



# QUALITY ASSURANCE PLAN

FOR

## MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION'S LEAKING UNDERGROUND STORAGE TANKS PROGRAM

Revision Number: 7

Date: 6/10/19

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06-10-19

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## 1.0 INTRODUCTION

### 1.1 Project Description

Under the RCRA, Subtitle I, a number of Cooperative LUST Trust Fund Agreements have existed between the U.S. Environmental Protection Agency (EPA) and the Maine Department of Environmental Protection (MEDEP), since 1988. The purpose of the agreements has been to assist in the development and maintenance of a statewide remediation program pertaining to leaking motor fuel underground storage facilities. This is accomplished, in part, through a grant to MEDEP to investigate and effectively remediate motor fuel leaking underground storage tank (LUST) sites.

Maine's petroleum remediation program is broad in scope and also addresses oil discharges from other USTs (e.g., heating oil) and other sources (e.g., aboveground tank facilities). Several divisions of the MEDEP Bureau of Remediation and Waste Management (BRWM) are involved in the LUST Program including Response Services (RS), Technical Services (TS), and Petroleum Management (PM). Response Services will be the first MEDEP responders to a reported spill. If the site requires long-term corrective action, it will be referred to Technical Services for follow-up investigation. Technical Services and/or Response Services may request assistance from the Division of Petroleum Management for project management expertise.

Under the LUST program, UST Facility owners and operators are responsible to report any evidence of a spill to the MEDEP. Such reports are initially forwarded to the Response Services Division, MEDEP/BRWM. Many reported releases are resolved quickly, and do not require long-term corrective actions. These sites will be closed by Response Services, and will not require formal, written site work plans. When a release cannot be resolved quickly, Response Services will forward the initial site assessment and all pertinent information to the Technical Services Division, MEDEP/BRWM. Sites involving complicated long-term corrective action may be assigned a project manager from the Petroleum Unit of the Division of Petroleum Management, MEDEP/BRWM. These sites will typically require more planning and subsequently require more detailed work plans and documentation.

Environmental and released-product samples may be taken for chemical analysis to detect the presence of gasoline or other fuel oil and for concentration determination in connection with remediation and/or compliance-related activities. Program staff are responsible for the

collection, documentation and maintenance of chain-of-custody of such samples until they have been properly relinquished to the laboratory. The laboratory analyzes the samples and generates data reports to the MEDEP for evaluation and consideration in remediation and/or compliance-related actions.

## **1.2 QAP Implementation**

The United States Environmental Protection Agency (USEPA) requires that all environmental monitoring and measurement efforts mandated or supported financially by USEPA participate in a centrally managed Quality Assurance Plan (QAP).

Any party generating data under this Program has the responsibility to implement minimum procedures to assure that the precision, accuracy, completeness, and representativeness of its data are known and documented.

As stated in USEPA Order CIO 2105.0 (formerly 5360.1 A2) "Policy and Program Requirements for the Mandatory Agency-Wide Quality System" (approved May 5, 2000), the primary goal of the QAP is to ensure that all environmentally related measurements performed or supported by USEPA produce data of adequate quality and usability for their intended use. The quality of the data is known when all components associated with its derivation are thoroughly documented, with such documentation being verifiable and defensible.

All Quality Assurance/Quality Control (QA/QC) procedures must be in accordance with applicable professional technical standards, USEPA requirements, government regulations and guidelines, and specific project goals and requirements.

This document serves as the MEDEP/LUST Program QAP. This document will describe, or reference attached documents that describe:

- (a) The MEDEP/LUST Program organization;
- (b) Personnel responsible for assuring the standards set in the QAP are met;
- (c) Quality standards goals;
- (d) The basic flow of project activities;
- (e) Equipment available to MEDEP/LUST Program;

- (f) Standard Operating Procedures for conducting field work; and
- (g) MEDEP/LUST Program procedures for obtaining analytical support.

## **2.0 QUALITY ASSURANCE STATEMENT**

It is the goal of the MEDEP/LUST Program to implement a Quality Assurance Plan (QAP) for all environmental activities that generate analytical data. The QAP is a management tool that will help guarantee that data is of sufficient known quality to withstand scientific and legal challenge relative to the use for which the data is obtained.

