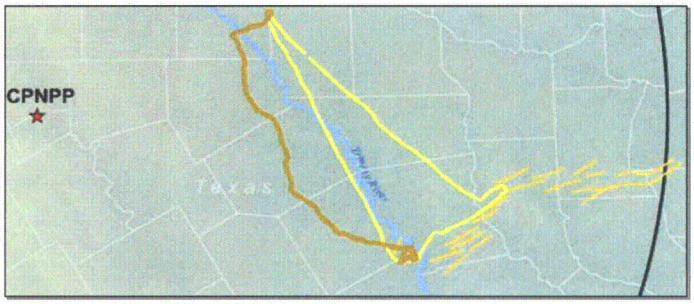
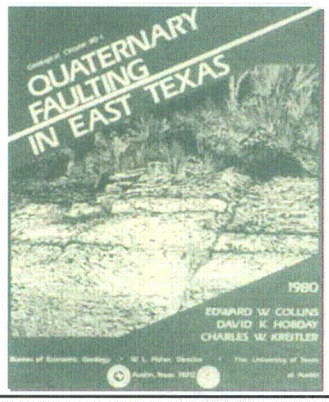
Mt. Enterprise - Elkhart Graben (MEEG)

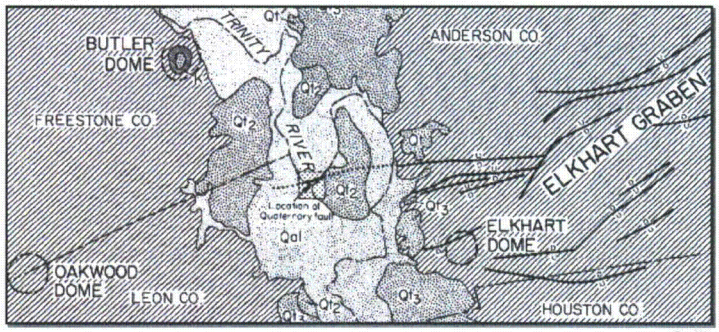
- Discussed in detail in Subsection 2.5.1.1.4.3.4.2
  - Late Jurassic to Early Cretaceous normal fault system
  - Youngest offset units are Eocene in age
  - Faults are rooted in Jurassic Luan salt at maximum depth of 4.5 to 6 km



- Research on MEEG comes from studies predating EPRI-SOG (i.e., pre-1986)
- Dominant opinion is that MEEG is a salt-rooted structure, and any Quaternary deformation is likely related to salt migration (e.g., Ewing, 1991; Ferguson, 1984; Jackson, 1982; Murray, 1964)
- One study with results presented in grey literature suggests there has been Quaternary slip on MEEG faults (Collins et al., 1980)

