assignment.

Suggested names include Susan R. Bolton, I. Sylvan Brown, Colin G. Campbell, B. Michael Dann, Pamela J. Franks, Frank T. Galati, Steven Gerst, Robert L. Gottsfield, David L. Grounds, Robert A. Hertzberg, Alan S. Kamin, Gregory Martin, Thomas W. O'Toole, Michael D. Ryan, John H. Seidel, Michael O. Wilkinson and Michael A. Yarnell. The Court is not bound to appoint any of the judges on the list.

The search underway to replace Goodfarb has not unduly delayed the adjudication proceedings. The proceedings already were mainly on hold awaiting the outcome of the deliberations of the Joint Select Committee on Arizona General Stream Adjudications and the Supreme Court ruling on the subflow issue.

Meanwhile Judge Allen Minker likely will handle any emergency situations that may arise.



## Special Projects

Last July, the Water Resources Research Center began distributing *Arizona Water*, a large, colorful poster. *Arizona Water* continues the Water Center's commitment to using new methods and media, including videotape, posters, searchable databases and bi-lingual handbooks, to more widely disseminate water resource-related information.

The culmination of a year-long effort, the *Arizona Water* map poster project began with two deceptively simple goals — to be attractive and informative. One year and many hard lessons later, the map poster is, by all accounts, both attractive and informative. Inspired in part by the classic *California Water Map*, the goal was to create an educational poster featuring a detailed map along with relevant text and photos that still had great eye appeal.

Major support for this project was provided by the Arizona Department of Environmental Quality, with additional funding and technical assistance from the Arizona Department of Water Resources, the Salt River Project, and Project WET (Water Education for Teachers). Their generous support meant that few compromises in quality and production were made. The final product is suitable for framing.

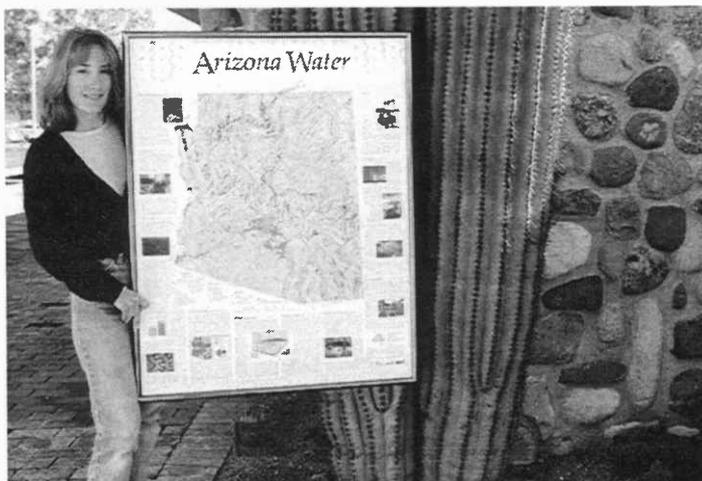
The centerpiece of the large (41" x 31.4") poster is a 1:1 million scale map that shows topography, along with surface water and groundwater features. The base map, produced by cartographers from the highly regarded *Raven Maps & Images*, shows the terrain of the state in stunning detail and convincing three-dimensionality. Shaded areas indicate such features as irrigated agriculture, groundwater aquifers, and incorporated cities. Line features, such as surface water and watershed boundaries and riparian habitats, also are included. Rivers extend across borders, with line thickness and color indicating base flow and source. The observer is rewarded for examining closely and is encouraged to make connections

between themes on the map.

Surrounding the map are text capsules covering a dozen topics ranging from history and climate to water quality and the Central Arizona Project. These are illustrated with pictures and graphs, including photographs taken by *National Geographic* and *Arizona Highways* photographers. The poster is further enhanced with original graphic art.

All these elements were brought together using a combination of computers and traditional techniques. At some point in the production process, virtually every component was digitized. Working on the "bleeding edge" of technology proved perilous, but provided unmatched precision and accuracy in the final product. It also produced graphic components that are readily updated and re-usable. The poster was printed on the world's largest press, in a two-pass process with six inks.

*Arizona Water* is rapidly becoming ubiquitous within Arizona's water community. In addition, free copies are being distributed to each of the state's 1,700 schools. Copies are available from the Water Center (see Order Form below). Proceeds from the map are earmarked for related water education materials, and for future reprinting costs.



