UNDERGROUND STORAGE TANK (UST) / LEAKING UNDERGROUND STORAGE TANK (LUST)

QUALITY ASSURANCE PROJECT PLAN (QAPP)

Louisiana Department of Environmental Quality
Office of Environmental Compliance
USTR Division

Revision 4

A PROJECT MANANGEMENT

A.1 TITLE AND APPROVAL PAGE

UST / LUST Quality Assurance Project Plan

Louisiana Department of Environmental Quality
Office of Environmental Compliance (OEC)
Underground Storage Tank and Remediation Division
P.O. Box 4312
Baton Rouge, LA 70821-4312

Quality Assurance Project Plan for Underground Storage Tanks / Leaking Underground Storage Tanks
concurrence:
Revision 4

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Signature: Carla Morin Date: 09/02/15

U.S. Environmental Protection Agency Region 6 (EPA)

Name: **Audray Lincoln**

Title: LUST Project Officer

Signature: _____ Date: 9/29/15

Document Review and Revision Record
Note: Actions older than 5 yrs may be removed from this record

Approval Date	Revision No.	Record of Activity
10/6/2010	0	QAPP 1006 and QAPP 1009 have been combined into QAPP 1027
11/21/2011	1	Replaced USTD with USTRD throughout the entire document. Replaced Office of Environmental Services (OES) with Office of Environmental Compliance (OEC) throughout the entire document. Replaced Tim B. Knight with Thomas F. Harris throughout the entire document. Replaced Carla Richards with Carla Hawkins throughout the entire document. ES Technical Support Team was split and placed under ES Managers in Figure 2.
10/22/2012	1	Reviewed in August 2012 and no revisions needed.
08/21/2013	2	Changed Carla Hawkins to Carla Morin on the Title and Approval Page and throughout the document. Included verbiage regarding CEIs performed by EPA in Sections A.4.1.5, A.6.A, A.7.1, and A.9.1.1. A.7.1 The CEI reports are submitted directly into EDMS by the LDEQ contract inspectors or EPA contract inspectors and the Technical Team Leader are notified electronically. After review of the CEI reports, the Technical Team Leader notifies the Environmental Scientist Supervisors electronically of the reports containing AOCs. A.9.1.1 Original inspection reports generated by LDEQ contractors, EPA inspectors, or EPA contractors are submitted directly into EDMS and Technical Team Leaders are notified electronically.
8/5/2014	3	Changed Administrator from Thomas F. Harris to Gary Fulton throughout the document.
9/29/2015	4	Changed responsibilities of Technical Team Leaders in Section A.4.1.5. Changed responsibilities to Quality Assurance Representative in Section A.4.2.3 and to Quality Assurance Coordinator in Section A.4.2.4. Changed number of UST's located nationwide in Sections A.5.1 and A.5.2. Changed number of UST's and facilities located in Louisiana in Sections A.6.1 & A.6.2. Various other minor corrections throughout the document. Changed Approval page from Gary Fulton USTRD Administrator to Kyle Blanchard ES Manager UST Group 2.

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REFERENCES 47

A.3 DISTRIBUTION LIST

Louisiana Department of Environmental Quality

The official version of the UST QAPP is posted on the LDEQ Intranet. The Project Quality Assurance Coordinator will notify the following LDEQ personnel via interoffice mail when the latest version is posted.

Office of Environmental Compliance (OEC)
- Executive Section
  - Assistant Secretary

- Underground Storage Tank and Remediation Division (USTRD)
  - Administrator
  - Environmental Scientist Managers and Supervisors
  - Quality Assurance Representative
  - Environmental Scientists and Staff
  - Geologist Supervisors
  - Geologists
  - Toxicologist

- Office of Management and Finance (OMF)
  - Information Services Administrative
  - Quality Assurance Manager

- Financial Services Division (FSD)
  - UST Trust Fund Environmental Scientist Manager

U.S. EPA Region 6 Personnel

LUST Project Officer (receives an original copy)

Response Action Contractors (RACs)

A copy of the QAPP will be supplied to each RAC listed on the current RAC List.

Environmental Consultants

An Environmental Consultant carrying out a response action at a LUST site will be provided a copy of the LUST QAPP.

A.4 PROJECT/TASK ORGANIZATION

The Louisiana Department of Environmental Quality (LDEQ), Office of Environmental Compliance, Underground Storage Tank and Remediation Division (OEC/USTRD) has been assigned the primary responsibility to ensure

that all underground storage tanks are operated in accordance with state and federal Underground Storage Tank rules and regulations. This QAPP is the combination of the UST QAPP 1009 and the LUST QAPP 1006 which were previously separate due to the jurisdiction falling under separate divisions. The Underground Storage Tank and Remediation Division organization consists of an Administrator, Environmental Scientist Managers and Supervisors, and Technical Team Leaders. A USTRD Division Personnel Organization chart can be found in Figure 1. A brief description of the responsibilities of each position follows.

A.4.1 UST PROGRAM

A.4.1.1 U.S. EPA UST Project Officer, Region VI - Audray Lincoln

The EPA Region VI UST Project Officer is responsible for coordination of EPA Region VI administrative issues, including processing the UST Grant Work Plan and approving the LDEQ UST Program Quality Assurance Project Plan (QAPP).

A.4.1.2 USTRD Administrator – Gary Fulton

The USTRD Administrator is responsible for directing the planning and implementation of the LDEQ UST Program within the USTRD. The UST Project Organization chart can be found in Figure 2.

A.4.1.3 Project QA Coordinator – Carla Morin

The Project QA Coordinator is responsible for maintaining the official, approved UST QAPP. The project QA coordinator is also responsible for the following:

- Revise and update the UST QAPP to reflect current LDEQ practices
- Send the UST QAPP to EPA for approval
- Post the updated QAPP on the intranet
- Notify and provide updated copies of UST QAPP to appropriate personnel
- Conduct periodic assessments and updates of the QAPP

A.4.1.4 USTRD Environmental Scientist Managers and USTRD Environmental Scientist Supervisors

USTRD Environmental Scientist Managers and USTRD Environmental Scientist Supervisors are responsible for overall performance of the UST

activities within their assigned regions (Figure 3). The responsibilities include the following:

- Balance the workload between regions and staff, and provide team leader assignments
- Ensure consistent implementation of UST practices among regions
- Oversee the workload and progress of assignments and provide assistance to Technical Team Leaders
- Review and approve work completed by the Technical Team Leaders
- Ensure proper hand-offs are made and received from other departmental processes and divisions

A.4.1.5 Technical Team Leaders

The Technical Team Leaders consist of Environmental Scientists, Environmental Staff, Geologists and Toxicologist from USTRD. The Technical Team Leaders are responsible for the following:

- Perform compliance evaluation inspections on UST systems
- Investigate UST-related complaints and reports of releases, spills, and suspected releases
- Perform UST closure oversight inspections and review and approve UST closure packets
- Review and approve UST installation and repair notifications and perform UST installation and repair oversight inspections
- Review laboratory results submitted by the LDEQ UST Certified Worker/Environmental Consultant
- Review UST inspections conducted by contractors and the EPA
- Issue enforcement letters for inspections that have areas of concern
- Track and follow-up on all enforcement letters issued as a result of DEQ UST inspections and DEQ contractor inspections

A.4.2 LUST PROGRAM

A.4.2.1 U.S. EPA UST Project Officer, Region VI - Audray Lincoln

The EPA Region VI LUST Project Officer is responsible for coordination of EPA Region VI and LDEQ Leaking Underground Storage Tank (LUST) Program administrative issues, including processing the LUST Grant Work Plan and approving the LDEQ LUST Program Quality Assurance Project Plan (QAPP).

A.4.2.2 Underground Storage Tank and Remediation Division (USTRD) Administrator – Gary Fulton

The USTRD Administrator is responsible for overall implementation of the LUST Program and associated remediation process activities as they relate to assessment and corrective actions within USTRD. The LUST Project Organization chart can be found in Figure 4.

A.4.2.3 USTRD Quality Assurance Representative - Erin Folse

The QARs are responsible for all aspects and functions of the LDEQ LUST Program QA/QC requirements including the following:

- Provide input to the department Quality Management Plan (QMP) and review of QAPP documents
- Orientation of the project staff to the quality assurance needs and requirements of the LUST program
- Posting the update QAPP on LDEQ's intranet

A.4.2.4 Project QA Coordinator – Carla Morin

The Project QA Coordinator is responsible for maintaining the official, approved LUST QAPP. Also responsible for the following:

- Revise and update the LUST QAPP to reflect current LDEQ practices
- Send the LUST QAPP to EPA for approval
- Sending updated QAPP for posting on LDEQ's intranet
- Notify and provide updated copies of LUST QAPP to appropriate personnel

- Conduct periodic assessments

A.4.2.5 Operations Group - USTRD Administrator, and USTRD Environmental Scientist Managers and Geology Supervisors.

The Operations Group is responsible for overall performance of the LUST program within the Remediation process. These tasks include:

- Site classification and prioritization
- Balance the workload between regions and staff. Provide team leader assignments
- Ensure consistent implementation of remediation processes among regions
- Oversee the workload and progress of assignments and provide assistance to Technical Team Leaders
- Ensure proper hand-offs are made and received from other departmental processes and divisions

A.4.2.6 Technical Team Leaders

The Technical Team Leaders consist of Environmental Scientists, Environmental Staff, Geologists, and Toxicologists from USTRD. Technical Team Leaders are responsible for managing the activities of LUST sites at the facility level. These tasks include:

- Provide oversight for assessment and remediation activities at LUST sites to ensure that they are completed in accordance with approved standard procedures and quality assurance requirements
- Review and approve site investigation and monitoring reports
- Maintain and calibrate all field equipment. Additionally, experienced personnel shall provide operator training for field equipment as needed for Technical Team Leaders who require training either due to lack of experience, updates, or refreshers.
- Maintain proper documentation of field activities, and ensure that proper labeling, handling, storage and shipping requirements are met
- Comply with all appropriate chain-of-custody procedures

- Notify the appropriate laboratory if circumstances exist that may adversely affect the quality of data derived from LUST site field activities

- Ensure that site investigation, corrective action, site monitoring, and completion sub-processes (Figure 5) are performed in accordance with the remediation process standard operating procedures (SOPs) (Reference 1)

- Assist the QARs to create and revise the QAPP and relevant SOPs

A.4.2.7 Response Action Contractors/Environmental Consultants

A response action is any technical services activity or specialized services activity including, but not limited to, assessment, planning, design, engineering, construction, operation of a recovery system, or ancillary services that is carried out in response to any discharge, release or threatened release of motor fuels into the groundwater or subsurface soils. (See Section A5 for an explanation of the Trust Fund.) When emergency conditions exist as a result of a release from a motor fuels UST, this shall include any person performing department-approved emergency response actions during the first 72 hours following the release.

