TETRA TECH

April 20, 2012

Mr. David Andrews
On-Scene Coordinator
U. S. Environmental Protection Agency, Region 4
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Atlanta, Georgia 30303

Subject: **Final Sampling and Analysis Plan, Revision 1**
Liberty Fibers Emergency Response
EPA Contract No. EP-W-05-054 (START III, Region 4)
Technical Direction Document No. TTEMI-05-001-0126

Dear Mr. Andrews:

The Tetra Tech Superfund Technical Assessment and Response Team (START) is submitting revision 1 of the final sampling and analysis plan (SAP) to provide removal assessment sampling support at the Liberty Fibers site located in Morristown, Hamblen County, Tennessee. This SAP includes site figures (Enclosure A), the site-specific quality assurance project plan (Enclosure B) and associated tables, and the site-specific health and safety plan (Enclosure C). The proposed technical approach has been developed in accordance with the U.S. Environmental Protection Agency (EPA) Performance Work Statement for the subject contract dated April 21, 2010.

Please call Paul Prys at (678) 775-3106 or Brian Croft at (678) 775-3113 if you have any questions or comments regarding this submittal.

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FINAL
SAMPLING AND ANALYSIS PLAN

LIBERTY FIBERS EMERGENCY RESPONSE
MORRISTOWN, HAMBLEN COUNTY, TENNESSEE

Revision 1

Prepared for

U.S. ENVIRONMENTAL PROTECTION AGENCY
Region 4
Atlanta, Georgia 30303

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1.0 INTRODUCTION

Under Superfund Technical Assessment and Response Team (START) Contract Number (No.) EP-W-05-054, Technical Direction Document No. TTEMI-05-0010126, the U.S. Environmental Protection Agency (EPA) tasked Tetra Tech EM Inc. (Tetra Tech) to prepare this sampling and analysis plan (SAP) for perimeter air and bulk (soil, suspected asbestos-containing materials [ACM], and water) sampling to be conducted during removal activities scheduled to begin in December 2011 at the Liberty Fibers Emergency Response Site located in Morristown, Hamblen County, Tennessee. This site was previously investigated under Superfund Technical Assessment and Response Team (START) Contract Number (No.) EP-W-05-054, Technical Direction Document No. TTEMI-05-003-0041. The purpose of this SAP is to specify the proposed type, number, and locations of samples to be collected during removal activities, as well as to describe the sampling methods to be followed. Air, bulk, and rainwater sampling activities will be led and conducted by Tetra Tech START under the direction of the EPA Region 4 Emergency Response and Removal Branch (ERRB).

All activities and procedures discussed and described in this SAP will be conducted in accordance with the approved Tetra Tech Quality Management Plan dated November 2009 (Reference [Ref.] 1). Tetra Tech START will conduct sampling activities in accordance with applicable EPA, Occupational Safety and Health Administration (OSHA), and National Institute for Occupational Safety and Health (NIOSH) regulations and/or approved guidance documents to ensure that data quality objectives are met. These guidance documents specifically apply to various aspects of removal activities, including sampling locations, sample types, sampling procedures, general sample analysis, field quality assurance and quality control (QA/QC), and related topics. Sampling activities will include the following:

- Collecting perimeter and decontamination unit area air samples for analyses by phase contrast microscopy (PCM) and transmission electron microscopy (TEM);
- Collecting personal air samples for analyses by PCM and TEM;
- Collecting personal air samples for crystalline silica analysis;
- Collecting samples of bulk asbestos-containing material (ACM);
- Collecting rainwater samples from existing underground structures for volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), Resource Conservation and Recovery Act (RCRA) metals, and polychlorinated biphenyls (PCBs) analysis;
- Collecting rainwater samples from facility outfall locations for pH, chemical oxygen demand (COD), total suspended solids (TSS), oil and grease, total cyanide, total aluminum, tolal chromium, hexavalent chromium, total copper, total iron, total lead, total nickel, total zinc, and 48-hour lethal concentration at 50 percent (LC50);
- Collecting asbestos clearance soil samples;

- Obtaining and documenting global positioning system (GPS) data for sampling locations; and
- Preparing written and photographic documentation of site features, sampling locations and removal actions.

This SAP is organized as follows:

- Section 2.0 describes the site background and information from previous investigations.
- Section 3.0 describes the proposed sampling plan, as well as the sampling methods.
- Section 4.0 summarizes the data quality objectives.
- Section 5.0 summarizes the analytical methodology.
- Section 6.0 summarizes the field work to be conducted.
- Section 7.0 discusses disposal of investigation-derived waste (IDW).
- Section 8.0 provides a list of sources referenced for development of this SAP.
- Enclosure A includes site figures.
- Enclosure B is the site-specific quality assurance project plan (QAPP).
- Enclosure C is the site-specific health and safety plan (HASP).

To ensure that all appropriate data quality objectives are met, Tetra Tech will also carry-out activities in accordance with prescribed guidance documents, including the EPA Office of Solid Waste and Emergency Response (OSWER) Asbestos Committee of the Technical Review Workgroup, *Framework for Investigating Asbestos-Contaminated Superfund Sites*, OSWER Directive #9200.0-68 (Ref. 2); California Environmental Protection Agency, Air Resources Board (CARB), *Method 435, Determination of Asbestos Content of Serpentine Aggregate* (Ref. 3); the EPA Region 4, Science and Ecosystem Support Division (SESD), *Field Branches Quality System and Technical Procedures*, specifically, the procedures for *Soil Sampling* (SESDPROC-300-R1), *Waste Sampling* (SESDPROC-302-R1), and the other SESD procedures identified in Section 8.0 of this SAP (Ref. 4); the EPA *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*, Fourth Edition (SW-846)(Ref. 5); the EPA *National Functional Guidelines for Superfund Organic Methods Data Review* (Ref. 6); the EPA *National Functional Guidelines for Inorganic Data Review* (Ref. 7); the EPA *Test Method for the Determination of Asbestos in Bulk Building Materials* (EPA/600/R-93/116)(Ref. 10); NIOSH Method 7400 – Asbestos and Other Fibers by Phase Contrast Microscopy (Ref. 11); NIOSH Method 7402 – Asbestos by Transmission Electron Microscopy (Ref. 12); NIOSH Method 7500, Silica, Crystalline, by X-Ray Diffraction (Filter Redeposition)(Ref. 13); EPA Method 1664, Revision A (Method 1664A): N-Hexane Extractable Material (HEM; Oil and Grease) and Silica Gel Treated N-Hexane Extractable Material (SGT-HEM; Non-polar Material) by Extraction and Gravimetry (Ref. 14); the EPA *Methods for Chemical Analysis of Water and Wastes* (Ref. 15); and EPA *Methods for Measuring the Acute Toxicity of Effluents an Receiving Waters to*

Freshwater and Marine Organisms (Ref. 16). These guidance documents specifically apply to sampling locations, sample types, sampling procedures, use of data, data types, field quality QA/QC samples, and sample analyses.

2.0 SITE BACKGROUND AND PREVIOUS INVESTIGATIONS

The Liberty Fibers site is a former rayon fiber manufacturer located in Morristown, Hamblen County, Tennessee (Enclosure A, Figure 1). According to a briefing memorandum prepared by the Tennessee Department of Environment and Conservation (TDEC), Liberty Fibers filed for bankruptcy in September 2005. A&E Salvage Company (formerly J&N Salvage Company) bought the salvage rights to the Liberty Fibers property in October 2006. The salvage rights include any and all equipment and materials located on the property and the option to purchase the property (Ref. 17).

In September 2006, TDEC, in coordination with EPA, conducted a site visit in response to a tip that TDEC had received regarding demolition activities and the presence of hazardous materials, including PCBs, on the site. During the site visit, TDEC observed approximately 24 transformers and 80 capacitors that were labeled as containing PCBs. Also in September 2006, the Commissioner of TDEC received a letter from the Mayor of Hamblen County expressing his concern about the potential for release of on-site PCBs, asbestos, and other chemicals during the ongoing salvage operations at the site. During a discussion in October 2006 among EPA personnel, A&E Salvage Company personnel, a Liberty Fibers representative, the court-appointed trustee, and TDEC personnel, A&E Salvage Company acknowledged that it was the owner of the PCB equipment and that it would accept full legal responsibility for proper removal and disposal of the PCB equipment in compliance with appropriate regulations (Ref. 17).

A&E Salvage Company submitted a plan to EPA in January 2007 for sampling and removal of all transformers and capacitors located on site. A&E Salvage Company contracted SD Myers to sample the dormant on-site transformers and capacitors, and submit the samples for PCB analysis. The energized transformers and capacitors could not be sampled, however, until Morristown Utilities ran new electrical service to the site. SD Meyers sampled 39 transformers: 4 transformers were found to contain PCBs, 12 units were found contaminated with PCBs, and 23 units neither contained nor were contaminated with PCBs. A&E Salvage Company then contracted Booher Industrial Company of Jasper, Georgia to remove and dispose of the transformers; however, EPA later informed A&E Salvage Company that Booher Industrial Company was not an EPA-approved treatment, storage and disposal facility for PCB waste in accordance with the Toxic Substances Control Act (TSCA)(Ref. 17).

In March 2007, A&E Salvage Company held a meeting with IPI Business and Morristown Utilities, during which the City of Morristown decided to annex the Liberty Fibers site and include the site as part of its Urban Growth Boundaries. As a result, the City of Morristown would be responsible for providing utility services including power and water to the Liberty Fibers site (Ref. 17).

In March 2008, the EPA Resource Conservation and Recovery Act and Oil Pollution Act Enforcement and Compliance Branch contacted the ERRB regarding conducting a removal assessment of the facility. EPA On-Scene Coordinator (OSC) Steve Spurlin contacted the EPA and TDEC representatives involved with the facility to discuss the site and review documentation. OSC Spurlin, supported by Tetra Tech, as well as representatives from TDEC, EPA Asbestos, EPA RCRA, and EPA TSCA Enforcement programs, coordinated a site visit for March 20 and 21, 2008. EPA and Tetra Tech START were joined by Mr. Mark Sawyer, a local investor in A&E Salvage Company, and Mr. Tom Montgomery, a former employee of Liberty Fibers Corporation. During the site visit, EPA and Tetra Tech START observed several drums, totes, and tanks; bags labeled as "asbestos containing material"; a 50,000-gallon sulfuric acid tank containing approximately eight inches of product; known and suspected PCB-containing articles and oils; and suspected ACM; as well as discolored soil throughout the property. In addition, Mr. Montgomery identified the on-site concrete vault that, at the time, contained six 10,000-gallon tanks used to store carbon disulfide, an extremely flammable chemical used in manufacturing rayon (Enclosure A, Figure 2). To prevent fire and explosion, the vaults were typically filled with water, thereby submerging the tanks. Mr. Montgomery also identified a leak in the western wall of the vault, which appeared to have resulted in the carbon disulfide tanks being only half-submerged in water within the vault and, therefore, represented a significant hazard (Ref. 17).

Soil, surface water, and waste samples were collected during the March 2008 site visit. A grab surface soil sample (LF-SS-01), collected from the soil directly beneath the leak in the western wall of the carbon disulfide tank vault, contained 0.927 milligrams per kilogram (mg/kg) of carbon disulfide. A composite surface soil sample (LF-SS-02), collected from a ditch where TDEC personnel had observed two transformers during a previous visit, contained 0.362 mg/kg of the PCB Aroclor 1260. A surface water sample (LF-SW-01), collected from the afore mentioned ditch, contained 2,480 micrograms per liter (µg/L) of the PCB Aroclor 1260. A waste sample, collected from oil-soaked saw dust located within a non-permitted PCB storage area, contained 380 mg/kg of the PCB Aroclor 1260 (Ref. 17).

In December 2009, EPA OSC Perry Gaughan, Tetra Tech START personnel, and TDEC personnel conducted another site visit with Mr. Sawyer. During the site visit, Mr. Sawyer informed EPA and Tetra

Tech START that the carbon disulfide tanks within the concrete vault had not contained any product, had been removed from the vault sometime in the Spring of 2009, and had been sold for scrap metal. The tanks had been removed because of the potential for explosion. During that visit, the water that had submerged the tanks remained in the vault. The Power Mechanical Shop contained bagged asbestos waste, and the Welding Shop contained PCB-contaminated transformers and capacitors (Enclosure A, Figure 2). Although the facility was partially demolished, the debris fields - mixed with presumed ACM - remained. Recycling and reclamation operations were ongoing, and at least one metals recycling business was currently operating on site (Ref. 18).

