# QUALITY ASSURANCE PROJECT PLAN / SITE SAMPLING PLAN

# LOBECO PRODUCTS REMOVAL INVESTIGATION LOBECO, BEAUFORT COUNTY, SOUTH CAROLINA

**Revision 1.0**

**Prepared for:**

**U.S. ENVIRONMENTAL PROTECTION AGENCY**
**Region 4**
**61 Forsyth Street**
**Atlanta, Georgia 30303**

**Prepared by:**

**Oneida Total Integrated Enterprises**
**1220 Kennestone Circle, Suite 106**
**Marietta, Georgia 30066**

| | | |
|---|---|---|
| Contract No. | : | EP-W-05-053 |
| Task Order No. | : | TNA-05-003-0154 |
| Date Submitted | : | November 17, 2011 |
| EPA Task Monitor | : | Chuck Berry |
| Telephone No. | : | 404-562-8278 |
| Prepared by | : | Lou Von Oldenburg |
| Telephone No. | : | 678-355-5550 |

**REVIEWS AND APPROVALS**

**CLIENT NAME: U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION 4**
**CONTRACT NO.: EP-W-05-053**
**TECHNICAL DIRECTION DOCUMENT NO. TNA-05-003-0154**
**QUALITY ASSURANCE PROJECT PLAN / SITE SAMPLING PLAN**
**LOBECO PRODUCTS REMOVAL INVESTIGATION**
**LOBECO, BEAUFORT COUNTY, SOUTH CAROLINA**

We the undersigned have read and approve of the quality assurance guidelines presented in this Quality Assurance Project Plan/Site Sampling Plan for work activities at the Lobeco Products Removal Investigation site in Beaufort, South Carolina.

**Prepared by:**

Lou Von Oldenburg
START Project Manager

**Approved by:**

Limari Krebs
START Quality Assurance Manager

Chuck Berry
EPA Task Monitor/Quality Assurance Manager

## DISTRIBUTION LIST

This document will be distributed to the following project participants once all approval signatures have been received:

| | |
|---|---|
| Chuck Berry<br>EPA Task Monitor<br><br>Katrina Jones,<br>EPA Project Officer<br><br>Sharyn Erickson,<br>EPA Project Officer | 61 Forsyth Street, SW<br>Atlanta, GA 30303 |
| START File,<br>Oneida Total Integrated Enterprises (OTIE) | 1220 Kennestone Circle<br>Suite 106<br>Marietta, GA 30066 |

**CONTENTS**

Section Page

## APPENDICES

**APPENDIX A - FIGURES**



**APPENDIX B – TABLES**

# 1.0 INTRODUCTION

The U.S. Environmental Protection Agency (EPA) has tasked the Oneida Total Integrated Enterprises, (OTIE) Superfund Technical Assessment Response Team (START), under Contract Number (No.) EP-W-05-053, Technical Direction Document (TDD) No. TNA-05-001-0138, to provide the technical expertise and field personnel to perform field investigation activities in support of a Removal Investigation (RI) at the Lobeco Products (LP) site located in Lobeco, Beaufort County, South Carolina (the site). The general purpose of this RI is to collect information and identify the nature and extent of contamination and to determine the need for federal intervention under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980 and the Superfund Amendments and Reauthorization Act (SARA) of 1986.

Under this TDD, START has been tasked to:

- Develop a Health and Safety Plan (HASP) that includes site-specific health and safety measures for conducting the RI designed to identify volatile organic compound (VOC), semi-volatile organic compound (SVOC), metals, pesticide, polychlorinated biphenyl (PCB), and asbestos contamination at the site;
- Document site conditions and RI activities with written logbook notes and digital photographs;
- Develop a Quality Assurance Project Plan (QAPP)/Site Sampling Plan (SSP) that includes site-specific sampling and analysis procedures and quality assurance measures for conducting an RI designed to identify VOC, SVOC, metals, pesticide, PCB, and asbestos contamination at the site;
- Perform RI activities including waste sampling, field hazard categorization (FHC) testing, environmental sampling for VOCs, SVOCs, metals, pesticides, and PCBs, and sampling debris for asbestos as outlined in the QAPP/SSP; and,
- Prepare a comprehensive report summarizing the site conditions, sampling activities, and analytical results of the RI.

All activities and procedures discussed and described in this QAPP/SSP will be presented and conducted in accordance with the approved OTIE QAPP and the EPA Region 4 Science and Ecosystem Support Division (SESD) *Field Branches Quality System and Technical Procedures* (FBQSTP) (Refs. 1, 2).

This QAPP/SSP documents the policies, project organization, quality assurance (QA) requirements, and quality control (QC) procedures to be implemented during field activities to ensure the data are valid for use. This QAPP/SSP combines all EPA requirements for a QAPP (QA-R5) with the elements of a field SSP so that field and laboratory activities are described in one document (Ref. 3). It defines the QA/QC methods that must be implemented to ensure data meet the Data Quality Objectives (DQOs). The Health and Safety Plan (HASP), which is issued as a separate document, defines the preventative and protective procedures that will be implemented during the field investigation to ensure the safety of the field team.

Field activities will include waste and environmental sampling, asbestos sampling and FHC testing. Analytical services will be provided by an EPA-approved private laboratory and will comply with the laboratory's Standard Operating Procedures (SOPs) and the applicable analytical methods required for this project. The findings of this sampling event will be used to generate an RI report that will then be used to determine the need for further federal intervention under CERCLA.

The following sections provide the details of this QAPP/SSP:

- Section 2: Describes the proposed project personnel;
- Section 3: Describes the required training/certification of project personnel;
- Section 4: Describes the site background;
- Section 5: Describes the project and objectives;
- Section 6: Describes the sampling design and proposed field activities supporting the sampling event;
- Section 7: Describes the site documentation and data management procedures;
- Section 8: Details the exceptions to the assignment;
- Section 9: Summarizes the proposed field activities supporting the sampling event; and,
- Section 10: Provides references cited to support this document.

Figures and tables are provided in Appendices A and B, respectively.

# 2.0 PROJECT ORGANIZATION

This section presents the project organization for this field investigation. The organizational structure is provided in Appendix A, Figure 4.

## 2.1 EPA START PROJECT OFFICER

The EPA assumes the overall management of this investigation at the request of SCDHEC and the County of Beaufort (the county). The EPA START Project Officer represents the EPA and is responsible for:

- Ensuring that EPA guidance and policy is followed and that EPA objectives are achieved during project activities;
- Tracking TDD budgets;
- Reviewing Work Plans;
- Providing incremental funding; and,

- Maintaining communication with the EPA On Scene Coordinator (OSC) and START Project Manager (PM).

The EPA START Project Officer is Ms. Katrina Jones.

## 2.2 EPA ON SCENE COORDINATOR

The EPA OSC directs the project and is responsible for ensuring that the work is completed in accordance with the requirements of the action memorandum for the site, and for overseeing implementation of the work required under the TDD. The OSC is also responsible for:

- Maintaining communications with the START PM regarding project status;
- Reviewing Monthly Progress Reports (MPRs);
- Providing oversight of field efforts; and,
- Reviewing all project deliverables prepared by START.

The EPA OSC for this project is Mr. Chuck Berry.

## 2.3 START PROJECT MANAGER

The START PM is responsible for project performance, budget, and schedule, and for ensuring the availability of necessary personnel, equipment, subcontractors, and services. The START PM will direct the development of the field sampling plan, evaluate findings, and prepare the RI report. The START PM is selected based on technical experience, project needs, and previous START project experience. Additional responsibilities include:

- Ensuring timely resolution of project-related technical, quality, safety, or waste management issues;
- Functioning as primary interface with the EPA OSC, field and office personnel, and subcontractor points-of-contact;
- Monitoring and evaluating subcontractor laboratory performance;
- Coordinating and overseeing work performed by field and office technical staff (including data validation and report preparation);
- Coordinating and overseeing maintenance of all project records;
- Coordinating and overseeing review of project deliverables;
- Preparing and issuing final deliverables to the EPA; and,
- Approving the implementation of corrective action.

The START PM is Mr. Lou Von Oldenburg.

## 2.4 QUALITY ASSURANCE MANAGER

The QA Manager will be responsible for ensuring that all QA/QC procedures for this project are being followed. The QA Manager will review and approve the QAPP/SSP. The QA Manager will monitor sample techniques and collection, and will address any corrective action or issue that may arise with the analytical laboratory. The QA Manager will also perform internal and external performance and system audits. The audit process will include, but not be limited to, auditing field sampling techniques. The EPA Region 4 QA Manager will assure that the QA/QC procedures for this project are being followed on behalf of the EPA. The START QA Manager, Ms. Limari Krebs, is responsible for reviewing the field QA sample results to ensure that project DQOs are achieved in accordance with this QAPP. The START Associate Program Manager, Mr. Russell Henderson, is responsible for auditing field sampling techniques.

## 2.5 LABORATORY RESPONSIBILITIES

An EPA-approved and SCDHEC certified laboratory will be procured for this project. The analytical method list and matrices that will be analyzed for this project are located in Table 3, Appendix B.

The Laboratory PM will communicate directly with the START PM and will be responsible for the following:

- Efficient delivery of the daily services and support necessary to accommodate the analytical demands of this project;
- Coordination between the network of laboratories for this investigation, if more than one laboratory is procured;
- Coordinating laboratory analyses;
- Supervising in-house chain-of-custody (COC);
- Scheduling sample analyses;
- Overseeing data review and completeness;
- Overseeing preparation of analytical reports; and,
- Approving final analytical reports prior to distribution.

Laboratory QA Officers will be responsible for the following:

- Overview laboratory QA;
- Overview QA/QC documentation;
- Determining whether to implement laboratory corrective actions, if required;
- Conducting detailed data review, if corrective action warrants;

- Defining appropriate laboratory QA procedures; and,
- Preparing laboratory SOPs.

Laboratory Sample Custodian responsibilities will include:

- Receiving and inspecting the incoming sample containers;
- Recording the condition of the incoming sample containers;
- Signing appropriate documents;
- Verifying COC and its correctness;
- Notifying laboratory manager and laboratory supervisor of sample receipt and inspection;
- Assigning a unique identification number and customer number, and entering each into the sample receiving log;
- Facilitating sample transfer to analysts who are retrieving and documenting their removal for use in analysis. The sample custodian is also in charge of restocking the sample after they are returned by the analysts, and documents its arrival to keep a record of custody; and,
- Controlling and monitoring access/storage of samples and extracts.

Laboratory Technical Staff will be responsible for sample analysis and identification of corrective actions. The laboratory will have a Level I/II review process where the analyst reviews the initial data, followed by a Level II review from a senior analyst. The Laboratory PM reviews for completeness. The QA Officer will handle any corrective action necessary.

The analytical laboratory will also be responsible for properly disposing of unused sample aliquots.

