GEOSource

Real-Time Total Organic Carbon (TOC) and Pyrolysis in the field

GeoSource service provides wellsite geochemical analysis of reservoir and source rocks. GEOLOG specialists are then able to characterize the organic matter present in the rock for evaluation of the source rock potential, maturity and origin. GeoSource is unique because it provides TOC and Pyrolysis information in the field using GEOLOG designed and built, fit for purpose equipment.

Benefits

- Direct measurement of TOC – unlike inferred wireline calculations
- Rapid identification of sweet spots for enhanced completion design
- Identify best source rock for horizontal well placement
- Analytical process and data directly comparable with conventional lab results
- Early analysis of Kerogen typing vs lab results

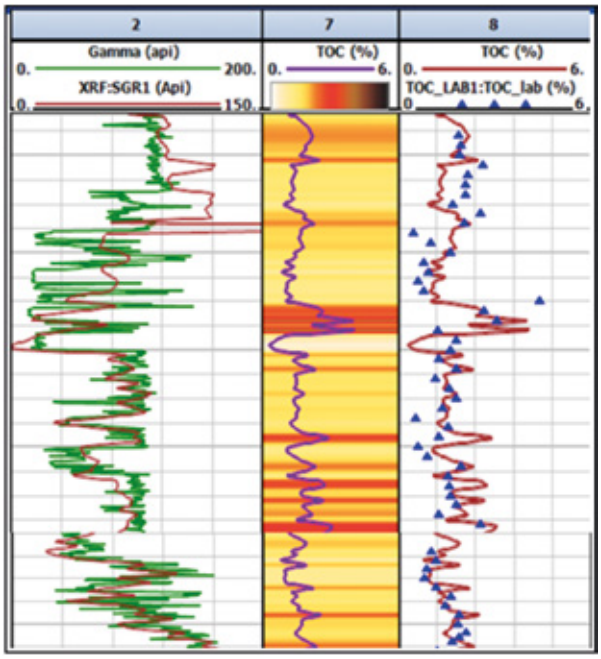
Challenges and Solutions

When faced with budget constraints, various formation evaluation services are often scrutinized such as coring, wireline, and mud logging. Which one provides the biggest value for your budget?

Reduced coring budgets lend themselves to the use of GeoSource where measurements of cuttings can provide direct measurements where wireline cannot and cores are unavailable. The result is a comprehensive evaluation of Total Organic Carbon, Tmax, S1, S2, and Hydrogen Index in near real-time.

Another challenge is obtaining these cuttings analyses more rapidly than lab results; to reduce overall project costs when securing rigs and services in remote areas.

GeoSource service is an ideal solution to replace or supplement the wellsite to lab workflow in these critical environments, ensuring samples stay in the region and quick analyses are provided for future drilling and completion plans without unnecessary rig delays.



Applications

GeoSource is ideal in unconventional plays for source rock characterization. The service is most suitable for onshore operations and compatible with water and oil based muds, and is cost effective for exploration, appraisal and development wells.

GeoSource is available in combination with other GEOLOG services or as a stand-alone service.

Determine organic richness and maturity of potential source rocks in the field.