From January 18 through 22, 2010, Tetra Tech START conducted a removal assessment (RA) of the site. The RA consisted of six primary objectives: 1) collecting bulk asbestos samples; 2) conducting a geophysical investigation in an attempt to identify the locations of possible buried transformers; 3) collecting aqueous and solid waste samples from the carbon disulfide tank vault and surrounding area; 4) collecting solid waste samples from two neutralization pits; 5) collecting waste samples from on-site drums and totes; and 6) collecting personal and area air samples for PCM analysis to evaluate the level of exposure of site personnel to airborne asbestos fibers during the assessment and to determine the concentration of airborne asbestos fibers that may be migrating off site. The results of the RA are presented in the Tetra Tech Final Removal Assessment Report, Liberty Fibers Site, Lowland, Hamblen County, Tennessee, dated January 17, 2011 (Ref. 19).

On April 21, 2010, EPA and Tetra Tech START conducted an emergency response site assessment in response to a debris fire on-site. The fire occurred in the foundation of a demolished cooling tower located on the west side of the site (Ref. 17). On April 29, 2010, Tetra Tech START conducted a visual assessment of presumed ACM in remaining tenant buildings on-site (Ref. 20).

On March 17, 2011, EPA and Tetra Tech START conducted a drainage assessment at the Liberty Fibers Rayon Plant, and assessed potential effects on various buildings located at the Nylon Staples Plant (Ref. 21).

3.0 PROPOSED SAMPLING PLAN

Tetra Tech START will focus on collecting PCM air samples around the perimeter of the property to assess the presence or absence of airborne fibers that may be migrating off site. PCM area air samples will be collected in the Emergency Response and Removal Services (ERRS) contractor decontamination unit to evaluate the effectiveness of their personal decontamination procedures. Air samples collected

will also be analyzed utilizing TEM to verify the presence or absence of airborne asbestos fibers that may be migrating off site or released during personal decontamination procedures. Tetra Tech START will also collect clearance surface soil samples for asbestos analysis from areas once EPA-prescribed removal activities have been completed. Rainwater samples will be collected from existing underground structures to determine if the accumulated rainwater could possibly be used (i.e. as dust suppressant) during removal activities. Rainwater samples will also be collected from the facility outfall locations to determine if removal activities are impacting local waterways. PCM asbestos and crystalline silica personal air samples for EPA and Tetra Tech START personnel will be collected to assess personnel exposure during removal activities involving the potential generation of asbestos or silica-containing dusts. Bulk samples will be collected from suspected ACM as directed by the EPA Task Monitor.

The Tetra Tech START project manager and the EPA Task Monitor may change sampling locations and the number of samples to be collected in response to site conditions encountered during removal activities. Sampling will be conducted and QA/QC samples will be collected in accordance with procedures documented in the EPA Region 4 SESD *Field Branches Quality System and Technical Procedures* (Ref. 4). Figure 2 in Enclosure A depicts the site layout and proposed perimeter air sampling locations. Table A-1 in Appendix A of the site-specific QAPP lists the numbers and types of samples proposed, as well as the sampling locations. Table A-2 in Appendix A of the site-specific QAPP summarizes the QA/QC samples to be collected during field sampling activities. The analytical methodology is described in Section 4.0 of this SAP.

3.1 SITE PERIMETER AND DECONTAMINATION UNIT AREA AIR SAMPLING

EPA and Tetra Tech START will conduct initial background and daily air sampling around the perimeter of the property to determine the presence or absence of airborne fibers that may be migrating off-site prior to and during removal activities, as well as to establish action levels and implement appropriate safety controls. Also, EPA and Tetra Tech START will conduct periodic area air sampling in the ERRS contractor decontamination unit to evaluate the effectiveness of their personnel decontamination procedures. This sampling will be conducted by a State of Tennessee-accredited asbestos project monitor using low-volume air monitoring pumps fitted with 25 millimeter (mm), 0.8 micrometer (µm) mixed cellulose ester (MCE) filter cassettes that will be analyzed by PCM. Initial background and daily perimeter and periodic decontamination unit area air samples will be collected approximately 4 to 5 feet above the ground surface (to represent exposures in the breathing zone) prior to and during removal and decontamination activities. The filter cassettes will be placed in a downward position with the inlet caps of the filter cassettes removed (such that they are open-faced) during sampling. Initial and daily

perimeter air samples will be collected at a flow rate of 2 to 2.5 liters per minute (L/min). The flow-rate of the air sampling train created from this assembly will be measured before sample collection using a Bios Drycal, rotameter or similar device. Once the sampling pump has been adjusted to the desired flow-rate, the initial flow-rate recorded will be the average of ten continuous flow readings. The post-sampling period flow rate will also be measured using a Bios Drycal, rotameter or similar device, however, this measurement will be taken after the air sampling train has completed collecting the air sample at its assigned location. Without adjusting the flow-rate of the sampling pump, the post sampling flow-rate will be recorded as the average of ten continuous flow readings.

PCM air samples will be analyzed in accordance with the guidelines established in 29 *Code of Federal Regulations* (CFR) 1926.1101, Appendix A and Appendix B (Ref. 9) using NIOSH Method 7400 (Ref. 11). Any perimeter and/or decontamination unit area air samples showing results exceeding 0.01 fibers per cubic centimeter (f/cc) will be analyzed for the presence of asbestos via TEM in accordance with NIOSH Method 7402 (Ref. 12) to determine the presence or absence of airborne asbestos fibers. Also, for the perimeter air samples which are below 0.01 f/cc but indicate the potential of off-site migration of asbestos fibers, the perimeter air sample with the highest result for that day will be analyzed via TEM in accordance with NIOSH Method 7402 (Ref. 12) to determine whether or not airborne asbestos fibers are migrating from the site during removal activities. For decontamination unit area air samples which are below 0.01 f/cc but indicate the potential presence of asbestos fibers, the area air sample with the highest result for that day will be analyzed via TEM in accordance with NIOSH Method 7402 (Ref. 12) to evaluate the effectiveness of the ERRS contractor personnel decontamination procedures.

Proposed initial and daily air sampling locations around the perimeter of the Liberty Fibers Emergency Response site are depicted on Figure 2 in Enclosure A. If approved by the EPA Task Monitor, air sampling location 8 will be relocated periodically depending on the prevailing wind direction and speed, as well as the location of ongoing removal activities. In addition, Tetra Tech START will coordinate the decontamination unit area air sampling locations with the EPA Task Monitor.

3.2 PERSONAL ASBESTOS AIR SAMPLING

EPA and Tetra Tech START will conduct initial and periodic personal air monitoring on EPA and Tetra Tech START personnel to establish personal exposure levels to airborne asbestos hazards during removal activities, as well as to establish action levels and implement appropriate safety controls (i.e., engineering controls, administrative controls, and personal protective equipment [PPE] requirements). This sampling will be conducted by a State of Tennessee-accredited asbestos project monitor using low-volume air

monitoring pumps fitted with 25 mm, 0.8 µm MCE filter cassettes that will be analyzed by PCM. Personal samples will be collected in the "breathing zone" (i.e., attached to or near the collar or lapel, near the worker's face in a downward-facing position) and will be representative of the 8-hour, time-weighted average (TWA) and 30-minute short-term exposures of each employee regardless of the level of respiratory protection being worn. The filter cassettes will be placed in a downward-facing position with the inlet caps of the filter cassettes removed (such that they are open-faced) during sampling. Personal air samples will be collected at a flow rate of 2 to 2.5 L/min. The flow rate of the air sampling train created from this assembly will be measured before sample collection using a Bios Drycal, rotameter or similar device. Once the sampling pump has been adjusted to the desired flow-rate, the initial flow-rate recorded will be the average of ten continuous flow readings. The post-sampling period flow rate will also be measured using a Bios Drycal, rotameter or similar device, however, this measurement will be taken after the air sampling train has completed collecting the personal air sample. Without adjusting the flow-rate of the sampling pump, the post sampling flow-rate will be recorded as the average of ten continuous flow readings. Representative 8-hour time weighted average (TWA) personal exposures shall be determined on the basis of one or more samples representing full-shift exposures for each shift employee in each job classification within each work area. Representative 30-minute, short-term personal exposures will be determined on the basis of one or more samples representing 30-minute exposures associated with operations most likely to produce exposures above the OSHA excursion limit of one asbestos fiber per cubic centimeter of air for each shift for each job classification within each work area. Once initial monitoring is completed, periodic monitoring of personal exposures during removal activities will occur. Additional exposure monitoring will be conducted when a change in production, process, control equipment, personnel, or work practices may result in new or additional exposures above the TWA permissible exposure limit (PEL) and/or the excursion limit; or if for any suspected reason a change may result in new or additional exposures above the PEL and/or excursion limit.

Samples will be analyzed in accordance with the guidelines established in 29 CFR 1926.1101, Appendix A and Appendix B (Ref. 9) using NIOSH Method 7400 (Ref. 11). Those personal air samples showing results exceeding the OSHA PEL will be further analyzed for the presence of asbestos via TEM in accordance with NIOSH Method 7402 (Ref. 12). Also, for the personal air samples which are below the OSHA PEL but indicate a potential exposure, the personal air sample with the highest result for that day will be analyzed via TEM in accordance with NIOSH Method 7402 (Ref. 12) to determine personal exposures (regardless of the level of respiratory protection being worn) to airborne asbestos fibers during removal activities.

3.3 PERSONAL CRYSTALLINE SILICA AIR SAMPLING

EPA and Tetra Tech START will conduct initial and periodic personal air monitoring on EPA and Tetra Tech START personnel to establish personal exposures to airborne crystalline silica during removal activities involving the potential generation of silica-containing dusts, as well as to establish action levels and implement appropriate safety controls (i.e., engineering controls, administrative controls, and PPE requirements). For this sampling, Tetra Tech START will use a low-volume air monitoring pump fitted with a 37 mm, 5 µm polyvinyl chloride (PVC) filter cassette with a 10 mm cyclone attachment (10 mm nylon, Higgins-Dewell, aluminum, or equivalent). The samples will be analyzed in accordance with the guidelines established in NIOSH Method 7500 – Silica, Crystalline, by XRD (filter redeposition) (Ref. 13). Personal samples will be collected in the "breathing zone" (i.e., attached to or near the collar or lapel, near the worker's face, with the cassette in a downward-facing position), and will be representative of the 8-hour TWA exposure of each employee regardless of the level of respiratory protection being worn. The inlet plug of the filter cassette will be removed during sampling. The flow rate for this method varies by the type of cyclone used, but ranges from 1.7 to 2.5 L/min. The flow rate of the air sampling train created from this assembly will be measured before sample collection using a Bios Drycal, rotameter or similar device. Once the sampling pump has been adjusted to the desired flow-rate, the initial flow-rate recorded will be the average of ten continuous flow readings. The post-sampling period flow rate will also be measured using a Bios Drycal, rotameter or similar device, however, this measurement will be taken after the air sampling train has completed collecting the personal air sample. Without adjusting the flow-rate of the sampling pump, the post sampling flow-rate will be recorded as the average of ten continuous flow readings. Representative 8-hour TWA personal exposures will be determined on the basis of one or more samples representing full-shift exposures for each shift employee in each job classification within each work area. Once initial monitoring is completed, periodic monitoring will be conducted to monitor personal exposures during removal activities. Additional exposure monitoring will be conducted when a change in production, process, control equipment, personnel, or work practices may result in new or additional exposures above the established exposure limit or if for any suspected reason a change may result in new or additional exposures above the established exposure limit. It should be noted that the OSHA PELs for mineral dusts, including crystalline silica, are based on the percentage of silicon dioxide, which is fused silica and quartz, contained in the sample as respirable quartz. For this project, the NIOSH Recommended Exposure Limit of 0.05 milligrams of silica per cubic meter of air will be used as the exposure limit.

3.4 ASBESTOS CLEARANCE SOIL SAMPLING

EPA and Tetra Tech START will collect clearance soil samples from the surface of each removal area to confirm the presence or absence of asbestos prior to backfilling the removal area with clean fill dirt. Each removal grid will encompass an area of 200 by 200 feet (ft) from which surface debris and six inches of soil will be removed. Once removal activities in each grid have been completed, the removal grid will be further subdivided into four quadrants of 100 by 100 ft. A 10-point composite soil sample will be collected from the surface of each quadrant to a depth of 0 to 1 inch below ground surface (bgs). After collection of a 10-point composite from each quadrant, the remaining surface soil from each quadrant will be homogenized to form one 40-point composite sample for the original 200 by 200 ft removal grid. All asbestos clearance soil samples will be analyzed in accordance with the EPA OSWER Asbestos Committee of the Technical Review Workgroup, *Framework for Investigating Asbestos-Contaminated Superfund Sites*, OSWER Directive #9200.0-68 (Ref. 2); and CARB Method 435 (Ref. 3). For each 200 by 200 ft removal grid that does not meet the clearance criteria established by EPA of less than 0.25 percent asbestos, Tetra Tech START and EPA will submit the composite samples from each quadrant of that removal grid for analysis. The results of these samples will be used to determine which specific quadrants will require additional soil removal. The degree (depth of excavation) to which a previously excavated quadrant indicating greater 0.25 percent asbestos is over-excavated, will be determined by the EPA Task Monitor. As each removal grid meets the EPA-established clearance criteria, it will be backfilled with clean soil.

