

## **The Water Wars of Arizona -NYT**

Attracted by lax regulations, industrial agriculture has descended on a remote valley, depleting its aquifer — leaving many residents with no water at all.

By Noah Gallagher Shannon

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Early one morning in July 2014, Lori Paup awoke in her new home in the Sulphur Springs Valley of Arizona and began unpacking boxes of clothes, hanging photographs and prepping the day's home-schooling lessons for her two teenage children. Paup, who until a few days earlier had never been to Arizona, was exhilarated to have finally arrived at the house on East Hopi Drive — a blue two-bedroom trailer on two acres of land — but also exhausted. The move from Fallentimber, Pa., where the family lived for 15 years, required a cross-country trip in the semi-truck that Lori's husband, Craig, drove for work, and now a long list of chores awaited. Outside, the day was already north of 80 degrees. Lori was just beginning to fill a glass of water when she noticed the stream from the faucet was cloudy and brown. "The water looked like the desert surrounding the house," she said. "The same color." Running her hand under the stream, she found what appeared to be small grains of sand.

A small woman with a tight smile and a bright orange streak in her hair, Lori was immediately unnerved by the sight. Like all homes in the valley, where there are no reservoirs or rivers, the Paups' house drew its water from a private well drilled into the underlying aquifer. According to the real estate listing, the well reached a depth of more than 300 feet. Lori, who is 51 and a mother of five, reminded herself of this when, a few moments later, the sand appeared to clear and the water again looked normal. Busy with other projects, she scribbled a note to call the previous owners, figuring there was dirt clogged in the kitchen pipes. Soon enough, she forgot about it.

A few days later, Lori and her daughter Amy were doing laundry when the washing machine stopped filling with water. Then, a few hours later, the dishwasher conked out, too. Craig, who had serviced his own diesel truck for some 20 years, inspected both machines but couldn't find anything wrong with either. It was the pipes feeding them that seemed to be the issue; they merely trickled, then sputtered out sand. Having lived in the rural mountains of Pennsylvania, Craig and Lori were both familiar with wells; they picked the house on East Hopi for its sweeping views eastward to the Chiricahua Mountains but also for the solitude that came with owning a remote piece of property, which was only possible so long as they had their own source of water. But as worrisome as the incidents seemed, they didn't yet form any recognizable pattern. One evening

sometime later, Lori drew a bath and left the room. When she returned a while later, she found the tub stood only half full, the water murky with silt. She watched, over the next few moments, as a thin layer of sand settled along the bottom.

A local driller arrived for an inspection a short while later. Visible from most rooms in the house, the well consisted of a five-horsepower pump, an eight-inch-wide borehole and a screen that filtered dirt and rock from the aquifer's water. Although the well was somewhat old, it appeared to be in good working order, the driller explained, capable of pumping 25 gallons a minute, enough to supply a home many times larger than the Paups'. The stoppages and intrusions of sand, he went on, in all likelihood signaled that the water level had begun dipping below the mouth of the pipe, causing the pump to act as a vacuum for sand. The problem wasn't the well, in other words; it was the aquifer, which had retreated below where the well could reach it.

"You're running out of water," Lori recalls the driller telling them. There was no way of knowing how long the remaining water might last.

Lori was so overcome by panic that she forgot to ask the driller the many questions surging through her mind. When she had negotiated the home's lease-to-buy agreement over the phone for about \$70,000, she took specific care to inquire about the well's water quality. In Fallentimber, they had lost several dogs and donkeys to wasting illnesses that Lori suspected were related to a contaminated water table. But now, as she listened to the driller — and several other experts she later consulted — it began to dawn on her that she had never thought to ask about water/quantity/. It wasn't something you needed to think about in Pennsylvania. "If you were washing your car and dropped the hose and let the hose run, no big deal," she says. "There was always water."

Over the next few weeks, as the Paups asked around, they heard from one neighbor, then a half-dozen more, who had begun finding sand in their water. Soon, at least 100 families from all across the valley had failing or dry wells. On Sept. 24, after scores of angry families demanded action, a regularly scheduled visit from state representatives turned into a de facto emergency water meeting at the Chamber of Commerce. Word of the dry wells had traveled quickly around the state, and Michael J. Lacey, who was then the director of the Arizona Department of Water Resources (A.D.W.R.), made the three-hour drive from Phoenix for the standing-room-only meeting. The politicians had hardly begun to speak when men and women in cowboy hats grew impatient and cut them off, shouting, "Water!" For the next two hours, Lacey tried to retain control as panicked families rose one after another and told their stories.

