



## Hot Springs Conservation District

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July 3, 2019

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WYPDES Permitting Supervisor  
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Water Quality Division  
200 West 17th Street  
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Submitted online: <http://wq.wyomingdeq.commentinput.com/?id=f4gaH> and email [jason.thomas@wyo.gov](mailto:jason.thomas@wyo.gov)

RE: Aethon Energy (Moneta Divide) Proposed Discharge Permit WY0002062

Dear Mr. Thomas:

The Hot Springs Conservation District submits the following comments with regard to the proposed renewal of WYPDES permit number WY0002062, for Aethon Energy's Frenchie Draw/Moneta Divide. We thank you for extending the deadline for comments and providing public meetings to help our communities become better informed.

Many citizens of Hot Spring County utilize the waters of Boysen Reservoir for fishing and recreation, additionally, as the first county below Boysen Dam, we take conservation of this Class 1 water resource very seriously. Not only do we gain a significant economic boost from the scenic value, recreation, fishing and agricultural industries these waters support, but they also provides our drinking water.

### **Class 1 Antidegradation:**

The requirement for Class 1 water is stated clearly on page 2, Statement of Basis (SOB) of this permit, "...the water quality and physical and biological integrity which existed on the water at the time of *designation* will be maintained and protected.' The Wind River below Boysen Reservoir was designated as a Class 1 water in 1979." The baseline water quality data, below Boysen Dam, used in Environmental Resources Management's (ERM) modeling study was collected beginning thirty one years after its designation, from 2010 to 2016. The USGS has recorded data below Boysen Dam for many of the constituents modeled ([https://nwis.waterdata.usgs.gov/wy/nwis/qwdata/?site\\_no=06259000](https://nwis.waterdata.usgs.gov/wy/nwis/qwdata/?site_no=06259000)). The use of new data where historic data exists, violates the antidegradation law of Section 303(d)(4)(B) of the Clean

Water Act, as well as, WDEQ's, Implementation Policies for Antidegradation Mixing Zones and Dilution Allowances Turbidity Use Attainability Analysis of 2013.

As presented on SOB page 3, this permit allows concentrations of monitored constituents to increase by up to one standard deviation. The allowance of the one standard deviation came from WDEQ's Interim Policy on Establishing Effluent Limits for Permitted Point Source Discharges to Class 1 Water Tributaries of 2007. To our understanding, this policy was not reviewed by the EPA per 303(c)(2)(A) nor is it a Wyoming law or binding policy; it is merely the opinion of the WDEQ administrator. It did not follow the Water Quality Divisions procedures (W.S. 35-11-114), for public comment, review by the Water Quality Advisory Board nor was it reviewed by the Environmental Quality Council (W.S. 35-11-112). **As such the one standard deviation utilized in reaching concentration limits should not be used.**

The standard deviations (std Dev) shown in the Model Output – Baseline Concentrations and Permit Limits table on SOB page 3, suggest great variations in the values reported in the lab samples. Upon reviewing the file, Boysen Dam Baseline Sampling Data (BDBSD) [2018\_11\_13\_Boysen Dam Baseline\_ND\_reporting limits\_BD2\_Nickel], provided by WDEQ's Bill DiRienzo, it is apparent that outliers were not excluded. Not removing outliers creates baseline averages which misrepresent what the actual Wind River Baseline averages (utilizing the 2010-2016 data) would be, and distort the std Dev values. Additionally, there are many examples of inconsistencies between the two documents e.g., sometimes values are rounded and sometimes they are not. While the BDBSD showed a std Dev of 11 ug/L, the Model Output table reports 10.8 ug/L for Zinc.