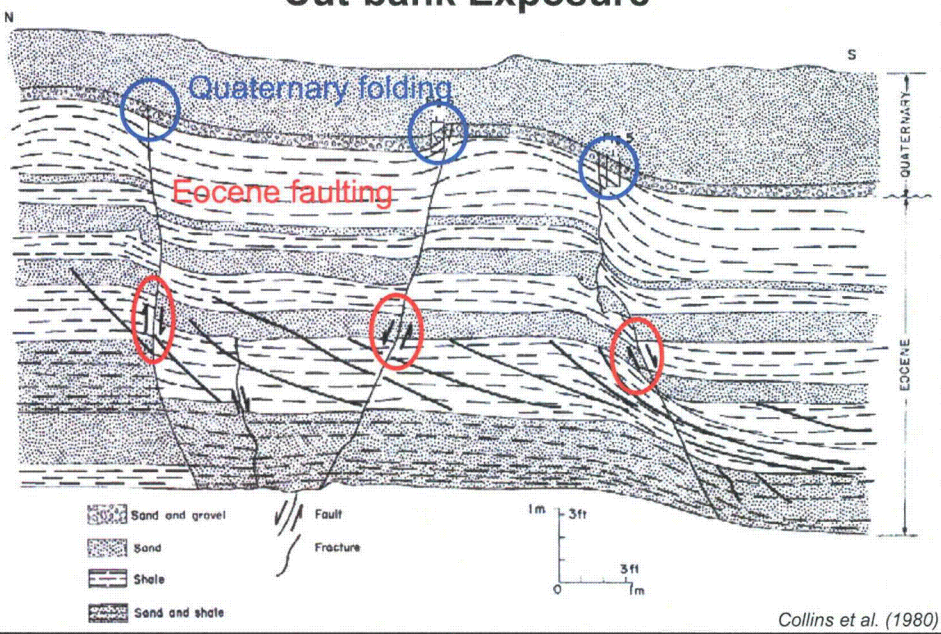


- Collins et al. present three lines of evidence they use to support their hypothesis that MEEG has Quaternary activity
  - Folded Quaternary gravels observed in river cut-bank deposits
  - presumed folded Quaternary gravels in an auger profile
  - leveling data showing down to the south change in surface elevation



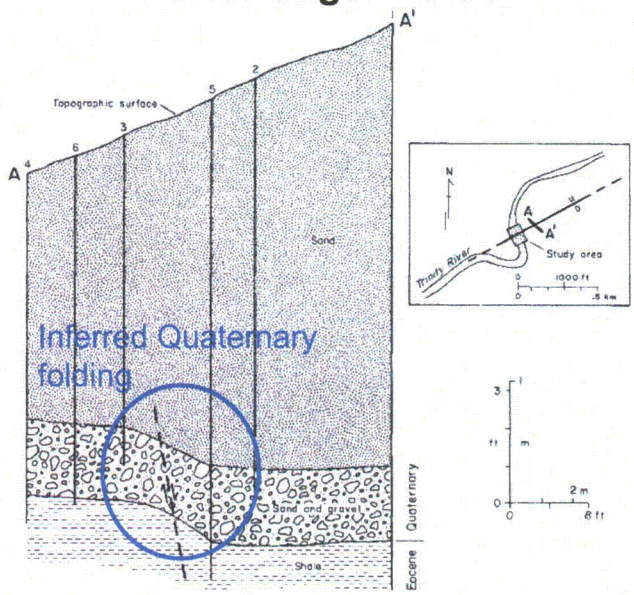
Collins et al. (1980)

Folded Quaternary Deposits: Cut-bank Exposure



Collins et al. (1980)

Folded Quaternary Deposits: Power-auger Holes



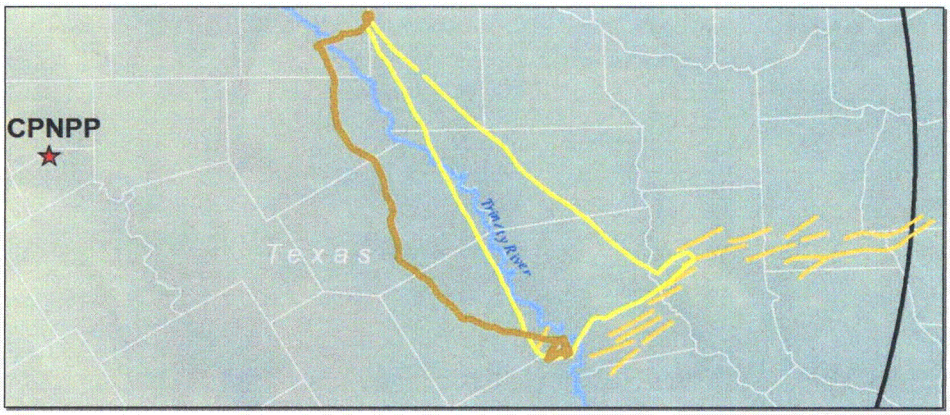
Collins et al. (1980)

