CO_2 Sequestration in Coal Seams

Black Warrior Basin, Alabama (SECARB)

Jack C. Pashin

Geological Survey of Alabama

PRINCIPAL SPONSOR

U.S. Department of Energy - NETL

PROGRAM TEAM

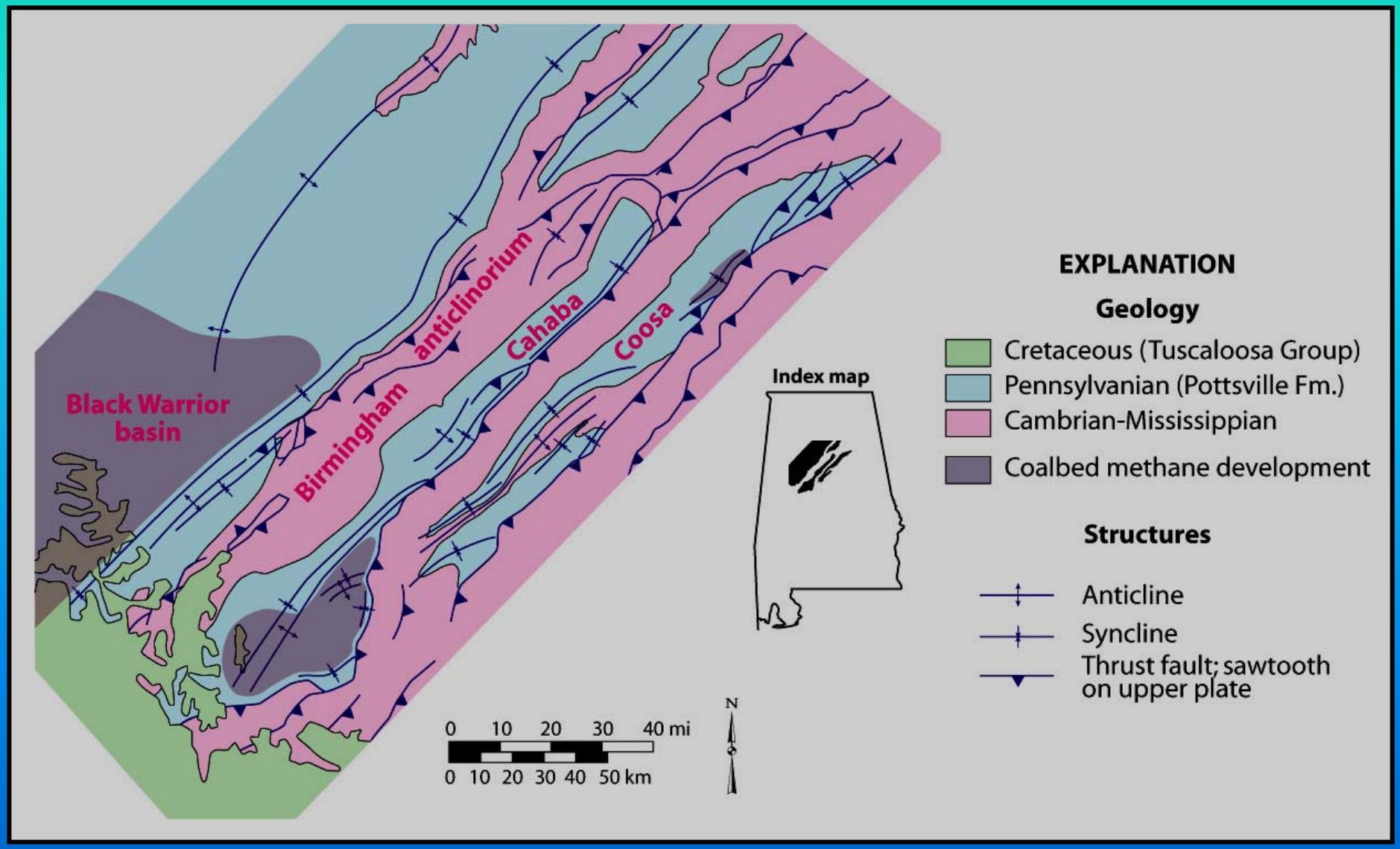
SSEB, Virginia Tech - Administrative Lead
Geol. Survey of AL - Technical Lead, Geology
SCGCS (University of Alabama) - Engineering
Southern Company/EPRI - MMV
Institute for Clean Energy Technology (MSU) - MMV
Univ. British Columbia - Analytical
Oak Ridge National Laboratory - Analytical
ARI - Reservoir Simulation
CCP2 - Reservoir Modeling
Denbury Resources - CO_2
Dominion E&P - Mature CBM well

