The Tyler Formation is a key target in North Dakota due to its potential for hydrocarbon plays. It is composed of source rocks that have generated a significant amount of petroleum. The formation can be divided into two main source rock intervals based on organic content and thermal maturation. The organic-rich intervals are primarily located in the western part of the state, where they are thought to be thermally mature and capable of generating hydrocarbons.

**Source Rock Intervals within the Tyler Formation, North Dakota**

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**DISCUSSION**

The Tyler Formation is a complex system that has been influenced by various geological processes. The formation is composed of two main source rock intervals, each with distinct characteristics. The upper Tyler source rock interval is characterized by high organic content and thermal maturity, indicating that it has reached a level of intense oil generation. The lower Tyler source rock interval, on the other hand, is less mature and less productive.

**Organic Matter Content**

The Tyler Formation contains a significant amount of organic matter, which is critical for generating hydrocarbons. The organic matter content is highest in the upper Tyler source rock interval, with values ranging from 8 to 19% TOC. In contrast, the lower Tyler source rock interval has lower organic content, ranging from 3 to 6% TOC. This difference in organic content is likely due to variations in kerogen type and maturity within the source rocks.

**Thermal Maturation**

The thermal maturation of the Tyler Formation is also an important factor in determining its potential for generating hydrocarbons. The Time-Temperature Index (TTI) is a useful tool for assessing thermal maturation. The TTI values for the Tyler Formation range from 43° to 46° C, indicating that the formation is thermally mature and capable of generating oil.

**Field Data**

In the field, the Tyler Formation is marked by gas kicks, which are encountered while drilling. These gas kicks are typically associated with organic-rich intervals. The gas kicks are thought to be a result of intense hydrocarbon generation and are a key indicator of the formation's potential for generating hydrocarbons.

**Conclusion**

The Tyler Formation is a promising target for hydrocarbon exploration in North Dakota. The formation contains two main source rock intervals with distinct characteristics, each with its own potential for generating hydrocarbons. Further research is needed to fully understand the formation's potential and to develop effective exploration strategies.