Taking Zinc as the example, there were three outliers: 10.4 ug/L, 30ug/L, and the highest 80 ug/L which is over 13 times the average of 5.8 ug/L listed on table as being the baseline average; all other reported values were between 2.5 and 5.2 (with the 5.2 being an outlier itself within the 2010-2013 data). Outlier removal would have significantly changed the std Dev, as well as the baseline average. The Model Output table reports 10.8 ug/L as the std Dev. Utilizing a std Dev that is 5 points higher than the baseline average, generates an Anti-deg Target 3 times greater than the baseline average. **Removal of the three outliers moves the baseline average of 5.8 ug/L down to 3.8 ug/L and the std Dev down 10 points to 1 ug/L.**

Six constituents listed in the Model Output table show a std Dev above the Wind River Baseline Concentration averages; Manganese, Copper, Nickel, Zinc, and Cadmium. The std Dev recomputed with outliers removed, causes changes anywhere from 1 point to 30 points, in the case of Manganese. Baseline average changes are: Manganese 14 ug/L (file - 13.9 ug/L) to 5.1 ug/L; Copper 4 ug/L to 2.9 ug/L; Nickel 2 ug/L (file - 1ug/L) to .4 ug/L; Zinc 5.8 ug/L to 3.8 ug/L; Cadmium .4 ug/L to .3 ug/L.

For Mercury, the numbers listed in the BDBSD file are not even the data used on SOB page 3. Sometimes data are rounded, sometimes not and in this case it is unclear where data even came from. There are additional issues with the Model Output – Baseline Concentrations and Permit Limits table on SOB page 3 in relation to the Boysen Dam Baseline Sampling Data file. They need serious review in their entirety.

Not removing outliers creates Wind River baseline averages which are, in some instances significantly misrepresentative of what the true baseline (utilizing the 2010-2016 data) would be and a significant degradation from actual 2010-2016 levels. The SOB page 10, states that WDEQ does not believe waters below Boysen Dam would ever reach these thresholds.

If this permit were accepted as it stands, the numbers WDEQ/ERM used for the Wind River Baseline would become erroneously established. Additionally, these numbers were used by ERM for modeling and used by WDEQ for setting the Standards and Effluent Limits in this permit.. **This inaccurate data compiling constitutes a clear violation of Antidegradation of Class 1 water as well as begging the question of the reliability of the ERM model as a whole.**

Category 1 pollutants: If the chloride contaminant amounts evaluated in this permit (SOB page 5) are sent downstream in the allowed zero treated flow of 2.856 MGD, which the permit maintains is, “just below the antidegradation target,” (this statement implies a level between 11 and 12) again, degradation already exists. This also means that if Aethon’s reverse osmosis (RO) system should be offline for *any* amount of time, and the flows of up to 8.274 MGD are released, chloride limits rise quickly well above present averages and antidegradation targets. WDEQ states in the permit SOB page 10, “Any increase in downstream pollutant levels within Badwater Creek would be expected only during short periods of servicing or malfunction of the treatment unit, if at all. During such times, the permit still requires full compliance with all established effluent limits.” Our concern lies in these waters reaching beyond Badwater Creek, on into Badwater Bay, Boysen Reservoir and potentially the Class 1 water and below. WDEQ does not address this in its discussion, except in Badwater Creek. **While the requirement that Aethon maintains, “full compliance” is stated, the reality is, as confirmed by the BLM’s 2019 Draft EIS page 3-81 showing 33 violation by Aethon, and WDEQ’s public meeting presentation (depicting severe erosion), violations of significant magnitude do occur and it only takes one misstep to cause down-stream catastrophe.**

For pH SOB page 3, shows no standard deviation and yet WDEQ is proposing increasing the Anti-deg Target from a pH of 8 to a pH of 9 in a system which is already at the upper end of the alkalinity scale. This is of great concern to those who use waters below Boysen Dam for irrigation, as they already struggle with alkaline soils. We do not believe that a status of no degradation can be maintained when the pH average is allowed to be increased so significantly.

Frenchie Draw was established prior to the Clean Water Act of 1972, however, the amount of discharge water from the field at that time was relatively small (1 MGD), due to the minimum amount of development. The WDEQ has the authority/obligation to regulate pollutant levels. They also have the authority to allow or disallow the grandfathering of those pollutant levels. The proposed Moneta Divide field expansion will allow produced water of 8.27 MGD, however, discharge water at full development are estimated at 58.8 MGD (BLM 2019 Draft EIS pg. 2-70). Grandfathering in higher pollutant levels for an increasing field development of this size is contrary to the mission of WDEQ “To protect, conserve and enhance the quality of Wyoming’s environment for the benefit of current and future generations,” as well as the value to be, “...consistent by fairly applying and implementing regulatory requirements.” Allowing the huge volume of water containing pollutants to be discharged into state park and recreational waters

goes counter to your mission. No facility coming into existence after the Clean Water Act is given such an economic advantage. Aethon is not being required to take care of their own environmental pollutants by meeting current limits associated with their discharge water. They are passing along any possible damages to the public. Does WDEQ have a bond in place for Aethon to ensure monies are in place to remediate any potential damages they may cause?