## 2.6 DATA VALIDATION MANAGER

The Data Validation Manager is responsible for ensuring that analytical laboratory data are reviewed and validated in accordance with the project objectives outlined in this QAPP/SSP. The following items summarize principle areas of responsibility:

- Reviews compliance of the analytical laboratory to methods and analytical requirements as outlined in the QAPP/SSP and laboratory specification;
- Ensures completeness of analytical deliverables both electronic and hardcopy;
- Ensures data validation qualification is conducted in accordance with the EPA National Functional Guidelines (NFG) for Organic and Inorganic analysis requirements;
- Performs a QA review of all validation reports and validated analytical data;
- Reviews and approves all validation qualifications entered into the electronic database;
- Conducts verification and accounting for all samples, analyte fractions, and analytical parameters; and,

- Approves final qualified analytical database.

All data validation activities will be performed by Ms. Keely Meadows.

## 2.7 FIELD PROJECT LEADER

The Field Project Leader (FPL) is responsible for coordinating all on-site personnel, field decisions, and the overall success of the field investigation. The FPL, or designee, will coordinate and lead all sampling activities and will ensure the availability and maintenance of all sampling materials/equipment. The FPL is a highly experienced environmental professional who will report directly to the START PM.

Specific FPL responsibilities include the following:

- Function as communications link between field staff members, Site Safety Officer (SSO), the EPA OSC, and the START PM;
- Oversee the mobilization and demobilization of all field equipment and subcontractors;
- Coordinate and manage the Field Technical Staff;
- Adhere to the work schedules provided by the START PM;
- Be responsible for maintenance of the field logbook and field recordkeeping;
- Initiate field task modification requests when necessary;
- Identify and resolve problems in the field;
- Resolve difficulties in consultation with the EPA OSC; and,
- Implement and document corrective action procedures and provide communication between the field team and START PM.

The FPL for this site is Ms. Amanda Miolen

## 2.8 START SITE SAFETY OFFICER

The START SSO ensures that the HASP is prepared and implemented during field investigation activities. The SSO is knowledgeable with Occupational Safety and Health Administration (OSHA) and EPA Health and Safety requirements.

Specific SSO responsibilities include:

- Monitoring health and safety of the field sampling personnel;
- Assessing hazardous and unsafe situations;
- Developing measures to assure personnel safety during field investigations;

- Correcting unsafe acts or conditions through the regular line of authority;
- Exercising emergency authority to prevent or stop unsafe acts when immediate action is required;
- Maintaining awareness of active and developing situations; and,
- Conduct on-site safety meetings.

The START SSO is Mr. Ryan Stubbs (or designee assigned)

## 2.9 FIELD TECHNICAL STAFF

The Field Technical Staff for this project will be drawn from OTIE's pool of qualified personnel. Field personnel are responsible for conducting all field activities according to the requirements presented in this QAPP/SSP. All of the designated field team members will be experienced professionals who possess the degree of specialization and technical competence required to effectively and efficiently perform the required work. The following START personnel will be involved in the field investigation as follows:

- Mr. Ryan Stubbs (or designee assigned) Sampler/FHC
- Jerry Partap (or designee assigned) Sampler/FHC

# 3.0 SPECIAL TRAINING/CERTIFICATION

Training is required for each individual performing activities in support of environmental data collection or analysis. The OTIE Human Resources (HR) Department maintains an individual file for each OTIE employee who includes certificates for 40-hour hazardous waste operations and emergency response (HAZWOPER) and 8-hour refresher training records.

The laboratory performing analytical services must hold certification by SCDHEC and/or the National Environmental Laboratory Accreditation Program (NELAC) as a requirement for this project. In addition, the laboratory manager is responsible for ensuring that personnel training are current and documented as defined in the laboratory's SOPs. It is the laboratory's manager's responsibility to determine specific training and certification needs, and for ensuring that any required training is documented.

Individuals implementing this QAPP/SSP must receive, at a minimum, orientation to the project's purpose, scope, and methods of implementation. This orientation is the responsibility of the PM or designee. Any field team members involved with sample collection or handling will have received 40-

hour HAZWOPER – 29 CFR 1910.120 training and their 8-hour HAZWOPER refresher up to date. The Health and Safety Officer will have received 8-hour supervisor training course (HAZWOPER – 29 CFR 1910.120). Any other safety-related training is defined in the project HASP.

# 4.0 BACKGROUND

The following sections provide background information to provide a historical, scientific, and regulatory perspective for this project.

## 4.1 SITE DESCRIPTION

The LP site is located at 23 John Meeks Way in Lobeco, Beaufort County, South Carolina (Appendix A, Figures 1 and 2). The property includes 125 acres of land surrounded by agricultural, rural residential, and undeveloped property. Most of the site is currently owned by Coastal Demolition, although portions of the property are owned by other parties (Ref. 4).

The site's latitude is 32.555753$^{o}$ north and the longitude is -80.729317$^{o}$ west and the closest cross road is Keans Neck Road, located to the northeast. It's located on FEMA's flood insurance rate map 4500250040D and is rated as Flood Zone C. The commercial property ID is recorded as R700 037 000 0017 and its legal description is listed as:

> TRACT 1 DORMANT LAND ASSESSED BY SCDOR 607 00094 FILE#60700125 LOBECO PRODUCTS *SPLIT 10/90 4.93 AC 37/17B *CORPORATE NAME CHG DB1735 P579 *4/10 9.16 AC MERGED FROM 37/94 PB128 P16 *4/10 SPLIT 121.04 AC 37/181-186, 188 *4/10 SPLIT 33.49 AC 37/187 PB128 P21 DORMANT LAND ASSESSED BY SCDOR 607 00094 FILE#60700125 LOBECO PRODUCTS

Currently the site maintains a portion of the chemical processing structures, a storage/warehouse, a lab testing area, offices and the waste water treatment facility. Part of the processing facility has been demolished but the rubble remains onsite; there is concern for asbestos in the demolition debris. The site is bordered to the north and west by undeveloped property owned by the Community Development Corporation of Beaufort County, and several site features, including the large parking lot, the most northeastern building, and the electronic gate are actually on property owned by the Community Development Corporation of Beaufort County. To the east are several single-family residences. To the south, the site is bordered by Morgan Road (also known as State Road S-7-301), which is immediately adjacent to the Huspa Creek tidal flats.

## 4.2 REGIONAL GEOLOGY AND HYDROGEOLOGY

The Natural Resource Conservation Service (NRCS) soil survey lists the dominant soil type at the site as Yemassee loamy fine sand (Ye) with a zero to two percent slope (Ref 5). The report also lists the mean annual precipitation to be from 45 to 52 inches, and the mean annual air temperature to be 64 degrees Fahrenheit (º F) to 70º F. The parent soil material is comprised of loamy marine deposits, and is a considered a somewhat poorly drained soil. The typical profile is listed as zero to fifteen inches of loamy fine sand underlined by fine sandy loam. The typical depth to water table is between twelve and eighteen inches below ground surface (bgs). The Soil Survey of Beaufort and Jasper Counties, South Carolina reports the profile of the surface soil is dark gray loamy fine sand and the subsurface soil will be light yellowish-brown loamy fine sand, commonly found within the Lower Coastal Plain region (Ref. 6).

According to the NRCS soil survey, additional soil types at the property include Tomotley loamy fine sand (To) and Chisolm loamy fine sand (CmB). Tomotley loamy fine sand also has a zero to two percent slope, parent soil material that is comprised of loamy marine deposits, and is a poorly drained soil. The typical profile is listed as zero to thirteen inches of loamy fine sand underlined by sandy clay loam and sandy loam. The typical depth to water table is between zero and twelve inches below ground surface (bgs). The Soil Survey of Beaufort and Jasper Counties, South Carolina reports the profile of the surface soil is dark gray loamy fine sand, and red, olive, and/or brown mottles can be observed with depth.

The Chisolm loamy fine sand has a zero to six percent slope, parent soil material that is comprised of loamy marine deposits, and is considered a somewhat excessively drained soil. The typical profile is listed as zero to twenty-five inches of loamy fine sand underlined by sandy clay loam and fine sandy loam. The typical depth to water table is between thirty-six and sixty inches below ground surface (bgs). The Soil Survey of Beaufort and Jasper Counties, South Carolina reports the profile of the surface soil is grayish-brown to pale brown sand, and the subsurface is comprised of yellowish-red sandy clay loam with red, brown and/or gray mottles observed with depth (Refs. 5, 6).

## 4.3 OPERATIONAL HISTORY

The LP site operated as a specialty chemical manufacturer for more than 40 years (1966 to 2009). The product lines included dyes, farm chemicals, drilling fluid chemicals, and general specialty chemicals. The property has been abandoned since December of 2010, with power off to most or all of the property.

The site was initially owned by Tenneco Chemicals, Inc. The Tenneco Chemicals Berkshire Color Division constructed the plant for the production of dyestuff intermediates in 1967. Prior to that time the property was farmland and had not been subject to any industrial or commercial use. From 1974 to 1982 ACC owned the facility and operated as a manufactured chemical facility; the exact chemicals produced are unknown. From 1982 to 1989 the property was owned by Venture Chemicals (a.k.a. Lobeco Products). Venture Chemicals historically worked with basic cellulose and lignite derivatives. From 1989 to 1998 the site was owned by Compagnie Francaise des Produits Industriels (CFPI). CFPI was a manufacturer of agrochemicals, surfactants and other specialty industrial chemicals. One of their products was a granulation aid and anti-caking agent for fertilizers - particularly ammonium nitrate. NuFarm acquired CFPI stock in 1998 and owned the facility from 1998 to 2005. NuFarm also worked with chemicals and chemical preparation, particularly pesticides, herbicides and fungicides. From 2005 to 2009 the facility was owned by ARR-MAZ Custom Chemicals Inc, known for pesticides and agricultural chemicals. After ARR-MAZ the facility was shut down and sold at auction to Coastal Demolition. Coastal Demolition recovered an unknown amount of scrap from the facility, demolishing the reactor building in the process. No chemicals were reported to have left the facility during Coastal Demolition's operation.

While operating under Tenneco the facility used Monsanto Corporation's Aroclor 1248 PCB product. The Aroclor 1248 was used as a heat transfer oil. During the process of producing its J-Acid, a dyestuff intermediate, raw material had to be interacted at very high temperatures. The high temperatures were attained by the use of a heat transfer oil in a hot oil reactor system. Aroclor 1248, a PCB oil, was used in that system.

The hot oil system in which Aroclor 1248 was used malfunctioned at times. On these occasions the heating elements would blow out resulting in discharges of PCBs into the Lobeco drainage system. The quantity ranged from a few gallons to 300 gallons, the entire capacity of the system. Also in order to replace blown out elements, the entire hot oil system had to be drained. When the change out occurred, sometimes the oil would leak into the drainage system and straight into the holding lagoons or the ground. Untreated liquids from the lagoon were discharged directly into Whale Branch, which flows into Campbell Creek, and ultimately the Atlantic Ocean.