Response actions may be performed by Response Action Contractors (RACs) or Environmental Consultants (ECs). It is required to use a Response Action Contractor (RAC) to complete response actions for LUST sites in Louisiana that are seeking reimbursement from the Louisiana Motor Fuel Underground Storage Tank Trust Fund. A RAC is a person who has been approved by the department to carry out any response action at a Motor Fuel UST Trust Fund (here in after referred to as the "Trust Fund") eligible site, excluding a person retained or hired by the RAC to provide services relating to a response action. Sites that are not Trust Fund eligible, those that qualify for federal reimbursement, or sites funded by a private entity are not required to use a RAC to conduct response actions. Instead they may use an Environmental Consultant (EC) to perform response actions. An EC is a person other than a RAC who carries out response action(s) at a non- Trust Fund eligible LUST sites.

RACs and ECs are responsible for performing remediation activities in accordance with the following guidance and regulations:

- LDEQ Risk Evaluation/Corrective Action Program 2003 (RECAP) (Reference 2)

- LDEQ/LDOTD Construction of Geotechnical Boreholes and Monitoring Well Systems Handbook, (Reference 3)

In this document, the term "RAC/EC" will be used to indicate those persons who perform response actions on Trust Fund eligible sites (RAC) and/or Trust Fund non-eligible sites (EC).

A.4.2.8 Laboratories

Laboratories performing analyses on samples from LUST sites must use department-approved methods. Commercial laboratories must participate in LDEQ's Louisiana Environmental Laboratory Accreditation Program (LELAP) (Reference 4).

