A Process for Stakeholder Education and Engagement in Sustainable Energy: The Carbon Sequestration Case

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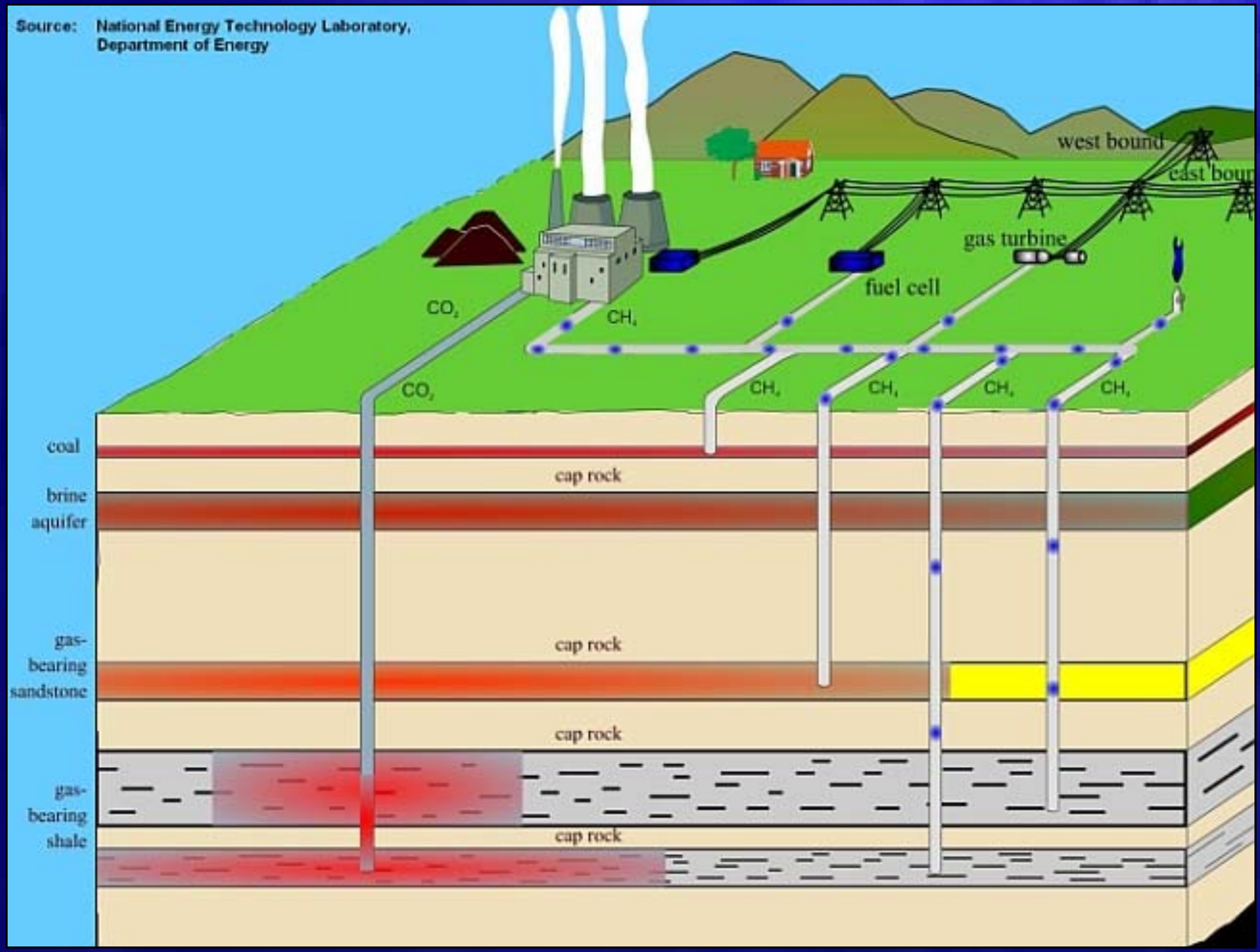
Outline