3.5 BULK ASBESTOS SAMPLING

EPA and Tetra Tech START will collect bulk samples of suspect ACM if and when suspected materials are discovered during site activities or as directed by the EPA Task Monitor. The number, type, and locations of asbestos samples to be collected will be determined in the field by a State of Tennessee-accredited asbestos inspector and the EPA Task Monitor. Because an extensive asbestos survey has already been completed at the site, bulk asbestos samples will be collected to confirm the presence of asbestos at previously identified locations. Bulk asbestos samples will be collected and analyzed in accordance with EPA Asbestos Model Accreditation Plan, 40 CFR 763, Appendix C (Ref. 8), and the EPA *Test Method for the Determination of Asbestos in Bulk Building Materials* (EPA/600/R-93/116) (Ref 10).

3.6 RAINWATER SAMPLING IN EXISTING UNDERGROUND STRUCTURES

As directed by the EPA Task Monitor, Tetra Tech START will collect samples of accumulated rainwater from existing underground structures (i.e. inundated basements, sumps, pits, etc.) at the Liberty Fibers site to determine if the rainwater could possibly be used (i.e. as dust suppressant) during removal activities. The samples will be analyzed for VOCs, SVOCs, RCRA metals, and PCBs. The VOC samples will be analyzed in accordance with SW-846 Method 8260B (Ref. 5). The SVOC samples will be analyzed in accordance with SW-846 Method 8270D (Ref. 5). The PCB samples will be analyzed in accordance with SW-846 Method 8082A (Ref. 5). The RCRA metals samples will be analyzed in accordance with SW-846 Method 6010C/7470A (Ref. 5). The rainwater will be sampled from the side of the underground structure in accordance with the EPA Region 4 SESD *Field Branches Quality System and Technical Procedures* using a disposable bailer (Ref. 4). Table A-1 in Appendix A of the site-specific QAPP lists the numbers, types, and locations of the rainwater samples proposed.

3.7 RAINWATER SAMPLING AT FACILITY OUTFALL LOCATIONS

As directed by the EPA Task Monitor, Tetra Tech START will collect rainwater samples from facility outfall locations at the Liberty Fibers site to determine if removal activities are impacting local waterways. The samples will be analyzed for pH, COD, TSS, oil and grease, total cyanide, total aluminum, total chromium, hexavalent chromium, total copper, total iron, total lead, total nickel, total zinc, and 48-hour LC50. The pH will be analyzed in accordance with SW-846 Method 9040C (Ref. 5). The total aluminum, total chromium, total copper, total iron, total lead, total nickel, and total zinc samples will be analyzed in accordance with SW-846 Method 6010C (Ref. 5). The total cyanide samples will be analyzed in accordance with SW-846 Method 9010C/9012B (Ref. 5). The hexavalent chromium samples will be analyzed in accordance with SW-846 Method 7196A/7199 (Ref. 5). The oil and grease samples will be analyzed in accordance with EPA Method 1664A (Ref. 14). The TSS samples will be analyzed in accordance with MCAWW Method 160.2 (Ref. 15). The COD samples will be analyzed in accordance with MCAWW Method 410.4 (Ref. 15). The 48-hour LC50 samples will be analyzed in accordance with EPA 821-R-02-012 (Ref. 16). The rainwater will be sampled from the facility outfall locations in accordance with the EPA Region 4 SESD *Field Branches Quality System and Technical Procedures* using a disposable bailer or other means depending on the access to each outfall location (Ref. 4). Table A-1 in Appendix A of the site-specific QAPP lists the numbers, types, and locations of the rainwater samples proposed.

4.0 ANALYTICAL METHODOLOGY

The samples collected prior to and during removal activities at the Liberty Fibers Emergency Response site will be submitted to a Tetra Tech START-procured laboratory for analysis. The laboratory analytical methods to be used are:

- California Environmental Protection Agency, Air Resources Board (CARB) Method 435 (Ref. 3)
- EPA Method 600/R-93/116 (Ref. 10)
- SW-846 Method 8260B (Ref. 5)
- SW-846 Method 8270D (Ref. 5)
- SW-846 Method 8282A (Ref. 5)
- SW-846 Method 9040C (Ref. 5)
- SW-846 Method 6010C/7470A (Ref. 5)
- NIOSH Method 7400 (Ref. 11)
- NIOSH Method 7402 (Ref. 12)
- NIOSH Method 7500 (Ref. 13)
- EPA Method 1664A (Ref. 14)
- MCAWW Method 160.2 (Ref. 15)
- MCAWW Method 410.4 (Ref. 15)
- EPA-821-R-02-012 (Ref.16)

Table A-3 in Appendix A of the site-specific QAPP specifies the appropriate analytical methods for each sample matrix, the required sample containers, preservation methods, and sample holding times. The laboratory analytical data packages will be validated by the Tetra Tech START QA manager. Any rejected data and the reasons for their rejection will be summarized in the data validation report. QA/QC samples will be collected during the sampling event to monitor variations in sample collection, sample handling, equipment decontamination, and laboratory analytical procedures. The frequency and types of QA/QC samples is provided in Table A-2 in Appendix A of the site-specific QAPP.

5.0 DATA QUALITY OBJECTIVES

Sampling and laboratory analysis will be conducted to determine: (1) concentrations of airborne fibers in the perimeter air samples collected prior to and during removal activities; (2) concentrations of airborne asbestos fibers in personal air samples collected prior to and during removal activities; (3) concentrations of crystalline silica in personal samples during removal activities involving the potential generation of silica-containing dusts; (4) presence or absence of asbestos in clearance soil samples from each removal grid; (5) presence or absence of asbestos in suspect ACM bulk samples; and (6) concentrations of VOCs, SVOCs, PCBs, and RCRA metals in rainwater from existing underground structures. Ultimately, the data will be used to establish and determine appropriate safety control measures (i.e., engineering controls,

administrative controls, and PPE requirements), the efficacy of removal activities, the presence of any remaining bulk ACM, and the feasibility of using accumulated rainwater (i.e. as dust suppressant) during removal activities.

The sampling approach, including determining the type and number of samples to be collected, will be biased to identify source locations. Field QC samples will be collected during the sampling event to monitor sampling precision and assess the cleanliness of the air sampling media and other sampling equipment. Table A-2 in Appendix A of the site-specific QAPP summarizes the sample designations, types, and sampling rationales for all proposed field quality control samples.

Data validation reports to be prepared will indicate any rejected data and the reasons for their rejection, and will present the limitations to the data based on the review of the data quality. The EPA Task Monitor will be responsible for determining the impact of any data qualifications, as well as any limitations on data usability. Additional information regarding the project data quality objectives is provided in the site-specific QAPP presented in Enclosure B.

Chain-of-custody of the samples collected during the field event will follow requirements specified in the site-specific QAPP (Enclosure B) and, by reference, the appropriate operating procedures in the EPA Region 4 SESD *Field Branches Quality System and Technical Procedures* (Ref. 4).

6.0 FIELD WORK SUMMARY

Tetra Tech START and EPA will conduct air, soil, bulk suspected ACM, and rainwater sampling activities at the Liberty Fibers Emergency Response site beginning in December 2011. All results from samples collected by Tetra Tech START will be entered into the Scribe database and stored at the Tetra Tech, Duluth, Georgia office. Once completed, the database will be submitted to EPA. Proposed sampling activities are described in Section 3.0 of this SAP. The Tetra Tech field team leader or the EPA Task Monitor may change sampling locations and the number of samples to be collected in response to site conditions at the time of the field event. Sampling will be conducted and field QC samples will be collected, in accordance with the guidance documents presented in Section 1.0. Tetra Tech will follow health and safety procedures during site operations as outlined in the site-specific HASP presented in Enclosure C.

Anticipated field team members and their responsibilities are as follows:

- David Andrews, EPA — Task Monitor/On-Scene Coordinator
- Karen Buerki, EPA — On-Scene Coordinator
- Paul Prys, Tetra Tech — Project Manager/Site Manager
- Bryan Erickson, Tetra Tech — Alternate Site Manager

All training requirements for personnel will be addressed in the site-specific HASP (Enclosure C). EPA will be responsible for obtaining access to the Liberty Fibers Emergency Response Site property and any off-site sampling locations. EPA reserves the right to conduct oversight of sampling.

7.0 DISPOSAL OF INVESTIGATION-DERIVED WASTE

IDW will generally consist of disposable latex or nitrile gloves, boot covers, Tyvek (or similar) protective suits with head covers, duct tape, plastic bags, spent breathing air cartridges, paper towels, plastic scoops, bailers, and disposable sampling pans. These items are used mainly for project sample collection, to prevent cross-contamination during sampling activities, and to provide protection and sanitary conditions to personnel throughout field work. IDW requiring disposal will be collected and disposed of by the ERRS contractor during the decontamination process (Ref. 22).

8.0 REFERENCES

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14. EPA. Method 1664, Revision A: N-Hexane Extractable Material (HEM; Oil and Grease) and Silica Gel Treated N-Hexane Extractable Material (SGT-HEM; Non-polar Material) by Extraction and Gravimetry, EPA-821-R-98-002. February 1999.

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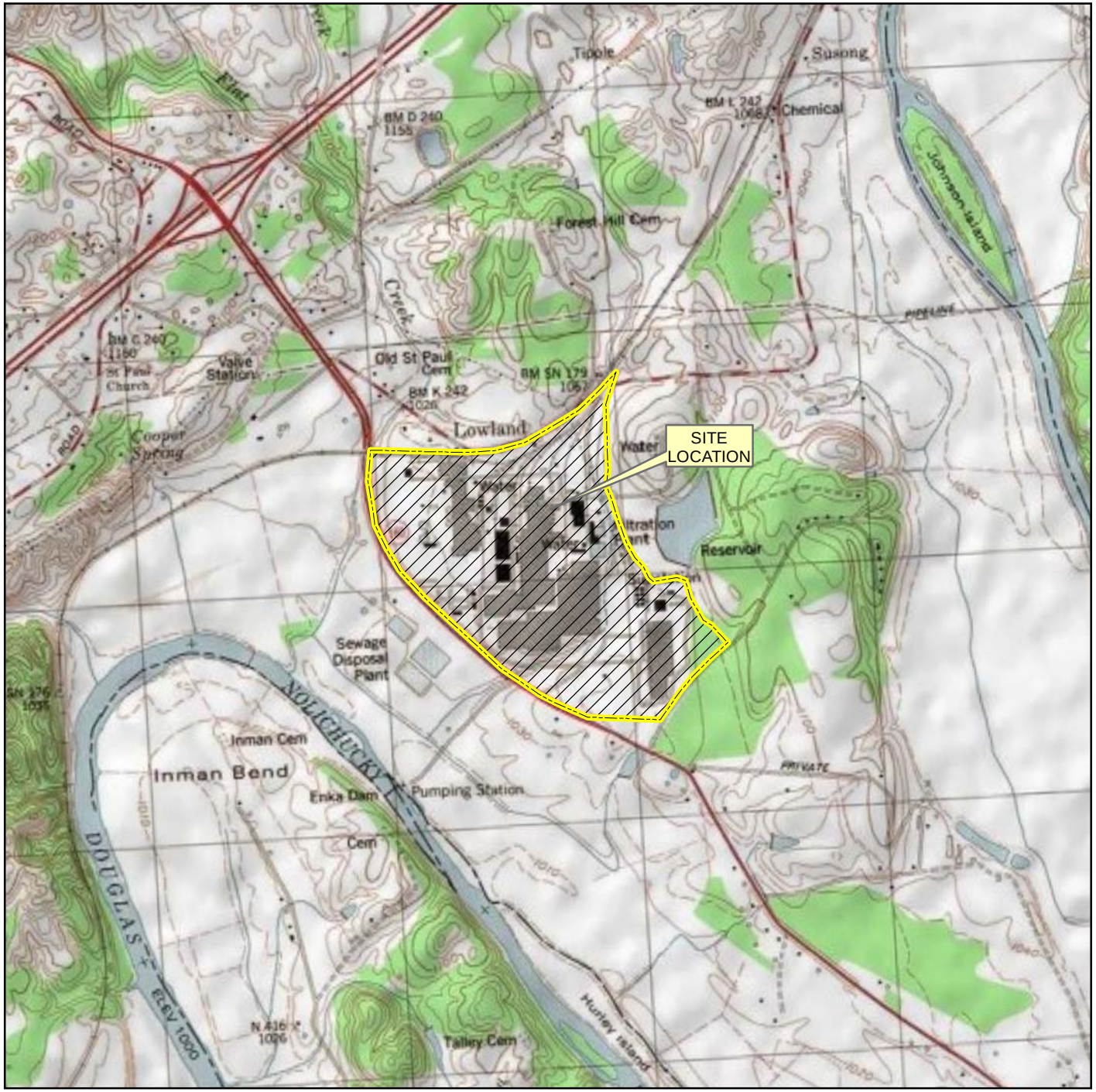
ENCLOSURE A

