Stacked Storage Field Project

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Stacked Storage Field Project

Bureau of Economic Geology
at the Jackson School of Geosciences,
University of Texas at Austin

MMV : DIAL, LLNL LBNL, Schlumberger
Operator and CO_2 Source: TBD

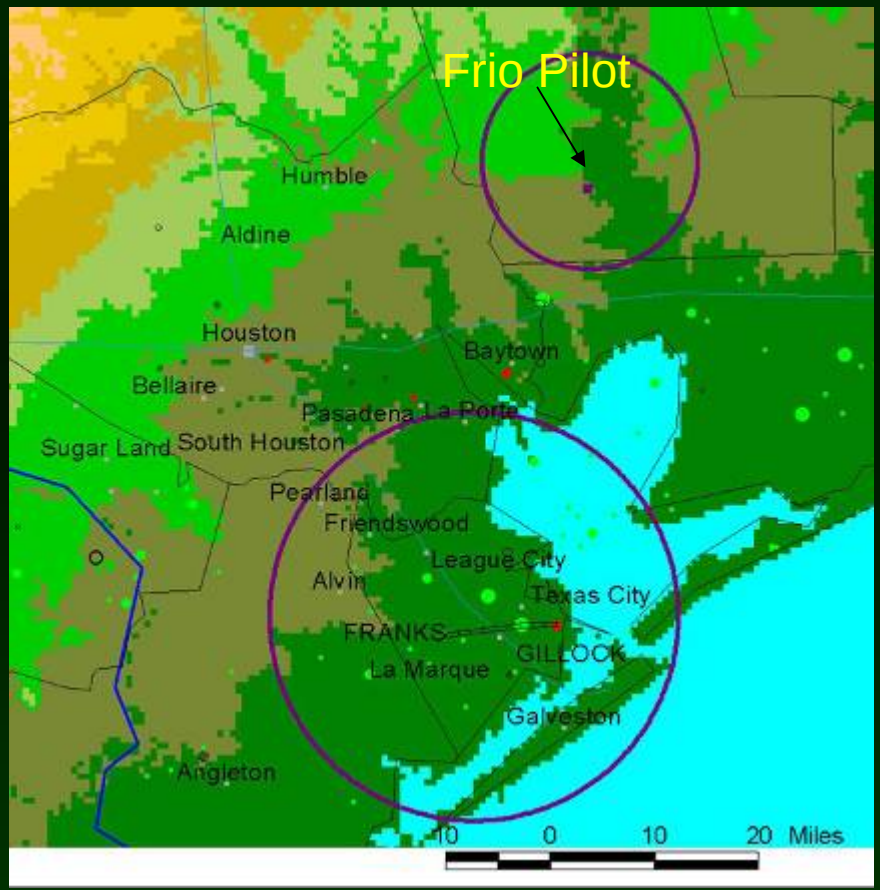
Technology Gaps – Stacked Storage Field Test Objectives

- Explore options for monitoring permanence at full implementation – define the gold standard for MMV
- Data to support risk assessment
  - Stress conditions during large injection
  - Displacement of brine
  - Impacts at surface – deformation and tilt
- Improved economic modeling – measure recovery efficiency for current technologies Gulf Coast case specific reservoir
- Dual permit for EOR + disposal

Stakeholders in Stacked Storage Pilot

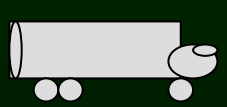
- Demonstration that provides value to participants with overlapping objectives:
  - US carbon storage program – effectiveness and safety of CCS
  - GCCC industry partners – new markets for products, emissions trading, IP
  - Operator – maximize production

