Approved: March 9, 2011
Date

MINUTES OF THE HOUSE ENERGY AND UTILITIES COMMITTEE

The meeting was called to order by Vice Chair Forrest Knox at 9:00 A.M. on February 11, 2011, in Room 785 of the Docking State Office Building.

All members were present except:
Representative Phil Hermanson-excused
Representative Tom Sloan-excused

Committee staff present:
Matt Sterling, Office of the Revisor of Statutes
Corey Carnahan, Kansas Legislative Research Department
Renae Hansen, Committee Assistant

Conferees Appearing Before the Committee:
Tom Day-KCC
John McCannon-KCC
Eric Nordling, SW Kansas Royalty Owners

Others Attending:
Twenty-three including the attached list.

Hearing on:
HB 2164-Concerning Property: relating to ownership of pore space.

Matt Sterling, Office of the Revisor of Statutes, (Attachment 1) gave an explanation to the committee on **HB 2164**.

Questions were asked and comments made by Representatives: Don Schroeder, and Don Hineman.

Proponents:

Tom Day, KCC, gave an introduction of the KCC presenter.

John McCannon, KCC, (Attachment 2) offered testimony in support of **HB 2164**. Mr. McCannon gave the committee some definitions of pore space and specifically the way that Kansas has not yet defined that terminology.

Questions were asked and comments made by Representative Annie Kuether.

Neutral:

Erick Nordling, SW Kansas Royalty Owners, (Attachment 3) spoke about **HB 2164** from a neutral standpoint. He spent time explaining legally what the owner of land owns, "from the heavens to the depths". Included with his testimony is a number of attachments:

- Department of Transportation, Michigan v. Michael Goike et al. (Attachment 4)
- James Ellis and Wand Lou Ellis v. Arkansas Louisiana Gas Company (Attachment 5)
- Article on Carbon capture and storage in South Dakota, South Dakota Law Review (Attachment 6)
- Article on Land & Water Law Division: Geologic CO2 sequestration: Who owns the pore space (Attachment 7)
- West Wyoming Statutes annotated, (Attachment 8)
- West's North Dakota Century Code Annotated, (Attachment 9)

Questions were asked and comments made by Representatives: Annie Kuether, Vern Swanson, Carl Holmes, Forrest Knox, and Stephen Alford.

The minutes of the House Energy and Utilities Committee at 9:00 A.M. on February 11, 2011, in Room 785 of the Docking State Office Building.

Representative Carl Holmes spent time explaining the genesis of **HB 2164** and why it is necessary to give a definition of pore space to the State of Kansas. He also explained some key points of the bill.

Mr. Doug Lewis, KCC , and Rex Buchanon, Kansas Geological Survey, helped answer questions brought forth by the committee. Mr. Buchanon helped explain some of the recent projects that dealt with pore space.

The hearing on was closed on **HB 2164.**

Other information was passed to committee that had been asked for in previous meetings:

- KCC, information regarding the purpose of the Kansas Broadband Advisory Task Force, (Attachment 10)
- KSA 79-34, 160-164 explanation, (Attachment 11)
- Kansas Qualified Agricultural Ethyl Alcohol Production Incentive Payments for 1988 – present, (Attachment 12)

The next meeting is scheduled for February 15, 2011.

The meeting was adjourned at 10:00 A.M.

HOUSE ENERGY AND UTILITIES COMMITTEE
GUEST LIST

DATE: February 11, 2011

NAME	REPRESENTING
Lon Stanton	Northern Natural Gas
[illegible]	KCC
John McCannon	KCC
Tom Day	KCC
Larry Berg	Midwest Energy
[illegible]	KCC
Derek Mein	Mein Law Mein
Ken Peterson	KS Petroleum Council
Tom Tunnell	KS Assn of Ethanol Processors
David Rouner	Kearney & Assoc.
Scott Jones	KCPL
Doug Smith	SW KS Royalty Owners Association
Erick Nordling	" "
[illegible]	KEC
Mary Jane Stankiewicz	KS Assoc. of Ethanol Processors
Shari Albrecht	KDHE
Carol McDowell	Tallgrass Ranchers
[illegible]	GPA
[illegible]	Gaches Braden

HOUSE ENERGY AND UTILITIES COMMITTEE
GUEST LIST

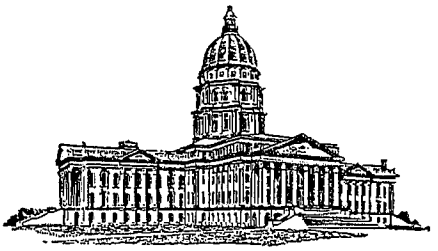
DATE: February 11, 2011

NAME	REPRESENTING
John Peterson	Capitol Strategies
	Bottled Water Assn

MARY ANN TORRENCE, ATTORNEY
REVISOR OF STATUTES

JAMES A. WILSON III, ATTORNEY
FIRST ASSISTANT REVISOR

GORDON L. SELF, ATTORNEY
FIRST ASSISTANT REVISOR



OFFICE OF REVISOR OF STATUTES
KANSAS LEGISLATURE

Legal Consultation—
Legislative Committees and Legislators
Legislative Bill Drafting
Legislative Committee Staff
Secretary—
Legislative Coordinating Council
Kansas Commission on
Interstate Cooperation
Kansas Statutes Annotated
Editing and Publication
Legislative Information System

MEMORANDUM

To: Chairman Holmes and members of the House Energy and Utilities Committee

From: Matt Sterling, Assistant Revisor of Statutes

Date: February 11, 2011

Subject: House Bill 2164

HB 2164 concerns property and the ownership of pore space. The bill defines "pore space" as "a cavity or void, whether natural or artificially created, in a subsurface sedimentary stratum." A subsurface sedimentary stratum is an underground bed or layer of accumulated mineral and organic fragments that have roughly the same composition throughout.

The bill provides that title to pore space in all strata underlying the surface of lands and waters would be vested in the owner of the mineral rights. Any conveyance of title to the mineral rights or interest would also convey title to the pore space in all strata underlying the surface of the property. The bill would bind title to the pore space to the title of the mineral rights and any conveyance that attempted to sever title to pore space from title to the mineral rights would be void. However, the bill would not prohibit the leasing of pore space.

300 SW TENTH AVE - STE 010-E, Statehouse—TOPEKA, KA
PHONE (785) 296-2321 FAX (785) 296-6668 E-mail: Re

HOUSE ENERGY AND UTILITIES
DATE: 2/11/2011
ATTACHMENT 1

Commission Staff supports defining pore space and pore space ownership. During the process of adopting regulations for carbon dioxide sequestration, the question of pore space ownership kept coming up. We found that ownership of pore space was not specifically defined either by Statute or the courts. We recognized that defining pore space ownership would be essential for any party to start a carbon dioxide sequestration project.

Wyoming defined pore space and pore space ownership in 2008. Wyoming Statute 34-1-152(d) defines pore space as "subsurface space which can be used as storage space for carbon dioxide or other substances". HB 2164 defines pore space as "a cavity or void, whether natural or artificially created, in a subsurface sedimentary stratum".

By defining pore space in such a broad manner, Staff is concerned that it might unintentionally include, horizontal boring under roads, irrigation wells and excavations for septic tanks, swimming pools and basements. We also were concerned about how the definition might affect leasing for saltwater disposal rights. Staff doesn't have expertise in leasing disposal rights, but would be interested in the opinions of those who do.

Staff wonders why sedimentary stratum is specifically included in the definition but metamorphic and igneous stratum are not included. Practically speaking, sedimentary stratum contains the vest majority of pore space, but with the development of new technology the other two major rock types could also be used for storage.

Staff did not understand the term "water" in line eight. What waters are being referred to, as there are both surface and subsurface water.

Finally at the end of line 16, Staff questions whether "surface estate" should be "mineral estate".

HOUSE ENERGY AND UTILITIES

DATE: 2/11/2011

ATTACHMENT 2

SWKROA

SOUTHWEST KANSAS ROYALTY OWNERS ASSOCIATION

209 East Sixth Street
Hugoton, Kansas 67951

Telephone: 620-544-4333
Email: erickn@swkroa.com
erick.nordling@nordlinglaw.com

Testimony before the House Committee on Energy and Utilities
HB 2164 – an act relating to ownership of pore space

February 11, 2011

Chairman Holmes and Members of the Committee:

My name is Erick Nordling. I would like to submit written testimony on behalf of SWKROA in regard to HB 2164. I am from Hugoton and serve as the Executive Secretary of SWKROA. I also am an attorney with the law firm of Kramer, Nordling, and Nordling, LLC. In my law practice, and as Secretary for the Association, I regularly advise mineral and royalty interest owners, as well as surface owners and farm tenants, with regard to issues relating to access on their lands for oil and gas operations and from damages resulting from such access and use of the land for oil and gas operations.

HB 2164 is an interesting bill, which presents somewhat of a dilemma for the membership of our Association. As you know, our organization represents the interests of mineral and royalty owners, but we also have a number of our members who own surface interests too. We understand this bill is designed to target the ownership of pore spaces as it relates the injection and sequestration of carbon dioxide. At first blush, HB 2164 appears to favor mineral owners by declaring that they own the pore spaces under the surface where their mineral interests lie. Although we believe that it would be good policy for the Kansas Legislature to address the ownership of pore spaces, we are concerned that HB 2164 changes the common law of Kansas and may trigger claims of inverse condemnation and constitutional challenges. Also, as HB 2164 paints with a broad brush there may be some unintended consequences as the bill is presently drafted.

The mineral estate in Kansas, like many other states, is dominant over the surface estate such that the owner of the oil, gas and other minerals is allowed to use as much of the surface estate as is necessary to explore for and develop the minerals, subject to reasonable accommodations to the surface owner for the mineral owner's use of the surface. The oil and gas lease is the key document in which the mineral owner can grants an oil and gas company the rights to explore for, drill, and extract oil and gas. In return for the mineral owner (as Lessor) granting the oil and gas company (as Lessee) the exploration and production rights, the Lessee pays the Lessor royalty for gas and oil which is produced and sold from the leased property.

Many oil and gas leases also give the Lessee the right to dispose of salt water produced from the wells located on the leased premises, in to subsurface strata. Also, most leases would

permit an operator to inject water, carbon dioxide, or other fluids into the producing formation as a part of enhanced or secondary recovery operations to maximize production from the gas and oil deposits.

Interestingly, in Kansas, if an oil and gas company has a lot of produced water from several wells, they can enter into a salt water disposal agreement with some surface owner to drill a new well or utilize an old wellbore, for the disposal of salt water in a subsurface zone. The Kansas Corporation Commission has rules and regulations governing the injection and disposal of salt water, and for injection of fluids for enhanced recovery operations. HB 2164 would likely reverse this long standing practice.

Jurisdictions which have reviewed the issue of whose permission must be obtained for the storage of natural gas in underground storage reservoirs in which the 'native' gas and oil have been extracted, have concluded that the injector must obtain permission from the owner of the surface estate. This has also been the case in Kansas. HB 2164 could also affect this long standing practice.

Other states which have addressed this issue have concluded that it is the surface owner who owns the pore spaces. As part of their legislative declaration, Wyoming and North Dakota state that their legislation would not alter the common law of the state. HB 2164, appears to be patterned, almost verbatim, from North Dakota's 2009 legislation (*North Dakota Century Code Annotated, Section 47-31-01 through 47-31-08*), **except** that the North Dakota Legislature declared that the pore spaces were owned by the **"owner of the overlying surface estate."** HB 2164, also glaringly leaves off the North Dakota provision (NDCC 47-31-08) which declared that their legislation **"does not change or alter the common law as of April 9, 2009, as it relates to the rights belonging to, or the dominance of, the mineral estate."**

Wyoming's statute (W.S. 1977 Section 34-1-152) appears to be a more balance approach to the ownership of pore space issue. Wyoming also declares that, **"the ownership of all pore space in all strata below the surface lands and waters of this state is declared to be vested in the several owners of the surface above the strata."**

(Copies of the North Dakota statute are being delivered to the Committee Secretary, as well as an electronic version.)

To our knowledge, we believe that no state has declared the mineral owner to be the owner of the pore spaces. HB 2164 would alter the common law of Kansas.

Professor Owen L. Anderson, in his article, *Geologic CO[2] Sequestration: Who Owns the Pore Space?, 9 WYO. L. Rev. 97 (2009)*, examines the ownership of pore spaces in context of

CO_2 sequestration states, "that under the common-law maxim, *cujus est solum, ejus est usque ad et ad inferos*, a fee-simple owner of land owns the entire tract "from the heavens to the depths." Thus, a fee-simple owner owns the subterranean pore spaces. The question of pore-space ownership arises when the fee-simple interest is severed into a mineral estate and a surface estate. As between the surface owner and mineral owner, most jurisdictions, including Texas, have not specifically determined the ownership of subterranean pore spaces." He further submits that most likely the 'owner' of the pore space is the surface owner.

Professor Anderson states that the mineral owner has the right to *use* the pore space to extract the oil and gas reserves. ("Accordingly, even though the surface owner may own the pore spaces, the mineral owner has broad rights to penetrate or otherwise use them in connection with mineral exploration and exploitation. Indeed, commercial deposits of oil and gas occupy pore spaces within geologic traps. Thus, the mineral owner may be able to enjoin CO_2 sequestration that prevents, greatly hinders, or endangers the capture of oil and gas.")

There is also a good law review article by South Dakota law student, Blayne N. Grave, entitled, *Carbon Capture and Storage in South Dakota: The need for a clear designation of Pore Space Ownership, 55 S.D. L. Rev. 72 (2010),* for your review. Mr. Grave concludes that, "...Pore space ownership is a critical piece of the puzzle. Because of the lack of case law in the jurisdiction regarding pore space is likely the best way to achieve clarity on the issue. Most commentators and the states surrounding South Dakota that have addressed the issue are in favor of the surface estate owning the pore space."

(Copies of the articles by Professor Anderson and Blayne N. Grave are being delivered to the Committee Secretary, as well as an electronic version.)

A couple of other cases are available through the Committee Secretary, including: (a) *Ellis v. Ark. La. Gas Co., 450 F. Supp. 412 (E.D. Okla. 1978)*, at (422) (observing that if "it was the mineral interest owner and not the surface owner who had power to grant storage rights, it would typically mean that hundreds of severed mineral interest owners would have to be contacted if those rights were to be obtained privately." And (b) *Dept. of Transportation v. Goike, 220 Mich. App. 614 (1996)* (A cased dealing with the issue of "once the fluid minerals and gas have been extracted from the property, does the resulting underground storage space that held those fluid minerals and gas belong to the surface owner or to the owner of the mineral rights." The Court concluded in favor of the surface owner.)

Although it may look attractive for the mineral owner to be declared the owner of the pore spaces, it may actually create a bigger burden to obtain permission from all mineral owners, than it would to obtain permission from surface owners since so many mineral interests have been severed from the surface estate and have become very fractionated over time.

As stated above, SWKROA believes it to be a good idea to declare the ownership of the pore spaces, but for the reasons stated above, urges that the surface owner should be declared as the owner of the pore spaces. The Wyoming approach seems to be one which you could consider.

Thank you, for your consideration of our remarks.

Respectfully submitted,

Erick E. Nordling
Executive Secretary, SWKROA

ErickTestimony.2011 02 01.Pore Space HB2164

LEXSEE

DEPARTMENT OF TRANSPORTATION, Plaintiff-Appellee, v MICHAEL GOIKE, MARJORIE GOIKE, PAUL C. STEWART, and CAROLEE STEWART, Defendants-Appellants.

No. 176456

COURT OF APPEALS OF MICHIGAN

220 Mich. App. 614; 560 N.W.2d 365; 1996 Mich. App. LEXIS 436; 136 Oil & Gas Rep. 591

July 18, 1996, Submitted
December 27, 1996, Decided

PRIOR HISTORY: [***1] Macomb County. LC No. 90-000154.

DISPOSITION: Affirmed.

COUNSEL: Frank J. Kelley, Attorney General, Thomas L. Casey, Solicitor General, Marc G. Whitefield, Assistant Attorney General, for the plaintiff.

Eric G. Flinn, for the defendant. Sterling Heights.

JUDGES: Before: Sawyer, P.J., and Bandstra and M.J. Talbot, * JJ

* Circuit judge, sitting on the Court of Appeals by assignment.

OPINION BY: David H. Sawyer

OPINION

[*615] [**365] SAWYER, P.J.

Defendants appeal from a judgment of the circuit court in favor of plaintiff in this mineral rights dispute. We affirm.

Defendants are the former owners of certain real property located in Washington Township in Macomb County. Plaintiff acquired the property in order to improve Highway M-53 and was granted title in fee simple. However, it is undisputed that, pursuant to MCL 231.53; MSA 8.265(3), defendants retained the "fluid mineral and gas rights" in the property.

The issue on appeal is, once the fluid minerals and gas have been extracted from the property, does the resulting underground storage space that held those fluid minerals and gas belong to the surface owner or to the owner of the mineral rights. We agree with the [*616] trial court that the storage space, [***2] once it has been evacuated of the minerals and gas, belongs to the surface owner.

Section 3 of the Uniform Condemnation Procedures Act, *MCL 213.53*; MSA 8.265(3), provides that fluid mineral and gas rights are considered excluded when a government agency acquires an interest in [**366] land unless the instrument granting the land to the agency specifically includes those rights. It is undisputed that defendants retained the fluid mineral and gas rights when plaintiff acquired the property for the highway improvement project. At issue is whether the storage space is part of the mineral and gas rights. We conclude that it is not.

The statute does not define "fluid mineral and gas rights." Accordingly, we are to give the phrase its plain

and ordinary meaning. *Great Lakes Sales, Inc v State Tax Comm, 194 Mich. App. 271; 486 N.W.2d 367 (1992).* Black's Law Dictionary (6th ed), p 995, defines "mineral right" as "an interest in minerals in land, with or without ownership of the surface of the land. A right to take minerals or a right to receive a royalty." Therefore, a mineral right is a right to the minerals themselves, not to the land surrounding the minerals. That is, defendants retained only [***3] a right to the fluid minerals and gas themselves.

This is consistent with the decisions in other states. In *United States v 43.42 Acres of Land, 520 F. Supp. 1042 (WD La, 1981)*, the court considered the rights to profits from the storage of oil in caverns created from the mining of salt. The court concluded that the mineral owner possesses no ownership interest in the subsurface strata containing the spaces where the minerals were found. *Id. at 1046.* Similarly, in *Southern* [*617] *Natural Gas Co v Sutton, 406 So. 2d 669, 671 (La App, 1991)*, the court held that surface ownership includes the right to use the reservoir underlying the surface for storage purposes.

In *Emeny v United States, 188 Ct. Cl. 1024, 412 F.2d 1319 (Ct Cl, 1969)*, the defendant had obtained the gas rights to the plaintiffs' property. The land contained an underground dome that, in its natural state, had contained a deposit of natural gas. The defendant was using the dome for the storage of helium gas. The court concluded that the defendant had only the right to explore for and extract the minerals for which it had rights and that the plaintiffs retained all other rights, including the use of underground [***4] structures for use to store "foreign" or "extraneous" gas produced elsewhere. *Id. at 1323.*

In *Ellis v Arkansas Louisiana Gas Co, 450 F. Supp. 412 (ED Okla, 1978)*, aff'd *609 F.2d 436 (CA 10, 1979)*, the court noted that although the English and Canadian rule is that the owner of the mineral rights retains an interest in the cavern that remains after the extraction of underground minerals, the American view is that the cavern is owned by the surface owners.

Accordingly, we conclude that a surface owner possesses the right to the storage space created after the evacuation of underground minerals or gas. [1] While defendants may, of course, "store" any fluid minerals or gas native to the chamber that has not yet been extracted, they cannot introduce any foreign or extraneous [*618] minerals or gas into the chamber. Only the surface owner, in this case plaintiff, possesses the right to use the cavern for storage of foreign minerals or gas, and then only after defendants have extracted the native gas from the cavern.

1 Plaintiff acknowledges that, as long as native fluid minerals or gas remain, it could not inject its own foreign minerals or gas into the chamber because it would be impossible to segregate plaintiff's gas from defendants' gas.

[***5] Affirmed. Plaintiff may tax costs.

/s/ David H. Sawyer

/s/ Richard A. Bandstra

/s/ Michael J. Talbot

JAMES C. ELLIS and WANDA LOU ELLIS, his wife, Plaintiffs v. Arkansas Louisiana Gas Company, Defendant

Civil No. 76-211

UNITED STATES DISTRICT COURT FOR THE EASTERN DISTRICT OF OKLAHOMA

450 F. Supp. 412; 1978 U.S. Dist. LEXIS 18650; 61 Oil & Gas Rep. 368

March 31, 1978

COUNSEL: [**1] Charles B. Grethen, Purcell, Oklahoma, for Plaintiff.

William D. Curlee, Oklahoma City, Oklahoma, for Defendant.

JUDGES: Morris, United States District Judge.

OPINION BY: MORRIS

OPINION

[*414] MEMORANDUM OPINION

Morris, United States District Judge

The principal question in this case has not been decided in Oklahoma and remains undecided in the overwhelming majority of jurisdictions in the United States. The question is: when the oil, gas and other minerals have been severed by conveyance from the fee simple estate in a tract of land, and subsequent to severance natural gas is injected in and under that tract of land as a part of an underground gas storage reservoir, from whom must the injector secure permission to store natural gas?

Plaintiffs, James C. Ellis and Wanda Lou Ellis, his wife, are the surface owners of approximately 78 acres of land in Pontotoc County, Oklahoma. They seek to recover damages and injunctive relief for the unauthorized use by defendant of an underground strata of plaintiffs' land for the storage of natural gas. Plaintiffs also seek damages for the unauthorized use of an injection well located on plaintiffs' land and claim that an easement given by [**2] plaintiffs to defendant which grants defendant the right to operate a gas injection well on plaintiffs' land should be rescinded for lack of consideration. Mr. Ellis will sometimes be referred to herein as plaintiff.

The defendant denies any liability to plaintiffs, claims it has the right to inject gas by virtue of certain oil and gas leases, gas storage leases and the gas injection easement granted to defendant by plaintiffs. Defendant further claims that plaintiffs' action is barred by the doctrine of prescription.

The case was tried to the court without a jury. At trial neither side introduced into evidence the instruments which effected the severance of the oil, gas and other minerals from the surface and because the court viewed the record as incomplete without such instruments, the court invited counsel to submit them for the court's consideration and to make them part of the record. By stipulation filed on November 22, 1977, counsel so stipulated.

Plaintiffs acquired the surface of approximately 76 acres of the land in question in 1963, referred to in this

action as Tract I; they acquired the surface of approximately 2-1/2 acres of the land in question in 1972, referred [**3] to in this action as Tract II (Tr. 5 and 19). The surface of Tract I had been severed from the oil, gas and other minerals in 1939 in a deed from O. W. Skirvin to Eunice Davidson which reserved to Skirvin all of the oil, gas and other minerals (Stipulation filed November 22, 1977). Eunice Davidson conveyed the surface of Tract I to her son, Glen D. Davidson, in December of 1962 or January 1963 (Tr. 117) and shortly thereafter in 1963 Davidson conveyed the surface of Tract I to plaintiffs (Tr. 5 and 120).

The surface of Tract II was severed from the oil, gas and other minerals in a series of deeds commencing in 1921 with a complete severance of all oil, gas and other minerals from the surface being effected on July 16, 1945. Plaintiffs have always been surface owners only; they have never been the owners of the oil, gas and other minerals in and under Tracts I and II (Stipulation filed November 22, 1977).

In 1928 the predecessor in title of defendant secured gas leases from the then owners of Tracts I and II. These leases did grant, lease, let and demise unto the lessee for "the *sole* and *only purpose of mining* [*415] *and operating for gas* and laying pipe lines, building [**4] tanks, towers, stations and structures thereon, to *produce, save* and take care of said products" on land embraced in Tracts I and II (Emphasis added). Each of the two leases was for a flat term of 50 years, during which 50 year term the lessee was to have "the sole and exclusive right to *prospect* for and *produce*, use and market gas, including the natural gasoline . . ." (Emphasis added). The leases further provided that the consideration paid at the time of lease execution by the lessee to the lessor relieved the lessee of any "obligation to *develop* said lands for gas or pay any rental or royalty on the production thereof, and that no *implied obligation for development* shall apply to this lease as to offset wells or otherwise, and the amount and extent of *exploration* and *development* of said lands shall be optional with lessee only." (Emphasis added). The leases further provided that "failure to develop said lands or any part thereof shall not be construed as an abandonment of the whole or part of the land." (Defendant's Exhibits 1 and 2).

In 1939 the first mineral severance occurred. The deed effecting the severance of the minerals from the surface in [**5] Tract I provided in part as follows:

> It is especially understood and agreed by the parties hereto that ALL interest in and to all of the oil, petroleum, gas, coal, asphalt and all other minerals of every kind or character in and under, and that may be *produced* from the above described land, is hereby reserved by party of the first part, together with the *right of ingress and egress at all times for the purpose of mining, drilling and exploring* said lands for said minerals and removing the same therefrom, and with the rights of way, easement and servitudes for pipe lines, telephone and telegraph lines, for tanks, power houses, stations, gasoline plants and fixtures for *producing*, treating and caring for such products, and housing and boarding employees, and all other rights and privileges necessary, incident to, or convenient for the economical operation of the said land for the *production of said minerals*, . . . (Emphasis added).

Exhibit A to Stipulation filed November 22, 1977.

Three deeds effected the severance of the minerals from the surface of Tract II, the last one being executed in 1945. These three deeds provided in part as follows:

> 1. [**6] WITNESSETH: That said parties of the first part in consideration of the sum of One Dollars, ($1.00) and other valuable consideration, the receipt of which is hereby acknowledged, do by these presents grant, bargain, sell and convey unto the said party of the second part, his heirs and assigns, an undivided one-half interest in and to all oil, gas and all other mineral substances in and under the hereinafter described land and the right to *extract and market the same*, together with *all right of ingress and egress*, at all times, *for the purpose of prospecting* for said oil, gas or minerals, including, the right to occupy and use so much of the surface of said land as may reasonably be necessary to carry on the work of *extracting, mining, piping*, . . . (Emphasis

added).

Exhibit B to Stipulation filed November 22, 1977.

> 2. EXCEPT Grantor does hereby except from this grant and reserves unto himself, his heirs, executors, administrators, and assigns, an undivided one-fourth (1/4th) interest in and to all of the oil, gas and other minerals, in and under the surface of all the above described lands . .. together with the free right of ingress and egress thereto, [**7] and the right to use and occupy such portion of the land as may be reasonably necessary for the purposes of *operating, drilling and marketing the production therefrom.* (Emphasis added).

Exhibit C to Stipulation filed November 22, 1977.

> 3. It is especially understood and agreed by the parties hereto that Grantor's undivided interest in and to all of the oil, petroleum, gas, coal, asphalt and all other [*416] minerals of every kind or character *in and under, and that may be produced from* the above described lands, is hereby reserved by party of the first part, *together with the right of ingress and egress at all times for the purpose of mining, drilling, and exploring said lands* for said minerals and *removing the same therefrom*, and with the rights of way, easements and servitudes for pipe lines, telephone and telegraph lines, for tanks, power houses, stations, gasoline plants and fixtures for producing, treating and caring for such products, and housing and boarding employees, and all other rights and privileges necessary, incident to, or convenient for the economical operation of the said land *for the production of said minerals.* (Emphasis [**8] added).

Exhibit D to Stipulation filed November 22, 1977.

In 1946 and 1947, *subsequent to the severance* of the surface from the oil, gas and other minerals, the *mineral interest owners* executed instruments denominated as gas storage leases in favor of Southwest Natural Gas Company. These gas storage leases were thereafter acquired by the defendant.

The gas storage lease on Tract I provided in part as follows:

> WHEREAS, Second Party is desirous of obtaining a lease on the above described premises for the purpose of *introducing and storing gas in*, and extracting said gas from, any sand or formation down to a depth of 1,500 feet deemed suitable by second party for such purposes but particularly in and from what is commonly known as the Cromwell Sand found at approximate depth of 1,300 feet;
>
> NOW, THEREFORE, for and in consideration of the sum of Ten Dollars ($10.00), cash in hand paid by second party, receipt whereof is hereby acknowledged, first party hereby grants and leases unto second party the exclusive right and privilege of *introducing and storing gas in any form and extracting and taking such gas from said sand or sands*, either through a well or [**9] wells now or to be situated on said premises, or through wells located on adjacent and surrounding premises, and for the purposes of laying pipe lines, building power stations and structures, warehouses, dwellings, telephone and telegraph lines used in conjunction with the storing and extracting of said gas, together with the right of ingress and egress, and the further right to drill any additional well or wells on said premises in such locations as deemed advisable by second party *for the purpose of introducing or extracting gas already introduced and stored.* (Emphasis added). (Defendant's Exhibit 3).

The gas storage lease on Tract II contained virtually identical language with minor differences in language being used to identify the parties (Defendant's Exhibit 4). The *surface owners did not join* in the execution of the gas storage leases.

Tract No. I is essentially the East Half of the Northeast Quarter of Section 17, Township 6 East, Range 4 North, Pontotoc County, Oklahoma, with a small piece out in the northwest corner (Plaintiff's Exhibit 2). When

plaintiffs acquired Tract I there were four pipelines running across the land. Three of those pipelines run [**10] essentially north and south and almost the full length of Tract I (Tr. 7, 118, 119). Portions of at least two of those pipelines were on the surface and were visible a long time before plaintiff bought Tract I (Tr. 119). The 8" and 4" lines going straight to his house could be seen on the top of the ground (Tr. 132).

Plaintiff is a building contractor (Tr. 6). He has lived in this area all of his life (Tr. 18). Shortly after he acquired Tract I he built a home on his land. It is a three minute drive away from Ada (Tr. 12). He later made an addition to his home, converted his garage to an office and started a 36 foot long car port (Tr. 7). It was discovered during the construction that one of the defendant's pipelines ran beneath the corner of plaintiff's house and would also be beneath a swimming pool he proposed to build. (Tr. 7, 81, Defendant's Exhibit 5). Plaintiff immediately contacted a representative of the defendant (Tr. 7). Thereafter [*417] defendant's representative Mr. Courtney came out to plaintiff's house and discussed the matter with him at length. There was some discussion concerning who should pay the cost of rerouting and relocating the lines, whether [**11] or not the defendant had any easements for the initial laying of the lines, and whether the defendant had permission to use the gas injection well, which, together with the blow pit, is located 450 or 500 feet south of plaintiffs' house (Tr. 11-12 and 81-85). As a result of these conversations, an instrument dated June 3, 1967 and signed by plaintiffs was executed and delivered by them to the defendant (Plaintiffs' Exhibit 7) and the pipeline which ran beneath the corner of their house was taken out of use insofar as the transmission of gas was concerned and the gas line was rerouted (Tr. 84-85; Defendant's Exhibit 5). The easement signed by plaintiffs grants to the defendant the right-of-way to maintain, alter, repair, operate and remove pipelines for the transportation of oil, gas or products of oil and gas on, over and through certain lands described as follows:

> The existing four (4) pipelines on the surface across part of the E/2 NE/4 Section 17-T4N-R6E, including a Gas injection well for gas storage and a pit. Relocation of approximately 450' of 8" Transmission Line #634 across part of the North End of the E/2 NE/4 Section 17-T4N-R6E, lying East and South of dwelling.

[**12] The instrument recites that the consideration paid to plaintiffs was $5.00. The $5.00 was not in fact paid (Tr. 96-97). The defendant's cost of installing, rerouting and relocating the pipeline was $2,736.34 (Defendant's Exhibit 7; Tr. 158).

Tracts I and II are located within the confines of what is sometimes referred to as the Ada Storage Facility. (Plaintiff's Exhibits 3 and 4). The sand strata which is being used for the underground storage of gas by the defendant is the Upper Cromwell Sand. It is bounded on all four sides by an impermeable barrier of some type and thus makes a good underground gas storage reservoir (Tr. 46-47). The total acres inside the reservoir limits are 1230; of those 1230 acres plaintiffs own approximately 78 (Tr. 49, 44 & 64). The average pay thickness of the reservoir as a whole is 100 feet with the average pay thickness in and under plaintiffs' land being 96 feet (Tr. 49; Plaintiff's Exhibit 5).

The reservoir comprising the Ada Storage Facility (the Upper Cromwell Sand) was originally a gas only producing reservoir; there was never any oil in this reservoir (Tr. 48). The reservoir was discovered as a producing gas reservoir in 1922, it produced [**13] more than 23 billion cubic feet of gas before it was depleted in 1928 (Tr. 50). "The volumes of recoverable native gas originally in place therein were depleted prior to the commencement of gas storage operations . . ." (findings of the Oklahoma Corporation Commission on October 3, 1973, p. 3 of Order attached as Exhibit A to Exhibit A of Plaintiff's Request for Admissions. See Tr. 75). It has been used continuously since 1949 by the defendant for underground storage of natural gas and some use was made of it as a storage facility prior to that time (Order and Journal Entry of Judgment of District Court within and for Pontotoc County, Oklahoma, filed December 16, 1975, a part of plaintiffs' request for admissions; Tr. 75). Plaintiffs' expert witness, Victor W. Pryor, testified that it had been used as an underground storage facility for approximately 50 years (Tr. 48). There are nine gas producing-injection wells in the reservoir (Plaintiffs' Exhibit 3, Tr. 49). Two of the nine injection wells are located on plaintiffs' Tract I (Plaintiffs' Ex. 3; Tr. 7) although one has been plugged (Tr. 126). A third injection well, the Balthrop # 6, is located just across the road immediately [**14] north a short distance from plaintiffs' house (Plaintiffs' Ex. 3; Tr. 11). On plaintiffs'

land and south of their house 450 to 500 feet is an injection well. It is identified as WP # 3 (Plaintiffs' Ex. 2; Tr. 127). This well has been serviced by an employee of defendant once or twice a week, and oftener when the weather was cold from 1945 to the date of trial (Tr. 127, 128, 141). Plaintiff knew what the well [*418] was being used for (Tr. 130). The WP # 3 "sticks up out of the ground there and it has a big blow pit to the west of it that takes up nearly a half acre where, when it gets water in the tank it has a huge silver tank, when they take gas out of the ground moisture comes up and catches and blows it out in the pit and the pit takes up some of it, the well takes up some of it, and then at times the cattle in the pasture, it has a big handle on it, pull it down and it blowed gas, after the fluid is all gone it blows natural gas and sometimes the cattle gets against that, it has an automatic turn-on and turn-off, and sometimes it gets hung and blows gas, and that gas smell gets real strong at times. And it would make noise, wake us up in the middle of the night and [**15] make noise. I called Mr. Scroggins if it gets hung and he would come down and fix it. The blow pit killed a few trees around there and all. I guess you expect stuff like that." (Tr. 11-12).

