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**Feature article**  
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## The Battle for the Verde

by **Tony Davis**

### Will a new pipeline dry up one of the West's last free-flowing streams?

Clarkdale, Arizona -- A 200-yard-long trail leads from Mayor Doug Von Gausig's home to the Verde River. Just as he steps outside, a female hummingbird darts into view. A red-tailed hawk, best identified by the black on the leading edge of its wings, soars overhead a few minutes later.

As he reaches the river, violet-green swallows skim the water's surface, and a great blue heron flies upstream out of a treetop. The river is grassy and lined with cottonwood, willow and Arizona ash, as well as non-native saltcedar and the Asian tree of heaven. Von Gausig has seen 175 species of birds on his property in the five years he's been here. But the Verde is more than bird habitat. The river is a touchstone for people who live near it, he says, "a place to spend time in, something beautiful, something that brings peace to their lives."

The Verde is also ground zero in a water war that pits the Verde Valley's communities against Prescott, Prescott Valley and other cities to the west. Later this year, the picturesque city of Prescott — which has been growing at rates that give new meaning to its motto, "Everybody's Hometown" — hopes to start construction of a 36-inch-diameter, 30-mile-long pipeline to take groundwater from the Big Chino sub-basin north of the city to supplement its own aquifer, which has been declining for decades. The pipeline has spurred widespread fears among valley residents that it could lower the water table enough to dry up the Verde River's first 25 miles — the stretch that leads almost to Von Gausig's home — and greatly reduce flows further down the river.

City and some county officials strongly deny the charge, and the dispute has escalated from there, with dueling hydrologists producing studies and counter-studies while major environmental groups and one of Arizona's oldest and most powerful utilities threaten lawsuits.

Though the proposed Prescott pipeline put the Verde on last year's American Rivers' list of endangered waterways, it's hardly the only threat the river faces. In the Verde Valley itself, growth and drought have triggered sharp declines in the aquifer that feeds the river, forcing many local residents to deepen their wells. Back in the Big Chino — a juniper-covered grassland now used mainly by farmers, ranchers and a small number of exurbanites — groundwater pumping for planned developments of up to 39,000 homes could also harm the Verde.

Rapid growth is colliding with limited water supplies across formerly rural Arizona, from Sierra Vista and Kingman to Flagstaff and Williams. The trend is hardly limited to Arizona; inspired by growth and worries that global warming could reduce future precipitation, billions of dollars in water projects are on drawing boards across the West, with Montana and Wyoming and Nevada and Utah arguing over access to surface and groundwater and California looking at new dams to bolster its water-storage system. But Arizona recently became the country's fastest-growing state, with a population expected to top 14 million by 2040. And few places in the state are growing faster than the Verde River watershed, making the water war there particularly volatile as the pipeline's projected 2009 completion date nears.

The Verde brouhaha could end the way other Western water disputes have played out — with a hunt for supplies to be imported from far, far away. The federal government has done preliminary studies on shipping Colorado River water south from Lake Powell or east from Lake Mead to Flagstaff and Williams, north of Prescott and south of the Grand Canyon. An advisory committee is starting to look into similar notions for Prescott.

On the other hand, if some environmentalists have their way (which would be something of a surprise in rural Arizona development disputes), there could be at least a temporary limit on building permits in the Prescott area.

But today, no one knows precisely what effect Prescott's pipeline or growth will have on the river. Some answers will come after the state and federal governments finish a regional computer groundwater study, which isn't expected to be complete for at least 18 months. For now, though, people on both sides of the 7,800-foot Mingus Mountains can only speculate about their water future — or head for court.

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About 20 miles north of Prescott and 19 miles south of the start of the proposed pipeline, a series of springs lies just below the unincorporated settlement of Paulden. The springs feed an intermittent, narrow stream no more than a few inches deep. An even narrower stream, Granite Creek, dribbles into the river at that spot; there is barely any water at the confluence. Still, birds abound.

Early last fall, three turkey vultures flew high above the cliffs — colored with alternating bands of tan, white, brown and gold — that soar 200 feet above this stretch of the river. A black-headed, white-bellied black phoebe hopped down from one willow tree to another, then jetted away. A belted kingfisher, white with a blue-gray head and breastband, flew out of the water and lit on a willow. The river disappeared into the sand every few hundred feet, then returned to the surface. Cattail grasses glistened in the sun, and cottonwood trees towered, 40 and 50 feet tall, at the river's edge.