During a court case of American Color & Chem. Corp. v. Tenneco Polymers, it was revealed that when the facility was operated under Tenneco it utilized an isolated burn site on the outer reaches of its Lobeco property for the burial of used drums, off-spec material, and paper and metal refuse. Reportedly, Aroclor 1248 was released into the burn site area during Tenneco's ownership of the plant.

## 4.4 PREVIOUS INVESTIGATIONS

In 1983 SC DHEC conducted an in-stream assessment of Campbell Creek and Whale Branch. A follow up SC DHEC study in December 1984 revealed the presence of PCBs in the immediate vicinity of the Lobeco plant effluent discharge point. As a result of this finding Davis & Floyd Engineering conducted groundwater testing and produced a groundwater monitoring report which revealed the presence of PCBs at the Lobeco Plant.

Based on this information Tenneco Products commissioned further tests in order to characterize the extent and location of the PCB problem at the Lobeco Plant. Initial soil borings indicated the presence of PCBs in the abandoned lagoon.

In 1986 G & E Engineering, hired by SC DHEC, issued a preliminary investigation report pinpointing the location of the PCB contamination at the lagoon and burn site areas. In 1987, under the first of three SC DHEC consent orders, cleanup of the PCBs commenced. RMT of Greenville was chosen as the contractor for the remediation, dig and haul. An exact date of the completion of the dig and haul remediation was not found, however the final report was produced in November 1991. Under the second consent order there was still a concern for PCB impact and cited a need to define the horizontal and vertical extent of groundwater contamination. A well survey of residential wells was performed and found no PCB contamination of groundwater existed in the neighboring wells. No further information could be found at this time.

The current investigation is not focused on these areas, however, and is instead focused on the remaining bulk wastes on site, both in above-ground -containers and in surface impoundments, as well as on-site soil in operational areas of the site, specifically the now demolished reactor building.

# 5.0 PROJECT DESCRIPTION

## 5.1 PROJECT OBJECTIVES

The scope of this removal investigation is to conduct sampling and analysis as well as FHC testing activities at the site to 1) identify any hazardous wastes which may be remaining at the site in containers, tanks, drums, surface impoundments, or other bulk storage containers, and 2) identify any impacts to site soil or surface impoundment sludges resulting from historical releases of CERCLA hazardous substances. All sampling activities will be conducted in accordance with the SESD FBQSTP (November 2007).

Samples will be collected from all above-ground bulk storage containers 55-gallons or greater. Smaller containers may be sampled if time permits. The contents will undergo FHC testing on-site in order to determine if the material contains any characteristically hazardous waste as well as testing for bulking and disposal purposes. Samples from wastewater surface impoundments will also be collected to determine if the water or sludge pose a threat to human health and if it meets any of the definitions of hazardous waste given in 40 CFR 261. The analytical data gathered during this field investigation will provide EPA with sufficient information to determine the need for further federal intervention under CERCLA.

### 5.1.1 Project Target Parameters and Intended Data Usage

Table 3 in Appendix B summarizes the laboratory methods that will be conducted for, sludge, and bulk asbestos sampling.

All analytical data will be reported to the analyte's laboratory-specific method detection limit (MDL); i.e., positive results below the RL but greater than the MDL will be reported by the laboratory and flagged as estimated (J). MDLs will be adjusted on a sample-by-sample basis, as necessary, based on dilutions, sample volume, and percent moisture.

Waste samples will be subjected to field hazard characterization testing, which will collect qualitative, rather than quantitative, data. These data will be used to group like chemicals together for subsequent compositing and analysis. Laboratory analytical data will be used to determine if the material meets any of the definitions of hazardous waste as defined in 40 CFR 261.

## 5.2 TASK DESCRIPTION

The following subsections discuss tasks that START will perform to complete this work assignment allowing for modifications, as needed.

- Task 1 - Perform Project Management and Reporting
- Task 2 - Develop QAPP/SSP
- Task 3 – Develop Sampling Design
- Task 4 - Perform Field Investigation Activities and Data Acquisition
- Task 5 - Prepare Field Investigation Report
- Task 6 - Perform TDD Close-Out Activities

The schedule by which START anticipates conducting/completing the tasks under this work assignment is listed in Table 4 located in Appendix B.

If the statement of work changes because of an amended work assignment, START will revise this QAPP/SSP to incorporate changes in the scope and cost.

### 5.2.1 Task 1 - Perform Project Management and Reporting

START will perform general TDD management activities including communications with the EPA OSC, managing and tracking costs using Removal Cost Management System (RCMS), and attending project meetings. The anticipated period of performance for this project is from October 27, 2011 through April 27, 2012. Specifically, START will prepare MPRs in accordance with contract requirements; track costs in RCMS and submit 1900-55 Daily Contractor Cost Report forms as directed by the EPA OSC; and prepare and submit monthly invoices. START will report costs and level of effort for the reporting period as well as cumulative amounts expended to date.

### 5.2.2 Task 2 - Develop QAPP/SSP

This QAPP/SSP has been developed to outline activities to be conducted in support of the RI. The QAPP/SSP lists the tasks to be performed; discusses the technical approach for each task, including identifying DQOs, determining sampling objectives and rationale for the field investigation activities, and ensuring that QA/QC measures are conducted to fulfill DQOs; identifies key personnel to support this work assignment; and provides a schedule for completing each task and submitting deliverables as required by the TDD. START has reviewed available background documents relevant to the investigation, as provided by the EPA, in order to achieve a familiarity with the site and support the development of the tasks.

All efforts will be made to provide the most cost-effective approach to supporting EPA in this work assignment. The QAPP/SSP will be amended as necessary to incorporate unforeseen future activities or changes in the scope of the work assignment.

### 5.2.1 Task 3 - Develop Sampling Design

START will develop a sampling design in accordance with the EPA *Guidance on Choosing a Sampling Design for Environmental Data Collection* (QA/G-5S) to ensure that DQOs are fulfilled for the RI (Ref. 7). Specifically, the design will take into account data needs, key decisions, and environmental variables, such as physical and site constraints, and how the spatial and temporal boundaries of the contamination and population at risk will be identified. The sampling design presented in Section 6.1 has been developed based on the results of an initial site walk, and input from the TM.

### 5.2.2 Task 4 - Perform Field Investigation Activities and Data Acquisition

START will perform field investigation activities including sampling and FHC testing. The data will provide EPA with sufficient information to identify the need for federal intervention under CERCLA. This task will begin with EPA approval of this QAPP/SSP and will end with the demobilization of field personnel and equipment from the site.

### 5.2.3 Task 5 – Prepare a RI Report

START will prepare a RI Report summarizing the existing conditions at the site, describing the field investigation activities, and describing the contamination at the site. The RI Report will provide information to assess immediate risks to human health and the environment. Environmental and QA/QC analytical data will be evaluated and data tables will be attached to the report. Significant QA/QC issues regarding sample collection, handling, and analysis will be identified in the report.

### 5.2.4 Task 6 - Perform TDD Closeout Activities

START will perform the necessary activities to close out the TDD in accordance with the contract requirements including packaging and returning documents to the U.S. government and duplicating, distributing, and storing files, as necessary.

## 5.3 DELIVERABLES AND INVESTIGATION SCHEDULE

The schedule by which START anticipates submitting the associated deliverables under this work assignment is listed in Table 4 located in Appendix B.

## 5.4 DATA QUALITY OBJECTIVES AND CRITERIA

START has identified DQOs for the site in accordance with the EPA Guidance for the DQO Process, (U.S. EPA QA/G-4, 2006), that will define study objectives, decisions to be made, and the criteria by which the data will be assessed (Ref. 8). These data will then be used for decision making. Upon completion of the work described throughout the QAPP/SSP, the data collected will be compared to the established DQOs to ensure that the information collected meets the intended goal of the work. DQOs have been developed following these seven steps:

- Problem statement
- Identify the decisions
- Identify the inputs into the decision
- Define the boundaries of the study
- Develop decision rules
- Specify tolerable limits on decision errors
- Optimize the design for obtaining data

The information presented in the next several sections describes the DQOs identified for this assessment.

### 5.4.1 Problem Statement

A former custom-chemical manufacturing plant has been abandoned, and there is a potential for a release of hazardous substances, pollutants, or contaminants into the environment from drums, tanks, or other containers on site.

### 5.4.2 Identify the Decisions

This investigation will focus on 1) determining if material stored in containers and water and sludge in the wastewater treatment ponds could be classified as characteristically hazardous waste, and 2) determining the presence or absence of contamination in and around the former manufacturing areas of the site, including the debris pile in the area where the reactor building once stood. Therefore, the following primary decisions have been identified:

1. Do the contents of ASTs, vessels, drums, totes, and wastewater surface impoundments meet the definition of hazardous waste as defined at 40 CFR 261?
2. Does the level of contamination warrant further EPA involvement?

### 5.4.3 Decision Inputs

The primary input needed to support the decision making process is reported analytical concentrations of contamination in waste, wastewater, and sludge samples collected from the site. Analytical results used in the decision-making process will come from Target Compound List (TCL) VOCs, TCL SVOCs, TCL pesticides, PCBs, TAL metals, asbestos, and FHC results. Laboratory analysis of the samples collected on site will be performed by an EPA-approved private laboratory.

### 5.4.4 Study Boundaries

The media of interest include on-site sludges and debris piles. The study boundaries include the study area, sample depth, temporal boundaries such as field investigation dates and turnaround times on analytical results, and physical boundaries.

- The study area is the boundary of the site as shown in Figures 1 and 2 located in Appendix A.
- Samples from on-site ASTs, vessels, drums, and totes will be collected and assessed using FHC procedures to determine if characteristically hazardous waste is present.
- Sediment samples will be collected from the wastewater treatment impoundments and submitted to the laboratory for VOC, SVOC, metals, pesticide, and PCB analysis.
- Wastewater samples will be collected from the wastewater treatment impoundments and submitted to the laboratory for VOC, SVOC, metals, pesticide, and PCB analysis.
- Various solid samples collected on-site from debris piles will be submitted to the laboratory for asbestos analysis.
- Field investigation activities are scheduled to commence the week of January 17, 2012. Field investigation activities are expected to last one week. A standard turnaround time will be requested for final analytical results from the laboratory. An additional 6 weeks will be necessary to perform data validation activities.

### 5.4.5 Decision Rule

The primary decisions in the DQO process for the site are: (1) Are the contents of the containers and wastewater surface impoundments characteristically hazardous? (4) Is there asbestos in the debris pile which may pose a threat to persons working in the area?

Waste samples will be collected and submitted to a certified laboratory for VOCs, SVOCs, TAL metals, pesticides, and PCBs. In addition, various solid samples will be collected on-site and submitted to a

certified laboratory for asbestos analysis. Analytical and screening results will be used to determine if contaminants of concern exist on site and whether federal invention under CERCLA is needed.

