UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6
1201 ELM STREET, SUITE 500
DALLAS, TEXAS 75270

May 5, 2021

Ms. Dianna Kilburn, Assessment & Remediation Senior Manager
Office of Land Resources
Division of Environmental Quality
5301 Northshore Drive
North Little Rock, AR 72118-5317

Re: Quality Assurance Project Plan Approval

Dear Ms. Kilburn:

This letter is to acknowledge the receipt and approval of the Assessment & Remediation, Office of Land Resources' Quality Assurance Project Plan (QAAP). The QAPP is approved through June 11, 2022 and has been assigned Q-Track number 21-254. Enclosed are two completed signature pages for your files.

We appreciate your efforts in meeting this program requirement. If you have questions, please contact me at (214) 665-7131, or have your staff contact Tameka McCaskill at 214-665-8578.

Sincerely,

Robert Snowbarger, Chief
UST & Pollution Prevention Section
Land, Chemical & Redevelopment Division

Enclosures

ARKANSAS
ENERGY & ENVIRONMENT

April 30, 2021

Ms. Tameka McCaskill (6PD-U)
Office of Underground Storage Tanks
U. S. EPA, Region 6
1445 Ross Avenue, Suite 1200
Dallas, TX 75202-2733

Re: Federal Fiscal Year 2021 QAPP Update

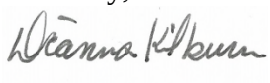
Dear Ms. McCaskill:

Enclosed are three (3) signature pages for Assessment & Remediation, Office of Land Resources' Quality Assurance Project Plan (QAPP). The QAPP signature page and Project/Task Organization, Source Control required updates for FY2021.

Please sign all three (3) of the enclosed signature pages and retain one (1) of them for EPA's files. Please return the other two (2) completed signature pages to me along with a cover letter acknowledging EPA's receipt and approval of the QAPP revisions and the appropriate Q-Track number.

Thank you for your assistance in this matter. Please don't hesitate to contact me at (501) 682-0844 if you have any questions.

Sincerely,



Dianna Kilburn
Senior Manager, Assessment & Remediation
Office of Land Resources

Enclosures

QUALITY ASSURANCE PROJECT PLAN

for the

Arkansas Department of Energy and Environment
Division of Environmental Quality

Regulated Storage Tanks Program
Office of Land Resources

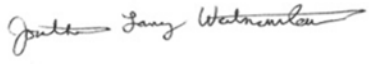
Federal Fiscal Year 2021

DIVISION OF ENVIRONMENTAL QUALITY:

Name: Dianna Kilburn
Title: Senior Manager, Assessment & Remediation, Office of Land Resources (OLR)

Signature:  **Date:**

Name: Jonathan Westmoreland
Title: Quality Assurance Officer
ADE&E, Office of Chief Technical Officer

Signature:  **Date: 4/30/2021**

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY:

Name: Tameka McCaskill
Title: USEPA - Region VI UST/LUST Grants Project Officer

Signature: TAMEKA MCCASKILL Digitally signed by TAMEKA MCCASKILL DN: c=US, o=U.S. Government, ou=Environmental Protection Agency, cn=TAMEKA MCCASKILL, 0.9.2342.19200300.100.1.1=68001003655656 Date: 2021.05.03 11:56:14 -05'00' **Date:** 5/3/2021

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Appendix:

Appendix I - DEQ Guidelines for the Permanent Closure of Petroleum Underground Storage Tank Systems

A3 - DISTRIBUTION LIST

The approved Quality Assurance Project Plan (QAPP) and any subsequent revisions will be made available electronically in PDF format, accessible to staff and stakeholders from the RST program's webpage.

A4 - PROJECT/TASK ORGANIZATION

Ultimate responsibility for the RST program lies with the DEQ Director, currently Becky Keogh. However, management of the data gathering and decision-making functions are at the program level.

A4.1 - Key Quality Personnel

Key personnel in the quality chain for the RST program in Arkansas are -

* Quality Assurance Officer, ADE&E Office of Chief Technical Officer: Jonathon Westmoreland

  Responsible for the Laboratory Accreditation Program and QMP development, and verification that DEQs QMP and the RST program's QAPP are properly implemented. Reports to the AEE Chief Technical Officer on QA issues.

* Senior Manager, Assessment & Remediation, OLR: Dianna Kilburn

  Responsible for overall implementation and management of the RST program in Arkansas and the Assessment and Remediation program for the Office of Land Resources (OLR). Reports to the Associate Director, OLR.

* Senior Manager, Policy & Administration,, OLR: Bailey Taylor

  Responsible for oversight of enforcement of all RST, Solid Waste, and Hazardous Waste program regulations, policies, and requirements. There are two Enforcement Coordinators, and two Enforcement Analysts in the Enforcement Section. Also responsible for oversight of the licensing of Underground Storage Tank (UST) installers and testers, training, and certification of UST operators and the Solid Waste operator licensing program, RST fee invoicing/collection, and RST data and records management. There are two Licensing Coordinator sand two Administrative Specialist III positions in the Licensing and Training Section. Reports to the Associate Director, OLR.

Branch Manager, Compliance Section, OLR: Penny Wilson

Responsible for oversight of all RST, Solid Waste, and Hazardous Waste compliance assistance efforts and implementation of the RST QAPP at the field services level. Also responsible for training for RST compliance staff development. There are two Inspector Supervisors and eleven Inspectors in the RST Compliance Section. Reports to the Senior Manager of Regulated Waste Operations, OLR.

* Ground Water Branch Manager, Assessment and Remediation, OLR: Blake Whittle

Responsible for oversight of the technical policies and requirements of all RST, Solid Waste, and Hazardous Waste programs and implementing the RST QAPP while conducting or overseeing assessment and corrective action requirements of Part 280 upon case referral from the Compliance Section, OLR. Responsible for training for RST technical staff development. There are three Geologists and one Geologist Supervisor in the RST Remediation Section. Reports to the Senior Manager, Assessment & Remediation, OLR.

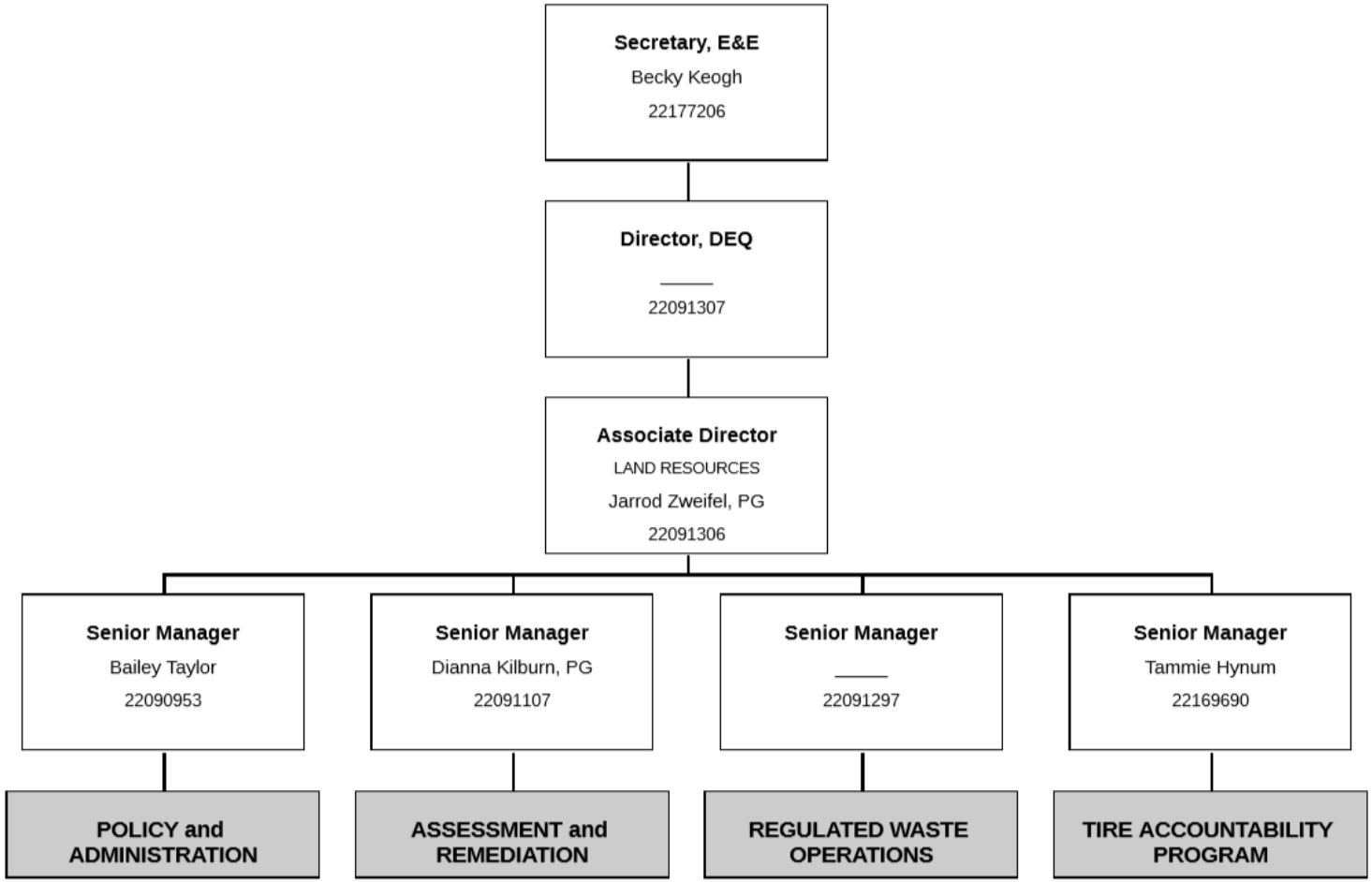
* Petroleum Storage Tank Trust Fund Manager, Assessment and Remediation, OLR: Jacqueline Trotta

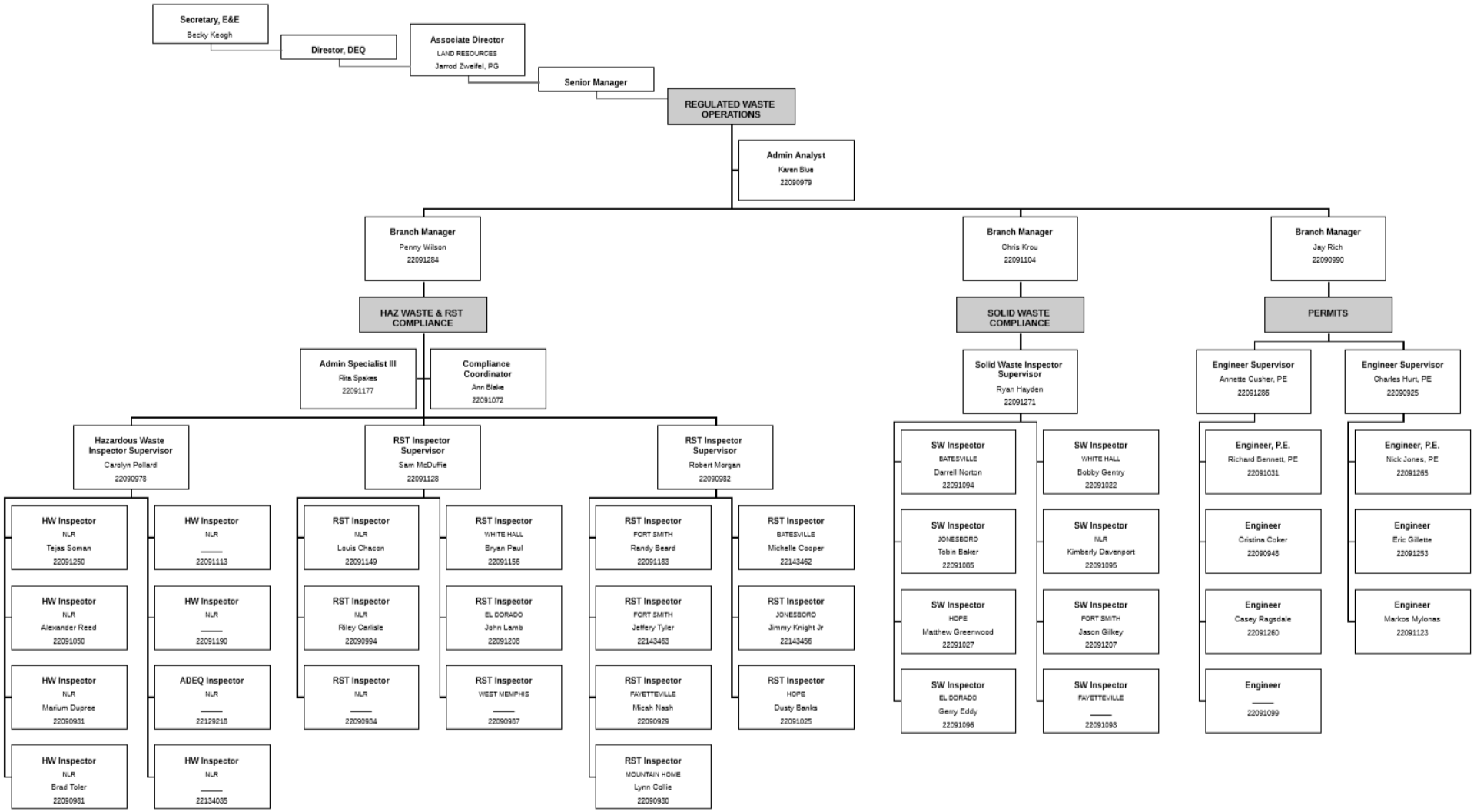
Responsible for administration of the Petroleum Storage Tank Trust Fund; grants, budget and contracts. The section consists of one Environmental Program Coordinator and one Administrative Analyst. Reports to the Trust Fund Branch Manager, OLR.

* Senior Manager – Laboratory Services: Lessie Redican

Laboratory Services is part of Shared Services of the Arkansas Department of Energy and Environment (ADE&E). Responsible for all aspects and functions Laboratory Services including implementation of the laboratory QAPP. Reports to the ADE&E Chief Technical Officer.

A4.2 - Quality Organizational Chart (Note: RST's On-Call Remediation Contractors are currently AECOM, Little Rock, Arkansas; Pollution Management, Inc., Little Rock, Arkansas; Environmental Works, Inc., Springfield, MO; and SPATCO Energy Solutions, North Little Rock, Arkansas. The contracts are administered by the PST Trust Fund Manager.)




