



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

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February 14, 2007

[Sent by Facsimile to the Wyoming Department of Environmental Quality on February 14, 2007]

Ref: 8EPR-EP

Mr. Bill DiRienzo
Wyoming Department of Environmental Quality
Herschler Building
122 W. 25th, 4th Floor
Cheyenne, Wyoming 82002

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Terri A. Lorenzon, Director
Environmental Quality Council

Dear Mr. DiRienzo:

At its February 15, 2007 hearing the Wyoming Environmental Quality Council (Council) will consider comments concerning proposed revisions to the *Water Quality Rules and Regulations - Chapter 1, Wyoming Surface Water Quality Standards*. The U.S. Environmental Protection Agency Region 8's Water Quality Unit (WQU) offers comments on the proposed revisions now before the Council. Please note that the positions described in our comments, regarding proposed revisions to the water quality standards, are preliminary in nature and should not be interpreted as final Agency decisions pursuant to Clean Water Act Section 303(c).

The principal revisions proposed include: 1) a change in the primary bacterial indicator organism, from fecal coliform to *E. coli*, for protection of recreational uses and the creation of subcategories of recreational uses; 2) creation of two new classifications, 2D and 3D, applicable to effluent-dependent waters and a new procedure for calculating ambient-based criteria for those waters; 3) a new appendix H, implementing the State's narrative agricultural standard in Section 20; 4) updates to the numeric criteria for toxic pollutants, in Appendix B, to be consistent with EPA's recommendations; and 5) modifications to the numeric criteria for chloride and aluminum. In addition to these proposed revisions, the Council also will consider comments on proposed site-specific standards for several segments.

In general, the WQU supports the proposed revisions. We do, however, have comments on and suggested amendments to certain elements of the proposed revisions. In particular, we have significant concerns with two elements of the proposed rule which we believe are inconsistent with federal requirements: 1) a proposal to downgrade a significant number of waters from primary to secondary contact recreation; and 2) a proposal that would allow variances from the proposed *E. coli* standards based on a finding that the source of contamination is unavoidable or otherwise in the public interest. Other comments are offered as support for




specific proposed rule revisions or as suggestions that we believe would improve the rule. The WQU's comments on the proposed amendments to *Chapter 1, Wyoming Surface Water Quality Standards* are included in an enclosed attachment.

The proposed revisions to *Chapter 1, Wyoming Surface Water Quality Standards* and the Department of Environmental Quality's (DEQ's) Implementation Policies include a number of very significant and important amendments, and as noted above and as explained in the enclosure to this letter, the WQU strongly supports a number of the proposed revisions. We recognize that the proposal now before the Council represents a tremendous amount of work by the DEQ staff, addressing very significant and difficult water quality issues. The DEQ is to be commended for that effort and the revisions proposed.

Nevertheless, we have comments on and suggested changes for several elements in the proposal. In particular, we ask that the Council consider the significant concerns we have with two elements of the proposed rule which we believe are inconsistent with federal requirements. Those concerns are discussed in the enclosed attachment.

If you have questions or wish to discuss this further, please call me at 303-312-6236, or ask the DEQ staff to contact Bill Wuerthele, of my staff, at 303-312-6943.

Sincerely,


Karen Hamilton, Chief
Water Quality Unit

Enclosures

cc: John Wagner, Administrator, Water Quality Division
Amy Newman, OST, EPA Headquarters

EPA Region 8 Water Quality Unit's Comments on and Suggested Changes to the Proposed Revisions to *Chapter 1, Wyoming Surface Water Quality Standards*

The U.S. Environmental Protection Agency Region 8's Water Quality Unit (WQU) offers comments on the proposed revisions to the *Water Quality Rules and Regulations - Chapter 1, Wyoming Surface Water Quality Standards*. The principal revisions proposed include: 1) a change in the primary bacterial indicator organism, from fecal coliform to *E. coli*, for protection of recreational uses and the creation of subcategories of recreational uses; 2) creation of two new classifications, 2D and 3D, applicable to effluent-dependent waters and a new procedure for calculating ambient-based criteria for those waters; 3) a new appendix H, implementing the State's narrative agricultural standard in Section 20; 4) updates to the numeric criteria for toxic pollutants, in Appendix B, to be consistent with EPA's recommendations; and 5) modifications to the numeric criteria for chloride and aluminum. In addition to these proposed revisions, the Council also will consider comments on proposed site-specific standards for several segments.

In general, the WQU supports the proposed revisions. We do, however, have comments on and suggested amendments to certain elements of the proposed revisions. In particular, we have significant concerns with two elements of the proposed rule which we believe are inconsistent with federal requirements: 1) a proposal to downgrade a significant number of waters from primary to secondary contact recreation; and 2) a proposal that would allow variances from the proposed *E. coli* standards based on a finding that the source of contamination is unavoidable or otherwise in the public interest. Other comments are offered as support for specific proposed rule revisions or as suggestions that we believe would improve the rule.

