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October 30, 2009

Wyoming-Somerset Regional Water Resources Corporation
Department of Environmental Protection
Water Management Program
Northeast Regional Office
2 Public Square
Wilkes-Barre, Pennsylvania 18711-0790

Dear Mr. Brunamonti:

Please accept these comments on the Wyoming-Somerset Regional Water Resources Corporation (“RWRC”) NPDES Draft Permit on behalf of Trout Unlimited, Trout Unlimited Pennsylvania State Council and the Stanley Cooper, Sr. Chapter of Trout Unlimited (collectively “TU”). TU’s Mission Statement is to conserve, protect, and restore North America’s Cold Water Fisheries and their watersheds.

The proposed discharge to Meshoppen Creek from the RWRC would flood a small creek with up to a half a million gallons of industrial effluent, thereby harming its otherwise healthy benthic ecosystem.¹ If the NPDES permit is issued to RWRC, the community living in the vicinity of the treatment plant no longer will be able to use the Creek for fishing or whitewater rafting.²

To avoid these adverse impacts, DEP must ensure that the water quality of the receiving stream is maintained, that the influent is fully and adequately characterized, that the effluent limitations are properly calculated, and that the final permit fully protects all aquatic life, recreation, and industrial uses. A final NPDES Permit should not be issued to RWRC until the concerns outlined in these comments have been addressed.

¹ Memorandum from Timothy L. Daley to Tiffann Fox (October 24, 2008), TABLE 3: RESULTS OF BENTHIC MACROINVERTEBRATE SAMPLING ON MESHOPPEN CREEK *reprinted in* WYOMING SOMERSET FACT PACKET, at 38 (Vinod Patel ed. 2008) [hereinafter FACT PACKET] Wyoming-Somerset Application, Table 3.

² *Pennsylvania Whitewater – Meshoppen Creek, Susquehanna/Wyoming County*, RIVERFACTS.COM, <http://www.riverfacts.com/rivers/12856.html> and *Our Finest Easter Region Trout Streams*, GAME & FISH, http://www.pagameandfish.com/fishing/trout-fishing/PA_0407_01/index1.html.

I. DEP Must Protect All Designated Uses of Meshoppen Creek.

DEP has proposed a number of effluent limits based on an average monthly discharge of 0.38 million gallons per day (“MGD”) and a maximum of 0.5 MGD. The applicant’s plan, however, has a number of shortcomings that DEP has not adequately considered in its proposed regulation of the facility.

A. DEP Must Set Effluent Limitations That Protect the Existing Uses of the Receiving Stream.

1. DEP Must Appropriately Regulate Metals and Other Pollutants for Both the Near-Field and Far-Field.

DEP has recognized that “toxic metals can challenge water quality standards both in the immediate receiving water, and accumulate with loadings from other discharges to challenge water quality standards in the far field.”³ Because of the potential for load accumulation, metals like barium, strontium and boron, for which the treatment options appear to be constrained, must be monitored at both the Point of Discharge (“POD”) and the Public Water Supply (“PWS”) intake.⁴ Rather than implementing protective monitoring requirements at both the POD and PWS, DEP has simply noted, “in the short-term, we have to keep an eye on metals, BOD5, ammonia, and the other pollutants that we’ve identified as possible problems.”⁵ DEP’s effluent limitations for metals and for Total Dissolved Solids (“TDS”), an aggregate measure of many dissolved pollutants, are designed to protect the drinking water supply at the PWS. These limitations, therefore, may not adequately restrict pollutant concentrations in the immediate receiving water at the POD. In order to account for this inadequacy, DEP must determine and enforce a water-quality based effluent limit for near-field osmotic pressure modeled using an annual Q7-10 flow. DEP must carry out its responsibility to set limitations that protect Meshoppen Creek’s aquatic life as well as human health.⁶

2. DEP Must Enforce Effluent Limitations for All Pollutants of Concern.

DEP must formulate limits for all parameters and should not utilize a process in which a 'report' function is used to replace the required limitations. DEP has exacerbated the lax characterization of the

³ DEPARTMENT OF ENVIRONMENTAL PROTECTION, PERMITTING STRATEGY: STRATEGY FOR HIGH TOTAL DISSOLVED SOLIDS (TDS) WASTEWATER DISCHARGES, *Appendix B: Fate, Treatment Considerations and Pollutants Other than TDS* at 15 (April 11, 2009) [hereinafter PERMITTING STRATEGY]

⁴ *See, e.g., id.* at 17

⁵ *Id.* at 1.