Secretary, E&E
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Associate Director
LAND RESOURCES
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Senior Manager
REGULATED WASTE OPERATIONS
Admin Analyst
Karen Blue
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Penny Wilson
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Branch Manager
Chris Krou
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Branch Manager
Jay Rich
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HAZ WASTE & RST COMPLIANCE
SOLID WASTE COMPLIANCE
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Annette Cusher, PE
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Hazardous Waste Inspector Supervisor
Carolyn Pollard
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RST Inspector Supervisor
Sam McDuffie
22091128
RST Inspector Supervisor
Robert Morgan
22090982
HW Inspector
NLR
Tejas Soman
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HW Inspector
NLR
Alexander Reed
22091050
HW Inspector
NLR
Marium Dupree
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HW Inspector
NLR
Brad Toler
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HW Inspector
NLR
22091113
HW Inspector
NLR
22091190
ADEQ Inspector
NLR
22129218
HW Inspector
NLR
22134035
RST Inspector
NLR
Louis Chacon
22091149
RST Inspector
NLR
Riley Carlisle
22090994
RST Inspector
NLR
22090934
RST Inspector
WHITE HALL
Bryan Paul
22091156
RST Inspector
EL DORADO
John Lamb
22091208
RST Inspector
WEST MEMPHIS
22090987
RST Inspector
FORT SMITH
Randy Beard
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FORT SMITH
Jeffery Tyler
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RST Inspector
FAYETTEVILLE
Micah Nash
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MOUNTAIN HOME
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RST Inspector
BATESVILLE
Michelle Cooper
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RST Inspector
JONESBORO
Jimmy Knight Jr
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RST Inspector
HOPE
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HOPE
Matthew Greenwood
22091027
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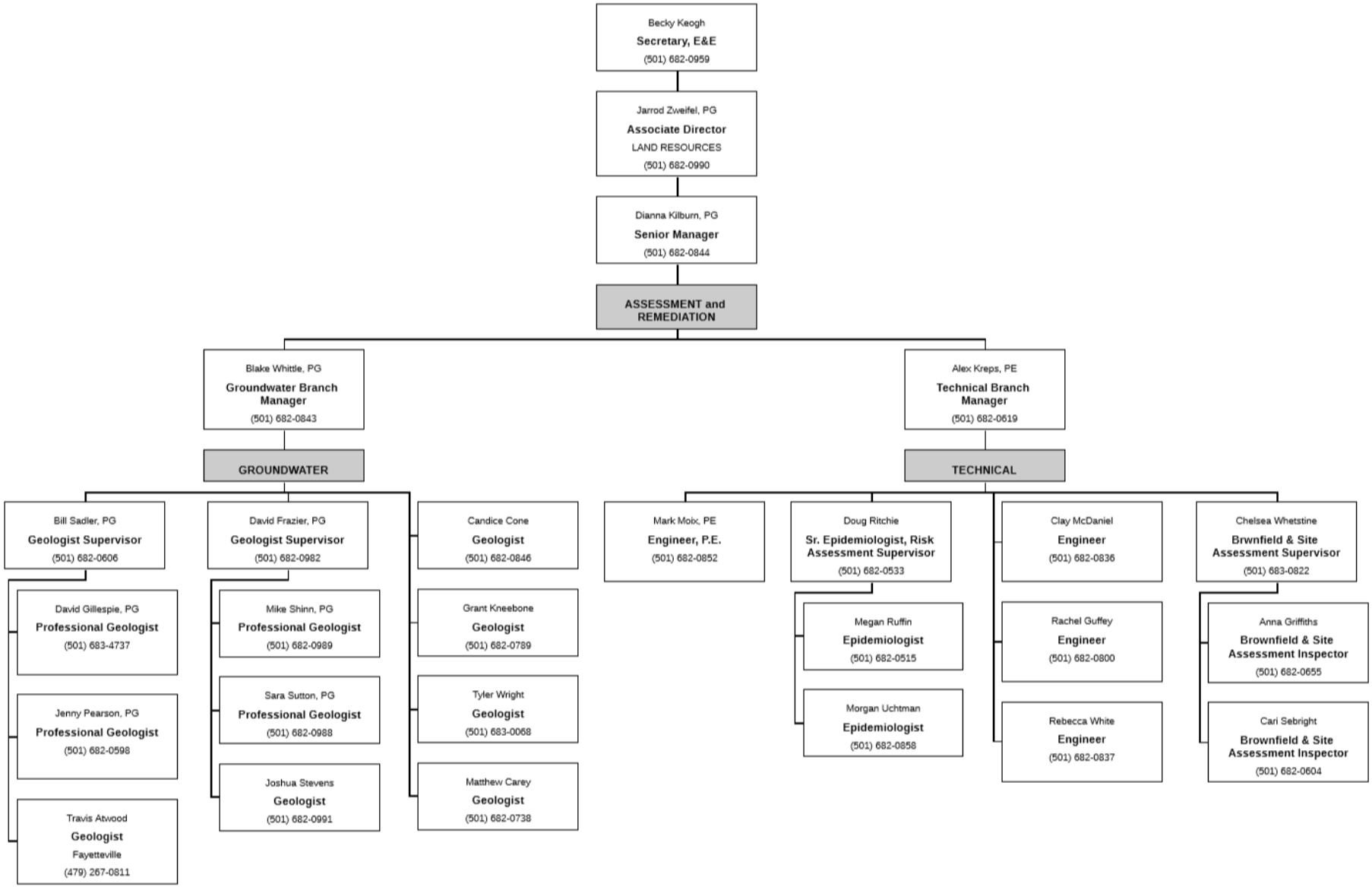
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A5 - PROBLEM DEFINITION/BACKGROUND

In the 80's, amid growing concerns about leaking underground storage tanks (LUSTs), Congress amended the Resource Conservation and Recovery Act (RCRA), mandating the Environmental Protection Agency (EPA) to develop a program regulating USTs containing petroleum products and selected hazardous substances (those listed as hazardous in Section 101(14) of the Comprehensive Environmental Response, Compensation, and Liability Act, CERCLA, but not regulated by RCRA Subtitle C). This RCRA amendment also set forth the state program approval provisions.

The Arkansas Department of Energy and Environment – Division of Environmental Quality (DEQ) responded to these provisions with its Regulation Number 12, and regulatory authority to implement the UST program in Arkansas was delegated to DEQ on April 25, 1995.

Because implementation of the UST program requires environmental measurements and data generation, the DEQ is required by the EPA General Grants Regulations (40 CFR Part 30) to develop and implement a quality assurance plan. Specifically, 40 CFR Part 30.503(f) identifies the topics which must be addressed in an acceptable Quality Assurance Project Plan (QAPP).

A6 - PROJECT/TASK DESCRIPTION

The storage tanks program in Arkansas is the responsibility of the DEQ Regulated Storage Tanks (RST) Program, housed in the Office of Land Resources (OLR). Program activities include not only the enactment of traditional LUST Trust Fund activities, but also GIS activities, establishment and enforcement of UST regulations, facility registration and inspections, licensing of tank installers and testers, training and certification of UST operators, supervision of potentially responsible party-lead investigative and remedial activities, and outreach and education programs for the regulated community.

At any Arkansas facility where a leak from a regulated storage tank has occurred, the staff of the RST Program is responsible for ensuring that all site activities are performed in accordance with accepted quality assurance procedures. Environmental investigation activities to be pursued by, for, or under contract to the DEQ might include:

* Immediate response measures required to abate or mitigate the effects of petroleum releases from USTs;

* Testing of UST systems;

* Site contamination assessment studies to confirm the presence of a release and determine the source, identify environmentally-significant releases, and delineate the level and extent of contamination;

* Ecological and human health risk assessments;

* Corrective action performance evaluation;

* Provision of drinking water to affected individuals; and

* Waste characterization for regulated management.

Some specific activities which will generate and/or affect environmental data include soil and water sample collection and analysis; GPS readings/data collection; soil boring and monitor well installation; decontamination procedures; groundwater, geophysical and other survey measurements; and data reduction and analyses. APC&EC Regulation No. 12 adopted 40 CFR Part 280 by reference for the Arkansas UST program, and these requirements are carefully enforced, including the specified deadlines.

A6.1 - Decisions Needed

The decisions which must be made include:

* Has a confirmed release occurred (§280.52)?

* Do the contaminant levels on the site present a current or future risk to human health or the environment (§280.65)?

* Are sources of long-term contamination present which must be addressed (§280.64)?

* How must wastes resulting from RST corrective action be managed (§280.62 and 280.64)?

A6.2 - Risk-based Corrective Action

On cases referred from the Compliance Section, OLR, the Technical Branch uses a simple, risk-based corrective action process with three tiers:

Tier 1P - For petroleum storage tanks only, this tier is used at the "Site Check" (§280.62) and the "Assessment at Closure" (§280.72) stage to confirm the presence of environmentally-significant releases. Authoritative, limited media sampling and analysis for a limited suite of petroleum contaminant indicators is performed. The results are compared to a look-up table. If exceeded, further site and risk characterization must be performed.

Tier 1 - This tier is used at the "Site Check" (§280.62) and the "Assessment at Closure" (§280.72) stage to confirm the presence of environmentally-significant releases. Authoritative, limited media sampling and analysis for contaminants of concern is performed. The results are compared to the USEPA-Region VI Medium-Specific

Screening Levels (MSSLs) for pertinent human health exposures, along with the Arkansas Water Quality Criteria for ecological impacts. If exceeded, these values may be attained by remediation, or further risk characterization/assessment must be performed.

Tier 2 - For all releases where an "Investigation for Soil and Groundwater Clean-up" (§280.65) must be performed, level-and-extent determinations of contaminant levels in all impacted media are required. This tier allows limited modification of the MSSLs for site-specific conditions according to the MSSL Technical Background Document. The Arkansas Water Quality Criteria may not be modified. Compliance with Tier 2 must be demonstrated by long-term monitoring of impacted media.

A6.3 - Source Control

For those releases without completed health or ecological exposure pathways, there is a regulatory requirement to address free product removal "…to the maximum extent practicable" (40CFR§280.64). For the purposes of this document, RST may include free product "source materials" along with that requirement. "Source materials" are soils contaminated at residual saturation concentrations or above. This determination is made from site specific considerations. RST will apply initial free product screening levels of 720 mg/kg TPH-GRO and 1205 mg/kg TPH-DRO.

A6.4 - Waste Characterization

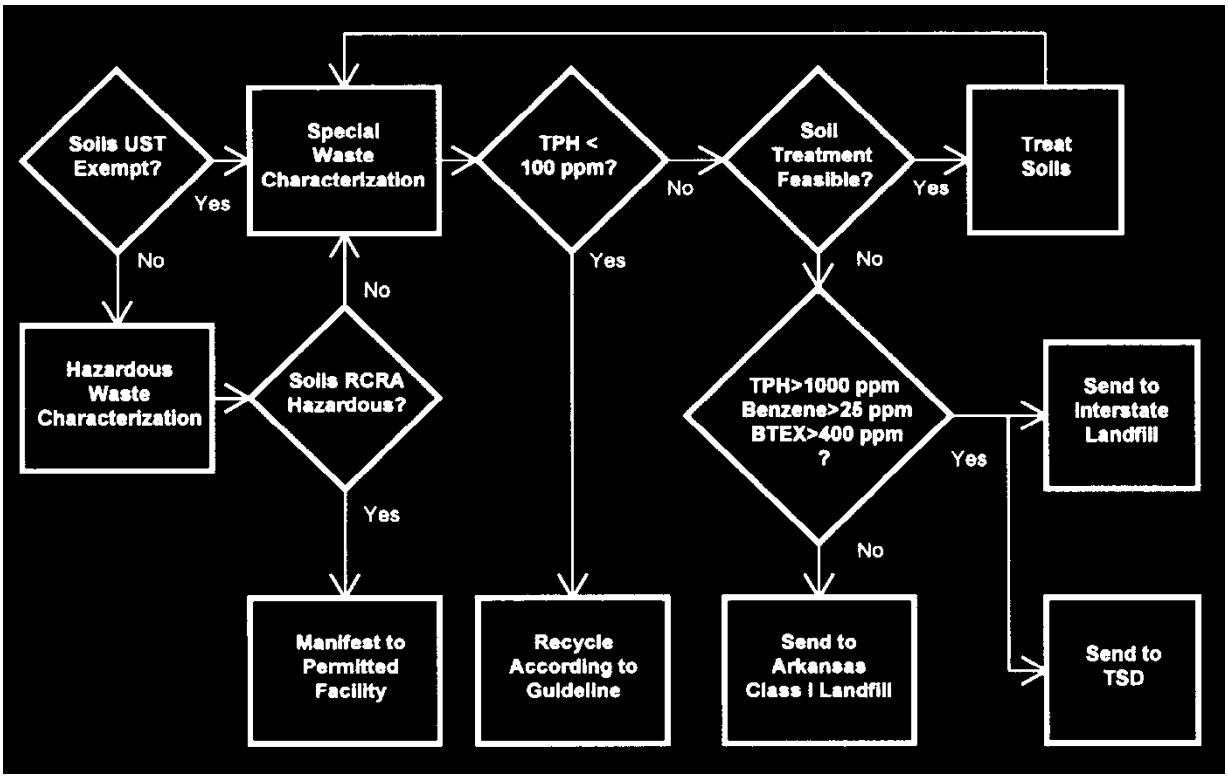
Management of non-deferred wastes resulting from RST corrective actions is specified by other regulatory programs' requirements. For example, liquid wastes must be removed from the site by a licensed hauler, or treated for discharge under the NPDES program. Each regulatory program has quality assurance requirements specific to its program which will not be discussed here.

The wastes which are typically managed under RST program control are petroleum-contaminated soils. The process is outlined schematically below.

A7 - QUALITY OBJECTIVES and CRITERIA

DEQ's primary goal for quality assurance procedures is to produce sufficient environmental data of known quality which will support the objectives of any UST or LUST investigation. To meet this goal, data quality objectives which qualitatively and quantitatively specify the site-specific data requirements will be determined during development of site plans on a site by site basis.

The objectives of RST site investigation may include source confirmation, determination of level and extent of contamination, characterization of site conditions for risk assessment and development of corrective action plans, GIS data collections and verification of remedial action.



The level of data quality and quantity required to achieve any of these objectives is dependent on the nature of these objectives, specifically the prioritized data uses, appropriate analytical levels, contaminants of concern, required detection limits and critical sample requirements.

Due to the large number of relatively small-scale investigations undertaken by the RST program each year and limited staff and contractor resources, much use is made of standardized procedures to bring site-to-site consistency to the program.

A7.1 - Data Quality Levels

One of the RST program's primary goals is protection of human health and the environment from regulated substance releases. The primary data needed for this task is the incidence of regulated substance contamination, as measured in environmental media. Some secondary data is also necessary to evaluate the relationship between the incidence of contamination and potentially impacted receptors, and the potential for migration. The RST measurement program recognizes two analytical Data Quality Levels:

Primary	Regulatory compliance data. All sample analysis is performed in off-site, Arkansas-accredited, third-party laboratories, using SW-846 methods and specified quantitative performance. Rigorous quality assurance and documentation procedures are required.
Secondary	Data about data. Field measurement is performed, using visual/manual techniques (e.g. receptor survey, soil textural classification), field-portable instrumentation (e.g. turbidity, TOV headspace analysis, horizontal/vertical survey measurements), or field-laboratory techniques (e.g. portable GC, immuno-assay and colorimetric kits, IR or gravimetric TPH).

A7.2 - Data Quality Indicators

The data quality objectives for data acquisition activities can be defined by the representativeness, comparability, completeness, precision and accuracy of the collected data, which in turn may be specified and evaluated by data quality indicators.

A7.2.1 - Representativeness

Representativeness expresses the degree to which an individual sample represents site conditions and is largely dependent upon the physical procedures employed. Using good sampling (Section B2) and sample handling techniques (Section B3), and appropriate analytical methods (Section B4) will determine that the measurement data actually do represent the conditions at the investigation site. This parameter is qualitative.

A7.2.2 - Comparability

Comparability is a qualitative parameter expressing the confidence with which one data set can be compared with another. Comparability of data is produced by use of good standard operating procedures and rigorous QA enforcement to limit the opportunities for measurement variance. The wide-spread use by the RST program of standard procedures for most tasks is rooted in this requirement.

A7.2.3 - Completeness

Completeness is defined as all measurements and data that are necessary to meet the requirements of the study. Ideally, 100% of the data should be available. However, the possibility of data becoming unavailable due to laboratory accidents, insufficiency in sample volume collected, or samples being broken in shipping must be expected. Also, emergency situations may be present or arise, or field conditions may not allow or indicate a requirement for 100% data completeness.

While completeness may or may not be an issue for deterministic data, lack of completeness is a vital concern for probabilistic sampling strategies. For that reason, it will be the goal of the RST program to have sufficient data to meet the data quality objectives established for the task.

A7.2.4 - Precision

The precision and accuracy of data are determined by particular actions of the sampling and analytical personnel. The precision of data is a measure of the reproducibility of a measurement when the measurement is repeated. The precision of the sample collection/sample handling/sample analysis chain is evaluated by duplicate sample collection and analysis, and is quantified by Relative Percent Difference (RPD) between the duplicates.

A7.2.5 - Accuracy (Bias)

Accuracy is a measure of the closeness of an individual measurement (or the average of a number of measurements) to the true value. Accuracy is evaluated by analyzing a sample to which a known concentration or amount of contaminant has been added (e.g. matrix spike), and is quantified by percent recovery.