- The Carbon Sequestration Case
- U.S. Department of Energy Regional Carbon Sequestration Partnerships
- SECARB Coal Seam Group
  - Education Plan
  - Action Plan for Outreach
- Conclusions

The Carbon Sequestration Case

- Sequestration can sustain coal and other fossil fuel utilization in a carbon emission capped era
- Economic development potential associated with enhanced coalbed methane production
- Expand research efforts in the local, state, federal and private sector communities
- Environmental benefit from mitigation of greenhouse gases
- Locating major new facilities (i.e., electric generation facilities, C-T-L conversion plants, biofuel plants, etc) in proven CO_2 sequestration locations may be required, thus enormous economic development impacts to the region


Source: National Energy Technology Laboratory, Department of Energy
west bound
gas turbine
fuel cell
CO_2
CH_4
CO_2
CH_4
CH_4
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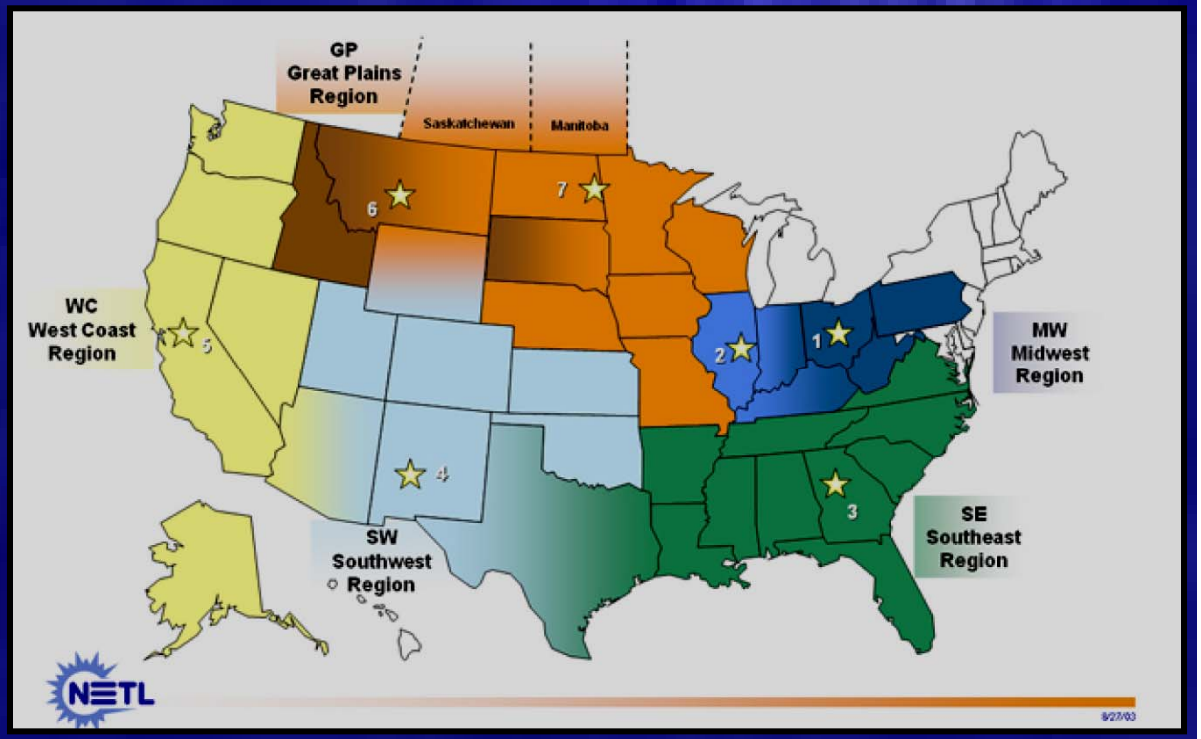
CH_4
coal
cap rock
brine aquifer
gas-bearing sandstone
cap rock
cap rock
gas-bearing shale
cap rock

