

PETROGRAPHIC AND MICROFACIES ANALYSIS OF THE SHUBLIK FORMATION, NORTHERN ALASKA: IMPLICATIONS FOR AN UNCONVENTIONAL RESOURCE SYSTEM

April Knox

Geology, University of Alaska Fairbanks, Fairbanks, Alaska

arknox@alaska.edu

Abstract

The North Slope of Alaska includes a world-class conventional petroleum system, one of the most prolific in the United States, and has been producing for approximately 40 yr. The decline in conventional hydrocarbon production and the presence of high quality source rocks inspire the evaluation of an unconventional petroleum system where oil or gas are produced directly from source rocks. The regional stratigraphy includes multiple proven source and reservoir rocks including the Middle to Upper Triassic Shublik Formation. The Shublik Formation is heterogeneous, and has been interpreted to indicate deposition influenced by marine upwelling. Currently, the Shublik Formation is being evaluated by Great Bear Petroleum for its economic potential as an unconventional petroleum system.

A combination of techniques and methods including backscatter electron imaging and x-ray mapping will be employed as part of this project. Facies stacking patterns identified through core, outcrop, and petrographic analysis will be calibrated to well logs to map relevant stratigraphic intervals on a regional scale. Integrating organic and inorganic geochemical data and electron microscopy with outcrop and core observations will provide important information on brittle and ductile intervals, source rock distribution, and the types of pores found within different facies. Combining the proposed methods will prove to be an innovative approach to evaluating the Shublik Formation as a potential unconventional resource system. The heterogeneous nature of the Shublik Formation implies that more simple unconventional systems, like the Eagle Ford or Bakken, are unlikely to be good analogs for the Shublik.