Short Course

Clastic Facies, Depositional Environments and Sequence Stratigraphy in Core: Examples from the WCSB

Instructors: Brian Zaitlin, Ph.D., P. Geol., CPG., ZGL- Zaitlin Geoconsulting Ltd.
Location: AER Core Research Centre, 3545 Research Way, NW, Calgary, AB (3Days)

November 22-24, 2023, | 8:00am-4:00pm (MST)
Member rate: $2400+gst
Non-member rate: $3000+gst

CLICK HERE TO REGISTER

Prerequisites: An introductory knowledge of clastic facies and depositional environments, in addition to basic log interpretation skills, are required.

Materials Needed: Hand lens, grain size chart, colored pencils, straight edge, unconformity ruler, tape measure and graph paper. Course handbook, core description templates and all relevant supportive material (petrophysical logs, core analyses, exercises etc....) will be provided.

Overview

This 3-day course will provide the skills necessary to make critical observations of physical and biogenic sedimentary structures and textures of clastic facies in core and construct logical process-sedimentologic based interpretations of their depositional environments. Emphasis will be placed on the inherent relationship between processes of sedimentation and the products of their deposition as the fundamental building blocks of the hydrocarbon reservoir. Hands on training will be provided in the logging of clastic facies in core providing a logical and objective means of summarizing observations in a graphic form and communicating this information to colleagues. Concepts will be reinforced through examples in selected cores demonstrating the variability and contrast observed in nature among a spectrum of different environments of deposition including fluvial, deltaic estuarine and shoreline settings. Students will learn to appreciate that lateral and vertical variability are the norm in depositional systems, not the exception, as displayed in clastic sedimentary facies. However, and most importantly, emphasis will be placed on the fact that such variability is highly predictable and can become a very powerful tool in unraveling reservoir architecture and compositional heterogeneity. Core exercises will provide students with the opportunity to test their newly learned skills and share learnings with others in the class. The instructor will provide ample information to place all core examples into a reservoir and regional sequence stratigraphic context. Emphasis will be placed on the practical applications of core-based insights to hydrocarbon exploration and development. Sequence stratigraphy provides a framework for the integration of geological, geophysical, and engineering data, with the aim of
predicting the distribution of reservoir, source rock and seal lithologies. It gives the geoscientist and engineer a powerful predictive tool for regional basin analysis, shelf-to-basin correlation, and characterization of reservoir heterogeneity. This course will examine the geological principles, processes and terminology related to sequence stratigraphic interpretation as applied to non-marine and marginal marine settings in the WCSB. The strength of this course is the application of these basic principles to subsurface WCSB datasets in a series of “hands-on” exercises and core.

Biography

Zaitlin Geoconsulting Ltd. (ZGL) was established in 2014 to provide geological consulting services and applied training seminars to the petroleum industry. ZGL specializes in proprietary/exclusive regional exploration evaluation, prospect generation, basin analysis, production/reservoir geology, pool studies, reservoir characterization, acquisition & divestiture evaluations, and geological training, focusing on clastic reservoirs and depositional systems.

Brian A. Zaitlin is currently President and Founder of Zaitlin Geoconsulting Ltd. Brian has ~40 years of front-line exploration/exploitation, R&D and A&D experience, and has progressively worked as a Geologist, Explorationist, Technical Specialist, Technical and Exploration Advisor and Chief Geologist with a variety of E&P companies (e.g. Gulf, Esso, PanCanadian, Encana, Suncor, Enerplus Resources Fund, and EOG Resources) and in Corporate Banking/Private Equity with the BMO A&D Advisory Group and Native American Resource Partners.

Brian’s focus is on both conventional and unconventional new play development throughout the Western Canada Sedimentary Basin, Rocky Mountain Basins, Appalachia, and various international basins. His research interests lie in the understanding of siliciclastic fluvial, coastal, and shallow-marine depositional systems and their preserved stratigraphy, and in applying this knowledge to reservoir characterization and modeling. He is the author of more than 100 peer-reviewed technical papers and authored and co-authored oral presentations and is the recipient of numerous awards including the CSUR Sproule Innovation and Achievement Award, CSPG Medal of Merit for best published paper, CSPG Tracks Award for Education, CSPG Ph.D. Thesis award, co-authored AAPG, SEPM and CSPG Best Paper/Oral Paper Awards, and was an AAPG Distinguished Lecturer.

Brian holds a B.Sc. (Geology) from Concordia (Loyola) University (1979), a M.Sc. (Geology) from University of Ottawa (1981), and a Ph.D. (Geology) from Queen’s (Kingston) University (1987). Brian is a registered Professional Geologist (APEGA), Certified Petroleum Geologist (AAPG-DPA) and a member of the AAPG, CSPG, CSUR, RMAG and SEPM.
Course Outline *(subject to change)*

**Day 1:**
- Introduction
- Textural Attributes, Sedimentary Structures, Ichnology
  - Core Viewing: Primary and Biogenic Sedimentary Structures
- Sequence Stratigraphy and Clastic Facies
- Non-marine Depositional Systems (Alluvial Fan, Braided, Meandering, Lacustrine, Aeolian)
  - Core Viewing: Non-marine deposits (Basal Quartz, Cadomin, Gething)
  - Correlation Exercise: Lithostratigraphy vs Chronostratigraphy

**Day 2:**
- Incised Valley Systems and Estuarine
  - Core Viewing: Glauconitic (Lake Newell, Lathom)
  - Core & Correlation Exercise: Viking (Crystal)
- Nearshore Depositional Systems (Delta, Shoreline (Dissipative, Intermediate, and Reflective Shorelines; Barrier Island)
  - Core Viewing: Montney, Lower Banff, Fernie, Niton, Glauconitic, Viking, Belly River
  - Exercise: Stratigraphic Surfaces

**Day 3:**
- Core & Correlation Exercises: Viking Joffre; Falher (Spirit River)
- Shelf Break and Deepwater Depositional Systems: Slope, Canyon and Deepwater (Fan) Environments
  - Core Viewing (Montney)
- Course Summary