Beneficial Use Case Study

Asheville Regional Airport Temporary Runway

Coal Combustion Product Type
Fly Ash, Bottom Ash

Project Location
Asheville, North Carolina

Project Participants
Asheville Regional Airport Authority, Duke Energy, Charah LLC

Project Completion Date
September 2016

Project Summary
When the Asheville Regional Airport needed to rebuild its only runway, instead of shutting down, they decided to build a new taxiway to serve as a temporary runway during reconstruction. Partnering with Duke Energy and Charah, the airport undertook a massive 85-acre reclamation project using coal ash as structural fill to raise previously unusable land by 40 to 60 feet to airfield elevation for aviation and commercial use. This state-of-the-art encapsulated beneficial-use project saved the airport an estimated $12 million and avoided approximately 3.5 million cubic yards of borrow excavation and additional land disturbance.

Project Description
In 2009, Charah initiated site development with an environmental assessment following the ASTM E2277-03, *Standard Guide for Design and Construction of Coal Ash Structural Fills*. Under this guide, Charah determined the physical and engineering characteristics of the coal combustion products (CCPs); investigated the geologic and hydrogeologic conditions of the 85-acre site; surveyed for and delineated any pre-existing environmental resources (including jurisdictional streams, wetlands, and cultural resources); incorporated the permitting procedures (local, state, and federal) for the design and construction of the project; coordinated the design and implementation of erosion, sediment, and pollution prevention controls and activities; and followed the testing, engineering, and construction practices for CCP engineered fill projects.

Upon completion of Charah's environmental assessment, in August 2010, engineering commenced on what the industry would consider a state-of-the-art engineered fill facility. This facility featured environmentally conscious controls, such as comprehensive liner-and-cap, leachate collection, and storm-water management systems.

Initial construction activities included clearing, grubbing, and excavation of existing soils to establish the designed subgrade surface. Upon completion of the subgrade surface, Charah began installation of the bottom liner and drainage collection systems. The bottom liner system included a compacted in-place clay soil subgrade overlain with a bentonite geosynthetic clay liner (GCL) and a 60-mil high-density polyethylene (HDPE) liner. Both the GCL and HDPE liners act as a barrier layer to prevent any CCP material or related moisture from passing through the comprehensive liner system.

Fill material needed for the project was provided by excavating CCPs from the ash basin located at Duke Energy's Asheville Steam Station less than 3 miles from the airport. CCPs were excavated using long-reach excavators, specially constructed dewatering methods, and traditional excavation techniques and then placed in decant stockpiles located adjacent to or in the ash basin. The CCPs were then allowed to decant to an acceptable level of moisture for transfer, placement, and compaction in the engineered fill at the airport.

CCPs were hauled by dump trucks equipped with tarped beds from the power plant to the fill site. Upon placement, Charah used bulldozers to spread the CCPs in uniform lifts to meet the specified elevation tolerance of ±0.25 ft. Compaction of the CCP material was achieved using a vibratory smooth drum roller to achieve the compaction requirement of 95% to 100% modified Proctor.

Upon completion of CCP placement, a 40-mil HDPE cap liner was used to encapsulate the material. In addition to the HDPE cap liner, a minimum of 6 feet of compacted soil was placed across the CCP fill limits at a compaction rate of 98 to 100% modified Proctor. This specification met FAA fill placement requirements for the development of utilities, aviation facilities, and infrastructure. While state regulations did not require the use of a comprehensive liner system or an HDPE cap liner when using CCPs as an engineered fill, Charah and Duke Energy considered the application of these design elements environmentally responsible and the only method suitable for this project.

SOURCE: Charah LLC