



Beneficial Use Case Study

ACAA Brickhaven #2 Mine Remediation and Structural Fill

Coal Combustion Product Type

Fly Ash, Bottom Ash

Project Location

Moncure, Chatham County, North Carolina

Project Participants

Charah Solutions Inc. and a major utility

Project Completion Date

Estimated closure completion: 2021

Project Summary

To execute two large closure-by-removal (CBR) impoundment projects for a major utility in North Carolina, Charah Solutions needed a custom “out of the box” solution. Charah Solutions purchased an active, centrally located 300-acre clay mine to serve as an offsite facility and provided rail delivery and unloading infrastructure capable of relocating up to 300,000 tons of ash per month. Cell construction, mine reclamation, and leachate management were all owned and financed by Charah Solutions.

Project Description

To meet changing regulatory requirements, a major utility decided in 2014 to excavate or close many of its coal ash basins but needed an innovative solution to complete the clean closure of ash ponds at multiple generating stations in central and eastern North Carolina that had been retired in 2013.



Credit: Charah Solutions.

In order to execute such major CBR impoundment projects and meet complex engineering and regulatory challenges, Charah Solutions developed a custom, turnkey solution and deployed massive material handling capabilities and innovative logistics coordination. It first purchased Brickhaven, an active, centrally located 300-acre clay mine previously used by the brick industry in Chatham County, N.C., which was then repurposed using an existing reclamation permit for this site.

Next, Charah Solutions designed and constructed a Subtitle D equivalent engineered fill site for placement of coal ash. As part of this unique high-volume material handling project, Charah Solutions provided all siting, design, permitting, construction, engineering, QA/QC, and operations. Approximately 6.725 million square feet of HDPE liner and cap was utilized for the engineered fill, and three 500,000-gallon leachate storage tanks were installed for leachate collection in the constructed cells. The construction activities were financed by Charah Solutions on a per-ton basis.

To support this large-scale logistics operation, Charah Solutions recognized that rail would be the most efficient and safest way to move ash from both sites with the least environmental impact. The project uniquely involved the use of rail to relocate up to 300,000 tons of ash per month, coupled with the potential beneficial use of the removed pond ash. Charah Solutions installed approximately two miles of rail spurs at Brickhaven to connect with CSX rail systems and employed five 85-car unit trains to support the rail delivery and unloading infrastructure.

As part of this state-of-the-art system, Charah Solutions specifically modified its railcars with locking fiberglass covers to eliminate fugitive dust and employed elevated excavators to straddle the railcars so as to unload approximately 9,000 tons of ash in under 12 hours. On average, one dedicated unit train with 85 cars was unloaded at the Brickhaven site each day.

Upon completion of coal combustion products (CCP) relocation in 2019, the site will enter 18 to 24 months of closure activities and be permanently capped and closed according to regulatory requirements with site management and ground-water monitoring in place for 30 years. The original design for clay mine reclamation and structural refill was for storage of up to 12 million tons of CCPs. This includes the more than 5 million tons excavated and transported from one plant and 2 million tons from another already in place. Four railcar storage and switching spurs, an 880' long rail unloading “subway,” and over 300 acres of previously unusable land will now be available for future industrial development.