

# QUALITY ASSURANCE SAMPLING PLAN

FOR

## BRITISH PETROLEUM OIL SPILL

Prepared for  
U.S. Environmental Protection Agency



**Prepared in conjunction with:**  
EPA Region 6  
EPA Region 4  
EPA Environmental Response Team  
EPA ASPECT  
CTEH

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# 1. INTRODUCTION

The British Petroleum Oil spill source is located approximately 52 miles southeast of Venice, Plaquemines Parish, Louisiana, (28.73667° N, -88.38722° W). The source is a leaking production well as well as a release of diesel fuel caused by damage from the sinking of the Transocean Deepwater Horizon drill rig at BP Site Mississippi Canyon 252. The current spill is estimated to be approximately 80 miles east to west and 42 miles north to south in size. The spill is affected by wind and wave action, which is currently keeping the spill offshore; however, forecasted weather conditions in the coming days is predicted to push the spill towards the southeast Louisiana coastline. Through coordination with the United States Coast Guard (USCG), British Petroleum PLC (BP), the Responsible Party, through their Oil Spill Response Organization (OSRO) contractors are planning controlled burns of the oil in sections while weather conditions are acceptable.

The following groups have jointly prepared this Quality Assurance Sampling Plan (QASP).

## **Environmental Protection Agency**

- Region 6
- Region 4
- Environmental Response Team (ERT),
- National Decontamination Team (NDT) Airborne Spectral Photometric Environmental Collection Technology (ASPECT)

## **Contractors**

- ERT's contractor, Scientific, Engineering, Response and Analytical Services (SERAS),
- Retional Contractors, Superfund Technical Assessment and Response Team (START),
- British Petroleum's contractor, Center for Toxicology and Environmental Health (CTEH)

The purpose of this QASP is to describe the technical scope of work to be completed as part of this emergency response. The objective of this study is to conduct ambient air monitoring and sampling to assess the environmental and human health impact of the in-situ burn process and impacts from the volatilization of the crude oil, in addition to surface water and sediment sampling. In the event of future burns and depending on where the oil comes ashore, additional air, surface water, and sediment monitoring plans will need to be generated to include affected sites.

## 1.1 MONITORING AND SAMPLING STRATEGIES

**EPA Region 4:** EPA Region 4 will conduct monitoring at several locations using several methods to measure particulate matter (PM) and volatile organic compounds (VOCs) that are expected to be present as a result of the burn. Affected Region 4 areas where impact is possible include the states of Mississippi, Alabama, and Florida.

The Gulf Coast of Region 4 presently contains a robust fixed ambient air monitoring network of sites which are operated and maintained by state and local operators from the respective states. These sites monitor for a large array of ambient pollutants including PM<sub>2.5</sub>. The state monitoring sites from the Louisiana border to Panama City operating filter based PM<sub>2.5</sub> samplers will sample on a 1 in 3 day

sampling schedule. As conditions warrant, the PM<sub>2.5</sub> filter based sampling may be increased to every day sampling.

Five of these existing sites close to Venice, Louisiana will be augmented with additional monitoring equipment including continuous PM<sub>2.5</sub> samplers and VOC samplers. The sites that will be augmented include: Waveland, Mississippi; Gulfport, Mississippi; Fairhope, Alabama; Pensacola, Florida; and Panama City, Florida. In addition to the ambient monitoring, VOC grab samples will be conducted as requested or necessary according to meteorological patterns.

There are two National Air Toxics Trends Sites (NATTS) stations which are located in the Tampa Bay area, in the vicinity of the spill, which could be requested to provide additional monitoring data by increasing their station's sampling frequency. One is located in Pinellas County, and the other is located in Hillsborough County, both monitoring on a 1 in 3 day schedule. These two sites operate an array of air toxics monitors including VOCs, and have laboratory capability for analysis of several air toxics components.

**EPA Region 6:** EPA Region 6 will assess the impacts of the BP Oil Spill on the air, sediment and water quality of far southeast Louisiana, specifically the area around Venice, Duvic and Fort Jackson, Plaquemines Parish and an area between Alluvial City and Chalmette in St. Bernard Parish, Louisiana. EPA will utilize PQ200 air samplers, DataRAM DR-4000 particulate monitors, Tedlar bags for VOC grab samples and AreaRAE air monitors. Additionally, SUMMA passivated canisters (SUMMAs) with flow controllers will be used to sample for VOCs. For water and sediment sampling, EPA will utilize multi-parameter water quality instruments.

Air samples will be collected once every 24 hours by the PQ200 and analyzed for concentrations of particulates 2.5 microns and smaller. Grab samples for VOCs will be collected using Tedlar bags and low flow pumps, and analyzed using EPA/ERT TAGA bus instruments. The SUMMA<sup>®</sup> canisters will collect samples for VOCs every 8 hours and will be analyzed by method TO-15A. DataRAMs will be used in real-time monitoring of the PM-2.5 particulate levels and AreaRAEs to monitor for VOCs.

