A MULTI-METHOD APPROACH TO LANDFILL DELINEATION

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A geophysical survey was conducted on four closed landfills in Albuquerque, New Mexico. The landfills operated from 1948-1983 at various intervals, and received an estimated waste tonnage of more than three million tons. Presently, the surface conditions of the landfill sites vary from gravel and asphalt parking lots to more natural desert-like conditions. Historical records of the landfill geometries are incomplete for most of the sites. The geophysical survey effort was conducted to determine the lateral extents and thickness of buried waste as well as the depth of cover material over the waste. The geophysical methods selected for this project included a combined electromagnetic (EM) and magnetic (Mag) survey over the landfill sites, and a number of two-dimensional lines of electrical resistivity tomography (ERT). The EM and Mag data were collected using a fiberglass cart towed by an ATV, and covered a total area of over 200 acres over the four sites. The EM and Mag results provided the information needed to estimate the lateral extent of landfill waste. A total of 17 ERT survey lines (4,250 line meters) were collected after analysis of the EM and Mag data, and were placed in such a manner to provide additional information in areas where the estimated landfill lateral extents varied from the EM and Mag results. The ERT data also provided the information needed to estimate waste thickness and cover depth. Our results showed many differences in the landfill size and waste depth than was expected based on historical records. By using these combined methods, we were able to piece together a near complete picture of subsurface conditions that would have been difficult from any one geophysical method used alone.