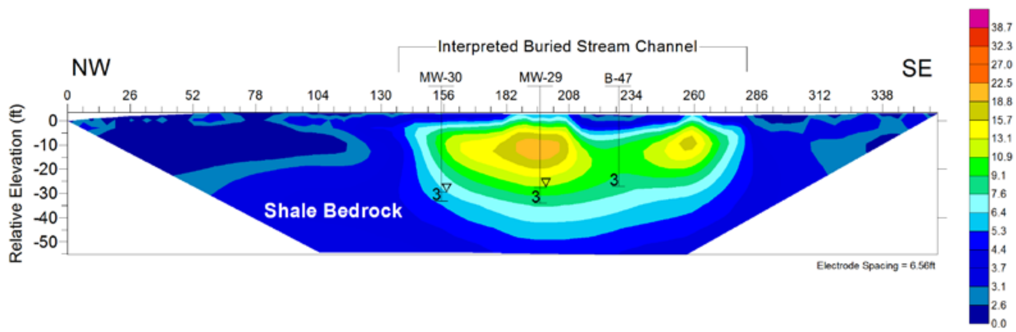
PALEOCHANNEL DELINEATION

Resistivity And Seismic Refraction – VANDENBERG AIR FORCE BASE, CALIFORNIA

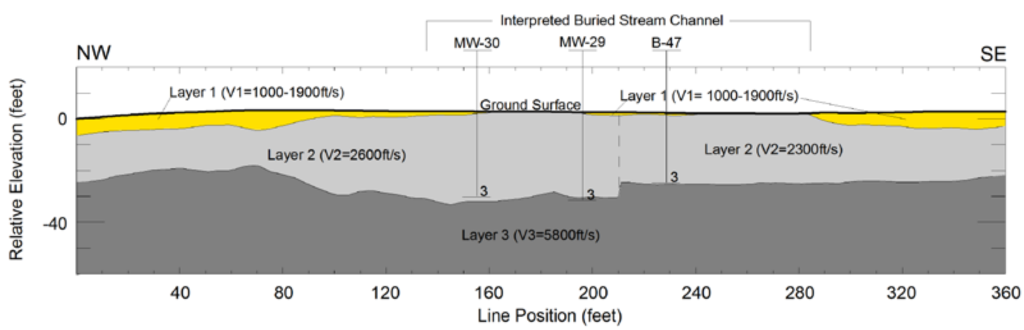
A geophysical investigation was conducted at Vandenberg Air Force Base, California to trace a buried stream channel in Miocene-aged sedimentary rocks. This paleochannel had previously been identified as a conduit for contaminated groundwater during an environmental investigation at the site. The methods used to accomplish this were DC electrical resistivity and seismic refraction.

Spectrum collected pole-dipole and Schlumberger DC electrical resistivity data along 2 parallel transects using AGI's R8/IP SuperSting unit, two-meter cable and a linear array of 56 electrodes. The transect shown was approximately 110 meters (361 feet) long. The electrical resistivity data revealed a concave-upward high resistivity (greens and yellows) anomaly between Stations 138 and 282 (interpreted as the paleochannel) surrounded by very low resistivity material (shale bedrock).



Electrical Resistivity Profile

Seismic refraction data were collected along four parallel transects using a Seistronix RAS-24 signal enhancement seismograph, 10-Hz vertical geophones, and a 20-lb. sledgehammer. The seismic refraction profile shown was approximately 360 feet long and consisted of 2 overlapping spreads, each consisting of 24 geophones at 10-foot spacing. Seismic data were processed using the GRM method, which allows for an undulating bedrock surface and lateral changes in the velocity of the target refractor. The seismic refraction data revealed a broad thickening and deepening of the low velocity (light grey) layer between Stations 70 and 210 (interpreted as the paleochannel) underlain by a higher-velocity (5800 feet/s) layer (shale bedrock).



Seismic Refraction Profile

Both electrical resistivity and seismic refraction provided an image of the paleochannel; however, electrical resistivity proved to be more definitive than seismic refraction because of the presence of a seismically fast hard-pan clay layer above bedrock. Using the interpreted electrical resistivity and seismic refraction sections, the Client was able to accurately predict the trend of the paleochannel and optimally place subsequent monitoring wells.