



## Delaware River Basin Commission

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### **DRBC WATER MANAGEMENT ADVISORY COMMITTEE MEETING July 27, 2010**

#### **COMMITTEE MEMBERS PRESENT:**

Mary Ellen Noble	Delaware Riverkeeper Network, WMAC Chair
Michael Bleicher*	NJ Dept. of Environmental Protection
Janet Bowers	Chester County Water Resources Authority
Paula Conolly*	Philadelphia Water Department
Michael Holt	NYS Dept. of Environmental Conservation ( <i>via Conference Call</i> )
David Jostenski	PA Department of Environmental Protection
George Kunkel	Philadelphia Water Department
Stewart Lovell	Delaware DNREC
John Mello	US EPA, Region II
Joseph Miri	NJ Dept. of Environmental Protection
Bob Molzahn	Water Resources Association
Joanne Rufft	Artesian Water
Ron Sloto	US Geological Survey
Glen Stevens	U.S. Army Corps of Engineers

\*Denotes alternate or non-official member.

#### **DRBC STAFF:**

Carol Collier, Executive Director  
David Sayers, Planning & Information Technology  
Kent Barr, Planning & Information Technology  
Eric Engle, Geologist, Water Resources Management  
David Kovach, Geologist, Water Resources Management

#### **REVIEW OF MINUTES / REVIEW AND APPROVAL OF AGENDA:**

The meeting was called to order at 10:00 am by Mary Ellen Noble, Chair of the Committee. The minutes from the January 14, 2010 meeting were reviewed and approved without changes. Committee chair noted that there was a change to the Agenda and that the Marcellus Shale / Natural Gas topic was moved up to the first agenda item.

#### **MEMBERSHIP**

David Sayers welcomed Joanne Rufft of Artesian Water as an official WMAC member representing the water purveyor sector.

#### **FUTURE MEETINGS**

The next WMAC meetings have been scheduled for Wednesday, October 20, 2010 and February 1, 2011. The next Commission Meeting dates were also discussed and are to occur on 9/15/10 and 12/8/10.

## **MARCELLUS SHALE – GAS WELL DRILLING**

Carol Collier provided an update to the Committee regarding regulating the natural gas well drilling in the upper Basin and how it has been an evolving process. DRBC has consulted a number of environmental organizations, landowners and industry to assess the impact that natural gas drilling may have in the Delaware River Basin. To the west, the Susquehanna River Basin Commission (SRBC) has been dealing with the issue for over two years and we can learn from them, but DRBC plans to regulate based on the concept of a three-legged stool, to include; water, wastewater and issues related to well pad siting. The Commission also recognizes that all this activity is occurring in the top third of the basin and it is the most sensitive area so it must be done carefully and more holistically considering factors such as the basin being a source of water supply to over 15 million people, Special Protection Waters (SPW) and Wild and Scenic designation.

Carol Collier also discussed the May 2009 and June and July 2010 Executive Director determinations and changes related to exploratory wells. The determinations state that consideration of natural gas production projects will occur after new DRBC regulations are adopted. DRBC staff has placed high priority on drafting regulations to put before the Commissioners. The July 2010 determination also allows for a limited number of exploratory wells to be drilled in the Basin. It is expected that the information gained from these exploratory wells will be useful to inform decision making.

Current thinking on the draft regulations allows for a normal review process for water withdrawals (surface and groundwater) for natural gas use, but a fast-track option or approval-by-rule will be offered to use already docketed water sources. If a water company or municipal authority has water available, a modification to their docket could be processed quickly to provide water for gas well drilling. With respect to water withdrawals the amounts do not seem significant when you consider other withdrawers in the basin but there is an issue of timing and two things need to be considered; 1) what is happening to smaller tributaries i.e. multiple withdrawals out of the tributary at the same time and then localized problems; and 2) Delaware flow management issues, increased consumptive use above Montague, and how is that water made up?

On the wastewater side, PA passing the TDS was significant and beneficial. As they have new standards for gas wells and have a more stringent standard for wastewater plants. They have to meet 500mg/L TDS effluent standard which means that used “frac” water will have to be taken to a pre-treatment facility before it goes to a normal wastewater plant. Down-basin states Commissioners are very concerned with wastewater impacts.

Evaluation of Well Pads is proposed for the rule, but requires careful coordination with State reviews as it is something that is not normally handled by DRBC. Of concern is siting issues to minimize forest fragmentation, setbacks, floodplains, public water supplies and wetlands which have minimal setbacks in some of the State regulations.

Draft natural gas regulations are expected to be published by the end of summer 2010, with a public rulemaking process to follow.

**DRBC will keep WMAC members informed of actions that DRBC takes relative to natural gas, e.g., publication of draft regulations, etc.**

## **WATER AND WASTEWATER PROJECTIONS FOR THE MARCELLUS SHALE NATURAL GAS DRILLING**

David Kovach, Geologist/Hydrologist, DRBC, gave a PowerPoint presentation entitled Preliminary Analysis of Water Withdrawals and Wastewater Production from the Marcellus Gas Play in the DRB.

The analysis and estimated usages are based on assumptions. Facts were gathered from activities in Pennsylvania and other shale plays. The most important factor gathered by performing this exercise is tabulating a list of parameters that can be modified as needs change and new information is obtained.