(1) Change to *E. coli* as the bacterial indicator for recreational uses and creation of recreational use subcategories (Section 27)

The WQU strongly supports the proposed change to *E. coli* as the bacterial indicator for protection of recreational uses. EPA believes that, for fresh water, *E. coli* is the indicator best suited for use in determining the potential risk of contracting acute gastrointestinal illness from incidental ingestion of contaminated water during recreational activities. The proposed numerical criteria of a geometric mean of 126 organisms per 100 milliliters for primary contact recreation and a geometric mean of 630 organisms per 100 milliliters for secondary contact recreation are consistent with EPA's recommendations¹, and therefore, the WQU supports the proposed criteria. In addition, numerical single-sample maximum criteria are proposed for protection of primary contact based on frequency of use (i.e., high, moderate, light or infrequent use). The proposed criteria are consistent with the upper percentile values for an acceptable risk level for primary contact recreation, and their proposed application, based on frequency of use, is within the State's risk management discretion. The proposed single-sample criteria are,

¹ EPA's most recent recommendations on the use of *E. coli* as a bacterial indicator for the protection of recreational uses are presented in a document entitled *Implementation Guidance for Ambient Water Quality Criteria for Bacteria*, March 2004. Although this is not a final document, it represents the Agency's current thinking on this subject, and Region 8 recommends its application in guiding development and implementation of bacterial indicator criteria.

therefore, acceptable as well. There are, however, several aspects of the proposed revisions to Section 27 that warrant additional consideration and, in several cases, further revision.

Downgrading of Primary Contact Recreational Waters based on Table A and Table B

The proposed Section 27(a), addressing primary contact recreation, notes that waters in Table A of the Wyoming Surface Water Classification List are designated for primary contact recreation (unless specifically identified as a secondary contact water). Waters not specifically listed in Table A are designated as secondary contact waters. At present, all waters of the State are designated as primary contact recreation. This proposal, therefore, downgrades the recreational use classification, from primary to secondary contact, for a very significant number of waters statewide based simply on whether or not they appear in Table A. The proposed change in use classification will be made without supporting use attainability analyses (UAAs). Neither the federal nor State water quality standards regulation allows such an outcome.

The Clean Water Act and EPA's water quality standards regulation effectively establish a rebuttable presumption that the CWA Section 101(a)(2) uses, aquatic life and primary contact recreation, are attainable and should apply to all waters. This presumption can be rebutted, but only where it is affirmatively demonstrated that such uses are not attainable. The mechanism for making such a demonstration is the UAA, and EPA's water quality standards regulation, at 40 CFR Section 131.10(j), identifies the UAA requirements. A UAA is required, in part, where the State "... wishes to remove a designated use that is specified in Section 101(a)(2) of the Act ...", and the regulation, at 40 CFR Section 131.10(g), further identifies the six specific use removal criteria that may be considered in demonstrating that attaining a use is infeasible (Section 33 of the revised Wyoming surface water quality standards includes six use removal criteria that are essentially the same as those in the federal regulation).

Section IV of the Department of Environmental Quality's (DEQ's) *Recreational Use Designations Use Attainability Analysis (UAA) Worksheet* recognizes this need to provide a UAA when downgrading from a primary to a secondary contact recreational use designation. Specifically, the DEQ's guidance notes:

"Chapter 1, Section 33(b) requires that all petitions to lower a classification or criteria must be based on one or more of the use removal factors listed in Section 33(b)(i) through (vi). Most commonly, the factors that apply to reclassifying a water from a primary to a secondary contact designation are 33(b)(ii) or (v) though there may be unique circumstances where one of the other factors is most appropriate."

Yet, the proposed amendment to Section 27 provides no UAAs for the blanket downgrading of a very significant number of waters statewide.

The rationale for the Table A default approach to revising the recreational use classifications is that Table A is a listing of waters that are named on the USGS 1:500,000

hydrologic map of Wyoming. These, therefore, are the larger mainstem streams, lakes and reservoirs that have a higher probability of supporting primary contact recreation. Although this may be a reasonable expectation, the DEQ acknowledges that there are likely waters on Table B that now support or warrant support for primary contact recreation (the DEQ also acknowledges that there are likely waters on Table A that do not support primary contact recreation). We understand the goal of the proposed approach is to provide a better approximation, albeit an imperfect one, of the actual potential for primary contact recreation, and we acknowledge that some adjustments to the current use designations may be warranted. Nevertheless, we do not believe the approach to making those adjustments, as proposed in the revised Section 27, is supported by either State or federal law. We also believe it would set a poor precedent to ignore the State's UAA requirement, in this case, simply because the outcome seems reasonable.

