

## **Report from the Colorado Carbon Capture and Geological Sequestration Task Force**

### **Background**

Approximately 65 percent of Colorado's power is fueled by coal. Colorado coal provides jobs and serves as the economic backbone of Colorado communities. Notwithstanding federal clean air standards, as well as state legislative and regulatory efforts that are driving utilities to rely less on coal and more on natural gas and renewable sources, coal will continue to play a very large role in Colorado's energy future. To balance Colorado's reliance on coal with our interest in protecting the environment, our goal is to advance carbon capture and geologic sequestration ("CCS") and other technologies designed to make coal usage cleaner. One of the barriers to cleaner coal is the inadequacy of state and federal legal and regulatory infrastructures.

To that end, in the Spring of 2010, Governor Ritter authorized the Colorado Department of Natural Resources to convene a Carbon Capture and Sequestration Task Force to assure that the legal foundation for CCS was in place in the event the technology and cost of CCS became feasible. The initial goal was to develop omnibus CCS legislation that could be introduced in the Colorado General Assembly in 2011 and, accordingly, the Task Force was comprised of legislators, agency officials, as well as industry and environmental stakeholders.

### **Members**

Bob Randall, Chair, Assistant Director for Energy and Minerals, Colorado Department of Natural Resources

Scott Anderson, Senior Policy Advisor, Environmental Defense Fund

Ginny Brannon, Climate Change Manager, Colorado Department of Public Health and Environment

Lauren Buehler, Legal Counsel, Xcel Energy

Krista Johnson, Rocky Mountain Region Government Affairs Manager, Shell Oil Company

Representative Claire Levy, Colorado House of Representatives

Tom Lipetzky, Colorado Department of Agriculture

Representative Marsha Looper, Colorado House of Representatives

Senator Gail Schwartz, Colorado Senate

Dianna Tickner, Vice President of Project Management and Development, Peabody Energy

Barbara Walz, Vice President for Environmental Affairs, Tri-State Generation and Transmission Association

Senator Al White, Colorado Senate

## Issues Reviewed and Discussed

### Ownership of the Pore Space:

The Task Force convened in April of 2010 and immediately turned its attention to establishing who owns the pore space, the practical effect of which is to determine who gives permission for the storage of CO<sub>2</sub> in the pore spaces. If the surface and mineral estates are not severed, then under common law the owner of the land owns the entire tract from the “heavens to the depths” (Ad Coelum Doctrine). If the estates are severed, then under common law, ownership of the pore space remains with the surface estate based on the notion that property rights not expressly conveyed are retained. That said, the owner of the mineral estate has the right to reasonable use of the surface estate to harvest the mineral resources, but that interest is terminated once the minerals are extracted.

Wyoming has addressed this issue in legislation and generally determined that conveyance of the surface ownership includes conveyance of the pore space in all strata below the surface unless the ownership of the pore space is explicitly excluded in the conveyance. Other states that have passed similar legislation include New Mexico, Montana, North Dakota, Indiana, Louisiana, Michigan, and West Virginia.

The Task Force convened a panel of experts to address the legal and policy issues associated with ownership of the pore space. The panelists represented the following constituencies: agriculture, conservation, mining, natural resources, oil and gas, property, real estate, water and state and federal government. Most members on the panel thought that, where ownership has not been expressly conveyed, ownership belongs to the surface owner. Most cautioned, however, that the mineral estate remains dominant such that any storage of CO<sub>2</sub> would take a back seat to extraction of the mineral resource. Oil and gas had no particular preference with respect to the assignment of ownership of the pore space as long as it is clear that it remains servient to the mineral estate. Others were not convinced that ownership defaults to the surface, in some cases noting that the Ad Coelum Doctrine has no place in the modern world.<sup>1</sup>

Others pointed out an interesting twist which is that, even if ownership is with the surface estate, the surface owner’s hands are tied with respect to their ability to allow sequestration. This is because residual amounts of mineral resources are typically left behind due to the fact that they are not economically viable to extract. New technologies, however, might provide for economic extraction in the future and, until there is an absence of the mineral resource, the mineral estate remains in place and dominant. In such cases, arguably there would need to be some sort of contractual arrangement between the surface and mineral owners before the CO<sub>2</sub> could be sequestered.

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<sup>1</sup> For example, a surface owner cannot assert that a planes flying over their land is a trespass based solely on the notion that they own from the “heavens to the depths.”

