

Garden Banks 754 “Norton” Prospect Well Study: Immature Cretaceous and Jurassic Source Rocks

Phase I GB754: Basic geochemical and biostratigraphy results - Price \$15,000.00

- Headspace gas analysis on 46 canned cuttings
- TOC and Rock-Eval data on 64 cuttings and core
- Vitrinite reflectance profile on 25 samples
- Saturate and aromatic biomarker analysis of 24 samples
- Detailed biostratigraphy report
- Written report and graphics

Phase II GB754: Detailed geochemical analysis as shown - Price \$14,000.00

- Photography of kerogens
- High temperature gas chromatography of extracts
- Pyrolysis high resolution gas chromatography
- Saturate fraction gas chromatography
- Isotopic analysis of saturate and aromatic hydrocarbons
- High resolution GCMSMS analysis
- Bulk kinetic analysis of all source intervals
- Clay mineralogy

Prediction of Production Properties: Oil Quality, Gas Yields, and overall Compositional Yields at various levels of maturation

Phase III GB754: Compositional kinetics and MSSV analysis - Price \$23,000.00

- Compositional kinetic assessment on 3 samples for C₁ (dry gas), C₂-C₄ (wet gas), C₅-C₁₄ (light oil), and C₁₅+ (black oil) fractional kinetic parameters and yields data
- MicroScale Sealed Vessel (MSSV) analysis of source rocks matured to 3 different conversion levels for light hydrocarbon and generated oil fingerprints

Phase IV GB754: MSSV or hydrous pyrolysis biomarker analysis and comparison to 80 type specific oils GOM – Price \$25,000.00

- MicroScale Sealed Vessel (MSSV) analysis of source rocks matured to 3 different conversion levels for “whole oil” biomarker analysis
- Comparison to oils (GC, GCMS) throughout the GOM (80 oils)

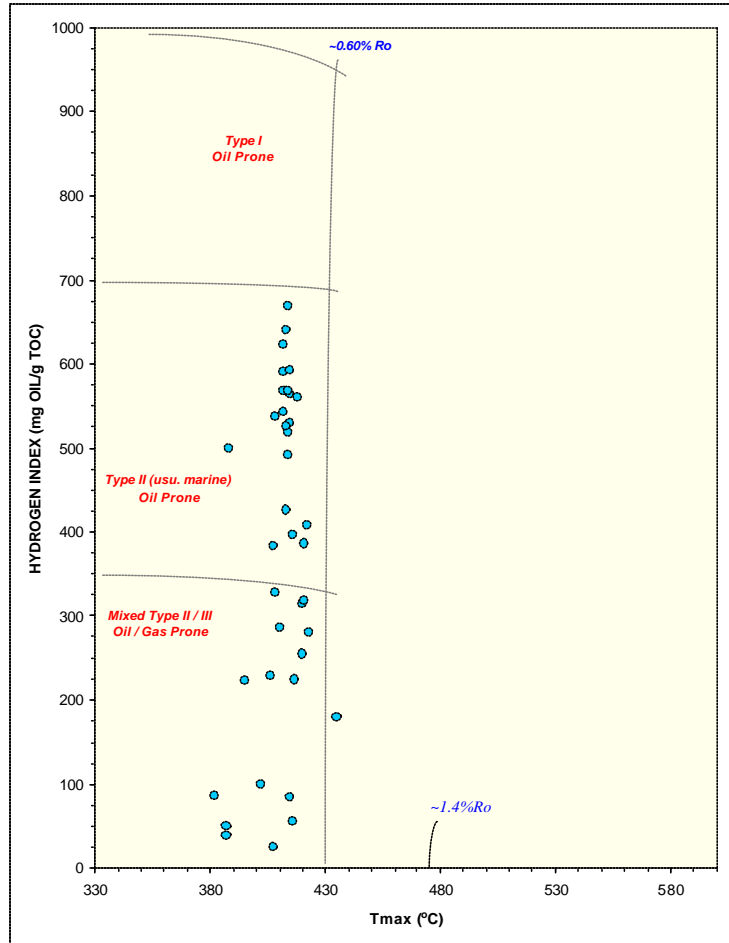
Phase V: Bulk kinetics on oil asphaltenes and rock extract asphaltenes – Price \$10,000.00

- Asphaltene precipitation
- Bulk oil asphaltene kinetics
- Bulk extraction asphaltene kinetics

All 5 phases total: \$87,000.00; all 5 phases purchase price: \$70,000.00.

**Garden Banks 754 Norton Prospect
Espitalie Kerogen Type and Maturity Plot**

The availability of largely unaltered organic matter from the Cretaceous and Jurassic horizons will allow detailed determination of the characteristics of these source rocks. The rates of decomposition of kerogen can be measured on these rocks. In addition the maturation of these kerogens in the laboratory will allow determination of the characteristics of pristine oils as they are generated from these sources at increasing levels of thermal maturity.



Thus, accurate modeling of hydrocarbon generation based on bulk and compositional kinetics, the yields of oil and gas, and oil quality assessment will be the major benefits of this study. In addition lithofacies-specific biomarkers will be recorded. Modeling of thermal maturation of these kerogens will aid efforts to calibrate well data to those measured on these source rocks. Additional well data may be added.

Figure 1. Espitalie kerogen type and maturity plot of cuttings and SWC samples from the Garden Banks 754 Norton Prospect drilled by Amerada Hess (Jarvie *et al.*, 2002). These data show the very high remaining hydrocarbon potential for either oil or gas on these low maturity source rock samples from the Cretaceous and Jurassic sections.

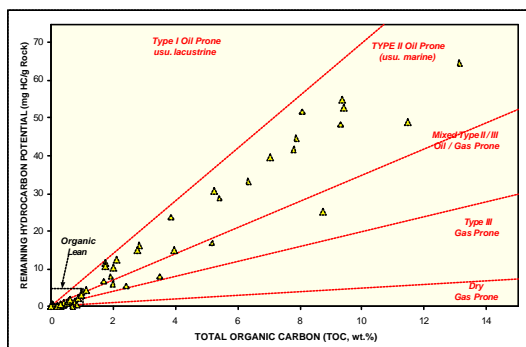


Figure 2. The high organic carbon content and oil prone nature of these immature Cretaceous and Jurassic source rocks is demonstrated by a kerogen typing plot from TOC and Rock-Eval data (Jarvie *et al.*, 2002).

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