The Paups didn't attend the meeting, but they needed only to drive a few

miles in any direction to see where their water was going. Stretching outward from downtown Willcox, the hub of the valley, lay a sprawling latticework of recently cultivated farms and nut orchards. Local farmers had watched over the last decade and a half as waves of industrial farms arrived, tilling so much land that dust storms began darkening the sky. These enormous corporations were descending on the valley for the same reason homesteaders had a century ago: the year-round growing season and the lax regulation. Compared with those for rivers and lakes, few laws govern the extraction of groundwater today. Aquifers across the globe are beginning to quietly dry up under the compounded strain of increased food production and a two-decade stretch that now includes the 10 warmest years in recorded history, sending farmers plumbing deeper for deposits of water.

At the meeting, residents accused farmers of sucking the water out from under them and the state of shirking its responsibilities. Lacey, the A.D.W.R. official, argued that the state couldn't put water back into their wells. The only solution for homeowners, the officials explained, was to chase the water downward, by deepening their wells a few hundred feet. The cost of this, residents knew, was \$15,000 to \$30,000 — as much as half the value of some homes in the valley.

With most of their life savings invested in the home, the Paups couldn't afford to move or drill deeper, so in early October Lori and Craig held a family meeting, talking with their children about a system of water rationing, as they watched the well's output dwindle from 100 gallons a day to 50. (The average household in Phoenix uses more than 540.) Showers, they explained, would have to be fewer and faster. They set up buckets to catch runoff and poured leftover dishwater in the toilet. By the end of their fourth month in Arizona, it wasn't unusual for the Paups to go two or three days without running water. Unthinkable just a few months before, a single thought began to occupy Lori's waking hours: "What happens when we run out?"

Water is so crucial to so many aspects of our lives that it can be difficult to grasp just how much we use. The standard unit in farming, for instance, is the acre-foot — the amount it takes to cover an acre in a foot of water — which can seem like a huge quantity or not much at all, depending on how it's used or what comparison you make: 325,851 gallons, half an Olympic pool or 50 bushels of corn. The problem is even thornier below ground. Buried deep within the earth, groundwater is a largely hidden resource but one that supplies 25 to 40 percent of global drinking water. Still, agriculture uses the bulk of it; about 70 percent of water withdrawn from aquifers is consumed by this one industry. Nearly all the planet's freshwater reserves not stored in polar ice lie at depths below 3,000 feet. Together they form one of the planet's largest waterways, a six-quintillion-gallon supply of Ice Age rain and snow that is almost entirely uncharted.

Most North American aquifers lie beneath the Western United States and date back to the beginning of the continent as we know it. Six million

years ago, as the Rocky Mountains thrust upward, rivers gashed deep channels in the crust, separating ranges with basins that gradually filled with eroded rock, trapping water beneath it. One of the largest aquifers in the world, the Ogallala, which runs through eight Plains states, is not a vast subterranean lake, as one might imagine, but a 174,000-square-mile layer of waterlogged earth, moving and twisting through strata of dry rock like a wet article of clothing in the laundry bin. Subject to eons of pressure, every aquifer arranges itself differently, forming vast networks of coves and seams of water, some a thousand feet thick but others just a thin vein. Aquifers are unimaginably complex and incredibly fragile; once tapped, they can take more than 6,000 years to replenish.

Among the most vulnerable aquifers are those underlying the desert basins of the American Southwest. The Sulphur Springs Valley, in Arizona's far southeastern corner, is one such basin. Surrounded on three sides by steep mountain ranges, the valley is an unusually flat and level 1,900-square-mile expanse of sagebrush and tanglegrass, which acts as a massive natural vessel for rain and snowmelt. In geological terms, it is a "closed basin," as none of its water rejoins a river. Instead, it pools at the center, percolating into the ground. Centuries of evaporation have transformed this ancient lake bed into a dry alkali flat, inhabited today by a migratory roost of 30,000 sandhill cranes. Beneath it, buried in layers of sediment, lies all the water that never flowed to the ocean. Some of it is more than 20,000 years old.

