

Prairie Formation Salt Isopach

Ned W. Kruger

2019

General Information on the Prairie Formation

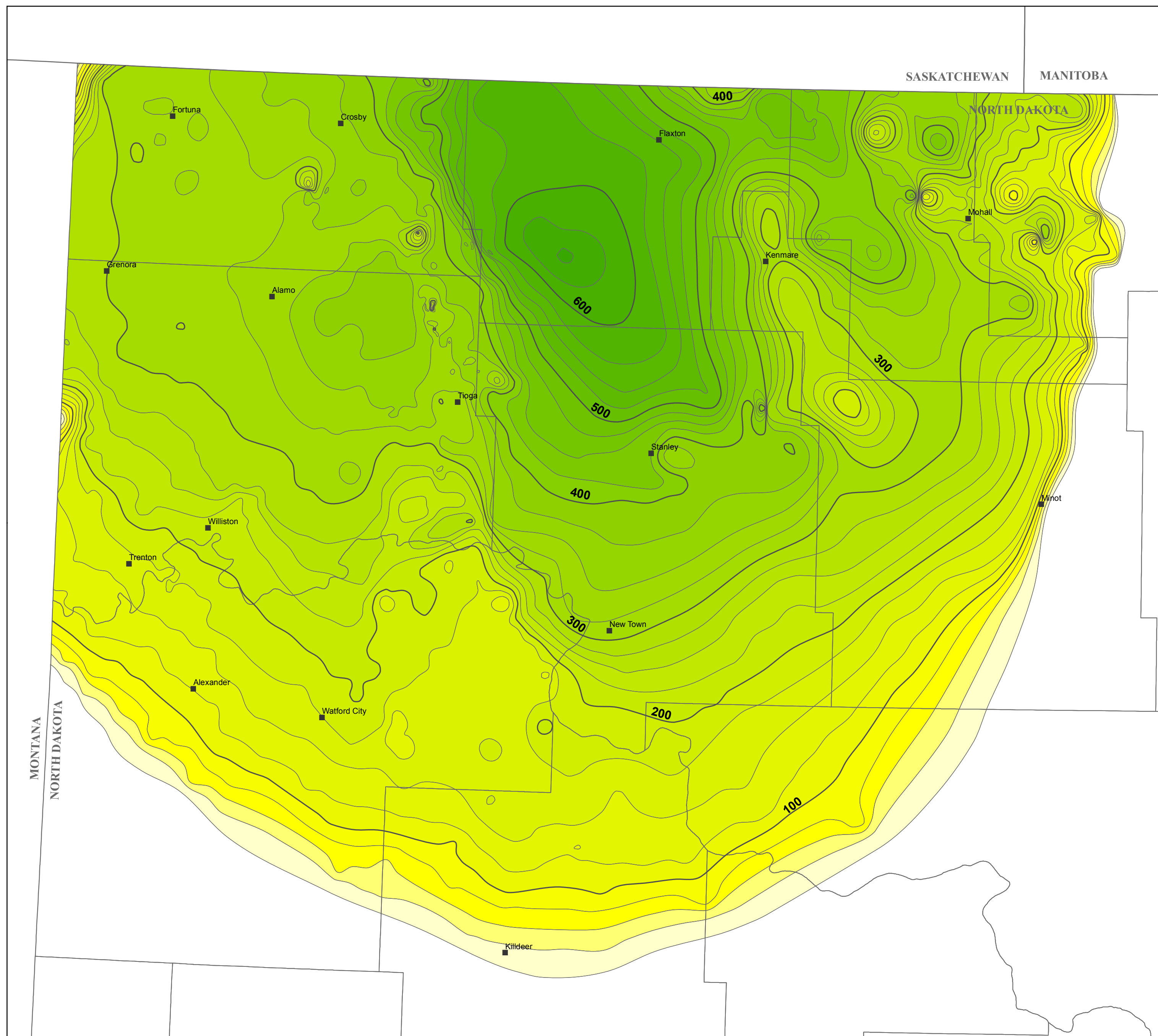
The Prairie Formation consists of a thick sequence of evaporates of mid-Devonian age. At the time of deposition, open ocean water, at what is now the southern Northwest Territories of Canada, flowed through the interior of Canada via a corridor referred to as the Elk Point Basin. Water become increasing concentrated with solutes as reefs restricted inflow from the open sea and as circulation was impeded by additional reefs forming on structural divides within the basin (Holter, 1969). The resultant brines deposited horizontally bedded salts over large areas including parts of Saskatchewan, southwestern Manitoba, northwestern North Dakota, and northeastern Montana. The deposition followed a typical progression of gypsum or anhydrite, followed by halite, sylvite, and carnallite. Alternating beds of halite, sylvite, and carnallite occurred when the introduction of fresh water into the system reversed the depositional sequence (Anderson and Swinehart, 1979; Kruger, 2014). The isopach contours of this sheet are based upon log interpretations of the tops and bottoms of the main body of salt, excluding the basal clay or anhydrite layer where it is observed, from 895 wells.

