

Substantive Review of SWEPI's Huerfano County APDs:

Fortune 4-9, State 2-36, Seibert 3-8, and Freeman 3-24

*Submitted by Keli Kringel, on behalf of Citizens for Huerfano County
June 7, 2012*

We have reviewed, to the extent possible in 20 days, the new Huerfano County SWEPI Location Assessments (4) and APDs (8): Fortune 4-9, State 2-36, Seibert 3-8, Freeman 3-24, and have the following observations and requests on them. We request that the COGCC respond to our specific, local concerns related to public health, safety, and welfare, including the environment and wildlife of Huerfano County, before issuing these permits.

Thank you for the COAs currently proposed (in "correspondence"). Please make sure they are included for all 4 wells.

Fortune 4-9

This well location puts the surface and groundwater of the community of Gardner, CO and nearby residents at risk due to many factors:

1. The pad is immediately adjacent to an active water well/spring, which is sitting in a cut out corner of the pad, visible in the application materials (MCALPINE WELL).
2. The water table at the location is shallow, ~35 feet.
3. Downhill from the well, in the direction of the pad slope, lays Muddy Creek, a few hundred feet from the pad. (The Muddy joins the Huerfano River approximately 3 miles downstream of the well location.)
4. The edge of the pad is within about 100 feet of the riparian area around Muddy Creek. (Note: On COGIS, the McAlpine well is shown as south of the location, but in the APD maps it is in the north corner of the pad. This makes determination of the distances to Muddy Creek and the Riparian boundary using COGIS ambiguous.)
5. Downstream along Muddy Creek, there are shallow domestic water wells, and even more along the Huerfano River as it runs into the town of Gardner.
6. There are two community/municipal wells in the town of Gardner. e.g.: <http://www.dwr.state.co.us/WellPermitSearch/View.aspx?receipt=9087011> . They pipe water to over 100 homes. We can provide more information if needed. As they are within 5 miles downstream of the well surface location, this raises the question of Rule 317B Public Water System Protection status. (Whether the ground water is under direct influence from the surface

water is an open question, but seems likely given the shallow water table along the length of Muddy Creek/Huerfano River.) These community wells should receive baseline water testing.

Due the factors above, our opinion is that this is a risky and sensitive location, and that no well pad should be placed here. Should you move ahead with permitting this location, we strongly request Sensitive Area Classification, and evaluation for 317B Public Water System Protection. Any additional regulations resulting from these classifications should be applied in addition to the existing COAs, which should be retained. For example, if the usage of the salt or oil-based muds has the potential to contaminate the shallow water table through which the drilling occurs, alternatives should be found. We request monitoring wells to protect the downstream water table and town of Gardner's water, in addition to baseline testing of more wells and surface water downstream. There are already several existing in Gardner.

State 2-36

There is a road missing from the application maps, CR 542, which is nearly as close to the location as the mapped road CR 540 (see Google maps). There is an active stock well/spring on the left side of the road along CR 542 about 1000-2000 feet north of the intersection of CR 542 with CR 540. This well/spring is not seen on COGIS nor the application maps. This well/spring might be ~500 feet from the pad. Depth to ground water for the location is listed at 80 feet, but is that based on COZINE well more than a mile away. It should be based on the static water level of this well/spring near the pad.

Also, as can be seen in the Hydrology Map, the pad abuts a stream. This is a live stream/spring that runs to the Huerfano downstream. The detention ponds are on that side of the pad and the pad slopes towards this adjacent spring.

Finally, this portion of Huerfano Park has many springs (see whole area in Access Road Map). What depth are the springs coming from? If the hydrology of the springs in this area is not understood, additional precautions are needed.

These factors suggest a Sensitive Area classification for this location. Any additional regulations resulting from this classification should be applied in addition to the existing COAs, which should be retained. Pitless operations are particularly important given the frequent high winds in Huerfano County which would cause blowing of produced and flowback water. We request monitoring wells to protect the downstream water table, in addition to baseline testing and monitoring of the surface waters downstream.

Seibert 3-8

This location apparently has a shallow water table. We request the current COAs be retained. A point of note, satellite images seem to show a building closer than the 2200ft listed (to the south).

Freeman 3-24

There are many plugs, dikes, and sills in this location/area, which run both East-West and North-South. See Geology 250K map. There is a dike across the County road to the south less than 1/2 mile from the site (to the southwest), visible on the REFERENCE AREA MAP (*elevation=7467*). The dikes visible at the surface enclose the location in a "C" of about 2 miles diameter. Dikes run deep, having extruded from the magma, do not all show on the surface, and are accompanied by fractures and faults up to a mile away. Dikes are transmissive, as faults and fractures are. It has been hypothesized this occurs because of alteration of the shale alongside the dikes even in the deep shale layers. These features do pose drilling and hydrological risks. We request the COGCC take steps to proactively mitigate problems that could be caused by this feature of the unique geology of Huerfano County. Drilling and production accidents have already occurred in this basin due to lack of information on these features. SWEPI has 3D seismic data which *may or may not* be able to detect these features. Please examine the seismic data.

Hydraulic fracturing will only increase the risk of potential unintended connections, and therefore we request: Please make "no frac'ing or additional reservoir stimulation methods" a COA of the well.

This well is pending COA correspondence. We request conditions of approval similar to the other SWEPI wells'.

Additional Conditions of Approval Requested (all wells)

1. We request an *apriori*, thorough, hydrogeological study of the basin, and that permits are not granted if drilling or fracturing could adversely impact water resources based on the study.
2. Please make "no frac'ing or additional reservoir stimulation methods" (as per the drilling plan)s a COA of the wells.
3. In addition to COAs that that only closed-loop, pitless drilling and pitless operations be used, we request that they only be done with non-toxic drilling and fracking chemicals and green completions.
4. We request advance notice to public of Hydraulic Fracturing.
5. In addition to the existing COA that it shall not be stored in ponds, we request that raw produced water from drilling, fracking, completion or production, NOT be spread on roads or grounds.
6. We request the applicant shall post a bond, escrow account or liability insurance policy of sufficient monetary value to fully compensate local citizens and communities for any damage to their air, water, health, safety, environment or property values.

7. Likely abundant natural fissures, faults, and fractures in the area make for increased risk of cement casing failure (with nothing to support it under high pressures). Please include stringent requirements for testing the cement prior to completion and periodically during production.

8. Huerfano County has many radioactive mineral claims in Uranium and Vanadium. Please evaluate locations for the potential to encounter these NORMs during drilling/operations, and monitor their production during operations, and make reports publicly available quickly.

Additional Questions/Requests of COGCC

1. Surface casing on all 4 wells runs to exactly 815 feet. Sources indicate deeper formations can be water bearing (see *McLaughlin, T.G., 1966, Ground water in Huerfano County, Colorado; U.S. Geological Survey, Water Supply Paper 1805, TABLE 3.*) How was the depth of aquifers evaluated/defined? How is it known that potentially usable water is protected?

2. Dikes, sills, faults and fractures are deep, transmissive, and the details of their connections to aquifers are not known except possibly through 3-D seismic data Shell may have collected. CHC requests COGCC examine the data to establish that there is NO possibility of connection between SWEPI well-bores or fractures and natural fractures or dikes that communicate with aquifers.