

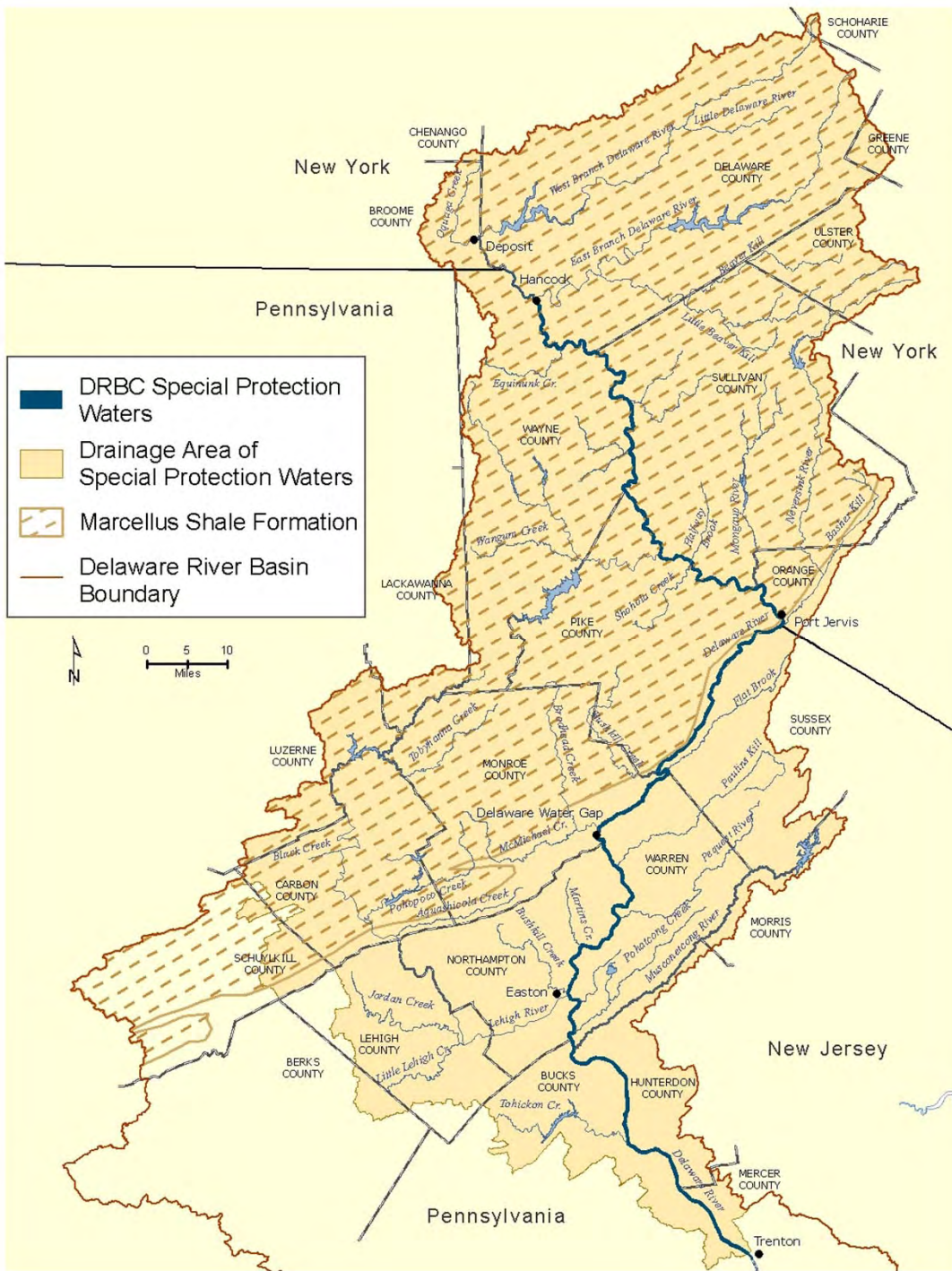


DRBC Natural Gas Draft Rule

Water Management Components and Data Requirements

Delaware River Basin
Commission

WMAC Meeting
May 17, 2011



Marcellus Shale, DRBC Special Protection Waters

36% (4,937 mi²) of the Basin is underlain by Marcellus Shale

Projected Water Needs



Over 10-20 years:

- 5 million gallons per horizontal well stimulated
- 90 BG w/ no recycling
- 72 BG – assuming 90% reuse of initial flowback water

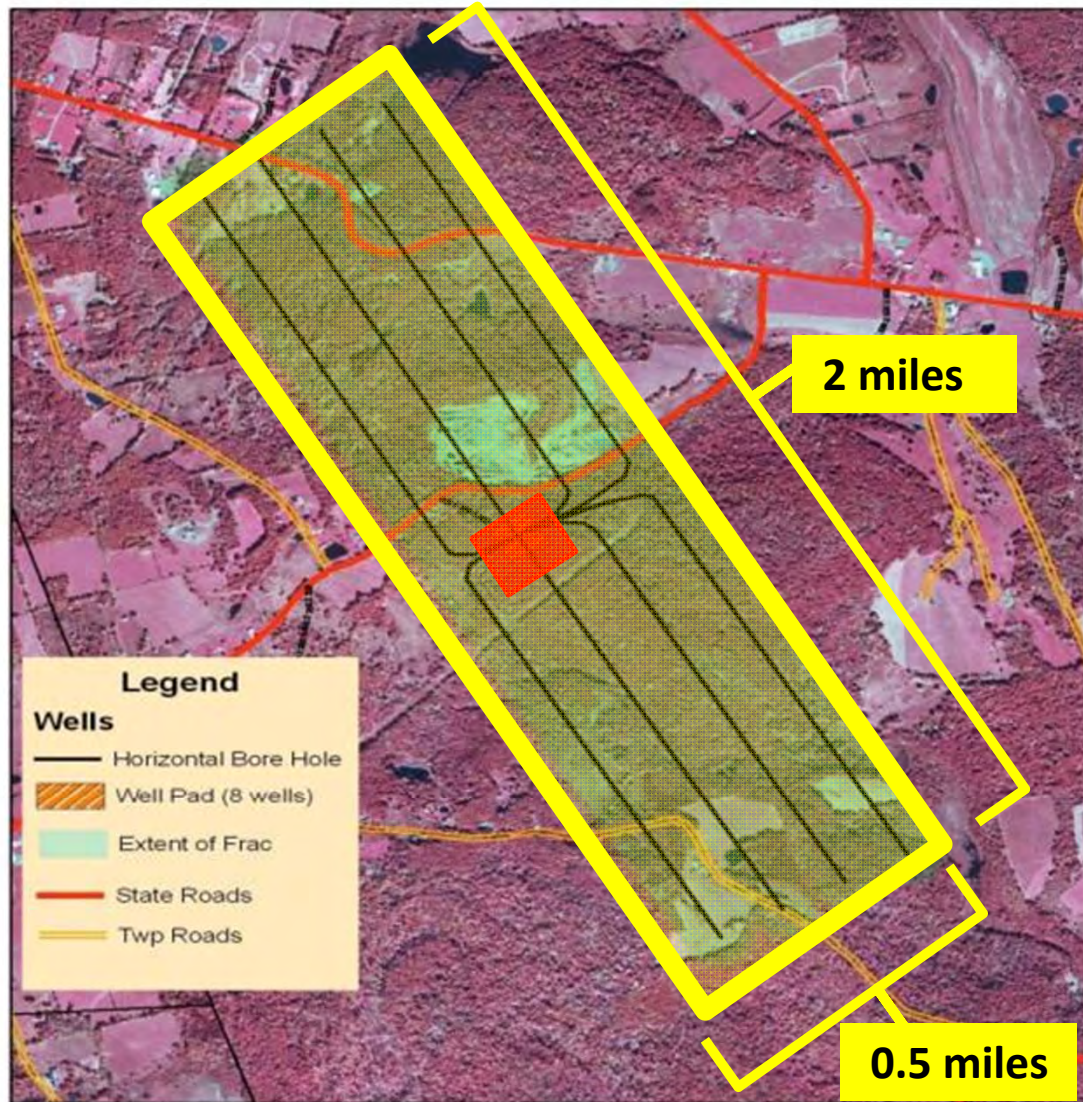
Projected Natural Gas Wells/Pads

- ❑ 15,000-18,000 horizontal wells (8 wells per pad; does not include vertical wells)
- ❑ 2,000-2,200 well pads covering 10,000-12,000 acres
- ❑ Additional acres for support infrastructure