A8 - SPECIAL TRAINING/CERTIFICATION

* Securing training for environmental investigations for RST program personnel is the responsibility of the Compliance Section Branch Manager, OLR, and Groundwater Branch Manager. Assessing the training needs of individual employees and arranging for the training shall be the responsibility of the employee's immediate supervisor.

* UST systems testing contractors are licensed by DEQ as a requirement to perform this service. Each potential licensee must present certification from the vendor of the testing method that he/she has been adequately trained, and must pass an examination administered by DEQ before the license is granted. In addition, continuing education by the test method manufacturer must be documented over a two (2)-year period.

* Environmental investigation and/or remediation such as that performed by the RST program's on-call remediation contractors constitute the public practice of geology and/or engineering in Arkansas, and persons having responsible charge for such work must be

qualified by experience or training, and licensed to practice in Arkansas. This certification is granted by legislatively-sanctioned state boards, according to promulgated regulations.

* All personnel performing environmental investigations for regulated substance contamination in Arkansas must have HAZWOPER training according to 29 CFR 1910.120, consisting of 40 hours of initial training, followed by annual 8-hour updates. Annual training is provided through USEPA or private contractors for DEQ personnel.

  All others must use third-party vendors which are generally available.

A9 - DOCUMENTS and RECORDS

The PST Trust Fund & Administration Manager of the RST program is responsible for providing and maintaining access to the most current, approved version of the QAPP. The approved QAPP and any subsequent revisions will be made available electronically in PDF format, accessible to staff and stakeholders from the RST program's webpage. The RST Trust Fund & Administration Manager is also responsible for maintaining records/data of the Division and making those records/data available to the users. In addition to internal regulatory uses, records and data maintained by DEQ are public property, accessible under the state's Freedom of Information Act.

Reports required by the RST program (including inspections, laboratory, UST closure, site check, initial site characterization, risk assessment, and corrective action, etc.) must be generated and submitted in 8.5" X 11" format (to fit the filing system). Data and/or records which might be contained in the required reports include:

Narratives of site observations, interpretations, conclusions, and recommendations
Scaled maps of the study area indicating cultural features above-and below-ground
Scaled maps of the study area indicating sampling locations
Scaled maps of the study area indicating potentially impacted receptors
Scaled maps of the study area indicating contamination sources
Scaled maps of the study area indicating groundwater elevations and flow directions
Scaled maps of the study area indicating topography and surface structural features
Scaled cross-sections of the subsurface stratigraphy of the study area
Schematic cross-sections of the regional geology
Schematic boring logs of vertical geologic profiles
Tabulations of sampling results or site observations
Copies of laboratory reports, field notes, boring logs, chain-of-custody forms, etc.

Also maintained as part of the records for the project are any GIS data/maps, copies of correspondence and orders from DEQ, internal memoranda of evaluation or review, compliance checklists, project-specific workplans, and originals of correspondence received by DEQ.

The agency's official environmental records are maintained in Zylab, DEQ's electronic record management system.

B1 - SAMPLING PROCESS DESIGN

Data collection for the RST program typically consists of either soil, groundwater or surface water samples. These samples may be collected in response to a variety of RST activities such as LUST investigations, complaint investigations, tank closures, LUST site assessments and/or corrective action. In general, the following guidance documents are utilized:

X Use of EPA approved sample collection, sample preservation, and field measurement methods as referenced in Section B2; RCRA Groundwater Monitoring Technical Enforcement Guidance Document (EPA/OSWER Directive 9950.1); Test Methods for Evaluating Solid Waste, Volume II: Field Manual Physical/Chemical Methods (SW 846); Handbook for Sampling and Sample Preservation of Water and Wastewater (EPA-600/4-82-029); and DEQ Guidelines for the Permanent Closure of Petroleum Underground Storage Tank Systems (Appendix I).

B2 - SAMPLING METHODS

This section deals with the mechanics of media sample collection and handling in the field. The RST program concerns itself primarily with surface soils (contaminated by spills and overfills), subsurface soils (leaks from USTs and piping), groundwater (impacted by contaminated soils and/or product), and contaminated waste soils which must be characterized for disposal. The following sections provide general requirements for media sampling, along with the specified practices for each medium.

Assessing the training needs of individual employees and arranging for the training shall be the responsibility of the employee’s immediate supervisor.

B2.1 - Field Recordkeeping

All information pertinent to an UST or LUST investigation sampling shall be recorded in a fieldbook, permanently bound with consecutively numbered pages. Pages are not to be removed from the fieldbook. The fieldbook is a permanent and public record; nothing should be recorded which does not fit this condition.

A sketch of the sampling site must be made which clearly shows all the sample locations and depths. Each location should be identified with a unique sample identification code. Include the location of surface features, tanks and lines, any distinguishable buried utilities, etc. The sketch should be of such a scale that these features are easily discernable, and the plat should be labeled with the job name and address.

Additional information to record when samples are collected should include, but not be limited to, the following:

* Name of collector;
* Date, time, and weather conditions;
* General site information including location and LUST ID number (if applicable);
* Equipment calibration log;
* Sample identification code or number;
* Collection method (including preservation used) and type of analysis to be requested;
* Ancillary data connected with the sampling, such as depth to water, turbidity, pH, or the thickness of free product layers;
* Any problems encountered or pertinent field observations.

Each sample shall be individually labeled at the time of collection, according to the procedures in Section B3. The label should be securely affixed to the sample container. A self-adhesive label is usual, or a rubber band or tie may be used to attach the label to the container. Waterproof, indelible ink should be used to record the following information on the label:

* Sample identification code or number;
* Name of collector;
* Date and time of collection; and
* Place of collection.

Care should be taken to write legibly. Since the required sampling will usually involve iced or cold storage of the samples prior to analysis, each sample or group of samples from one point should be placed in a ZipLock polyethylene bag after collection, to help keep the labels intact and readable

B2.2 - General Sampling Technique

In order to maintain the integrity of the sampling procedure, the following general sampling measures must be followed in each case:

* Sampling equipment must not be placed on the ground or other potentially-contaminated surfaces (i.e., tailgate of the truck) where it can become contaminated prior to use. The use of a disposable plastic sheet or an easily-cleaned tote are methods of avoiding this problem.

* The equipment used should not alter the chemical constituents of the sample, and should not carry the products of the sampling from one sample to another. If dedicated or disposable equipment is not available for each sampling point, extreme care should be taken to ensure that the equipment is properly cleaned and decontaminated prior to each measurement. Cleaning and decontamination procedures are described in the next Section B6.

* It is difficult to decontaminate hands sufficiently for low-level organic sampling, and there are chemical exposure issues involved. New, disposable gloves must be donned by the sample collector for each sampling point, and changed as needed to prevent contamination of other equipment.

* To prevent loss of volatiles, sampling containers should be filled directly where the technique allows, and in all cases, containers should be filled with care to prevent agitation of the sample.

* Containers for volatile samples should be filled completely, without headspace for volatile losses. After filling and capping water samples, the vial should be turned upside down and checked for bubbles. If a bubble is observed, the container should be emptied and the sample collected again. It may be helpful to wet the cap liner with the sample water before capping.

* The wide-mouth jars specified for soil samples should be filled with gloved hands and packed down to minimize headspace. Use a dry wipe to clean the threads of the jar before capping.

* Under no circumstances are sampling personnel to enter confined spaces or un-protected excavations to collect samples. Extension handles on samplers may be used, or a backhoe bucket can be used to retrieve a soil mass and the sampling conducted on the verge of the excavation.

B2.3 - Sampling Containers and Preservation

Preparation of sample containers outside the laboratory is not permitted under the RST program. Single use sampling containers obtained from the laboratory which will do the analysis should be used whenever possible. If sampling containers are recycled, they must be cleaned and prepared by the laboratory, according to the laboratory QA procedures adopted for that purpose.

Sample preservation requirements vary with the analyte and the expected holding time of the sample. A summary of the required containers, sample quantities, preservatives, and holding times for each class of analytes is found below.

MEDIA SAMPLING CONTAINERS, PRESERVATION, AND HOLDING TIMES

Analyte Class	Matrix	Container	Preservative	Holding Time
Volatile Organics (e.g. BTEX, GRO)	Soil	1@250 mL WMGlass w/Teflon-lined Cap	Cool, ≤ 6° C	14 days
	Water	2@40 mL Glass Vials w/Teflon Septum	Cool, ≤ 6° C	7 days
Semi-volatile Organics (e.g. PAHs, TRPH, DRO)	Soil	1@250 mL WMGlass w/Teflon-lined Cap	Cool, ≤ 6° C	14 days until extracted, 40 days after extracted
	Water	1@ L Amber Glass w/Teflon-lined Cap	Cool, ≤ 6° C	7 days until extracted, 40 days after extracted
RCRA Metals (e.g. Arsenic, Lead)	Soil	1@250 mL WMGlass w/Teflon-lined Cap	Cool, ≤ 6° C	6 months; Mercury 28 days
	Water	1@ L Polyethylene or Glass	HNO_3 to pH<2	6 months; Mercury 28 days

The Arkansas lab accreditation program has stringent sample acceptance rules. The correct sample containers for each analysis (as in Section B2.4), along with sample labels and chain-of-custody forms, will be provided (upon request) by DEQ-accredited laboratories as a part of the lab's QA/QC program. Some will even provide coolers or shipping containers.

B2.4 - Sample Collection

The following sections describe the actual procedures to be used for collecting media samples in specific cases.

B2.4.1 - Potable Water Supply Sampling

Use the following instructions on sampling water supplies for complaint investigation or water system surveillance:

* Under the SDWA, compliance sampling is conducted at the point of customer contact (i.e the tap), ahead of point-of-entry treatment. Sample cold water only.

* Taps which weep from the valve stem, or which are exposed to exterior contamination from being under the sink rim, or below grade in freeze-proof enclosures, should not be used for sampling points.

* Check the water system for point-of-entry treatment. Remove hoses, filters, or aerators attached to the tap before sampling.

* Allow the tap to run at a moderate rate (no splashing) for not less than 2 minutes before collecting the sample.

* Fill the sampling container directly and completely, with minimum agitation to prevent loss of volatiles, and immediately seal with a teflon-lined cap. No headspace may be present in the sample container once it has been capped.

* Make field determinations for the sampling location.

* Complete any necessary paperwork, and discard the sampling disposables.

* In addition to collecting the general sampling information described in Section B2.1, obtain the resident’s name(s), mailing address, and home/work telephone numbers for follow-up contact.

B2.4.2 - Surface Water Sampling

A common surface water sampling scenario encountered by RST personnel involves evaluation of possible impact to a small (less than 10' across) stream, a spring or seep, or an engineered stormwater drainage structure.

* A sample may be collected directly into the sample container when the surface water is accessible by reaching or wading. In moving water, the sampler should face upstream. Use care not to disturb the sediment, and to minimize agitation and loss of volatiles.

* An extension-handle dipper may be used for reaching out into the body of water to collect the sample. Care should be used for decanting volatiles to prevent loss.

* Make field determinations for the sampling location.

* Complete any necessary paperwork, discard the sampling disposables, and decontaminate equipment.

Liquids resulting from decontamination procedures are investigation-derived wastes, requiring capture/containerization/characterization and regulated management.

B2.4.3 - Stockpiled Soil Sampling

RST's sampling program normally centers around petroleum contaminated soils, but may also include CERCLA contaminated soils and/or stockpiles. The sampling guidance documents for soils are referenced in Section B1.

Each grab sample making up the composite may also be physically composited if properly done. The recommended method is -

* Beginning at the top of the pile and working vertically downward toward the bottom, remove six inches of soil with a shovel, forming a groove.

* Starting at the ground and progressing upwards, collect small quantities of soil with a scoop or shovel into a stainless steel cake pan, from within the groove.

* VOC samples should be immediately placed in the sample container with gloved hands. SVOC and metals samples should be mixed in the pan and debris and the larger fragments broken up or removed prior to sample containerization.

* Complete any necessary paperwork, discard the sampling disposables, and decontaminate equipment.

Liquids resulting from decontamination procedures are investigation-derived waste, requiring capture/containerization/characterization and regulated management.

B2.4.4 - Soil Sampling

There is a great deal of variability inherent in soil sampling. However, to make data as comparable as possible from site to site, consistent techniques are specified in the RST program.

B2.4.4.1 - Surface Soils

For those occasions where a surface leak or release has occurred or where the contamination is shallow, the following procedures will be implemented:

* Just prior to collecting a surface soil sample, three to six inches of soil should be rapidly removed from the immediate surface where the sample is to be collected. Any vegetation or extraneous organic matter must be removed prior to containerization.

* Samples will be collected over the subsequent six vertical inches, using a trowel, hand auger, or push sampler, into a stainless steel cake pan.

* VOC samples should be immediately placed in the sample container with gloved hands. SVOC and metals samples should be mixed in the pan and debris and the larger fragments broken up or removed prior to sample containerization.

* Make field determinations for the sampling location from the soils remaining in the pan.

* Complete any necessary paperwork, discard the sampling disposables, and decontaminate equipment.

Liquids resulting from decontamination procedures are investigation-derived wastes, requiring capture/containerization/characterization and regulated management.

B2.4.4.2 - Subsurface Soil Sampling

Subsurface soil sampling will be performed in accordance with the sampling procedures outlined in the LUST sampling and UST closure guidance documents found in Appendix I.

B2.4.5 - Groundwater Sampling

Groundwater samples may be collected from excavations, open boreholes, and monitoring wells. Sampling protocol outlined in the LUST sampling and UST closure guidance documents will be followed when taking groundwater samples. (See Appendix I).

B3 - 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 and regulatory actions. The procedure has two elements:

* Identification of individual samples. A label affixed to the sample container is used.

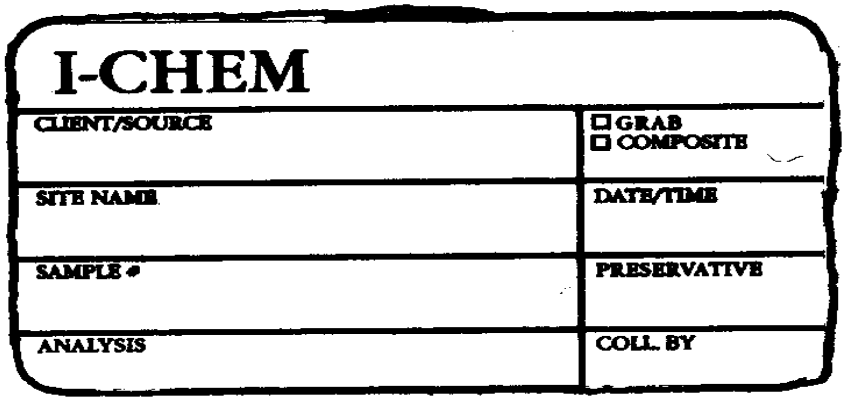
* A log of the sample's chain of custody.

B3.1 - Sample Labels

Self-adhesive labels are standard procedure, and the labels are ordinarily provided by the container vendor. No special format is required, but the labels must contain the following minimum information:

* Sample identification code or number;
* Name of collector/signature;
* Analysis required and preservative used (if any);
* Date and time of collection; and
* Place of collection.

An example of an acceptable label which might be provided by the container vendor is pictured below:



B3.2 - Sample Custody

The principle of sample custody is simply being able 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 sample collector, the sample transporter, and the laboratory staff.

The primary documentation which the DEQ utilizes to track proper sample custody from the time of sampling to the arrival of the sample at the laboratory is the chain-of-custody form. The form used by DEQ is pictured on the next page. However, any form which provides the information outlined below may be used:

* Site or facility name, location and point of collection. This establishes where the particular portion of water, soil, solid waste, etc., became an official sample.

* Time and date of collection. This information starts the chain-of-custody clock. The date of shipment adds to this information.

* The collector's signature. This establishes the first person with responsibility for the sample's custody.

* The presence or absence of added preservatives. This establishes that the sample will not be significantly altered before the arrival at the laboratory due to microbial, chemical, or physical actions.

