Characterization of a World Class Carbon Dioxide Storage Complex in Kemper County, Mississippi, USA

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Advanced Resources International, Inc.

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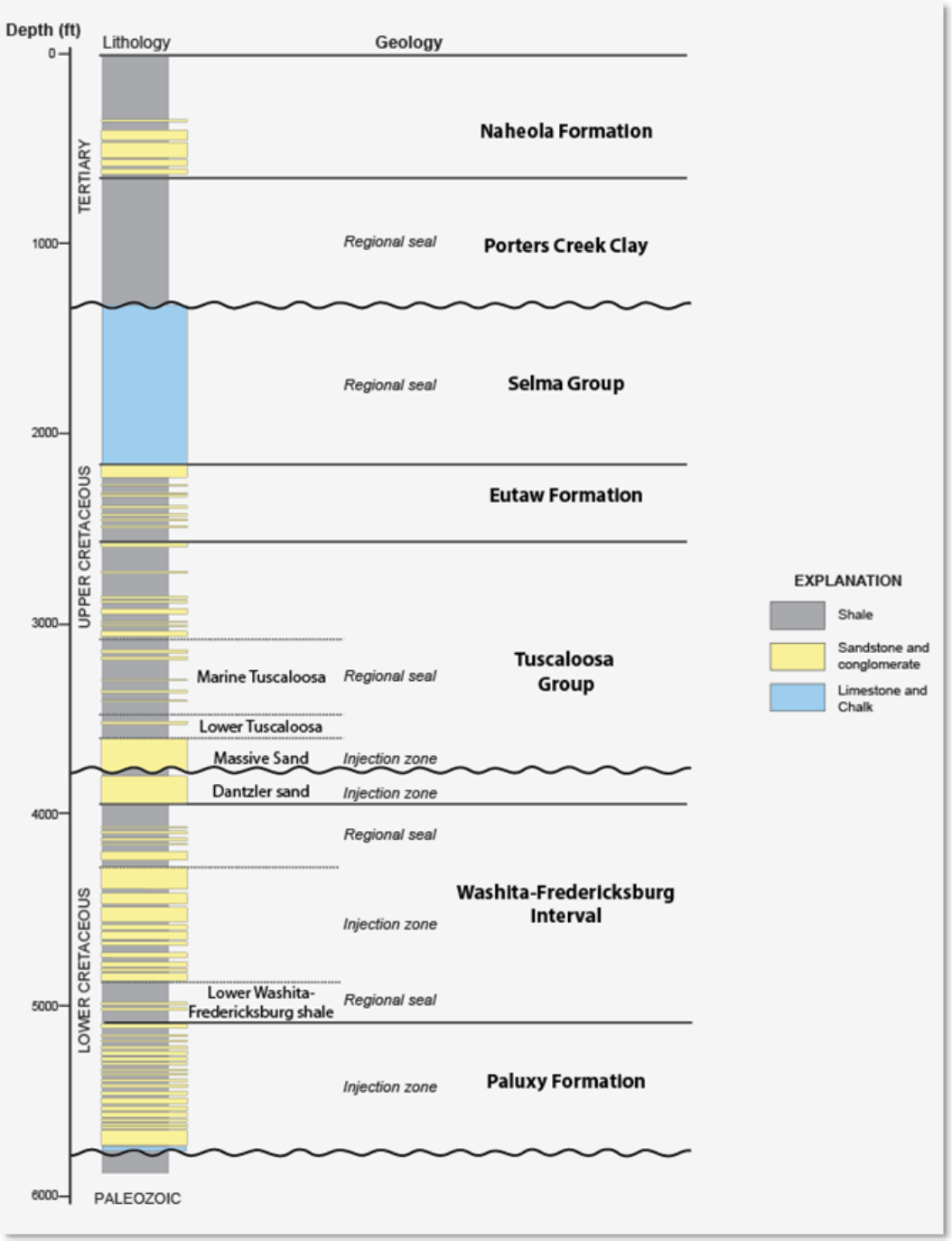
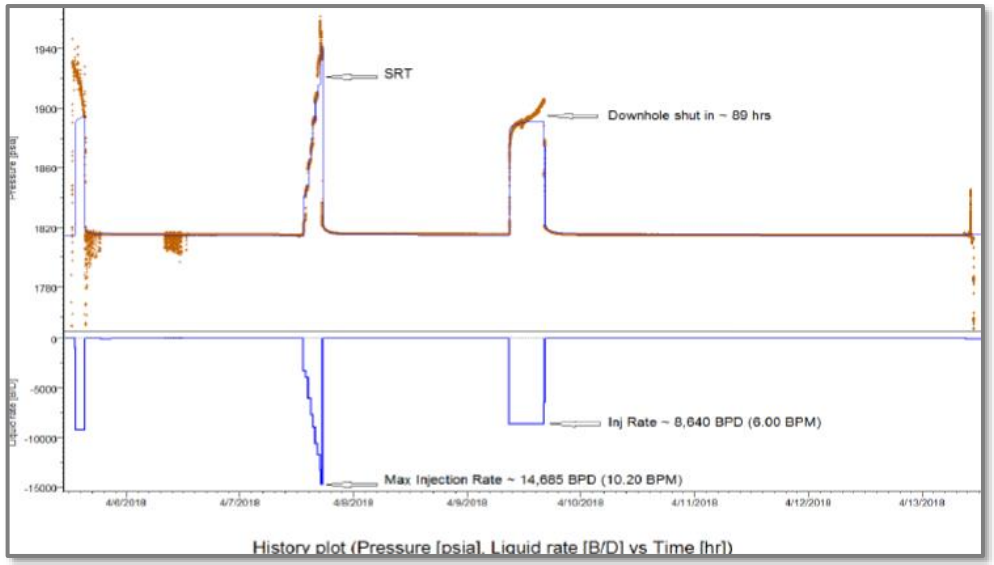