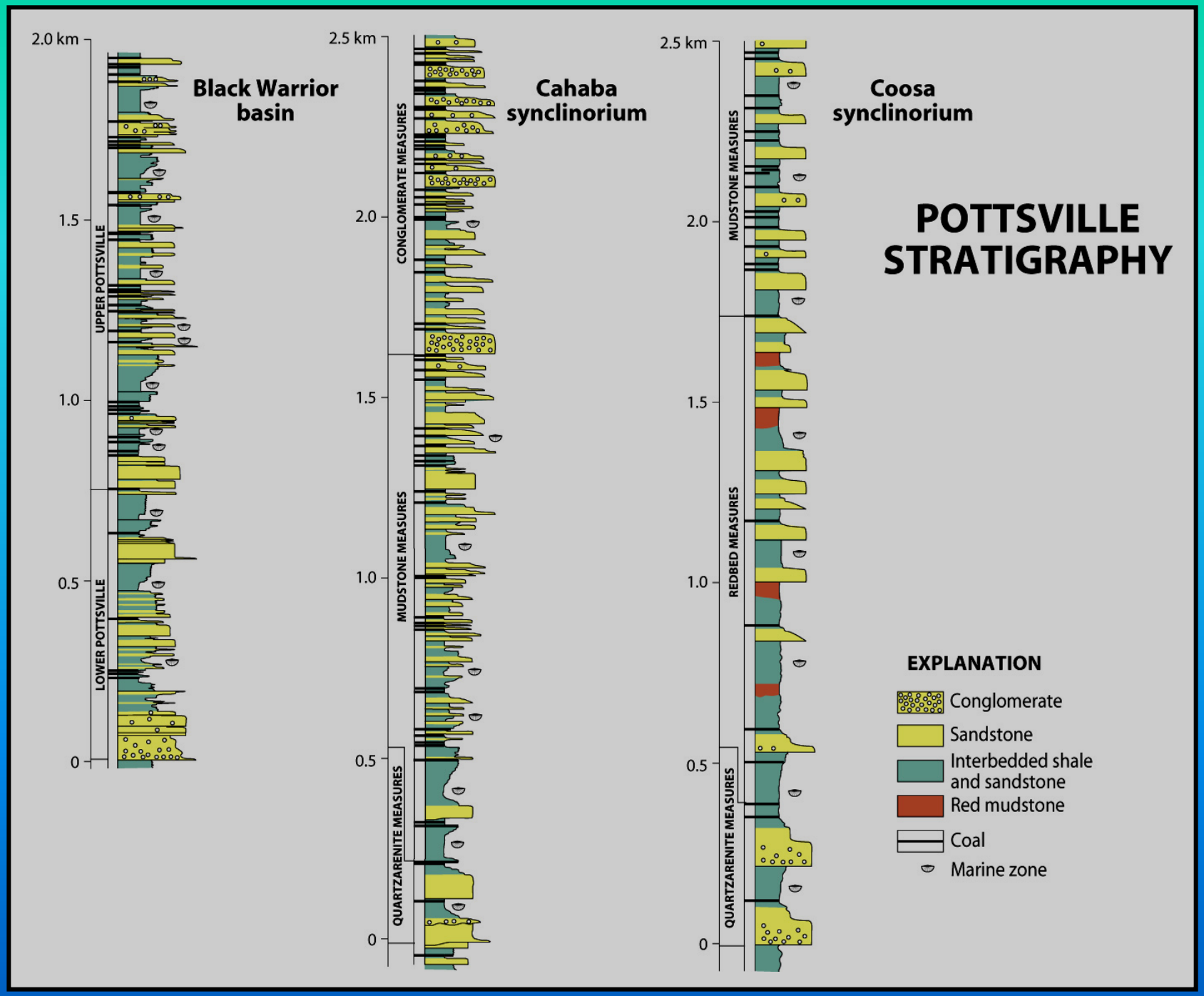
SECARB Coal Group

ASSESSMENT ACTIVITIES

(2006)

REGIONAL GEOLOGY




POTTSVILLE STRATIGRAPHY
Black Warrior basin
Cahaba synclinorium
Coosa synclinorium
2.0 km
2.5 km
2.5 km
1.5
1.0
0.5
0
2.0
UPPER POTTSVILLE
LOWER POTTSVILLE
CONGLOMERATE MEASURES
MUDSTONE MEASURES
QUARTZARENITE MEASURES
REDBED MEASURES
EXPLANATION
Conglomerate
Sandstone
Interbedded shale and sandstone
Red mudstone
Coal
Marine zone

COOSA

CO_2 capacity = 0.072 Tcf (4.2 Mt)

ECBM Potential = 0.007-0.013 Tcf

CAHABA

CO_2 capacity = 2.2 Tcf (126 Mt)

ECBM Potential = 0.2 to 0.4 Tcf

BLACK WARRIOR

CO_2 capacity = 5.9 Tcf (342 Mt)

ECBM Potential = 0.6 to 1.2 Tcf

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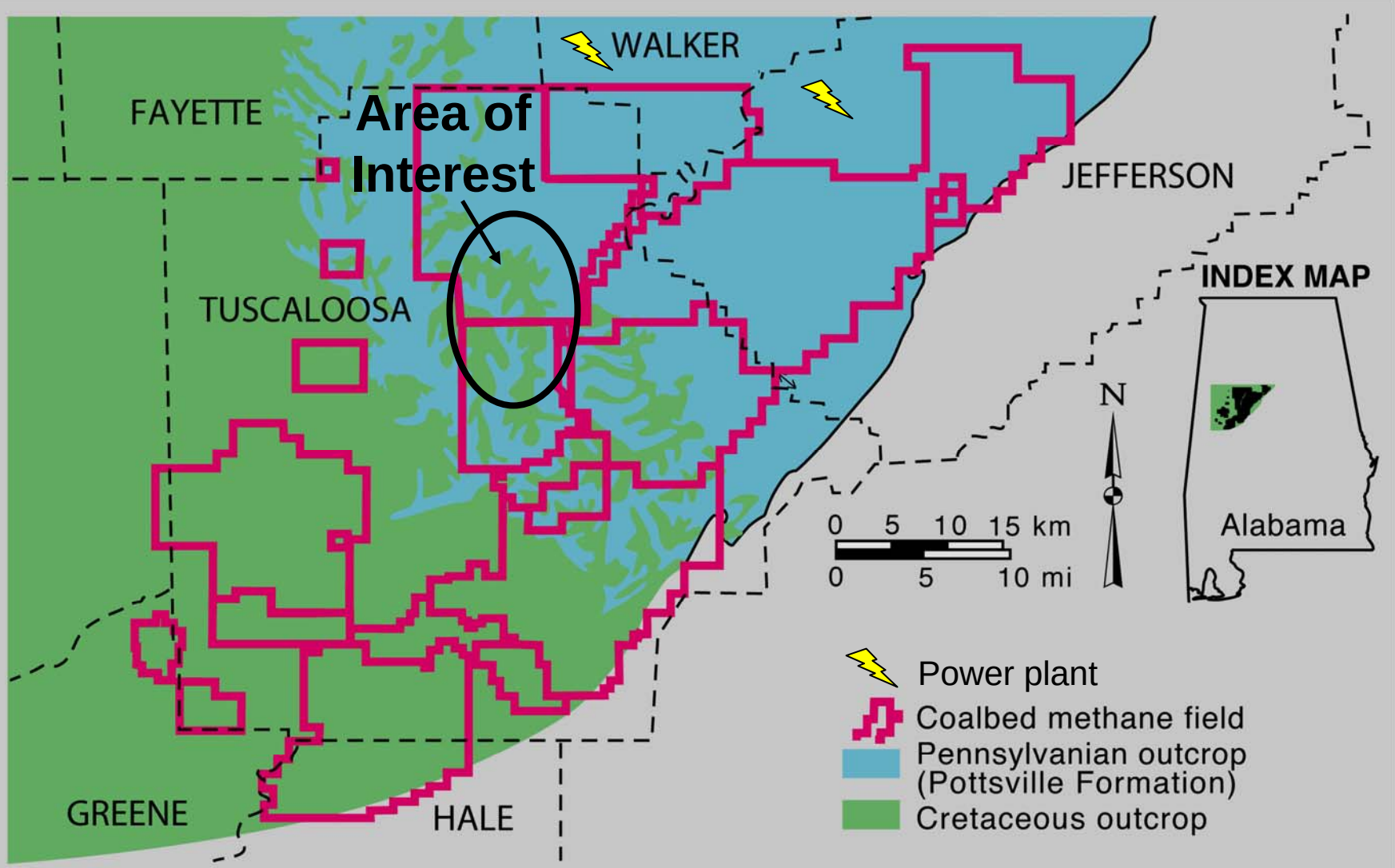
BLACK WARRIOR FIELD TEST