FIGURES

(Two Pages)

FIGURE

1 SITE LOCATION
2 SITE LAYOUT



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MAP SOURCE:
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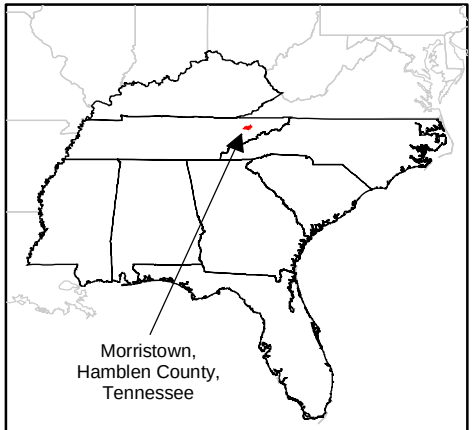
TOPOGRAPHIC QUADRANGLE, 1981



United States Environmental Protection Agency

LIBERTY FIBERS
MORRISTOWN,
HAMBLIN COUNTY,
TENNESSEE
TDD No.TTEMI-05-001-0126

FIGURE 1
SITE LOCATION

TETRA TECH

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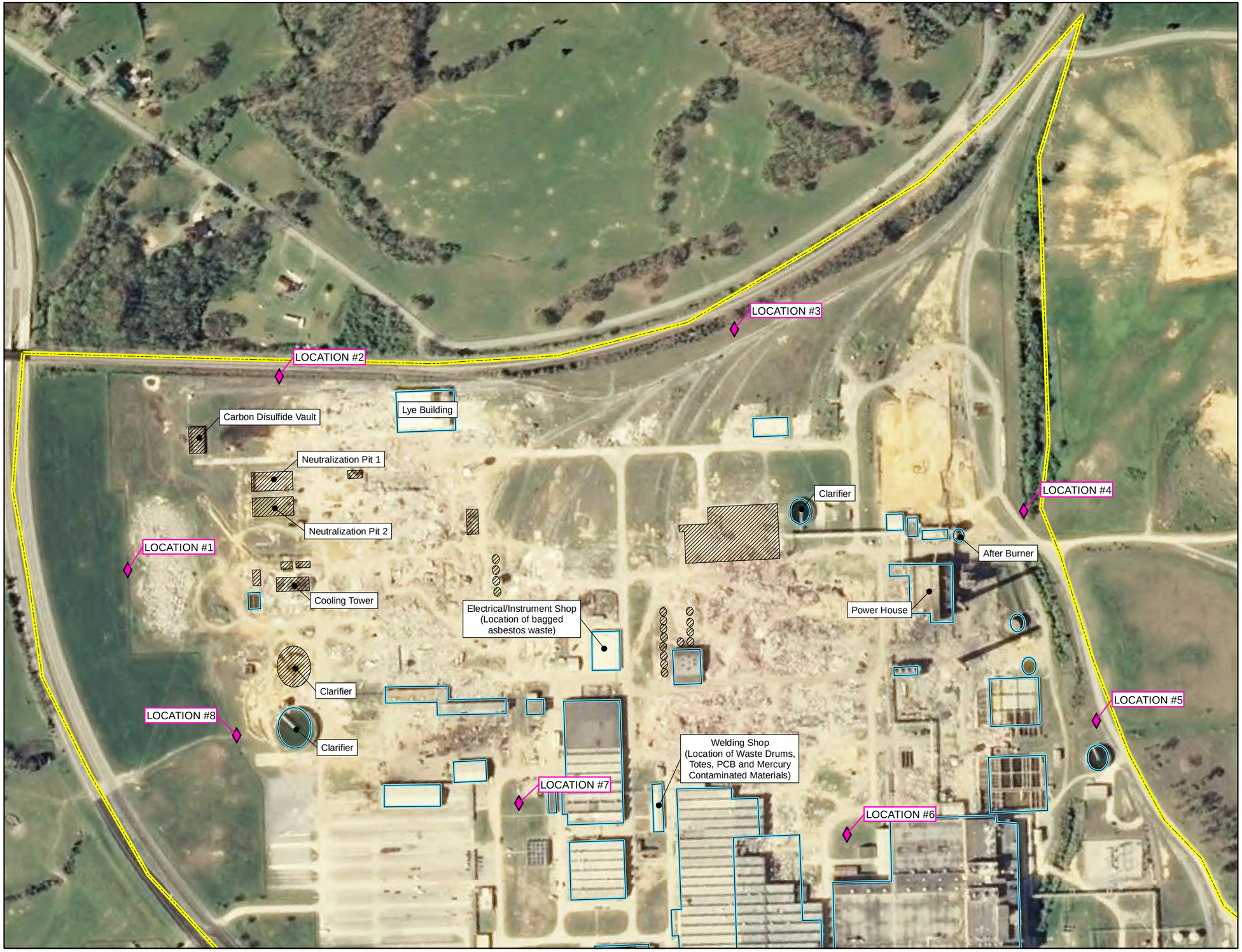

LEGEND

- Proposed Air Sampling Location
- Existing Structure
- Former Structure
- Approximate Property Boundary

Aerial Image Source:
04/2008 GlobeXplorer

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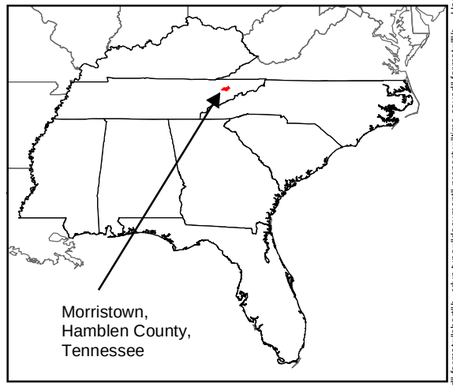

United States
Environmental Protection Agency

LIBERTY FIBERS
MORRISTOWN,
HAMBLEN COUNTY,
TENNESSEE
TDD No.TTEMI-05-001-0126

FIGURE 2
SITE LAYOUT AND PROPOSED AIR SAMPLING LOCATIONS

TETRA TECH

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ENCLOSURE B

SITE-SPECIFIC QUALITY ASSURANCE PROJECT PLAN

(26 Pages)

FINAL
QUALITY ASSURANCE PROJECT PLAN (SHORT FORM)

LIBERTY FIBERS EMERGENCY RESPONSE
MORRISTOWN, HAMBLEN COUNTY, TENNESSEE

Revision 1

Prepared for

U.S. ENVIRONMENTAL PROTECTION AGENCY
Region 4
Atlanta, GA 30303

Contract No.	:	EP-W-05-054
TDD No.	:	TTEMI-05-001-0126
Date Prepared	:	April 20, 2012
EPA Task Monitor	:	David Andrews
Telephone No.	:	(404) 562-8763
Prepared by	:	Tetra Tech, Inc.
START III Site Manager	:	Paul Prys
Telephone No.	:	(678) 775-3106

Prepared by	Reviewed by	Approved by
Paul Prys START III Site Manager	Jessica A. Vickers START III Technical Reviewer	Andrew F. Johnson START III Program Manager

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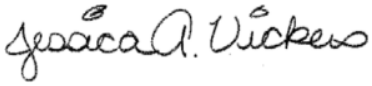
QUALITY ASSURANCE PROJECT PLAN (SHORT FORM)

U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION 4 & TETRA TECH, INC.

SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM CONTRACT NO. EP-W-05-054

Site Name:	Liberty Fibers Emergency Response	**City, County:** Morristown, Hamblen County	**State:** Tennessee
Prepared By:	Tetra Tech, Inc. (Tetra Tech)	**Date:** March 5, 2012	
Approved By:	Paul Prys **Date:** 4/20/12	**Signature:** 	
Title:	Tetra Tech Project Manager/Site Manager		
Approved By:	Jessica Vickers **Date:** 4/20/12	**Signature:** 	
Title:	Tetra Tech Quality Assurance (QA) Manager		
Approved By:	Andrew Johnson **Date:** 4/20/12	**Signature:** 	
Title:	Tetra Tech Program Manager		
Approved By:	David Andrews **Date:**	**Signature:** David Andrews, OSC Digitally signed by David Andrews, OSC DN: cn=David Andrews, OSC, c=US, o=ERRB, ou=USEPA Region 4, email=andrews.david@epa.gov Reason: I have reviewed this document Date: 2012.04.25 10:31:40 -04'00'	
Title:	U.S. Environmental Protection Agency (EPA) Task Monitor and EPA Region 4 QA Manager's Designated Approving Official		

1.0 PROJECT INFORMATION

1.1 Distribution List:

EPA Region 4:	Tetra Tech:
David Andrews, EPA On-Scene Coordinator (OSC)	Angel Reed, Tetra Tech Document Control Coordinator
Karen Buerki, EPA OSC	Bryan Erickson, Tetra Tech Alternate Site Manager
Katrina Jones, EPA Project Officer	Brian Croft, Tetra Tech Task Order Manager

1.2 Project/Task Organization:

David Andrews will serve as the EPA Task Monitor for the activities described in this Quality Assurance Project Plan (QAPP). Paul Prys of Tetra Tech is the Tetra Tech START project manager and is responsible for maintaining an approved version of this QAPP. Jessica Vickers of Tetra Tech is Tetra Tech START QA manager and is responsible for providing Tetra Tech approval of this QAPP. Specific Tetra Tech field personnel will be selected prior to mobilization, including a senior scientist as defined under the Superfund Technical Assessment and Response Team (START III) Contract No. EP-W-05-054.

1.3 Problem Definition/Background:

The Liberty Fibers Emergency Response site is located at 4855 Enka Highway, Morristown, Hamblen County, Tennessee (See Figure 1 in Enclosure A of the Sampling and Analysis Plan [SAP]). The site occupies approximately 300 acres and is bordered by a small residential community to the north, landfills and a retention pond to the east, the inactive nylon and polyester staple plants to the south, and a water treatment plant and farmland to the west. See Figure 2 in Enclosure A of the SAP.

The Liberty Fibers site is a former rayon fiber manufacturer. According to a briefing memorandum prepared by the Tennessee Department of Environment and Conservation (TDEC), Liberty Fibers filed for bankruptcy in September 2005. A&E Salvage Company (formerly J&N Salvage Company) bought the salvage rights to the Liberty Fibers property in October 2006. The salvage rights include any and all equipment and materials located on the property and the option to purchase the property.

In September 2006, TDEC, in coordination with the EPA, conducted a site visit in response to a tip that TDEC received regarding demolition activities and the presence of hazardous materials, including polychlorinated biphenyls (PCBs) on the site. During the site visit, TDEC observed approximately 24 transformers and 80 capacitors that were labeled as containing PCBs. Also in September 2006, the Commissioner of TDEC received a letter from the Mayor of Hamblen County expressing his concern about the potential for release of on-site PCBs, asbestos, and other chemicals during the ongoing salvage operations at the site. During a discussion among the EPA personnel, A&E Salvage Company personnel, a Liberty Fibers representative, the court-appointed trustee, and TDEC personnel in October 2006, A&E Salvage Company acknowledged that it was the owner of the PCB equipment and that it would accept full legal responsibility for proper removal and disposal of the PCB equipment in compliance with appropriate regulations.

A&E Salvage Company submitted a plan to the EPA in January 2007 for sampling and removal of all transformers and capacitors located on site. A&E Salvage Company contracted SD Myers to sample the dormant on-site transformers and capacitors and submit the samples for PCB analysis. The energized transformers and capacitors could not be sampled, however, until Morristown Utilities ran new electrical service to the site. SD Meyers sampled 39 transformers: four transformers were found to contain PCBs, 12 units were found contaminated with PCBs, and 23 units neither contained nor were contaminated with PCBs. A&E Salvage Company also contracted Booher Industrial Company of Jasper, Georgia to remove and dispose of the transformers. However, EPA later informed A&E Salvage Company that Booher Industrial Company was not an EPA-approved treatment, storage and disposal facility for PCB waste in accordance with the Toxic Substances Control Act (TSCA).