## **3.0 MEDEP/LUST PROGRAM ORGANIZATION**

### **3.1 Organizational Hierarchy**

The MEDEP/LUST Program organizational chart can be found in Appendix A.

### **3.2 Personnel Responsible for QAP Implementation**

Maine's Quality Management Plan (Revision 7.4, June 20, 2017) 1.4 reads, in part, "[c]ommitment to and responsibility for the quality objectives and operations detailed in...any QAP...begins with the commissioner and continues through all levels of management and staff." As such, division and program-level managers, as outlined in the LUST Organizational Chart, bear primary responsibility for ensuring that the QA standards specified in this QAP are met.

#### 3.2.1 Program Manager

Name: Victoria Eleftheriou  
Title: Director, Division of Technical Services  
Phone: (207) 287-7166

Responsibilities: Grant administration and semi-annual LUST 4 Report submission, completion of public record, fund tracking, journaling state match requirements and allotments, policy and regulation development, establishment of priorities and general program management.

#### 3.2.2 Department Quality Assurance Officer

Name: William Longfellow  
Title: Quality Assurance Manager, Office of the Commissioner  
Phone: (207) 287-2821

Responsibilities: Communicates all QAP updates to USEPA, and communicates QMP and USEPA requirements to MEDEP/LUST Program personnel responsible for QAP implementation.

3.2.3 Project Quality Assurance Chemist

Name: Kelly Perkins  
Title: Chemist III, Division of Technical Services  
Phone: (207) 287-7878

Responsibilities: Review QAP annually, and send a review report to the Program Manager and Department QA Officer; send all approved QAP updates to Program personnel responsible for QAP implementation; report any unresolved laboratory issues to the Maine Laboratory Certification Officer and provide technical guidance to project staff as requested.

3.2.4 Quality Assurance Team

Quality assurance is the responsibility of MEDEP/BRWM statewide supervisory technical, emergency response and project management staff whose names, titles and phone numbers follow:

Name, Office	Title	Phone Number
Troy Smith, CMRO	Environmental Hydrogeology Manager	(207) 592-0830
Molly King, CMRO	Senior Environmental Hydrogeologist	(207) 287-8169
Paul Blood, EMRO	Senior Environmental Hydrogeologist	(207) 941-4438
Mark Woodruff, SMRO	Senior Environmental Hydrogeologist	(207) 822-6353
Tim MacMillan, CMRO	Environmental Engineering Services Manager	(207) 287-6175
Peter Eremita, SMRO	Senior Environmental Engineer	(207) 592-0592
Ed Cousins, CMRO	Senior Environmental Engineer	(207) 287-3409
Jeff Squires, CMRO	Director, Division of Response Services	(207) 287-7190
Jon Woodard, CMRO	Oil and Hazardous Materials Responder III	(207) 287-3692
Bob Shannon, EMRO	Oil and Hazardous Materials Responder III	(207) 941-4570
Stephen Flannery, SMRO	Oil and Hazardous Materials Responder III	(207) 822-6337
Scott Whittier, CMRO	Director, Division of Petroleum Management	(207) 287-7674
Stacy Ladner, CMRO	Environmental Specialist IV	(207) 287-7853

Responsibilities: Perform, or delegate, periodic observation of sampling and sample handling techniques for conformity with MEDEP/LUST



Program guidance documents; and provide technical guidance to Project Manager and project staff as requested.

#### **4.0 QAP ASSESSMENT**

As required by the Policy to Assure the Competency of Organizations Generating Environmental Measurement Data under Agency-Funded Assistance Agreements (Agency Policy Directive Number FEM-2012-02 Revision 1; Approved March 13, 2013, Updated December 21, 2016), activities involving the use or generation of environmental data are evaluated to ensure they are performed by individuals competent to perform the activity.