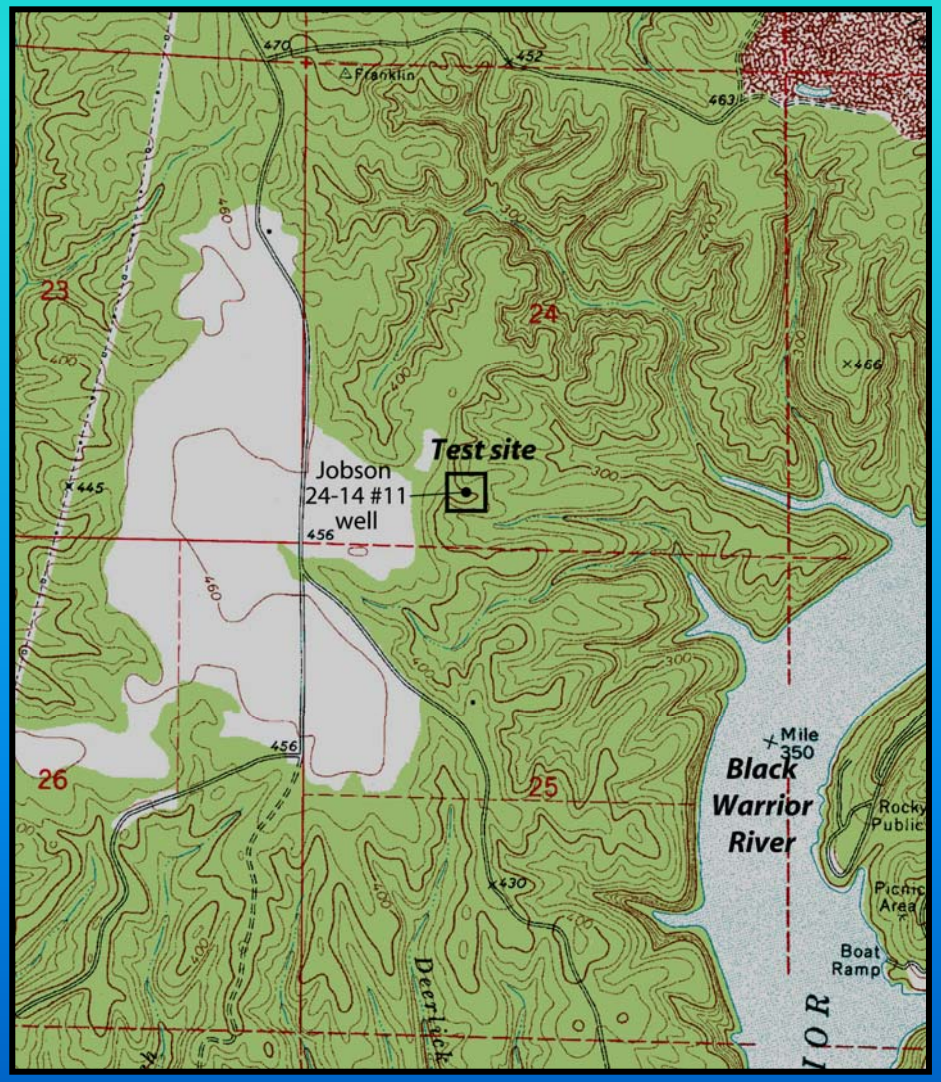
(2006-2009)