### 5.4.6 Error Limits

Sections 6.2.4 and 6.2.7 will describe the error limits introduced through sample collection, mixing, storage, transportation, and analysis.

### 5.4.7 Optimize Sampling Design

The data collection activities will focus on identifying the presence or absence of contamination in several study areas. Section 6.1 will describe the sampling design in detail.

## 5.5 MEASUREMENT QUALITY OBJECTIVES

Measurement quality objectives can be expressed in terms of precision, completeness, and sensitivity goals. Precision are monitored through the analysis of QC samples (Section 6.5.2). Completeness is a calculated value. Sensitivity is monitored through instrument calibration and the determination of MDLs and RLs. Qualitative quality objectives, expressed in terms of comparability, are not addressed as part of this sampling design since sampling locations are biased and not random.

- **Accuracy** is defined as the degree of agreement between an observed value and an accepted reference value. Accuracy shall be measured through the collection of blanks, performance evaluation samples, and blind spike samples.
- **Precision** is defined as degree to which a set of observations or measurements of the same property, obtained under similar conditions, conform to themselves. Precision shall be measured through the collection of duplicate field samples.
- **Completeness** is the amount of data collected as compared to the amount needed to ensure that the uncertainty or error is within acceptable limits. The goal for data completeness is 100%. However, the project will not be compromised if 99% of the samples collected are analyzed with acceptable quality.
- **Representativeness** is the degree to which data accurately and precisely represent a characteristic of a population. This is a qualitative assessment and is addressed primarily in the sample design, through the selection of sampling sites and procedures that reflect the project goals and environment being sampled. It is ensured in the laboratory through (1) the proper handling, homogenizing, compositing, and storage of samples and (2) analysis within the specified holding times so that the material analyzed reflects the material collected as accurately as possible.
- **Sensitivity** is the capability of a test method or instrument to discriminate between measurement responses representing different levels (e.g., concentrations) of a variable of interest. Sensitivity is addressed primarily through the selection of appropriate analytical methods, equipment, and instrumentation. The methods selected for this assessment were chosen to provide the sensitivity required for the end-use of the data. This is a quantitative assessment and is monitored through

the instrument calibrations and calibration verification samples and the analysis of procedural blanks with every analytical batch.

- **Method Detection Limits** (MDLs) for all analyses will be those identified through SW-846 methods.
- **Reporting Limits** (RLs) for all analysis are based on a low calibration standard and are described in each analytical method identified above. Sample-specific reporting limits will be calculated and reported with the final data. There may be numbers reported that are below the RL. These numbers must be flagged appropriately. When the analysis demonstrates a non-detect at the MDL, the data shall be flagged with a "U." The value reported is the MDL, adjusted by any dilution factor used in the analysis. When an analyte is detected between the lower quantitation limit and the MDL, the data shall be flagged with a "J." The value reported is an estimate.

## 5.6 DATA AND DOCUMENT CONTROL

START will maintain logbook notes and collect digital photographs during the sampling event. START will use this information to complete a RI Report summarizing the existing conditions at the site, the field investigation activities, and the nature of contamination at the site. Environmental and QA/QC analytical data will be evaluated and data tables will be attached to the report. Significant QA/QC issues regarding sample collection, handling, and analysis will be identified in the report.

The OTIE internal QC process requires that all project deliverables be reviewed to promote technical adequacy and completeness. The OTIE QA manager or designee will perform internal QC checks of work assignment activities. Internal QC checks will address adherence to this QAPP and the OTIE QAPP for START.

START will retain all file information related to the site in the Marietta, Georgia, OTIE office. Upon EPA request, the entire site file, including all documents generated under the work assignment, will be inventoried and submitted to EPA or to an EPA-designated location within three weeks of the request. In addition, START will provide digital copies of all documents generated under the work assignment, including reports, e-mails, and figures if requested by EPA. All documents generated for the work assignment are the property of EPA and will be retained as part of EPA files. All EPA files will be delivered to EPA at the conclusion of the START contract.

A draft version of the report will be available for review and commenting by EPA within 28 days following receipt of final analytical results from the laboratory. A final version of the report will be available within two weeks following receipt of comments by EPA. Laboratory data will be released to the EPA OSC as it becomes available, if desired. Table 4 in Appendix B lists the schedule for the deliverables and investigation.

# 6.0 SAMPLE DESIGN, DATA GENERATION, AND ACQUISITION

This section of the report discusses the purpose of the sampling event, sampling procedures, a description of tasks associated with the RI, schedule of deliverables, laboratory data management, data quality control, and data validation.

## 6.1 SAMPLE DESIGN

START has developed a sampling design to ensure that DQOs are fulfilled for the sampling investigation. Specifically, the design takes into account data needs, key decisions, and environmental variables, such as physical and site constraints, and how the spatial and temporal boundaries of the contamination and population at risk will be identified. The sampling design presented in the following sections has been developed based on available information from SCDEHC and previous site activities.

Approximately 10 sludge samples, 10 water samples, 5 waste stream samples, eight aboveground storage tank samples and 5 suspect asbestos containing material (ACM) debris samples. Tables 1-3, located in Appendix B, identify the sample analysis, sample numbers, and types of samples proposed.

Sampling locations may change during the field investigation based on field observations by the EPA OSC.

## 6.2 FIELD SAMPLING METHODS AND PROCEDURES

The following section details sample collection methods and equipment for waste, sludge, and debris sampling, sample preservation requirements, and decontamination procedures.

### 6.2.1 Mobilization

START will provide the necessary personnel, equipment, supplies, materials, and facilities for the execution of the field investigation. Activities may include the mobilization of equipment and vehicles, and site access coordination with federal, state, local, and private entities.

### 6.2.2 Site Control and Access

The site is secured and any problems with unauthorized personnel accessing the site operations are not anticipated. However, if at any time, investigation activities cannot, in the opinion of the FPL/SSO, or

sample team members, be conducted due to the proximity of unauthorized persons or other unforeseen conditions or situations, then operations will cease until such time as they can be safely resumed.

During the investigation, field vehicles will be located such that they do not interrupt or impede flow of traffic through the area. Keys to each vehicle will be located with team leaders, as appropriate. Each field vehicle will maintain a copy of this QAPP/SSP and the site specific HASP during all investigation activities.

### 6.2.3 Site Mapping

The location of all sampling stations will be collected using a Trimble® Global Position System (GPS) instrument. GPS coordinates will be collected at each sampling location during the field event. As specified in FBQSTP Global Positioning System procedure (SESDPROC-110-R3), stations will be located with one meter accuracy. If a location is in an area where a GPS signal cannot be received, the GPS of sampling locations will be collected from the nearest point where a signal is received and any deviations noted in the field logbook.

### 6.2.4 Sample Collection

Waste, wastewater/sludge, and debris sampling will be conducted to assess the extent of potential contamination. In short, in the onsite waste water treatment plant area the two aeration tanks will be sampled for sludge and water column, the four clarifiers will be samples for sludge and water column, and the basins will be sampled for sludge and water column. A composite sample from the eight pH adjustment totes will be sampled, the miscellaneous unknown drums and totes will be tested and compiled and an aliquot of the waste stream will be sampled. The random aboveground storage tanks will be checked for product and tested. Also several suspect ACM will be sampled along with an air sample from a personal air monitor.

The sludge and sludge samples will be submitted for laboratory analysis of VOCs, SVOCs, pesticides, PCBs, and TAL metals based on the study area investigated. In addition, the debris samples will be submitted for laboratory analysis of asbestos. Table 3, located in Appendix B, specify the analyses identified for each field sample. Approximately 2 additional QA/QC sample duplicates will be collected as required in FBQSTP Field Sampling Quality Control (SESDPROC-011-R3). All samples collected will be immediately preserved in accordance with FBQSTP Sample and Evidence Management (SESDPROC-005-R1) guidelines.

***Sludge Sampling***

A grab sludge sample will be collected from the bottom of the AST, vessel, or other sludge filled vessel using a sludge judge, ponar dredge or other dredging device. The sample will be placed in a decontaminated stainless steel bowl, and decontaminated stainless steel spoons will be used to place the sample in the appropriate containers for laboratory analysis. Samples will be preserved and placed on ice in accordance with the FBQSTP Sample and Evidence Management (SESDPROC-005-R1) guidelines.

All field observations and descriptions will be recorded in the logbook.

***Debris Sampling***

A grab solid sample will be collected from the debris pile located on-site using a gloved hand. The sample will be containerized, preserved and placed on ice in accordance with the FBQSTP Sample and Evidence Management (SESDPROC-005-R1) guidelines.

All field observations and descriptions will be recorded in the logbook.

### 6.2.5 Equipment Decontamination Procedures

All field sampling equipment will be cleaned and decontaminated in accordance with the FBQSTP Field Equipment Cleaning and Decontamination procedures (SESDPROC-205-R1).

### 6.2.6 Management of Investigation-Derived Waste

All investigation derived waste (IDW) will be managed according to the procedures found in the FBQSTP Management of Investigation-Derived Waste procedure (SESDPROC-202-R1). The following identifies the types of IDW that could be generated during the investigation. IDW will generally consist of personal protective equipment and used disposable sampling equipment. All IDW will be secured in a 55-gallon drum on site, until sample analytical results are received. If, in the best professional judgment of the FPL, personal protective equipment can be rendered non-hazardous, it will be double-bagged and deposited in an industrial waste container, as directed in the FBQSTP SESDPROC-202-R1. All field sampling equipment will be cleaned and decontaminated according to the FBQSTP Field Equipment Cleaning and Decontamination procedures (SESDPROC-205-R1).

### 6.2.7 Sample Processing and Custody

All samples will be collected, containerized, preserved, handled, and documented in accordance with the EPA FBQSTP and the EPA CLP Guidance for Field Samplers (CLPGFS) dated July 2007. The following activity procedures will be followed during field sampling:

- Sample and Evidence Management SESDPROC-005-R1
- Equipment Inventory and Management Procedure SESDPROC-108-R3
- Packing, Marking, Labeling, and Shipping of Environmental and Waste Samples SESDPROC-209-R1

Both hard and electronic copies of the referenced procedures, in addition to the site-specific HASP, will be maintained by the FPL for reference during all phases of the field sampling activities. Any deviations in sampling procedures specified in this QAPP/SSP will be documented, including the reason for the deviation, in the field logbooks.

**Chain of Custody**

All Chain-of-Custody (COC) and record keeping procedures will be in accordance with FBQSTP SESDPROC-005-R1 and the CLPGFS. COC procedures are comprised of the following elements: 1) maintaining sample custody, and 2) documentation of samples for evidence. COC forms will be completed and generated with Scribe software as per the current START contract requirements.

**Station and Sample Identification**

Station IDs will be assigned as follows:

- LP01 – LP21, where LP stands for Lobeco Products RI and the stations are numbered sequentially.