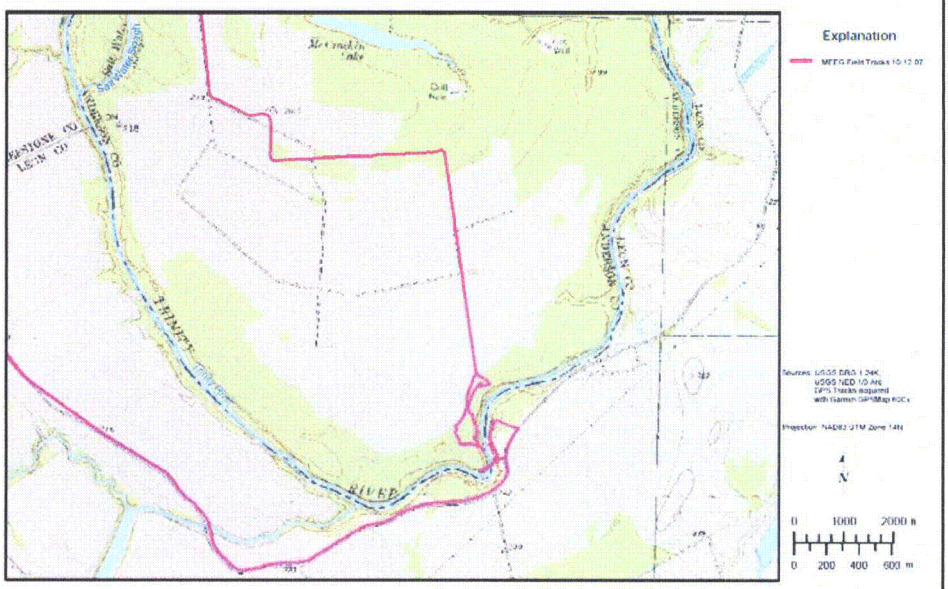
MEEG Capability

- Concluded not a capable fault based on:
  - Shallow, salt driven deformation mechanism
  - No evidence of seismogenic rupture
    - Potentially folded Quaternary deposits show no evidence of scarp formation
    - No observed or reported scarps
  - Potential evidence for slow, aseismic creep
  - Research on MEEG was pre-EPRI-SOG, so no new information to suggest inclusion as a source or a modified evaluation of capability

MEEG Field Reconnaissance

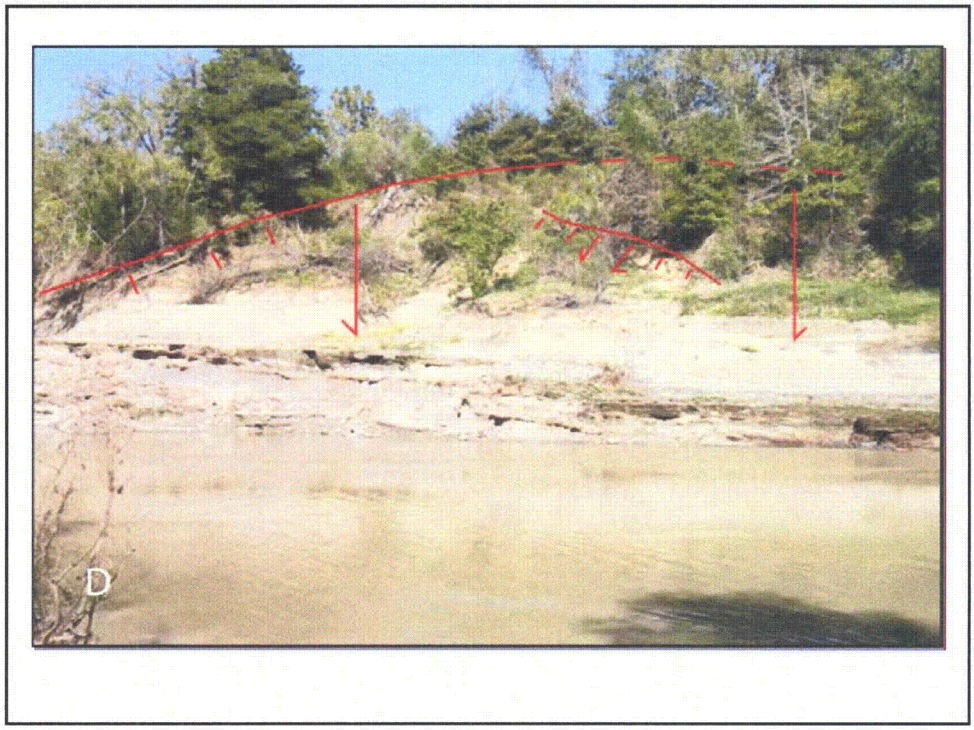
- Despite strong conclusion that MEEG was not capable, performed ground and aerial reconnaissance of Collins et al. field areas

