

Testimony on
Marcellus Shale Natural Gas Drilling and Philadelphia's Drinking water Supplies
Before the Environmental Resources and Energy Committee
Pennsylvania House of Representatives

Howard M. Neukrug, P.E.
Director, Office of Watersheds,
City of Philadelphia Water Department

Thank you for inviting me to speak on behalf of the Philadelphia Water Department. Pennsylvania is fortunate that its natural resources can contribute to U.S. energy independence and create thousands of jobs across the state. Natural gas is widely recognized as a lower emissions energy resource that will help transition our economy away from high emission fossil fuels to renewable resources. We would like to acknowledge the extraordinary effort that the DEP and state officials have put towards making natural gas extraction both economically beneficial and environmentally responsible. As a utility that provides the full gamut of water services - drinking water, regional wastewater treatment, and stormwater management for 2.0 million people in Southeastern Pennsylvania, we can appreciate the often overwhelming commitment of time and resources required to balance economic, environmental and social considerations.

We are following these discussions closely because we know all too well that by being at the bottom of a 10,000 square mile watershed, comprehensive watershed management must

include preservation of headwater streams and forest lands well upstream of Philadelphia. Indeed, the quality and quantity of water available to Philadelphia as drinking water depends on land and water resource decisions and actions made upstream of the city.

Although HALF of the source for Philadelphia's drinking water is underlain by Marcellus Shale, we recognize that the extraction of natural gas using is an activity that can be performed with low risk to natural resources if there is good enforcement of existing regulations, inspection of drilling sites, and restoration of sites to their pre-drilling state.

We are pleased at the state's commitment to increase inspections of well sites and the staff to perform them, the increase in state-wide industrial wastewater treatment capacity, and the acknowledgement that groundwater pollution regulations need to be stronger. Given these recent very positive DEP activities, I'd like to focus this testimony on the prevention of loss of forest lands due to drilling operations. Preventing forest loss is fundamental to the long term quality of Philadelphia's drinking water supply.

Our concern is that existing state regulations – while requiring site stabilization and vegetative restoration - do not require full site restoration of a site that was once forested back to its pre-drilling state. The regulations ultimately leave the details of site restoration to be negotiated between the landowner and gas company. We are here to advocate for a more comprehensive approach. Without this, there can be long term degradation of water quality due to forest clearing and soil compaction.

Philadelphia's 10,000 square mile watershed encompasses two great rivers - the Delaware and the Schuylkill – and three states - Pennsylvania, New York, and New Jersey. The watershed is dominated by forested lands which cover over half of the area. In Pennsylvania portion of the watershed alone, we have 2,800 square miles of forested water supply, 70% of which is underlain by Marcellus Shale and vulnerable to clearing from natural gas extraction.

Statewide, forested watersheds cover over 80% of our drinking water resources,¹ making Pennsylvania's drinking water resources some of the cleanest in the world. Forests assimilate nutrients, filter out waterborne sediments, hold soils in place to prevent erosion, and act like a sponge to hold rain water which is then slowly released to replenish streams and groundwater supplies. Philadelphia's regional Source Water Assessment and Protection Plans confirm that the excellent water quality of the Delaware River basin is attributed to the dominance of forested land cover; and the forested areas are critical to maintaining good water quality in the face of future challenges from development pressure and climate change.

As a drinking water provider, we routinely model the relationship between land cover and water quality. If we were to compare the pollutants found in runoff from forested vs. residential lawns,

- the turbidity concentration in runoff from lawns is 2 times greater than that from forested lands

¹ - Pennsylvania State University Agricultural Research and Cooperative Extension

- the nitrogen concentration in runoff from lawns is almost 5 times greater than that from forested lands, and 3 times greater for phosphorus
- the *Cryptosporidium and Giardia* concentrations in runoff from lawns is over 30 times greater than that from forested lands, and fecal coliform concentrations are 3,000 times greater

In essence we view the loss of forested lands as synonymous with water quality degradation. Pennsylvania has poured millions of dollars into the protection of forested areas based on their value to watershed protection through state agencies, private entities, and public utilities. Philadelphia has likewise expended great resources through regional partnerships like the Schuylkill Action Network and the Act 220 Delaware Region Water Plan to protect lands in its water supply. We do not want to see all of the environmental improvements and statewide support for watershed protection set-back by failing to return cleared drilling sites to their original pre-drilling state.

Once sites are cleared and drilling operations are completed, soil compaction will limit forest re-growth. The use of "heavy construction equipment can compact soil so significantly that the soil bulk density of lawn soil approaches the bulk density of concrete...the result is a surface that is functionally impervious because the water absorbing capacity of the soil is so altered and reduced"². The Marcellus Shale drilling sites will use similar heavy construction equipment and have significant heavy-truck traffic.

² Pennsylvania Stormwater Best Management Practices Manual

To encourage re-growth and full restoration, the solutions are simple. Drilling sites may need top soil replacement, mitigation of compacted soils, planting of saplings with deer browsing protections, removal of access roads, and invasive species control in order to overcome the disturbances associated with drilling activities.

We appreciate the extraordinary efforts of DEP to regulate all facets of Marcellus Shale drilling. However, each drilling site cannot be left as a hardened clearing. If this were to happen, drinking water suppliers across the state would experience water quality degradation because forests play such a fundamental role in water resource protection.

In closing, we hope the state continues its focus on producing clean energy by drawing the attention of agencies, land owners, gas companies, utilities, and environmental organizations to the issue of full site restoration. We are not necessarily calling for stricter regulations, though they could be part of the solution. Forests can also be protected if sufficient commitment and funding is dedicated to full site restoration, and if skilled environmental groups are provided opportunities to get involved.

The health and viability of Pennsylvania's vast forest resources are of incalculable value to the water resource, hunting, recreation, and silviculture communities. Thank you for letting us lend our support to protecting these great resources.