



Vol. 31, No. 1

**Update on SAI's
Work with the NJ
Schools
Development
Authority**

As described in our Fall 2011 newsletter, SAI is one of the environmental contractors selected by the New Jersey Schools Development Authority (NJS-DA) to assist with environmental issues at various schools throughout the state. To date SAI has performed a variety of tasks for both the Quarter Mile Lane and Buckshutem Road Elementary Schools in Bridgeton.



SAI Field Scientist Jack Taylor performs geotechnical sampling for the NJSDA project.

NJSDA's projects are multi-phased endeavors, which can include Preliminary Assessments (PAs), Site Investigations (SIs) and environmental screening reports. For these two schools SAI has also conducted geotechnical investigations and testing, hazardous materials surveys, and storm-water surveys.

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Update to Clients

Update

SAI Client Receives Historic Approval for Commercial Medical Waste Treatment Facility

On September 12, 2012, the State of New Jersey granted its first approval for construction and operation of a commercial medical waste treatment facility. This approval was issued to MedAssure, which provides a clean, safe system for the transportation and treatment of regulated medical waste, and offers healthcare providers a state-of-the-art, environmentally safe solution for their waste disposal needs.



The MedAssure facility is permitted to handle up to 7,500 tons per year of regulated medical waste (RMW). Regulated medical waste essentially consists of any solid waste generated in the diagnosis, treatment or immunization of human beings or animals, or in research or the production or testing of biological agents.

New Jersey was the first state in the country to establish a stringent program requiring handling RMW separately from regular solid waste, from the point of generation to the point of disposal. Historically, treatment of RMW has taken place either at out-of-state treatment facilities or at selected in-state medical facilities. There have not been any permitted, commercial RMW treatment facilities in-state, only facilities such as hospitals that have their own dedicated RMW treatment systems.

The MedAssure facility is located on Towbin Avenue in the Township of Lakewood, Ocean County, New Jersey. Dr. Marwan Sadat, P.E., assisted MedAssure in their initial efforts to have the proposed facility included in the Ocean County District Solid Waste Management Plan in August 2010. The Ocean County Board of Chosen Freeholders approved the plan's inclusion, which was later certified

by the Commissioner of the NJDEP.

From August 2010 until March 2012, SAI worked with MedAssure to prepare a permit application for the treatment facility. The application included an engineering design, comprised in part of a site plan and details for retrofitting a portion of an existing

light industrial building to accommodate the treatment system. The permit application also included a separate air permit for the vent system required for the treatment process. The treatment process selected by MedAssure is a Sanitec Microwave Disinfection Unit (MDU), which is capable of processing approximately 1,000-1,200 pounds per hour of RMW. The MDU includes a shredder to pulverize the incoming waste materials thoroughly, followed by a steam and microwave radiation disinfection process. At this point the treated waste is completely sterilized and no longer contains any recognizable components of RMW. It can therefore be classified as ordinary solid



A view of the outside of the MedAssure facility in Lakewood, NJ.

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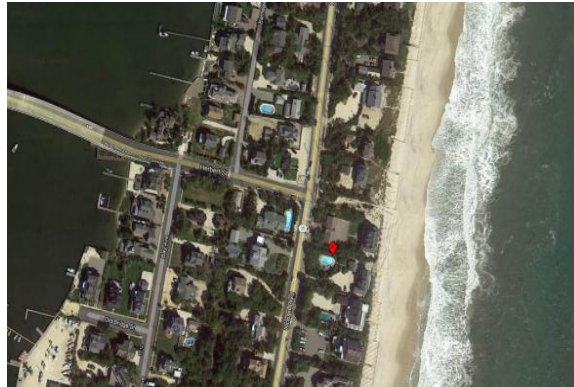
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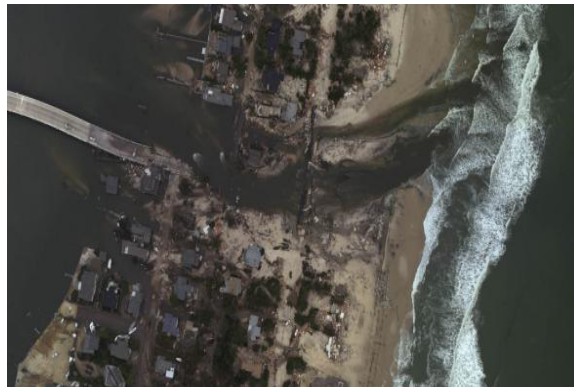


Factoring Climate Change into Environmental Projects

New Jersey's recent experience with Hurricane Sandy has heightened awareness of the reality of climate change. SAI has in the past been asked by various clients to consider the risks of climate change for long range infrastructure projects.