Although plaintiff testified that he did not know at the time he purchased Tract I that it was part of an underground gas storage reservoir (Tr. 18, 22) and that he did not learn that it was until 1967, the court finds that he in fact had both actual and constructive knowledge that Tract I was part of a gas storage reservoir at the time he bought it in 1963. Mr. Davidson, plaintiffs' grantor, told Mr. Ellis prior to his purchase of the land that he was getting the "surface only" -- none of the minerals -- but "because of the storage of gas . . . on the place, he would get free gas for this one house." (Tr. 120). Furthermore, the Gas Storage Lease which covered Tract I was recorded in the office of the County Clerk of Pontotoc County on February 14, 1947 (Defendant's Ex. 3) thereby giving him constructive knowledge of its terms. 16 O.S. *§ 16.* And he had the title examined prior to purchase (Tr. 121). Moreover he described in considerable detail the gas injection well just south of his house [**16] -- how it looked, how it sounded and how it smelled. Thus, although the testimony is in conflict the court finds that plaintiff knew that the land in question was being used as a gas storage reservoir.

There is no issue in this case relating to who is entitled to produce the injected gas although both sides have directed this court's attention to various cases which do involve that issue. *See Hammonds v. Central Kentucky Natural Gas Co., 255 Ky. 685, 75 S.W.2d 204 (1934)*; *Lone Star Gas Co. v. J. W. Murchison, 353 S.W.2d 870, 94 A.L.R.2d 529 (Tex.Civ.App. 1962)*, error refused n. r. e.; *White v. New York State Natural Gas Corp., 190 F. Supp. 342 (W.D.Pa. 1960).* Plaintiffs, as surface owners, are not asserting that they have title to or the right to drill into and produce any of the injected gas. But plaintiffs do assert that after the pore spaces in the reservoir rock have been depleted of native natural gas -- and it is uncontroverted in this case that all economically recoverable gas reserves were depleted by 1928 (Tr. 50) -- that they, as surface owners, own the reservoir and the void pore space in the rocks which is now being utilized by the defendant in storing natural [**17] gas produced elsewhere and injected into the reservoir. They claim in essence that their land is being used by the defendant without authority and that they are entitled to damages for its unauthorized use.

Defendants, on the other hand, deny liability and assert that because of the peculiar nature of the common law concerning ownership of natural gas in place, the ownership of the subsurface strata does not determine the right to store and recapture natural gas and that one injecting natural gas into such a stratum cannot be held to have committed a trespass. It further argues that gas storage rights were properly secured from the mineral owners by the oil and gas leases and the gas storage leases in 1928, 1946 and 1947 and that it is the mineral interest owner and not the surface owner who is empowered by law to grant storage rights to the defendant. The defendant argues that under the authority of *Hammonds, supra; Central Kentucky Natural Gas Co. v. Smallwood, 252 S.W.2d 866 (Ky. 1952)* and *West Edmond Salt Water Disposal Association v. Rosecrans, 204 Okla. 9, 226 P.2d 965 (1950)* one who reinjects gas or water into a reservoir loses ownership of [*419] the reinjected [**18] fluid, that such fluid becomes subject to the law of capture and that because ownership is lost by virtue of reinjection, the defendant cannot be held liable for trespass or damages. The defendant especially urges *West Edmond* because it was decided by the Oklahoma Supreme Court.

There is no question, this being a diversity case, but that this court is obligated to follow state law. But in this court's view, *West Edmond* is not dispositive. *West Edmond* was concerned with the potential liability of a party who injected salt water into an underground

formation, which formation was already saturated with salt water. Proof was adduced that salt water, which was injected by defendant into a well located on a 40-acre tract which adjoined plaintiffs' land to the west, was forced to the east through the porous stratum into which it was injected where it commingled with the salt water which already saturated that stratum in and under plaintiffs' land. Unlike the facts in this case, no one knew what the perimeter boundaries were of the Hoover-Tonkawa formation into which the salt water was injected. That "formation was saturated with salt water and was of great extent, the actual [**19] boundaries thereof not being capable of accurate ascertainment." *204 Okla. 9, 226 P.2d 965, 968.* The court did find, however, that following injection of salt water into the Hoover-Tonkawa Sand, the defendants lost ownership of the injected salt water, did seem to say that minerals were *faere naturae* and did cite *Hammonds, supra*, with approval. *226 P.2d at 970-71.*

The factual setting of *West Edmond* is important. There, the salt water which was injected was commingled with the salt water which already saturated the stratum in and under plaintiffs' land. The salt water was a valueless substance. No one knew what the confines or boundaries were of the formation into which the salt water was injected. In the case before this court none of those circumstances exist. There is no commingling of economically recoverable native gas and storage gas. The reservoir was depleted prior to injection. All of the gas injected is owned by the defendant. The limits of the reservoir are well defined. All of this is undisputed.

In a fact circumstance quite similar to the one which is before this court, and in declining to follow the animal *faere naturae* analogy, the court in [**20] *White, supra*, stated:

> It becomes readily apparent, however, that a strict application of this analogy to the present facts is of no benefit to plaintiff's cause. To begin with, the storage gas in question has not escaped from its owners. On the contrary, it is yet very much in the possession of the storage companies, being within a well-defined storage field, the Hebron-Ellisburg Field, and being subject to the control of the storage companies through the same wells by which the gas originally had been injected into the storage pool.

190 F. Supp. 342, 348.

Looking at this same analogy, Professor Kuntz has noted:

> The analogies used are imperfect and objectionable, and the result reached is reasonable only if compelled by a lack of scientific knowledge. The result is not reasonable if the character and area of the reservoir can be determined or if the specific substance can be identified and traced.
>
> If the underground area is capable of being defined with certainty, ownership of the substances injected should not be lost, unless it appears that they have been abandoned. Further, the injector should be held to be a trespasser if the substance was intended [**21] to invade the land of another.

1 Kuntz, *The Law of Oil and Gas* § 2.6, p. 71.

This court's decision in this case is limited to a circumstance where the reservoir is defined and there is no commingling between economically recoverable native gas and injected gas. In this factual setting, it is my view that the law of Oklahoma is that the injector does not lose ownership of the gas by injecting it into the underground reservoir. And for these reasons I do not regard *Bezzi v. Hocker, 370 F.2d 533 (10th Cir. 1966)* as determinative in this case. *See, Lone Star Gas Co., supra.*

[*420] But the question still remains: Did the severed mineral interest owners have the legal right to grant gas storage rights to the defendant? If they did the plaintiffs cannot prevail because such rights were granted to the defendant. Professors Williams and Meyers say that in this country there "are two reported cases dealing with this matter." 1 *Williams and Meyers, Oil and Gas Law, § 222*, p. 328.3. A Kentucky case, *Central Kentucky Natural Gas Co. v. Smallwood, 252 S.W.2d 866 (1952)*, noted in 7 Okla.L.Rev. 225 (1954) has held that the mineral interest owner has authority, [**22] to grant a gas storage lease. A West Virginia case, *Tate v. United Fuel Gas Co., 137 W.Va. 272, 71 S.E.2d 65 (1952)* holds

that the surface owner has authority to grant a gas storage lease. These two cases, looking in opposite directions, were both decided in 1952. The Court of Claims has also addressed the question more recently and has concluded that the right and power to use a depleted reservoir for gas storage purposes is vested in the surface owner. *Emeny v. United States, 188 Ct. Cl. 1024, 412 F.2d 1319 (1969).*

Writers and academicians who have looked at the question are about equally divided. Professors Williams and Meyers urge "adoption of the view that the mineral severance should be construed as granting exclusive rights to subterranean strata for all purposes relating to minerals, whether 'native' or 'injected,' absent contrary language in the instrument severing such minerals." Williams and Meyers, *supra*, at p. 333. In accord with this view, *see* Stamm, *Legal Problems in the Underground Storage of Natural Gas*, 36 Tex.L.Rev. 161 (1957). A contrary view is expressed by McGinnis, *Some Legal Problems in Underground Gas Storage*, Southwestern Legal [**23] Foundation, 17th Annual Institute on Oil and Gas and Taxation 23 (1966); Scott, *Underground Storage of Natural Gas: A Study of Legal Problems*, 19 Okl.L.Rev. 47 (1966); Creekmore and Harvey, *Subsurface Storage of Gas*, 39 Miss.L.J. 81 (1967).

There are several factors which should be considered in arriving at a decision concerning whether the mineral owner or the surface owner has the right and power to grant the storage right and to receive the compensation therefor. One is intention. What was the intention of the parties at the time the minerals were severed from the surface? Was it the intention that the mineral interest owner have the power to explore, develop, produce and *store* gas in and under the land in question? The first place to look in ascertaining that intention are the deeds which effect the severance. In this case it seems quite clear that the mineral severance instruments gave to the mineral interest owner all of the oil, gas and other minerals *"that may be produced";* that he had the "right of ingress and egress at all times for the purpose of *mining, drilling* and *exploring* said lands." Indeed all of the words used denote *exploration, production* [**24] and *development.* Nothing is said about *injection, storage* or *occupation.* And there is nothing before me which suggests that these rights should be reasonably inferred from other language used in the deeds.

Speaking to this same point, Mr. McGinnis has stated:

> It is submitted, however, that neither the right to store nor the right to use the surface in connection with storage should be implied or presumed in the absence of clear evidence of intent to grant such rights.

McGinnis, *Some Legal Problems in Underground Gas Storage, supra*, at 51. Although Professors Williams and Meyers are of the view that the power to grant storage rights should be in the mineral interest owners, they urge this position "*absent contrary language* in the instrument severing such minerals." (Emphasis added). While the severing instruments in this case do not negate in express terms the right to inject or store gas (that is to say, they do not read "the mineral interest owner shall *not* have the power or right to inject or store gas") the only reasonable construction of the language used is that no such power is bestowed upon him. This court accordingly concludes that [**25] the parties did not intend [*421] that the mineral interest owner should have injection, storage or occupation rights.

Apart from intention, if A owns a tract of land in fee simple and conveys to B all of the oil, gas and other minerals in and under and that may be produced from that tract of land, A retains everything which he did not convey. It is clear in Oklahoma that a grant of minerals simply gives to the grantee the right to explore for, produce and reduce to possession, if found, the oil, gas and other minerals. It is an incorporeal interest analogous to a profit to hunt and fish on the land of another. *Rich v. Doneghey, 71 Okl. 204, 177 P. 86 (1918).* Such a deed does not convey the minerals in place and does not convey the stratum of rock containing the pore spaces within which the oil and gas may be found. In the hard mineral area of the law and in the absence of language in the severing deed dictating a different construction, the English and Canadian rule is that the cavern which remains in the land after the hard minerals are mined is owned by the mineral interest owner; the American view is that the cavern is owned by surface owners. See *Mines and Minerals* [**26] , 54 Am.Jur.2d § 204 (1971); *Mines and Minerals*, 58 C.J.S. § 162, at 338 (1948); Stamm, *Legal Problems in the Underground Storage of Natural Gas, supra*, at 168; Creekmore and Harvey, *Subsurface Storage of Gas, supra*, at 96; Lyndon, *The Legal Aspects*

of Underground Storage of Natural Gas, 1 Alberta L.Rev. 543, 545 (1961). There is no reason in principle why the American rule should not apply to a depleted gas storage reservoir. Mr. Scott, in addressing himself to this question, has stated:

> Based upon the foregoing principles, the surface owner alone should be compensated for the use *per se* of a stratum. He is the owner of this formation, and like an owner of a warehouse, he is entitled to the rental or other compensation paid for the use of his property.

Scott, *Underground Storage of Natural Gas: A Study of Legal Problems, supra*, at 61.

While the Supreme Court of Oklahoma has not passed upon this point, it has considered a closely analogous question in dealing with the rights of the mineral and surface owners which leads this court to conclude that it would hold, in the circumstances which face this court, that the surface owner has the power [**27] to convey gas storage rights. In *Sunray Oil Co. v. Cortez Oil Co., 188 Okla. 690, 112 P.2d 792 (1941)* Cortez Oil Company was the owner of an undivided 1/4 mineral interest in a tract of land. A well had been drilled by an oil and gas lessee on said land which was unproductive of oil or gas. The Cromwell Sand had been encountered and was approximately 105 feet thick; it was not productive of oil or gas and was saturated with salt water. Sunray Oil Company secured from the lessee an assignment of the oil and gas lease on the ten acres on which the well was situate. Genevieve Greer was the owner of the surface and of 53/80ths of the minerals. Sunray secured from her a license to use the well as a salt water disposal well. Cortez Oil Company sought to enjoin Sunray from so using the well. On the basis of the evidence adduced the court concluded that there was no possibility of finding oil or gas in the Cromwell Sand and hence any threat of injury to the Cortez mineral interest in that formation was purely speculative. The court then addressed the question of who had the right to Grant to Sunray the right to inject and store salt water which was produced by Sunray from oil [**28] and gas wells on another lease some distance from the well in question. The court stated:

> So in this case Genevieve Greer, . . . has the right to so use *the surface and substrata* of her land as she sees fit, or permit others so to do, so long as such use does not injure or damage other persons. (Emphasis added).

188 Okla. 690, 112 P.2d 792, 795. This court must conclude that a reasonable construction of that language is that Genevieve Greer, *as the surface owner*, was entitled to grant the salt water storage rights to Sunray. I consequently must conclude that a similar construction would be reached by that court on the evidence adduced in the trial of this case.

[*422] It is undisputed that the underground storage of natural gas as a conservation measure is one that clearly promotes the general welfare; it is a highly desirable and worthwhile undertaking in our severely energy-short economy. As a matter of policy, it is an undertaking which should be encouraged. The conclusion which the court reaches this day does not on the whole fetter or burden or make gas storage projects more difficult. If this court had concluded that it was the mineral interest [**29] owner and not the surface owner who had the power to grant storage rights, it would typically mean that hundreds of severed mineral interest owners would have to be contacted if those rights were to be obtained privately. Especially is this so if the underground gas storage reservoir was once a producing gas field. Small fractional mineral interests are typically extremely numerous on any tract of land which at some time in its history has been involved in a substantial oil and gas play. Admittedly there may be instances where, for example, the gas storage facility underlays a metropolitan area, it will be necessary to secure the consent of a large number of surface tract owners. But on the whole, that would not ordinarily be the case and there is no evidence before this court to suggest that it is the case here.

Furthermore, even if the mineral interest owner is the one who has the power to grant gas storage rights, all writers apparently agree that if there is to be "some user of the surface for injection or production wells or other surface installations" the surface owner's consent and authority must be secured in all events. *Williams and Meyers, supra, at 331.*

For all [**30] of the foregoing reasons the court concludes that the defendant did not have authorization or permission to inject and store the gas in the subsurface

stratum of plaintiffs' land.

Defendant also argues that it acquired gas storage rights on plaintiffs' land by virtue of the easement granted on June 3, 1967 (Plaintiff's Exhibit 7). That easement granted unto the defendant the "right of way to maintain, alter, repair, operate . . . on, over and through" Tract I "the existing four pipelines on the surface . . . including a gas injection well for gas storage and a pit." There is nothing in this instrument which purports to grant gas *storage* rights as such and the court concludes that such rights are not so granted by it. Even if the mineral interest owner had the right to grant gas storage rights, it would still be necessary for defendant in this circumstance to secure permission from the surface owner to install upon the topographic surface of his land the injection well and other equipment which might be necessary to inject or withdraw natural gas. This easement granted those rights to the defendant; it granted nothing more. Williams and Meyers, *supra*, pp. 331 and 332.

[**31] Plaintiffs argue and allege in the amendment to their complaint that this easement "fails for lack of consideration in that the consideration cited therein has never been paid." They contend that in view of the lack of consideration the court should grant rescission of the instrument.

It is undisputed that $5.00 was not paid to plaintiff. The easement shows on its face, however, that defendant agreed to relocate some 450 feet of pipeline (see also Defendant's Exhibit 5). It is undisputed that this relocation was performed without cost to plaintiffs at a cost to defendant of $2,736.34. Plaintiffs admit in their brief of May 9, 1977 that the relocation, as set out in the instrument in question, was bargained for between the parties. They expressly state that "the only thing that was bargained for as to . . . [the June 3, 1967 instrument] is the relocation of the 450 feet of lines." However, they argue that since the only thing bargained for between the parties was the moving of the pipeline, the balance of the terms and conditions set out in the instrument are severable and should be rescinded.

The argument is without merit. The relocation was performed at substantial expense [**32] to defendant. Plaintiffs admit that this relocation was bargained for. Defendant's obligation under the "bargain" was to relocate the pipe and bear all expenses associated [*423] therewith. It is obvious that, in exchange for defendant's promise, plaintiffs promised, as set out in the instrument, to grant defendant the right of way to maintain, alter, repair, operate and remove pipelines on plaintiffs' land, including a gas injection well for gas storage and a pit.

It is clear, therefore, that plaintiffs' promise to grant defendant the easement was supported by defendant's promise to relocate the pipeline. This constituted a bargained-for exchange, since mutual promises are consideration for the formation of a bilateral contract. 15 O.S. § 106; *Nadel v. Zeligson, 207 Okla. 658, 662, 252 P.2d 140 (1953).*

The defendant finally contends that it obtained by prescription the right to inject and store gas in the subsurface strata of plaintiffs' land. Plaintiff argues that this contention should not be countenanced by the court because it was not contained in the pleadings or in the pretrial order. Prior to the trial this court directed the parties to submit trial briefs [**33] and proposed findings of fact and conclusions of law. On April 5, 1977, more than three weeks in advance of trial, the defendant filed and submitted to opposing counsel his proposed findings of fact and conclusions of law. Paragraph 12 of his proposed conclusions of law was:

> Except for the fact that defendant and its predecessors were using the well for gas injection and the Upper Cromwell Sand for gas storage under *express grants* from plaintiffs and their predecessors, defendant long since *would have acquired the prescriptive right to do so, all other elements of adverse possession having been shown by the evidence.* (Emphasis added).

This court has concluded that the "grants" referred to by defendant, namely (1) the oil and gas leases, (2) the gas storage leases, and (3) the line relocation easement provide no authority in law for the defendant's underground storage of natural gas. Substantial amounts of evidence were adduced at trial directly bearing on the maturation of a prescriptive easement. Plaintiff did not suggest before the trial or object during the trial to any evidence being introduced on the grounds that it was beyond the issues framed by the [**34] pleadings or the pretrial order. At the conclusion of the trial the court invited counsel to submit briefs on the question of whether defendant had matured a prescriptive right to

store injected gas. Then, for the first time, in his brief filed on May 16, 1977, did plaintiffs object on the grounds that this issue was outside the pleadings and the pretrial order. The Court of Appeals for the Tenth Circuit has quite recently stated:

> It is the general rule that where an issue is developed in the evidence admitted without objection, the issue is before the court for determination and the pleadings should be regarded as amended to conform to the proof. See *Rule 15(b) F.R.Civ.P.*; *Hopkins v. Metcalf, 435 F.2d 123, 124-25* (10th Cir.); and see *Rule 16, F.R.Civ.P.*, governing amendment of pretrial orders.

Sanders v. International Harvester Co., Case No. 76-1407 (10th Cir. 1978). The contention of plaintiffs is accordingly lacking in merit and the court will consider whether or not the defendant matured an easement by prescription for the storage of gas.

60 O.S. § 333 provides as follows:

> Occupancy for the period prescribed by civil procedure, or any law of this [**35] State as sufficient to bar an action for the recovery of the property, confers a title thereto, denominated a title by prescription, which is sufficient against all.

An easement may be acquired by prescription. *Frater Oklahoma Realty Corp. v. Allen Laughon Hardware Co., 206 Okl. 666, 245 P.2d 1144, 1147 (1952).* The burden of proof is upon the party asserting a prescriptive right and the requisite showing has been stated by the Oklahoma Supreme Court as follows:

> To obtain title to property by prescription, all elements of adverse possession must be established by clear and positive proof and cannot be established by inference. Adverse possession is to be taken strictly, and every presumption is in favor of possession in subordination to the rightful owner. The burden of proof [*424] rests on the party asserting adverse possession to show the necessary elements of actual, adverse, open, notorious, peaceable, exclusive and hostile possession for a period of fifteen years. Where the evidence is conflicting it is an issue of fact to be determined by the trier of the facts.

Tindle v. Linville, 512 P.2d 176, 178 (Okl. 1973). See also Sears v. State Department [**36] *of Wildlife Conservation, 549 P.2d 1211 (Okl. 1976).*

In this case plaintiffs and their predecessors in title knew that the Upper Cromwell Sand underlying the topographic surface of the land in question was a part of the Ada Gas Storage Facility. The reservoir has been continuously used as a gas storage reservoir since 1949. There are nine injection wells on the surface of the land embraced in the storage facility. Plaintiff is a building contractor and has lived in the area all of his life. One of the principal injection wells is on his land and is located 450 to 500 feet south of his house. It has been there since before 1945. The log from this well formed the basis for the determination by the Oklahoma Corporation Commission concerning the thickness of the Upper Cromwell Sand (Plaintiffs' Ex. 5; Tr. 47). That well, according to plaintiff's testimony, with its "big blow pit" that "takes up nearly a half acre" and its "huge silver tank" is highly visible, is noisy and is smelly (Tr. 11-12). It has been serviced once or twice a week by employees of defendant from 1945 to the date of trial. Plaintiff knew what it was being used for. Some of the pipelines running from the [**37] gas reservoir were visible on the surface. The 8" and 4" lines going straight to plaintiff's house could be seen on top of the ground.

Plaintiffs' immediate predecessor in title was Mr. Glen D. Davidson and he had acquired title from his mother. Mr. Davidson was employed by the defendant from 1956 until 1977. He worked at the defendant's Ada warehouse just 3 miles north of Ada (Tr. 115). He and his father had a hog farm on the land where plaintiffs' house is located before plaintiff bought the land from him (Tr. 118). He was quite familiar with the land and had prepared for defendant the diagram (Defendant's Ex. 5) rerouting the pipeline around plaintiffs' house (Tr. 116). Although Mr. Davidson and his father and mother did not live on the land, they were intimately familiar with it and members of their family lived on it for several years (Tr. 118). They all knew of the pipelines and their connection with the gas storage reservoir (Tr. 118-119). Mr. Davidson, plaintiffs' grantor, told plaintiff prior to his purchase of the land that he was getting the "surface only" but "*because of the storage of gas on the place*, he

would get free gas for this one house." (Tr. 120). [**38] Plaintiff also had constructive knowledge of the gas storage leases (Defendant's Exhibit 3) and had examined the title prior to purchase (Tr. 121).

Plaintiffs argue that the use by the defendant has been permissive. The record is devoid of any evidence which suggests that the plaintiffs or their predecessors in title have granted permissive use to the defendant to store gas. The plaintiff has testified, although the court has found to the contrary, that he did not know his land was being used as an underground gas storage reservoir until 1967. He objected at that time to defendant's use of the land as a gas storage reservoir. He testified as follows:

> Q. And what was it that you said to him complaining about or objecting to the use of the injection well?
>
> A. Well, I remember it very well, I said looks to me like if a man had a big warehouse and it's full of canned oil and I sold you the oil and I said, sir, this is your oil, sir you can get it out anytime you want to, he gets all of the canned oil out and I look around and he is putting oil back in there that is relatively unfair. When the gas company got out their gas out of the land it looks like this property [**39] is mine and I should be paid something for using it again. He said it's absolutely under the mineral part of it and you don't have no say-so under it. So, that's how come that is still in that easement with my name on it. (Tr. 32).

Plaintiff then went to an attorney to get an opinion on the right of the defendant to use his land as an underground gas storage reservoir but did not follow it up (Tr. 33) and although he did not formally object [*425] again to the gas company, he "moaned and groaned and complained to everybody but an attorney," including his "friends and business acquaintances" (Tr. 33). The record is simply devoid of any evidence whatsoever that any surface owner ever gave permission to the defendant to store gas in and under this land; the only permission defendant obtained was from mineral interest owners.

Plaintiffs next argue that it is essential that the defendant be claiming under color of title and that it was not so claiming. This contention is totally lacking in merit. It is abundantly clear that, mistaken though the defendant was concerning who had authority to grant gas storage rights, it is and always has been claiming under the oil and [**40] gas leases, the gas storage leases and the easement it took from plaintiffs; all of these are claims under color of title.

The evidence of knowledge on the part of plaintiffs and their predecessors in title of actual, adverse, open, notorious, peaceable, exclusive and hostile possession by defendant of the Ada Gas Storage Facility for a period of time far in excess of 15 years is overwhelming. The court accordingly must conclude that defendant has matured a prescriptive easement for the underground storage of natural gas.

Plaintiffs also argue that the condemnation action by the defendant in the District Court of Pontotoc County against plaintiffs to condemn the Upper Cromwell Sand pursuant to state law "is in fact an admission that plaintiffs, as surface owners, own storage rights in the aforedescribed tracts. Such an admission standing alone should warrant only examination of the case on the issue of damages . . ." (Plaintiff's Trial Brief p. 2). In effect plaintiffs argue that this action somehow bars or prevents the legal assertions which defendant makes here. This contention is not well founded. It may well be that defendant's April 1, 1976 condemnation action exhibits [**41] uncertainty concerning the state of the law on whether it is the mineral owner or the surface owner who has the power to grant gas storage leases. That question, after all, had not been resolved in Oklahoma when that action was brought. Indeed, it stands unresolved today in most of the jurisdictions of this country. And it is essential for the effective operation of an underground gas storage reservoir for the injector to acquire the requisite authority from *all of the property interest owners in that reservoir.* But simply because the defendant took a cautious step to protect against the possibility of the very decision which this court today makes does not mean that the defendant is precluded from contending that it had gas storage rights under its gas storage leases and the other instruments of title on which it relies or that it is precluded from asserting that it has matured a prescriptive easement. The contention by plaintiffs that the institution of a condemnation action by the defendant somehow infects the validity of its arguments here is without merit.

Judgment will be entered in accordance with this Memorandum Opinion.

[*none] [EDITOR'S NOTE: The following [**42] court-provided text does not appear at this cite in 450 F. Supp.]

JUDGMENT

Pursuant to memorandum opinion of even date, judgment is entered against the plaintiffs and in favor of the defendant.

DATED this 31st day of March, 1978.

South Dakota Law Review

2010

55 S.D. L. REV. 72

LENGTH: 16742 words

STUDENT ARTICLE: CARBON CAPTURE AND STORAGE IN SOUTH DAKOTA: THE NEED FOR A CLEAR DESIGNATION OF PORE SPACE OWNERSHIP

NAME: BLAYNE N. GRAVE+

BIO:

+ J.D. Candidate, Class of 2011, University of South Dakota School of Law; B.S., 2004, University of Minnesota. The author would like to thank Joe Nadenicek for his topic suggestion and guidance throughout the writing process; Derric Iles for his technical expertise; Dean Barry Vickrey for his guidance in legislative drafting and editing; Professor Elizabeth Burleson, Alex Hagen, Brooke Swier, and Jay Zenor for their help during the editing process; and, last but not least, the author would like to thank her parents, Roger Damgaard, and Alex Hagen for their encouragement and support.

LEXISNEXIS SUMMARY:

... However, carbon capture and storage projects pose a number of unanswered issues, one of the most important of which is subsurface pore space ownership. ... The uncertainty with how pore space property rights will be recognized in South Dakota impedes the development of carbon capture and storage projects within the state and prevents the creation of a new, valuable use of land. ... Statutes by State The legislatures of Montana, North Dakota, and Wyoming have passed comprehensive regulation for CCS, each of which specifically designates the surface estate as the owner of the pore space in the event that the subsurface or mineral estate has been severed from the surface estate. ... Minnesota provides that "innovative energy projects" "shall make a good faith effort to obtain funding from the United States Department of Energy and the United States Department of Agriculture to conduct a demonstration project at the facility for either geologic or terrestrial carbon sequestration projects to achieve reductions in facility emissions or carbon dioxide."

HIGHLIGHT: *Carbon capture and storage is a promising new tool to combat climate change whereby carbon dioxide is pipelined underground into a geological reservoir for permanent storage. Momentum is growing in support of carbon capture and storage at the federal level and has been addressed by states neighboring South Dakota. However, carbon capture and storage projects pose a number of unanswered issues, one of the most important of which is subsurface pore space ownership. Property rights are generally functions of state law, and South Dakota has not yet addressed this issue. The uncertainty with how pore space property rights will be recognized in South Dakota impedes the development of carbon capture and storage projects within the state and prevents the creation of a new, valuable use of land. This comment considers surrounding state legislation on pore space ownership and examines existing subsurface case law in*

South Dakota to support the notion that pore space ownership should rest with the surface estate.

TEXT:

[*72] I. INTRODUCTION

Carbon capture and storage (CCS) is a process by which carbon dioxide is "captured" before it is released into the atmosphere and pipelined underground for permanent storage in subsurface geologic reservoirs. n1 Climate change is a driving force behind development of carbon capture and storage. n2 Pending climate change legislation creates incentives for CCS by establishing a cap-and-trade system n3 to reduce carbon dioxide emissions. n4 It is possible that the United [*73] States could not meet the proposed restrictions on carbon dioxide emissions without using CCS. n5 Furthermore, the Electric Power Research Institute believes that CCS is one of the most significant technologies needed to be commercially deployed to reduce carbon dioxide emission rates to 1990 levels. n6 CCS is a promising technology made increasingly relevant by financial incentives created to reduce carbon dioxide levels. n7

Regional carbon sequestration projects are researching potential locations where geologic storage of carbon dioxide may be appropriate. n8 At least one area of northwestern South Dakota has been specifically noted as being appropriate for such a storage project. n9 Given the momentum building around CCS at the national level, n10 and potential storage located in our state, n11 South Dakota needs to clarify subsurface property rights in order to promote development of projects within the state. n12

The critical issue that specifically needs to be addressed at the state level is the question of ownership of subsurface pore space used for storage of the sequestered carbon dioxide. n13 This question arises when the mineral estate has been severed from the surface estate. n14 Most jurisdictions have not yet [*74] determined which interest holder prevails and can therefore grant sequestration rights. n15

With the exception of federal lands, subsurface property rights issues are functions of state law and will therefore be jurisdiction-specific. n16 As CCS projects gain momentum, property rights issues, including ownership of pore space, will be increasingly important concerns. n17 The resolution of this issue also determines who is entitled to compensation in the event of condemnation. n18 For a carbon capture and storage project to be feasible in South Dakota, the question of pore space ownership must be answered. n19

This comment discusses carbon capture and storage generally and the subsurface property rights issue raised in South Dakota in particular. n20 Part II of this comment provides background on climate change and carbon sequestration. n21 Part II also discusses momentum building around CCS through federal legislation and assesses South Dakota's potential role as a storage site for sequestered carbon dioxide. n22 Finally, Part II provides an overview of proposed Environmental Protection Agency (EPA) regulation of geological sequestration. n23 Part III answers the question of pore space ownership in South Dakota by building on basic principles of South Dakota subsurface law and analyses of other jurisdictions' subsurface law. n24 Part III also examines a model act proposed by the Interstate Oil and Gas Compact Commission (IOGCC) Geological CO[2] Sequestration Task Force as well as legislation recently passed in Montana, North Dakota, and Wyoming. n25 Part IV concludes that in order to promote development of geologic sequestration projects within the state, the South Dakota Legislature should designate the surface estate as the owner of the pore space used to store sequestered carbon dioxide. n26

[*75] II. BACKGROUND

Climate change mitigation is a driving force behind carbon capture and storage. n27 The earth as a whole is getting warmer. n28 This is most likely due to human activities that cause greenhouse gas emissions, n29 the most significant of which is carbon dioxide. n30 The EPA recently declared that greenhouse gases are pollutants that endanger public health and welfare. n31 This declaration was a direct response to *Massachusetts v. E.P.A.* n32 wherein the United States Supreme Court ordered the agency to conduct a scientific review determining the threat posed by greenhouse gases. n33

Impacts of climate change include, but are not limited to, increased concentrations of ground-level ozone, increased drought, more frequent downpours and flooding, more frequent and intense heat waves and wildfires, rising sea levels, more intense storms, and harm to water resources, agriculture, wildlife, and ecosystems. n34 In addition, "[eleven] retired U.S. generals and admirals signed a report from the Center for Naval Analyses stating that climate change 'presents significant national security challenges for the United States.'" n35 This threat arises when violence escalates over scarce resources, such as water. n36 The violence, in turn, "drives massive migration to more stabilized regions of the world." n37 The dire consequences of global climate change are thus prompting governments to find ways to reduce greenhouse gas emissions. n38

Reducing concentrations of anthropogenic greenhouse gases can be accomplished in four basic ways:

> 1) through energy conservation and energy efficiency; 2) by using technologies involving renewable energy, nuclear power, hydrogen, or fossil fuels containing lower carbon content, e.g., natural gas; 3) by [*76] indirect capture of CO[2] after its release into the atmosphere utilizing the oceans or terrestrial sequestration, e.g., reforestation, agricultural practices, etc.; or 4) by carbon capture and geological storage [CCS], whereby CO[2] is captured and stored in geologic formations through underground injection (instead of being released into the atmosphere). n39

Thus, carbon dioxide can be removed from the atmosphere and sequestered in more than one way. n40

A. CARBON SEQUESTRATION AND ENHANCED RECOVERY PROJECTS

"Carbon sequestration" can refer to either geological or biological sequestration. n41 This comment focuses on carbon capture and therefore geological sequestration. n42 Biological sequestration is another form of carbon sequestration whereby plants take up carbon dioxide through photosynthesis. n43 Biological and geological sequestration will become increasingly useful tools in mitigating climate change because each can achieve significantly lower levels of atmospheric carbon dioxide with currently available technology, and neither calls for major changes in how the nation uses or generates energy. n44 In fact, carbon sequestration, whether geological or biological, allows for continued reliance on coal and other carbon-heavy fuels. n45 "Indeed, CCS is advocated by those who view ongoing reliance on fossil fuels as inevitable with the world's energy picture in 2030, and even 2050 still showing heavy carbon dependency." n46 Carbon sequestration, therefore, is a useful tool for mitigating climate change during the shift away from energy sources derived from fossil fuel. n47

