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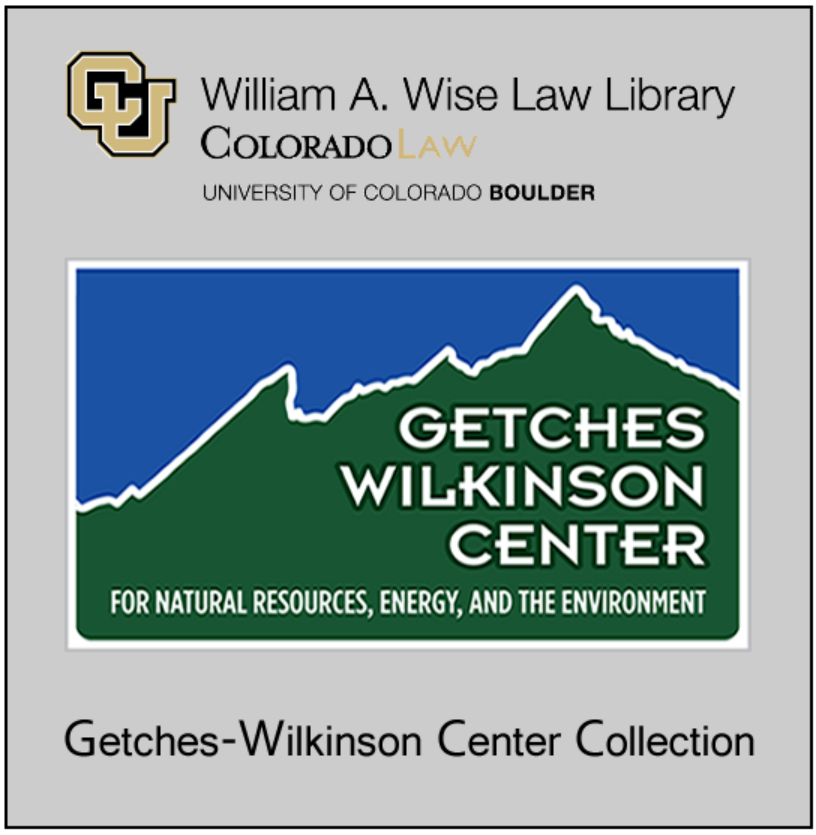

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THE GROWING INFLUENCE OF TORT AND PROPERTY LAW ON NATURAL RESOURCES LAW: CASE STUDIES OF COAL BED METHANE DEVELOPMENT AND GEOLOGIC CARBON SEQUESTRATION

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I. Introduction

A. Natural Resources Law has always been and continues to be based on tort and property law. These doctrines have been central in establishing and resolving basic questions in Natural Resources Law:

1. How to balance development of natural resources with private property rights?

2. How to balance public needs with private interests?

3. How to allocate resources between competing private concerns and needs?

4. What remedies should be available when a private or public entity damages, contaminates, takes, trespasses on, or interferes with resources owned or managed by another public or private entity?

5. How to prevent depletion or contamination of resources through allocation of rights, requirements for remediation, or imposition of damages and penalties?

B. These issues are present whether the focus is water rights, mineral rights, public and private lands, development pressures, or protection of endangered species.

C. Sources of tort law and property law include federal constitutional and statutory law, state statutory law and state common law. When common law or constitutional protection is perceived as insufficient, pressure builds for a state or federal legislative solution.

D. State tort law and property law provide the foundation for how we regulate natural resources, but their influence has been greatly overshadowed for many decades by the massive statutory and regulatory structure Congress has created to govern natural resources. Examples:

1. SMCRA

2. ESA

3. NEPA

4. Public Lands Laws

5. Others

E. Common Law

1. In the face of new problems and new technologies governing natural resources, sometimes the common law can play an important role in creating or articulating rights and remedies until state or federal legislation can address the issue.

2. Common law is not a substitute for effective regulation.

3. Common law can and should be used to fill the gaps between the statutes, and also to highlight current problems through the court system to spur legislative action to address the problem.

F. State Statutory Law

1. State legislative action can enhance or diminish property rights or tort law causes of action.

2. When piecemeal litigation relying on common law becomes too burdensome, pressure builds for a state legislative restructuring of rights with regard to resources.

G. This cycle of "pushing" the common law while at the same time making legislative changes to state property rights and tort causes of action continues as new issues arise regarding the development and preservation of natural resources.

