



June 15, 2010

Environmental Quality Board
P.O. Box 8477
Harrisburg, PA 17105
RegComments@state.pa.us

Re: Proposed Chapter 93 Ambient Water Quality Criterion; Chloride (Ch)

Dear Environmental Quality Board Members,

Thank you for the opportunity to comment on the Proposed changes to 25 Pa. Code Chapter 93.7, Table 3 to establish an Ambient Water Quality Criterion for Chloride (Ch). Delaware Riverkeeper Network submits these comments in addition to comments we submitted with Clean Water Action and other organizations on June 15, 2010 (Clean Water Action comment).

Delaware Riverkeeper Network (DRN) strongly supports the Environmental Quality Board (the Board) setting water quality criteria to address chloride in the Commonwealth's waterways and water bodies to protect the fish, plants and aquatic life that make up these ecosystems. However, we advocate for the adoption of criteria that are based on accurate and appropriate species and current data rather than that used by the Board which mirrors the U.S. Environmental Protection Agency's (EPA) 1988 recommendations (*Ambient Water Quality Criteria for Chloride*, USEPA, February 1988). We do not consider the proposed criterion to be protective of aquatic life here and therefore do not consider the proposed rulemaking to meet the requirements of the law.

DRN does not support the wholesale adoption of the 1988 EPA recommendations for several reasons, as discussed in detail in the Clean Water Action comment and accompanying technical report which we endorse here. The reasons, in summary, include: the 1988 EPA species criteria is not accurate for the streams and rivers of Pennsylvania and the species that rely on these waterways; the data is out of date since there have been numerous scientific studies and reports issued since 1988; and there are errors in the 1988 EPA analysis. We also herein make some suggestions regarding policy and implementation.

The Need for Rulemaking

In the effort to address Total Dissolved Solids and salts in Pennsylvania's streams and rivers, the adoption of criteria for chloride is key. This is particularly true for the 64% of Pennsylvania that is underlain by Marcellus shale or the additional regions not in the Marcellus shale fairway underlain by other deep gas bearing formations or regions that will receive discharged effluent from wastewater treatment facilities that process gas drilling wastewater, which is high in chloride. This is virtually the entire Commonwealth. The Commonwealth has already experienced a catastrophic spike in chloride that turned the warm water fishery of Dunkard

Creek into a salt water environment, killing all aquatic life that had gills for up to 40 miles in September 2009. Recently recorded spikes in conductivity on monitored waterways illustrate further possible chloride enrichment in other streams located in shale gas development regions, presumably from runoff or groundwater expression. Existing “brine” discharge facilities in Pennsylvania that are relying on dilution as the primary means of “treatment” are contributing salty effluent daily to the state’s western streams. Other existing sources of chloride are loading salts into waterways across the state, as discussed further below.

Anti-Degradation and Stream Category Policies

While DRN agrees with the Board’s statement in the Proposed Rulemaking that an aquatic life criterion for chloride is needed and that current schemes (i.e. osmotic pressure) are not workable, and that the state’s existing chloride criterion (250 milligrams per liter of water) is not adequate to protect aquatic life, particularly because it is only applied at the point of water supply intake, we do not agree with the proposed one-size-fits-all criterion. Criteria need to be developed specific to the various classifications of Pennsylvania streams in order to protect the variety of species that live in these waterways. Different criteria may be necessary for cold water fisheries, warm water fisheries, trout stocked fisheries, and migratory fisheries. Species specific to each of these classifications need to be used to establish an accurate ranking of species sensitivity to chloride. Temperature and perhaps other environmental factors (stream morphology, size of watershed, existing discharges and withdrawals, etc.) need to be considered in the analysis.

Further, in order to meet antidegradation requirements, specific criteria need to be developed using sensitivity information for the species that populate Pennsylvania’s Special Protection Waters, particularly Exceptional Value (EV) and High Quality (HQ) Streams. To accomplish this, there needs to be an established process that incorporates data on the species that inhabit an individual Special Protection Water, so that designated waters can establish criteria that are truly protective of the species and habitat present.

Implementation Policies

Application of the criterion to all sources

In order to protect stream quality, a water quality standard that applies to the whole stream is needed to reflect cumulative loading from various sources. The proposed implementation is primarily through Pennsylvania Department of Environmental Protection’s (PADEP) National Pollutant Discharge Elimination System Program (NPDES). How will PADEP implement the chloride criterion for multiple sources, particularly nonpoint pollution sources? If the Department only applies the criterion for a discharge, how will diffuse sources be addressed?

The Board states that anthropogenic sources of chloride include de-icing salt for roads and urban and agricultural runoff, both nonpoint sources primarily. De-icing is one of the largest sources and results in chloride spikes that vary with weather. Also, overland runoff from oil and gas well development sites where high-chloride fluids and wastewater is handled and stored contributes loads to surface waters. Salty groundwater expression to the surface, especially in times of low rainfall or drought, is also a potential source of chlorides to surface waters. It is unacceptable to wait until a Total Maximum Daily Load (TMDL) is to be developed to address the control and reduction of chloride as this guarantees degradation from existing quality in many streams, especially EV and HQ streams.

The natural background levels of salt in streams (whether classified as SPW or not) in forested and very rural, intact subwatersheds, for instance, also require protection from degradation

outside of the TMDL process. DRN considers the TMDL process to be an after-the-fact and imperfect if not intrinsically flawed process when relied on as the only method to control nonpoint sources. DRN does not consider the use of the TMDL process alone to accomplish anti-degradation goals to be compliant with Clean Water Act requirements and Pennsylvania's Clean Streams Law.

