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GMA 7 Planners Share Updates, Thoughts On Water Planning

By Colleen Schreiber

SAN ANGELO — Texas is known for a lot of things, but typically it is only the experts who know just how diverse the state's geology truly is. For water planners this diversity in geology often provides challenges, in part because it impacts aquifer characteristics within the state.

“That makes it very difficult to come up with regulations that fit every aquifer,” said Caroline Runge.

Runge is consulting manager for the Menard County Underground Water District. She was one of a handful of speakers at a recent Groundwater Management Area 7 meeting here.

GMA 7, a district which encompasses 585,000 square miles, is the largest one in area and also the largest one in number of groundwater districts, at 21. Several counties that lie within the boundaries of GMA 7, she noted, do not have a groundwater district.

There are four major aquifers in GMA 7. These include the Edwards Trinity Aquifer, the aquifer for which the boundaries of GMA 7 are configured, the Ogallala, which has a little piece sticking down from the north, the Pecos Valley Alluvium, which is completely in Pecos County, and a small piece of the Trinity off to the east.

Runge told listeners that about 40 percent of all the available groundwater within GMA 7 is in one county. Pecos County, for example, has about 240,000 acre-feet of available groundwater while Menard County has only 2000 acre-feet of available groundwater. This is one reason, Runge opined, that groundwater regulation needs to be done on a county by county basis.

There are also several minor aquifers — the Capitan Reef, the Dockum, the Ellenburger, San Saba, the Hickory, the Lipan, and the Marble Falls — in GMA 7. Some of these minor aquifers, like the Hickory and the Ellenburger, Runge said, make up the major water supply for several districts. The Dockum also supplies some of the districts in the northern end of GMA 7.

The groundwater ownership right entitles a landowner to drill and produce groundwater, Runge pointed out, making every landowner entitled to a well. However, because the groundwater in some of the counties within GMA 7 is so limited, the Menard district has chosen to permit groundwater from the Edwards Trinity strictly for domestic and livestock use.

“We don't permit any irrigation wells,” said Runge, “but it's pretty well self-regulating, because our typical well pumps only five to 10 gallons a minute.”

The amount of water that a landowner can capture basically is dictated by the groundwater district.

“I think we’re going to see a lot of litigation over what the right of ownership really means when we continue to have the rule of capture,” Runge opined. “My view of absolute ownership of groundwater is that the person who wants to keep his water under his land is as entitled to protection as the person who wants to sell his water. Both of those people have a right to deal with their property as they see fit, and it’s the duty of the district to try to achieve a balance that lets both of those things happen.”

Groundwater districts, Runge reminded, were initially created by the Texas legislature to provide for conservation, preservation, protection, recharging, and preventing of waste of groundwater.

“Our primary mission is to protect the resource for the future,” she told listeners. “What we really do is balance the various competing interests in groundwater as best we can to suit our districts and our communities.”

In addition to domestic and livestock use, groundwater exemptions also include the drilling of a water well to supply water for an oil rig that is actively engaged in drilling or exploration. Some districts, she said, do not consider fracking to be actual drilling or exploration, and therefore argue that water for fracking should require a permit.

“They’re dealing with the 800-pound gorilla,” opined Runge. “It’s hard to fight the oil companies on this issue.”

There is also an exemption for water used for mining.

Groundwater districts are also charged with balancing the rights of surface water owners and groundwater rights owners.

“That’s a little difficult to do in a lot of our districts, because there’s a statutory disconnect between surface water regulation and groundwater regulation,” said Runge. “I think we are beginning to come around in recognizing in law a little bit more of the interconnection between groundwater and surface water, but many groundwater districts do not consider surface water at all.

“In the Edwards Trinity there are an enormous number of springs and rivers, so the interaction between surface water and groundwater is very important, and we do take it into consideration,” she told listeners.

Groundwater management areas must also balance the water supply needs among districts with different economic uses and widely varying yields from the aquifer.

“GMA 7 has this giant aquifer that covers 43,000 square miles, and we have to balance the needs of the district that has 240,000 acre-feet with the needs of a district in the same aquifer

that only has 2000 acre-feet,” she reminded. “That’s where the joint planning process comes into play.”