**ERT/SERAS:** Air monitoring will be conducted along the coastlines of EPA Regions 4 and 6. The TAGA Mobile Laboratories will provide mobile monitoring for the selected compounds of interest (i.e., benzene, toluene, ethylbenzene and xylenes). ERT/SERAS will also provide quick turnaround analysis of selected compounds for samples collected in Tedlar bags.

**NDT/ASPECT:** The ASPECT airborne monitoring system collects data regarding emissions and tracking releases. The goal of this mission is to collect data over the source area (sunken rig) to establish a chemical fingerprint of the release source, collect data over the site of an in-situ burn of contained oil to provide information on burn effectiveness, and a higher altitude photo reconnaissance to cover a broader area of the oil release.

## 1.2 PROJECT TEAM

The Project Team will be divided into multiple locations and multiple teams based upon site conditions and operations. As the meteorological and operational situations change, sampling and monitoring teams and operations will adapt, based upon direction from the Unified Command. EPA Federal On-Scene Coordinators (OSCs) and START personnel from Region 6 will have responsibility for sampling and monitoring in Louisiana, and Texas if necessary. EPA OSCs and START personnel from EPA Region 4 will have responsibility for sampling and monitoring of the plume in Mississippi, Alabama and Florida as necessary. EPA ERT members will assist EPA Region 6 and 4 with sampling and data collection and

analysis as needed. EPA will coordinate with the Unified Command through EPA OSCs located in Houma, Louisiana and the USCG Sector Mobile.

The ERT/SERAS project team will consist of four persons for each TAGA mobile laboratory (driver, TAGA Operator, GC/MS Operator and GIS Data Reduction Specialist) as well as an EPA/ERT member for each 12-hour shift. EPA/ERT members will assist EPA Regions 6 and 4 with sampling, data collection and analysis, as needed.

The EPA NDT will provide over-flight operations over the affected areas utilizing the ASPECT airborne monitoring system.

CTEH, a contractor for British Petroleum, responded in support of site operations for the British Petroleum Oil Spill on Sunday, April 25, 2010. CTEH is providing air monitoring, air sampling, and toxicology support along the Gulf coast from Pensacola, Florida to Venice, Louisiana to address public health and worker health and safety concerns resulting from the crude oil spill.

### **1.3 OVERVIEW OF SAMPLING ACTIVITIES**

#### **1.3.1 Data Quality Objectives**

The objective of air monitoring and sampling will be to confirm the presence of particulates (2.5 microns and smaller) and VOCs in air resulting from the off shore in-situ burn, and from possible air quality impacts due to the oil spill coming on-shore.

#### **1.3.2 Air Sampling/Monitoring Approach**

Air monitoring and sampling will be conducted in general accordance with the EPA guidelines and standard industry practices, included the DRAFT START Emergency Response Air Quality Assurance Sampling Plan (QASP) and with START Standard Operating Procedures (SOPs). The Region 4 samples will be collected following EPA Region 4 Science and Ecosystem Support Division (SESD) SOPs. In Region 6, a field communication protocol based upon VOC readings using the real-time data from a MultiRAE or AreaRAE PID will be implemented. START will collect Benzene or Toluene colorimetric tube samples for confirmatory air monitoring readings. This will occur when a total VOC reading of 10.0 ppm or higher is recorded. After positive confirmatory monitoring, Region 6 field teams will contact the field operations OSC to notify them of the elevated VOC monitoring reading, which will then be passed onto to EPA representatives at Unified Command.

#### **1.3.3 Air Sampling and Monitoring Program for Oil at Landfall**

The air sampling and monitoring program for British Petroleum Oil Spill landfall operations will be modified as necessary to adjust for wind direction and landfall location. In summary, the program will include real-time monitors, aerial flyovers as necessary, real-time speciated VOC sampling for BTEX compounds using the TAGA and collection of whole air samples using SUMMA<sup>®</sup> canisters and grab samples using Tedlar bags as identified below:

Based upon VOC readings, using the real-time data from a MultiRAE or AreaRAE PIDs, benzene or toluene colorimetric tubes will be used to take confirmatory air monitoring readings for benzene and toluene. This will occur when a total VOC reading equal to or greater than 10.0 parts per million (ppm) is

recorded. Also, at that time, field teams will contact the field operations OSCs to notify them of the elevated VOC monitoring reading. Additional monitoring techniques have been employed, including but not limited to:

- ERT TAGA sampling in downwind shore locations for BTEX and any other appropriate compounds – available beginning Mid-day April 30;
- NDT ASPECT if necessary and appropriate for oil spill delineation – Daylight operations, as necessary;
- Downwind dataRAM/miniRAM particulate monitors near potentially exposed populations (R6 or R4 START);
- SUMMA<sup>®</sup> canister capability for 8-hour composite samples for VOCs (R6 or R4 START);
- Tedlar Bag grab samples for VOCs on odor complaints and as necessary (R6 and R4 START);
- AreaRae and MultiRae detectors as appropriate for odor complaints (R6 or R4 START);
- Additional elements to be added as required.