* A list of parameters instructing the laboratory what analyses are needed.

If any of this information has been omitted from the chain-of-custody form, including any of the required signatures or official change of possession times, the documentation of sample custody prior to arrival at the laboratory will be incomplete.

In order to meet Arkansas laboratory accreditation requirements, the receiving laboratory must have standard operating procedures for receiving samples, including a sample custodian who examines all arriving samples for proper documentation, condition, and preservation. The custodian accepts delivery and certifies compliance by signing the chain-of-custody form

B4 - ANALYTICAL METHODS

Sampling data is collected by the RST program to evaluate the relationship between contamination in the environment and its potential for migration to receptors.

B4.1 - Laboratory Analysis

Samples collected by the RST program will be analyzed by the Arkansas Department of Energy and Environment (ADE&E) Laboratory Services or a private contract laboratory. Contract laboratories must be DEQ accredited. Any analytical results submitted to the RST program for regulatory review must be from a DEQ-accredited laboratory.

B4.2 - Sample Analytical Methods

Substances regulated by the RST program are as defined by 40 CFR 280:

[a] Any substance defined in Section 101(14) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, but not including any substance regulated as a hazardous waste under Subtitle C; and

[b] Petroleum, including crude oil or any fraction thereof which is liquid at standard temperature and pressure, such as motor fuels, lubricants, petroleum solvents, and used/waste oils.

Refined petroleum products consist of a large and varying number of individual constituents, and it would not be practical to analyze for all of them. A table listing the indicators used for assessing petroleum releases in Arkansas is found on the following page.

These indicator parameters have been chosen because of their toxicity, potential migration (solubility, persistence), relative ease of analysis, and because they are most often present in soil and groundwater contamination scenarios involving petroleum products.

PETROLEUM CONTAMINATION INDICATORS
Soil and Groundwater

Indicator Parameter	**SW-846 Methods*** any more recent, validated version of the cited method may be used	
	Soils	**Water**
Gasoline Range Organics (GRO)	**8015B**	**8015B**
Diesel Range Organics (DRO)	**8015B**	**8015B**
TRPH	EPA **1664B/AR TPH**	EPA**1664B**
Benzene	**8021B or 8260C**	**8260C**
Ethylbenzene	**8021B or 8260C**	**8260C**
Toluene	**8021B or 8260C**	**8260C**
Total Xylenes	**8021B or 8260C**	**8260C**
Methyl-tertiary-Butyl-Ether	**N/A**	**8260C**
Naphthalene	**8021B, 8100 or 8270D**	**8260C or 8270D**
Acenaphthene	**8100 or 8270D**	**8270D**
Anthracene	**8100 or 8270D**	**8270D**
Benzo(a)anthracene	**8100 or 8270D**	**8270D**
Benzo(a)pyrene	**8100 or 8270D**	**8270D**
Benzo(b)fluoranthrene	**8100 or 8270D**	**8270D**
Benzo(k)fluoranthrene	**8100 or 8270D**	**8270D**
Chrysene	**8100 or 8270D**	**8270D**
Dibenzo(a,h)anthracene	**8100 or 8270D**	**8270D**
Fluoranthene	**8100 or 8270D**	**8270D**
Fluorene	**8100 or 8270D**	**8270D**
Ideno(1,2,3-cd)pyrene	**8100 or 8270D**	**8270D**
Pyrene	**8100 or 8270D**	**8270D**

Indicator Parameter	**SW-846 Methods*** any more recent, validated version of the cited method may be used	
	Soils	**Water**
Ethylene Dibromide (1,2-Dibromoethane)	**8021B or 8260C**	**8021B or 8260C**
1,2-Dichloroethane	**8021B or 8260C**	**8021B or 8260C**
1-Methylnaphthalene	**8270D**	**8270D**
2-Methylnaphthalene	**8270D**	**8270D**
Arsenic	**6020B or 6010D**	**6020B or 6010D**
Cadmium	**6020B or 6010D**	**6020B or 6010D**
Chromium	**6020B or 6010D**	**6020B or 6010D**
Lead	**6020B or 6010D**	**6020B or 6010D**

In cases where the release history is incomplete or the quality of information is poor, laboratory analyses should initially include a broad range of contaminants. Alternately, the contaminants of concern may be specified on a site-by-site basis or deleted from further consideration at any assessment level if they are absent from all of the samples collected from the facility site.

B5 - QUALITY CONTROL

Internal quality control check procedures will be followed by the RST program in order to verify the degree of quality for environmental data collected. These procedures will be used to provide a measure of the consistency of samples and to provide an estimate of the variance and/or bias which may have been introduced during any point of the sample collection, analysis, and reporting process.

Generally, internal quality control checks are performed by adhering to the established SOPs for the following:

* Sample collection;
* Sample preservation and transportation;
* Sample chain-of-custody;
* Sample analysis;
* Reporting of sample results; and
* Equipment calibration procedures.

To further verify that analytical results generated are valid, the following guidelines will be employed as internal quality control checks.

* Field blanks and field duplicates will be taken by the field sampling personnel at the time of sampling.

* Field blanks will be generated by processing and collecting distilled deionized water through any sampling equipment used.

* A field duplicate will consist of a repeat sampling of one selected sample point. One field blank and one field duplicate will be taken for every set of ten samples or less.

* The accuracy and precision of each method employed will be assessed through analyses performed on duplicate matrix spikes.

* The frequency of matrix spikes shall be a least one spike and duplicate spike per ten samples.

* Method blanks will be employed if required by the method. A method blank will be generated each time the method of interest is used.

* Where possible, surrogate spikes will be used in analyses.

B6 - INSTRUMENT/EQUIPMENT TESTING and MAINTENANCE

DEQ-accredited laboratories are required to maintain their own program for this function, and for that reason, this section will deal with testing and maintenance of field equipment only.

To minimize downtime of the measurement system, all field equipment must be maintained in a working condition. Backup equipment or common spare parts should be available if any piece of equipment fails during use so that repairs or replacement can be made quickly and the measurement task completed.

Since different types of field equipment may be utilized in the field, all equipment which has manufacturers' recommended schedules of maintenance should receive preventive maintenance according to that schedule. Equipment which is used only occasionally should be inspected for availability of spare parts, cleanliness, battery strength, etc., prior to being taken into the field. After use in the field, all equipment should be rechecked for needed maintenance prior to storage.

Where decontamination is necessary in the field, the following generic procedures shall be followed:

* **The equipment shall be disassembled to component parts.**

* **Each part contacting the sample shall be washed with a non-phosphate detergent and rinsed with tap (potable) water.**

* **If the equipment is to be used for water or groundwater sampling, a subsequent rinse with reagent-grade methanol shall be used, followed by a final rinse with distilled or de-ionized water. If a QA sample of the decontamination procedure is required, the equipment blank shall be collected from this rinse.**

Liquids resulting from <u>field</u> decontamination procedures are investigation-derived wastes, requiring capture/containerization/characterization and regulated management.

B7 - INSTRUMENT/EQUIPMENT CALIBRATION

DEQ-accredited laboratories are required to maintain their own program for this function, and for that reason, this section will deal with testing and maintenance of field equipment only.

Due to the variability among field instrumentation types and calibration procedures, a generic calibration protocol will be specified:

* Before mobilization, each instrument will be cleaned, serviced, checked for function, and calibrated accorded to the manufacturer's instructions.

* In the field, the instrument will be calibrated before beginning work, and after every twenty (20) observations, or four (4) hours, whichever is less.

* If the instrument is used continuously (e.g. survey mode), it will be calibrated before beginning work and after any shut-down lasting longer than one hour, and at four hour intervals during continuous operation.

* Each calibration check performed in the field will be noted in the logbook for the project. Provide instrument name and number, time of calibration check, and personnel performing the check.

B8 - SUPPLIES AND CONSUMABLES

RST's environmental investigation program is specifically designed to use non-critical field supplies and consumables.

* Bailer line, latex gloves, disposable wipes, non-phosphate decontamination detergent, and distilled water are off-the-shelf items from local retail outlets.

* Methanol for decontamination purposes is provided by the vendor under specification as reagent-grade.

* Disposable bailers are provided by the vendor under specification they are pre-cleaned and suitable for low-level organic sampling.

* Calibration standards are specific to the equipment vendor and are supplied from that source.

* The Arkansas lab accreditation program has stringent sample acceptance rules. The correct sample containers for each analysis, along with sample labels and chain-of-custody forms, will be provided (upon request) by DEQ-accredited laboratories as a part of the lab's QA/QC program. Some laboratories also provide coolers or shipping containers.

B9 - NON-DIRECT MEASUREMENTS

The RST program is frequently provided data which was not generated under the program's oversight or QAPP, but which nevertheless must be used for decision-making purposes.

Data which does not originate under the RST program's oversight shall be evaluated by the following questions:

* What were the objectives of the original data collection? Were those objectives reasonably consistent with the data quality objectives of the current assessment needs?

* Are the data still relevant? What changes have occurred at the site since the data was gathered?

* Were quality control measures in place at the time of data generation, and if so, were those quality measures reasonably consistent with the RST program's QAPP?

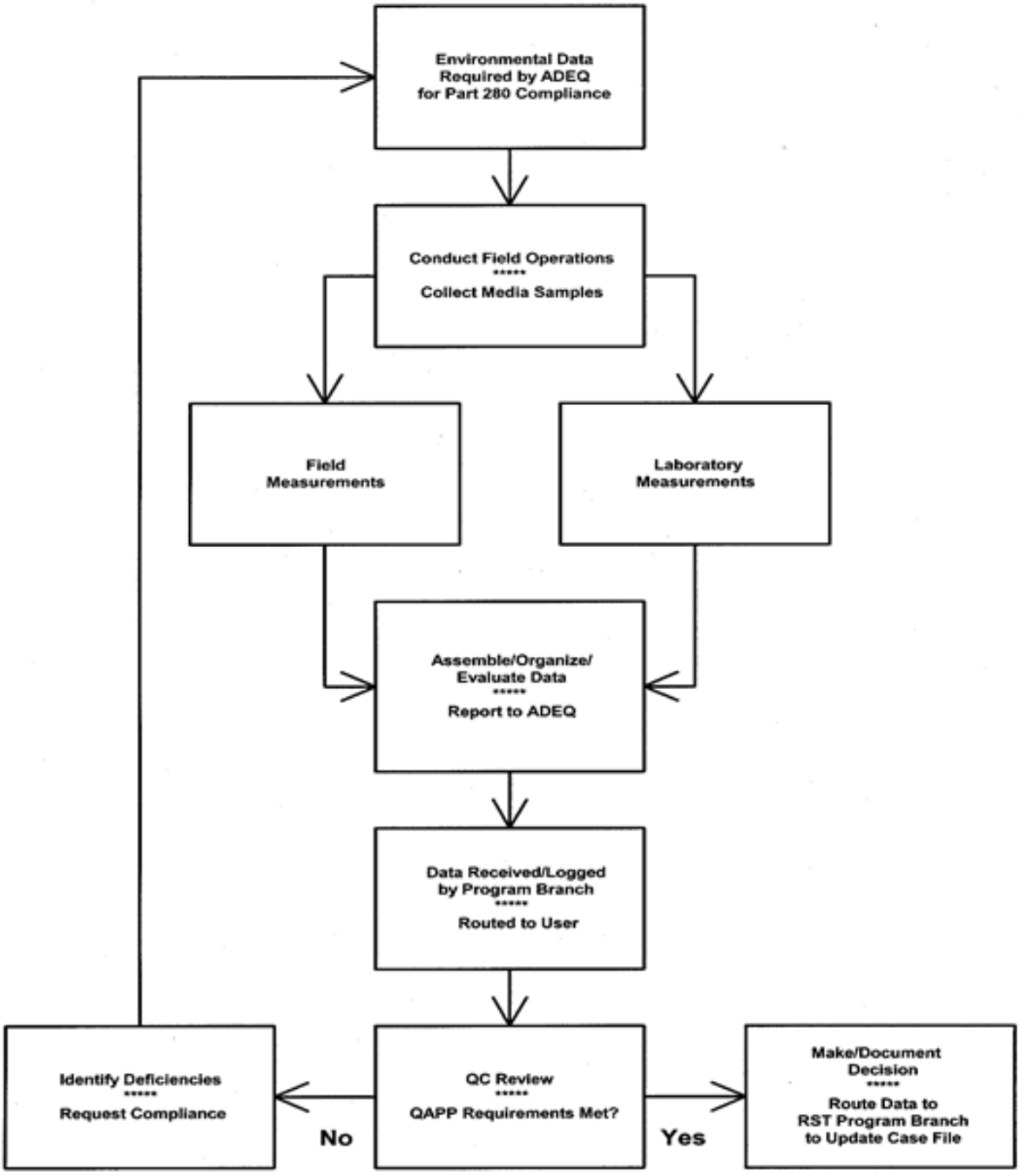
* Can confirmatory sampling establish data relevance and quality?

Data which can be documented to comply with the current program, or for which compliance has been confirmed by follow-up sampling, may be used for risk assessment and risk management purposes.

Data of relatively poor or unknown quality may be used to confirm that a release has occurred, or for planning the next data collection effort, but cannot be used to demonstrate a release has not occurred, limit or eliminate new sampling locations, or support critical risk management decisions.

B10 - DATA MANAGEMENT

The flow diagram below describes the pathway of environmental compliance data from generation to storage. Some perspective on the process may be gained from the data life cycle flow diagram below. (See Section A4.2 for RST personnel organizational chart and Section A9 for data storage and retrieval discussion.)



C1 - ASSESSMENTS and RESPONSE ACTIONS

To evaluate the quality of the data generated by and for the RST program, the following assessments are used:

C1.1 - Laboratory Quality

The QAO audits the multi-media laboratory in Laboratory Services at least once per year. In addition, the laboratory participates in two performance evaluation studies provided by an EPA-approved vendor each year.

The results of these studies will be used to discover and correct possible errors in procedures and techniques. Reporting is to the ADE&E Chief Technical Officer.

C1.2 - Laboratory Accreditation Program

The backbone of the quality system for environmental measurements in Arkansas is the laboratory accreditation program, operated by DEQ to ensure the infrastructure is in place to provide an adequate level of quality analytical work. Periodic technical systems audits and performance evaluation samples are part of this program.

C1.3 - Quality Assurance Reports

RST's Quality Assurance Coordinator (QAC) will generate an annual report to the department=s QAO listing updates or revisions to the QAPP and reporting any QC failures or project-related problems. The QAO will use this report in revising and updating the QMP for the department.

C1.4 - Routine Field Surveillance

RST program field personnel make unscheduled visits to release sites or sites with suspected releases on an Aas needed@ basis to observe what is happening and how work is being performed. Primary targets for these inspections are technique-defined quality measures, such as sample handling and decontamination procedures, which are not ordinarily closely documented in compliance reports, and which cannot be quantified by control samples. Also at this step, media samples may be split with the contractor on a limited, randomly-chosen basis.

Sample splits go to ADE&E Laboratory Services, and the results are compared to those subsequently reported. If a relative percent difference greater than 20% for groundwater, or 50% for soils, is obtained, a review of the reporting laboratory by the QAO is requested.

An oral warning is given for any shortcomings or deficiencies, and the circumstances (and sampling data, if applicable) are noted in the inspector's fieldbook. This record will become part of the proceedings of the project, and depending upon subsequent quality control review results, will be taken into account if corrective action is needed.

C1.5 - Report Review

After a release investigation report is received, RST program personnel evaluate assessment reports to see that the necessary control samples are submitted, calibrations performed, chain-of-custody maintained, data quality indicators achieved, etc. Documentation of any deficiencies noted may be made via either correspondence, internal checklists or both.

C1.6 - Management Systems Review

Management Systems Reviews (MSRs) are scheduled for DEQ by USEPA-Region VI when resources permit.

Following each MSR by USEPA, a report of the findings will be prepared by the QAO. If the RST program is the reviewed regulatory program, the RST QAC will make a written response within ten (10) working days to any finding reported.