H. This phenomenon is illustrated in the related area of environmental law. States are bringing public nuisance suits against auto manufacturers and power plants to address global warming concerns in the face of the federal government's failure to regulate greenhouse gases. In addition, states and private parties are relying more frequently on common law claims of strict liability, nuisance, negligence and trespass to obtain compensation not available under federal environmental laws for damages arising from lead paint, contaminated soil and groundwater and other sources of pollution. *See generally* Alexandra B. Klass, *Common Law and Federalism in the Age of the Regulatory State*, 92 IOWA L. REV. 545 (2007); Alexandra

B. Klass, *From Reservoirs to Remediation: The Impact of CERCLA on Common Law Strict Liability Environmental Claims*, 39 WAKE FOREST L. REV. 903 (2004).

I. The same phenomenon is also present in the area of Natural Resources law as is illustrated by the following case studies on Coal Bed Methane Development and Geologic Carbon Sequestration.

II. Natural Resources Case Study #1 – Coal Bed Methane, Split Estates, Property Rights and Tort Claims

A. Natural gas supplies as much as 25% of U.S. energy demands and gas prices are on the rise. To address prices and demand, there has been a push to develop more of the estimated 30 trillion cubic feet of coal bed methane gas that underlies the Powder River Basin in eastern Wyoming and Montana. *See Coal Bed Methane Frequently-asked Questions* (2003), http://waterquality.montana.edu/docs/methane/cbmfaq.shtml.

B. This resource underlies approximately 14 million acres, much of which is held in "split-estate," meaning the land surface and the mineral rights are in separate ownership. Forty-eight percent of all privately-owned land in Wyoming is split-estate. *See* www.wyominglandowners.org/splitestates/index.php.

C. The federal government owns most of the mineral rights in the Power River Basin and leases these rights to oil and gas companies.

D. Currently, there are approximately 20,000 CBM wells operating in the Powder River Basin and 30,000 more have been approved. The Bureau of Land Management ("BLM") predicts permitting 50,000-70,000 wells in Wyoming over the next ten years.

E. As a result of CBM development, Wyoming has the largest surplus in the nation as a percentage of its budget and will collect billions of dollars in tax revenues and royalty payments. 2003 gas production was valued at about $1.5 billion, providing $257 million in tax and royalty income to the state and counties. *See* Ruckelshaus Institute of Environment and Natural Resources, Final Report, Water Production from Coalbed Methane Development in Wyoming: A Summary of Quantity, Quality and Management Options 8-9 (Dec. 2005), at *http://www.uwyo.edu/enr/ienr/CBMWaterFinalReportDec2005.pdf*

F. Cumulative CBM water production from 1987 though December 2004 was over 380,000 acre-feet (2.9 billion barrels), while annual CBM water production in 2003 was 74,457 acre-feet (577 million barrels). Total production of CBM water across all Wyoming coal fields could total roughly 7 million acre-feet (55 billion barrels) if all of the recoverable CBM gas in the projected reserves of 31.7 tcf were produced. *See* Ruckelshaus Final Report at 10/ *See also* http://www.bizjournals.com/denver/stories/2005/04/18/focus3.html

G. Disputes between mineral rights holders and surface owners in the west have existed as long as lands have been held in split estate beginning in the early part of the 20th century with the Stock-Raising Homestead Act of 1916 and the Taylor Grazing Act of 1934.

H. Under common law in most states, the mineral estate is dominant but surface owners have some rights through the "accommodation doctrine," contract rights, or other sources of law.

I. Conflicts between surface owners and mineral rights holders have heightened significantly since the increase in CBM development in Wyoming, Montana, Colorado and New Mexico over the past several years.

J. The rate of development, the spacing and frequency of wells, and the need to discharge massive amounts of groundwater into surface ditches and streams to release the CBM gas has created new conflicts between surface and mineral rights holders.

K. The existing statutory and regulatory law relating to traditional oil and gas development is unable to easily address these new concerns:

1. CBM development companies have the power of eminent domain to take surface lands for water discharge purposes as well as drilling purposes.

2. Pursuant to 40 C.F.R. 435, subpart E, groundwater may be discharged directly to the surface from oil and gas operations in western states (west of the 98th meridian) where the produced water is of good enough quality for livestock watering or agricultural use and is put to such use.

