

Marcellus Shale Water Management Issues



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Water Management Considerations



- Water withdrawals
- Consumptive use
- Return flows (location and volume)
- Water quality
- Aquatic resources

Which Agencies Regulate Water?



- **Pennsylvania Department of Environmental Protection (DEP)**
 - Registration (>10,000 gpd)
 - Reporting (>100,000 gpd)
 - Water management plans for DEP regions
- **Susquehanna River Basin Commission**
 - Consumptive uses (>20,000 gpd)
 - Withdrawals (>100,000 gpd)
- **Delaware River Basin Commission**
 - Withdrawals (>100,000 gpd)

What is Needed?



- Determine water needs for fracking operations
(3 -10 mg/month)
- Estimate water availability
 - Ground water
 - Surface water
- Identify vulnerable streams, stream segments, and aquifers
- Determine existing water withdrawals and allocations.
- Recommend management strategies

Aquatic Resource Criteria

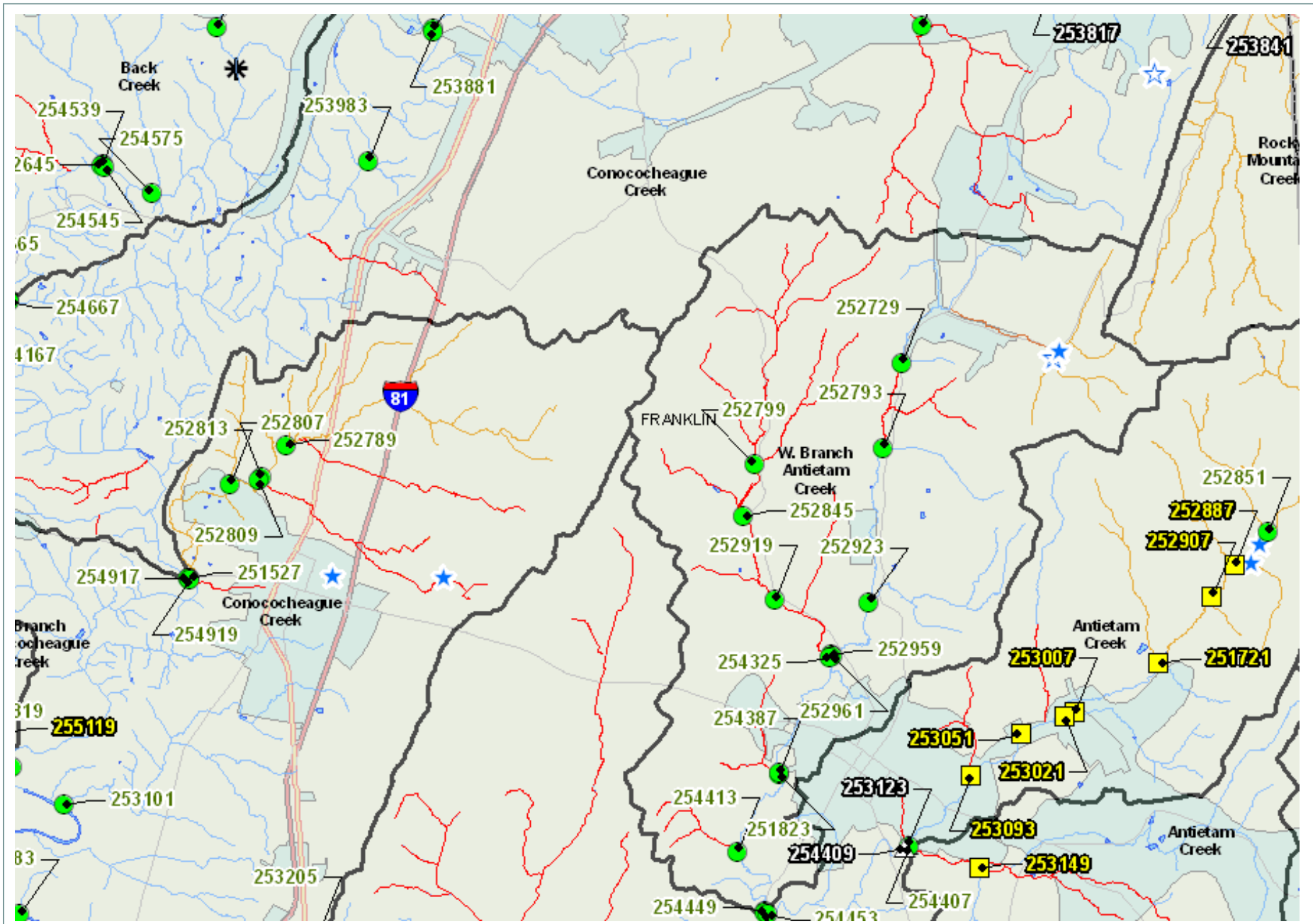


<u>do not result in or exceed:</u>	Surrogate for Initial Screening
Acute dewatering of streams	50% Q7-10
Class A trout streams (carbonate) – 5% mean annual habitat loss	30% Q7-10
Class A trout streams (non carbonate)- 5% mean annual habitat loss	50% Q7-10
Class B trout Streams – 10% mean annual habitat loss, Class C&D – 15% mean annual habitat loss	50% Q7-10

State Water Plan Initial Screening



- USGS developed GIS based tool to evaluate water availability at a “screening level” at pre-selected number of “pour points”.
- Pour Points were located to assess watersheds greater than 10 square miles.
- U.S.G.S. prepared low flow regression equations for Pennsylvania regions.
- Screening tool compares low flow conditions with net withdrawals (withdrawals minus discharges)



A Sample Watershed with Pour Point

A watershed is the surface area of land that drains water into a body of water such as a stream or lake. A pour point may be placed anywhere along a waterbody to define a watershed drainage area to that point.

Sources of

Water Withdrawal

(Water taken from the surface and subsurface)

- Industrial/Commercial
- Public Water Supply
- Electric Generation
- Agriculture
- Mining

Sources of

Water Discharge

(Water being returned to surface)

- Manufacturing Plant
- Sewage Treatment
- Power Plant
- Quarry

Example of a typical pour point defining a stream's watershed

Watershed Flow

Screening Criteria

Positive Indicator represents poor potential for CWPA
Negative Indicator represents good potential for CWPA

Low Stream Flow

+ Discharges

- **withdrawals**

= Screening Indicator