Above, the shoreline of Mantoloking, NJ, before it was hit by Hurricane Sandy. Below, the same area after the hurricane. The storm breached the barrier island on which the town sits. Images courtesy of www.zerohedge.com.



It is now apparent that even the most routine design activities should consider potential impacts from extreme weather conditions. While NJDEP utilizes the 10-, 25- and 100-year storms in the stormwater management program, designers should consider the implications of much greater intensities of stormwater runoff in the design of erosion controls and emergency overflow channels. In remediation design, the integrity of capping systems must take into account the potential for severe storms to submerge or wash away the cover at remedial projects if proper erosion

controls are not instituted.

SAI has checked with its clients to determine the impacts of the recent storm on the integrity of landfill caps and other structures, and is pleased to learn that the systems designed by SAI survived the hurricane. Obviously, the projects most susceptible to coastal flooding were of the greatest concern. The Tides at Seaboard Point, built on a bay facing the Atlantic Ocean in Cape May County, had adequate bank protection to withstand the storm surge. The wetland restoration area at Jersey Gardens Mall survived the surge and debris flow with minimal damage. The Pulaski Distribution Center in Jersey City also made it through the storm with minimal impacts.

In the past, SAI has evaluated major infrastructure transactions, such as the potential privatization of four major state highways (which included the New Jersey Turnpike, Garden State Parkway, Atlantic City Expressway, and portions of Route 440). This task was undertaken for the Department of Treasury as a subcontractor to a major infrastructure firm that was studying the economics of privatization of these assets. SAI's assignment was to quantify the potential future environmental upgrading needs and costs of these assets for a potential 99-year lease period. However, SAI also undertook a qualitative assessment of additional risk factors including those posed by climate change. It was apparent that ocean level increases over the 99-year lease period would affect the viability of stormwater management facilities, bridges and culverts, particularly in coastal areas.

As engineers and environmental scientists who are closely attuned to regulatory compliance, we must also think about the big picture, addressing climate change and the need to rethink design criteria for all remediation and infrastructure projects. Therefore, SAI will include a specific evaluation as appropriate in future engineering reports and designs for potential implications of climate change on any project undertaken from this point forward.

Dr. Lahbib Chibani, Ph.D., P.E., President of SAI, received his Ph.D. from the University of Illinois in civil engineering with a concentration in coastal

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SAI Teams Up to Win NJDEP Remedial Design Contract

SAI is pleased to announce that we are part of one of the two winning teams on the 2012 NJDEP Remedial Design Services Term Contract. SAI entered into a Joint Venture agreement with CDM Smith, a consulting, engineering, construction, and operations firm with offices and projects across the globe.

The management of this contract will be led by Dr. Lahbib Chibani, P.E., President of SAI, and Ms. Maria Watt, P.E., Senior Project Manager at CDM Smith. This \$5 million contract will be specifically with the NJDEP, but our team will also be available to other state agencies in need of remedial design and redesign services.

SAI is proud to team with such a global engineering leader, and is looking forward to continuing our ongoing professional relationship with the State of New Jersey.

From the Editor -

If you would like to receive a full-color electronic version of our newsletter in Adobe PDF format via email, or if you want additional information about SAI and its services, please send an email to: lthompson@sadat.com.

Thanks — we look forward to hearing from you.

**SAI Performs High Rate
Aquifer Pumping Tests with
Customized Variable Speed Pump**

SAI staff designed and constructed a variable speed high capacity pump for performing long-term constant rate aquifer pumping tests. Aquifer tests performed with high capacity pumps are invaluable for defining site-specific hydrogeology and estimating critical aquifer parameter values.



Above, a photo of SAI's variable speed high capacity pump.

Typical pumps used in performing aquifer tests have limited maximum pumping rates, and often cannot be carefully controlled to achieve and maintain a specific pumping rate throughout the tests. Maintaining a constant pumping rate simplifies analysis and improves the accuracy of estimated aquifer parameter values. Higher pumping rates are necessary for stressing a larger area of the aquifer, which vastly improves both our overall understanding of the site and the design of appropriate groundwater remediation programs.

SAI recently used its variable speed high capacity pump to perform a 24-hour constant rate pumping test at a client's site. During the step-drawdown test (performed to estimate the maximum sustainable pumping rate of the well) a pumping rate of approximately 100 gallons per minute was achieved. The final sustainable pumping rate identified for the well was 35 gpm, which was maintained throughout the duration of the 24-hour test.