In March 2007, A&E Salvage Company held a meeting with IPI Business and Morristown Utilities, during which the City of Morristown decided to annex the Liberty Fibers site and include the site as part of its Urban Growth Boundaries. As a result, the City of Morristown would be responsible for providing utility services, including power and water, to the Liberty Fibers site.

In March 2008, the EPA Resource Conservation and Recovery Act (RCRA) and Oil Pollution Act Enforcement and Compliance Branch contacted the Emergency Response and Removal Branch (ERRB) regarding conducting a removal assessment of the facility. EPA On-Scene Coordinator Steve Spurlin contacted the EPA and TDEC representatives involved with the facility to discuss the site and review documentation. OSC Spurlin, supported by Tetra Tech START, as well as representatives from TDEC, the EPA Asbestos, the EPA RCRA Division, and the EPA Toxic Substances Control Act Enforcement programs, coordinated a site visit for March 20 and 21, 2008. The EPA and Tetra Tech START were joined by Mr. Mark Sawyer, a local investor in A&E Salvage Company, and Mr. Tom Montgomery, a former employee of Liberty Fibers Corporation. During the site visit, the EPA and Tetra Tech observed several drums, totes, and tanks; bags labeled as “asbestos containing material”; a 50,000-gallon sulfuric acid tank containing approximately eight inches of product; known and suspected PCB-containing articles and oils; suspected asbestos containing material (ACM); and discolored soil throughout the property. In addition, Mr. Montgomery identified the on-site concrete vault that contains six 10,000-gallon tanks used to store carbon disulfide, an extremely flammable chemical used in manufacturing rayon (Enclosure A, Figure 2 of Sampling and Analysis Plan [SAP]). To prevent fire and explosion, the vaults were typically filled with water, submerging the tanks. Mr. Montgomery also identified a leak in the western wall of the vault, which appeared to have resulted in the carbon disulfide tanks being only half-submerged in water within the vault and, therefore, represented a significant hazard.

In December 2009, EPA OSC Perry Gaughan, Tetra Tech START personnel, and TDEC personnel conducted another site visit with Mr. Sawyer. During the site visit, Mr. Sawyer informed the EPA and Tetra Tech START that the carbon disulfide tanks within the concrete vault had not contained any product, had been removed from the vault sometime in the Spring of 2009, and had been sold for scrap metal. The tanks had been removed because of potential for explosion. During that visit, the water that had submerged the tanks remained in the vault. The Power Mechanical Shop contained bagged asbestos waste, and the Welding Shop contained PCB-contaminated transformers and capacitors (Enclosure A, Figure 2). Although the facility was partially demolished, the debris fields - mixed with presumed ACM - remained. Recycling and reclamation operations were ongoing, and at least one metals recycling business was currently operating on site.

From January 18 through 22, 2010, Tetra Tech START conducted a removal assessment (RA) of the site. The RA consisted of six primary objectives: 1) collecting bulk asbestos samples; 2) conducting a geophysical investigation in an attempt to identify the locations of possible buried transformers; 3) collecting aqueous and solid waste samples from the carbon disulfide tank vault and surrounding area; 4) collecting solid waste samples from two neutralization pits; 5) collecting waste samples from on-site drums and totes; and 6) collecting personal and area air samples for PCM analysis to evaluate the level of exposure of site personnel to airborne asbestos fibers during the assessment and to determine the concentration of airborne asbestos fibers that may be migrating off site

On April 21, 2010, the EPA and Tetra Tech START conducted an emergency response site assessment in response to a debris fire on-site. The fire occurred in the foundation of a demolished cooling tower located on the west side of the site. On April 29, 2010, Tetra Tech START conducted a visual assessment of presumed ACM in the remaining tenant buildings on-site.

On March 17, 2011, the EPA and Tetra Tech START conducted a drainage assessment at the Liberty Fibers Rayon Plant and the potential effects on various buildings located at the Nylon Staples Plant.

1.4 Project/Task Description:

Tetra Tech START is tasked with performing perimeter and personal air monitoring, collecting bulk samples of suspect asbestos containing building materials, collecting clearance soil samples for asbestos, collecting rainwater samples in existing underground structures and from facility outfall locations for chemical analyses, preparing site related reports, and logbook and photographic documentation of site activities.

Schedule: The project is scheduled to begin in January 2012.

1.5 Quality Objectives and Criteria for Measurement Data:

Identification of the seven steps of the data quality objectives (DQO) process: DQOs were established for the Liberty Fibers Emergency Response site to define the quantity and quality of the data to be collected to support the objectives of the removal project. DQOs were developed using the seven-step process outlined in the following guidance documents: "EPA Requirements for Quality Assurance Project Plans," EPA QA/R-5, March 2001; "Guidance for Quality Assurance Project Plans," EPA QA/G-5, December 2002; and "Guidance on Systematic Planning Using the Data Quality Objectives Process," EPA QA/G-4, February 2006.

Step 1: State the Problem	**Stakeholders:** the EPA, TDEC, Mr. Mark Sawyer. **Site History/Conceptual Site Model:** The Liberty Fibers Emergency Response site is located at 4855 Enka Highway, Morristown, Hamblen County, Tennessee. The property contains existing, demolished, and partially demolished buildings that formerly operated as a rayon filament plant. The facility was once used for salvage operations and currently contains active tenants. For additional information, see Section 1.3 of this Quality Assurance Project Plan (QAPP). **Statement of Problem:** Air, water, and soil sampling and laboratory analysis will be required to determine whether or not asbestos fibers are being released and migrating off-site during removal activities, to assess personnel exposure during removal activities, to determine if water from existing underground structures can be used during removal activities (i.e. as dust suppressant), to determine if water from removal activities is impacting local waterways, and to determine the efficacy of removal activities by collecting asbestos soil samples for clearance following removal activities.
Step 2: Identify the Goals of the Study	**Study Questions:** Are airborne asbestos fibers being released and migrating off-site during removal activities in concentrations harmful to site personnel and the surrounding community? Are contaminants present in the rainwater from existing underground structures below levels to allow for reuse of the rainwater in removal activities? Are contaminants present in the rainwater from the facility outfalls generated during removal activities impacting local waterways? Were materials sufficiently removed to render the property safe for reuse? **Decision Statements:** Evaluate analytical data for environmental samples to determine whether contaminant concentrations exceed comparison criteria.
Step 3: Identify Information Inputs	**Inputs:** Site history contained in Section 1.3 of this QAPP.
Step 4: Define Study Boundaries	**Spatial Boundary:** The Liberty Fibers Emergency Response site is defined as an approximately 300 acre facility at 4855 Enka Highway, Morristown, Tennessee. The property is bordered by a small residential community to the north, landfills and a retention pond to the east, the inactive nylon and polyester staple plants to the south, and a water treatment plant and farmland to the west. See Figure 2 in Enclosure A of the SAP. **Temporal Boundaries:** Removal activities are scheduled to begin in December 2011 and continue until the EPA Task Monitor determines that activities are complete.

Step 5: Develop the Analytical Approach

Analytical Methods: All analyses will be performed by subcontract laboratories procured by Tetra Tech. Laboratory analysis of air samples will include:

- National Institute of Occupational Safety and Health (NIOSH) 7400 Method – Asbestos and Other Fibers by Phase Contrast Microscopy (PCM).
- National Institute of Occupational Safety and Health (NIOSH) 7402 Method – Asbestos by Transmission Electron Microscopy (TEM).
- NIOSH, Method 7500 – Silica, Crystalline, by X-Ray Diffraction (filter redeposition).

Laboratory analysis for clearance soil samples will include California Environmental Protection Agency, Air Resources Board (CARB), Method 435 - Determination of Asbestos Content of Serpentine Aggregate.

Laboratory analysis for rainwater samples in existing underground structures will include:

- Target compound list (TCL) volatile organic compounds (VOCs) using the EPA Test Methods for Evaluating Solid Waste, Physical/Chemical Methods (SW-846) Method 8260B.
- TCL semivolatile organic compounds (SVOCs) using the SW-846 Method 8270D.
- RCRA metals (including mercury) using the SW-846 Methods 6010C/7470A.
- PCBs using the SW-846 Method 8082A.

Laboratory analysis for rainwater samples from facility outfall locations will include:

- Selected metals (total aluminum, chromium, copper, iron, lead, nickel, and zinc) using the SW-846 Method 6010C.
- pH using the SW-846 Method 9040C.
- Cyanide using the SW-846 Methods 9010C/9012B.
- Hexavalent chromium using the SW-846 Methods 7196A/7199.
- Total suspended solids (TSS) using the Methods for Chemical Analysis of Water and Wastes (MCAWW) Method 160.2.
- Chemical oxygen demand (COD) using the MCAWW Method 410.4.
- Oil and grease using the EPA Method 1664A.
- 48-hour lethal concentration at 50 percent (LC50) using EPA-821-R-02-012.

In addition, bulk samples will be collected, as directed by the EPA Task Monitor, and analyzed for asbestos by polarized light microscopy (PLM) using Method for the Determination of Asbestos in Bulk Building Materials, EPA 600/R-93/116, July 1993.

Comparison Criteria: Analytical data results will be compared with the comparison criteria listed below.

- For bulk samples of suspected ACM, 40 CFR Part 763-Asbestos: http://www.epa.gov/asbestos/pubs/2003pt763.pdf
- For perimeter, decontamination unit area, and personal PCM air samples using NISOH Method 7400, 29 CFR 1926.1101 – Asbestos and 40 CFR Part 763-Asbestos:: http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_id=10862&p_table=STANDARDS, http://www.cdc.gov/niosh/docs/2003-154/pdfs/7400.pdf, and http://www.epa.gov/asbestos/pubs/2003pt763.pdf
- For perimeter, decontamination unit area, and personal TEM air samples using NISOH Method 7402, 29 CFR 1926.1101 – Asbestos: http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_id=10862&p_table=STANDARDS and http://www.cdc.gov/niosh/docs/2003-154/pdfs/7402.pdf
- No visible contamination and less than 0.25% asbestos using CARB Method 435: http://www.arb.ca.gov/testmeth/vol3/M_435.pdf
- Maximum Contaminant Levels (MCL) for rainwater in existing underground structures
- Comparison criteria for rainwater from facility outfall locations is listed in NPDES Permit TN0080641

	• For crystalline silica, NIOSH Recommended Exposure Limit (REL) of 0.05 mg/m^3 (50 µg/m^3) **Decision Rules:** If contaminants are detected at concentrations equal to or less than the comparison criteria listed above, then analytical data are considered acceptable. If contaminants are detected at concentrations exceeding comparison criteria, then appropriate safety control measures (i.e. engineering controls, administrative controls, personal protective equipment [PPE] requirements) will be implemented or additional removal of soil will need to be completed.
Step 6: Specify Performance or Acceptance Criteria	Analytical results for initial acceptance will be assessed during the Stage 2A validation of the Level II data packages performed by Tetra Tech START that evaluates the usability of the data defined. Level II data packages for air, water, soil, and bulk samples, where applicable, will be requested from the Tetra Tech START-procured laboratory. Any rejected data and the reasons for rejection will be summarized in the data validation report.
Step 7: Develop the Plan for Obtaining Data	An unknown number of air and soil samples are proposed for this project, as sampling will be on-going during removal activities. Water and bulk sampling will be determined by the EPA Task Monitor, as necessary. Sample nomenclature, locations, and rationales are described in Table A-1 of Appendix A of this QAPP.

1.6 Special Training/Certification Requirements:

☒ 29 CFR 1910.120 ☒ Special Equipment/Instrument Operator (describe below): ☐ Other (describe below):

Special Requirements: Asbestos air and soil sampling will be undertaken by a Tennessee-certified asbestos project monitor and inspector.

1.7 Documentation and Records:

The most current version of this QAPP will be distributed to the entire distribution list presented in Section 1.1. The Tetra Tech project manager will be responsible for maintaining the most current revision of this QAPP and for distributing it to all personnel and parties involved in the field effort. Field records that may be generated include the following:

☒	Chains-of-Custody Forms	☒	Health and Safety Plan (HASP)
☒	Field Instrument Calibration	☒	Photographic log
☒	Field Monitoring and Screening	☒	Site Logbook
☒	Safety Briefing Sign-In Sheets	☒	Site Maps and Drawings

Field documentation and records will be generated and maintained in accordance with the requirements presented in the EPA Region 4 Science and Ecosystem Support Division (SESD) "Field Branches Quality System and Technical Procedures" (FBQSTP) guidance document for *Logbooks* (SESDPROC-010-R4), October 2010. This document can be found at the following web address: http://www.epa.gov/region4/sesd/fbqstp/index.html. All field-generated data will also be maintained in the project file and included, as appropriate, in project deliverables in final form after all reviews and applicable corrective actions are completed.