Kemper Storage Complex Stratigraphy

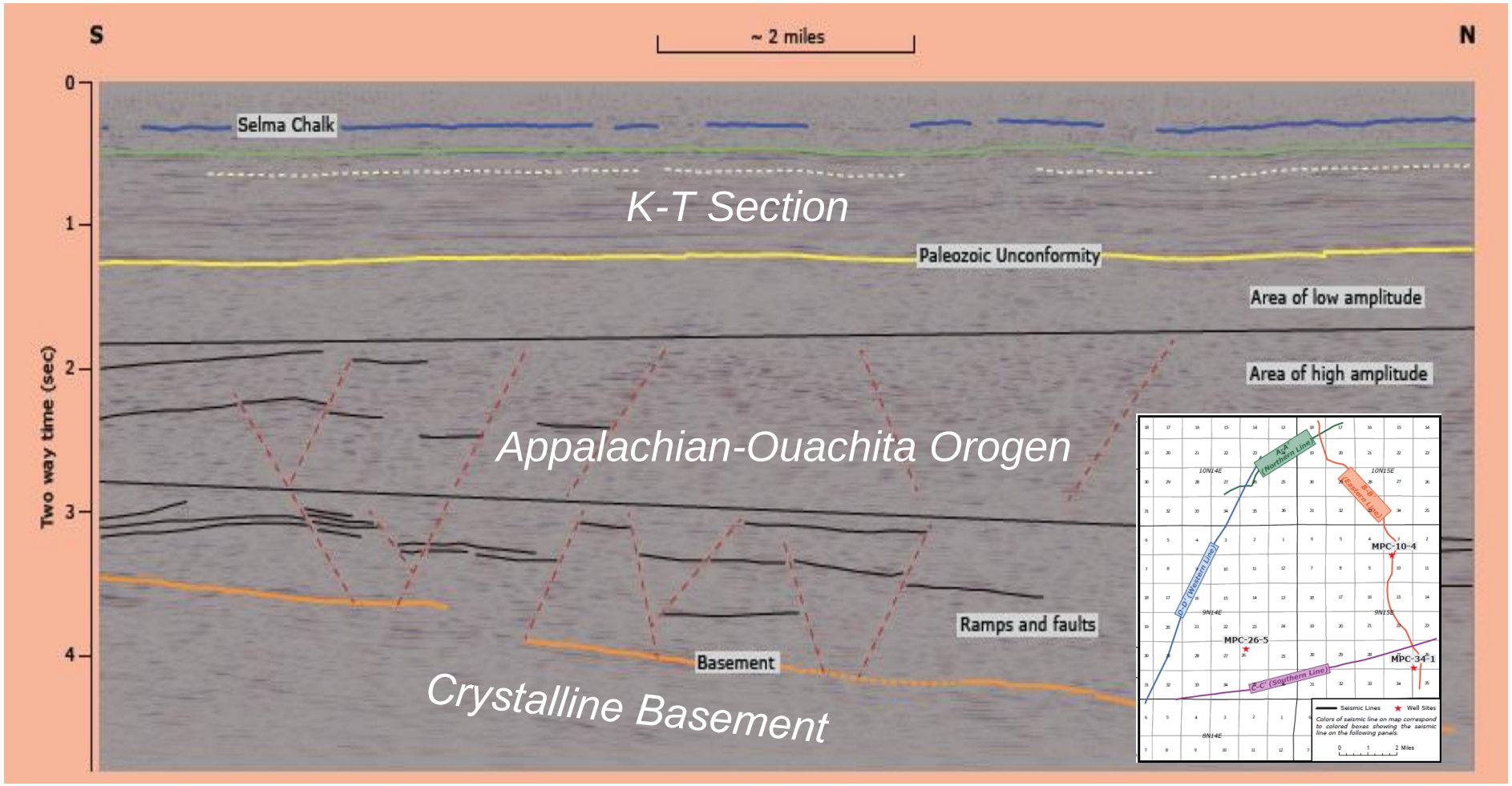
- **Storage zones**
  - Lower Tuscaloosa Grp ('Massive' sand)
  - Washita-Fredericksburg interval
  - Paluxy Formation
- **Confinement**
  - Tuscaloosa marine shale
  - Shale interval at top of the Washita-Fredericksburg
  - Shale interval at base of Washita-Fredericksburg
  - Shallower seals in the Selma and Midway Groups

