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I thank the US Coast Guard and the Department of Homeland Security for the opportunity to comment on the proposed policy (Docket No. USGC-2013-0915).

My comments are based on over 30 years of professional research experience in water quality issues with more recent investigations into brinewater and associated impacts related to hydrologic fracturing.

The following comments are suggestions followed by rationale intended to strengthen the proposed rule to increase protection of communities and the environment. Comments are listed in order of priority.

1. I suggest the USCG **convene a panel of scientific experts** to study and strengthen the existing proposal.

The rationale is that other regulatory agencies, for instance USEPA, have used this model successfully to strengthen proposed rules on other highly controversial topics, for instance mountaintop removal mining.

By convening experts from all sides (industry, regulatory, community) all parties benefit. Industry benefits by reviewing plans in detail that can help alleviate future potential liability, especially stemming from specific subject areas that may have been overlooked in their business planning. Regulatory agencies benefit by further developing details of oversight activities and gaining confidence that all expertise has been brought to bear ahead of proposed activities. Communities benefit from confidence that rulemaking has represented them and included their concerns, and from confidence that contingency plans are in place in case of worst case scenarios.

The proposal in its current form suffers from an obvious lack of technical expertise. That comment is not meant to be a slight on USCG in that it is also obvious from the proposed rule and supporting documentation that the Coast Guard has the best interests of all parties in mind. The note on the possible radon air exposure pathway of barge workers due to venting is encouraging, as is the overall consideration of this material as hazardous waste. However, there is no mention of volatile organic

compounds that are known to occur in high concentrations in the shale formations (and thus transport vehicles) themselves. I note that only one scientific article (the USGS Radium study) was cited in the supporting documentation (*i.e.* the letter from Capitan Mauger).

2. I suggest the USCG **conduct a Risk Assessment** in support of the proposed rule.

The most significant shortcoming of the proposed rule as submitted for public comment is the lack of risk assessment. Risk assessment ranks number 2 in my assessment only because it should be the primary topic of consideration by an expert panel that I have ranked priority number 1. The rationale for this is easy but the assessment itself is difficult. Still, it needs to be done for the approximately 3 million of people that depend on the Ohio River as their primary drinking water source. Risk assessment also needs to be done for the thousands of people subjected to air emissions at the Wheeling, WV on-loading site, and for those living in and around the proposed New Matamoras, OH offloading site.

Whereas the proposed rule does consider worker exposure to radon from barge venting, it fails to consider impacts to communities from tank and barge venting. Many of the chemicals found in fracwater (SGEWW) are volatile beyond just radon gas. Furthermore, the barging of fracwater increases air exposure pathway by a factor of 3X. For instance, currently trucks are loading at well sites (thus venting truck tanks, exposure pathway 1) then offloading at deep well injection sites (venting tanks, exposure pathway 2). With this new proposed rule trucks would offload into tanks in Wheeling, then load barges, both of which would require venting (exposure pathways 3 & 4). Then the barges would have to be offloaded to tanks, and tanks to trucks, both requiring venting, for transport to deep wells (exposure pathways 5 & 6). Those are exposure pathways that have not been considered. Some of them are in residential neighborhoods. The locations of exposure pathways 3 through 6 are subjected to frequent low-level atmospheric (air trapping) inversions.

The quantities of fracwater proposed to be shipped by barge have not been considered. The quality of fracwater (e.g. barium, benzene, and bromide come to mind) has not been fully documented and considered. The rationale is that there is very little evidence that available literature and scientific expertise has been brought to bear in developing the policy. For instance, in the letter distributed by Captain Mauger (Proposed policy letter: carriage of conditionally permitted shale gas extraction wastewater in bulk) only one scientific study is referenced, that being the 2011 study from US Geological Survey addressing radium in the Marcellus Shale formation. The outcome from incorporating the USGS paper in the rule is obvious, radium is of concern and receives attention in terms of analysis, criteria, and safety requirement (Enclosure (1) to CG-ENG Policy Letter 13-XX). The USCG should use and should likewise use other scientific literature in promulgating the rule.