The modeling accounted for, “all other sources of water flowing into Boysen Reservoir” and implies that it accounted for all current pollutants being added to Boysen Reservoir. If with ERM’s modeling you set their Effluent Limits at the highest level possible for the lowest flow month, then no other operator would be allowed any future development or pollutant additions. Any additional pollutant inflows would be added to the existing levels and would then exceed downstream Class 1 water antidegradation targets. To counter the permit states, “assuming that all modeled constituents will pass through the reservoir” which DEQ does not believe will occur. However, nothing in this permit addresses issues of future weather extremes, which can be expected to include extreme drought. **Natural inflows could be decreased to well below historic levels, and this scenario is not accounted for in ERM’s modeling.**

#### **Discharge Water Used for Agriculture, Livestock and Wildlife:**

Water Quality for Wyoming Livestock and Wildlife, Raisbeck et. al., 2007 sets short exposure and chronic exposure levels for some of the constituents listed in this permit’s WQ Standards and Effluent Limits, SOB table on page 3. The EOP Mixed Concentration Limit for Sulfate is 3000 mg/L. However, according to the report, “a water SO<sub>4</sub> concentration of 1125 mg/L will meet or exceed the NRC’s (*National Research Council*) maximum tolerance limit for S in cattle.” It goes on to say, “In practice, water SO<sub>4</sub> concentrations as low as 2000 mg/L have caused PEM (*Polioencephalomalacia*) and/or sudden death in cattle.” The permit addresses, “Historical Beneficial Use” and “Agricultural and wildlife use of water,” but does not address the safety of the proposed effluent limits in this regard.

The EOP Mixed Concentration Limit for TDS is 6400 mg/L and while the report states, “We do not recommend relying upon TDS to evaluate water quality for livestock and wildlife; however, if no other information is available, TDS concentrations less than 500 mg/L should ensure safety from almost all inorganic constituents. Above 500 mg/L, the individual constituents contributing to TDS should be identified, quantified, and evaluated.” **This analysis should be done to assist in determining if TDS constituents could pose additional hazards to livestock and wildlife.**

The suitability of the proposed discharge water for use by livestock and wildlife based on the very high Sulfate and TDS limits proposed in this permit need greater review or are in direct conflict with the Water Quality for Wyoming Livestock & Wildlife, A Review of the Literature Pertaining to Health Effects of Inorganic Contaminants, a study funded by WDEQ.

As stated in Texas A&M AgriLife Extensions publication, Irrigation Water Quality Standards and Salinity Management Strategies, “As water evaporates, the dissolved salts remain, resulting in a solution with a higher concentration of salt . The same process occurs in soils. Salts as well as other dissolved substances begin to accumulate as water evaporates from the surface and as crops withdraw water.” pg. 2. The report goes on to say, “High concentrations of salt in the soil can result in a “physiological” drought condition. That is, even though the field appears to have

plenty of moisture, the plants wilt because the roots are unable to absorb the water.” pg. 3 <https://aglifesciences.tamu.edu/baen/wp-content/uploads/sites/24/2017/01/B-1667.-Irrigation-Water-Quality-Standards-and-Salinity-Management-Strategies.pdf> pg. 2. Our concern is that farmers and ranchers utilizing the discharged water in the Moneta Divide area, for irrigation, may in the long term, cause soils to become so salinized that they are no longer suitable for agricultural or wildlife purposes.

