

Budget making

Money you can count on

Congress is wrestling with deficits, the New Mexico Legislature is facing tough decisions, and the state's universities are preparing contingency plans. The New Mexico Water Resources Research Institute is watching—and planning. It's budget time.

"All things considered, we did fairly well last year," said WRRRI Director Tom Bahr. "Our research budget ranked in the top ten among the nation's 54 institutes." In 1984, the institute administered \$1.4 million in research funds from eight funding sources to support 36 research projects.

The prime ingredient in a successful research program is obvious, according to Bahr—funding support. "The key," he added, "is getting the money."

Budget making begins with an accounting of reoccurring appropriations from the state and federal government. "Then we list research priorities and send out a request for proposed research projects," he said. The proposals are then sent out for national peer review.

The institute's Program Develop-

ment and Review Board considers the peer comments in awarding the projects. The projects are awarded based on the board's numerical ranking.

Bahr said although awards are made "until we run out of money," some appropriated funds are held in reserve for research projects that require matching funds for federal grants.

Virtually all funds administered through the institute are awarded competitively. Those researchers who compete successfully must meet certain guidelines. "When our program development and review board approves a proposal, it must be water related, address an important water problem either in New Mexico or the region, and be based on good, solid science."

In the case of outside competitive grants, the institute does not play a direct role in awarding the grant. Instead, the institute becomes the research broker. That involves identifying funding sources and knowing which researchers would be best for the research project. In addition, the institute will assist in developing the proposal and if the project is awarded, will administer it.

"Generally, we have more good ideas and capable people than money. If we don't have the money to fund a good project, we try to help the researcher look for support elsewhere," Bahr said.

The recent trend in federal funding is to put more responsibility on the state for managing its water



problems. This philosophy also applies to water research. Federal funding to the WRRRI dropped from a high of nearly \$800,000 in 1980 to \$325,000 in 1984.

In contrast, the state of New Mexico has increased its funding for water resources research. The state's first reoccurring appropriation to the institute in 1971 totaled \$100,000. Today, that amount has increased to about \$400,000. Other state funding increased the total state investment in research to \$1.1 million.

"In this part of the country, water is very important. People view funding decisions as an investment rather than an expenditure," he said.

Bahr is optimistic for 1985. "We think the state will continue its strong support, and we have reason to expect additional matching grant funding from the federal government. But, we'll just have to watch and see what budgets are approved."



Lab business booms

For \$7, they will tell you the source of that awful smell in your well. For \$8, they will tell you if your plants need minerals, and for free, they will let you look at the Red Sea in a bottle.

Their's is not a sorcerer's laboratory, turning out a tidy profit, but the Soil, Plant and Water Testing Laboratory at New Mexico State University.

The laboratory, which is spread over six rooms in NMSU's Agriculture and Home Economics building, is a hive of pouring, burning, computing, weighing, and stirring activity. The laboratory is equipped to perform 27 separate tests on water, five detailed soil tests and nine tests on plants. About 700 samples a month are run through at least one of these tests.

According to laboratory Director Andrew Bristol, the lab is the only one in New Mexico capable of performing soil fertility analysis and the only public lab in Southern New Mexico that can run water samples. Overall, about 50 percent of the lab tests are for soil, 40 percent for water and 10 percent for plants.

Originally, the laboratory was under the management of the Co-operative Extension Service and performed simple soil and water tests. Then in 1974 the Crop and Soil Sciences Department took over administration and expanded the services to include elemental analysis on water and soil. Recently, plant analysis also was added to the services. Bristol, who has an M.S. in soil chemistry from



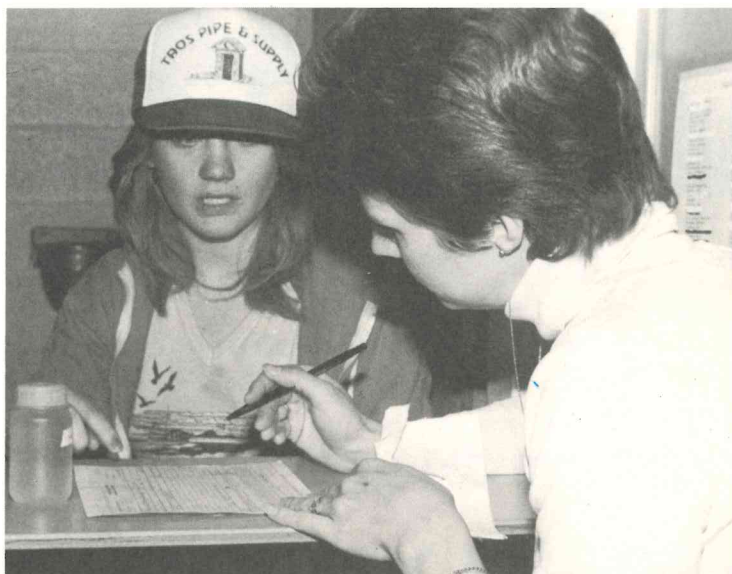
the University of Idaho, came to NMSU in 1973 and helped set up the new lab.