Around the turn of the 20th century, when sulfurous water was discovered bubbling out of the ground, cattle ranches and homesteads began to proliferate across the valley. One of the first deep water wells was drilled around 1915, when Texas farmers began adopting the oil industry's turbine pump. Overnight, this innovation allowed agriculture to stray deep into arid climates, and in the span of a generation, the valley became home to a thriving agricultural economy. In the late 1990s, during the first few years of what would eventually turn out to be a 19-year-and-counting Arizona drought, only about 15,000 acre-feet of water were estimated to have percolated into the aquifer each year, while 100,000 were being pumped out; as the valley continued to warm throughout the 2000s and 2010s, with rainfall and snowmelt plummeting, estimates for recharge went unrecorded, as annual pumping soared to 200,000 acre feet. Once, it had been possible for ranchers to develop natural springs into watering holes using only a shovel. Now, after watching water levels drop 100 to 300 feet in 35 years, some farmers wondered how long they could go on.

Until the last three decades, the technology to make detailed maps of these underground waterways did not readily exist. It wasn't until 2015, in fact, that NASA published its first comprehensive study of global groundwater reserves. The mission began in 2002, with the launch of the Gravity Recovery and Climate Experiment (Grace), two satellites that follow each other in orbit, measuring changes in gravitational pull. The

mission's primary purpose was to look at ice-sheet depletion, but over the next several years Dr. Jay Famiglietti, the senior water scientist at NASA's Jet Propulsion Laboratory, and his team noticed that many of the most significant sites of water loss were actually below ground. Of the planet's 37 major aquifer systems, they discovered, 21 were on the verge of collapse. In the Great Plains, farmers had exhausted a third of Ogallala's potable water in just 30 years. In California, the Central Valley aquifer was showing signs that it could drop beyond human reach by the middle of this century. But the worst declines were in Asia and the Middle East, where some of the planet's oldest aquifers were already running out of water. "While we are so busy worrying about the water that we can see," Famiglietti told me, "the water that we can't see, the groundwater, is quietly disappearing."

In the United States, it is disappearing most rapidly in the rural agricultural belt extending from Kansas to California. Without ready access to more traditional stores of water, many farmers have been forced to rely even more heavily on groundwater, pitting them against local residents watching their wells go dry. In 2014, in Tulare County, Calif., 7,000 people ran out of drinking water. The next year, wells hit a record low, as 64 percent recorded declines nationwide and one in 30 failed in Western states. Squeezed by drought and tightening regulations, large farms started to seek out lesser-known pockets of cheap water. In rural Arizona, where there are essentially no groundwater regulations governing irrigation, they found an ideal destination. "What the smart money is doing is looking around and saying, 'Where else can we go where there is no regulation?'" Robert Glennon, a professor of water law and policy at the University of Arizona and the author of "Water Follies," told NPR in an interview. "And that is Arizona."

Arizona was particularly attractive to Middle Eastern farmers. A policy of unregulated pumping on the Arabian Peninsula had, in 40 years, drained aquifers that had taken 20,000 years to form, leaving thousands of acres fallow and forcing Saudi Arabia and others to outsource much of their agricultural production. In 2014, a Saudi Arabian-owned company, the Almarai Corporation, bought 10,000 acres in the town of Vicksburg, northwest of Sulphur Springs Valley, planting alfalfa to ship halfway around the world to feed Saudi cattle. Then, a United Arab Emirates farming corporation, Al Dahra, bought several thousand-acre farms along both sides of the Arizona-California border. These purchases were perfectly legal, but many residents felt these newcomers were essentially "exporting water." At least once, the Sheriff's Department in Vicksburg deployed five deputies to stand guard at a town-hall meeting.

