

Exploring for Helium and Hydrocarbon in Alberta – The HeHC Strategy

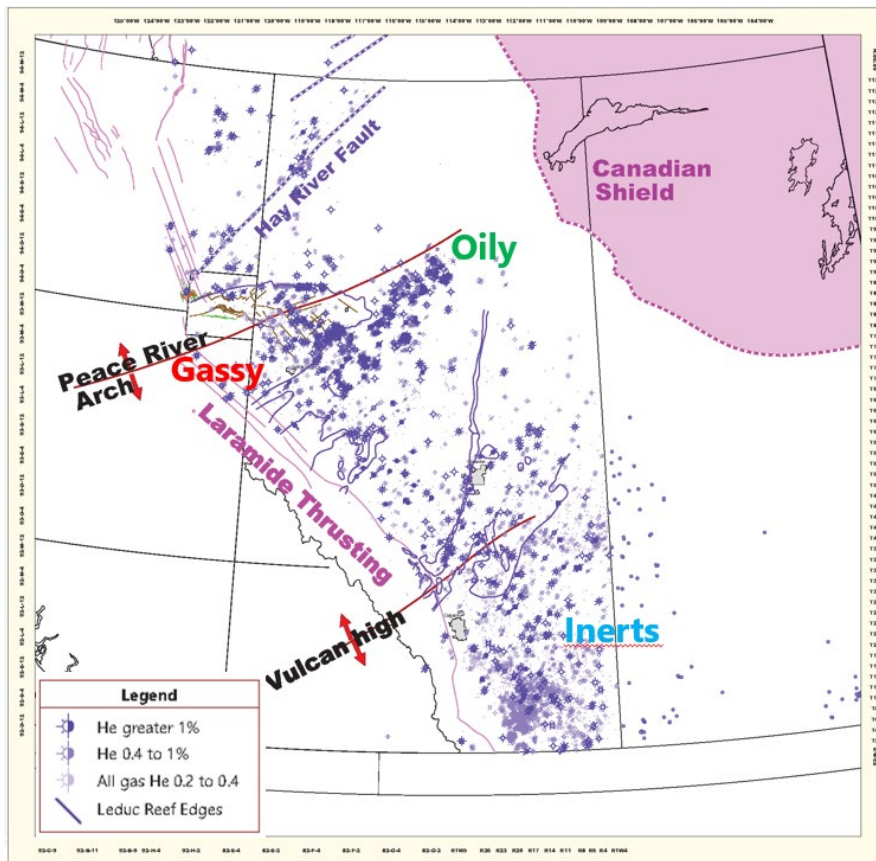
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Alpha Helium

Introduction

Alpha Helium Inc. was founded in 2020 with a goal to seek helium opportunities having basin-scale potential. The team evaluated most of the sedimentary basins in Canada, screening for helium content, but also for access to infrastructure and the presence of economic hydrocarbons. The reasoning was that developing two unrelated commodities would provide a natural hedge when the value of one or the other was in recession. When both commodities are strong, this play type would potentially have twice the value of plays containing just a single commodity.

Exploration Strategy

The Western Canada Sedimentary Basin has a long history of hydrocarbon exploration and a resulting deep understanding of reservoirs and hydrocarbon trapping mechanisms. In addition, the central repository of publicly available data allows explorationists access to an incredible volume of data to develop prospects with considerably more data than rank exploration prospects. Initially utilizing this data set to prospect for helium resources has been an exercise in culling through the massive gas analysis database. There are over 190,000 gas analyses available of which about 3000 indicate helium concentrations more than 0.4% (considered the economic threshold for our work).