Laboratory analytical data will be generated and maintained in accordance with the EPA Contract Laboratory Program (CLP) "National Functional Guidelines (NFG) for Superfund Organic Methods Data Review", USEPA-540-R-08-01, June 2008; the EPA CLP "NFG for Inorganic Superfund Data Review", USEPA-540-R-10-11, January 2010, "Method for the Determination of Asbestos in Bulk Building Materials", EPA 600/R-93/116, July 1993, CARB Method 435;NIOSH Method 7400; NIOSH Method 7402; NIOSH Method 7500; and SW-846, Fourth Edition, Including Updated, I through IVB, February 2007 (which can be found at: http://www.epalgov/SW-846/main.htm).

The formal deliverables to the EPA associated with this project are specified in the EPA technical direction document (TDD). Draft and final reports will be prepared to summarize field activities and findings and present laboratory analytical results. All project records under Tetra Tech's control will be maintained and retained in accordance with the requirements of the EPA START III Contract No. EP-W-05-054.

2.0 DATA GENERATION AND ACQUISITION

2.1 Sampling Process Design:

Tables A-1 through A-4 in Appendix A of this QAPP present details on the types and numbers of samples to be collected, sample locations, sample matrices, and laboratory analytical methods. The rationale for this sampling process design is based on the DQO process discussed in Section 1.5 of this QAPP. Samples will be submitted to the subcontract laboratories procured by Tetra Tech START and will be analyzed for PCM airborne fibers, TEM airborne asbestos fibers, crystalline silica, asbestos in soils, VOCs, SVOCs, RCRA metals, PCBs, selected metals, pH, oil and grease, TSS, COD, LC50, and PLM asbestos.

2.2 Sample Methods Requirements:

Matrix	Sampling Method	EPA and Tetra Tech Standard Operating Procedures and Guidance
Air	Perimeter, decontamination unit area, and personal air samples will be collected approximately 4 to 5 feet from the ground surface to represent exposures in the breathing zone during removal.	Refer to NIOSH Method 7400; NIOSH Method 7402; EPA Asbestos Committee of the Technical Review Workgroup of the Office of Solid Waste and Emergency Response (OSWER). *Framework for Investigating Asbestos-Contaminated Superfund Sites*. OSWER Directive #9200.0-68. September 2008; NIOSH. Method 7500; and the EPA Region 4, SESD FBQSTP for *Ambient Air Sampling (SESDPROC-303-R4)*, January 2011, available at the following web address: http://www.epa.gov/region4/sesd/fbqstp/index.html. Also refer to Tables A-1 through A-4 in Appendix A of this QAPP, and to Section 2.2, page 20 of the Tetra Tech START Program Level QAPP, May 2011. A list of applicable Safe Work Practices is included in the site-specific Health and Safety Plan (HASP), which will be available on site during field activities.
Soil	Soil samples will be collected from 0 to 1 inches below ground surface using plastic scoops and disposable aluminum pans.	Refer to CARB Method 435 and the EPA Region 4, SESD FBQSTP for *Soil Sampling (SESDPROC-300-R1)*, November 2007, available at the following web address: http://www.epa.gov/region4/sesd/fbqstp/index.html. Also refer to Tables A-1 through A-4 in Appendix A of this QAPP, and to Section 2.2, page 20 of the Tetra Tech START Program Level QAPP, May 2011. A list of applicable Safe Work Practices is included in the HASP, which will be available on site during field activities.
Water	Rainwater samples will be collected from the water column along the sides of existing underground structures and from facility outfall locations using disposable bailers or other means.	Refer to SW-846 Method 8260B; SW-846 Method 8270D; SW-846 Method 8082A; SW-846 Methods 6010C/7470A, SW-846 Method 9040C, SW-846 Methods 9010C/9012B, SW-846 Methods 7196A/7199, EPA Method 1664A, MCAWW Method 160.2, MCAWW Method 410.4, EPA 821-R-02-012; and the EPA Region 4, SESD FBQSTP for *Surface Water Sampling* (SESDPROC-201-R1), November 2007, available at the following web address: http://www.epa.gov/region4/sesd/fbqstp/index.html. Also refer to Tables A-1 through A-4 in Appendix A of this QAPP, and to Section 2.2, page 20 of the Tetra Tech START Program Level QAPP, May 2011. A list of applicable Safe Work Practices is included in the HASP, which will be available on site during field activities.
Bulk	Various bulk suspect asbestos-containing materials will be collected as directed by the EPA Task Monitor.	Refer to EPA 600/R-93/116 PLM Method and the EPA Region 4, SESD FBQSTP for *Bulk Sampling for Asbestos* (SESDPROC-104-R0), August 2009, available at the following web address: http://www.epa.gov/region4/sesd/fbqstp/index.html. Also refer to Tables A-1 through A-4 in Appendix A of this QAPP, and to Section 2.2, page 20 of the Tetra Tech START Program Level QAPP, May 2011. A list of applicable Safe Work Practices is included in the HASP, which will be available on site during field activities.

Other Sample Method Requirements: The Tetra Tech project manager, in coordination with the EPA Task Monitor, will be responsible for identifying failures in sampling and field measurement systems, overseeing any corrective actions, ensuring that the corrective actions are implemented and documented in site logbooks and other appropriate records, and assessing the efficacy of corrective actions. Field decontamination, if necessary, will be conducted in accordance with the procedures provided in the EPA Region 4, SESD FBQSTP *Field Equipment Cleaning and Decontamination* (SESDPROC-205-R1), November 2007, available at the following web address: http://www.epa.gov/region4/sesd/fbqstp/index.html. Equipment required for this sampling event includes the equipment listed in Table A-5 in Appendix A of this QAPP and the PPE identified in the HASP (Enclosure C of the SAP dated April 20, 2012).

2.3 Sample Handling and Custody Requirements:

Sample handling and chain-of-custody record keeping will be conducted in accordance with EPA Region 4, SESD FBQSTP *Packing, Marking, Labeling, and Shipping of Environmental and Waste Samples* (SESDPROC-209-R2), April 2011, available at the following web address: http://www.epa.gov/region4/sesd/fbqstp/index.html. Once collected, samples will be placed in a cool, dry place or on ice and kept in a custody-sealed cooler in a secure location. The Tetra Tech START site manager will ensure that custody of samples is maintained until they are shipped to the laboratory. Chain-of-custody records will be used to document the samples collected and delivered to the laboratory. Also refer to Section 2.3, page 29 of the Tetra Tech START Program Level QAPP, May 2011.

2.4 Analytical Method Requirements:

The analytical parameters and associated laboratory analytical methods that will be used for this project are listed in Tables A-3 and A-4 in Appendix A of this QAPP.

A turnaround time of 24 hours and 5 days will be requested for PCM and TEM air sampling results, respectively. Unless otherwise directed by the EPA Task Monitor, a turnaround time of 10 business days for preliminary results will be requested for all other sample analyses from the Tetra Tech START-procured subcontract laboratories. Analytical results for initial acceptance will be assessed during validation performed by Tetra Tech START that evaluates the usability of the data. Level II data packages for water samples will be requested from the laboratory procured by Tetra Tech START. A Stage 2A validation of the Level II data packages will be performed by Tetra Tech START. Any rejected data and the reasons for rejection will be summarized in the data validation report. See Table A-4 in Appendix A of this QAPP.

2.5 Quality Control Requirements:

Quality control (QC) requirements for field monitoring are provided in the EPA Region 4, SESD FBQSTP *Field Measurement Uncertainty* (SESDPROC-014-R0), February 2008, and QC requirements for field sampling are provided in the EPA Region 4, SESD FBQSTP *Field Sampling Quality Control* (SESDPROC-011-R3), October 2010. Both are available at the following web address: http://www.epa.gov/region4/sesd/fbqstp/index.html.

QC requirements for analytical methods are presented in the EPA CLP NFG for Superfund Organic Methods Data Review, USEPA-540-R-08-01, June 2008; the EPA CLP NFG for Inorganic Superfund Data Review, USEPA-540-R-10-11, January 2010, EPA 600/R-93/116 PLM Method; *Framework for Investigating Asbestos-Contaminated Superfund Sites,* OSWER Directive #9200.0-68, September 2008; CARB Method 435;NIOSH Method 7400; NIOSH Method 7402; NIOSH Method 7500; SW-846 Methods 8260B, 8270D, 8082A, 6010C, 7470A, 9040C, 9010C, 9012B, 7196A, 7199, EPA Method 1664A; MCAWW Methods 160.2 and 410.4; and EPA 821-R-02-012.

Laboratory and QC samples will include one matrix spike and matrix spike duplicate (MS/MSD) from sample sets collected at a frequency of one MS/MSD set for every 20 rainwater matrix samples collected. Field QC samples will include field duplicate samples collected at a frequency of one field duplicate sample for every 20 rainwater matrix samples collected; one aqueous trip blank per shipment; one aqueous field blank. For the purposes of these projects, the rainwater samples collected from existing underground structures will be considered a different matrix from those collected at the facility outfall locations. These QC samples do not apply to asbestos or crystalline silica analyses. For asbestos and crystalline silica samples, media and/or field blanks will be collected as stated in Table A-2 of this site-specific QAPP. All QC samples will be submitted for analyses of parameters, as appropriate, listed in Tables A-3 and A-4 in Appendix A of this QAPP.

2.6 Instrument/Equipment Testing, Inspection, and Maintenance Requirements:

For instrument testing, inspection, and maintenance requirements for field monitoring, refer to the EPA Region 4, SESD FBQSTP *Equipment Inventory and Management* (SESDPROC-108-R3), April 2009, available at the following web address: http://www.epa.gov/region4/sesd/fbqstp/index.html. Also refer to the manufacturer's operating manual for further instructions on field instrument testing, inspection, and maintenance, as well as to Section 2.6.2, page 42 of the Tetra Tech START Program Level QAPP, May 2011. Table A-3 in Appendix A of this QAPP contains a list of field equipment that will be used during this sampling event.

Laboratory instrument testing, inspection, and maintenance requirements are contained in the CARB Method 435; NIOSH Method 7400; NIOSH Method 7402; NIOSH Method 7500; EPA 600/R-93/116; MCAWW Methods 160.2 and 410.4; EPA Method 1664A; EPA 821-R-02-012; and the SW-846 methods, as well as in the associated manufacturer's operating manuals and Section 2.6.3, page 42 of the Tetra Tech START Program Level QAPP, May 2011.

2.7 Instrument Calibration and Frequency:

For instrument calibration and frequency requirements for field monitoring, refer to the EPA Region 4, SESD FBQSTP *Equipment Inventory and Management* (SESDPROC-108-R3), April 2009, available at the following web address: http://www.epa.gov/region4/sesd/fbqstp/index.html. Also refer to the manufacturer's operating manual for further instructions on calibration, as well as to Section 2.7.1, page 43 of the Tetra Tech START Program Level QAPP, May 2011.

Instrument calibration and frequency requirements for analytical methods are specified in the CARB Method 435; NIOSH Method 7400; NIOSH Method 7402; NIOSH Method 7500; EPA 600/R-93/116; MCAWW Methods 160.2 and 410.4; EPA Method 1664A; EPA 821-R-02-012; and the SW-846 methods, as well as in the associated manufacturer's operating manuals, the laboratory QA manual, and in Section 2.7.2, page 43 of the Tetra Tech START Program Level QAPP, May 2011.

2.8 Inspection/Acceptance Requirements for Supplies and Consumables:

Supplies and consumables required for sampling will be inspected and accepted by the Tetra Tech START project manager or designated field team member, and include, but are not necessarily limited to, sample jars, sampling implements, sample packaging materials, and PPE identified in the HASP (including disposable nitrile gloves and boot covers). All sample containers will meet EPA criteria for cleaning procedures for low-level chemical analysis. Certifications will be provided by the manufacturer for sample containers in accordance with pre-cleaning criteria established by the EPA. See Section 2.8, page 45 of the Tetra Tech START Program Level QAPP, May 2011. See Table A-3 in Appendix A of this QAPP for a list of supplies and consumables that will be used during the anticipated sampling events.

