

CO₂ MONITORING, VERIFICATION AND ACCOUNTING (MVA)

Buchanan County CO₂ Injection into Unmineable Coal Seams with Enhanced Coalbed Methane Recovery

WHY MONITOR FOR CO₂?

To ensure and verify that geologic storage of CO₂ is safe and effective

Benefits of monitoring:

- Protection of the surrounding atmosphere, soil, potable groundwater and other surface and subsurface ecosystems
- The safety of project workers and the public

Goals of MVA:

- Improve understanding of storage processes and confirm their effectiveness
- Evaluate interactions of CO₂ with solids and fluids in the formation
- Assess environmental, safety, and health impacts should the CO₂ migrate
- Evaluate and monitor measures should a containment issue occur
- Provide a basis for assisting in legal issues should they occur

HOW DO YOU MONITOR FOR CO₂?

Atmospheric monitoring, including:

- CO₂ detectors
- Laser systems
- Tracers (isotopes)

Near-surface monitoring, including:

- Ecosystem stress monitoring
- Tracers
- Groundwater monitoring
- Thermal hyperspectral imaging
- Tiltmeters

Subsurface monitoring, including:

- Multi-component 3-D surface seismic time-lapse survey
- Vertical seismic profile
- Electromagnetic induction tomography (EMIT)
- Gamma ray logging

MVA OVER THE LIFE OF THE PROJECT

Pre-injection:

- Design MVA plan
- Begin monitoring to establish baselines for CO₂ in soil, water, atmosphere

Injection:

- Monitor closely during the duration of the injection (1 year), to ensure well-head integrity, health and safety

Post-injection:

- Monitor during project closure
- Ongoing monitoring after project closure, to ensure long-term project effectiveness