

SGR

Spectral Gamma Ray

APPLICATIONS

- Well placement
- Pad and factory drilling
- Underbalanced drilling
- Air drilling
- Shale gas and oil drilling
- Coalbed methane drilling
- Steam-assisted gravity drainage (SAGD)

ADVANTAGES

- Enables well-to-well correlation and steering within sweet spots
- Provides insight into clay content and total organic carbon
- Measures potassium, uranium, and thorium for elemental analysis
- Simplifies logistics with sourceless sensors and single-collar MWD design

The TelePacer* modular MWD platform with spectral gamma ray (GR) provides detailed while-drilling formation structure data. This advanced GR configuration positively identifies stratigraphic laminations along the lateral by giving insight into mineral composition and clay content.

SPECTRAL GR MEASUREMENTS FOR HIGH-VOLUME RESERVOIRS

Using potassium, thorium, uranium, and total GR measurements, spectral GR provides three additional curves and 2% total GR precision. With this data, you can more efficiently and effectively:

- place laterals and steer within the targeted zone
- identify lateral formation heterogeneity
- determine clay type
- assess clay volume
- perform accurate well-to-well correlation
- infer total organic carbon when combined with information from pilot wells.

This module is offered within the single-collar TelePacer platform. By adding additional components without increasing the length of the drillstring, the TelePacer platform preserves the tight economics inherent to drilling in high-volume unconventional reservoirs.

GR SENSOR SPECIFICATIONS

Detector type		Nal scintillation	
Measurement range,† gAPI		0 to 1,200	
Measurement†	Accuracy	Repeatability‡	
Collar OD, in		63/4 (2 sensors)	4 3/4 (1 sensor)
Potassium	Greater of 0.002 (weight fraction) or 5% (relative error)	0.004 (weight fraction)	0.004 (weight fraction)
Thorium	Greater of 0.5 ppm or 5%	1.9 ppm	2.3 ppm
Uranium	Greater of 0.5 ppm or 5%	1.4 ppm	1.5 ppm
GR	Greater of 2 gAPI or 5%	1.50%	1.70%

GR SENSOR SPECIFICATIONS

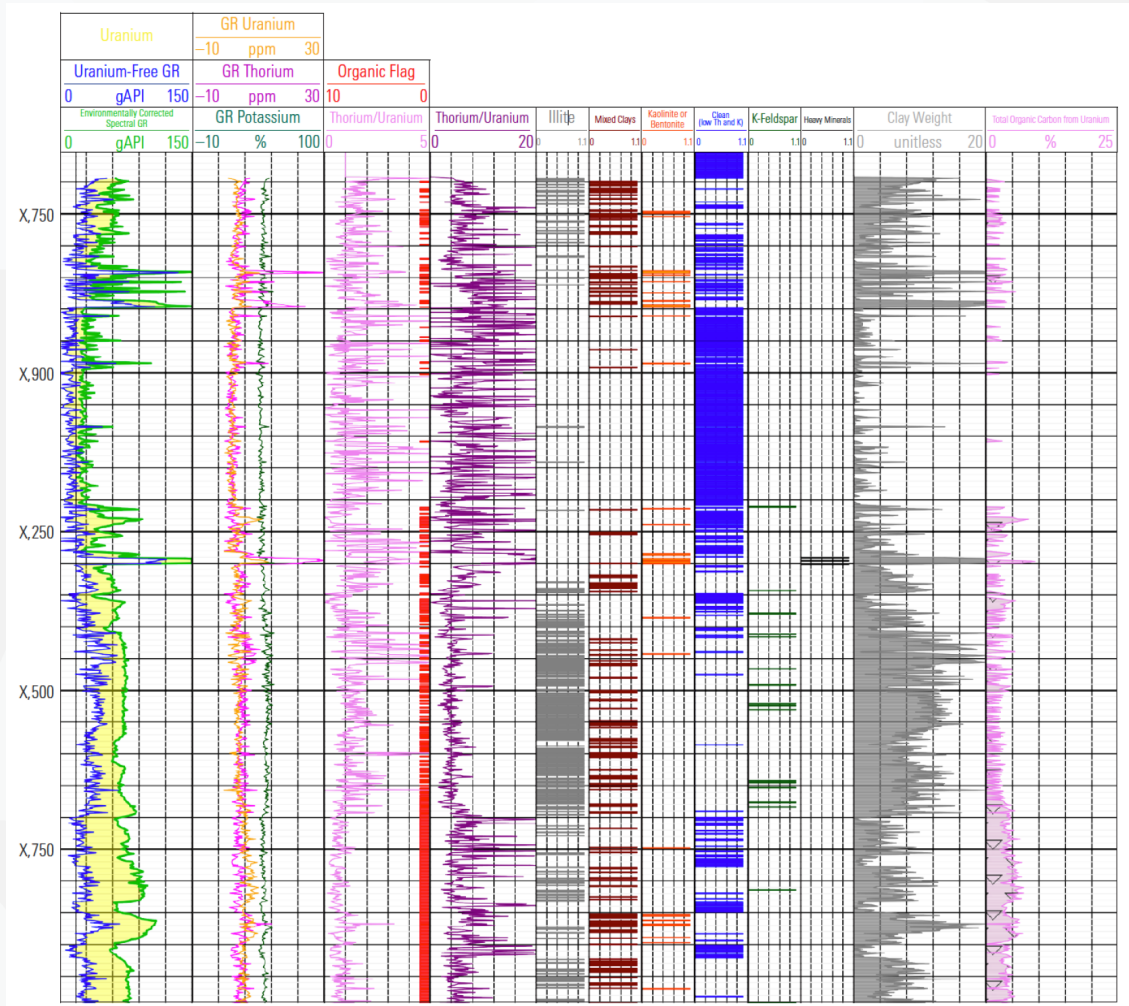
Max. vibration, gn [m/s ²]	20 [200] (rms, random, 5 to 1,000 Hz)		
Max. shock, gn	[m/s ²] 500 [4,903.3]		

† Extreme™ GR measurements are calibrated to API standards and are highly repeatable, even in high-temperature environments.

‡ Standard 100-gAPI shale (2% K, 12-ppm Th, 6-ppm U); 18-s averaging.

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The spectral GR configuration of the TelePacer platform provides advanced evaluation without adding additional components to the drillstring.