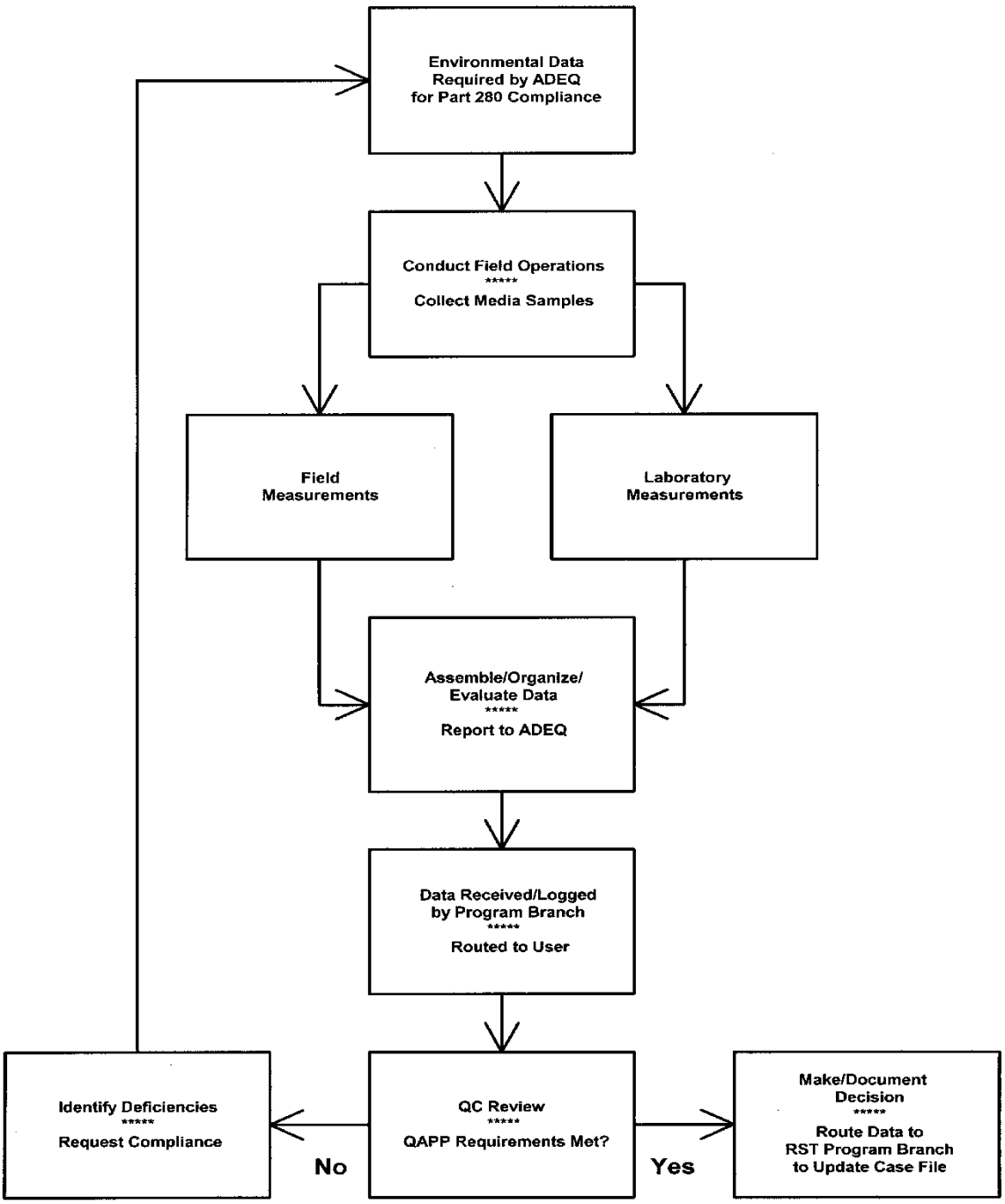
C2 - Reports to Management

The QAO is required to annually report the status of data quality to USEPA Region VI Office of Quality Assurance under the DEQ's Quality Management Plan. This report must cover all projects operated with any funding received from EPA grants. RST program activities therefore are included.

Routine QC evaluation reports are made by case managers and field personnel to their immediate supervisors, and become a part of the program's file.

D1 - DATA REVIEW, VERIFICATION, and VALIDATION

The life cycle of data generation with the RST program is charted below. Note carefully the bottom box in the middle column:



After the deliverables from an environmental investigation are submitted for review in voluntary or ordered compliance with applicable regulations, and before any environmental decision is made, a quality control review must be completed.

D1.1 - Quality Control Review

After a release investigation report is received, RST program personnel evaluate assessment reports to see that the necessary control samples are submitted, calibrations performed, chain-of-custody maintained, data quality indicators achieved, etc. Documentation of any deficiencies noted may be made via either correspondence, internal checklists or both. An example of a checklist which may be used by division staff is on the next page.

Also evaluated are data quality indicators for precision and accuracy:

* The precision of the sample collection/sample handling/sample analysis chain must be assessed by calculating the Relative Percent Difference (RPD) for each measured parameter between compliance samples and the required duplicates. Calculate RPD by -

$$RPD = (|A - B|)(100)/(A + B)(0.5)$$

where:

A = compliance sample A, parameter x
B = duplicate sample A, parameter x

RPDs greater than 20% for groundwater, and 50% for soils, indicate inadequately precise measurements.

* The accuracy (bias) of the measurement process is usually already calculated as part of the laboratory reporting as Percent Recovery of surrogate (GC/MS) or matrix (all others) spikes. If not, calculate the Percent Recovery (PR) by -

$$PR = \frac{100 * (C - A)}{S}$$

where:

C = analyzed concentration of parameter x in spiked sample
A = analyzed concentration of parameter x in submitted sample
S = spiked amount of parameter x

Percent Recoveries are compared to either lab-determined default limits or limits derived from historical data to determine adequate accuracy and precision.

Facility ID#: _____ **Review Date:** _____

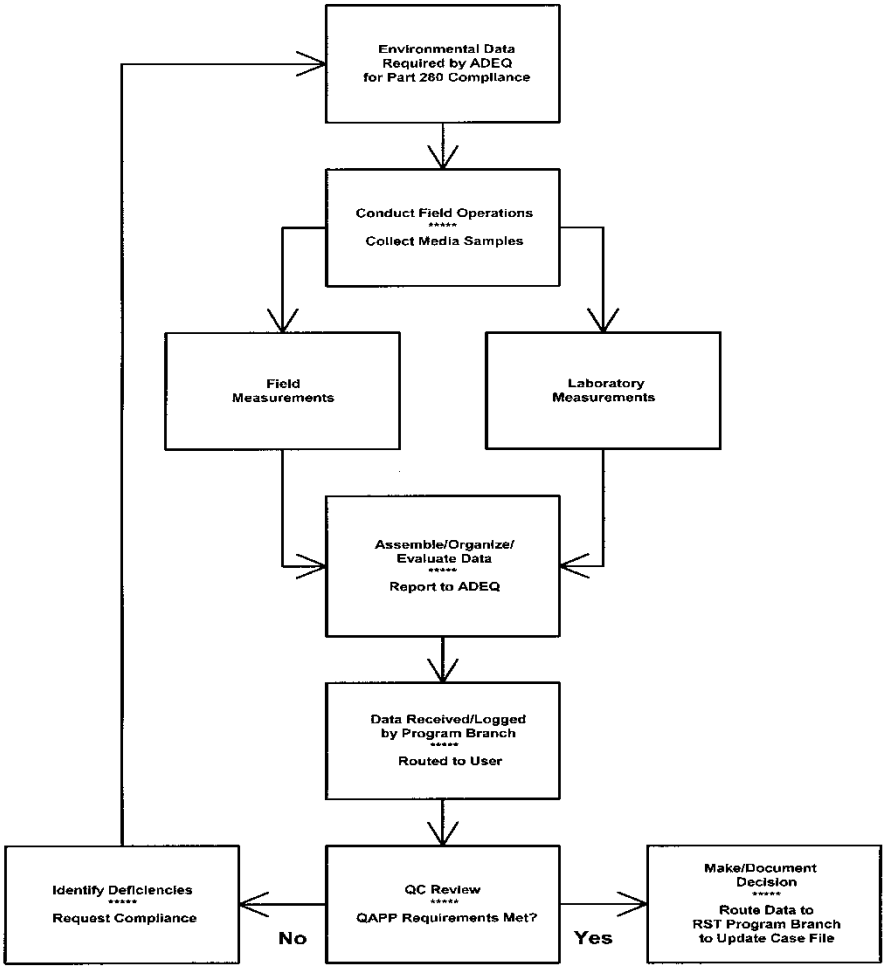
Report Date: _____ **Reviewer:** _____

QUALITY CONTROL REVIEW

After the deliverables from an environmental investigation are submitted for review in voluntary or ordered compliance with applicable regulations, and before any environmental decision is made, a Quality Control Review according to the questions below must be completed.

Yes	No	N/A	Unk	
☐	☐	☐	☐	All data in the report generated under RST oversight/QAPP?
☐	☐	☐	☐	Report bears the seal of a Professional Geologist or Engineer licensed to practice in Arkansas?
☐	☐	☐	☐	Field measurements (distance, elevation) conducted to the specified accuracy?
☐	☐	☐	☐	Samples collected in the prescribed (or approved) locations?
☐	☐	☐	☐	Prescribed (or approved) sample collection SOPs followed?
☐	☐	☐	☐	Monitoring well performance checked by turbidity and purging data for each sampling point?
☐	☐	☐	☐	Chain of custody maintained/documented for all samples collected?
☐	☐	☐	☐	Specified (or approved) SW-846 analytical methods used for each analyte/media?
☐	☐	☐	☐	Reporting Limits requirements met for all ND analytical results?
☐	☐	☐	☐	Supporting documents(boring logs, lab reports, fieldbook notes, etc) appended or attached?
☐	☐	☐	☐	Calibration checks performed/documented at the specified intervals?
☐	☐	☐	☐	Water/groundwater samples duplicated at 10% rate?
☐	☐	☐	☐	Relative Percent Difference less than 20% for water/groundwater sampling?
☐	☐	☐	☐	At least one field blank for each sampling day/event collected/analyzed?
☐	☐	☐	☐	Field blank(s) negative for all measured parameters?
☐	☐	☐	☐	Field decontamination performed?
☐	☐	☐	☐	Equipment blank(s) collected/analyzed at 5% rate?
☐	☐	☐	☐	Equipment blank(s) negative for all measured parameters?
☐	☐	☐	☐	Percent Recovery for all laboratory matrix spikes between 70% and 130%?

D2 - VALIDATION and VERIFICATION METHODS



The life cycle of data generation with the RST program is charted below.

Environmental data for the RST program is reviewed by RST staff against the quality protocols outlined in the QAPP for validation. If data does not meet required standards, it will not be accepted as valid and a verification review will not be conducted. If accepted as valid, data is then reviewed by program staff using established procedures, ranges, etc., for verification. If verified, data is accepted as part of the RST files.

D3 - RECONCILIATION with USER REQUIREMENTS

After the deliverables from an environmental investigation are submitted for review in voluntary or ordered compliance with applicable regulations, and before any environmental decision is made, a quality control review must be completed by RST personnel.

The QAPP is closely prescribed to meet the needs of the RST program. If shortfalls between the data delivered and the QAPP are detected, the shortfalls must be remedied by the data generator before the data can be used for compliance decisions by the RST program. Documentation of any deficiencies noted, remedies requested or limitation on data use imposed will be maintained as part of the RST files which are available to all potential users.

APPENDIX I

"DEQ Guidelines for the Permanent Closure of Petroleum Underground Storage Tank Systems"

GUIDELINES FOR THE PERMANENT CLOSURE OF UNDERGROUND STORAGE TANK SYSTEMS

ARKANSAS DEPARTMENT OF ENVIRONMENTAL QUALITY
REGULATED STORAGE TANKS PROGRAM
5301 NORTHSHORE DRIVE
NORTH LITTLE ROCK, AR 72118-5317

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SECTION 1 - GENERAL

1.1 INTRODUCTION

The purpose of this document is to provide guidance that explains the requirements regarding the permanent closure of petroleum underground storage tank (UST) systems.

This document does not specifically address the closure of USTs which contain or have contained a hazardous substance. Prior to permanently closing hazardous substance USTs, owners/operators must submit a closure plan to the Regulated Storage Tanks (RST) Program for review and approval. The plan shall specify, in detail, the proposed sampling plan, proposed analyses, and any other measures necessary to conduct an adequate closure. Closure plan guidelines can be obtained by contacting any district field office or the North Little Rock central office.

The UST regulations require that when a UST is permanently closed, the site must be assessed for the presence of a release where contamination is most likely to be present. The sampling requirements in this guide are only the minimum necessary and are not intended to substitute for the specific conditions that may apply to an individual site. Additional sampling may be justified whenever obvious areas of contamination are found.

Reporting the presence of free product and/or petroleum saturated soil that would indicate a release has occurred is covered in Appendix B.

No closure report will be accepted as complete without the minimum sampling data that is described herein.

Questions regarding this document should be directed to the Regulated Storage Tanks Program district field office responsible for the county in which the UST is located or the Regulated Storage Tanks Program central office in North Little Rock. A district map listing the inspectors and their districts can be obtained by contacting the Regulated Storage Tanks Program at (501) 682-0999.

SECTION 2 - REPORTING REQUIREMENTS

2.1 TANK REGISTRATION

All USTs storing a regulated substance on or after January 1, 1974, if not already registered, must be registered and all annual tank fees paid in full prior to permanent closure. USTs may be registered by submittal of a "Notification For Underground Storage Tanks" form which may be obtained by contacting any district field office or the North Little Rock office. Notification forms submitted for registration must be signed by the owner and dated.

Note: UST systems taken out of service and emptied of all contents prior to January 1, 1974, will be deemed as non-regulated only upon receipt of a written statement from the owner describing when the system was taken out of service.

2.2 NOTICE TO PERMANENTLY CLOSE UST SYSTEM(S)

The owner of the UST system or his/her representative must submit the original "30-day Notice For UST Permanent Closure" form at least 30 days prior to closing underground storage tanks and/or piping. All forms submitted must be complete and accurate. Registration status of all USTs scheduled for closure will be checked upon receipt of the notice. If it is determined that the USTs scheduled for closure have not been previously registered, then the owner will be provided with a notification form for registration purposes. Contractors should check with the district field inspector to verify tank registration and to verify if the inspector has received the 30-day notice form prior to beginning any closure work.

2.3 UNDERGROUND STORAGE TANK SYSTEM CLOSURE REPORT

The owner of the UST system or his/her representative must submit the closure report within 20 days of completing the closure. The UST closure report includes: 1) amended notification form; 2) contractor's closure report; 3) copies of all analytical results of any and all samples; 4) valid chain-of-custody; and 5) a site diagram. If the closure involves the removal of piping only, then the closure report shall include all of the above except for an amended notification. In addition, if the closure involves the disposal of contaminated soils and/or groundwater, a copy of the waste manifests must be included in the submittal. Failure to submit all of the documentation necessary to complete the closure will result in a delay in processing the closure report.

2.4 SITE DIAGRAM

A site diagram must be included with the UST closure report. The site diagram must contain the following:

* general site layout
* tank locations, sizes, and contents of USTs
* locations of all fuel lines
* locations of all dispenser islands
* dimensions of the excavation
* depth of the excavation
* sample locations
* nearby structures and properties adjacent to the site
* arrow indicating north

2.5 SAMPLE CHAIN-OF-CUSTODY RECORD

A chain-of-custody record must accompany the sample from the time of sample collection to delivery to the laboratory. The possession or custody of samples must be traceable from the time of collection until the time the samples are submitted to the laboratory for analysis.