2.9 Non-Direct Measurement Requirements:

Information pertaining to the site (including photographs, maps, and so forth) has been compiled from file information obtained from the EPA. The extent to which these data and information, if any, are used to achieve the objectives of this project will be determined by Tetra Tech START in cooperation with the EPA Task Monitor. Any justifications and qualifications required for the use of these data and information will be provided in the reports generated for this project. Refer to Section 2.9, page 45 of the Tetra Tech START Program Level QAPP, May 2011.

2.10 Data Management:

All reference materials generated during this investigation and included in the final reports will be submitted to the EPA Task Monitor in portable document format. All field-generated data will be managed as part of the permanent field record for the project. All laboratory analytical data will be managed in accordance with the requirements specified in the EPA CLP NFG for Superfund Organic Methods Data Review, USEPA-540-R-08-01, June 2008; the EPA CLP NFG for Inorganic Superfund Data Review, USEPA-540-R-10-11, January 2010, the CARB Method 435; NIOSH Method 7400; NIOSH Method 7402; NIOSH Method 7500; EPA 600/R-93/116; MCAWW Methods 160.2 and 410.4; EPA Method 1664A; EPA 821-R-02-012; and the SW-846 methods, as well as in the associated manufacturer's operating manuals, the laboratory QA manual, and in Section 2.10, page 46 of the Tetra Tech START Program Level QAPP, May 2011. Finally, all field-generated data and other records generated or obtained during this project will be managed according to the requirements of EPA START III Contract No. EP-W-05-054, as well as to Section 2.10, page 46 of the Tetra Tech START Program Level QAPP, May 2011.

3.0 ASSESSMENT AND OVERSIGHT

3.1 Assessment and Response Actions:

All deliverables to which Tetra Tech START contributes in whole or in part, including the final reports, will be subject to a corporate two- or three-tiered review process, which includes a technical review, a QC review, and (for the three-tiered review only) an editorial review. Each reviewer will sign-off on a QC review sheet when any issues or revisions have been addressed. These reviews will be performed by qualified individuals in accordance with the requirements of EPA START III Contract No. EP-W-05-054.

3.2 Corrective Action:

The Tetra Tech START site manager, in coordination with the EPA Task Monitor, will be responsible for identifying failures in sampling and field measurement systems, overseeing any corrective actions, ensuring that the corrective actions are documented in site logbooks and other appropriate records, and assessing the effectiveness of corrective actions. Corrective action requirements for the EPA analytical methods are presented in Section 3.1.2, page 49 of the Tetra Tech START Contract-Level QAPP, May 2011.

3.3 Reports to Management:

Tetra Tech START is responsible for notifying the EPA Task Monitor if any circumstances arise during the field investigation that may impair the quality of the data collected. All formal deliverables to EPA associated with this project will be prepared, reviewed, and distributed in accordance with the requirements of the EPA START III Contract No. EP-W-05-054.

4.0 DATA VALIDATION AND USABILITY

4.1 Data Review, Verification, and Validation Requirements:

All field-generated data and records (such as field sampling sheets, global positioning system coordinates of sample and other locations, and field logbook notes) will be reviewed for completeness and accuracy by the Tetra Tech START project manager, site manager, and appropriate designees. Field data and records will be reviewed at the end of each day or as soon as possible so that corrective actions, if necessary, can be made before field crews demobilize from the site.

Analytical results for initial acceptance will be assessed during validation performed by Tetra Tech START that evaluates the usability of the data defined. A Stage 2A validation of Level II data packages for water samples will be performed in accordance with the EPA CLP NFG for Superfund Organic Methods Data Review, USEPA-540-R-08-01, June 2008; the EPA CLP NFG for Inorganic Superfund Data Review, USEPA-540-R-10-11, January 2010, MCAWW; EPA Method 1664A; EPA 821-R-02-012;and SW-846, Fourth Edition, Including Updated, I through IVB, February 2007 (which can be found at: http://www.epalgov/SW-846/main.htm). Any rejected data and the reasons for rejection will be summarized in the data validation report.

4.2 Verification and Validation Methods:

All field-generated data will be maintained in the project file and included (as appropriate) in project deliverables in final form after all reviews and associated corrective actions. The laboratory analytical data will be validated as discussed in Section 4.1 above. The data validation reports will contain a summary of all data qualifier flags and their explanations, as well as indicate any rejected data and the reasons for their rejection, and present the limitations to the data based on the review of the data quality.

4.3 Reconciliation of the Data to the Project-Specific DQOs:

The Tetra Tech START project manager, in cooperation with the EPA Task Monitor and Tetra Tech START QA Manager, will be responsible for reconciling the data and other project results with the requirements specified in this QAPP and by the data users and decision makers. Ultimate acceptance of the data is at the discretion of the EPA Task Monitor. Depending on how specific data quality indicators do not meet the project's requirements, the data may be discarded, and resampling and reanalysis of the subject samples may be required. Resampling, reanalysis, or other out-of-scope actions identified to address data quality deficiencies and data gaps will require approval by the EPA Task Monitor, EPA Project Officer, and EPA Contracting Officer.

Limitations of the data and data rejection and qualification will be identified during the validation process conducted by Tetra Tech. The data will be reviewed to determine whether any data are rejected and whether any data qualifiers or limitations assigned during the validation process affect the usability of the data, as defined in Section 1.5 of this QAPP. Tetra Tech will review all final laboratory data packages to evaluate whether the site-specific DQOs, as defined in Section 1.5 of this QAPP, are met. The data will be reconciled with the project-specific DQOs also in accordance with EPA guidance documents, including "Guidance on Systematic Planning Using the Data Quality Objectives Process," EPA QA/G-4, February 2006. Also see Section 4.3, page 56 of the Tetra Tech START Contract-Level QAPP, May 2011.

APPENDIX A

TABLES

(11 Pages)

Table

A-1 SAMPLING LOCATIONS AND RATIONALE
A-2 QUALITY ASSURANCE/QUALITY CONTROL SAMPLES
A-3 ANALYTICAL METHODS, REQUIRED SAMPLE CONTAINERS, AND PRESERVATIVES
A-4 PERFORMANCE OR ACCEPTANCE CRITERIA
A-5 EQUIPMENT AND SUPPLIES

TABLE A-1
LIBERTY FIBERS EMERGENCY RESPONSE
SAMPLING LOCATIONS AND RATIONALE

Station Identification	Sample Identification	Depth (in bgs)	Sample Type	Sample Location	Rationale
LFAAL01 through LFAALXX	LF-AA-LXX-mmddyy	NA	PCM Area Air Sample	Area air samples will be collected around the perimeter of the site during removal activities.	Determine the presence or absence of contamination.
LFAAD01 through LFAADXX	LF-AA-DXX-mmddyy	NA	PCM Area Air Sample	Area air samples will be collected inside of the decontamination unit during removal activities.	
LFPAFP01 through LFPAFPXX	LF-PA-FPXX-mmddyy	NA	PCM and Crystalline Silica Personal Air Samples	Personal air samples will be collected on field personnel during removal activities.	
LFSAXY	LF-SA-ZZ-XY	0 to 1	Composite Soil	40-point composite of each 200 foot x 200 foot grid space comprised of four 10-point composites from each 100 foot x 100 foot quadrant from that grid space.	
LFSAXY	LF-SA-ZZ-XY-Q	0 to 1	Composite Soil	10-point composite from each 100 foot x 100 foot quadrant of each grid space.	
LFRWOFXX	LF-RW-OFXX-mmddyy	TBD	Grab Sample	Rainwater samples will be collected from the facility outfall locations.	
LFRWXY	LF-RW-XY-##	TBD	Grab Sample	Rainwater samples will be collected from the side of existing underground structures.	
LFABS001 Through LFABS200	LF-AB-XY-XXXX-##	NA	Bulk Material	Various locations throughout the site.	

TABLE A-1
LIBERTY FIBERS EMERGENCY RESPONSE
SAMPLING LOCATIONS AND RATIONALE

Notes:

##	Station ID to be assigned during sampling activities.	NA	Not applicable
		PA	Personnel air sample
AA	Area air sample	PCM	Phase contrast microscopy
AB	Asbestos bulk sample	Q	Grid quadrant identifier (A, B, C, D)
bgs	Below ground surface	RW	Rainwater located in existing underground structures
FP	Field personnel		
FPXX	Field personnel being sampled	SA	Asbestos soil sample collected at depth of 0 to 1 inches from surface
LF	Liberty Fibers		
LXX	Area air sampling location to be assigned during sampling activities	TBD	To be determined
		XXXX	Asbestos media code to be assigned during sampling activities
in	Inches	XY	Grid identifier
mmddyy	Date of sample	ZZ	Confirmation sequence sampling number
OFXX	Outfall sampling location		

TABLE A-2
LIBERTY FIBERS EMERGENCY RESPONSE
QUALITY ASSURANCE/QUALITY CONTROL SAMPLES

Sample Identification	Sample Type	Rationale
LF-TB-RW-mmddyy	Trip blank (aqueous)	Determine if unknown site conditions or sample handling procedures are influencing analytical results. One trip blank will be submitted with each sample shipment for VOC analysis only.
LF-RW-OFXX-mmddyy	MS/MSD	Provide information about the effect of each sample matrix on the sample preparation procedures and measurement methodology. One MS/MSD sample will be designated for every 20 rainwater samples.
LF-RW-XY-##	MS/MSD	Provide information about the effect of each sample matrix on the sample preparation procedures and measurement methodology. One MS/MSD sample will be designated for every 20 rainwater samples.
LF-FB-##-mmddyy	Field Blank	Determine whether the air sample collection media are being contaminated through field handling (but not including collecting air samples) and shipping of the media; thus, affecting the analytical results for air samples. Each set of samples taken will include 10 percent field blanks or a minimum of 2 field blanks. These blanks must come from the same lot as the filters used for sample collection.
LF-LB-mmddyy	Lot Blank	Determine whether the sample-collection media are affecting the analytical results for air samples. Two lot blanks will be collected per lot of cassettes.
LF-RW-OFXX-mmddyy-DUP	Field duplicate	Measure both field and laboratory precision. One duplicate sample will be collected for every 20 rainwater samples collected per matrix.
LF-RW-XY-##-DUP	Field duplicate	Measure both field and laboratory precision. One duplicate sample will be collected for every 20 rainwater samples collected per matrix.
LF-SA-ZZ-XY-DUP	Field duplicate	Measure both field and laboratory precision. One duplicate sample will be collected for every 20 soil samples collected per matrix.
LF-SA-ZZ-XY-Q-DUP	Field duplicate	Measure both field and laboratory precision. One duplicate sample will be collected for every 20 soil samples collected per matrix.

TABLE A-2
LIBERTY FIBERS EMERGENCY RESPONSE
QUALITY ASSURANCE/QUALITY CONTROL SAMPLES

Notes:	Also refer to Section 2.5 of this QAPP.
##	Station ID to be assigned during sampling activities
DUP	Duplicate
FB	Field blank
LB	Lot blank
LF	Liberty Fibers
mmddyy	Date of sample
MS/MSD	Matrix spike/matrix spike duplicate
OFXX	Outfall sampling location
Q	Grid quadrant identifier (A, B, C, D)
RW	Rainwater sample
SA	Asbestos soil sample collected at depth of 0 to 1 inches from surface
TB	Trip blank
XY	Grid identifier
ZZ	Confirmation sequence sampling number

TABLE A-3
LIBERTY FIBERS EMERGENCY RESPONSE
ANALYTICAL METHODS, REQUIRED SAMPLE CONTAINERS, AND PRESERVATIVES

ANALYTICAL PARAMETER	PARAMETER TO BE NOTED ON CHAIN-OF-CUSTODY RECORDS	MATRIX	ANALYTICAL METHOD	NUMBER AND TYPE OF SAMPLE CONTAINER	PRESERVATION METHOD	SAMPLE HOLDING TIME
AIR SAMPLES						
Asbestos by Phase Contrast Microscopy (PCM)	PCM	Air	NIOSH Method 7400[1]	One 25-mm diameter, 0.8-µm MCE membrane filter cassette	None; store in a cool dark location	Indefinite
Asbestos by Transmission Electron Microscopy (TEM)	TEM		NIOSH Method 7402[2]	One 25-mm diameter, 0.8-µm MCE membrane filter cassette	None; store in a cool dark location	Indefinite
Silica, Crystalline, by X-ray Diffraction (filter redeposition)	Crystalline Silica		NIOSH Method 7500[3]	One 37-mm diameter, 5-µm PVC membrane filter cassette with a 10-mm cyclone attachment	None; store in a cool dark location	Indefinite
AQUEOUS SAMPLES						
Target Compound List (TCL)[4] volatile organic compounds (VOC)	VOCs	Rainwater and QC samples (trip blank and equipment rinsate blank)	SW-846 Method 8260B[5]	Two 40-mL glass vials with Teflon-lined septum lids	Hydrochloric acid (HCl) to pH<2; cool to 4 °C	14 days
TCL[4] semivolatile organic compounds (SVOC)	SVOCs		SW-846 Method 8270D[5]	Two 1-liter amber glass bottles with Teflon-lined lid	Cool to 4 °C	7 days to extraction; extracts must be analyzed within 40 days following extraction.
Polychlorinated Biphenyls (PCB)	PCBs		SW-846 Method 8082A[5]	Two 1-liter amber glass bottles with Teflon-lined lid	Cool to 4 °C	7 days to extraction; extracts must be analyzed within 40 days following extraction.
Resource Conservation and Recovery Act (RCRA) Metals	TCL Metals		SW-846 Methods 6010C/7470A[5]	One 500-mL polyethylene bottle	Nitric acid (HNO_3) to pH<2; cool to 4 °C	28 days for mercury and 6 months for all other metals