3. In most states, there are no limits on the quantity of water to be discharged to the surface. Landowners in Colorado sued the state engineer for his refusal to exercise jurisdiction over permitting of CBM wells under its well-permit regulations. *See* Dale Rodebaugh, *Ranchers: Gas Drilling, Water Don't Mix*, The Durango Herald (December 2, 2005); Dale Rodebaugh, *Water Court Says Landowners Can Challenge Drillers*, The Durango Herald (May 12, 2006).

4. Wyoming law designates CBM water as a beneficial use and allows discharge to the surface by permit. *See* Wyo. Stat. § 41-3-101; http://seo.state.wy.us/PDF/GW_CBM%20Guidance.pdf.

5. In April 2007, Governor Dave Freudenthal of Wyoming rejected rules governing water discharge associated with CBM operations enacted in February 2007 by the state Environmental Quality Council ("EQC"). The Governor rejected the rules on grounds that they were an attempt to regulate water quantity, not water quality, and that only the state engineer, not EQC, could regulate water quantity issues. The state engineer has declined to regulate the quantity of water discharged from CBM operations. *See* Letter from Gov. Dave Freudenthal to EQC regarding Final Rules for Water Quality Division, April 23, 2007; Tripp Baltz, *Wyoming Governor Rejects Rules on Water Produced by Coal Bed Methane Operations*, BNA Daily Env. Rep. No. 79, at A-10 (April 25, 2007).

L. The disputes are not only between surface owners and minerals rights holders but also between states.

1. In January 2007, the State of Montana sued the State of Wyoming in the U.S. Supreme Court for alleged violations of the Yellowstone River Compact. Montana alleges that it has experienced severe water shortages in the Tongue and Power Basins in large part due to Wyoming's permitting of water storage facilities and pumping of groundwater for CBM development. *See* www.doj.mt.gov/news/releases2007/20070201.asp.

2. There have also been disputes between Montana and Wyoming over Montana's adoption of water quality rules that would severely limit the discharge of CBM water from Wyoming into the Power and Tongue Rivers that flow downstream into Montana. Wyoming has

asked the EPA to reject Montana's rules and Montana has countered that the salinity from CBM waters pollutes Montana's rivers and also limits Montana's ability to develop CBM resources in its own state. *See* http://www.mtstandard.com/articles/2006/04/06/newsstate/hjjdjfjdjcggge.txt.

M. Although regulatory efforts to address CBM development are beginning in some states, they are far from mature. In the interim, parties turn to tort law and property law to assert their rights and resolve disputes.

N. Common Law Developments

1. Until recently, the law had been fairly settled with regard to the rights of mineral owners and surface owners.

a) The mineral estate is the dominant estate. *See Mingo Oil Producers v. Kamp Cattle Co.*, 776 P.2d 736, 740 (Wyo. 1989).

b) The mineral owner has the right to use that portion of the surface estate reasonably necessary to develop the severed mineral interest. *See Gerrity Oil & Gas Co. v. Magness*, 946 P.2d 913, 926 (Colo. 1997).

c) The owner of the mineral rights is not liable for surface damage in the absence of negligence unless there is a contractual agreement to pay damages or a statute providing a right to damages. *See Amoco Prod. Co. v. Carter Farms*, 703 P.2d 894 (1985); *EOG Resources v. Turner*, 908 So. 2d 848, 854-55 (Miss. Ct. App. 2005). *See also Wyoming Outdoor Council v. Army Corps of Engineers*, 351 F. Supp.2d 1232, 1245-47, 1260 (D. Wyo. 2005) (recognizing that surface owners have a limited to ability to control the activities of drilling companies on their lands).

2. Starting in the 1970s, some courts began to adopt forms of the "accommodation doctrine" which required mineral owners to "accommodate" surface owners to the fullest extent possible. This meant that if the method of developing mineral rights would preclude or impair surface uses, and there were reasonable alternatives available to develop the mineral rights that would NOT preclude or

impair surface uses, such reasonable alternatives must be used. Any interference with surface rights than could have been avoided through reasonable alternatives constitutes a trespass. See *Gerrity Oil & Gas Co.*, 946 P.2d at 297; *Getty Oil Co. v. Jones*, 470 S.W.2d 618, 622 (Tex. 1971); *Trenolone v. Cook Exploration Co.*, 166 S.W.2d 495, 498-99 (Tex. Ct. App. 2005). A 2005 Wyoming statute may have codified the accommodation doctrine in that state, but it has not yet been interpreted by Wyoming courts. *See* Wyo. Stat. § 30-5-402(a).

