K₂O Grades of the Esterhazy Member of the Prairie Formation
Mohall 100K Sheet, North Dakota

2020

This series of maps of the Mohall 100K Sheet was based on public data from 97 wells gathered by the North Dakota Industrial Commission – Department of Mineral Resources, Oil & Gas Division. The Esterhazy member was identified on the geological logs of 88 wells. Isochores were generated via PETRA version 3.3.2.1 geological software. The contour lines were computer generated based on well-control data only, with minimal adjustments made by the author. Areas with a geological anomaly may not be accurately portrayed. The potash member thickness for each well, and the isopach contours generated from them, were modified from Kruger (2014).

All calculations were based on gamma-ray log measurements recorded in API units taken at or near the bottom of the potash-containing portion of the log. Corrections for borehole size and drilling mud weight as well as removal of the baseline gamma-ray signal were made (Evan, 2014) (Evan & Anderson, 1996). The corrected gamma-ray measurements were converted into apparent potassium oxide (K₂O) concentrations and potash member thicknesses were obtained using the grade-thickness method described in Kusama (2001), where best thickness is equal to the distance between the intersections at which the gamma-ray response declines to one-half its maximum value.

When a potash member displayed multiple gamma-ray log peaks separated by troughs representing salt or isolated such as clay or siltstone, thin potash intervals at the upper or lower boundaries of the member were not included in thickness or average-potash-grade calculations. If the corrected gamma-ray measurements were less than 600 API or separated by more than four feet from main body of the potash member, this occurred most frequently in depths of the White Bear Member, which may appear as one or two potash-rich beds underlying a thin potash-containing zone separated by an interval of halite.

The volume of potash from the Esterhazy Member as represented on this sheet is approximately 144,900 acre feet.

Thickness (ft)

Symbols

- Well Control

* **±** ± log (API / Potash %)

Other Features

- 1 = Federal Highway
- 1.5 = State Highways

References:


Donnybrook (7.5/4.0)

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