The only other mention of elements of concern is in enclosure 2 from the Pennsylvania Department of Environmental Protection. The PA DEP enclosure is a well-crafted document compiled with a tremendous team effort and obviously, a lot of iterations. However, by simply attaching it to the proposed rule it becomes a mere laundry list of to-do chemical tests with no limits and no consequences for exceeding any kind of standards, including hazardous waste standards. There is no mention of who would interpret such data and what criteria would be used to limit any potential impacts in the case of

an accident or spill. In fact, there doesn't seem to be any risk analysis of any sort in the policy. The policy begs the question "is the US Coast Guard not willing to do adequate risk analysis because of the industry exemptions to NEPA?" I think the policy should give a straight answer to that question.

Allow me to rationalize using a simple analogy. When teaching my sons to drive on gravel roads in the mountains of West Virginia I have instructed them as follows. When the road is in good condition drive normally. When the road is coarse or slick drive slower and more cautiously. When the road condition is good but the consequences are grave (no guard rail, or steep hill side) drive slower and more cautiously. In other words, when the potential consequences are grave use more caution. The proposed policy fails to recognize the severity of consequences for the millions who utilize the Ohio River as a drinking water source.

As presented, the proposed policy does not answer the questions 1) "how many people are dependent on the Ohio River for their water supply?", 2) "what are the low-flow volumes available for drinking water minus the projected withdraws for frackwater?", 3) "what would the concentrations be of elements of concern (e.g. barium, bromide, benzene) in a worst-case scenario of low flow, high demand, and total liquidation?", 4) "What is the turnover/residence time for contaminants entering the water supplies downstream?", and finally 5) "what is the resupply or evacuation (action) plan for the millions of people living downstream of a worst-case scenario?"

This proposed activity cries-out for risk assessment with oversight by seasoned professionals representing a variety of expertise and affiliations. There are not enough tankers in the National Guard fleet to supply water to the millions of people that could lose their water for a long period of time in a worst-case scenario.

3. I suggest that the USCG **promulgate the proposed rule in a data-rich environment.**

It seems as if little hard data was considered in promulgating the proposed rule. I note from a study of 13 fracwater trucks sampled by the West Virginia Department of Environmental Protection that 5 of 13 trucks were carrying hazardous waste. Such data need to be considered thoroughly in promulgating the proposed rule.

I would hope the USCG would consider taking a look at hard data, sharing it with experts, and promulgating rules based on factual evidence. I do support the use of the Pennsylvania DEP testing protocol because it is a well developed and well thought-out document that is the culmination of a lot of interagency and outside expert iterations. However, in the proposed rule it is used as just a test. There is no indication of how and by whom the test results will be used to judge the suitability of a given load of fracwater for barge transport. Frankly, I don't think that is fair to the industry or communities. Testing infers thresholds will be used for judgment, but no standards for any elements or compounds have been set. If testing is being required just for the sake of testing, I think the USCG should clearly admit that.

Bromide is scantily mentioned in the proposal. It is well known that communities in the upper Ohio River valley have been struggling to make-up safe drinking water due to the bromination of fine organic

particles during pre-chlorination at water treatment facilities. The resulting trihalomethanes, a class of polycyclic aromatic hydrocarbon, all known carcinogens. Brominated PAH's being the worst, and are routinely exceed primary drinking water standards in this regions public water supplies. The scientific community paid little attention to bromide in this region prior to the onset of slickwater hydrologic fracturing. This issue is a consequence of bromides residing within the 350 million year old shale formations and coming to the surface with fracwater flowback.

Background bromide levels in water supply sources should be at or near the limit of detection, perhaps as low as 0.015mg/l. Those levels have been often exceeded in regional rivers and streams in the past several years, and particularly at two sites draining Ohio watersheds that have been sampled by my laboratory as part of the foundation funded Three Rivers Quest project. During low-flow conditions the Ohio River at Wheeling frequently exceeds bromide target levels, and Wheeling continues to violate EPA primary drinking water standards for trihalomethanes.