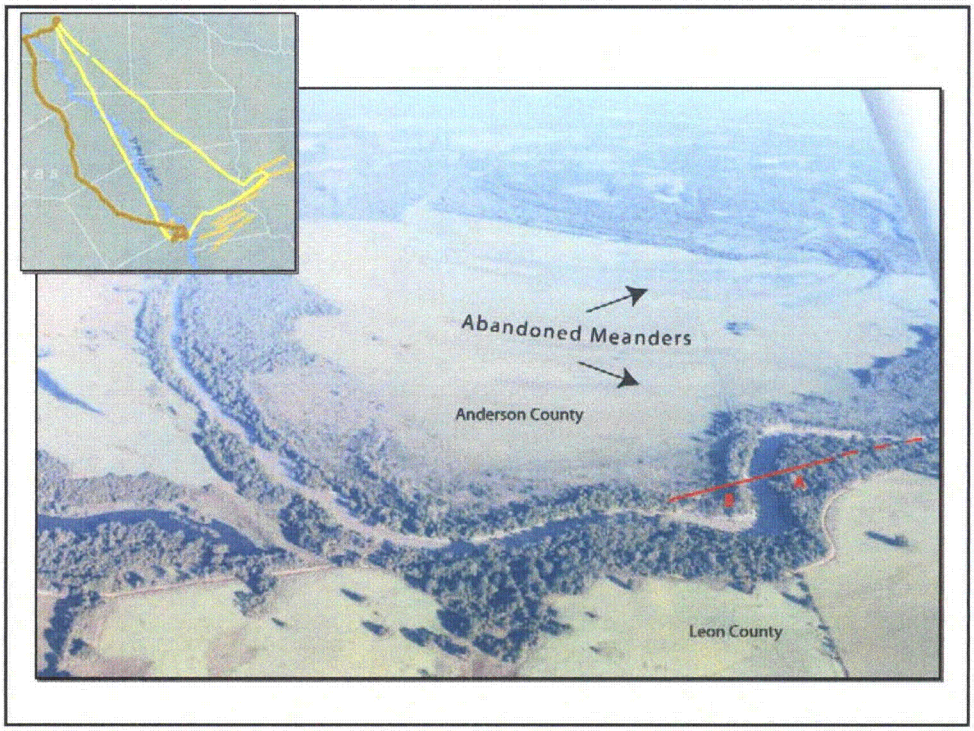





A


C


D

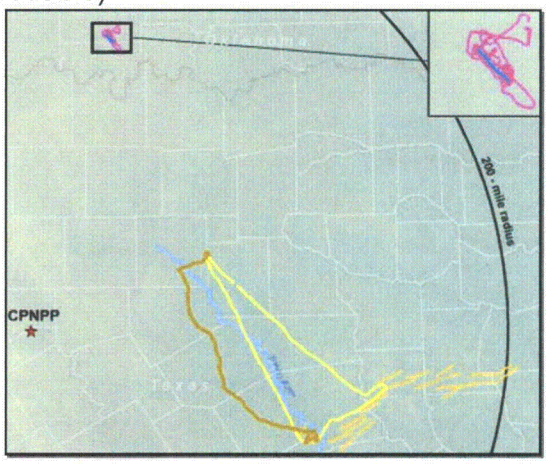

Abandoned Meanders
Anderson County
Leon County

MEEG Field Reconnaissance - Conclusions

- Faulted Eocene rocks and potentially folded Quaternary sediments of Collins et al. (1980) are contained within a large river-bank slump and cannot be used as constraints on faulting
- No evidence of folded Quaternary sediments was observed
- Therefore, no evidence to suggest MEEG is a capable fault