⁶ 25 Pa. Code § 93.6.

fracturing wastewater by merely requiring the applicant to report the inadequately characterized chemicals. DEP has justified this laxity by citing the uncertainty surrounding the actual contents of the proposed effluent.⁷ DEP claims that the lack of knowledge about which pollutants will cause harm means that it will “have to handle the reasonable potential analysis differently. It won’t be reasonable to apply [its] normal 50% rule.”⁸ In other words, DEP proposes to treat the discharge as less likely to have a reasonable potential to “cause, or contribute to an excursion above any state water quality standard”⁹ simply because of its uncertain composition. The opposite inference would be appropriate, if any. By so turning a blind eye to the possibility that unknown harmful pollutants will be discharged into Meshoppen Creek, DEP has forsaken its regulatory duty.

3. DEP Must Establish Best Professional Judgment Effluent Limitations That Are Tailored to the Unique Circumstances of This Permit.

Where national technology-based effluent limitations do not exist, the permit engineer must use his/her best professional judgment (“BPJ”) to set technology-based effluent limits.¹⁰ While using his/her BPJ, the permit engineer must consider the available technologies, costs in relation to effluent reduction benefits, engineering aspects of various control techniques, available best management practices, and non-water quality environmental impacts.¹¹ Throughout the draft permit, the DEP engineer has used technology-based effluent limitations without attempting to justify those values. DEP has not explained how those technology-based effluent limits have been derived, and it appears that the DEP engineer has simply transplanted the suggestions of the Final Permitting Strategy without considering the individual characteristics of this particular case. As recognized in the Final Permitting Strategy, however, “Permit engineers are best equipped to identify potentially problem metals or other persistent pollutants.”¹² The DEP engineer should make an independent judgment and describe the basis of his/her BPJ calculation for each chemical that does not have an established national technology-based effluent limitation.

B. The Facility’s Volume of Discharge Will Have a Detrimental Effect on the Meshoppen Creek Ecosystem.

The volume of water to be discharged from the facility will have a severely detrimental effect

⁷ PERMITTING STRATEGY at 15.

⁸ *Id.* At 15.

⁹ 40 CFR § 122.44(d)(1)(i); 25 Pa. Code § 92.2(b)(14).

¹⁰ 33 U.S.C. § 1342(a)(1)(B); 40 C.F.R. §§ 122.44(a)(1), 125.3(c)(3).

¹¹ 40 C.F.R. 125.3(c)(d)

¹² PERMITTING STRATEGY at 15

on Meshoppen Creek's ecosystem. The facility plans to discharge effluent at a rate of 0.59 cubic feet per second ("CFS"), but Meshoppen Creek flows at only 3.65 CFS.¹³ This discharge will cause a net increase in flow of 16 percent to Meshoppen Creek. This increase in flow will be even more pronounced when the Meshoppen Creek flow is below 3.65 CFS.

Aquatic and benthic communities rely on Meshoppen Creek's natural flow patterns. The discharges from the proposed facility are likely to be intermittent and will interrupt the natural flow regime. Aquatic life is also affected by water temperature. Unless the facility is required to discharge at the same temperature as exists in the Creek, which varies over time, the discharge will undoubtedly harm life in the Creek. Additionally, the Meshoppen Creek ecosystem is in equilibrium with the Creek's current morphology. An overall increase in flow will lead to higher peak flows, which will likely widen and deepen the stream in places, disrupting the equilibrium and destroying habitat. Aquatic life is also in equilibrium with the Creek's unique chemical makeup. The discharge water will have a different chemical makeup than the Creek, and such a relatively large discharge could severely alter the Creek's chemical makeup and adversely affect those species that thrive in Meshoppen Creek under its current chemical makeup.