Wheeling, WV has one of the more sophisticated analytical laboratories in the region at its water plant on which other smaller municipalities rely for analytical services. Yet Wheeling does not have the analytical capabilities to measure bromide at levels that impact the community water supply (personal communications). If a spill occurred at the proposed Wheeling barging terminal 1.2 miles upstream of the Wheeling water intake, it is questionable whether the spill could be detected prior to shutting down the intake. It is doubtful that other communities could either. If contaminated water ends up in the distribution system it would take weeks to clear it, a period of time during which thousands, and downstream perhaps millions of people would be without potable water. Given that it takes 80 to 100 days for Ohio River water to move from Pittsburgh to Cincinnati during low flow conditions, a contamination event could result in mass evacuations from the region. In the proposed rule there is no indication of any Action Plan to address a worst case scenario.

The average bromide concentration in the 13 samples of fracwater collected by WV DEP in Wheeling was 170.8mg/l. The average bromide concentration in 5 samples of brinewater collected by the Ohio Department of Natural Resources was 917.6mg/l. The industry supported study by Hays (2009) measured bromide concentrations in the range of 15.8-1,600mg/l in flowback water from multiple wells. I note that ORSANCO requires an inventory of barge traffic carrying hazards that may impact the 32 municipal water intakes on the Ohio River in order to protect the approximately 3 million households whose primary drinking water source is the Ohio River. The proposed rule in its current form makes no indication of how that will be done. Rather, the rule implies that barge inventory information could be withheld from the public as "proprietary information." That is absurd. There are too many people involved in the water supply industry that need acute access to information for the USCG to be selectively disclosing barge contents in case of an emergency.

4. I suggest **full transparency of barge contents** by deleting references to proprietary information. The Coast Guard should provide the PA DEP reference **chemical inventory available real-time with access to the public** for all contents of any barge containing fracwater.

The rationale for full transparency and real-time information is simply to protect the nearly 3 million public water supply users stemming from the 32 municipal water supply intakes along the course of the Ohio River. The proposal should consider the work of R.E. Steacy (1961) "Time of Travel of Water in the Ohio River Pittsburgh to Cincinnati" regarding the potential for contamination issues that may impact potability of water supplies for millions of people (Geological Circular 439, US Department of Interior, Washington, DC, 14 pages).

5. I suggest USCG **lengthen the comment period to 90 days**. The rationale is that the proposed rule is much more complex than implied. Ordinary citizens will shy away from addressing specific elements of the rule because of the difficulty in interpreting the complexities of chemistry and mathematics without getting support from scientists that can help them interpret the rule. Therefore, the USCG is more likely to get comments like "I'm for it" or "I'm against it" without addressing the substance and details within the proposed rule. Without substance, the community voice is unlikely to significantly contribute to any potential modifications to the rule from which the USCG, industry, and communities could benefit. An additional 60 days would provide sufficient time for the affected communities to work together and obtain the expert advice necessary to make substantive comments that could significantly strengthen the rule.

6. I suggest the USCG **conduct a cost/benefit analysis** prior to implementing the proposed policy.

Where is the cost/benefit analysis conducted prior to implementing such a policy?

The rationale is that communities need to know what the benefit of the proposed policy are to them prior to constructing any meaningful commentary on the policy. The assumption is that barging fracwater will reduce truck traffic, but it is just an assumption. The public frequently hears comments such as "we look forward to being able to get the trucks off the highways as quickly as possible" (James McCarville, Port of Pittsburgh Commission quoted in PublicSource, 2013). How many trucks? What is the cost savings? How many truck accidents and spills have there been to date and how many of those would be eliminated if barging were used? What is the cost savings and how will communities benefit? What communities, like Wheeling, will actually see increased truck traffic? How do the cost savings of barging compare to the potential cost of remediation of a barge accident?

Here I think USCG had the opportunity to make a compelling argument but failed to do so. I know the Coast Guard has the best intentions when it comes to public safety, but from the outside the development of this proposed policy seems to be from hearsay rather than fact, and from the words of a few versus the careful scientific analysis of the many talented people that could be brought to bear in addressing such a controversial issue.