GasFact™ Gas Analysis Service

ENHANCED GAS EXTRACTION, DETECTION, AND ANALYSIS FOR RAPID, RELIABLE FLUID CHARACTERIZATION

OVERVIEW

Accurate reservoir fluid characterization can help you understand your reservoir fluids and potential economic returns from a field development project. Methods of obtaining reservoir fluid information include running wireline or logging-while-drilling (LWD) services in the wellbore. However, it can also be obtained through gas extraction from the mud or drilling fluid during the drilling phase. GasFact™ gas analysis service from Halliburton Sperry Drilling is a surface data logging service that combines the capabilities of the constant volume and temperature gas extraction from the EAGLE™ gas extraction system, Halliburton Mass Spectrometer, and geochemical analysis to overcome the limitations of conventional systems.

By combining the appropriate technologies with our mud logging experts and technical expertise, the GasFact service delivers high-quality, consistent sampling, along with comprehensive gas measurements of hydrocarbons, aromatics, atmospherics, and other gases. By enhancing reservoir insight and understanding, the service helps operators improve production and maximize the value of their assets in a wide range of drilling environments such as deepwater and unconventionals.

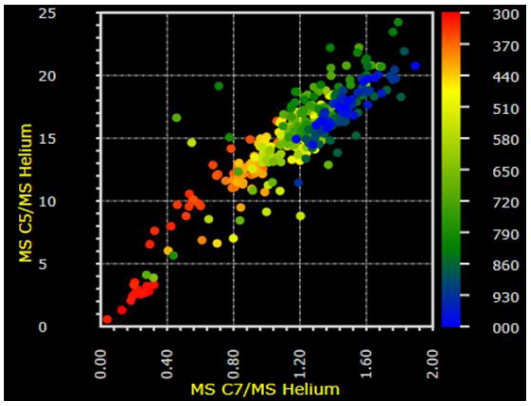
FEATURES

- The EAGLE™ or Modular EAGLE™ Systems (either single or dual systems on mud-in and mud-out) for effective, consistent and reliable gas extraction
- EAGLE system and Halliburton Mass Spectrometer can be used separately with conventional equipment
- The Halliburton Mass Spectrometer, which can detect up to 36 chemical species
- Total hydrocarbon analyzer for total gas detection for increased safety
- Gas chromatograph for methane through pentane analysis
- Carbon isotopic analyzer for carbon isotope concentration ($^{12}C/^{13}C$) of methane through propane
- Gas Analysis Studio™ software to provide interactive analysis of the gas results, along with tools for gas data interpretation
- Dynamic extraction efficiency correction to model downhole fluid composition

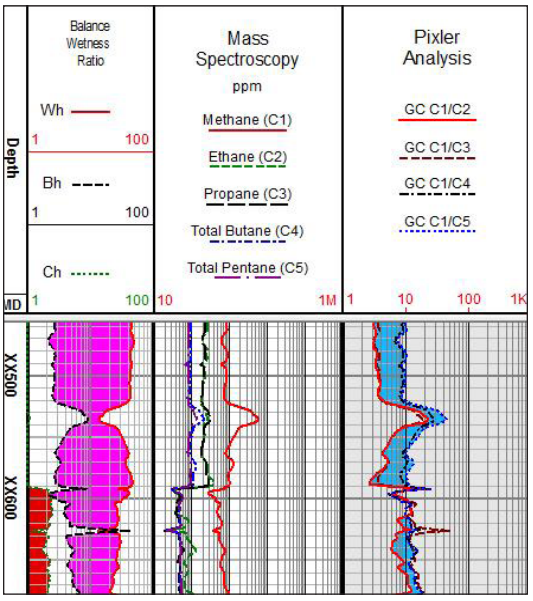
BENEFITS

Enhance Reservoir Understanding

- Delivers advanced gas analysis by trained and experienced specialists who provide geochmical analysis
- Reduces uncertainty of the reservoir by overcoming deficiencies and limitations of conventional gas extraction systems and gas chromatograph services
- Determines fluid contacts, compartmentalization, reservoir porosity, and proximity to lateral accumulations to better understand the reservoir



The Halliburton Mass Spectrometer can provide new ratios for a better understanding of the reservoir.