With less rain and snow reaching the desert floor, over pumping has rendered a semi-renewable resource finite, touching off the kind of resource war perhaps more familiar to coal camps and oil boomtowns. Hydrogeologists use the phrase "groundwater mining" to describe situations in which the rate of water withdrawal exceeds the rate of replenishment. For some, the metaphor offers a stark lesson. "If we know

we're mining the water, let's just say it," said Richard Searle, when I visited at his ranch outside Willcox. At 63, Searle still cuts a frontiersman's profile; a cutting-horse competitor and former bank manager, he is descended from a prominent ranching family and formerly served as county supervisor. Part of the reason groundwater mining in the valley hadn't forced a reckoning earlier, he said, was that water was ubiquitous to the point of being invisible. Local farmers were never required to put meters on their wells, he pointed out, which meant that nobody knew exactly how much water was being pumped, much less how much was left. "Long term, people say we should search for a solution," he said, "but they don't want to be the ones to suffer."

Seated at his desk, Searle reached and opened a glass cabinet, lifting out arrowheads and a stone ax blade that he dug out of his ranch over the last 50 years. "You know, we weren't the first ones here in this valley, and we weren't the first ones struggling with water," he said. His face turned pensive, and he spoke for a time about the ancient Hohokam and Tohono O'odham tribes, which traversed this part of the Sonoran Desert for thousands of years without digging deep wells. "But the mining industry isn't a long-term industry," he continued. "Name me a long-term mining community. Ajo, Pearce — those are ghost towns. Pecos was like this: a natural resource mined until the town fell apart around it. If we die, it'll be a slow one. If the whole county dries up, it'll be just a blip on the radar."

\*When the corporate incursion\* to the valley began in earnest, in 2003 or so, local farmers had been mining the aquifer gently for the last 60 years. Even as the amount of irrigated acres more than doubled, from around 40,000 to 100,000, the potential consequences for the valley's water supply weren't yet apparent to them. "I could see acres being planted," said Alan Seitz, who farmed chile peppers and alfalfa for close to 40 years. "It just happened over a period of time." Plain-spoken and self-effacing, with a gray mustache and Stetson, Seitz advises local farmers on pest control, operating his business out of a Ford F-250, which was littered with fertilizer studies and geological maps. He spent most days on the road, covering hundreds of miles as he checked fields. It wasn't uncommon to see farmers shifting growing patterns or fallowing acres; new drilling rigs or freshly tilled acreage didn't excite much chatter. What drew Seitz's interest, in 2010 or so, was the depth to which the farmers were drilling. "Those of us that had been in the valley growing corn, cotton, alfalfa, historically, we couldn't drill deep wells," he said. The cost made it prohibitive. When he saw people drilling down to 1,000 feet or 2,000 feet, Seitz knew straight away that moneyed operations intended to plant nut trees.

Over the previous decade, the price per pound for pecans and pistachios has roughly doubled, driven largely by demand from China. But those nuts, like almonds, require an exorbitant amount of both water and capital to farm. An average orchard can cost more than \$20,000 an acre to clear and raise, in part because the trees don't bear nuts for five

to 12 years. In the valley, where land is a fraction of the price of California's, the principal cost for nut farmers is water. During sapling years, trees consume only about two acre-feet of water a year but grow to require as much as six acre-feet when mature, among the highest of any crop. To ensure a consistent supply of water from an aquifer already plummeting deeper every year, farmers often drill a well every 160 acres, each to a depth of at least 1,000 or 1,500 feet. One farming conglomerate, expanding from Minnesota, bought or drilled 293 wells, some pumping more than 2,000 gallons a minute.

Suddenly, the very qualities of the valley that had nurtured generations of family agriculture — its cheap ground, its lack of groundwater regulation — seemed to threaten its existence. In the span of a few months, Intent to Drill notices increased almost fivefold, as Chase Farms and the National Pecan Company, two of the largest pecan growers in the world, bought and consolidated several thousand-acre farms. Soon, tree-nut orchards blanketed about 20,000 acres, forcing the state to put a six-month moratorium on new farms. (Today, there are 35,000 acres of tree nuts in the valley.) The groundwater had created, as local farmer Ted Haas put it, “a gold-rush mentality,” which in the next five years yielded a dozen new vineyards, as well as 20,000 acres of corn and wheat and 16 greenhouses for Nature Sweet Tomatoes, the country's largest producer. As yearly water consumption doubled, the sands and gravels within the aquifer began to shift and collapse, causing the elevation to sink more than 15 feet in places. About 50 miles of earth fissures ruptured the surface of the valley, even splitting a major highway in half.