We are not persuaded that the proposed downgrading, from primary to secondary contact recreation, for a very significant number of waters statewide without supporting UAAs is consistent with federal requirements at 40 CFR Section 131.10(j). If this use downgrade provision is adopted as proposed, we would recommend that the Regional Administrator disapprove the revision.

Variations

The proposal includes a provision for temporary or permanent variations from the bacterial standards where the source of contamination is due to wildlife, is unavoidable, or otherwise in the public interest. The WQU has recognized that it may be appropriate to exclude fecal contamination from regulatory control where the source is determined to be due to wildlife, and we have acknowledged that the wildlife issue can be addressed with a footnote, effectively exempting this natural source from regulatory control.² We do not believe, however, it would be similarly appropriate to provide variations, without public review through the water quality standards-setting process, for "unavoidable sources" or circumstances in the "public interest."

A variance is a short-term exemption from meeting an otherwise applicable water quality standard. EPA, therefore, considers a variance to be a change to a water quality standard, and as such, it is subject to a State's water quality standards-setting requirements and EPA review and approval (see 40 CFR Section 131.13 addressing general policies; the 1983 preamble to EPA's water quality standards regulation; and Section 5.3 of EPA's *Water Quality Standards Handbook*). As proposed, the revised rule would effectively allow temporary or permanent changes to the State's numeric water quality standards for *E. coli* outside the State's water quality standards rulemaking process. Whether a source is "unavoidable" or whether a variance is

² For example, several States in the Region have used a footnote similar to the following to address natural sources: "Where the *E. coli* criteria are exceeded and there are natural sources (wildlife), the criteria may be considered attained, provided there is reasonable basis for concluding that the indicator bacteria density attributable to anthropogenic sources is consistent with the level of water quality required by the criteria. This may be the situation, for example, in National Wildlife Refuges and State Waterfowl Management Areas."

considered to be in the "public interest" are questions that, by their very nature, warrant review by the public. And, because the outcome of such a review could effectively amend, permanently, the State's numeric water quality standards for *E. coli*, that review is to be conducted through the standards-setting process. This proposal, therefore, needs to be revised to indicate that, where a variance is proposed because the source is "unavoidable" or a variance is deemed to be in the "public interest," that variance will be approved and adopted through the State's water quality standards review process and submitted to EPA for review and approval pursuant to Section 303(c) of the Clean Water Act.

We are not persuaded that the proposed variance provision is consistent with federal requirements at 40 CFR Section 131.13. If this variance provision is adopted as proposed, we would recommend that the Regional Administrator disapprove the revision.

Seasonal Recreational Uses

Seasonal recreational uses are acceptable in States such as Wyoming where ambient air and water temperatures in the winter months make primary contact recreation unlikely. EPA's water quality standards regulation allows for seasonal uses, provided the criteria adopted to protect such uses do not preclude attainment of more protective uses in another season (see 40 CFR 131.10(f)). The seasonal uses, as proposed, would not preclude attainment of the primary contact recreational use, and therefore, the proposal for seasonal uses is acceptable. The federal regulation does not require a formal UAA to support adoption of seasonal uses.

(2) Creation of two new classifications, 2D and 3D, applicable to effluent-dependent waters and a new procedure for calculating ambient-based criteria for those waters (Section 36)

This proposed revision is intended to resolve a lingering and important issue between the DEQ and EPA Region 8 on the general matter of available options for appropriately designating aquatic life uses on effluent-dependent waters³. The proposed revision includes two new aquatic life use classifications applicable to effluent-dependent waters, and to accompany the new use classifications, a new performance-based provision allowing for derivation of numerical criteria applicable to and protective of these new use classifications is proposed. The WQU believes this proposal includes the key elements that will resolve the effluent-dependent waters issue statewide, and we support its adoption.

Background

The Clean Water Act and EPA's water quality standards regulation effectively establish a rebuttable presumption that the CWA Section 101(a)(2) uses, aquatic life and recreation, are

³ An effluent-dependent waterbody is one that would be ephemeral without the presence of wastewater effluent, but which has continuous or intermittent flows for all or a portion of its reach as the result of the discharge of treated wastewater, e.g., Whitetail Creek and its tributary.

attainable and should apply to all waters. As indicated in the recreational use discussion above, this presumption can be rebutted, but only where it is affirmatively demonstrated that such uses are not attainable. The mechanism for making such a demonstration is the UAA. EPA's water quality standards regulation, at 40 CFR Section 131.10(j), identifies the UAA requirements. A UAA is required, in part, where the State "... wishes to remove a designated use that is specified in Section 101(a)(2) of the Act ...", and the regulation, at 40 CFR Section 131.10(g), further identifies the six specific use removal criteria that may be considered in demonstrating that attaining a use is infeasible (Section 33 of the revised Wyoming surface water quality standards includes six use removal criteria that are essentially the same as those in the federal regulation).

