GeoTesting EXPRESS

Salt Waste Processing Facility

Project Description

This project includes both preliminary and final design, construction and start-up of the Salt Waste Processing Facility (SWPF) at the Department of Energy's (DOE) Savannah River Site (SRS). This facility will handle roughly 37 million gallons of high-level radioactive liquid waste to separate actinides and remove radioactive cesium. The decontaminated salt solution will then be treated as low-level waste. The actinides and concentrated cesium waste will be further processed and disposed of in a high-level waste facility. The SWPF is part of the DOE's plans for an accelerated risk reduction and a cost-effective cleanup of the high level waste tanks at the Savannah River Site.

GeoTesting Express' Role

GeoTesting Express, Inc. (GTX) was a key member of the team contracted to perform the comprehensive geotechnical investigation in support of the final design of the SWPF. GTX's role was to perform laboratory testing on all of the undisturbed Shelby tube samples for the project. GTX's ability to store, process and test over 340 undisturbed Shelby tubes in an accelerated schedule was a major factor in our selection.

Another major factor was GTX's previous nuclear experience in providing testing services on the Savannah River Site. GTX's quality system was designed to meet the requirements of NQA-1, which is necessary to work on nuclear-related projects. We had procedures in place not only for performing all of the testing, but also for maintaining a comprehensive quality system.

Quality oversight during the project was

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Shelby tube samples in the 100%-relative-humidity chamber

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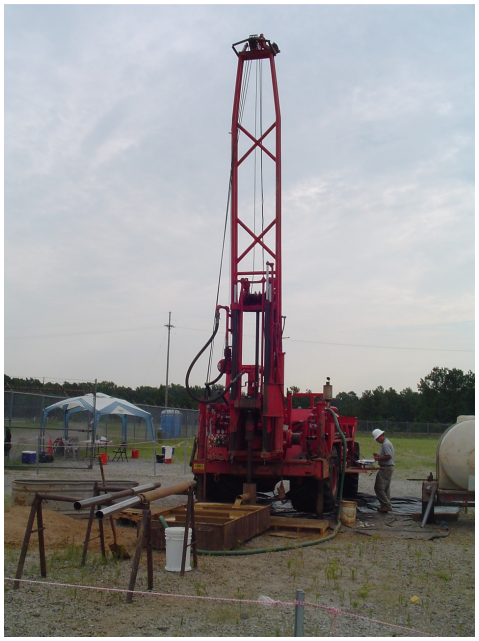
intense. Several audits were conducted at our laboratory to ensure quality compliance. Audits were conducted before the test program began, during the test program and after the test program was completed. GTX responded to any findings during those audits within days of being notified.

Shelby tubes were transported from the Aiken, SC site to our Boxborough, MA laboratory using our state-of-the art Shelby tube shipping containers, which are specially designed to minimize sample disturbance. To reduce the chance of sample disturbances and moisture loss, the Shelby tubes were stored upright inside a 100%-relative-humidity chamber.

GTX x-rayed each Shelby tube and produced a high-definition color image of the x-ray. This allowed the client to see the condition of the samples, any changes in strata, and any voids within the tube. The client could then dictate exactly where tests were to be performed on each tube.

The soils encountered on the site were layered with sorted alluvial deposits and shallow marine deposits of which 4 compressible layers were targeted for undisturbed sampling and testing. These soils ranged from clays to combinations of silty fine sands and sandy clays. The borderline classifications of some of these soils made the x-ray process a vital component in determining the condition of the samples prior to opening the tubes, and in allowing the best quality sample to be tested. Although some of the compressible soils encountered were plastic in nature, some were more border-line, making the handling, storing and trimming important in producing the best possible data.



Field sampling operations

In a roughly thirteen week period, GTX performed the following analyses:

- 340+ x-rays of Shelby tubes
- 340+ index tests (grain size analysis, Atterberg limits, moisture content, specific gravity, density, classification)
- 50+ UU triaxials
- 60+ constant-rate-of-strain consolidations
- 55+ CU triaxials
- 30+ permeabilities
- 20+ direct shear
- 20+ unconfined compressions

We also provided the detailed data packages as required by the project specification. This included the final test report, all raw laboratory test data, all calculations, test equipment used and calibrations, three hard copies and an electronic deliverable.

Benefits to Client

Initially GTX had nineteen weeks to complete the testing required for the project, however, due to sampling delays in the field, that schedule was condensed to about thirteen weeks. Facing a condensed schedule, GTX acted quickly to bring additional test stations on-line, including six consolidation (incremental and constant-rate-of-strain), three triaxial and three direct shear test stations. By doing so, we were able to meet the project schedule and to provide final results to the client on time. This allowed the client to commence the final design without delay.

This flexibility proved to be an incredible asset to the project team, saving thousands of dollars in delay costs. Our project team was able to manage this $250,000+ testing program and to provide the detailed reporting submittals on time. Also, GTX's previous nuclear-facility-related experience meant that we understood exactly what the quality requirements of the project were. We had little trouble meeting the requirements of the project and gaining approval to begin testing.

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