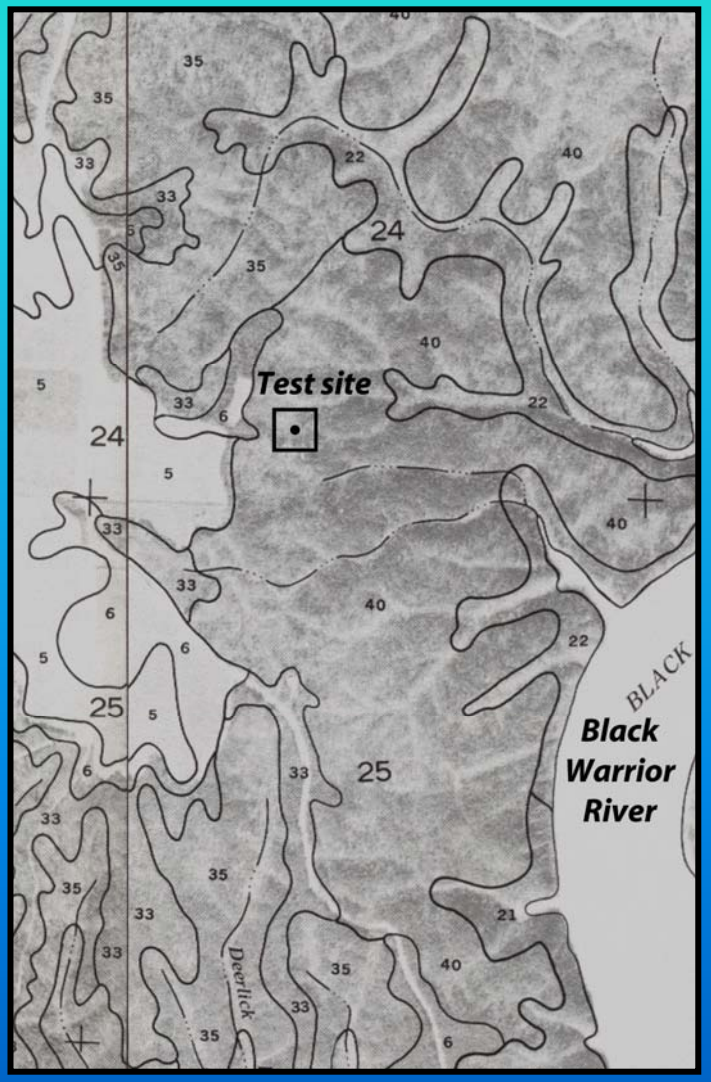
COALBED METHANE FIELDS OF THE BLACK WARRIOR BASIN