The EPA defines CCS as "the process of capturing CO[2] from an emission source, (typically) converting it to a supercritical state, transporting it to an injection site, and injecting it into deep subsurface rock formations for long-term storage." n48 Geological sequestration is related to CCS, but geological sequestration does not include the capture or transport of carbon dioxide. n49

Enhanced recovery of oil or gas involves injecting carbon dioxide underground similar to CCS, but the purpose behind this practice is not [*77] permanent storage. n50 The purpose behind enhanced recovery projects is to force out oil or gas that would otherwise be unobtainable. n51 Using CCS as a tool for mitigating climate change involves different technical issues, larger volumes of carbon dioxide, and therefore, larger scale projects than enhanced recovery projects. n52

In addition, enhanced recovery projects do not implicate the issue of pore space ownership:

> In the case of CO[2] enhanced oil recovery projects, the right to inject CO[2] into the subsurface oil reservoir generally is contained in and part of the oil and gas lease that would have been obtained to develop the project. During the operation of a CO[2] enhanced oil recovery project (EOR), a certain amount of the injected CO[2] remains in the oil reservoir, and should be considered stored CO[2]. Consequently, the right to use an oil reservoir for the associated storage of CO[2] during the operational phase of a CO[2] EOR project would be permissible under an oil and gas lease. n53

The issue of pore space ownership does arise when the enhanced recovery project ceases to recover oil or gas and becomes solely a site for the permanent storage of carbon dioxide. n54

B. THE MECHANICS OF CARBON CAPTURE AND STORAGE

To understand the benefits of geological storage of carbon dioxide and the legal issues it poses requires a more thorough assessment of how CCS actually works. n55 There are essentially four stages of carbon capture and storage: (1) capture, n56 (2) transportation, n57 (3) geological storage, n58 and (4) post-closure. n59 The process begins by using technology to capture carbon dioxide before it is released into the atmosphere. n60 For example, chilled ammonia has been found to capture more than 88% of carbon dioxide before it is emitted into the [*78] atmosphere. n61 Capture technologies are usually thought of in relation to power plants, but these technologies can also be used with other carbon dioxide emitting industries, like cement manufacturing, oil refining, ammonia production, and iron and steel manufacturing. n62 Capture technology is the most expensive part of the CCS process. n63

The second stage of CCS is transportation. n64 Once the carbon dioxide has been captured, it must be transported from the source to the underground storage site. n65 "While various options may be feasible, large volumes are most likely to be transported by pipeline." n66 Cost of transportation will be a "function of the distance and quantity [of carbon dioxide] transported." n67

The third stage of CCS is storage in a geological storage unit. n68 Geological storage sites are selected by locating a permeable subsurface formation beneath an impermeable capping formation. n69 The impermeable layer keeps the sequestered carbon dioxide from escaping upward. n70 The depth of the geological storage unit needs to be roughly one kilometer. n71 The three main types of geological storage formations are: (1) depleted oil and gas reservoirs, (2) deep saline formations, and (3) coal beds. n72 Each has different characteristics, potential, and concerns. n73 Saline formations are the best candidate for geological sequestration "because of their large storage potential and broad distribution." n74 Initial CCS projects will likely take place in oil and gas reservoirs accompanying enhanced recovery projects because there is more subsurface data available for these sites and the revenue from the recovered resources can help defray the costs of the project. n75

The fourth stage, or the post-closure stage, refers to the stage of the project when carbon dioxide is no longer being sequestered. n76 This stage includes [*79] continued monitoring of the project to follow any movement of the stored carbon dioxide and to identify any leaks. n77 This monitoring activity will likely take place over a period of at least decades. n78

C. EFFECTIVENESS OF CCS

Risks associated with CCS can be either operational or global. n79 Operational risks include environmental, health, and safety risks associated with the capture, transportation, and injection of carbon dioxide, and management during the post-closure phase. n80 Global risks are those associated with the uncertainty of the effectiveness of CCS. n81 Allaying concerns of escape, however, the International Panel of Climate Change estimates that properly selected and managed sites will likely retain over 99% of the sequestered carbon dioxide for over 1,000 years. n82 In addition, of the three large-scale geological sequestration projects in existence today, none has had problems with carbon dioxide leaking. n83

To effectively reduce greenhouse gas emissions, geological storage space must have the capacity for large volumes of carbon dioxide. n84 However, capacity estimates are lacking and uncertainty about pore volumes translates to uncertainty around regulation. n85 The Department of Energy has begun assessing storage capacity in the United States through seven Regional Carbon [*80] Sequestration Partnerships. n86 However, these assessments are not always uniform and complete. n87 Thus, another key issue to the effectiveness of CCS is whether there is enough capacity to store carbon dioxide in volumes large enough to actually mitigate climate change. n88

Carbon capture and storage is not a fix-all for climate change. n89 The main focus of reducing greenhouse gas

emissions should be on reducing emissions at their sources, but CCS is a critical alternative for reducing greenhouse gas emissions as the economy shifts away from fossil fuel-based energy. n90 However, major environmental groups are split on the issue of whether they support CCS or not. n91

D. FEDERAL LEGISLATION CREATES NATIONWIDE INCENTIVES

"'There are no technical or physical barriers to [geologic sequestration] . . . . The only thing that stands in the way of progress at the moment is policy.'" n92 On this point, the United States House of Representatives passed the American Clean Energy and Security Act of 2009 on June 26, 2009, and the bill is currently on the Senate Legislative Calendar. n93 The bill calls for the Administrator of the EPA to develop a strategy addressing barriers to the commercial-scale deployment of CCS, n94 to establish an approach to permit geological sequestration, n95 and to promulgate regulations to minimize the risk of carbon dioxide escaping back into the atmosphere. n96 This bill would also amend the Safe Drinking Water Act, requiring the Administrator to develop regulations for sequestration wells, n97 which the EPA has recently proposed. n98

[*81] The main thrust of the proposed climate change legislation establishes a cap-and-trade system for reducing carbon dioxide emissions from capped sources to 97% of 2005 levels by 2012, 83% by 2020, 58% by 2030, and 17% by 2050. n99 If the proposed energy bill passes with these restrictions on carbon dioxide emissions from capped sources, it is possible that the use of CCS would be the only way to meet the restrictions. n100 While the ultimate status of the bill is uncertain at this time, the determination of the Obama administration to reduce greenhouse gas admissions is made clear through a recent announcement that it is planning to move "forward on new rules to regulate greenhouse gas emissions from hundreds of power plants and large industrial facilities." n101

In addition to the potential reduction incentives and restrictions on carbon dioxide emissions in pending H.R. 2454, other federal legislation encourages investment in geological sequestration projects. n102 For example, the Energy Independence and Security Act of 2007 authorized substantial federal funding of research and development for CCS technologies and projects. n103 Also, "in 2008, legislation was enacted providing tax credits for owners of facilities that capture not less than 500,000 metric tons of CO[2] during the taxable year." n104 In addition, Congress expanded a program granting tax credits for investment in qualified clean coal projects to include CCS projects and increased funding for the program to $ 2.55 billion. n105 Furthermore, the American Recovery and Reinvestment Act of 2009 created a 30% tax credit for qualified advanced energy projects, including CCS projects. n106 At least $ 20 million dollars was awarded to research CCS technology through the stimulus package. n107 In sum, [*82] momentum is building for CCS at the federal level. n108

E. SOUTH DAKOTA IS A POTENTIAL STORAGE SITE

South Dakota has potential to play a role in both biological and geological sequestration strategies. n109 The United States Department of Energy has developed seven regional carbon sequestration partnerships, which consist of states, universities, the private sector, and Canadian provinces. n110 The seven partnerships are the Big Sky Carbon Sequestration Partnership, the Plains CO[2] Reduction Partnership, the Midwest Geological Sequestration Consortium, the Midwest Regional Carbon Sequestration Partnership, the Southeast Regional Carbon Sequestration Partnership, the Southwest Regional Partnership on Carbon Sequestration, and the West Coast Regional Carbon Sequestration Partnership. n111 The goal of the partnerships is to help develop technology, infrastructure, and regulations in the different regions of the country. n112

South Dakota is part of the Big Sky Carbon Sequestration Partnership (BSCSP) along with Montana, Wyoming, Idaho, and eastern Washington and Oregon. n113 The BSCSP region produces a small percentage of overall carbon dioxide emissions in the United States, but the region is a key area for fossil fuel energy development. n114 The BSCSP Region also contains oil and gas reservoirs that could serve as potential sequestration sites. n115

Of the BSCSP Region, South Dakota is the least populous state, and emits the lowest levels of carbon dioxide.

n116 Most of South Dakota's carbon dioxide emissions come from ethanol production. n117 However, Otter Tail Power Company, on behalf of Big Stone II, has applied for and received a permit to construct a coal-fired power plant in Grant County, South Dakota. n118 This plant alone would increase South Dakota carbon dioxide emissions by 34% from 2001 [*83] EPA records. n119 In addition, if built, the Hyperion oil-refining plant n120 would also increase South Dakota carbon dioxide emissions. n121 South Dakota appears to be a target for significant fossil fuel energy development, n122 which is exactly the type of industry appropriate for carbon capture technology. n123

South Dakota is also a member of the Plains CO[2] Reduction (PCOR) Partnership along with Iowa, Minnesota, Missouri, Montana, North Dakota, Nebraska, Wisconsin, and Wyoming. n124 This Partnership plans to utilize the Williston Basin's sequestration potential. n125 A study done by PCOR in 2005 looked at the potential sequestration capacity of oil fields within the Williston Basin, n126 which includes North Dakota, South Dakota, Montana, and provinces of Canada. n127 The report notes that while only the southern edge of the Williston Basin extends into South Dakota, the opportunity for enhanced oil recovery and sequestration through carbon dioxide flooding in the area is not lessened. n128

No comprehensive study of South Dakota subsurface space has been done to assess storage potential or capacity for carbon dioxide within the state, but based on the information gathered through oil and gas studies, the northwest corner of the state is the most likely location for geologic sequestration projects because of the depth of possible host geologic units in that region. n129 However, further research will need to be done to determine if adequate low permeability capping structures are present to keep the sequestered carbon dioxide trapped underground. n130 With momentum for CCS building at a national level, n131 and research on potential sites being done within South Dakota, n132 it would be prudent for South Dakota to address the issue of pore space ownership in order to promote development of projects within the state. n133

[*84] F. EVOLVING FEDERAL PROGRAM LEAVES UNANSWERED QUESTIONS

In July 2008, the EPA proposed a rule regulating geological sequestration of carbon dioxide under its authority through the Underground Injection Control (UIC) program of the Safe Drinking Water Act (SDWA). n134 "Underground injection," as defined in section 1421(d)(1) of the SDWA, includes the geologic sequestration of carbon dioxide through well injection. n135 Certain states, territories, and tribes have primary enforcement responsibility, or primacy, for UIC programs. n136 South Dakota does not have primacy and shares responsibility for its UIC program with the EPA. n137

The UIC program currently has five classes of injection wells. n138 Class I wells are used for hazardous waste. n139 Class II wells are used for: (1) injection of fluids brought to the surface in conjunction with natural gas storage operations or oil and natural gas production; (2) enhanced recovery of oil or natural gas; or (3) storage of hydrocarbons that are liquid at standard temperature and pressure. n140 Class III wells are used for injection of substances for the extraction of minerals. n141 Class IV wells are used for injection of hazardous or radioactive waste. n142 Class V wells are used for injection of substances not covered in Class I-IV. n143 EPA's proposed rule establishes a new class of injection well, a Class VI well. n144 As geologic sequestration is already being researched and developed in order to evaluate technical aspects of the process, the EPA and states with primacy currently permit injection wells associated with these research and development projects as Class V wells. n145 However, the proposed Class VI well is designed to address future full-scale projects. n146

The proposed rule establishes "technical criteria for the geologic site characterization, area of review (AoR) and corrective action, well construction, operation, mechanical integrity testing, monitoring, well plugging, post-injection site care, and site closure for the purposes of protecting underground sources of drinking water[.]" n147 The SDWA does not provide the EPA authority to develop [*85] regulations pertaining to the capture and transport of carbon dioxide, the determination of property rights, the transfer of liability from one entity to another, or accounting for greenhouse gas reductions. n148 States must therefore take the lead on developing a comprehensive regulatory framework for CCS on issues not addressed by the proposed EPA rule. n149

III. ONE PIECE OF THE PUZZLE: RESOLVING OWNERSHIP OF PORE SPACE

There are many unanswered questions associated with CCS, but perhaps the most important is that of pore space ownership. n150 "If law is still lacking on a critical issue such as substrata rights or unitization, investors face uncertainty as to which risks will be ameliorated by clear laws and regulations in the near future and which will not." n151 Furthermore, "the clarification of property rights as they relate to [geological sequestration] is important from both regulatory and liability perspectives, as each can have significant impacts on the future cost, public acceptability, and feasibility of [geological sequestration] projects." n152

For a carbon capture and storage project to be feasible in South Dakota, the question of pore space ownership needs to be answered. n153 Although the EPA addressed the effects of CCS with respect to drinking water, n154 states, including South Dakota, must fill the gaps in regulation with respect to storage rights. n155 South Dakota's property law should inform mineral estate owners, energy development companies, surface estate owners, and all other parties involved in the development process how ownership rights will be recognized and protected. n156

A. FEDERAL AGENCY CANNOT DETERMINE STORAGE RIGHTS

A recent administrative ruling by the EPA Environmental Appeals Board emphasizes the need for state action on clarifying subsurface property rights. n157 [*86] The order by the EPA Environmental Appeals Board denying review of a UIC Class V permit for carbon dioxide storage highlights the importance of the project operator obtaining permission to use the pore space. n158 In response to the petitioners' argument that the permit issued potentially violates the rights of adjacent property owners by allowing subsurface trespass to occur, U.S. EPA Region 5 n159 stated:

> The UIC program does not have authority to determine surface, mineral, or storage rights when issuing permit decisions. Issues relating to property ownership or lessee rights are legal issues between the permittee and property owners. Under federal UIC regulation, a permittee is not required to demonstrate ownership or legal access to all properties, only that the operation of the well will not allow contaminants into a[n] [underground source of drinking water]. Issuance of a permit neither confers the right to trespass nor conveys property rights of any sort or any exclusive privilege; nor does it authorize any injury to persons or property, any invasion of other private rights, or any infringement of State or local law or regulations. This is the case with respect to all classes of wells, including those which inject CO[2] for permanent sequestration in an underground formation. n160

The Environmental Appeals Board affirmed Region 5's decision to deny review of the permit, and it denied the petitioners' motion for reconsideration on January 15, 2008. n161 Therefore, the grant of a permit from the EPA for the action of geologic carbon sequestration is not the equivalent of receiving a right to the pore space. n162 Furthermore, adjacent landowners are not precluded from bringing an action for subsurface trespass. n163 A project operator should be aware that the permit alone does not give a property right to the pore space. n164 Also, a project operator would want to be certain that it had obtained the right to the pore space from the appropriate party to avoid any liability for subsurface trespass. n165

As the EPA has no authority to determine property rights, states must resolve the issue of pore space ownership as one piece of comprehensive CCS regulation. n166 "With the exception of federal lands, the rules concerning mineral rights are largely governed by state law and differ significantly across [*87] jurisdictions." n167 South Dakota law would not determine whether federally owned or Indian owned mineral rights includes ownership of pore spaces. n168

B. SOUTH DAKOTA COMMON LAW

In South Dakota, "real property consists of land, that which is affixed to land, that which is incidental or appurtenant to land, and that which is immovable by law." n169 "Land is the solid material of the earth, whatever may be the ingredients of which it is composed, whether soil, rock, or other substance." n170 South Dakota is one of five

states that codified the principle that the owner of the land in fee "has the right to the surface and to everything permanently situated beneath or above it." n171 Thus, in the absence of a severance of mineral rights, a fee simple owner in South Dakota owns not only the surface but also that which lies beneath it, including the subsurface pore space. n172

1. Surface Owner v. Mineral Owner

Questions surrounding pore space ownership arise when the mineral estate has been severed from the surface estate. n173 Most jurisdictions have not yet determined whether the mineral or surface estate owner prevails, which determines who may grant sequestration rights. n174 The resolution of this issue also potentially determines who is entitled to compensation in the event of condemnation. n175 One way to resolve the question in South Dakota is to build on the state's existing subsurface law. n176 South Dakota does not have any case law specifically addressing ownership of subsurface pore space; n177 however, certain general principles of property law shed light on the matter. n178

[*88] First, severing a mineral interest from the surface creates two separate and distinct estates. n179 A severed estate creates pore space ownership issues because there may be more than one party from whom storage rights need to be obtained. n180 Next, South Dakota recognizes the reasonable use doctrine, which recognizes that a mineral developer has certain rights in order to enjoy her mineral estate:

> The mineral owner has the right to enter upon and make reasonable use of the surface for exploration and development of mineral deposits. A severed mineral interest normally includes development and executive rights, i.e., the right to drill or execute an oil and gas lease. n181

Of note is that only development and executive rights are specifically included. n182 Further, the court's language is elucidating: The mineral owner is only being allowed to *use* the surface. n183

Dicta from the South Dakota Supreme Court supports the proposition that the reasonable use doctrine extends to the subsurface in South Dakota. n184 While not specifically addressing the use of the subsurface or airspace, the South Dakota Supreme Court mentioned that a mineral owner may be liable for damages to resources below the surface, such as groundwater, in *Heikkila v. Carver.* n185 This would seem to imply that the mineral owner may be liable for groundwater damages, which are subsurface property rights, resulting from activities "not reasonably necessary to the object of the contract." n186 The Texas Supreme Court has specifically extended the reasonable use provision to the use of the subsurface and airspace of the land. n187 Professor Owen Anderson [*89] suggests this language indicates that ownership remains with the surface estate because the mineral owner only has a right "to *use* that which belongs to the surface owner." n188 While South Dakota case law is not clear on this issue, a valid argument in favor of the surface owner retaining ownership rights of the pore space can be made by extrapolating *Heikkila.* n189

In addition, most commentators looking at case law from around the nation suggest that surface owners, as opposed to mineral owners, prevail in pore space ownership disputes. n190 However, commentators also acknowledge that mineral owners have a valid interest, and many suggest it would be prudent for a potential purchaser to secure the rights from both estates. n191 One commentator explains:

> This approach is recommended because, although the surface owner is likely to be the owner of the pore space in most jurisdictions, the mineral estate is the dominant estate, which grants the mineral owner the right to use the surface or subsurface in a manner reasonably necessary to explore for minerals. Further, the mineral estate survives as long as there remain minerals to be extracted. n192

South Dakota recognizes the mineral estate as dominant. n193 Therefore, the cautious approach would be to obtain permission for sequestering carbon dioxide from both the surface and the mineral owner in South Dakota. n194

2. Obtaining Storage Rights

If a mineral or surface owner is unwilling to sell its storage rights, eminent domain n195 and unitization n196 laws present options for geologic sequestration project operators to obtain the requisite storage rights. n197 For example, the Natural Gas Act of 1938 n198 provides for the acquisition of underground storage [*90] rights through the power of eminent domain for the storage of natural gas. n199 Similar legislation could provide for the acquisition of underground storage rights through the power of eminent domain for sequestration purposes. n200

"If a party seeking to sequester CO[2] had the power of eminent domain, then no 'owner,' whether surface or mineral, would be able to prevent a sequestration project." n201 This "solution" still begs the question of who is entitled to compensation. n202 As stated above, according to most commentators, the answer favors the surface owner. n203 Yet, condemnation can come at a high cost and is a politically sensitive issue. n204 Therefore, some jurisdictions may not be receptive to its use for acquisition of subsurface storage for carbon dioxide. n205

In South Dakota, the Board of Minerals and Environment considers applications for unitization. n206 Unitization allows an oil and gas field to be treated like a unit so that individual property owners can share in proceeds from resource recovery. n207 The Board of Minerals and Environment also has the authority to order compulsory unitization of tracts. n208 In order for the Board to issue a unitization order, 60% of the royalty owners and 60% of the working interest owners must approve. n209 In this way, the Board has a duty to protect the correlative rights of all persons with a legal interest in the substance or substances in question. n210 However, the primary duty of the Board in such a situation is to prevent waste of the oil and gas operations. n211

The only site surveyed for potential use as a carbon sequestration site in South Dakota to date is Buffalo Field. n212 As this is an oil-producing site, South Dakota unitization laws could be adapted to obtain ownership rights of the pore space. n213 An agency, like the Board of Minerals and Environment, if authorized, could approve unitization of the pore space for the purpose of carbon sequestration. n214

[*91] C. LEGISLATIVE DECLARATIONS

Commentators on pore space ownership in other jurisdictions have predominantly suggested that the surface estate owner, as opposed to the mineral estate owner, owns the pore space. n215 However, South Dakota case law is not well developed on the issue. n216 In fact, the issue of which interest holder owns the pore space has not been conclusively settled in any jurisdiction short of the legislature of a given state making a declaration as to whether the mineral estate or the surface estate prevails. n217 States surrounding South Dakota have settled the issue of pore space ownership through legislative declarations. n218 As no case law in South Dakota specifically settles the question of pore space ownership, a clear declaration from the South Dakota Legislature may best settle the issue. n219

[*92] *1. Statutes by State*

The legislatures of Montana, North Dakota, and Wyoming have passed comprehensive regulation for CCS, each of which specifically designates the surface estate as the owner of the pore space in the event that the subsurface or mineral estate has been severed from the surface estate. n220 Thus, one way for South Dakota to resolve the issue of ownership of pore space is to mirror or adapt the regulation of surrounding states. n221 This may make even more sense given that South Dakota is in partnership with Montana, North Dakota, and Wyoming through the Department of Energy regional carbon sequestration partnerships. n222

The IOGCC Task Force n223 has drafted a model framework for states to regulate carbon capture and storage. n224 An assessment of subsurface property rights provided with the model legislation states:

> . . . [Geological sequestration] statutes and rules would best serve the public by clearly declaring that [geological sequestration] is an important activity for the public interest, clearly identifying the *surface owner* as the person with the right to lease pore space for storage, while protecting other stakeholders from potential damage attributable to sequestration activities. n225

Montana, North Dakota, and Wyoming have each used the IOGCC Task Force work in developing a legal and regulatory framework for geological sequestration. n226

[*93] *2. Wyoming*

Wyoming became the first state to enact comprehensive carbon sequestration legislation in March 2008. n227 Wyoming law provides that the owner of the surface estate owns the pore space beneath the surface estate. n228 The statute handles conveyances as follows:

> A conveyance of the surface ownership of real property shall be a conveyance of the pore space in all strata below the surface of such real property unless the ownership interest in such pore space previously has been severed from the surface ownership or is explicitly excluded in the conveyance. The ownership of pore space in strata may be conveyed in the manner provided by law for the transfer of mineral interests in real property. No agreement conveying mineral or other interests underlying the surface shall act to convey ownership of any pore space in the stratum unless the agreement explicitly conveys that ownership interest. n229

Therefore, ownership of the pore space remains with the surface estate unless explicitly excluded or conveyed. n230 Severing the pore space from the surface estate is not prohibited as long as it is done in compliance with the statute. n231 Wyoming common law regarding rights and status of the mineral estate as the dominant estate remains unchanged. n232 Obtaining consent from the pore space owners is not a requirement for the project operator to receive a permit for the geological sequestration of carbon dioxide. n233 However, any plan for unitization of the unit area must be approved by individuals owning at least 80% of the pore space storage capacity. n234 The Wyoming Oil and Gas Conservation Commission has the authority to reduce the percentage to 75% upon application when certain requirements are met. n235

The Wyoming Department of Environmental Quality administers the state's [*94] carbon sequestration program. n236 However, enhanced recovery projects are not subject to the provisions for permanent storage of carbon dioxide, and jurisdiction over enhanced recovery projects remains with the Wyoming Oil and Gas Conservation Commission. n237 If the project operator wishes to convert from an enhanced recovery project to a storage project, jurisdiction shifts from the Wyoming Oil and Gas Conservation Commission to the Department of Environmental Quality. n238

3. North Dakota

In 2009, the North Dakota Legislature added a chapter on subsurface pore space policy to the North Dakota Century Code. n239 This chapter specifically provides that "title to pore space in all strata underlying the surface of lands and waters is vested in the owner of the overlying surface estate." n240 A conveyance of title to the surface of real property also conveys the pore space beneath. n241 Unlike the Wyoming provision, severing the pore space from the surface estate is prohibited under North Dakota law. n242 However, leasing is not considered a severance, and is therefore not prohibited. n243

The common law between surface and mineral estate owners remains unchanged, and the mineral estate retains its dominant status. n244 The stated policy for this chapter is codified at § 47-31-01, which states, "undivided estates in land and clarity in land titles reduce litigation, enhance comprehensive management, and promote the security and stability useful for economic development, environmental protection, and government operations." n245

In 2009, the North Dakota Legislature also passed Senate Bill 2095, an act relating to the geologic storage of carbon dioxide. n246 North Dakota's enactment begins by stating, "it is in the public interest to promote the geologic storage of carbon dioxide" and goes on to give reasons why this is so: n247

> Doing so will benefit the state and the global environment by reducing greenhouse gas emissions. Doing so will help ensure the viability of the state's coal and power industries, to the economic benefit of North

> Dakota and its citizens. Further, geologic storage of carbon dioxide, a potentially valuable commodity, may allow for its ready availability if needed for [*95] commercial, industrial, or other uses, including enhanced recovery of oil, gas, and other minerals. n248

These reasons reflect how the development of carbon capture and storage can benefit both the environment and the economy. n249

For a storage operator to obtain a permit to sequester carbon dioxide in North Dakota, it must obtain the consent of at least 60% of the persons who own the storage reservoir's pore space. n250 If the operator does not obtain the requisite percentage of consenting landowners, "the commission may require that the pore space owned by nonconsenting owners be included in a storage facility and subject to geologic storage." n251 The nonconsenting owners must be equitably compensated for the taking of their underground storage space. n252 The Industrial Commission oversees the regulation of North Dakota's carbon sequestration program. n253

In addition, North Dakota law goes beyond Wyoming's provisions by establishing a scheme for liability. n254 The storage operator holds title to the sequestered carbon dioxide while the facility is in operation, and during this time, "the operator is liable for any damage the carbon dioxide may cause, including damage caused by carbon dioxide that escapes from the storage facility." n255 After a storage operator has ceased injecting carbon dioxide into the storage space and has applied to the Industrial Commission for a certificate of project completion, the Commission can only issue the certificate after public notice and hearing and after consulting with the North Dakota State Department of Health. n256 Injection of carbon dioxide must have ceased for at least ten years for the Commission to issue the certificate of completion. n257 Upon issuance of a certificate, title to the storage facility and stored carbon dioxide transfers to the state and the project operator is released "from all regulatory requirements associated with the storage facility." n258

4. Montana

During the 2009 legislative session, Montana passed SB 498, which established regulations for carbon capture and storage in Montana. n259 However, [*96] SB 498 does not become effective until the Montana Board of Oil and Gas Conservation is granted primacy under the Underground Injection Control program of the Safe Drinking Water Act for carbon dioxide sequestration wells. n260

Senate Bill 498 establishes that the surface owner has ownership rights of the pore space for geologic sequestration in the absence of express language otherwise. n261 However, the bill also protects any mineral owners' rights to drill near a storage reservoir to explore for and develop minerals, "provided that the drilling, production, and related activities comply with board requirements that preserve the storage reservoir's integrity[.]" n262 Montana's common law regarding surface and mineral rights remains untouched under this bill. n263 Senate Bill 498 is silent as to whether pore space ownership may be severed from the surface estate. n264

The Montana bill, like the North Dakota provisions, expands on the Wyoming provisions by establishing a scheme for liability. n265 The operator of the project is liable for the operation and management of the injection well, the geologic storage reservoir, and the carbon dioxide until a certificate of project completion is issued. n266 At this point, title to the stored carbon dioxide and geologic storage reservoir transfers to the state. n267 In this way, project operators are protected from never ending liability, and local residents may still hold someone accountable if the company later disappears. n268 The Montana bill provides that the certificate may not be issued until at least fifteen years after carbon dioxide injection ends. n269

[*97] *5. Other Surrounding State Initiatives*

Other states surrounding South Dakota are addressing carbon sequestration, whether geological or biological, by passing legislation that encourages development of projects or that quantifies sequestration potential in order to facilitate participation in carbon trading systems. n270 Iowa has created a fund designed to spur the development of

technologies reducing greenhouse gas emissions, which specifically includes carbon sequestration projects. n271 Minnesota provides that "innovative energy projects" n272 "shall make a good faith effort to obtain funding from the United States Department of Energy and the United States Department of Agriculture to conduct a demonstration project at the facility for either geologic or terrestrial carbon sequestration projects to achieve reductions in facility emissions or carbon dioxide." n273 Nebraska created a Carbon Sequestration Advisory Committee to quantify carbon sequestration on agricultural land in order to enhance "the state's agricultural landowners' ability to participate in systems of carbon or greenhouse gas emissions marketing or trading. n274

IV. CONCLUSION

Carbon capture and storage is a potential area for development that the South Dakota Legislature has yet to address. In order to facilitate development of the state's subsurface storage space, it is important for South Dakota to provide clear regulation for developers with regard to how property rights will be recognized, protected, and acquired. Comprehensive regulation for carbon capture and storage raises many questions, and ownership of the pore space used to store the sequestered carbon dioxide is only one piece of the puzzle. However, pore space ownership is a critical piece of the puzzle. Because of the lack of case law in the jurisdiction regarding pore space ownership, a declaration from the South Dakota Legislature on ownership of pore space is likely the best way to achieve clarity on the issue. Most commentators and the states surrounding South Dakota that have addressed the issue are in favor of the [*98] surface estate owning the pore space. South Dakota should also consider designating the surface estate as the owner of the pore space. This promotes uniformity between South Dakota and North Dakota, Wyoming, and Montana, simplifies regulation of storage projects crossing state lines, and creates a new, valuable use of land in South Dakota.

Legal Topics:

For related research and practice materials, see the following legal topics:
Energy & Utilities LawNuclear Power IndustryGeneral OverviewEnergy & Utilities LawOil, Gas & Mineral InterestsSurface Use InterestsEnvironmental LawClimate Change

FOOTNOTES:

n1 David J. Hayes & Joel C. Beauvais, *Carbon Sequestration, in* GLOBAL CLIMATE CHANGE AND U.S. LAW 691, 692 (Michael B. Gerrard ed., 2007).

n2 Larry Nettles & Mary Conner, *Carbon Dioxide Sequestration -- Transportation, Storage, and Other Infrastructure Issues,* 4 TEX. J. OIL GAS & ENERGY L. 27, 27-28 (2008-2009).

n3 The following is a useful explanation of how a cap-and-trade system works:

Cap-and-trade systems set an overall cap on the amount of a given pollutant that can be emitted during a specified period of time. They then allocate portions of that cap to the various emitters so that the sum of these allocations equals the cap. These allocations take the form of "allowances," which are essentially permits to emit a given amount of pollution. Cap-and-trade programs require that at [the] end of a specified compliance period, each facility must hold the rights to enough allowances to cover its emissions for that period. Facilities can meet this requirement by reducing their emissions to the level of their allocation. Or, they can purchase emission permits from other sources that have reduced their emissions below their own allocation and so have excess

allowances to sell. Sources that can figure out how to decrease their emissions cheaply will usually reduce to a level below their allocation so that they can sell their excess allowances for a profit. Sources that find it expensive to make reductions usually purchase allowances so that they do not have to reduce themselves. The net result is that the lower-cost reducers end up making the majority of the reductions. This enables society to achieve its emissions reduction goal (the cap) at a much lower cost than if every facility had to reduce equally.