##### **4.1 Laboratory Services Evaluation**

All analyses used to assess petroleum contamination must conform to methods listed in the Remediation Guidelines for Petroleum Contaminated Sites in Maine, November 20, 2009 (amended May 23, 2014); Appendix S of Rules for Underground Oil Storage Facilities, 06-096 C.M.R. ch. 691 (amended September 26, 2018) (Chapter 691. The LUST Program will only accept data results from a Maine accredited laboratory. The Maine Laboratory Accreditation Program administered by the Department of Health and Human Services maintains a list of laboratories accredited to perform these analyses in water, soil and indoor air as well as other matrices. Under the Maine Laboratory Accreditation Program, accredited laboratories must annually pass performance evaluation samples for each accredited analysis.

##### **4.2 Internal Assessment**

Personnel responsible for performing field and laboratory sampling activities are responsible for continually monitoring individual compliance with the QAP. The Quality Assurance Team will perform, or delegate, periodic observation of sampling and sample handling techniques for conformity with MEDEP/LUST Program guidance documents. The results of this internal assessment are discussed with appropriate staff with suggestions and/or recommended requirements for a plan to correct observed deficiencies.

##### **4.3 External Evaluation**

Field activities may be reviewed by personnel external to the MEDEP/LUST Program, such as the Department QMP Audit Team or USEPA. Such an assessment is an extremely valuable method for ensuring that the QAP is appropriately implemented. The results of an external assessment will be submitted to the LUST Program Manager.

The Program Manager, with input from staff will respond to the audit report with a plan to correct observed deficiencies. Appropriate corrective actions will be communicated to all program staff.

#### **4.4 Yearly QAP Review**

The Project QA Chemist will conduct an annual review of the QAP, and a review report will be sent to the Program Manager and the Department QA Officer. QAP revisions will be sent to the Quality Assurance Team as outlined in Section 3.2.

A meeting of project personnel responsible for environmental sampling will be scheduled annually as appropriate to review sampling procedures and any QAP updates.

### **5.0 DATA QUALITY OBJECTIVES**

The Quality Assurance objective of this program is to assure valid and reproducible data. All laboratory tests performed for the LUST program must be in accordance with Appendix S of Chapter 691. The laboratories performing VPH, EPH and APH analyses must be Maine accredited, and are required to adhere to established standard operating procedures (Appendix C) for measurement of concentrations of petroleum analytes. Laboratories performing new drinking water supply analyses must also be Maine certified, and are required to adhere to USEPA approved drinking water methods. The sampling and analytical procedures outlined in this QAP are intended to produce data which are of appropriate accuracy for assessing public health risks, remediation decision making, and defensible for any required enforcement and litigation purposes.

Some analyses, as an exception to the above requirement, may be performed using formerly standard methods should this be found necessary to maintain consistency for litigation or enforcement purposes in a specific instance.

#### **5.1 Sample Collection and Preservation**

Samples are taken as needed for the purposes of establishing site-specific compliance or non-compliance with existing regulations and to support remediation decisions. The number and type of samples to be collected is governed by the project quality objectives and is documented in the project file. The project quality objectives are defined by the remediation guidelines applicable to the discharge and site as contained in the Remediation Guidelines for Petroleum Contaminated Sites in Maine (May 23, 2014) and included as Appendix D to this QAPP. Media determined to

be at risk and the applicable guidelines are documented for each site in the Division of Technical Services Priority List Database.

Below is a screenshot from the Priority List Database of a list of wells for a site that are either impacted or at risk. Based on the guideline applicable to the site, these wells will be monitored according to the Remediation Guidelines for Petroleum Contaminated Sites in Maine. Below this screenshot is a screenshot of the Guideline record in our Priority List Database.