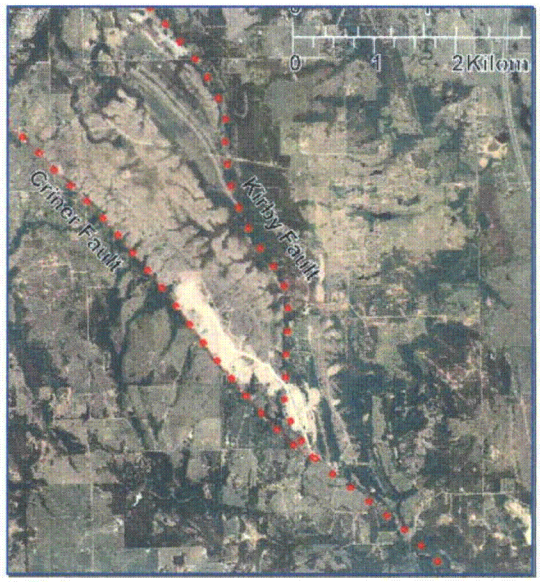
Criner Fault

- Discussed in detail in Subsection 2.5.1.1.4.3.4.2
  - Distinct fault-line scarp caused by differential erosion of the Ordovician limestone of the Criner Hills (resistant) and the Pennsylvanian limestone, sandstone & shale of the Marietta Basin (erodable)



Criner Fault

- Potential for Quaternary deformation noted in unpublished consultant reports by Geomatrix (1990, 1993)
- Primarily based on observation of sheared Pleistocene to alluvium
- Later studies demonstrated shearing was due to landslide (Williamson, 1996; Hanson et al., 1997)

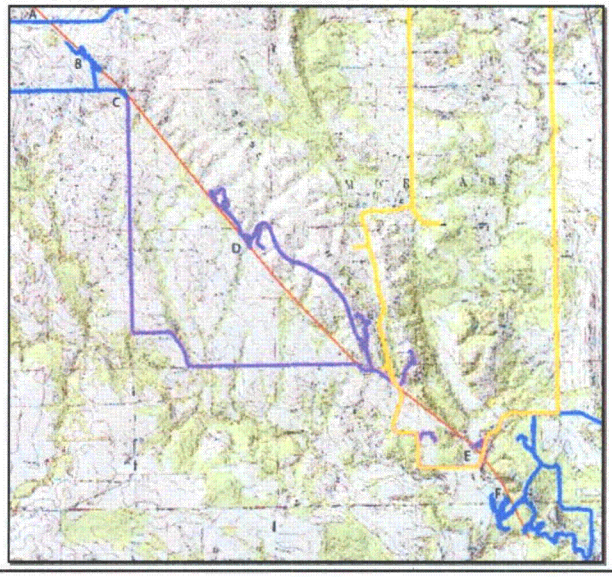


Criner Capability

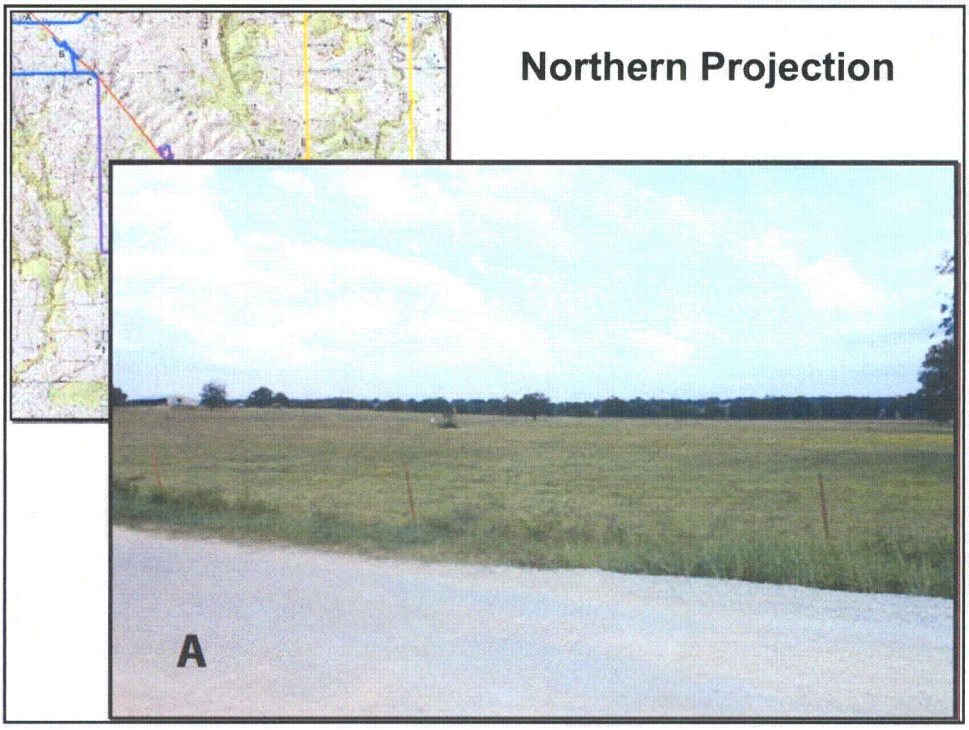
- Concluded not a capable fault based on:
  - No evidence of Quaternary activity
  - Previously hypothesized evidence was weak and has been reinterpreted