Dennis Hirsch, et al., *Emissions Trading -- Practical Aspects, in* GLOBAL CLIMATE CHANGE AND U.S. LAW 627, 629-30 (Michael B. Gerrard ed., 2007).

n4 *See* American Clean Energy and Security Act of 2009, H.R. 2454, 111th Cong. § 311 (2009).

n5 Donna M. Attanasio, *Surveying the Risks of Carbon Dioxide: Geological Sequestration and Storage Projects in the United States,* 39 Envtl. L. Rep. News & Analysis 10376, 10376-77 (2009) (citing Proposal for a Directive of the European Parliament and of the Council on the Geologic Storage of Carbon Dioxide and Amending Council Directives 85/337/EEC, 96/61/EC, Directives 2000/60/EC, 2001/80/EC, 2004/35/EC, 2006/12/EC and Regulation (EC) no 1013/2006, COM(08)18 final at 2). "For example, a 2008 European Union (EU) report asserted: '[W]e cannot reduce EU or world CO[2] emissions by 50% in 2050 if we do not also use the possibility to capture CO[2] from industrial installations and store it in geologic formations . . . .'" *Id. See infra* note 99 and accompanying text.

n6 Electric Power Research Institute, *Electricity Technology in a Carbon-Constrained Future* 16 (Feb. 2007), *available at* http://mydocs.epri.com/docs/CorporateDocuments/Newsroom/EPRIUSElect SectorCO2Impacts021507.pdf.

n7 *See supra* text accompanying notes 4-6.

n8 *See infra* Part II.E.

n9 *See infra* Part II.E.

n10 *See infra* Part II.D.

n11 *See infra* Part II.E.

n12 *See infra* Part III.

n13 *See generally* INTERSTATE OIL & GAS COMPACT COMMISSION (IOGCC) TASK FORCE ON CARBON CAPTURE AND GEOLOGIC STORAGE, CO[2] STORAGE: A LEGAL AND REGULATORY GUIDE FOR STATES (2007) [hereinafter IOGCC LEGAL AND REGULATORY GUIDE], *available at* http://iogcc.publishpath.com/Websites/iogcc/pdfs/Road-to-a-Greener-Energy-Future.pdf; *but cf.* Attanasio, *supra* note 5, at 10388 (stating that CCS projects suggest a need "for a high degree of uniformity with respect to CO[2] products and the process of sequestration" at an interstate and international level and asserting that proceeding on a state-by-state or region-by-region basis does not help investors).

n14 Owen L. Anderson, *Geologic CO[2] Sequestration: Who Owns the Pore Space? 9 WYO. L. REV. 97, 99 (2009).*

n15 *Id.*

n16 Elizabeth J. Wilson & Mark A. de Figueirdo, *Geologic Carbon Dioxide Sequestration: An Analysis of Subsurface Property Law, 36 Envtl. L. Rep. (Envtl. Law Inst.) 10114, 10116 (2006)* ("With the exception of federal lands, the rules concerning mineral rights are largely governed by state law and differ significantly across jurisdictions."); Hayes & Beauvais, *supra* note 1, at 719 (stating that property rights in the United States are primarily a matter of state law and may vary significantly from state to state).

n17 Anderson, *supra* note 14, at 98.

n18 *See id.* at 108.

n19 *See* Nettles & Conner, *supra* note 2, at 45. "For a carbon sequestration project to be feasible, a clarification of property rights is essential." *Id.*

n20 *See infra* Parts II, III.

n21 *See infra* Part II.

n22 *See infra* Parts II.D, II.E.

n23 *See infra* Part II.F.

n24 *See infra* Part III.B.

n25 *See infra* Part III.C.

n26 *See infra* Part IV.

n27 *See* Nettles & Conner, *supra* note 2, at 28.

n28 Intergovernmental Panel on Climate Change, *Summary for Policymakers, in* CLIMATE CHANGE 2007: THE PHYSICAL SCIENCE BASIS. CONTRIBUTION OF WORKING GROUP I TO THE FOURTH ASSESSMENT REPORT OF THE INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE 5 (Solomon, S. et.al, eds., Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA) [hereinafter IPCC Summary].

n29 *Id.*

n30 *Id.*

n31 Press Release, Envtl. Prot. Agency, EPA Finds Greenhouse Gases Pose Threat to Public Health, Welfare/ Proposed Finding Comes in Response to 2007 Supreme Court Ruling (April 17, 2009), *available at* http://yosemite.epa.gov/opa/admpress.nsf/0/0EF7DF675805295D8525759B00566924.

n32 *549 U.S. 497 (2007).*

n33 *Id. at 534-35.*

n34 *See* Press Release, Envtl. Prot. Agency, *supra* note 31.

n35 *Id.*

n36 *Id.*

n37 *Id.*

n38 Massachusetts Institute of Technology, THE FUTURE OF COAL: OPTIONS FOR A CARBON CONSTRAINED WORLD 1 (2007) [hereinafter MIT STUDY], *available at* http://web.mit.edu/coal; *see also* Wilson & de Figueirdo, *supra* note 16, at 10114 (stating that concern in the international community over rising concentrations of atmospheric carbon dioxide is growing the political impetus for mitigating carbon dioxide emissions).

n39 IOGCC LEGAL AND REGULATORY GUIDE, *supra* note 13, at 13.

n40 *Id.*

n41 Hayes & Beauvais, *supra* note 1, at 691.

n42 *See infra* text accompanying note 49.

n43 Hayes & Beauvais, *supra* note 1, at 691.

n44 *Id.* at 692.

n45 *Id.* at 691. Catherine Redgwell, *International Legal Responses to the Challenges of a Lower-Carbon Future: Climate Change, Carbon Capture and Storage, and Biofuels, in* BEYOND THE CARBON ECONOMY: ENERGY LAW IN TRANSITION 85, 86 (Donald N. Zillman ed., 2008).

n46 Redgwell, *supra* note 45, at 86.

n47 Hayes & Beauvais, *supra* note 1, at 691; Nettles & Conner, *supra* note 2, at 53.

n48 Fed. Requirements Under the Underground Injection Control (UIC) Program for Carbon Dioxide (CO[2]) Geologic Sequestration (GS) Wells, *73 Fed. Reg. 43492, 43493* (proposed July 25, 2008) (to be codified at 40 C.F.R. pts. 144 and 146) [hereinafter Fed. UIC Requirements for CO[2] Wells].

n49 *Id. at 43493-94.*

n50 Les Lo Baugh & William L. Troutman, *Assessing the Challenges of Geologic Carbon Capture and Sequestration: A California Guide to the Cost of Reducing CO[2] Emissions, 9 SUSTAINABLE DEV. L. & POL'Y 16 (Winter 2009);* Wilson & de Figueiredo, *supra* note 16, at 10118-19.

n51 Wilson & de Figueiredo, *supra* note 16, at 10118. "Many early [geological sequestration] projects will probably be linked to CO[2]- EOR; however, the fundamental goal of EOR is not to sequester CO2, and a fair amount of injected CO[2] is produced with the pumped oil." *Id.* at 10119. "Additionally, the laws, property rights, statutes, and regulations that specifically govern oil and gas production may not apply to [geological storage] injection into saline aquifers without hydrocarbon resources." *Id.*

n52 U.S. Envtl. Prot. Agency, *Geological Sequestration of Carbon Dioxide,* http://www.epa.gov/safewater/uic/wells_sequestration.html (last visited Aug. 24, 2009).

n53 IOGCC LEGAL AND REGULATORY GUIDE, *supra* note 13, at 27.

n54 *Id.* "It's possible that at the time CO[2] [enhanced oil recovery] ceases and storage begins, the subsurface rights necessary for storage might need to be acquired, if they had not already been acquired at the beginning of the project." *Id.*

n55 *See generally* Nettles & Conner, *supra* note 2, at 30-34.

n56 For a discussion of capture technology, *see* Hayes & Beauvais, *supra* note 1, at 707-10.

n57 For a discussion of issues with transportation, *see id.* at 710.

n58 For a detailed description of storage structure, *see id.* at 710-12.

n59 Nigel Bankes and Martha Roggenkamp, *Legal Aspects of Carbon Capture and Storage, in* BEYOND THE CARBON ECONOMY: ENERGY LAW IN TRANSITION 345-48 (Donald N. Zillman ed., 2008).

n60 *See* Hayes & Beauvais, *supra* note 1, at 707.

n61 Posting of David Biello to Scientific American 60-Second Science Blog, *Carbon capture success in Wisconsin, available at* http://www.scientificamerican.com/blog/60-second-science/post.cfm?id=carbon-capture-success-in-wisconsin-2009-05-20 (May 20, 2009, 04:20 EST).

n62 *See* Hayes & Beauvais, *supra* note 1, at 707-08.

n63 Nettles & Connor, *supra* note 2, at 30.

n64 *See supra* text accompanying note 59.

n65 *See* Hayes & Beauvais, *supra* note 1, at 707.

n66 Bankes & Roggenkamp, *supra* note 59, at 345-46.

n67 MIT STUDY, *supra* note 38, at 58. "Transport costs can be lowered through the development of pipeline networks as opposed to dedicated pipes between a given source and sink." *Id.*

n68 *See supra* text accompanying note 59. Geologic storage sites may be located onshore or offshore, and the United States has access to both. Bankes & Roggenkamp, *supra* note 59, at 340. For a discussion of legal issues relating to offshore geological and ocean storage, *see* Hayes & Beauvais, *supra* note 1, at 720-24.

n69 Hayes & Beauvais, *supra* note 1, at 711.

n70 *Id.*

n71 MIT STUDY, *supra* note 38, at 44.

n72 Hayes & Beauvais, *supra* note 1, at 711.

n73 *See id.* at 711-12.

n74 MIT STUDY, *supra* note 38, at 44.

n75 *Id.*

n76 Bankes & Roggenkamp, *supra* note 59, at 348.

n77 *Id.*

n78 *Id.*

n79 *Id.* at 349.

n80 *Id.* Furthermore, a large, rapid release of carbon dioxide can cause asphyxiation. *See* Fed. UIC Requirements for CO[2] Wells, *supra* note 48, at 43498. During a sudden lake turnover known as a limnic eruption, Lake Nyos and Lake Monoun in Cameroon released large amounts of built up carbon dioxide. *Id.* The release events asphyxiated thousands of people and thousands of others suffered toxic gas burns. Attanasio, *supra* note 5, at 10386. "EPA's 'minimal' risk assessment appears rooted in its observation that the unusually high concentration of CO2 released over a short period was a direct result of the oddity of a sudden lake turnover, whereas a leak through rock or soil would be more diffuse." *Id.* (citing Federal Requirements Under the Underground Injection Control (UIC) Program for Carbon Dioxide (CO[2]) Geologic Sequestration (GS) Wells, Proposed Rule, *73 Fed. Reg. 43492, 43494* (July 25, 2008)).

n81 Bankes & Roggenkamp, *supra* note 59, at 349.

n82 MIT STUDY, *supra* note 38, at 44 (citing Intergovernmental Panel on Climate Change, IPCC Special Report on Carbon Dioxide Capture and Storage, 2005, Interlachen, http://www.ipcc.ch/). The MIT study

explains how the carbon dioxide becomes less mobile over time:

Once in the pore, over a period of tens to hundreds of years, the CO[2] will *dissolve* into other pore fluids, including hydrocarbon species (oil and gas) or brines, where the CO[2] is fixed indefinitely, unless other processes intervene. Over longer time scales (hundreds to thousands of years) the dissolved CO[2] may react with minerals in the rock volume to *precipitate* the CO[2] as new carbonate minerals. Finally, in the case of organic mineral frameworks such as coals, the CO[2] will physically *adsorb* onto the rock surface, sometimes displacing other gases (e.g., methane, nitrogen).

Id.

n83 *Id.* at 48. The three major projects in existence today are Sleipner in Norway, Weyburn in Canada, and In Salah in Algeria. *Id.*

n84 *Id.* at 43.

n85 *Id.* at 45-46.

n86 *Id.* at 46. *See also infra* Part II.E.

n87 MIT STUDY, *supra* note 38, at 46.

n88 *Id.* at 43-47. In addition, studies at scale need to be done to examine crustal responses to injection of large volumes of carbon dioxide. *Id.* at 52.

n89 *See* Hayes & Beauvais, *supra* note 1, at 691.

n90 *Id.*

n91 *See* Natural Res. Def. Council, *Return Carbon to the Ground: Reducing Global Warming Pollution and Enhancing Oil Recovery* (June 2006), *available at* http://www.nrdc.org/globalWarming/coal/return.pdf; *Accord, Testimony before the H. Subcomm. on Energy and Air Quality Comm. on Energy and Commerce, Hearing on Carbon Capture and Sequestration,* 110th Cong. (March 6, 2007) (statement of David G. Hawkins, Director, Climate Center, Natural Res. Def. Council) (advocating for rapid deployment of capture and disposal systems for sources using coal), *available at* http://docs.nrdc.org/globalWarming/files/glo_07030601a.pdf; *but see* Press Release, Greenpeace, Carbon Dioxide Capture and Storage (CCS) and Coal-Fired Power (Oct. 19, 2007),

available at http://www.greenpeace.org/raw/content/international/press/reports/CCS-briefing.pdf (stating opposition to CCS because it diverts funds from renewable energy projects and because of "uncertainties surrounding the effectiveness, regulatory, liability and environmental impacts of CCS").

n92 Anderson, *supra* note 14, at 98 (quoting THE PETROLEUM ECONOMIST, LTD., FUNDAMENTALS OF CARBON CAPTURE AND STORAGE TECHNOLOGY 8-9 (Tom Nicholls ed. 2007)).

n93 American Clean Energy and Security Act of 2009, H.R. 2454, 111th Cong. (2009).

n94 *See id.* § 111.

n95 *See id.* § 112.

n96 *See id.*

n97 *Id.*

n98 *See infra* Part II.F.

n99 American Clean Energy and Security Act of 2009, H.R. 2454, 111th Cong. § 311 (2009).

n100 *See supra* note 5. Furthermore, as the costs associated with carbon dioxide emissions increase, so too does the allure of CCS. *See* Bankes & Roggenkamp, *supra* note 59, at 344-45.

n101 John M. Broder, *E.P.A. Moves to Curtail Greenhouse Gas Emissions,* N.Y. TIMES, Oct. 1, 2009, at A1. "The proposed rules, which could take effect as early as 2011, would place the greatest burden on 400 power plants, new ones and those undergoing substantial renovation, by requiring them to prove that they have applied the best available technology to reduce emissions or face penalties." *Id.* Of note is that all four Republican gubernatiorial candidates in South Dakota believe a cap and trade plan would be bad for the state. John Ellis, *United Against Cap and Trade,* SIOUX FALLS ARGUS LEADER, Nov. 2, 2009, at 3A. Supporters of the plan say the promotion of alternative energy industries, including wind, would be good for South Dakota. *Id.*

n102 *See generally* Attanasio, *supra* note 5.

n103 *See* Nettles & Conner, *supra* note 2, at 29 (citing Energy Independence and Security Act of 2007, *42 U.S.C.A. § 16293* (West 2008)).

n104 Attanasio, *supra* note 5, at 10377 (citing Emergency Economic Stabilization Act of 2008, Division B, § 115(a), Pub. L. No. 110-343, *122 Stat. 3765, 3829-31* (amending the tax code to add § 45Q)). "The credit was modified by the American Recovery and Reinvestment Act of 2009 to specify that CO[2] that is used for enhanced oil recovery must remain permanently sequestered to qualify for the credit." *Id.* at 10377 n.12.

n105 *Id.* at 10377-78 (citing Emergency Economic Stabilization Act of 2008, Division B, § 111(c)(3)(C), Pub. L. No. 110-343, *122 Stat. 3765, 3829-31* (amending § 48A of the tax code)).

n106 *Id.* (citing American Recovery and Reinvestment Act of 2009, Division B, § 1302, Pub. L. No. 111-5, *123 Stat. 115, 345-48* (amending the tax code to add § 48C)).

n107 Press Release, Dep't of Energy, Departmentt of Energy Awards $ 20 Million for Project to Advance Industrial Carbon Capture and Storage (August 10, 2009), *available at* http://fossil.energy.gov/news/techlines/2009/09055-DOE_Announces_Ramgen_Power_Systems.html.

n108 *See supra* text accompanying notes 93-107.

n109 U.S. DEP'T OF ENERGY (DOE), OFFICE OF FOSSIL ENERGY, NAT'L ENERGY TECH. LAB., 2008 CARBON SEQUESTRATION ATLAS OF THE U.S. AND CANADA 30 (2008) [hereinafter DOE ATLAS], *available at* http://www.netl.doe.gov/technologies/carbon_seq/refshelf/atlasII/atlasII.pdf.

n110 Bankes & Roggenkamp, *supra* note 59, at 343.

n111 U.S. Dep't of Energy, *Carbon Sequestration Regional Partnerships,* http://fossil.energy.gov/sequestration/partnerships/index.html (last visited Nov. 8, 2009).

n112 Bankes & Roggenkamp, *supra* note 59, at 343.

n113 DOE ATLAS, *supra* note 109, at 30.

n114 *Id.* at 31.

n115 *Id.* at 32.

n116 *Id.* at 31.

n117 *Id.*

n118 *In re* Otter Tail Power Co. on behalf of *Big Stone II, 2008 SD 5, P 1, 744 N.W.2d 594, 596.* The facility would be located next to Big Stone I, an older facility. *Id. at P 5.* Recently, Big Stone II announced that Otter Tail Power Company has withdrawn from the project. Press Release, Big Stone II, Big Stone II Announces Participant Changes (Sept. 11, 2009), *available at* http://www.bigstoneii.com/NewsMedia/PDF/NewsRelease_BSP2_ParticipantChangesOTPwithdraws.pdf. The remaining Big Stone II participants are Central Minnesota Municipal Power Agency, Heartland Consumers Power District, Missouri River Energy Services, and Montana-Dakota Utilities Co. *Id.* They plan to move forward with Big Stone II "if sufficient participants can be found to join the project." *Id.*

n119 *In re Otter Tail Power Co., 2008 SD 5, P 18, 744 N.W.2d at 600.*

n120 Hyperion is an oil company from Texas that is considering Union County as a location for a power plant and oil-refining facility. S.D. Dep't of Env't and Natural Res., *Hyperion Energy Center -- Environmental Permits,* http://denr.sd.gov/hyperion.aspx (last visited Nov. 8, 2009).

n121 For documents regarding the Hyperion air quality permit, *see* S.D. Dep't of Env't and Natural Res., *Hyperion Energy Center -- Environmental Permits,* http://denr.sd.gov/hyperion.aspx (last visited Nov. 8, 2009).

n122 *See supra* text accompanying notes 118-21.

n123 *See supra* text accompanying note 62.

n124 DOE ATLAS, *supra* note 109, at 61. The Canadian provinces of Alberta, British Columbia, Manitoba, and Saskatchewan are also PCOR partners. *Id.*

n125 *Id.* at 68.

n126 Steven A. Smith et al., *Sequestration Potential of Petroleum Reservoirs in the Williston Basin* 1 (September 2005), *available at* http://www.undeerc.org/PCOR/newsandpubs/scireports.aspx.

n127 *Id.* at 17.

n128 *Id.* at 12.

n129 Interview with Derric Iles, State Geologist, South Dakota Geologic Survey, in Vermillion, S.D. (August 4, 2009).

n130 *Id.*

n131 *See supra* Part II.D.

n132 *See supra* text accompanying notes 126-29.

n133 *See* Nettles & Conner, *supra* note 2, at 45 (stating that "for a carbon sequestration project to be feasible, a clarification of property rights is essential").

n134 Fed. UIC Requirements for CO[2] Wells, *supra* note 48, at 43492.

n135 U.S. Envtl. Prot. Agency, *Geological Sequestration of Carbon Dioxide,* http://www.epa.gov/safewater/uic/wells_sequestration.html (last visited Nov. 8, 2009)

n136 *Id.*

n137 U.S. Envtl. Prot. Agency, *UIC Program Primacy,* http://www.epa.gov/safewater/uic/primacy.html#who (last visited Nov. 8, 2009).

n138 *40 C.F.R. § 144.6 (2008).*

n139 *Id.* § 144.6(a)

n140 *Id.* § 144.6(b)(1)-(3).

n141 *Id.* § 144.6(c).

n142 *Id.* § 144.6(d).

n143 *Id.* § 144.6(e).

n144 Fed. UIC Requirements for CO[2] Wells, *supra* note 48, at 43502.

n145 *Id.*

n146 *Id.*

n147 *Id.* at 43492.

n148 *Id.* at 43495.

n149 *See generally* IOGCC LEGAL AND REGULATORY GUIDE, *supra* note 13.

n150 *See* IOGCC LEGAL AND REGULATORY GUIDE, *supra* note 13, at 17 ("Perhaps the most important aspect of Texas law is that the question of pore space ownership is not clearly settled, highlighting the need for statutory and regulatory clarity.").

n151 Attanasio, *supra* note 5, at 10380.

n152 Wilson & de Figueiredo, *supra* note 16, at 10115.

n153 Nettles & Conner, *supra* note 2, at 45.

n154 *See supra* Part II.F.

n155 *See* Nettles & Conner, *supra* note 2, at 45 (stating that because property rights are governed by state law, pore space ownership will necessarily be jurisdiction-specific).

n156 *See* James R. McCurdy, *South Dakota Mineral Development: Ownership and Other Conflicting Rights,* 1981 Legal Inst.: Mineral Law for the Gen. Practitioner 5-1 (stating that in the context of mineral development, "initial issues of ownership are of crucial importance to mineral estate owners, energy development companies, surface estate owners, and all other parties involved in the development process"). This publication was sponsored by the State Bar of South Dakota Committee on Continuing Legal Education as part of a CLE program that was held June 25, 1981.

n157 *See In re Core Energy, LLC, UIC Appeal No. 07-02, 2007 WL 4472274* (E.A.B., December 20, 2007) (cited and discussed in Anderson, *supra* note 14, at 121).

n158 *See id.*

n159 EPA Region 5 encompasses the states of Illinois, Indiana, Michigan, Minnesota, Ohio, and Wisconsin. U.S. Envtl. Prot. Agency, *Region 5,* http://www.epa.gov/region5.

n160 *In re Core Energy, LLC, 2007 WL 4472274,* at *4.

n161 *In re Core Energy, LLC, UIC Appeal No. 07-02, 2008 WL 171617* (E.A.B., January 15, 2008).

n162 *In re Core Energy, LLC, 2007 WL 4472274,* at *4.

n163 *Id.*

n164 *See id.*

n165 *See id.*

n166 *See* Hayes & Beauvais, *supra* note 1, at 719 (stating that "property rights in the United States are primarily a matter of state law, and . . . may vary significantly from state to state").

n167 Wilson & de Figueirdo, *supra* note 16, at 10116; *see also* Hayes & Beauvais, *supra* note 1, at 719.

n168 *See* Anderson, *supra* note 14, at 137 (stating the same point with regard to Wyoming law). "Although no federal case law addresses pore-space ownership, limited reservations of minerals, such as the reservation of coal, is not likely to reserve pore spaces in the federal government." *Id.*

n169 McCurdy, *supra* note 156, at 5-7 (citing *S.D.C.L. § 43-1-3* (1967)).

n170 *S.D.C.L. § 43-1-4* (2008).

n171 John G. Sprankling, *Owning the Center of the Earth, 55 UCLA L. REV. 979, 1001-02* (April, 2008). Louisiana, Montana, North Dakota, and Oklahoma are the other states with such statutes. *Id.*

n172 *Broadhurst v. American Colloid Co., 177 N.W.2d 261, 267 (1970); but see* Sprankling, *supra* note 171, at 1002 (arguing that the statutory language is insufficiently clear as to how far down these rights truly extend). Pore space could not be included in the South Dakota definition of land as pore space is the absence of solid material. *See* text accompanying note 170. However, pore space should be included in "everything permanently situated beneath" land. *See* text accompanying note 171.

n173 Anderson, *supra* note 14, at 99.

n174 *Id.*

n175 *See id.* at 108.

n176 *See generally id.* (building on existing Texas subsurface law to conclude the surface owner prevails); *see also* IOGCC LEGAL AND REGULATORY GUIDE, *supra* note 13, at 15-19 (surveying a variety of state subsurface case law).

n177 *See infra* text accompanying notes 179, 181, 184-86.

n178 Anderson, *supra* note 14, at 99-102. University of Oklahoma College of Law Professor Owen Anderson outlines four general principles of Texas case law in concluding that the most likely owner of the pore space is the surface owner: (1) "[A] property right not expressly conveyed is retained, or conversely, a property right not expressly reserved is conveyed."; (2) "When a fee-simple owner transfers the mineral estate or transfers the surface estate, reserving minerals, two separate or severed estates in land are created."; (3) "Texas law recognizes the mineral estate as dominant over the surface estate . . . ."; and (4) "[A] regulatory agency with the power to authorize regulated activities, such as the Texas Railroad Commission, authorizing underground gas storage or saltwater disposal, has no authority to determine property rights." *Id.*

n179 *Broadhurst v. American Colloid Co., 177 N.W.2d 261, 265 (1970).*

n180 *See* Anderson, *supra* note 14, at 99.

n181 *Heikkila v. Carver, 416 N.W.2d 593, 596 (S.D. 1987)* (internal citations omitted).

n182 *See supra* text accompanying note 181. A California case, *Cassinos v. Union Oil Co. of Cal., 18 Cal. Rptr.2d 574 (1993),* provides a useful clarification of a surface owner's rights after a conveyance of mineral rights:

Surface owners typically own nearly all rights in the land except for the exclusive right to drill for and produce oil, gas and other hydrocarbons. The owners of the mineral estate, and their lessees, typically hold only the very limited right, analogous to an easement, to drill and capture subsurface oil and gas, and the incidental

rights necessary to accomplish this. Thus, under a typical oil and gas lease, the lessee generally obtains only a non-possessory interest in real property to capture such substances, which is in the nature of an easement.

Id. at 581.

n183 *See supra* text accompanying note 181.

n184 *See Heikkila, 416 N.W.2d at 596.*

n185 *Id.*

n186 *Id.*

n187 *Getty Oil Co. v. Jones, 470 S.W.2d 618, 621 (Tex. 1971).*

n188 Anderson, *supra* note 14, at 101 (emphasis in original).

n189 *See supra* text accompanying notes 179-88.

n190 Nettles & Conner, *supra* note 2, at 46; *see also infra* note 215.

n191 Nettles & Conner, *supra* note 2, at 46.

n192 *Id.*

n193 *See Heikkila v. Carver, 416 N.W.2d 593, 596 (1987)* (stating that "the mineral owner has the right to enter upon and make reasonable use of the surface for exploration and development of mineral deposits").

n194 Anderson, *supra* note 14, at 106-07.

n195 "Eminent domain" is defined as: "The inherent power of a governmental entity to take privately owned property, esp. land, and convert it to public use, subject to reasonable compensation for the taking." BLACK'S LAW DICTIONARY 444 (8th ed. 2005).

n196 "Unitization" is defined as: "The collection of producing wells over a reservoir for joint operations such as enhanced-recovery techniques." *Id.* at 1283. Unitization is essentially the concept of eminent domain as it applies to subsurface oil and gas reservoirs. *See* Nettles & Conner, *supra* note 2, at 47. However, "unlike condemnation, there is no court proceeding and, therefore, fewer complications and hurdles." *Id.*

n197 *Id.* at 46-47; *see also* Anderson, *supra* note 14, at 108.

n198 Natural Gas Act, ch. 556, § 7, *52 Stat. 821, 824-25 (1938)* (current version codified at *15 U.S.C. § 717f*(a) (2006)).

n199 Anderson, *supra* note 14, at 117.

n200 *Id.*

n201 *Id.* at 108.

n202 *Id.*

n203 *See supra* text accompanying note 190; Anderson, *supra* note 14, at 108; Wilson & Figueirdo, *supra* note 16, at 10123; IOGCC LEGAL AND REGULATORY GUIDE, *supra* note 13, at 22.

n204 Nettles & Conner, *supra* note 2, at 47.

n205 *Id.*

n206 *See S.D.C.L. § 45-9-31* (2008).

n207 Nettles & Conner, *supra* note 2, at 47.

n208 *S.D.C.L. § 45-9-38* (2008).

n209 *Id.* § 45-9-40. *See Koch Exploration Co., 387 N.W.2d 530, 535 (S.D. 1985)* (interpreting an older version of the same statute).

n210 *Id.*

n211 *Id.*

n212 Smith, *supra* note 126, at 12.

n213 *See supra* text accompanying notes 206-12.

n214 *See supra* text accompanying notes 206-12.

n215 IOGCC LEGAL AND REGULATORY GUIDE, *supra* note 13, at 22; Anderson, *supra* note 14, at 109 (examining Texas case law to conclude that the surface owner should prevail); Lo Baugh & Troutman, *supra* note 50, at 17 ("While no California court has explicitly vested pore space ownership in the surface owner of a severed estate for CCS purposes, absent legislative action or 'judicial activism,' it appears that the better argument is that pore space ownership resides with the surface owner and generally remains so even if mineral rights are severed."); Wilson & de Figueiredo, *supra* note 16, at 10123 ("In most of the case law explored here, the ownership of the subsurface pore space seems to rest with the owner of the surface estate."). *But see Williams & Meyers, 1 OIL & GAS LAW § 222*, at 335 (1998) (stating that the surface owner should not be entitled to compensation for storage of gas in an underground reservoir below their surface property "unless there is to be some user of the surface for injection or production wells or other surface installations").

n216 *See supra* Part III.B.1.

n217 *See* Lo Baugh & Troutman, *supra* note 50, at 17. Even in jurisdictions that have addressed pore space ownership, the answer is not clear. IOGCC LEGAL AND REGULATORY GUIDE, *supra* note 13, at 16. For example, Texas natural gas storage case law gives two conflicting results. *Id.* In *Mapco, Inc. v. Carter, 808 S.W.2d 262 (Tex. App. 1991), rev'd in part on other grounds, 817 S.W.2d 686 (Tex. 1991)*, the court determined

that the *mineral* owner was entitled to compensation for use of the subsurface storage area as opposed to the surface owner. However, in *Emeny v. U.S., 412 F.2d 1319 (Ct. Cl. 1969),* the court found in favor of the *surface* owner. Other ambiguities arise in other jurisdictions. IOGCC LEGAL AND REGULATORY GUIDE, *supra* note 13, at 17-19.

n218 *See infra* Part III.C.2-4; *but see* Anderson, *supra* note 14, at 137 (stating that "the Wyoming Supreme Court will likely have the last word regarding nonfederal and non-Indian lands").

n219 *See infra* Part III.C.1-4. The author proposes the following bill draft modeled after N.D. Century Code Chapter 47-31:

FOR AN ACT ENTITLED, An Act to provide for property rights relating to ownership of subsurface pore space.

BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF SOUTH DAKOTA:

Section 1. That chapter 43-16 be amended by adding thereto a NEW SECTION to read as follows:

In this chapter "pore space" means a cavity or void, whether natural or artificially created, in a subsurface sedimentary stratum.

Section 2. That chapter 43-16 be amended by adding thereto a NEW SECTION to read as follows:

Title to pore space in all strata underlying the surface of lands and waters is vested in the owner of the overlying surface estate.

Section 3. That chapter 43-16 be amended by adding thereto a NEW SECTION to read as follows:

A conveyance of title to the surface of real property conveys the pore space in all strata underlying the surface of the real property.

Section 4. That chapter 43-16 be amended by adding thereto a NEW SECTION to read as follows:

Title to pore space may not be severed from title to the surface of the real property overlying the pore space. A provision that seeks to sever title to pore space from title to the surface is void as to the severance of the pore space from the surface interest. Leasing pore space is not a severance.

Section 5. That chapter 43-16 be amended by adding thereto a NEW SECTION to read as follows:

This chapter does not affect transactions before the effective date of this section which severed pore space from title to the surface estate.

Section 6. That chapter 43-16 be amended by adding thereto a NEW SECTION to read as follows:

In the relationship between a severed mineral estate and a pore space estate, this chapter does not change or alter the common law as of the effective date of this section as it relates to the rights belonging to, or the dominance of, the mineral estate.

These provisions only address subsurface pore space policy; additional provisions would be necessary to provide for the permitting and operation of carbon sequestration projects.

n220 *See infra* Part III.C.1-4.

n221 *See infra* Part III.C.1-4.

n222 *See supra* Part II.E.

n223 The Task Force membership included representatives from IOGCC member states and international affiliate provinces, state and provincial oil and gas agencies, the U.S. Department of Energy (DOE), DOE-sponsored Regional Carbon Sequestration Partnerships, the Association of American State Geologists, and independent experts. The Task Force was funded by DOE and its National Energy Technology Laboratory (NETL). IOGCC LEGAL AND REGULATORY GUIDE, *supra* note 13, at 3.

n224 *See generally id.* It is worth noting that the Task Force treats carbon dioxide as a commodity rather than a waste. *Id.* at 4-5.

n225 *Id.* at 22 (emphasis added).

n226 IOGCC LEGAL AND REGULATORY GUIDE, *supra* note 13, at 10 (stating that North Dakota and Wyoming are "in various stages of developing a legal and regulatory framework for geological storage as a result of the work of the Task Force"); *see generally* ENERGY AND TELECOMMUNICATIONS INTERIM COMMITTEE, CARBON SEQUESTRATION STUDY, 2007-08 Interim, 61st Sess. (Mont. 2008), *available at* http://leg.mt.gov/content/Publications/committees/interim/2007_2008/2008carbonsequestration.pdf.

n227 Patricia E. Salkin, *Energy and Climate Change,* 4 Am. Law. Zoning § 37:6 (5th ed.).

n228 *WYO. STAT. ANN. § 34-1-152(a)* (2009).

n229 *Id.* § 34-1-152(b) (2009).

n230 *Id.*

n231 *Id.* By way of analogy, Wyoming is looking at the issue of severability of the right to develop wind resources from the surface estate. Matt Joyce, *As wind farm plans spread, Wyoming considers nature of wind rights,* BILLINGS GAZETTE, Oct. 4, 2009, at 1B (Wyoming edition only), *available at* http://www.billingsgazette.com/news/state-and-regional/wyoming/article_ec2dcedc-b0f4-11de-9aa2-001cc4c03286.html. There is concern that allowing the wind rights to be severed from the surface leaves the surface owner with all of the burden of the development and none of the benefit. *See id.* South Dakota does not allow wind rights to be severed from the surface estate, though these rights may be leased for a period of up to fifty years. *S.D.C.L. § 43-13-19* (2004). Analogously, South Dakota may want to prohibit severing pore space from the surface estate. *See supra* note 219.

n232 WYO. STAT. ANN. *Id.* § 34-1-152(e) (2009).

n233 *See id.* § 35-11-313 (listing permit requirements).

n234 *Id.* § 35-11-316(c).

n235 *Id.* § 35-11-316(e).

n236 *Id.* § 35-11-313(a); *see also id.* § 35-11-103(a)(i).

n237 *Id.* § 35-11-313(b).

n238 *Id.* § 35-11-313(c).

n239 N.D. CENT. CODE § 47-31 (Supp. 2009).

n240 *Id.* § 47-31-03.

n241 *Id.* § 47-31-04.

n242 *Id.* § 47-31-05.

n243 *Id.* § 47-31-06.

n244 *Id.* § 47-31-08.

n245 *Id.* § 47-31-01.

n246 Act of April 9, 2009, ch. 318, 2009 N.D. LAWS (S.B. 2095), *available at* http://www.legis.nd.gov/assembly/61-2009/session-laws/documents/MINE.pdf#CHAPTER318.

n247 *N.D. CENT. CODE § 38-22-01* (Supp. 2009).

n248 *Id.*

n249 *Id.*

n250 *Id.* § 38-22-08(5).

n251 *Id.* § 38-22-10.

n252 *Id.* § 38-22-08(14).

n253 *Id.* § 38-22-03; *see also id.* § 38-22-02(2).

n254 *See infra* text accompanying notes 255-58.

n255 *N.D. CENT. CODE § 38-22-16* (Supp. 2009).

n256 *Id.* § 38-22-17(1)-(3).

n257 *Id.* § 38-22-17(4).

n258 *Id.* § 38-22-17(6).

n259 Act of May 6, 2009, ch. 474, 2009 MONT. LAWS (S.B. 498), *available at* http://data.opi.mt.gov/bills/2009/billhtml/SB0498.htm. The bill does not apply to tribal lands in Montana unless the tribe adopts a carbon sequestration law and enters into an agreement with the state. *Id.* at § 1(2)(e). Interestingly, environmental groups in Montana were not in support of this bill because "the bill gives unchecked authority to the Board of Oil and Gas," EPA guidelines have not yet been finalized, and carbon sequestration is "a new, untested technology." Montana Environmental Information Center, *Vote NO on SB 498 Carbon Sequestration Bill, available at* http://www.meic.org/2009-legislature-1/fact-sheets/VOTE%20NO%20ON%20SB%20498.pdf.

n260 *Id.* at § 31. Recall that "primacy" is a term that means "primary enforcement responsibility." *See supra* text accompanying note 136.

n261 Act of May 6, 2009, ch. 474, 2009 MONT. LAWS (S.B. 498) § 1(3), *available at* http://data.opi.mt.gov/bills/2009/billhtml/SB0498.htm.

n262 *Id.* at § 1(1)(b).

n263 *Id.* at § 1(2)(a)

n264 *See generally* Act of May 6, 2009, ch. 474, 2009 MONT. LAWS (S.B. 498) § 1(3), *available at* http://data.opi.mt.gov/bills/2009/billhtml/SB0498.htm.

n265 *See infra* text accompanying notes 276-77.

n266 Act of May 6, 2009, ch. 474, 2009 MONT. LAWS (S.B. 498) § 3(1), *available at* http://data.opi.mt.gov/bills/2009/billhtml/SB0498.htm.

n267 *Id.* at Section 4. Daniel C. Vock, *States retooling laws to bury coal's CO[2]* (April 28, 2009), *available at* http://www.stateline.org/live/details/story?contentId=395692.

