

# UNIVERSITY OF WYOMING

Department of Renewable Resources  
College of Agriculture  
Department 3354 • Laramie, WY 82071-3354  
(307) 766-2263 • fax (307) 766-6403 • <http://uwyo.edu/RenewableResources>

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Terri A. Lorenzon, Director  
Environmental Quality Council

Environmental Quality Council  
c/o Mr. Bill DiRienzo  
Watershed Program Supervisor  
Wyoming Department of Environmental Quality  
122 West 25<sup>th</sup> Street  
Herschler Building  
Cheyenne, WY

**RE: Chapter 1 Water Quality Rules & Regulations Proposed changes**

Dear Environmental Quality Council Members:

I am submitting written comments for consideration regarding Section 20 of Chapter of the Wyoming Surface Water Quality Standards that will be considered by the Wyoming Environmental Quality Council (EQC) on February 15 and 16, 2007. I am submitting these comments both as a member of the workgroup that worked on revising section 20 of the Chapter 1, and as a Faculty member at the Wyoming Land Grant University. I have been asked by several landowners within the state to submit comments regarding the Agricultural Use Policy section of the Water Quality Standards now before you. These statements address the policy as it is presented in the proposed appendix to the EQC. Thank you in advance for your time and consideration of these comments.

First, I would like to state that I agree that this proposed policy should be applied as a rule and a new appendix H within Chapter 1. That would ensure that this is an enforceable rule (rather than a narrative policy) and therefore more protective of Wyoming's water and agricultural resources.

Since June of 2004, I have worked with Wyoming Department of Environmental Quality (DEQ) on revising the water quality standards for the Agricultural Use Policy now before the EQC. As a scientist at the University of Wyoming and a member of the Agricultural Use Policy work group, my objective has been to integrate the "best available science" into the water quality standards. This means that the data used are credible data and the data and the science have gone through the peer review process. Anecdotal evidence and

non scientific documents should not be used to make policy decisions that impact the quality of Wyoming agriculture (soil and water) resources. This is especially important regarding the "Default Limits". The USDA Bridger Plan Materials Center Technical note does not present information that has gone through the scientific peer review process. This section should be deleted and replaced with the DEQ recommendation in the footnote.

Section 20 of chapter 1 is written to be protective of all agricultural uses and should not be limited in scope. The inclusion of sub-irrigated bottom lands in the rule is an important addition. However, it is important that all bottomland areas that are used or have the potential for agricultural use are protected. The current area threshold used to define "significant" areas is too broad and leaves many significant bottomland areas that are used for livestock grazing unprotected. I have addressed this same issue in previous comments submitted to DEQ and this issue has been discussed at length with the Governors CBM taskforce.

Though I am not a proponent of the tiered process for setting water quality standards, I do understand why the process is being proposed. However, there are important factors that need to be considered in implementing this approach. First and foremost, section 20 as a whole and tier 1 in particular are to be protective of Wyoming's agricultural resources. The best available science should be used to set the standards. Using EC and SAR limits for the most sensitive plant is a viable approach. However, a SAR limit of 16 is not protective of Wyoming's soil and vegetation resources. Continued application of high SAR water will most likely result in build up of ESP of the soil, even if the water added has high enough salinity to infiltrate.

The Bureau of Land Management (BLM) references the 1999 Environmental Impact Statement as the source for the statement (Section 4.1): "Government soil experts state that SAR values of only 13 or more cause potentially irreversible changes to soil structure, especially in clayey soil types, that reduce permeability for infiltration of rainfall and surface water flows, restrict root growth, limit permeability of gases and moisture, and make tillage difficult" (PRB FEIS page 4-144). The BLM's "government soil experts" would place the soil SAR limit at 13. NRCS have for many years used a saturated paste SAR of 13 as the number at which potentially irreversible reductions in permeability, gas exchange and root penetration will occur. The NRCS National Engineering Handbook identifies an SAR of 13 as the threshold for soils. This would convert to a water SAR of 7 or 8, certainly no more than an SAR of 10 (water) to result in an SAR of 12 or less in the soil. A very recent study conducted by the USDA Salinity Laboratory based on Powder River Basin soils (*Evaluation of Water Quality Criteria for Rain-Irrigation Cropping Systems* Donald L. Suarez, James D. Wood and Scott Lesch, Salinity Laboratory USDA-ARS. Final Report to EPA, June 30, 2006) looked at the impacts of SAR on infiltration rates. They found significant decreases in infiltration rates in soils with an SAR between 2 and 5. Significant decreases were found at SARs as low as 6. Therefore, an SAR of 10 should definitely be the upper limit allowed. Ideally, the permitted SAR will be set to be protective of the soil and water resources and the hydrologic processes that affect the vegetation and the system.

In addition, there is a great potential for the misinterpretation and poor implementation of the water quality rules as stated for tier 2. The policy reads that "Tier 2 procedure would result in effluent limits equal to the background quality of the receiving water." It also states that in cases when the background water quality data cannot be obtained, that permit limits will be based on the "best information that can be reasonably" obtained. Currently, DEQ is using soil samples to determine background water quality. This is not a reasonable method. Soil sampling should not be used as a methodology for calculating background water quality. There are many reasons that a given soil sample may have a higher EC or SAR value than the background water quality of that area. It is important to remember that the primary water source before CBM development in most of these areas was precipitation. The factors that can influence soil SAR and EC values are numerous and include (but not limited to): timing of soil sample relative to the latest storm or runoff event; the size of the storm; the location of the soil samples (older terraces may have higher EC and SAR values), and depth to water table. Soils can have higher EC and SAR levels than the background water quality for many reasons; however, it is very important to note that a soil SAR of 18 does not mean that the background water quality had an SAR of 18. Ideally, background water quality levels for a tier 2 analysis will be conducted by an independent third party and using a sampling methodology agreeable to both the landowner and DEQ.

Thank you all for your hard work and commitment to protecting and maintaining Wyoming's environmental quality. If you have any questions regarding my comments, please feel free to contact me. Again, thank you for your time and consideration of this important issue.

Sincerely,



Ginger Paige  
Assistant Professor, Water Resources