To Seitz, the farmers' arrival seemed like a blessing at first. “There's more outside money moving in, and it's great for the area,” he said. “That's good for the John Deere dealership. I'm in the crop-consulting business — if I sell product, it's good for me. It's good for irrigation companies.” But a few weeks after the community meeting, Seitz sent a concerned email to 15 of his clients and business partners. “We need to get together and figure this water thing out,” he wrote. As more farms arrived and more families lost water, Seitz had come to realize that the boom was “good for the area on one hand, but we're still shooting ourselves in the foot.” Most of the recipients were, like Seitz, prominent local farmers who owned modest, family-run acreages with long legacies in the valley.

Seitz knew the responsibility of preventing further groundwater loss would in all likelihood fall to its greatest perpetrators: farmers. He also knew that to do so they would in all likelihood have to accept what their ancestors had come to this corner of the desert to avoid: regulation. Seitz figured that placing some sort of limit on groundwater use was the only way to stabilize the aquifer. It was also the only way to protect farmers who had been in the valley for generations against industrial-scale operations that could simply pick up and move to other untapped seams of water once the valley's aquifer was too deep, salty or expensive to draw from. But imposing regulations on corporate farms also meant imposing regulations on friends and neighbors — and on themselves.

If they were going to save the aquifer, the farmers would have to administer policies harming their own livelihoods.

When the group first met at the Elks Lodge, pushing card tables together, the mood was somber. Coverage of the valley's dry wells had fed months of bad press, strengthening the growing perception that agriculture was stealing water from impoverished homeowners. A local petition was circulating, with 500 signatures, demanding a moratorium on agriculture drilling. With the U.S.D.A.'s recent designation of the county as a natural disaster area because of drought and the A.D.W.R. conducting a survey of dry wells in the valley, government action felt imminent. It seemed to Seitz and the others that if they didn't come up with a solution, one might be imposed on them.

Most groundwater rights in Arizona are still based on the frontier legal doctrine of "reasonable use," which holds that a landowner retains the right to pump as much water as he or she pleases, so long as it's put to a "reasonable use" such as farming. In 1980, Arizona became the first state to pass groundwater reform, effectively deeming groundwater a public rather than a private resource. But in the years since, few regulatory safeguards have extended beyond the boundaries of Tucson and Phoenix. Outside those places, little has changed since statehood in 1912: A farmer needed only to file an Intent to Drill notice and pay a \$150 permitting fee and was then free to pump as much as desired. For valley farmers, growing high-water crops like alfalfa and nuts, this often meant about 2,000 gallons, roughly the capacity of a tanker truck, every minute, 24 hours a day, with only intermittent breaks for several months. In 2017 alone, one farm pumped 22 billion gallons, nearly double the volume of bottled water sold in the United States annually.

For nearly all the men in the room — white and weather-beaten, in late middle age, having spent several decades on horseback — the "law of the largest pump" was the only one they had ever known. But no one in the room needed to be reminded of the challenges they faced: a rapidly warming climate, bottomed-out commodity prices and out-of-state funding that could afford to drill more and deeper than they could. Pinned between corporate farms draining the water out from under them and a community blaming them for it, the men began to speak openly of a future where their children could not live in the valley.

For the next year, the farmers met monthly for four hours, ironing out a proposal for a "withdrawal fee" on agricultural wells — the word "tax," Seitz says, was carefully avoided — plus a freeze on large-scale irrigation and a limit on high-water-use crops. In effect, they would create a management zone, protecting the aquifer, and by extension their own farms, from deep water exploration by new and corporate competitors. They had only just begun to finalize the proposal in the early spring of 2015 when word of the closed-door meetings began to spread. Many felt any restriction on water would devalue property and, worse, deal yet another blow to the declining self-rule of rural culture. Townspeople arrived at committee members' homes at all hours, accusing them of theft.

By the spring of 2015, Seitz feared that the longer they deliberated, the more bad blood would be stirred up. In nearby towns, similar disputes over water turned violent. Already, Seitz had lost several customers, and neighbors had begun turning away from him at the grocery store. One morning he awoke to an op-ed in *The Arizona Range News* accusing another committee member, Mark Cook, of being an outside operator. “I have dug graves, helped bury some 100 old-timers that were homesteaders,” an elderly resident wrote. “I don’t recall any of Mr. Mark Cook’s people in the valley.” (Cook, in response, supplied the newspaper with a list of farms in his family dating back to the 1880s.) In nearby San Simon, calls for a drilling ban provoked several fist fights, some among longtime friends. Farmers felt betrayed to see other farmers, sometimes people they went to high school with, take sides against them. There were even rumors of death threats against those pushing the water proposal.