Thickness (in feet)

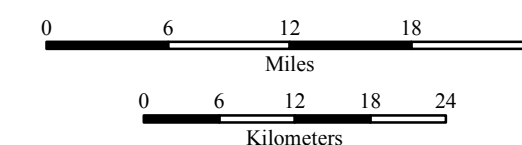
0-25	351-375
26-50	376-400
51-75	401-425
76-100	426-450
101-125	451-475
126-150	476-500
151-175	501-525
176-200	526-550
201-225	551-575
226-250	576-600
251-275	601-625
276-300	626-650
301-325	651-675
326-350	

Other Feature

■ City



Scale 1:600,000



North American Datum 1983 Lambert Conformal Conic

References:

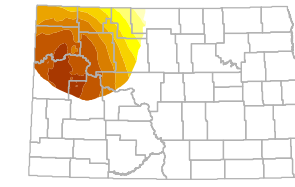
Anderson, S.B. and Swinehart, R.P., 1979, Potash Salts in the Williston Basin: Economic Geology, v. 74, no. 2, p. 358-376.

Holter, M.E., 1969, The Middle Devonian Prairie Evaporate of Saskatchewan: Saskatchewan Department of Mineral Resources, Rep. 123, 134p.

Kruger, N.W., 2014, The Potash Members of the Prairie Formation in North Dakota: North Dakota Geological Survey, Report of Investigation no. 113, 39p