A mile or so downstream of the headwaters, watercress fills the river, now 30 to 40 feet wide. By the time it hits the Verde Valley 25 miles to the south, the river is a mile wide in some places, red rock cliffs providing a stark, craggy backdrop.

The Verde travels 170 miles across central Arizona before it joins the Salt River, slicing through a series of geologic formations that range from a few million to 1.8 billion years old. Until it hits Horseshoe Dam 60 miles northeast of Phoenix, it is a free-flowing stream — one of the last in the desert Southwest. It is much wider and deeper than its more famous counterpart to the south, the San Pedro River, which runs north from Mexico through southeast Arizona. The Verde can't match the San Pedro's 450 individual bird species, but its concentration of breeding birds — more than 1,000 pairs per 100 acres, in mature cottonwood stands — is one of the highest in North America. The river plays host to eight native fish species, including three that are federally protected as endangered and threatened.

Home to Prescott and its neighbors Prescott Valley and Chino Valley, Yavapai County has long been one of the country's fastest-growing rural areas. Mild temperatures, sweeping vistas, clear skies and surrounding mountains have made the Prescott area a retiree haven. *Money* magazine named it one of the U.S.'s top five retirement communities just last year.

Prescott has a substantial and charming downtown, complete with an historic courthouse square, one side of which houses a string of bars known as Whiskey Row. But toward the fringe of Prescott is its faster-growing neighbor, Prescott Valley, where strip centers, real estate signs and freshly bladed subdivisions-in-progress dominate the landscape.

Incorporated in 1978, Prescott Valley has an auto dealership built into a hillside overlooking the main drag. Its economy is fed by growth: About 33 percent of Prescott Valley's sales tax revenue comes from the sale of new buildings, and 15 percent of Yavapai County's jobs are in construction. (The statewide average is 9 percent.)

By 2050, the Verde River Basin — which takes in both the east and west sides of the Mingus Mountains — is expected to be home to some 540,000 people. That doesn't include the planned developments in the Big Chino, only now starting to shape up, which could add

tens of thousands more. Today, the entire county has about 220,000 people, two-thirds of them in the Prescott area. But people on both sides of the basin are already draining the aquifers that feed the river.

The Verde Valley cities east of the Mingus Mountains — Clarkdale, Cottonwood and Camp Verde — currently use nearly twice as much water each year as Prescott Valley and its neighbors west of the mountains, federal records show. Much of the Verde Valley's water use involves irrigation for alfalfa farms. Some of that water — by one estimate, as much as 50 percent — returns to the river after it filters through fields and pastures. But even excluding agriculture, the valley today still slurps down about as much water as the Big and Little Chino sub-basins serve to Prescott and its neighbors.

As he walked downriver this spring, Clarkdale Mayor Von Gausig stopped at the Cottonwood Ditch, a 12-foot-wide irrigation canal gushing with river water being diverted toward neighboring alfalfa fields, lawns and gardens. It's one of 20 ditches in the Verde Valley that have the right to take as much water as users want — with no monitoring by local or state officials.

The Cottonwood Ditch Association has built a 10-foot-tall earthen berm two-thirds of the way across the river to funnel water into the ditch. In recent dry years, the association has extended the dam across the riverbed to catch even more water, at times leaving the river dry for the next quarter-mile. The last such dry-out came four years ago and lasted several weeks; it turned the Verde's fate into a public controversy, Von Gausig said. "They (the irrigators) realize it's politically a bad thing to do," the mayor said. "I think people didn't realize it could happen. They were shocked."

There's no systematic study showing how far or fast the water table is dropping beneath the Verde Valley. But Nathan White, who has drilled private home and business wells in the valley for 30 years, said that he's been deepening wells about 200 feet in recent years because of falling water levels.

One of his customers last year was Richard Adams, a physician who moved from Phoenix to Clarkdale in search of a small-town atmosphere in which to raise his son. A year ago, Adams noticed the household water pressure dropping suddenly and repeatedly after he turned the water on. His home, in the high desert about a mile from the river, is outside the Clarkdale water system, so Adams paid White \$12,000 to deepen his well from about 280 to about 600 feet deep.

Today, Adams is anxious about the future of his well and his home, worried not just about continuous growth in the valley but also about the Prescott pipeline. "We may be some of the first people (in Arizona) to confront the reality of running out of water," Adams said.

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The Prescott area lives under stricter water-use rules than the Verde Valley because it lies inside an Active Management Area, one of five in Arizona governed by the state Department of Water Resources. By Arizona law, such areas are supposed to reach "safe yield" — that is, a situation in which the area recharges groundwater at the same rate it is being pumped — by 2025.