Criner Field Reconnaissance

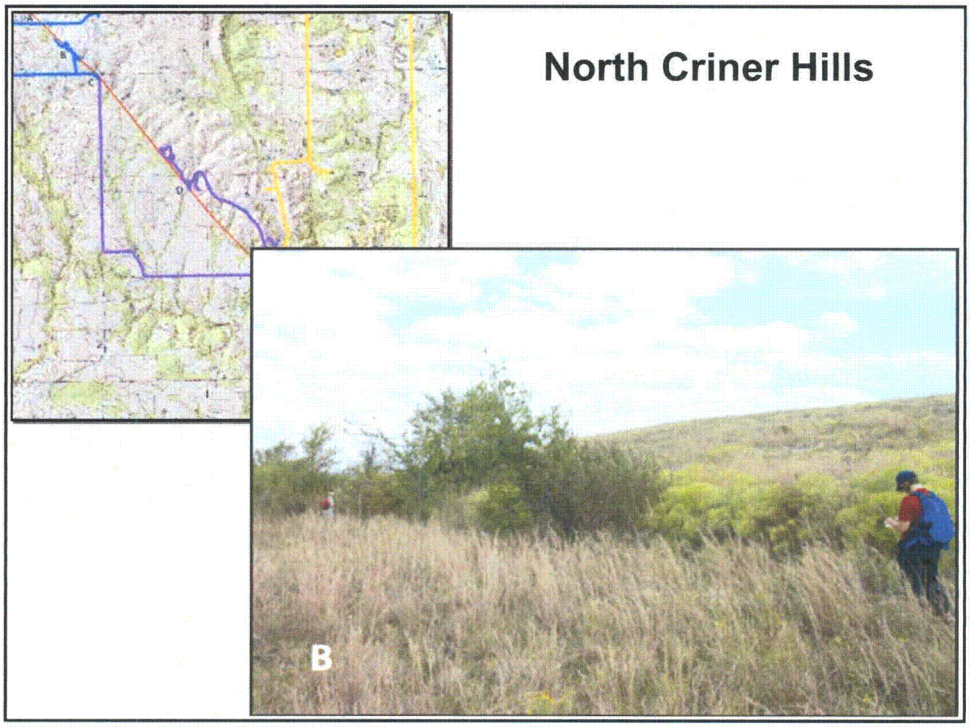
- Despite lack of Quaternary evidence of activity, ground and aerial reconnaissance conducted



