



CCAFS Landfill Environmental Compliance

Cape Canaveral Air Force Station

Relevant Services

- Planning, Permitting and Compliance
- Contamination Assessment
- Risk Management
- Investigative Waste Disposal
- Well Rehabilitation
- Groundwater Sampling
- Aquifer Performance Testing
- Hydrogeologic modeling
- GIS Mapping

Challenges

- Historical Inconsistencies
- Multiple Contractors
- Expedited field activities
- Rugged terrain and sampling conditions

Contract number: W91278-15-D-0096

Task Order number:
W9127817F0162

OVERVIEW

NovelE was hired as a named subcontractor to this U.S. Army Corps of Engineers (USACE), Mobile District project to provide FY17 Landfill Compliance Services for the 45th Space Wing (45 SW) at Cape Canaveral Air Force Station (CCAFS). The scope of work for the Task Order includes three projects for the CCAFS landfill. Cover permit compliance is required for the construction and demolition (C&D) and asbestos monofill landfill cells, and a groundwater compliance monitoring assessment is required for the entire landfill complex.

Groundwater compliance monitoring assessment was subcontracted to NovelE. NovelE conducted a groundwater compliance monitoring assessment for the Cape Canaveral Air Force Station (CCAFS) landfill complex. The assessment was intended to assist in maintaining permit compliance and included an investigation, an optimization plan, and recommended corrective measures. Core services provided by NovelE included Aquifer testing; Development of a conceptual groundwater flow model; 3-D hydrogeologic modeling using GIS; Well redevelopment, rehabilitation, abandonment, and installation; Groundwater sampling, a Background Study with ProUCL Statistical analysis; and Design of corrective measures.

Above average constituent concentrations had been reported for samples from the landfill groundwater monitoring system for the last five years. The groundwater compliance monitoring assessment was intended to evaluate the cause of the increased constituent concentrations. The assessment included a monitoring well optimization study to identify natural background concentrations, parameters exceeding background, and possible



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issues contributing to sample concentrations. The results of the study were used to design corrective actions for identified deficiencies and prepare recommendations to optimize the groundwater-monitoring network and monitoring program.

The assessment included a detailed hydrogeologic investigation of the entire landfill complex. A well survey was conducted and groundwater flow interpretations for the past decade revised based on the new survey data. The revised groundwater flow interpretations confirmed prior historical data indicating groundwater flow beneath the landfill complex to an adjacent canal. Subsequently, the investigation focused on evaluation of the groundwater and surface water interaction and hydraulic connection.

A series of Aquifer Performance Tests (APTs) were conducted to define aquifer parameters and heterogeneity both vertically and laterally. Slug tests were performed at individual wells and multiple-well pumping tests were performed at well clusters. Long-term hydrographs were obtained from monitor wells at various depths within the surficial aquifer and from the canal at staff gauges. The collected data was used to prepare a conceptual groundwater flow model for the complex including groundwater and surface water interaction.

According to FDEP guidance, the background concentration for each constituent is either the maximum concentration reported or twice the mean concentration, whichever is lower. ProUCL 5.1.00, a statistical software for environmental applications for data sets with and without non detect observations, was utilized to generate the general statistics. Average or Mean values were calculated using the Kaplan-Meier (KM) method with non-detects at one-half of their value. General statistics were calculated for each well and for each of the three zones based on the corrected groundwater flow direction and evaluation of background wells. This data was utilized to support an Investigation Phase Report and Optimization Plan outlining next steps for the landfill compliance. As part of the optimization phase, NovelE provided oversight for repairs of existing compliance wells to ensure surface water intrusion into groundwater is not occurring and abandonment of pumping test wells installed by prior consultants.