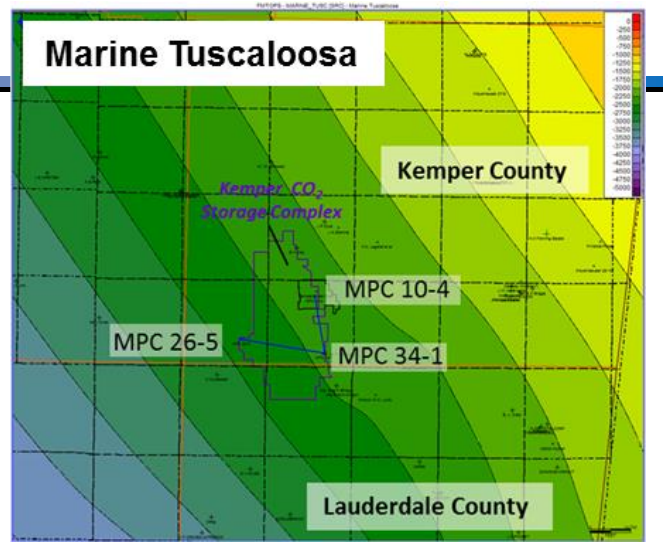
Data Collection

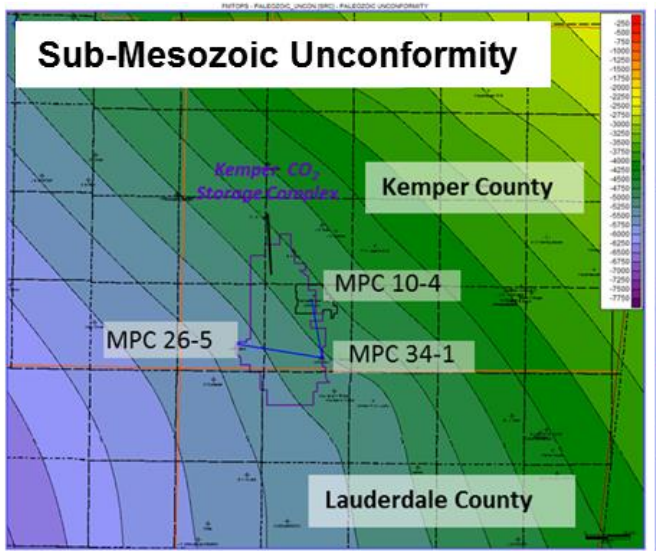
- Three characterization/monitoring wells were drilled in 2017 to test and characterize geologic properties
- 200 ft of hole core was taken from the Paluxy and Washita-Fredericksburg reservoirs and the Marine Tuscaloosa shale confining unit
- Reservoir fluid sampling
- Injection tests confirm porosity/permeability



