Water In the Middle Rio Grande: One Observer's View

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What follows are a few thoughts about water in our desert state, the Rio Grande as a semi-underground stream, the laws we have for sharing (or not sharing) it, how man manipulates it like a plumbing system, and the predicaments we've gotten ourselves into because none of these things are considered in concert.

Some Hydrologic Fundamentals

New Mexico is the 3rd most arid state in the nation. It receives an estimated 87.7 million acre-feet of water each year through precipitation and surface flow, but as much as 97% of that moisture evaporates, and we're left with about 1.2 million acre-feet of surface water. In addition, there may be as much as 20 billion acre-feet of ground water, the majority of which is saline and not fit for use. ("Water of Enchantment: A Citizen's Guide to New Mexico Water Law," by Tim De Young)

If you look at a map of the upper Rio Grande Basin, what you see is an outline of high ground. Inside that outline is all the land drained by this single river system. To the west is the Continental Divide; to the north are the San Juan, Nacimiento, Jemez, and Sangre de Cristo Mountains; along the basin's east side are the Sandias, Manzanos, Los Piños, and Fra Cristóbals. Runoff and snowmelt from all of these watersheds form the tributary streams of the middle Rio Grande.

When water moves over a steep gradient, it erodes away pieces of rock and soil, and the stream carries this sediment along with it. The faster water flows, the more sediment it can carry. Once something slows the water down, however, the solid particles settle out, beginning with the heaviest material. This has happened on a very large scale in the middle Rio Grande. As the river comes down out of the narrow confines of the Taos Gorge and past the lava flows of the Jemez region, the landscape begins to open up. The water has room to spread out, and when it does, it begins to drop the sediment it carries. The middle valley from Cochiti to Elephant Butte rests on many hundreds of feet of gravel, sand, and clay brought down from the highlands and deposited by the river's ancestors over some 30 million years.

As the present Rio Grande flows through these valley soils, it penetrates easily because there are spaces between the particles of sand and gravel. For all intents and purposes, the river and the water table are one, and there is far more water below ground than in the channel above. The layers of saturated sediments are called aquifers, and hydrologists are currently discovering just how unpredictable and fractured ours are.

The Middle Rio Grande valley is also blessed with deposits of deep groundwater, meltwater from the time of the last glaciation. In some places, this deep water is isolated and receives no recharge from precipitation or percolating runoff. In other places, it is in contact with the shallow ground water, and thus with the river. This interaction between surface water and ground water is exceedingly important, because the Rio Grande--like any stream--will attempt to fill every void and alleviate every thirst along its course. The river you see is *what is left over* after evaporation, transpiration, and seepage to groundwater have taken their toll.

A Speed Course In Water Law

Just about every stream in the state is fully appropriated. That means every drop of surface water is spoken for, and to continually supply newcomers with even their most basic needs, something, or somebody, has to give some water up.

New Mexico water law is based on two rules that have been employed throughout the West: whoever used the water first has priority in times of shortage, and, water must be put to beneficial use or the right to it is forfeited. The oldest water rights belong to Native American pueblos and tribes, but most of these rights have never been "quantified." In other words, it has never been determined exactly how many acre-feet a specific tribe might be entitled to. Having unknown quantities of senior rights is a problem in a fully-allocated river system, and it has often been said that if tribes were granted all the water they have a right to under federal law, there may be little left for anyone else.

Agricultural irrigation rights are the next oldest. These stem from New Mexico's Spanish colonial days, with some dating back to the late 1600s. There are more than a thousand acequias or community ditches in New Mexico, and they still operate as they did under Spanish law: a governing commission is elected by the landowners who farm along the ditch, everyone does a share of the work required to keep the *acequia* operational, and everyone shares the water--in good years and in bad. The date a ditch was established gives it its priority rank, and that can mean the difference between having water in a dry year, and not receiving any.