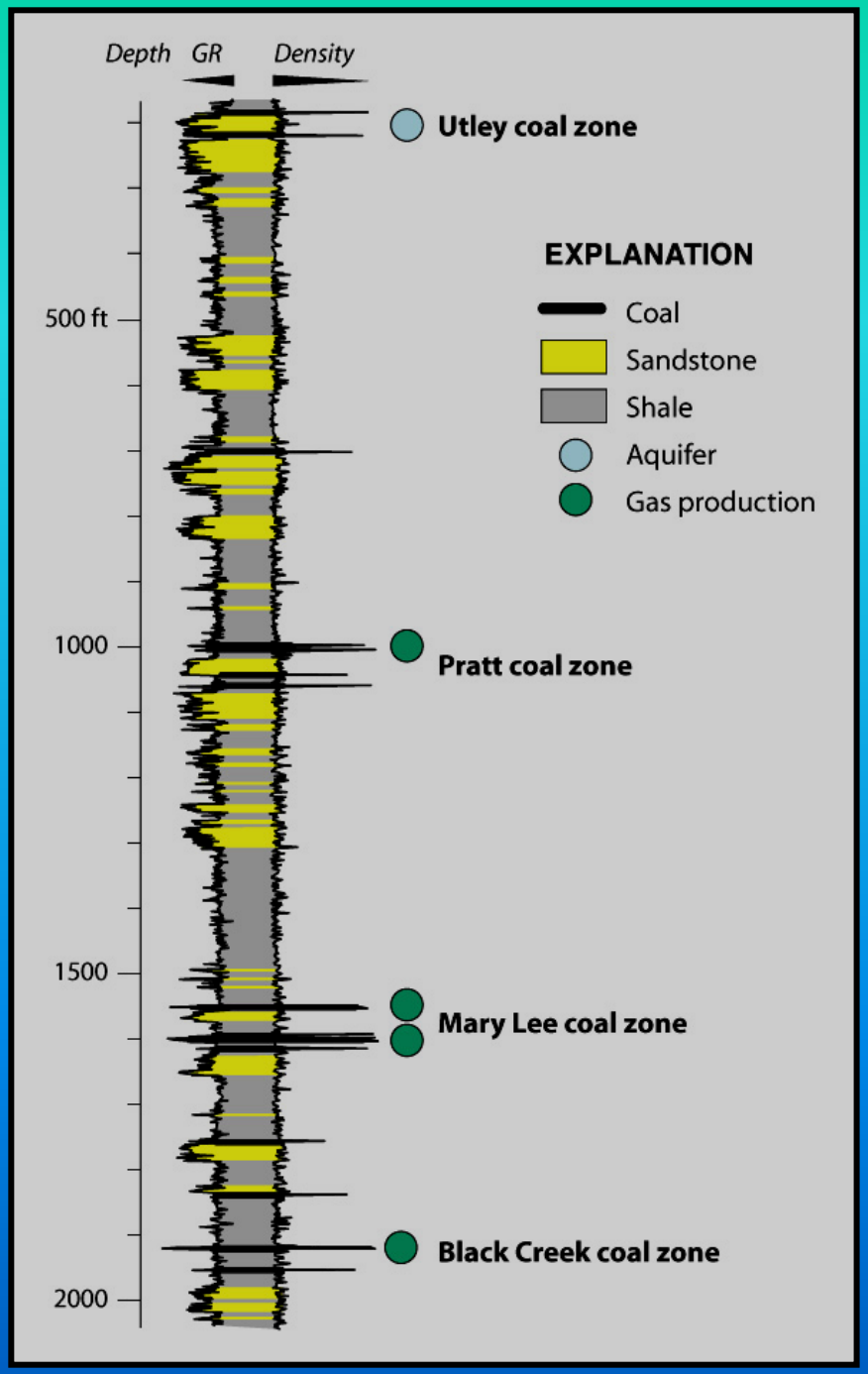
BLACK WARRIOR TEST SITE

Topography



Soil Survey





POTTSVILLE STRATIGRAPHY

Blue Creek and Deerlick Creek Fields

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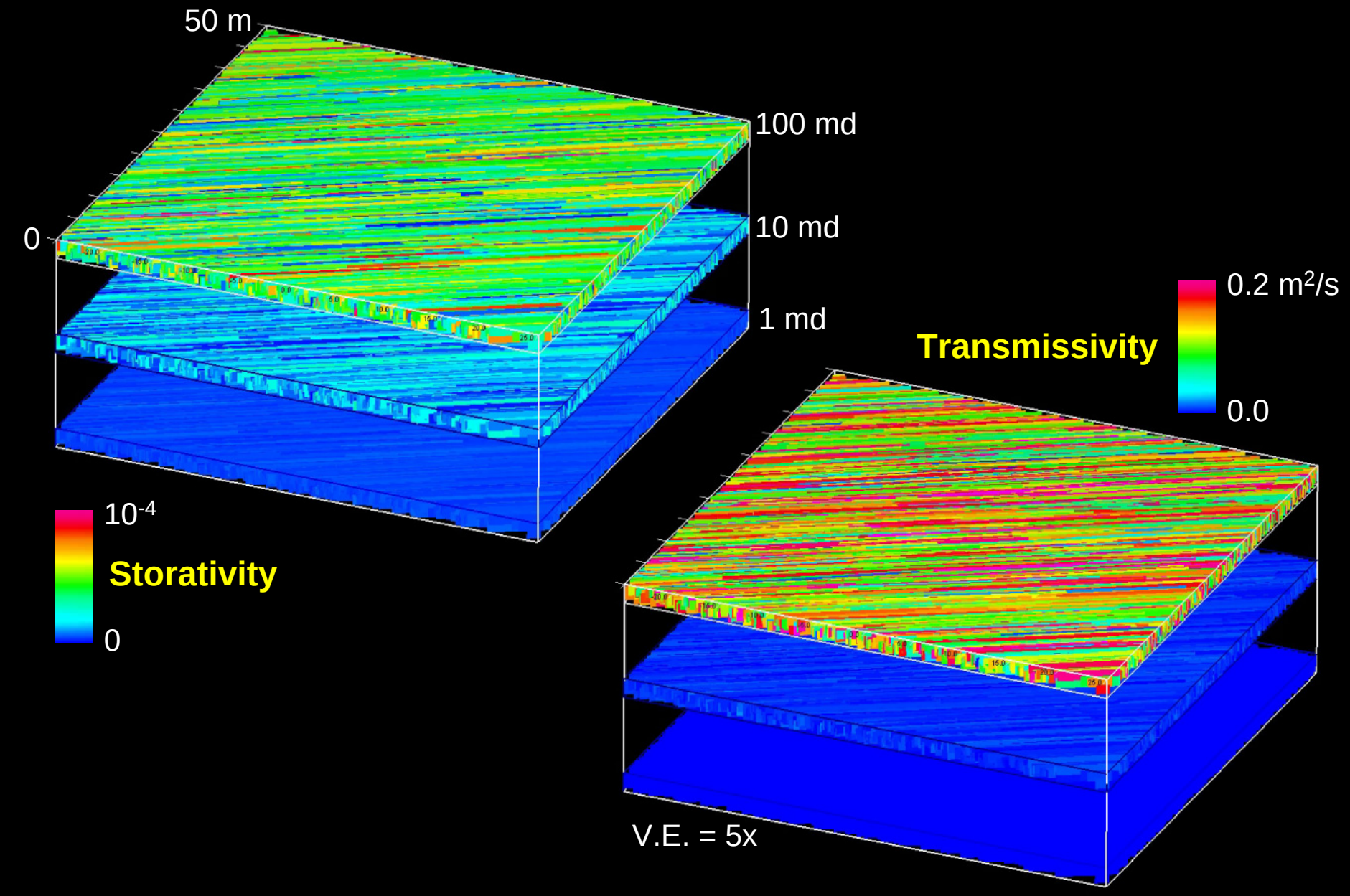
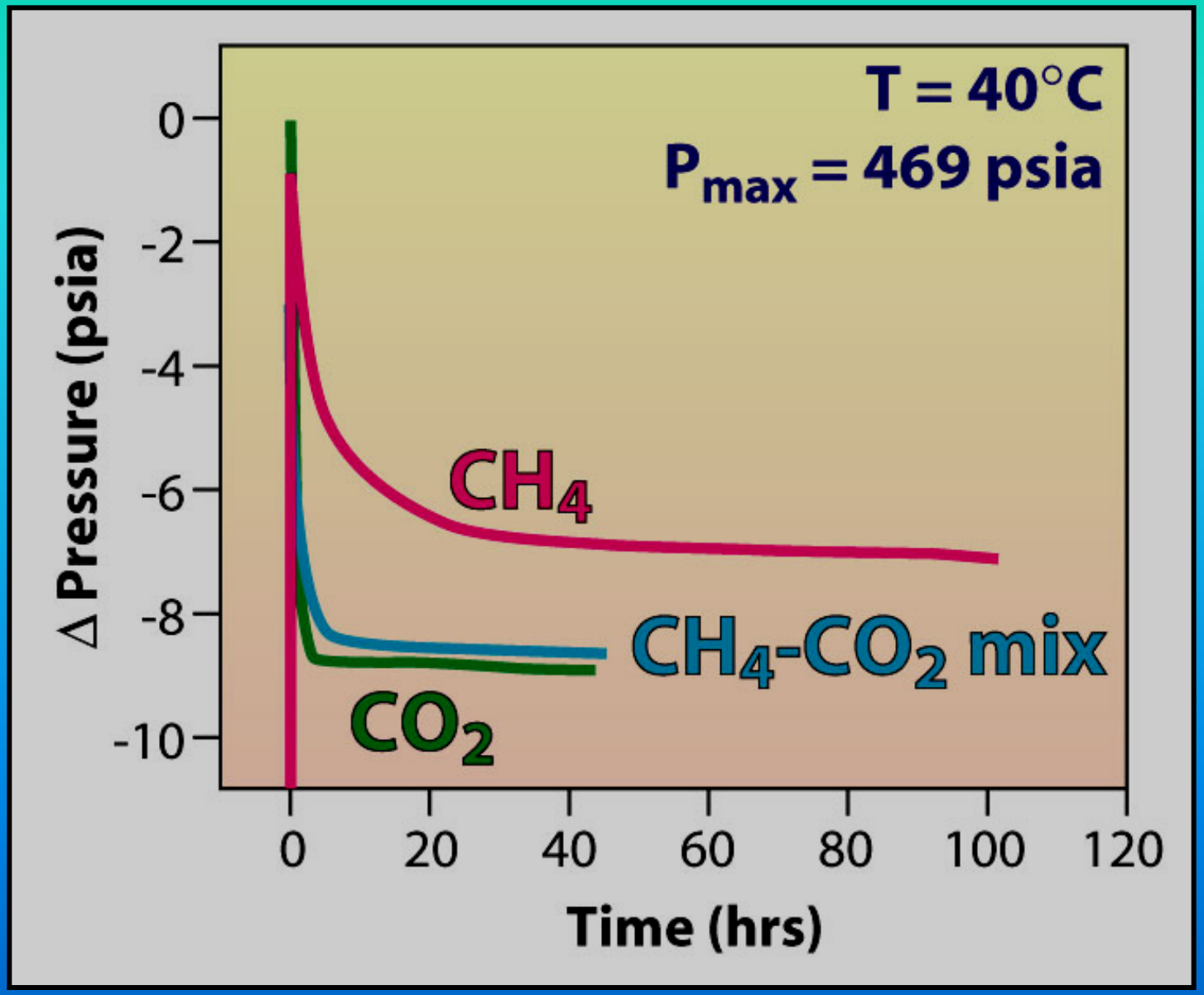
STORAGE AND TRANSMISSIVITY