Sample identification numbers will be assigned using the following format:

- LP-SS-##
- LP-DP-##

LP stands for Lobeco Products RI, the SS stands for sludge sample, DP stands for debris pile, and the ## is the sample number beginning at -01.

**Sample Labels**

Sample labels will be prepared and affixed to each sample container sent to the laboratory. The labels will be prepared using waterproof, non-erasable ink as specified in FBQSTP SESDPROC-005-R1 and CLPGFS. Sample labels will be generated with Scribe software as per the current START contract requirements.

**Sample Custody Seals**

The samples collected and containerized will be sealed as soon as possible following collection as specified in the FBQSTP SESDPROC-005-R1 and CLPGFS. The sample custodian will write the date and their signature or initials on the seal.

**Sampling Equipment and Sample Containers**

Sampling equipment used during the field investigation will include a ponar dredge, a sludge judge, stainless steel spoons, and stainless steel bowls. The ponar dredge, sludge judge, spoons, and bowls will be decontaminated in accordance with FBQSTP SESDPROC-205-R1 prior to mobilization to the site. All associated non-dedicated/reusable (ponar dredge, sludge judge, spoons, and bowls) equipment will be decontaminated as necessary during the sampling event in accordance with FBSQTP. All equipment will be handled in accordance with the FBQSTP Equipment Inventory and Management procedure (SESDPROC-108-R3).

Sample containers for samples submitted to the private laboratory will be obtained from the private laboratory. All samples will be placed into QC-quality glass jars, and placed on ice in accordance with the requirements specified in the FBQSTP SESDPROC-209-R1 and CLPGFS.

**Custody Procedures**

The field COC is used to record the custody of all samples sent to the laboratory. All samples shall be accompanied by a COC, completed and maintained as specified in FBQSTP SESDPROC-005-R1. The COC documents transfer of custody of samples from the sample custodian to another person, the laboratory, or other organizational elements. To simplify the COC and eliminate potential litigation problems, as few people as possible will have custody of the samples or physical evidence during the investigation.

The COC also serves as a sample logging mechanism for the laboratory sample custodian. Scribe software will be used to log samples and create a COC for all samples or physical evidence collected. A separate COC will be used for each final destination or laboratory utilized during the investigation.

### 6.2.8 Demobilization

START will remove all equipment and restore all site sampling locations which may have been disturbed during the field investigation.

## 6.3 SAMPLE HANDLING AND CUSTODY

All samples will be containerized, preserved, handled, and documented in accordance with the EPA FBQSTP SESDPROC-005-R1.

### 6.3.1 Sample Handling

Information identifying the location and date/time will be inscribed on each container. After the samples are containerized, they will be placed on ice (maintaining a sample temperature of 4°C), processed (see below), packaged for shipment in accordance with FBSQTP Packing, Marking, Labeling, and Shipping of Environmental and Waste Samples (SESDPROC-209-R1), and transported to a private laboratory for analysis via FedEx.

**Sample Labels**

Sample labels will be prepared and affixed to each sample container sent to the private laboratory. The labels will be prepared using waterproof, non-erasable ink as specified in FBQSTP SESDPROC-005-R1.

**Sample Custody Seals**

The samples collected and containerized will be sealed as soon as possible following collection as specified in the FBQSTP SESDPROC-005-R1. The sample custodian will write the date and their signature or initials on the seal.

### 6.3.2 Chain of Custody

**COC Record**

The field COC Record is used to record the custody of all samples sent to the laboratory. All samples shall be accompanied by a COC Record, completed and maintained as specified in FBQSTP SESDPROC-005-R1. To simplify the COC Record and eliminate potential litigation problems, as few people as possible will have custody of the samples or physical evidence during the investigation.

The COC Record also serves as a sample logging mechanism for the laboratory sample custodian. A separate COC Record will be used for each final destination or laboratory utilized during the investigation.

**COC Procedures**

COC procedures are comprised of the following elements: 1) maintaining sample custody and 2) documentation of samples for evidence. A sample file is under custody when any one of the following conditions is satisfied:

- The item is in the actual physical possession of an authorized person.
- The item is in view of the person after being in his or her possession.
- The item was placed in a secure area to prevent tampering.
- The item is in a designated and identified secure area with access restricted to authorized personnel only.

*Field Custody Procedures*

The FPL (or designee) is responsible for the care and custody of the samples collected until they are relinquished to the laboratory or entrusted to a commercial courier. Custody procedures apply to all environmental and associated field QC samples obtained as part of the data collection system. When transferring samples, the individuals relinquishing and receiving the samples will sign, date, and note the time on the COC record. The original record will accompany the shipment and the field sampler will retain a copy. This record documents the sample custody transfer from the sampler to the laboratory, often through another person or agency (common courier). After COC records have been placed within sealed shipping coolers, the signed courier airbills will serve to document COC. Upon arrival at the laboratory, internal laboratory sample custody procedures will be followed (see below).

*Laboratory Custody Procedures*

Laboratory custody procedures will ensure that sample integrity is not compromised from the time of receipt at the laboratory until final data are reported to EPA and START. This requires that the laboratory control all sample handling and storage conditions and circumstances.

Laboratory custody procedures for sample receiving and log-in; sample storage and numbering; tracking during sample preparation and analysis; and storage of data are described in laboratory SOP. In general, upon laboratory receipt of a shipment of samples, the laboratory's sample custodian will verify that the correct number of coolers has been received. The custodian will examine each cooler's custody seal to verify that it is intact and that the integrity of the environmental samples has been maintained. The

custodian will then open each cooler and measure its internal temperature by measuring the temperature of the temperature blank. The temperature reading will be documented in the "comments" column of the COC form or on an internal laboratory form. The sample custodian will then sign the COC form and examine the contents of the cooler. Identification of broken sample containers or discrepancies between the COC form and sample labels will be recorded. The laboratory will retain the original field COC forms, providing copies of the forms with the final data package deliverable. All problems or discrepancies noted during this process will be promptly reported to the START PM. Samples will be logged into the laboratory information management system.

## 6.4 ANALYTICAL PROCEDURES

### 6.4.1 Laboratory Analytical Methods

Sludge samples will be submitted to a private laboratory for analysis of VOCs, SVOCs, TAL metals, pesticides, and PCBs. All samples will be analyzed according to the methods outlined in Test Methods for Evaluating Solid Waste Physical/Chemical Methods (SW-846) and Methods for Chemical Analysis of Water and Wastes. VOC analysis will be conducted by SW846-8260, SVOC analysis will be conducted by SW846-8270, Metals analysis will be conducted by SW846-6010B, pesticide analysis will be conducted by SW846-8081, and PCB analysis will be conducted by SW846-8082. Based on total analytical results and the rule of 20, if it appears the sample will exceed hazardous waste levels the sample will be analyzed for TCLP (toxicity characteristic leaching procedure) method 1311. In addition, asbestos analysis will be conducted by PLM 600. Table 3 presented in Appendix B summarizes the analytical methods by sample matrix.

## 6.5 QUALITY ASSURANCE

QA procedures must begin in the planning stage and continue through sample collection, analyses, reporting, and final review. The methods used to ensure data quality is discussed below.

### 6.5.1 Organization and Responsibilities

The FPL has overall responsibility for field QA. Off-site laboratory analyses for samples collected will be conducted by a private laboratory.

### 6.5.2 Field QA Samples

The following sections describe the number and types of QC samples that will be collected and submitted to the private laboratory during the field investigation. Appendix B, Table 2 details the QA/QC samples

to be collected and Table 3 presents the appropriate sample containers and preservatives to be used per sample type. Approximately 2 QA/QC samples including duplicates will be collected as required in the FBQSTP SESDPROC-011-R3. All samples will be preserved as needed and immediately be placed on ice in accordance with the FBQSTP SESDPROC-011-R3.

**Temperature Blanks**

A temperature blank will be placed in a cooler so that the temperature of each cooler can be measured accurately upon receipt at the laboratory without compromising sample integrity. Temperature blanks are not assigned a unique field sample identification number.

**Metals Blank**

Metals Blanks are pre-prepared samples provided by the EPA Sample Management Office prior to sampling activities. Metals blank samples will not be opened and will be shipped to the laboratory with the field samples. These samples are only required when samples are submitted to CLP participating laboratories. Metals blanks are not required for private laboratories, and will not be submitted for this field investigation.

**Duplicate Samples**

Field duplicates will be collected and analyzed for chemical constituents to measure the cumulative uncertainty (i.e., precision) of the sample collection, splitting, handling, storage, preparation and analysis operations, as well as natural sample heterogeneity that is not eliminated through simple mixing in the field. Field duplicates are two samples prepared by mixing a volume of sample and splitting it into two separate sample containers that are labeled as individual field samples. Following collection of the initial sample, the duplicate sample will be re-collected from the same location using clean equipment. Field duplicates are labeled as individual environmental samples and are not identified to the laboratory as duplicate samples. The duplicate sample will be identified with a sequential sample number and identified on the regional copy of the chain of custody so that there is no indication to the laboratory that the sample is a duplicate. The sample will be submitted to the private laboratory for analysis. START anticipates collecting two sludge field duplicate samples.

### 6.5.3 Laboratory QC Requirements

The analytical laboratory will have a QC program to ensure the reliability and validity of the analyses performed at the laboratory. The laboratory's QC Plan will describe the policies, organization, objectives, QC activities, and specific QA functions used by the laboratory. All analytical procedures are documented in writing as SOPs and each SOP will include a QC section that addresses the minimum QC

requirements for the procedure. The internal QC checks might differ slightly for each individual procedure but in general the QC requirements include the following elements:

- Reagent/preparation blanks (applicable to inorganic analysis)
- Calibration verifications
- Surrogate (or SMC) spikes
- Analytical spikes
- Field duplicates
- Laboratory duplicates
- Laboratory control standards
- Internal standard areas for GC/MS analysis; control limits
- Mass tuning for GC/MS analysis

Data obtained will be properly recorded. The data package will include a full deliverable package capable of allowing the recipient to reconstruct QC information and compare it to QC criteria. The laboratory will reanalyze any samples analyzed in nonconformance with the QC criteria, if sufficient volume is available. It is expected that sufficient volumes/weights of samples will be collected to allow for reanalysis when necessary.

## 6.6 INSTRUMENT CALIBRATION AND FREQUENCY

Laboratory equipment will be calibrated in accordance with laboratory SOPs or the manufacturers' recommendations. Laboratory equipment refers to articles used in the laboratory in support of data collection (e.g., refrigerators). Laboratory instruments are units used for sample analysis (e.g., GC/ECD).