In some cases, newer systems have superceded old acequias, and dams have been built to store spring runoff for irrigation later in the season. The works of the Middle Rio Grande Conservancy District extend from roughly Cochiti Dam to Bosque del Apache Wildlife Refuge, and were built in the early 20th Century to consolidate more than seventy acequias with headings on the river, and to drain the valley's exceedingly high water table.

Administering water rights is the job of New Mexico's State Engineer, whose office was created in 1907. Any water in use prior to that date was granted senior status. You will hear these referred to as "vested" rights, or "pre-1907" rights. Anyone who wished to acquire water after 1907 had to apply to the State Engineer for a permit. The largest post-1907 water right holder in this part of the state is the Middle Rio Grande Conservancy District, which applied for a permit to service 123,267 acres in 1930. Some 80,785 of those acres had been irrigated prior to formation of the district, including lands belonging to the Pueblos of Cochiti, Santo Domingo, San Felipe, Santa Ana, Sandia and Isleta. The remaining MRGCD rights are considered junior, but they predate water owned by municipalities such as the City of Albuquerque.

Today, with only so much water and more and more demand for it, a market exists for water rights which have early priority dates. Senior rights are constantly being transferred from agricultural to municipal and industrial uses. Transfers require that land originally served by the water right be dried up in order for the water to be used elsewhere. Theoretically this is a fair

system; in reality, it has had some serious effects, which I will discuss in more detail later.

Another legal rule of great importance in the basin is the Rio Grande Compact. It is an interstate agreement with oversight by the federal government, and it apportions the annual flow of the Rio Grande between the states of Colorado, New Mexico and Texas. Signed in the 1920s, it is very complicated, and in a lot of ways, it is very unfair. Native Americans were not at the bargaining table; neither were cottonwood trees or silvery minnows, and there is no allotment of water set aside for the river. There are those who think the compact should be re-negotiated, but that might not be in New Mexico's best interest: due to their greater population and more diligent efforts to conserve water, Colorado and Texas could quite possibly end up with a larger share of the Rio Grande than they have now, leaving New Mexicans to make do with less.

In addition to the compact, river managers are also bound by an international treaty that allocates 60,000 acre feet of the Rio Grande to Mexico every year. There are arguments for revisiting that agreement, too, because unlike the compact, which bases each state's share on how much water there is in a given year, the treaty with Mexico guarantees our southern neighbor a set amount of water--it's what Mexico gets, no matter how much or how little the river is actually carrying.

And finally, federal laws like the Endangered Species Act and the Clean Water Act have huge implications for our desert river. They weren't even a gleam in Congress' eye when the Rio Grande was apportioned, but today they mandate the flows necessary for species habitat and water quality, leaving management agencies and stakeholders to battle over where the additional supplies will come from.

Plumbing System

Mankind likes to improve on nature, and we've certainly had a field day altering the way water flows in the high desert. In the natural scheme of things, peak flows occur in late spring with the melting of mountain snowpacks. Temporary high flows due to heavy thunderstorms are also possible, generally in mid-summer. The rest of the time, not much more than a trickle remains in the channel, and because of this feast-or-famine hydrograph, humans are forever trying to even things out.

The present day Rio Grande and its tributaries are often likened to a complex plumbing system. There are dams that hold water back for irrigation and municipal use, and dams that control flood water. There are sediment dams to trap silt and clay particles, and diversion dams that shunt water from the river into irrigation canals. Besides altering the natural ebb and flow of the river, we have also confined it to the narrowest possible channel. No longer is it allowed to sweep from side to side across a generous floodplain, because these days, people live there.

A dozen agencies oversee this synthetic system, and their separate missions don't always mesh. Some aren't even recognized as *having* a water mission. The Forest Service and the Bureau of Land Management, for instance, are responsible for upland health, where thirsty species like piñon and juniper are crowding out water-saving native grasses; where roads and recreational uses invite erosion on steep slopes; and where wildfire supression has allowed the woodland

understory to become far too dense. The natural function of watersheds--to absorb runoff and then release it slowly--has been compromised, and we are having to reconsider our land management policies in light of increasing demands for more water downstream.