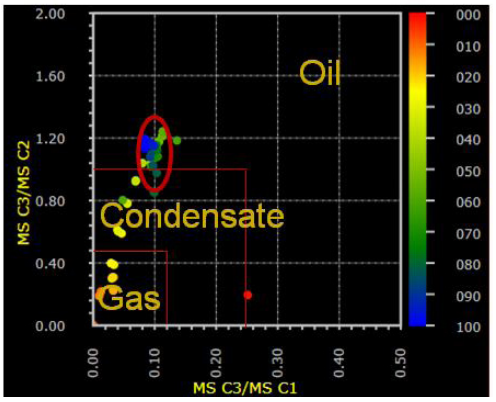


This illustration shows an example plot of gas-while-drilling analysis from the Halliburton mass spectrometer.

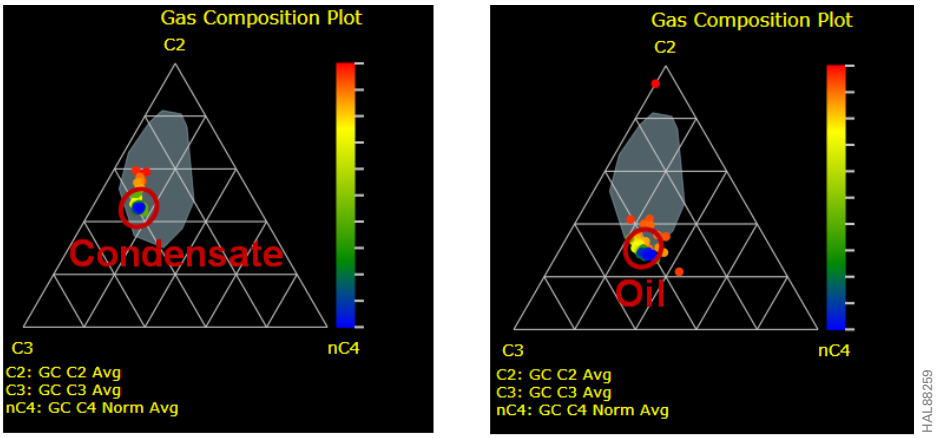
- Provides the most complete reservoir characterization with the Halliburton Mass Spectrometer, which allows the largest selection of chemical species (up tp 36 chemical compounds)
- Improves estimates of petroleum type and quality
- Enables traditional analysis, along with extraction and detection of C6-C14 hydrocarbons
- Reduces uncertainty by inferring nearby water contact for either gas-driven or water-driven reservoirs

IMPLEMENTATION

The GasFact service is composed of three components. The first component is the EAGLE or Modular EAGLE gas extractor, which provides constant volume and constant temperature gas measurements up to 175°F (80°C). The EAGLE and Modular EAGLE systems can operate with water-, oil-, or synthetic-based drilling fluid systems. The second component includes the detectors. The primary detector is the Halliburton Mass Spectrometer, which can detect methane through tetradecane, aromatic hydrocarbons, cyclic hydrocarbons, and non-hydrocarbon species. Included among secondary detectors can be a total gas detector or total hydrocarbon analyzer, gas chromatograph, and carbon isotopic analyzer. The third component of the service is the analysis. The geochemical analysis is performed by highly trained Halliburton specialists using Gas Analysis Studio software in real time or post-run for fluid identification. In addition, the analysts are trained to use a proprietary unique dynamic extraction efficiency correction to give an accurate representation of downhole fluid composition.



Plot Analysis Studio software determines gas, condensate, and oil for better resevoir insight.



Gas composition before (left) and after (right) dynamic extraction efficiency correction, delivering a better representation of downhole fluid composition.

The high-quality sample produced by the EAGLE and Modular EAGLE systems allows for near-laboratory-quality gas analysis. To understand true or uncontaminated gas from the formation, two complete systems of extractors and detectors that include the Halliburton Mass Spectrometer, total hydrocarbon analyzer, gas chromatograph, and gas control panel are used to remove contamination from recycled gases. The use of two systems allows for a real-time net gas from the formation to be calculated based on full circulation and lag depth to give a clear understanding of the formational fluids coming to surface. When a dual system is used, the dynamic extraction efficiency correction is applied to both systems to give a representative downhole fluid composition of all components detected.

For more information about technical specifications, contact your local Halliburton representative, visit us on the web at www.halliburton.com, or email sperry@halliburton.com