

# Kim Wilbert

Wyoming Department of Environmental Quality:

Following are my comments I ask you to consider and respond to regarding Aethon Energy's application for a wastewater disposal permit for the Moneta Divide Field.

Based on the concerns I enumerate below, I ask that the DEQ reject the permit application.

My concerns are as follows:

1) Aethon's disposal plan is based on a dilution model designed by their contractor who apparently has no Wyoming engineering or geological certification, or recognition by Wyoming licensing agencies. Further, just the fact that the consultant creating the modeling data is totally bought and paid for by the company desiring the permit makes me very suspect. The model proposed must be thoroughly examined and investigated by licensed Wyoming engineers and geologists who are independent of the company benefiting from the proposed permit extension.

2) The whole premise of the permit, that Boysen Reservoir is to act as a water treatment facility for oil field wastewater, laden with a host of salts and toxins, is counter to the recreational and ecological values of this important central Wyoming lake. The current legally recognized beneficial uses of Boysen include drinking water supply, contact recreation, and cold-water fishery. The addition of wastewater treatment as a use is contrary to these long standing other beneficial uses.

3) The entire permit is based on a premise that everybody acknowledges is not based in reality. The model assumes that all the wastewater, treated and untreated, magically mixes (all 16 discharge points are physically separate, and would depend on stream flows in Alkali and Badwater Creeks to mix with other flows) and all flows some 40 miles downstream to Boysen. Yet the DEQ, and certainly local folks realize that Badwater only typically flows all the way to Boysen very sporadically. Even though the permit contemplates the higher flows of additional production water being dumped into these natural streams, the highest flows amount to about 12cfs. Where is the analysis that demonstrates how far that production water will actually flow, especially during dry years

So why is the permit model based on a fantasy that all the waste water uniformly flows in those drainages all year around into Badwater Bay? The answer to my question may be that the engineering is much easier than trying to model the real situation. Tons and tons of chloride and sulphate salts enter the drainages from the discharge points. Most of the time, all those pollutants will get deposited into sediments in the drainages, to lie there until larger flows carry them downstream. How often that may happen is up to the weather, but certainly not contemplated in the model. This is important because the dilution model is based on the pollutants continually reaching Boysen, whereas in reality, they may likely only reach Boysen in surge events, radically changing the concentrations. There have been periods of several years when Badwater virtually never flowed all the way to Boysen, times like 2000-2005. So, how does the model work when a big summer thunder storm causes a big flood down these ephemeral creeks, and pushes thousands of tons of sediment, with years of toxins included, into Badwater Bay? How will the sauger spawning beds do with two years worth of chloride and sulphate flowing in there in one day?

3) Why is the DEQ totally unconcerned with pollutants and toxins in Badwater Creek? With it's

designation as a Class 2AB waterway, Badwater should get careful consideration as to what all these chemicals and salts are doing to that desert stream. This project proposes to dump tons of pollutants into this natural stream, impacting the entire ecosystem of Badwater Creek for many miles. The whole riparian zone of this unique waterway will be impacted, but I see no analysis of these impacts. The salts will heavily impact riparian terrestrial vegetation, not to mention aquatic plants and animals. We must see careful analysis of aquatic invertebrates and plant life in Badwater Creek, upstream of any oil field discharges, as compared to various points downstream of where Alkali with all the production water joins the drainage.

4) The proposed permit, as well as the current operating procedure, depends on the field operator adding a portion of treated water from their reverse osmosis facility, the Neptune Plant. Further, the permit applicant claims they can get up to 50% more capacity out of that plant than it is rated for. Yet, at the DEQ meeting in Thermopolis, we heard that the plant is often off line, and that it has never operated at rated capacity for any significant period of time. The operator's ability to consistently treat the portion of the production water required by the model, is not based in fact. The track record of Neptune, since it went on-line in 2015 to present should be the basis of the model, not Neptune's rated capacity, and certainly not on greatly improved outputs as imagined and hoped for by the operator.

5) To my ears, the DEQ is trying to pass off this plan to dump hundreds of thousands of tons of pollutants into natural Wyoming waterways as acceptable because, first, Alkali and Badwater Creeks have always had crappy water quality, and second, the Bighorn River system has long had lots of oil field chemicals flowing in from this oil field and well as many other oil fields. Why not add a bunch more nasty stuff? The effects of oil field discharge into Badwater Creek, a Wyoming Class 2AB waterway are not carefully considered in this permit application. Further, because we are already adding bunches of nasty stuff to the Bighorn system does not make it acceptable to add a bunch more. Two bunches might add up to disaster.

6) The whole premise of the proposed operating model is to find the maximum amount of pollutants that the operator can put into Boysen without exceeding maximum limits in the Wind River below the reservoir. The DEQ says, for totally unknown reasons, that it is ok to raise the pH of the ENTIRE WIND RIVER from pH 8 to pH 9!!! That is an order of magnitude more alkaline, as the pH scale is logarithmic, not linear. Water at a pH 9 is very poor water quality in terms of plant life. Many essential plant nutrients are not available to most plant types (like Cottonwood trees, and most other trees, shrubs, grasses and forbes) from soil solutions at pH 9. I know this because my wife and I owned and operated a greenhouse and plant nursery in Riverton for 25 years. Our customers with high pH well water often could not successfully grow most local landscape plants. High sulphates, high chlorides, and high pH = not much grows. Our own greenhouse growing operations were impacted by pH change, from pH 8.2 Riverton city water in the winter when our water is from the city wells, to pH 7.8 when the city switches to treated river water in May. Of course, we also saw a drop in dissolved salts when the water quality changed every spring. We had to very carefully monitor our fertilizer applications in concert with these swings in water quality. The point is, adding salts and raising pH creates big impacts to plant life. How can it be acceptable that the permit may allow raising the pH of the Wind River to a level TEN TIMES AS ALKALINE AS PRESENT?? The baseline measure of pH8 is ALREADY MUCH HIGHER THAN THE NATURAL RIVER WOULD BE BECAUSE OF POLLUTED INFLOWS. We must see the DEQ provide careful analysis of the impacts of pH 9 water in the Wind River on the whole riparian system, as well as downstream uses.

In conclusion, I am adamantly opposed to this permit extension. We need to be trying to figure out how to make our waters safer and cleaner. This permit allows just the opposite, allowing the field operator to add tons of pollutants to the river system, and knowingly making the water quality worse by every metric as it goes downstream. Please, let's not allow this to happen. The idea that we will keep dumping into the river, right up to the maximum amount allowed, is abhorrent, and absolutely contrary to any reasonable notion of excellence in environmental quality.

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