But in the Prescott area, water levels have dropped at least half a foot each year going all the way back to 1982, and more quickly since 1994 — anywhere from 1.5 to 4 feet a year. Today, the area is pumping its groundwater supplies almost twice as fast as they're being replenished.

In January 1999, the state water agency declared that Prescott and the neighboring cities of Prescott Valley and Chino Valley were "mining" groundwater (that is, taking more from aquifers than was being replenished). The decision meant that all new subdivisions in the management area would be restricted in how much groundwater they could use. But the ruling hardly meant that growth would stop.

In the preceding three years, local governments had issued "plats," or formal approvals, for new subdivisions that will hold 32,106 homes — enough to double the management area's population, state records show. About two-thirds of those were issued during a four-month window, legally built into state regulations, between the date that the water department

tentatively declared the basin to be mining groundwater and the time that the state made its final water-mining declaration.

With those homes exempt from the water-mining restrictions, another 10,000 acre-feet of water can be pumped each year that otherwise would have stayed in the ground. The additional water is almost 15 percent more than would be supplied by Prescott's planned pipeline from the Big Chino.

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If any single person has symbolized Yavapai's expansion, it is Carol Springer. A former state treasurer and legislator, a retired real estate broker, and now a Yavapai County supervisor, Springer, 70, has long been at the forefront of a powerful property-rights movement that has pushed hard and generally successfully against almost any statewide regulation of development.

Springer's worldview is clear. A Republican, like virtually all Yavapai political leaders, she has a history of fiscal conservatism that she traces to raising five kids as a single mom. She originally was spurred to run for the Legislature back in the 1980s by her predecessor, who had voted for a tax increase as a recession loomed.

But in 1992, she pushed a bill through the Legislature authorizing the Prescott pipeline, which now stands to cost sponsoring cities \$192 million — not counting interest. Her bill authorized Prescott to tap water from the Big Chino sub-basin, which lies north of the Little Chino sub-basin where the city has historically sunk its wells. Twelve years later, Prescott paid \$23 million to buy a ranch in the Big Chino to obtain its water rights.

Springer's bill created the only exception anywhere in Arizona to a previously approved ban on inter-basin water transfers — a law aimed at preventing one region from stripping another of its water resources, Chinatown-style. Her explanation for the need for the transfer is that a community must “grow or die.”

“If we can't grow at all in the future, because we lose our right to pump groundwater, we will cease to exist,” Springer said. “There is no such thing as a static kind of a situation in terms of a community. You can't not grow at all and survive. We have to have some element of growth.”

The Big Chino transfer bill wasn't Springer's only political effort relating to water supplies in the Verde Basin. Just last year, she chaired the group behind a successful statewide “takings” initiative that requires compensation of any landowner who can prove a new regulation reduces his property value. Some say the initiative could make it harder for the state to regulate development in rural areas with inadequate water supplies.

And in 1994, she co-sponsored a bill that allowed Arizona landowners to split their lots into as many as five pieces — up from three in the past — without having to gain approval for a formal subdivision. Because lots created in this way usually require their own water wells, this bill also nurtured a proliferation of “exempt” wells across rural areas — that is, wells that pump no more than 35 gallons a minute, but have no metering or regulation of their water use. As of this March, Yavapai County had more than 27,000 exempt wells — more than any other county in the state — and was getting 400 to 500 new ones each year. At least 2,500 exempt wells lie within five miles of the springs that feed the Upper Verde.

Critics accuse Springer and like-minded local officials of being “addicted” to growth. She responds that growth is inevitable, and she is simply trying to accommodate it. Many local residents have been scared into believing that the area has a water crisis by “extremists who preach doom and gloom,” she says.

“It's getting harder and harder to get out a reasonable message that we have enough water in Arizona to serve our population and to serve reasonable growth. The water is not always where people are, so getting it involves the expense in transporting it. Those kinds of issues we are going to have to continue to deal with.

“But at this point in time, we have no immediate crisis.”

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Chip Davis is also a Yavapai County supervisor and a Republican, but that's where his resemblance to Springer stops. Springer represents part of Prescott and rural areas to its northwest, including the Big Chino Basin; Davis is elected from the Verde Valley. He was raised in a ranching family that has run cattle amid the mesquite and catclaw along Blind Indian Creek, about an hour's drive south of Prescott, since the 1880s.