On the river itself, America's two famous dam-building agencies, the U.S. Bureau of Reclamation and the U.S. Army Corps of Engineers, have oversight of a whole suite of impressively engineered facilities. Newcomers to the state might look at the map and believe we were blessed with a string of large, natural lakes along our central waterways. Not so. Every one of them is manmade. As a rule of thumb, Reclamation and the Corps of Engineers address the two extremes of surface water in the desert: the former worries about not having enough, and latter worries about having too much. Heron, Elephant Butte and Caballo are Bureau of Reclamation reservoirs that store water for irrigation and municipal use; Abiquiu, Cochiti and Jemez Canyon are Corps of Engineer facilities, built to control flood water and sediment. Over the years, however, Congress has amended the authorizing legislation of some of these facilities. Abiquiu, for instance, was originally constructed for flood control, but today, it also banks water for cities and irrigation
districts. One thing to keep in mind about these manufactured lakes is that they are also regulated by the Rio Grande Compact. If the amount of water in Elephant Butte falls below 400,000 acre feet, no water may be stored in upstream reservoirs. In a drought year, with levels at the Butte below that magic number, any snow the highlands get will be lost to New Mexico; the runoff must be passed down the river instead.

Now let's really complicate things and talk about the San Juan-Chama Diversion Project.

As with the Rio Grande, the water of the upper Colorado River is divided among its many users according to the terms of interstate compacts. New Mexico is entitled to 11.25 % of the Upper Colorado's annual flow because one of the Colorado's tributaries, the San Juan River, snakes through the northwestern corner of our state. Some of New Mexic's share of Colorado River water is used in the San Juan basin, but the rest is diverted into the Rio Grande basin through a series of tunnels blasted through the Continental Divide by the Bureau of Reclamation. Since 1972, an average of 96,000 acre-feet of water a year has gushed through the tunnels to Heron Reservoir on the Rio Chama. Various entities, including the City of Albuquerque, the Middle Rio Grande Conservancy District, the City of Santa Fe, and smaller villages along the Rio Grande, have contracts with the Bureau of Reclamation for specific amounts of that imported water. Its addition to the Rio Grande system has been an immense blessing, but there have been some serious repercussions, too.

The Problems We've Created

The major water issues we face on the Rio Grande--and indeed, all over the globe--can be summed up pretty quickly: there are too many of us humans, we're in denial about our ecological parameters, and eventually we're going to have to pay the piper.

In 1998, regional planners commissioned a water budget for the Middle Rio Grande. The necessary data lay waiting in a dozen places, but it had never been comprehensively assembled

for study by hydrologic experts. Those who participated in the effort were from many diciplines, and they argued long and hard before concluding that the region has an annual deficit of between 55,00 and 70,000 acre-feet. That's the equivalent of Rio Grande water that Mexico is entitled to in a year, and nearly the amount of surface water left over statewide after evaporation takes its toll.

How could the middle basin be that much in the hole, especially when there are hard and fast rules as to what must be delivered downstream? There are several answers to that question. (1) The last twenty years have been among the wettest on record in the Southwest. (2) Municipalities like Albuquerque have been pumping groundwater from the basin's finite, deep aquifers, and putting half of that water into the river as "return flow" from their wastewater treatment plants. (3) The natural flow of the Rio Grande has been augmented for the last three decades by those annual transfusions of San Juan-Chama water.

So we have had the benefit of three great windfalls. Unfortunately, events are conspiring that could eliminate each of these sources of extra water all at once.

There is every likelihood that we have entered a period of long range drought. Given the population explosion of the past thirty years, if the region has to endure anything like the rainlessness of the 1950s, our house of cards is going to come down. Texas will sue New Mexico for failure to comply with the Rio Grande Compact, junior water rights will be curtailed, senior rights will go to the highest bidder, or perhaps be condemned for urban use, and both the environment and the economy will be in the trash can. And the truth is, the 1950s do not represent the benchmark for how dry it can get. Tree ring data indicates there have been periods of inconceivable drought across the entire Southwest, some lasting as long as *seven hundred years*.