They must also balance in-district use with out-of-district use.

“This is a big issue in our groundwater management area, because some of our districts contribute enormous amounts of water to the Rio Grande, for instance, and to several other rivers,” said Runge. “People downstream on those rivers have historically depended on that water for municipal water supplies and irrigated water supplies.

“If we’re going to have big growth in groundwater use within a district and we have to consider the downstream uses, it becomes quite a challenge to figure out exactly what’s fair.”

Again, this is where the joint planning process comes into play. In addition, HB 1763, adopted in 2005, requires all districts within a groundwater management area to adopt every five years desired future conditions for every “relevant” aquifer within the GMA.

“The desired future conditions are then submitted to the TWDB, which uses groundwater availability models to determine modeled available groundwater, and that is the amount of water that your district is supposed to have available for permitting.”

The DFC, she explained, is based on what each groundwater district desires its relevant aquifers to look like in 50 years and is reviewed every five years. The DFC can be based on a target percentage depletion over 50 years, a desired water quality in 50 years, or maintenance of spring and surface water flows or other objective standards. Most districts, she said, have chosen to go with the target percentage or depletion or the maintenance of spring and surface water flows.

Once the groundwater management area adopts the DFC, the groundwater availability models, computer models which simulate the operation of aquifers, are used by the Texas Water Development Board to determine the Modeled Available Groundwater.

“The MAG is the amount of water that is available for permitted production in an aquifer.”

Runge said one of the things that distinguishes GMA 7 from other GMAs is that the majority of Texas’ largest springs that form the headwaters of a lot of rivers are found within their boundaries. In the Rio Grande Basin, these include the West Nueces, the Nueces, the Frio, the Devils, and the Dry Devils River. In the Colorado Basin there are the North Llano, South Llano, Llano, South Concho, and San Saba rivers.

“This region makes enormous contribution to stream flows,” she told listeners.

There is quite a bit of variation between the recharge versus the discharge into the various springs and rivers. For example, in Kimble County there is about 14,000 acre-feet of recharge, and 45,000 acre-feet is discharged into the stream because of lateral inflows. She explained that

other water is flowing into the aquifer from outside Kimble County, and that discharges into the Llano River and its tributaries.

Menard County, on the other hand, has about 15,453 acre-feet of recharge a year, and all of that plus a little bit more is discharged into the San Saba and its tributaries.

The big sacrifice, Runge said, comes from Val Verde County, which has about 57,165 acre-feet of recharge and discharges 86,000 acre-feet into the Rio Grande. This is because it has net lateral inflows of 65,000 acre-feet from outside the county.

“One of the things that makes planning very difficult is we have some districts like the Menard and Kimble County districts that depend almost entirely on surface water for their water supply,” Runge reiterated.

Schleicher County right next door, however, depends almost entirely on groundwater, and there are some high capacity wells in the eastern edge of the county. These wells, she insisted, have the potential for impacting the total available water supplies in Menard County.

“We have to consider all of this in the planning process, and we have to try and work out something that achieves a balance.”

During the first planning cycle, GMA 7 commissioned a study which considered the effects of drought on recharge. What the study found was that in Schleicher County, for example, there may be as much as 55,000 acre-feet of recharge under normal conditions. However, during years when rainfall is 70 percent of normal there is zero recharge. Similarly, Val Verde County has 108,000 acre-feet of recharge, but recharge goes to zero at 70 percent of normal rainfall.

“We certainly experienced this in Menard County in 2011 and 2012. Even when we got a little bit more rainfall in 2012, we didn’t see our aquifer levels come up at all from the declines that we saw in 2011.”

Another factor that has to be considered for planning purposes, she said, is drawdown impacts on neighboring counties. She based her comment on the MAG used in the last planning session; in Pecos County, for example, if pumping is increased from 220,000 to 240,000 acre-feet, the drawdown goes from nine to 11 feet. This impacts neighboring Crockett County because they’ve shown that even with no change in pumping, Crockett County drawdown drops a foot, from eight to nine feet. A similar connection, Runge told listeners, is seen between Glasscock and Irion counties.

