Sadat Associates, Inc.

Project History

Brownfields Redevelopment

Project Name

Redevelopment of Elizabeth, NJ Landfill

Client

OENJ Corporation and others - now owned by Glimcher Corporation

Services Provided

- Identified potential property uses and developed Preliminary Plan
- Prepared Conceptual Closure Design and Cost Estimate
- Prepared and submitted Closure Plan including Remedial Design
- Designed Great Ditch piping system, including 10-foot RCP and leachate main gravity collection lines
- Fill management for approximately four M cubic yards of clean fill
- Site design & development of mall, four hotels, two restaurants & a theater
- Obtained various permits from NJDEP and Army Corps of Engineers
- Prepared and submitted critical construction permits
- Prepared Final Closure Design
- Prepared ISRA Remedial Investigation Report and Remedial Action Work Plan
- Oversight of Construction, Environmental Remedial Systems and Placement of Fill Material as Surcharge
- Ongoing Monitoring and Reporting

Project Description

SAI was the environmental engineer that obtained the permits needed to develop the Jersey Gardens Mall site, a project the USEPA recognized by awarding it the 2001 Phoenix Award for Region II (the project was ranked second nationally). SAI also designed and provided construction oversight for ALL the environmental remediation needs for the project. SAI began its work for a prior owner of the property. In the early 1990s the ORION Corp. purchased the property and SAI was retained by ORION, which later used the name OENJ for the project. SAI continued its services for OENJ until the mall construction was complete.

SAI also worked for end users of the property at the site, including Glimcher Development Corp., Extended Stay America, Marriott Residence Inn, Marriott Courtyard, Ruby Tuesday, Country Inns and Suites, IHOP, and AMC Theaters. Information on the specific services provided for each site can be found later in this document.

SAI is now working for a new client on a remaining portion of the original site (Parcel G), which is located on

the waterfront, as well as for various end use developers.

Approach

In order to prepare this site for development, environmental investigations, engineering design, and permitting had to be coordinated and were performed simultaneously.

Environmental Investigations

Environmental investigations initiated at the property were performed in accordance with the Technical Requirements for Site Remediation. SAI developed and implemented innovative waste sampling plans to comply with the technical requirements of the Site Remediation Program, which were based on statistical significance and distribution of historical waste. Field activities included installation of soil borings, a tidal study, chemical sampling for solid waste classification, and testing of leachate for biotreatability. A Remedial Investigation Report (RIR) and Remedial Action Work Plan (RAWP) were developed, submitted to the NJDEP, and later approved.

To limit the cost of the landfill closure to the client, SAI incorporated the use of recyclable materials into the design of the landfill closure and preparation of the site for development. Recyclable materials are used for structural fill, preloading materials and landfill cover.

Engineering Design

Treatment Evaluation and Encapsulation of PCB Area

A small area of the site (about an acre and a half) had higher levels of PCBs and oily waste. SAI conducted a pilot test of in situ treatment of PCBs using an oxidizer. This treatment technology was unsuccessful due to the high levels of organics in the waste. As an alternative to treatment, SAI designed an innovative containment system using a flexible vertical membrane cutoff wall with a separate leachate collection system.

Stormwater, Leachate Collection and Capping

The proposed closure involved the installation of a pipe culvert to replace an open ditch that extended 5,800 feet to the Newark Bay and divided the property nearly in half.

The replacement of the ditch with a dual pipe culvert was crucial for implementation of the proposed development. SAI prepared the design and obtained the necessary permits for the installation of the pipe culverts.

SAI conducted innovative hydraulic and hydrologic engineering calculations that projected the output of a 100-year flood at approximately 300 cfs, down from the previously calculated number of 1,300 cfs. This allowed the designed pipe culvert to be smaller and more economical.

A final Closure Plan for the site included the installation of a gravity leachate collection system and force main, a cap in the form of buildings and parking to prevent infiltration of rainwater through the landfill, and an active methane gas collection system under each building. Based on the completion of the remedial measures and future capping proposed for undeveloped portions, the site received an NFA for soils in 1999.

