**POTENTIAL OIL-PRONE AREAS IN THE CANE CREEK SHALE PLAY, PARADOX BASIN, UTAH, U.S.A., IDENTIFIED BY EPFLUORESCENCE TECHNIQUES**

**Summary**

Fluorescence (EPF) microscopy has been extensively utilized in oil exploration, and it is essential for identifying the oil-prone areas, including the recognition of development zones. The shale plays of the Paradox Basin, southern Utah, are well-known for their potential oil-prone characteristics. The Cane Creek shale, in particular, has been recognized as a promising target for hydrocarbon accumulation. This study employed EPF microscopy to evaluate the potential oil-prone areas within the Cane Creek shale zone in the Paradox Basin, Utah.

**Methods**

Fluorescence microscopy was performed on core chips and cuttings from Cane Creek wells to identify areas with potential oil-prone characteristics. The samples were illuminated with ultraviolet light, and the fluorescence intensity was measured using a dual-wavelength fluorescence spectrophotometer. The results were compared with the known oil-prone areas identified by conventional methods, such as geologic mapping and seismic data analysis.

**Results**

The EPF microscopy studies revealed several potential oil-prone areas within the Cane Creek shale zone. These areas are characterized by high fluorescence intensity, indicating the presence of oil-prone rocks. The results are presented in a map form, showing the distribution of potential oil-prone areas across the study area.

**Conclusions**

Fluorescence microscopy is a valuable tool for identifying potential oil-prone areas in the Cane Creek shale play. The results from this study can be used to guide future exploratory drilling and enhance the efficiency of oil extraction in the Paradox Basin, Utah.

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**Table: Characteristics of Potential Oil-Prone Areas**

<table>
<thead>
<tr>
<th>Area Name</th>
<th>Location</th>
<th>Fluorescence Intensity</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cane Creek Unit #26-3</td>
<td>Map #10; NESW sec. 18, T. 29S, R. 21E, San Juan County</td>
<td>2.4</td>
<td>Mottled Anhydrite with possible organic or microbial in origin.</td>
</tr>
<tr>
<td>Horsehead Unit #1</td>
<td>Map #21; NWSW sec. 18, T. 29S, R. 21E, San Juan County</td>
<td>2.1</td>
<td>Very bright and continuous fluorescence (rated 3.0 – 3.5).</td>
</tr>
<tr>
<td>USA Lockhart 1</td>
<td>Map #22; NWSW sec. 20, T. 20S, R. 20E, San Juan County</td>
<td>2.2</td>
<td>Adequate porosity and permeability/fracturing.</td>
</tr>
<tr>
<td>Hart Point Fed 1</td>
<td>Map #23; NWSW sec. 21, T. 20S, R. 20E, San Juan County</td>
<td>2.6</td>
<td>Indicative of oil in the system, but probably not adequate porosity and permeability/fracturing.</td>
</tr>
</tbody>
</table>

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**Figure: Fluorescence Imaging**

The figure illustrates the fluorescence imaging of core chips from the potential oil-prone areas. The images show the distribution of fluorescence under incident light, indicating the presence of oil-prone rocks within the Cane Creek shale zone.

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**References**

Hite, J. D., and Cater, C. J. (1972). **Modified from Hite, 1960; Paradox Basin of Utah.** Note the position of the Pennsylvanian Cane Creek section determind from subsurface sections from the project area stored at the Utah Core Research Center and are available to the public.) Thus, sample preparation is inexpensive and rapid.
**Majority of production from Big Flat area**

- Shallow near western edge/shelf of basin
- Deeper in northern part of study area

Cane Creek Structure

- Average thickness = 100 ft

**Cane Creek Penetration**

- Very prospective
- High risk areas that have low ratings (in orange) within Green River sections appear to exist in large
- The anomalous trend on this map displays lower average ratings for
- The lobes of high average ratings that occur both northwest and southeast of the largest Cane Creek field (Big Flat) are not
- The anomalies tend on this map displays lower average ratings -
- Phenomenon of high average thickness highest maximum ratings.
**TYPICAL GAMMA RAY-SONIC LOGS**

**MAP OF THE HIGHEST MAXIMUM EPIFOURESCENCE BASED ON VISUAL RATING OF CANE CREEK WELL CUTTINGS AND CORE CHIPS, INTERVAL B**

- General Characteristics:
  - Lower end.
  - Skin log with abundant endoluteal and matrix shale.
  - High-angle formation.
  - Clay fraction is in moderate.

**MAP OF THE HIGHEST AVERAGE EPIFOURESCENCE BASED ON VISUAL RATING OF CANE CREEK WELL CUTTINGS AND CORE CHIPS, INTERVAL B**

- General Characteristics:
  - Lower end.
  - Skin log with abundant endoluteal and matrix shale.
  - High-angle formation.
  - Clay fraction is in moderate.

**THICKNESS OF THE CANE CREEK SHALE ZONE, INTERVAL B**

- Thickness of the Cane Creek Shale Zone is 36 ft on average.

**ACKNOWLEDGMENTS**

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**REFERENCES**

- Utah Division of Oil, Gas, and Mining, 2014, Oil and gas summary production report by field, December 2014: Online, in the UGS website.