**Section 2: Products - Water Supplies - Score History - Guidelines - Closure - Paperwork**

Products **Water Supply** Score History Guidelines Path to Closure Closure Paperwork

**Contaminated**  
 Total Score: 9

Supply Type	#Units	Units	Dependency	Score	Comments	Action
Residential	1	Households	1	3	Nadeau	
Residential	1	Households	1	3	Dean	
Residential	1	Households	1	3	Almeida	

**At Risk**  
 Total Score: 12.60

Supply Type	#Units	Units	Dependency	Risk	Score	Comments	Action
Residential	1	Households	1	0.80	2.40	Labranch	
Residential	1	Households	1	0.80	2.40	Merrill/Lindsey	
Residential	1	Households	1	0.20	0.60	Pierce, Jr.	
Residential	1	Households	1	0.50	1.50	Gagne	
Residential	1	Households	1	0.50	1.50	Strang	

### Edit Guideline x

Spill Number  Project Name

Data Completed  Town  Revision

Lister  Manager

Geologist  Engineer

1. Saturated Soils (Section 2)

Free Product/LNAPL

Oil Saturated Soil

2. Home Heating Oil (Section 3)

Home Heating Oil

3. Water (Section 4)

Tier 1 ground/drinking water (Table1)

Tier 1 Soil Leaching to Groundwater (Table 3)

Tier 2 Modelling of Soil Leaching to Groundwater

Tier 3 Site Specific Guideline

4. Soil Exposure (Section 5)

Tier 1 Direct for Small Discharges (<200 cy)(Table4)

Tier 2 Contact Scenarios (Table 5)

- Residential
- Recreational User
- Commercial Worker
- Excavation/Construction Worker

Tier 3 Site Specific Guidelines

5. Vapor (Table 6)

Exposure to vapor

Evaluation Needed

6. Alternative Site Specification (Section 7)

Alternative Site Specific Guideline

Use Institutional Control

Justification

Initial discharge or leak investigations must conform to requirements in Section 12(C)(4), Discharge and Leak Investigation, Response and Corrective Action Requirements and Appendix P, Requirements for a Site Assessment at Facility Closure or Abandonment, in Chapter 691.

Typically, all ground and surface water samples will be collected and handled as described in Appendix B, MEDEP/LUST Program Standard Operating Procedures. Appendix B, SOP TS003, Field Quality Control Guidance, Attachment 1 outlines basic sampling criteria including sample collection and preservation parameters.

## **5.2 Sample Custody**

Samples are maintained under documented custody, as described below, until accepted by the analytical laboratory. The laboratory is responsible for subsequent custody control and documentation.

Chain-of-custody provides defensible documentation of sample integrity from the point of collection to analysis. Chain-of-custody consists of two components: documentation and actual physical custody. It includes custody in the field and in the laboratory. When handling samples from the point of collection until delivery to the laboratory, the custodian will keep the containerized sample in their physical possession, or in view, or secured to prevent tampering or inadvertent contamination in a locked storage area.

Using an appropriate chain of custody form, all applicable information will be completed by the person(s) collecting the sample. Any person(s) assuming custody prior to delivery to the laboratory will adhere to these custody procedures and will document transfer of custody by entering signature, date and time on the chain of custody form.

Upon receipt of the sample by the laboratory, documented by signature, date and time on the chain of custody form, the laboratory is responsible for following equivalent internal SOPs regarding maintenance of custody to ensure sample and data integrity. Sample handling procedures for laboratories utilized by this program must be documented in the Laboratory Quality Assurance Manual.

## **5.3 Data Use**

The data use(s) will be identified on a project specific basis. Data collected for the MEDEP's LUST Program may be used to meet any of the following objectives:

- (a) To determine the need for emergency action;
- (b) To identify any waste materials and contaminants;
- (c) To determine the quantity and levels of contamination;
- (d) To identify impacted targets/receptors and natural resources; or
- (e) To document the needs for further action or no further action.

Data use can be broken down into three basic categories: initial investigation of a site, routine monitoring of a site, and site closure. Data collected for milestone remediation decisions and site closure generally requires the highest level of quality. Staff collecting or using data must be competent in the activity performed. Samplers must strictly adhere to appropriate sampling standard operating procedures, and analytical data must adhere strictly to the quality control requirements of the appropriate methods.

#### **5.4 Data Quality Necessary for Project**

Data quality needs depend on several factors including data use and analytical requirements of the site. Analytical requirements, and data quality goals for site investigations, are based on the Remediation Guidelines for Petroleum Contaminated Sites in Maine, November 20, 2009 (amended May 23, 2014); Appendix Q, Section 2, Notification Requirements of Chapter 691 and the Vapor Intrusion Guidance section of the <http://www.maine.gov/dep/spills/publications/guidance/> webpage. At a minimum, data quality assurance/quality control will be evaluated for the items included in the BRWM Basic Data Review Checklist (QAPP Appendix I).

