

Geophysical Prospecting on the Industrial waste dumpyard of PoHang Steel Co.

SONG, MOO YOUNG and KIM, MYONG SIK

Heologym Chungnam Nat'l University, Daejeon, 305-764, Korea

Before 1980 in Korea, most of the industrial waste disposal had been carried out without special consideration on the environmental provocation such as the underground water pollution and ground distortion due to the swelling of the waste material. We investigated the waste landfill site of PoHang Steel Co, through the geophysical prospecting in order to reactivate the land-use and the environmental recovery from the identification of material and their special distribution.

The waste landfill site is spread on the surface area 200cm X 400m with thickness around 70m including the fluvial sediment layer along the coast. The solid waste material was composed of slag of iron material and sludge after initial treatment, alternatively dumped with soil layer originated from nearby Tertiary mudstone.

On considering the physical property of the earth material, slag, and sludge, we adapted the surface geophysical prospecting in seismic and electric resistivity, and the borehole exploration with high resolution in optical image, P-S wave velocity logging, resistivity logging, and seismic tomography through the cross-well and the borehole to surface.

The drilling investigation showed the layer structure of upper landfill, slag layer, upper reclamation layer, silty sand, sand gravel, weathered mudstone with the base rock mudstone around 70m depth in the borehole. The slag layer consists irregularly of iron material, refractory material, and other by-products, and shows moist state with thickness 11.8m ~ 15.9m. The seismic velocity pattern delineates the distribution of high velocity (>2000m/s) for base rock and sand layer, medium velocity (2000~1000m/s) for slag layer and silty clay, and also sludge due to montmorillonite swelling. The distribution output can be visualized and useful for the new construction design in this space.