Today, business is booming. The four full-time staff members and six students provide water testing services for every science department at NMSU, as well as departments at other universities. "We've tested seawater from the Red Sea, and geothermal water from Peru, Mexico, Washington state and New York," Bristol says. He explains that the geothermal waters are used in comparison tests to see if water is worth putting into production.

Other customers, including the U.S. Forest Service, the New Mexico Environmental Improvement Division, and mining companies, rely on the lab for various analyses for research and regulatory samples. The laboratory is certified under the Safe Water Drinking Act to test water for heavy metals, nitrate, fluoride and coliform. Smaller New Mexico communities such as Deming, Garfield and Mesilla also contract with the laboratory to test their municipal supplies.

The lab also gets walk-ins. "Some people just like to have their water tested to make sure their water supply is good. It only costs \$7 for the bacterial tests and that's cheaper than a doctor bill if the water was contaminated," he says.

Soil analysis results are used in research, mapping soils, land use



Staff member Beth Landers (right) takes water sample information from lab customer Tommie Long. Ms. Long makes regular deliveries of water samples from the city of Deming, New Mexico.

planning, mine reclamation, and for preparing Environmental Impact Statements. "We test for just about anything except organics such as pesticides, and oil and gas," Bristol says.

Plant analysis involves testing for elements such as zinc, iron and phosphorus in vegetation samples.

Bristol says the testing fees keep the laboratory self-supporting, "but not profit-making." For information on fees and services, call (505) 646-4422, or write Soil, Plant and Water Testing Laboratory, P.O. Box 3Q, Las Cruces, NM 88003.



Mike Monday, an NMSU premed student, checks the coliform count in a water sample. He is one of six students employed part-time at the lab.

Gila—complex and controversial

Although the Gila River originates in New Mexico's Mogollon Mountains, the area's rugged terrain and fierce Apache Indians discouraged its development until copper was discovered there in the late 1800s.

Even today, the Gila River remains a poor provider for this remote, mountainous area of Southwestern New Mexico. Its 100-mile flow through New Mexico is silt-laden and erratic, making permanent irrigation impractical. In addition, the river's 600-mile flow through Arizona to the Colorado River is fully appropriated.

These appropriations are guaranteed under the Gila Decree and the *Arizona v. California* Decree. The 1935 Gila Decree recognized the early irrigation activities of both Indians and non-Indians and established rights and priorities for those lands. The 1964 Supreme Court decision *Arizona v. California*, in one of its actions, limited water rights in tributaries that would harm water rights on the Colorado River. One of those tributaries is the Gila River Basin.

The *Arizona v. California* decision also revived water development under the Central Arizona Project (CAP). The CAP—started in 1944 but tabled during the litigation—was designed to provide Colorado River water to six counties in Arizona and New Mexico.

The CAP also changed the Gila's fortunes. In 1968, as part of the CAP, Congress increased New Mexico's share of Colorado River water by 18,000 acre-feet and allocated rights to this water to New Mexico. A city with a population of 50,000 uses about 15,000 acre-feet of water a year. But because it is not feasible to pipe water from the Colorado River to the Gila Basin, the allocation was authorized as an exchange.

In the exchange, 18,000 acre-feet of Gila River water will be held back in New Mexico, according to Bill Miller, staff engineer, New Mexico State Engineer Office. That 18,000 acre-feet will be subtracted from the amount of Colorado River

water available to CAP users. To allow for the exchange, Congress also authorized construction of a dam and reservoir, originally proposed at Hooker, a site north of Cliff, but now targeted for Conner, north of Red Rock.

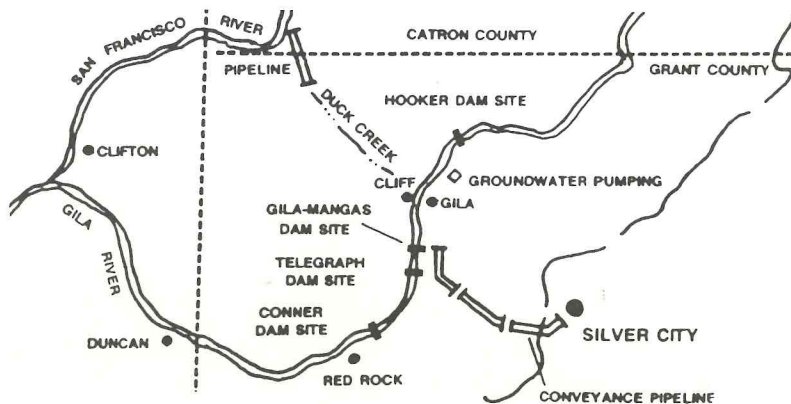
Miller said the exchange will be allowed only if it does not cause economic injury to downstream water rights in Arizona. "The tough part," he said, "will be convincing these downstream users that the exchange won't affect their rights."