Prospective Source-sink Matches for Stacked Storage

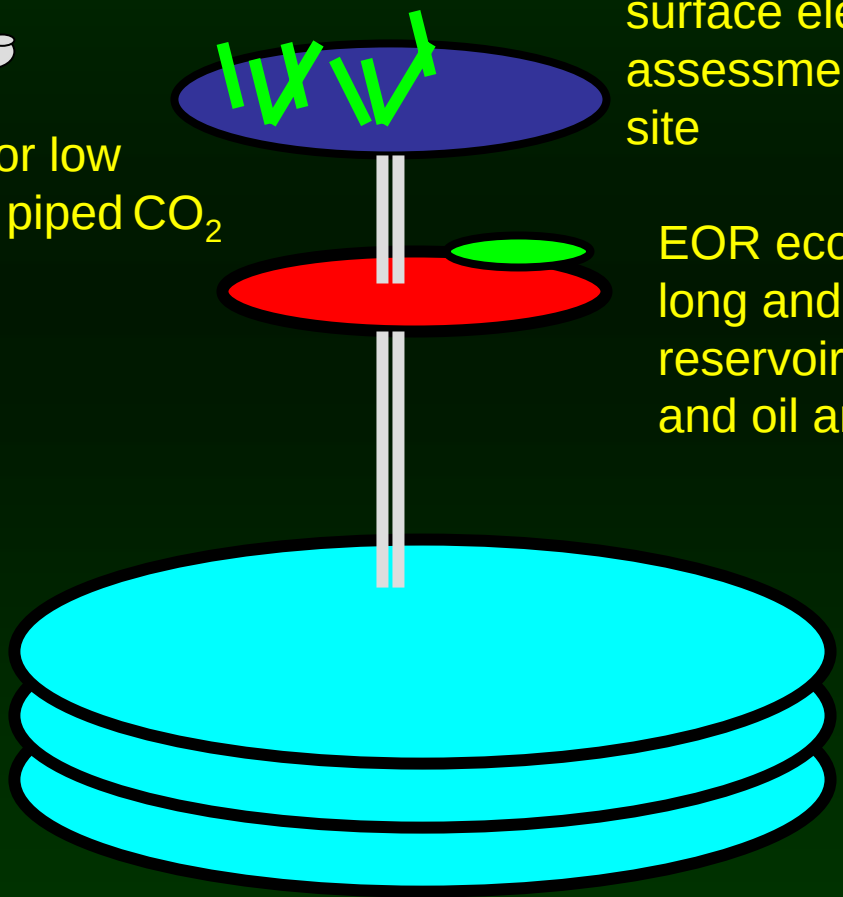


- Source – numerous Texas City refineries, Praxair hydrogen plant
- Sinks – two reservoirs; Smith Energy, Hunt Petroleum, capacity 4 million tons in stacked structural closures, excellent data
- 5-8 mile pipeline
- Coastal lowland, stacked sinks