Kemper Storage Complex Geologic Structure

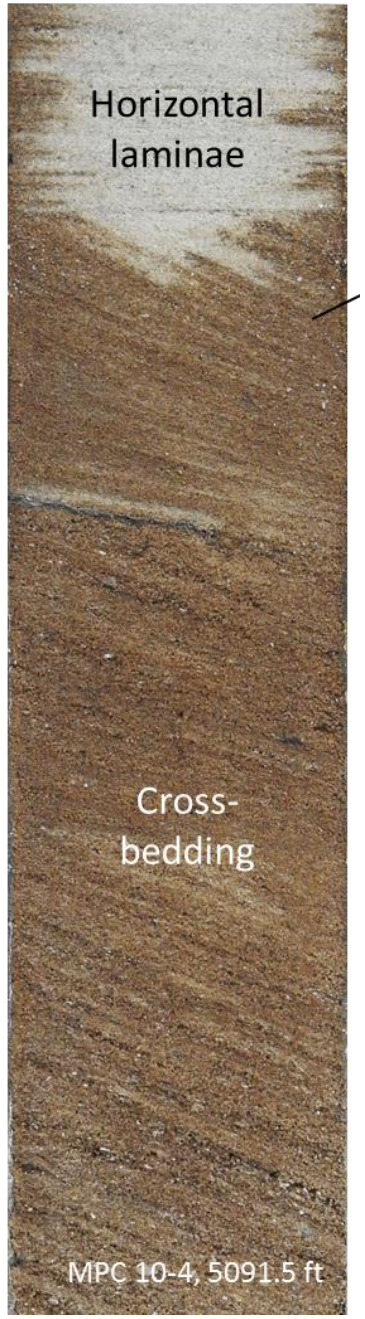






Rock Properties

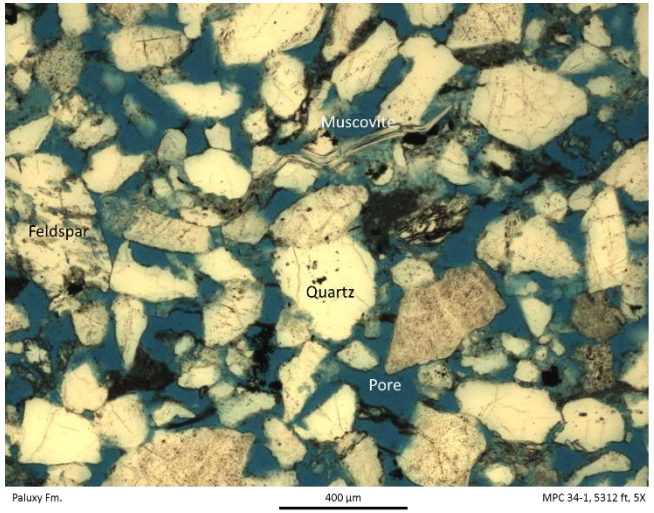
Paluxy sandstone

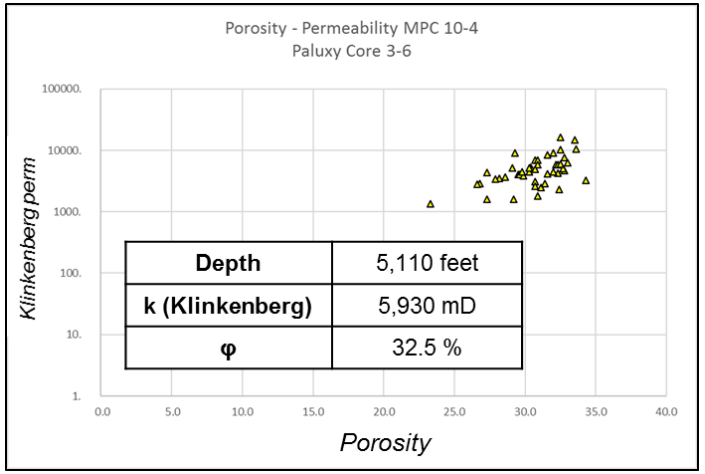


Interpretation: sandy braided stream deposit

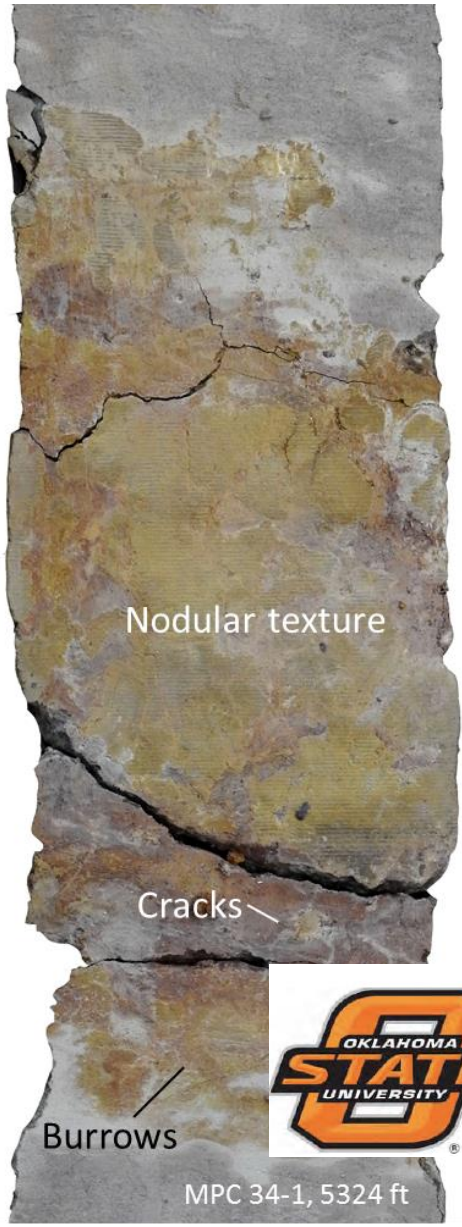
- 350 meters of net sand. Logs and core show sandstone average porosity of 30%(!!)
- Darcy-class permeability common (up to 16 Darcies)