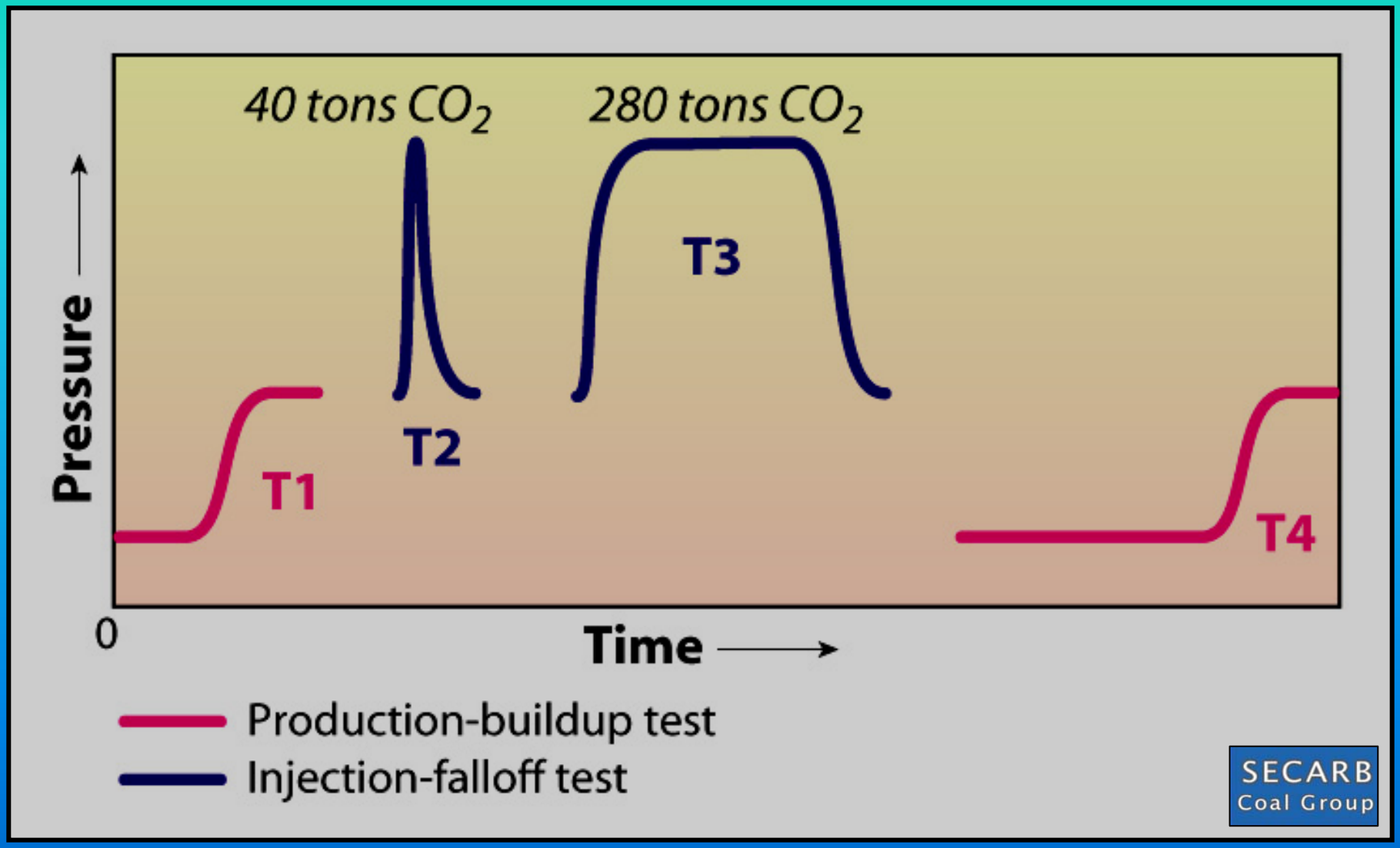
ADSORPTION KINETICS



Blencoe et al. (2006)