The Water Center's Jennifer Murchison displays a framed *Arizona Water* map. (Photo: Kael Alford)

### ORDER FORM

Arizona Water Map	\$ 8.00
Add'l copies	6.00 ea.
Laminated maps	20.00
Add'l laminated	17.00 ea

For information on bulk orders of 25 or more, foam-mounted maps and limited edition framed maps, call 602-792-9591.

**Special rates for K-12 educators**  
For one free map and pricing on additional copies, send a request on school letterhead.

Enclosed is check made payable to the  
Water Resources Research Center for:

<u>Item</u>	<u>Q'ty</u>	<u>Price</u>	<u>Amnt</u>
Map	1	@ 8.00	_____
Add'l copies	___	@ 6.00	_____
Laminated	___	@ 20.00	_____

### Shipping & handling:

1 - 2 maps =	\$2.00
3 - 5 maps =	3.50
6 -24 maps =	5.00

TOTAL ENCLOSED \_\_\_\_\_

NAME \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_

STATE \_\_\_\_\_ ZIP \_\_\_\_\_

Please mail order form and check to:

Water Resources Research Center  
350 N. Campbell Ave.  
Tucson, AZ 85719



## Publications

**Soil and Water Quality: An Agenda for Agriculture**  
National Research Council — National Academy of Science's Board on Agriculture. This report affirms that new agricultural practices that both protect the environment and help farm productivity are needed to address the nation's soil and water problems. The report recommends four interrelated strategies for a national policy to prevent soil and water problems while sustaining farm profits: (1) Broadening the approach to protecting soil quality; (2) Increasing efficiency in the use of fertilizers, pesticides and irrigation methods; (3) Reducing farm erosion and runoff; (4) Creating and protecting "buffer zones." Copies available from the National Academy Press, 2101 Constitution Ave., NW, Washington, D.C. 20418; 1-800-624-6242; \$54.95 + \$4 shipping.

**Water Resources Education: A Lifetime of Learning; and Changing Roles in Water Resources Management and Policy**

Edited by N. Earl Spangenberg and Donald F. Potts, respectively. Together in a single volume, these proceedings combine and summarize papers from two seemingly diverse, yet interrelated topics — water resource education and the changing work of water resources. They bring together both technical and teaching professionals and help the groups develop similar goals and new working relationships. Order from American Water Resources Association, 5410 Grosvenor Lane, Suite 220, Bethesda, MD 20814-2192; 301-493-8600; \$44 for AWRA members, \$55 for non-members.

*The following two U.S. Environmental Protection Agency publications are available from Noyes Publications, 120 Mill Road, Park Ridge, NJ 07656; 201-391-8484; fax: 201-391-6833.*

**Storm Water Management and Technology**

This book offers a step-by-step format for compliance with Storm Water Pollution Prevention Plan requirements and provides industrial facilities with guidance on developing storm water pollution prevention plans and Best Management Practices. It contains information generally useful for controlling storm water pollution from almost any type of developed site. ISBN 0-8155-1327-5(1993), 375 pp., \$48.

**World-Wide Limits for Toxic and Hazardous Chemicals in Air, Water and Soil**

This book summarizes allowable limits for over 1,100 chemicals in workplace air, ambient air, water of various types and soils, in all pertinent states and 25 foreign countries and organizations. Values for water are generally for domestic water but may also be given for fishery waters or for agricultural water. ISBN 0-8155-1344-5(1994), 792 pp., \$98.

*The following five Arizona Geological Survey (AZGS) publications may be purchased from AZGS Publications, 845 North Park Ave. #100, Tucson, AZ 85719-4816. Orders are shipped UPS which requires a street address for delivery. All orders must be prepaid by check or money order payable to the Arizona Geological Survey.*

**Surficial and Environmental Geology of the Sierra Vista Area, Cochise County.**

K.A. Demsey and P.A. Pearthree. Potential geologic hazards and limitations, including floods, debris flows, soil conditions, and seismicity, are described. Information such as this may be used as a general guide in assessing possible geologic impacts on existing and future development. Open File Report 94-6 (Pub. number OFR 94-6), 14 p., scale 1:24,000; \$6.95 + \$3 shipping.

