Catskill Mountainkeeper

Dear Commissioners:

I omitted the following citation from our previously submitted technical comments. I am therefore supplying it now, with its abstract and a URL for online access to the entire article (see below). This research demonstrates that discharges of "partially treated produced water has the potential to increase salt loads to surface waters significantly" and that such loads may cause "unacceptably high concentrations of dissolved solids or bromide in source waters, particularly when rivers are at low-flow conditions."

Because flow levels are variable and response times in terms of permitting activities are not immediate, issuing permits based on flow parameters is a less secure and ultimately more cumbersome and expensive approach to management than a universal ban on discharges of produced water from oil and gas development.

Please incorporate this additional information in your review of our recommendation that the Delaware River Basin Commission ban the transportation, storage, spreading, treatment, or discharge of waste from oil and gas development in the Delaware River Basin and its waters.

Sincerely,
/Kathleen Nolan, MD, MSL/

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RESEARCH ARTICLE: Oil and Gas Produced Water Management and Surface Drinking Water Sources in Pennsylvania

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Abstract

Produced water from oil and gas development requires management to avoid negative public health effects, particularly those associated with dissolved solids and bromide in drinking water. Rapidly expanding drilling in the Marcellus Shale in Pennsylvania has significantly increased the volume of produced water that must be managed. Produced water management may include treatment followed by surface water discharge, such as at publically owned wastewater treatment plants (POTWs) or centralized brine treatment plants (CWTs). The use of POTWs and CWTs that discharge partially treated produced water has the potential to increase salt loads to surface waters significantly. These loads may cause unacceptably high concentrations of dissolved solids or bromide in source waters, particularly when rivers are at low-flow conditions. The present study evaluates produced water management in Pennsylvania from 2006 through 2011 to determine whether surface water discharges were sufficient to cause salt or bromide loads that would negatively affect drinking water sources. The increase in produced water that occurred in 2008 in

Pennsylvania was accompanied by an increase in use of CWTs and POTWs that were exempt from discharge limits on dissolved solids. Estimates of salt loads associated with produced water and with discharges from CWTs and POTWs in 2008 and 2009 indicate that more than 50% of the total dissolved solids in the produced water generated in those years were released to surface water systems. Especially during the low-flow conditions of 2008 and 2009, these loads would be expected to affect drinking water.