### **Concentration of constituents due to evaporation:**

The evaporation effect along Alkali and Badwater Creeks which are known to be ephemeral at times, will deposit sodium, chloride and other pollutant constituents in the stream and streambank sediment. A significant rain event, will carry sediment downstream in mass; just as we saw in the 2015 event which closed Wind River Canyon. Has WDEQ evaluated the effect of this accumulation of polluted sediment on the downstream systems? ERM’s modeling did not. Have streambed samples been taken to determine the current level of constituents in the sediment and does it have a monitoring program for future testing to determine build up? If you will review the “mixing zone” slides presented in your public meetings, in Riverton and Thermopolis, you will notice the plume of darker colored water moving out into Boysen Reservoir. It distinctly shows that solids are moving well beyond the “mixing zone” and on into Boysen Reservoir. **The permit does not address extreme flood events where evaporated crystalized pollutant deposits are picked up and rapidly carried downstream and well beyond the “mixing zone.”**

### **Level and frequency of monitoring:**

Permit page 2 states, “This permit does not cover activities associated with discharges of drilling fluids, acids, stimulation water or other fluids derived from the drilling or completion of the wells.” The permit only covers end of pipe (EOP) mixed concentration limits for 12 of the 105 Priority Pollutants listed in Appendix B of the Wyoming Surface Water Quality Standards. **How do you intend to monitor for the other 93 priority pollutants to ensure they do not exceed human health and safety levels for skin contact, drinking water, fish and fish consumption in Boysen Reservoir and below Boysen Dam?**

A much more in-depth and frequent level of monitoring and testing must be put into place. This is crucial to the status and nature of the Class 1 water resource being protected. Quarterly testing of BWC1, BWB1 and WRC1 should be monitored and reported at least on a monthly interval and those results need to be used for regulation. Monitoring and testing must be done by an independent firm and facility, not by the operator (Aethon) or one of their agents.

### **Modeling:**

As previously mentioned with regards to the Wind River Baseline Data file and the SOB page 3 Model Output – Baseline Concentrations and Permit Limits table, the ERM modeling report is of questionable soundness. The report contains 22 uses of the word assumed and twelve references to insufficient, most referencing assumptions made to do the modeling or insufficient data for modeling input. For example on page 4 of Hydros Consulting’s, Review of ERM Water-Quality Modeling Study of Boysen Reservoir dated July 1, 2018 they state:

“... only collected tributary inflow water-quality data on one day in April of 2017. These often-single data points are the basis for many of the inflow WQ assumptions. And yet, in the case of Badwater Creek, ERM used the one sample from Tough Creek, as a surrogate for conditions upstream of produced water discharges. There is no reason to believe that the water quality in Tough Creek is similar to that of Badwater Creek and no reason is provided as to why sampling did not occur at such a critical location.”

This is just one example of the serious concerns we have with the data used in ERM’s modeling. **We do not believe modeling done by ERM is of sufficient quality for WDEQ to safely rely upon it to determine the actual effects of using Badwater Bay and Boysen Reservoir as a filtration system for Aethon’s pollution discharges.**

**Fisheries:**

We are greatly concerned that the protection of the aquatic life zone located at Badwater Bay has not been fully evaluated. Many species utilize Badwater Bay and Boysen Reservoir as habitat. The Sauger fish in Boysen Reservoir are the last native population of Sauger in Wyoming. This means we have allowed situations to occur throughout the state which make it unsuitable for Sauger. Young Sauger (as well as Walleye) utilizes Badwater Bay as a nursery habitat as young fry (per phone conversation with WG&F, Fisheries Biologist, Craig Amadio). Were Badwater Bay to become unsuitable for these fish they would have to move out of the bays protective shallows and place themselves at greater risk to predation. We also draw your attention to the analysis done by, “Harold Bergman, PhD, Professor Emeritus, University of Wyoming, Laramie, WY; and Joseph Meyer, PhD, Chief Scientist, Applied Limnology Professionals LLC, Golden, CO,” dated June 27<sup>th</sup>, 2019. This review points out serious failures on the part of ERM’s model and the effluent limits being set, to ensure aquatic biota protection.

While we are in support of the development of Aethon’s Moneta Divide field, and the economic value it has for both Wyoming and associated communities, we do not believe the discharge water permit, as proposed, is validated in such a way as to ensure the valuable natural resources of Badwater Bay, Boysen Reservoir, Wind River Class 1 water and downstream users are protected. Thank you for considering our comments.

Respectfully Submitted,



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CC: Governor Mark Gordan  
Hot Springs County Commissioners  
Thermopolis Town Mayor

Enclosures:

Bergman – Fisheries Review  
Boyer – ERM Modeling Review  
Boysen Dam Baseline Data