## Long Term Responsibility

Establishing who has long term liability for the CO<sub>2</sub> is arguably important for the deployment of CO<sub>2</sub> geologic sequestration. Arguments favoring the federal government include: it may be the only entity that can make a long term credible commitment; it could establish a nationwide monitoring and management system; and, it is in the best position to regulate sites in a uniform fashion. A benefit of assigning liability to the states is they could use their government status to tailor more effective management of sites, but the political reality is that most states will not take on long term liability. While the injector/operator could have post closure liability for some period of time (e.g. 5-10 years), there is no financial integrity to the assignment of long term liability to an entity that may not exist. A hybrid approach would involve the injector assuming post closure liability for a defined period of time with an operational bond and then long term liability going to the federal government with a trust fund established through some sort of fee structure. It is also worth noting that some members of the Task Force thought that no special government policies are needed regarding long term liability. At the end of the day, the Task Force reached no definitive conclusion or consensus.

## Unitization

To facilitate geologic sequestration of CO<sub>2</sub> where there are multiple pore space owners, unitization allows for the pooling of pore space if enough pore space owners want the sequestration, even if some pore space owners object. For example, if 80% of the pore space owners want to sequester CO<sub>2</sub>, then they could “force pool” the remaining 20% to get the desired pore space for the sequestration project. Most likely, an application could be filed with the Colorado Oil and Gas Conservation Commission and, if certain criteria were met along the lines of identifying costs and benefits, the Commission could issue an order allowing the unitization.

Unitization is currently in play for oil and gas extraction and some states, such as Wyoming, have passed legislation allowing unitization for CO<sub>2</sub> storage in pore space. There was no consensus in the Task Force as to whether such legislation would be desirable, let alone what its provisions might entail. There was some agreement that unitization legislation would be controversial and, if tied to legislation on pore space ownership, might defeat the latter.

## **Current Developments in Colorado**

The Colorado Geologic Survey (CGS), in partnership with Tri-State Generation and Transmission, Shell Exploration and Production, Schlumberger Carbon Management, University of Utah, as well as the Geologic Surveys from Utah, Arizona and New Mexico, is launching a site characterization project to study CO<sub>2</sub> storage in a deep underground saline aquifer in the Weber sandstone in Moffat County. The Project will provide an opportunity to assess the effectiveness of CO<sub>2</sub> storage and develop an optimal injection program in anticipation of any carbon capture and geologic sequestration activities. The drill site will be close to Tri-State’s Craig power station for easy access to the CO<sub>2</sub>.

This is a \$9.8 million project, primarily funded by the Department of Energy (DOE). The initial award from DOE was \$3.8 million with a \$1 million contribution from the partners, and in August 2010 DOE committed to an additional \$5 million. The infusion of \$5 million will allow for enhanced site characterization and CO<sub>2</sub> injection program development. In March 2011, CGS submitted an additional request to DOE for \$10 million to inject 50,000 tons of CO<sub>2</sub> in 2012.

The project launched in 2010 and will take place over a three-year period. The partnership is currently characterizing the geologic structure, including shooting the seismic line and picking locations for the drill holes. In August-September of 2011, the partners will drill the well and conduct CO<sub>2</sub> injectivity experiments on the cores, as well as begin engineering analysis and reservoir modeling. In 2012, the partners will complete the modeling of the reservoir, including an assessment of storage volume, CO<sub>2</sub> potential for migration, and leakage pathways.

This project is part of an overall effort to pave the way for the possibility of carbon capture and geologic sequestration and ensure that coal remains a central part of Colorado's energy mix.

### **Path Forward**

At the time the Task Force convened, there was considerable activity in Congress surrounding a cap and trade bill or possibly a carbon tax that would have put a price on carbon. When Congress didn't pass the cap and trade or carbon tax, it didn't appear that sequestering carbon would be financially viable and so there was less urgency to assuring that a legal foundation was in place. Also, the economic climate in Colorado and throughout the nation had diminished the desire to pass CCS legislation on both the federal and state levels. Accordingly, the Task Force decided to hold off on introducing legislation in the 2011 session and adjourned in November of 2010.

Nevertheless, as a state and a nation, we are heavily dependent on coal and our environmental health depends on cleaner coal which is not viable without legal and regulatory certainty for CCS. To that end, we will assess the merits of reconvening the Task Force at a later time.