- Mudrock units are likely effective seals; slow permeation of the mudrock pore systems makes significant migration of injected CO_2 out of the storage complex unlikely.

High-porosity sandstone in Paluxy Formation





Paluxy mudstone



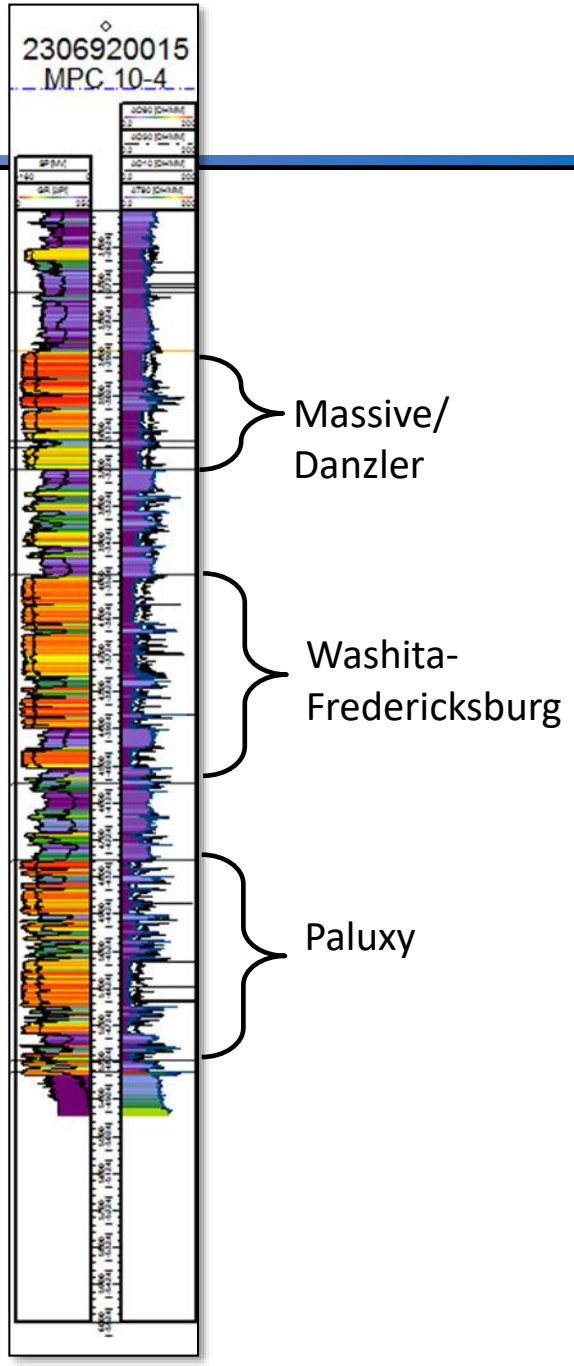
Interpretation: paleosol

Storage Complex Capacity

- Each of the three potential storage zones have commercial capacity
- Together the three storage zones result in a gigatonne capacity storage complex that has the potential to act as a regional hub