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Case History

$500,000 USD saved using GeoSource service

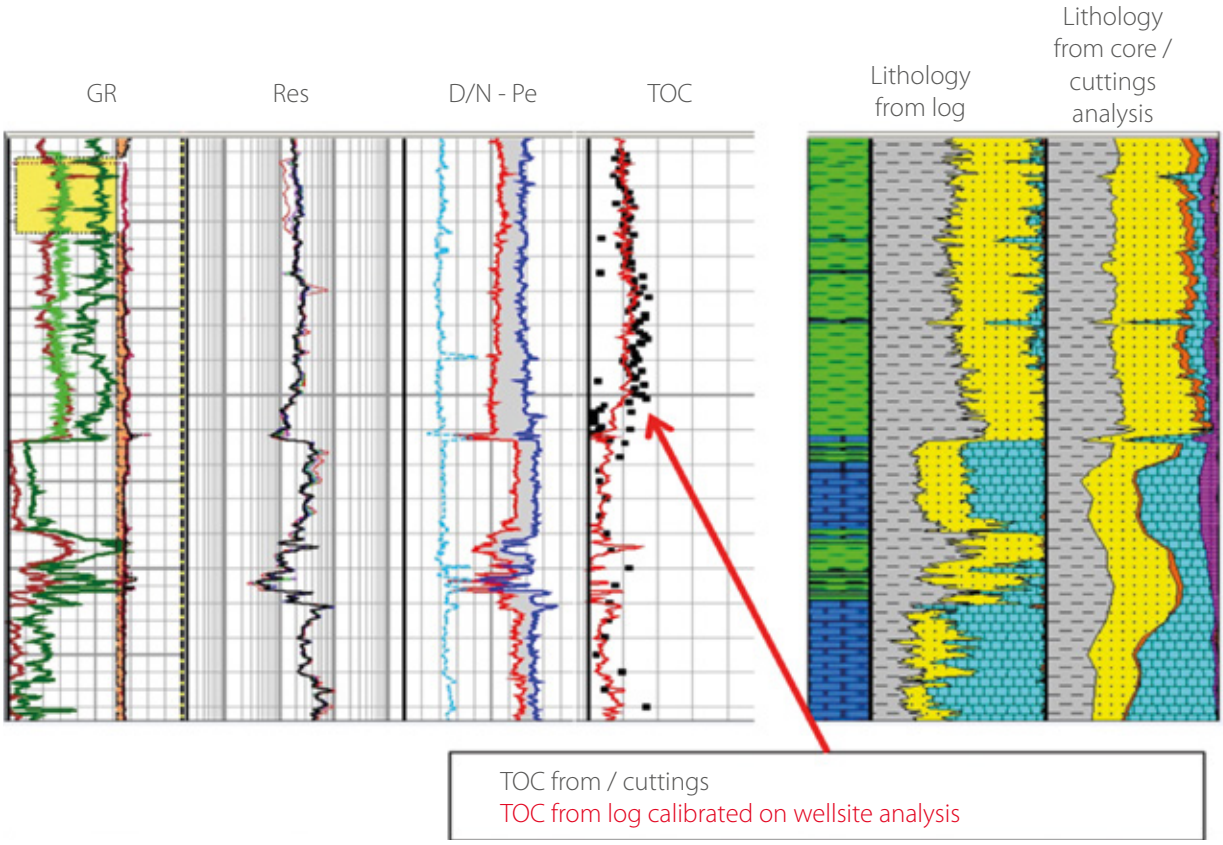

Figure 1. Comparison of TOC from cuttings vs. TOC from log calibrated wireline tool.
TOC drop corresponded to changes in reservoir quality and coring operation was stopped.

In this example, the client was drilling in an unconventional reservoir and utilized the GeoSource service to analyze in near real-time the TOC of core chips. Once the last core was on surface, and before cutting the planned next core, the GeoSource specialist informed the client that the TOC had decreased to near zero and that the shale was no longer organically rich from that point onwards. A critical decision was made to proceed drilling without coring and observe the TOC from cuttings alone. This decision to interrupt the coring program and save valuable rig time accounted for more than $500,000 saved.

Specifications

GeoSource	TOC	Pyrolisis
Measurements	Total Organic Carbon	S1, S2, Tmax, HI
Minimum Sample Required	10 mg	25 mg
Analysis Time	5 min (+ sample preparation)	15 min (+ sample preparation)

GEOLOG around the World

Technical Paper References

Advanced Cuttings Analysis Improves Reservoir Characterization and Reduces Operating Times in Shale Gas Drilling Project.
IPTC-17186-MS (International Petroleum Technology Conference, Beijing, March 2013, Eni)