**A Reconnaissance of Earth Fissures Near Apache Junction, Chandler Heights, and Southwestern Picacho Basin.**

R.C. Harris. Unpublished maps of earth fissures, based on a helicopter survey in 1987, were field checked to verify that the fissures were correctly plotted on maps and to determine whether new fissures had formed or old ones had enlarged or extended. Open File Report 94-11 (Pub. no. OFR 94-11), 5 p., 2 sheets, scale 1:24,000 and 1:27,000; \$4 + \$2 shipping.

**Surficial Processes on Two Fluvially Dominated Alluvial Fans in Arizona.**

J.J. Field. Cottonwood and White Tank alluvial fans were studied in detail to learn more about alluvial fan processes in desert climates. Distinct differences in the drainage basin characteristics of the fans enabled the author to assess the importance of regional and local control on fan processes. Surficial features associated with two recent floods on each fan provided a unique opportunity to study whether changes in flood magnitude affect process types and distribution. Open File Report 94-12 (Pub. number OFR 94-12), 31 p.; \$8.50 + \$3 shipping.

**Processes of Channel Migration on Fluvially Dominated Alluvial Fans in Arizona**

J.J. Field. The influence of large and small-scale geomorphological events on the process and frequency of channel migration was examined on five fluvially dominated alluvial fans in southern Arizona. Historical air photos and field reconnaissance were used to document processes and events associated with recent channel diversions. Open-File Report 94-13 (Pub. no. OFR 94-13), 40 p.; \$6.25 + \$3 shipping.

**A Geomorphic and Hydraulic Evaluation of an Extraordinary Flood Discharge Estimate: Bronco Creek, Arizona.**

P.K. House and P.A. Pearthree. The authors reevaluated the August 19, 1971 Bronco Creek flood discharge using paleohydrological techniques to estimate peak discharges in stable, bedrock-controlled channel reaches near the mouths of the watershed's three major sub-basins. Open-File Report 94-19 (Pub. no. OFR 94-19), 21 p., 8 figs.; \$4.50 + \$2 shipping.



## Transitions

The Arizona Water Protection Fund Commission recently held its initial meeting (see August/September *AWR*, p. 1). The newly-appointed commissioners met to select officers, form three committees and determine lengths of initial terms.

**John Keane** of the Salt River Project is Commission Chairperson and **Jim Hartdegan** of Cyprus Mines is the Co-chair. Three sub-committees were established: Applications and Guidelines; Public Involvement; and Rules and By-Laws (see Table below).

Lengths of initial terms were determined by lot, with five commissioners drawing full three-year terms, five drawing two-year terms, and five drawing terms of one year. Subsequent appointments will be for staggered three-year terms.

ARIZONA WATER PROTECTION FUND COMMISSION Sub-Committee Assignments & Terms		
Commissioner	Sub-Committee	Term
Martin Antone, Sr.		1
Michael Block	Appl. & Guidelines	2
Frank Brandt	Appl. & Guidelines	3
Paul Brick	Appl. & Guidelines	3
Jim Hartdegan	Co-Chair; Pub. Inv.	1
John Keane	Chairperson	1
Doug Koppinger	Appl. & Guidelines	1
Virginia Korte	Public Involvement	2
Andy Laurenzi	Public Involvement	2
Roger Manning	Rules & By-Laws	2
Paul Orme	Rules & By-Laws	2
Kay Otte		1
Dennis Parker	Rules & By-Laws	3
Julie Stromberg	Appl. & Guidelines	3
Gwendolyn Waring	Appl. & Guidelines	3

The University of Arizona Water Resources Research Center has two new members on its External Advisory Committee. **Lois Kulakowski** of the Southern Arizona Water Resources Association and **Robert O'Leary** of the Water Utilities Association of Arizona have joined the committee. They replace **Sue Lofgren** of The Forum and **Mike Lytle** of the Arizona Small Utilities Association.

Kulakowski and O'Leary join 11 other advisory committee members, including **Phil Briggs** of Geraghty & Miller, **Herb Dishlip** of the Arizona Department of Water Resources, **Dave Esposito** of Pima County's Department of Environmental Quality, **Dave Iwanski** of the Agri-Business Council of Arizona, **John Keane** of SRP, and **Floyd Marsh** of Scottsdale's Water Resources Department.