If chain-of-custody procedures are not followed, the integrity of the sample is compromised and the analysis is invalid. A chain-of-custody record must be completed for all samples that will be analyzed by the laboratory. This record must be completed in the field at the time of sampling. Correct chain-of-custody must continue when the samples are transferred to the laboratory or to the person responsible for the delivery of the samples to the laboratory. Upon transfer of the samples, each person handling the samples must sign, date and note the time each person received the samples. Each chain-of-custody record must include the following:

* sample identification
* name and address of the site
* date and time of sample collection
* location and depth of sample(s)
* number of samples
* analysis to be performed
* appropriate places for signatures of sampler and person(s) assuming custody of samples

A completed chain-of-custody record must be submitted for all samples and included with the UST closure report.

SECTION 3 - SAMPLING PROCEDURES

3.1 SAMPLING REQUIREMENTS

Soil and/or groundwater samples must be collected at the time of permanent closure to determine if a release has occurred. The importance of good sampling procedures is critical to the assessment of a site during closure. Since gasoline and some other petroleum products consist largely of volatile organic compounds, special care in collecting samples is required. Special precautions must be taken to be certain that samples collected from each site are representative of the soil and/or groundwater at that location and that the sample is neither altered nor contaminated by the sampling and handling procedure.

All samples must be placed in proper containers immediately upon collection, properly packaged and labeled with the following minimum information:

* facility name
* sample location
* date and time samples were collected
* depth samples were collected
* person collecting samples
* analytical test(s) required

All samples must be placed on ice immediately after collection and shipped to an ADEQ-certified laboratory within 24 hours of collection.

3.2 SOIL SAMPLE COLLECTION PROCEDURES

Depending upon the purpose for the collection of the sample, soil samples may be taken either from an excavation, a borehole or a waste pile. In every case the object is to collect a sample representative of the in situ conditions. This includes the retention of volatiles present in the soil. Every effort should be made to ensure that these materials are not lost.

There are a variety of tools available for collecting soil samples. Hand-held tools include shovels, bucket augers, trowels, and hollow T-shaft push tubes. Always thoroughly clean tools between samplings to prevent cross contamination.

Soil samples should be collected in clean half-pint (250 ml) wide-mouth glass jars with teflon-lined sealing caps. Exposure of the sample to air and warmth must be minimized.

The following procedures should also be followed:

- The volume of the soil sample should be at least eight (8) ounces and should always fill the jar to capacity to avoid air spaces ("head space") within or above the sample. This provides an adequate amount of soil for all known methods for BTEX, TPH-GRO and TPH-DRO.
- Just prior to collecting the sample, a minimum of three or, preferably, six inches of soil should be rapidly removed from the immediate surface where the sample is to be collected. If sampling from a core sample, the immediate surface (about one-quarter inch) of core should be discarded. Most standard coring procedures are acceptable for sample collection. Data obtained from samples collected from air-rotary cuttings are not acceptable.
- Use a clean stainless steel trowel, scoop or gloved hands to handle the soil.
- The sample must be placed into the jar with a minimum of disturbance.
- The threads of the jar should be cleaned carefully with a disposable wipe and the jar sealed with the teflon-lined cap.
- The container should be properly labeled as described in section 3.1 and the appropriate chain-of-custody form completed as described in section 2.5.

If soil samples cannot be safely collected from an open excavation, a backhoe may be used to remove a bucket of soil from each of the sample areas. The soil is brought rapidly to the surface where samples are to be immediately taken from the soil in the bucket according to the directions above.

After sample containers are sealed, they should immediately be placed on ice and maintained at a temperature of 39 to 43 degrees Fahrenheit (4 to 6 degrees Celsius) until they are prepared for analysis by the laboratory. Samples must be analyzed within 14 days of collection.

3.3 GROUNDWATER SAMPLE COLLECTION PROCEDURES

Groundwater samples can be collected from borings or from open excavations. Samples should be collected in vials or containers specifically designed to prevent loss of volatile constituents from the sample. Sample containers should be pre-labeled before any sample collection begins. The laboratory can provide instructions about the type and size of containers to be used and the number of samples to be collected for each sampling point.

The following general instructions are given for collecting groundwater samples for BTEX analysis:

- 40 ml glass vials with teflon-lined septum caps should be used for sample collection.
- Samples must be taken with a device designed to minimize the loss of volatile components. A bailer with a sampling port is an acceptable sampling device.

* Water must be transferred to the sampling container with as little agitation as possible and immediately sealed with a teflon-lined cap. No headspace may be present in the sample container once the container has been capped. Verify no headspace by inverting the vial and tapping it gently to check for air bubbles. If air bubbles are present, a new sample must be collected. As a rule of thumb, it is best to gently pour the last few drops into the vial so that surface tension holds the water in a "convex meniscus." The cap is then placed on the vial and some overflow is lost, but air space in the vial is eliminated.
* Immediately store samples on ice, complete a chain-of-custody form as described in section 2.5 and ship samples to the laboratory within 24 hours of collection.

The following general instructions are given for collecting groundwater samples for TPH-DRO analysis:

* A quart (1,000 ml) glass jar with a teflon-lined cap should be used for sample collection.
* If a bailer is used for sample collection, transfer the sample from the bailer to the container and completely fill container to the top.
* Immediately store samples on ice, complete a chain-of-custody form as described in section 2.5 and ship samples to the laboratory within 24 hours of collection.

3.4 UST BACKFILL MATERIAL

All excavated backfill material must be composite sampled unless it is disposed of in an approved landfill or the material is placed in a properly constructed treatment cell. If the backfill material is to be placed back into the excavation, then samples must be taken. A minimum of one composite sample, consisting of 4 grab samples, must be taken for each 50 cubic yards of soil. The samples must be collected at a point of at least one foot into the stockpile. The backfill samples must be analyzed for the same constituents as the tank excavation samples. Disposal options are described in section 6.1.

Note: All samples must be analyzed by an ADEQ-certified laboratory to be valid. A list of certified laboratories can be obtained by contacting any district field inspector or ADEQ Technical Services.

SECTION 4 - SAMPLING LOCATIONS FOR TANKS

4.1 GENERAL REQUIREMENTS

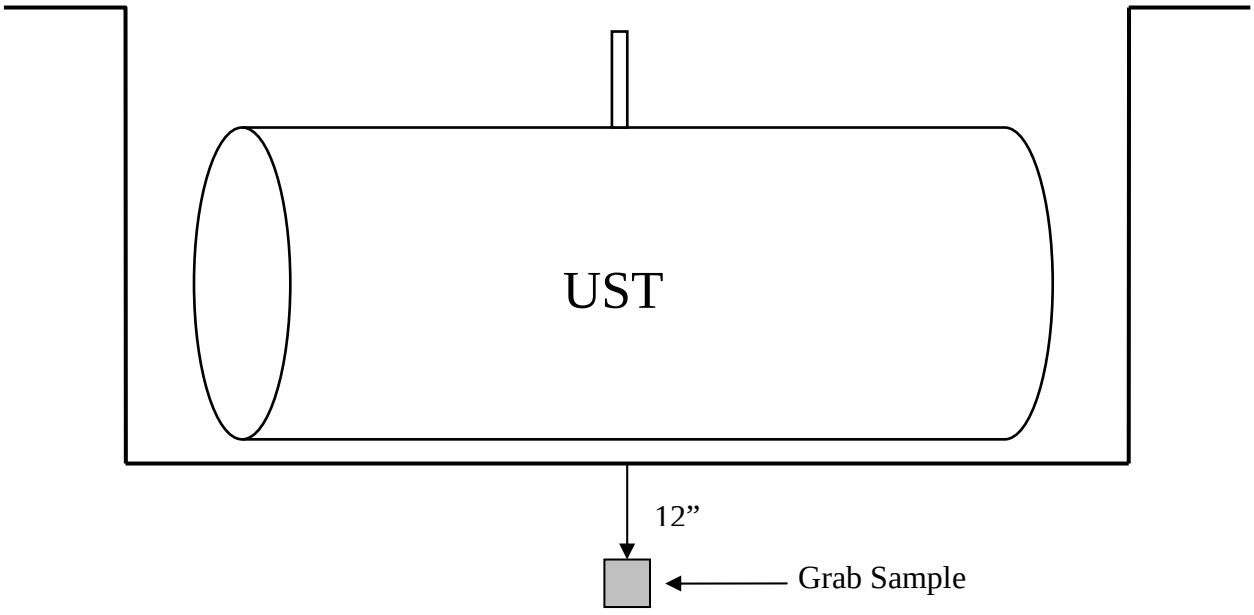
When conducting sampling at a tank removal, all backfill materials must be removed from the excavation prior to sampling. Whether sampling the sidewalls or the floor of an excavation, all samples must be collected from a depth of at least one foot into the native soil. No compositing of samples is allowed, and each sample that is collected must be analyzed separately.

After all backfill material has been removed from the excavation, it may be necessary to over-excavate the tankhold to ensure that all contamination has been removed. No more than two feet of native soil should be over-excavated from the tankhold prior to sampling.

After over-excavation has been conducted, samples must be collected from the bottom of the excavation where the highest level of contamination would likely exist (e.g., below the tank where the fill pipe was located or in a stratum more permeable than most of the surrounding soils.) At least one soil sample per tank should be taken in the location as shown in Figure 1.

Figure 1

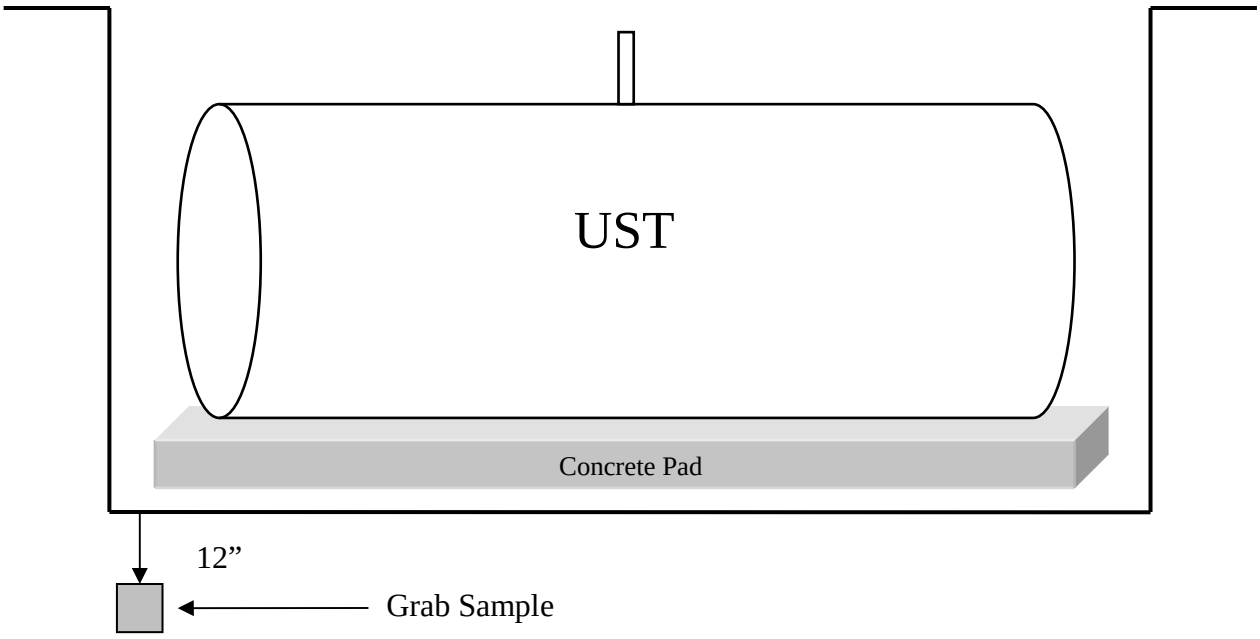
Soil Sample Location For USTs



If the UST is resting on a concrete pad and the pad is to be left in the ground, then it must be cleaned and examined for cracks and petroleum staining. If the pad is level, a soil sample must be taken from either end of the pad, one foot into the native soil as shown in Figure 2. If the pad is tilted, then the sample must be taken from the down gradient side, one foot into the native soil and where petroleum staining is heaviest.

Figure 2

Soil Sample Location For UST Resting On A Concrete Pad



If the UST is resting on bedrock, then the bedrock must be examined for fractures and petroleum staining after all backfill material has been removed. If bedrock prevents the collection of soil samples from the bottom of the tank pit excavation, then samples must be taken from the sidewalls.

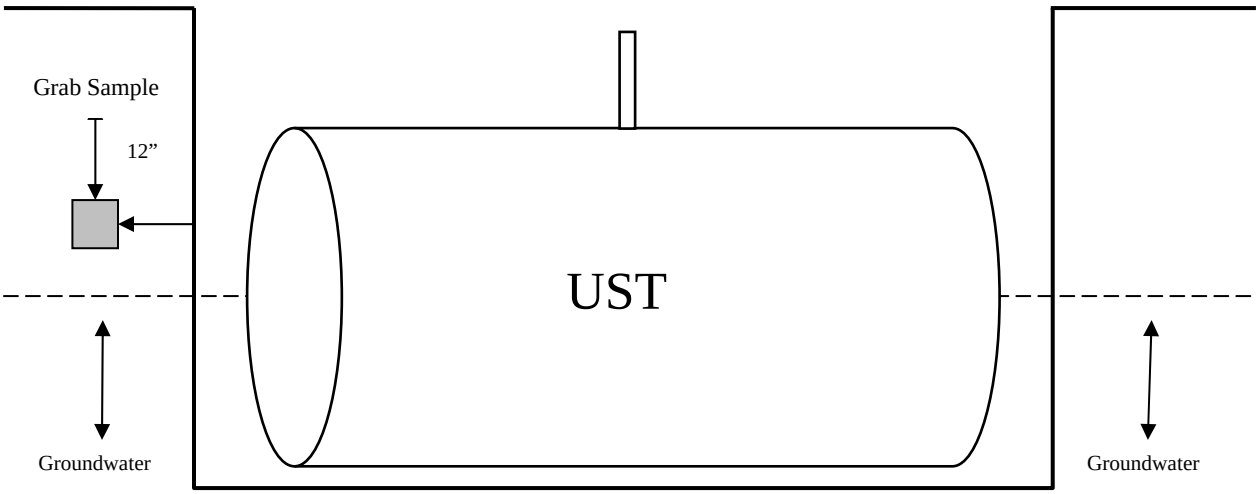
If water is encountered in the tank excavation, it must be removed to determine whether groundwater or trapped surface water has been encountered. For UST closures, groundwater is defined as the first saturated zone or water bearing unit capable of any measurable recharge within 24 hours.

If the tank excavation recharges with groundwater, a grab sample of the water in the excavation must be collected and analyzed. Water removed from the excavation must be disposed of properly as described in section 6.2.

In addition to collecting a water sample, a soil sample must be taken from the wall of the excavation most likely to be contaminated and immediately above the groundwater surface as shown is Figure 3.

Figure 3

Soil Sample Location For UST When Groundwater is Encountered



4.2 CLOSURE IN PLACE OR CHANGE IN SERVICE

Borings are utilized to locate and define the extent of contamination when excavation activities have not been initiated or when complete excavation of all contaminated soils is not possible. Core materials should be logged and examined carefully to characterize the backfill material. Samples are normally collected at two to four foot intervals where contamination is evident or in soil strata most likely to be contaminated. Unless groundwater is encountered in the boring, the soil sample shall be taken from the bottom of a borehole which extends at least two feet below the bottom of the tank, as near to the tank as possible, on the fill pipe end.

If "true" groundwater (refer to section 4.1) is encountered during soil boring activities, then a groundwater sample must be taken in addition to a soil sample. The soil sample should be collected within approximately four to six inches above the surface of the groundwater.

Tanks closed in place must be cleaned and filled with an inert material such as sand, concrete, grout or a "foam" material approved for such purposes. All tank sludges removed during the cleaning process must be properly disposed of as described in section 6.3.