### 6.6.1 Laboratory Instrument Calibration

Calibration procedures for a specific laboratory instrument will consist of initial calibration (3- or 5-points), initial calibration verification (ICV) and continuing calibration verification (CCV). The SOP for each analysis performed in the laboratory describes the calibration procedures, their frequency, acceptance criteria and the conditions that will require recalibration. In these cases, the initial calibration will be verified using an independently prepared calibration verification solution. The laboratory maintains a sample logbook for each instrument which will contain the following information: instrument identification, serial number, date of calibration, analyst, calibration solutions run and the samples associated with these calibrations. Calibration of laboratory equipment will be based on approved written procedures. Records of calibration, repairs, or replacement will be filed and maintained by the designated laboratory personnel performing QC activities. These records will be filed at the location where the work

is performed and will be subject to QA audit. For the applicable instruments, the laboratory will maintain a factory-trained repair staff with in-house spare parts or will maintain service contracts with vendors. The records of calibration will be kept as follows:

- A label will be affixed to each instrument showing description, manufacturer, model numbers, date of last calibration, by whom calibrated (signature), and due date of next calibration reports and compensation or correction figures will be maintained with instrument;
- A written stepwise calibration procedure will be available for each piece of test and measurement equipment; and
- Any instrument that is not calibrated to within the manufacturer's original specification will display a warning tag to alert the analyst that the device carries only a "Limited Calibration".
- Calibration dates are recorded on log sheets or electronically by data processing systems.

All analyses will be governed by the appropriate laboratory SOPs, and appropriate calibration procedures and frequencies can be found in each SOP.

**Volatile and Semi-volatile Analyses by Methods 8260B and 8270C**

Prior to calibration, the instrument(s) used for Gas Chromatograph/Mass Spectrometer (GC/MS) analyses are tuned by analysis of p-bromofluorobenzene for volatile analyses and decafluorotriphenyl phosphine for semi-volatile analyses. Once the tuning criteria for these reference compounds are met, the instrument should be initially calibrated by using a five-point calibration curve. The instrument tune will be verified each 12 hours of operation. Continuing calibration is verified as specified in the method, or at least each working day, using criteria specified by the method. The calibration standards will be EPA or National Institute of Standards and Technology (NIST) traceable and are spiked with internal standards and surrogate compounds. Whereas, calibration and CCV of instruments will be performed at approved intervals as specified by the manufacturer or the analytical method (whichever is more frequent). Calibration standards used as reference standards will be traceable to the NIST or EPA when existent.

**Metals Analysis by Method 6010B**

The Inductively Coupled Plasma (ICP) emission spectrophotometer instruments are calibrated by use of a minimum of three calibration standards prepared by dilution of certified stock solutions. An analysis blank is prepared with one calibration standard at the quantitation limit for the metal. The other standards bracket the concentration range of the samples. Calibration standards will contain acids at the same concentration as the digestates. A continuing calibration standard, prepared from a different stock solution than that used for preparation of the calibration standards, is prepared and analyzed after each ten samples or each two hours of continuous operation. The value of the continuing calibration standard concentration must agree with + 10 percent of the initial value (+ 20 percent for mercury analysis) or the

appropriate corrective action is taken which may include recalibrating the instrument and reanalyzing the previous ten samples. For the ICP, linearity near the quantitation limit will be verified with a standard prepared at a concentration of two times the quantitation limit. This standard must be run at the beginning and end of each sample analysis run or a minimum of twice per eight-hour period.

**Pesticides and PCB Analysis by Methods 8081 and 8082**

Prior to analysis using the Gas Chromatograph (GC), the instrument is calibrated using a five-point calibration curve. Single point calibration is used for multi-component pesticides (typically toxaphene and technical chlordane). For multi-component analytes, the mid-level standard must be analyzed as part of the initial calibration. This single point calibration is used to quantitate multi-component analytes. The analyst may include a full five-point calibration for any of the multi-component analytes with the initial calibration. The 12 hour calibration verification sequence must be analyzed within 12 hours of the start of the initial calibration and at least once every 12 hours thereafter if samples are being analyzed. If more than 12 hours have elapsed since the injection of the last sample in the analytical sequence, a new analytical sequence must be started with a 12 hour calibration. A mid-level calibration standard is used for the 12 hour calibration.

If instrument drift is expected due to sample matrix or other factors, it may be advisable to analyze the continuing calibration standard more frequently. A five-point calibration of the Aroclor 1016/1260 mix is generated with at least mid-level single points for the other Aroclor mixes. The average response factor is used to quantitate Aroclors 1260 and 1016; other Aroclors are quantitated from the mid-level single point. The analyst may include a full five-point calibration for any of the Aroclors with the initial calibration. The 12 hour calibration verification must be analyzed within 12 hours of the start of the initial calibration and at least once every 12 hours thereafter if samples are being analyzed. If there is a break in the analytical sequence of greater than 12 hours, then a new continuing calibration run must be analyzed before proceeding with the sequence. If more than 12 hours have elapsed since the injection of the last sample in the analytical sequence, a new analytical sequence must be started with a 12 hour calibration. At a minimum, the 12 hour calibration includes analysis of the Aroclor 1260/1016 mix. It is adequate to verify calibration with a mixture of Aroclors 1016 and 1260. If a specific Aroclor is expected, it may be included in the daily calibration check.

For this method samples must be bracketed with successful calibration verification runs. The Aroclor 1260/1016 calibration mix is analyzed as the calibration verification standard. This is analyzed after every 20 samples, including MS, LCS, and method blanks. A mid-level standard is used for the

calibration verification. When using a dual column for analysis, the higher of two values will be reported unless professional judgment by the analyst dictates a different value is more appropriate.

## 6.7 INSPECTION/ACCEPTANCE OF SUPPLIES AND CONSUMABLES

All supplies and consumables that may directly or indirectly affect the quality of the project must be clearly identified and documented by field personnel. Acceptance criteria are based on the individual characteristics of the supply or consumable to be used. Typical examples of supplies and consumables include sample bottles, materials for decontamination activities, deionized water, and potable water. For each item identified, field personnel shall document the inspection, acceptance testing requirements, or specifications (i.e., concentration, purity, source of procurement) in addition to any requirements for certificates of purity or analysis. All acceptance certificates will be retained on file.

Acceptance criteria must be consistent with overall project technical and quality criteria. If special requirements are needed for particular supplies or consumables, a clear agreement should be established with the supplier (i.e., particular concentration of calibration gas).

The FPL is responsible for insuring that consumables are properly inspected and that the documentation procedures stated above have been accomplished.

## 6.8 DATA MANAGEMENT

This section defines the specific records and data that must be maintained for each field activity to ensure that samples and data are traceable and defensible. Field data reporting shall be conducted principally through the transmission of the information written in bound, paginated field logbooks to provide a secure record of field activities; and data sheets containing tabulated results of measurements made in the field. All field records and documentation must comply with the documentation requirements defined in the SESD FBSQTP Logbooks (SESDPROC-010-R4).

### 6.8.1 Field Data

Site conditions during sampling and the care with which samples are handled may factor into the degree to which samples represent the media from which they are collected. This, in turn, could affect the ability of decision makers to make accurate and timely decisions concerning the contamination status of the site. As appropriate, logbooks are assigned to, and maintained by, key field team personnel.
Information to be recorded and retained in the logbook during this assessment includes:

- Name of laboratory and contacts to which the samples were sent, turnaround time (TAT) requested, and data results, when possible
- Termination of a sample point or parameter and reasons
- Unusual appearance or odor of a sample
- Measurements, volume of flow, temperature, and weather conditions
- Additional samples and reasons for obtaining them
- Eliminated samples and reasons for elimination
- Levels of personal protection equipment used (with justification)
- Meetings and telephone conversations held with regulatory agencies, project manager, or supervisor
- Details concerning any samples split with another party
- Details of QC samples obtained
- Sample collection equipment and containers, including their serial or lot numbers
- Field analytical equipment, and equipment utilized to make physical measurements
- Calculations, results, and calibration data for field sampling, field analytical, and field physical measurement equipment
- Property numbers of any sampling equipment used, if available
- Sampling station identification
- Date and time of sample collection
- Description of the sample location
- Description of the sample
- Sampler(s) name(s) and company
- How the sample was collected
- Diagrams of processes
- Maps/sketches of sampling locations
- Weather conditions that may affect the sample (e.g., rain, extreme heat or cold, wind, etc.)

Field logbook assignments shall be recorded in the Site Logbook or other central file whose location is known by the FPL and the PM.

Together, field logbooks and sample documentation including COC forms provide a record that should allow a technically qualified individual to reconstruct significant field activities for a particular day without resorting to memory.

### 6.8.2 Laboratory Data

Case narratives will be prepared which will include information concerning data that fell outside laboratory acceptance limits, and any other anomalous conditions encountered during sample analysis. The Level II data package shall include the following data elements:

Case Narrative:

- Any deviations from intended analytical strategy
- Laboratory lot number/sample delivery group (SDG)
- Numbers of samples and respective matrices
- QC procedures utilized and also references to the acceptance criteria
- Laboratory report contents
- Project name and number
- Condition of samples 'as-received'
- Discussion of whether or not sample holding times were met
- Discussion of technical problems or other observations which may have created analytical difficulties
- Discussion of any laboratory QC checks which failed to meet project criteria
- Signature of the laboratory QA Manager

Chemistry Data Package:

- Case narrative for each analyzed batch of samples
- Summary page indicating dates of analyses for samples and laboratory QC checks
- Cross referencing of laboratory sample to project sample identification numbers
- Data qualifiers to be used should be adequately described
- Sample preparation and analyses for samples
- Sample results
- MS and MS duplicate recoveries, laboratory control samples, method blank results, calibration check compound, and system performance check compound results
- Preparation factors and logbook notations

For this investigation, the laboratory will provide a standard or 14-day turn-around-time for the analytical data package and EDD. The 14-day timeframe begins the day the laboratory receives a given sample for analysis.

### 6.8.3 Electronic Data Deliverables

Analytical data will be managed electronically using the Scribe environmental data management system as required by the START-3 contract. The laboratory shall also prepare and verify an electronic data deliverable (EDD). The format of the EDD shall be in the approved Region 4 format. All EDDs produced by the laboratory will be uploaded to the Scribe data management system and will conform to the Region 4 DART software system.

## 7.0 DATA VALIDATION AND USABILITY

Data validation is the process of verifying that qualitative and quantitative information generated relative to a given sample is complete and accurate. Data validation procedures shall be performed for both field and laboratory operations as described below. Validation of analytical data will be conducted by START. START will perform data assessment on laboratories' hardcopy and electronic deliverables based on contractual and technical requirements outlined in the analytical method and in accordance with the NFGs. The FPL will review the data qualifier report to determine any data limitations and the impact of any qualified data on overall data usability for the project. Detailed guidance for data assessment may be found in the *Guidance for Data Quality Assessment* (EPA QA/G-9 2000).

## 7.1 PROCEDURES USED TO EVALUATE FIELD DATA

Procedures to evaluate field data for this project primarily include checking for transcription errors and review of field logbooks/field data sheets, on the part of field crewmembers. Further, results of all instrument calibration will be reviewed by the START QA Manager to ensure that all criteria that are specified in this QAPP/SSP are followed. Data collected from instruments not meeting calibration standards will be re-measured once the calibration problem has been solved. The FPL will be responsible for ensuring that these measurements are re-taken.

