



Above left: Site following construction of the impermeable cap. Lower left: during construction. Above right: completed outboard embankment

Honeywell Baltimore Works - Hydraulic Barrier Design and Construction

Baltimore, Maryland

Mueser Rutledge Consulting Engineers (MRCE) designed and prepared contract specifications for a hydraulic barrier to contain Honeywell's 15 acre former chromium processing facility in downtown Baltimore's Inner Harbor. Two-thirds of the barrier alignment borders the Patapsco River waterfront. The subsurface soils and ground water contain trivalent and hexavalent chromium, with a pH range from 1.5 to 12. MRCE provided design, contract specifications, and construction inspection for the zoned rock embankment, to stabilize the aging industrial bulkheads, and provide land area for barrier construction outboard of the contaminated site. The barrier and embankment are major components of a larger remediation project that included a RCRA cap, and a head maintenance and monitoring system. The 3 ft wide hydraulic barrier was constructed in a 3,200 ft long slurry trench backfilled with recycled excavation spoils mixed with a special salt water compatible bentonite. The barrier is keyed into decomposed rock at an average depth of 80 ft. The design required construction from an elevated construction platform for stability of the slurry supported excavation. Construction was performed in modified Level D, with air quality at the site perimeter continuously monitored. MRCE performed field and laboratory investigations for the barrier design.

Borings were made along the alignment to define subsurface conditions. Soils recovered in the borings were stratified and analyzed to define the materials available for backfill. MRCE tested trial backfill mixes for permeability and compatibility with site ground water. Compatibility testing was performed to demonstrate long term performance of the backfill.

MRCE's backfill design provided a cutoff with 5×10^{-9} cm/sec average permeability. MRCE prepared a geotechnical report and barrier design report for agency review and attachment to the contract for bidding. MRCE prepared contract drawings, technical specifications, and bid documents for the work. Crushed stone materials from the embankment portion of the alignment were segregated from the natural soils to allow gradation blending for backfill preparation. MRCE was responsible for technical oversight and construction quality assurance. MRCE provided and operated a triaxial permeability and slurry quality control laboratory on site, enabling immediate testing of the slurry stabilizing the excavation, and providing evaluation and approval of the prepared backfill before it was placed.