Generic Single Pad Drilling Unit

8 Wells, 5,000 ft. horizontals, 640 acres

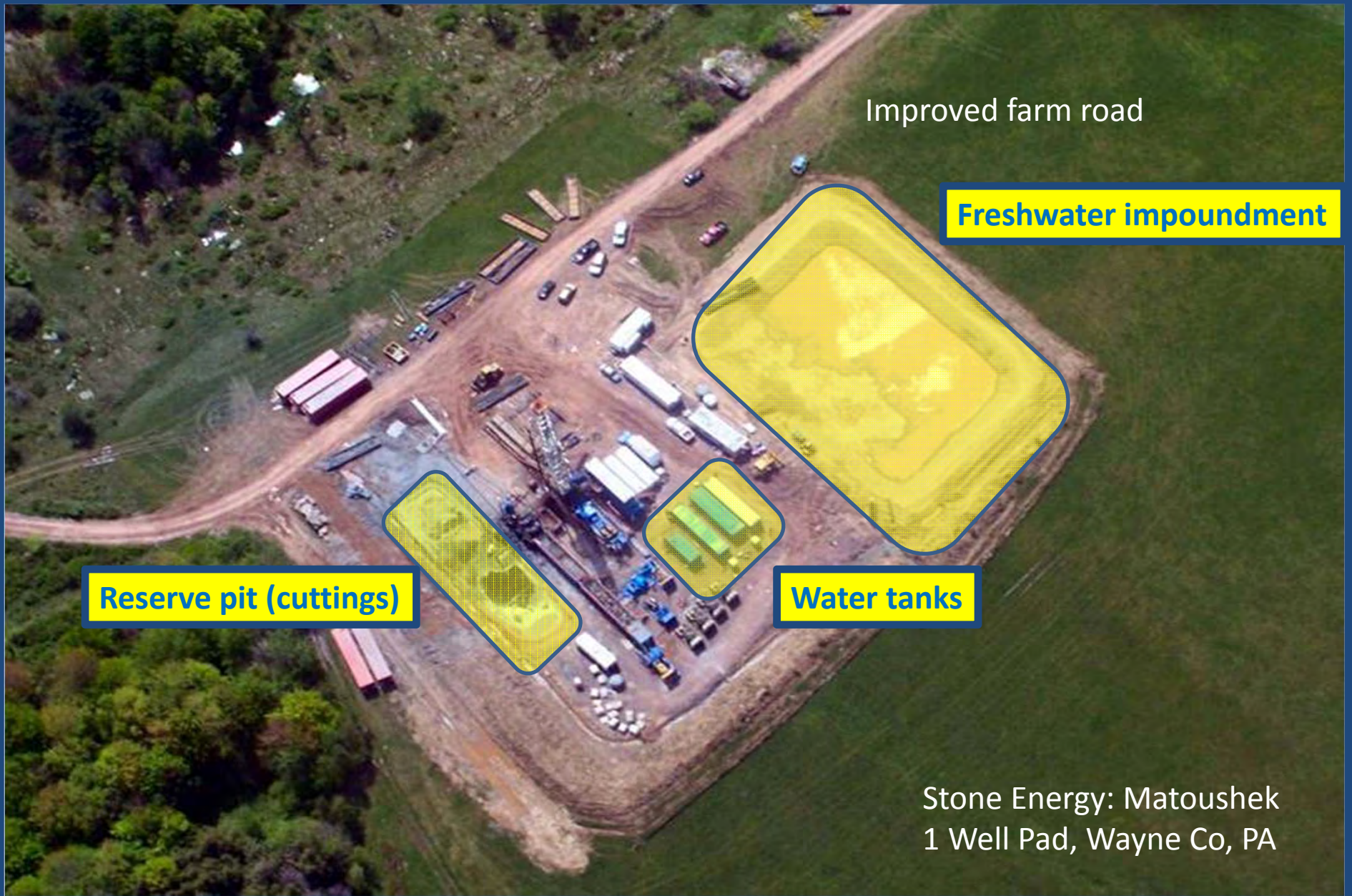


Well Pad
Drilling Site

Gas
Extraction
Area



Well Pad Drilling Site



Improved farm road

Freshwater impoundment

Reserve pit (cuttings)