Figure 1 – USTR Division Personnel Organization

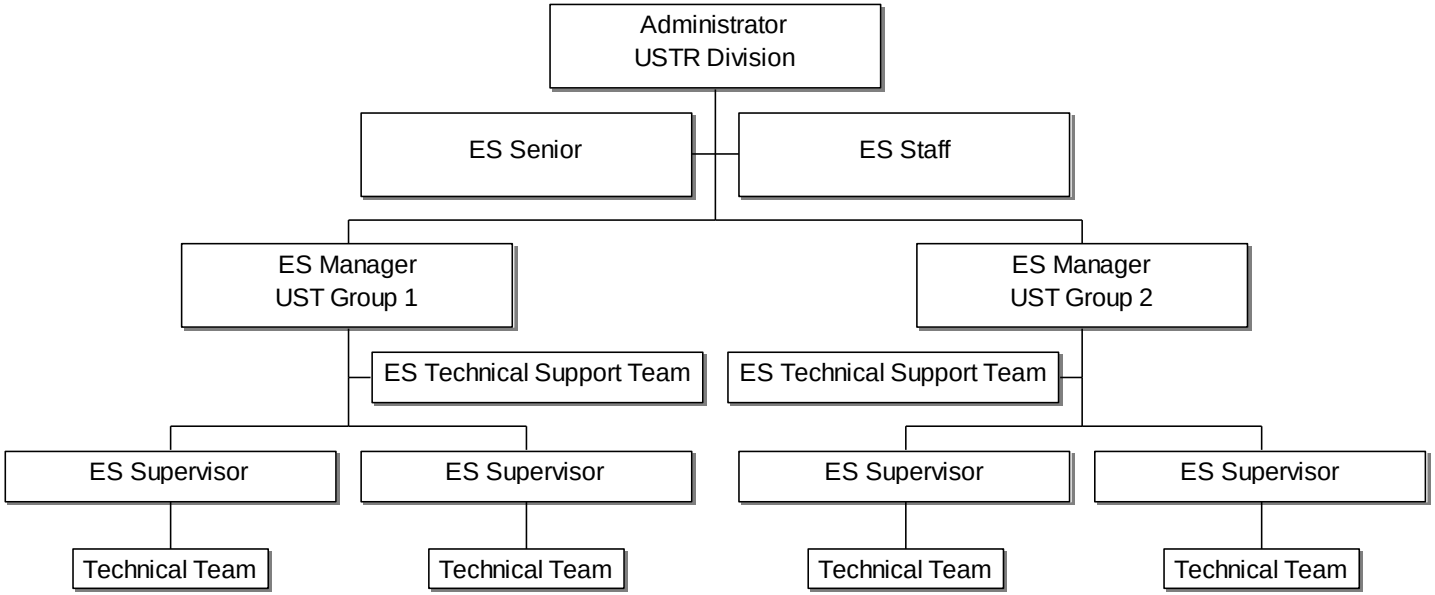


Figure 2 UST Project Organization

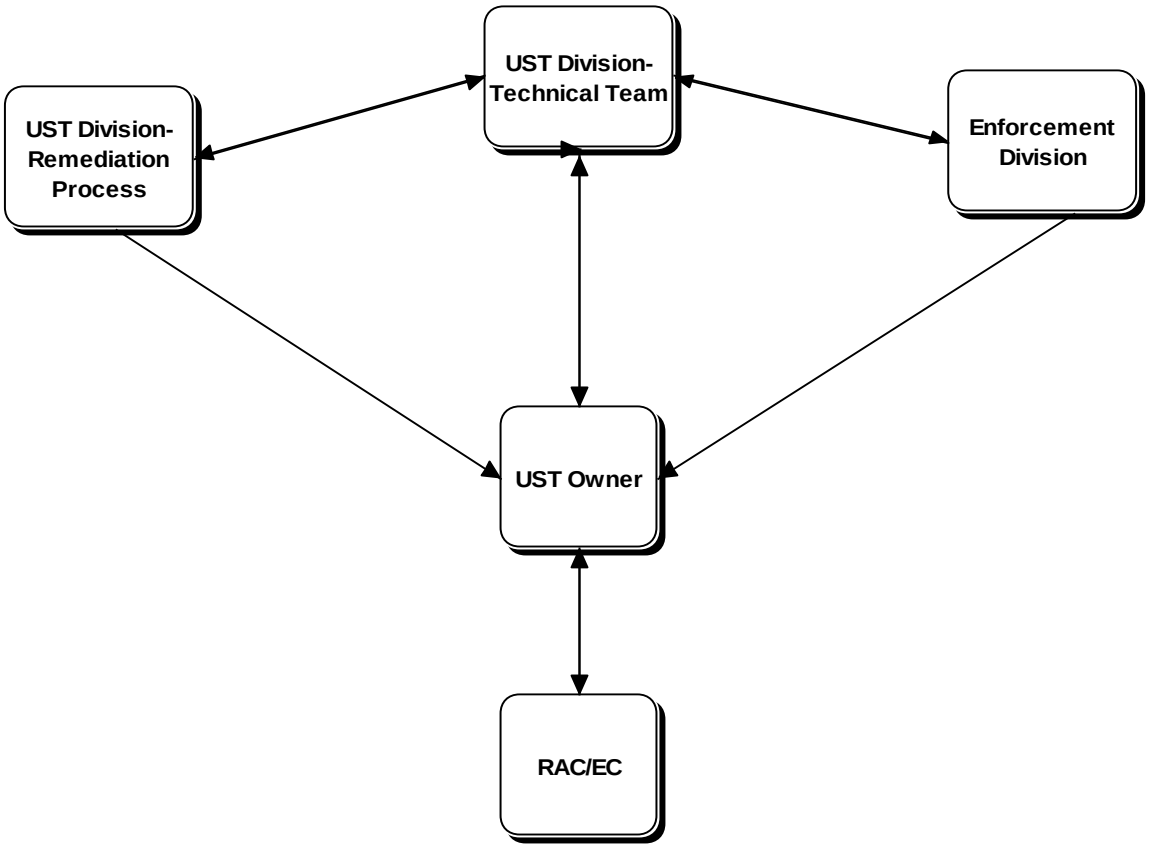


Figure 3 Regional Map

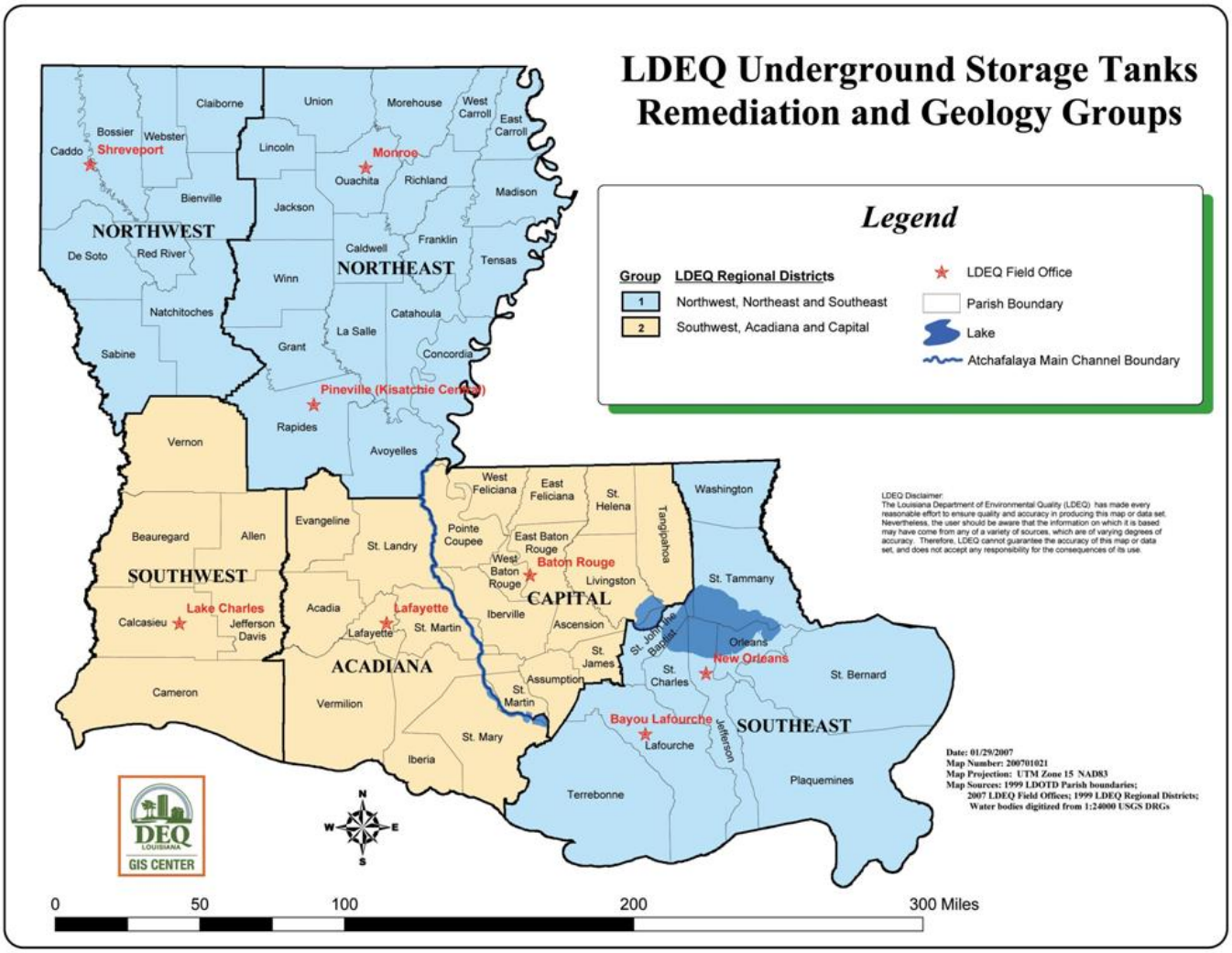


Figure 4 LUST Project Organization

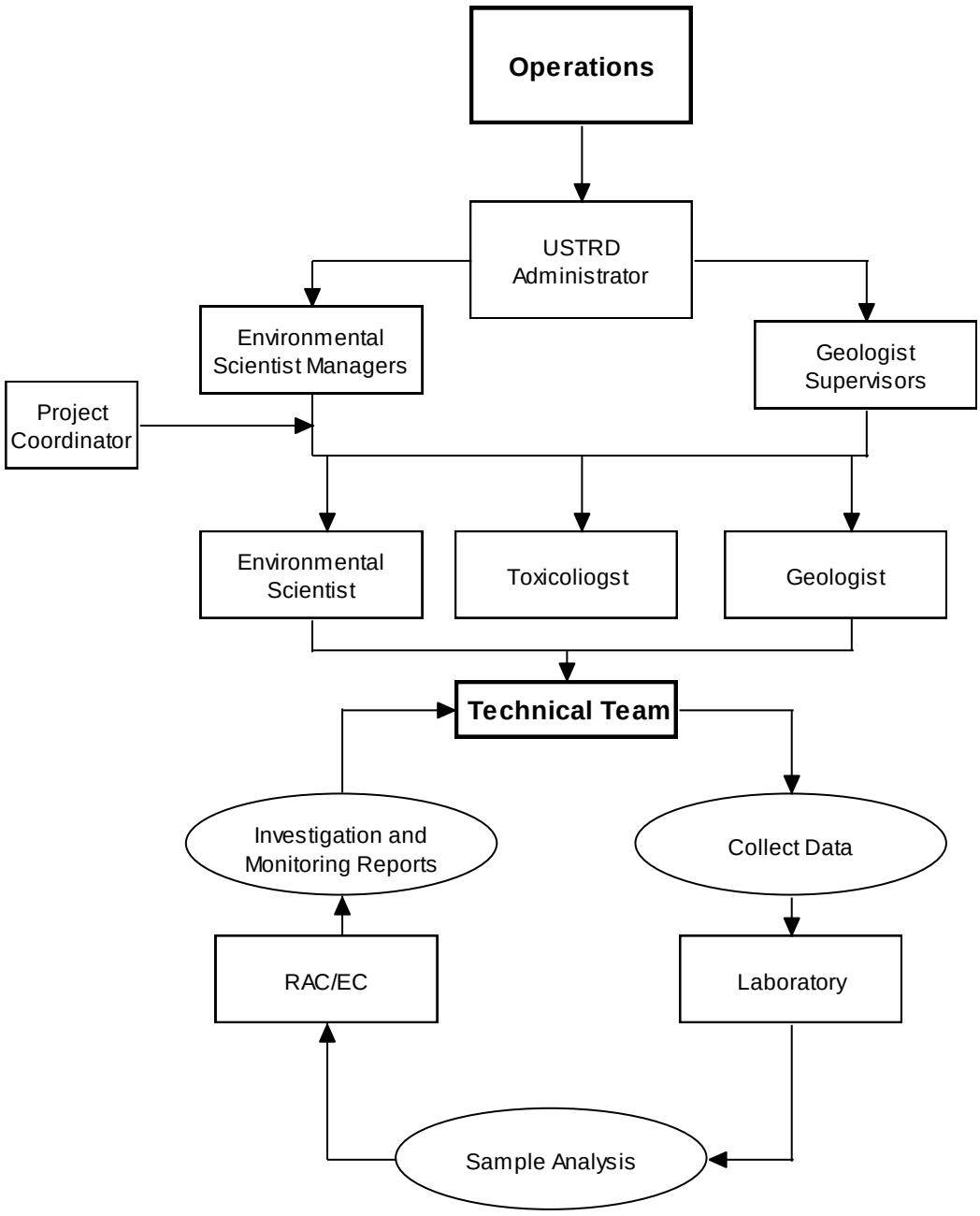
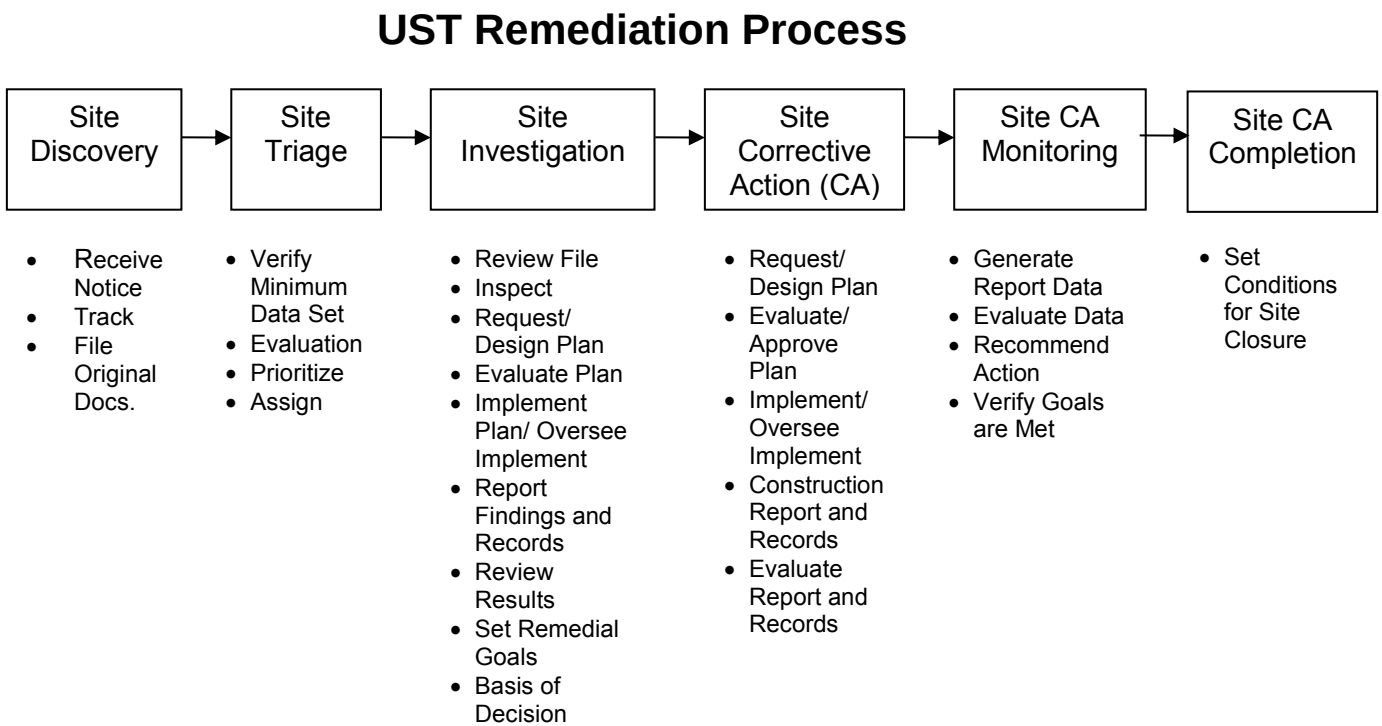


Figure 5 UST Remediation Process



A.5 PROBLEM DEFINITION/BACKGROUND

A.5.1 UST PROGRAM / PROBLEM DEFINITION/BACKGROUND

The U.S. EPA estimates that there are approximately 571,000 underground storage tanks (USTs) located nationwide that contain petroleum or hazardous substances. USTs have been found to leak for a number of reasons such as corrosion of the system, faulty installation, inadequate or improper maintenance, etc. These leaking UST systems can release their contents into the soil and/or groundwater, and subsequently pose a threat to human health or the environment.

In an effort to protect human health and the environment from the potential hazards of waste disposal, Congress developed the Resource Conservation and Recovery Act (RCRA) of 1976. Subtitle I of RCRA regulates USTs. In 1984 Subtitle I was amended to establish a comprehensive program for the regulation of USTs. At that time, states had to either comply with EPA's regulations or to develop an EPA approved program in lieu of the federal program.

In 2005 Congress enacted the Energy Policy Act of 2005 (Reference 5). Title XV, Subtitle B of this act, known as the UST Compliance Act of 2005, contains amendments to Subtitle I of the Solid Waste Disposal Act (SWDA), the original legislation that created the UST program. Since that time, the USTRD has worked to develop and implement procedures so that Louisiana will meet or exceed the milestone requirements set forth in this act.

Louisiana developed a UST program in response to the requirements referenced above and to meet the needs of its citizens. The program received EPA approval in 1992, at which time Louisiana retained the primary responsibility for enforcing the UST program in Louisiana. The UST Quality Assurance Project Plan (QAPP), developed in accordance with EPA regulations (40 CFR Part 31), was created in an effort to provide guidance for all persons involved in the project's organization. The UST / LUST QAPP's have been combined in an effort to make the annual review process more efficient.

A.5.2 LUST PROGRAM - PROBLEM DEFINITION/BACKGROUND

The U.S. EPA estimates that there are approximately 571,000 underground storage tanks (USTs) located nationwide that contain petroleum or hazardous substances. USTs have been found to leak for a number of reasons such as corrosion of the system, faulty installation, inadequate or improper maintenance, etc. These leaking UST systems can release their contents into the soil and/or groundwater, and subsequently pose a threat to human health or the environment. In an effort to decrease the number and threat that leaking USTs pose to human health and the environment, Congress added Subtitle I to the Resource Conservation and Recovery Act (RCRA) in 1984. Subtitle I required EPA to develop a regulatory program for USTs storing petroleum and other hazardous substances (Reference 6).

In October of 1986, Congress amended Subtitle I of RCRA and therein created the federal Leaking Underground Storage Tank (LUST) Trust Fund. The fund was set up to oversee clean-ups by responsible parties; to pay for clean-ups at sites where the owner or operator is unknown, unwilling, or unable to respond; or for use in emergency conditions. Additionally, these funds are allocated to pay for field personnel time and other resources used in the remediation of sites.