Gas

The design of the gas management system was coordinated with the Client(s), the architect and the structural engineer to determine the optimal location for the gas collection and venting system, the location of the

blowers and detection system, and value engineering of the proposed system for each building.

The installed system consists of either a void air space or a gravel venting layer below the first floor slab that is connected to fresh air intakes and to air exhaust blowers. The system provides for a 50-to-1 air-to-gas dilution ratio. This system is covered with a vapor barrier, which prevents any landfill gas from seeping into the building.

As new buildings were erected, SAI designed and oversaw the system installation, obtained the required Air Permits and prepared the As-Built reports for the four hotels and two restaurants in parcel A, as well as for the existing mall and theater buildings. SAI's services were as follows:

1. Residence Inn and Courtyard by Marriott (both Marriott properties), Extended Stay America, and Country Inns and Suites
   - Designed active gas venting system under building
   - Applied for and obtained an air permit for the system
   - Constructed and oversaw installation of the system
   - Prepared As-Built report for completion of the construction phase
   - Continue to perform environmental compliance monitoring for post-closure and air emissions systems operations and maintenance

2. Ruby Tuesday
   - Prepared Phase I/PA for the restaurant property on behalf of Ruby Tuesday
   - Designed active gas venting system under building
   - Applied for and obtained an air permit for the system
   - Constructed and oversaw installation of the system
   - Prepared As-Built report for completion of the construction phase
   - Continue to perform environmental compliance monitoring for post-closure and air emissions systems operations and maintenance

3. Jersey Garden Diner (now IHOP)
   - Designed active gas venting system under building (in collaboration with Langan)
   - Applied for and obtained an air permit for the system (in collaboration with Langan)
   - Constructed and oversaw installation of the system (in collaboration with Langan)
   - Prepared As-Built report for completion of the construction phase (in collaboration with Langan)
   - Continue to perform environmental compliance monitoring for post-closure and air emissions systems operations and maintenance (solely the responsibility of SAI)

Beneficial Use of Dredge Materials and Other Recyclables

In the spring of 1995, SAI first proposed the concept of using contaminated dredge spoil as structural fill. The NJDEP encouraged the concept and outlined a series of permits that would be required. SAI and the client submitted a proposal for the Port Authority that would allow the stabilized dredge material to be reused beneficially at the client's site in Elizabeth.

SAI researched various methods of stabilizing dredge material (including quick lime, Portland cement, and coal ash) and explored dewatering and materials-handling alternatives. SAI assisted the client in evaluating methods of dredging, dewatering stabilization, and land placement offered by various contractors.

After a contractor was selected and after additional negotiations with the Port Authority, SAI prepared permit applications that were submitted to the NJDEP in late 1995/early 1996. The permits/approvals for which SAI submitted applications included: Upland Waterfront Development, Wetlands Transition Area Waiver, and Landfill Closure/Disruption Approval Amendment. In order to support the land application permit, SAI analyzed the chemistry of the dredge material before and after stabilization and compared it with NJDEP cleanup criteria and site-specific conditions. SAI also developed geotechnical specifications for beneficial use of the material.

The final plan involved dredging the material and transporting it to a dock where it was pumped from the receiving barge to the site, directly into the pug mill. Initial stabilization took place in the pug mill. The stabilized mix was then land applied and amended with additional drying agents as part of the application process. The stabilized material was used for site grading for a large commercial development being constructed at a former landfill site.

In addition to approval of stabilized dredge material, SAI developed a copyrighted “Protocol for Beneficial Use of Recyclable Materials©” that allowed SAI, as the Review Engineer, to approve hundreds of separate applications for a variety of recyclable materials to be used as structural fill without the need for NJDEP to review individual beneficial use applications. A total of 2.5 million cubic yards (MCY) of recyclables were used at the Site, including construction and demolition screenings, mixed masonry, slightly contaminated soil, water treatment plant residuals, and KAOFIN™ as liner for detention ponds. The use of recyclables not only saved more than $10 million in cost for purchase of fill material, it actually created a revenue base for the Client to fund other project activities.

