

# PROJECT PROFILE

## PREPARATION OF LANDFILL OPERATION AND CLOSURE PLANS

The Hackensack Meadowlands 1A Landfill is a 400-acre, 150-foot-high municipal waste disposal facility. Filling at this landfill initially began in the late 1960s. By the mid-1980s, it was approaching its permitted capacity, and work was initiated to modify the operational plan and to prepare a plan for closing the facility by the late 1980s.

The primary feature of the modified operational plan involved raising the height of the landfill an additional 50 feet. In most areas of the landfill, placement of an additional 50 feet of refuse would have caused concerns for the stability of the waste slopes because of the presence of deep deposits of soft, compressible varved clay soils underlying the site. These concerns were greatest along the east side of the facility where high-voltage transmission towers, founded within about 80 feet of the toe of the landfill, were present.

To evaluate the potential for instability, subsurface exploration, and in-situ and laboratory testing programs were undertaken to characterize the engineering behavior of the varved clays. Field testing of the clays included standard penetration tests (SPTs), field vane shear tests, and pressuremeter and dilatometer testing. The strength of the refuse was estimated from large-scale direct shear tests conducted at the site. Index, consolidation, conventional and special

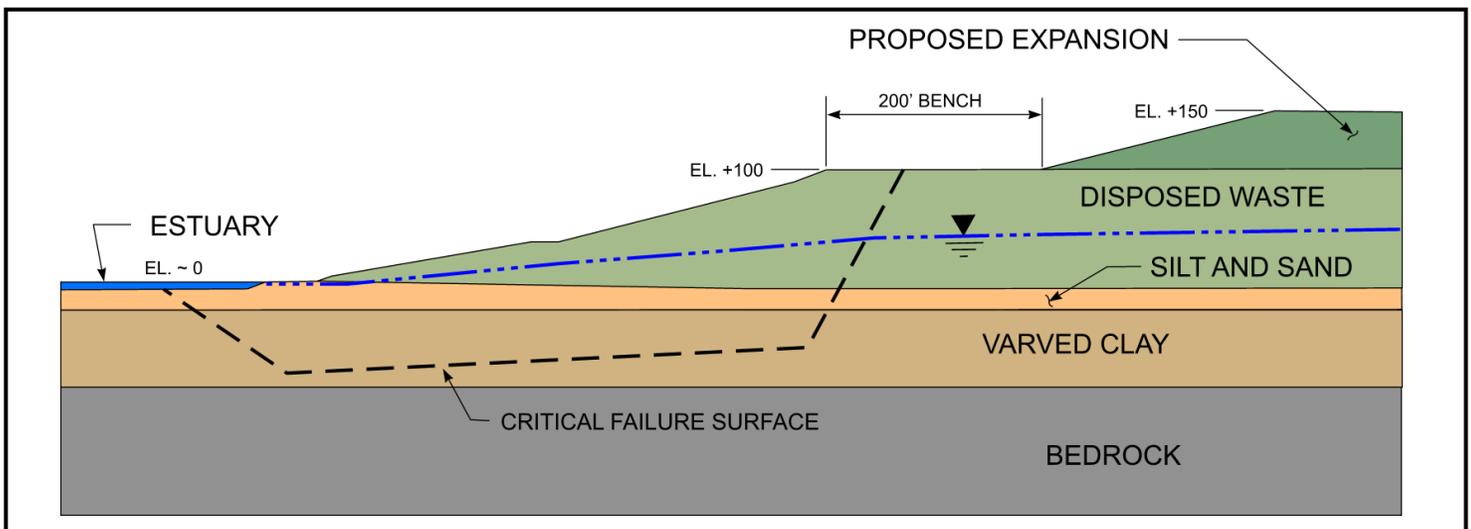


*Hackensack Meadowlands 1A landfill prior to raising by 50 feet.*

triaxial shear strength, and direct simple shear strength testing of the varved clays was performed in the laboratory. The stability of embankment slopes was evaluated by limit equilibrium methods of analysis, and the effect of ground movements on the transmission tower foundations was also evaluated using two-dimensional finite element analyses. The results of these analyses led to the decision to raise the height of the landfill provided that a minimum 200-foot-wide bench was provided along the east slope of the landfill.

The closure plan involved the design and preparation of plans and specifications for perimeter leachate collection, surface drainage, cover systems, and an

access road around the perimeter of the landfill. The leachate collection system included a soil-bentonite slurry wall and excavated gradient control drain. The landfill cover system was designed to accommodate an additional five feet or more of long-term settlement, construction of ponds and access roads on top of the landfill for fire protection, and a methane gas venting system below the cap system. A 30-mil-thick HDPE liner was incorporated into the cover design based on deformation behavior and long-term performance characteristics. D'Appolonia was responsible for the preparation of health and safety, quality control/quality assurance (QA/QC), and post-closure maintenance documents as part of this effort.



*Hackensack landfill cross section showing proposed expansion and critical failure surface.*