Measured Depths to the Prairie Formation Salt

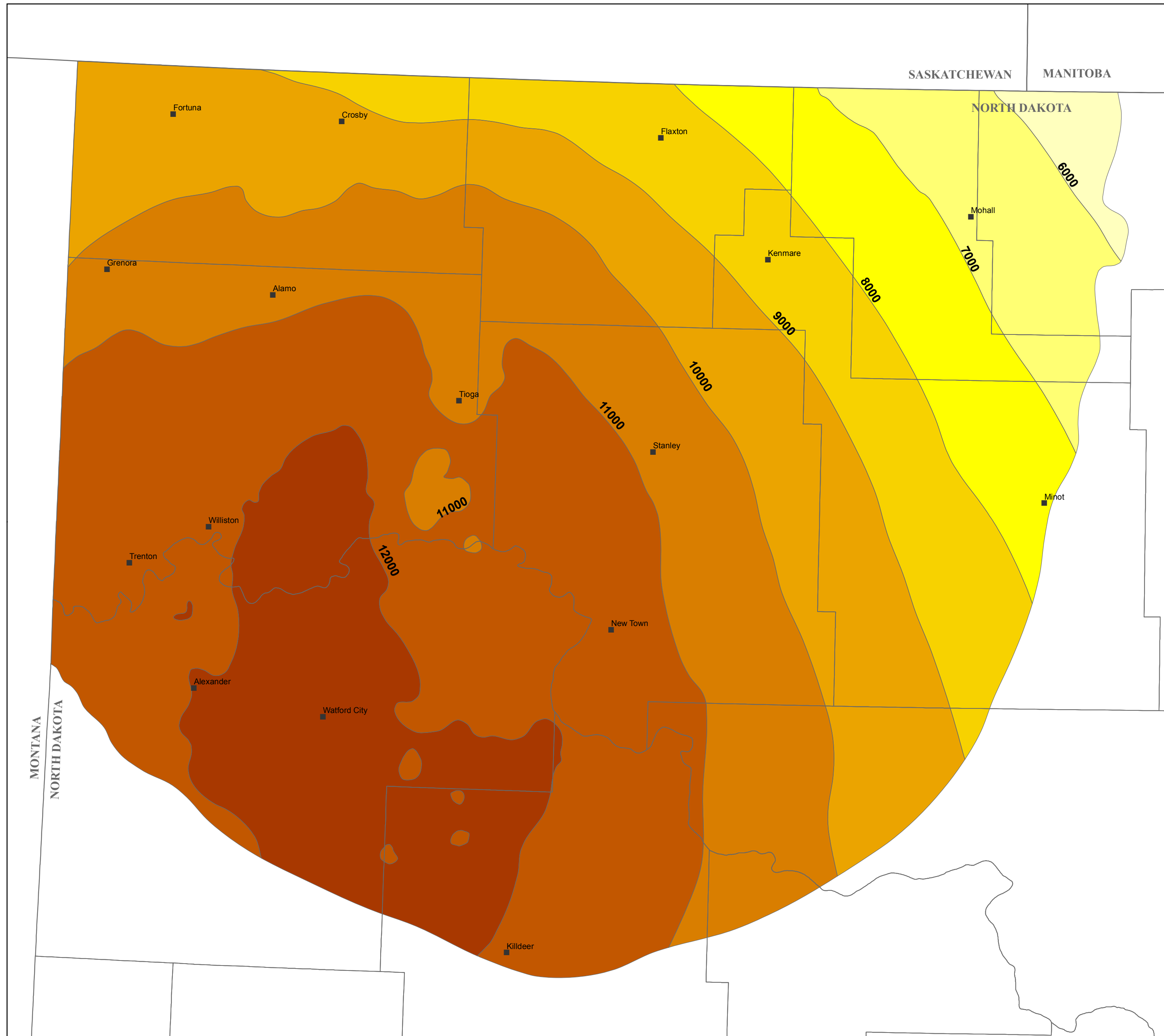


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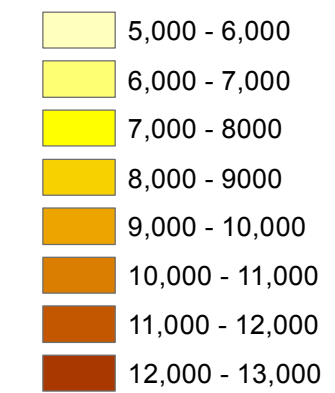
2019

General Information on the Prairie Formation

The Prairie Formation is the thickest salt layer in North Dakota. It is subdivided into seven members including a basal anhydrite (the Ratner) and six potash-containing salts (Esterhazy, White Bear, Belle Plaine, Patience Lake, Mountrail, and White Lake) separated by halite beds (Anderson and Swineheart, 1979; LeFever and LeFever, 2005; Kruger, 2014). The Prairie Formation is capped by the "Second Red Bed", a red to green dolomite or calcareous shale. The depths presented on this map are to the top of the Prairie salt below the Second Red Bed. Tops were picked by the interpretation of the logs from 895 wells. Measured depths ranged from 5,602 feet below kelly bushing in northern Bottineau County to 12,563 feet below kelly bushing in northwestern Dunn County.



Depths (in feet)

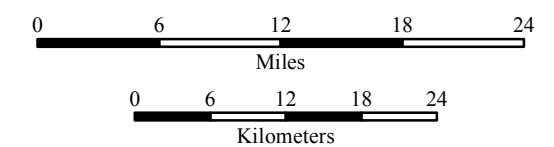


Other Feature

■ City



Scale 1:600,000



North American Datum 1983 Lambert Conformal Conic

References:

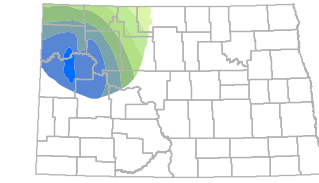
Anderson, S.B. and Swinehart, R.P., 1979, Potash Salts in the Williston Basin: Economic Geology, v. 74, no. 2, p. 358-376.

LeFever, J.A., and LeFever, R.D., 2005, Salts in the Williston Basin, North Dakota: North Dakota Geological Survey, Report of Investigation no. 103, 41p.

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Mean Sea Level Elevation of the Prairie Formation Salt