Giving the state eventual ownership was necessary to get companies to start using sequestration, said Rep. Mike Phillips (D), the bill's House sponsor. Without it, companies would worry about being forever liable for any damage the carbon dioxide might cause. And local residents might not get any protection at all if the company later disappears.

Id.

n268 *Id.*

n269 Act of May 6, 2009, ch. 474, 2009 MONT. LAWS (S.B. 498) § 4, *available at* http://data.opi.mt.gov/bills/2009/billhtml/SB0498.htm.

n270 *See infra* text accompanying notes 271-74.

n271 *IOWA CODE ANN. § 469.9* (Supp. 2009).

n272 "Innovative energy projects" means a facility:

that makes use of an innovative generation technology utilizing coal as a primary fuel in a highly efficient combined-cycle configuration with significantly reduced sulfur dioxide, nitrogen oxide, particulate, and mercury emissions from those of traditional technologies; (2) that the project developer or owner certifies is a project capable of offering a long-term supply contract at a hedged, predictable cost; and (3) that is designated by the commissioner of the Iron Range Resources and Rehabilitation Board as a project that is located in the taconite tax relief area on a site that has substantial real property with adequate infrastructure to support new or expanded development and that has received prior financial and other support from the board.

MINN. STAT. ANN. § 216B.1694, subd. 1 (Supp. 2009).

n273 *Id.* § 216B.1694, subd. 2(a)(6).

n274 *NEB. REV. STAT. ANN. §§ 2-5301*, 2-5302 (2001).

LEXSEE 9 WYO. L. REV. 97,AT 99

2009

9 Wyo. L. Rev. 97

LENGTH: 21715 words

LAND & WATER LAW DIVISION: ARTICLE: GEOLOGIC CO[2] SEQUESTRATION: WHO OWNS THE PORE SPACE?

NAME: Owen L. Anderson *

BIO:

* Eugene Kuntz Chair in Oil, Gas & Natural Resource at the University if Okalahoma College of Law(c). This essay was prepared for the 2008 Rudolph Lecture at the University of Wyoming College of Law, April 14, 2008, and has been updated to reflect the decision of the Texas Supreme Court in Coastal Oil & Gas Corp. v. Garza Energy Trust on August 29, 2008. Professor Anderson served as the E. George Rudolph Distinguished Visiting Chair of Law at the University of Wyoming College of Law during the spring semester of 2008. Professor Anderson thanks Ashleigh Boggs, second-year law student at The University of Oklahoma College of Law, for her valuable research assistance in preparing this paper. For a related article addressing geologic carbon sequestration in this edition, see Delissa Hayano, Guarding the Viability of Coal & Coal-Fired Power Plants: A Road Map for Wyoming's Cradle to Grave Regulation of Geologic CO[2] Sequestration, *9 WYO. L. REV. 139 (2009)* [below]. See also Philip M. Marston & Patricia A. Moore, From EOR to CCS: The Evolving Legal and Regulatory Framework for Carbon Capture and Storage, *29 ENERGY L.J. 421 (2008);* Steven Bryant, Geologic CO[2] Storage--Can the Oil and Gas Industry Help Save the Planet?, *54 ROCKY MTN. MIN. L. INST. 2-1 (2008);* Jerry R. Fish & Thomas R. Wood, Geologic Carbon Sequestration Property Rights and Regulation, *54 ROCKY MTN. MIN. L. INST. 3-1 (2008).*

LEXISNEXIS SUMMARY:

... The surface owners of tracts nearby a proposed non-hazardous-waste-disposal site challenged the issuance of the disposal permit, alleging that the agency acted beyond its authority and alleging a taking on the ground that the evidence indicated that, within ten years, the injected waste would likely reach the subsurface stratum beneath their property. ... Thus, regarding CO 2 sequestration that is not related to EOR, obtaining permission from both the surface and mineral owner is the cautious approach even though I conclude that the storage rights are most likely held by the surface owner. ... Nevertheless, if a neighboring landowner suffered actual damages either from CO 2 sequestration or from gas storage, a court would probably award damages on grounds of trespass, nuisance, or negligence, but most likely would not issue an injunction if the sequestration or injection were done under the auspices of a regulatory permit. ... More specifically, the Act provides as follows:

After an order of the commission is issued approving a storage facility, a storer may condemn without

further attack as to its right to condemn, any subsurface sand, stratum, or formation for the underground storage of natural gas, condemning all mineral and royalty rights as are reasonably necessary for the operation of the storage facility, subject to the limitations of this subchapter, and the storer may condemn any other interests in property that may be required, including interests in the surface estate in the sand, stratum, or formation reasonably necessary to the operation of the storage facility, provided that: (1) no part of a reservoir is subject to condemnation unless the storer has acquired by option, lease, conveyance, or other negotiated means at least 66-2/3 percent of the ownership of minerals, including working interests, and 66-2/3 percent of the ownership of the royalty interests, computed in relation to the surface area overlying the part of the reservoir which as found by the commission to be expected to be penetrated by displaced or injected gas; (2) no dwelling, barn, store, or other building is subject to condemnation; and (3) the right of condemnation is without prejudice to the rights of the owners or holders of other rights or interests of land to drill through the storage facility under such terms and conditions as the commission may prescribe . . . . When neighboring surface owners discovered that the waste was projected to reach their subsurface strata within 10 years of injection, they asserted that the agency was authorizing an impairment of their subsurface rights. ... Together, these two cases suggest that the surface owner has title to pore spaces, but the mineral owner has a right to use stratum for ongoing mineral operations.

TEXT:

[*97] I. INTRODUCTION

As scientific findings supporting global warming are increasingly embraced by society, government officials and carbon-producing industries face the challenge of how to lessen greenhouse-gas emissions. The energy industry, which is often blamed for global warming, offers an innovative potential remedy: geologic carbon-dioxide (CO[2]) sequestration--"the injection of CO[2] into deep ... geologic formations for the explicit purpose of avoiding atmospheric emission of CO[2]." n1

Currently, CO[2] is produced and sold for use in enhanced-oil-recovery projects (EOR). CO[2] is injected into oil-bearing strata to stimulate oil and gas production, n2 [*98] and the CO[2] that is produced with oil can be reinjected. n3 Incentives encourage the use of CO[2] for EOR purposes, including tax credits in Texas, but no incentives presently exist to sequester CO[2] underground. n4 Nevertheless, because using CO[2] for EOR is an established practice, "kit is very likely that initial [geologic sequestration] projects will be linked to EOR projects." n5

Geologic sequestration as a permanent waste-storage possibility involves injecting CO[2], in either gas or liquid form, into deep subterranean strata or caverns. The technology for geologic sequestration is "already adequate and will steadily improve," but one of the greatest impediments to successful implementation of sequestration is public acceptance, which will develop as the public becomes more aware of its advantages. n6 Also, federal and state governments must agree on a CO[2] sequestration regulatory policy that will encourage CO[2] emitters and entrepreneurs to undertake this expensive endeavor. n7 "There are no technical or physical barriers to [geologic sequestration]. . . . The only thing that stands in the way of progress at the moment is policy." n8 Of course, CO[2] sequestration must also be commercially viable, and commercial viability may, in part, depend on how the property-rights issues are resolved.

As geologic CO[2] sequestration projects gain momentum, property rights and related liability issues will be important concerns, as Texas courts have yet to sort out ownership and liability issues pertaining to the use of subsurface pore spaces for CO[2] sequestration and other uses--regarding both directly targeted tracts and tracts that may suffer CO[2] migration.

Section II of this essay discusses the ownership of subsurface pore space in Texas--an important inquiry to determine which property-interest holder has the sequestration rights. Section III briefly considers property-related liability issues regarding CO[2] injection and sequestration. Then, Section IV draws comparisons and conclusions

between the application of these legal principles and CO[2] sequestration. Appendix 1 provides a brief discussion of the ownership of stored CO[2] and the nature of a CO[2]-sequestration right. Appendix 2 provides a brief discussion of the laws of some other petroleum-producing jurisdictions.

[*99] II. OWNERSHIP OF THE PORE SPACE

When CO[2] is injected into the subsurface, the injector must either own or have permission from the owner of the subterranean pore space. Under the common-law maxim, *cujus est solum, ejus est usque ad et ad inferos*, a fee-simple owner of land owns the entire tract "from the heavens to the depths." Thus, a fee-simple owner owns the subterranean pore spaces. The question of pore-space ownership arises when the fee-simple interest is severed into a mineral estate and a surface estate. As between the surface owner and mineral owner, most jurisdictions, including Texas, have not specifically determined the ownership of subterranean pore spaces. Because of the lack of a definitive answer to the question of who may grant the right to store CO[2], the Interstate Oil and Gas Compact Commission Task Force on Carbon Capture and Geologic Storage stated in a September 2007 report: "Perhaps the most important aspect of Texas law is that the question of pore space ownership is not clearly settled, highlighting the need for statutory and regulatory clarity." n9

The lack of consistent Texas case law leads to the inefficient, yet realistic, conclusion that permission from both the surface owner and mineral owner is certainly the cautious approach. Nevertheless, I submit that the most likely "owner" of the pore space is the surface owner. I reach this conclusion based on four general principles:

First, a property right not expressly conveyed is retained, or conversely, a property right not expressly reserved is conveyed. n10

Second, when a fee-simple owner transfers the mineral estate or transfers the surface estate, reserving minerals, two separate or severed estates in land are created. n11

Accordingly, if Able, fee-simple owner of Blackacre, conveys the "oil, gas, and other minerals" to Baker, Able would retain, as part of the so-called surface estate, everything not granted by the severance deed--that is, everything but the "mineral estate," which in this case would be any oil, gas, and minerals subsisting in Blackacre. Likewise, if Able conveyed Blackacre to Baker, reserving oil, gas, and minerals, Baker would receive everything not reserved by Able--that is everything [*100] but any oil, gas, and minerals subsisting in Blackacre--*i. e.*, the mineral estate. n12 Thus, in either case, the owner of the surface estate would own the subterranean pore space. Of course, a deed or reservation could expressly address ownership of pore spaces, but, typically, does not. n13

Third, Texas law recognizes the mineral estate as dominant over the surface estate, a concept often overstated. In proper context, "dominant" means that the mineral owner has the right to *use* as much of the airspace, surface, and subsurface as is reasonably necessary to explore for and exploit the minerals belonging to the mineral owner, n14 subject to the limitation of the "accommodation doctrine." The accommodation doctrine requires the mineral owner to accommodate the surface owner's reasonable existing uses to the extent that the mineral owner may reasonably be able to do so while still being able to exercise exploration and exploitation rights. n15

This third principle has a flip side: the surface owner cannot unreasonably interfere with the interests of the mineral owner. n16 Under Texas law, the meaning of "other minerals" in the granting clause of a mineral deed includes "all valuable substances . . . whether their presence or value was known at the time of conveyance . . . ." n17 Thus, any minerals present in the property may belong to the mineral owner, and the surface owner must reasonably accommodate exploration and exploitation. n18 This broad construction of the term "minerals" implicitly means that the mineral owner has a potentially broad right of reasonable use that the [*101] mineral owner may affirmatively protect. n19 Accordingly, even though the surface owner may own the pore spaces, the mineral owner has broad rights to penetrate or otherwise use them in connection with mineral exploration and exploitation. Indeed, commercial deposits of oil and gas occupy pore spaces within geologic traps. Thus, the mineral owner may be able to enjoin CO[2] sequestration that

prevents, greatly hinders, or endangers the capture of oil and gas. But does the "dominance" of the mineral estate address "ownership" of the pore space? Indirectly, yes.

Texas courts categorize the mineral-owner's right as a right to *use* the surface, subsurface, and airspace to capture oil and gas that is owned by the mineral owner in fee-simple determinable. n20 For example, in *Getty Oil Co. v. Jones*, the court stated: "We now hold *explicitly* that the reasonably necessary limitation extends to the superadjacent airspace as well as to the lateral surface *and subsurface* of the land." n21 This holding indirectly recognizes the surface-owner's title to the subsurface because the court's express reference to the subsurface is in the context of discussing the rights of the mineral owner to *use* that which belongs to the surface owner. n22 However, assuming the surface owner owns the pore spaces, the surface owner must nevertheless reasonably accommodate the mineral-owner's use of the pore spaces in connection with mineral exploration and exploitation operations. Likewise, if the mineral owner owns the pore spaces, then, presumably, the mineral owner must accommodate the surface-owner's use of the subsurface in connection with the surface-owner's retained rights. Thus, in either case, the cautious CO[2] sequestration operator would secure permission from both surface and mineral owners.

Assuming that the surface owner "owns" the pore space, the mineral-estate owner nevertheless has the right to use the pore space to facilitate mineral exploration and exploitation. This right of use would include the right to inject substances, such as CO[2], for purposes of enhanced oil recovery. The fact that CO[2] injection might also result in the long-term sequestration of CO[2] should not, in my opinion, alter the right of the mineral-estate owner to engage in CO[2] injection for enhanced oil recovery. Thus, the mineral-owner's right to inject CO[2] for enhanced oil recovery, including the additional goal of long-term CO[2] sequestration, should fall within the mineral-owner's right of reasonable use even though "ownership" of pore spaces lies with the surface owner.

[*102] That CO[2] is also injected for sequestration should be no different than injecting saltwater for EOR. When saltwater is injected, either partially or wholly for EOR or disposal purposes, permanent sequestration of the saltwater is contemplated, although, potentially, the saltwater could be withdrawn for use in another EOR project. The same would hold true with CO[2], but, if one purpose of CO[2] injection is to address concerns about global warming, the objective of permanent sequestration would be a paramount concern, which would necessarily require a robust regulatory system to assure that this objective is achieved. As with water, however, such a regulatory system might not prohibit the later withdrawal, use, and reinjection of CO[2] for another EOR project, as long as the CO[2] was ultimately sequestered. On the other hand, the right to inject CO[2] solely for sequestration, unrelated to enhanced-oil recovery, would most likely be held by the surface owner.

Another indication that the surface owner owns the subsurface after a mineral severance is that the surface owner retains groundwater rights. n23 In *Sun Oil Co. v. Whitaker*, the Texas Supreme Court held that Sun, the oil and gas lessee, acting under a lease from the fee-simple owner who subsequently conveyed the surface estate to Whitaker, had the right to use groundwater to the extent reasonably necessary to produce oil and gas. n24 In other words, Sun's right to *use* groundwater implicitly recognizes surface-owner title to the groundwater. Although surface-owner title to groundwater does not necessarily mean that the surface owner holds title to subsurface pore spaces, the Texas groundwater cases give no hint of another possibility.

Fourth, a regulatory agency with the power to authorize regulated activities, such as the Texas Railroad Commission, authorizing underground gas storage or saltwater disposal, has no authority to determine property rights. n25 Thus, the fact that a regulatory agency has issued a permit to an operator for geologic CO[2] sequestration does not give that operator title to any subsurface pore spaces. However, when considering liability, a permit may be of some relevance if CO[2] migrates beyond the tract where it is injected--an issue addressed in the next section.

Although no Texas case law finally determines the ownership of subterranean pore spaces as between the surface and mineral owner, a handful of cases shed [*103] some light on the issue. The facts of an unreported case are on point; however, the issues discussed by the appellate court are not. Nevertheless, *Makar Production Co. v. Anderson* n26 illustrates the ownership issue, and the trial court's findings and conclusions are a matter of record. In this case, at

the request of the lessor's successor in interest to an oil and gas lease, the trial court permanently enjoined the lessee's successor from bringing saltwater produced from wells located on other tracts onto the leased premises and from injecting the saltwater into subsurface strata beneath the leased premises. n27 The injunction was issued even though the Railroad Commission had issued a permit for the saltwater disposal. n28

The injunction was granted on the ground that the oil and gas lease did not expressly authorize the lessee or its successors to use the leased premises as a commercial waste-disposal site. n29 Thus, while *Makar* implies that the fee-simple owner could have expressly leased disposal rights, the rights are not leased by implication. In Texas, an oil and gas lease is not a "lease," but a conveyance of any oil and gas in place for the duration of the lease--typically a fee simple determinable. n30 Because a lease conveys a fee simple determinable, this same reasoning should also apply to the severance of minerals by a mineral deed or to a reservation of minerals in a deed that conveys the surface. Thus, while a mineral deed may expressly convey, and a reservation may expressly reserve, underground disposal and storage rights, such rights are not conveyed or reserved by implication. Accordingly, in a typical mineral deed, title to pore spaces is not conveyed by implication. Likewise, in a typical reservation of minerals, title to pore spaces is not reserved by implication.

CO[2] sequestration is somewhat analogous to underground gas storage. Somewhat surprisingly, Texas law does not finally determine whether the owner of the surface or the owner of the mineral rights holds the right to store gas underground. If Texas case law did answer this question, then this same case law would likely determine which owner holds CO[2] sequestration rights. Two contrasting cases illustrate the issue. *Emeny v. United States*, a federal Court of Claims case applying Texas law, held in favor of surface owner's title to storage rights. n31 In contrast, in *Mapco, Inc., v. Carter*, a Texas appellate decision, the mineral owners prevailed on their ownership claim. n32

[*104] In *Emeny*, the federal Court of Claims, applying Texas law, concluded that the surface owners retained the gas storage rights. n33 In this case, fee-simple owners leased tracts "for the sole and only purpose of mining and operating for oil and gas and of laying pipe lines . . . to produce, save, and take care of said products." n34 The lessees developed a stratum called the Bush Dome for natural gas. This gas contained small amounts of helium. Due to the strategic nature of helium, the United States acquired these leases by purchase or condemnation and later brought in helium-gas mixtures for storage in pore spaces in the Bush Dome, where some native gas had already been extracted. n35 The court concluded as follows:

> The surface of the leased lands and everything in such lands, except the oil and gas deposits covered by the leases, were still the property of the respective landowners. . . . This included the geological structures beneath the surface, including any such structure that might be suitable for the underground storage of 'foreign' or 'extraneous' gas produced elsewhere.
>
> It necessarily follows that the 1923 oil and gas leases on the lands containing the Bush Dome did not grant to the lessee--or to the defendant as the present holder of gas rights under such leases--any right to use the Bush Dome for the storage of gas produced elsewhere. n36

In *Humble Oil & Refining Co. v. West*, the Texas Supreme Court cited *Emeny* for the proposition that the surface owner retained "the geological structures beneath the surface, together with any such structure that might be suitable for the underground storage of extraneous gas produced elsewhere." n37 However, Professors Smith and Weaver have observed: ". . . that [this] proposition was hardly crucial to the outcome of the case," n38 which was an action by royalty owners who asserted rights in the stored gas on the ground that the gas was being commingled with native gas in the reservoir.

An unreported decision of the Court of Appeals for the Third District also supports surface-owner title to pore spaces. In *FPL Farming, Ltd. v. Texas Natural* [*105] *Resources Conservation Commission*, the court implicitly accepted the notion that surface owners own the pore spaces. n39 The surface owners of tracts nearby a proposed non-hazardous-waste-disposal site challenged the issuance of the disposal permit, alleging that the agency acted beyond

its authority and alleging a taking on the ground that the evidence indicated that, within ten years, the injected waste would likely reach the subsurface stratum beneath their property. n40 The court affirmed the agency order but indicated that "should the waste plume migrate to the subsurface of FPL Farming's property and cause harm, FPL Farming may seek damages from EPS." n41 This statement, which is dicta, suggests that the court believed that the surface owners held title to the subsurface strata, as the court's statement does not say that the "surface" itself must be harmed for FPL to have a cause of action.

In contrast to *Emeny*, the court in *Mapco* held that the mineral owner held title to the subsurface storage space for natural gas. n42 In *Mapco*, owners of certain fractional mineral interests brought a partition action against the surface owner, who also owned a fractional mineral interest and was storing gas underground. n43 The storage reservoir was created by partially leaching salt from a salt dome. n44 Salt is recognized as a "mineral" in Texas. n45 In awarding owelty damages, the court reasoned as follows:

> Texas adopted the view that interest in minerals, such as oil, gas, salt and other minerals are susceptible of ownership in place in the ground prior to production of the minerals at or on the surface. The Texas rule is that this interest in minerals is an interest in real property. Thus, the fee mineral owners retain a property ownership, right and interest after the underground storage facility--here, a cavern--had been created. These same fee mineral owners are vested with ownership rights, including, of course, entitlement to compensation for the use of the cavern. . . . Thus, Texas law would recognize the continuing property ownership interest of the fee mineral estate owners in the cavern
>
> . . . .
>
> [*106] . . .The Appellees [plaintiff mineral-interest owners] .. . owned an undivided, but large majority, interest in the fee title and fee estate to the minerals in place and, as such, they had a fee title interest in the cavern after the minerals were extracted. n46

Thus, the *Mapco* court, although ultimately reversing on other grounds, n47 concluded that, because the mineral owner had title to the salt, the mineral owner had title to the salt cavern and walls of the cavern. n48

Query whether the court would have reached the same conclusion if the storage reservoir had been created in a subsurface formation that did not contain "minerals." Arguably, *Mapco* applies only when storage space is created by *partially* excavating a mineral-bearing strata and then using that strata's excavated space for storage. Surface owners may strongly argue that *Mapco* does not support mineral-owner title in generic subsurface strata because the court emphasized the fact that the mineral owner created the storage space by mining a mineral deposit. The storage space was not a naturally occurring pore space, but rather an excavated cavern, and the storage container was itself that same mineral that had been partially extracted. Moreover, the mineral owner would presumably have the right to use the cavern to extract the remainder of the salt. n49

Concluding Thoughts: Notwithstanding *Mapco*, surface owners have the stronger argument for ownership of pore spaces and hence subsurface CO[2] sequestration rights that are not related to EOR. Nevertheless, mineral owners, as holders of the dominant estate, have the right to explore for and produce oil, gas, and minerals without unreasonable interference from the surface owner. "When a surface owner unreasonably interferes with the rights of the mineral owner, the surface owner may be enjoined and liable for damages. In *Ball v. Dillard*, the Texas Supreme Court stated that the rights of surface and mineral owners are "reciprocal and distinct" and that "[n]either party can interfere with the rights of the other." n50 Therefore, a surface owner, by asserting a right of pore-space ownership and by engaging in subsurface CO[2] sequestration may not unreasonably interfere with mineral exploration or exploitation. Furthermore, if the storage reservoir contains naturally occurring and commercially recoverable hydrocarbons, then the mineral owners may be deprived of their right to the native hydrocarbon gas in place. Thus, [*107] regarding CO[2] sequestration that is not related to EOR, obtaining permission from both the surface and mineral owner is the cautious approach even though I conclude that the storage rights are most likely held by the surface owner. On the other hand, regarding oil and

gas development, including CO[2] injection for EOR, only the mineral owner need give permission, such as by executing an oil and gas lease.

If CO[2] sequestration is a goal, whether in addition to, or independent of EOR, then a robust regulatory system is needed to assure that the goal of sequestration is actually achieved. Moreover, a robust regulatory permit process could lessen the likelihood that dissenting surface or mineral owners could launch a successful challenge to a CO[2] sequestration project. If the legislature declares that CO[2] sequestration is in the public interest, if an agency is charged with the duty to regulate and authorize sequestration, if the agency holds a public hearing that meets all due-process requirements, and if the agency issues a permit to inject CO[2] into what the agency finds to be a well-defined and confining stratum after making findings of fact that support the utility of the specific sequestration project, then the likelihood of a successful challenge by dissenting surface or mineral owners is remote. n51 For example, although sequestration may make mineral exploitation below the storage reservoir more expensive, such exploitation is still likely to be possible; n52 thus, a regulatory taking claim is not likely to succeed. Other grounds for reversal of administrative orders can be avoided through the passage of appropriate enabling legislation and through appropriate agency implementation and processes.

Any regulatory regime should explicitly recognize that the recovery of commercial minerals will generally have priority over the use of pore spaces for CO[2] sequestration so as not to interfere with the rights of mineral developers and so as not to cause the underground waste of mineral resources. While priority rules arising under the recordation acts, coupled with the "dominance" of the mineral estate, might be theoretically used to achieve this end, given the prevailing checkerboard pattern of land and mineral ownership, a regulatory regime that gives primacy to commercial mineral development over CO[2] sequestration would [*108] be a more practical and workable approach. n53 In *Storck v. Cities Service Gas Co.*, the Oklahoma Court of Appeals held that, despite contrary provisions in a gas storage lease, the lessors and their mineral lessees had a statutory right to explore for oil and gas in formations other than the one used for storage, subject to the right of the storage lessee to monitor and approve drilling plans and subject to Oklahoma Corporation Commission regulations. n54 Wrongful interference by the storage lessee could give rise to actual damages, such as damages caused by drainage of oil to nearby lands, and possible punitive damages. n55

Of course, the ultimate answer may be eminent domain--the common means of acquiring gas storage rights in several states n56 and under federal regulatory law. n57 If a party seeking to sequester CO[2] had the power of eminent domain, then no ((owner," whether surface or mineral, would be able to prevent a sequestration project. But the question remains: Who is entitled to compensation for the taking? Currently, the safest answer is to compensate both surface and mineral owners. However, I submit that, under the umbrella of a regulatory regime, a reasonably safe answer would be to compensate surface owners on the theory that they own the pore spaces and hence the sequestration rights. In particular circumstances, mineral owners should be compensated where their ability to exploit known commercial mineral reserves would be prevented by the CO[2] sequestration project, although proving prevention may often be a burden that is too hard to meet. However, if a party intended to inject CO[2] into a gas reservoir containing native gas that was being left in the reservoir as "cushion gas" to prevent water encroachment into the pore spaces, the gas owner should be entitled to compensation for that native gas if the owner can prove that the gas could have been economically recovered. n58 Moreover, a regulatory agency might find that producing the cushion gas would result in greater comparative waste if water encroachment would ruin the reservoir for sequestration purposes.

[*109] Another reason favoring eminent domain is the prevalence of co-tenancy title. Co-tenancy title would be of greatest concern if mineral owners held the storage rights because severed mineral interests have become more and more fractionalized. n59 But whether the pore space is owned by co-tenant surface owners or mineral owners and regardless of the nature of the sequestration interest--whether deemed a lease, an easement, or an outright sale of the pore space--each co-tenant must consent to the burdening or sale of her interest for the sequestration interest to be fully effective. n60 Similar consent problems arise with successive interests. n61

In conclusion, regarding the issue of pore-space ownership, consider the following statement by Professors Smith and Weaver:

> The issue ultimately turns on whether the implied easement to use the surface and subsurface in any way reasonably necessary for exploring, drilling, producing, transporting, and marketing includes the right to store non-native gas. Unlike pressure maintenance and cycling operations, underground injections for storage purposes are not directly related to production. Indeed, they are usually not even associated with initial marketing, but with downstream activities more closely connected to final retail sales. From this perspective, it would seem that the right to store gas produced from a stratum other than the one in question is roughly analogous to the right to open a service station, a right that belongs more properly to the surface estate than the mineral estate. n62

Thus, absent an EOR-related CO[2] sequestration, this comment would seem to support surface-owner title to the pore space and hence the right to sequester CO[2].

[*110] III. TRESPASS-RELATED ISSUES

The prior section considered pore-space ownership of the tract where the CO[2] sequestration operation directly occurs. This section deals with the thornier question of neighboring tracts. Even if an injecting party holds the appropriate rights regarding the tracts actually used for the sequestration operation, that party may be liable for trespass or related torts if CO[2], whether injected for sequestration or EOR, migrates to neighboring tracts. Because CO[2] sequestration is closely analogous to EOR, wastewater storage, and natural gas storage, case law involving these activities is helpful in assessing the risk of liability to neighboring landowners.

A. Enhanced Oil Recovery Injections and Fracturing Analogies

With EOR, trespass issues arise when the injected substance, commonly water, crosses ownership lines, invading neighboring property and perhaps even displacing oil and gas reserves or making recovery of the reserves more difficult and more expensive. Trespass issues can also arise when fracturing operations create fractures that extend beyond the operator's unit. Once again, Texas case law provides an indefinite answer. Some cases recognize a cause of action for subsurface trespass and other cases avoid any definitive rule on the issue.

As with title issues, regulatory bodies, such as the Railroad Commission, have no general authority to authorize trespasses or other torts. However, two cases suggest that regulatory orders may provide some protection. In *Corzelius v. Railroad Commission*, the commission issued an order authorizing a party, as agent of the commission, to drill a directional well to help extinguish a gas-well blowout and fire that was threatening the surrounding area. n63 The party responsible for the blowout sought to enjoin this operation on the ground that the agent's well bore would directly invade the party's mineral estate. n64 In this emergency, the court concluded that the commission's order shielded the driller from being enjoined. n65 Although a trespass was not enjoined, this case offers little comfort to a party wishing to sequester CO[2] because it deals with an emergency situation.

A case providing more comfort is *Railroad Commission of Texas v. Manziel.* n66 The plaintiff landowners sought to set aside a commission order authorizing the operator of an adjacent tract to drill an exception-location well close to their tract to inject water for EOR. n67 The exception well was authorized under the auspices [*111] of a commission-approved voluntary unitization plan. n68 The landowners sought to set aside the order on the ground that water injected at that location would inevitably cross ownership lines, resulting in a trespass and the early watering out of one of their oil wells. n69

The court stated that it was presented with the issue of "whether a trespass is committed when secondary recovery waters from an authorized secondary recovery project cross lease lines." n70 After discussing the utility of FOR operations the court stated:

> We conclude that if, in the valid exercise of its authority to prevent waste, protect correlative rights, or in the exercise of other powers within its jurisdiction, the Commission authorizes secondary recovery projects, a trespass does not occur when the injected, secondary recovery forces move across lease lines,

> and the operations are not subject to an injunction on that basis. *The technical rules of trespass have no place in the consideration of the validity of the orders of the Commission.* n71

In reaching this conclusion, the court quoted Professors Howard Williams and Charles Meyers:

> What may be called a 'negative rule of capture' appears to be developing. Just as under the rule of capture a landowner may capture such oil or gas as will migrate from adjoining premises to a well bottomed on his own land, so also may he inject into a formation substances which may migrate through the structure to the land of others, even if it thus results in the displacement under such land of more valuable with less valuable substances n72

The result in this case would be more comforting if it had been brought against the operator of the injection well, rather than brought as an action to set aside an order of the Railroad Commission. While a consideration of trespass may have "no place" in a proceeding to determine the validity of a commission order, trespass would be pertinent in a private cause of action in tort. Indeed, the court seemed to recognize this distinction, when it stated:

> [*112] [NV] e are not confronted with the tort aspects of such practices. Neither is the question raised as to whether the Commission's authorization of such operations throws a protective cloak around the injecting operator who might otherwise be subjected to the risks of liability for actual damages to the adjoining property n73

Nevertheless, the court did discuss trespass in some detail and was sympathetic to the view that traditional rules of trespass may not be appropriate for subsurface invasions that are for the greater public good--such as for FOR in this case and, by analogy, perhaps for CO[2] sequestration in a future case. The court's discussion suggests that a regulatory order, issued in the public interest, is necessary if traditional trespass rules are to be avoided. n74 However, this suggestion begs the following question: If a regulatory order is entered, thereby avoiding traditional trespass rules, what "nontraditional" trespass rules will apply? The issuance of [*113] an order, even one that includes a finding of fact that no harm will result to neighboring properties, will not necessarily bar a private action in tort. n75 Perhaps injunctive relief would be denied, limiting a plaintiff to a recovery of proven actual damages resulting from trespass, which could be a difficult burden to meet. Moreover, if a regulatory order is entered, then Texas courts would be unlikely to award punitive damages.

Or perhaps traditional trespass rules would be more fully avoided in favor of a nuisance analysis that would balance the utility of CO[2] sequestration with the gravity of the harm to the plaintiff landowner. This latter approach would treat CO[2] sequestration similarly to the treatment of atmospheric CO[2] emissions--albeit that emitting pollutants into the atmosphere to be carried by prevailing winds through the airspace of neighboring tracts is distinguishable from the intentional injection of pollutants for permanent storage beneath specific tracts. As with trespass, if the sequestration were authorized by a regulatory commission, then injunctive relief to abate a nuisance might be denied and punitive damages might be barred.

In contrast to voluntary unitization for EOR, trespass issues posed by hydraulic fracturing historically did not receive the same favorable treatment that water injection received in *Manziel.* In *Gregg v. Delhi-Taylor Oil Corp.*, the Texas Supreme Court held that courts, not the Railroad Commission, have primary jurisdiction to determine whether a fracturing operation may result in a trespass and whether relief is appropriate. n76 Finding that cracks resulting from fracture treatments crossing property lines are analogous to drill bits that cross property lines, the court concluded that such an intentional and direct invasion could constitute a subsurface trespass. n77

In *Geo-Viking, Inc. v. Tex-Lee Operating Co.*, n78 however, the Texas Supreme Court retreated from its pronouncements in *Gregg.* In this case, an operator sued a well-service company for improperly fracturing a well. n79 In appealing a damages award, the well-service company argued that the jury should have been instructed to disregard the amount of production obtained from fractures extending beyond [*114] the boundaries of the leased land. n80 The

court of appeals rejected this argument, n81 citing the rule of capture, which protects drainage from beneath the land of others. n82 The Texas Supreme Court initially reversed, finding that fracturing the subsurface of another's land is trespass, precluding application of the rule of capture. n83 Subsequently, however, at the request of the parties, the Texas Supreme Court withdrew its opinion and its writ of error, stating that the "application was improvidently granted" n84 and concluding that "we should not be understood as approving or disapproving the opinions of the court of appeals analyzing the rule of capture or trespass as they apply to hydraulic fracturing." n85 This ruling left much confusion about whether fracturing that crosses property lines constitutes trespass.

