

PROJECT PROFILE

RCRA FACILITY SITE ASSESSMENT, PERMITTING, MONITORING AND CLOSURE

D'Appolonia performed and assessed ground water and waste monitoring and prepared permit applications and design documents for operation and closure of a RCRA facility at an operating steel mill. Two settling lagoons that had been used by the mill to receive listed hazardous wastes from tin plating operations contained halogenated organic solvents, cyanide, and metals that included hexavalent chromium, cadmium, nickel, and zinc.

D'Appolonia developed a monitoring program for the operating lagoons prior to closure that involved sampling and characterization of settled sludges and underlying soils and ground water within alluvium, colluvium and bedrock in the vicinity of the lagoons.

A system of monitoring well clusters were installed in the lagoon area because of variations in underlying sediment types and hydrogeologic properties. D'Appolonia negotiated with the USEPA to establish upgradient and downgradient monitoring locations, considering the tight physical constraints of the site, the complex hydrogeology, and other mill activities that might have affected background conditions.

We performed statistical analyses of the ground water analysis results, considering independent sampling and laboratory replicates. These analyses included T tests as well as the alternative analysis of variance (ANOVA). Results of



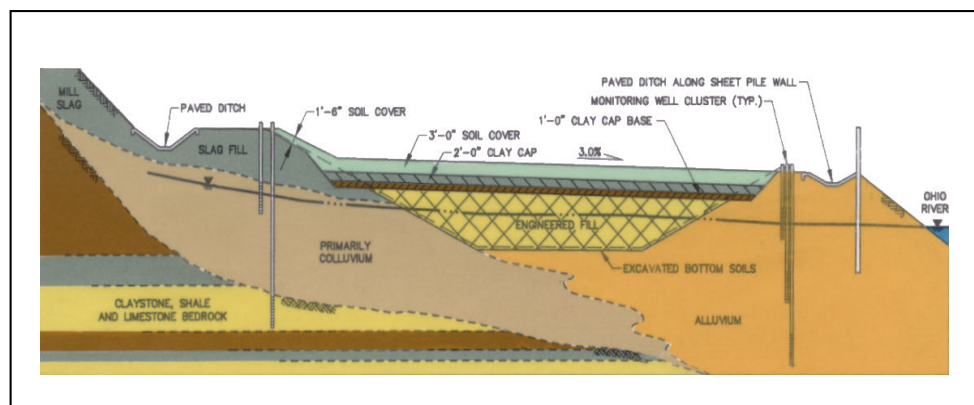
Hazardous waste settling lagoon during closure. Sludge is being removed for stabilization and off-site disposal. The Ohio River is on the opposite side of the sheet piling.

the ANOVA method indicated that, at the required confidence level, no significant ground water contamination had occurred.

Following construction of a wastewater treatment facility, we developed a lagoon closure plan, including engineering design, permit preparation and construction monitoring. The closure plan consisted of (1) dewatering the lagoons; (2) removing, stabilizing, and disposing of sludge off site; (3) field and lab testing of metals concentrations in the bottom soils; (4) placing engineered fill over the former lagoons; (5) installing a clay cap system; and (6) constructing drainage controls. Based on the ground

water monitoring data and the low mobility of metals exhibited in underlying soils, excavation for closure was limited to removal of the lagoon sludge and minimal removal of bottom soils. Because the facility was in the floodplain of the Ohio River and sludge and soils were excavated from elevations below river level, a surface drainage system and a series of dewatering wells were required. Ground water pumped from the dewatering system was discharged to the wastewater treatment plant at the site.

D'Appolonia demonstrated to regulatory authorities that on-site materials met the specifications for the engineered fill and the cap system, thus saving the costs associated with importing more than 25,000 cubic yards of material. We prepared construction documents, detailed cost estimates, and a construction schedule to meet regulatory requirements for the facility closure. We also provided construction monitoring services throughout the closure effort. Subsequent monitoring indicated acceptable conditions for redevelopment of the former lagoon site for other usage.



Schematic cross section of lagoon following closure. Upgradient and downgradient monitoring well locations were established based upon negotiations with the USEPA.