### 1.3.3.1 REGION 4 and REGION 6 FIXED AIR MONITORING SITES

Region 4 and Region 6 will collect air quality data from existing ambient air monitoring sites located on the Gulf Coast of Mississippi, Alabama and Florida. The sites are described below by location and monitored analytes:

<u>LOCATION</u>	<u>ANALYTE</u>
<b>MISSISSIPPI</b>	
Waveland	PM <sub>2.5</sub> , O <sub>3</sub>
Gulfport	PM <sub>2.5</sub> , O <sub>3</sub>
Pascagoula	NO <sub>2</sub> , SO <sub>2</sub> , O <sub>3</sub> , PM <sub>2.5</sub>
<b>ALABAMA</b>	
Fairhope	PM <sub>2.5</sub> , O <sub>3</sub>
Chickasaw	PM <sub>10</sub> , PM <sub>2.5</sub> , O <sub>3</sub>
Mobile, Bay Rd.	PM <sub>2.5</sub> , O <sub>3</sub>
Mobile, Telegraph Rd.	PM <sub>10</sub>
<b>FLORIDA</b>	
Pensacola, Ellyson	NO <sub>2</sub> , SO <sub>2</sub> , PM <sub>2.5</sub> , O <sub>3</sub>
Pensacola, NAS	O <sub>3</sub>
Panama City, Cherry St.	PM <sub>2.5</sub>
Holmes Co., Tri County Apt.	O <sub>3</sub>
Okaloosa Co., Lovejoy Rd.	O <sub>3</sub>
Santa Rosa Co., Woodlawn	O <sub>3</sub>
<b>LOUISIANA</b>	
Kenner Site	VOC
Chalmette Vista	VOC

As part of the National Air Toxics Trends Stations (NATTS), Pinellas and Hillsborough Counties, Florida, presently conduct monitoring for air toxics. These sites operate on a one-in-six day schedule, and collection frequency may be modified to support the spill response monitoring efforts.

Data for the gaseous pollutants, Nitrogen Dioxide (NO<sub>2</sub>) and Sulfur Dioxide (SO<sub>2</sub>) will be collected continuously at the monitoring sites specified above. Additionally, ozone (O<sub>3</sub>) data will be observed because hydrocarbons can interfere with ozone detection; therefore unusual increasing levels of “ozone” can potentially be a reasonable surrogate for the presence of hydrocarbons.

For short-term data collection, Region 4 will rely on SESD for VOC sampling and the states for PM<sub>2.5</sub> monitoring. Sampling and monitoring support may also be supplied by the Emergency Response and Removal Branch (ERRB) OSCs with START contractors. The state and local agencies and/or contractors are expected to provide long term monitoring and sampling support in operation of the monitoring network.

EPA ASPECT aerial flyovers will take place during in-situ burn operations. The ASPECT sensors and monitors will collect particulate and combustion product data.

### **1.3.3.2 Mobile Air Monitoring Using the ERT Trace Atmospheric Gas Analyzer (TAGA)**

TAGA monitoring will be conducted using draft SERAS SOP #1711, *Trace Atmospheric Gas Analyzer (TAGA) IIe*. The ECA TAGA IIe is based upon the Perkin-Elmer API 365 MS/MS and is a direct air monitoring instrument capable of detecting, in real time, trace levels of many organic compounds in ambient air. The TAGA employs a triple quadrupole MS/MS to differentiate and quantitate target compounds.

At the beginning of each TAGA monitoring day, a gas mixture containing the target analytes of concern will be introduced by a mass flow controller into the sample air flow (SAF). The gas mixture is introduced into the SAF, and the tuning parameters for the first quadrupole and the third quadrupole are optimized for sensitivity and mass assignment. The TAGA will be calibrated for the target compounds at the beginning and end of the monitoring day; the detection and quantitation limits for each day will be calculated, and the intermediate response factors will also be calculated daily.

### **1.3.4 Particulate Air Monitoring**

**REGION 4 Air Particulate PM<sub>2.5</sub> Monitoring:** EPA will monitor PM<sub>2.5</sub> concentrations at the selected 4 fixed sites using continuous PM<sub>2.5</sub> samplers. The samplers used will be MetOne E-BAM PM and the MetOne BAM 1020 which use beta attenuation technology to measure PM concentrations on a continuous basis. Three of the selected fixed sites, Gulfport, Mississippi, Panama City, Florida and Pensacola, Florida already contain continuous PM samplers whose data can be used for monitoring the burn event. These continuous samplers have a distinct advantage over filter based methods in that the data can be transmitted directly to a central location via telephone line or satellite link. The selected sites are part of the regular ambient air monitoring network and have been approved by EPA Region 4 as meeting 40 CFR Part 58, Appendix E sitting criteria for ambient air monitoring. Additional portable PM<sub>2.5</sub> air monitors may be used to identify plumes in real-time to identify pollutant plumes. This may include the use of DataRAMs or similar equipment.

**REGION 6 Air Particulate Monitoring:** START will conduct baseline particulate (dust) monitoring downwind of the in-situ burn using DataRAM instruments over a 24-hour period, during burning activities. The DataRAM instrument is capable of data logging, and the results will be logged no less than every 5 minutes and downloaded to a computer at the end of each operating period. Air monitors

will be collocated with PQ200 air samplers, which will be selected using local meteorological data, daily observations, and locations of burning activities.

