**ABSTRACT**

Gothic Aneth field. Utah’s largest oil producer, was discovered in 1957 and has produced over 451 million barrels (MMBbls) of oil. Located in the Paradox Basin of southeastern Utah, Greater Aneth is a stratigraphic trap, produced from the Pennsylvanian Paradox Formation. The field is part of the Greater Aneth Project, a Phase I-B field demonstration project and part of the Oilfield Development Project Phase I of the U.S. Department of Energy’s Oilfield Development Project. The Greater Aneth Project is a field demonstration project that consists of a 568-acre disposal area, 15,266 BCF capacity, and 20 MMBbls storage capacity. The project is designed to test the interaction between CO2 and the seal at its contact with the reservoir and to test the geologic, petrophysical, petrological, and geochemical factors that affect CO2 well completion and storage efficiency. The project is designed to test the interaction between CO2 and the seal at its contact with the reservoir and to test the geologic, petrophysical, petrological, and geochemical factors that affect CO2 well completion and storage efficiency.

**ACKNOWLEDGMENTS**

This ongoing research is supported by the science programs of the U.S. Department of Energy and the U.S. Department of Energy’s Office of Science, Energy Efficiency and Renewable Energy, Office of Fossil Energy, and Office of Electricity Delivery and Energy Reliability. The project is also supported by the U.S. Department of Energy’s Office of Science, Energy Efficiency and Renewable Energy, Office of Fossil Energy, and Office of Electricity Delivery and Energy Reliability. The project is also supported by the U.S. Department of Energy’s Office of Science, Energy Efficiency and Renewable Energy, Office of Fossil Energy, and Office of Electricity Delivery and Energy Reliability.
**GEOCHEMISTRY**

<table>
<thead>
<tr>
<th>Depth</th>
<th>Tmax</th>
<th>S1</th>
<th>S2</th>
<th>S3</th>
<th>Tmax (top of S2 peak)</th>
<th>S1</th>
<th>S2</th>
<th>S3</th>
<th>Tmax (top of S2 peak)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5379.40</td>
<td>2.570</td>
<td>2.89</td>
<td>2.09</td>
<td>6.45</td>
<td>0.73</td>
<td>445</td>
<td>224</td>
<td>25</td>
<td>72</td>
</tr>
<tr>
<td>5390.80</td>
<td>2.522</td>
<td>4.42</td>
<td>2.39</td>
<td>9.46</td>
<td>0.76</td>
<td>449</td>
<td>214</td>
<td>17</td>
<td>54</td>
</tr>
</tbody>
</table>

Tmax is an indication of the stage of maturation of the organic matter.

<table>
<thead>
<tr>
<th>Sample Weight</th>
<th>Mesh</th>
<th>PL</th>
<th>VL</th>
<th>PETR OGRAPHY</th>
</tr>
</thead>
<tbody>
<tr>
<td>224.61 g</td>
<td>287</td>
<td>1.98</td>
<td>32.8</td>
<td>1.02</td>
</tr>
<tr>
<td>201</td>
<td>1.39</td>
<td>25.5</td>
<td>0.80</td>
<td></td>
</tr>
<tr>
<td>124</td>
<td>0.85</td>
<td>17.7</td>
<td>0.55</td>
<td></td>
</tr>
</tbody>
</table>

Pressure Gas Content (Dry Basis)

- **Depth:** 5470.8 ft
- **Depth:** 5471.9 ft

**ANALYSIS OF NATURAL FRACTURES**

Summary of hand sample descriptions of natural fractures in core:

- Vertical fractures: These include fractures that are perpendicular to the bedding surface.
- Horizontal fractures: These include fractures that are parallel to the bedding surface.
- Cross-cutting fractures: These include fractures that cut across other fractures.

**METHOD**

- **Depth:** 5379.4 ft
- **Depth:** 5379.5 ft

**PETROGRAPHY**

- **Depth:** 5379.4 ft
- **Depth:** 5379.5 ft

**VOLUME FRACTION**

- **Depth:** 5379.4 ft
- **Depth:** 5379.5 ft

**E&M**

- **Depth:** 5379.4 ft
- **Depth:** 5379.5 ft
**Petrophysical Properties**

<table>
<thead>
<tr>
<th>Bulk Density</th>
<th>Pore Volume</th>
<th>Grain Density</th>
<th>Density (g/cc)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.572</td>
<td>2.615</td>
<td>2.649</td>
<td>3.51</td>
</tr>
<tr>
<td>2.561</td>
<td>2.597</td>
<td>2.621</td>
<td>2.72</td>
</tr>
<tr>
<td>2.570</td>
<td>2.623</td>
<td>2.648</td>
<td>3.35</td>
</tr>
</tbody>
</table>

**Porosity versus depth.**

**Saturation versus injection pressure.**

**Conclusions**

- The Gothic shale is an effective seal where the Entrada Creek outcrop zone marks the Paradox basin/Paradox Formation. South Desert, Desert Well, Utah, Four Corners, Geological Society Symposium, 1992, p. 65-79.
- The overall low saturation in the Entrada Creek reservoir is a relief of the Paradox basin. The Gothic shale is a relatively impermeable seal that is effective in preventing fluid flow. The seal capacity is very high, particularly at the depth of 5.4 km. The Entrada Creek reservoir contains a high porosity and a low permeability, which is typical of shale reservoirs.
- The Gothic shale has a high capillary pressure and is a good candidate for gas storage. The capillary pressure is a function of porosity and permeability, and the Gothic shale has a high capillary pressure, which is indicative of a good seal.
- The Gothic shale has a high interfacial tension, which is a function of the chemical composition of the brine and CO2. The interfacial tension is a critical parameter in determining the capillary pressure.

**Equations for Converting Mercury Injection Permeability and Pore Aperture Distributions Analysis.**

- Axial stress difference versus volumetric strain, measured during unconfined compression testing. The figure describes the evolution of the strains under compression loading.
- Averaged radial strain versus axial strain, measured during unconfined compression testing. The figure describes the evolution of the strains under compression loading.
- Averaged values are shown by the solid gray line. The figure shows the evolution of the strains under compression loading.
- Young’s Modulus – Transverse (psi)
- Poisson’s Ratio – Horizontal dynamic Poisson’s ratio as a function of horizontal static Young’s modulus. The figure describes the evolution of the strains under compression loading.
- Young’s Modulus – Vertical dynamic Young’s modulus as a function of vertical static Young’s modulus. The figure describes the evolution of the strains under compression loading.

**Horizontal and vertical properties for a salt solution are as”

*Dispense a solution of sodium chloride into a beaker and mix it thoroughly. The solution should be a uniform color and have a specific gravity of 1.2. Measure the density of the solution using a hydrometer. The solution should have a density of 1.2. Measure the density of the solution using a hydrometer. The solution should have a density of 1.2.

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