C. DEP Must Prohibit the Use of Reverse Osmosis Filtration of Fracturing Wastewater.

Reverse osmosis ("RO") is not an acceptable procedure for treating fracturing wastewater. The supplemental information filed by the applicant's consultant, Montgomery Watson Harza, reveals that the applicant plans to utilize RO to filter the fracturing wastewater and reduce TDS in order to comply with discharge limits.¹⁴ In a webinar hosted by the Penn State University College of Agricultural Sciences ("CAS") Cooperative on October 28, 2009, Brian Swistock, Water Resource Specialist at CAS, noted that concentrations of dissolved pollutants are so high in hydraulic fracturing wastewater that RO alone is not a viable treatment technique. "The challenge is that the fracking water contains very high concentrations, and the fact is that those concentrations will compromise the membrane technologies, even with high levels of dilution. If RO is used there needs to be a combination of different treatment possibilities."¹⁵ Swistock stated that because the current membrane technology is not equipped to filter wastewater of such high dissolved pollutant concentrations, many companies

¹³ VINOD PATEL, DEPARTMENT OF ENVIRONMENTAL PROTECTION, WYOMING SOMERSET FACT PACKET at 5, 9.

¹⁴ MEMORANDUM FROM LYNN HAAS TO VINOD PATEL (JULY 14, 2009) at 5. [hereinafter Lynn Haas Memorandum]

¹⁵ Brian Swistock, Pennsylvania State University Cooperative Extension Hydraulic Fracturing Wastewater Webinar (Oct. 28, 2009).

have been reluctant to propose the use of RO systems.

Even if RO is utilized, DEP must require the applicant to submit a detailed description of how it will implement the RO process. The applicant has indicated that it will use stormwater to dilute the fracturing wastewater before putting it through RO. Dilution is necessary to prevent the filtration membranes from malfunctioning. There is no indication, however, that enough stormwater could be captured to make this dilution possible. If the facility is unable to achieve sufficient dilution, the RO filtration system is likely to fail. The applicant must be required to demonstrate how it will capture sufficient stormwater such that RO will be a successful method of filtration. In addition, the amount of stormwater required for dilution will result in a significant increase in the amount of processed wastewater that will require disposal. This additional water will inevitably be discharged into the Meshoppen and will have a significant effect on the stream flow as discussed above.

Furthermore, the applicant concedes that more evaluation is required to determine which anti-scaling chemical should be used, which dose of that chemical will be appropriate, and how the RO membranes should be pretreated.¹⁶ The applicant has provided absolutely no documentation regarding the details of the proposed RO process. The DEP must require the applicant to outline how reverse osmosis will work, the amount of stormwater that will be required for sufficient dilution, the manner in which stormwater collection will occur, and the effect of the additional stormwater discharge on the flow of the stream. DEP must require the applicant to address each of these significant concerns prior to issuing a final NPDES permit.

D. DEP Must Provide for the Regulation of All Hazardous Waste Produced by the Facility.

The applicant has particularly noted and expressed concern about the potential for radioactivity in clarifier sludge and RO-derived slurry ("RO slurry").¹⁷ The applicant admits that the influent stream contains Radium 226, Radium 228, Gross Alpha and Gross Beta radiation, and that it is concerned that the sludge resulting from treatment of the influent will be a radioactive waste. The applicant proposes to sell the RO slurry for a beneficial reuse. However, because the facility will be accepting a polluted influent that requires extensive treatment in order to render an effluent that can be legally discharged into the Commonwealth's waters, the concentrated sludge extracted from the influent must also be carefully analyzed and controlled.

¹⁶ LYNN HAAS MEMORANDUM (JULY 14, 2009) at 5.

¹⁷ *Id.* at 4.

Though the applicant is currently evaluating methods to remove the relevant radionuclides from the clarifier sludge, no method has been identified, and it appears that no permit application has been submitted for sludge storage or disposal. While the Commonwealth does not currently regulate technologically enhanced naturally occurring radioactive material, the disposal of hazardous waste is governed by the Resource Conservation and Recovery Act (“RCRA”). Treatment sludge generated from wastewater having a hazardous characteristic must be managed if it also exhibits a characteristic of hazardous waste.¹⁸ In this instance, the sludge would be subject to full Subtitle C regulations, including on-site storage standards, off-site transportation requirements, and land disposal requirements.¹⁹

Similarly, it is premature for the applicant to assert that the slurry or salt resulting from evaporative concentration of the RO concentrate will be sold for a beneficial reuse prior to analysis of the waste product. It is far more likely that this doubly concentrated waste product may pose a threat to public health without carefully regulated storage and disposal. DEP must not grant a NPDES permit while concentrated waste streams that may be subject to RCRA regulations go unpermitted.