3. Landowners in Wyoming, where the bulk of CBM development has occurred, have brought high-profile trespass and nuisance lawsuits based on the flow of CBM water into ephemeral streams causing damage to trees and agriculture.

a) Swartz v. Beach, 229 F. Supp.2d 1239 (D. Wyo. 2002)

Swartz sued the state and CBM company seeking damages to his ranch as a result of the high salinity of water discharged to a creek in connection with CBM development. Swartz contended the high salinity of the CBM water damaged his crops.

Swartz alleged nuisance and trespass against the gas company, along with claims against the state under the Clean Water Act and for inverse condemnation for allowing the damage to occur.

The district court denied the state's motion to dismiss the takings claim and held that Swartz had alleged sufficient facts to pursue a "physical" taking as well as a "regulatory" taking. The physical taking was as a result of the water placed without permission on private property which destroyed the usefulness of the land. The regulatory taking was based on the state's failure to perform statutory obligations for the benefit of economic development.

The court also denied the gas company's motion to dismiss the trespass and nuisance claim.

The parties reached a settlement after the decision.

b) Williams v. Maycock (Wyo. Dist. Ct.)

Williams proposed to develop CBM gas pursuant mineral rights on Maycock's land. In order to extract the gas, Williams wished to pump out the groundwater and drain it through two creeks which it argued were "watercourses" under Wyoming law. If the creeks were "watercourses," then Williams would not need to condemn the land because the watercourses were owned by the state, not Maycock.

The district court ruled in October 2005 that CBM waters were "waters of the state," that if the creeks were watercourses, they were subject to the state's easement for water flow, and thus payment to Maycock via condemnation was not required.

The district court later ruled in March 2006 that the creeks were too ephemeral to constitute watercourses, and thus Williams could only pump water onto those lands if it condemned them and paid just compensation to Maycock. In the absence of taking the lands through condemnation, the discharge of water would constitute a trespass and would support liability for damage to Maycock's meadows.

Williams then condemned an easement to flow water in the drainage across Maycock's ranch.

c) Paxton Resources v. Brannaman, 95 P.3d 796 (Wyo. 2004)

A jury awarded $810,887 to the Branamans in connection with damage to their ranch and horse farm as a result of CBM development damages. The complaint alleged breach of the parties' surface damage agreement, breach of duty of good faith and fair dealing, trespass, negligence and sought compensatory and punitive damages. The Wyoming Supreme Court dismissed Paxton's appeal as untimely filed.

Paxton employees drilled seven wells, which disturbed 600 acres of the ranch. They dug several reservoirs in a creek bottom, carved numerous drill pads in the hillsides, built a dirt road through the property, and caused hundreds of thousands of dollars of soil erosion damage.

d) Cole v. J.M Huber Corp., Civil Action No. 06-CV-0142-J (D. Wyo.).

Plaintiffs have drinking water wells on their properties north of Sheridan, Wyoming that were drilled and permitted several years before Huber began CBM operations on lands surrounding the plaintiffs.

In the course of drilling hundreds of CBM wells in the area, Huber began producing millions of gallons of water from the coal seams in which the plaintiffs' wells were located. Soon after, plaintiffs allege that their wells had difficult producing water and instead began producing methane gas.

Plaintiffs sued Huber under theories of trespass and negligence seeking diminution in value to property, emotional distress damages and punitive damages, among other relief.

The case is pending before the district court.

e) The PeeGee Ranch v. Devon Energy Prod. Co., Case No. 26607 (Wyo. Dist. Ct., March 19, 2007).

In 2000, Devon began discharging CBM water into ephemeral drainages that flowed through the plaintiff's property and into the Powder River.

The plaintiff alleged damages to trees on his property and sued Devon for trespass.

The court dismissed the claims after a trial on the grounds that: (1) the Wyoming State Engineer's Office has designated the production of water for CBM

production purposes to be a beneficial use of groundwater; (2) Devon received an NPDES permit and a water right to discharge CBM water into the drainage; (2) water legally placed in natural watercourses, even water produced from CBM, is a water belonging to the state and the state enjoys an easement across all private property for the purpose of flowing and managing waters of the state; (3) the drainages at issue are "natural watercourses" subject to the state's easement; (4) the plaintiff's ranch is subject to the state's easement and thus the discharge of water into the state's easement did not constitute a trespass on the plaintiff's land.