During the last planning session, the Edwards Trinity districts that have little groundwater or depend heavily on surface water, springs or both, adopted a DFC of less than two feet of drawdown over the 50-year period. Other counties adopted DFCs from two to seven feet of drawdown over the 50-year period, seven to 13 acre-feet of drawdown, and two districts that have more storage than other parts of the aquifer adopted a DFC of 31 to 34 acre-feet of drawdown. These districts, Runge said, also have a “huge” amount of exempt use.

“Until recently Glascock County had more drilling rigs operating than any other county in the state, so the amount of water that’s going into drilling exploration and fracking in those two counties is huge, and it’s also getting to be quite a bit in Crockett County,” said Runge. “In fact, the exempt use for drilling and fracking in that county exceeds the MAG.

Bill Hutchison, an independent groundwater consultant for GMA 7, described some of what he’s doing in the way of modeling for GMA 7, which is then used in the joint planning process.

When GMA 7 first began meeting, the desire of the group was to minimize the drawdown in the eastern part of the GMA, where the headwaters lie for a lot of rivers and streams. The group also wanted to provide for irrigation drawdowns in the western part of the region, but questioned whether those two goals were compatible.

The process, Hutchinson said, basically began with all 27 counties developing county pumping estimates. When those estimates were added up, the total pumping for GMA 7 was 530,000 acre-feet per year.

“In 2005 our best pumping estimate was about 400,000 acre-feet a year, so we’re anticipating some degree of growth,” he pointed out.

They then assumed average recharge and ran a model out to the year 2060. That was essentially the baseline. He then ran several different scenarios. Scenario one was a continuation of 2005 pumping conditions, and the other scenarios bumped up pumping by 10, 20, 30, and 40 percent.

Using the 400,000 acre-feet of pumping in 2005 and the requested pumping of 530,000 acre-feet resulted in a four to six-foot drawdown over the whole GMA. When pumping was bumped up, drawdown increased accordingly to seven, eight, nine, and 10 feet, Hutchison said.

Breaking it out county by county showed that drawdown was greatest in Glascock and Reagan counties but relatively low, less than five feet, he said, for the rest of GMA 7.

In 2010 GMA 7 made the decision to adjust the incremental pumping increases on a county by county basis rather than on an incremental basis across all of GMA 7. Again, several model scenarios were used, but at the end of the day the group adopted the scenario which indicated a seven-foot average drawdown over the whole area and 571,000 acre-feet of pumping, which, Hutchison noted, was a 41,000 acre-foot increase over what they had started out with. This scenario, he said, met GMA 7’s vision in terms of providing for drawdown in the west and protecting the headwaters in the eastern half of the area.

Hutchison also talked briefly about how the process and deadlines for setting desired future conditions have changed. During the first round of DFC establishments there were no real guidelines. The legislature later changed that, however, and at the same time established a new statutory deadline for proposed DFCs of May 1, 2016.

The nine specific factors that districts must consider in setting a DFC include things such as recharge and aquifer conditions, the state water plan, projected projects, and property rights, to name a few. The rest of the DFC process entails a 90-day public comment period and public hearings, a report summarizing those public comments, review of the comments, and adoption of any necessary changes. Then the final DFC and an explanatory report are sent to the TWDB for administrative review.

The long and the short of Hutchison's remarks is that the entire planning process is in constant flux, and the numbers derived for planning purposes are a best guess based on available science. Much of that science involves the use of models, but as Hutchison pointed out, the models are planning tools and should not be the sole decision-maker. Common sense, he said, must also be incorporated.

"Unfortunately, the importance of models has grown because of the definitions developed and because of the way the board (TWDB) uses them to generate MAGs," Hutchison told listeners.

"I run the models in such a way that they provide information," he added. "Instead of running a model once and saying 'this is the answer,' I run it lots of times and say 'here is a wide range of information you can use to make your decision.'"

Hutchinson opined that the whole planning process is moving further away from reality.

"The reality is that surface and groundwater interact all the time everywhere in the state, but the law does not recognize that," he stated. "Now we have two bills in the legislature that would further subdivide groundwater into fresh brackish and ASR from a regulatory standpoint. We're going in the wrong direction, frankly. It's not good."