Rather than Springer's "grow or die" view of development, Davis, 48, said his approach is to "build what you are capable of sustaining." He makes a point of saying that he believes that rangeland is still rangeland, not subdivisions waiting to happen, and that he doesn't believe growth in rural areas is inevitable. It's not just water that he sees as a potential limit to growth; he thinks it's unfair to saddle taxpayers with the bill to extend public services into "the middle of nowhere."

"I was raised with the idea that if you take care of the land, the land will take care of you. I think God's beauty is a heckuva lot nicer than man's beauty," Davis said.

Springer's water-transfer bill passed with almost no opposition because in 1992, he says, people didn't understand the connection between the Big Chino aquifer and the Verde River. "Arizona is a fairly young state, and people in rural Arizona were not as sophisticated and experienced," Davis said. "We were not aware of the bill. There wasn't much media coverage.

"In a way, it's refreshing now. Ten years ago, there wasn't a water issue in rural Arizona. There was actually a water issue, but people didn't know about it. Now, they do."

One of the reasons people know about it now is Laurie Wirt, an outsider who hammered home the connection between the Big Chino aquifer and the river. Wirt was a geochemist for the United States Geological Survey who had been studying the Verde on and off since the early 1990s. Working out of the agency's Denver and Tucson offices, she was also a river-lover who had rafted the Verde repeatedly and was concerned that it would suffer the same fate as the Santa Cruz, Gila, Rio Grande and other Southwestern rivers that had dried up or lost much of their flow due to pumping, cattle grazing and diversion. She was killed last June in a rafting accident in northern Colorado at age 48, only a few months after publishing the last of several studies of the Verde linking its water supply with the Big Chino.

Wirt had collected samples on the Verde off and on since 1991, and, as her friends in the scientific and environmental communities note, she was above all a scientist. But she was of a different stripe than the average government researcher, taking an activist approach with her research, recalled Steve Monroe, a former survey hydrologist who rafted and worked with Wirt as far back as the early 1990s. She met regularly with citizen groups to talk about the Verde and donated money to the Center for Biological Diversity, an environmental group that has been fighting to stop the Prescott pipeline.

"She saw the connection between the science and social issues and political issues, and that's not normally the mission of U.S.G.S.," said Monroe, who now works for the National Park Service. "A lot of times people look at U.S.G.S. as an objective scientific agency. Some people take it a little further."

Through the 1990s, scientific disputes over the Big Chino's link to the Verde waxed and waned. Back in the mid-1970s, water-level data gathered by U.S.G.S. showed that groundwater in the Big Chino flowed directly toward the river. But in 1991, a study done for Prescott concluded that a clay layer in the Big Chino blocked its groundwater from reaching the Verde. Three years later, the U.S. Bureau of Reclamation published a study contradicting the Prescott study, and the clay-layer theory has since been generally discredited.

In 2000, Wirt and retired U.S.G.S. hydrologist Win Hjalmarson, an outspoken critic of the pipeline plan, collaborated on a report that combined isotope analysis, stream flow and rainfall records, groundwater documentation and geologic information to conclude that at least 80 percent of the Upper Verde's flow came from the Big Chino.

They didn't have much money, so Wirt, then based in Denver, flew to Arizona to work on her own time and raised money to publish their report. Their work refuted a 1997 study by

Arizona State University that said the Verde's prime water source was Big Black Mesa north of the river. The groundwater level on the mesa was slightly lower than at the springs feeding the Verde — "strong physical evidence" that the mesa wasn't a source, they wrote.

Six years later, Wirt and two U.S.G.S. colleagues produced a more detailed report that said up to 86 percent of the Upper Verde comes from the Big Chino. To pin down the origins of the river water, she had water from the river's springs, the Big Chino and other places in the area analyzed for elements such as lithium and boron that appeared in the rocks, and for various isotopes of hydrogen and oxygen, to date the water and determine how long had it taken for it to move from one spot to another.

Neither report was popular in Prescott, and the Arizona Department of Water Resources published a highly critical review of the first one. But in 2005, Department of Water Resources hydrologist Frank Corkhill wrote that the second study is a valuable reference tool for future research. In an e-mail this spring, he said Wirt's 80 to 86 percent figure lies within the "possible range" of contributions from the Big Chino to the river.

Prescott and Prescott Valley last year commissioned a separate review of Wirt's 2006 report. Prescott Valley water director John Munderloh said that though consultants found numerous errors and omissions in Wirt's study, they didn't take issue with the 80 to 86 percent figure. "It's important to point out that the Laurie Wirt report isn't an impact study. You can't use that report to come to the conclusion" that the pipeline will dry up the river, Munderloh said.