Water tanks

Stone Energy: Matoushek
1 Well Pad, Wayne Co, PA

Wastewater “Treatment” & Disposal

- Initial Flowback –
20% of frac volume
= 1 MG per well
- 18 BG over 10-20
years
- Treatment capacity
and capability
currently lacking



Objectives of Draft DRBC NG Regulations Issued Dec. 2010

- Consolidate requirements in one code Section - Article 7 of Water Quality Reg's, 18 CFR 410
- Include rules for withdrawals, wastewater disposal well pads, and natural gas development plans
- Provide certainty to the industry
- Include an approval by rule process (ABR) for water sources and well pads that meet specified conditions
- Rely on NY/PA programs and expertise to regulate well construction and operations
- Applicable to all natural gas target formations

DRBC Natural Gas Regulatory Strategy



1. Water Withdrawal

- Protect surface and groundwater supplies
- Preserve ecological flows
- Ensure assimilative capacity for discharges

2. Well Pads and Ancillary Infrastructure

- Natural Gas Development Plan
- Manage water use & disposal
- Monitor and protect surface water & groundwater

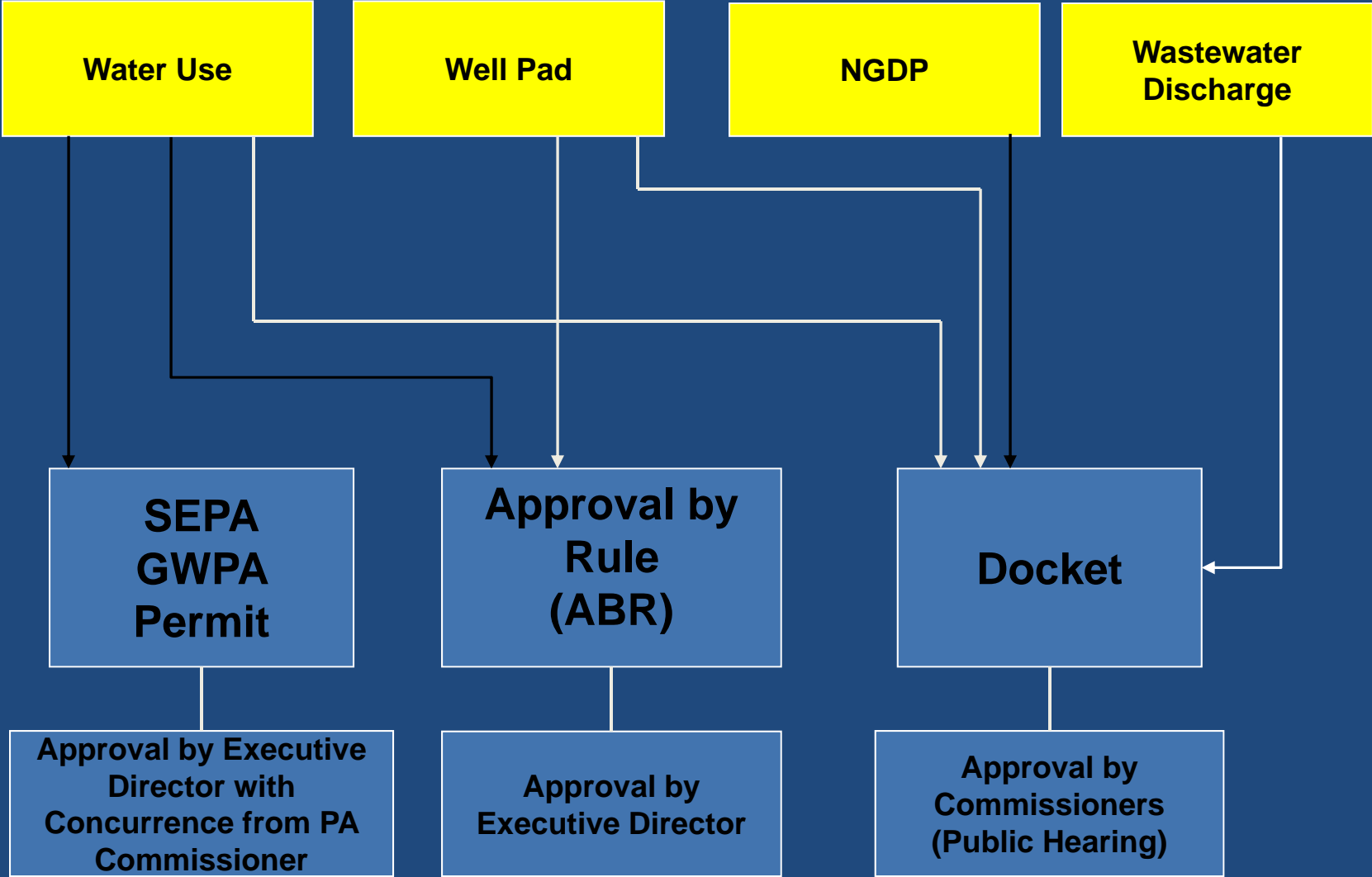
3. Wastewater Disposal

- Protect receiving water bodies
- Track wastewater production, reuse, and disposal
- Ensure adequate treatment is available for expected waste stream

Framework of Draft NG Reg's

- **Section 7.1 Purpose, Authority, Scope and Relationship to other Requirements and Rules**
- **Section 7.2 Definitions**
- **Section 7.3 Administration**
- **Section 7.4 Water Sources for Uses Related to Natural Gas Development**
- **Section 7.5 Well Pads for Natural Gas Activities**
- **Section 7.6 Wastewater Generated by Natural Gas Development**
- **Appendix: Wording of Financial Assurance Instruments**

Section 7.3 Natural Gas Development Projects and Approvals



[Public Notice Water/Wastewater](#)

[Public Notice Well Pads](#)

7.4 Water Withdrawal and Use Approvals

- Existing DRBC-approved sources, incl. treated wastewater and non-contact cooling water, are eligible for **ABR**.
- New fresh sources, mine drainage water, imported water – all require docket.