U.S. Department of Energy-Regional Carbon Sequestration Partnerships

- **7 Regional Partnerships**
- **Partnerships include +240 organizations in 40 states, three Indian Nations and <u>two</u> Canadian Provinces**



Virginia Participates in SECARB, a Partnership Managed by the Southern States Energy Board

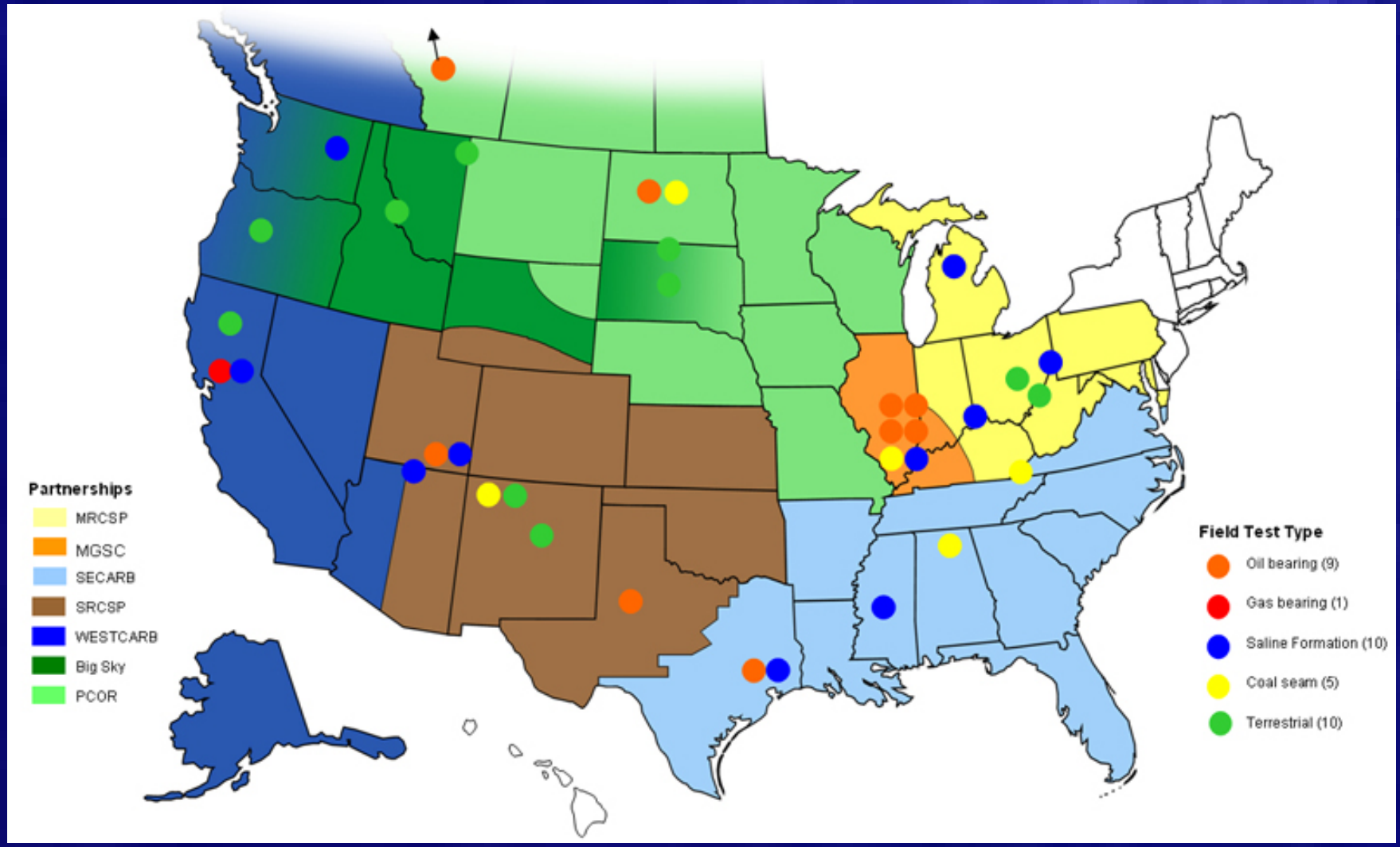
Project Phases

Phase I: Completed
Geological Characterization and Initial Feasibility Study
(2004 – 2005)