The federal use removal criterion #2 clearly contemplates that there may be situations where low flow conditions prevent the attainment of an aquatic life use and that certain low flow conditions may be an acceptable basis for either removing or not designating an aquatic life use. A key aspect of both the federal and State regulations, however, is the language "... *unless these conditions may be compensated for by the discharge of sufficient volume of effluent discharges without violating state water conservation requirements to enable uses to be met.*" EPA interprets this language to mean, where an ephemeral waterbody receives a discharge of sufficient volume to alter the natural, ephemeral character of the waterbody, establishing or sustaining an aquatic life use, that existing use is to be designated in the water quality standards and protected. In such a situation, removal of an aquatic life use or failure to designate an aquatic life use is unacceptable.

The DEQ has argued that removal of the aquatic life use is warranted because: 1) the produced water discharge creates valuable wildlife and agricultural uses in an otherwise dry area of the State; 2) Class 4 includes protection of these wildlife and agricultural uses; 3) the aquatic organisms that have colonized the stream are, by definition, adapted to the existing water quality and thus protected; 4) if forced to meet the aquatic life numeric standards for Class 3, the produced water will be re-injected and the beneficial uses of the water for aquatic life, wildlife and agriculture will be lost; and 5) therefore, removal of the discharge (pollutants) will create more environmental harm than leaving it in place. Thus, the DEQ argues that the federal use removal criterion, at 40 CFR Section 131.10(g)(3), is satisfied.

While the WQU acknowledges the value of the created wildlife and agricultural uses in arid areas of the State, we have not accepted the DEQ's conclusion that removal of the aquatic life use is warranted and supported by federal and State law. The DEQ's conclusion that removal of the aquatic life use is warranted is unacceptable because: 1) it ignores the instruction that where an ephemeral waterbody receives a discharge of sufficient volume to alter the natural, ephemeral character of the waterbody, establishing or sustaining an aquatic life use, that existing use is to be designated in the water quality standards and protected; 2) it ignores, therefore, the existing use protection provisions of the federal and State regulations; and 3) the use removal criterion at 40 CFR Section 131.10(g)(3) (Wyoming's Section 33(b)(iii)) does not apply, because the created use is an existing use.

Elements of the proposed approach to effluent-dependent waters

The proposed revisions to Chapter 1 would retain the aquatic life use for effluent-dependent waters and focus on adjusting numeric criteria applicable to these waters on either a category- or site-specific basis. By retaining the aquatic life use, the proposed approach would resolve the effluent-dependent waters issue statewide. The WQU views the following elements as key to the proposed approach:

- Two new aquatic life use classifications would be created, Classes 2D and 3D, applicable specifically to effluent-dependent waters;
- Class 2D would apply to waters supporting fish and Class 3D would apply to waters supporting aquatic organisms other than fish;
- A new Section 36 in the water quality standards would authorize development of site-specific, ambient-based criteria for Classes 2D and 3D, the effluent-dependent waters;
- The existing UAA procedure would be modified to:
 - 1) allow for identification of eligible waterbodies; and 2) where an effluent-dependent waterbody is identified, set out the data requirements and decision-making process that would be used to implement the new Section 36;
- Although the Region would continue to review and approve or disapprove the UAA-based assignment of the new 2D or 3D Classes to individual waterbodies, the Region would not need to review site-specific criteria adjustments for those individual waterbodies made pursuant to an EPA approved performance-based implementation procedure;
- Of the available criteria derivation options, a key one will be a site-specific criteria approach in which the criteria could be set equal to the existing, ambient condition based on a finding of "net environmental benefit" (NEB);
- NEB-based criteria would be authorized where a) the waterbody is effluent-dependent; b) a discharge has been shown to create an environmental benefit and removal of the discharge would cause more environmental harm than leaving it in place; c) there is a credible threat to remove the discharge; and d) appropriate safeguards are in place, ensuring that downstream uses will be protected and the discharge will pose no health risk or hazard to humans, livestock or wildlife (in addressing the potential adverse effects to humans, livestock and wildlife, the hazard analysis would focus on persistent and bioaccumulative toxics in the discharge);
- There could be an alternative approach for certain parameters, e.g., chloride, where category-specific (rather than site-specific) criteria could be identified and assigned to Classes 2D and 3D. The Region would review and approve/disapprove category-specific criteria.

The New Section 36

The proposed Section 36 provides the authority to make adjustments to the numeric criteria in Appendix B applicable to the newly proposed Class 2D and 3D waters. The criteria

modifications could be made on either a categorical or site-specific basis and will be authorized where there is a showing that a permitted effluent discharge creates a "net environmental benefit." The proposed Section 36(a) is consistent with the proposed approach to effluent-dependent waters discussed above, and as explained above, the WQU supports this approach to establishing an appropriate level of protection for effluent-dependent waters.