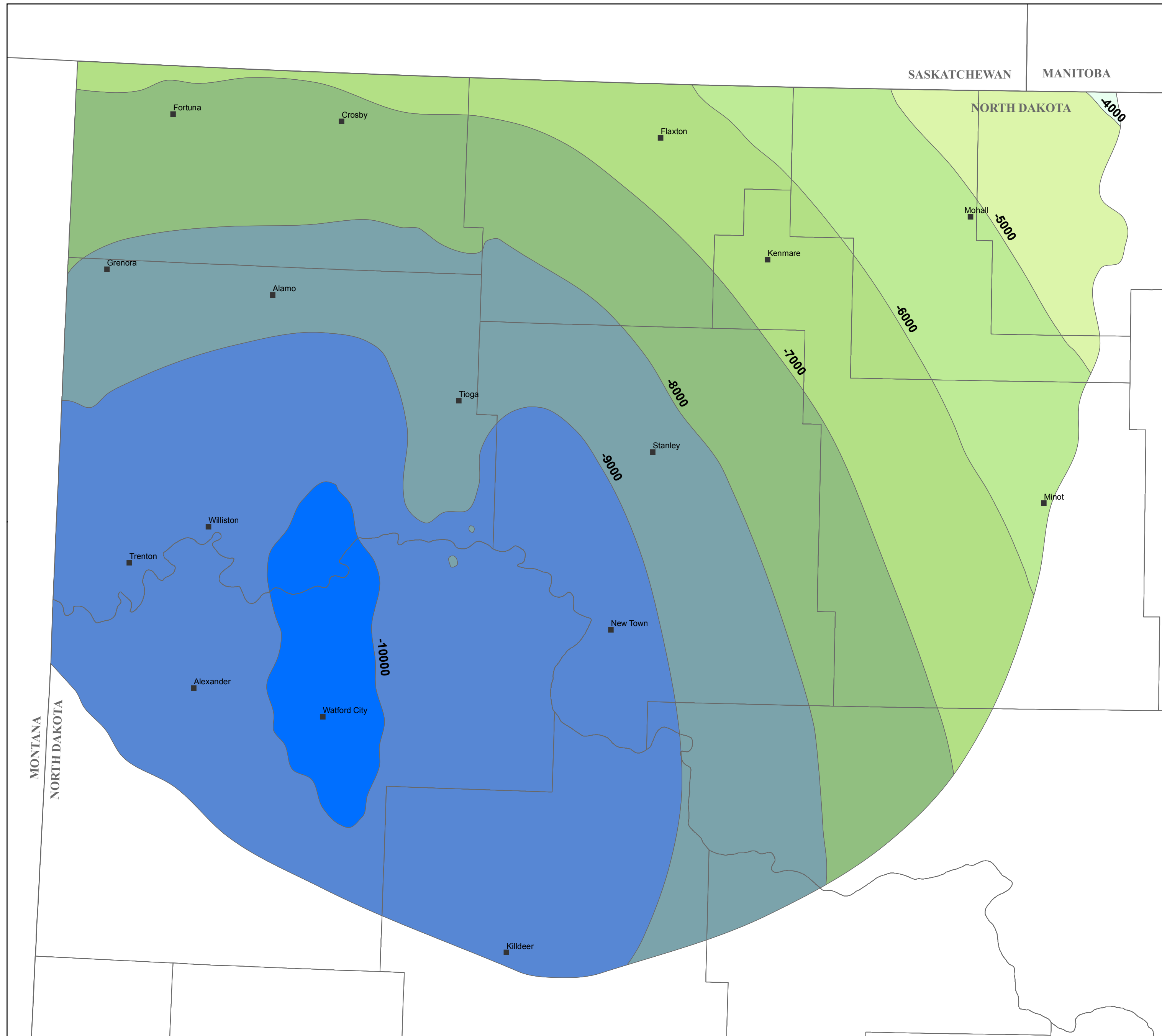


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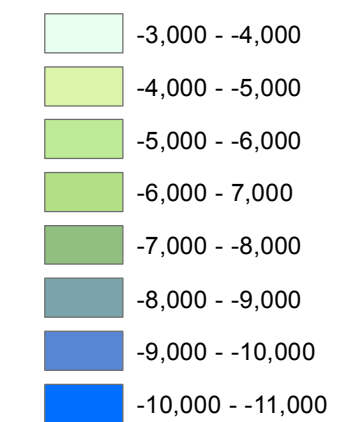
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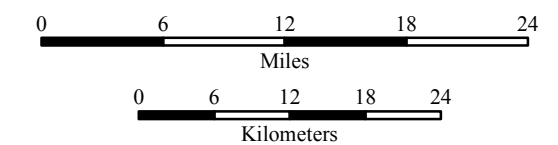
Elevation (mean sea level)



Other Feature
 ■ City



Scale 1:600,000



North American Datum 1983 Lambert Conformal Conic

References:

Anderson, S.B. and Swinehart, R.P., 1979, Potash Salts in the Williston Basin: Economic Geology, v. 74, no. 2, p. 358-376.

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