Phase II: On-Going
Expand Study Area, Reservoir Modeling, Pilot CO_2 Injection Testing, Evaluation of Potential
(2005 – 2009)

Phase III: SOON!!!
7-10 Year Injection, Monitoring and Verification of a Large CO2 Test (1mil tons of CO_2)

Regional Partnerships- Test Sites Under Phase II



SECARB Coal Group Phase II

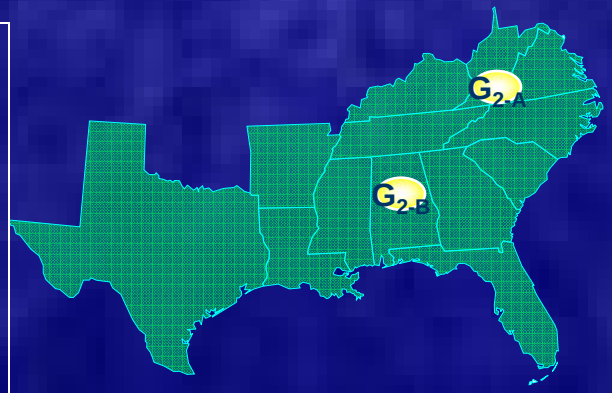
- Project duration:
  - October 2005 – September 2009
- Support:
  - Funding from the U.S. Department of Energy
  - Industrial partners support through well donation, data, property access and direct funding

CO_2 ECBM recovery:

- Unmineable coals can provide sequestration and add economic value
- At least 1,000 MMT CO_2 of feasible capacity in the targeted areas

Two target areas:

- Central Appalachian Basin, $G_{2\text{-}A}$
- Black Warrior Basin, $G_{2\text{-}B}$
- 1,000 tons of CO2 injected on each site



SECARB Coal Group Team

- Southern States Energy Board
- Virginia Center for Coal and Energy Research – Virginia Tech
- Marshall Miller and Associates, Inc.
- Geological Survey of Alabama
- University of Alabama
- Southern Company
- Kentucky Geological Survey
- Advanced Resources International
- Eastern Coal Council

Participating Organizations

- Alpha Natural Resources
- Alawest
- AMVEST
- Buckhorn Coal
- CCP2 Project
- CDX Gas
- CONSOL,CNX Gas
- Cumberland Resources Corporation
- Dart Oil & Gas
- Denbury Resources
- Dominion E&P
- Dominion Resources
- EPRI
- Equitable Production
- Institute for Clean Energy Technology (MSU)
- GeoMet
- McJunkin Appalachian
- Norfolk Southern
- Natural Resource Partners
- Oak Ridge National Laboratory
- Penn Virginia
- Pine Mountain Oil & Gas
- Piney Land
- Pocahontas Land
- Univ. British Columbia