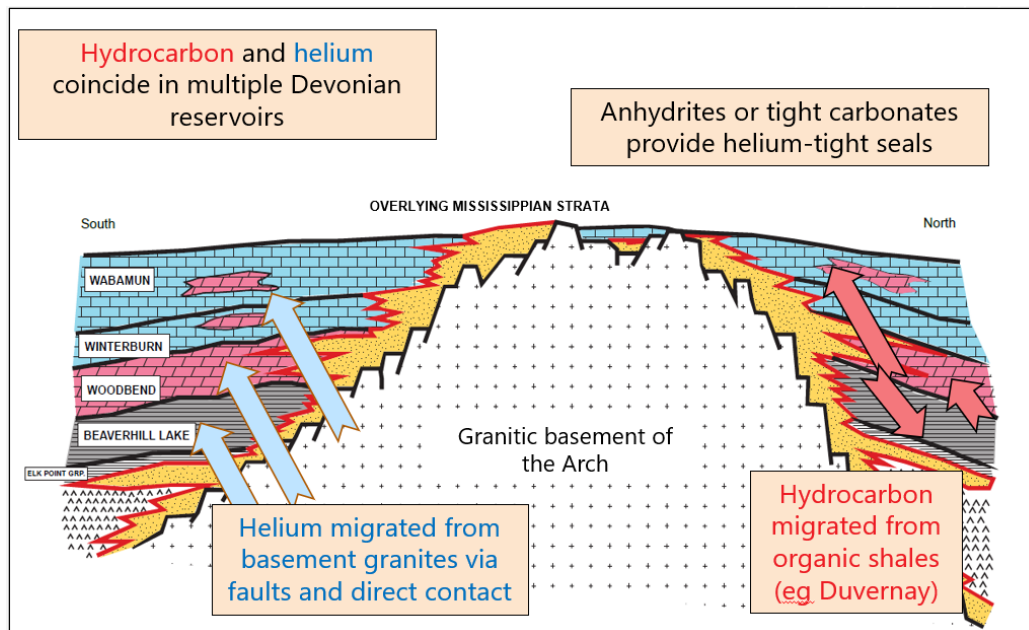


In southern Alberta and Saskatchewan, Junior companies prospect for basement highs draped by highly-variable reservoirs developed in the basal regolith, or look for structural closures in thin overlying Devonian dolomites where significant helium shows were identified in gas analysis. Both targets lie below oil and gas source rocks, and so are filled largely with nitrogen and up to 2% helium. These “green” helium prospects were promoted as environmentally-friendly investments that would not generate greenhouse gas emissions. While one company (North American Helium) has had considerable success in developing new helium reserves with this model, it remains difficult for smaller helium start-ups to attract new investment for similar plays in southern Alberta and Saskatchewan. Their prospects are seen by many investors to lack substantial identifiable upside, and they are also put off by uncertain pricing and lack of market transparency for helium.

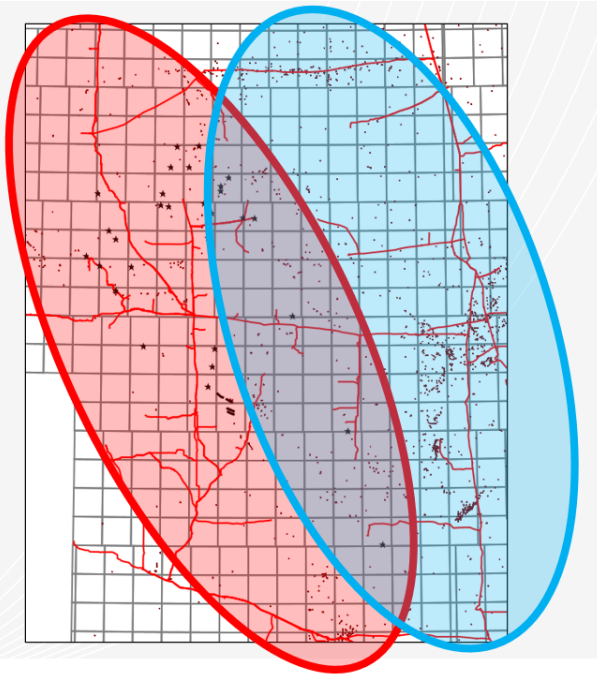
Breaking away from the “green” helium paradigm, at least two helium explorers have discovered opportunities to pursue helium plays in western Alberta, building on decades of hydrocarbon exploration and production in the most gas-prone part of the basin. Weak North American natural gas prices and the dominance of big unconventional plays like the Montney and Duvernay have steered most operators away from historical conventional plays. But many of the deeper plays

feature helium concentrations comparable to the “green” helium fairway, promising robust economics generated by producing three commodities – natural gas, natural gas liquids, and helium. We call this new exploration model the HeHC strategy. We’ll have a closer look at Alpha Helium strategy and progress in northern Alberta.

Alpha Helium focused initially on the greater Alberta Peace River Arch area where over 50% of the significant helium shows in the entire gas analysis database reside. These are primarily concentrated in Devonian reservoirs onlapping the emergent granites of the Peace River Arch. Additional high-grading was accomplished by focusing exploration on the gas window where the helium concentrations have not been diluted too much by hydrocarbons. Further refinement then became an exercise familiar to hydrocarbon explorationists. Various reservoirs were mapped for favourable reservoir quality using petrophysical techniques and finally existing test data was analyzed for bypass productivity. Locally high-graded opportunities were posted and purchased at crown sales.



- Liquids-rich **natural gas**
- **Helium** in economic quantities
- Seek porous, permeable **reservoirs** with links to basement helium source rock



Conclusions

Hydrocarbon-rich, helium-bearing reservoirs were historically heavily explored and so have a wealth of data available. Exploring for new un-depleted reservoirs can be accomplished using conventional hydrocarbon exploration techniques. Conventional gas reservoirs have been ignored since the advent and focus on resource-based targets. The current focus on liquid-rich gases and oils is not coincident with the favourable helium-rich gas fairway.

By focusing on helium associated with hydrocarbon bearing strata we have identified opportunities with a natural hedge against variability in commodity price of either helium or hydrocarbons.

Acknowledgements

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