A change in service is when the contents of the tank are changed from a regulated substance (e.g., gasoline) to an unregulated substance (e.g., water.) In order to accomplish a change in service, the same notification and sampling requirements for the permanent closure of a UST system must be followed. Sampling must be conducted in the same manner as tank closure in place and the interior of the tank properly cleaned. In addition, owners/operators must notify the Regulated Storage Tanks Program of the change in service by submittal of a "Notification for Underground Storage Tanks" form which indicates what unregulated substance is presently stored in the tank.

Note: Sample results must be submitted to the Regulated Storage Tanks Program for review and approval **prior** to closing tanks in place by filling with an inert material.

SECTION 5 - SAMPLING LOCATIONS FOR PIPING

5.1 GENERAL REQUIREMENTS

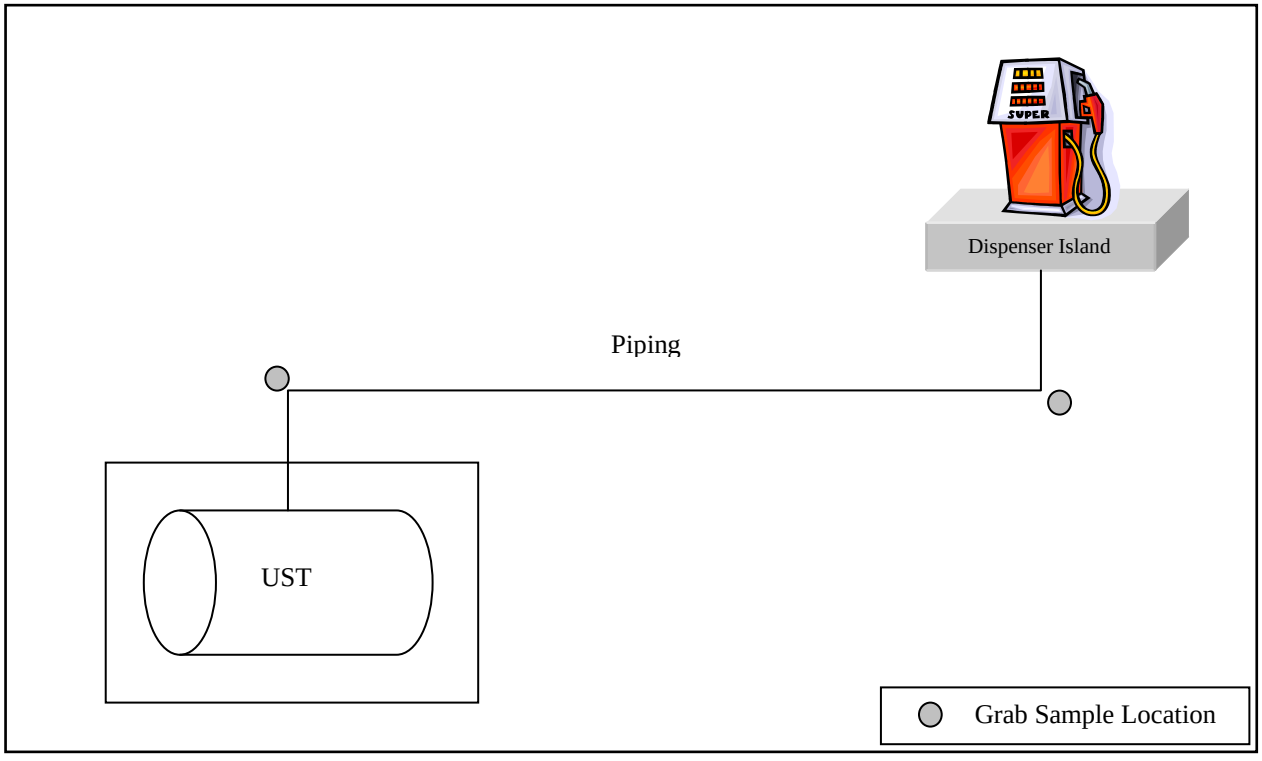
When performing a UST system closure, all piping must be removed from the ground or grouted with a concrete slurry if the piping is closed in place. When closing the piping in place, the goal is to render the piping unusable. Therefore, provided the piping is no longer usable, filling of all voids in the piping is not necessary.

5.2 PIPING TRENCHES

Sampling is required whenever a piping trench is taken out of service. When piping is removed, samples must be collected at each point where piping changes direction as shown in Figure 4. During removal of piping, sampling along a straight run of piping is not required unless contamination is encountered.

Figure 4

Sampling Locations When Piping Is Removed

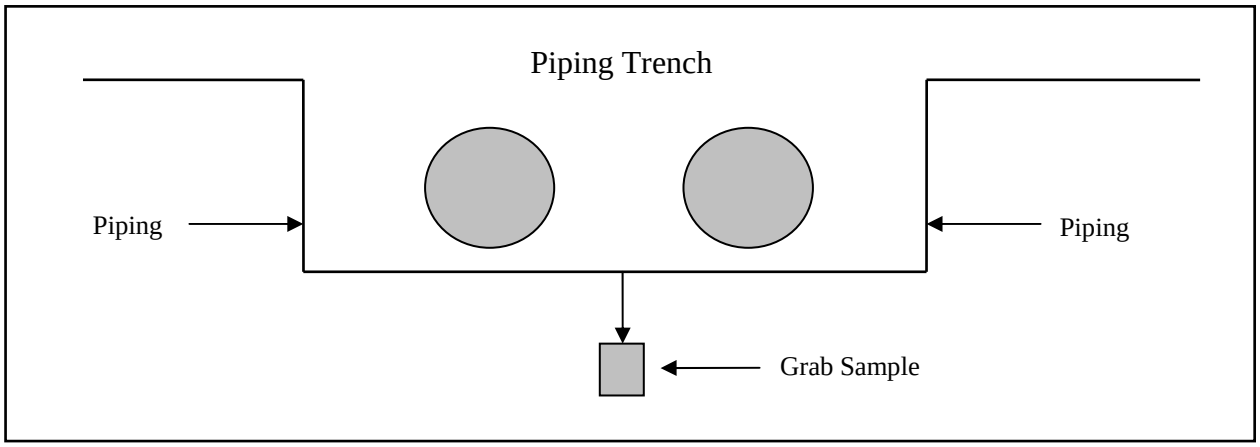


Prior to beginning any sampling activity, all backfill material must be removed from the piping trench excavation. Backfill material must be characterized properly as described in section 3.4.

Soil samples must be collected at a depth of one foot below the piping trench and into native soil as shown in figure 5. If bedrock is encountered at the floor of the excavation, then a soil sample must be taken from the wall of the excavation trench and one foot into native soil.

Figure 5

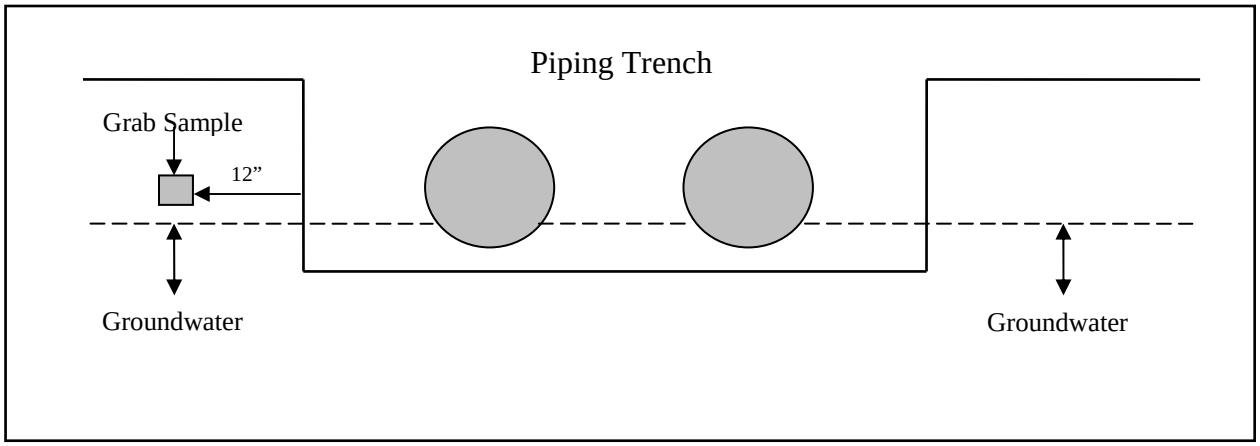
Sampling From Floor Of Piping Trench



If "true" groundwater (refer to section 4.1) is encountered during piping removal, then a groundwater sample must be taken in addition to a soil sample. A soil sample must be taken from the wall of the excavation trench immediately above the groundwater surface and one foot into native soil as shown in Figure 6.

Figure 6

Sampling From Sidewalls When Groundwater Is Encountered

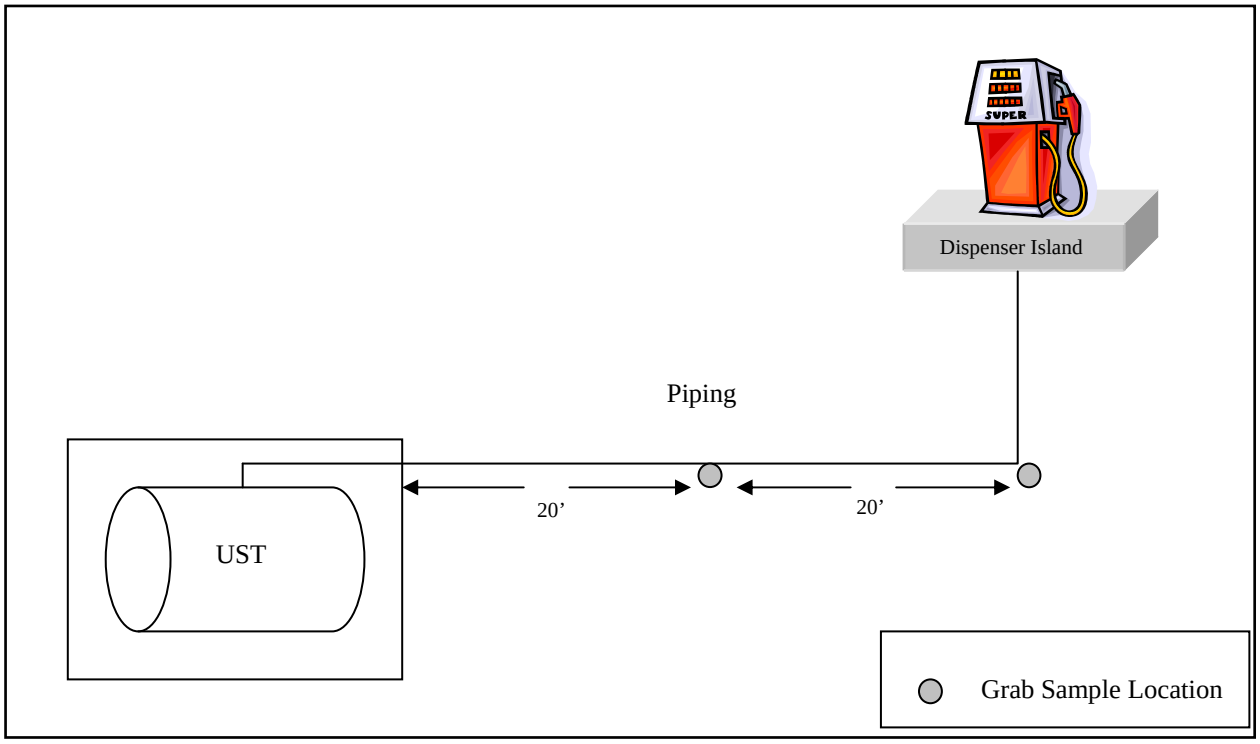


Prior to closing piping in place, all product must be removed from the piping. Samples must be collected where piping changes direction, if known, and approximately every 20 feet along a straight run of piping as shown in Figure 7. Unless groundwater is encountered in the boring, the soil sample must be collected from the borehole which extends at least one foot below the piping trench or as close to the piping trench as possible and into native soil.

If "true" groundwater (refer to section 4.1) is encountered during in place closure, a groundwater sample must be collected from the boring.

Figure 7

Sampling Location When Piping Is Closed In Place



If bedrock is encountered during the in place closure of piping, then a soil sample must be collected at the soil/bedrock contact.

If a change in service to the UST system is conducted (changing from storage of a regulated substance to a non-regulated substance), then samples must be collected from the piping trench. Sampling requirements for a change in service must be conducted in the same manner as removal or closure in place.

Note: Sample results must be submitted to the Regulated Storage Tanks Program for review and approval **prior** to closing piping in place.

5.3 DISPENSER ISLANDS

Soil samples must be taken below each island in which a dispenser is or was located. The number of samples required depends on the length of the dispenser island. An island is considered to be any dispenser or series of dispensers that are oriented in a straight line.

5.3.1 REMOVAL OF DISPENSER ISLANDS

Prior to beginning any sampling activities, all backfill materials must be removed from the excavation. If no contamination of the sidewalls is apparent, then a soil sample or samples must be collected at a depth of one foot below the piping trench and into native soil. The number and location of samples required is as follows:

a. Single dispenser island or island $\leq$ 20 ft. in length - 1 sample in the center of the length. (**Figure 8**)

b. Dispenser island > 20 ft. $\leq$ 50 ft. in length - 2 samples spaced at equal distances apart. (**Figure 9**)

c. Dispenser island > 50 ft. $\leq$ 80 ft. in length - 3 samples spaced at equal distances apart. (**Figure 10**)