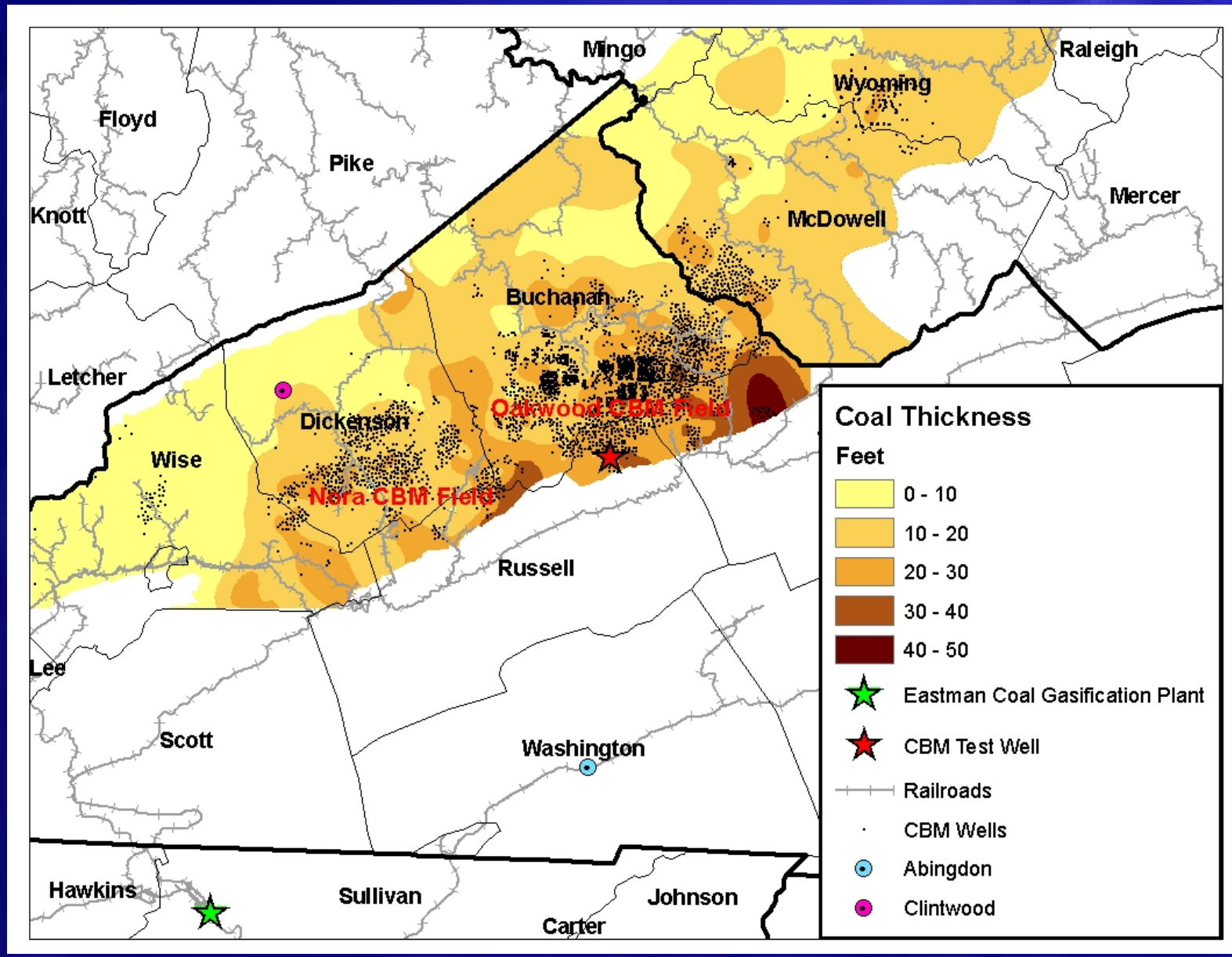
The Case for CO_2 Sequestration in Coal Seams

- Significant coal resources near major CO_2 emission sources (i.e., power plants)
- Favorable coal characteristics and depositional environments
- Potential capacity to sequester considerable amounts of CO_2
- Shallow reservoir with low P & T can reduce compression cost
- Potential of CO_2-stimulated Enhanced Coal Bed Methane (ECBM) recovery provides an economic incentive