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Shortly before Wirt drowned last June, she warned — in public speeches and in private correspondence with pipeline critics — that she was concerned the pipeline would dry up the Verde. This drew criticism from pipeline supporters who felt she was stepping beyond the bounds of science.

Prescott officials asserted that the odds are low that pumping water from the Big Chino sub-basin will greatly impact the Verde, because the city-owned ranch where the pipeline will start lies 19 miles from the springs that feed the river. The city's groundwater model predicted a water table decline of only 77 feet over 100 years, far too little to cause significant water-level reductions so far away, said Jim Holt, Prescott's water resource manager.

The city and town are installing an extensive network of monitoring wells in the Big Chino Valley that will allow them to keep tabs on groundwater levels every 15 minutes. To reduce the pipeline's effects, the city has also bought and retired 3,600 acre-feet of water rights historically used for area farms, Holt said.

But Jim Holway, a former state water official who was heavily involved in the Prescott disputes back in the 1990s, said he had little doubt that drawing down the Big Chino aquifer would have an effect on the river, particularly when the pipeline is combined with new housing developments pumping away in the area. "There's only so much water there — we can't both move it and develop there at the same time without creating a significant overdraft problem," said Holway, now associate director at Arizona State University's Global Institute for Sustainability.

Victoria Langenheim, a geophysicist who collaborated on Wirt's second study, said she is sure the pipeline will eventually have an impact on the river. The question is when. "All the water level indicators do suggest that groundwater there is moving towards the river. If you pump water out of it, it will affect the springs," she said. The pipeline proposal has sparked threats to sue from both the Center for Biological Diversity and the Salt River Project, a Phoenix utility that gets 30 to 40 percent of its surface water from the Verde and whose rights to the Verde date back a century.

In 2001, SRP President William Schrader wrote the mayors of Prescott, Prescott Valley and Chino Valley (which later dropped out of the pipeline project) that their plan was precipitous and unwise. "It is our intention to make you aware of our opposition to your pumping proposal right now," Schrader wrote. "If you choose to continue on with construction of the pipeline, despite our express opposition to it, you will do so at the financial risk of the cities and towns."

Today, Salt River Project officials say their basic legal stance hasn't changed, although they don't know when they might sue if the pipeline goes forward. They've installed a gauge at the river's headwaters to monitor the river's flow and have told Prescott officials it would be good to get a mitigation plan in place before they start pumping groundwater.

"The cone of depression (the area where the pumping of groundwater lowers the water table) is eventually going to reach the river — it's just a matter of time," said Dave Roberts, SRP's manager for water rights and contracts. "As you withdraw more water, the cone just expands further and further outward from the place of pumping."

Center for Biological Diversity officials say it will sue to protect Southwestern bald eagles living along the Verde and critical habitat for the threatened spikedace minnow, if Prescott-area cities get federal permits needed for the pipeline. Some of the center's legal clout will depend on the success of two separate efforts in court: one seeks to prevent the U.S. Fish and Wildlife Service from delisting the Southwestern bald eagle when it removes the rest of the Lower 48's eagle population from the endangered species list; the other would force the Service to list the roundtail chub that lives in the Upper Verde as endangered.

The group hopes, however, that Prescott and the other cities will work with the Service to produce a mitigation plan before the pipeline starts operations, said Michelle Harrington, the center's rivers program director. "If they can pull together water that would go back into the aquifer to replace what they are taking out, if they can cobble together a plan that shows they are going to protect the aquifer and outflow to the river, then we wouldn't have anything to fight them over," Harrington said.

Since the lawsuit threats first surfaced, the pipeline furor has grown. The cost of the project has mounted from \$30 million to more than \$190 million, plus interest on bond sales. This year, Prescott officials acknowledged they still must acquire rights of way for the line from 160 property owners along the route. The right-of-way issue clouds the pipeline's construction timetable, although officials said they still intend to open it in 2009.

County Supervisor Tom Thurman said he feels confident that the pipeline will not be stopped, but adds, "I never say never anymore." If the pipeline isn't built, the only way he can see Prescott ever coming into compliance with the state's water laws would be to tell one-third of Yavapai County's population to move out and bulldoze their homes.

"That is not feasible, of course," he said.

The pipeline faces another obstacle. Its backers must prove to the state that the wells feeding the line will tap into an assured 100-year water supply. Such assurance will be difficult to make, given the presence of neighboring property owners who are eyeing Big Chino water, led by a Missouri investment firm that has asked the state to certify that water is available for the future development of the 30,000-acre CVCF ranch.