Also on the External Advisory Committee are **Errol Montgomery** of Errol Montgomery & Associates, **Brian Munson** of the Arizona Department of Environmental Quality, **Doug Nelson** of the Arizona Rural Water Association, **Karl Polen** of Robson Communities and **Don Young** of the Arizona Attorney General's Office.

The External Advisory Committee provides advice and guidance on Water Center programs and publications. Committee responsibilities include screening and ranking pre-proposals for federal 104(b) grants.

**Gregg Houtz** has been appointed by the Arizona Department of Water Resources to be the **Indian Water Rights Settlement Facilitator** for the general stream adjudications.

**Owen Olpin** has been appointed by Secretary of Interior **Bruce Babbitt** to head the federal negotiating team involved in settlement talks between the Navajo Nation and the Hopi Tribe. The dispute involves water used in northeast Arizona for coal mining and a proposed pipeline to import Lake Powell water to the tribes.

*Arizona Water Resource* is financed in part by sponsoring agencies, including:

- Arizona Department of Environmental Quality
- Arizona Department of Water Resources
- Arizona Hydrological Society
- Arizona Municipal Water Users Association
- Central Arizona Water Conservation District
- Geraghty & Miller
- Salt River Project
- Tucson Water
- USGS Water Resources Division
- Water Utilities Association of Arizona

Their contributions help make continued publication of this newsletter possible.



## Announcements

### Try New, Improved Water Database

The EPA's Water Resource Center has greatly improved outside access to materials and now operates a database of over 4,000 titles of publications, documents and videotapes. Materials can be obtained from the center at no cost and are available to the public. The center's database allows the office's staff of eight to access titles and catalogues of materials related to key words or interests, as well as by specific titles or requests. The center accepts requests 24 hours a day, seven days a week, through a voice-mail system at 202-260-7786. Direct written requests for specified material to: Water Resource Center, RC-4100, Environmental Protection Agency, 401 M St., S.W., Washington, D.C. 20460.

### Johns Hopkins Seeks Hydrologist

The Department of Geography and Environmental Engineering at Johns Hopkins University is seeking to fill a tenure-track faculty position in the area of hydrology for the 1995-96 academic year. The department is seeking candidates with a strong background in hydrology and hydraulics and with interests in surface water processes, precipitation and runoff mechanisms, water-landform-climate interactions, water resources, or hydrologic/ecologic relations. Applicants should send a curriculum vitae, the names of three references, and a statement of research and teaching interests by December 1 to Professor Peter Wilcock, Department of Geography and Environmental Engineering, 313 Ames Hall, The Johns Hopkins University, Baltimore, MD 21218-2686. Phone: 410-516-5421; Fax: 410-516-8996; Internet: Wilcock@JHUVMS.HCF.JHU.EDU.

### Phoenix Water Department Seeks Economic Analyst

The Phoenix Water Services Department seeks someone to assist its Lead Economic Analyst with special projects on development fees and water resource project costs related to the Water Resources Plan. The position, which will start immediately and run through April 8, 1995, is for 40 hours per week at \$17.77 per hour, with no benefits.

Applicants should be familiar with demographic projections and construction cost estimates, and must understand time value of money, discount rate, and benefit-cost calculations. Experience in spreadsheet modelling also is desired. Contact Jeff DeWitt, Lead Economic Analyst, Phoenix Water Services Department, at 602-262-6361.

### Upcoming Conferences Announced

The Terrene Institute and U.S. EPA announce a national conference "Protecting Groundwater: Promoting Understanding, Accepting Responsibility, and taking Action," to be held December 12-13, in Washington, D.C. The conference is to foster an exchange of practical information on groundwater pollution and tools and techniques to address problems in communities. Registration for government/non-profit is \$115 prior to November 14. Contact: 202-833-8317.

The Groundwater Guardian Foundation, a new foundation program designed to support communities protecting their groundwater, announces its national launch with a conference, "Communities Leading Groundwater Protection." The conference will be held on Nov. 17-18 at the Doubletree Hotel-National Airport in Washington, D.C. In addition to a wide variety of groundwater and community expert speakers, the conference will offer tours and workshops by organizations which have available resources for communities to use in their groundwater protection activities. Contact The Ground Water Foundation at 1-800-858-4844.