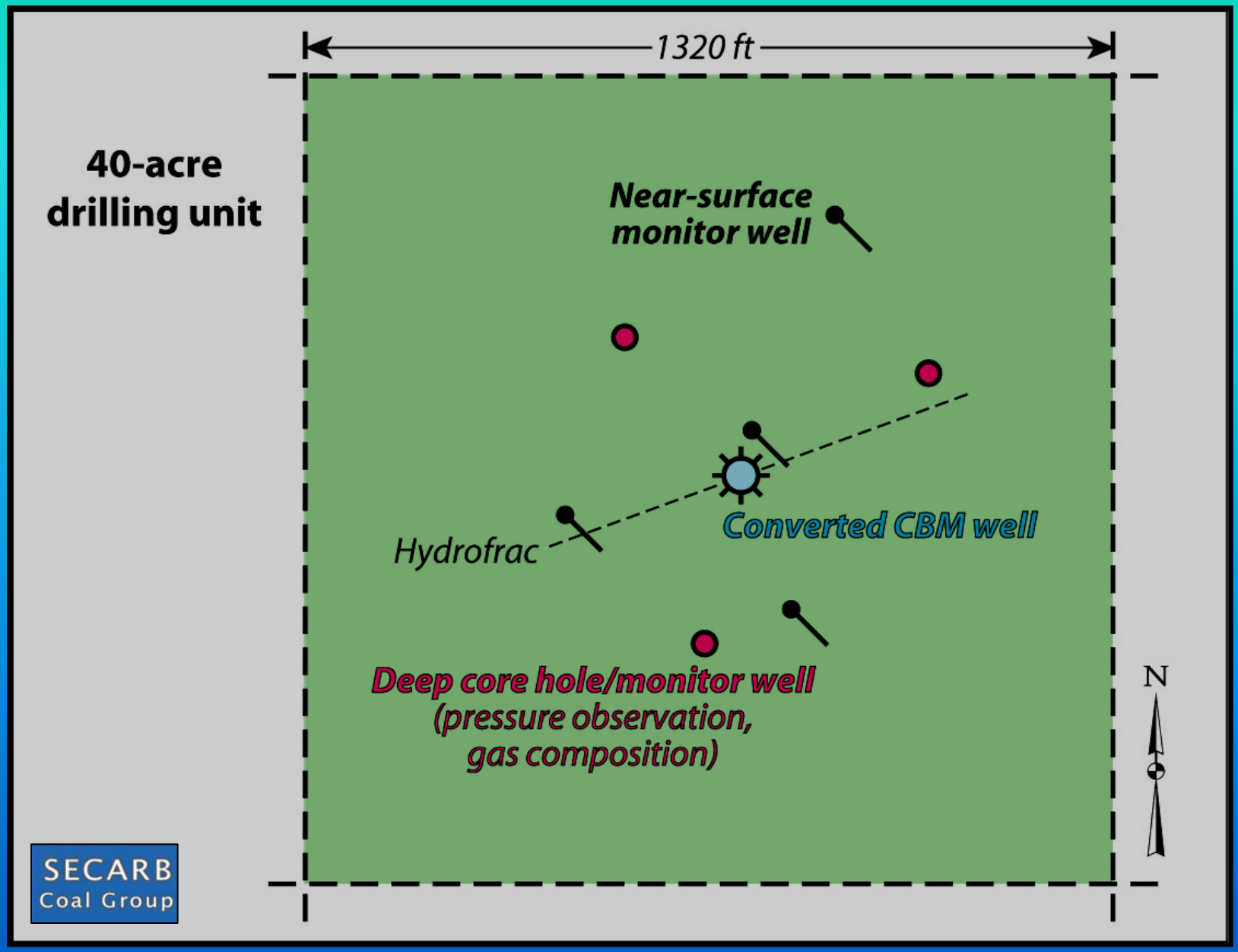
Oak Ridge National Laboratory

PRODUCTION AND INJECTION TESTS



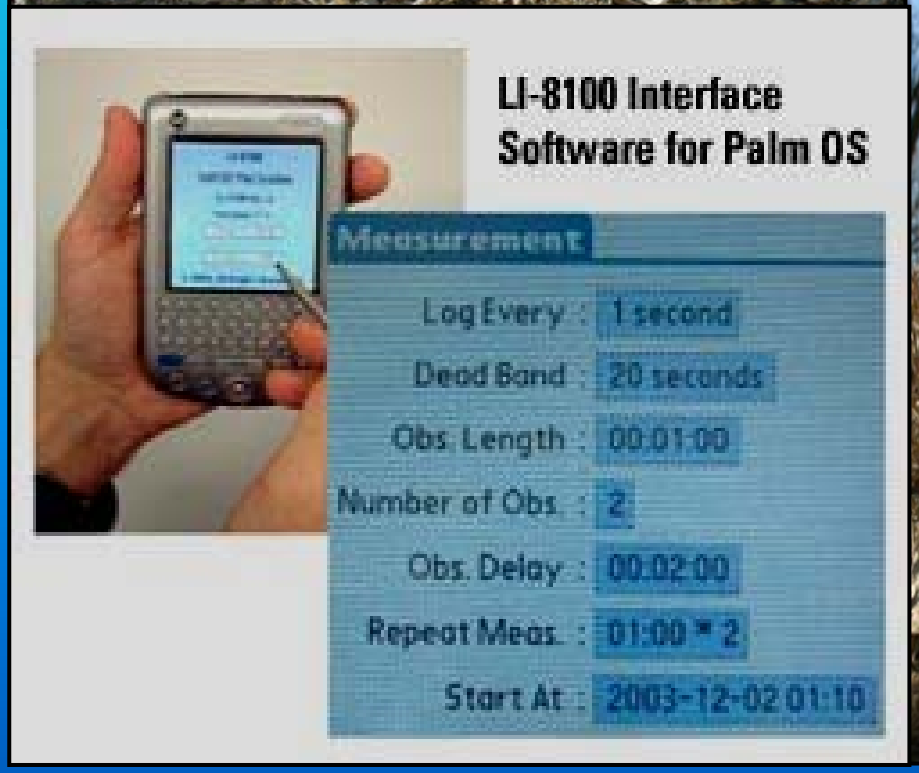
Three sets of tests (Black Creek, Mary Lee, and Pratt coal zones)