Where the net environmental benefit factors are satisfied, the numeric criteria will be set equal to the background condition. Clearly, therefore, the manner in which the background condition is determined will be key to assigning an appropriate level of protection to these effluent-dependent waters. Section 36(b) proposes that the background condition will be based on the highest recorded concentration plus one standard deviation. In comments to the Water and Waste Advisory Board on the proposed Section 36 in March, 2005, the WQU expressed concern with this approach to calculating background quality and suggested that our concern could be addressed if the criteria derived in this way were expressed as instantaneous maxima. That provision has been incorporated into the current proposal addressing our principal concern.

(3) Agricultural Use Protection - Appendix H, Implementing Section 20

The WQU supports the development of a procedure that will implement the narrative agricultural use protection standard in Section 20 of Chapter 1. The proposed Appendix H includes a number of positive features and should facilitate consistent and appropriate application of the narrative standard. The proposed three tiered approach to protection of irrigated agriculture, with a default and two options for making site-specific adjustments, is reasonable in that it allows for recognition of local soils, crops, background water quality and irrigation practices. This proposal includes several important elements, such as the provision allowing for maintenance of background water quality where the quality is significantly better than that estimated to provide 100% yield and the provision allowing for the capping of SAR below the magnitude allowed by the maximum EC.

The WQU has comments on four elements of the proposed Appendix H: protection of future irrigated crops; calculation of background water quality; the Water and Waste Advisory Board's proposal for default EC and SAR values; and the potential need to adjust SAR values to account for the effects of rain on sodic soil.

Protection of future irrigated crops

As explained in the proposal, the goal of the narrative standard in Section 20 is to maintain water quality that will support agricultural uses that have developed around it. The proposal further explains that the effect threshold, avoiding a "measurable decrease in crop and livestock production," implies the goal is to protect pre-existing agricultural uses. Water quality standards, however, are to protect existing and designated uses, and in designating uses, States are to evaluate both existing and attainable conditions, considering potential uses in addition to those that are currently in place. To satisfy this goal in establishing protective EC and SAR

levels, therefore, it will be important to consider crops now grown, potential crops that could be successfully grown, and the relative sensitivity of those crops to salinity.

In our view, the Tier 1 default approach, as proposed by the DEQ, would allow for such consideration of both existing and potential crops. This is because the procedure relies on standard references, such as the USDA's salt tolerance database, to derive EC values that predict 100% yield thresholds for sensitive "species of interest." Under this approach, in addition to existing crops, the "species of interest" could therefore include potential crops that could be successfully grown. For example, where an irrigator indicated an intention to change from an existing crop to one with perhaps a higher value but greater salt sensitivity, that more sensitive crop would become the species of interest in the Tier 1 calculation of the 100% yield threshold. Although we believe the Tier 1 procedure allows for consideration of future, more salt sensitive crops, our suggestion is that Appendix H clearly state the ability of the Tier 1 procedure to consider potential crops that could be successfully grown. We do not believe the goal of protecting Wyoming's existing irrigated agricultural uses would prohibit consideration of changes in crops grown or irrigation practices used within the State's irrigated farming industry.

Calculation of background water quality

The Tier 2 approach allows the EC and SAR discharge limits to be set equal to background quality where that pre-existing background water quality, at the point of diversion, is worse than the effluent quality. The procedure explains how the background water quality would be measured or calculated, but it does not include an evaluation of the cause of the poorer background quality, e.g., whether it is due to natural or irreversible human-caused conditions. In the Tier 2 approach, the existing background quality effectively becomes "ambient-based" criteria for EC and SAR at that site.

Ambient-based criteria, less stringent than predictive, protective criteria (such as the Tier 1 values), are allowed where it can be shown that the existing ambient condition is due to either natural or irreversible human-caused conditions. Where that can be demonstrated, ambient-based criteria are warranted. The Tier 2 procedure, therefore, should include a provision requiring an evaluation of the cause of the poorer background quality to determine whether it is natural or, where human-caused, irreversible. Alternatively, use of poorer background quality as the basis for limiting EC and SAR discharges could be allowed where it is demonstrated that the existing background quality would fully protect the designated use(s). A suggestion, therefore, would be to revise the introduction to Section 2 of the proposal to clarify the two options available for using background water quality, poorer than the default values, as the basis for limiting EC and SAR discharges:

2. Refining EC and SAR limits (Tiers 2&3)

Establishing EC and SAR ... This type of showing can be made by demonstrating that background water quality conditions are of lower quality than the default values due to either

natural or irreversible, human-caused conditions or by demonstrating that because of local soil conditions and irrigation practices there would be no harm to crop production from less stringent EC and SAR limits.