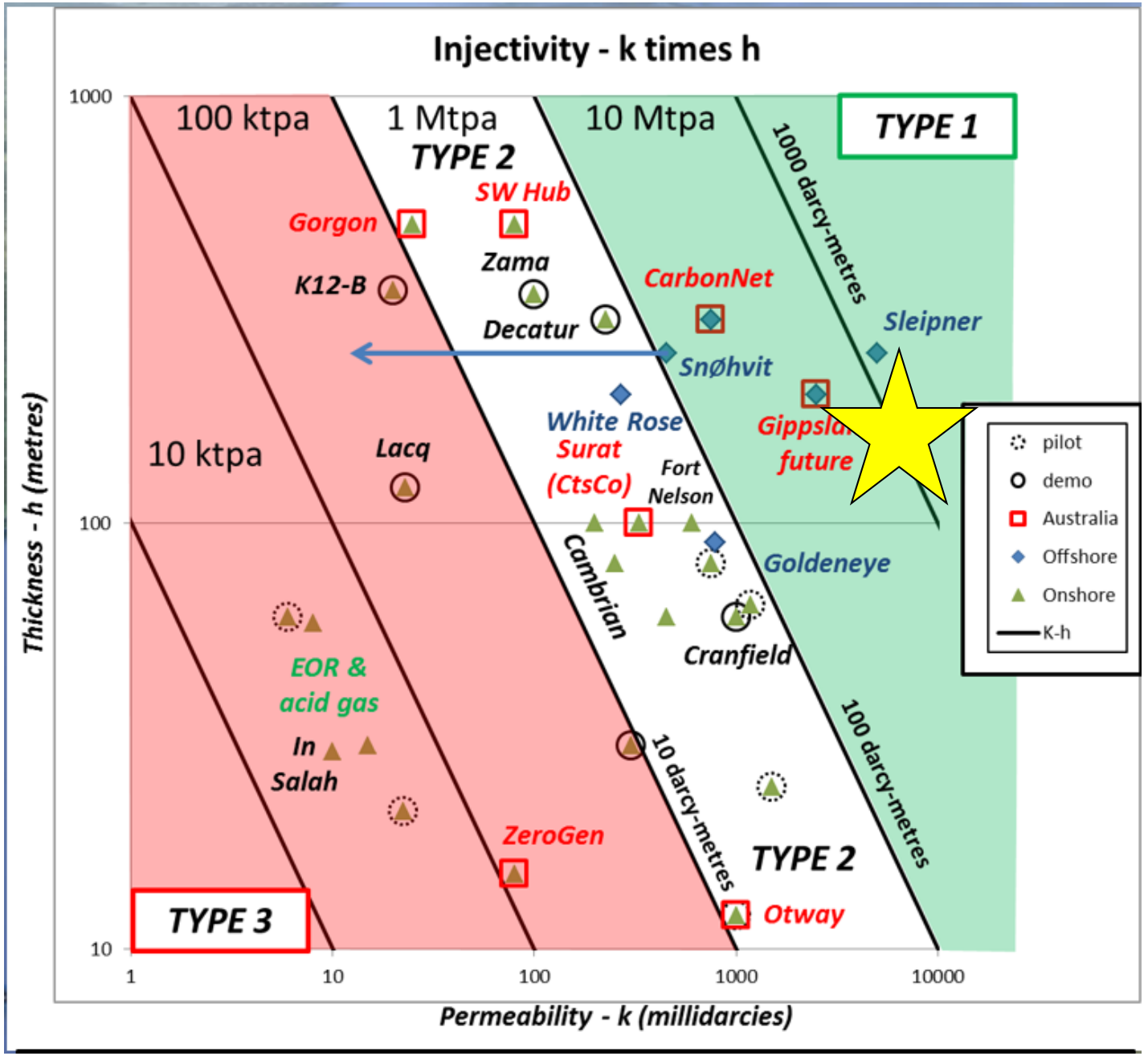
CO_2 Storage Reservoir	P_{10} Capacity (MMmt)	P_{50} Capacity (MMmt)	P_{90} Capacity (MMmt)
Massive/Dantzler	60	120	200
Wash.-Fred.	280	540	920
Paluxy	160	310	530
TOTAL	**510**	**970**	**1,660**

DOE methodology for site-specific saline storage efficiency calculation based on fluid displacement factors for clastic reservoirs where net pay, net thickness and net porosity are known of 7.4% (P_{10}), 14% (P_{50}) and 24% (P_{90}) (Goodman et al., 2011)



What in the World is a "World Class" Storage Complex?