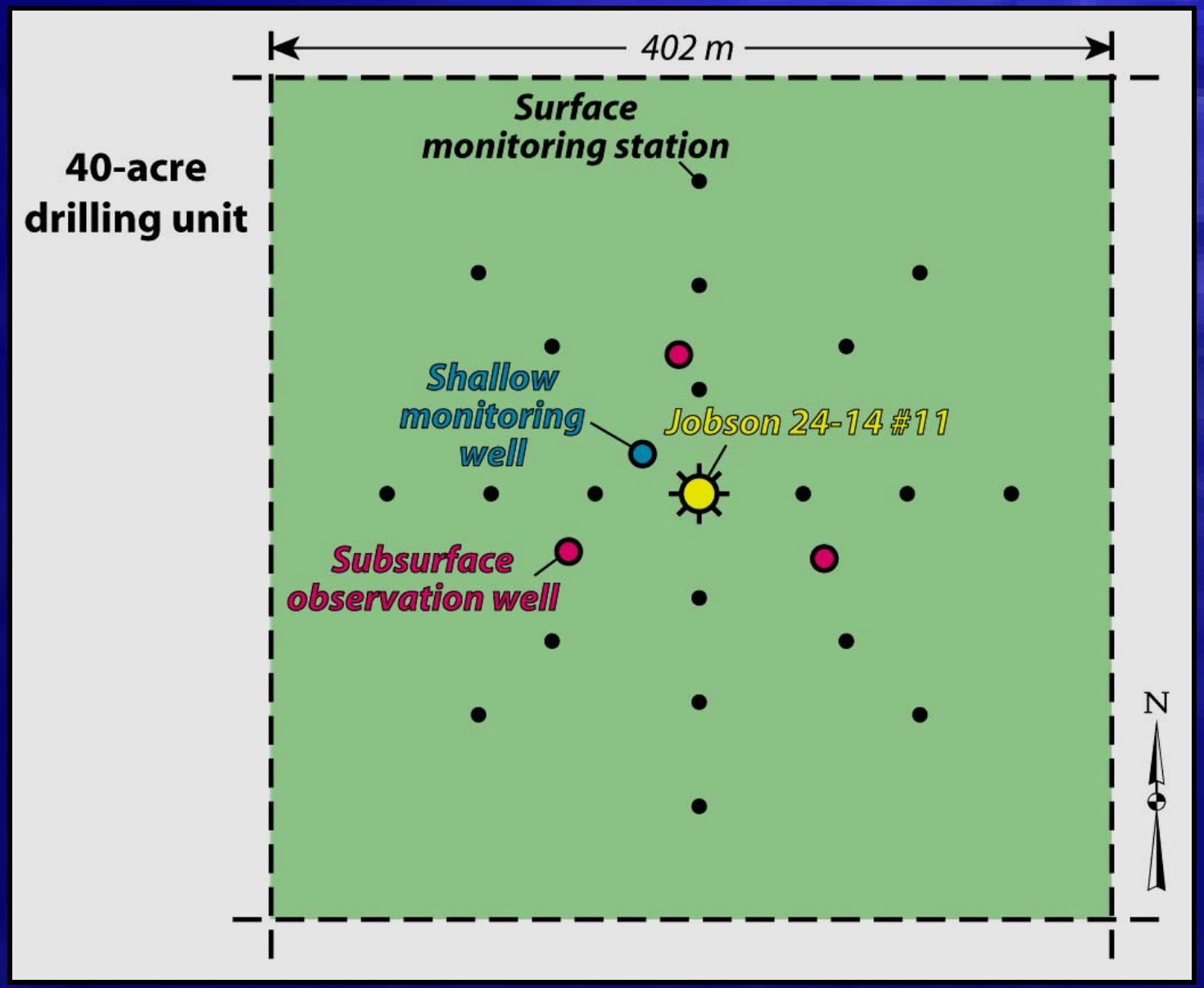
SECARB Coal Group
Phase II Project Tasks

- Regional Characterization and Site Selection
- Reservoir Modeling
- Core Hole Drilling and Evaluation
- Pilot Preparation and Risk Analysis
- Pilot Project Operations (Multi-seam Interference Tests)
- Interpretation and Assessment
- Public Outreach
- Technology Transfer

