

A NEW UPCYCLE POTASH TREND EMERGES

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INTRODUCTION

The NDGS has completed a map series depicting the thickness of Prairie Formation salt deposits and is continuing to produce maps depicting thicknesses of each of the six potash-containing members which are observed in North Dakota and log-based estimates of potassium oxide (K_2O) percent concentration for those members, from various wells (figs. 1 & 2). These maps are at the 1:100,000 scale and are expected to be useful for planning future potash exploration activities or potential dissolution of salt caverns to be used for storage.

As the southern extension of the salts mined for potash in Canada, the Prairie Formation potash deposits in North Dakota have huge potential for future production (Kruger, 2020). Due to the shape of the Williston Basin, the potash deposits are deeper in North Dakota than Saskatchewan and Manitoba, but account for most of the 7 billion tons of estimated potash resources within the United States.

PRODUCTION AND PRICES INCREASE

World potash production again reached new all-time highs in both 2020 and 2021 (estimated) following a decline in production in 2019 (fig. 3) (Jasinski, 2022). Worldwide, it is estimated that production was approximately 74% of total mine capacity (62.3 million tons) in 2021, and by the end of that year, forecast analysts projected production could near 69 million tons by 2025, mostly from new mine and expansion projects in Canada, Belarus, and Russia. The last phrase has raised some eyebrows.

Russia and Belarus are the second and third leading potash producers for world markets, respectively, and together account for approximately 35% of world potash production. Even prior to the Russian invasion into Ukraine, the Belarussian potash producer had already been placed under U.S. and other western governmental sanctions in 2021 in response to the Belarussian president's crackdown against political opponents. Additional sanctions on their exports and those of Russia may shake-up the markets further. Ukraine is a major exporter of fertilizers, wheat and other crops. Prices for Canadian potash more than doubled in March and now stand at its highest level since the rise and fall in prices experienced during the financial crisis of 2008 & 2009 (fig. 4).

In the U.S., production comes from six mines located in New Mexico and Utah. While COVID had a minimal effect on the domestic potash market, U.S. production did decline to its lowest level of the past two decades in 2020 before gently increasing to an estimated 480,000 metric tons in 2021 (Jasinski, 2022).

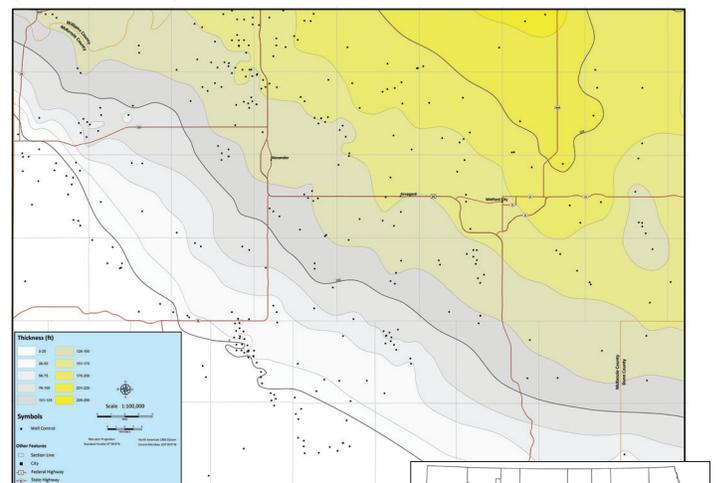


FIGURE 1. Prairie Formation isopach map of the Watford City region from Geological Investigation No. 261 (Kruger, 2022).

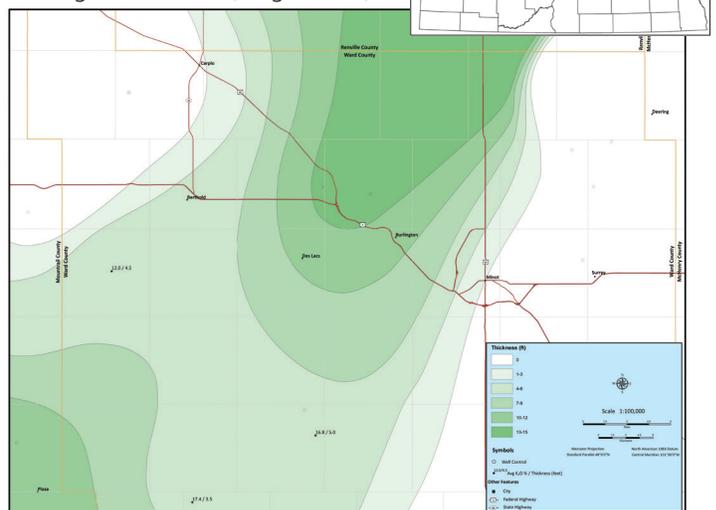


FIGURE 2. White Bear potash member isopach of the region surrounding Minot from Geological Investigation No. 258, sheet 2 of 3 (Kruger, 2021).