But natural drought is not the only kind we face. In the summer of 2001, the City of Albuquerque filed an application with the Office of the State Engineer to divert for municipal consumption its entire 47,000 acre-foot-a-year allocation of San Juan-Chama water. Along with that, city engineers hope to take an equal or greater amount of native Rio Grande water to facilitate the transport of the San Juan-Chama water through the Albuquerque distribution system. The native water will be returned to the river at the city's Southside wastewater treatment plant, but all told, as much as 103,000 acre-feet of water a year could be removed from a seventeen-mile stretch of the river. The city contends its Drinking Water Project will have few if any impacts, and the Office of the State Engineer recently approved the city's diversion permit. But others expect serious consequences for the river corridor, its associated aquifer, and every water user downstream of the new diversion. Why?

The Rio Grande we have come to count on is made adequate by water from the San Juan, and by return flows from the 70,000 acre feet of groundwater that Albuquerque pumps annually. In spite of this massive amount of supplemental water, New Mexico is barely meeting its Rio Grande Compact obligations, the cottonwood bosque is in decline for lack of overbank flooding, and water management agencies are struggling to ensure enough flow for endangered silvery minnows. Albuquerque's plan to cease groundwater mining and instead supply municipal needs

with diverted San Juan-Chama water will magnify these problems. According to the city's own groundwater flow models, even if municipal pumping were to be completely eliminated, the aquifer's condition will not improve for at least sixty years, and the diminished river will keep trying to fill the void. Moreover, in two decades, or perhaps sooner, the city will once again be up against the limits of the water rights it owns, and will have to return to mining ground water. For Albuquerque, San Juan-Chama water is a temporary band-aid. Meanwhile, over-population will persist and the Rio Grande ecosystem, which depends on transfusions of non-native water, will undergo what can only be called a manmade drought.

How did we get here? Didn't anyone see this coming?

Originally, Albuquerque purchased its San Juan-Chama water to offset, or make up for, what it was pumping from the aquifer. The state requires municipalities and other large users of ground water to buy and retire surface water rights in order not to cause depletion to the stream: water previously put to use on a parcel of agricultural land is instead left in the river, making up for that portion of flow that will seep away to the aquifer. But in the mid 1990s, computer flow models began to suggest that the connection between river and aquifer was not as intact as formerly assumed, and the city immediately began to plan for more direct use of its San Juan-Chama water.

City taxpayers had shelled out millions of dollars since 1972 for what they believed was a guaranteed supply of water for the future. Little by little, they were told, the city would be using all of the 47,000 acre-feet a year to offset its groundwater pumping. In the meantime, everyone seemed to assume the paid-for water would wait around in the system, hang out at Abiquiu Reservoir, or ho-hum its way downriver untouched. But of course, the reality is that the multiple thirsts the river works to quench do not know the difference between "imported" water and "native" water, and have been happily using both like nobody's business. Wildlife, riparian vegetation, irrigated agriculture and domestic wells have all benefitted from the presence of San Juan-Chama water, and so has urban growth. The region would have hit the deficit wall far earlier had transbasin water not been underwriting the boom of the past three decades.

Unraveling the mess we've made may be impossible, and it certainly isn't going to be fun. Let's look at some of the loose ends.

Agriculture and the Environment

Agricultural lands are an integral part of the Rio Grande ecosystem, and have been for many hundreds of years. Though the river is confined to a narrow channel, irrigation ditches and drains allow water to roam across the Rio Grande's historic floodplain, and where there are agricultural lands, wildlife habitat and riparian vegetation remain woven into the landscape. Pave the fields and seal the ditches that supply water to them, and you annihilate a substantial part of the riverine environment.

