**SFD® Case Example: Castilla**

The Cretaceous-aged Castilla oil field consists of an anticline which is part of a buried structural complex of the Llanos foreland basin of the Andean thrust belt within east-central Colombia. Discovered in 1969, the field is located about 15 km to the east of the exposed frontal thrust fault.

NXT has conducted various Research and Development surveys in the area to quantify the response of the SFD® survey system. These fields were used as templates for surveys conducted in similar geological settings.

**References:**

Guarupe, L. A. B., 2009, ANH: Heavy Oil in Colombia and other investment opportunities; World Heavy Oil Congress 2009


Parravano, V., Teixell, A. and Mora, Andrés, 2015, Influence of salt in the tectonic development of the frontal thrust belt of the eastern Cordillera (Guatiquía area, Colombian Andes). Interpretation: November 2015, SSA17-SSA27

Castilla Field - Structural Setting

T2 Structural Map

Ecopetrol, 2004

NW

SE

T2 Structural Map

CASTILLA FIELD

(Quarupe, 2009)

Regional Structural Schematic Cross-section
The Castilla Field anticline is a NW-SW-trending structure with a three-way dip closure against the Castilla Fault complex to the southeast. Its two largest producing units are the Massive Guadalupe (K2) and Upper Guadalupe (K1) formations.

The Guadalupe formation has a gross thickness of up to 100 ft with porosity from 15%-22%.

The K2 formation consists primarily of sand with alluvial/fluvial aggradational channel fill deposits from braided and meandering channel belts. The sandstones and gravel deposits are poorly sorted from fine to medium-grained exhibiting planar to trough cross-bedding.

The K1 unit consists mostly of shale and siltstone with some sand lenses. These lenses are thin, isolated and discontinuous that exhibit fair reservoir quality. They were deposited in a shallow marine setting.
SFD® Case Example – Central Colombia
Cretaceous Anticline – Castilla Field

Central Colombia
- SFD® flight 90602 was acquired in central Colombia over the Cubarral area.
- The Castilla field was picked to evaluate the SFD® signal responses.
- Surface Area: 55.4 km²
- In-Place Volume: ~ 2,600 MMbbl
- Net Pay (K1+K2): 144 m
- Oil API: 13.5°
SFD® 90602 Castilla Anticlinal Structure

Signal frequency increase with character change anomaly

Excellent Reservoir Anomaly

Major Geological Change

Local Geological Change

SFD® Case Example – Central Colombia
Cretaceous Anticline – Castilla Field
SFD® Case Example – Central Colombia
Cretaceous Anticline – Castilla Field

SFD® 90602 Castilla Anticlinal Structure

Local Geological Change

Signal baseline drop with character change anomaly

Major Geological Change

Excellent Reservoir Anomaly
**Summary**

- SFD® flight 90508 detected an excellent reservoir anomaly over the Castilla field.

- SFD® showed an anomalous region starting with a local geological change at 510 and finishing with a major geological change at 570.

- Within the anomalous region the signal attributes are used to further delineate the core reservoir anomaly between 530 and 555.