In order to help UST owners meet the financial responsibility requirements of Subtitle I of RCRA, the Louisiana Legislature enacted Act 1767 on July 15, 1988. Act 1767 established the Motor Fuels UST Trust Fund (hereinafter referred to as "the Trust Fund"). The Trust Fund was designed to reimburse costs incurred during the rehabilitation and remediation of affected soils, groundwater, and inland surface waters at eligible motor fuel contaminated UST sites, provided these costs are necessary and appropriate. It was initially financed through a per-tank fee of $100, but the fee structure changed with the adoption of Act 1014 on July 26, 1990. At that time the fee structure changed from a per tank rate to a per gallon delivered rate. On June 16, 1995, Act 336 of the 1995 Regular Session of the Legislature passed. This act increased the fee from $27.00 to $72.00 for each delivery of 9,000 gallons of fuel ($0.008 per gallon) delivered to a UST. This fee is collected by bulk operators and remitted to the Louisiana DEQ on a monthly basis.

The Trust Fund only reimburses allowed costs, which return the site to the use and occupancy in effect at the time the release occurred.

The staff involved in processing the reimbursement claims insure that the integrity of the Trust Fund is not jeopardized by the incorporation of inappropriate and/or excessive expenditures and that claims are processed in a reasonable time.

Through a cooperative agreement with the EPA, LDEQ is responsible for the administration of these funds and for the enactment of LUST program activities in Louisiana. In accordance with EPA regulations (40 CFR Part 31), a quality assurance system must be developed if the program involves environmental measurements and/or data generation. The system must include policies, procedures, specifications, standards, and documentation sufficient to produce data of adequate quality.

The Quality Assurance Project Plan (QAPP), developed pursuant to EPA Requirements for QAPPs, EPA QA/R-5; March 2001 for the LDEQ's LUST program, was created in an effort to provide guidance for LDEQ Technical Team Leaders and RAC/EC who perform the critical procedures noted above. The UST / LUST QAPP's have been combined in an effort to make the annual review process more efficient.

A.6 PROJECT/TASK DESCRIPTION

A.6.1 UST PROGRAM / PROJECT/TASK DESCRIPTION

The LDEQ/OEC is responsible for ensuring that all underground storage tanks are maintained and operated in compliance with all applicable federal and state rules and regulations. Currently, there are approximately 10,943 USTs located at UST facilities throughout Louisiana that have been registered with the LDEQ as of August 2015. Each of these 4084 facilities is unique depending on its components, the type of products stored, the local hydro-geologic conditions and the history of releases. It is the mission of the USTRD to ensure that all underground storage tanks are in compliance as mandated by federal and state regulations, and to ensure that all regulated underground storage tanks that are not active are properly closed.

One of the tasks for the USTRD is to perform compliance evaluation inspections (CEIs) at each UST facility throughout the state. CEIs are required to be conducted at least every three years. Compliance evaluation inspections are conducted on-site by a technical team leader, an LDEQ contractor, EPA inspectors, or an EPA contractor, and include a visual inspection of the accessible UST system equipment and a review of the applicable records. The

inspector is responsible for reviewing the facility's records. These include but are not limited to:

- The most current registration forms
- Current UST Registration Certificate
- Release detection records
- Corrosion protection records
- Tank, line, leak detector test records
- UST system repair records
- Financial assurance records
- Operator training certificates

Findings from both the visual inspection and the record review are documented in a report that is added to the facility's file. If areas of concern are noted in the report, it is reviewed by LDEQ's Enforcement Division. The enforcement division reviews the findings and initiates or has the USTR Division staff member initiate appropriate corrective action(s) for that facility.

Compliance evaluation inspection reports submitted by LDEQ contractors or EPA contractors are reviewed by a designated technical team leader to verify areas of concern noted in the report. Deficient reports are returned to the contractor for correction.

In addition to compliance inspections, the Technical Team Leaders observe and review UST closures to ensure that UST closures comply with state rules and regulations. UST closures must be performed in accordance with LDEQ's Underground Storage Tank Closure/Change in Service Guidance Document (Reference 7).

UST owners or operators must officially notify the appropriate regional office at least 30 days prior to tank closure. The notification form is reviewed for completeness, and subsequently approved by the technical team leader. Once approved by the USTRD staff, the UST closure process may be completed. The UST closure process must be completed by a LDEQ certified UST closure worker. To determine if the tank/tank system has leaked, a certain number of soil samples are collected from specified locations during the tank closure (Reference 7). These samples are sent to a LDEQ accredited laboratory for analysis.

UST owners are required to submit the analytical results along with other closure information to the appropriate regional office within 60 days of tank closure. Once received, the closure assessment forms and reports are reviewed by the technical team leaders. Technical team leaders evaluate all sample results in accordance

with the LDEQ "Risk Evaluation/Corrective Action Program" (RECAP) (Reference 2). If sample results exceed the appropriate soil screening levels, then these sites are handled by the UST-Remediation Process in accordance with LDEQ's *Underground Storage Tank / Leaking Underground Storage Tank Program Quality Assurance Project Plan* (UST / LUST-QAPP) (Reference 8). If sample results do not exceed soil screening standards, then the closure form is signed and there is no further action at that time.

The UST soil screening standards can be found in Appendix M of the most current revision of LDEQ's "Underground Storage Tank Closure/Change-In-Service Guidance Document" (Reference 7).

The Technical Team Leaders also review and approve UST installation and repair notifications, and perform installation and repair oversight inspections, in order to ensure that all installations and repairs are conducted in accordance with the secondary containment regulations in LAC 33:XI.303 (Reference 9).

A.6.2 LUST PROGRAM / PROJECT/TASK DESCRIPTION

The responsibilities of the Leaking Underground Storage Tank (LUST) program in Louisiana are shared among different divisions within the LDEQ. The bulk of the work primarily lies within the Underground Storage Tank and Remediation Division (USTRD) where corrective action, including investigation and remediation, is performed. The associated Trust Fund lies within the Financial Services Division, which is responsible for disbursement of funds from the Trust Fund.

Currently, there are approximately 10,943 underground storage tanks (UST) located at UST facilities throughout Louisiana that have been registered with the LDEQ as of August 2015. Each of these approximately 4,084 facilities is unique depending on its components, the type of products stored, the local hydro-geologic conditions and the history of releases. In addition, LUST facilities exist in virtually every type of Louisiana community, ranging from rural to metropolitan. At any Louisiana facility where a leak from a UST has occurred (LUST site), the staff of the USTRD is responsible for ensuring that all site activities are performed in accordance with accepted quality assurance procedures; however, the USTRD Administrator, through the QA Representative and program supervisors, have overall responsibility for the implementation of all quality assurance procedures related to sites managed within the LUST program.

The LDEQ's QAPP for the LUST program, presented in this document, describes the LDEQ's quality assurance plan for Louisiana LUST site activities. The quality assurance plan attempts to ensure that LUST site activities pursued by, for, or under contract to the LDEQ are conducted in a consistent manner and in accordance with the remediation process (Figure 5). Specific objectives of the quality assurance procedures include:

- Ensure that all data generated for or by the LDEQ will be of sufficient or greater quality to withstand scientific and legal challenge

- Ensure that the necessary levels of data quality are attainable by defining the intended use of all data before data collection efforts begin.

- Properly define all sample collections and analyses, these shall be project specific and included in the investigation work plan

- Certify that all data produced by or for the LDEQ will be of known and acceptable precision, accuracy, representativeness, completeness and comparability

- Provide adequate supervision by the USTRD staff at LUST projects to ensure quality data are collected

LDEQ recognized that some LUST site activities which generate and/or affect environmental data must follow a specific process to ensure consistency with environmental data generation in order to meet and exceed these objectives. Therefore in addition to the QAPP, all LUST sites activities shall be conducted in accordance with the following documents:

- Louisiana LDEQ Risk Evaluation/Corrective Action Program 2003 (RECAP) (Reference 2)

- LDEQ/LDOTD Construction of Geotechnical Boreholes and Monitoring Well Systems Handbook (Reference 3)

- Applicable Remediation Process Standard Operation Procedures (SOPs) (Reference 1)

A.7 QUALITY OBJECTIVES AND CRITERIA

A.7.1 UST PROGRAM / QUALITY OBJECTIVES AND CRITERIA

The primary objective of this project is to ensure that all active underground storage tanks in the State of Louisiana operate in compliance with all applicable state and federal underground storage tank rules and regulations. In order to meet this objective, Compliance Evaluation Inspections are performed at active facilities by LDEQ inspectors, LDEQ contract inspectors, EPA inspectors, or EPA contract inspectors as described in Section A.6 Project/Task Description.

In order to ensure consistency, LDEQ inspectors, LDEQ contract inspectors, EPA inspectors, and EPA contract inspectors use standardized Compliance Evaluation Inspection (CEI) checklists which are kept up to date with lists of specific violations for each area of concern.

CEI reports which are submitted by LDEQ inspectors are reviewed by a USTRD Environmental Scientist Supervisor for consistency, proper documentation of citations, and use of correct citations for each area of concern.

The CEI reports are submitted by the LDEQ contractor inspectors or EPA contract inspectors directly into EDMS, and the Technical Team Leader is notified electronically. CEI reports which are submitted by LDEQ contract inspectors or EPA contract inspectors are reviewed by one designated Technical Team Leader. This Technical Team Leader reviews each report for consistency, proper documentation of citations, and use of correct citations for each area of concern. Deficient reports are returned for correction. The Technical Team Leader notifies the Environmental Scientist Supervisors electronically of the CEI reports with Areas of Concern. The Supervisors review the CEI reports for consistency, proper documentation of citations, and use of correct citations for each area of concern.

All CEI reports submitted by either LDEQ inspectors or contract inspectors which indicate Areas of Concern are reviewed for consistency by Enforcement Circuit Rider personnel. Enforcement Circuit Riders meet periodically with LDEQ Technical Team Leaders, Environmental Scientist Supervisors in each LDEQ Regional Office, and the USTRD Senior Scientist, to review these reports. This group review also ensures that UST regulations are consistently applied and Expedited Penalties are enforced consistently throughout the state.

This project is also aimed at ensuring that all regulated underground storage tanks that are permanently closed and closed in accordance with the regulations. On-site closure inspections are performed by Technical Team Leaders on an as-needed basis as determined by Environmental Scientist Supervisors and Environmental Scientist Managers. Technical Team Leaders track all closure time frames as defined by the most current revision of LDEQ's "Underground Storage Tank Closure/Change-In-Service Guidance Document" (Reference 7) for every UST closure. Technical Team Leaders also review every UST Closure Assessment Report for consistency with the LDEQ "Risk Evaluation/Corrective Action Program" (RECAP) (Reference 2).

