

4.0 GEOGRAM PROCESSING

GEOGRAM plots were generated using 10-40 hertz and 15-55 hertz Butterworth filtered zero phase ricker wavelets. The presentations include both normal and reverse polarity at 3.75 in/sec.

GEOGRAM processing produces synthetic seismic traces based on reflection coefficients generated from sonic and density measurements in the well-bore. The steps in the processing chain are the following:

- Time to depth conversion
- Generate reflection coefficients
- Generate attenuation coefficients
- Choose a suitable wavelet
- Convolution
- Output.

4.1 Time to Depth Conversion

Open hole logs are recorded from the bottom to top with a depth index. This data is converted to a two-way time index and flipped to read from the top to bottom in order to match the seismic section.

4.2 Primary Reflection Coefficients

Sonic and density data are averaged over chosen time intervals (normally 2 or 4 millisecs). Reflection coefficients are then computed using:

$$R = \frac{\rho_2 \cdot \nu_2 - \rho_1 \cdot \nu_1}{\rho_2 \cdot \nu_2 + \rho_1 \cdot \nu_1}$$

where

- ρ_1 = density of the layer above the reflection interface
- ρ_2 = density of the layer below the reflection interface
- ν_1 = compressional wave velocity of the layer above the reflection interface
- ν_2 = compressional wave velocity of the layer below the reflection interface

This computation is done for each time interval to generate a set of primary reflection coefficients without transmission losses.