The evaluation of equipment blanks and other field QC samples will provide definitive indications of the data quality. If a problem arises, it should be able to be isolated via the complete sample tracking and documentation procedures that will be performed. If such a problem does arise, corrective action can be instituted, documented, and reported to the agencies via the Quality Control Summary Report. If data are compromised due to a problem, appropriate data qualifications will be used to identify the data.

The handling, preservation and storage of samples collected during the sampling program will be monitored on an on-going basis. The project laboratories will document sample receipt including proper containers and preservation at the time samples are logged into their individual laboratory. The sample receipt records (a required data package deliverable) as well as the COC documentation will also be assessed during data validation. Sample handling, storage or preservation problems identified during data validation will result in appropriate qualification of data.

## 7.2 PROCEDURES USED TO VALIDATE LABORATORY DATA

The purpose of chemistry data validation is to verify that the data are of known quality, are technically valid, are legally defensible, satisfy the project objectives, and are usable for their intended purpose. The objectives of the data validation process will be to:

- Assess compliance to project specific procedures and programs.
- Evaluate system process control through review of control charts (if applicable).
- Verify that no systematic errors exist within the data sets.
- Assess field QC samples to determine if sampling has adversely impacted the reported results and, therefore, usability.
- Assess both method and laboratory performance through tabulation of QC outliers.

Provide measures of data quality in terms of precision, accuracy, and completeness so that overall usability can be determined. The following guidance documents shall serve as the basis for data validation:

- USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (OSWER 9240.1-48, EPA-540-R-08-01, June 2008)
- USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (OSWER 9240.1-51, EPA 540-R-10-011, January 2010)

One hundred percent (100%) of the data packages will be evaluated and qualified for all quantitative QC elements e.g., spike recoveries, method and field blank contamination, and duplicate sample %RSD using hard-copy summary forms. This Summary Validation of 100% of the data is equivalent to an EPA CLP "QA Level II" validation. Specific QC elements that will be reviewed during the Summary Validation include:

- Presence and completeness of COC and “cooler receipt form” (also known as sample receipt form) documentation
- Sample Index (correlation of field sample ID to laboratory sample ID)
- Laboratory Case Narrative (method deviations and QC anomalies)

- Analytical holding times
- Where applicable, laboratory control standard recoveries
- Method blank contamination
- Surrogate spike recoveries
- Matrix spike compound recoveries
- Matrix spike/matrix spike duplicate RPD values
- Field duplicate RPD values
- Review of reagent/preparation blanks (inorganics)
- Review of Laboratory Control Standards (LCS)

## 8.0 EXCEPTIONS TO THE ASSIGNMENT OR ANTICIPATED PROBLEMS

This QAPP/SSP details the tasks described in the TDD, the anticipated deliverable and field investigation schedule. Additionally, this QAPP/SSP specifically addresses activities and procedures associated with anticipated sludge sampling as well as FHC testing; and QA/QC measures to be adhered to in order to ensure that DQOs are fulfilled. START will notify EPA as quickly as possible if exceptions or problems are foreseen or occur. START can modify this QAPP/SSP or the schedule within at the request of EPA.

## 9.0 REFERENCES


1. Oneida Total Integrated Enterprises (OTIE). Quality Assurance Program Plan (QAPP). January 2006.

2. U.S. Environmental Protection Agency (EPA), Science and Ecosystem Support Division (SESD), Region 4. Field Branches Quality System and Technical Procedures (FBQSTP). November 2007.

3. EPA. EPA/240/B-01/003. EPA Requirements for Quality Assurance Project Plans. EPA QA-R5. March 2001.

4. SCDHEC. Lobeco Products, Inc. PowerPoint Presentation. August 2011.

5. USDA. National Resource Conservation Service Soil Survey: http://websoilsurvey.nrcs.usda.gov/app/HomePage.htm

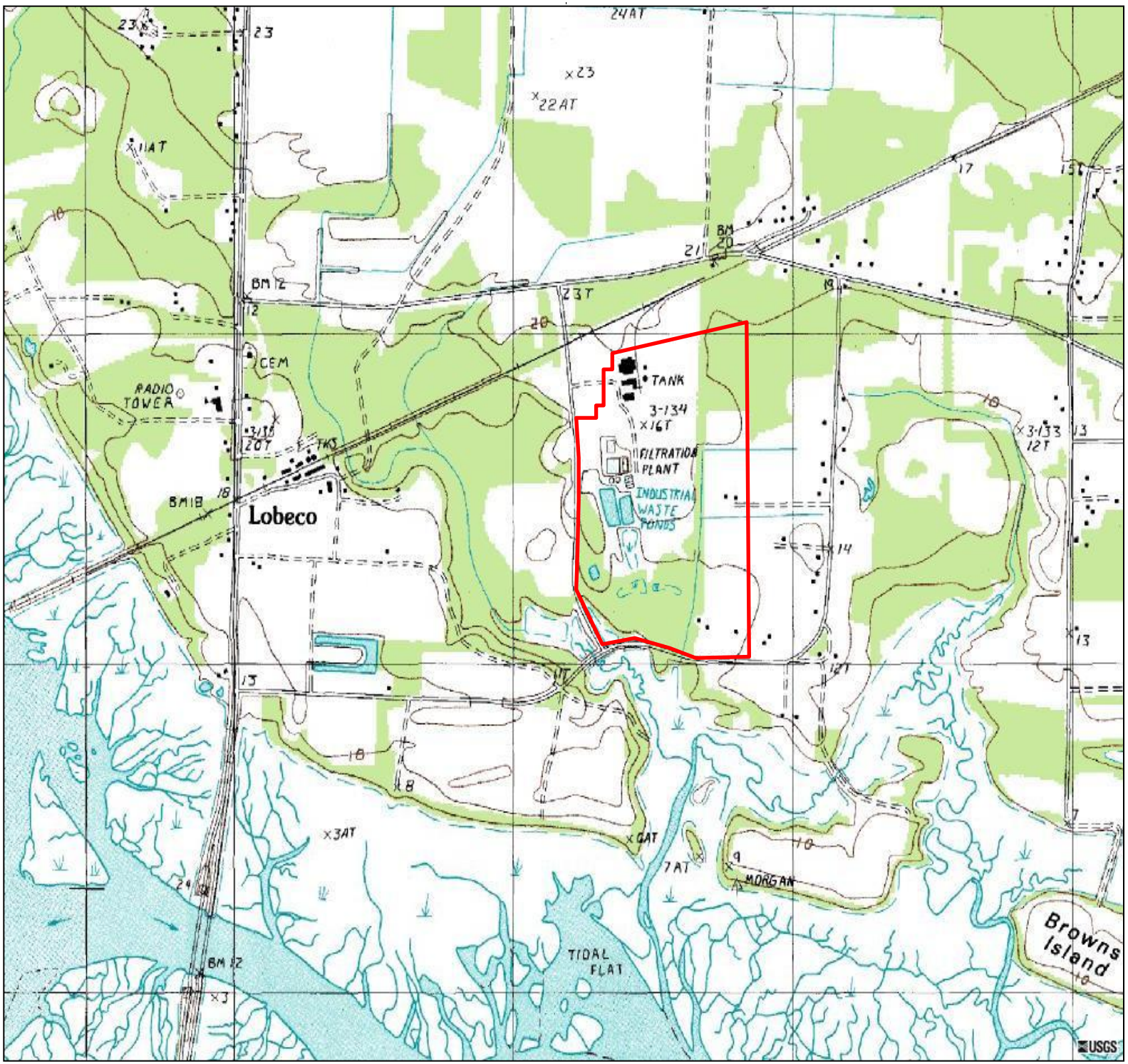
6. USDA. Soil Conservation Service. Soil Survey of Beaufort and Jasper Counties, South Carolina. January 1980.

7. EPA. Guidance on Choosing a Sampling Design for Environmental Data Collection. EPA QA-G5S. December 2002.

8. EPA. EPA/240/B-06/001. Guidance on Systematic Planning Using the Data Quality Objectives Process. EPA QA-G4. February 2006.

# APPENDIX A

# FIGURES



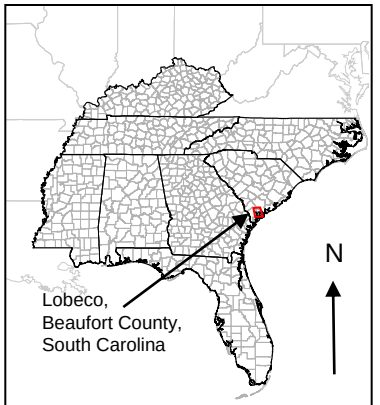

## Legend

Site Boundary

SOURCE: Modified from
U.S. Geological Survey
July 1987

Feet
0 1,750 3,500

Disclaimer: This map is intended for visual orientation use only. In no way is this map to be used for precise locational use.




United States Environmental Protection Agency

LOBECO PRODUCTS REMOVAL
LOBECO,
BEAUFORT COUNTY,
SOUTH CAROLINA
TDD No. TNA-05-003-0154

**FIGURE 1**
**TOPOGRAPHICAL MAP**

OTIE
Oneida Total Integrated Enterprises

\GIS_Workspace\TN Associates\pdfs\FIG1_TopoMap.pdf

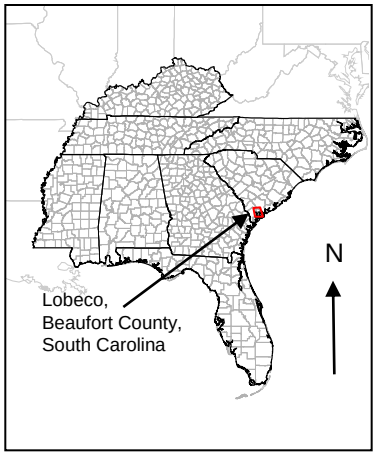
## Legend

Site Location

SOURCE: Modified from
Google Maps
Image captured January 29, 2011

Feet
0 600 1,200

Disclaimer: This map is intended for visual orientation use only. In no way is this map to be used for precise locational use.




United States Environmental Protection Agency

LOBECO PRODUCTS REMOVAL
LOBECO,
BEAUFORT COUNTY,
SOUTH CAROLINA
TDD No. TNA-05-003-0154

**FIGURE 2**
**AERIAL MAP**

OTIE
Oneida Total Integrated Enterprises

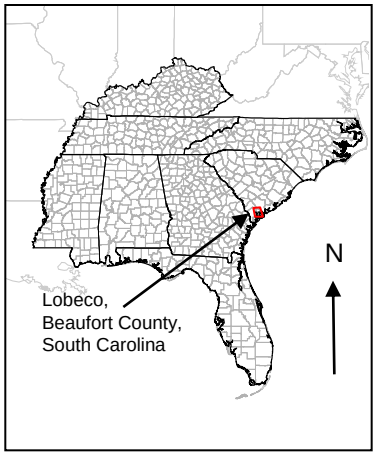
\GIS_Workspace\TN Associates\pdfs\FIG1_TopoMap.pdf

## Legend

SOURCE: Beaufort County GIS 2009

0 40 80 120 Feet

Disclaimer: This map is intended for visual orientation use only. In no way is this map to be used for precise locational use.