The Water and Waste Advisory Board's proposal for default EC and SAR values

For the Tier 1 element of Appendix H, the Water and Waste Advisory Board (Board) has proposed an approach to deriving default EC and SAR values that differs from the one proposed by the DEQ in its fifth draft of what was then a DEQ proposed Policy. The Board's proposal is the one presented in the body of the proposed Appendix H. The DEQ's position on this issue is presented in Footnotes 1 and 2 of Appendix H. For EC, the Board's proposal would use the NRCS' Bridger Plant Materials Center's 1996 Technical Note No. 26 as the principal resource for determining soil salinity tolerance values. Alternatively, the DEQ's proposal is to use the Salt Tolerance Database published by the USDA Agricultural Research Service to arrive at appropriate EC values.

As explained in the introduction to the NRCS' Technical Note 26, that document "... provides information regarding the reclamation of brine sites." The information was compiled from a literature review as well as from a brine site revegetation study completed in Graham County, Kansas by the Graham County Conservation District and the Manhattan Plant Materials Center. Figure 2 of this document, which we assume is being suggested by the Board as the basis for default EC values, offers only a general guide for rating the relative salt tolerance of species commonly used in the reclamation of brine sites. This does not appear to be an ideal source of information for providing the specificity needed for a Wyoming procedure aimed at maintaining "... surface water quality at a level that will continue to support the local agricultural uses that have developed around it."

It is our understanding that at a DEQ organized January 9, 2007 meeting of soil scientists there was little support for use of the Bridger Technical Note as the basis for EC values for protecting irrigated agriculture in Wyoming. The WQU supports the DEQ's proposal to use the Salt Tolerance Database, published by the USDA Agricultural Research Service, as the basis for deriving appropriate EC values. We believe that information is more consistent with the intent of this procedure.

The Board also proposes a default SAR value of 16. This value is considerably higher than the DEQ's proposed SAR default cap of 10. In the discussion below addressing the rain-on-sodic-soil event, the WQU recommends that the DEQ and the Council consider adjusting its SAR default cap of 10 downward. It follows, then, that we would make the same recommendation for the Board's SAR cap of 16, and at a minimum, we recommend that the cap be no higher than the 10 proposed by the DEQ.

SAR and rain-on-sodic-soil

The DEQ's Tier 1 default procedure incorporates a relationship between SAR and EC, which recognizes that as salinity increases the potential impacts of SAR decrease (see the Hanson diagram presented in Appendix H). This relationship is not unbounded, however, and the DEQ's default procedure caps the SAR value at 10 to minimize the potential for sodium build-up in poorly drained soils (see Footnote 2 of Appendix H). Another consideration in establishing an upper bound limit for SAR is the potential impact of rainfall on sodic soils. Rainfall can cause SAR problems in surface soil because of the differential way in which EC and SAR respond to a rain event (significant lowering of the EC and little change in the SAR). We believe it will be important to account for this potential rain-on-sodic-soil problem in establishing allowable maximums for SAR.

Dr. Donald Suarez, USDA Salinity Laboratory Director, and his colleagues recently completed a report entitled *Evaluation of Water Quality Criteria for Rain-Irrigation Cropping Systems* (copy attached). The paper reports on the results of his simulated field evaluation of differing levels of EC and SAR using soils collected in the Tongue and Powder River Basins. The evaluation was done with the aim of helping to address several site-specific questions that arose as Montana was developing its SAR and EC water quality standards in 2002 - 2003. For example, much of the available literature information, prior to Dr. Suarez's work, was based on work done in places with soils, crops and climate different from those in the Tongue and Powder River Basins.

Dr. Suarez's evaluation used soils and cropping conditions representative of the Tongue and Powder River Basins in an effort to provide information that might have more applicability to these Basins. In particular, he looked at the rain-on-sodic-soil event as perhaps the limiting factor for combined rain and irrigation systems such as those found in these Basins. According to the report, Dr. Suarez concludes that significant decreases in infiltration may occur at SAR levels as low or lower than 4 for clay soils and as low or lower than 6 for loams. We suggest the Council consider the findings in this report in evaluating the process for setting maximum SAR values in the Tier 1 default procedure.

(4) Updates to the Toxic Criteria

A key EPA priority for the water quality standards program is that States review EPA's updated, national toxic pollutant criteria and revise their water quality standards, as appropriate, to be consistent with EPA's most recently published recommendations or State-derived, defensible alternatives that would be protective of designated uses. The proposed revisions to Appendix B include updated criteria for toxic pollutants consistent with EPA's current recommendations (see the Agency's revised *National Recommended Water Quality Criteria: 2004* made available in May, 2004). The WQU strongly supports these proposed revisions to Wyoming's criteria for toxic pollutants.

In doing our final review of the proposed revisions to Appendix B, however, we found several typographical errors. Those errors are listed below and should be easy to correct.

