

CASE HISTORY

Quantification of Aggregate Resources Using Geophysics

Challenge:

MUNDELL was contracted to quantify the extent of the sand and gravel reserves located beneath an 18 acre site in central Indiana. In this region, the nominal bedrock depth is about 90 to 100 feet, with the unconsolidated soils above bedrock consisting predominantly of fine-grained glacial till with high amounts of interbedded coarse grained sediments. However, as a stream bordered the site, sand and gravel resources were expected.

Action:

Prior to the geophysical study, four (4) test borings had been advanced across the site. These borings indicated a great deal of variability in the thicknesses of the aggregate across the site. To better understand this variability, and to better delineate the aggregate resources commercially available at the site, MUNDELL collected seven (7) two-dimensional resistivity profiles to image the upper 100 to 200 feet of the subsurface. These profiles were analyzed for the presence of aggregates, and then studied from a mining perspective, to determine which of the detected resources were minable. Next, the data were compiled into a three-dimensional data set, and slices were taken at elevations where the sand and gravel were most prominent. These slices allowed for a lateral approximation of the aggregates to be made, and then a volume approximated, using estimated thicknesses and standard slope values. After the data was processed, three (3) test borings were advanced along different points of the profile lines by MUNDELL in order to corroborate the results.

Results:

The seven resistivity profiles collected across the site indicated not only great areas of aggregate resources, but allowed for the identification of interbedded clay lenses that reduce the commercial value of the property from the mining perspective. This information, collected in only two days of field work, allowed the client to evaluate the real commercial value of the property.

