PROJECT BRIEF

GEOVision geophysical services

GROUNDWATER REMEDIAL FIELD INVESTIGATIONS
APPLE VALLEY AND LENWOOD-HINKLEY SANITARY LANDFILLS

The Project

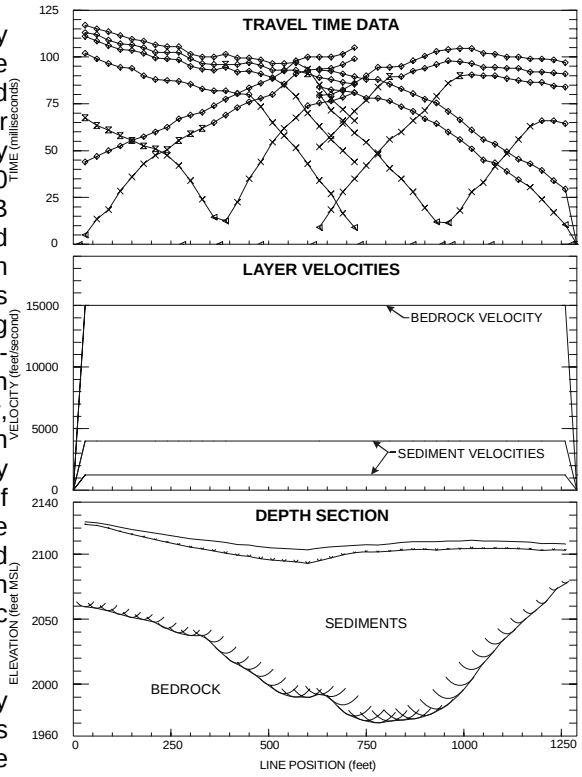
GEO*Vision* geophysicists completed geophysical investigations in support of comprehensive Groundwater Remedial Investigations at the Apple Valley and Lenwood-Hinkley Sanitary Landfills under contract to the County of San Bernardino, Solid Waste Management Department.

The Objective

The objectives of the geophysical investigations were to map bedrock topography, regional faults, and fracture zones in the area adjacent to the landfills in order to accurately locate future site groundwater monitoring wells and determine the potential effect of the underlying geologic structure on the local hydrogeologic environment.

Key Results

Conducted a geophysical survey at the Apple Valley Sanitary Landfill to map subsurface bedrock topography, determine the location of faults and fracture zones in the vicinity of the site, and aid in the determination of the most appropriate locations for three groundwater monitoring wells. Vertical electrical resistivity soundings (VES) were conducted using an Abem SAS 2000 booster transmitter and an Abem Terrameter Model 300B receiver to determine depth to bedrock in the site vicinity and aid in the design of the seismic refraction survey. A high-resolution seismic refraction survey, using a 24-channel EG&G Geometrics ES2401 seismograph, 14-hertz geophones with a station spacing of 30 feet, and an EG&G Geometrics Dynasource (vacuum-assisted weight drop) as the seismic source, was conducted in the areas adjacent to the landfill to map bedrock topography, specifically bedrock valleys. A CSAMT survey was conducted in the areas adjacent to the landfill in order to map low resistivity zones, indicative of faulting or fracture zones. Interpretation of the geophysical data indicated the orientation of the subsurface bedrock valley and local subsurface bedrock topography, and revealed that a zone of highly fractured bedrock exists beneath the landfill, which causes an increase in local hydraulic conductivity and, therefore, groundwater migration.



Conducted a geophysical survey at the Lenwood-Hinkley Sanitary Landfill to delineate a regional fault and fracture zones in the vicinity of the site, and to aid in the determination of the most appropriate locations for six additional groundwater monitoring wells. VESs were conducted using an Abem SAS 2000 booster transmitter and an Abem Terrameter Model 300B receiver to determine depth to bedrock in the site vicinity and to aid in the design of the seismic refraction survey. A high-resolution seismic refraction survey, using a 24-channel EG&G Geometrics ES2401 seismograph, 14-hertz geophones with a station spacing of 30 feet, and an EG&G Geometrics Dynasource (vacuum-assisted weight drop) as the seismic source, was conducted to map the orientation and depth to bedrock on both sides of a regional fault in order to accurately locate two additional monitoring wells near the fault. A dipole-dipole resistivity survey was conducted in the areas adjacent to the landfill in order to map low-resistivity zones, which are indicative of faulting or fracture zones. Interpretation of the geophysical data indicated the orientation and depth to bedrock on both sides of the regional fault and several steeply-dipping low-resistivity zones interpreted to be caused by increased hydraulic conductivity and groundwater migration in fracture systems associated with a dike swarm crossing the area.