- Footnotes 2 and 8 refer to an exposure rate of 6.5 grams of aquatic organisms per day. The new exposure rate used in calculating the human health criteria for most parameters is 17.5 grams per day. However, there are a few that are still based on 6.5 grams per day (eventually, these will be updated to use the 6.5 value). Therefore, footnotes 2 and 8 should be revised to indicate that the criteria are based on either 6.5 or 17.5 grams per day.
- The proposed chronic and acute criteria for thallium are listed as 2.4 and 4.7 ug/L respectively. The actual values are 0.24 and 0.47 ug/L.
- For 2,4-Dimethylphenol, the new criterion, 380 ug/L, is based on toxicity information. The old criterion of 400 ug/L was based on organoleptic effect. Footnote 7, therefore, no longer applies to this pollutant.

(5) Modifications to the Chloride and Aluminum Criteria

Chloride

The DEQ's proposal is to revise the chloride criteria, clarifying that these criteria will apply only to Class 1 and 2 fisheries. The effect of this change will be to remove the current application of the chloride criteria from Class 3 waters. The WQU understands the DEQ's concern with the chloride criteria as now applied to Class 3, and we do not object to the proposal. Nevertheless, we believe that an alternative approach to resolving the current concern would be to develop chloride criteria specific to protection of the aquatic communities typical of Class 3 waters. We understand the DEQ believes this would be too resource intensive an approach. Nevertheless, we continue to believe this is an approach that warrants consideration, and we are willing to work with the DEQ in exploring available options for making appropriate adjustments to the statewide chloride criteria for Class 3 waters.

Aluminum

The proposal here is to revise the Appendix B footnote by removing the reference noting that these criteria are to be measured as total recoverable aluminum. As explained in the DEQ's *Statement of Principal Reasons*, this change is being made to address a problem common to many Wyoming waters, i.e., storm-related runoff resulting in suspension of naturally occurring clays with concentrations of aluminum silicates well above the current State numeric criteria. Although aluminum silicate is not toxic, it is measured by the total recoverable analysis, resulting in an exceedence of the standard. The problem, then, is that this exceedence could be viewed as indicating a problem where no toxic effect would be expected. EPA has acknowledged this problem and has allowed States to address the naturally occurring aluminum silicate issue by changing the method of analysis from total recoverable to dissolved, as is being proposed here by the DEQ. Therefore, the WQU does not object to the proposed change.

Nevertheless, there is a caution that warrants consideration by the DEQ and the Council. Although the DEQ's proposed change to the footnote is a reasonable way of addressing this common situation where the measured aluminum is due to clay runoff, there could be situations where a regulated point source is discharging aluminum that clearly is not clay. Here, the total recoverable metal has meaning since EPA's evaluation of aluminum toxicity, at the time of the criteria development, showed the total recoverable fraction of certain aluminum compounds to be the more toxic fraction. Although the DEQ's proposal is consistent with what has been done elsewhere, an alternative approach would be to use somewhat revised footnote language to address both the natural clay runoff issue and the potential for a point source discharge of aluminum in a toxic form. The alternative proposal would be to: 1) retain the deleted footnote 14 language; and 2) add language specifically addressing the natural clay runoff problem. For example, language could be added to the end of footnote 14, noting that:

"Where storm-related runoff results in suspension of naturally occurring clays or where waterbodies naturally carry high levels of suspended clays, with resulting elevated concentrations of aluminum silicates, compliance with these criteria will be determined based on the dissolved metal fraction."

This approach would address the clay runoff problem, while retaining the State's authority to apply the total recoverable metal fraction to regulated point source discharges where that application would have toxicological meaning.

(6) Proposed Site-Specific Criteria

Salt Creek, Meadow Creek and the Powder River

The proposal is to amend the chloride criteria, for Salt Creek and its tributaries and a portion of the Powder River, from 230 mg/L and 860 mg/L (the Appendix B values), to 1600 mg/L for Salt Creek and Meadow Creek and 984 mg/L for the Powder River (note: the proposed rule lists 984 mg/L and 1600 mg/L for the Powder River). This proposal is based on a UAA provided by Anadarko Petroleum Corporation. Although the UAA generally makes an effective argument for the proposed site-specific chloride standards, the WQU has several comments and questions that we will need to explore in reaching a final decision on the acceptability of the proposal.

- Comment. One of the prominent "lines of evidence" presented in the UAA is an analysis of the effect of ceasing the discharge(s). Although that effect may have practical implications here, the argument should not be confused with the "net environmental benefit" (NEB) concept introduced elsewhere in Chapter I as a basis for deriving ambient-based criteria. As now proposed, NEB would have application only where the pre-discharge, natural flow condition is truly ephemeral. Based on the narrative in this UAA, the streams in question are naturally intermittent or low flow perennial, not ephemeral. Also, as indicated in this UAA, the designated uses that might be affected by

chloride concentrations are attained. That is the key outcome of the attainability analysis and the key argument for the proposed standards. The UAA further uses literature toxicity information as added support for the proposed values.