### 1.3.5 Particulate Air Sampling

**REGION 4 Air Particulate PM<sub>2.5</sub> Sampling:** Eight of the state operated monitoring sites on the Gulf Coast currently sample for PM<sub>2.5</sub> using the filter-based method sampling for 24 hours on a 1 in 3 day schedule. As conditions warrant, the PM<sub>2.5</sub> filter based sampling may be increased to every day sampling.

**REGION 6 Air Particulate Sampling:** START will deploy PQ200 air samplers equipped with a filter cassette to measure PM<sub>2.5</sub> concentrations in ambient air at three locations in Plaquemines Parish and three locations in St. Bernard, Louisiana. The samplers will be set up at the pre-determined sampling locations that will be selected using local meteorological data, daily observations, and distance from sources of interference, and locations of burning activities. Prior to use, START will calibrate the samplers with the representative sampling media to verify correct flow rates. Meteorological conditions will be documented at each sample location when each sample period begins and ends. START will collect one 24-hour air PM<sub>2.5</sub> samples at each station for the duration of the in-situ burn or as directed by an EPA OSC.

### 1.3.6 VOC Air Monitoring

**REGION 4 and REGION 6 VOC TEMPORARY MONITORING STATIONS:** ERRB will mobilize air monitoring teams to deploy EPA Region 4 AreaRAEs along the coastline; the teams will each consist of one OSC and several START personnel. Additional AreaRAE resources may be deployed from ERT and will be maintained by ERT personnel and contractors. The placement of the temporary station locations will be selected based on real-time plume progression, forecasted weather conditions, population centers and geographical areas that will augment the fixed monitoring stations according to spatial gaps. Additional portable VOC air monitors may be used to identify plumes in real-time to identify pollutant plumes. In addition, grab samples will be collected utilizing either Tedlar® bags that will be manually transported to the ERT TAGA mobile laboratory, or SUMMA canisters that will be shipped to a contract laboratory for analysis.

**REGION 4 VOC Composite Sampling:** VOC composite sampling will be conducted daily at the 5 selected sites: Waveland, Mississippi, Gulfport, Mississippi, Fairhope, Alabama, Pensacola, Florida, and Panama City, Florida using evacuated six-liter (L) SUMMA canisters over a period of 24 hours. In the beginning phase of the study, the VOC samples will be analyzed by the SESD laboratory using the SESD modified TO-15 method. Air toxics data from canisters will require 3 to 4 days turnaround time for analysis from the laboratory. It is expected that as the study progresses the continued analysis of these VOC samples will be conducted by a contract laboratory. For quality assurance, duplicate samples will be collected at one monitoring site by placing an identical apparatus next to the primary, with the sample inlets within six inches of each other.

**REGION 4 VOC Grab Sampling:** VOC grab sampling will be conducted as requested or necessary according to meteorological patterns using evacuated six-L SUMMA canisters or Tedlar bags over a period of approximately 5 minutes without the use of a flow control device. The VOC grab samples collected in the SUMMA canisters will be analyzed by the SESD laboratory using the SESD modified TO-15 method. The grab samples collected in the Tedlar® bags will be analyzed by the ERT TAGA mobile laboratory if possible. It is expected that the VOC grab samples collected in Tedlar® bags and analyzed by the TAGA laboratory would be completed in a matter of hours after collection. It is expected



that as the study progresses the continued analysis of these VOC samples will be conducted by an outside laboratory.

**REGION 6 VOC Air Sampling:** START will also collect three 8-hour air samples using a SUMMA canister with a flow controller at each air monitoring location. The SUMMA canister will be mounted and secured no less than one meter from the ground. The flow controllers will be calibrated and checked for accuracy by the laboratory prior to sampling, and between each sampling run. Additional VOC grab samples will be collected using 1-L Tedlar bags each being allowed to collect ambient air using a low-flow air pump (SKC or equivalent) for approximately 10-15 seconds. These Tedlar bags will be held and analyzed for VOCs through method TO-15 by an EPA/ERT TAGA Mobile Laboratory, two of which are currently staged in the operational area.

### 1.3.7 Water and Sediment Sampling (Region 6)

Sediment samples will be collected. The exact number and locations of the samples will be determined by the EPA OSC and START Project Team Leader (PTL). Initially, in Region 6, samples will be collected within critical target regions in Louisiana water quality sub-segments 070401, 070601, 042209, 021001, and 042001. Initially samples will be collected from impacted areas and also un-impacted areas to attempt to get data on the impacts and background areas. Sampling points, as a general rule, will be located within approximately 100 feet of ecologically sensitive areas. The sampling points will have adequate spatial separation of at least five miles to achieve even representation across the impacted areas. Frequency of the sampling will be determined by EPA OSCs in consultation with Unified Command. The sediment samples will be submitted to a qualified subcontracted commercial laboratory for the following analyses:

- Target Compound List Volatile Organic Compounds (TCL VOCs) by SW-846 Method 8260B.
- TCL Semi-volatile Compounds (SVOCs) by SW-846 Method 8270D.
- Target Analyte List (TAL) Metals by SW-846 Method 6010C.
- Mercury by SW-846 Method 7471.
- Total Petroleum Hydrocarbons – Gasoline Range Organics (TPH GRO) by SW-846 Method 8015B.
- Total Petroleum Hydrocarbons – Diesel and Oil Range Organics (TPH DRO/ORO) by SW-846 Method 8015B.
- Polynuclear Aromatic Hydrocarbons (PAH) by SW-846 Method 8270D SIM.