Continuous water level instruments were installed on numerous monitoring wells during the test to measure water level declines (i.e., drawdowns) induced by pumping over time. The time-drawdown data collect-

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**SAI Designs and Performs
Comprehensive Surface Water Study**

SAI designed and performed an NJDEP-approved surface water study for a client whose site is located near the Raritan River. The objective of the study was to determine whether groundwater flowing from the site is impacting the water quality of the river.

The study consisted of collecting numerous water quality samples at eleven approved surface water stations situated on both sides of the Raritan River, located upstream, downstream, and adjacent to the site. The water quality parameters included select metals, volatile organic compounds, and general water quality indicators like total dissolved solids, total suspended solids, ammonia, coliform, and pH. Numerous surface water stations were necessary to account for variable water quality conditions that change in response to land use conditions, as well as variable hydrologic and hydraulic conditions.

Water quality samples were collected during two high tide and two low tide events. In addition, sediment samples were collected during the first low tide sampling event at the eleven surface water sampling stations. A bathymetric survey was also performed to estimate the river's volumetric discharge rate during both low and high tide conditions.

SAI performed a study using its team of environmental scientists, marine scientist, and a licensed boat operator. Samples were collected using an 18-foot powerboat, and a canoe for a less accessible station. The study results are being combined with a water level study of both the groundwater system and the Raritan River to estimate and verify potential impacts from the site on the Raritan River. The results of the study will be used to support an application for a Classification Exception Area (CEA) and modified post-closure site requirements.

NJSDA

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"These projects for the NJS-DA fit nicely with SAI's menu of professional services," says Randy Kertes, SAI's Director of Land Use & Environmental Services. "They require the talents of civil engineers, environmental planners, environmental scientists, environmental engineers, and regulatory permit specialists, all of whom we have in-house. SAI has the expertise to handle multi-faceted projects of this nature, which makes us an ideal firm to meet the needs of the NJSDA."

MedAssure

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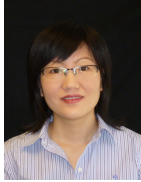
waste suitable for disposal at a licensed solid waste disposal facility.

SAI's Project Manager, Mr. Khaled Benslimane, worked closely with Mr. Joe Deloioacovo, Vice President of MedAssure, a national expert in the field of medical waste and its various treatment systems. Mr. Deloioacovo currently manages a series of waste management systems operated by MedAssure. The Lakewood facility is designed to handle waste from the immediate Ocean County area and several adjacent counties.

SAI is proud to have completed another first in obtaining a permit for a much needed treatment facility. In addition to creating jobs in New Jersey, the MedAssure Lakewood facility will bring the state one step closer to being self-sufficient in handling its waste treatment needs.

Welcome!

Dr. Wen Liu is a project engineer at SAI. She holds B.S. and M.S. degrees in Environmental Science from Sun Yat-sen University in Guangzhou, China, and received her M.S. and Ph.D. degrees in Environmental Science from Rutgers University. Dr. Liu has experience with assessing personal exposure to air pollutants and developing health and safety protocols.



Wen Liu

Jonathan Marino received a B.S. in Civil Engineering from the University of Delaware in May 2012. Jon worked as an intern for SAI during the summer of 2011. Jon is a project engineer for SAI.

SAI's Holiday Project

2012 was another successful year for SAI. In the spirit of the season, our employees gave back to the local community. Specifically, we became involved in the Adopt-a-Family program through Volunteers of America in the Delaware Valley region. We adopted two families through this program. We provided each family with gift cards to help during the holiday season, and fulfilled the wish lists of the children and their parents by providing clothes and toys.



Volunteers of America operates year-round. If you are interested in offering your time or services, please visit their website at www.voadv.org.

Hurricane Sandy

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engineering. In addition to his consulting work, Dr. Chibani has taught numerous civil and environmental engineering courses, including several that addressed coastal engineering issues. He has worked on marine research and optimal design of coastal structures under dynamic wave loads, and designed a model for wave energy recovery. He will provide direction to other members of the firm in integrating considerations about climate change into SAI's engineering and design projects.

Pumping Test

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ed during the test were analyzed to derive the aquifer parameter values and to estimate the extent of hydraulic capture induced by the pumping well and the entire groundwater control system. This information is necessary for assessing the potential impacts of the site on nearby receptors, and is essential for designing a groundwater control system that uses the proper number and spacing of recovery wells for containing groundwater contamination migration.

This pump was designed and built in-house; it is not currently available in the retail market. For more information on how such a device might work for your project, please contact Dr. Emery A. Coppola, Jr., SAI Senior Project Manager.



Substantial shore protection structures such as this sea wall (left) did not survive the hurricane's storm surge. Hundreds of engineering projects for shore stabilization are currently being planned -- will they be properly designed for the next big one?