In *Mission Resources, Inc. v. Garza Energy Trust*, the Court of Appeals for the Thirteenth District held *inter alia* that Texas recognizes a cause of action for trespass from subsurface fracture treatments that cross property boundaries. n86 The court rejected the contradictory holding by the Court of Appeals for the Sixth District in *Geo-Viking*, n87 citing the Texas Supreme Court's holding in *Gregg*. n88 On August 29, 2008, the Texas Supreme Court reversed this portion of the case, holding that subsurface hydraulic fracturing was not an actionable trespass because the drainage of hydrocarbons by this means was protected by the rule of capture. n89 Presumably, the injection of CO[2] for enhanced recovery would be [*115] similarly protected. Some of the reasons cited by the court for its decision would also support protecting CO[2] sequestration from trespass actions.

The court reasoned that trespass requires actual injury and that trespass injury should not be inferred when the physical invasion occurs far below the surface. The court noted that the *ad coelum* maxim Thas no place in the modern world" and that "the law of trespass need no more be the same two miles below the surface than two miles above." n90 The court also reasoned that it should not usurp the lawful authority of the Texas Railroad Commission to decide to regulate, or not regulate, fracturing, should not allow the litigation process to determine the extent of harm (drainage) that is caused by fracturing, and should not allow an actionable trespass (by changing the rule of capture) when the oil and gas industry does not "want or need the change." n91 Justice Willett, concurring, would have gone further and held that, not only was fracturing not an actionable trespass, it was not a trespass at all. n92 His concurring opinion discussed the necessity of hydraulic fracturing for the recovery of hydrocarbons. As a matter of public policy, as with hydraulic fracturing, Texas courts should find that no trespass occurs if injected CO[2] crosses property lines. Because CO[2] injection, unlike hydraulic fracturing, will be subject to a regulatory permitting regime, the court should have even fewer concerns about CO[2] injection for enhanced recovery or CO[2] sequestration.

B. Gas Storage Analogy

Natural gas is frequently injected into the subsurface for temporary storage. Underground gas storage is closely analogous to CO[2] sequestration, except that CO[2] sequestration is indefinite, not temporary. Trespass issues arising in the gas storage context offer insight about how Texas courts will likely analyze trespass in the CO[2] sequestration context. Of course, CO[2] sequestration and gas storage are factually distinct: gas storage is an ongoing operation, involving a continuous cycle of injections and withdrawals of gas, while CO[2] sequestration involves injection for permanent storage. CO[2] is essentially a waste product, while gas is a valuable commodity. Moreover, at some point, a CO[2] sequestration reservoir would reach its maximum capacity, at which time ongoing CO[2] injection would come to an end, whereas active gas injections and withdrawals could continue indefinitely. These factual distinctions, however, do not seem significant enough to justify ignoring gas storage *law*, which does seem analogous.

In *Hammonds v. Central Kentucky Natural Gas Co.*, an early Kentucky case, the court reasoned that natural gas injected for storage was really released back [*116] to nature--in essence, abandoned. n93 Because the gas was abandoned, the gas had no owner. n94 Comparing injected gas to captured wild animals returned to nature, the court found that no trespass occurred when the released gas migrated to neighboring property. n95 However, the court further ruled that when the gas was returned to nature, it became "subject to appropriation by the first person" to capture the gas. n96

Texas rejected the reasoning of *Hammonds*, finding that injected natural gas is not abandoned but remains the personal property of the injecting party and, as such, is no longer subject to capture by neighboring landowners even if

the gas migrates beneath neighboring tracts. n97 However, because the gas is not abandoned, the question of trespass then arises. In *Lone Star Gas Co. v. Murchison*, the gas storage company acquired the right to store natural gas in what was thought to be a well-defined subsurface reservoir. n98 However, unknown to the storage company, the reservoir was connected to other subsurface strata, allowing the injected gas to migrate to neighboring subsurface property. n99 Because the storage company had title to the injected gas as personal property, the court held that the storage company did not lose title to gas that migrated under neighboring land. n100 Neither *Murchison* nor any other Texas case squarely addresses the trespass question--perhaps because of the difficulty of proving actual damages.

Trespass resulting from stored natural gas may be more easily tolerated because its storage is temporary and because it is not a waste product. In contrast, CO[2] might be treated differently because CO[2] is a waste product intended for permanent storage. Nevertheless, if a neighboring landowner suffered actual damages either from CO[2] sequestration or from gas storage, a court would probably award damages on grounds of trespass, nuisance, or negligence, but most likely would not issue an injunction if the sequestration or injection were done under the auspices of a regulatory permit. To avoid a potential damages claim, the cautious approach would be to acquire sequestration or storage rights for the entire reservoir. Moreover, acquiring rights to the entire reservoir, in the case of gas, effectively prevents neighbors from producing stored gas under the guise [*117] of producing native gas, and, in the case of CO[2], effectively prevents neighbors from drilling into the reservoir in a manner that could result in the escape of CO[2]. These risks, however, could be largely ameliorated by a robust regulatory process.

Again, the ultimate answer may be eminent domain. In the case of gas storage, gas utilities in Texas may acquire gas storage rights by eminent domain. n101 In addition, the Natural Gas Act of 1938 allows underground gas storage rights to be obtained by eminent domain. n102 Similar legislation could authorize the acquisition of CO[2] sequestration rights. The Texas Underground Natural Gas Storage and Conservation Act of 1977 provides that "the storer has the right to condemn all of the underground storage area and any surface area required for the use and enjoyment of the storage facility." n103 More specifically, the Act provides as follows:

> After an order of the commission is issued approving a storage facility, a storer may condemn without further attack as to its right to condemn, any subsurface sand, stratum, or formation for the underground storage of natural gas, condemning all mineral and royalty rights as are reasonably necessary for the operation of the storage facility, subject to the limitations of this subchapter, and the storer may condemn any other interests in property that may be required, including interests in the surface estate in the sand, stratum, or formation reasonably necessary to the operation of the storage facility, provided that:
>
> (1) no part of a reservoir is subject to condemnation unless the storer has acquired by option, lease, conveyance, or other negotiated means at least 66-2/3 percent of the ownership of minerals, including working interests, and 66-2/3 percent of the [*118] ownership of the royalty interests, computed in relation to the surface area overlying the part of the reservoir which as found by the commission to be expected to be penetrated by displaced or injected gas;
>
> (2) no dwelling, barn, store, or other building is subject to condemnation; and
>
> (3) the right of condemnation is without prejudice to the rights of the owners or holders of other rights or interests of land to drill through the storage facility under such terms and conditions as the commission may prescribe n104

Although the Act seems neutral on the issue of pore-space "ownership," the Act implies that both mineral and surface owners have rights in the storage strata. Under the Act, the storing party is merely authorized, not required, to condemn subsurface strata, including all mineral and royalty rights, as are reasonably necessary for the operation of the storage facility. This provision allows the storing party to protect its storage rights by condemning any rights to exploit the storage strata and its contents; however, all rights to drill through the strata are expressly preserved. Further, the storing party may condemn any rights in the surface estate in the sand, stratum, or formation reasonably necessary to the

operation of the storage facility. If mineral owners owned the pore spaces, then there would be no need to condemn surface interests because the storing party could acquire the rights of reasonable use of the airspace, surface, and subsurface from the mineral owner without the need to acquire any further rights from the surface owner. As a whole the statute implies that the storing party may need to condemn the surface rights respecting the land where injection, withdrawal, monitoring, and transportation operations take place and condemn those mineral and royalty interests that may be actually damaged by storage operations.

C. Wastewater Injection Analogy

Another activity closely analogous to CO[2] sequestration is wastewater disposal. Wastewater is often disposed of by injecting it into deep subsurface formations. n105 Wastewater disposal is regulated by the Texas Commission on Environmental Quality, n106 and, in the case of waste disposal from oil and gas operations, by the Texas Railroad Commission. n107

[*119] In *FPL Farming, Ltd. v. Texas Natural Resources Conservation Commission*, an unreported case, the Court of Appeals for the Third District, discussed in Section II, above, stated in dicta that a landowner who suffers encroachment of wastewater may seek damage if the plaintiff suffers actual intrusion and actual harm. n108 The state regulatory agency granted permits to a disposal company for injection wells to inject non-hazardous waste at depths between 7,350 to 8,200 feet below the surface. n109 The agency required the applicant to project how far and in what directions the waste may migrate over a 30-year period. n110 When neighboring surface owners discovered that the waste was projected to reach their subsurface strata within 10 years of injection, n111 they asserted that the agency was authorizing an impairment of their subsurface rights. n112

The court "assumed without deciding" that the surface owners had "'existing rights' in the deep subsurface beneath their land," but noted the legal trend that "property owners do not have the right to exclude deep subsurface migration of fluids." n113 Dismissing the argument that "migration alone will impair [their] existing rights," the court held that "some measure of harm must accompany the migration for there to be impairment." n114 "[B]ecause of [the agency's] . . . expertise in the geological effects of subsurface migration of injectates," the court deferred to the agency's finding that, in this case, no existing rights would be impaired by the injection. n115 Nevertheless, at the end of its opinion, the court indicated that, if the waste did migrate and cause some measure of harm, the surface owners could seek damages from the injector. n116 In general, migration and actual harm have been difficult to prove. n117 Similarly, in the context of CO[2] sequestration, the difficulty in proving actual intrusion and actual damages is likely to impede [*120] trespass actions by neighboring property owners. Though a surface owner may prove ownership of the subsurface strata and perhaps an actual intrusion, proving actual damage may be difficult. In the end, as with conventional waste disposal, public interest may weigh more heavily in favor of protecting CO[2] sequestration from speculative damage claims.

Concluding Thoughts: Regarding neighboring lands, I submit that permission from neighboring landowners should not be necessary, although receiving permission from the owners of all pore spaces invaded by CO[2] would certainly be the cautious approach. n118 My view would be strengthened if Texas were to bolster its CO[2]-injection regulatory law with a statute similar to the Texas voluntary unitization law. n119 Nevertheless, the weight of analogous Texas case law strongly suggests that the courts will not entertain trespass actions arising from CO[2] injection or sequestration in the absence of actual injury.

IV. APPLICATION OF LEGAL PRINCIPLES TO CO[2] STORAGE

Because EOR, hydraulic fracturing, natural gas storage, and wastewater disposal are all closely analogous to CO[2] sequestration, Texas courts are likely to issue opinions regarding CO[2] sequestration that rely on existing case law addressing these analogous activities. And because strong public-policy arguments can be made in favor of initiatives that will reduce the human CO[2] footprint, Texas courts are likely to render opinions that will encourage the development of a healthy and vibrant CO[2] sequestration industry.

The question of whether the surface estate or mineral estate owns the property interest in the pore space remains. Although the weight of law supports surface-owner title, absent a robust regulatory program to assure and protect the integrity of subsurface CO[2] reservoirs, prudent CO[2] injectors may also elect to obtain permission from mineral owners. As indicated in the prior section, the need for surface-owner permission should ordinarily be limited to permission from the surface owner of the land where the injection operations are conducted. As a practical matter, the need for mineral-owner permission regarding the lands where the injection operations are conducted, and regarding the lands nearby, depends on the likelihood of conflicting mineral operations and on the existence of a robust regulatory system protecting the integrity of the CO[2] reservoir, while still allowing mineral development to occur in a manner that does not impair that integrity.

[*121] A recent adjudication by the Environmental Protection Agency's ("EPA") Environmental Appeals Board underscores why the storage permittee must gain permission to store from the proper interest holder. n120 The EPA administers the Safe Drinking Water Act by issuing permits to inject wastewater and other wastes, including CO[2]. The petitioners claimed that the EPA's issuance of a permit to store CO[2] authorized a trespass onto the deep subsurface of their adjacent land. n121 The regional EPA permitting authority stated, and the board affirmed, that the permitting program "does not have authority to determine surface, mineral, or storage rights when issuing permit decisions. Issues relating to property ownership or lessee rights are legal issues between the permittee and property owners." n122 Therefore, the authority may issue permits to the storing party without considering ownership because the only factor that is relevant to the issuance of a permit is whether drinking water may be contaminated. The permit confers no property right and no right to trespass. n123 Under these regulations, a wastewater storage permit does not give the holder any property right to store CO[2] underground and does not preclude a cause of action for trespass. n124 Accordingly, the storing party must be careful to gain permission from the proper property owners--whether the mineral owner, surface owner, or both. At this point, without an affirmative ownership declaration from the Texas courts, it is advisable to gain permission from both--at least regarding the tract where the injection operations will take place.

I have suggested that a robust regulatory process could, at least in some cases, eliminate the need to seek permission from mineral owners where CO[2] is injected for sequestration independent of an FOR project and where there is little likelihood of commercially recoverable oil and gas or where the sequestration operation is unlikely to interfere with ongoing or future oil and gas operations. This suggestion assumes that the surface owner owns the pore spaces. Absent a robust regulatory process and absent clarification of the ownership question, the words of Professor Eugene Kuntz, addressing gas storage, summarize the best practice for CO[2] sequestration:

> Because the cases on the subject are few in number and are not in harmony, when a subsurface stratum is acquired for storage purposes, the grant should be taken from the person having the rights to extract the particular substance to be stored, [*122] the surface owner and the owner of any other mineral rights. Prudence also dictates that grants be secured from mineral owners of any separate strata not acquired whose rights of access might be impaired, from owners of various surface interests, and from owners of easements or other similar interests whose rights might be impaired in some way. It should be observed that an ordinary oil and gas lease will not yield the measure of protection required for subsurface storage of gas. n125

APPENDIX 1

Ownership of Injected CO[2] and the Nature of a CO[2] Sequestration Right

Brief comments are appropriate regarding ownership of injected CO[2] and the nature of a CO[2] sequestration right. Again, legal analogies are helpful. In *Bingaman v. Corporation Commission*, the Oklahoma Supreme Court held that the operator of an FOR unit retained the right to recover gas injected in furtherance of the unitization plan. n126 That the injector or the injector's contractor retains continuing ownership of, and hence liability for, the injected CO[2] may not be the best policy if CO[2] sequestration is to be encouraged. n127

The more appropriate legal analogy may be to treat CO[2] similarly to the atmospheric emissions of CO[2]. Under this approach, the injector or its contractor would be deemed to have intentionally abandoned the CO[2] and hence be unable [*123] to assert continuing title to it. This approach would also suggest that a neighboring landowner would have no trespass claim for CO[2] migration, although a nuisance claim would still be possible. However, this approach might also mean that the injected CO[2] would be available to the first finder or appropriator who captured it with the lawful permission of the landowner. Of course, recapture and any assertion of ownership of sequestered CO[2] by finders or any other interference with sequestered CO[2] could be fully addressed through a robust regulatory system, which could include regulatory safeguards to assure that the CO[2] would remain sequestered or, if extracted for some use, would be properly re-sequestered. Control, access to, and use of the strata containing CO[2] could also be regulated to assure that the CO[2] remains sequestered. If necessary, eminent domain could be used to further protect the integrity of CO[2] reservoirs.

A combined abandonment, regulatory, and eminent domain approach is preferable to an approach that would assume that the injector or the injector's contractor would continue to own injected CO[2]. In other words, if an injector secured the necessary regulatory permits required under a robust regulatory regime and, acting in good faith, without negligence, and relying on sound science and technology, sequestered CO[2] in a confining stratum, the injector should not be deemed to be the indefinite owner of the CO[2]. Realizing that CO[2] can be deadly in concentrated form and acidic if not pure, a comprehensive regulatory program must address how the escape of sequestered CO[2] that endangers public health should be addressed, both in terms of its containment and in terms of compensating injured parties; however, that topic is beyond the scope of this paper.

Under a well-devised regulatory approach, third parties, having a legal right and legitimate need to penetrate the sequestered reservoir to gain access to deeper natural resources, could have the right to do so if regulatory safeguards were followed to prevent the escape of CO[2]. So long as these other parties are not prevented from developing deeper resources, they should not have a takings claim.

[*124] The nature of the CO[2] sequestration right could be classified as a license, a lease, an easement, n128 or an outright conveyance of the pore space. n129 A 50-year gas storage "lease" was classified as a lease of real property. n130 The acquisition of a gas storage right by condemnation has been classified as an easement, not the taking of a fee. n131 The classification of a gas storage right as an easement can be significant in determining the compensation required in a condemnation proceeding. If classified as an easement, damages in such an action might be measured by the diminution in value of the burdened fee estate. n132

The following discussion of *Reese Exploration Inc. v. Williams Natural Gas Co.*, n133 taken from the supplement to the Kuntz treatise, n134 offers insightful comments regarding the nature of a gas storage right and the consequences of the classification:

> In *Reese*, . . . the Tenth Circuit Court of Appeals, applying Kansas law and based upon the granting clauses of oil and gas leases that contained a gas storage provision, held that the right to store gas is not limited to the formation initially used for storage and that no part of the rights had been abandoned. And based upon provisions of the lease assignments, the court held that another party's oil rights were expressly subject to and inferior to the gas storage rights. The case involved a suit [*125] for negligence in permitting injected gas to migrate from an underground gas storage zone into overlying oil sands that were being waterflooded by the owner of the oil rights. The owner of the oil rights charged that the owner of the gas storage rights knowingly increased pressure in its storage formation even though it knew that gas was escaping and hindering secondary oil recovery efforts. The court stated that, while the oil-rights owner owed an implied duty not to interfere with the superior gas storage rights, the gas storage owner owed no corresponding duty to the oil-rights owner. Although the court intimated that the gas storage owner might be subject to an implied covenant to reasonably and prudently conduct its storage operations, the court declined to further address that question because Kansas courts had not applied the reasonable and prudent operator standard to gas storage operations and because the parties

had not raised the issue. . . . In reaching its decision, the court never discussed the nature of a gas storage right. Is it like a landlord/ tenant lease? If so, then abandonment of part of a gas storage right would not be recognized (*e.g.*, if a tenant who leases a 10-story building uses only the first floor, the tenant will not be found to have abandoned the other floors). Is the gas storage right similar to an oil and gas lease--valid for so long as gas is stored? If so, [partial or complete] abandonment would be possible if the lease is classified as a profit [but the element of intent to abandon is often difficult to prove]. Or is a gas storage right like a general easement? Suppose that, under a general road easement, the road is constructed so that it crosses only a small portion of the burdened land. At that point, the corridor of the easement may be defined and limited. *See generally* 2 American Law of Property § 8.66 (A. J. Casner ed. 1952) and *Columbia Gas Transmission Corp. v. An Exclusive Natural Gas Storage Easement, 127 O&GR 346, 620 N.E.2d 48 (Ohio 1993)* (describing a gas storage right as an easement). Thus, if a gas storage right is like an easement, the storage right might be confined to the formations historically used when the easement is first put to use. Perhaps analogies are inappropriate. Perhaps a gas storage right is sui generic. If so, then it should not be compared to other interests, including the oil and gas lease--even though the storage right itself is included in such a lease. Thus, the court's reference to oil and gas lease implied covenants does not seem helpful or appropriate. Indeed, if the gas storage owner owed no duty regarding negligence, it is difficult to see how it would have owed a duty based upon an implied covenant. However, one analogy to an oil and gas lease that does seem appropriate is the right of the lessee to make reasonable use of the surface [*126] subject to the modern accommodation doctrine. In other words, perhaps the gas storage right should have been construed in light of a duty to accommodate multiple uses of the property. Under an accommodation approach, the test would be whether the gas storage owner could reasonably accommodate the efforts by the owner of the oil rights to recover additional oil through waterflooding. This case points out that conflicts among various subsurface users (*e.g.*, coal miners, oil producers, and gas storage users) may not be best resolved by a formalistic application of property interest priority rules originally established without contemplation of this kind of conflict. Perhaps they would be better resolved administratively in a manner that encourages multiple land use, promotes the greatest possible economic recovery of natural resources, prevents waste, protects correlative rights, and encourages accommodation. n135

APPENDIX 2

Selected Survey of Other Jurisdictions Regarding Pore-Space Ownership

Colorado

Colorado has no case law that expressly addresses pore-space ownership; however, one could argue that *Grynberg v. City of Northglenn* n136 supports mineralowner title to pore spaces. In this case, the City, desirous of installing a wastewater reservoir, was required by statute to determine whether the land was suitable for a wastewater reservoir. n137 The City obtained permission from the surface owner to obtain core samples and such samples were publicly filed with the state officials. Grynberg, an unrecorded lessee of the coal rights, which were held by the State of Colorado, sued for damages to the speculative value of his coal rights. In deciding in favor of Grynberg, the court held that Grynberg, as the coal lessee, had the exclusive right to grant permission to collect core samples from the coal seams. While this case did not hold that Grynberg owned the pore spaces in the coal, such an argument is likely to be made in a case that does involve pore-space ownership. In any event, the *Grynberg* decision seems wrong. A surface owner desirous of intense surface development should have the right to take core samples to determine whether the land is suitable for the intended development. The [*127] mineral owner should not be allowed to hold the taking of core samples for ransom, which is the practical effect of the decision. n138

In *Board of County Commr's v. Park County Sportmen's Ranch, LLP*, the Colorado Supreme Court held that the storage of water in an aquifer does not constitute a trespass against neighboring landowners where there was no physical invasion of neighboring lands by directional drilling or occupancy by recharge structures or extraction wells. n139 In

addition, the court concluded that such use of an aquifer would not require the use of eminent domain or the payment of just compensation. n140

Kansas

Kansas has not directly addressed the issue of ownership of storage rights; however, where an oil and gas lease expressly grants storage rights, such rights are considered severable from the right to produce oil and gas. n141 In other words, a lessee having storage rights can separately assign such rights to a third party.

In the gas storage context, if gas stored by a private party--as opposed to a public utility having the power of eminent domain n142 --migrates to a neighboring tract, no trespass occurs, but the neighboring landowner is free to produce and claim the gas. n143 Since the landowner is permitted to produce the migrating gas, thus actually benefitting from the gas migration, the landowner suffers no actual damage.

In *Crawford v. Hrabe*, a case dealing with trespass of water injected for FOR purposes, the Kansas Supreme Court found no actionable trespass. The facts of the case involved a lessee who used wastewater brought onto the leased premises [*128] from elsewhere to enhance production on the plaintiffs' land. n144 The plaintiffs claimed their interests had been injured by the migration of this water throughout the premises. n145 The court surveyed other jurisdictions' treatments of subsurface trespass of wastewater, finding that the orthodox rules applied to surface trespasses do not usually apply to subsurface trespass and that, when water is injected to increase production on the lessor's land, no actionable trespass occurs. n146 The court also found that secondary recovery by injecting wastewater was practical and an efficient use of a potentially hazardous waste product. The court held that plaintiffs had no cause of action for trespass. n147

However, in *Tidewater Oil Co. v. Jackson*, plaintiff proved actual damages, and the court held the injector of wastewater for FOR liable when the water flooded the plaintiff's oil wells. The court reasoned:

> [T]hough a water flood project in Kansas be carried on under color of public law, as a legalized nuisance or trespass, the water flooder may not conduct operations in a manner to cause substantial injury to the property of a non-assenting lessee-producer in the common reservoir, without incurring the risk of liability therefor. n148

To establish liability, "[i]t is sufficient that the water flooding activities were intentional and the consequences foreseeable. They were actionable, even though lawfully carried on, if they caused substantial injury to the claimants." n149 Nevertheless, because the activity was lawful under a conservation agency order, the court reversed an award of punitive damages. n150

The Kansas Supreme Court has rendered three decisions concerning personal injury and property damage arising when stored gas migrated from the underground reservoir and eventually vented at a surface location in downtown Hutchinson, Kansas. The leak culminated in a massive explosion of natural gas in the heart of the city, killing several people and destroying several businesses. n151 [*129] The first opinion dealt with an award of negligence and punitive damages for loss suffered by a particular business. The last two opinions dealt with unsuccessful class-action suits. n152

Kentucky

Two Kentucky cases suggest that the mineral owner may have the right to control the use of potential petroleum-bearing sands. n153 In *Central Kentucky Natural Gas Co. v. Smallwood*, the court, citing what it believed to be the English rule and without deciding ownership of the pore space, found that the mineral owner had a continuing right to use strata to produce either naturally occurring or stored gas. n154 Thus, the mineral owner controlled the right to use the strata for that purpose. This case must be read in light of *Hammonds v. Central Kentucky Natural Gas Co.*, where the court held that injected natural gas was returned to nature and thus once again subject to the rule of capture.

n155 Given the reasoning of *Hammonds* and the migratory nature of gas, the mineral owner would logically own the right to produce the migrated injected gas, but that does not mean that the mineral owner would own the injection right, which, under *Hammonds*, is of questionable value, given that the injected gas was deemed abandoned and subject to the rule of capture. However, in *Smallwood v. Central Kentucky Natural Gas Co.*, as between the mineral owner and oil and gas lessee, the lessee was not allowed to extend a lease beyond its primary term through injection operations where the secondary term of the lease habendum clause required production. n156

Some of the abandonment and rule-of-capture reasoning of *Hammonds* and both *Smallwood* cases was overruled in *Texas American Energy Corp. v. Citizens Fidelity Bank & Trust Co*:

> It is therefore the opinion of this court that, in those instances when previously extracted oil and gas is subsequently stored in underground reservoirs capable of being defined with certainty and the integrity of said reservoirs is capable of being maintained, [*130] title to such oil and gas is not lost and said minerals do not become subject to the rights of owners of surface above the storage fields. n157

Arguably, the court rejected little of the reasoning in *Hammonds*. First, ownership of any gas that was released back to nature and that migrated to nearby lands would presumably lie with the mineral owner, not the surface owner; however, that does not mean that the mineral owner owns the pore space. Second, if the language about maintaining integrity means that the injector controls all rights of access to the gas throughout the full extent of the reservoir--the facts in *Texas American*--then little of *Hammonds* has been overruled as a practical matter because, in *Hammonds*, the injector did not have full control.

Louisiana

In *United States v. 43.42 Acres of Land*, a federal eminent domain case construing Louisiana law, the court stated, "[w]hether a state is governed by an 'ownership' or a 'non-ownership' theory of mineral rights, the mineral owner cannot be considered to have ownership of the subsurface strata containing the spaces where the minerals are found." n158 By holding that the surface owner, rather than the mineral owner, was entitled to compensation, the court effectively held that the surface owner has the right to authorize subsurface storage. In *Mississippi River Transmission Corp. v. Tabor*, the court also held that the surface owner owns the storage rights, but the court recognized that the "mineral servitude owner . . . enjoys the 'right to participate in the production of the remaining natural gas and condensate in the reservoir' . . . and must be compensated for the expropriation of this right." n159 However, in a federal condemnation case arising in Montana, compensation for native gas was denied where the native gas could be produced only because of increased pressure caused by the stored gas. n160

The issue of subsurface trespass in Louisiana is less definitive. In *Raymond v. Union Texas Petroleum Corp.*, the plaintiffs claimed saltwater injected under adjacent lands had migrated to their subsurface property. n161 The court held that, [*131] because the state regulatory agency had issued a permit for the saltwater injection, "it is not unlawful and does not constitute a legally actionable trespass." n162 In dicta, however, the court noted that a permit does not preclude recovery for actual damages and for inconvenience. n163 Later, in *Mongrue v. Monsanto*, the Fifth Circuit affirmed the decision of the federal district court in Louisiana, finding that migrating wastewater did not cause the injecting party to be liable for a taking without just compensation. n164 The plaintiffs also asserted at the district court level that the injector had committed subsurface trespass, although this issue was not raised on appeal. n165 Nevertheless, the Fifth Circuit stated that if wastewater had migrated across property lines, "appellants may recover under a state unlawful trespass claim . . . regardless of the permit allowing for injection." n166 The Fifth Circuit affirmed *Raymond* in another case, reasoning that migration of injected wastewater is not "unlawful" if a valid regulatory permit authorizes the action. n167

Michigan

Michigan law supports the surface owner's title to subsurface pore space. In *Department of Transportation v. Goike*

, the state acquired the surface estate of a tract of land to improve a highway, leaving the former fee-simple owner with only the mineral estate. n168 The issue before the court was to determine who owned the right to store non-native gas in the subsurface pore space. n169 The court held that "the storage space, once it has been evacuated of the minerals and gas, belongs to the surface owner." n170

In *ANR Pipeline Co. v. 60 Acres of Land*, the court, in dicta, stated that "if injected gas moves across boundaries there may be a trespass." n171 However, the court held that the migration of non-native gas to neighboring property does not give rise to a claim of inverse condemnation. n172

[*132] *New Mexico*

In *Hartman v. Texaco Inc.*, the court held that an oil and gas operator who suffered actual damages from subsurface flooding caused by neighboring waterflooding operations has a cause of action for trespass, but the statutory right of double damages does not apply to a subsurface trespass. n173 In an earlier case, the New Mexico Supreme Court affirmed a decision of the conservation agency that found that a salt-water disposal operation would not result in salt-water migration to a nearby tract. n174 However, the court stated in dicta:

> The State of New Mexico may be said to have licensed the injection of saltwater into the disposal well; however, such license does not authorize trespass. The issuance of a license by the State does not authorize trespass or other tortious conduct by the licensee, nor does such license immunize the licensee from liability for negligence or nuisance which flows from the licensed activity. . . . In the event that an actual trespass occurs by Mobil in its injection operation, neither the Commission's decision, the district court's decision, nor this opinion would in any way prevent Snyder Ranches from seeking redress for such trespass. n175

New York

In *International Salt Co. v. Geostow*, the court construed a conveyance of "mines" of salt to mean that the grantee held fee title to the salt and not to the excavation cavity. n176 Nevertheless, the grantee retained exclusive right to use the cavity so long as salt was not exhausted and mining operations were not abandoned. n177 The case did not involve storage or disposal activities. Rather, the case involved the salt miner's right to continue to use the mined caverns to transport salt from parts of the mine that were beneath other lands. In *Miles v. Home Gas Co.*, n178 the court held that right to store foreign gas belonged to the surface owner. Together, these two cases suggest that the surface owner has title to pore spaces, but the mineral owner has a right to use stratum for ongoing mineral operations.

[*133] *Ohio*

In *Chance v. BP Chemicals, Inc.*, the plaintiffs brought a class-action suit against BP Chemicals, claiming *inter alia* that the company had trespassed on their subsurface property rights by injecting waste fluids through injection wells and that the fluids had migrated across their property lines. n179 Relying on the holding from *Willoughby Hills v. Corrigan*, n180 the court found that "ownership rights in today's world are not as clear-cut as they were before the advent of airplanes and injection wells." n181 Though surface owners may claim to own the land from the heavens to the depths and retain all not deeded in the severance of a mineral estate, limitations exist on their rights to the subsurface. n182

> Just as a property owner must accept some limitations on the ownership rights extending above the surface of the property, we find that there are also limitations on property owners' subsurface rights. We therefore extend the reasoning of *Willoughby Hills*, that absolute ownership of air rights is a doctrine which "has no place in the modern world," to apply as well to ownership of subsurface rights. n183

Therefore, the court found the appellants' subsurface rights to exclude others extend only to invasions that "actually interfere with the appellants' reasonable and foreseeable use of the subsurface." n184

From the rule that subsurface rights extend only to the owner's "reasonable and foreseeable use," the court did recognize the operator's potential liability for subsurface trespass if injected waste interfered with "reasonable and foreseeable *use*" of the subsurface, not mere title or possession. n185 In other words, the pore-space owner must suffer actual damages. Though the plaintiffs' claims were deemed too speculative, the court noted that one class member might have a valid claim because the subsurface migration of BP Chemicals' waste forced that plaintiff to abandon drilling plans. n186 Accordingly, a mineral owner may have a valid trespass [*134] claim in Ohio against a party who injects waste on neighboring lands if that waste migrates across property lines and unreasonably interferes with access to oil and gas.

Oklahoma

In Oklahoma, subsurface pore space belongs to the surface owner. In *Sunray Oil Co. v. Cortez*, the Oklahoma Supreme Court held the surface owner had the right to grant permission to inject wastewater into the subsurface, as long as there was no interference with the mineral estate's recovery of oil and gas. n187 Relying on this holding and applying Oklahoma law, a federal district court, in *Ellis v. Arkansas Louisiana Gas Co.*, n188 held that a storage company must obtain permission from the surface owner to store natural gas produced off the leased premises. The court found that the mineral deed allowed the grantee the right to *produce* oil, gas, and other minerals; therefore, the subsurface strata itself was retained by the surface estate. n189 Furthermore, the court noted the public policy interest in such storage, stating that if "it was the mineral interest owner and not the surface owner who had the power to grant storage rights, it would typically mean that hundreds of severed mineral interest owners would have to be contacted if those rights were to be obtained privately. n190 Thus, the surface owner owns the rights for both wastewater injection and gas storage.