Environment/Storage/Economic Field Project: MMV design



Trucked or low pressure piped CO_2

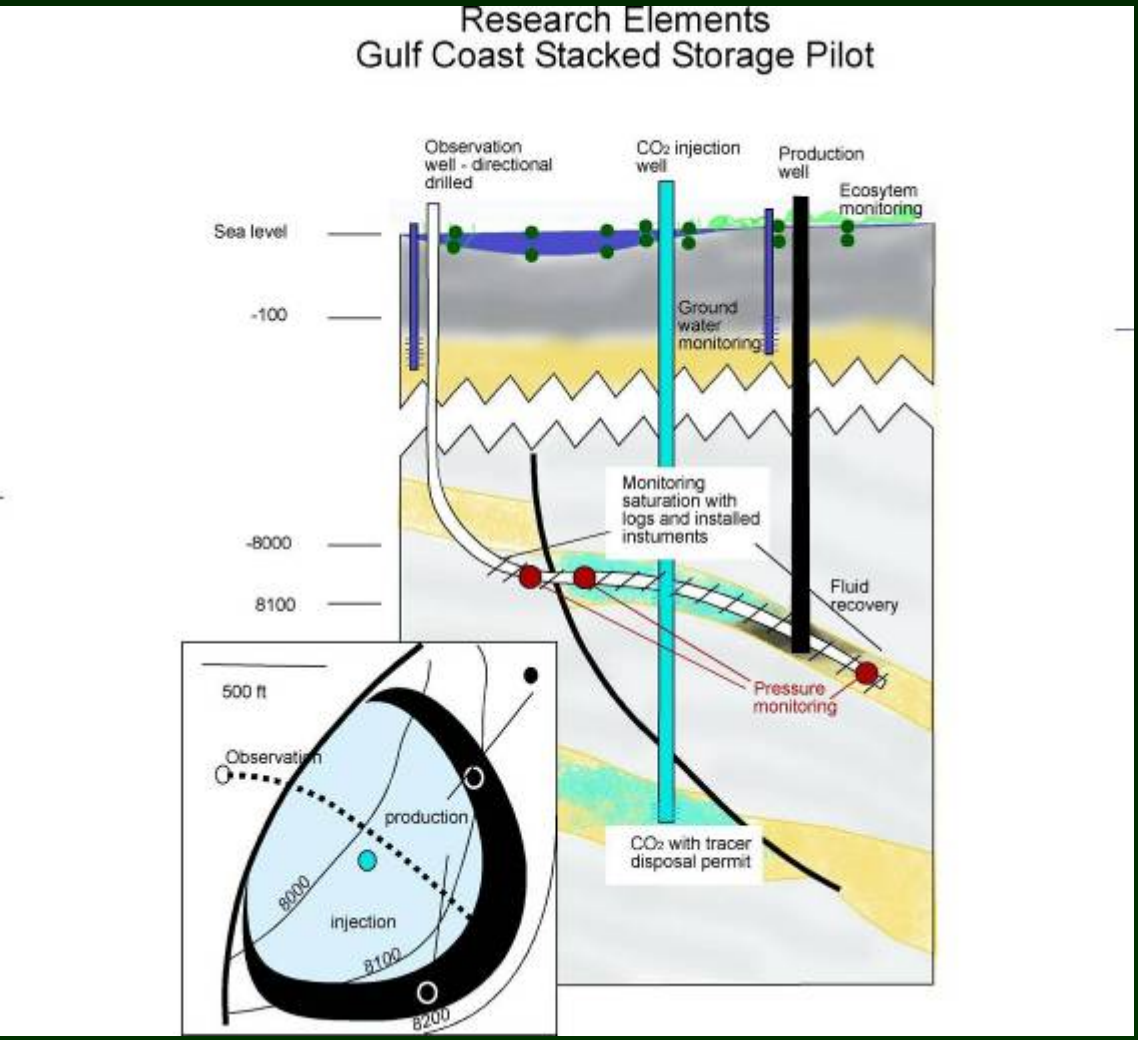


Wetlands protection – land surface elevation, risk assessment in high water table site

EOR economics, well leakage risk, long and short term trapping in reservoir by dissolution in water and oil and two phase trapping

Storage in brine – predicting foot print, permanence, fluid displacement interaction with faults, ultimate fate of injectate.

