CENTRAL UTAH: A NEW OIL AND GAS PROVINCE
By: Floyd Moulton and Mike Pinnell
Presentation Outline

- Regional Setting
- Paleozoic Source Rock Enigmas
- Reservoir Rocks
- Seal: Is the Arapien the One and Only
- Cross Sections
- Timing of Critical Events
- How Many Prospects Are There?
- Where Do We Go From Here?
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Thrust and Fold Belt of Western North America
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Source Rock Enigma 1: Why Is There No Paleozoic Sourcing in the Wyoming Thrust Fields?
Source Rock Enigma 2:
Which Paleozoic Formations are the Real Utah Source Rocks?
We Will Watch Wolverine and the State of Utah Arm Wrestle Over this Important Matter
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Jurassic Reservoir Rock: Navajo Sandstone
Fractured Jurassic Reservoir Rock: Twin Creek Limestone
ARAPIEN SHALE

Covenant Field Discovery and Producing Area for Several Wells

18 Wheeler for Scale

10,000 barrel tanks

WOLVERINE TANK FARM AND OFF-LOADING FACILITY (UNDER CONSTRUCTION)

Jurassic Seal: Arapien Shale, Siltstone and Evaporites
<table>
<thead>
<tr>
<th>Formation/Member</th>
<th>Thickness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anakeeh Formation</td>
<td>900 feet thick</td>
</tr>
<tr>
<td>Woodside Shale</td>
<td>1,000 feet thick</td>
</tr>
<tr>
<td>Manning Canyon Shale</td>
<td>1,000 feet thick</td>
</tr>
</tbody>
</table>

**SEALING ROCKS**

Hintze, 1993, BYU Studies, Special Publication 7
<table>
<thead>
<tr>
<th>STRATIGRAPHIC SERIES</th>
<th>DEPTH RANGES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cretaceous</td>
<td>300’-600’ Twin Creek Limestone</td>
</tr>
<tr>
<td></td>
<td>1,200’-1,500’ Navajo Sandstone</td>
</tr>
<tr>
<td></td>
<td>100’-150’ Thaynes Limestone</td>
</tr>
<tr>
<td>Jurassic</td>
<td>1,200’ Phosphoria equivalent carbonates, 800’ Diamond Creek Sandstone</td>
</tr>
<tr>
<td>Triassic</td>
<td>3,000’ Mississippian and Devonian carbonates (like Canadian Thrust Salient production)</td>
</tr>
<tr>
<td>Permian</td>
<td></td>
</tr>
<tr>
<td>Pennsylvanian</td>
<td></td>
</tr>
<tr>
<td>Mississippian</td>
<td></td>
</tr>
<tr>
<td>*up to 7,000’ of reservoir rock*</td>
<td></td>
</tr>
</tbody>
</table>
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Diagrammatic Cross-Section of the Hingeline and Rift Valley of Central Utah
Modified after Alan R. Hansen, RMAG Symposium, 1976
Wolverine Discovery
Strawberry Reservoir
Uinta Mountains
Thrust Belt Production, Southern Portion, Wyoming Salient
Salt Lake City
Strawberry Reservoir
Wolverine Discovery
150 Miles of Prospects (Most Active Area to Date)

BASE MAP USED IN THE REST OF THE PRESENTATION
Emery High:
Pennsylvanian Uplift
(Permian on Mississippian)
Gunnison Arch
Gunnison Arch
Sanpete-Sevier Rift

Ancient Ephraim Fault
Gunnison Arch
Sanpete-Sevier Rift
Gunnison Thrust
(trace of the leading edge of Navajo #2, 2,000 feet below production at Covenant Field)
Gunnison Arch
Sanpete-Sevier Rift
Gunnison Thrust
Back Limb Thrust
(Covenant Field Navajo #1 producing zone, 2,000 feet above Navajo #2)
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Enlarged Cross Section
COVENANT FIELD
SEVIER CO., UTAH

Geology by Floyd Moulton
July, 2005
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Scale Comparison to Wyoming Thrust Belt Salient Production

Major Fields in Wyoming Thrust Belt Salient
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Some analysts say the Rocky Mountains already have been “picked clean” for major oil and gas deposits. Finding oil in the Utah Thrust Belt will be like finding a wallet on a busy subway car after the cleaners move through it– “possible, but unlikely”

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Deseret Morning News, September 22, 2005
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It is time to prove the “experts” are wrong!
THANKS TO: AAPG, INTERNATIONAL PETROLEUM, LLC AND PIONEER OIL AND GAS