

Project Name

Closure & Remediation of 320-acre Landfill Site

Client

Edgeboro Disposal, Inc.

Services Provided

- Analyzed Potential Superfund Ranking
- Prepared and Implemented a Master Plan for Closure/Remediation Permitting
- Performed Multimedia Environmental Studies for Evaluation of Remedial Alternatives
- Remediated a 45-acre Uncontrolled Waste Area
- Designed and Implemented Closure Activities such as Final Cover, Leachate Control System, Gas Collection/Disposal Systems, Stormwater Control Systems, and Capping Systems
- Riverfront Restoration
- Gas Collection System Upgrade



Project Description

SAI was retained to assess the status of the State’s largest operating landfill with respect to potential hazardous pollutant releases. Concern over groundwater contamination from local citizen groups prompted the EPA to investigate the site for potential inclusion on the Superfund list. This EPA investigation made State regulatory agencies reluctant to re-issue the Landfill’s operating permit, which was soon to expire.

SAI evaluated the site’s potential for inclusion on the Superfund list and provided data to the NJDEP concerning potential releases and existing control systems. Based on the remedial strategies developed by SAI, the State regulatory agency decided to permit an additional 100 acres for expansion. The EPA has since re-ranked the site under the HRS system and concluded that it ranks below 28.5, and therefore did not qualify for the Superfund.

SAI designed various components of the landfill closure, including an interim leachate collection system, a groundwater control system, a cut-off wall remediation, the remediation of waste located outside the engineering controlled area, riverfront restoration, gas collection system, and long-term groundwater monitoring and compliance.

Approach

Master Plan Preparation and Implementation - Permitting

In 1989, SAI began assisting Edgeboro Disposal with Closure and Remediation issues and in permit negotiations for a new landfill expansion and the closure of existing waste areas which consist of 140 acres inside a slurry wall and seven older landfills encompassing 120 acres outside the slurry wall.

In order to satisfy the NJDEP that old waste areas would be properly closed, and that the impact of prior landfill activities would be clearly defined, SAI proposed a Master Plan to address systematically all of the separate closure and expansion issues.



The purpose of the Master Plan was to identify the interrelated technical and compliance requirements for the old landfill cells as well as for the proposed cells. The Master Plan identified schedules and task responsibilities, the technical approach to comply with the NJPDES Permit for groundwater and surface waters, the Solid Waste Facility permits, and the Order of Termination for Phase I. The plan identified funding allocation involving \$78 million in escrow monies. The Master Plan was submitted jointly by Edgeboro Disposal and the Middlesex County Utilities Authority in October of 1991, and was conditionally approved in January of 1993.

SAI has been directly involved with the implementation of all technical activities outlined in the Master Plan as well as with operating and closure permits.

Multimedia Environmental Studies for Evaluation of Remedial Alternatives

Under the Master Plan, SAI was retained to perform a remedial investigation of waste contained within a slurry wall, and seven old waste areas outside the wall.

SAI was directly involved with the design and implementation of numerous field activities leading to the preparation of a remedial investigation report and a comprehensive remedial action plan to address all potential exposure and contaminant migration that could impact environmental receptors.

Remediation of a 45-acre Uncontrolled Waste Area

As part of the closure / remediation programs implemented at the site, SAI remediated an area of approximately 45 acres of uncontrolled waste outside the slurry wall. This included the design and implementation of a leachate collection system, the relocation of approximately 2,000,000 tons of solid waste, extensive on-line air sampling, site restoration, and post-remediation monitoring. SAI coordinated most of the closure and remediation activities, including permit compliance, field monitoring, verification reporting, technical presentations to state and local authorities as well as public interest groups, reporting and construction certifications.

Following the relocation of the waste, SAI acted as engineer for the placement of final cover over the contained waste area. SAI was directly involved with the design, maintenance, and repair of stormwater control systems.

After this portion of the landfill was remediated and post-monitoring samples were submitted, the NJDEP determined that the remediation of this 45-acre waste area had eliminated any environmental risk to neighboring commercial and residential properties.

Interim Leachate Collection/Groundwater Control Systems Design

SAI designed an interim leachate collection and groundwater control systems, which consisted of a series of pneumatic pumps and submersible pumps to provide hydraulic control of the leachate inside the landfill. SAI designed a compressor, air supply and leachate discharge pipes, and the associated control system for leachate flow data collection. SAI prepared technical specifications, bid documents, and assisted the Client in the bidding process. SAI also oversaw the construction and prepared the as-built drawings and report following the completion of the construction.

Cut-off Wall Remediation

SAI designed remediation of the cut-off wall, which consisted of a system of deep soil mixing to provide a

hydraulic control of the leachate inside the landfill. The cut-off wall extended over a depth of approximately fifty feet through the waste, the peat, and the sand formation. SAI applied for various NJDEP permits to implement the project.

Gas Collection System Modification

SAI prepared the design of the gas collection system modification to comply with the EPA's and the NJDEP's Title V air regulations. The design consisted of active gas collection wells and horizontal trenches to collect the gas from the landfill and convey it to the off-site co-generation power plant. The system was designed to evacuate approximately 4,400 cfm of gas from the landfill. SAI prepared an Alternate Operating Scenario required by the US EPA for the operation of the gas collection system. SAI also applied for the Solid Waste Disruption and Soil Erosion & Sediment Control permits for the construction of the gas collection system.

Installation of Photovoltaic Cells

SAI assisted in the designing and permitting for the installation of the Solar Panels at the Edgeboro Landfill in Middlesex County, New Jersey. The solar panel installation occurred in a 26.72 Acre area located in the southern and eastern portions of the Edgeboro Landfill. Installation of solar panels utilized landfill surface to create green energy for beneficial use that supplement the energy generated by the LFG production. Generation of energy by two renewable energy sources at the Edgeboro Landfill (LFG and solar) serve as a model of sustainable energy production for sanitary landfills across the United States. Approximately 9,000 solar panels are combined to form an array. A total of 4 MW of energy output is generated from the solar array field.

Permitting

Permits secured for the project included:

- Air
- Landfill Disruption and Closure
- Soil Erosion and Sediment Control Plan Approval
- TWA
- Remedial Action Workplan
- Remedial Action Report/As Built Certification for Waste Relocation
- Stormwater

[Project Impact](#)

A comprehensive Master Plan was prepared to guide the proper closure of seven old landfills, to facilitate proper closure of over 100 acres. To date, 45 acres have been remediated. The riverbank area of the landfill was also restored.