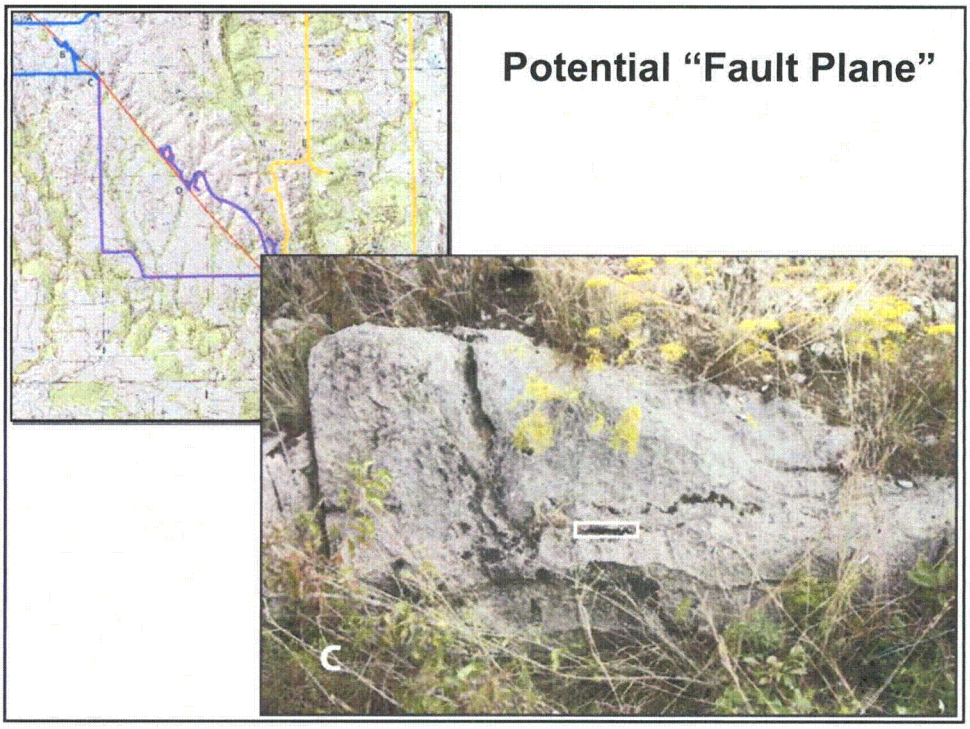
Northern Projection



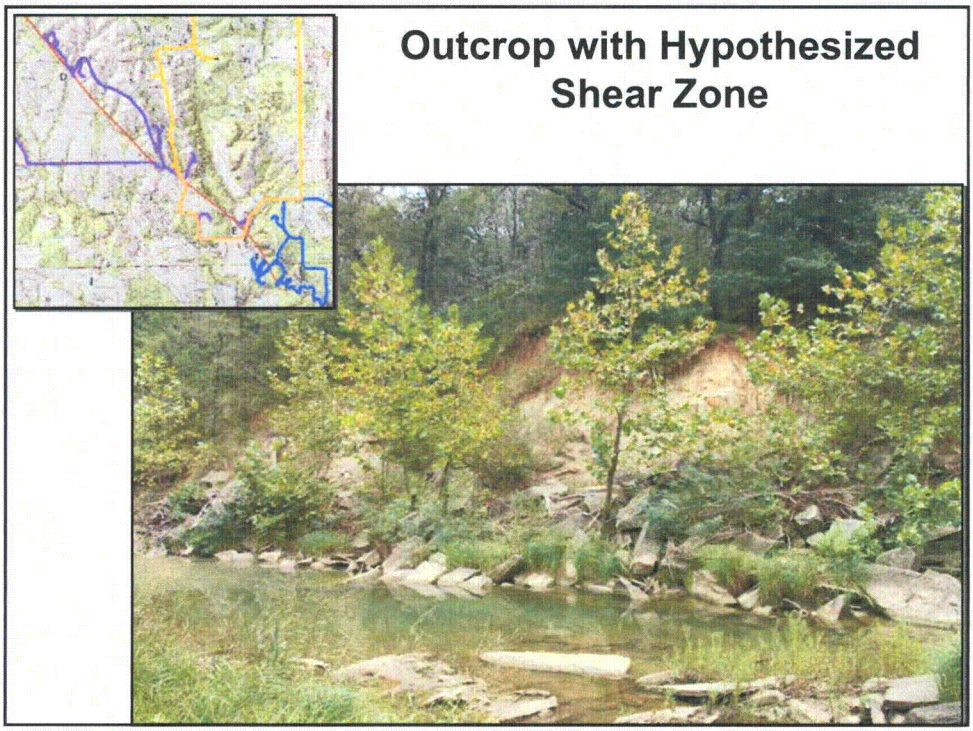
North Criner Hills



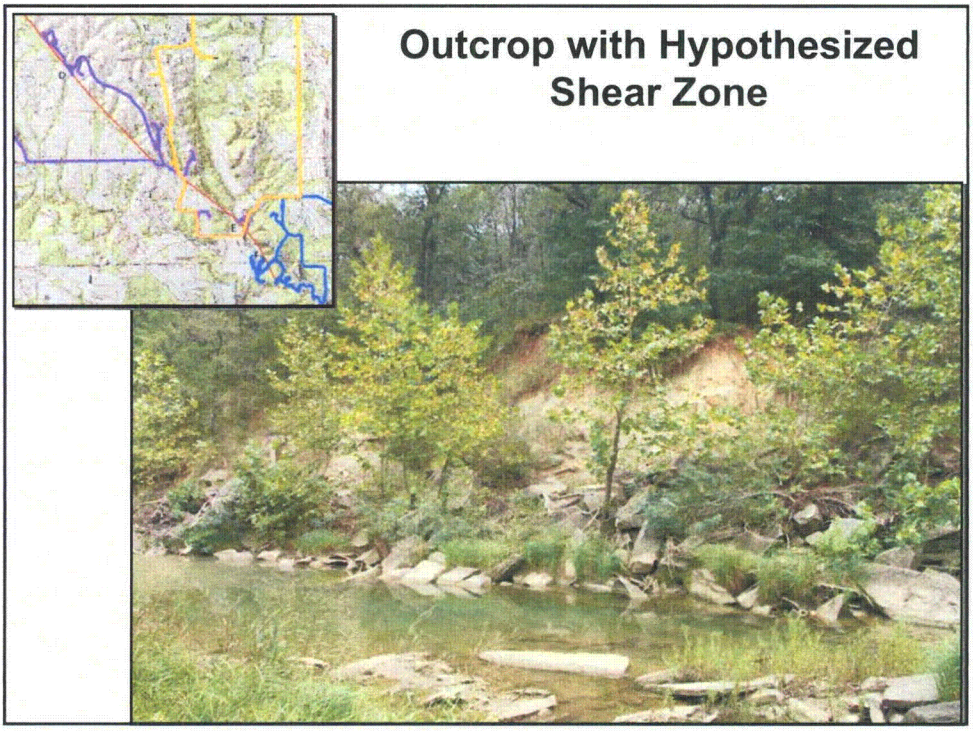
Potential "Fault Plane"



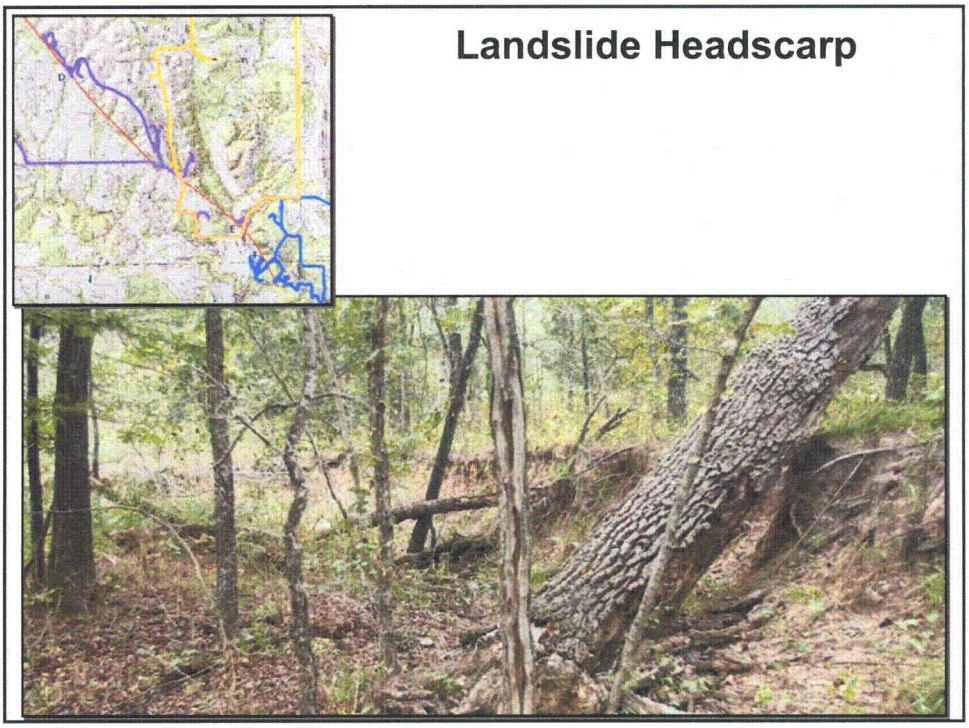
Outcrop with Hypothesized Shear Zone



Outcrop with Hypothesized Shear Zone



Landslide Headscarp



Criner Field Reconnaissance - Conclusions

- Hypothesized Pleistocene shearing is correlated to landslide
- No evidence of Quaternary faulting
- Therefore, no evidence to suggest Criner is a capable fault