

Natural Releases of CO₂ Workshop

CO₂ Sequestration – What have we learned so far?

Big Sky Region Regulatory Approaches to CCS

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Big Sky Carbon Sequestration Partnership



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North America and CCS

- Canada things are progressing
 - Federal and Provincial legislation
 - Well funded pilots
 - Federally and Provincially
- US Mid-term elections
 - Legislation is not eminent and getting less likely by the day...even California!
- EPA regulating GHG (many in new congress want to prohibit this).
- EPA adopting new Class 6 well program
- IOGC providing guidance for CO₂ transport
- DOE Carbon Partnerships play an important role in decision making process



Regulatory Roadblocks to CCS

Pore Space Ownership



Liability



Pipelines



Property Law: Key Issues

- Who should own CO₂ storage spaces?
- Who should own the injected CO₂?
- What if pore space ownership varies across borders and reservoirs extend across borders?
- Should unitization or pooling be used for large reservoirs with multiple pore space owners?

State Primacy for the UIC Program

States can elect to accept primacy for the Underground Injection Control (UIC) Program of the Safe Drinking Water Act (SDWA).

Montana's adoption of new CCS statutory authority is predicated on assumption of primacy from EPA and the statute is moot until such time that EPA grants primacy.

WY, ND, ID, and WA currently have primacy over the UIC program

Requirements	Wyoming	Montana	North Dakota	Washington
UIC Primacy	Yes	No	Yes	Yes
Pore Space Owner	Surface Owner	Surface Owner	Surface Owner	State/SO
Split Estate w/ Minerals	Mineral Estate Dominant – no injection in structures with HC	Equal Standing	Equal Standing	Equal Standing
Regulating Agency	DEQ/WOGCC	MBOG/DEQ	Industrial Commission/Health Department	WDOE
Unitization Requirement	75%	60%	60%	Not Defined
Fee Structure	Application Fee	/T charge TBD	/T charge TBD	Application Fee
Financial Responsibility	Liability Policy, Surety Bond TBD	Surety Bond TBD	Surety Bond TBD	Financial Assurance Mechanism
Release of Liability to third party	NA	30	10	Determined post-closure and does not terminate with permit termination
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Area of Review beyond predicted plume size	1 Mile	½ Mile	¼ Mile	10 Miles
Separate Process for Research Wells	Yes	No	Yes	Yes



Pore Space Ownership

Many states that harbor significant subsurface mineral and/or oil and gas deposits create a “split estate” that separates the surface estate from the mineral estate.

Within the subsurface there are pore spaces or voids that are not occupied by minerals or oil and gas and these spaces are statutorily assigned to the surface owner in WY, MT and ND independent of the mineral estate.

WA does not define nor establish ownership of the pore space specifically but can be determined through county regulations or ground water issues.

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Dominance of Subsurface Ownership

Wyoming established dominance of the mineral estate over the pore space ownership. Geologic storage in the pore space is prohibited without the consent of the mineral estate owner. Geologic storage is prohibited in formations that contain commercial quantities of hydrocarbons. This does not apply to EOR operations.

The other states all give equal standing to the mineral estate and the pore space owner and require that neither approach can interfere with the other.

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Regulatory Agency

For Wyoming and Montana, primary responsibility for geologic sequestration rests with the state environmental agency and the oil and gas agency. However, the environmental agency has a consultative role in MT and the oil and gas agency a consultative role in WY. ND has an arrangement similar to MT.

The Washington Department of Ecology has sole responsibility for CCS activities in that state.

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Unitization of Pore Space

During geologic sequestration, the plume may extend across several surface owners. To facilitate cooperation among surface owners, the storage reservoir can be “unitized” to establish volumes occupied for each surface owner for pricing purposes and to require some surface owners to cooperate with the injection even though they may object to the project. As noted in the table, each state (except WA) has determined that a majority (60-75%) of affected surface owners agreeing to the occupancy of the pore space will require adjoining affected landowners to cooperate as well. This approach is similar to eminent domain.

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Fee Structure

To protect the public from an operator that does not properly operate the site or abandons the site prior to closure, states have imposed a fee structure that places funds in a dedicated account to reimburse the state should the government have to assume responsibility for the site. This is done through application fees and annual operating fees, and through a per ton charge levied on each ton of CO₂ placed in the reservoir (MT and ND). The fees can also be used to administer the program and to monitor operations.

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Financial Responsibility

Operators of geologic sequestration sites are required to maintain financial responsibility for the site, including any mitigation of leaks, contamination of ground water, etc, for the life of the injection and for a varying period of time post-closure of the site. All states accept a surety bond in an amount determined by the regulatory agency and Washington allows for other financial assurance instruments including letters of credit, cash, and liability insurance policies.

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CO2 Purity

MT and ND require the injection stream to be of sufficient purity that it does not compromise the ability of the reservoir to store the injected CO2.

Wyoming allows the injected stream to contain CO2 and “constituents.”

Washington does not allow any constituents in the stream for which there is a technology available for removing the constituent from the injection stream.

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Area of Review

Once the areal extent of the storage reservoir has been determined, states vary in the additional area that must be characterized for abandoned wells, faults, active wells, etc (1/4 to 10 miles). These requirements also include notification of surface owners and mineral rights owners.

Proposed UIC regulations may usurp state requirements since the area of review must include the plume and associated pressure front. State requirements can be more strict but not less strict than federal regulations.

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Financial Responsibility	Liability Policy, Surety Bond TBD	Surety Bond TBD	Surety Bond TBD	Financial Assurance Mechanism
Release of Liability to third party	10	15	10	Determined post-closure and does not terminate with permit termination
Other constituents allowed in injection stream	Yes	Yes	Yes	No
Area of Review beyond predicted plume size	1 Mile	½ Mile	¼ Mile	10 Miles
Separate Process for Research Wells	Yes	No	Yes	Yes



Expected Regulatory Activities

Activity	OR	ID	WY	MT	ND	SD	WA
Emissions Reporting*	Y	Y	Y	Y	Y	N	Y
CO2 Pipelines	N	Y	Y	N	Y	Y	N
Financial Assurance	N	N	Y	Y	Y	N	N
Liability	N	N	Y	Y	Y	N	N
Indemnification**	N	N	Y	Y	Y	N	N
Reservoir Fluid Displacement	N	N	Y	N	N	N	Y

* Regulatory responses to draft EPA rules governing emissions for EOR and CCS

** Regulatory responses to Congressional action



Questions, Comments and Discussion