II. DEP Must Address the Inadequacies in Information Provided by the Applicant by Requiring Complete Reporting of Discharge Conditions and Comprehensive Testing of River Conditions.

A. DEP Should Require That the Applicant Provide Information on Table 3 Hazardous Substances.

The applicant is required to provide information concerning “Specific Substances Which Must Be Identified if Known or Expected to Be Present” (Table 3 Hazardous Substances); however, the applicant stated in the application that none of these substances are known to be present and therefore did not provide such information.²⁰ At least some of these hazardous substances are expected to be present in hydraulic fracturing wastewater. For example, DEP’s “Form 26R: Chemical Analysis of Residual Waste” specifically requires Marcellus Shale wastewater to be tested for uranium and strontium, both of which are Table 3 Hazardous Substances.²¹

¹⁸ 66 Fed. Reg. 27266, 27272 (May 16 2001)

¹⁹ 55 Fed. Reg. 22520, 22657 (June 1, 1990)

²⁰ WYOMING SOMERSET REGIONAL WATER RESOURCES CORPORATION, NPDES APPLICATION TO DISCHARGE INDUSTRIAL WASTEWATER FROM OIL & GAS FRAC DEVELOPMENT FLUIDS AND BRINE WASTEWATER, Module 1 at 4. [hereinafter NPDES APPLICATION]

²¹ DEPARTMENT OF ENVIRONMENTAL PROTECTION, FORM 26R: CHEMICAL ANALYSIS OF RESIDUAL WASTE, ANNUAL REPORT BY THE GENERATOR INSTRUCTIONS 3 (2009) [hereinafter FORM 26R]

B. DEP Should Require That the Applicant Provide Information on Table 2 Hazardous Substances.

The applicant chose not to provide a Hazardous Substance Table (Module 10) in its application concerning Table 2 Hazardous Substances.²² Given that the composition of hydraulic fracturing wastewater remains unknown, DEP should require that the applicant supply a Hazardous Substance Table. DEP's Application Instructions state that the purpose of both the required and optional analyses in the application are "to develop as clear a picture as possible concerning the chemical constituents of the wastewater ... expected to be discharged."²³ DEP considers Table 2 Hazardous Substances because the pollutants for which applicants are required to perform testing "do not include all toxic substances which may be present...."²⁴ DEP uses the information that the applicant provides on Table 2 Hazardous Substances to "decide whether or not effluent limitations or other control requirements are necessary for these pollutants."²⁵ Without this information, DEP's permitting engineers cannot perform their crucial function, identified in the Permitting Strategy, of "evaluating data submitted by applicants" in order to "raise a flag when they see a potential cumulative concern in the watershed."²⁶

DEP's "Summary of Hydraulic Fracturing Solutions – Marcellus Shale" lists at least seven substances that are identified as reportable hazardous substances in Table 2.²⁷ Furthermore, DEP's "Form 26R: Chemical Analysis of Residual Waste" includes a section specifically for Marcellus Shale hydraulic fracturing wastewater that requires Marcellus Shale wastewater to be tested for nearly 50 extra residual pollutants of concern. Many of these residual pollutants of concern are Table 2 Hazardous Substances.²⁸

C. DEP Should Require That the Applicant Address its Inadequate Procedures for Influent Sampling.

DEP must compel industrial applicants to use robust data-reporting practices, and otherwise take measures to ensure that the influent is adequately characterized. DEP currently permits NPDES applicants to engage in a haphazard process of influent sampling. The sampling locations are specified

²² NPDES APPLICATION, Applicant Checklist.

²³ BUREAU OF WATER STANDARDS AND FACILITY REGULATION, DEPARTMENT OF ENVIRONMENTAL PROTECTION, APPLICATION FOR PERMIT TO DISCHARGE INSTRUCTIONS at 7 (2005). [hereinafter APPLICATION INSTRUCTIONS]

²⁴ *Id.* at 9.

²⁵ *Id.* at 9.

²⁶ PERMITTING STRATEGY at 17.