### ADWR Clarifies Augmentation Grant Application Process

The Arizona Department of Water Resources has issued a further clarification on projects eligible for augmentation grants in the Tucson Active Management Area. Previously, the Tucson AMA announced that project proposals involving effluent would not be considered unless it was for underground storage. This decision has been reviewed, and ADWR's legal division has concluded that direct uses of effluent which supplement the AMA's water supply do qualify as augmentation.

Examples that qualify as supplemental water include direct use of effluent: that otherwise would be lost to the AMA via evapotranspiration or flow out of the AMA; generated from CAP or other imported water use; in projects that match quality of supplies to appropriate uses through separate delivery systems; and that addresses seasonal disparities between supply and demand. In addition, effluent storage, importation and recharge clearly are authorized augmentation activities. For further clarification, contact Pat Speyer, Tucson AMA office, 602-628-6758.

### Dos Cabezas Wilderness Plan Draft

The Bureau of Land Management is seeking comments on its Draft Dos Cabezas Mountains Wilderness Management Plan. This document proposes management direction for the 11,998-acre wilderness area, located 20 miles east of Willcox in Cochise County. Comments must be submitted by November 30, 1994. Contact Tom Schnell, BLM, 711 14th Ave., Safford, AZ 85546 or call 602-428-4040.



## Calendar of Events



### RECURRING



**Arizona Hydrological Society.** 2nd Tuesday of the month, 7:30 p.m. Meetings held at WRRRC, 350 N. Campbell Ave., Tucson. Contact: Laurie Wirt 602-670-6231.

**Arizona Water Resources Advisory Board.** Dec. meeting to be announced. Contact: Beverly Beddow 602-417-2440.

**Casa Del Agua.** Hourly tours, Sunday noon to 4:00 p.m., 4366 North Stanley, Tucson. Contact: 602-791-4331

**Central Arizona Water Conservation District.** 1st Thursday of the month, 12:30 p.m. CAP Board Room, 23636 N. 7th St., Phoenix. Contact: 602-870-2333.

**City of Tucson Citizens Advisory Committee.** 1st Tuesday of the month, 7:00 a.m. 310 W. Alameda, Tucson. Contact: Karen Alff 602-791-2666.

**Phoenix AMA, GUAC.** Joint meeting in Tucson. See "Upcoming" calendar, Nov. 14th

**Pima Association of Governments / Water Quality Subcommittee.** 3rd Thursday of the month, 9:30 a.m. 177 N. Church St., Suite 205, Tucson. Contact: Gail Kushner 602-792-1093.

**Pima County Flood Control District Advisory Committee.** 3rd Wednesday of the month. Nov. 19, 7:30-9:30 a.m. 201 N. Stone St., Tucson. Contact: Carla Danforth 602-740-6350.

**Pinal AMA, GUAC.** Joint meeting in Tucson. See "Upcoming" calendar, Nov. 14.

**Prescott AMA, GUAC.** Joint meeting in Tucson. See "Upcoming" calendar, Nov. 14.

**Tucson AMA, GUAC.** Joint meeting in Tucson. See "Upcoming" calendar, Nov. 14.

**Verde Watershed Association.** Dec. 5th, 7 p.m., Cottonwood Contact: Tom Bonomo, VWA Newsletter Editor, c/o Verde R.D., P.O. Box 670, Camp Verde, 602-567-4121.

**Yavapai County Flood Control District Board of Directors meeting.** 2nd Monday of the month in Prescott, 255 E. Gurley St.; 4th Monday of the month in Camp Verde, Yavapai County Justice Facility. Contact: YCFCD, 255 East Gurley, Prescott, 602-771-3196.

### UPCOMING



Nov. 14, Tucson, Main Library, 101 N. Stone Ave., 6:00-9:00 p.m. **Arizona Department of Environmental Quality Public Hearings.** Update public on issues presented this year. Contact: 602-207-4539.

Nov. 14, **Joint Groundwater Users Advisory Council Meeting.** Includes Phoenix, Pinal, Prescott, and Tucson AMA, GUAC. 8:30-2:30 p.m. Ironwood Gallery, Arizona-Sonora Desert Museum, 2021 N. Kinney Rd., Tucson. Contact: Teresa Klinger, 602-628-6758.

