



## SECARB PARTNERS MONTHLY UPDATE

**November 2008**

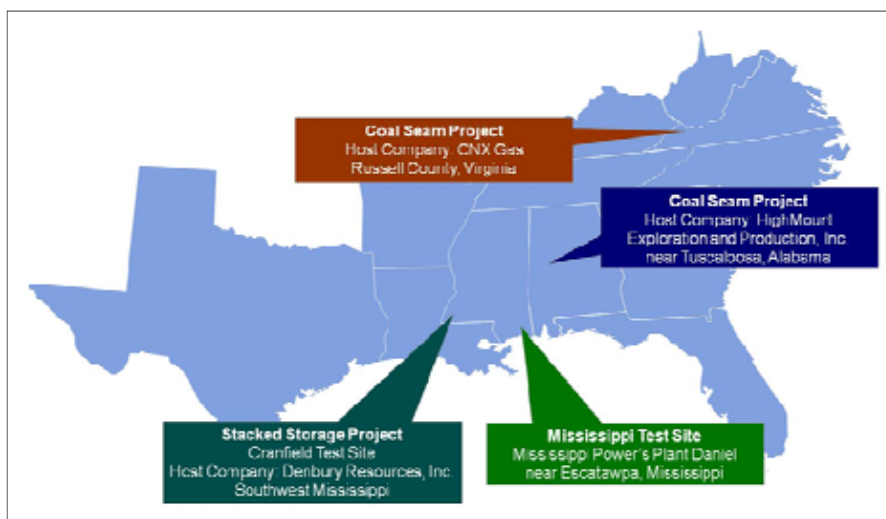
# CO<sub>2</sub> INJECTION OPERATIONS *ONE COMPLETE, ONE UNDERWAY*

The Southeast Regional Carbon Sequestration Partnership (SECARB) research team is in its most exciting year of the Phase II program, as small-scale field testing of carbon sequestration technologies are well underway. CO<sub>2</sub> injection at the Gulf Coast Stacked Storage Project began in July and continues today. Denbury Resources International (DRI) began enhanced oil recovery at Cranfield utilizing CO<sub>2</sub>, and the field team has established a sophisticated monitoring program to collect and analyze reservoir data pre-, during and post-injection. The Saline Aquifer Field Test team has successfully completed carbon dioxide (CO<sub>2</sub>) injection and currently is performing post-injection monitoring activities to ensure that the CO<sub>2</sub> is permanently se-

questered. The coal seam project in Central Appalachia is in the final stages of preparation for injection operations to begin this winter. Site-specific up-

dates on recent activities and accomplishments follow.

*Please see **CO<sub>2</sub> Injection**, Page 2*



**SECARB Geographic Region and Phase II Field Test Site Locations**

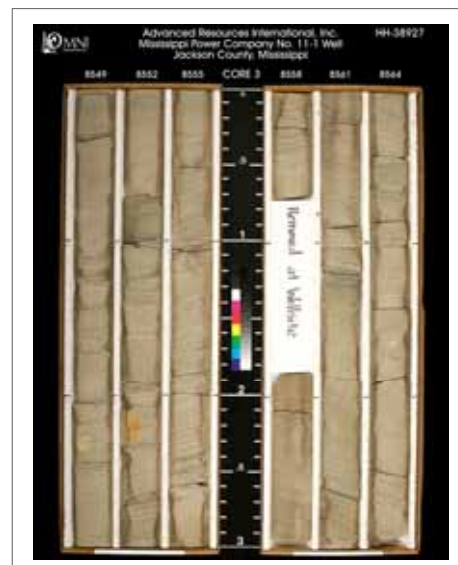
### Inside this issue:

CO <sub>2</sub> Injection Operations	<b>1-3</b>
Geologic Characterization of the Southeast	<b>1-2</b>
Southern States Energy Board	<b>4</b>
Register Now for the SECARB 4th Annual Stakeholders' Briefing	<b>4</b>

## GEOLOGIC CHARACTERIZATION OF THE SOUTHEAST

The project team has developed an initial geologic model for reservoir simulation of the Lower Tuscaloosa Massive Sandstone. Detailed core description and fracture description of the three cores from the Saline Aquifer Field Test's observation well has been completed. Reservoir flow units were identified and an initial scheme for layering the sandstones for the purpose of flow simulation was developed, which uses the porosity-permeability relationships extrapolated

*Please see **Characterization**, Page 2*



**Cores of Lower Tuscaloosa Massive Sand (ARI)**

## CO<sub>2</sub> INJECTION (CONTINUED FROM PAGE 1)

### Gulf Coast

#### Stacked Storage Project

SECARB's first Phase II CO<sub>2</sub> injection began at the Gulf Coast Stacked Storage Project in Cranfield, Mississippi, under the leadership of the Gulf Coast Carbon Center at The University of Texas at Austin. Injection operations began on July 14 with two wells and increased incrementally to 10 injectors. Real-time monitoring of CO<sub>2</sub> injection has been used to track the movement of CO<sub>2</sub> being injected for oil recovery into the Tuscaloosa Formation. This geologic formation is representative of the high quality CO<sub>2</sub> storage locations that exist throughout the Gulf Coast region. The primary objectives are to verify CO<sub>2</sub> retention in the injection zone; quantify storage capacity; and determine near- and far-field pressure response to CO<sub>2</sub> injection. Downhole pressure and temperature measurements are obtained from these monitoring stations and transmitted via satellite uplink every 10 minutes. By the end of September, 100,000 tonnes of CO<sub>2</sub>

were injected. Injection rates currently exceed 0.5 million tonnes per year.

