Brief Review of Water Use Requirements from other States:

Pennsylvania:

From PA Act 13:

Water management.--The following shall apply to water management:

(1) No person may withdraw or use water from water sources within this Commonwealth for the drilling or hydraulic fracture stimulation of any natural gas well completed in an unconventional gas formation, whether on or off of the land where the gas well is located, except in accordance with a water management plan approved by the department.

(2) The department shall review and approve water management plans based upon a determination that the proposed withdrawal, when operated in accordance with the proposed withdrawal operating conditions set forth in the plan, including conditions relating to quantity, withdrawal rate and timing and any passby flow conditions, will:

(i) not adversely affect the quantity or quality of water available to other users of the same water sources;

(ii) protect and maintain the designated and existing uses of water sources;

(iii) not cause adverse impact to water quality in the watershed considered as a whole; and

(iv) include a reuse plan for fluids that will be used to hydraulically fracture wells.

(3) As to criteria:

(i) The criteria under paragraph (2) shall be presumed to be achieved if the proposed water withdrawal has been approved by and is operated in accordance with conditions established by the Susquehanna River Basin Commission, the *Delaware River Basin Commission* or the Great Lakes Commission, as applicable.

(ii) Notwithstanding subparagraph (i), the department may establish additional requirements as necessary to comply with the laws of this Commonwealth.

(4) In addition to the requirements under paragraphs (1), (2) and (3), compliance with a department-approved water management plan shall be a condition of any permit issued under this chapter for the drilling or hydraulic fracture stimulation of any natural gas well completed in an unconventional formation and shall be deemed to satisfy the laws of this Commonwealth.

Setback for well(s)/well pad(s) required based on the water body classification.

Predrilling/Pre-alteration Survey: used to document water quality prior to drilling or alerting a well.

Samples must be collected by 3rd party company/lab.

Report must be submitted within 10 days of receiving laboratory analytical results.

- Location of sampled wells and landowner information.
- Date of survey and name of company/laboratory.
- Sample collection procedures.
- Type and age of water supply/treatment, if known
- Name of proposed well and any other identification information
- Results of laboratory analyses

  *must include documentation of any refusals by land owners surveyed.

Pit/Tank Requirements:

- Must have sufficient capacity to maintain 2 feet of free board at all times

- Must have limited/restricted access.
- Technical details:
  30 mills lining sealed seams flat bottom & smooth sides (2:1)
- Must have plan incase integrity of lining fails.

Delaware River Basin Commission (DRBC): natural Gas development regulations

Is a Federal and inter-state compact for the management and protections of the entire river basin area (Delaware, New Jersey, New York, Pennsylvania and ACOE).

The Commission has determined that all natural gas development projects may have a substantial effect on water resources of the Basin.

Authority of Pact: project review, future control of pollution, and to promote sound watershed management practices.

- Withdrawal requirements to protect/preserve downstream quantity and quality.
- Tracking of water use
- Monitoring of surrounding water features and discharge waters.

Internal sourcing (within basin) vs. Import (external sources- bulk water use)

General Guidelines Points:

- Performs concurrent permit application review as host state and any other agencies.
- Requires tracking from withdrawal point to usage to wastewater phase (treatment/discharge/disposal).
- Bulk water notification = 2,000 ft of well pad and along/adjacent to any pipeline right-of-way
- Withdrawal less than 7Q10; or more stringent guideline.
- Recycled Water should be treated as waste water and will need to be treated before reuse.
  - Additive, Total Dissolved Soilds (TDS), salinity.
- Recovered flowback and production water is exempt from usage fee charges.

Withdrawal site plan:

- Description of site
- Facilities to be installed onsite
- Map indicating the location of all facilities
- Methods of limiting site access
- Metering plan to measure within 5% of actual flow
  - Metering records to be maintained for 10 years and available during inspection.
- Operation plan for metering, recording & reporting withdrawals and pass-by flow.

- Notice of start and completion of construction (10 days and 30 days, respt.)
- Drought contingency plan
- Hydrogeo. Report: required for all groundwater well sources
    - Field procedures, data gathered, analysis of data with potential impacts, geological map, well log, well charts, observation well data (static, pumping, recovery, appropriate calculations, extrapolated data out to 6 months
    - Methods/practices to prevent artificial recharge at wells
    - Weather and stream flow data prior to and throughout test
    - A map with all wells with as complete well information as available.

Colorado Water Use/Management:

It appears that most water used on-site come sources where the water is purchased or leased.

Municipal or land owner agreements.

There are components of a water use plan located in various sections of the rules (protection of groundwater- well casing and cementing; Surface water protections- buffers and setbacks; flow back/recycled water- waste management).

- Rule 317.d requires casing programs to prevent the migration of oil, gas, or water from

one horizon to another.

- Rules 317.e & f require surface casing to reach a depth sufficient to protect all fresh

water and prevent blowouts or uncontrolled flows.

State has recently added to the water sampling/monitoring requirements.

New O/G Permits require at least 4 wells to be sampled at 6 months, 12 month, and between 5-6 years to monitor the groundwater quality. Sampling is to be conducted prior to and after drilling of the well.

Reporting requirements and site planning and construction will change and become stricter the closer an operator proposes work to the water feature in a buffer zone.

All buffer areas require: an emergency plan in case of a spill, water sampling and analysis according to EPA standards and guideline, containment of drilling fluids, use of best management practices

Ohio Water Use/Management:

- abundance of fresh water sources, both from surface and underground supplies
    - Water may be leased from private landowners, purchased from municipal sources and/or withdrawn from Ohio's streams, rivers and lakes.

Withdrawal Registration: Ohio requires registration if a facility has the capacity to withdraw 100,000 gallons per day even if a lower volume is actually withdrawn. Registration under this program is not a permit to withdraw water, nor does registration impose any restrictions on withdrawals. Withdrawal registration requirements pertain to all of Ohio.

Consumptive Use: No facility may have a new or increased consumptive use of more than 2 million gallons of water per day, averaged over any 30-day period (60 million gallons per month), without first obtaining a permit from the Director of the Department of Natural Resources (ORC 1501.33).

Fact Sheet for Ohio water source:
http://www.epa.state.oh.us/Portals/0/general%20pdfs/sources%20of%20water%20for%20hydraulic%20fracturing%20fluids.pdf

Permit Requirements:
Area of review:
(1) The areas circumscribed by circles of one-half-mile radii with their center points at the locations of each input well in which injection of greater than an average volume of two hundred barrels per day per year is proposed;
(2) The areas circumscribed by circles of one-quarter-mile radii with their center points at the locations of each input well in which a maximum injection of an average volume of two hundred barrels per day per year is proposed; and
(3) The areas circumscribed by circles of one-quarter-mile radii with their center points at the locations of each input well in which gas is used as the injected fluid; or
(4) An area approved by the chief for good cause shown.