Ichnology and Sedimentology of Fluvio-Estuarine Incised Valley Deposits: The Late Mississippian (Visean) Stoddart Group of NW Alberta

Natalie A. Sirman* and S. George Pemberton
Ichnology Research Group, Department of Earth and Atmospheric Sciences
University of Alberta 1-26 Earth Sciences Building, Edmonton, AB, T6G 2M7
nsirman@ualberta.ca

ABSTRACT

Recent trends of hydrocarbon exploration within the Western Canada Sedimentary Basin have lead to closer examination of less developed plays such as the Late Mississippian (Visean) Kiskatinaw Formation within the Stoddart Group. The study area within TWP 77-83, Ranges 24w5-12w6 contains two Kiskatinaw producing fields, the George and Eaglesham Fields. Detailed investigation of the ichnology and sedimentology of the Stoddart Group within this area was done in order to develop a synergistic model to determine the depositional history. Such a model will aid in the exploration and exploitation of this reservoir.

The Kiskatinaw reservoir is comprised of clean, medium to coarse grained channel sandstones which overlie and incised surface on the Golata shales, and have high porosities and permeabilities. Channel beds are overlain by finer grained interbedded sandstones and shales, as well as mixed clastic/carbonate and paleosol suites.

Detailed core logs from both fields show facies successions within the Golata and Kiskatinaw Formations. Progression from a quiet marine embayment to a macrotidal estuary is shown in both the sedimentary and biogenic structures. The ichnofossils seen in the Golata Formation include *Chondrites, Planolites, Zoophycus, Teichichnus, Asterosoma,* and *Rhizocorallium* and help to interpret a fully marine environment. The cores from the Kiskatinaw typically show a more restricted trace fossil assemblage within the fining upward tidal sequences. These sequences show progression from a flooding surface into channel lags, subtidal channels, point bars, tidal flats, supratidal mudflats and finally supratidal and coastal marshes and soils.