Stacked Storage Monitoring Elements



Ecosystem monitoring: Sensitive chemical and biologic parameters

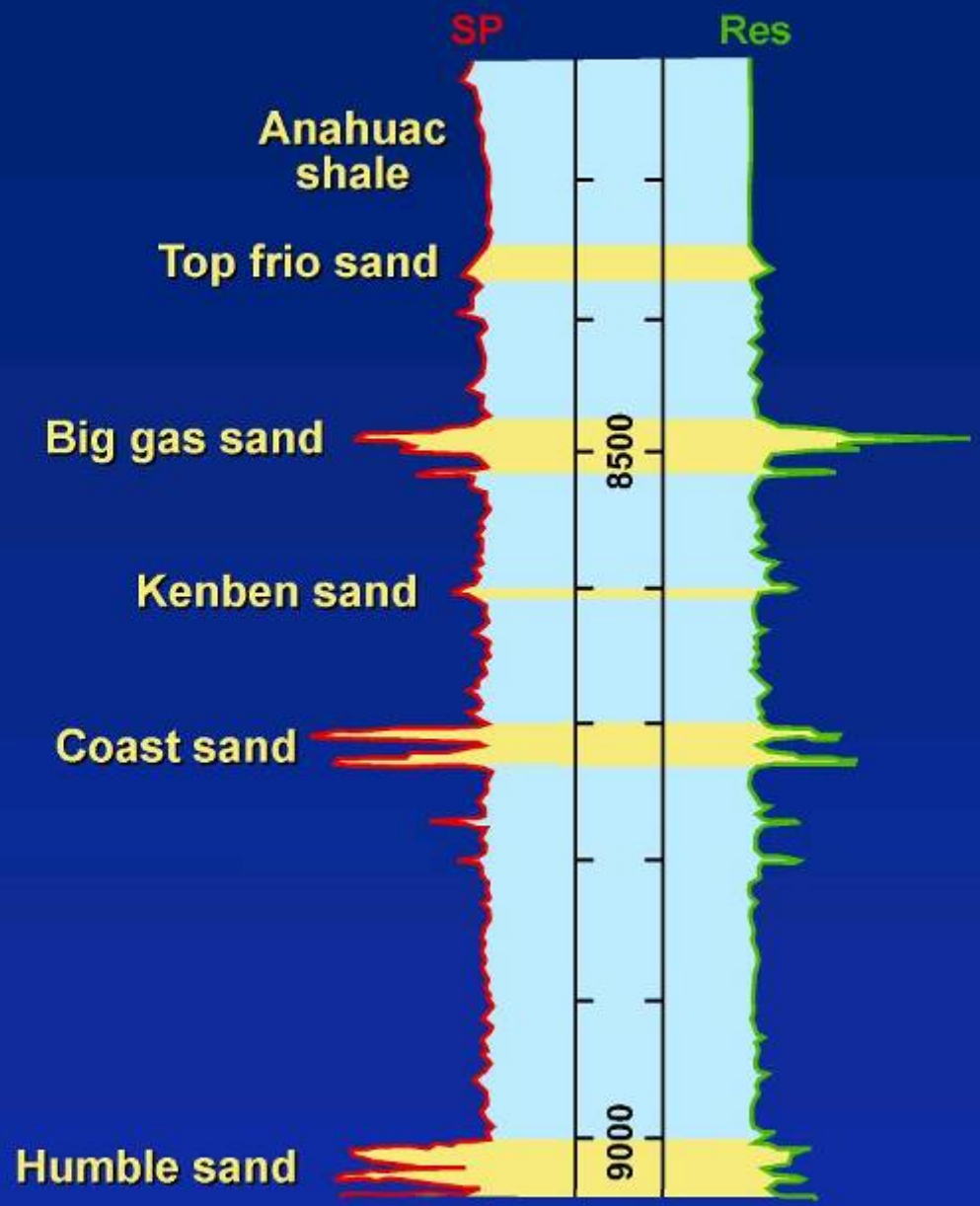
Groundwater monitoring

Oil production – economic success

Injection horizon: pressure, temperature, oil and CO_2 saturation