

Nuts and Bolts of Marcellus Shale Drilling and Fracking



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Marcellus Shale Development Overview

- Major Stages:
 - Site development
 - Well drilling, hydraulic fracturing, production
 - Water withdrawals
 - Water and wastewater storage
 - Waste management
 - Processing and transmission

- Potential Environmental Impacts:
 - Surface water
 - Groundwater
 - Air

Laws and Regulations

- Oil and Gas Act
 - 25 Pa. Code Chapter 78 (relating to Oil and Gas Wells)
- Coal and Gas Resource Coordination Act
- Oil and Gas Conservation Law
- Clean Streams Law
 - 25 Pa. Code Chapter 91 (relating to General Provisions)
 - 25 Pa. Code Chapter 93 (relating to Water Quality Standards)
 - 25 Pa. Code Chapter 95 (relating to Wastewater Treatment Requirements)
 - 25 Pa. Code Chapter 102 (relating to Erosion and Sediment Control)

Laws and Regulations (continued)

- *Dam Safety and Encroachments Act*
 - 25 Pa. Code Chapter 105 (relating to Dam Safety and Waterway Management)
- *Waterways Planning Act*
 - 25 Pa. Code 110 (relating to Water Resources Planning)
- *Solid Waste Management Act*
- *Storage Tank and Spill Prevention Act*
- *Air Pollution Control Act*
- *Environmental Laboratory Accreditation Act*

Well Permit

- Notice to surface landowner, users of water supplies within 1,000 feet
- Well location restrictions:
 - 100 feet from streams and other bodies of water identified on topographic map
 - 100 feet from wetlands greater than 1 acre
 - 200 feet from buildings and water supplies
- Consideration of impacts to public resources

Erosion and Sediment Control

- Erosion and Sediment Control General Permit
 - 5 Acres or more of earth disturbance.
 - E&S plan
 - Post construction stormwater management plan and well site restoration

Water Withdrawal

- Single water management plan covers multiple well sites.
- Applies in Ohio, Susquehanna and Delaware basins.
- Required to protect existing and designated uses
– 25 Pa. Code Chapter 93.

Spill Prevention

- PPC Plan: Preparedness, Prevention, and Contingency Plan
 - Operators must review their operations and identify all pollutional substances and wastes that will be used or generated, as well as identify the methods for control and disposal of these substances or wastes.
 - Operators are required to identify potential risks and plan for the possibility of an accident occurring at the well site during hydraulic fracturing operations.

Pits, Tanks and Centralized Impoundments

- All pits and impoundments must be impervious and structurally sound.
- Low impact centralized impoundments that store wastewater are permitted by regional oil and gas staff.
- High impact impoundments permitted by dam safety.
 - Impact wetlands, on streams, breach threatens welfare/property.

Groundwater Protection

- Gas migration
- Protection of water supplies
- Final rulemaking – 25 Pa. Code Chapter 78
 - Oil and Gas Well Cementing and Casing
 - Effective February 5, 2011

25 Pa. Code Chapter 78 Overview

- Cement
- Casing
- Well control
- Inspections
- Gas migration Response

25 Pa. Code Chapter 78: Reporting Requirements

- Requires mandatory electronic production reporting to DEP.
- New well record and completion reporting requirements submitted by the operator as part of the stimulation record include pump rates, pressure, total volume and list of hydraulic fracturing chemicals used, the volume of water used, and the identification of water sources used pursuant to an approved water management plan.

Hydraulic Fracturing Wastewater Management

- Follow Residual Waste Regulations.
 - Generator, transporter and treatment facility regulatory and record-reporting requirements.
- Annual Well and Waste Production Report
- Chemical characterization of frac waste required.
 - Reporting mechanism: *Form 26R, Chemical Analysis of Residual Waste, Annual Report by the Generator.*

Hydraulic Fracturing Wastewater Management

- TDS strategy
- New and Expanded Sources Only
 - 500 Mg/l TDS
 - 250 Mg/l Chlorides
 - 10 Mg/l Barium and Strontium
- Underground Injection Control Program
 - EPA administers
 - Only 7 Class II UIC disposal wells in PA.

Thank you!

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