United States Environmental Protection Agency

LOBECO PRODUCTS REMOVAL
LOBECO,
BEAUFORT COUNTY,
SOUTH CAROLINA
TDD No. TNA-05-003-0154

**FIGURE 3**
**LOBECO CHEMICAL PLANT**

OTIE
Oneida Total Integrated Enterprises

\GIS_Workspace\TN Associates\pdfs\FIG1_TopoMap.pdf

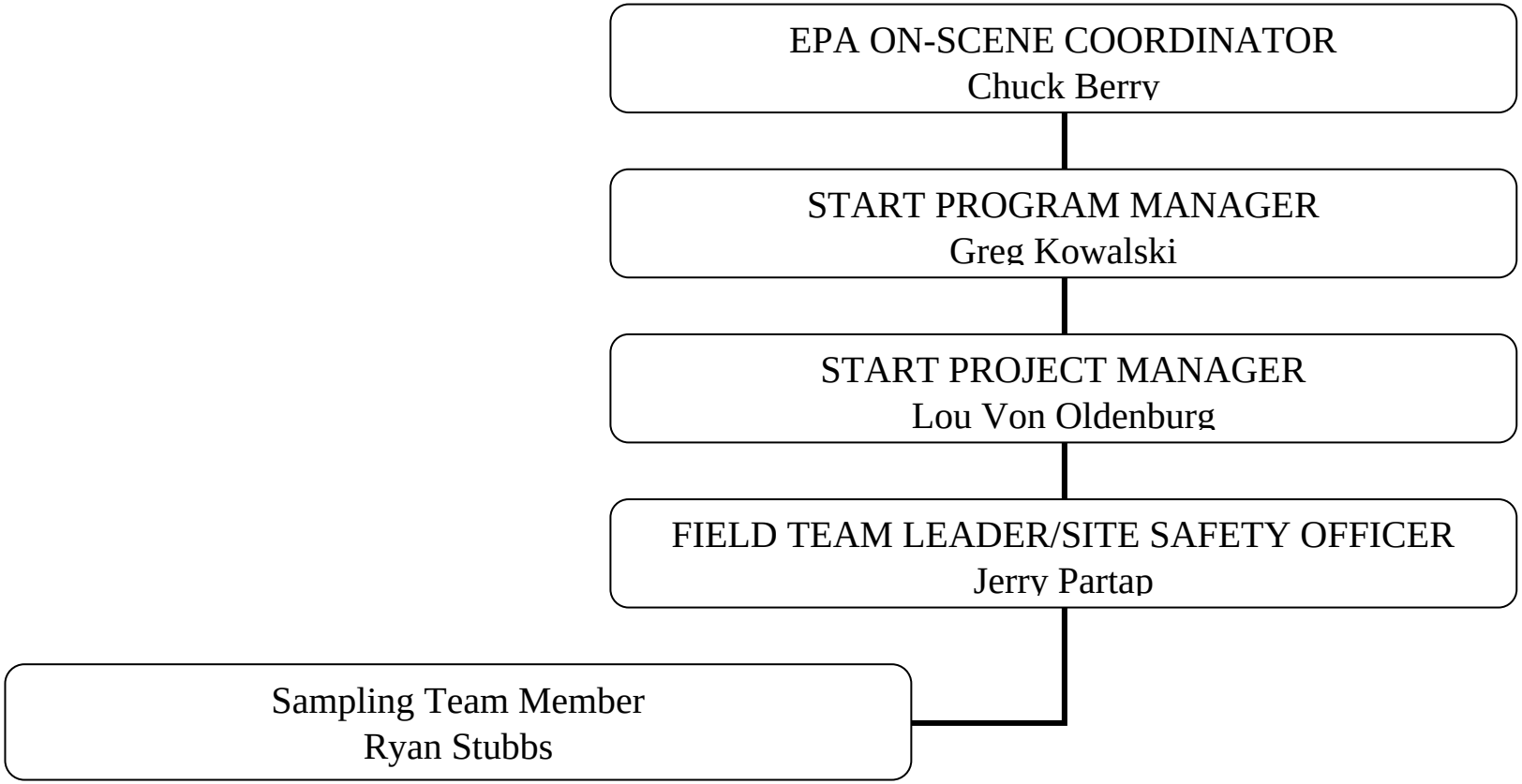



**FIGURE 4**
**ORGANIZATIONAL CHART**

**LOBECO PRODUCTS REMOVAL**
Lobeco, Beaufort County, South Carolina
TDD: TNA-05-003-0154

OTIE
Oneida Total Integrated Enterprises

# APPENDIX B

# TABLES

**TABLE 1**
**SAMPLE LOCATIONS**
**LOBECO PRODUCTS**

| Station ID | Sample Number | Location | Rationale |
|---|---|---|---|
| LP01 | LP-SS-01 | To be determined in the field | Determine the presence or absence of hazardous constituents |
| LP02 | LP-SS-02 | To be determined in the field | Determine the presence or absence of hazardous constituents |
| LP03 | LP-SS-03 | To be determined in the field | Determine the presence or absence of hazardous constituents |
| LP04 | LP-SS-04 | To be determined in the field | Determine the presence or absence of hazardous constituents |
| LP05 | LP-SS-05 | To be determined in the field | Determine the presence or absence of hazardous constituents |
| LP06 | LP-SS-06 | To be determined in the field | Determine the presence or absence of hazardous constituents |
| LP07 | LP-SS-07 | To be determined in the field | Determine the presence or absence of hazardous constituents |
| LP08 | LP-SS-08 | To be determined in the field | Determine the presence or absence of hazardous constituents |
| LP09 | LP-SS-09 | To be determined in the field | Determine the presence or absence of hazardous constituents |
| LP10 | LP-SS-10 | To be determined in the field | Determine the presence or absence of hazardous constituents |
| LP11 | LP-SS-11 | To be determined in the field | Determine the presence or absence of hazardous constituents |
| LP12 | LP-SS-12 | To be determined in the field | Determine the presence or absence of hazardous constituents |
| LP13 | LP-SS-13 | To be determined in the field | Determine the presence or absence of hazardous constituents |

**TABLE 1 (Continued)**
**SAMPLE LOCATIONS**
**LOBECO PRODUCTS**

| Station ID | Sample Number | Location | Rationale |
|---|---|---|---|
| LP14 | LP-SS-14 | To be determined in the field | Determine the presence or absence of hazardous constituents |
| LP15 | LP-SS-15 | To be determined in the field | Determine the presence or absence of hazardous constituents |
| LP16 | LP-SS-16 | To be determined in the field | Determine the presence or absence of hazardous constituents |
| LP17 | LP-SS-17 | To be determined in the field | Determine the presence or absence of hazardous constituents |
| LP18 | LP-SS-18 | To be determined in the field | Determine the presence or absence of hazardous constituents |
| LP19 | LP-SS-19 | To be determined in the field | Determine the presence or absence of hazardous constituents |
| LP20 | LP-SS-20 | To be determined in the field | Determine the presence or absence of hazardous constituents |
| LP21 | LP-SS-21 | To be determined in the field | Determine the presence or absence of hazardous constituents |
| LP22 | LP-DP-01 | To be determined in the field | Determine the presence or absence of hazardous constituents |
| LP23 | LP-DP-02 | To be determined in the field | Determine the presence or absence of hazardous constituents |

Notes:

DP – Debris Pile
LP – Lobeco Products
SS – Sludge Sample

**TABLE 2**
**QUALITY ASSURANCE/QUALITY CONTROL SAMPLES**
**LOBECO PRODUCTS**

| Station ID | Sample Number | Location | Rationale |
|---|---|---|---|
| *Station ID for parent sample* | LP-S-100 | Duplicate sludge sample; To be determined in the field | Verify laboratory precision |
| *Station ID for parent sample* | LP-S-101 | Duplicate sludge sample; To be determined in the field | Verify laboratory precision |

Notes:

PB – Preservative Blank
BSL – Broadway Street Lead
SS – Surface Soil Sample
MB – Metals Blank
TB – Trip Blank

**TABLE 3**
**ANALYTICAL METHODOLOGY, SAMPLE CONTAINERS, PRESERVATIVES, AND HOLDING TIME FOR SAMPLES**
**LOBECO PRODUCTS**

| Matrix | Analysis | EPA Method | Sample Container | Preservative | Holding Time |
|---|---|---|---|---|---|
| Sludge | VOC (TCL) | SW846-8260B | Three VOA vials; One 2-oz jar | Two vials – $NaHSO_4$ One vial – MeOH Cool to 4 $^oC$ | 14 Days |
| | SVOC (TCL) | SW846-8270C | One 16-oz jar | Cool to 4 $^oC$ | 14 Days |
| | PCBs | SW846-8082 | | | 14 Days |
| | TAL Metals | SW846-6010/7471 | | | 28 days Hg; 180 days others |
| | Pesticides | SW846-8081 | | | 14 Days |
| Sludge | VOC (TCLP) | 1311 | One 2-oz jar | Cool to 4 $^oC$ | 14 Days |
| | SVOC (TCLP) | 1311 | One 16-oz jar | Cool to 4 $^oC$ | 14 Days |
| | Metals (TCLP) | 1311 | One 16-oz jar | Cool to 4 $^oC$ | 180 Days |

**Notes:**

$^oC$ - Degree Celsius
oz - Ounce
VOC - Volatile Organic Compounds
SVOC - Semivolatile Organic Compounds
TCL - Target Compound List
TAL - Target Analyte List
PCBs - Polychlorinated Biphenyls
TCLP - Toxicity Characteristic Leaching Procedure

**TABLE 4**
**SCHEDULE OF DELIVERABLES**
**LOBECO PRODUCTS**

| ACTIVITY | DUE DATE |
|---|---|
| Submit MPR | 25th of every month |
| Submit QAPP/SSP, Rev. 0 | November 17, 2011 |
| Submit QAPP/SSP, Rev. 1 | 5 days after receipt of EPA comments |
| Submit QAPP/SSP, Rev. 2 | 5 days after receipt of EPA comments |
| Initiate Field Work | Fieldwork will be initiated upon approval |
| Complete Field Work | 5 days after initiating work |
| Removal Investigation Report, Rev. 0 | 4 weeks after receipt of final analytical |
| Removal Investigation Report, Rev. 1 | 30 days after receipt of EPA comments |

**Notes:**
MPR – Monthly Progress Reports
QAPP/SSP – Quality Assurance Project Plan/ Site Sampling Plan
Rev. – Revision