"Legally," Miller said, "Arizona's needs must be met first because they hold senior rights. The only water left for New Mexico will be flood water."

down on the river, "it would stop flooding after the fact."

The real beneficiaries of the stored water will be municipal users. Silver City, the area's largest city, now has a moratorium on new water wells. With the availability of more water, Silver City could buy the 6,000 acre-feet of water necessary for its projected growth.

Not everyone is sold on the dam. Although cost and environmental objections to the Hooker site have shifted attention to the Conner site, the environment still is a concern. The proposed Conner Dam would inundate about 20 miles of channel upstream and create a 110,000 acre-foot reser-



Proposed Gila River Dam Sites. Courtesy Albuquerque Journal.

"In a way, Bill Miller is right," said Joseph Smith, team leader for the Bureau of Reclamation in Phoenix. "Taking only the flood supply ensures that the senior rights holders get their supply."

He explained that the Bureau of Reclamation computes dam storage capacity based on flood flow records. "We look at how the river flowed in the past, and then sized the reservoir to hold this flow." Preliminary estimates show the dam will need about 110,000 acre-feet in storage to produce 18,000 acre-feet a year.

Although the area has a history of flooding, the latest in December 1984, flood control is not the dam's main purpose. Miller said the Conner site is so far

voir. While the site is not a designated wilderness area, it does contain a federal bird sanctuary. An environmental impact statement will be required before construction begins.

Miller said the dam would require some environmental trade-offs. "The dam will have an impact on native habitat and the bird management area, but the reservoir will be good for sport fishing. A lot of people may not agree, but that has been the case in nearly every dam construction."

Smith estimated the dam will cost about \$70 million, depending on the final site. If Bureau of Reclamation plans stay on schedule, construction could begin as early as 1988.

Water symposium draws near

The WRRI will present a wide-ranging perspective at the "Water and Science" symposium Feb. 15. The meeting will be held at the Macey Center on the New Mexico Tech campus.

Keynote speaker Russell Brown, a staff member of the Senate Committee on Energy and Natural Resources, will talk on the ties between science and policy.

In the Water and the Weather session, Bernie Silverman of the Bureau of Reclamation will talk about weather modification. Then, Stanley Cook of the Soil Conservation Service will discuss snow survey forecasting. Abdul Sattar Al-Dabagh of New Mexico State University (NMSU) will talk about flow forecasting.

The Water Management session will feature NMSU researchers Peter J. Wierenga, discussing drip and trickle irrigation; Robert Hulsman, irrigation scheduling and surge irrigation; Bill Melton, water efficient crop development; and Gregory Phillips, genetic engineering for drought tolerance. Also, Kyle Schilling of the U.S. Army Corps of Engineers will discuss water management for conservation.

The Ground Water Recharge session will feature New Mexico Tech geoscientists Daniel B. Stephens, talking about physical aspects of ground water recharge; and Fred Phillips, discussing chemical considerations in ground water recharge. E.P. Weeks of the U.S. Geological Survey will close with a talk on artificial ground water recharge.

Due to room limitations, Symposium attendance is limited to 100 persons. To register, call the Institute at (505) 646-4337. The registration fee of \$25 includes attendance, proceedings and lunch. The student registration fee is \$10.

Handbook helps in water conservation

The New Mexico Solar Energy Institute is offering a handbook designed to help communities plan water conservation projects.

The handbook, available in limited supply, is a storehouse of information on planning a community water project, recruiting volunteers, and conducting workshops and school education programs.

Also included in the handbook are instructions on how to make up a conservation kit.

The handbook was prepared by the New Mexico governor's office

WRRI on KRWG

The WRRI's research program at New Mexico State University will be highlighted in four half-hour programs on KRWG-TV's "Interface" series. The first WRRI segment will be aired Friday, Feb. 15 at 7:30 p.m., with other WRRI segments scheduled the third Friday of each month.

"Interface" can be seen at 7:30 p.m. every Friday on channel 22 (cable channel 3) in most Southern New Mexico cities. For other areas, check local Public Broadcasting Station listings for proper UHF, VHF and cable channels.

in conjunction with the McKinley Area Council of Governments and funded by the New Mexico Interstate Stream Commission and ACTION, a federal volunteer service agency.

Also available in limited supply is a brochure entitled "Thirty Water-Saving Tips for the Home." Both the handbook and brochure are free. To order, write: Paul Rowland, Education Specialist, New Mexico Solar Energy Institute, Box 3SOL, Las Cruces, NM 88003.

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the divining rod

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