\*Later that summer, nearly a year to the day after the Paups moved to the valley, the family finally ran out of water. During the winter and spring, the well’s output had been relatively plentiful: Days of rain and a fallow period of growing appeared to have helped recharge the aquifer. Lori found she could use the sink for 10 minutes at a time if she didn’t run it full blast, and occasionally she even treated herself to a two- or three-minute shower. A small swirl of sand sometimes lingered in their drinking glasses, the Paups’ son David said, but otherwise it wasn’t too bad.

But by late May, the start of the summer growing season, it began to take half a day to eke out five gallons, barely enough to flush the toilet twice. Unable to rely on the well’s outflow, Lori began each morning by filling a bucket for dishes, then placing glasses and bowls under each faucet with the tap open, hoping to catch any residual water. She put stoppers in each drain and set up a gray-water station in the kitchen. “We don’t use any water until we need it,” Craig told his kids, who were frustrated mainly by the short showers. It had become commonplace by then for some in the family to bathe only once every four or five days and for scarcely long enough to wash their hair. Trying to see how far they could stretch each gallon, Lori and Craig gave their children incentives to come up with novel ways to conserve. At one point, David rigged up an outdoor shower that used bottled water, warming it up by laying a black PVC pipe across a piece of sheet metal in the sun.

For Seitz and the farmers, watching families like the Paups suffer was by turns exasperating and motivating. Some felt that embracing the desert lifestyle meant learning its tough lessons — one of which, as Seitz says, is “you either drill deeper or you don’t survive.” But others acknowledged that families didn’t have access to the sort of loans and Department of Agriculture support that farmers did. And as summer came to a close, the committee began to think about ways their proposal might assist local families.

A few months later, shortly before the next legislative session, Seitz and five other farmers gathered in a basement conference room at the capital, in Phoenix, to present their proposal. Seven of the original 14 committee members decided against making the trip. After weathering months of phone and email attacks, a few of them had bowed out of the committee completely. One of them later told his brother that he would never serve on a board again. “Would you rather arbitrate water use in the Sulphur Springs Valley or peace in Israel?” his brother asked me. Others simply felt there were too many forces already marshaled against them, including the state’s strong agriculture and ranching lobbies.

Dressed in jeans and cowboy boots, Seitz explained to several state representatives and lawyers that there was clear evidence the aquifer was at serious risk of failure. Given that climate models offered little hope of restoring the aquifer to “safe yield” — in which percolated water and withdrawals are roughly even — the committee instead proposed stabilizing it by limiting water-intensive crops and charging fees for irrigation-related extraction. “If nothing else, we need to slow the decline,” Seitz said. The fees generated by their proposal would be used to fund aquifer recharge, a process by which water is returned to the aquifer through a vast network of soaking pools. But the fund would also go a step further, Seitz continued, by supplying aid to those families who had lost their water supply, like the Paups.

“We felt sympathy for them,” Seitz later told me. “On some level, we know we’re responsible.”

Leaving the capital, Seitz allowed himself to feel, as he put it, only “cautiously hopeful.” Watching the water war unfold seemed to have made some of the state representatives nervous to intervene, and the cattle and ranching lobbies had each voiced vehement opposition to any change in regulation, however regionally focused. Sensing the bill’s probable failure, the farmers stopped at Texas Roadhouse and over rounds of beers took solace in having tried to remedy things democratically. “We don’t want a lot of government involvement,” Seitz told me, “but something like this, on water issues, the government really needs to be involved.” It was the only way to keep neighbors from being pitted against neighbors. A few months later, after the end of the legislative session, Seitz learned the proposal was never drafted into bill form.