Laboratory-specific analyte lists and reporting limits will be included as received from the laboratories. Deviations from the sample locations will be due to new observations made prior to sampling, information obtained in the field that warrants an altered sampling point, difficulty in sample collection, or limited access. The EPA OSC will be notified, and concurrence will be obtained should significant deviations from the planned sampling points be proposed. Details regarding deviations of the QASP will be documented in the site logbook.

START will collect surface water samples as part of the response. The exact number of samples and locations of the samples will be decided by the EPA OSC and START PTL. Surface water samples will be submitted to a qualified subcontracted commercial laboratory for the following analyses:

- TCL VOCs by SW-846 Method 8260B.
- TCL SVOCs by SW-846 Method 8270D.

- TAL Metals by SW-846 Method 6010C.
- Mercury by SW-846 Method 7470.
- TPH GRO by SW-846 Method 8015B.
- TPH DRO/ORO by SW-846 Method 8015B.
- PAH by SW-846 Method 8270D SIM.

The laboratory-specific analyte list and reporting limits will be included in the QASP when received.

### **1.3.8 Sampling and Field QC Procedures**

Samples will be collected using equipment and procedures appropriate to the matrix, parameters, and sampling objectives. The volume of the collected sample will be sufficient to perform the analysis requested. Samples will be stored in the proper types of containers and preserved in a manner for the analysis to be performed per laboratory guidelines.

Dedicated sampling equipment, sample containers, and PPE will be maintained in a clean, segregated area. It is anticipated that each sample will be collected with dedicated sampling equipment and placed directly onto the laboratory supplied glass fibre filters. Personnel responsible for sampling will change gloves between each sample collection/handling activity. Each sample will be assigned a unique identification number and assembled and catalogued prior to shipping to the designated laboratory. SUMMA canisters will be handled per laboratory and manufacturers' guidance, observing safe and effective collection and preservation of the data.

START will collect field duplicate samples of air samples, both filters and canisters, and prepare filter blanks as needed during the removal action. QA/QC samples will be collected according to the following:

- Blind field collocated air samples will be collected during sampling activities at locations selected by the EPA OSC and START PTL. The data obtained from these samples will be used to assist in the quality assurance of the sampling procedures and laboratory analytical data by allowing an evaluation of reproducibility of results. Efforts will be made to collect duplicate samples in locations where there is visual evidence of contamination or where contamination is suspected. Blind field collocated samples will be collected at the rate of one duplicate for every 10 samples collected.
- Filter blanks will be prepared by analyzing a laboratory supplied filter from the same batch as the collected samples at a rate of one filter per batch per day. The blank filter will be used to evaluate possible contamination.

START will collect field duplicate and matrix spike/matrix spike duplicate (MS/MSD) samples of soil, sediment, and surface water and prepare equipment rinsate blank samples as needed during the removal assessment sampling activities. QA/QC samples will be collected according to the following dictates:

- Blind field duplicate samples will be collected during sampling activities at locations selected by the START PTL. The data obtained from these samples will be used to assist in the quality assurance of the sampling procedures and laboratory analytical data by allowing an evaluation of reproducibility of results. Efforts will be made to collect duplicate samples in locations where there is visual evidence of contamination or where contamination is suspected. Blind field duplicate samples will be collected at the rate of one duplicate for every 10 samples collected.

- Equipment rinsate blanks will be prepared by pouring laboratory-grade deionized water over nondisposable sampling equipment after it has been decontaminated and collecting the rinse water in sample containers for analyses. These samples will be prepared to demonstrate that the equipment decontamination procedures for the sampling equipment were performed effectively. No equipment rinsate blanks will be collected as part of this sampling activity as dedicated sampling equipment will be used as part of the sampling activity.
- Field blanks will be collected when VOC samples are taken and are analyzed only for VOC analytes. The field blank consists of American Society of Testing and Materials (ASTM) Type II reagent-grade water poured into a VOC sample vial at the sampling site. It is handled like an environmental sample and transported to the laboratory for analysis. Field blanks are used to assess the potential introduction of contaminants from ambient sources (e.g., gasoline motors in operation, etc.) to the samples during sample collection. No field blanks will be collected as part of this sampling activity.
- Laboratory prepared trip blanks will be submitted with each shipment containing samples for VOC analysis. The laboratory prepared trip blanks will consist of two 40-milliliter (mL) glass sample containers with Teflon-lined septum caps. The trip blanks will be prepared with deionized water prior to leaving the laboratory. Trip blanks are used to evaluate the potential cross-contamination that may occur during the shipment of samples.
- Temperature blanks will be prepared in the field and will consist of one 40-mL glass sample container with Teflon-lined septum cap. The temperature blank will be packaged along with the field samples in the shipping cooler and will represent the temperature of the incoming cooler upon receipt at the laboratory. Use of these samples within a shipping container enables the laboratory to assess the temperature of the shipment without disturbing any of the field samples.
- MS/MSD samples will be collected during sampling activities at locations selected by the START PTL. The data obtained from these samples will be used to assist in the quality assurance of the sampling procedures and laboratory analytical data by allowing an evaluation of reproducibility of results. Efforts will be made to collect MS/MSD samples in locations where there is no visual evidence of contamination or where contamination is not suspected. MS/MSD samples will be collected at the rate of one MS/MSD sample per matrix for every 20 samples collected.