No formal development plans have been announced, but the CVCF's owners have sunk \$1 million into test drilling to learn more about the water supply. The owners of the 51,000-acre Yavapai Ranch, which hired a Phoenix firm as a development partner, are still finalizing a land swap with the U.S. Forest Service and don't know precisely how many acres they'll have to develop in the Big Chino area. But they expect to submit a development scheme to the county in two months.

Meanwhile, Verde Valley and Prescott-area officials — who would seem to have reasons to limit Big Chino development — can't even agree on how to cooperate.

They are in a verbal slugfest over the Verde River Basin Partnership, a group of local, state and federal officials, nonprofit groups and community activists that is supposed to conduct scientific studies about the river's future. The group was created by a land-swap bill, pushed through by U.S. Sen. John McCain, aimed at trading tens of thousands of acres of private land owned by the Yavapai Ranch for tens of thousands of acres of Forest Service land in the area.

Despite the endorsement of McCain, a Republican, the Prescott-area cities and Yavapai County government have quit the group or refused to join, partly out of what they say is concern that it is held captive by "special interests" out to stop growth and the pipeline.

They've formed their own Upper Verde Watershed Protection Coalition to look for ways of mitigating the pipeline's damage to the river — should it occur.

The group-related conflicts burst into the open at a meeting of the watershed protection coalition late in March. An audience member asked if the coalition had considered the science developed by the Verde partnership in drawing up the coalition's mitigation plans.

"I don't recognize what the partnership is doing," shot back a brusque Springer, seated at the front of the meeting room with other coalition representatives.

Prescott Valley's Munderloh, standing to the side, interjected diplomatically that "coordination with other groups will be a key aspect of what we're doing."

"Good for you for giving the politically correct answer," Springer told him.

All the same, if there were any hope for a water ceasefire, it would seem to stem from shared opposition to the planned mega-developments on the grasslands northwest of Prescott.

Prescott officials who favor the pipeline, for instance, agree with environmentalists that the mega-developments could threaten not just the river but the water supplies that cities need for their growth. Verde Valley leaders, on the other hand, hope that officials on both sides of the mountain can quit throwing "grenades" and unite to stop the Big Chino projects. But one key official may not be sympathetic to growth limits of any kind.

Opening a huge map of Yavapai County, with public lands colored in black and private lands colored white, Springer pointed to the only large section of white that's still vacant: more than 800,000 acres in and around the Big Chino basin. At the county's current zoning requirements, that's room for 400,000 new homes.

Since only 25 percent of the county's land is privately owned, Springer said, "I don't think it should come as a surprise to anyone where this growth will occur and why we have to accommodate it."

Right now, there's not much local governments can do about the development plans, except to try to raise money to buy the land. Arizona law doesn't allow counties to reject new subdivisions in rural areas for lack of water. A bill is moving through the Legislature to give counties that authority, but it would require a unanimous vote by county supervisors to adopt the rule. Springer has already come out against the bill, making it highly unlikely that any Yavapai County subdivisions would be turned down.

Arizona Department of Water Resources director Herb Guenther is wrestling with what he sees as a dysfunctional water management scheme in the Prescott area — a scheme that's underpinned by the state's failure to require adequate water supplies for development in rural areas. He sees the entire region in denial about the problems caused by the overdrafting of groundwater. He calls the Prescott pipeline nothing more than an interim solution to the region's water problems.

The groundwater model study being developed by the U.S.G.S. could provide answers to many of the questions now being raised. The model will plug in a just-finished set of growth projections for Yavapai County and try to determine how fast groundwater moves from one place to another, to get a better handle on how quickly the Verde could be lowered by pumping.

"Nobody knows what they've got up there," Guenther said in an interview. "There is no committed water supply. There's nothing to say that a basin has X number of acre-feet to support X number of people for 100 years. Another problem is that we are only looking 100 years ahead."

Now 66, Guenther can still recall his high school days in Phoenix back in the 1950s, when he gave a talk to the Future Farmers of America. He uses an experience with his senior class project — the irrigation of a barley pasture with ditchwater — as a metaphor for Arizona's current water wars.

The barley fields lay in what's now a highly urbanized area of Northwest Phoenix. After he turned the ditchwater onto his fields from a headgate, he would run along the property, closing side gates leading from the ditch to other pastures and homes, so they couldn't get

access to the barley field's water.

But by the time he got back to his pasture, homeowners along the ditch route had reopened the side gates, "borrowing, actually stealing your water," and leaving him with barely a trickle.

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