#### Saline Aquifer Field Test

Injection of approximately 3,000 tons of CO<sub>2</sub> into the Tuscaloosa Formation has been completed at SECARB's Saline Aquifer Field Test at Mississippi Power Company's Plant Victor J. Daniel in Escatawpa, Mississippi. Injection began on October 2 and was successfully completed on October 28, 2008. According to Richard Esposito, Principal Research Geologist at Southern Company, "Everything went exactly the way we thought it would based on the results of the extensive geologic characterization studies and computer models created prior to the drilling and injection. We are now beginning to evaluate the overall results, and the post-injection monitoring will continue over the next year."

The project team hosted an Open House at the injection site on October 15. The event included a briefing on current activities and a site visit where more than 30 participants witnessed the injection operations first-hand. On October 17, the Edison Electric Institute Carbon Capture and Storage (CCS) retreat group toured the project. "The sequestration project at Plant Daniel is

on the cutting edge of carbon dioxide sequestration research," said Rick Berry, Mississippi Power Company's Manager of Environmental Quality. "It's exciting for us at Mississippi Power to play such an im-



**More than 30 participants gathered for an Open House at the SECARB Saline Aquifer Field Test to witness CO<sub>2</sub> injection operations first-hand on October 15, 2008.** (SAMS/SSEB)

portant role in this industry partnership and be able to share the results with others." The project is a first-of-a-kind to be performed at a coal-fired power plant.

Many thanks to the field team, including Electric Power Research Institute, Advanced Resources International and the numerous field service providers who made the operations component of the project a tremendous success. Also, a special thanks to the individuals at Southern Company and Mississippi Power Company for hosting the site and for graciously dedicating their time and expertise to the SECARB program.

#### Central Appalachian Coal Seam Project

The Southeast Regional Carbon Sequestration Partnership's Coal Group continued work on the design of test site operations, regulatory compliance, monitoring, verification and accounting (MVA) design,

*Please see CO<sub>2</sub> Injection, Page 3*



**Satellite uplink of real-time data is transmitted every 10 seconds to researchers at The University of Texas at Austin for monitoring and analysis.**

## CHARACTERIZATION (CONTINUED FROM PAGE 1)

from the whole core and sidewall core analyses. Additional special core analyses, including mercury-injection capillary pressure, x-ray diffraction mineralogy, thin section, relative permeability, shale rock properties and thermal maturity began in October to provide additional data to the reservoir simulation, as well as to better characterize the sealing capability of the caprock formations. ■



# CO<sub>2</sub> INJECTION (CONTINUED FROM PAGE 2)

implementation and outreach activities. A Class V Underground Injection Control permit was granted by the U.S. Environmental Protection Agency's Region III for the Central Appalachian Coal Seam Project hosted by CNX Gas in Russell County, Virginia. Drilling of one monitoring well to a total depth of 2,300 feet is complete at the field test site, where the team ran a suite of geophysical logs for characterization purposes. Drilling and continuous coring of a second monitoring well is underway. Core analyses will begin soon. The coals from the cores are being desorbed for gas content and adsorption isotherms, and porosity and permeability measurements will be run on the samples.

MVA activities related to background characterization are ongoing at the Central Appalachian field test. These activities include weekly soil flux measurements to develop a baseline of CO<sub>2</sub> soil flux at 18 locations surrounding the site. In October, a group from DOE's National Energy Technology Laboratory visited the site to take hydrocarbon soil samples prior to injection at the 18 locations and installed a tracer detection instrument to detect tracers that will be injected with the CO<sub>2</sub> in both shallow soil and surface air. A monitoring station for weather, ambient CO<sub>2</sub> monitoring and data

collection will be constructed at the site this month.

On August 18, 2008, Virginia Congressman Rick Boucher, jointly with the U.S. Department of Energy's Acting Assistant Secretary of Fossil Energy James Slutz,



**Drilling Monitor Well (BD-114M2) at the Central Appalachian Coal Seam Project site in Russell County, Virginia.**

kicked-off the start of the Central Appalachian Coal Seam Project as part of a successful groundbreaking event with local, regional and national stakeholders attending. At the groundbreaking ceremony, Congressman Boucher stated, "...we are taking a large step to assure the long term future for coal both locally and across the nation. The goal of this test is to prove that unmineable coal seams will be a suitable media for sequestering carbon dioxide. This is the largest and most prominent project launched in the central Appalachian region to evaluate coal seams as carbon dioxide storage repositories. Unmineable coal seams will be a major way that CO<sub>2</sub> is sequestered since there is a large capacity for coal seams to accommodate CO<sub>2</sub> across the Nation and because coal seams are situated near to major users such as power plants and coke-making ovens. Today we begin the process of demonstrating to the Nation that coal seams can realize this potential."

