

The Role of Groundwater Sampling/Monitoring COGCC Proposed Rule 609

University of Colorado Law School
Nov 26, 2012

What is the Purpose of Proposed Rule 609?

- To document baseline groundwater conditions prior to initiation of oil and gas drilling or facility installation activities
- To ensure no impacts to underground sources of drinking water occurred in the near future from these activities

How Can Sampling/Monitoring Be Accomplished?

- Groundwater collection:
 - Domestic wells
 - Springs
 - Monitoring wells (optional)



What will the Sampling Tell Us?

- Baseline conditions in the immediate vicinity of the well/facility site
 - **Will** provide the State and homeowner with sample results
 - **Will** document limited aquifer/domestic well water quality
 - **Will** protect the operator from false claims from homeowners
 - **Will** provide a comfort factor to the homeowner

What will the Sampling Tell Us? (continued)

- **May** minimize adverse impacts to homeowners if mitigation practices are implemented to address:
 - existing (baseline) contamination that is discovered; or
 - subsequent contamination that is detected after drilling/fracing or facility construction is complete
- **May** help with early detection of an adverse impact from drilling operations and thus aid in early implementation of mitigation practices

What will the Sampling Tell Us? (continued)

- **Will not** prevent an adverse impact to an aquifer or homeowner
- **Will not** fully characterize water quality of an aquifer or the potentially impacted zone
- **Will not** address data quality issues that are inherent with domestic wells
- **Is not** fool proof! (i.e., two samples may not be enough to detect existing contamination or any potential contamination caused by the drilling activity/facility)

What Does All This Cost?

- Two GW samples from domestic wells or natural springs:
 - **Analytical costs:**
 - Approx. \$600/sample (basic analytes)
 - Approx. \$500/sample for gas compositional analysis and stable isotope analysis **if** methane detected in the initial basic analytes).
 - Total analytical cost: \$1,200 - \$2,200
 - **Sampling labor/ODCs:** approx. \$1,500 – 2,000
 - **Total Cost:** \$2,700 - \$4,200 per well/facility
 - **Time:** 1 day

Note: significant implementation cost (1600 wells/\$4.8M+)



Issues and Concerns

- Two GW samples may not be enough
 - Operator option: typical investigations include at least one upgradient and two downgradient sample locations
- Proximity to the project site (side gradient is not preferred)
- Proposed rule requires sampling of GW within a half mile radius of the well/facility site (i.e., well head). Operator option: additional sampling along the well lateral which could be as much as 7,000 feet; will increase sampling activity/cost

Issues and Concerns (continued)

- Access agreements with landowners
- Liability insurance
- Access to the well
 - Pumps, wires, tubing
- Sampling methods
 - Sample drawn from tap
 - Sample drawn from well (EPA preferred method)
- Potential damage to well from sampling process: indemnification, waivers

Issues and Concerns (continued)

- Questionable data due to unknowns associated with existing wells:
 - Well Records
 - Aquifer in which the well is drawing from
 - Zone of influence
 - Well integrity
 - Well use (private, commercial, drinking, irrigation)
 - Historical water quality
 - Tampering

Note: this is a critical issue that should be considered during rulemaking and at least addressed during sampling planning stages



How Can an Operator Deal With The Issues and Concerns?

- Collect additional samples (operator option)
 - All wells or a percentage of wells within the half mile radius from the project site
- Utilize wells that are upgradient or downgradient of the project site
 - Could install monitoring wells (operator option)
- Extend radius of concern to include the lateral
- Obtain access agreements with landowners in advance
- Apply for “**exception**” if satisfactory locations are not available or homeowners decline access

How Can an Operator Deal With The Issues and Concerns? (cont.)

- Make sure consultants (performing the sampling) have sufficient liability insurance
- Well inspections prior to sampling
- Discuss preferred sampling methods with Fed/State agencies
- Perform record searches with State agencies
- Homeowner questionnaire to document well construction details (depth, screen level, installation materials, seals, etc.)

Monitoring Wells (optional)

- Not required
- In some cases, operators may want to consider installing monitoring wells
 - Drill/install/develop/sample standard monitoring wells:
 - 2 shallow wells (<25 ft): \$13K - \$15K
 - 2 intermediate wells (\approx 100 ft): \$30K - \$40K
 - 2 deep wells (\approx 300 ft): \$80K - \$100K

Questions?

Gene Florentino, PG

gflorentino@ene.com

716-684-8060

Walsh Environmental Scientists and Engineers

303-443-3282