

# Colin Archer

Dear WDEQ,

I am writing in response to the application for renewal of Aethon's permit to discharge oilfield produced waters upstream of the Boysen Reservoir. I have worked for Schlumberger Well Services in the Wyoming and North Dakota regions for the last 13 years, my current job is lab manager for the west region where I am directly involved in fracturing operations. I have significant experience working with oilfield waters, both fresh and produced sources. I am by no means, though, a hydrogeologist so my opinions are only based on my work experience.

As someone who has worked with produced water for many years and despite being someone who could possibly benefit from additional drilling activity in Wyoming, I strongly urge you to reconsider allowing an increase in surface discharge volumes. Industry "experts" love touting the phrase that fracturing fluids are 99% water and less than 1% chemicals, but some of those chemicals are extremely dangerous to human and animal health even in very small doses.

Fluid recipes in the fracturing industry change rapidly. Service providers roll out new technologies; Operators often look for cheaper alternatives; or there is simply a disruption in chemical supply chains that cause an emergency change in designs. All of that aside, there are a number of chemicals which are very commonly used that I did not see listed in the application's required analytes. Boron is the first that come to my immediate thoughts. I understand one of our competitors still uses Tert Butyl Hydroperoxide in their fracturing fluids, which I don't think I need to tell you is one of the worst substances that I have ever had the displeasure of working with in my career. Hydrogen Sulfide is listed as Report Only, despite it being potentially deadly and quite often found in producing wells. My point here is that produced water is far more dangerous than industry insiders try to lead us to believe.

Admittedly I am by comparison just another Joe Shmoe and by no means an expert. I have met many people much smarter than I on these topics. But I do know enough to say that raw untreated produced water should never be allowed to enter the environment in any circumstance. It is simply impossible for us to be certain that it won't cause immediate and permanent damage. It should be disposed of well guarded from any surface or ground water sources that support life.

Thank you,  
Colin