### **1.3.9 Investigation-Derived Wastes**

Attempts will be made to eliminate or minimize generation of investigation-derived waste (IDW) during this investigation. All non-dedicated equipment will be decontaminated according to START SOP 1201.01. Non-dedicated equipment will be rinsed with soap and water and attempts will be made to dispose of decontamination fluids on-site. The analytical data from collected samples will be reviewed after completion of the field activities, and disposal options will be evaluated accordingly. It is anticipated that minimal amounts of IDW will be generated during this activity.

### **1.3.10 Sampling and Sample Handling Procedures**

Samples will be collected using equipment and procedures appropriate to the matrix, parameters, and sampling objectives. The volume of the sample collected must be sufficient to perform the laboratory analysis requested. Samples must be stored in the proper types of containers and preserved in a manner

appropriate to the analysis to be performed. A sample collection and analyses summary table (Table 1-1) is included in this document.

All clean, decontaminated sampling equipment and sample containers will be maintained in a clean, segregated area. All samples will be collected with clean decontaminated equipment following START SOP 1201.01. All samples collected for laboratory analysis will be placed directly into pre-cleaned, unused glass or plastic containers. Sampling personnel will change gloves between each sample collection/handling. All samples will be assembled and catalogued prior to shipping to the designated laboratory (following START SOP 1101.1 and 1102.01).

## **1.4 SAMPLE MANAGEMENT**

Specific nomenclature that will be used by START will provide a consistent means of facilitating the sampling and overall data management for the project (START SOP 0110.04). The START Assessment/Inspection Manager must approve any deviations from the sample nomenclature proposed below.

As stated in START SOP 0110.04, sample nomenclature will follow a general format regardless of the type or location of the sample collected. The general nomenclature consists of the following components:

- Geographic location (e.g., location within a school or park).
- Collection type (composite, grab, etc.).
- QA/QC type (normal, duplicate, etc.).
- Sequence - An additional parameter used to further differentiate samples.

Sample data management will be completed utilizing SCRIBE including Chain-of-Custody (COC) and sample documentation needs.

## **1.5 SAMPLE PRESERVATION, CONTAINERS, AND HOLD TIMES**

Once collected, air samples for particulate matter will be stored in antistatic plastic baggies. The PM<sub>2.5</sub> samples will also be stored at and shipped at 4 degrees centigrade. There are no holding time requirements for the sample storage. The samples will be sent to the designated laboratory by a common carrier.

Water samples will be stored in coolers on-site until shipped for laboratory analysis. The samples will be shipped via common carrier, or driven by START members to the laboratory.

The sample turnaround time (TAT) is initiated when the samples are collected in the field and continues until the analytical results are made available to START either verbally or by providing facsimile or email copies of the results for review.

All analyzed samples will be disposed by the designated laboratory in accordance with the laboratory SOPs.

**Table 1-1**

**Requirements for Containers, Preservation Techniques, Volumes, and Holding Times  
Mississippi Canyon Oil Spill  
Plaquemines Parish, Louisiana**

<b>Name</b>	<b>Analytical Methods</b>	<b>Matrix</b>	<b>Container</b>	<b>Preservation</b>	<b>Minimum Volume or Weight</b>	<b>Maximum Holding Time</b>
Particulate Matter (PM <sub>2.5</sub> )	40 CFR Part 50, Appendix L and QAGD 2.12	Air	PTFE Filter	Antistatic bags, 4 C	NA	NA
VOCs	TO-15	Air	SUMMA <sup>®</sup> Canister / Tedlar Bag	None	6 Liter @ 11.5 mL/min + 10% for an 8 hour sample collection	30 days
TCL VOCs	SW846 8260B	glass, (Teflon-lined septum for water)	4°C, HCl to pH<2 (pH adjust for water only)	3 x 40 mL vials (water, 4 oz (solid))	14 days (7 days if unpreserved by acid for water)	TCL VOCs
TCL SVOCs	SW846 8270D	Amber glass, (Teflon-lined for water)	4°C	2 x 1 liter, 8 oz	7 days extract (water), 14 days (solid)/ 40 days analysis	TCL SVOCs
TAL Metals and Mercury	SW846 6010C and SW846 7470A	Polyethylene (water), Glass (solid)	HNO <sub>3</sub> to pH<2 (water), 4°C	500 mL, 8oz	28 days for mercury 180 days all other metals	TAL Metals and Mercury
TPH GRO	SW846 8015B	glass, (Teflon-lined septum for water)	4°C, HCl to pH<2 (pH adjust for water only)	3 x 40 mL vials (water, 4 oz (solid))	14 days (7 days if unpreserved by acid for water)	TPH GRO
TPH DRO and ORO	SW846 8015B	Amber glass, (Teflon-lined for water)	4°C	2 x 1 liter, 4 oz	7 days extract (water), 14 days (solid)/ 40 days analysis	TPH DRO and ORO
PAH	SW846 8270D SIM	Amber glass, (Teflon-lined for water)	4°C	2 x 1 liter, 8 oz	7 days extract (water), 14 days (solid)/ 40 days analysis	PAH

