

## Shallow VSP for Near-Surface Structure and Statics

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### Abstract/Excerpt

Shallow vertical seismic profiling (VSP) data can serve as a near-surface characterization tool-providing velocity values for static corrections and reflection images for structure. Two hydrophone VSP surveys were acquired in shallow (~40 m), fluid-filled boreholes in the West Castle River area of southern Alberta. The processed hydrophone VSP data showed distinct first arrivals and credible reflections. The P-wave velocity model is obtained by travel time inversion. The velocities range from 910 m/s in the shallow sands to 3500 m/s in the deeper competent shales. Event identification in the field data is aided by synthetic seismograms generated using a finite-differencing algorithm. The synthetic seismograms were also used in developing and testing a processing flow for the field VSP data. A promising correlation between the VSPCDP map of the field and synthetic data indicates considerable potential for the VSP hydrophone technique in near-surface characterization.