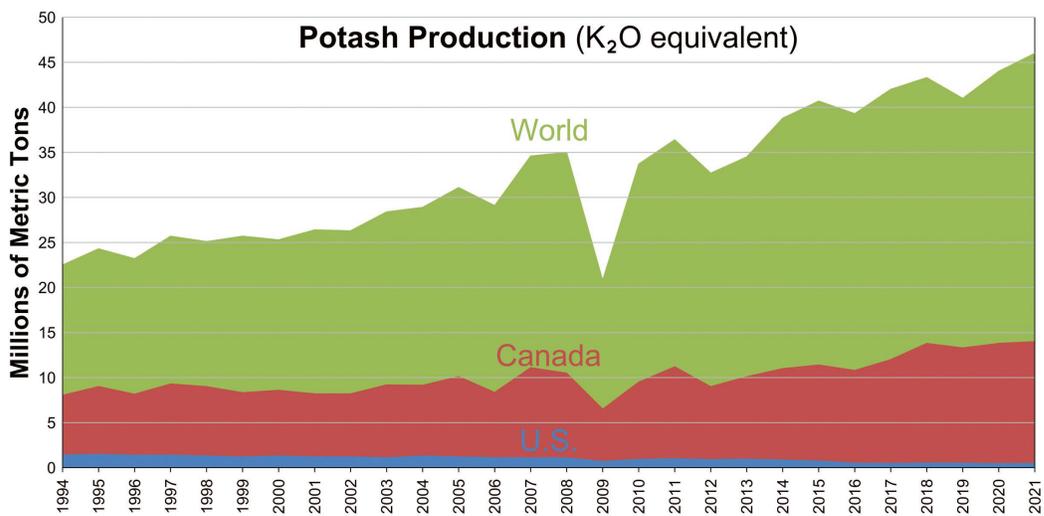


FIGURE 3.

World, Canadian, and U.S. production of potash from 1994 through 2021. Source: U.S. Geological Survey Mineral Commodity Surveys.

POTASH LISTED AND DELISTED AS A “CRITICAL MINERAL”

In May of 2018, the United States Department of the Interior, pursuant to a Presidential Executive Order, published a report identifying 35 minerals and elements, including potash, as “critical minerals.” As currently defined, a critical mineral is (1) identified to be a nonfuel mineral or mineral material essential to the economic and national security of the United States, (2) from a supply chain that is vulnerable to disruption, and (3) that serves an essential function in the manufacturing of a product, the absence of which would have substantial consequences for the U.S. economy or national security. This list is not a permanent designation of mineral criticality, but rather is updated at least every three years to represent current trends of supply, demand, concentration of production, as well as current policy priorities.

In November of 2021, a new draft list of critical minerals was posted in the Federal Register by the director of the United States Geological Survey for public comment. The draft list was based on directives from the Energy Act of 2020, which updated the methodology used to identify potential critical minerals. Potash was not included on the new list. While public comments were received which advocated

for the inclusion of potash in the new listing, there were no inaccuracies found in the determinative quantitative evaluation and potash was left out of the final list in 2022 (United States Geological Survey, 2022). The mineral designation of critical is beneficial in the appropriation of federal funding for resource characterization and can also be advantageous in securing financing for new mining or expansion projects.

REFERENCES

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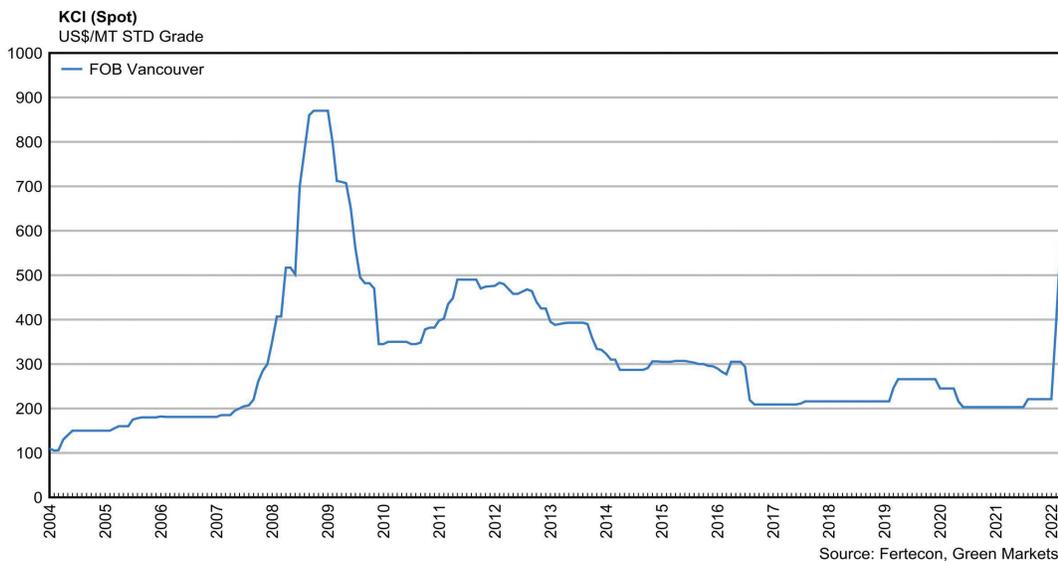


FIGURE 4.

Potash spot market prices from 2004 through May of 2022. Sources: Fertecon, Green Markets.