Nov. 14-18, **Flood Plain Hydraulics Using HEC-2.** 8:15 a.m.-5:30 p.m. Mon. thru Thur. 8:15 a.m.-12:30 p.m. Fri. Engineering Center, Arizona State University, Tempe. Contact: Center for Professional Development, College of Engineering and Applied Sciences, Arizona State University, Box 877506, Tempe, AZ 85287-7506; phone 602-965-1740, fax 602-965-8653.

Nov. 18, **Arizona Rural Water Association Program.** 9:00-4:00 p.m., Swiss Village, Payson. Contact: 602-230-7771.

Dec. 7-8, **Riparian Management: Diverse Values — Seeking Common Ground.** Contact Terry Tindall, University of Idaho, Boise ID, (208) 736-3600.

Dec. 11-13, **Seventh National Symposium on Individual and Small Community Sewage Systems.** 8:00 a.m.-5:00 p.m. Atlanta Hilton and Towers, Courtland and Harris Streets NE, Atlanta, GA 30043; phone 404-659-2000; fax 404-222-2868. Contact: ASAE Meetings Department, 2950 Niles Rd., St. Joseph, MI 49085-9659, phone 616-429-0300, fax 616-429-3852.

Dec. 12-13, **Protecting Ground Water: Promoting Understanding, Accepting Responsibility, and Taking Action.** Washington, D.C. Renaissance Hotel, 999 Ninth Street, NW, Washington, D.C. 20001-9000, phone 202-898-9000. Contact: Ground Water Protection Conference, c/o Terrene Institute, 1717 K Street, NW, Suite 801, Washington, D.C. 20006, phone 202-833-8317, fax 202-296-4071.

Jan. 14-21, **48th Annual International Meeting of the Society for Range Management,** to be held in Phoenix. This year's topic is "Diversity of Land and People." Contact John H. Brock, Environmental Resources, Arizona State University, Tempe, AZ 85287-2005; 602-965-7036.



*Survey, continued from page 1*

actual site surveys to about 19 randomly selected Arizona small utilities are planned. These site visits are to provide technical assistance in gathering and reporting requested information.

Federal officials have expressed concern that sufficient funding may not be available to conduct the site visits at the small water utilities. The unavailability of such funds would limit the intent of the survey since it is the small utilities that often are most in need of the financial assistance to be offered by the SRF.

Participating Arizona utilities are among the more than 3,000 community water systems across the country, including systems on Indian lands and in Alaskan native villages, to be surveyed by the EPA for this study.

Personnel from the Tucson, Flagstaff and Phoenix offices of the Arizona Department of Environmental Quality will be participating in the project. ADEQ personnel will provide technical assistance to systems filling out the questionnaires. They also will check that each systems's survey responses are accurate before forwarding the data to EPA for further quality review, compilation, and analysis. State water officials also will be able to verify the accuracy of EPA's final data input.

ADEQ officials will be invited to join EPA and survey personnel when they conduct site visits to collect data from

small drinking water systems. Their input is invited during EPA's computer modeling as the agency estimates the capital investment needs of all small water systems within Arizona.

After collecting the survey information, EPA will use computer models to project drinking water systems capital investment needs nationwide. The agency intends to make public the results of its survey and computer analysis in a report to Congress in early 1996.

The survey is in response to concerns of water utilities nationwide that they face burdensome short- and long-term capital costs in complying with stricter state and federal drinking water standards. Such costs include replacing aging infrastructure (such as distribution systems), expanding current operations, and merging with other systems.

The study intends to put a dollar figure on such costs. Its results will provide a basis to determine federal allocations to the SRFs. Plans now call for an appropriation of about \$700 million in FY 1995.

Jim Maston of the Tucson ADEQ office believes the study will help Arizona. "It might be a useful tool for the state to use later to facilitate the maintenance and perhaps even the upgrade of some of the systems that are in poor conditions now," he said.

Titled "The 1995 SRF Needs Survey," the study represents a first for EPA. It is the agency's initial nationwide effort to determine the short- and long-term capital investment needs of drinking water systems.

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