

Wednesday, March 24, 2021

Virtual Meeting via Zoom

12:00 – 1:00 p.m.

HGS Members \$10 Non-Members \$25 Students \$5

<https://www.hgs.org/civicrm/event/info?id=2263>

Registered Attendees: A confirmation email will be sent upon registration with meeting links.

Event contact: Bryan Guzman – [bryanguzman85@gmail.com](mailto:bryanguzman85@gmail.com)

**\*\*Non-Members can submit an application and pay their dues before registering to get the member price. Please call the HGS office at 713-463-9476 to be registered only AFTER your application and dues are submitted.\*\***

## HGS General Virtual Lunch Meeting

*Bryan McDowell*

*Sabata Energy Consultants LLC*

HGS General Virtual Lunch Meeting

# Helium Exploration in the Rocky Mountains: A Case Study from the Uinta-Piceance Basins, Utah and Colorado

Helium is a naturally occurring, inert gas commonly associated with oil and gas accumulations. Although it generally constitutes less than two percent of the total gas stream, its occurrence within specific stratigraphic intervals and geographic areas can shed light on gas migration pathways within a basin. Moreover, the recent rise in helium prices and contemporaneous drop in oil and gas commodities has piqued commercial interests where oil and gas infrastructure, insight, and expertise is readily available. Most petroleum explorationists are not familiar with

helium exploration; however, a widespread and common method may be easily modified for our purposes: the petroleum system. Like a petroleum system, an inert gas (helium, nitrogen, carbon dioxide, etc.) system is identified by its source rock, reservoir, trap, seal, and migration pathway. To illustrate these elements, a case study from the Uinta basin of eastern Utah and Piceance basins of northwestern Colorado will be shown. These basins produce nearly two percent of the total natural gas in the United States and contribute appreciable amounts of helium from various geologic formations. Two helium systems are identified and tentatively called the Uncompahgre and Uinta systems; named after their interpreted “source rock” intervals. The helium gas, as well as nitrogen and carbon dioxide, are believed to migrate through basinal brine systems until trapped in conventional petroleum traps. These gases are found primarily in the Entrada, Morrison, Dakota, and Frontier formations, as well as the Prairie Canyon Member of the Mancos Shale. The Mancos Shale provides a basin-wide seal for both helium systems and prevents significant leakage to the younger Mesaverde, Wasatch, and Green River gas-productive intervals. ■

### Biographical Sketch



**BRYAN MCDOWELL** is a geologist/reservoir engineer at Sabata Energy Consultants LLC and doctoral candidate (PhD, Geology) at Colorado School of Mines. He worked most recently as an engineering/geoscience technical advisor for asset development at Discovery Natural Resources before starting his own company in 2020. Bryan received his BSc, Geology at Texas A&M University in 2010; his MSc, Petroleum Engineering at Colorado School of Mines in 2018; and has worked in the oilfield since 2011.