during and post-injection, instrumented slant hole

Characterization of deeper horizon in preparation for eventual disposal

GILLOCK FIELD TYPE LOG



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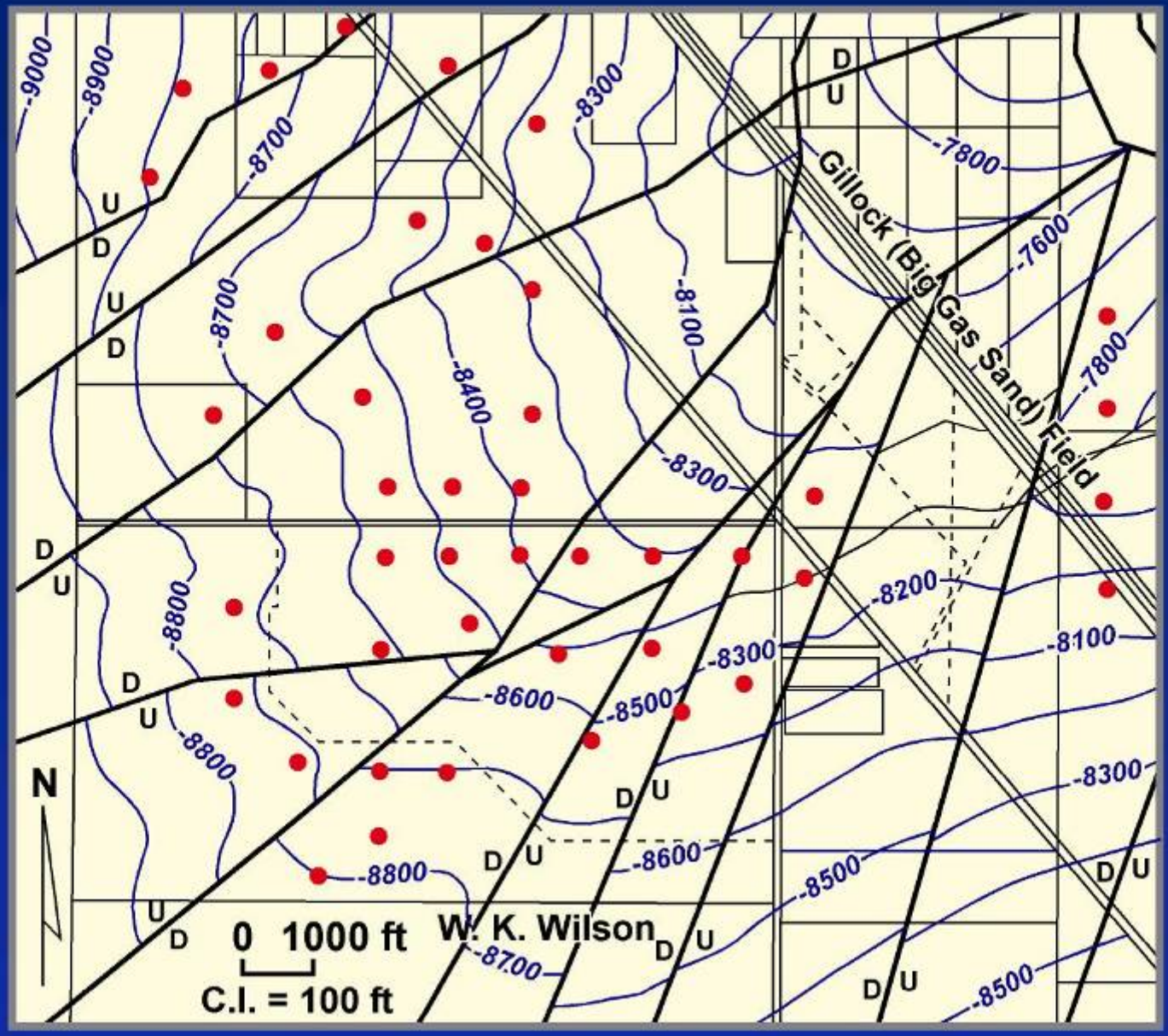
GILLOCK (Big Gas Sand) FIELD