The groundbreaking was a high-profile event that is helping foster public acceptance of carbon storage in coal seams and is transferring critical information on carbon sequestration and enhanced coalbed methane recovery to a broad range of stakeholders. As part of the groundbreaking event, the SECARB Coal Group team hosted a luncheon and delivered informational presentations for industry and government stakeholders at the Southwest Virginia Community College. ■



**Central Appalachian Coal Seam Project Groundbreaking Ceremony, August 18, 2008. (SAMS/SSEB)**



6325 Amherst Court  
Norcross, Georgia 30092  
P (770) 242-7712  
F (770) 242-0421  
www.sseb.org  
sseb@sseb.org



#### Overall Program Management

Kenneth J. Nemeth (PI)  
Executive Director  
nemeth@sseb.org

Kathryn A. Baskin  
Managing Director  
baskin@sseb.org

#### Technical Program Management

Gerald R. Hill  
Senior Technical Coordinator  
hill@sseb.org

Kimberly Sams  
Program Operations Manager  
sams@sseb.org

#### Finance/Contract Management

Kathy A. Sammons  
Assistant Director, Business Operations  
sammons@sseb.org

Leigh A. Parson  
Grants and Accounting Specialist  
parson@sseb.org

#### Acknowledgements

This update is based upon work supported by the **Department of Energy/ National Energy Technology Laboratory** under DE-FC26-04NT42590.

To the SECARB field teams, partners, host site companies and landowners and participants, **thank you** for your hard work, dedication and continued support!

## REGISTER NOW FOR THE 4TH ANNUAL SECARB STAKEHOLDERS' BRIEFING

*Registration Available Online*

*[www.sseb.org/events.html](http://www.sseb.org/events.html)*

Mark your calendar and register to attend the Fourth Annual Southeast Regional Carbon Sequestration Partnership (SECARB) Stakeholders' Briefing. The event will be held at the Hilton Atlanta Airport Hotel in College Park, Georgia, on March 3-4, 2009. Registration is available online via the SSEB Registration Website at <http://www.sseb.org/events.html>.

The briefing will begin on Tuesday, March 3, with technical reports on the four field tests currently underway in Phase II and the two Phase III projects. On Wednesday, March 4, the conference will reconvene for a special session on technologies for carbon capture and separation at anthropogenic sources.

The Southern States Energy Board (SSEB) is hosting a special dinner for SECARB partners in appreciation for their continued support of the program. This event will include a special briefing and an opportunity to provide feedback to the SECARB team. The dinner will be held at the conference hotel on March 3, 2008, from 6:30 to 8:00 p.m.

Please plan to join us in Georgia for this important event!

## SOUTHERN STATES ENERGY BOARD AND SECARB

The Southern States Energy Board (SSEB) is a non-profit interstate compact organization created in 1960. The Board's mission is to enhance economic development and the quality of life in the South through innovations in energy and environmental policies, programs and technologies. SSEB was created by state law and consented to by Congress with a broad mandate to contribute to the economic and community well-being of the southern region. The Board exercises this mandate through the creation of programs in the fields of energy and environmental policy research, development and implementation, science and technology exploration and related areas of concern. SSEB serves its members directly by providing timely assistance designed to develop effective energy and environmental policies and programs and represent its members before governmental agencies at all levels.

SECARB is a program underway at SSEB to define the role for clean coal in a carbon constrained world and balance the environmental effects of existing and prospective industrial facilities. While many of our Nation's leaders are working hard to ensure that coal continues to contribute to this Nation's economic growth and homeland security, it is evident that carbon capture and sequestration technologies have a dominant role in that future. SECARB is a \$119 million program established in 2003 and managed by SSEB with the primary goal of identifying major sources of carbon emissions, characterizing the geology of a 13-state region, determining the most promising options for commercial deployment of carbon sequestration technologies in the South, and validating the technology options through carefully executed field testing through 2017. SECARB is one of seven regional partnerships nationwide and co-funded by the United States Department of Energy and SECARB partners.

*Sixteen southern states and two territories comprise the membership of SSEB: Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, Missouri, North Carolina, Oklahoma, Puerto Rico, South Carolina, Tennessee, Texas, U.S. Virgin Islands, Virginia and West Virginia. Each jurisdiction is represented by the governor and a legislator from the House and Senate. A governor serves as the chair and legislators serve as vice-chair and treasurer. Ex-officio non-voting Board members include a federal representative appointed by the President of the United States, the Southern Legislative Conference Energy and Environment Committee Chair and SSEB's executive director, who serves as secretary.*