The quantity of data needed will vary based on site-specific conditions, available usable data, data use and analytical methods used.

#### **6.0 PROCEDURAL REQUIREMENTS FOR MEETING QAP**

In order to assure the generation of quality data, procedural steps described in the QAP and Chapter 691, Rules for Underground Oil Storage Facilities, Section 12, Discharge and Leak Investigation, Response and Corrective Action Requirements and Oil Discharge Notification interim guidance, June 2010, must be followed. These steps include:

- (a) Site assessments shall be conducted by facility owners in accordance with procedures outlined in Appendix P of Chapter 691 (QAPP Appendix G);

- (b) Field determination of soil hydrocarbon content shall be conducted according to Standard Operating Procedure: TS004, Compendium of Field Testing of Soil Samples for Gasoline and Fuel Oil, Revision 2.1, October 15, 2012 (included in Appendix B);
- (c) Laboratory methods and performance standards found in Appendix S of Chapter 691 shall be used (QAPP Appendix G);
- (d) Field notes shall be taken either in bound field books or on appropriate field note forms. Notes shall be signed and contain at a minimum:
  - (i) Date, site name and location;
  - (ii) Weather conditions;
  - (iii) Personnel present;
  - (iv) Purpose of the visit;
  - (v) Field measurements, if taken;
  - (vi) Sample locations, if taken; and
  - (vii) Any information the field staff believes may be useful or pertinent in the project file.
- (e) Field quality control samples shall be collected during sampling events in accordance with Standard Operating Procedure: TS003, Field Quality Control, Revision 4, February 28, 2007 included in Appendix B.
- (f) Written work plans shall be developed for sites requiring long-term corrective action if: (a) a non-transient public water supply is contaminated or threatened, (b) two or more wells are contaminated, or (c) long-term corrective action costs are expected to exceed \$100,000. At a minimum, the work plan shall include:
  - (i) Names of personnel responsible for site work, including MEDEP team and any contractors responsible for environmental sampling;
  - (ii) Objectives established in accordance with the Remediation Guidelines for Petroleum Contaminated Sites in Maine, November 20, 2009 (amended May 23, 2014);
  - (iii) Modifications and limitations to objectives, and/or site-specific objectives;

- (iv) Site map;
- (v) Sampling locations and methods;
- (vi) Field QC samples;
- (vii) Analytical methods; and
- (viii) Any special training required.

Work plans for sites directly managed by MEDEP staff shall be reviewed for the eight elements described above, and a dated page carrying the approval signature of the MEDEP project manager shall be included in the project file. Work plans developed by external contractors shall be reviewed and approved by the MEDEP project manager, signed and filed as above. All active work plans shall be reviewed annually by the MEDEP project manager, and documentation of this review, including any changes to the work plan, shall be filed as above. Any review of workplans (e.g., for technical validation) by a person other than the MEDEP project manager shall likewise be documented.

- (g) Project managers and/or project scientists will maintain communication with remediation personnel during remediation activities and will periodically visit the site to monitor cleanup progress. All site visits will be documented in field notes.
- (h) Data will be assessed to determine if the Data Quality Objectives (DQOs) are met in accordance with Section 10 of this QAP.
- (i) Findings and conclusions of the initial hydrogeological investigation will be reported to the Department for review and approval;

## **7.0 EQUIPMENT AND SUPPLIES**

### **7.1 Equipment**

A variety of equipment is available to the MEDEP/LUST Program for conducting soil, groundwater and indoor air investigations. A list of the available equipment can be seen in Appendix B. All equipment is maintained and calibrated according to the manufacturers' instructions and in accordance with the appropriate analytical methods. Manufacturers' instructions and other instructional documentation will be kept in the equipment logbook maintained by support staff in MEDEP/TS. As new equipment is purchased or other otherwise made available to



MEDEP/LUST Program, the equipment list and SOPs will be updated, as needed.