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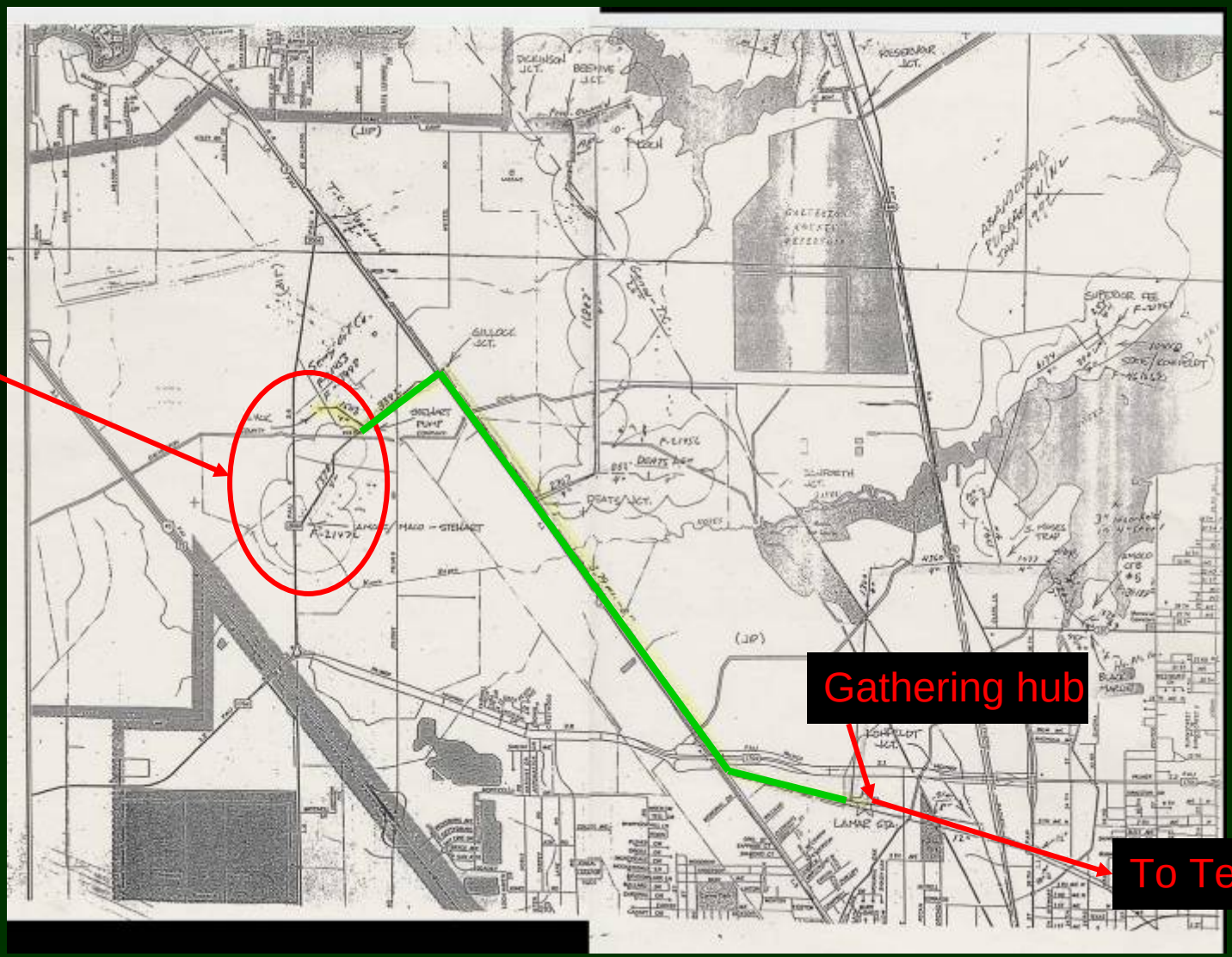
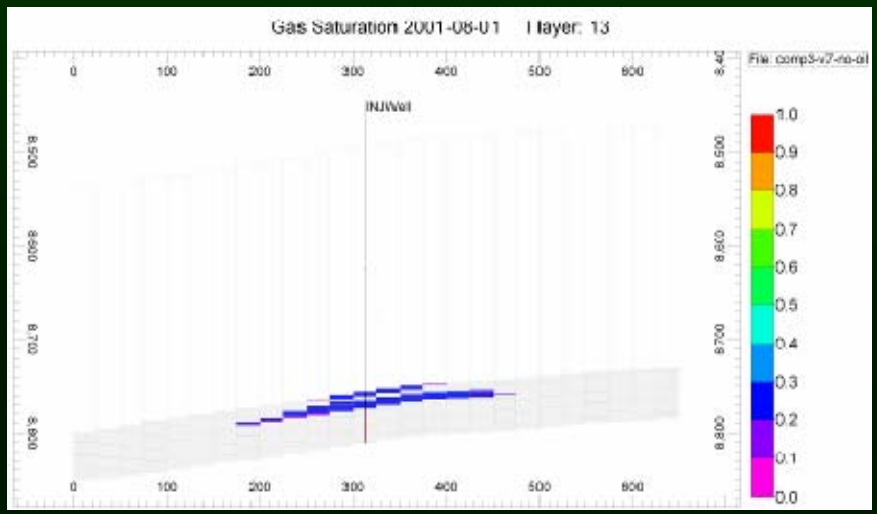
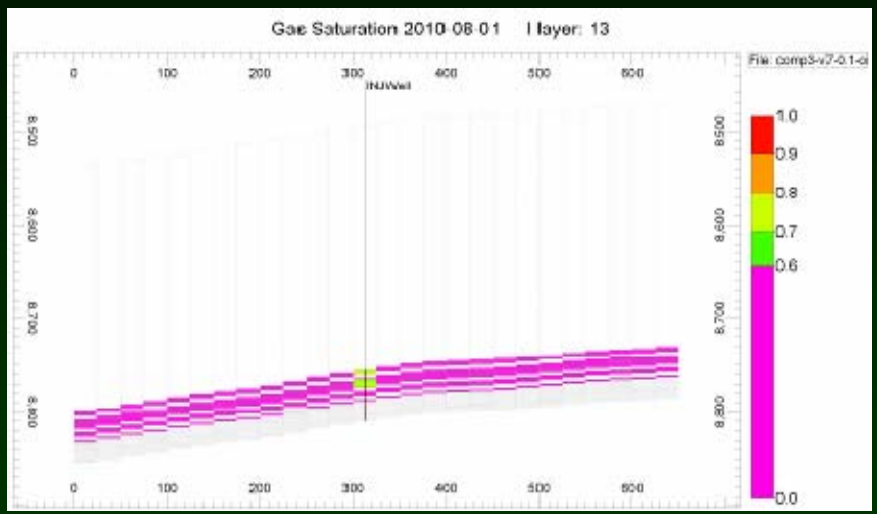
Amoco Pipeline Access to Gillock Field



Role of Oil in CO_2 Distribution





Comparing the migration of a 2 day injection (Huff and puff) in brine bearing to oil bearing formation

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Gillock Field, B7 well, Big Gas sand

Research Elements

- Demonstration in high emissions area with high injectivity
- Use of CO_2 for EOR – economic demonstration
- Assessment of impacts of injection in high water table setting
- Monitoring across a fault and though reservoir to measure CO_2 movement, oil bank formation, pressure evolution, and fluid migration.
- Development of dual use of subsurface for EOR and for disposal

Gulf Coast Carbon Center

Outreach Elements

- GCCC partners activities
- Technology transfer
- Workshops and symposia
- Extensive technical publications and presentations
- Public outreach – media, web, teacher training, public workshops