In *Oklahoma Natural Gas Co. v. Mahan & Rowsey, Inc.*, the court implicitly concluded that the injector retains title to injected gas that migrated to other lands. n191 However, evidence showed that the gas was confined to an identifiable and well-defined formation and that the gas was distinguishable, due to helium content and lack of certain organic compounds, from native gas in the area. Under Oklahoma statutory law, a public utility may acquire underground gas storage rights by condemnation. n192 Under this statutory law, injected gas remains the property of the injector, even if the gas migrates beneath other lands, provided that the injector can prove migration and also that the injector compensates the owner of the invaded stratum. n193

Oklahoma recognizes a cause of action for private nuisance when injected water injures another's interest in a well or leasehold, even when the water is [*135] injected for FOR purposes n194 and even if injection is authorized by the Oklahoma Corporation Commission. n195 However, the requirement of showing actual injury or recoverable damages remains. Therefore, if the waste is injected into a stratum where oil, gas, or other minerals are unrecoverable, the likelihood of showing damages decreases. In *West Edmond Salt Water Disposal Ass'n v. Rosecrans*, the Oklahoma Supreme Court found the owner of an adjacent tract had no cause of action for trespass where the defendant injected saltwater into a stratum already containing saltwater because the owner had suffered no actual damages. n196 The court found underground disposal to be the most practical solution for dealing with wastewater and reasoned "[i]f such disposal of salt water is forbidden unless oil producers first obtain the consent of all persons under whose lands it may migrate or percolate, underground disposal would be practically prohibited." n197 Nevertheless, Oklahoma recognized a cause of action when damages can be proved. In *West Edmond Hunton Lime Unit v. Lillard*, saltwater injected into a formation migrated onto adjacent land and interfered with the plaintiff's oil and gas operations. n198

Pennsylvania

In *United States Steel Corp. v. Hoge*, the Pennsylvania Supreme Court held that methane embedded in a coal seam belonged to the owner of the coal seam. n199 Some of the court's reasoning indicates that the court regarded the coal owner as owning the coal stratum: "[A]s a general rule, subterranean gas is owned by whoever has title to the property in which the gas is resting." n200 "When a landowner conveys a portion of his property, in this instance coal, to another, it cannot thereafter be said that the property conveyed remains as part of the former's land, since title to the

severed property rests solely in the grantee." n201 "The landowner, of course, has title to the property surrounding the coal, and owns such of the coalbed gas as migrates into the surrounding property." n202 Nevertheless, "the coal owner's interest in that situs [is] in the nature of an estate determinable, which reverts to the surface landowner by operation of law at some time subsequent to the removal of the coal." n203 Since the case concerned ownership of gas, it does not directly [*136] address ownership of pore spaces. Would the coal owner's property interest allow him to inject CO[2] into coal for permanent sequestration, which, as a practical matter, would convert his fee simple determinable into a fee-simple absolute?

West Virginia

In *Tate v. United States Fuel Gas Co.*, the West Virginia Supreme Court of Appeals held the surface owner had title to the subsurface space for natural gas storage, based on the language in the particular severance deed at issue. n204 The deed severed from the grant a mineral estate in "[t]he oil, gas, and brine and all minerals, except coal underlying the surface of the land." n205 The deed further provided that "minerals" includes "clay, sand, stone, or other minerals [that] may be necessary for the operation for the oil, gas and other minerals reserved and excepted" in the deed. n206 The court ruled that the owner of the surface estate held title to the subsurface, including any clay, sand, and stone, subject to the right of the mineral owner to use these substances as necessary to facilitate oil, gas, and mining operations. n207 As long as there were no recoverable minerals in the stratum at issue, the surface owner could grant storage rights in the subsurface without unreasonably encumbering the mineral owner's recovery of their property. n208 In this case, the atypical reservation was an important part of the court's analysis.

Wyoming

Wyoming has no case law addressing the ownership of pore spaces; however, Wyoming is of special interest because it has enacted legislation that declares that pore spaces are owned by the surface owner for purposes of CO[2] sequestration. n209 A separate act, addressing the regulation of CO[2] sequestration, n210 is based upon the Model Statute drafted by the Interstate Oil and Gas Compact Commission Task Force on Carbon Capture and Geologic Storage. n211

[*137] Because no Wyoming case law has addressed pore-space ownership, the legislature's declaration of pore-space ownership should be persuasive of Wyoming law, although the Wyoming Supreme Court will likely have the last word regarding nonfederal and non-Indian lands. Neither Wyoming case law nor statutory law would determine whether federally-owned or Indian-owned mineral rights--encompassing millions of acres in Wyoming--includes ownership of pore spaces. Although no federal case law addresses pore-space ownership, limited reservations of minerals, such as the reservation of coal, is not likely to reserve pore spaces in the federal government. n212

On the other hand, a broad reservation of minerals, such as the one under the Stock-Raising and Homestead Act of 1916 ("SRHA"), n213 might arguably reserve pore spaces because of the very broad interpretation given to such reservations by the federal courts. n214 Nevertheless, I believe that the SRHA provision requiring the reservation of "coal and other minerals" in patents, no matter how broadly defined by the federal courts, should not be construed as reserving pore spaces. In *Watt v. Western Nuclear, Inc.*, the court, in a five to four ruling, held that gravel was a "mineral." n215 Writing for the majority, Justice Marshall stated: "we interpret the mineral reservation in the Act to include substances that are mineral in character . . ., that can be removed from the soil, that can be used for commercial purposes, and that there is no reason to suppose were intended to be included in the surface estate." n216 This statement emphasized the extraction of substances that are mineral in character.

Nevertheless, some language in the opinion might leave open the possibility for the federal government to claim pore spaces. For example, Justice Marshall concludes:

> Finally, the conclusion that gravel is a mineral reserved to the United States in lands patented under the SRHA is buttressed [*138] by "the established rule that land grants are construed favorably to the

> Government, that nothing passes except what is conveyed in clear language, and that if there are doubts they are resolved for the Government, not against it." [citations omitted] . . . In the present case this principle applies with particular force, because the legislative history of the SRHA reveals Congress' understanding that the mineral reservation would "limit the operation of this bill *strictly to the surface of the lands.*" n217

Although this statement of legislative intent is broad enough to encompass federal ownership of subsurface pore spaces, the Congressional focus of the Act was on reserving minerals, not pore spaces. Thus, I would argue that the SRHA does not vest ownership of pore spaces in the federal government.

Legal Topics:

For related research and practice materials, see the following legal topics:
Energy & Utilities LawConveyancesMineral InterestsGeneral OverviewEnergy & Utilities LawOil, Gas & Mineral InterestsSurface Use InterestsReal Property LawMiningSurface Rights

FOOTNOTES:

n1 Elizabeth J. Wilson & Mark A. de Figueiredo, *Geologic Carbon Dioxide Sequestration: An Analysis of Subsurface Property Law, 36 ENVTL. L. REP. 10114, 10115 (2006).*

n2 *Id. at 10118.*

n3 THE PETROLEUM ECONOMIST, LTD., FUNDAMENTALS OF CARBON CAPTURE AND STORAGE TECHNOLOGY 38-39 (Tom Nicholls ed. 2007).

n4 *Id*

n5 Wilson & de Figueiredo, *supra* note 1, at 10118.

n6 THE PETROLEUM ECONOMIST, *supra* note 3, at 8-9.

n7 *Id.*

n8 *Id.* at 16.

n9 INTERSTATE OIL AND GAS COMPACT COMM'N TASK FORCE ON CARBON CAPTURE AND GEOLOGIC STORAGE, STORAGE OF CARBON DIOXIDE IN GEOLOGIC STRUCTURES, A LEGAL AND REGULATORY GUIDE FOR STATES AND PROVINCES 17 (2007). The Executive Summary of the report states: "The interest of states in the geologic storage of CO[2] arises because, in addition to conservation, it is among the most immediate and viable strategies available for mitigating the release of CO[2] into the atmosphere." This indicates the public policy rationale for supporting CO[2] geologic storage. *Id.* at 9.

n10 *Duhig v. Peavy-Moore Lumber Co., 144 S.W.2d 878, 880 (Tex. 1940).*

n11 *Humphreys-Mexia Co. v. Gammon, 254 S.W. 296, 299 (Tex. 1923).*

n12 Similar reasoning should apply where the severance of oil and gas rights is classified as a profit. The holder of the oil and gas rights would have the right to exploit any oil and gas but the underlying fee owner would retain all other rights--presumably including ownership of pore spaces.

n13 The granting clause of oil and gas leases frequently conveys the right to store hydrocarbons. *See, e.g., Ryan Consol. Petroleum Corp. v. Pickens, 285 S.W.2d 201, 203 (Tex. 1955)* (lessor "granted, demised, leased and let and by these presents does grant, demise, lease (and) let unto said lessee, with the exclusive right to prospect, ... operate, produce, *store* and remove therefrom oil, gas, casinghead gas, and all petroleum products . . .") (emphasis added). Of course, the right to store oil, gas, casinghead gas, and all petroleum products does not specifically address CO[2] or "ownership" of the pore space. Moreover, when leasing, a mineral-interest owner cannot confer rights that are greater than what such owner holds.

n14 *Getty Oil Co. v. Jones, 470 S.W.2d 618, 621 (Tex. 1971). See also Ball v. Dillard, 602 S.W.2d 521, 523 (Tex. 1980); Humble Oil & Ref. Co. v. Williams, 420 S.W.2d 133 (Tex. 1967)* (discussing excessive use).

n15 *Getty Oil Co., 470 S.W.2d at 621-22; Sun Oil Co. v. Whitaker, 483 S.W.2d 808, 810-11 (Tex. 1972).*

n16 *Ball, 602 S.W.2d at 523.*

n17 *Moser v. U.S. Steel Corp., 676 S.W.2d 99, 102 (Tex. 1984).*

n18 *Id. at 103* (citing *Getty Oil Co., 470 S.W.2d 618).*

n19 *See, e.g., Emerald Coal & Coke Co. v. Equitable Gas Co., 107 A.2d 734 (Pa. 1954)* (finding that a coal company successfully enjoined subsurface gas storage that was to occur in stratum directly beneath an active coal mine).

n20 In the case of solid minerals, a full mineral interest would be owned in fee-simple absolute and include a similar right to use the surface, subsurface, and airspace.

n21 *Getty Oil Co., 470 S.W.2d at 621* (emphasis added).

n22 *Id*

n23 *Pfluger v. Clack, 897 S.W.2d 956, 959 (Tex. App. 1995), writ denied.* Texas is perhaps the only remaining state to adhere to the "absolute ownership" theory regarding groundwater. *See City of Sherman v. Pub. Util. Comm'n, 643 S.W.2d 681, 686 (Tex. 1983)* ("The absolute ownership theory regarding groundwater was adopted by this Court in *Houston & T.C. Ry. Co. v. East, 98 Tex. 146, 81 S.W. 279 (1904).*").

n24 *483 S.W.2d 808, 811 (Tex. 1972).*

n25 *See, e.g., Ryan Consol. Petroleum Corp. v. Pickens, 285 S.W.2d 201, 207 (Tex. 1956); Pan Am. Prod. Co. v. Hollandsworth, 294 S.W.2d 205, 211-12 (Tex. Civ. App. 1956), writ refused n.r.e.*

n26 Makar Production Co. v. Anderson, No. 07-99-0050-*CV, 1999 WL, 1260015 (Tex. App. 1999), no writ.*

n27 *Id.* at *2.

n28 *Id.* at *1-2.

n29 *Id.* at *2-3.

n30 *See Cherokee Water Co. v. Forderhause, 641 S.W.2d 522,525 (Tex. 1982); Stephens County v. Mid-Kansas Oil & Gas Co., 254 S.W. 290,292 (Tex. 1923).*

n31 *Emeny v. United States, 412 F.2d 1319 (Ct. Cl. 1969).*

n32 *Mapco, Inc., v. Carter, 808 S.W.2d 262 (Tex. App. 1991), rev'd in part on other grounds, 817 S.W.2d 686 (Tex. 1991).*

n33 *Emeny, 412 F.2d at 1323.*

n34 *Id*

n35 *Id. at 1323.*

n36 *Id.*

n37 *Humble Oil & Refining Co. v. West, 508 S.W.2d 812, 815 (Tex. 1974)* (citing *Emeny, 412 F.2d 1319).*

n38 ERNEST E. SMITH & JACQUELINE LANG WEAVER, TEXAS LAW OF OIL AND GAS § 2.1.B.3 (Matthew Bender & Co. and LexisNexis Group 2007).

n39 FPL Farming, Ltd. v. Tex. Natural Res. Conservation Comm'n, No. 03-02-00477-*CV, 2003 WL 247183 (Tex. App. 2003) no writ.* The court noted that it was "assuming without deciding" that the surface owners had implicit "existing rights" in the deep subsurface beneath their land. *Id.* at *3.

n40 *Id.* at *1 n.3 (stating that the plaintiffs do not own the mineral interests associated with the property).

n41 *Id.* at *5 (citing *TEX. WATER CODE ANN. § 27.104* (West 2000)).

n42 *Mapco, Inc. v. Carter, 808 S.W.2d 262 (Tex. App. 1991), rev'd in part on other grounds, 817 S.W.2d 686 (Tex. 1991).*

n43 *Id. at 264-65.*

n44 *Id. at 274.*

n45 *Id.* (citing *State v. Parker, 61 Tex. 265, 268 (1884)).*

n46 *Mapco, 808 S.W.2d at 274-75.*

n47 *Mapco, Inc. v. Carter, 817 S.W.2d 686 (Tex. 1991).*

n48 *Mapco, 808 S.W.2d at 274.*

n49 *See Int'l Salt Co. v. Geostow, 878 F.2d 570 (2d. Cir. 1989)* (construing New York law).

n50 *Ball v. Dillard, 602 S.W.2d 521, 523 (Tex. 1980)* (citing *Brown v. Lundall, 344 S.W.2d 863 (Tex. 1961)).*

n51 For a glimpse of what a regulatory law might look like, see H.B. 0090, Enrolled Act No. 25, 59th Wyo. Leg. 2008 Budget Session (effective July 1, 2008). For analogous Texas regulatory law, see *TEX. NAT. RES. CODE §§ 91.201*-91.207 (regulating underground hydrocarbon storage) and *id.* §§ 91.171-91.184 (regulating underground natural gas storage).

n52 In general, absent proof that the enjoyment of minerals is impossible, courts have not found that a taking has occurred. *See, e.g., City of Abilene v. Burk Royalty Co., 470 S.W.2d 643 (Tex. 1971)* and *Tarrant County Water Control & Improvement Dist. v. Haupt, Inc., 854 S.W.2d 909 (Tex. 1993).*

n53 For an example of a newly enacted regulatory regime, see 2008 Wyo. Sess. Laws ch. 30, principally codified at WYO. STAT. ANN. § 30-11-313 (2008). For analogous law dealing with mineral-development conflicts, such as a conflict between a coal developer and an oil and gas developer, see N.D. CENT. CODE 38-15 (regulatory resolution of conflicts in subsurface mineral production). For an informative article discussing mineral-development conflicts, see Phillip Wm. Lear, *Multiple Mineral Development Conflicts: An Armageddon in Simultaneous Mineral Operations?*, 28 ROCKY MT. MIN. L. INST 79 (1983).

n54 *Storck v. Cities Serv. Gas Co., 575 P.2d 1364, 1368 (Okla. 1977), remanded* to *634 P.2d 1319 (Okla. Civ. App. 1981)* (citing *OKLA. STAT. tit. 52, § 36.1*).

n55 *Storck, 634 P.2d at 1322.*

n56 *See TEXAS NAT. RES. CODE §§ 91.171*-.184.

n57 *See 15 U.S.C. § 717f*(c)(1)(A).

n58 *See, e.g.*, ANR Pipeline Co. v. 60 Acres of Land, 418 E Supp.2d 933, 941-44 (WD. Mich. 2006); *see also Williston Basin Interstate Pipeline Co. v. An Exclusive Gas Storage Lease Hold in the Judith River Subterranean Geological Formation, 999 F.2d 546 (9th Cir. 1993)* (unpublished, but memorandum opinion is available at *1993 WL 242979).*

n59 *See, e.g., Ellis v. Ark. La. Gas Co., 450 F. Supp. 412, 422 (E.D. Okla. 1978)* (observing that if "it was the mineral interest owner and not the surface owner who had power to grant storage rights, it would typically mean that hundreds of severed mineral interest owners would have to be contacted if those rights were to be obtained privately").

n60 *See, e.g., Elliott v. Elliott, 597 S.W.2d 795, 802 (Tex. Civ. App. 1980), no writ.*

n61 *See, e.g., Kemp v. Hughes, 557 S.W.2d 139 (Tex. Civ. App. 1977), no writ.* Plausibly, however, by analogy to the prevailing law regarding mineral exploitation by less than all co-tenants, each co-tenant may have the right to sequester carbon if they account to other co-tenants for any net profits. *See Prairie Oil & Gas Co. v. Allen, 2 F.2d 566 (8th Cir. 1924).* While this approach is theoretically plausible, the notion that multiple co-tenants might engage in simultaneous sequestration operations may not be practical. Moreover, while, under the prevailing view, individual co-tenants can exploit minerals without being liable for waste, courts might not view carbon sequestration as analogous to mineral exploitation.

n62 SMITH & WEAVER, *supra* note 38, § 2.1.B.3.

n63 *Corzelius v. Railroad Comm'n, 182 S.W.2d 412,413-14 (Tex. Civ. App. 1944), no writ.*

n64 *Id.* at 414.

n65 *Id* at 416-17.

n66 *Railroad Comm'n of Tex. v. Manziel, 361 S.W.2d 560 (Tex. 1962).*

n67 *Id at 561.*

n68 *Id. at 566.*

n69 *Id.*

n70 *Id. at 567.*

n71 *Manziel, 361 S.W.2d at 568-69* (emphasis added).

n72 *Id. at 569* (quoting HOWARD WILLIAMS & CHARLES MEYERS: *OIL AND GAS LAW, § 204.5* (1995)).

n73 *Id. at 566.*

n74 For voluntary unitization for enhanced recovery or for the conservation and use of gas, see *TEX. NAT. RES. CODE §§ 101.001*-101.018. Under § 101.013:

> (a) Agreements for pooled units and cooperative facilities are not legal or effective until the commission finds, after application, notice, and hearing:
>
> (1) that the agreement is necessary to accomplish the purposes specified in Section 101.011 of this code;
>
> (2) that it is in the interest of the public welfare as being reasonably necessary to prevent waste and to promote the conservation of oil or gas or both;
>
> (3) that the rights of the owners of all the interests in the field, whether signers of the unit agreement or not, would be protected under its operation;
>
> (4) that the estimated additional cost, if any, of conducting the operation will not exceed the value of additional oil and gas so recovered, by or on behalf of the

several persons affected, including royalty owners, owners of overriding royalties, oil and gas payments, carried interests, lien claimants, and others as well as the lessees;

(5) that other available or existing methods or facilities for secondary recovery operations or for the conservation and utilization of gas in the particular area or field concerned or for both are inadequate for the purposes; and

(6) that the area covered by the unit agreement contains only that part of the field that has reasonably been defined by development, and that the owners of interests in the oil and gas under each tract of land in the area reasonably defined by development are given an opportunity to enter into the unit on the same yardstick basis as the owners of interests in the oil and gas under the other tracts in the unit.

(b) A finding by the commission that the area described in the unit agreement is insufficient or covers more acreage than is necessary to accomplish the purposes of this chapter is grounds for the disapproval of the agreement.

n75 *See, e.g., Gregg v. Delhi-Taylor Oil Corp., 344 S.W.2d 411 (Tex. 1961); compare Champlin Exploration, Inc., v. R.R. Comm'n of Tex., 627 S.W.2d 250 (Tex. App. 1982), writ refused n.r.e. with Muckelroy v. Richardson Indep. Sch. Dist., 884 S.W.2d 825 (Tex. App. 1994), writ denied* (distinguishing *Champlin*).

n76 *Gregg v. Delhi-Taylor Oil Corp., 344 S.W.2d 411, 415 (Tex. 1961).*

n77 *Id. at 416-17.*

n78 *Geo-Viking, Inc. v. Tex-Lee Operating Co., 1992 WL 80263 (Tex. 1992), opinion withdrawn, 839 S.W.2d 797 (Tex. 1992).*

n79 *Geo-Viking, Inc. v. Tex-Lee Operating Co., 817 S.W.2d 357, 364 (Tex. App. 1991), writ denied with per curiam opinion.*

n80 *Id. at 363-64.*

n81 *Id. at 364.*

n82 *See, e.g., Brown v. Humble Oil & Ref. Co., 83 S.W.2d 935,940 (Tex. 1935).*

n83 *Geo-Viking, Inc., 1992 WL 80263.*

n84 *Geo-Viking, Inc., 839 S.W.2d at 798.*

n85 *Id.*

n86 *Mission Resources, Inc. v. Garza Energy Trust, 166 S.W.3d 301,310 (Tex. App. 2005), pet. granted.*

n87 *Geo-Viking, Inc., 817 S.W.3d at 364-64.*

n88 *Mission Res., Inc., 166 S.W.3d at 311.*

n89 *Coastal Oil & Gas Corp. v. Garza Energy Trust, 268 S.W.3d 1 (Tex. 2008) rehearing denied.* In *People's Gas Co. v. Tyner, 31 N.E. 59 (Ind. 1892),* the Indiana Supreme Court held that the analogous technique of shooting a well to prime recovery was protected by the rule of capture but also subject to the law of nuisance where the shooting, which was done with nitroglycerin, posed a danger to a densely populated area.

I have suggested that the rule of capture would be an appropriate means of resolving the analogous trespass question when geophysical information is acquired from nearby lands through 3-D or conventional seismic operations that occur on other lands. Owen L. Anderson & Dr. John D. Pigott, *3D Seismic Technology: Its Uses, Limits, & Legal Ramifications*, 42 ROCKY MT MIN. L. INST. 16-1, 16-111-16-117 (1996). I have also suggested that the rule of capture should offer similar protection from trespass in the case of hydraulic fracturing. Bruce M. Kramer & Owen L. Anderson, *The Rule of Capture--An Oil and Gas Perspective, 35 ENVTL. L. 899,933-36 (2005).*

n90 *Coastal Oil, 268 S.W.3d at 11 (quoting United States v. Causby, 328 U.S. 256, 260-61 (1946)).*

n91 *Id.* at 14-16.

n92 *Id.* at 29 (Willett, J., concurring).

n93 *Hammonds v. Central Ky. Natural Gas Co., 75 S.W.2d 204, 205-06 (Ky. Ct. App. 1934).*

n94 *Id.*

n95 *Id. at 206.*

n96 *Id. Hammonds* has been greatly limited by *Tex. Am. Energy Corp. v. Citizens Fid. Bank & Trust Co., 736 S.W.2d 25 (Ky. 1987).*

n97 *See Humble Oil & Ref. v. West, 508 S.W.2d 812, 817 (Tex. 1974); Lone Star Gas Co. v. Murchison, 353 S.W.2d 870, 880 (Tex. Civ. App. 1962), no writ (citing Chaffin v. Hall, 210 S.W.2d 191 (Tex. Civ. App. 1948), no writ); see also White v. N.Y. State Natural Gas Corp., 190 F. Supp. 342 (W.D. Pa. 1960).*

n98 *Lone Star Gas Co., 353 S.W.2d at 871-72.*

n99 *Id.*

n100 *Id. at 880.*

n101 *TEX. NAT. RES. CODE ANN. §§ 91.171-*.184 (2007). This act provides that:

> *All natural gas in the stratum condemned* which is not native gas, and which is subsequently injected into storage facilities is personal property and is the property of the injector or its assigns, and in no event is the gas subject to the right of the owner of the surface of the land or of any mineral or royalty owner's interest under which the storage facilities lie, or of any person other than the injector to produce, take, reduce to possession, either by means of the law of capture or otherwise, waste, or otherwise interfere with or exercise any control over a storage facility. Upon failure, neglect, or refusal of the person to comply with this section, the storer has the right to compel compliance by injunction or by other appropriate relief by application to a court of competent jurisdiction.

Id. § 91.182 (emphasis added). Note that, by reason of the emphasized language, this statute does not address the right to injected gas that migrates beyond the stratum condemned.

n102 *15 U.S.C. § 717f* (2005).

n103 *TEX. NAT. RES. CODE ANN. § 91.180* (2001).

n104 *Id.* at § 91.179.

n105 46 TEX. PRACTICE SERIES, ENVTL. LAW § 26.12 (2007).

n106 *TEX. WATER CODE ANN. §§ 27.001*-.024 (2008).

n107 *Id.* 4§ 27.031--.038. Section 37.038 provides: "The commission has jurisdiction over the injection of carbon dioxide produced by a clean coal project, to the extent authorized by federal law, into a zone that is below the base of usable quality water and that is not productive of oil, gas, or geothermal resources by a Class II injection well, or by a Class I injection well if required by federal law."

n108 FPL Farming, Ltd. v. Tex. Natural Res. Conservation Comm'n, No. 03-02-00477-*CV, 2003 WL 247183,* *5 (Tex. App. 2003), *no writ.*

n109 *Id.* at *1.

n110 *Id.*

n111 *Id.*

n112 *Id.* at *4.

n113 *Id.* at *3 (*citing United States v. Causby, 328 U.S. 256, 260-61 (1946); Raymond v. Union Tex. Petroleum Corp., 697 F. Supp. 270, 274-75 (E.D. La. 1988); Chance v. BP Chems., Inc., 670 N.E.2d 985, 991-92 (Ohio 1996); Railroad Comm'n v. Manziel, 361 S.W.2d 560, 568-69 (Tex. 1962)).*

n114 *FPL Farming, Ltd., 2003 WL 247183* at *4.

n115 *Id.*

n116 *Id.* at *5.

n117 *See, e.g., Mongrue v. Monsanto Co., 249 F.3d 422, 433 (5th Cir. 2001); Chance, 670 N.E.2d at 991-92.*

n118 See discussion in prior section. Of course, the operator of a carbon sequestration project might face tort liability for negligent or wasteful operations to injured parties, whether or not such parties gave permission for the operations. *Cf. Elliff v. Texon Drilling Co., 210 S.W.2d 558, 562-63 (Tex. 1948)* (holding producer liable for negligent and wasteful drilling of a gas well).

n119 *See TEX. NAT. RES. CODE ANN. §§ 101.001-*.018 (2001).

n120 Core Energy, LLC, E.P.A. Envtl. Appeals Bd. Permit No. MI-137-5X25-0001, UIC Appeal No. 07-02 (Jan. 15, 2008).

n121 *Id.*

n122 *Id.*

n123 *Id.*

n124 *Id.*

n125 1 EUGENE KUNTZ, OIL AND GAS § 2.6(c) (1987) (footnotes omitted).

n126 *Bingaman v. Corp. Comm'n, 421 P.2d 635, 638 (Okla. 1966).*

n127 In Texas, the legislature has enacted legislation providing that the Railroad Commission will assume "ownership" of carbon sequestered under a clean coal FutureGen research project. *TEX. NAT. RES. CODE ANN. § 119.002* (2006). Upon commission acquisition of title:

> the owner or operator of the clean coal project is relieved from liability for any act or omission

> regarding the carbon dioxide injection location, and the method or means of performing carbon dioxide injection, if the injection location and method or means of injection comply with the terms of a license or permit issued by the state and applicable state law and regulations.

TEX. NAT. RES. CODE ANN. § 119.004 (2007). Similar Illinois legislation regarding a clean coal FutureGen research project provides:

> If the FutureGen Project locates at either the Tuscola or Mattoon site in the State of Illinois, then the FutureGen Alliance agrees that the Operator shall transfer and convey and the State of Illinois shall accept and receive, with no payment due from the State of Illinois, all rights, title, and interest in and to and any liabilities associated with the sequestered gas, including any current or future environmental benefits, marketing claims, tradable credits, emissions allocations or offsets (voluntary or compliance based) associated therewith, upon such gas reaching the status of post-injection, which shall be verified by the Agency or other designated State of Illinois agency. The Operator shall retain all rights, title, and interest in and to and any liabilities associated with the pre-injection sequestered gas. The Illinois State Geological Survey of the Illinois Department of Natural Resources shall monitor, measure, and verify the permanent status of sequestered carbon dioxide and co-sequestered gases in which the State has acquired the right, title, and interest under this Section.

20 ILL. COMP. STAT. 1107/20 (2008). Governor Dave Freudenthal of Wyoming has stated that the federal government must address the long-term liability and indemnification issues regarding the risk of a catastrophic release of sequestered CO[2]. Dave Freudenthal, *Carbon Sequestration: Lawyer's Cornucopia or Pandora's Box?*, 31 WYOMING LAWYER 16, 18 (February 2008). For analogous federal law limiting liability for atomic-energy projects, see *42 U.S.C. 2012* et seq.

n128 When a gas storage right is acquired by eminent domain in Texas, statutory law provides that, upon "abandonment" of the storage facility, the storing party must file in the county deed records an instrument stating that "all property, both mineral and surface, . . . has reverted to those who owned the property at the time of condemnation, or their heirs, successors, or assigns." *TEX. NAT. RES. CODE ANN. § 91.184* (2001). The reference to abandonment suggests that the interest condemned may be an easement, but the reverter language suggests that the interest condemned may be a fee simple determinable or a lease. However, another section suggests that the interest may be voluntarily acquired by "option, lease, conveyance, or other negotiated means . . . ." *Id.* § 91.179.

n129 In Pitsenberger v. N. Natural Gas Co. Inc. 198 E Supp. 665, 677 (S.D. Iowa 1961), the court rejected a challenge to underground gas storage agreements brought on the grounds that the storage permit transaction licensed a permanent nuisance and was therefore unconscionable. *See also Keasler v. Natural Gas Pipeline Co., 569 F. Supp. 1180, 87-88 (E.D. Tex. 1983)* (holding that such transactions are not fraudulent); *Storck v. Cities Serv. Gas Co., 575 P.2d 1364, 1369 (Okla. 1977)* (holding that such transactions are not fraudulent or against public policy).

n130 *Storck, 575 P.2d 1364, 1368 (Okla. 1977), remanded to 634 P.2d 1319 (Okla. Civ. App. 1981).*

n131 *See Peoples Gas Light & Coke Co. v. Buckles, 182 N.E.2d 169, 176 (Ill. 1962). See also Ozier v. Cent. Ill. Pub. Serv. Co., 297 N.E.2d 21, 22 (Ill. App. 1973).*

n132 *Peoples Gas, 182 N.E.2d at 176.*

n133 *Reese Exploration Inc. v. Williams Natural Gas Co., 983 F.2d 1514 (10th Cir. 1993).*

n134 1 EUGENE KUNTZ, *supra* note 125, § 3.6(c) (Supp. 2007).

n135 1 EUGENE KUNTZ, *supra* note 125, § 2.6(c) (Supp. 2007) (citing Phillip Lear, *Multiple Mineral Development Conflicts: An Armageddon in Simultaneous Mineral Operations?, 28 ROCKY MTN. MIN. L. INST. 79 (1982);* N.D. CENT. CODE ch. 38-15, § 2.6(c) (2007)).

n136 *Grynberg v. City of Northglenn, 739 P.2d 230 (Colo. 1987).*

n137 COL. REV. STAT. § 37-87-117 (1986 Supp.).

n138 After remand and further appeal, Grynberg received no damages. *Grynberg v. Northglenn, 829 P.2d 473 (Colo. App. 1991).*

n139 *Bd. of County Comm'rs v. Park County Sportsmen's Ranch, LLP, 45 P.3d 693, 710 (Colo. 2002).*

n140 *Id. at 715.*

n141 *Rook v. James E. Russell Petroleum, Inc., 679 P.2d 158, 166-67 (Kan. 1984).*

n142 Parties having the power of eminent domain may protect their rights by securing a state certificate and by condemning the reservoir, and such parties are further protected from the rule of capture if they can prove by a preponderance of the evidence that injected gas had migrated to adjoining property or to a stratum that has not been condemned. *KAN. STAT. ANN. § 55-1210* (2007). See Williams Natural Gas Co. v. Supra *Energy, Inc., 931 P.2d 7 (Kan. 1997); Union Gas Sys., Inc. v. Carnahan, 774 P.2d 962 (Kan. 1989).* For the meaning of "adjoining," see *N. Natural Gas Co. v. Nash Oil & Gas, Inc., 2005 U.S. Dist. LEXIS 10181* (D. Kan. May 16,

2005) (*unreported*). If gas migrates into another stratum, further condemnation may be pursued, but landowners' damages for the pre-condemnation trespass and unjust enrichment are measured by the fair rental value of such stratum. *Beck y. N. Natural Gas Co., 170 F.3d 1018 (10th Cir. 1999).*

n143 *Anderson v. Beech Aircraft Corp., 699 P.2d 1023, 1031 (Kan. 1985).*

n144 *Crawford v. Hrabe, 44 P.3d 442, 444 (Kan. 2002).*

n145 *Id. at 447.*

n146 *Id. at 448-50* (citing *Holt v. Sw. Antioch Sand Unit, Fifth Enlarged, 292 P.2d 998 (Okla. 1955)); Manziel, 361 S.W.2d at 568; Geo-Viking, Inc., 817 S.W.3d at 357.*

n147 *Crawford, 44 P.3d at 452-53.*

n148 *Tidewater Oil Co. v. Jackson, 320 F.2d 157, 163 (10th Cir. 1963).*

n149 *Id. at 164.*

n150 *Id. at 165.*

n151 *Hayes Sight & Sound, Inc. v. ONEOK, Inc., 136 P.3d 428, 433-34 (Kan. 2006).*

n152 *Gilley v. Kan. Gas Serv. Co., 169 P.3d 1064 (Kan. 2007); Smith v. Kan. Gas Serv. Co., 169 P.3d 1052 (Kan. 2007).*

n153 *See Gray-Mellon Oil Co. v. Fairchild, 292 S.W. 743, 745-46 (Ky. 1927). But see Rice Bros. Mineral Corp. v. Talbott, 717 S.W.2d 515, 516 (Ky. 1986)* (oil and gas "ownership is limited to possessing an exclusive legal right to explore and, if oil and gas is found, to reduce that substance to possession and ownership").

n154 *Cent. Ky. Natural Gas Co. v. Smallwood, 252 S.W.2d 866, 868 (Ky. 1952).*

n155 *Hammonds v. Cent. Ky. Natural Gas Co., 75 S.W.2d 204, 205-06 (Ky. 1934).*

n156 *Smallwood v. Cent. Ky. Natural Gas Co., 308 S.W.2d 439, 442-43 (Ky. 1958).*

n157 *Tex. Am. Energy Corp. v. Citizens Fidelity Bank & Trust, 736 S.W.2d 25, 28 (Ky. 1987).*

n158 *U.S. v. 43.42 Acres of Land, 520 F. Supp. 1042, 1043, 1046 (W.D. La. 1981).*

n159 *Miss. River Transmission Corp. v. Tabor, 757 F.2d 662, 672 (5th Cir. 1985)* (citing *S. Natural Gas Co. v. Poland, 406 So.2d 657, 666* (La. App. 2d Cir. 1981, writ denied)). *Accord B&J Oil & Gas v. FERC., 353 F.3d 71 (D.C. Cir. 2004)* (addressing the right of the pipeline operator to expand natural gas storage reservoir into area of active oil and gas production). State law determines the parties entitled to compensation. *Columbia Gas Transmission Corp. v. Exclusive Natural Gas Storage Easement, 962 F.2d 1192 (6th Cir. 1992).*

n160 *Williston Basin Interstate Pipeline Co. v. An Exclusive Gas Storage Lease Hold in the Judith River Subterranean Geological Formation, 999 F.2d 546 (9th Cir. 1993)* (unpublished, but memorandum opinion is available at *1993 WL 242979).*

n161 *Raymond v. Union Tx. Petroleum Corp., 697 F. Supp. 270, 271 (E.D. La. 1988).*

n162 *Id. at 274.*

n163 *Id.*

n164 *Mongrue v. Monsanto, 249 F.3d 422 (5th Cir. 2001).*

n165 *Mongrue v. Monsanto, No. CIV.A. 98-2531, 1999 WL 970354 (E.D. La. 1999), aff'd 249 F.3d 422 (5th Cir. 2001).*

n166 *Id.* at 432 n. 15.