- **But**, new on-site sources and use of flowback/produced water can be approved as condition of Natural Gas Development Plan (**NGDP**).

Key Requirements:

- Water tracking and reporting
- Aquifer testing for new wells
- Pass-by flow requirements



Water Withdrawal and Use Approvals

New Source

Groundwater withdrawal
Surface water withdrawal
Treated wastewater
Non-contact cooling water
Mine drainage water

Existing Approved DRBC Source


Groundwater withdrawal
Surface water withdrawal
Treated wastewater
Non-contact cooling water

**Reuse of Recovered
Flowback
or
Production Water**

**Imported Water or
Imported
Mine Drainage Water**



7.5 Well Pad and NGDP Approvals

- 
- Water and wastewater tracking and reporting
 - **Pre-alteration and annual ground and surface water sampling and analysis**
 - Drought plan, metering plan, invasive species mgmt. plan
 - **Public notice**
 - **Consumptive water use charges**
 - Financial assurances
 - **Flowback storage in tanks – remove w/in 45 days**
 - Off-site disposal of horiz. drill cuttings
 - **Siting restrictions and setbacks (variances available except for floodway)**

Natural Gas Development Plan

- Review “multiple” pads/wells instead of individually
- Evaluate lease holdings (50,000 acres) or smaller units
 - Based on location or timing
- Mapping of constraints and developable Areas
 - Existing information
- Optimize locations of proposed Well Pads and infrastructure

7.6 Wastewater Discharge Approvals



Key Req's

- DRBC approval req'd to accept non-domestic wastewater
- No measurable change to EWQ analysis in SPW
- **Treatability study**
- Analysis for DRBC Zone - Specific Water Quality Criteria, WQR Tables 3 – 7
- **Facility-specific discharge req'ments**
- Analysis for acute and chronic toxicity per section 7.6 (e)(1)
- **Analysis for TDS Stream Quality Objectives**
- Non-exceedance of EPA primary and secondary drinking water standards

Implementation

- DRBC will be the lead on implementation of the regulations.
- Where a State has equal or more stringent regulations, the state can be responsible for regulation of those aspects.
- DRBC is developing Administrative Agreements with the States to clarify which agency has the lead on which aspects.