Equipment that requires calibration for use, such as PIDs, pH meters, etc., shall be calibrated routinely on a monthly basis or as directed by the manufacturer, and prior to its use in the field at the beginning of each working day and checked at the end of each working day. Additional calibration may also be conducted throughout the work day as directed by the manufacturer, as required by SOP or as deemed necessary by the field personnel when equipment appears to be reporting suspect results. Documentation of routine calibration and maintenance shall be kept in the equipment calibration and maintenance logbook maintained by designated MEDEP/TS staff. Documentation of calibration of equipment prior to and during its use in the field will be noted in the field notes of the person conducting the calibration.

Staff must be determined to be competent in the use of all equipment prior to the use of the equipment to collect samples for soil, groundwater or indoor air investigations. In addition, staff must complete annual refresher training to demonstrate ongoing competency. Documentation of initial and ongoing equipment use competency for MEDEP staff is maintained by the MEDEP/TS Hydrogeology Unit or other designated personnel. Non-MEDEP personnel are responsible for maintaining their own competency demonstrations. Competency demonstrations for non-MEDEP personnel should be provided to the MEDEP upon request.

## **7.2 Supplies**

Supplies needed to perform sampling under this program are ordered and managed by the Hydrogeology Unit or support staff in MEDEP/TS, and stored in a clean secure room. Stocks are continually checked to ensure that an adequate supply is maintained.

Organic free water used for trip blanks and field blanks is either purchased or provided by the laboratory performing the analytical support for the project. All water is tested for VOC content prior to use.

Sample bottles, preservatives, and chain of custody forms are supplied by Maine certified laboratories for appropriate analyses. Unused VOC sample bottles taken into the field will not be returned to clean bottle storage unless proven to be free of contamination.

## 8.0 LABORATORY SERVICES

Maine accredited analytical laboratories provide laboratory services. These laboratories have been contracted to perform analyses for which they are accredited by the Maine Accreditation Program. A listing of these laboratories, and tests for which they are certified, is included in Appendix F.

The LUST Program will only accept drinking water supply well analytical results from Maine Accredited Drinking Water laboratories using approved methods. The Maine Laboratory Accreditation Program maintains a list of laboratories certified to perform these analyses.

The LUST Program will only accept Volatile Petroleum Hydrocarbons (VPH), Extractable Petroleum Hydrocarbons (EPH) and Air-Phase Petroleum Hydrocarbon (APH) results from a Maine accredited laboratory. The Maine Laboratory Accreditation Program maintains a list of laboratories accredited to perform these analyses in water, soil and indoor air. A list of currently accredited laboratories is included in Appendix F.

For some large remediation sites, a non-accredited on-site laboratory may be employed for quick turn-around analyses to guide cleanup. It is standard practice to send replicates of 10% of such samples to a Maine-accredited laboratory as a check for accuracy of the on-site analyses. In these cases, confirmation samples must be analyzed by an accredited laboratory.

Laboratories must submit electronic data formatted to the current version of MEDEP's electronic data deliverable as outlined on the Environmental and Geographic Analysis Database (EGAD) webpage: <http://www.maine.gov/dep/maps-data/egad/index.html>. In addition, all hardcopy and electronic data must include the minimum quality control/quality assurance elements as outlined on the EGAD webpage. Data from LUST sites are currently being collected, stored in EGAD and shared with staff and the public as applicable.

## 9.0 STANDARD OPERATING PROCEDURES (SOP)

MEDEP/LUST Program's standard operating procedures for conducting sampling and other data collection activities can be found in Appendix B, MEDEP/LUST Program Standard Operating Procedures Manual. Additional sampling methods for vapor intrusion investigations are found on the Vapor Intrusion Guidance section of the <http://www.maine.gov/dep/spills/publications/guidance/> webpage. Additional standard operating procedures are found at <http://www.maine.gov/dep/spills/publications/sops/index.html>.

Depending on circumstances and needs, it may not be possible or appropriate to follow these procedures exactly in all situations due to site conditions, equipment

limitations, and limitations of the standard procedures. In some instances it may be necessary to perform an activity that does not have a specific SOP. Whenever SOPs cannot be followed, they may be used as general guidance with any and all modifications fully documented in field notes.