O. Statutory Developments – Surface Owner Accommodation Laws ("Split-estate legislation")

1. The growing tensions between surface owners and CBM developers have also encouraged state legislatures to reallocate property rights through so called "split-estate laws." These laws tend to codify common law accommodation doctrines, allow for recovery of surface damages even in the absence of operator negligence, and grant additional leverage to surface owners in negotiating where and how CBM and other gas development on their lands will occur.

2. In the absence of such split-estate laws, common law generally provides that a CBM developer or other oil and gas company is only liable for damage to the surface if the surface owner can show negligence or if there is contract providing for such damages. *See Amoco Prod. Co. v. Carter Farms*, 703 P.2d 894 (N.M. 1985); *EOG Resources v. Turner*, 908 So. 2d 848, 854-55 (Miss. Ct. App. 2005). *See also Gilbertz v. United States*, 808 F.2d 1374, 1380 (10th Cir. 1987) (Stock-Raising Homestead Act only requires that mineral developer compensate surface owner for "crops" and "improvements" damaged by mining operations and not damage to natural vegetation, non-agricultural buildings and general loss of value of land).

3. In addition, under the common law, a surface owner that establishes negligence or has rights under a contract generally can recover only diminution in value to land for permanent damage and is limited to restoration costs for temporary damages that do not exceed

the value of the land. *See Amoco Production Co. v. Carter Farms Co.*, 703 P.2d 894, 897-98 (N.M. 1985); *McNeill v. Burlington Resource Oil & Gas Co.*, 153 P.3d 46, 53-54 (N.M. Ct. App. 2006), *cert. granted*, __ P.3d __ (N.M., Feb. 9, 2007).

4. In response to these common law limitations on damages, states have enacted statutes that impose strict liability on CBM and other gas developers for surface damages and specifically allow for restoration costs. These statutes also provide additional bargaining rights for surface owners.

5. For example, in 2005, Wyoming enacted the Surface Owner Accommodation Act. Wyo. Stat. § 30-5-401 to 410. The law gives protection to surface owners during oil and gas development. Key provisions include:

a) Oil and gas operators shall "reasonably accommodate" existing surface uses. Wyo. Stat. § 30-5-402(a).

b) Requires 30 days' written notice prior to obtaining access to private lands and beginning oil and gas operations. Wyo. Stat. § 30-5-402(d)-(e)

c) Landowners are entitled to compensation for economic losses caused by oil and gas activity, including lost land value, loss of value of improvements, and loss of production and income. Wyo. Stat. § 30-5-405.

d) Oil and gas operators must attempt to negotiate a surface use agreement with landowners regarding the planning of oil and gas activities that affect private surface lands. Wyo. Stat. § 30-5-402(f)

e) If negotiations fail, oil and gas companies can obtain a bond from the State Oil and Gas Conservation Commission to access private lands in split estate. Wyo. Stat. § 30-5-402(c) and 404(b).

6. New Mexico passed a split-estate law in 2007, and a similar bill was introduced in the Colorado legislature. North Dakota statutory law has granted surface owners the right to damages for loss of

agricultural production and income, lost land value and lost value of improvements caused by drilling operations since 1979. *See* N.D. Cent. Code. § 38-11.1-04; *Murphy v. Amoco Production Co.*, 729 F.2d 552 (8th Cir. 1984) (holding statute was not an invalid exercise of police power and did not constitute a taking without just compensation). Montana law provides for similar surface damage payments in connection with oil and gas development. *See* Mont. Code Ann. § 82-10-504.

7. The recent increase in split-estate legislation is another example of how property law is altered in response to tensions over a new type of natural resource development (CBM wells and water discharge). In this case, the problem is addressed not in the courts through common law but by state legislatures rebalancing property and tort rights.

P. Statutory Developments – Eminent Domain Reform

1. Much has been written about the state legislative reaction to *Kelo v. City of New London*, 545 U.S. 469 (2005), most of it focusing on placing limits on "economic development" takings.

2. In the area of natural resources law, however, eminent domain reform has also been used to readjust property rights between surface owners and mineral owners.

3. In natural resource-rich states like Wyoming and Montana, private oil and gas companies can use the power of eminent domain to condemn private lands associated with oil and gas development. These condemnation rights include the power to condemn land for easements or rights of way for drilling and production of oil and gas, roads, and also for the location, construction, maintenance and use of reservoirs, drains, ditches and other means of discharging water associated with oil and gas development. *See* Wyo. Stat. § 1-26-815. *See also Wyoming Resources Corp. v. T-Chair Land Co.*, 49 P.3d 999 (Wyo. 2002) (holding that condemnor has right under state law to condemn private lands for roads and water discharge associated with CBM development). As CBM development has increased in the Power River Basin, the use of eminent domain for the discharge of CBM wastewater has fueled the push for eminent domain reform.