Project Site Location

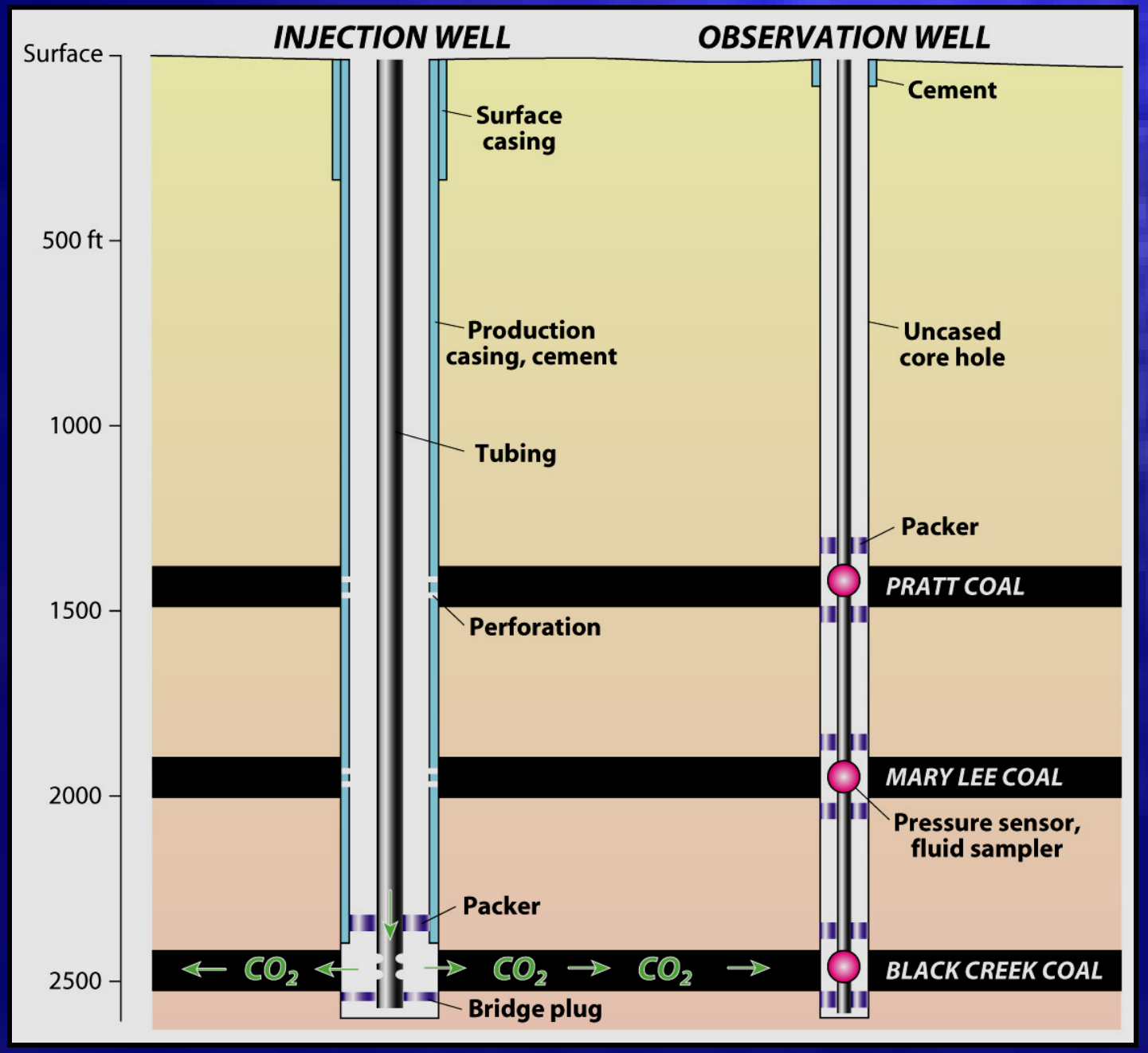


Project Site Schematic



SURFACE MONITORING

Southern Company
NETL



Core Hole Testing

Education Plan

- Develop education materials and disseminate the information to the public
  - The Goal: better inform the general public on the concepts of global warming, the options for mitigating the release of greenhouse gases and the development of sustainable energy technologies.