The MEDEP Program Manager must approve any changes in MEDEP/LUST Program SOPs. The SOPs are controlled documents and revisions should be indicated on each page in the right hand corner along with the revision date.

## **10.0 DATA QUALITY ASSESSMENT**

Given that imperfections in sampling and analytical procedures exist, it is sometimes commonplace to find that the reported concentration and actual concentration are not identical. The difference between the reported concentration and the actual concentration of a sample is a function of both the sampling and analytical error. Sampling error may be assessed with field QC samples including field duplicates and trip blanks, and will be minimized by following standardized sampling protocol. The potential magnitude of analytical error may be assessed by evaluating laboratory quality control samples, and will help determine the significance of a reported concentration.

Data review is a three step process evaluating data completeness, data integrity and data usability. The level of data review will vary depending on the use of the data. Even data of poor precision and/or accuracy may still be useful. At a minimum, data quality assessments will include the review of the items detailed in the BRWM Basic Data Review Checklist (QAPP Appendix I). The project scientist (Hydrogeologist or Environmental Engineer) or Environmental Specialist, with input from the Project QA Chemist as needed, will determine the usefulness of data that may be of poor quality.

All data generated will be reviewed by the project scientist or Environmental Specialist for the following data quality indicators: precision, accuracy, representativeness, completeness, comparability and sensitivity as described below in Sections 10.1 through 10.6. Additionally, field notes, custody forms, and sample extraction and analysis dates will be reviewed by the project scientist or Environmental Specialist to assure holding times and other standard procedures are met. The project scientist may also review QC sample results to assure that recoveries are within acceptable ranges, as well as reviewing blank, spike, and duplicate samples to assure they are within acceptance criteria.

If data of questionable quality are reported (i.e., outside the acceptance criteria presented in Section 10 of this QAP) or other quality control issues uncovered, the project scientist or Environmental Specialist will be notified. At a minimum, any data quality issues will be outlined in the final report for which the data was generated. Need for additional corrective action, including the collection of new

or additional samples, will be determined after review of the DQOs for the project on a case by case basis with input from the project scientist or Environmental Specialist, and any other appropriate personnel. If additional corrective action is necessary, it will be implemented as described in Section 12.0 - Corrective Action.

### 10.1 Precision

The precision required for a particular study will depend upon the difference between background levels and the action level. Laboratory precision is only one part of the total precision of the measurement process leading from sample collection through data reporting. Selection of an acceptable precision level should not be based solely on what is attainable in the laboratory. Once the sample has been submitted to the laboratory much of the sample to sample variation has already been introduced into the sample by activities in the field.

Replicate or duplicate QC samples are submitted from the field to provide a means of determining the precision of the measurement process. The following formula will be used for precision measured from duplicative samples, as defined by the relative percent difference (% RPD).

$$\% \text{ RPD} = 100 \times ( |X1 - X2| / ((X1 + X2)/2) )$$

where: X1 is the concentration of duplicate #1; and  
X2 is the concentration of duplicate #2.

The RPD should be less than 50% for soil and 30% for water unless specified otherwise in the analytical method. RPDs outside these criteria shall at a minimum be noted in the final report for the data.

### 10.2 Accuracy

Accuracy is controlled primarily by the laboratory and usually reported as percent recovery. Analysis of surrogate recovery and known concentrations in Laboratory Control Samples should be within the recovery range listed in the referenced analytical method. Recovery outside appropriate criteria shall at a minimum be noted in the final report for the data.

### 10.3 Representativeness

Representativeness is the ability to collect a sample that reflects the conditions of a particular site. Representativeness is measured by how

well the sampling followed the proposed Sampling and Analysis Plan so as to provide results that accurately depict the media and environmental conditions being evaluated.

Documentation of field events confirms that proper protocols were followed and all planned samples were collected and analyzed.

#### **10.4 Completeness**

Completeness is the number of valid measurements divided by the number of samples taken. The project scientist or Environmental Specialist will be responsible for determining the completeness of the data; if completeness falls below 90%, it shall be noted in the final report for the data.