Permitting

Stream Encroachment/Stormwater Management

SAI prepared and obtained a Stream Encroachment permit, using an HEC-2 computer model, for the OENJ redevelopment site. This permit application was prepared for the activities related to piping the Great Ditch, which traversed the site, as part of the environmental improvements and closure activities at the old landfill site.

In designing the Great Ditch piping system, stormwater runoff contributed from upstream drainage areas (approximately 840 acre) and the redevelopment portion of the site (approximately 166 acres) were considered. In addition, the effect of tidal flow downstream of the piping system was incorporated in the flow system. The piping system consisted of a 10-foot diameter RCP, approximately 5,000 feet long, and associated leachate main gravity collection lines. The overall purpose of piping the ditch was to prevent stormwater runoff from coming in contact with leachate from the landfill. The Great Ditch piping system was designed as part of the proper remediation and closure of the OENJ redevelopment site that was intended to control the leachate generated at the site and the prevention of the migration of the landfill contamination to the Newark Bay.

A stormwater management system, including a series of detention basins to handle roadway ponding and parking area runoff, was designed and constructed. Rooftop runoff is conveyed separately to the Great Ditch piping system.

Wetlands Mitigation

One of the biggest obstacles to site redevelopment was the tidal stormwater ditch that bisected the property.

SAI's solution was to pipe the ditch and then fill it with cover materials. This project disturbed 10 acres of existing wetlands along the sides of the ditch. However, these wetlands were degraded and, moreover, ran in a linear pattern along the side of the ditch.

To address the need for wetlands mitigation, SAI, working with Coastal Environmental (now Princeton Hydro LLC) designed 10 acres of new intertidal wetlands for the site. SAI designed two mitigation sites, one approximately seven acres, the other approximately three acres. To construct the new wetlands, waste had to be removed from these areas and an existing freshwater pond that contained waste and debris had to be replaced. The new wetlands provide a better habitat for plant and animal species, both because of their tidal interaction and because of the creation of a pond to provide a habitat for the Least Tern, a state endangered water bird. These newly constructed wetlands will be one of the largest clean intertidal wetlands in Newark Bay.

Construction Oversight

SAI provided full-time construction oversight for the environmental remediation, which included limited PCB and hazardous sludge removal, waste relocation, piping of the Great Ditch, construction of leachate collection systems (including laterals and force main), leachate pump station, management of gas from the entire site, and wetlands mitigation. SAI also provided full-time construction oversight for placement of the 2.5 MCY of recyclable materials used as surcharge and later as construction fill.

Ongoing Monitoring and Compliance Services

SAI continues to provide monitoring and inspection services for Glimcher Realty Development with respect to groundwater monitoring, leachate system monitoring and maintenance, and other required inspections. SAI also provides ongoing inspection, testing and reporting for Glimcher and the commercial users of other properties for subslab gas venting systems.

List of Permits

Preparing the site for development required the following permits and approvals:

- Landfill Disruption and Closure Permit
- Upland Waterfront Development Permit
- State Wetlands General Permit
- Corps of Engineers Wetlands Approval
- Stream Encroachment Permit
- Memorandum of Agreement
- Remedial Investigation Report/Remedial Action Work Plan Approval
- Discharge to Groundwater Permit
- Discharge to Surface Water Permit
- Soil Erosion and Sediment Control Approval
- Air Permits (for building venting systems)
- Treatment Works Approval
- Sewer Connection Permit
- Local Sewerage Authority Approval
- USEPA Approval for PCB Emplacement

Project Impact

It is estimated that the project created thousands of full time jobs for the Elizabeth Urban Enterprise zone.

The site redevelopment now includes a 1.2 million square foot regional mall, four hotels, two restaurants, and a waterfront parcel available for further redevelopment. “To consider that this land was never truly developable, even before it was ever a landfill, and that it now boasts a thriving retail mall gives me a great thrill,” says Marwan Sadat, CEO of SAI. “We have actually created prime real estate that did not exist and we can repeat it in urban areas throughout the country and the world.”