Educational Materials

- Digital video clips for dissemination via the Internet, at lectures and public information sessions.
- PowerPoint presentations and handouts based on images created for the videos.
- An educational webpage as part of our website: www.energy.vt.edu

Dissemination of Materials and Information

- Teachers
  - Materials will be made available to K-12th grade teachers throughout the region
  - Teachers will also be contacted through summer educational programs offered by the Powell River Project
  - Incorporation in university courses
- A Speakers Bureau will be created for local outreach and education
- Participation with local organizations at local and regional conferences, fairs and information sessions
  - Nature Conservancy, Sustainable Blacksburg, League of Women Voters, local civic organizations, chambers of commerce, county board of supervisors, etc.

Outreach Plan

- Researchers, mineral rights owners and appropriate subcontractors will meet with local stakeholder groups
  - Property owners in vicinity of project
  - Local government officials
  - Media and concerned citizens
- Individual property owners
  - Inform them of the nature, risks and mitigation associated with the testing
  - Allow opportunity for face-to-face questions and answers
  - Reassure those living and operating businesses near the test site

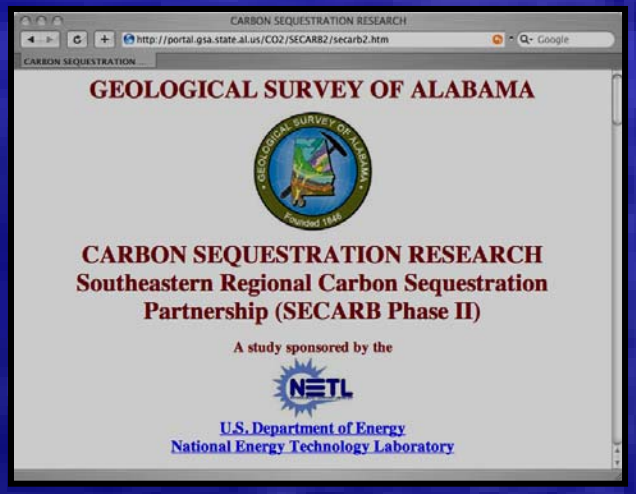
Outreach Plan - cont.

- Local government officials
  - Meetings with county boards of supervisors, town councils, local administrators and citizen groups to inform them of the project, the economic development potential and invite their input to help build social capital in the region
- Media and concerned citizens
  - Press packets will be prepared and a trained individual designated to respond to all inquiries

Outreach Activities

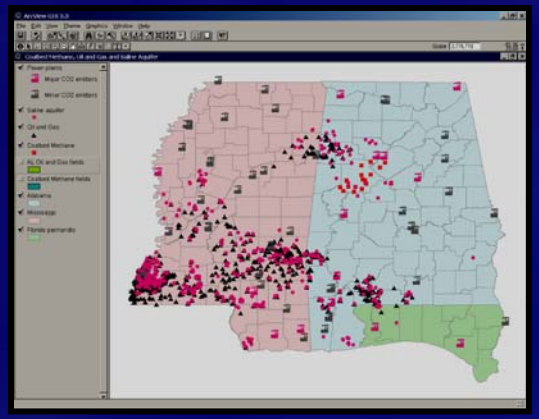
Web Resources

http://www.energy.vt.edu/SECARB



http://portal.gsa.state.al.us/CO2/CO2.htm

Publications



Meetings

2006 INTERNATIONAL COALBED METHANE SYMPOSIUM

Eastern Coal Council
28th Annual Conference
"Coal:Energy Security"

Test Schedule

Site selection – Completed

Monitoring – In Progress

Education & Outreach – In Progress

Coring – Fall 2007

Injection Testing – Begins Winter ’08

Site closure – 2009

Conclusions

- The engagement plan is progressing in two areas:
  - Educating individuals who will take responsibility for implementing education and outreach programs
  - Distributing educational materials
- The outreach plan is in the implementation stage
- Success of the program will be monitored at the national, regional and local levels
  - U.S. DOE
  - SECARB
  - Locally through feedback from stakeholders