n167 *Boudreaux v. Jefferson Island Storage & Hub, LLC, 255 F.3d 271, 274 (5th Cir. 2001).*

n168 *Dep't. of Transp. v. Goike, 560 N.W.2d 365, 365 (Mich. App. 1996).*

n169 *Id.*

n170 *Id.*

n171 *ANR Pipeline v. 60 Acres of Land, 418 F. Supp. 2d 933, 940 (W.D. Mich. 2006).*

n172 *Id. at 941.*

n173 *Hartman v. Texaco Inc., 937 P.2d 979 (N.M. App. 1997)* (construing *N. MEX. STAT. § 30-14-1.1*).

n174 *Snyder Ranches, Inc. v. Oil Conservation Comm'n, 798 P.2d 587 (N.M. 1990).*

n175 *Id. at 590.*

n176 *Int'l Salt Co. v. Geostow, 878 F.2d 570, 574 (2d. Cir. 1989)* (construing New York law).

n177 *Id. at 575.*

n178 *Miles v. Home Gas Co., 316 N.Y.Supp.2d 908 (N.Y. Sup. Ct. App. Div. 1970).*

n179 *Chance v. BP Chemicals, Inc., 670 N.E.2d 985 (Ohio 1996).*

n180 *Willoughby Hills v. Corrigan, 278 N.E.2d 658, 664 (Ohio 1972)* (citing *United States v. Causby, 328 U.S.*

256, 260-261 (1946)) ("[T]he doctrine of the common law, that the ownership of land extends to the periphery of the universe . . . has no place in the modern world.").

n181 *Chance, 670 N.E.2d at 992.*

n182 *Id.*

n183 *Id.*

n184 *Id.*

n185 *Id.* (emphasis added).

n186 *Chance, 670 N.E.2d at 993.*

n187 *Sunray Oil Co. v. Cortez Oil Co., 112 P.2d 792 (Okla. 1941).*

n188 *Ellis v. Ark. La. Gas Co., 450 F. Supp. 412, 421 (E.D. Okla. 1978), aff'd, 609 F.2d 436, 439 (10th Cir. 1979).*

n189 *Id.*

n190 *Id. at 422.*

n191 *Ok. Natural Gas Co. v. Mahan & Rowsey, Inc., 786 F.2d 1004, 1007-07 (10th Cir. 1986).*

n192 OKLA. STAT. ANN. tit. 52, §§ 36.1-36.7 (1951).

n193 *OKLA. STAT. ANN. tit. 52, § 36.6.*

n194 *Greyhound Leasing & Fin. Corp. v. Joiner City Unit, 444 F.2d 439 (10th Cir. 1971); Boyce v. Dundee Healdton Sand Unit, 560 P.2d 234 (Okla. Civ. App. 1975).*

n195 *Greyhound, 444 F.2d at 444-45; Boyce, 560 P.2d at 234.*

n196 *W. Edmond Salt Water Disposal Ass'n v. Rosecrans, 226 P.2d 965, 970 (Okla. 1950).*

n197 *Id. at 969.*

n198 *W Edmond Hunton Lime Unit v. Lillard, 265 P.2d 730, 731 (Okla. 1954).*

n199 *U.S. Steel Corp. v. Hoge, 468 A.2d 1380, 1383 (Pa. 1983)* (Flaherty, J., dissenting).

n200 *Id. at 1383* (Flaherty, J., dissenting).

n201 *Id.* (Flaherty, J., dissenting).

n202 *Id.* (Flaherty, J., dissenting).

n203 *Id. at 1384* (Flaherty, J., dissenting).

n204 *Tate v. United States Fuel Gas Co., 71 S.E.2d 65,71-72 (W. Va. 1952).*

n205 *Id.* at 67-68.

n206 *Id.* at 68.

n207 *Id.* at 72.

n208 *Id.*

n209 Wyo. Sess. Laws ch. 29, principally codified at *WYO. STAT. ANN. § 34-1-152* (2008).

n210 2008 Wyo. Sess. Laws ch. 30, principally codified at WYO. STAT. ANN. § 30-11-313 (2008).

n211 INTERSTATE OIL AND GAS COMPACT COMM'N TASK FORCE ON CARBON CAPTURE AND GEOLOGIC STORAGE, STORAGE OF CARBON DIOXIDE IN GEOLOGIC STRUCTURES, A LEGAL AND REGULATORY GUIDE FOR STATES AND PROVINCES, APPENDIX I: MODEL STATUTE FOR GEOLOGIC STORAGE OF CARBON DIOXIDE 31-35 (2007). The Task Force has also drafted model regulations. *Id.* at APPENDIX II: MODEL GENERAL RULES AND REGULATIONS at 36-47, *available at* http://www.crossroads.odl.state.ok.us/cdm4/item_viewer.php?CISOROOT=/stgovpub&CISOPTR=3726&CISOBOX=1&REC=1

n212 Cf. *Amoco Prod. Co. v. So. Ute Indian Tribe, 526 U.S. 865 (1999)* (holding that the reservation of coal in patents issued under the Coal Lands Acts of 1909 and 1910 did not include methane gas embedded in coal).

n213 *43 U.S.C. § 299* (West 1993).

n214 *Cf. Watt v. W. Nuclear, Inc., 462 U.S. 36 (1983)* (holding, on a vote of five to four, that the reservation of "coal and other minerals" in a patent issued under the Stock-Raising and Homestead Act of 1916 reserved gravel); *United States v. Union Oil Co., 549 F.2d 1271 (9th Cir. 1977)* (holding that the reservation of "coal and other minerals" in a patent issued under the Stock-Raising and Homestead Act of 1916 reserved geothermal resources on the ground that legislative history revealed that Congress intended to reserve all mineral fuel resources). *But see BedRoc Ltd. LLC v. United States, 541 U.S. 176 (2004)* (holding that the reservation of "coal and other valuable minerals" in a patent issued under the Pittman Underground Water Act of 1919 did not reserve sand and gravel); *United States v. Hess, 194 F.3d 1164 (10th Cir. 1999)* (vacating a ruling that the reservation of "all oil and gas, coal and other minerals" in a land exchange reserved gravel).

n215 *Watt, 462 U.S. at 55.*

n216 *Id. at 53.*

n217 *Id. at 59-60,* citing legislative history in H.R.Rep. No. 35, 64th Cong., 1st Sess. 18 (1916) (emphasis in original). *United States v. Union Oil Co., 549 F.2d 1271 (9th Cir. 1977)* contains similarly broad language: "All of the elements of a geothermal system--magma, porous rock strata, even water itself--may be classified as "minerals." *Id. at 1273-74.* Note, however, that even this Ninth Circuit opinion is silent about the pore spaces, and the thrust of the opinion regarded geothermal resources as a mineral because of its energy potential. In *Rosette Inc. v. United States, 277 F.3d 1222, 1227-29 (10th Cir. 2002)* (holding that geothermal resources were minerals under the SRHA), the court summarized the holding in *Watt* as follows:

> . . . [T]o qualify as a 'mineral' under the reservation of the SRHA a substance must be 1) mineral in character, i.e. inorganic, 2) removable from the soil, 3) usable for commercial purposes, 4) and of such a character that there was no reason to suppose Congress intended it to be included in the surface estate.
>
> . . . .
>
> The question is not what Congress intended to reserve, but rather what Congress intended to give away in its grant to the landholder in the SRHA. The established rule is that land grants are construed favorably to the government and nothing passes except that which is conveyed in clear language, resolving all doubts in favor of the government.

West's Wyoming Statutes Annotated

Title 34. Property, Conveyances and Security Transactions
Chapter 1. General Provisions (Refs & Annos)
Article 1. In General

W.S.1977 § 34-1-152

§ 34-1-152. Ownership of pore space underlying surfaces

Currentness

(a) The ownership of all pore space in all strata below the surface lands and waters of this state is declared to be vested in the several owners of the surface above the strata.

(b) A conveyance of the surface ownership of real property shall be a conveyance of the pore space in all strata below the surface of such real property unless the ownership interest in such pore space previously has been severed from the surface ownership or is explicitly excluded in the conveyance. The ownership of pore space in strata may be conveyed in the manner provided by law for the transfer of mineral interests in real property. No agreement conveying mineral or other interests underlying the surface shall act to convey ownership of any pore space in the stratum unless the agreement explicitly conveys that ownership interest.

(c) No provision of law, including a lawfully adopted rule or regulation, requiring notice to be given to a surface owner, to an owner of the mineral interest, or to both, shall be construed to require notice to persons holding ownership interest in any pore space in the underlying strata unless the law specifies notice to such persons is required.

(d) As used in this section, the term "pore space" is defined to mean subsurface space which can be used as storage space for carbon dioxide or other substances.

(e) Nothing in this section shall be construed to change or alter the common law as of July 1, 2008, as it relates to the rights belonging to, or the dominance of, the mineral estate. For the purpose of determining the priority of subsurface uses between a severed mineral estate and pore space as defined in subsection (d) of this section, the severed mineral estate is dominant regardless of whether ownership of the pore space is vested in the several owners of the surface or is owned separately from the surface.

(f) All instruments which transfer the rights to pore space under this section shall describe the scope of any right to use the surface estate. The owner of any pore space right shall have no right to use the surface estate beyond that set out in a properly recorded instrument.

(g) Transfers of pore space rights made after July 1, 2008 are null and void at the option of the owner of the surface estate if the transfer instrument does not contain a specific description of the location of the pore space being transferred. The description may include but is not limited to a subsurface geologic or seismic survey or a metes and bounds description of the surface lying over the transferred pore space. In the event a description of the surface is used, the transfer shall be deemed to include pore space at all depths underlying the described surface area unless specifically excluded. The validity of pore space

HOUSE ENERGY AND UTILITIES
DATE: 2/11/2011
ATTACHMENT 8-1

rights under this subsection shall not affect the respective liabilities of any party and such liabilities shall operate in the same manner as if the pore space transfer were valid.

(h) Nothing in this section shall alter, amend, diminish or invalidate rights to the use of subsurface pore space that were acquired by contract or lease prior to July 1, 2008.

Credits

Laws 2008, ch. 29, § 1, eff. July 1, 2008; Laws 2009, ch. 49, § 1, eff. July 1, 2009; Laws 2009, ch. 169, § 1, eff. March 11, 2009.

Current through the 2010 Budget Session

End of Document

8-2

Context and Analysis (4)

Historical And Statutory Notes (4)

Laws 2008, ch. 29, § 3 provided:

"It is the intent of the legislature to clarify the ownership of pore space underlying the surface of the lands and waters of this state. All conveyances of interests in real property on and after July 1, 2008 shall be subject to the provisions of this act. All conveyances of real property made prior to July 1, 2008 shall be construed in accordance with the provisions of this act unless a person claiming an ownership interest contrary to the provisions of this act establishes such ownership by a preponderance of the evidence in an action to establish ownership of such interest."

Laws 2009, ch. 49, § 1, in subsec. (e), added the second sentence.

Laws 2009, ch. 169, § 1, in subsec. (g), in the fourth sentence, changed "paragraph" to "subsection".

8-3

West's North Dakota Century Code Annotated

Title 47. Property
Chapter 47-31. Subsurface Pore Space Policy

NDCC, 47-31-01

§ 47-31-01. Policy

Currentness

Undivided estates in land and clarity in land titles reduce litigation, enhance comprehensive management, and promote the security and stability useful for economic development, environmental protection, and government operations.

Credits

S.L. 2009, ch. 401, § 1, eff. April 9, 2009.

Current through the 2009 Regular Session

End of Document

HOUSE ENERGY AND UTILITIES

DATE: 2/11/2011

ATTACHMENT 9-1

West's North Dakota Century Code Annotated

Title 47. Property
Chapter 47-31. Subsurface Pore Space Policy

NDCC, 47-31-02

§ 47-31-02. Pore space defined

Currentness

In this chapter "pore space" means a cavity or void, whether natural or artificially created, in a subsurface sedimentary stratum.

Credits

S.L. 2009, ch. 401, § 1, eff. April 9, 2009.

Current through the 2009 Regular Session

End of Document

9-2

West's North Dakota Century Code Annotated

Title 47. Property
Chapter 47-31. Subsurface Pore Space Policy

NDCC, 47-31-03

§ 47-31-03. Title to pore space

Currentness

Title to pore space in all strata underlying the surface of lands and waters is vested in the owner of the overlying surface estate.

Credits

S.L. 2009, ch. 401, § 1, eff. April 9, 2009.

Current through the 2009 Regular Session

End of Document

9-3

West's North Dakota Century Code Annotated

Title 47. Property
Chapter 47-31. Subsurface Pore Space Policy

NDCC, 47-31-04

§ 47-31-04. Conveyance of real property conveys pore space

Currentness

A conveyance of title to the surface of real property conveys the pore space in all strata underlying the surface of the real property.

Credits

S.L. 2009, ch. 401, § 1, eff. April 9, 2009.

Current through the 2009 Regular Session

End of Document

9-4

West's North Dakota Century Code Annotated

Title 47. Property
Chapter 47-31. Subsurface Pore Space Policy

NDCC, 47-31-05

§ 47-31-05. Severing pore space prohibited

Currentness

Title to pore space may not be severed from title to the surface of the real property overlying the pore space. An instrument or arrangement that seeks to sever title to pore space from title to the surface is void as to the severance of the pore space from the surface interest.

Credits

S.L. 2009, ch. 401, § 1, eff. April 9, 2009.

Current through the 2009 Regular Session

End of Document

9-5

West's North Dakota Century Code Annotated

Title 47. Property
Chapter 47-31. Subsurface Pore Space Policy

NDCC, 47-31-06

§ 47-31-06. Transactions allowed

Currentness

Leasing pore space is not a severance prohibited by this chapter.

Credits

S.L. 2009, ch. 401, § 1, eff. April 9, 2009.

Current through the 2009 Regular Session

End of Document

9-6

West's North Dakota Century Code Annotated

Title 47. Property
Chapter 47-31. Subsurface Pore Space Policy

NDCC, 47-31-07

§ 47-31-07. Application

Currentness

This chapter does not affect transactions before April 9, 2009, that severed pore space from title to the surface estate.

Credits

S.L. 2009, ch. 401, § 1, eff. April 9, 2009.

Current through the 2009 Regular Session

End of Document

9-7

West's North Dakota Century Code Annotated

Title 47. Property
Chapter 47-31. Subsurface Pore Space Policy

NDCC, 47-31-08

§ 47-31-08. Mineral and pore space estates--Relationship

Currentness

In the relationship between a severed mineral owner and a pore space estate, this chapter does not change or alter the common law as of April 9, 2009, as it relates to the rights belonging to, or the dominance of, the mineral estate.

Credits

S.L. 2009, ch. 401, § 1, eff. April 9, 2009.

Current through the 2009 Regular Session

End of Document

9-8

1500 SW Arrowhead Road
Topeka, KS 66604-4027

Kansas
Corporation Commission

phone: 785-271-3100
fax: 785-271-3354
http://kcc.ks.gov/

Thomas E. Wright, Chairman
Ward Loyd, Commissioner

Sam Brownback, Governor

February 10, 2011

House Energy and Utilities Committee
Docking State Office Building
915 SW Harrison, Rm. 785
Topeka, KS 66612

Chairman Holmes and members of the House Energy and Utilities Committee:

During our discussion on February 3, 2011, members of the committee requested further information regarding the purpose of the Kansas Broadband Advisory Task Force and also the take rate for broadband service in Kansas.

The Task Force was established by Governor Mark Parkinson in Executive Order 10-08, dated July 12, 2010. The Task Force is comprised of 24 people, including 4 legislative representatives. The Task Force has been charged with the following:

1. To develop recommendations for development and implementation of a broadband digital strategy to support statewide availability and adoption of broadband services consistent with the 2010 National Broadband Plan.
2. To coordinate key stakeholders input from both the public and private sectors to assist in broadband planning and implementation efforts and in a technology neutral manner.
3. To establish performance goals and metrics, and the impact on achieving statewide universal availability and adoption of broadband services with greatest attention to un-served and under-served communities.
4. Advise the Governor and the Kansas Legislature on statutory, regulatory, and policy changes necessary to support making affordable, quality broadband service available to every Kansas home and business and encourage its adoption and to provide feedback to federal agencies engaged in national broadband policy and funding efforts as they relate to Kansas.
5. Identify opportunities to leverage public/private partnerships in funding broadband sustainability and infrastructure.
6. Identify opportunities to foster economic development and technology innovation through partnerships between public, private and non-profit sectors.

With regard to Representative Sloan's question regarding the broadband take rate (or subscribership rate) in Kansas, we are not aware of any independent data that specifically addresses this. However, a November 2009, Industry Brief, authored by Brian Webster Consulting and The Gadberry Group, address broadband subscribership rates and provides state by state data. Their report shows that Kansas has a 78.23% take rate where broadband service is available. The take rate in Colorado is 75.46%, 76.28% for Oklahoma, 76.67% for Nebraska and

HOUSE ENERGY AND UTILITIES
DATE: 2/11/2011
ATTACHMENT 10-1

74.41 for Missouri. Kansas compares favorably with adjacent states and with the national rate of 72.90%. The entire report is available at http://broadbandbreakfast.com/wp-content/uploads/2009/12/Take-Rate-Brief.pdf

Please let me know if you have additional questions on this matter. I can be contacted at (785) 271-3230 or at g.mcdonald@kcc.ks.gov.

Sincerely,

Guy McDonald

Guy McDonald
Senior Telecommunications Analyst
Kansas Corporation Commission

Agricultural Ethyl Alcohol Incentive

(KSA 79-34,160-164)

Briefly, this is an incentive payment of 7.5 cents per gallon for ethanol producers who sell at least 5 million gallons per year. A producer can receive the incentive for no more than 15 million gallons annually, and for no more than 7 years.

This incentive is for facilities that have new production of agricultural ethyl alcohol (ethanol) of at least 5 million gallons in a year. No incentive is available for new or expanded production over 15 million gallons. The incentive for expanded or new production is $.075 per gallon sold and is limited to seven years.

Facilities and annual production eligible for the incentive include:

- Producers who were in production prior to July 1, 2001 and who increased production capacity on or after July 1, 2001 by an amount of 5 million gallons, and
- Producers who commenced production on or after July 1, 2001 and who sold at least 5 million gallons

Funding for the incentive comes from quarterly transfers of $875,000 ($3.5 million annually) in motor fuel tax receipts to the Kansas Qualified Agricultural Ethyl Alcohol Producer Incentive Fund. If production exceeds the fund balance, a proration of the distribution is performed

The agricultural ethyl alcohol incentive expires on July 1, 2011.

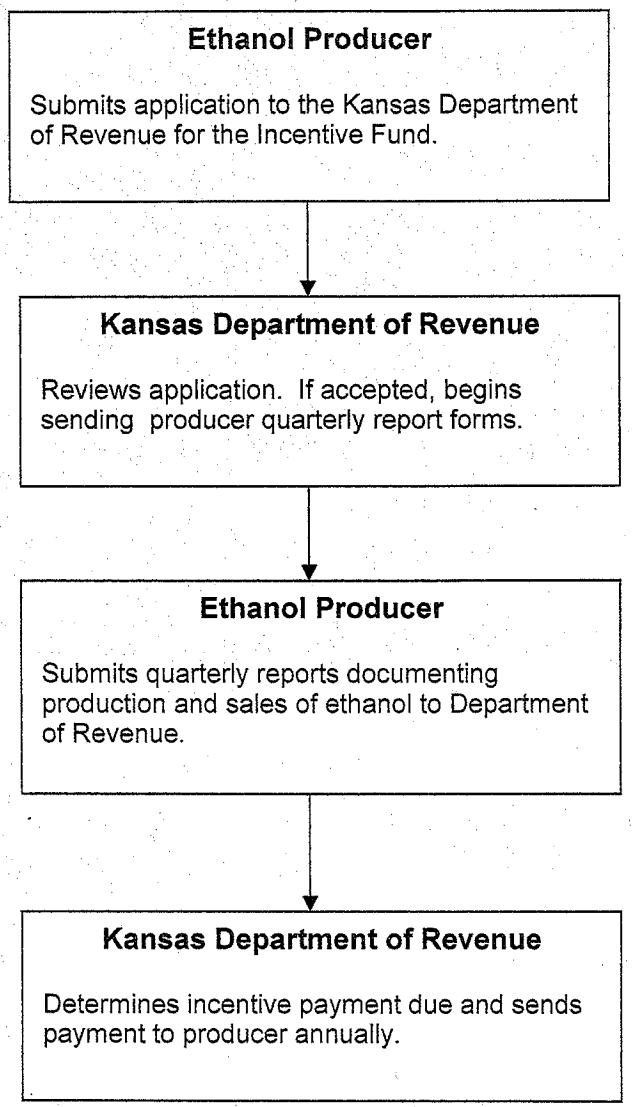
Kansas Legislative Research Department, 2/10/11

HOUSE ENERGY AND UTILITIES

DATE: 2/11/2011

ATTACHMENT 11-1

Process for Receiving Funds from the Agricultural Ethyl Alcohol Producer Incentive Fund



Kansas Qualified Agricultural Ethyl Alcohol Production Incentive

Fiscal Year	Qtr	Total Gallons Produced	Payment	Total Gallons PD On	Adjustment per gallon	Production Fund
1988	3rd qtr 87	2,884,588	$576,917.60	2,884,588	$0.20	
1988	4th qtr 87	3,249,903	$649,980.60	3,249,903	$0.20	
1988	1st qtr 88	3,591,307	$646,435.26	3,591,307	$0.18	
1989	2nd qtr 88	4,104,910	$615,736.50	4,104,910	$0.15	
1989	3rd qtr 88	4,189,220	$628,383.00	4,189,220	$0.15	
1989	4th qtr 88	4,377,611	$612,865.54	4,377,611	$0.14	
1989	1st qtr 89	4,445,794	$622,411.16	4,445,794	$0.14	
1990	2nd qtr 89	3,948,932	$631,829.12	3,948,932	$0.16	
1990	3rd qtr 89	4,209,450	$631,417.50	4,209,450	$0.15	
1990	4th qtr 89	3,866,744	$618,679.04	3,866,744	$0.16	
1990	1st qtr 90	4,462,553	$624,757.42	4,462,553	$0.14	
1991	2nd qtr 90	4,555,521	$637,772.94	4,555,521	$0.14	
1991	3rd qtr 90	4,431,541	$620,415.74	4,431,541	$0.14	
1991	4th qtr 90	5,071,939	$608,632.68	5,071,939	$0.12	
1991	1st qtr 91	5,550,070	$610,507.70	5,550,070	$0.11	
1992	2nd qtr 91	5,518,887	$662,266.44	5,518,887	$0.12	
1992	3rd qtr 91	5,800,986	$580,098.60	5,800,986	$0.10	
1992	4th qtr 91	6,262,991	$626,299.10	6,262,991	$0.10	
1992	1st qtr 92	6,695,673	$669,567.30	6,695,673	$0.10	
1993	2nd qtr 92	6,789,957	$611,096.22	6,789,957	$0.09	
1993	3rd qtr 92	5,832,054	$583,205.40	5,832,054	$0.10	
1993	4th qtr 92	6,336,491	$633,649.10	6,336,491	$0.10	
1993	1st qtr 93	6,708,849	$670,884.90	6,708,849	$0.10	
1994	2nd qtr 93	6,520,019	$586,801.71	6,520,019	$0.09	
1994	3rd qtr 93	5,857,404	$644,314.44	5,857,404	$0.11	
1994	4th qtr 93	6,585,072	$592,656.48	6,585,072	$0.09	
1994	1st qtr 94	8,405,251	$672,420.08	8,405,251	$0.08	
1995	2nd qtr 94	7,622,534	$609,802.72	7,622,534	$0.08	
1995	3rd qtr 94	8,433,414	$590,338.98	8,433,414	$0.07	
1995	4th qtr 94	8,659,222	$606,146.24	8,659,222	$0.07	
1995	1st qtr 95	8,321,879	$665,750.32	8,321,879	$0.08	
1996	2nd qtr 95	7,395,967	$591,677.36	7,395,967	$0.08	
1996	3rd qtr 95	7,763,318	$620,985.44	7,763,318	$0.08	
1996	4th qtr 95	8,498,678	$680,694.24	8,498,678	$0.08	
1996	1st qtr 96	6,971,175	$627,405.75	6,971,175	$0.09	
1997	2nd qtr 96	3,434,570	$618,222.60	3,434,570	$0.18	
1997	3rd qtr 96	3,711,415	$630,940.55	3,711,415	$0.17	
1997	4th qtr 96	7,206,921	$576,553.68	7,206,921	$0.08	
1997	1st qtr 97	7,433,820	$669,043.80	7,433,820	$0.09	
1998	2nd qtr 97	4,520,000	$607,095.20	4,520,000	$0.08	
1998	3rd qtr 97	8,268,552	$578,798.64	8,268,552	$0.07	
1998	4th qtr 97	8,199,188	$655,935.04	8,199,188	$0.08	

HOUSE ENERGY AND UTILITIES

DATE: 2/11/2011

ATTACHMENT 12-1

Kansas Qualified Agricultural Ethyl Alcohol Production Incentive

Fiscal Year	Qtr	Total Gallons Produced	Payment	Total Gallons PD On	Adjustment per gallon	Production Fund
1998	1st qtr 98	7,104,756	$639,428.04	7,104,756	$0.09	
1999	2nd qtr 98	7,732,723	$618,617.84	7,732,723	$0.08	
1999	3rd qtr 98	7,983,267	$638,661.36	7,983,267	$0.08	
1999	4th qtr 98	8,679,607	$607,572.49	8,679,607	$0.07	
1999	1st qtr 99	8,263,976	$661,118.08	8,263,976	$0.08	
2000	2nd qtr 99	8,139,144	$569,740.11	8,139,144	$0.07	
2000	3rd qtr 99	7,209,570	$648,861.30	7,209,570	$0.09	
2000	4th qtr 99	8,972,001	$628,040.07	8,972,001	$0.07	
2000	1st qtr 00	9,303,992	$651,279.44	9,303,992	$0.07	
2001	2nd qtr 00	9,108,709	$546,522.54	9,108,709	$0.06	
2001	3rd qtr 00	8,627,446	$690,195.68	8,627,446	$0.08	
2001	4th qtr 00	8,268,308	$578,781.56	8,268,308	$0.07	
2001	1st qtr 01	9,482,459	$663,772.13	9,482,459	$0.07	
2002	2nd qtr 01	8,888,175	$444,408.75	8,888,175	$0.05	
2002	3rd qtr 01	8,191,027	$409,551.35	8,191,027	$0.05	
2002	4th qtr 01	10,732,544	$536,627.20	10,732,544	$0.05	**Current production $.05**
	4th qtr 01	0	$0.00	0	$0.075	**New production account $.075**
2002	**1st qtr 02**	12,979,125	$519,165.00	12,979,125	$0.04	**Current production $.05**
	1st qtr 02	9,432,509	$707,438.18	9,432,509	$0.075	**New production account $.075**
2003	**2nd qtr 02**	13,769,308	$619,618.86	13,769,308	$0.045	**Current production $.05**
	2nd qtr 02	7,532,051	$417,561.83	5,567,491	$0.075	**New production account $.075**
2003	**3rd qtr 02**	7,859,745	$392,987.25	7,859,745	$0.05	**Current production $.05**
	3rd qtr 02	18,435,830	$647,735.92	8,396,997	$0.075	**New production account $.075**
2003	**4th qtr 02**	7,845,302	$392,265.10	7,845,302	$0.05	**Current production $.05**
	4th qtr 02	10,440,806	$783,060.45	10,440,806	$0.075	**New production account $.075**
2003	**1st qtr 03**	8,972,670	$448,633.50	8,972,670	$0.05	**Current production $.05**
	1st qtr 03	11,460,453	$341,939.55	4,559,194	$0.075	**New production account $.075**
2004	**2nd qtr 03**	8,627,067	$431,353.35	8,627,067	$0.05	**Current production $.05**
	2nd qtr 03	11,570,029	$0.00	0	$0.075	**New production account $.075**
2004	**3rd qtr 03**	7,535,472	$367,773.60	7,535,472	$0.05	**Current production $.05**
	3rd qtr 03	11,051,727	$0.00	0	$0.075	**New production account $.075**
2004	**4th qtr 03**	10,217,834	$510,891.70	10,217,834	$0.05	**Current production $.05**
	4th qtr 03	11,487,796	$861,584.70	11,487,796	$0.075	**New production account $.075**
2004	**1st qtr 04**	12,474,799	$623,739.95	12,474,799	$0.05	**Current production $.05**
	1st qtr 04	11,447,930	$263,415.30	3,512,204	$0.075	**New production account $.075**
2005	**2nd qtr 04**	12,052,786	$488,619.94	12,052,786	$0.04054	**Current production $.05**
	2nd qtr 04	20,403,463	$672,976.80	8,973,024	$0.075	**New production account $.075**
2005	**3rd qtr 04**	10,756,489	Ended FY 05	0	$0.000	**Current production**
	3rd qtr 04	20,376,549	$452,023.20	6,026,976	$0.075	**New production account $.075**
2005	**4th qtr 04**	4,126,664	Ended FY 05	0	$0.000	**Current production**
	4th qtr 04	26,149,188	$1,395,212.71	18,602,836	$0.075	**New production account $.075**
2005	**1st qtr 05**	10,264,350	Ended FY 05	0	$0.000	**Current production**
	1st qtr 05	21,102,662	$261,810.83	3,490,811	$0.075	**New production account $.075**

Kansas Qualified Agricultural Ethyl Alcohol Production Incentive

Fiscal Year	Qtr	Total Gallons Produced	Payment	Total Gallons PD On	Adjustment per gallon	Production Fund
2006	2nd qtr 05	9,121,910	Ended FY 05	0	$0.000	Current production
	2nd qtr 05	23,041,589	$760,135.43	10,135,139	$0.075	New production account $.075
2006	3rd qtr 05	8,022,241	Ended FY 05	0	$0.000	Current production
	3rd qtr 05	31,783,573	$1,034,193.83	13,789,251	$0.075	New production account $.075
2006	4th qtr 05	3,484,777	Ended FY 05	0	$0.000	Current production
	4th qtr 05	38,723,566	$1,892,659.50	25,235,460	$0.075	New production account $.075
2006	1st qtr 06	10,822,157	Ended FY 05	0	$0.000	Current production
	1st qtr 06	24,776,673	$204,832.80	2,731,104	$0.075	New production account $.075
2007	2nd qtr 06	9,742,561	Ended FY 05	0	$0.000	Current production
	2nd qtr 06	34,082,647	$1,597,186.95	21,295,826	$0.075	New production account $.075
2007	3rd qtr 06	8,144,707	Ended FY 05	0	$0.000	Current production
	3rd qtr 06	40,223,797	$652,813.05	8,704,174	$0.075	New production account $.075
2007	4th qtr 06	10,176,702	Ended FY 05	0	$0.000	Current production
	4th qtr 06	45,799,635	$2,183,121.97	34,559,474	$0.063	New production account $.06317
2007	1st qtr 07	10,296,740	Ended FY 05	0	$0.000	Current production
	1st qtr 07	46,735,934	$164,813.78	2,197,517	$0.075	New production account $.075
2008	2nd qtr 07	12,200,824	Ended FY 05	0	$0.000	Current production
	2nd qtr 07	45,993,352	$1,661,272.20	22,150,296	$0.075	New production account $.075
2008	3rd qtr 07	11,465,733	Ended FY 05	0	0.0000	Current production
	3rd qtr 07	46,140,189	$1,430,137.88	19,068,505	0.0750	New production account $.075
2008	4th qtr 07	12,058,615	Ended FY 05	0	0.0000	Current production
	4th qtr 07	74,251,893	$283,589.93	3,781,199	0.0750	New production account $.075
2008	1st qtr 08	12,268,641	Ended FY 05	0	0.0000	Current production
	1st qtr 08	85,319,431	$1,832,479.15	29,796,409	0.0615	New production account $.075
2009	2nd qtr 08		Ended FY 05		0.0000	Current production
	2nd qtr 08	103,467,224	$877,027.02	30,242,312	0.0290	New production account $.075
2009	3rd qtr 08	5,050,565	Ended FY 05	0	0.0000	Current production
	3rd qtr 08	95,749,898	$92,495.41	3,189,498	0.0290	New production account
	4th qtr 08	5,832,778	Ended FY 05	0	0.0000	Current production
	4th qtr 08	108,945,249	$0.00	0	0.0750	New production account
	1st qtr 09	5,001,655	Ended FY 05	0	0.0000	Current production
	1st qtr 09	100,545,723	$0.00	0	0.0750	New production account
2010	2nd qtr 09	115,167,583	$3,408,200.16	101,513,225	0.033568	New production account $.033568
	3rd qtr 09	118,013,858				
	4th qtr 09	113,861,229				
	1st qtr 10	116,218,711				
2011	2nd qtr 10	117,027,480	$3,499,932.05	101,967,488	0.034324	New production account $.034324
	3rd qtr 10					
	4th qtr 10					
	1st qtr 11					
2012	2nd qtr 11					
	3rd qtr 11					
	4th qtr 11					

12-3

Kansas Qualified Agricultural Ethyl Alcohol Production Incentive

Fiscal Year	Qtr	Total Gallons Produced	Payment	Total Gallons PD On	Adjustment per gallon	Production Fund
	1st qtr 12					
2013	2nd qtr 12					
	TOTAL	2,361,314,518	$68,907,268.90	1,006,563,703		

12-4