A.7.2 LUST PROGRAM / QUALITY OBJECTIVES AND CRITERIA

The LDEQ's primary goal for quality assurance procedures is to produce sufficient environmental data of known quality that will support the objectives of any LUST site investigation. In addition, LDEQ wants to ensure that activities which generate and/or affect environmental data follow a consistent process to ensure accuracy and consistency because this information may be used for the determination of the source, estimation of the magnitude and extent of contamination, determination of the nature of contamination, characterization of site conditions for development of remedial action procedures, and documentation of the effectiveness of remediation. The level of data quality and quantity required to achieve any of these objectives is defined in RECAP (Reference 2).

Data quality procedures and objectives for activities which are common to LUST sites (e.g. groundwater and soil sampling and analysis) are identified in RECAP (Reference 2). Specific quality assurance procedures and data quality objectives (DQOs) for specialized activities at LUST sites are developed during the planning stages for site activities.

Environmental data collection activities which will most commonly be performed during the course of a LUST site project include boring and monitor well installations; groundwater, soil and surface-water screening and sampling; sample preservation and analysis. With respect to potential LUST site activities, some specific data collection techniques, associated analytical level requirements, and site project objectives are summarized in the Louisiana DEQ RECAP Document and the LDEQ/LDOTD Construction of Geotechnical Boreholes and Groundwater Monitoring Systems Handbook (see References 2 and 3 respectively). Generally, the

most common data acquisition activities performed at LUST sites will require strict adherence to established quality assurance procedures for both sampling and analytical procedures. The USTRD Administrator has overall responsibility for the implementation of all quality assurance procedures related to sites managed within the LUST program, and it is the responsibility of the Technical Team Leader to ensure that these DQO's are met.

A.8 SPECIAL TRAINING/CERTIFICATION

A.8.1 UST PROGRAM / SPECIAL TRAINING/CERTIFICATION

Each member of the technical staff has a training plan in LDEQ's Student Center, which lists those courses that are required for that individual. Employees can register online for the required courses.

All LDEQ USTRD technical staff must have the following training:

- 40 hour OSHA HAZWOPER
- 8 hour OSHA HAZWOPER annual refresher

USTRD technical staff must have knowledge of underground storage tank installation, as well as spill, overfill, release detection, and cathodic protection equipment. This is to verify that tank installers have made proper installations. Additionally compliance training in UST regulations, requirements, and equipment is provided through workshops and classes conducted by EPA and LDEQ. On the job training by experienced USTRD staff is also provided to new USTRD inspectors. LDEQ will document completion of training requirements for LDEQ USTRD technical staff.

A.8.2 LUST PROGRAM / SPECIAL TRAINING/CERTIFICATION

Each member of the technical staff has a training plan in LDEQ's Student Center, which lists those courses that are required for that individual. Employees register online for required classes through the Student Training Center.

All LDEQ technical staff involved in the remediation process working on LUST projects must have the following training:

- 40-Hour OSHA HAZWOPER
- OSHA HAZWOPER Annual Refresher

Additionally, the following training is highly recommended:

- Introduction to Groundwater Investigations
- Sampling for Hazardous Materials
- RECAP Training
- Sampling solid materials using EPA SW846 Method 5035

A.9 DOCUMENTATION AND RECORDS

A.9.1 UST PROGRAM / DOCUMENTATION AND RECORDS

A.9.1.1 LDEQ

Original inspection reports generated by USTRD staff are forwarded to the main office for scanning into the department's Electronic Document Management System (EDMS). Original inspection reports generated by LDEQ contractors, EPA inspectors or EPA contractors are submitted directly into EDMS and the Technical Team Leaders are notified electronically. Once the records have been scanned into EDMS, the requirements for LDEQ's record retention policy have been met and it is no longer necessary to maintain a hard copy.

A.9.1.2 UST Owners

The UST owners are required to keep current registration forms, certificate, a minimum of thirty-six months of leak detection, and corrosion protection records. Depending upon the type, records such as repairs to the UST system must be kept onsite or at a nearby location for up to five years or the life of the facility. These records must be readily available for the USTRD staff at the time of an inspection. The tank owner or operator must also keep a permanent copy of all records pertaining to the UST closure as stated in LAC 33:XI.Chapter 509 and in the "Underground Storage Tank Closure/Change-in-Service Guidance Document" (Reference 9 and 7 respectively).

Documents and records, such as the Notice of Intent to Close and Closure Assessment Report, received from the UST owner/operators, are forwarded to the main office for scanning into EDMS; thus maintained in accordance with LDEQ's records retention policy.

A.9.2 LUST PROGRAM / DOCUMENTATION AND RECORDS

The LUST Project QA Coordinator is responsible for ensuring the appropriate LDEQ project personnel have the most current approved version of the QAPP. Once approved, an official version of the QAPP shall be distributed to the RACs and posted on the LDEQ Intranet (Reference 8).

LUST program records and documents shall be retained in accordance with CFR Title 40, Chapter I, Subchapter B, Section 31.42. LUST program records and documents generated by or for LDEQ will be scanned at LDEQ into an electronic format and can be retrieved by LDEQ employees via the Electronic Document Management System (EDMS). After being scanned, records and documents will be stored in an LDEQ archive file room for a minimum of three years. The three-year time period begins from the date of the LDEQ final yearly LUST Grant expenditure report to the EPA.

In accordance with LAC 33:I, Subpart 3, 5315(A), testing laboratories shall retain on record all raw data and observations, calculations and derived data, calibration records, and the final test report for a minimum of ten years or as required by regulatory or legal requirement (Reference 4).

B <u>DATA GENERATION AND ACQUISITION</u>

B.1 SAMPLING PROCESS DESIGN

B.1.1 UST PROGRAM / SAMPLING PROCESS DESIGN

UST closure sample collection shall be performed by a LDEQ certified worker in accordance with LAC 33:XI.Chapters 9 and 13 and LDEQ's UST Closure/Change in Service Guidance Document (Reference 9 and 7 respectively). This document provides guidance on the appropriate number of samples, sampling locations, and analyses required for the samples (Figure 6). These

closure samples must be analyzed by an LDEQ accredited contract laboratory.

B.1.2 LUST PROGRAM / SAMPLING PROCESS DESIGN

Data collection design for LUST activities in Louisiana includes the types and numbers of samples required, the design of the sampling network, sampling locations and frequencies, sample matrices, measurement parameters of interest, and the rationale for the design shall be conducted in accordance with the following documents:

- LDEQ Risk Evaluation/Corrective Action Program RECAP (Reference 2)

- LDEQ/LDOTD Construction of Geotechnical Boreholes and Groundwater Monitoring Systems Handbook (Reference 3)

B.2 SAMPLING METHODS

B.2.1 UST PROGRAM / SAMPLING METHODS

All UST closure sampling by LDEQ certified workers shall follow the sampling procedures that are detailed in the LDEQ “Underground Storage Tank Closure/Change-In-Service Guidance Document” (Reference 7). Refer to this document for guidance on the appropriate number of samples, sampling locations, and analyses required for the samples (Figure 6). Samples must be sent to an LDEQ certified laboratory.

B.2.2 LUST PROGRAM / SAMPLING METHODS

To ensure consistency in representative sampling and in order to produce valid results, sampling procedures conducted at LUST site activities- including investigations and monitoring events- shall be conducted in accordance with the following guidance materials:

- The Louisiana DEQ RECAP Document (Reference 2); Test Methods for Evaluating Solid Waste, Volume II: Field Manual Physical/Chemical Methods, SW846 (Reference 10); and the LDEQ/LDOTD Construction of Geotechnical Boreholes and Groundwater Monitoring Systems Handbook (Reference 3) shall be used to identify the EPA-approved sample collection, sample preservation, and field measurement methods.

- The EPA or manufacturers' specifications shall be used for proper calibration of field equipment. Refer to Section B7 of this document for instrument calibration requirements and frequency.

- The Louisiana DEQ RECAP Document (Reference 2) and EPA-approved methodology shall be used to identify proper sample handling and integrity verification procedures.

All LDEQ staff and/or RAC/EC involved in LUST site investigations shall be familiar with the sampling procedure requirements above.

LUST site investigations often involve sampling multiple media, most commonly soil and groundwater. Guidance for conducting soil and groundwater sampling activities is provided in the Louisiana DEQ RECAP document, Appendix B, and the LDEQ/DOTD Construction of Geotechnical Boreholes and Groundwater Monitoring Systems Handbook (References 2and 3 respectively).

Sample collection and preservation shall be completed according to EPA approved methods. After collection, all samples will be handled as few times as possible. The sampler shall coordinate with the laboratory to ensure that proper sample handoffs occur. All personnel will use extreme care to ensure that the integrity of the samples shall not be compromised from tampering and/or contamination from containers, pumps, tubing, bailers or any other equipment. Samples shall be properly identified, labeled, and transported to the laboratory in accordance with sample custody procedures in Section B3.

B.3 SAMPLE HANDLING AND CUSTODY

B.3.1 UST PROGRAM / SAMPLE HANDLING AND CUSTODY

Sample custody procedures are necessary to maintain and document sample possession and to adequately establish and support the use of sample data in potential enforcement, regulatory, or legislative actions. All sample handling and custody activities will be performed in accordance with Louisiana DEQ's Laboratory Accreditation Program described in LAC 33: I, Subpart 3 (Reference 4). Section 5501 of Subpart 3 specifically addresses sample integrity.

The principle of sample custody is to account for the integrity of the sample from the moment the sample is placed in a container until all analytical tests have been completed and any remaining sample is discarded. This means that proper sample custody is a joint effort of the sampling crew, the sample transporter, and the laboratory staff. The proper sampling protocol and chain of custody requirements are referenced in the LDEQ "Underground Storage Tank Closure/Change-In-Service Guidance Document" (Reference 7).

The documentation of sample custody shall be considered to be incomplete if any of the required information is omitted from the chain-of-custody form. This shall include any sample identification information or any of the required signatures or official change of possession times. In this case, the laboratory custodian should question whether the sample should be accepted or not. If possible the question should be referred to the sampler for consideration.

After the sample has been collected, sample integrity must be protected by preventing the intentional and/or accidental contamination of the sample. The receiving laboratory should reject any sample that is suspect of tampering or contamination. The laboratory must record and document these instances of sample rejection.

The laboratory must follow all holding times for samples as indicated in SW-846. Refer to chapter three, table 3.1 for sample holding times, recommended digestion volumes, and recommended collection volumes for inorganic analysis. Refer to chapter 4, table 4-1 for information regarding proper sample containers, techniques, and holding times for volatile organics. (Reference 10)

B.3.2 LUST PROGRAM - SAMPLE HANDLING AND CUSTODY

Sample custody procedures are necessary to maintain and document sample possession and to adequately establish and support the use of sample data in potential enforcement, regulatory, or legislative actions. All sample handling and custody activities will be performed in accordance with Louisiana DEQ's Laboratory Accreditation Program described in LAC 33:I, Subpart 3 (Reference 4). Section 5501 of Subpart 3 specifically addresses sample integrity.