- Comment. The UAA makes the comment that chloride is not a priority pollutant requiring application of a numeric criteria. Actually, the federal water quality standards regulation, at 40 CFR Section 131.11, establishes a general requirement for criteria to protect designated uses, making no distinction between priority and non-priority pollutants. Although it is true that the Clean Water Act sets out more specific expectations for the priority pollutants and the Agency has specifically pressed for numeric criteria for priority pollutants, it is not accurate to imply numeric criteria are expected only for priority pollutants.
- Comment. A principal argument presented in this UAA is that, based on observational information, the three use designations that are most likely to be affected by elevated chloride concentrations (aquatic life, wildlife and agriculture) are attained. Elsewhere, EPA has accepted the application of ambient-based criteria where it has been demonstrated that the designated uses are attained at ambient conditions exceeding a State's predictive standards (e.g., the Appendix B values). The key to this approach is accurately portraying the ambient condition that is supportive of the designated uses.
- Comment. The UAA applies an EPA statistical analysis to derive proposed site-specific chloride standards that will account for the temporal and spatial variability in the chloride data, while ensuring exceedences will be limited to the allowed failure frequency for water quality standards. As explained in the UAA, the value calculated by this statistical approach is often close to the 99th percentile of the data set. This appears to be borne out by the UAA's narrative which notes that: 1) "(a)verage concentrations in Salt Creek have been around 900 mg/L, ranging up to 1,600 mg/L during the summer months;" and 2) "Powder River concentrations have reached 957 mg/L at times when Salt Creek provides the bulk of the flow." [Note: The UAA also mentions that the "Powder River downstream of Salt Creek regularly exceeds the chloride WQC (we assume this refers to the 230 mg/L value) during the low-flow summer months but not during the rest of the year."] Therefore, the proposed standards are set at or near the maximum values recorded and will be implemented as instantaneous maximum values. The identification of these numerical standards as instantaneous maxima addresses the same degradation concern we initially had with the proposed Section 36.

With the above comments in mind, we have several questions:

- Question. In proposing these site-specific standards, was there any consideration given to seasonal standards? That is, there could be two sets of chloride standards reflecting: 1) the low flow "season" when chloride concentrations are elevated; and 2) a higher flow "season" when chloride concentrations are low. This might be a way to address both the current compliance issue and the degradation concern should discharge quality worsen or other dischargers come on line. A seasonal standards approach might better reflect what the aquatic organisms actually "see" over the course of a year as well, more accurately expressing the exposure scenario that supports the existing aquatic communities.

- Question. The UAA identifies the Powder River segment considered in the analysis as "an undetermined distance downstream of Salt Creek." Yet, the data discussion indicates that the chloride levels in the Powder River drop considerably such that the Appendix B values are consistently met at the State line. Was there any consideration given to re-segmenting the Powder River to more accurately portray the spatial decline in the chloride values?

Cottonwood Creek

The proposal is to amend the chloride and selenium criteria for Cottonwood Creek. The chloride proposal is to delete the chronic 230 mg/L value and apply only the 860 mg/L acute value (the Appendix B value). The selenium proposal is to remove the current 5 ug/L value and assign a site-specific chronic value of 43 ug/L. This proposal is based on a UAA provided by Merit Energy Company. A number of the comments and questions identified above, in the discussion of the Salt Creek, Meadow Creek and Powder River proposal, apply to this situation as well. In addition, the WQU has the following specific comments.

- Comment. The proposed selenium standard is based on the maximum recorded value plus one standard deviation. As a result, the proposed standards are set at or near the maximum values recorded and, therefore, will be implemented as instantaneous maximum values. The identification of these numerical standards as instantaneous maxima addresses the same degradation concern we initially had with the proposed Section 36.
- Comment. The tissue value referenced in this UAA is based on a draft EPA document that is subject to change in response to public comment (actually, this UAA references an earlier, and now revised, EPA draft document).
- Comment. As discussed above, the key to deriving ambient-based criteria is to accurately portray the ambient condition that is supportive of the designated uses. The chemical analysis for selenium is subject to a number of interferences, especially in saline water. The importance of the analytical procedure used in identifying ambient conditions is demonstrated by some recent work done by Utah DEQ in evaluating selenium levels in the Great Salt Lake. Historically, the monitoring data for the Lake indicated elevated levels of selenium, with values reported as high as 200 ug/L. Using new sampling protocols and new analytical techniques (e.g., collision cell ICP-MS), selenium values for the Lake are now consistently reported at or below 1 ug/L. Before we can have confidence that the proposed selenium standard accurately reflects the ambient condition of Cottonwood Creek, we would like to see more specific information on the sampling and analysis methods used and the manner in which those methods were employed to address issues specific to selenium at low concentrations.