- High permeability x net thickness
- Lower geomechanical risk
- Cheaper injection/storage costs
- Capacity to take a LOT of CO_2

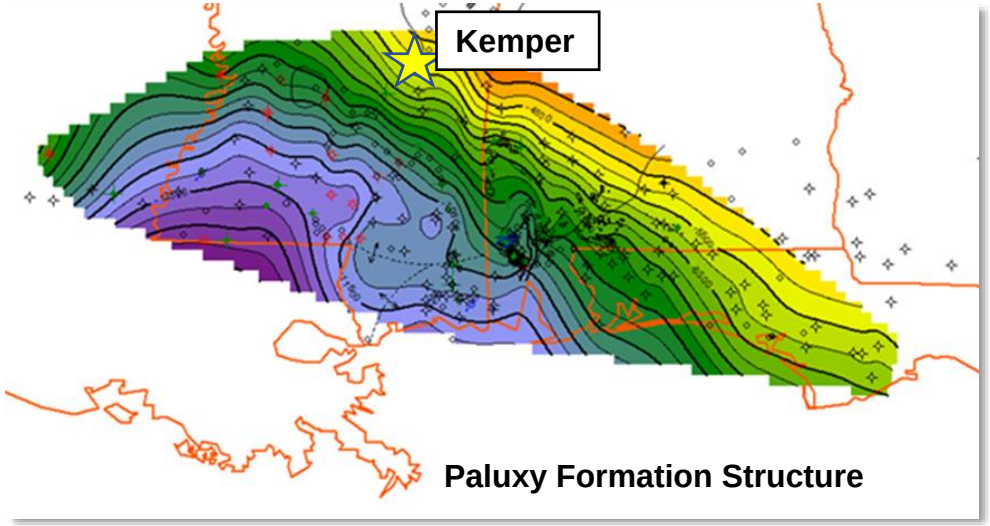


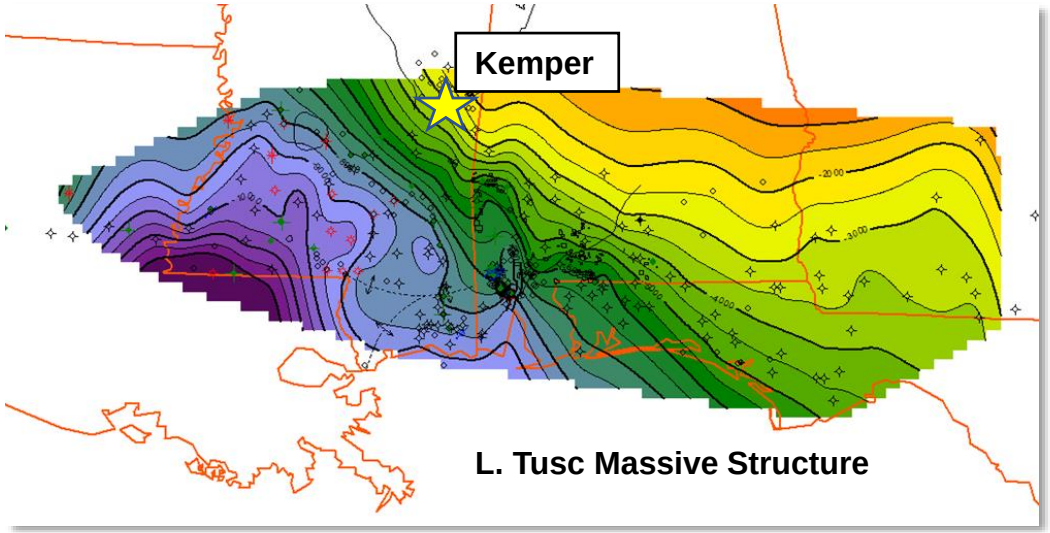
Hoffman et al., 2016. CarbonNet Storage Site Characterisation

