



4- π GAMMA-GAMMA DENSITY

4-pi Gamma-Gamma Density logging (GDL) is a single-hole logging technique utilizing a weak Cesium-137 source to emit gamma rays into the surrounding material. A small fraction of the gamma ray photons are reflected back to the probe, and their intensity is recorded as counts per second (cps) using a Sodium Iodide scintillation crystal. The measured count rate depends on the electron density of the surrounding medium, which is proportional to the mass per unit volume. As a result, the technique is useful for verifying the continuity of concrete placement and identifying defects such as soil intrusions and poor consolidation.

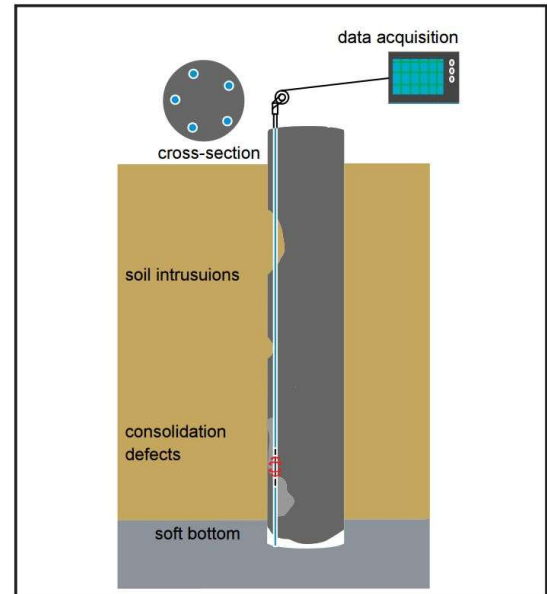
The Gamma-Gamma Density probe contains a single detector that collects formation density data within a spherical volume slightly exceeding the distance between the source and the detector. Compared to other density probes, it is more economical and specifically engineered to accommodate small-diameter boreholes, but is more sensitive to changes in borehole diameter and mudcake effects.

APPLICATIONS:

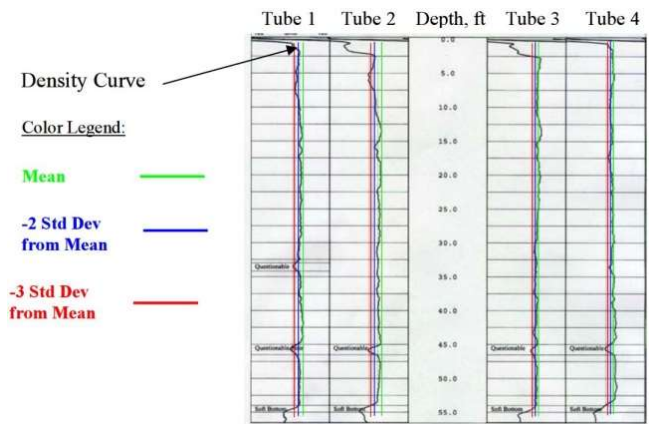
- + Formation Density
- + Concrete Dam/Foundation Density
- + Casing Completion Evaluation
- + Cement Pile Testing
- + Freshly Poured or Hardened Concrete

PROBE SPECIFICATIONS:

Diameter:	29 mm (1.13 in.)
Length:	1.42 m (4.67 ft.)
Max Temperature Rating:	50°C (122°F)
Max Pressure Rating:	200 bar (2900 psi)
Parameter Measured:	Gamma-ray intensity (cps)
Gamma Source:	100 mCurie Cs ¹³⁷
Gamma Detector:	Nal (TI) Crystal
Source-Detector Spacing:	~14 inches; user defined



4-pi gamma-gamma density logging field setup



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