The goals were as follows:

- 1) Estimate of the number of gas wells that could be drilled in the DRB.
- 2) Estimate the term of the play, how it may be ramped up, how it may be ramped down and what peak development years would look like in terms of how many wells are being installed.
- 3) Estimate the amount of water necessary for drilling and stimulating natural gas wells over the term of the play.
- 4) Estimate the amount of wastewater including produced water that may be generated and require treatment over the term of play.
- 5) Evaluate the effects of water re-use

### **Extent of Marcellus Shale within the Delaware River Basin – 36% (4,937 mi<sup>2</sup>)**

David Kovach discussed the shale formation and the corresponding topography and geology of the region. The viable area of Marcellus is based on assumptions, and estimates factor in geologic and regulatory constraints. The Barnett Shale was used as a model in assessments of area, depth and thickness because it is similar to the Marcellus Shale. It is possible that the gas has escaped via fractures or may be “cooked out” (not viable for production) in some areas. Out of 4,937 mi<sup>2</sup> of Marcellus Shale in the DRB, there may only be a viable area of 1,667 mi<sup>2</sup> due to regulatory constraints, slow development pace, some no drill zones and State spacing units. The DRBC estimates a range of 7,200 – 28,000 natural gas wells drilled, the most likely scenario being 10,000 wells.

### **Daily Water Demand Estimates**

DRBC Estimates 15-19 MGD for peak daily water demands under the 10,000 well scenario. These estimates are believed to be conservative (high). Two other estimates have been performed, one by ALL Consulting and one by the SRBC. ALL Consulting compiled a preliminary study of water use, and their findings were 75 MGD in the entire Marcellus Shale formation (95,000 mi<sup>2</sup>), the DRB proportional calculation would be equivalent to 4.0 MGD. SRBC calculated 25 MGD based on 19,807 mi<sup>2</sup>, the DRB proportional calculation would be equivalent to 6.25 MGD.

### **Wastewater Assumptions**

Flowback (water flowing back to the surface after hydro-fracturing) is estimated to account for approximately 20% of the volume of hydro-fracturing fluids used, within the first month. Estimates indicate that 72% of total wastewater will return over the life of a well, but these assumptions could be unrealistic; it is a framework to be refined when more data is available.

There was a group discussion among the WMAC regarding shipping out wastewater for treatment, the use of injection wells and pre-treatment facilities. A question was raised regarding the projected water demand for drilling natural gas wells (approximately 30cfs in the peak year) in relation to the flow target at Montague (1750 cfs) and in relation to other basin water uses.

**An electronic copy of presentation was forwarded to WMAC members.**

#### **SRBC/TNC/USACE ECOSYSTEM FLOW STUDY**

David Sayers provided an update on activity relating to Ecological Flows and Pass-by Flows with a presentation that was given by SRBC at the last Commission Meeting on 7/14/10 by David Heicher. For a number of years, the Commissioners have been involved in trying to improve the Q710 default pass-by flow and there have been a number of studies. The science has progressed but concrete changes to the regulations have not occurred. DRBC has been in contact with staff at the State level and the Commission level. Interest has been expressed in Pennsylvania's work through the SRBC in partnership with TNC and USACE.

The goal of the SRBC study is to describe the flow needs of aquatic ecosystems within subwatersheds and to develop quantitative flow recommendations that include the following; specific location, time period, flow magnitude, frequency and duration of event, and related ecosystem function.

**DRBC Staff to explore with the Nature Conservancy (TNC) a scope of work and costs associated with customizing Susquehanna work for the DRB, looking at physiographic provinces, key species for the basin and time periods of greatest importance.**

**An electronic copy of presentation was forwarded to WMAC members.**

#### **WATER ACCOUNTABILITY UPDATE**

David Sayers provided a synopsis of DRBC's outreach activities for water accountability. The implementation of the water accountability program will be phased initially to encourage the regulated community of purveyors to voluntarily adopt and use the AWWA Water Accountability approach / software before it becomes a mandatory format for the 2013 report (calendar year 2012 data). Letters will be sent to ensure that water purveyors are aware of the rule change, workshops are planned and additional details, links and other sources will be provided on the DRBC website.

George Kunkel provided an update from the industry perspective regarding further development of AWWA's tools, Free Water Audit Software and the pilot programs that have been using this approach and software on a voluntary basis. Pennsylvania's PUC two-year pilot program is progressing. Initial data for 2009 has been collected; once 2010 data is obtained an assessment will be performed to determine the framework for a more formal program for the private water utilities / companies in Pennsylvania.

DRBC Water Management Advisory Committee Meeting  
July 27, 2010

In terms of general observations the outreach is seeing some success. Water Audit requirements are showing up in a number of states and regional agencies and the use of the software is generally being grasped. The overall goal is to advocate a standardized approach and water audits on a national level rather than various agencies, state and regional agencies.

Several group discussions followed among the WMAC including issues concerning data, criteria, source meters, the public availability of data and primacy for data collection.

**DRBC and the States will begin coordination on data collection / sharing for 2012 Calendar Year Reports (when the new DRBC Reporting Format becomes Mandatory).**

### **WATERSMART/NATIONAL WATER CENSUS**

David Sayers presented a summary of the National Water Census: Quantifying, Forecasting, and Securing Freshwater for America's Future, a USGS effort. The Delaware River Basin has been chosen as one of three watersheds to receive funding (\$1.5m over 3 years) to pilot the information and tool development. The SECURE Water Act allows States to receive up to \$250k in grants for improvements to their water use data system.

The objective of the census is to place technical information and tools in the hands of stakeholders to answer two questions; 1) does the Nation have enough freshwater to meet both human and ecological needs; and 2) will there be water to meet future needs? The ultimate goal is to track human water use from where it is withdrawn, how it is used and then how it is returned to the environment.

As there was no other business the meeting adjourned at 12:45pm.