And pave over them we are. Valley subdivisions grow on old alfalfa fields where agricultural water rights have been transferred to serve new development on the mesas. Acre by acre, the

dried up bottomland sprouts new houses, most of which get water from private wells. For five dollars, a suburban homeowner can buy a permit from the State Engineer to suck from the ground the same amount of water that was sold off as surface rights. And of course, the groundwater these domestic wells are tapping is river water, because, once again, the river feeds the shallow aquifer and the shallow aquifer fills the holes. For years, the State Engineer has ignored the impact of thousands of domestic wells. There isn't even an reasonable estimate of how many there are because in the floodplain of the MRG, a well can be hand-driven in a matter of hours and never reported at all.

The water that is thus drawn away from the river and from the network of agricultural ditches and drains is not figured correctly into any water budget. Our accounting system simply does not recognize the impact of shallow and household wells on agricultural water diversions. Until recently, riparian consumption and aquifer recharge, too, were embedded in agricultural diversion figures. The cumulative effect of these "hidden" uses is large, and goes a long way toward explaining why the MRGCD's irrigation diversions have increased over the years even as agricultural acreage has diminished. It has long been assumed that water for new growth will come from tightening up "wasteful" agricultural practices, but in truth, if agricultural diversions are curtailed, the ecosystem as we know it may cease to exist.

The Impacts of Water Transfers

In considering Albuquerque's application to divert and consume its San Juan-Chama water, the State Engineer is required by law to consider three things: will the transfer impair existing water rights? Will it be contrary to water conservation? And will it be detrimental to the public welfare of the citizens of New Mexico? The last two questions have for the most part been delicately skirted in State Engineer decisions of the past, but those criteria must eventually be worked out.

Water transfers affect whole communities, and even whole regions. The export of San Juan-Chama water, for instance, has been detrimental for the San Juan Basin, where endangered species' needs are curtailing water use and there is no magic transbasin diversion to come to the rescue. Acequia communities are also feeling the sting of water transfers. With developers paying high prices (as much as $40,000 an acre foot for vested water rights in some areas of northern New Mexico!) small-time farmers are selling out, leaving fewer and fewer individuals to bear the costs and do the work of maintaining the local ditch. In the larger conservancy district, too, the allure of brokering water to growing municipalities threatens the fabric of the agricultural community. These questions speak to the issue of public welfare. Will the traditional lifestyles and rights of the people who are here, and who have retained the water by keeping it in beneficial use, be sacrificed to those who haven't been lured here yet?

And what about conservation? We are a water-profligate society, washing our cars, growing bluegrass, filling our swimming pools and dishwashers. We take multiple showers daily, and water runs down every other municipal gutter. Albuquerque is not on anybody's list of conservative water users in the Southwest, and while cities like El Paso and Tucson are proud of their 150 gallon-per-person-per-day statistics, ask a resident of the Navajo Nation what the average daily per capita water usage is on the reservation. The answer is an unbelievable

30-something gallons per day. We are simply not serious about water conservation, and it will take the lesson of real want to make us so. Present water conservation programs are little more than jokes because the goal is simply to free up water for more growth. We are fooling ourselves to think that we can keep that up. Every water use sector is eventually going to experience real pain, for there is going to be less water for everybody — trees, grass, fish, and folks. Get ready for it.

Water Quality

Last but not least, we humans use water as a medium for carrying away our wastes. We sully massive amounts of potable water to flush toilets and transport sewage, and few among us give much thought to what we routinely put down our kitchen and bathroom drains. In the recent past, river water below Albuquerque's sewage treatment plant was found to contain fourteen times the normal level of estrogen. It turns out that in processing substances called surfactants, which are used in hundreds of things from dish detergent to cosmetics, modern wastewater treatment plants are *manufacturing* estrogenic compounds. These compounds are not monitored by EPA, and are released into the river along with wastewater return flows. Europeans have known for years that such estrogens are produced by mechanical wastewater treatment processes, and that fish populations downstream cease to propagate in the estrogen-rich water.

One of these days, we are going to have to re-think our conventional practices, and take a hint from nature, where specific plants are adept at filtering certain poisons. Is it possible that local ecosystems evolve to handle those contaminants prevalent in the water? If so, does water quality in the Middle Rio Grande depend on the innate ability of cottonwoods and alfalfa to absorb the nitrate contamination of thousands of septic systems? We have only begun to ask such questions.

