

WS RANCH  
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Rec'd  
1-18-07

Re: EQC Hearing on PRBRC Petition  
Concerning proposed rule changes to Chapter 2 of  
Wyoming's Water Quality Rules and Regulations

If it would please the Council, we request your consideration of the following points regarding the citizen's petition before you:

1. The petition was originally generated in 2005 and therefore uses assumptions which are not true today.
  - It quotes the price of gas @ \$9; today's actual is <\$3.50. \$3.50 is the breakeven for O&G in the PR Basin.
  - I know of no irrigation in our area, Sheridan County, which is not managed irrigation...ie treating the soil and/or water before application.
  - Industry is doing more than paying "lip service" to solve the problems of water disposal. See Huber's work with Beneterra subsurface drip which shows tremendous promise.  
<http://www.beneterra.com/>
  - The current regulatory process is plenty tough. Here are excerpts from Huber's efforts on Prairie Dog Creek prior to 2002: (see source listed below)
    - 5 water well permits on BLM were held up for appeal in Washington
    - 3 NPDES permits were filed for on-channel ponds under

WDEQ Requirements to cover 100 wells. Only 2 of the 3 permits were granted.

- off-channel pits were permitted through the WOGCC. Engineering and construction Quality and Control issues were addressed to satisfy the permits. Monitoring wells were required to show non-degradation of the shallow aquifer. The aquifer had water of lower quality than the produced water so unlined pits were allowed.
- by 2001, permits for eight injection wells were sought, only six were permitted and 4 were drilled (deep injection wells Cost from \$400,000 to 3 million to drill)  
In late 2001 new DEQ regulations caused Huber to stop using three of the four injection wells.
- the regulatory environment for discharge to surface streams was so strict that Huber did not pursue this option.

See Case studies of produced water management relative to CBM production p. 22-26:

[http://www.all-llc.com/CBM/pdf/CBMBU/CBM%20BU%20Screen\\_Chapter%206%20Case%20Studies.pdf](http://www.all-llc.com/CBM/pdf/CBMBU/CBM%20BU%20Screen_Chapter%206%20Case%20Studies.pdf)

*These were all events which occurred with just one company in just one pod prior to the PRBRC petition....*

*Conclusion: the regulatory process is working!*



2. There are figures in the Petition concerning effluent limits which are difficult to substantiate.

- I find no documentation from the University of Utah Extension service recommending the maximum **sulfate** level of 500 mg/l. Here's what I did find: (sources listed below)
  - **Utah State University Extension service:** limit 4500 mg/l
  - **SDSU:** limit 3500 mg/l
  - **Agri-Food Canada:** Change mineral ration at levels over 1000mg/l
  - **CSU-** no recommendation found
  - A Nebraska study found that sulfate levels of 1500 mg/l Sulfate in water actually improved avg daily gain for calves and milk production for cows once they became accustomed to it.
  - For *weaned calves*, the sulphur, not the sulfate, content is important because increase H<sub>2</sub>S in the rumen of recently weaned calves can cause polioencephalomalacia...To arrive at the sulphur content for water, you divide sulfate by 3. The suggested maximum of sulphur to prevent polioencephalomalacia is 4000mg/l which would compute to 12,000 mg/l Sulfate and Sulfides combined. *Management issues for recently weaned calves should not effect water effluent limits statewide.*

*Conclusion: Leave Wyoming's current limit of 2,000mg/l as is.*

- **TDS recommendations are:**
  - SDSU, Utah State University, CSU, Agri-Food Canada:** All state 'up to 5,000 mg/l TDS satisfactory for livestock But may cause diarrhea'. Over 5,000 mg/l not recommended for lactating cows.

*Conclusion: Wyoming's current limit is spot on.*

Documentation of these points can be found at the following web addresses:

Utah State University recommendations:

[http://extension.usu.edu/files/publications/factsheet/AH\\_Beef\\_28.pdf](http://extension.usu.edu/files/publications/factsheet/AH_Beef_28.pdf)

South Dakota State University interpretation of water analysis for livestock suitability:

<http://agbiopubs.sdstate.edu/articles/ExEx2042.pdf>

Colorado State University livestock drinking water quality:

<http://www.ext.colostate.edu/Pubs/livestk/04908.html>

University of Nebraska “Variability of water composition and potential impact on animal performance”:

<http://www.das.psu.edu/dairynutrition/documents/sochawksh.pdf>

Agriculture and Agri-Food Canada “livestock and water quality”:

[http://www.agr.gc.ca/pfra/water/livestck\\_e.htm](http://www.agr.gc.ca/pfra/water/livestck_e.htm)

3. The EPA limit for **barium** in the nations drinking water is 2mg/l not .2mg/l as the petition and the proposed rule change state. The petitioner’s may have been referring to EPA’s reference dose (RfD) limit on Barium of .2mg/Kg/day. If so, it is well to note that EPA explains: ‘a reference dose limit does not mean this exposure level is unsafe, but rather without appreciable risk’. The RfD is **not** a presumptive drinking water standard but rather the first step toward developing one under the Safe Drinking Water Act. The scientific uncertainty spans from 1/3<sup>rd</sup> the RfD to three times the RfD. In any case, if one used EPA’s RfD limit for barium consumption of .2mg/kg/day, then a 1000 pound cow would be allowed 60 gallons of water at the 2mg/l EPA standard per day and a 180 pound rancher could safely consume 4 gallons of such water per day!
  - EPA explains that the drinking water standard of 2mg/l is the lowest Level to which water systems can reasonably be required to remove This substance from drinking water using today’s technology.
  - because most Wyoming soils and CBM waters are alkaline, there is little chance that Barium would be present in anything but its insoluble form which means it poses virtually no risk to Wyoming’s drinking water supply. The soluble compound, barium chloride, requires acidic conditions to mobilize into the water supply. Methane discharge waters are typically low in chloride and higher in sulfate and



bicarbonate. Therefore most barium would more readily exist as either insoluble barium sulfate or barium carbonate, neither of which would mobilize into the water supply. EPA's own study states that barium sulfate is largely insoluble and posed no threat to humans or animals and that barium carbonate was even more insoluble.

*Conclusion -there is no foundation for taking action on the petitioner's request to change the Barium limits in Wyoming.*

Documentation may be found at the following:

EPA consumer fact sheet on Barium:

[http://www.epa.gov/safewater/contaminants/dw\\_contamfs/barium.html](http://www.epa.gov/safewater/contaminants/dw_contamfs/barium.html)

EPA definition of a "reference dose":

[http://www.epa.gov/fedfac/documents/perchlorate\\_qa.htm](http://www.epa.gov/fedfac/documents/perchlorate_qa.htm)

EPA oral RfD summary for barium:

<http://www.epa.gov/iris/subst/0010.htm>

The Risk Assessment Information System toxicity summary for barium:

[http://rais.ornl.gov/tox/profiles/barium\\_f\\_V1.shtml](http://rais.ornl.gov/tox/profiles/barium_f_V1.shtml)

We thank you for consideration of these points and wish you Great prudence in your deliberations concerning this matter.

Thank you,



Sheridan and Lindy Burgess