Draft DRBC NG Regulations Issued Dec. 2010

3 Public Hearings Held in Feb 2011

Tuesday February 22

Honesdale High School

459 Terrace St.
Honesdale, PA 18431

Liberty High School

125 Buckley St.
Liberty, NY 12754

Thursday February 24

Patriots Theater at the War Memorial

1 Memorial Drive
Trenton, NJ 08608

Two 3-hour sessions were held at each venue (18 hours total).

377 testified, 1,000 attended

Public Comment Period Ended Friday, April 15 2011

~58,000 correspondences submitted

Next Steps: Review comments, prepare comment & response document, modify regulations accordingly

DRBC Natural Gas Draft Regulations:

- Water and Wastewater Tracking -

Tracking involves all three legs of the stool:

- Water Sources
 - ABR (approval by rule)
 - New sources
- Use on Well Pads
- Wastewater



Water Sources - ABR

– Approved Withdrawals:

- Record: Daily volume piped or trucked to each destination. Available on request by ED
- Report to DRBC: Quarterly; monthly total volumes provided to individual pads

– Approved Treated Wastewater:

- Record: Date, amount, carrier, vehicle or pipeline and destination. Available on request by ED
- Obtain confirmation that wastewater was received by intended destination facility (pad)

Water Sources – New Sources



Marty Memory, Talisman Energy USA Inc.

E.g., Stone Energy withdrawal exclusively for NG purposes

Record: Daily volume piped or trucked to each destination. Available on request by ED

Report to DRBC: Quarterly; monthly volumes provided to individual pads

Well Pads – Water

Record: Daily volume of each truck / pipeline delivery and its source. Available on request

Report to DRBC: Quarterly; monthly and daily volumes provided to from each source



Well Pads – Wastewater

Record:

- Record volume of all non-domestic wastewater produced onsite daily
- Record volume by individual truck/pipeline; record name, permit docket # of the destination reuse / disposal facility. Obtain confirmation that transferred wastewater was received by facility. Available on request by ED.

Report:

- Hydraulic Fracturing Report (see handout), within 60 days of HF completion; report covers 45 day period after HF completion.
- Quarterly; monthly and daily volumes of flowback and production water collected from well pad and transported offsite.

DRBC Information Technology Infrastructure Upgrades

- Commission needs to enhance its information technology capabilities to improve:
 - efficiency of data and document handling
 - storage and flow of electronic information
 - existing paper based processes
 - the need to efficiently process expected high volume of natural gas related projects



DRBC Information Technology Infrastructure Upgrades

- Key Elements of the IT upgrade:

- Work Flow Analysis

- Database Design/Upgrade

 - Water Source Reporting*

 - Water Use/Consumptive Use*

 - GW/SW water quality report*

 - Water Withdrawal Applications*

 - TDS Determination questionnaire*

 - Post hydraulic Fracturing report*

- Web-Based Application and Reporting Process

- Database Security

- Document Management System/Scanning

- Public Web Portal

- SOPs and Training

DRBC Information Technology Infrastructure Upgrades

- January 14th Commission issued RFP&Q
- February 4th Commission held a mandatory pre-bid meeting attended by 30 firms
- February 25th Commission received 12 proposals
- Staff evaluated and ranked the proposals
- April 15th and 18th the 5 firms with the highest technical ranking were interviewed
- April 19th a final ranking of firms was developed and the URS Corporation received the top ranking
- May 11 Commissioners approved Resolution No. 2011-05 authorizing the Executive Director to engage in contract negotiations with URS
- June 2011 Project Initiation
- NG Data Exchange with Basin States

State Requirements

Data Primacy

Exchange Methods