The principle of sample custody is to account for the integrity of the sample from the moment the sample is placed in a container until

all analytical tests have been completed and any remaining sample is discarded. This means that proper sample custody is a joint effort of the sampling crew, the sample transporter, and the laboratory staff.

The investigation work plan will provide sample labeling and handling details. Each sample will be labeled with a unique sample number, time, date, preservatives, and analytical parameters. This information should match the sample identification and testing information that is listed on the chain-of-custody form for the sample(s). The chain-of-custody form is the primary documentation that is used to track proper sample custody from the time of sampling to the arrival of the sample at the laboratory. A chain-of-custody form will be completed for every sample event at any LUST site.

The documentation of sample custody shall be considered to be incomplete if any of the required information is omitted from the chain-of-custody form. This shall include any sample identification information or any of the required signatures or official change of possession times. In this case, the laboratory custodian should question whether the sample should be accepted or not. If possible the question should be referred to the sampler for consideration.

After the sample has been collected, sample integrity must be protected by preventing the intentional and/or accidental contamination of the sample. The receiving laboratory should reject any sample that is suspect of tampering or contamination. The laboratory must record and document these instances of sample rejection.

The laboratory must follow all holding times for samples as indicated in SW-846. Refer to chapter three, table 3.1 for sample holding times, recommended digestion volumes, and recommended collection volumes for inorganic analysis. Refer to chapter 4, table 4-1 for information regarding proper sample containers, techniques, and holding times for volatile organics. (Reference 10)

B.4 ANALYTICAL METHODS

B.4.1 UST PROGRAM / ANALYTICAL METHODS

A LDEQ accredited laboratory must be used for the analyses of samples collected at UST sites in Louisiana. Refer to Figure 6 for the appropriate sampling protocol that should be scheduled for

each sampling event, including the analyses required and analytical methods. The analytical services are contracted by responsible parties or certified UST workers. Contracted laboratories will use only EPA approved methods when analyzing UST site samples as specified in the LDEQ "Underground Storage Tank Closure/Change-In-Service Guidance Document" (Reference 7).

Accredited laboratories as per Title 33, Part I, Subpart 3, 5301 (Reference 4), shall maintain a Quality Assurance/Quality Control (QA/QC) Program using appropriate document control practices. This includes the development and documentation of quality control procedures for each analytical procedure, demonstrating compliance with all quality control procedures, and having procedures in place for feedback and corrective action measures whenever testing discrepancies are detected or when there are departures from documented policies and procedures.

B.4.2 LUST PROGRAM / ANALYTICAL METHODS

Samples collected at LUST sites in Louisiana must be analyzed at an accredited, commercially-contracted laboratory. Contracted laboratories shall only use EPA approved methods when analyzing LDEQ LUST site samples for suspected or known contaminants as specified in Figure 7. For information regarding EPA approved methods, refer to the Louisiana DEQ RECAP Document (Reference 2) and Test Methods for Evaluating Solid Waste, Volume II: Field Manual Physical/Chemical Methods, SW846 (Reference 10).

Accredited laboratories as per Title 33, Part I, Subpart 3, 5301, shall maintain a Quality Assurance/Quality Control (QA/QC) Program using appropriate document control practices. This includes the development and documentation of quality control procedures for each analytical procedure, demonstrating compliance with all quality control procedures, and having procedures in place for feedback and corrective action measures whenever testing discrepancies are detected or when there are departures from documented policies and procedures (Reference 4).

B.5 QUALITY CONTROL

B.5.1 UST PROGRAM / QUALITY CONTROL

Quality Control (QC) activities performed for each sampling, analysis, or measurement must be performed in accordance with

the LDEQ “Underground Storage Tank Closure/Change-In-Service Guidance Document” and LAC 33:I, Subpart 3, 5301 (References 7 and 4 respectively).

B.5.2 LUST PROGRAM / QUALITY CONTROL

Quality Control (QC) activities performed for each sampling, analysis, or measurement technique must be performed in accordance with Sections 2.4 and 2.5 of RECAP and LAC 33: I, Subpart 3, 5301 (Reference 2 and 4 respectively) and as stated in specific analytical methods.

Figure 6 Closure Sample Analyses for the UST Program

PRODUCT STORED	SAMPLE MEDIA	ANALYSES REQUIRED	EPA SW-846 ANALYTICAL METHODS[1]	HOLDING TIMES
Gasoline	Soil	BTEX	8015, 8021, 8260, 8261	48 hours or 14 days
	Soil	MTBE	8015, 8260, 8261	48 hours or 14 days
	Soil	Lead[2]	6010, 6020, 6200, 6800, 7000, 7010	180 days
	Soil	TPH-GRO (C_6 - C_{10})	8015	48 hours or 14 days
Diesel	Soil	TPH-DRO (C_{10} - C_{28})	8015	14/40 days
	Soil	PAH[3]	8100, 8270, 8275, 8310	14/40 days
Used Oil	Soil	TPH-ORO ($C_{>28}$)	8015	14/40 days
	Soil	Total Metals[5]	6010, 6020, 6200	28/28 days[4]
	Soil	PAH[5]	8100, 8270, 8275, 8310	14/40 days
Kerosene, Jet Fuel	Soil	TPH-GRO (C_6 - C_{10})	8015	48 hours or 14 days
	Soil	TPH-DRO (C_{10} - C_{28})	8015	14/40 days
Hazardous or Other Substances	Soil	Analyze by approved method for the substance stored or primary constituent		
SPLP	Soil	Volatiles	Extraction: 1312, Analysis: 8260	14/14
SPLP	Soil	Semi-Volatiles	Extraction: 1312, Analysis: 8270	14/40
SPLP	Soil	Total Metals	Extraction: 1312, Analysis: 6010	28/28 days[4]

[1]Use most recent EPA SW-846 update of the selected method. The selected method should be capable of detecting the limiting soil standard.
[2]Required if facility dispensed gasoline prior to 1/1/86.
[3]Analyze only on TPH-DRO sample exhibiting highest concentration.
[4] Based on holding time for Mercury (28 days)
[5]Analyze only on TPH-ORO sample exhibiting highest concentration.
BTEX - Benzene, Toluene, Ethylbenzene, and Total Xylenes
TPH - Total Petroleum Hydrocarbons (GRO-Gasoline Range Organics, DRO-Diesel Range Organics, ORO-Oil Range Organics)
MTBE - Methyl tert-butyl ether
SPLP - Synthetic Precipitation Leaching Procedure
Total Metals - Arsenic, Barium, Cadmium, Chromium, Lead, Mercury, Selenium, Silver
PAH - Polynuclear Aromatic Hydrocarbons (Acenapthene, Acenaphthylene, Anthracene, Benz(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Chrysene, Dibenz(a,h)anthracene, Fluoranthene, Fluorene, Indeno(1,2,3-cd)pyrene, 2-Methylnaphthalene, Naphthalene, Phenanthrene, Pyrene)
48 hours or 14 days - Volatile organic compounds have either a 48 hour or 14 day holding time depending on the Method 5035 option selected.
14/14 - Samples extracted within 14 days and extracts analyzed within 14 days following extraction.
14/40 - Samples extracted within 14 days and extracts analyzed within 40 days following extraction.
28/28 - Samples extracted within 28 days and extracts analyzed within 28 days following extraction.

Figure 7 Petroleum Hydrocarbons Sample Analyses and Methods for the LUST Program

Product Stored	Sample Media	Analysis Required	Acceptable SW-846 Preparation Methods	Acceptable SW-846 Analytical Methods
Gasoline	Soil	BTEX[1]	5035	8021B[2], 8260B[14]
	Water	BTEX[1]	5030	8021B[2], 8260B[14]
	Soil	TPH-GRO [3] (C_6-C_{10})	5035	8015B, TCEQ 1005[12]
	Water	TPH-GRO[3] (C_6-C_{10})	5030	8015B
	Soil	Lead[5]	3050B, 3051	6010B, 6020, 7420, 7421
	Water	Lead[5]	3005, 3010A, 3015	6010B, 6020, 7420, 7421
	Soil	MTBE[6]	5035	8260B
	Water	MTBE[6]	5030	8260B
	Soil	MEK, MIBK[11]	5035	8015B
	Water	MEK, MIBK[11]	5030	8015B
Diesel	Soil	TPH-DRO[3] (C_{10}-C_{28})	3540, 3541, 3545, 3550, 3560	8015B, TCEQ 1005[12]
	Water	TPH-DRO[3] (C_{10}-C_{28})	3510, 3520	8015B
	Soil	PAHs[7]	3540, 3541, 3545, 3550, 3560, 3580	8100, 8270C, 8310[8]
	Water	PAHs[7]	3510, 3520	8100, 8370C, 8310[8]
Crude Oil	Soil	TPH-DRO[3] (C_{10}-C_{28})	3540, 3541, 3545, 3550, 3560	8015B, TCEQ 1005[12]
	Water	TPH-DRO[3] (C_{10}-C_{28})	3510, 3520	8015B
	Soil	TPH-GRO [3] (C_6-C_{10})	5035	8015B, TCEQ 1005[12]
	Water	TPH-GRO [3] (C_6-C_{10})	5030	8015B
	Soil	TPH-ORO[3] (>C_{28})	3540, 3541, 3545, 3550, 3560	8015B[4], TCEQ 1005[13]
	Water	TPH-ORO[3] (>C_{28})	3510, 3520	8015B[4]
	Soil	PAHs[7]	3540, 3541, 3545, 3550, 3560, 3580	8100, 8270C, 8310[8]
	Water	PAHs[7]	3510, 3520	8100, 8370C, 8310[8]
Refined Oils	Soil	TPH-DRO[3] (C_{10}-C_{28})	3540, 3541, 3545, 3550, 3560	8015B, TCEQ 1005[12]
	Water	TPH-DRO[3] (C_{10}-C_{28})	3510, 3520	8015B
	Soil	TPH-ORO[3] (>C_{28})	3540, 3541, 3545, 3550, 3560	8015B[4], TCEQ 1005[13]
	Water	TPH-ORO[3] (>C_{28})	3510, 3520	8015B[4]
Used Oil	Soil	TPH-ORO[3] (>C_{28})	3540, 3541, 3545, 3550, 3560	8015B[4], TCEQ 1005[13]
	Water	TPH-ORO[3] (>C_{28})	3510, 3520	8015B[4]
	Soil	Metals[9]	3050B, 3051	6010B, 6020, 7000 series[10]
	Water	Metals[9]	3005, 3010A, 3015	6010B, 6020, 7000 series[10]
	Soil	PAHs[7]	3540, 3541, 3545, 3550, 3560, 3580	8100, 8270C, 8310[8]
	Water	PAHs[7]	3510, 3520	8100, 8270C, 8310[8]
Kerosene & Jet Fuel	Soil	TPH-GRO [3] (C_6-C_{10})	5035	8015B, TCEQ 1005[12]
	Water	TPH-GRO [3] (C_6-C_{10})	5030	8015B
	Soil	TPH-DRO[3] (C_{10}-C_{28})	3540, 3541, 3545, 3550, 3560	8015B, TCEQ 1005[12]
	Water	TPH-DRO[3] (C_{10}-C_{28})	3510, 3520	8015B