Figure 8

Single Dispenser Island or Island $\leq$ 20 Feet In Length

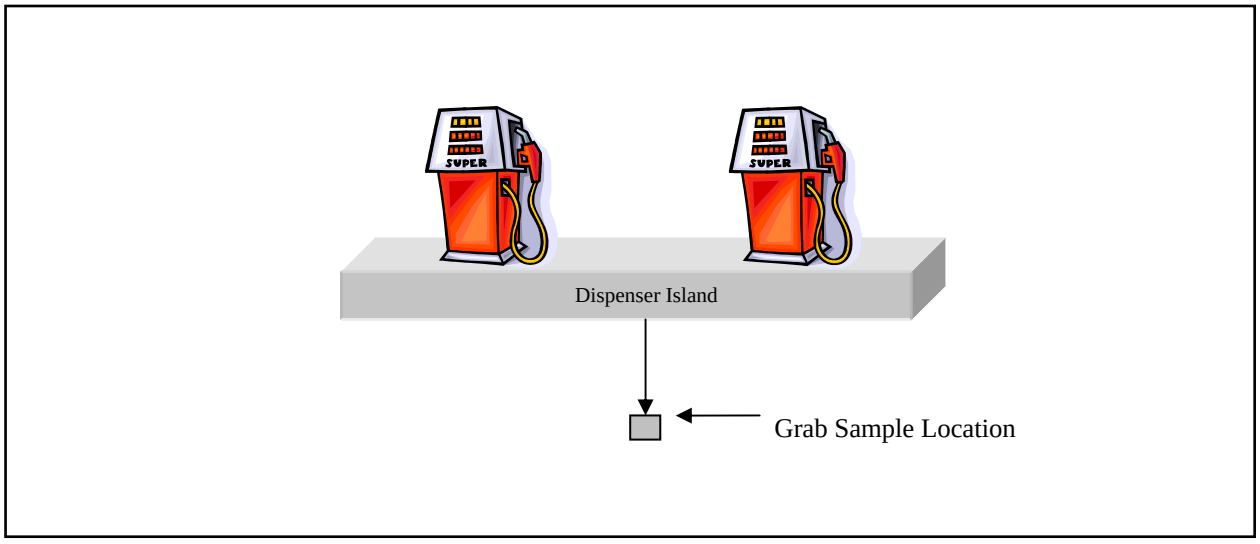


Figure 9

Dispenser Islands > 20 and ≤ 50 Feet In Length

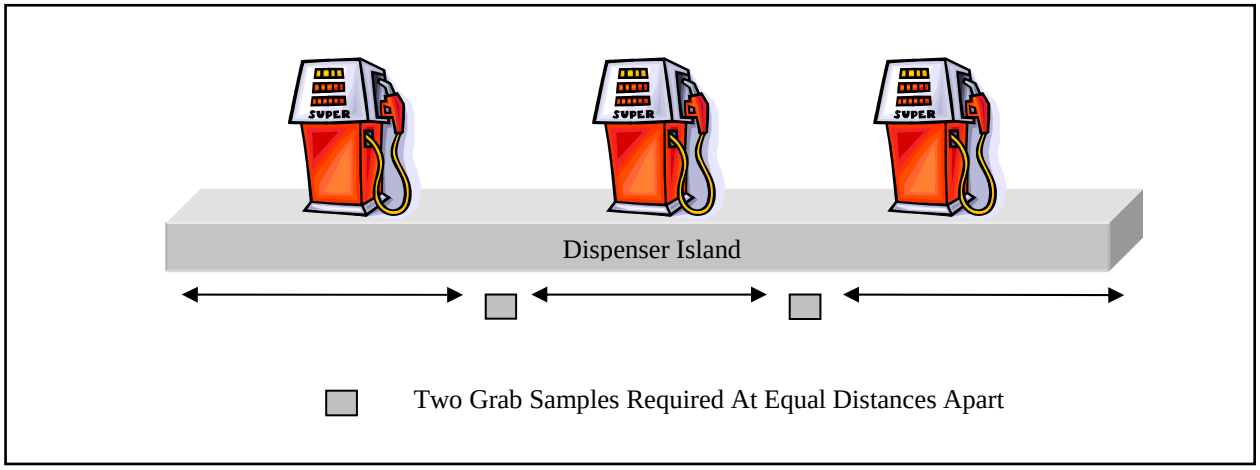
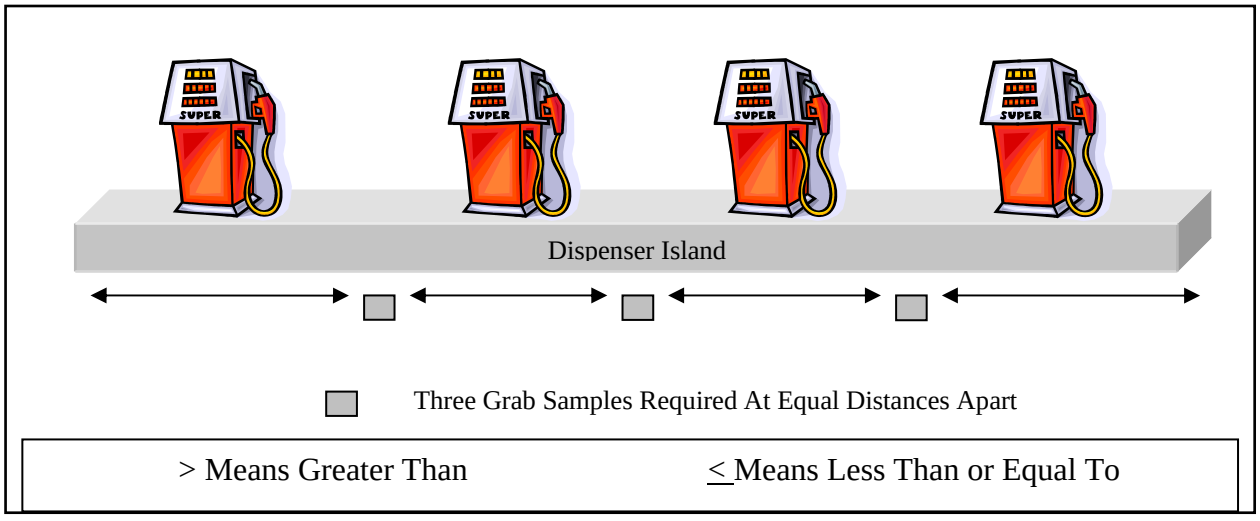


Figure 10

Dispenser Islands > 50 and ≤ 80 Feet In Length



If “true” groundwater is encountered during the removal of dispenser islands and piping, then a groundwater sample must be taken in addition to a soil sample. A soil sample must be taken from the wall of the excavation trench immediately above the groundwater surface and one foot into native soil

5.3.2 DISPENSER ISLAND CLOSURE IN PLACE

Prior to closing dispenser islands in place, soil borings must be conducted along the length of the island. Borings should be placed in the same area as the sample locations that are required for dispenser island removal. The required numbers of samples for closure in place are the same as those that are required for dispenser island removal. Unless groundwater is encountered in the boring, the soil sample must be collected from the bottom of a borehole which extends at least one foot below the piping trench or as close to the piping trench as possible and into native soil.

If "true" groundwater (refer to section 4.1) is encountered during soil boring activities, then a groundwater sample must be collected. Soil sampling must be conducted from those borings that do not have groundwater.

If bedrock is encountered during soil boring activities, then a soil sample must be collected at the soil/bedrock contact.

Note: Sample results must be submitted to the Regulated Storage Tanks Division for review and approval **prior** to closing dispenser islands in place.

SECTION 6 - DISPOSAL OF CONTAMINATED MEDIA

6.1 SOIL OPTIONS

Typically, all backfill material is contaminated and should be handled as such until laboratory analysis proves otherwise. Refer to section 3.4 for sampling requirements of backfill material. The following are the options allowed for handling the backfill material.

a. Dispose of in an approved landfill.

   All "special wastes" (petroleum contaminated soils) may be disposed of in an approved landfill. Contact the landfill for requirements prior to disposal.

b. Stockpile on site and await the laboratory results of sampling.

   All backfill material should be placed on and covered with an impervious material (plastic sheeting). If the analytical results of the backfill material are below the action levels of the RST Program, the backfill material may be placed back into the excavation. If the results are above RST Program action levels, your options are described in paragraphs a or d of this section.

c. Sample the backfill material and return it to the excavation.

The backfill material may be returned to the excavation with the understanding that the backfill material may have to be re-excavated if the analytical results are above the action levels of the RST Program. If the results are above action levels, your options are described in paragraphs a or d of this section.

d. Aerate or treat the backfill material on site.

If the analytical results indicate concentrations above action levels of the RST Program and the owner does not want to dispose of the backfill material in an approved landfill, the backfill material may be aerated or treated on site. To aerate or treat the backfill material, place the material on an impervious material (plastic sheeting) and spread the backfill material approximately one foot thick. Construct a berm around the backfill material that will retain any rainwater and prevent any contamination from spreading. Cover the soil on rainy days; uncover the soil on sunny days allowing for proper aeration. Disc or till the backfill material periodically. It may be necessary to treat the soil with fertilizer, for example, rather than rely on aeration especially for soil contaminated with diesel or waste oil. Soil should remain staged no longer than six months prior to sampling and/or disposal.

6.2 WATER OPTIONS

Petroleum contaminated water encountered outside the UST, whether perched or "true" groundwater, must be removed and disposed of properly. There are three options for the disposal of petroleum contaminated water encountered outside the UST, including: 1) disposal at a Publicly Owned Treatment Works (POTW) facility; 2) discharge under general permit limits; and 3) handled as a recyclable material.

a. Disposal at a POTW facility.

A POTW facility may accept petroleum contaminated water; however, they are not required to accept the discharge. Written permission to discharge petroleum contaminated water must be obtained from the treatment facility before the water is discharged.

b. Discharge under general permit limits.

Petroleum contaminated water cannot be discharged to the environment unless the owner/operator or contractor obtains an NPDES discharge permit from the Arkansas Department of Environmental Quality. An NPDES discharge permit is not required if the petroleum contaminated water is discharged into a sanitary sewer or hauled directly to a POTW facility with written permission.

c. Handled as a recyclable material.

Petroleum contaminated water may be removed and handled as a recyclable material by shipping to a refinery for re-work as a petroleum product. Petroleum contaminated water handled as a recyclable material must be shipped according to DOT regulations and documented by appropriate receipts from the receiving facility.

6.3 TANK CONTENTS

Below are options for the disposal of material removed from the inside of USTs.

a. Recovered product.

Product removed from the UST may be returned to the distribution system for re-use. Product that is not returned to the distribution system must be disposed of as a hazardous waste or handled as a recyclable material. Product disposed of as a hazardous waste must be properly labeled, manifested and shipped to a permitted Treatment, Storage, and Disposal (TSD) facility by a licensed hazardous waste transporter. Product handled as a recyclable material must be documented by appropriate receipts from the receiving facility. However the material is containerized, proper labeling and placarding must be followed according to DOT regulations.

b. Disposal of petroleum contaminated water.

There are four options for the disposal or handling of petroleum contaminated water, including: 1) disposal at a POTW facility; 2) discharge under general permit limits; 3) disposal at a permitted TSD facility; and 4) handled as a recyclable material.

1. Disposal at a POTW facility.

A POTW facility may accept petroleum contaminated water; however, they are not required to accept the discharge. Written permission to discharge petroleum contaminated water must be obtained from the treatment facility before the water is discharged.

2. Discharge under general permit limits.

Petroleum contaminated water cannot be discharged to the environment unless the owner/operator or contractor obtains an NPDES discharge permit from the Arkansas Department of Environmental Quality. An NPDES discharge permit is not required if the petroleum contaminated water is discharged into a sanitary sewer or hauled directly to a POTW facility with written permission.

3. Disposal at a TSD facility.

   Petroleum contaminated water must be transported by a licensed hazardous waste transporter for disposal at a permitted TSD facility. Although the petroleum contaminated water may not exhibit any hazardous waste characteristics, it must be disposed of as a hazardous waste if other options as listed are not available.

4. Handled as a recyclable material.

   Petroleum contaminated water may be removed and handled as a recyclable material by shipping to a refinery for re-work as a petroleum product. Petroleum contaminated water handled as a recyclable material must be shipped according to DOT regulations and documented by appropriate receipts from the receiving facility.

c. Disposal of petroleum sludge.

   Petroleum sludge that has accumulated in a UST must be disposed of as a hazardous waste or handled as a recyclable material. If disposed of as a hazardous waste, the material must be transported by a licensed hazardous waste transporter to a permitted TSD facility. If handled as a recyclable material, the material must be documented by appropriate receipts from the receiving facility. However the material is containerized, proper labeling and placarding must be followed according to DOT regulations.

Note: Any other soil/water disposal option not mentioned must be pre-approved by ADEQ.

SECTION 7 - TANK DISPOSAL

7.1 TANK DISPOSAL

A removed UST must be emptied and cleaned using industry-recommended procedures. Once cleaned, USTs may be disposed of as a solid waste at an acceptable facility or recycled. Examples of recycling include scrapping and salvaging. Disposal of USTs, whether as a solid waste or by recycling, must be conducted in accordance with industry-recommended procedures. The fate of USTs must be documented and included with the closure report.

SECTION 8 - SAMPLE ANALYSIS

8.1 TANKS

Samples must be analyzed for the product last stored in the UST. If evidence of a leak from a previously stored product is found or it is known that a tank stored a different substance at one time, then the samples must be analyzed for that substance also. For example, all of the tanks have stored diesel for the past several years, but it is known that one of the tanks was once used to store gasoline. Then, all samples collected from the tank excavation would have to be analyzed for BTEX, TPH-GRO and TPH-DRO.

If both diesel and gasoline tanks are in the same excavation, then all samples collected from the excavation must be analyzed for BTEX, TPH-GRO and TPH-DRO.

8.2 DISPENSER ISLAND & PIPING

Samples must be analyzed for the products last transferred in the piping. If evidence of a leak from a previously stored product is found or it is known that the piping transferred a different substance at one time, then the samples must be analyzed for that substance also.

If both diesel and gasoline piping are in the same trench/dispenser island, all samples collected from the piping trench/dispenser island must be analyzed for BTEX, TPH-GRO and TPH-DRO.

MINIMUM REQUIRED SAMPLE ANALYSES (TANKS & PIPING)

Product Stored	Sample Media	Analysis
Gasoline	Soil/Water	BTEX*, TPH-GRO**
Diesel, Jet Fuel, Kerosene, Used Oil	Soil/Water	TPH-DRO***
Hazardous or Other Substance	Soil/Water	****

* BTEX – The analysis for Benzene, Toluene, Ethylbenzene and Xylene
** TPH-GRO – The analysis for Total Petroleum Hydrocarbons-Gasoline Range Organics
*** TPH-DRO – The analysis for Total Petroleum Hydrocarbons-Diesel Range Organics
**** Analyze by approved method for the substance stored or primary constituent

APPENDIX A

Aquifer -	Underground body of sand or gravel which contains groundwater.
Backfill -	All of the material which was placed in the excavation when the tank system was installed. In UST systems installed after 1988, the backfill material is normally easy to determine since tank systems were required to be backfilled with clean sand or gravel and these materials are easily differentiated from the native soil.
BTEX -	Benzene, Toluene, Ethylbenzene, and Xylene - the four major components of gasoline.
Convex Meniscus -	Curved or rounded like the outside of a circle.
DOT -	Department of Transportation
DRO -	Diesel Range Organics
GRO -	Gasoline Range Organics
Groundwater -	For the purpose of UST closures, it is the naturally occurring water that seeps into the excavation from the aquifer.
Headspace -	The air space between the sample and the top of the closed container.
NPDES -	Federal National Pollutant Discharge Elimination System regulations pertaining to discharge permits for surface waters.
Perched Groundwater -	Unconfined groundwater separated from an underlying main body of groundwater by an unsaturated zone.
POTW -	Publicly Owned Treatment Works
Septum Cap -	A sample container cap that has a membrane for extracting water with a syringe.
Teflon Lined -	A synthetic liner used to line the sides and caps of sample containers to prevent samples from sticking.
TPH -	Total Petroleum Hydrocarbons
TSD -	Treatment, Storage, Disposal
Volatile Organic Compounds -	Chemicals which readily vaporize under normal atmospheric conditions.

APPENDIX B

ADEQ

A R K A N S A S
Department of Environmental Quality

Revised and Effective as of August 1, 2002

DISCOVERY AND REPORTING OF A RELEASE DURING UNDERGROUND STORAGE TANK CLOSURE

The Regulated Storage Tanks Division has received several questions about when to report a leak during a routine closure. Since trust fund eligibility of costs may hinge on whether or not a leak was reported and when, clarification in this area is important. The purpose of this bulletin is to provide a clearer understanding for both the contractors and owners/operators of when such a report should be filed.

If, at any time during closure, a level of contamination is encountered (i.e., free product or saturated soil) significant enough to indicate a release from the UST system has occurred, this should be reported to ADEQ within 24 hours of the discovery. Determination of eligible costs will be made from that point.

When a contractor's closure report is received and reviewed by the Department and the level of contamination indicated by the sample results warrant further assessment/remediation, a leak report will be generated by RST Division staff, and eligible costs from that point will be reviewed. However, this does not preclude the owner/operator from being subject to fines and penalties for non-compliance with the release reporting requirements as stated in 40 CFR 280.50.

No costs associated with routine elective tank closure work will be covered under the trust fund, nor will they apply toward the corrective action deductible. Examples or such work are:

1. Site preparation (uncovering tanks and lines, product/sludge removal from tank, etc.);
2. Excavation/disposal of the tank, piping system and backfill;
3. Required sampling of the tank excavation;
4. Backfilling of the excavation; and
5. Replacement of surface material (asphalt cap, concrete drive, etc.).

The costs of any other work performed during the six critical junctures of a routine elective closure as outlined by Arkansas Regulation No. 12, Chapter Five, Section 12.502(E), will not be considered eligible for trust fund coverage or application toward the deductible.

REVISED 8/01/02
Closure_Bulletin: 7/19/93

APPENDIX C

“Closure of Underground Petroleum Storage Tanks,” American Petroleum Institute Recommended Practice 1604, 1220 L Street, Northwest, Washington, D.C. 20005-4070, (202) 682-8000.

“Safe Entry and Cleaning of Petroleum Storage Tanks,” American Petroleum Institute Publication 2015.

“Interior Lining of Underground Storage Tanks,” American Petroleum Institute Publication 1631.

“Criteria for a Recommended Standard ...Working in Confined Space,” The National Institute for Occupational Safety and Health, Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.