4. In 2007, Wyoming enacted eminent domain reform not targeting *Kelo*-type urban renewal projects but focusing instead on providing new landowner rights in the context of condemnation proceedings for natural resource development. *See* Wyo. Stat. § 1-26-504, *et seq.* (2007).

5. Some of the new Wyoming statutory provisions include:

a) Requiring new negotiation protocols between condemning parties and landowners;

b) Landowners can recover attorneys fees if the condemning party refuses to negotiate in good faith;

c) Rural landowners can use comparable sales for easements and other property interests to define fair market value.

6. Eminent domain reform legislation is pending in Montana.

Q. Conclusion

1. CBM development has an impact on private property that is different from traditional oil and gas and coal development. The rapid increase in CBM development along with the massive amounts of water discharge associated with the development means that existing laws relating to traditional mineral development cannot address problems unique to CBM development.

2. Efforts to provide water quantity standards for CBM development are still nonexistent in most states. Stakeholders urging environmental regulators in Wyoming to enact rules and standards on CBM water discharge contend that they "have been left in a regulatory gap." *See* Tripp Baltz, *Wyoming Governor Rejects Rules on Water Produced by Coal Bed Methane Operations*, BNA Daily Env. Rep. No. 79, at A-10 (April 25, 2007).

3. In the meantime, the parties, courts and legislatures are working through tort and property law to resolve the ongoing disputes between surface owners and CBM developers.

4. In states with significant CBM development, notably Wyoming, there are reallocations of tort and property rights through the courts as well as legislative efforts to address surface rights and eminent domain reform. These reallocations will likely continue until policymakers create a regulatory framework specific to CBM development.

5. CBM development shows how tort and property law evolve to respond to and deal with changing conditions. The *Maycock* case built on existing easement and water law to establish a public easement in favor of CBM operators to flow water in established watercourses. Likewise, as land use conflicts increase as a result of CBM development in a more populated west, courts in many states have responded by adopting the accommodation doctrine to reallocate rights between surface owners and mineral developers.

6. CBM development raises important issue of tort and property law where natural resources are *removed* from the subsurface and released into the environment. The next case study is a mirror image in that it focuses on tort and property issues where natural resources are taken from the environment and *inserted* into the subsurface.

III. Natural Resources Case Study # 2 – Geologic Carbon Sequestration, Property Rights and Tort Claims

A. Background

1. One of the most pressing environmental problems of today is global warming and, particularly, the need to address increasing levels of carbon dioxide in the atmosphere.

2. One of the new technologies being developed to address increasing concentrations of CO2 in the atmosphere is Carbon Capture and Sequestration ("CCS"). This technology drastically reduces emissions from power plants and industrial sources by capturing CO2 emissions and storing or sequestering them in deep geologic formations for long periods of time.

3. The sequestration portion of this system is known as Geologic Carbon Sequestration ("GS").

4. Areas for potential CO2 sequestration include oil and gas fields, saline aquifers and coal seams. Estimates are that the Powder River Basin in Wyoming may have the capacity to sequester 13.6 billion metric tons of CO2. *See* Dustin Bleizeffer, *State has Vast Capacity for CO2 Sequestration*, CASPER STAR TRIBUNE (April 5, 2007).

5. A Department of Energy report released March 27, 2007 indicates very large capacity across the U.S. and Canada for storing CO2 and other greenhouse gases produced at power plants and other industrial sources. *See* Lawrence J. Speer, *DOE Finds Large Capacity for Storing Carbon Dioxide Across U.S., Canada*, Daily Environment Reporter, BNA No. 60 at A-5 (March 29, 2007). *See also* Williams, et al., *Carbon Capture, Pipeline and Storage: A Viable Option for North Carolina Utilities?*, Working Paper, Nicolas Institute for Environmental Policy Solutions and the Center on Global Change, Duke University (March 8, 2007), at www.nicholas.duke.edu/institute/carboncapture.pdf.

