

**Notes from Conversation with Rege* Leach,
Division Engineer, CO Dept of Water Resources, Division 7
Thursday, December 13, 2012**

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Attendees: Julie Ward, Sue Liefeld, Marilyn Brown

This interesting and productive conversation was open and wide-ranging, not necessarily sticking to all the prepared questions. Water quality is not within the jurisdiction or the Department of Water Resources so we did not get those questions answered.

There is very little drilling activity going on now in La Plata County, including the S. Ute Reservation, due to the low price of natural gas; however, exploration and evaluation of Mancos Shale for shale gas and oil is ongoing, especially on the southwest side of the county. This may be a big issue for water in 10-15 years.

State water rules take precedence over federal rules.

We are on the upper curved edge of the Fruitland formation so most of the drilling in this formation is in New Mexico. One of the places that the formation comes to the surface is south of Santa Rita Park and can be detected by a sulfur smell. 90% of the 3800 wells in La Plata County, which are about 1500' deep, are on the S. Ute Reservation. All these coal bed methane wells contain copious amounts of water, which comes up with the coal. This 'produced' water is stored and re-used for fracking other wells. For decades these vertical wells have been fracked using only high pressure and water. Recently operators have begun adding chemicals and considering horizontal drilling these wells.

Per the Vance decision (Vance v. Wolfe, 2009, CO Supreme Court), produced water from oil and gas wells is considered a beneficial use so well permits are necessary. The amount of produced water is reported to the CO Division of Water Resources, who issues the well permits. Per CO water law, surface owners own these water rights, not the operator. [Issues around surface ownership of produced water and CO's right to issue (water) well permits on the S. Ute Reservation are being tested in CO Supreme Court, decision expected in February. In the meantime the state has been issuing temporary permits.]

*(pronounced 'Reg', hard 'g')

If the produced water is tributary (i.e., is determined to flow into surface waterways thereby potentially impacting other water rights, the operator must augment (i.e., replace) the water produced. If the produced water is determined to be non-tributary, the operator does not have to augment. Most produced water in this county is tributary so operators consider all of it tributary and augment all of it, just to be sure. Annually, the operators obtain from either Lemon or Vallecito Reservoirs sufficient water to replace the expected produced water from their wells. Water is available in these reservoirs because irrigation water rights on the land submerged by the reservoirs were taken over by the Southwestern Water Conservation Board managing the reservoirs. The augmentation purchases to date have been very small, 35 acre feet and 14 acre feet respectively from Lemon and Vallecito Reservoirs.

The amount of produced water varies over the life of a well, peaking at the beginning and tapering off. Each time a well is re-fracked, the amount of produced water rises and then tapers off again. It is stored in lined pits and used to frack other wells or is disposed of in disposal wells. In La Plata County there are no evaporative ponds used for this purpose. The use of produced water for fracking means that the demand on other water is much less than elsewhere in CO where there isn't any water in the target formations, such as shale. Per Leach the regulatory agencies do not need to encourage water conservation since the operators do that automatically, because it costs money to buy, transport and dispose of water.

Produced water is not potable and cannot cost-effectively be put into the hydrological cycle at this time. Some produced water could be made useable for other (industrial) uses if cost-effective, considering what is in the produced water (salinity and heavy metals, including mercury). Leach is confident that industry research includes on-going investigation of ways to reduce water usage and of possible substitutes for water that are denser than water, as well as reducing the costs of drilling in general.

CO Dept of Water Resources doesn't have anything to do with disposal wells. The EPA issues permits and monitors disposal wells south of the traditional S. Ute line and the COGCC does it for disposal well north of that line (except that Leach only knows of any): the them. There are at least four disposal wells in the county, all south of the S. Ute line and new, around the depth of 4000'. Operators are required to submit annual reports to EPA of how much water has been put into them. In the permitting process the EPA apparently assesses the potential for earthquakes. A student of Professor Don May at FLC has done his senior seminar this year on disposal wells. A disposal well, drilled by BP, is located on Florida Mesa, just south of Lake Pastorius on the Simonson Cattle Ranch.

Water Sources and Demand for the Hydraulic Fracturing of Oil and Gas Wells in CO from 2010-2015: Many of us are questioning the 0.08% figure in this report for the proportion of water in CO which goes to fracking, compared to 85.5% for agriculture, for example. Per Leach this figure is calculated as follows: The amount of total water available in CO in a given year is known, as is the amount of water going into each use, including fracking. The average percent of water consumed by each use is also known (for example, 50% of flood irrigation water is consumed, 75% of sprinkler irrigation is

consumed, and 100% of fracking water is consumed, i.e., removed from hydrological cycle) so the proportion consumed by each use can then be determined. Recycling of water was not taken into account.

The bottom line is even though the amount of water used for fracking sounds excessive in terms of acre feet/well (average 15 acre feet/well), it is not, when compared with agricultural use and most other uses. As for the permanent removal of the amount of water consumed by fracking each year from the hydrological cycle, especially in the light of reduced availability of water due to climate change, Leach contends that the free market system and current water law will take care of this by increasing the price of water. The view of the CO Dept of Water Resources is that the use of water for fracking will have no greater impact on availability of water in times of shortage than will any other use. We admitted that we do not see the real value of water on our water bills. The amount drilling operators are paying to purchase water from Loveland and Fort Collins (\$1000-\$2000/acre foot), as compared to \$40-\$100/acre foot that farmers are paying, is probably closer to the real value of water.

Rege Leach lives in the southeast part of the county near a producing gas well. During the drilling/fracking period, he felt the fracking booms such that dishes and pans rattled. He could smell emissions somewhat. Now that the well has been completed, the thing that bothers the most is the access road to the site. The well itself is a non-issue.

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