Early last December, on a cold and cloudy morning in the desert, I climbed into the cab of Dean Bales’s 1984 Mack truck. Bales is a lean man of 79, with a pencil-thin mustache and the hunched frame of a lifelong tinkerer. For 35 years, he hauled mobile homes in Severn, N.C., until kidney failure from a contaminated well got him fixated on moving West. Watching the crisis worsen in the valley, he was struck by how few had the means to survive the drought, and in 2015 he resolved to start a water-delivery service, retrofitting his truck to carry two 750-gallon tanks. Bundled in a plaid work coat as he started his rounds, he chewed on gummy bears, lodging several in his lip like a tobacco pouch. After

refilling the tanks, we made our way east, passing several trucks hauling tanks of their own, the water sloshing around as it bumped over dirt roads. Before too long, we also began to pass drilling rigs, which towered 50 feet over the road, spewing mud. Some rigs lay barely a quarter mile from Bales's wells, which supplied not only those to whom he hauled water, but the town utility, which served about 30 households. The proximity worried him; he was already paranoid that townspeople were siphoning off his water. "If I'd had any idea what this place was like, I'd never had moved here," he said. On the road, signs warned "25 MPH, Earth Fissures Possible."

For the last few years, Bales's deliveries have been the sole measure of water security for many families in the valley, including the Paups. The 525 gallons that he delivered to them every week or so still required rationing, but the tank's presence brought the Paups their first semblance of normalcy in years. When we arrived at their house, just past 8 a.m., Bales and David Paup went about filling the tank, along with a new thousand-gallon auxiliary one, with the studied efficiency of routine. As the fear of losing water has subsided for the Paups, a sense of fatalism has settled in its place. "When it's all gone, they're going to leave," Craig said, referring to the farmers. "And we're all going to be struck here with what? Nothing."

As the Paups entered their fourth year without running water, they were left with a single inescapable problem: their home. Expenses related to hauling water to their house cost them nearly \$200 a month, effectively increasing their mortgage payment by 50 percent. Little outlays — laundromat, bottled water, air-conditioners — had begun to add up, and Craig had been forced to take month long trucking routes on the East Coast. Unable to recoup the four years of equity they had put into the home and unable to move on without it, they felt trapped. With little possibility of selling the house or seeking redress, Lori and Craig had begun talking about abandoning it. They saw dozens of their neighbors walk off their property over the last few years, including a close friend, Billy Frisbee, whose camper caught fire after his well pump combusted from filling with sand. Many of the empty homes lay just a few blocks away, piles of furniture and clothes still visible inside.

In March, the Paups received an offer to become the caretakers of a ranch one mile away. The ranch consisted of 11 acres, a mobile home similar to their own and a newly deepened well. All the same, Lori was hesitant. "It's hard to know where to go," she told me. "Because there's farming everywhere." Earlier that month, the largest water user in the valley, Riverview, announced plans to double its local dairy operation, adding another 8,000 cows to its 20,000 acres, some of which nearly bordered the Paups' potential new home. Looking at the property on Google Earth, hemmed in by bright green crop circles, Lori felt the move might be a gamble. But so, too, was staying. After discussing it as a family, the Paups left the house on East Hopi Drive in late April and moved to the ranch.

Before moving, the first thing Lori did was walk into the kitchen to test the water pressure. “It was nerve-racking,” she told me, when we talked over the phone a few weeks later. “You’re wondering what might happen when you turn on the sink. What it could mean.” She had been dreading this moment for days. The thought of it paralyzed her. After taking a few moments to collect herself, she opened the tap. Water poured out, crystal clear.

For now, the ranch has running water. But the Paups continue to practice much of the same conservation routine as before: using gray water, taking quick showers. As Lori pointed out, their situation remains, at heart, unchanged: awaiting safeguards, as the aquifer retreats quietly beneath them. “I’d like to be somewhere permanent,” Lori said the last time we spoke. “Eventually.”

In the midst of the tensions in Willcox, the governor of Arizona, Doug Ducey, announced the creation of a water-conservation committee, aimed at groundwater security and reform. Even so, this year only two rural groundwater bills have been introduced in the State House. Each proposed, among other things, to lift regulations, in order to make way for a 7,000-home and a 28,000-home development, respectively, just outside the Sulphur Springs Valley. In a promotional video for one, which boasts vineyards and at least one golf course, the developer calls southeastern Arizona “the best kept secret in the country.”

\*Noah Gallagher Shannon\* is a writer based in New York. He last wrote for the magazine about arroyos, streambeds that flow with water only occasionally.