[1] BTEX – Benzene, Toluene, Ethyl-benzene, and Xylenes
[2] If detected, 2nd column confirmations required (8000B, Section 7.9, page 29).
[3] TPH-DRO, GRO, ORO – Total Petroleum Hydrocarbons – Diesel Range Organics, Gasoline Range Organics, and Oil Range Organics
[4] Modified for RECAP Reporting Requirements
[5] When suspected to be present. Required for all gasoline USTs operated before 1/1/86.
[6] MTBE – Methyl tert-butyl ether
[7] PAHs – Polynuclear Aromatic Hydrocarbons (Acenapthene, Anthracene, Benzo(a)antracene, Benzo(a)pyrene, Benzo(b)flouranthene, Benzo(k)fluoranthene, Chrysene, Dibenz(a,h)anthracene, Floranthene, Fluorene, Indeno(1,2,3-cd)pyrene, Naphalene, Pyrene)
[8] Use for RECAP screening standards if 8270C does not obtain screening standard.
[9] Metals – Arsenic, Barium, Cadmium, Chromium, Lead, Mercury, Selenium, Silver
[10] Use methods in 7000 series of SW-846 for each metal specified in footnote 9.
[11] MEK – Methyl Ethyl Ketone, MIBK – Methyl Isobutyl Ketone. When suspected to be present.
[12] TCEQ – Texas Commission on Environmental Quality. Use SW846 5035 with modifications listed in section 6.1 of method TCEQ 1005.

[13] TCEQ – Texas Commission on Environmental Quality. Use SW846, Chapter 4, Section 4.1.
[14] Must use 8260B if MTBE analysis is also required to be eligible for trust fund reimbursement for analysis.

B.6 INSTRUMENT/EQUIPMENT TESTING, INSPECTION, AND MAINTENANCE

B.6.1 UST PROGRAM / INSTRUMENT/EQUIPMENT TESTING, INSPECTION, AND MAINTENANCE

All field equipment and electronic laboratory equipment utilized by LDEQ staff and certified UST workers for UST site activities shall be maintained in accordance with the manufacturer's requirements and specifications.

The USTRD currently utilizes organic vapor analyzers (OVA) and explosimeters. Preventive maintenance for these instruments includes checking the integrity of the battery prior to each use and calibration of the instruments. Calibration procedures are discussed in section B.7 of this QAPP. The field equipment will be maintained in accordance with the manufacturers' recommended maintenance schedules and will receive preventive maintenance according to that schedule. Equipment in need of repair will be sent to a factory authorized repair facility. A separate logbook will be maintained for each type of equipment whether its field or laboratory. All preventive or corrective maintenance will be recorded in these logbooks and will be performed in accordance with the scheduled use of the equipment.

Equipment maintenance and calibration records for instruments used by certified UST workers will be reviewed by the USTRD staff at the time of a UST inspection.

B.6.2 LUST PROGRAM / INSTRUMENT/EQUIPMENT TESTING, INSPECTION, AND MAINTENANCE

All field equipment and electronic laboratory equipment used for LUST site activities shall be maintained in accordance with the manufacturer's requirements and specifications.

Field instruments that are commonly used by LDEQ personnel in association with LUST activities are the organic vapor analyzers (OVA), water level indicators, explosimeters, and Global Positioning System equipment. A separate logbook shall be maintained for each type of equipment whether field or laboratory. All preventive or corrective maintenance will be recorded in these logbooks and should be performed in accordance with the manufacturer’s specifications.

In order to ensure consistently high quality data, general field equipment and/or supplies shall be inspected and determined to be of sufficient quality to provide acceptable quality environmental data prior to use. Technical team members shall perform routine and periodic inspections as well as any necessary preventative maintenance on all equipment. If for any reason equipment is found to be deficient, it should be taken out of operation until repaired. All of these procedures shall be documented in the equipment logbook, which shall be maintained for the life of the equipment and made available for systems audits.

As per Title 33, Part I, Subpart 3, 5303 all laboratory equipment shall undergo periodic and routine inspections per manufacturer's specifications. If equipment is found to be defective, the equipment shall be removed from service until it has been repaired. All equipment maintenance, both preventative and corrective, must be documented in the equipment logbook (Reference 4).

Permanent records of all equipment maintenance will be kept locally, dated, and reviewed by the appropriate USTRD Manager. Logbooks containing maintenance records will be kept with the equipment. When the equipment is de-commissioned, the maintenance logbooks will be stored at the LDEQ headquarters building.

B.7 INSTRUMENT/EQUIPMENT CALIBRATION AND FREQUENCY

B.7.1 UST PROGRAM / INSTRUMENT/EQUIPMENT CALIBRATION AND FREQUENCY

Field equipment (organic vapor analyzers and explosimeters) currently utilized by LDEQ staff and certified UST workers shall be calibrated in accordance with the manufacturer's requirements and specifications. Laboratory analysis equipment will be maintained and calibrated in accordance with the manufacturer's recommendations and must meet the requirements of the LDEQ Laboratory Accreditation Program.

B.7.2 LUST PROGRAM / INSTRUMENT/EQUIPMENT CALIBRATION AND FREQUENCY

Field equipment (organic vapor analyzers, water level indicators, explosimeters and Global Positioning System) used by LDEQ staff shall be calibrated in accordance with the manufacturer's

requirements and specifications and the LDEQ SOP for Instrument Use and Calibration. It is the responsibility of the Technical Team Leader to ensure that equipment is properly calibrated prior to use.

The RACs/ECs are responsible for maintaining field equipment that they use. The equipment shall be calibrated according to the manufacturer's requirements and specifications. It is the responsibility of the RAC/EC to ensure that the equipment is properly functioning and calibrated prior to use.

Laboratory equipment shall be maintained and calibrated in accordance with LAC 33: I, Subpart 3, 5303 and 5305 (Reference 4).

B.8 INSPECTION/ACCEPTANCE FOR SUPPLIES AND CONSUMABLES

B.8.1 UST PROGRAM / INSPECTION/ACCEPTANCE FOR SUPPLIES AND CONSUMABLES

All supplies and consumables, including support equipment, reagents, etc. must meet or exceed standards set forth in EPA publication SW846 (Reference 10), LDEQ's Laboratory Accreditation Program (Reference 4), as well as any specifications recommended by the manufacturer. LDEQ Technical Teams are responsible for inspecting and ensuring that all supplies and consumables used to collect environmental data meet acceptance requirements. The certified UST workers are responsible for the inspection and acceptance of supplies and consumables used to support their operations. All support equipment, reagents, etc. must meet, at a minimum, standards as set forth in EPA publication SW-846 and LDEQ's Laboratory Accreditation Program, as well as, any recommended by the appropriate manufacturers.

B.8.2 LUST PROGRAM / INSPECTION/ACCEPTANCE FOR SUPPLIES AND CONSUMABLES

All supplies and consumables, including support equipment, reagents, etc. must meet or exceed standards set forth in EPA publication SW846 (Reference 10), LDEQ's Laboratory Accreditation Program (Reference 4), as well as any specifications recommended by the manufacturer. LDEQ Technical Teams are responsible for inspecting and ensuring that all supplies and consumables used to collect environmental data meet acceptance requirements. Since most of the environmental data collected for the LUST program is performed by RACs/ECs, the RACs/ECs are

responsible for the inspection and acceptance requirements for all supplies and consumables used to support their sampling and analytical operations. All support equipment, reagents, etc. must meet, at a minimum, standards as set forth in EPA publication SW846 and LDEQ's Laboratory Accreditation Program, as well as, any recommended by the appropriate manufacturers. The same applies to any support equipment used by LDEQ staff.

B.9 NON-DIRECT MEASUREMENTS

B.9.1 UST PROGRAM / NON-DIRECT MEASUREMENTS

LDEQ staff and the certified UST contractors/workers hired by the responsible party at the UST site may gather data from the sources listed below:

- LDEQ files
- Water well maps and files
- Federal, state, and local groundwater resources
- Geological publications
- Studies by academic entities
- U.S. Dept. of Agriculture Soil Conservation Service surveys
- Applicable information from other federal, state or local agencies or authorities

Descriptions of site geology and soil properties for use in final reports and calculations must be based on data from field sampling and direct measurements.

B.9.2 LUST PROGRAM / NON-DIRECT MEASUREMENTS

For use in the prioritization of and the planning for work at LUST sites, data from the sources listed below may be used:

- LDEQ files
- Water well maps and files
- Federal, state, and local groundwater resources
- Geological publications
- Studies by academic entities
- U.S. Dept. of Agriculture Soil Conservation Service surveys
- Applicable information from other federal, state or local agencies or authorities

Descriptions of site geology, soil properties, and groundwater classification for use in final reports and calculations must be based on data from field sampling and direct measurements.

B.10 DATA MANAGEMENT

B.10.1 UST PROGRAM / DATA MANAGEMENT

The certified UST worker will submit data to LDEQ using the Underground Storage Tank Closure/Assessment Form (UST-SURV-02). Please refer to the most current revision of the LDEQ "Underground Storage Tank Closure/Change-In-Service Guidance Document" (Reference 7). An Environmental Scientist or Geologist reviews the report and determines if it meets state regulations. If there is no contamination found, the closure form is signed by the LDEQ reviewer and sent to the tank owner. One copy of the form is sent to USTRD to remove the USTs from the database. A copy of the form and all other pertinent information are submitted to LDEQ Headquarters and scanned into the Department's Electronic Document Management System (EDMS).

If analysis results are above LDEQ's specified action levels, then the site information is referred to UST-Remediation Process. Inspection information is entered into the agency's database. All facility site data becomes part of the permanent records on the facility and is maintained in accordance with LDEQ's record retention policy.

B.10.2 LUST PROGRAM / DATA MANAGEMENT

Sampling is conducted at LUST sites by LDEQ staff and/or RAC/EC. A chain-of-custody form accompanies the samples to the laboratory. A copy of the chain-of-custody form will also accompany the laboratory personnel sample report. As per Title 33, Subpart 3, 5301, accredited labs are required to have SOPs covering document control, data handling which includes processing, compiling, analyzing, and transmitting accurate and reliable data, data archival and retrieval procedures, and procedures for acceptable hardware and software configurations. The analytical data results are ultimately conveyed to the LDEQ Technical Team.