## 2. ANALYTICAL APPROACH

### 2.1 ON-SITE TEDLAR BAG VOC ANALYSIS

Ambient air samples collected in 1-L Tedlar<sup>®</sup> bags will be analyzed in accordance with draft SERAS SOP #1741, *Field Analysis of VOCs in Gaseous Phase Samples by GC/MSD Loop Injection*.

**On-Site GC/MS VOC Calibration:** At the beginning of each day, the GC/MS system will be tuned, either automatically or manually. A minimum of three of the calibration standards analyzed must be used to generate the initial calibration curve.

Quality control for the VOC GC/MS loop method will include the following:

- Method blank for on-site GC/MS analyses for each day of analysis.
- Replicate sample analysis for on-site GC/MS with the frequency of 5 percent.
- Lot blanks with the frequency of one per day
- Laboratory Control Sample with the frequency of 1:20 samples and within  $\pm 30\%$ .

### 2.2 OFF-SITE VOC ANALYSIS

Air samples collected by START will be analyzed by an EPA Region 6 approved laboratory utilizing 40 CFR Part 50, Appendix L and QAGD 2.12 for particulate matter and EPA Method TO-15 for VOCs. The START PTL will indicate on the Chain of Custody that a Level II data package is required.

The water and sediment samples will be submitted to a qualified subcontracted commercial laboratory for the following analyses with a turn-around-time of 24 hours for analytical results.

- TCL VOCs by SW-846 Method 8260B.
- TCL SVOCs by SW-846 Method 8270D.
- TAL Metals by SW-846 Method 6010C.
- Mercury by SW-846 Method 7470A/7471.
- TPH GRO by SW-846 Method 8015B.
- TPH DRO/ORO by SW-846 Method 8015B.
- PAH by SW-846 Method 8270D SIM.

### 2.3 DATA VALIDATION

START will validate the analytical data generated by the outside laboratories using EPA-approved validation procedures in accordance with the EPA Contract Laboratory Program National Functional Guidelines for Organic and Inorganic Data Review. A summary of the data validation findings will be presented in Data Validation Summary Reports as part of the final report. START will evaluate the following applicable parameters to verify that the analytical data is within acceptable quality assurance/quality control (QA/QC) tolerances:

- The completeness of the laboratory reports, verifying that required components of the report are present and that the samples indicated on the accompanying chain-of-custody are addressed in the report.
- The calibration and tuning records for the laboratory instruments used for the sample analyses.
- The results of internal standards analyses.
- The results of laboratory blank analyses.
- The results of laboratory control sample (LCS) analyses.
- The results of MS/MSD analyses.
- The results of surrogate recovery analyses.
- Compound identification and quantification accuracy.
- Laboratory precision, by reviewing the results for blind field duplicates.

Variances from the QA/QC objectives will be addressed as part of the Data Validation Summary Reports.

### **3. QUALITY ASSURANCE**

An EPA Region 6 Quality Control (QC) Officer will be assigned and will monitor work conducted throughout the entire project including reviewing interim report deliverables and field audits. The START PTL will be responsible for QA/QC of the field sampling and monitoring activities. The designated laboratory utilized during the investigation will be responsible for QA/QC related to the analytical work. START will also collect samples to verify that laboratory QA/QC is consistent with the required standards and to validate the laboratory data received. Activities occurring within Region 4 will follow SESD approved SOPs.

#### **3.1 SAMPLE CUSTODY PROCEDURES**

Because of the evidentiary nature of sample collection, the possession of samples must be traceable from the time the samples are collected until they are introduced as evidence in legal proceedings. After sample collection and identification, samples will be maintained under chain-of-custody (COC) procedures. If the sample collected is to be split (laboratory QC), the sample will be allocated into similar sample containers. Sample labels completed with the same information as that on the original sample container will be attached to each of the split samples. Personnel required to package and ship coolers containing potentially hazardous material will be trained accordingly.