Unfortunately, there may be worse things in our water than sewage, drugs, and hormones. The public is beginning to hear unnerving hints about what might be percolating down the canyons from Los Alamos, birthplace of the atomic bomb. Nothing extinguishes conversation quicker in certain agency circles than the mention of radioactive substances lurking in the sediments of Cochiti Lake...

If you've taken to heart even a portion of what you've just heard, you must be depressed to death. As the wizard Gandalf said, nobody relishes living in such times. But here we are, and what I hope you will remember most is that the work you are taking on as teachers, as researchers, as measurers and monitors of the bosque, is incredibly important. What you discover, and the knowledge you impart to the next generation, may well determine whether people continue to live in this exquisite place or not.

Impacts to "Agriculture" in the Event of A Rio Grande Compact Shortfall

In the Middle Rio Grande, water credited to 'agriculture' has come to serve some pretty varied users. Where does agricultural water really go in our very unique valley, and just who and what will feel the shock if its use is curtailed to meet a compact shortfall?

First and foremost, agricultural lands are of great consequence to the present hydrologic system. In the Rio Grande basin, there is a connection between water flowing on the surface and water underground. In its natural state, when the river was free to move back and forth across the valley, water seeped down to both the shallow and deep aquifers. In actual fact, as hydrologist John Shomaker has said, "The river *requires to be held up* by all that ground water."

But grave damage has been done to the Middle Rio Grande's watershed. Runoff doesn't percolate very well through pavement and concrete, and the basin's upland recharge zones are now wall-to-wall houses. At the bottom end, the river's annual high flows have long been curtailed, along with free access to its floodplain. Together these indignities have impaired the direct link between surface water and groundwater, and were it not for the artificial spreading of the river to the far edges of the floodplain through the local irrigation delivery system, 50% of the groundwater recharge to the Albuquerque basin would be lost. Where there are dirt ditches and irrigated fields, that fundamental connection is still being maintained.

In addition to replenishing the aquifer, agricultural water that leaks into the ground is drawn up by shallow wells throughout the floodplain. Every valley home with a domestic well and septic tank is dependent on agricultural water. Such uses are not distinguishable from the overall diversion of the Middle Rio Grande Conservancy District, and the state continues to issue permits for new wells without acknowledging where the water is coming from. Nor is there any means of controlling what is actually pumped from a domestic well—municipal and agricultural water use can be governed with rate increases and regulations, but domestic well use is not in any way constrained. A decrease in irrigated acreage in the valley, or even a reduced amount of water flowing through conservancy ditches, will impact the valley water table and thus the supply to domestic wells.

There will also be impacts to municipal pumping, which is already outstripping the ability of surface flow (in either the river or the ditches) to replace what is being withdrawn. A 2003 USGS map of groundwater declines in the Albuquerque area indicates there has already been a reversal in the direction of flow of groundwater away from the river and toward cones of depression created by municipal wells. To quote Dr. Shomaker once again: "It is the duty of the river to recharge groundwater, and it is very difficult to stop this administratively."

Perhaps a third of the region's irrigated acreage belongs to eight separate and sovereign Indian pueblos, six on the mainstem Rio Grande and two on the Rio Jemez. In addition, the Middle Rio Grande Conservancy District masks some seventy *acequias* or community ditches with priority dates as old as any in the state. Agriculture is integral to both Native American and Hispanic cultures, and to suppose otherwise is to be ignorant of New Mexico's unparalleled heritage. Rural values are interwoven here, even in the region's urban core. Corrales, Alameda, Los Ranchos, Duranes, Arenal, Atrisco, Pajarito, Los Padillas—all are remnant agricultural communities, built along historic waterways.