TABLE A-3
LIBERTY FIBERS EMERGENCY RESPONSE
ANALYTICAL METHODS, REQUIRED SAMPLE CONTAINERS, AND PRESERVATIVES

ANALYTICAL PARAMETER	PARAMETER TO BE NOTED ON CHAIN-OF-CUSTODY RECORDS	MATRIX	ANALYTICAL METHOD	NUMBER AND TYPE OF SAMPLE CONTAINER	PRESERVATION METHOD	SAMPLE HOLDING TIME
AQUEOUS SAMPLES						
Total Aluminum, Trivalent Chromium, Total Copper, Total Iron, Total Lead, Total Nickel, Total Zinc	Selected Metals	Rainwater and QC samples (trip blank and equipment rinsate blank)	SW-846 Method 6010C[5]	One 1-liter polyethylene bottle	Nitric acid (HNO_3) to pH<2; cool to 4 °C	6 months
Cyanide	CN		SW-846 Methods 9010C/9012B[5]	One 1-liter polyethylene bottle	Sodium hydroxide (NaOH) to pH>12; cool to 4 °C	28 days
Hexavalent Chromium	Cr +6		SW-846 Methods 7196A/7199[5]	One 1-liter polyethylene bottle	Nitric acid (HNO_3) to pH<2; cool to 4 °C	28 days
Oil and Grease	Oil and Grease		EPA Method 1664A[6]	One 1-liter amber glass bottles with Teflon-lined lid	Hydrochloric acid (HCl) to pH<2; cool to 4 °C	28 days
pH	pH		SW-846 Method 9040C[5]	One 500-mL polyethylene bottle	Cool to 4 °C	ASAP
Total Suspended Solids	TSS		MCAWW Method 160.2[7]			7 days
Chemical Oxygen Demand	COD		MCAWW Method 410.4[7]	One 500-mL polyethylene bottle	Sulfuric acid (H_2SO_4) to pH<2; cool to 4 °C	28 days
48-Hour Lethal Concentration (50%)	48-Hr LC50		EPA 821-R-02-012[8]	One 2-gallon Nalgene container	Cool to 4 °C	36 hours
BULK SAMPLES						
Asbestos by Polarized Light Microscopy (PLM)	PLM	Bulk Material	EPA 600/R-93/116[9]	One gallon sealed plastic baggie	None	None
SOIL SAMPLE						
Asbestos	Asbestos	Soil	CARB Method 435[10]	One 8-ounce glass jar with Teflon-lined lids	None; store in a cool dark location	Indefinite

TABLE A-3
LIBERTY FIBERS EMERGENCY RESPONSE
ANALYTICAL METHODS, REQUIRED SAMPLE CONTAINERS, AND PRESERVATIVES

Notes:

1	National Institute of Occupational Safety and Health (NIOSH) Manual of Analytical Methods, *Asbestos and Other Fibers by Phase Contrast Microscopy, Method 7400* , available at the following web address: http://www.cdc.gov/niosh/docs/2003-154/pdfs/7400.pdf
2	National Institute of Occupational Safety and Health (NIOSH) Manual of Analytical Methods, *Asbestos by Transmission Electron Microscopy, Method 7402* , available at the following web address: http://www.cdc.gov/niosh/docs/2003-154/pdfs/7402.pdf
3	National Institute of Occupational Safety and Health (NIOSH) Manual of Analytical Methods, *Silica, Crystalline, by X-ray Diffraction (filter redeposition): Method 7500* , available at the following web address: http://www.cdc.gov/niosh/docs/2003-154/pdfs/7500.pdf
4	Available at the following web address: http://www.epa.gov/superfund/programs/clp/target.htm.
5	U.S. Environmental Protection Agency, Test Methods for Evaluating Solid Waste, Physical/Chemical Methods (SW-846), available at the following web address: http://www.epa.gov/epawaste/hazard/testmethods/sw846/online/index.htm.
6	U.S. Environmental Protection Agency, Method 1664, Revision A: N-Hexane Extractable Material (HEM; Oil and Grease) and Silica Gel Treated N-Hexane Extractable Material (SGT-HEM; Non-polar Material) by Extraction and Gravimetry, EPA-821-R-98-002, available at the followng web address: http://water.epa.gov/scitech/methods/cwa/oil/1664.cfm
7	U.S. Environmental Protection Agency, Methods for Chemical Analysis of Water and Wastes (EPA/600/4-79/020), available at the following web address: http://nepis.epa.gov
8	U.S. Environmental Protection Agency, Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms (EPA-821-R-02-012), available at the following web address: http://water.epa.gov/scitech/methods/cwa/wet/disk2_index.cfm
9	Method for the Determination of Asbestos in Bulk Building Materials, EPA 600/R-93/116, July 1993
10	California Environmental Protection Agency, Air Resources Board (CARB). 1991. Method 435, *Determination of Asbestos Content of Serpentine Aggregate*
°C	Degrees Celsius
<	Less than
ASAP	As soon as possible
EPA	U.S. Environmental Protection Agency
MCAWW	Methods for Chemical Analysis of Water and Wastes
MCE	Mixed cellulose ester
mL	Milliliter
mm	Millimeter
µm	Micrometer
PVC	Polyvinyl chloride

TABLE A-4
LIBERTY FIBERS EMERGENCY RESPONSE
PERFORMANCE OR ACCEPTANCE CRITERIA

AIR, SOIL, WATER, AND FIELD QUALITY CONTROL SAMPLES	
Analysis	**Analytical Method**
Asbestos (Air - PCM)	NIOSH Method 7400
Asbestos (Air -TEM)	NIOSH Method 7402
Asbestos (Soil)	CARB Method 435
Asbestos (Bulk Solid)	EPA 600/R-93/116
Crystalline Silica (Air)	NIOSH Method 7500
Volatile Organic Compounds (Water)	SW-846 Method 8260B
Semivolatile Organic Compounds (Water)	SW-846 Method 8270D
Metals (Water)	SW-846 Method 6010C/7470A
Polychlorinated Biphenyls (Water)	SW-846 Method 8082A
pH	SW-846 Method 9040C
Cyanide	SW-846 Methods 9010C/9012B
Hexavalent Chromium	SW-846 Methods 7196A/7199
Oil and Grease	EPA Method 1664A
Total Suspended Solids	MCAWW Method 160.2
Chemical Oxygen Demand	MCAWW Method 410.4
48-hour Lethal Concentration (50%)	EPA 821-R-02-012

DATA QUALITY MEASUREMENTS	
Accuracy	Refer to the EPA Region 4, SESD FBQSTP for *Soil Sampling* (SESDPROC-300-R1), November 2007; the EPA Region 4, SESD FBQSTP for *Bulk Sampling for Asbestos* (SESDPROC-104-R0), August 2009; the EPA Region 4, SESD FBQSTP for Ambient Air Sampling (SESDPROC-303-R4), January 2011; the EPA Region 4, SESD FBQSTP for Surface Water Sampling (SESDPROC-201-R1), November 2007; the analytical methods listed above; and the data validation guidance documents discussed in Sections 4.1 and 4.2 of this QAPP.
Precision	Refer to the EPA Region 4, SESD FBQSTP for *Soil Sampling* (SESDPROC-300-R1), November 2007; the EPA Region 4, SESD FBQSTP for *Bulk Sampling for Asbestos* (SESDPROC-104-R0), August 2009; the EPA Region 4, SESD FBQSTP for Ambient Air Sampling (SESDPROC-303-R4), January 2011; the EPA Region 4, SESD FBQSTP for Surface Water Sampling (SESDPROC-201-R1), November 2007; the analytical methods listed above; and the data validation guidance documents discussed in Sections 4.1 and 4.2 of this QAPP.
Representativeness	Sample representativeness will be achieved by following the EPA Region 4, SESD FBQSTP for Soil Sampling (SESDPROC-300-R1), November 2007; the EPA Region 4, SESD FBQSTP for Bulk Sampling for Asbestos (SESDPROC-104-R0), August 2009; the EPA Region 4, SESD FBQSTP for Ambient Air Sampling (SESDPROC-303-R4), January 2011; and the EPA Region 4, SESD FBQSTP for Surface Water Sampling (SESDPROC-201-R1), November 2007.
Completeness	Based on a review of the available file information, including previous sampling data and discussions with the EPA OSC, the samples previously discussed in the Quality Assurance Project Plan are proposed for collection. The EPA OSC is responsible for determining if the field and laboratory data collected during this project achieve the level of completeness required to meet the objectives of the project.
Comparability	Sample and data comparability is expected to be achieved by conducting all field and laboratory work using the same, well-documented, uniform procedures.

TABLE A-4
LIBERTY FIBERS EMERGENCY RESPONSE
PERFORMANCE OR ACCEPTANCE CRITERIA

Notes:

CARB	California Air Resource Board
EPA	Environmental Protection Agency
FBQSTP	Field Branches Quality System and Technical Procedures
MCAWW	Methods for Chemical Analysis of Water and Wastes
NIOSH	National Institute of Occupational Safety and Health
PCM	Phase Contrast Microscopy
SESD	Science and Ecosystem Division
SW-846	Test Methods for Evaluating Solid Waste
TEM	Transmission Electron Microscopy

TABLE A-5
LIBERTY FIBERS EMERGENCY RESPONSE
EQUIPMENT AND SUPPLIES

FIELD INSTRUMENTS	SAMPLE CONTAINERS	EQUIPMENT AND SUPPLIES	SAMPLE PROCESSING SUPPLIES	DECONTAMINATION SUPPLIES	MISCELLANEOUS SUPPLIES
Trimble GeoXT GPS unit	Four-ounce glass jars with Teflon-lined lids	Stainless steel spoons or plastic scoops	Field data sheets	Paper towels	Digital camera
SKC Universal PCXR8 or Gilian GilAir 5 air pumps	Eight-ounce glass jars with Teflon-lined lids	Stainless steel bowls or disposable aluminum pans	Custody seals	Liquid detergent	Sharpies and pens
Bios DryCal DC-Lite primary flow meter	25-mm diameter, 0.8 µm MCE filter cassettes	Tyvek suits with booties and hoods	Laptop computer	Alcohol wipes	Logbooks
Rotameter with cassette adapter	40-mL VOA vials with HC1	Rubber boots or rubber over-boots	Measuring tape (100 ft)		Garbage bags
	1-L amber glass jars	Full-face respirator with P100 cartridges	Sample labels		First aid kit
	1-L polyethylene bottles with HNO_3	Nitrile or latex gloves	Printer		Eyewash
	2-gal Nalgene container	Plastic tubing and clips	Printer Paper		Personal flotation device
	500-mL polyethylene bottles with H_2SO_4	Duct tape	FedEx labels		Power strips, 10 receptacle
	500-mL polyethylene bottles	Ear plugs	Paper towels		Site fluids
	500-mL polyethylene bottles with HNO_3	Pin flags	Resealable plastic bags		Coolers
	1-L polyethylene bottles with NaOH	Bailers	Chain-of-custody forms		
	1-qt resealable plastic bags		Strapping or packaging tape		
	1-gal resealable plastic bags				

TABLE A-5
LIBERTY FIBERS EMERGENCY RESPONSE
EQUIPMENT AND SUPPLIES

Notes:

ft	Feet	MCE	Mixed cellulose ester
gal	Gallon	mL	Milliliter
GPS	Global positioning system	mm	Milimeter
HCl	Hydrochloric acid	NaOH	Sodium Hydroxide
HNO_3	Nitric acid	qt	Quart
H_2SO_4	Sulfuric Acid	µm	Micrometer
L	Liter	VOA	Volatile organic analysis

ENCLOSURE C

SITE-SPECIFIC HEALTH AND SAFETY PLAN

(170 Pages)