²⁷ DEPARTMENT OF ENVIRONMENTAL PROTECTION, *Summary of Hydraulic Fracture Solutions – Marcellus Shale*, available at http://www.dep.state.pa.us/dep/deputate/minres/oilgas/new_forms/marcellus/marcellus.htm.

²⁸ FORM 26R at 3 (2009).

in the application materials merely as "shown on line drawing."²⁹ This level of generality is unacceptable. The provision of specific sampling locations is necessary to ensure the integrity of the sampling process and to control for discrepancies in sampling conditions at different drilling sites. In addition, DEP should strengthen its requirements for influent sampling to match those of its effluent sampling requirements – a minimum of three sampling events would ensure a sampling average that would provide a realistic assessment of the composition of the influent. This characterization would facilitate Best Professional Estimate (“BPE”) effluent predictions, would provide better influent inputs for PENTOXSD and WQM 7.0 modeling, and therefore would produce better modeling results and more accurate limitation standards.

D. DEP Must Require That the Applicant Provide Best Professional Estimates for the Relevant Parameters.

The applicant has failed to provide adequate BPE for the required effluent parameters. Although the applicant has submitted tables for pollutant groups I and II, the tables contain insufficient substantive information. The applicant has only provided estimates for Total Suspended Solids, Oil and Grease, Barium, Boron, Iron, Copper, Mercury, and Selenium, leaving the rest of the parameters in pollutant groups I and II unaccounted for.

In addition, the applicant should be required to describe the factors used in the formulation of effluent BPE for each pollutant group. The applicant should take the influent sampling and proposed treatment processes into account in formulating detailed and accurate BPE’s of the effluent content. The applicant should be required to provide DEP with such comprehensive effluent predictions to assist DEP in assessing whether the modeled effluent limitations are reasonable.

E. DEP Should Require Whole Effluent Toxicity Testing in Order to Evaluate Instream Conditions and Protect Aquatic Life.

DEP may require an applicant to perform Whole Effluent Toxicity (“WET”) testing after receiving an application.³⁰ DEP’s application instructions state that, “all dischargers are ... encouraged to perform WET testing.”³¹ WET testing is one step DEP can take to learn more about the potential dangers associated with the applicant’s proposed facility. The advantages of WET testing include: measuring the aggregate toxicity of all constituents in a complex effluent; detecting toxicity caused by

²⁹ NPDES APPLICATION, *Analysis Results Table Pollutant Group 1, Module 4*.

³⁰ APPLICATION INSTRUCTIONS at 2.

³¹ *Id.* at 2, 32.

compounds not commonly analyzed; assessing the bioavailability of the toxic compounds; accounting for interactions of the various wastewater constituents; measuring toxicity directly for the species tested; and predicting ecological impacts before they occur.³²

As noted earlier, DEP is required to protect statewide and protected water uses in every permit action, unless those uses are exempt.³³ Nonetheless, DEP appears to have focused its Meshoppen Creek water quality evaluation exclusively on the PWS use. DEP is correct in holding the applicant to the PWS water quality criteria at the source of the potable water intake, but DEP must also control for instream concentrations of the effluent discharge to protect aquatic life.³⁴ DEP should maintain and protect instream water uses now, in this permit action, and reserve its right to add further regulations once a case-by-case evaluation has been completed.³⁵

DEP must protect public health, wildlife, fish, shellfish and recreation. Furthermore, EPA warns that the permitting authority should evaluate the aquatic life of the receiving stream to determine if locally important species may be particularly sensitive to chloride levels below the national criteria.³⁶ The fact sheet does not suggest that DEP has conducted such an evaluation, making a WET testing requirement particularly relevant. Furthermore, WET testing is particularly appropriate for this proposed discharge because the exact composition of the hydraulic fracturing wastewater is unreported. Thus, the final NPDES Permit should require the applicant to conduct WET testing at the POD.

In light of the above, we respectfully request that DEP not issue the permit until our concerns have been met.

Sincerely,



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³² *Id.* at 31.

³³ 25 Pa. Code § 93.4.

³⁴ 25 Pa. Code §§ 93.1, 93.4a(b), 93.4c(a)(1)(iv); 40 C.F.R. S 122.4(d).

³⁵ 25 Pa. Code §§ 93.4a, 93.4c.

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