Those manmade streams run through the heart of Albuquerque, a braidwork of wild parks that other cities can only dream of having. A friend of mine once said of his ditch, the Harwood Lateral, which crosses a portion of the North Valley just west of 4th Street, "It's a dog walk, a cat's lair, a horse path, a bicycle lane, a birdwatch zone, a shady jogging run, a nature trail for preschool kids and seniors. There's a young woman who walks there regularly, bagging shards of glass as she goes. That speaks pretty eloquently of how the Harwood is cherished."

At a water conference in the southern part of the state some years ago, I heard environmental advocate Kevin Bixby talk about the contrasts between Elephant Butte Irrigation District and the MRGCD. How fortunate we are up here, he said, to have these lush green ribbons, stretching for 150 miles beside the river. There are millions of non-humans who would agree with Kevin. Over the years, I have kept a list of birds and other critters I've seen in and around my acreage north of Tomé. The varieties of birds include American kestrels, Cooper's hawks, golden eagles, meadow larks, roadrunners, pheasants, dove, quail, redwing blackbirds, grackles, kingbirds, kingfishers, egrets, blue herons, night herons, ibis, curlews, ducks, sandhill cranes, snow geese and Canadas, to name but a few. The same landscape

supports toads and frogs and snakes, raccoons, water rats, skunks, ground squirrels, pocket gophers, prairie dogs, voles, field mice and even a few beavers that migrate up the drainage ditch from the bosque. There are coyotes, of course, and I've even seen a couple of foxes on Tomé Hill. All of these Middle Rio Grande citizens will suffer if there is less water.

To those who would dismiss aesthetics as a far-removed reason not to pilfer water from agriculture in the MRG, I caution you to think again. Economist Larry Swanson, head of the Regional Economy Program at the O'Connor Center for the Rocky Mountain West in Missoula Montana, offers this little piece of wisdom: "Twenty years ago, they liked to say 'you can't eat the scenery.' But now the scenery--the environment surrounding your town--has become the setting for your economy. *The setting is the reason the economy is here.*"

Agriculture was the middle valley's first industry, and it flourishes still. You can buy locally produced grains and nuts, every sort of vegetable and fruit, herbs, sod, bedding plants, flowers and trees, native seed varieties, honey, milk, butter, yogurt, eggs, meat and poultry, wine, and even champagne. The region's high-dollar dairy and horse industries depend on hay raised in the Rio Grande valley, and here I must put in a good word for that much-maligned crop, alfalfa. People tell you it needs worlds of water. It does not. I water mine only four or five times *a year*--one irrigation for each cut of hay. Show me a lawn that can survive that. Here's another thing worth thinking about. In Canada and Europe, researchers are using alfalfa to remove high concentrations of nitrates from soil and water. In the septic-tank-infested Rio Grande valley, maybe the fact that our groundwater is still drinkable is owed to the floodplain's two most prevalent crops: cottonwoods and alfalfa.

You will have to rely on others to put dollar signs on the agricultural ripple effects of failing to meet the Rio Grande Compact; I'm not a numbers kind of person. What I *can* tell you is that the burden will fall on good, hard-working people like Lester Paris, who at eighty still does my custom tractor work, and Ken and Margaret Wright, whose parts business keeps swathers and side-discharge rakes and sickle-bar mowers running throughout Valencia and Socorro Counties. It will hurt the folks at Old Mill and Chical Haystack who sell chicks and seed and bailing wire; it will impact mechanics, and field hands, and conservancy equipment operators, and 4-H kids, and farriers, and sale barn people, and bankers, and bureaucrats. These

aren't millionaires involved in heartless, faceless agro-business. They are my neighbors, and yours.

Finally, I was asked by John Carangelo, whom many of you know as an *acequia* spokesman and head of the Socorro Soil and Water Conservation District, to remind you that when agriculture is sacrificed, we nullify the promises made to Native Americans, and the promises made in the Treaty of Guadalupe Hidalgo, and the promises made in New Mexico's own constitution and body of law. Prior rights are the foundation—the setting, if you will—for the Middle Rio Grande's economy and its enchantment, the lifeline to its ecosystem and its aquifer. There is only so much water. If we continue to divide it, and divide it, and divide it, soon not one of us will have enough.