6. Several GS projects are underway or planned in Canada, the United States and other countries. See Elizabeth J. Wilson and Mark A. de Figueiredo, *Geologic Carbon Dioxide Sequestration: An Analysis of Subsurface Property Law*, 36 ELR 10114 (Feb. 2006). These projects include ones at Sleipner (North Sea), Weyburn (Canada), and In Salah (Algeria).

7. There is a current initiative to build the world's first integrated sequestration and hydrogen production research power plant. This project, called FutureGen, is made up of member power companies and is in review with the U.S. Department of Energy. The DOE is evaluating four candidate sites in Illinois and Texas and FutureGen will choose the project site in the fall of 2007 based on those deemed acceptable by DOE. *See* www.futuregenalliance.org/about/siting.stm.

B. Statutory Developments

1. Federal and state legislators have introduced bills addressing potential property rights and tort liabilities in connection with GS and FutureGen:

a) Failed Costello Amendment to HR 5656 (June 27, 2006) (providing that U.S. Department of Energy would indemnify FutureGen consortium and companies from legal liability resulting from storage of sequestered emissions up to $500 million per incident);

b) IL House Bill 5825/Senate Bill 3190 (would require state attorney general to indemnify FutureGen in civil proceedings from damages caused by the escape or migration of injected CO2);

c) Texas House Bill 149 (May 15, 2006) (providing that Texas Railroad Commission shall acquire title to CO2 captured by a FutureGen project);

d) Montana House Bill 24 (2007) (proposing to grant common carrier status to pipelines transporting CO2);

e) Montana Senate Bill 218 (2007) (proposing to authorize the state Board of Environmental Review to adopt rules establishing a GS program and permit system and to provide authority to assess fees, issue penalties and set bonds).

C. Regulatory Developments

1. There is no federal or state program that currently regulates GS and CO2 injection.

2. Some small scale CO2 storage projects have been permitted under EPA's Underground Injection Control ("UIC") Program created under the Safe Drinking Water Act of 1974, 42 U.S.C. § 300h(b)(1) ("SWDA"); 40 C.F.R. § 144.1. *See* Mark Anthony de Figueiredo, *The Liability of Carbon Dioxide Storage* (MIT Ph.D Thesis 2007).

D. Tort and Property Common Law Concerns

1. Most of data that exists on potential areas for GS covers the western United States, where split-estate lands predominate. As a result, there is same potential for conflicts between surface owners and subsurface owners in the GS context that exists in the oil and gas context.

2. The issue of "fugitive resources" and who will own CO2 that may migrate from one geologic formation to another will arise if large amount of CO2 are placed in subsurface storage. *See Hammonds v. Central Kentucky Natural Gas Co.*, 75 S.W.2d 204 (Ky. Ct. App. 1934) (no trespass claim because owner of gas lost title to gas once it was injected into the subsurface); Wilson and Figueiredo, *supra*, 36 ELR at 1021 (noting that *Hammonds* is not currently followed in the United States, that gas companies retain ownership of injected gas, and that trespass can occur if gas migrates).

3. Some courts have held that after the removal of underground minerals, or oil and gas, the surface owner retains the right to use the remaining space for storage. How these storage or "pore space" rights coexist with exploration of additional mineral rights is unclear, meaning that GS projects must address the rights of both surface owners and mineral rights holders.

4. There is a significant potential for trespass, nuisance, strict liability and negligence claims similar to those brought in cases where CO2 is presently injected into oil reservoirs for enhanced recovery. *See* Wilson and Figueiredo, *supra*, 36 ELR at 10117-10119; *Phillips Petroleum Co. v. Stryker*, 723 So. 2d 585 (Ala. 1998) (reversing $27 million jury award to plaintiff on claims of nuisance, trespass, negligence and fraud for secondary recovery operation that drained plaintiff's oil and gas reserves on grounds that award was against state policy on promoting secondary recovery).

IV. Conclusions

A. The tort and property issues associated with GS are less mature than those present in the area of CBM development because GS is far less developed as a natural resource technology.

B. It is clear though that both GS and CBM development presents critical concerns of ownership, trespass, allocation and property rights in the context of natural resources development.

C. As GS technology and policy develops, lawmakers and stakeholders can learn from the tort and property disputes in the CBM arena. Regardless of the sophistication of the technology, stakeholders must consider the tort

and property law issues that will be central to GS development. These issues can be addressed through a combination of contractual, statutory, market and common law forums.

D. Just as the law evolves to encompass new technologies and resources, new technologies and resources must fully consider existing tort and property frameworks.