START personnel will prepare and complete chain-of-custody forms using SCRIBE for all samples sent to a START designated off-site laboratory. The chain-of-custody procedures are documented and will be made available to all personnel involved with the sampling. A typical chain-of-custody record will be completed each time a sample or group of samples is prepared for shipment to the laboratory. The record will repeat the information on each sample label and will serve as documentation of handling during shipment. A copy of this record will remain with the shipped samples at all times, and another copy will be retained by the member of the sampling team who originally relinquished the samples. At the completion of the project, the data manager will export the SCRIBE chain-of-custody (COC) documentation to the Analytical Service Tracking System (ANSETS) database.

Samples relinquished to the participating laboratories will be subject to the following procedures for transfer of custody and shipment:

- Samples will be accompanied by the COC record. When transferring possession of samples, the individuals relinquishing and receiving the samples will sign, date, and note the time of the sample transfer on the record. This custody records document transfer of sample custody from the sampler to another person or to the laboratory.
- Samples will be properly packed for shipment and dispatched to the appropriate laboratory for analysis with separate, signed custody records enclosed in each sample box or cooler. Sample shipping containers will be custody-sealed for shipment to the laboratory. The preferred procedure includes use of a custody seal wrapped across filament tape that is wrapped around the package at least twice. The custody seal will then be folded over and stuck to seal to ensure that the only access to the package is by cutting the filament tape or breaking the seal to unwrap the tape.



- If sent by common carrier, a bill of lading or airbill will be used. Bill of lading and airbill receipts will be retained in the project file as part of the permanent documentation of sample shipping and transfer.

## 3.2 PROJECT DOCUMENTATION

Field observations will be recorded legibly and in ink and by entry into field logbooks, Response Manager, or SCRIBE. Response Manager is the Enterprise Data Collection System designed to provide near real-time access to non-analytical data normally collected in logbooks. Response Manager provides a standard data collection interface for modules of data normally collected by START field personnel while on-site. These modules fall into two basic categories for Response and Removal. The modules include Emergency Response, Reconnaissance, Facility Assessment, Shipping, Containers, Materials, Calls, HHW, and General/Site Specific data. The system provides users with a standard template for laptop/desktop/tablet PCs that will synchronize to the secure web interface using merge replication technology to provide access to field collected data via on the Regular Regulatory Control – Electronic Document Management System (RRC-EDMS) EPA Web Hub. Response Manager also includes a PDA application that provides some of the standard data entry templates from Response Manager to users for field data entry. Response Manager also includes an integrated GPS unit with the secure PDA application, and the coordinates collected in Response Manager are automatically mapped on the RRC-EDMS interactive mapping site. GIS personnel can then access this data to provide comprehensive site maps for decision-making support.

Response Manager also includes an Analytical Module that is designed to give SCRIBE users the ability to synchronize the SCRIBE field data to the RRC-EDMS Web Hub. This allows analytical data managers and data validators access to data to perform reviews from anywhere with an Internet connection. The Analytical Module is designed to take the analytical data entered into EPA SCRIBE software and make it available for multiple users to access on one site. START personnel will utilize SCRIBE for data entry on-site and will upload to the Response Manager Analytical module.

### 3.2.1 Field Documentation

The following field documentation will be maintained as described below.

**Field Logbook.** The field logbook is a descriptive notebook detailing site activities and observations so that an accurate, factual account of field procedures may be reconstructed. Logbook entries will be signed by the individuals making them. Entries should include, at a minimum, the following:

- Site name and project number.
- Names of personnel on-site.
- Dates and times of all entries.
- Description of all site activities, including site entry and exit times.
- Noteworthy events and discussions.
- Weather conditions.
- Site observations.
- Identification and description of samples and locations.
- Subcontractor information and names of on-site personnel.

- Dates and times of sample collections and chain-of-custody information.
- Records of photographs.
- Site sketches of sample location including identification of nearest roads and surrounding developments.
- Calibration results.

**Sample Labels.** Sample labels will be securely affixed to the sample container. The labels will clearly identify the particular sample and include the following information:

- Site name and project number.
- Date and time the sample was collected.
- Sample preservation method.
- Analysis requested.
- Sampling location.

**Chain-of-Custody Record.** A chain-of-custody will be maintained from the time of sample collection until final deposition. Every transfer of custody will be noted and signed for and a copy of the record will be kept by each individual who has signed it.

**Custody Seal.** Custody seals demonstrate that a sample container has not been tampered with or opened. The individual who has custody of the samples will sign and date the seal and affix it to the container in such a manner that it cannot be opened without breaking the seal.

**Photographic Documentation.** START will take photographs to document site conditions and activities. Photographs should be taken with either a film camera or digital camera capable of recording the date on the image. Each photograph will be recorded in the logbook and within Response Manager with the location of the photographer, direction the photograph was taken, the subject of the photograph, and its significance (i.e., why the picture was taken). Where appropriate, the photograph location, direction, and subject will also be shown on a site sketch and recorded within Response Manager.

### **3.2.2 Report Preparation**

At the completion of the project, START will review and validate laboratory data and prepare a draft report of field activities and analytical results for EPA OSC review. Draft deliverable documents will be uploaded to the EPA TeamLink website for EPA OSC review and comment.