The investigation report generated by or for LDEQ will be scanned at LDEQ into an electronic format and can be retrieved by LDEQ employees via the Electronic Document Management System (EDMS). After being scanned, records and documents will be stored in an LDEQ archive file room.

C. ASSESSMENT AND OVERSIGHT

C.1 ASSESSMENTS AND RESPONSE ACTIONS

C.1.1 UST PROGRAM/ ASSESSMENTS AND RESPONSE ACTIONS

LDEQ is committed to using approved equipment and methods when conducting a UST investigation.

Before any UST investigation, the LDEQ staff will verify that proper equipment is available for all field personnel. This includes sampling, safety, and field measurement equipment. The USTRD Manager is responsible to ensuring that proper equipment in good working condition is available for all field staff and that all personnel involved in field activities have received sufficient training to properly use the equipment including calibration standards and decontamination procedures. Records of training are kept in accordance with LDEQ's training policy. Equipment procurement and inventory records are kept in each regional office as well as LDEQ Headquarters.

To ensure that adequate QA/QC procedures are followed, all laboratories that submit data to the agency must be accredited by the LDEQ Laboratory Accreditation Program.

All field equipment utilized by LDEQ staff for UST inspections must be maintained and inspected in accordance with the applicable operations manual.

Records of maintenance and repairs shall be kept in the calibration logbook for each specific piece of equipment by LDEQ staff assigned this equipment. Environmental supervisors shall verify that logbook records are maintained properly.

C.1.2 LUST PROGRAM / ASSESSMENTS AND RESPONSE ACTIONS

Those performing field or laboratory work must use approved equipment and methods when obtaining environmental samples and when producing field or laboratory measurements. This equipment must undergo periodic verification to ensure that it is performing at a level to produce the required quality. The verification is accomplished by conducting performance and systems audits. The project QA Coordinator shall conduct periodic audits.

Prior to the initiation of field activities, the operating personnel shall verify that proper equipment is available for all field activities. This shall include sampling, safety, and field measurement equipment. The USTRD Managers should verify that all personnel involved in field activities have received sufficient training to properly use the equipment. It is the responsibility of the RACs/ECs to ensure that their field personnel have received sufficient training to properly operate the equipment. Training shall include proper operational procedures-including calibration standards and decontamination procedures.

All field equipment used for LUST projects must be inspected and maintained in accordance with the applicable operations manual. Prior to use of any field equipment, a performance audit shall be conducted by the operator to ensure that the operation of the field equipment provides acceptable quality environmental data. If the results of the performance audit conclude that the field equipment produces insufficient data, the field equipment shall be repaired if possible or otherwise replaced. For LDEQ equipment, the Technical Team Leader shall notify the appropriate USTRD Manager of the audit results and solutions undertaken to rectify problems discovered during the audit. RACs/ECs are responsible for inspecting and maintaining all field equipment that is owned and/or operated by their personnel.

Records of maintenance and repairs shall be kept in the calibration logbook for the specific piece of equipment. Appropriate USTRD Managers shall verify that logbook records are maintained properly.

All laboratories participating in LUST site sampling analyses must perform QA/QC operations in accordance with Sections 2.4 and 2.5 of RECAP and LAC 33:I, Subpart 3, 5301. To assure that quality data is generated at the laboratory, routine performance audits shall be conducted in accordance with LAC 33:I, Subpart 3, 5101 (Reference 4).

C.2 REPORTS TO MANAGEMENT

C.2.1 UST PROGRAM / REPORTS TO MANAGEMENT

The Technical Team member performing the inspection will identify any quality assurance problems encountered in the field and any corrective actions taken. This information shall be documented on a Field Interview Form (FIF), and a copy shall be provided to his/her supervisor. In addition, the QAR shall be informed either

informally or by formal memoranda, so that this information can be properly communicated to upper level management for distribution to appropriate staff.

C.2.2 LUST PROGRAM / REPORTS TO MANAGEMENT

The Technical Team Leader who oversees the LUST project shall identify any quality assurance issues in the field. The Technical Team Leader ensures that any problems that are encountered are corrected in the field, and at that time he/she shall document the problems and resolutions on a Field Interview Form (FIF). In addition, the Technical Team Leader shall report the problems verbally to his/her supervisor. A copy of the FIF shall be distributed to the RAC/EC, and a copy of the FIF shall be delivered to the Technical Team Leader's supervisor.

The Technical Team Leaders, supervisors and/or managers are responsible for informing the QAR either informally or by formal memoranda of any quality assurance problems encountered and solutions adopted. A written report, prepared by the appropriate USTRD Manager, outlining any problems and solutions employed discovered during any performance audits shall be submitted to the QAR for review and disbursement to upper Management/EPA as appropriate. The QAR shall ensure that this information is disseminated to upper level management for distribution to appropriate staff.

D. DATA VALIDATION AND USABILITY

D.1 DATA REVIEW, VERIFICATION, AND VALIDATION

D.1.1 UST PROGRAM / DATA REVIEW, VERIFICATION, AND VALIDATION

The Technical Team member reviews UST sample data and associated reports to ensure that all data that is required, such as sampling and testing results, are included in reports along with any other relevant information. If any data is missing, additional information will be requested before a report will be accepted. If all required information has been received and no areas of concern are noted, the closure document is signed by the LDEQ reviewer and forwarded to the tank owner. A copy of the closure form is also placed in the facility's permanent file.

D.1.2 LUST PROGRAM / DATA REVIEW, VERIFICATION, AND VALIDATION

The criteria used to review and validate data in an objective and consistent manner are stated in Section 2.5 of RECAP (Reference 2).

D.2 VERIFICATION AND VALIDATION METHODS

D.2.1 UST PROGRAM / VERIFICATION AND VALIDATION METHODS

The validation and verification method for field screening analysis only requires that the field screening instrument identifies the concentration of petroleum hydrocarbons within the detection range limit of the specific screening instrument. Specific validation and verification methods which include the acceptable analyte identification, minimum/maximum percent recovery of the target analytes and QA/QC compounds are defined in standard methods 8015, 8021(B), and 8260 located in SW-846. In addition, these methods set the performance criteria for instrument calibration, analyte identification, and identification/recovery of the QA/QC compounds.

The validated data compiled by laboratory personnel into a sample report is conveyed to the LDEQ staff. When sample reports are submitted to a certified UST worker they will incorporate this information in their Closure/Assessment Form which is submitted to LDEQ. LDEQ staff is responsible for verifying the sample data. This is achieved by reviewing the relative standard deviation and percent recovery and verifying that the data is within the defined acceptable range. LDEQ can take its own samples or split samples to verify the accuracy of the environmental contractor's samples.

D.2.2 LUST PROGRAM / VERIFICATION AND VALIDATION METHODS

The validation and verification method for field screening analysis requires that those instruments used for field screening must be able to identify the concentration of petroleum hydrocarbons within the detection range limit of the specific screening instrument.

Specific validation and verification methods are defined in the acceptable analytical methods of SW846 listed in Figure 7. These include the acceptable methods for identifying an analyte, minimum/maximum percent recovery of the target analytes and QA/QC compounds. In addition, these methods set the

performance criteria for instrument calibration, analyte identification, and identification/recovery of the QA/QC compounds.

Laboratory personnel are required to follow procedures outlined in SW846 or other department approved methods. The assigned LDEQ field staff or RAC/EC is responsible for completing accurate chain-of-custody forms that accompany samples to the laboratory.

D.3 RECONCILIATION WITH USER REQUIREMENTS

D.3.1 UST Program / RECONCILIATION WITH USER REQUIREMENTS

Results from soil sample tests at tank closures are reviewed and compared to screening levels set by the LDEQ "Risk Evaluation/Corrective Action Program" (RECAP) (Reference 2). Whenever a contaminated UST site cannot be closed by following the procedures in the LDEQ "Underground Storage Tank Closure/Change-In-Service Guidance Document" (Reference 7) the site will be referred to the UST-Remediation Process for appropriate action.

D.3.2 LUST PROGRAM / RECONCILIATION WITH USER REQUIREMENTS

When the procedures and guidelines to meet the specified levels of data quality established in this project plan are not successful, corrective action may be required.

Any personnel involved in LUST program activities that has observed or been made aware of any variance from quality assurance protocol may initiate corrective action. Variances from quality assurance protocol which may require corrective action may include, but are not limited to the following:

- Field and/or laboratory equipment problems or failures
- Field and/or laboratory procedural problems or failures
- Exceedance of precision and accuracy control limits
- Sample custody, safety, transportation, holding time, or handling problems or failures
- Preventive maintenance deficiencies
- Documentation of deficiencies or problems

References

NOTE: Available links to the current versions have been provided.

Number	Description
1	Remediation Process Standard Operating Procedures Official versions are available on LDEQ's Intranet at http://intranet/sop/soplist.asp
2	Risk Evaluation/Corrective Action Program (RECAP) http://www.deq.louisiana.gov/portal/DIVISIONS/UndergroundStorageTankandRemediationDivision/RemediationServices/RECAP.aspx
3	LDEQ/DOTD Construction of Geotechnical Boreholes and Groundwater Monitoring Systems Handbook under Useful Links http://www.deq.louisiana.gov/portal/DIVISIONS/UndergroundStorageTankandRemediationDivision/RemediationServices.aspx
4	LAC 33: I, Subpart 3, 5301 Laboratory Accreditation / Quality Assurance / Quality Control Requirements http://www.deq.louisiana.gov/portal/tabid/1674/Default.aspx
5	EPA Energy Act http://www.deq.louisiana.gov/portal/DIVISIONS/UndergroundStorageTankandRemediationDivision/UndergroundStorageTank/EnergyAct.aspx
6	EPA Underground Storage Tank Program Facts (March 2001) http://www.epa.gov/swerust1/pubs/ustfacts.pdf
7	Louisiana UST Closure/Change-In-Service Guidance Document under UST forms http://www.deq.louisiana.gov/portal/DIVISIONS/UndergroundStorageTankandRemediationDivision/UndergroundStorageTank.aspx
8	Underground Storage Tank/Leaking Underground Storage Tank Quality Assurance Project Plan (QAPP) Official version is available on LDEQ's Intranet at http://intranet/sop/soplist.asp

9 LAC 33 XI Underground Storage Tanks
http://www.deq.louisiana.gov/portal/tabid/1674/Default.aspx

10 EPA Publication SW846
http://www.epa.gov/wastes/hazard/testmethods/sw846/online/index.htm

Footnotes

[1]Management of an AOC/AOI may continue under RECAP 2000 until the current phase/task of the project has been completed and approved by the Department. Further assessment of the AOC/AOI shall be in compliance with RECAP 2003 unless otherwise approved by the Department.