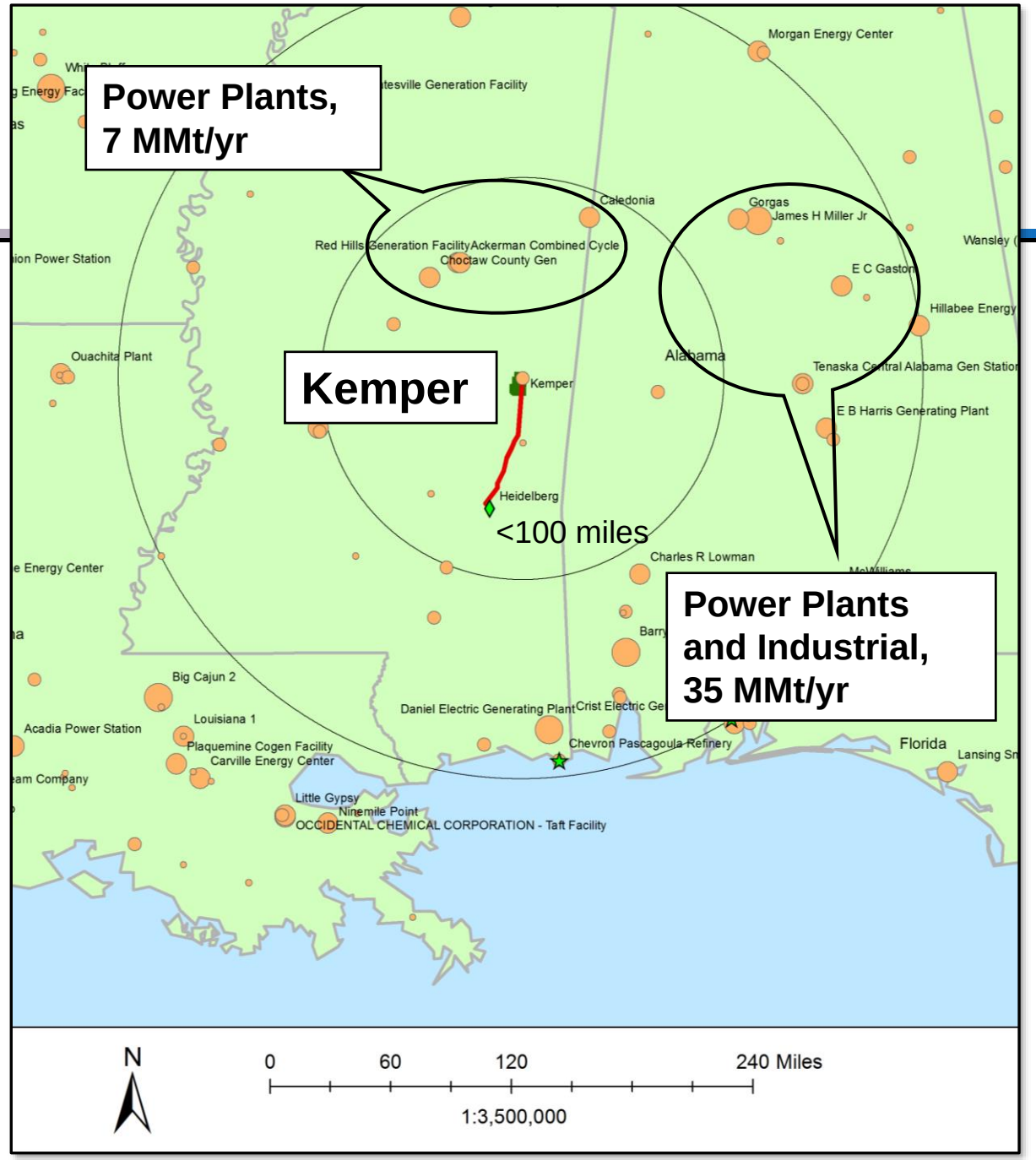
Storage Costs

- Low-cost storage options occur beneath the energy facility
  - $2.00 - $4.00 USD per metric ton
- This drives the value proposition where existing Kemper infrastructure could be utilized for CO_2 capture, compression, transportation and storage
- Given the expanded U.S. 45Q tax credit for CO_2 storage, having geologic storage data and cost estimates drives ongoing:
  - Applying data to internal resource planning and modeling
  - Improving internal transportation, storage and monitoring cost information
- Evaluation of Kemper site as a regional storage hub

Regional CO_2 Sources







Summary

A low risk CO_2 storage prospect

- Storage zones have exceptional capacity
- Caprocks are laterally continuous, confining properties are encouraging
- No structural “show stoppers”

Low storage costs drive commercial storage potential

Large point sources of CO_2 within a 100 to 200-mile radius

Southern Company

Mississippi Power

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