BLACK WARRIOR PILOT SITE PLAN



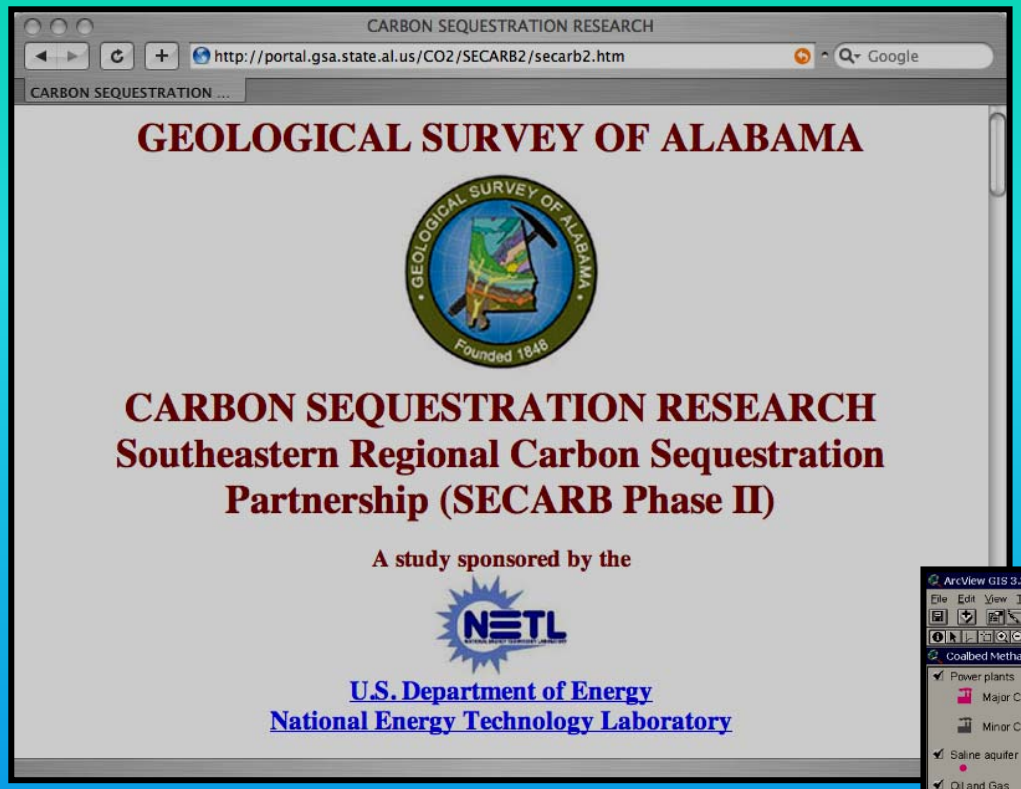
SURFACE MONITORING

Southern Company



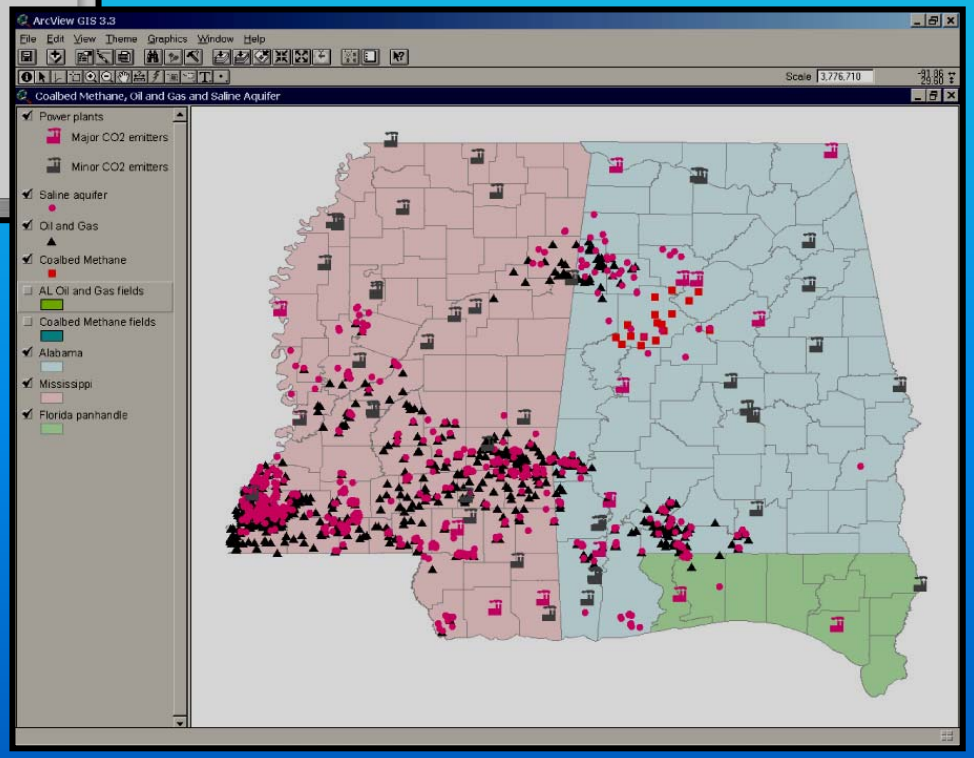
OUTREACH ACTIVITIES

Web resources



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

Publications



Meetings

2006 INTERNATIONAL COALBED METHANE SYMPOSIUM

TEST SCHEDULE

Site selection - 4/06 to 9/06

Coring - 12/06 to 3/07

Install monitoring equip. - 3/07 to 4/07

Monitoring - 4/07 to 7/09

Injection testing - 8/07 to 10/08

Site closure - 3/09 to 9/09

SECARB
Coal Group