Due to changes in the Commonwealth's stormwater management program, nonpoint sources of pollution are less likely to be captured effectively at oil and gas operations. The Permit-by-Rule process allows oil and gas exemptions from technical review, reduces oversight, does not require timely inspections, does not require post construction Stormwater Best Management Practices to be monitored and cuts out public review and participation in the decision making process, among other things. Those seeking coverage under Permit-by-Rule need only prepare and submit a complete Registration of Coverage to PADEP in which lists of requirements are simply checked off without assurance or verification that the Erosion & Sediment Control Plan, Post Construction Stormwater Management Plan, or Preparedness, Prevention and Contingency Plan will maintain or protect water quality, including the designated HQ waters of Pennsylvania's Special Protection Waters program.

The lack of individual permit review removes these essential safeguards that are needed more than ever as gas drilling speeds ahead in the Commonwealth and chloride potentially becomes more of a problem due to the high chloride content of hydraulic fracturing fluids used by the shale gas industry and the produced water from Marcellus shale and other deep geologic formations. Tens of thousands of miles of Pennsylvania streams, including 22,563 miles of Pennsylvania's HQ waters, will potentially be degraded under the Permit by Rule stormwater program and the proposed chloride criteria will not be met if the Department does not develop a system to implement the chloride criteria for these diffuse sources (i.e. when a NPDES permit is not required).¹ Exemptions in the Oil and Gas Act from Chapter 102 Stormwater regulations compound the potential for chloride loadings from oil and gas operations.

And problems are not uncommon from lack of adequate implementation of Post Construction Stormwater Best Management Practices (BMPs). For example, DRN witnessed first-hand the devastating results of the lack of proper installation of BMPs on an HQ stream. On an HQ reach of the Upper Perkiomen Creek, vast amounts of sediment in 2006 and 2007 polluted the stream due to land development. Development of steep slopes and lack of proper erosion and sediment controls caused major sedimentation of the stream when permanent BMPs were supposed to be installed.

Without follow up monitoring that is required by an individual permit, degradation is more likely than before Permit-by-Rule changes. With the development of gas wells in previously forested or naturally vegetated areas, land use changes will be radical as the scope of this development increases across Pennsylvania's landscape yet many of these wells will not trigger the requirement for a NPDES permit. Even when a NPDES permit is required, exemptions in the Oil and Gas Act allow this development to avoid needed provisions in Chapter 102, which poses a significant challenge to the effective implementation of chloride criteria for this source of the pollutant. This fact argues for a precautionary approach that utilizes a safety factor in the development of the criteria to make up for the missing pieces. Further, there needs to be a well crafted system of applying chloride criteria to the nonpoint source and non-NPDES

¹ The Permit-by-Rule policy is moving ahead despite a finding by the EHB in *Blue Mountain Preservation Association v. DEP and Alpine Resorts*, EHB 2005-077-K that held that compliance with Chapter 102 regulations regarding erosion and sedimentation control does not automatically constitute compliance with the antidegradation requirements.

permitted sources of chloride, both of which can reasonably be expected to increase chloride loads and, in volume and proportion, exceed current anthropogenic sources of chloride.

Monitoring

DRN advocates that when PADEP implements the chloride criteria, accurate sampling and continuous monitoring of Pennsylvania's streams be required at the expense of the developer/discharger. This is especially true of shale gas operations considering the variable nature of gas drilling wastewater and hydraulic fracturing fluids that are handled, mixed, injected, recovered and stored in an open pit on each gas well site and considering the high chloride content of gas drilling fluids and wastewater and the harmful effects of chloride on aquatic life. Salt-rich water that is present underground after a well is hydraulically fractured can express to the surface, adding another potential source of chloride to the waterways in gas drilling regions.²

All NPDES permits should require a comprehensive chloride monitoring requirement and baseline monitoring of the Commonwealth's streams is also needed to capture both existing water quality and potential changes and trends in affected waters. Equipment such as automatic data loggers and equipment to monitor flow and temperature, which may combine to magnify the impacts of chloride on aquatic life and stream ecosystems, are needed. The data results and real time data of stream conditions should be recorded and made easily available on line to local communities and the public, especially considering the high use of the Commonwealth's streams by recreational fishermen.

Annual macroinvertebrate studies and other aquatic life studies are needed to document existing conditions, which are not well documented in most of the Commonwealth's waterways. This baseline data is required to provide an accurate inventory of existing aquatic life in the stream. Followed by ongoing stream studies, this data can then be used to catch harmful changes and dangerous water quality trends early to ensure aquatic life are not harmed or degraded.

Finally, plants are also directly affected by chloride, as documented in various scientific studies. Similar to the systemic impacts that chloride has on fish and aquatic life, vegetation also can be devastated by chloride. The need to protect riparian vegetation and natural vegetation in contributing watersheds is of utmost importance in the protection of habitat for aquatic species. Vegetation is part of the essential ecosystem that comprises the Commonwealth's streams, rivers and water bodies and should be considered in Rulemaking.

Thank you for the opportunity to comment on this important water quality criterion. We urge the Department to reassess its rationale and not adopt wholesale the 1988 EPA recommendations and instead to develop specific chloride criteria that will truly protect the fish, aquatic life and habitats of the Commonwealth's waters.

Sincerely,

Maya K. van Rossum
the Delaware Riverkeeper

Tracy Carluccio
Deputy Director

² New York City's Final Assessment of the impacts of gas extraction and development in the reservoir watersheds in New York's Catskill Mountains makes clear that hydraulic fracturing fluids and deep saline waters can make their way to the surface through fractures and migration. [Final Impact Assessment Report \(PDF\)](#)