#### **10.5 Comparability**

Comparability is a qualitative parameter expressing the confidence with which one data set can be compared with another. Sample data should be comparable with other measurement data for similar samples and sample conditions. This goal is achieved through the use of standard techniques to collect and analyze representative samples and reporting analytical results in appropriate units. All laboratory samples for EPH, VPH and APH must be analyzed by the approved method.

When available, analytical data will be compared to data collected from previous sampling events and other secondary source data. If currently collected data differs from previously collected data, it shall be evaluated to determine if the current data reflects a data quality issue or a change in water quality. Unresolved data quality issues shall be, at a minimum, reported to the Project QA Chemist, Senior Hydrogeologist or Environmental Engineer as applicable. Need for corrective action will be determined after review of the DQOs for the project, and follow the procedures listed in Section 12.0 - Corrective Action of this QAP.

#### **10.6 Sensitivity**

Sensitivity is a quantitative measure indicating the lower limit that a compound of interest may be accurately quantified. The quantitation limits (reporting limits) of the method and those achievable by the analytical laboratory should be low enough to accurately report the contaminant at a specific concentration. The reporting limits should be based on the lowest calibration standard, not the method detection limit (MDL). Reported positive results between the reporting limit and the MDL should be flagged with an appropriate qualifier ("J" qualifier). The analytical methods chosen

for a particular project need to be sensitive enough to characterize the environmental conditions. When a project involves making a decision related to a specific regulatory limit, the analytical methods utilized should be sensitive enough to reach these limits.

## **11.0 DOCUMENT CONTROL**

Document control is a systematic procedure for ensuring that all sampling and monitoring documents are properly identified and accounted for during and after the completion of investigations and project reports. Document control will conform to MEDEP QMS Appendix 4, Section 4.5, Control of Department Documents and Records, and encompass document inventory and assignment record, and document file repository.

The term document control, as it applies to MEDEP/LUST Program inspections and investigations, refers to the maintenance of inspection, investigation and report project files. All project files shall be maintained by the appropriate project manager, and may be kept with the project manager's files or in the respective Regional Office Central Files. When sites are closed, project files shall be placed in the Regional Central Files, and a copy of the closure report sent to the MEDEP/BRWM Central File, located at the Augusta Office of MEDEP.

### **11.1 Project File**

The following documents shall be placed in the project file:

- (a) Original Chain of Custody Records and analytical data sheets;
- (b) A copy of field notes;
- (c) A complete copy of investigative reports and memorandums transmitting analytical or other data obtained during investigations;
- (d) Work Plans and Health and Safety Plans (HASPs);
- (e) All official correspondence received by, or issued by, the MEDEP/LUST Program relating to the investigation including records of telephone calls;
- (f) Applicable forms such as field worksheets;
- (g) Contracts and contract amendments for site work;
- (h) Any relevant permits; and

- (i) Any other relevant documents related to the original investigation/inspection or follow-up activities related to the investigation/inspection.

Under no circumstances is any personal observation or irrelevant information to be filed in the official project files. The project manager or designee shall review the file at the conclusion of the project to ensure that the file is complete.

## 11.2 Public Records

“Public records” shall mean all documents, papers, letters, maps, field notes, books, photographs, video, sound recordings, or other material regardless of physical form or characteristics made or received pursuant to law or ordinance or in connection with the transaction of official business by the MEDEP/LUST Program.

The following records shall not be deemed public unless specifically authorized:

- (a) Trade secrets and commercial or financial information obtained from a person, firm, or corporation, which is of a privileged or confidential nature according to *Uniform Trade Secrets Act*, 10 M.R.S. § 1542(4)(A) & (B);
- (b) Preliminary drafts, notes, impressions memoranda, working papers, and work products;
- (c) The contents of real estate appraisals, engineering or feasibility estimates and evaluations made for or by MEDEP/LUST Program relative to the acquisition of property or to prospective public supply and construction contracts, until such time as all of the property has been acquired or all proceedings or transactions have been terminated or abandoned; provided the law of eminent domain shall not be affected by this provision;
- (d) All investigatory records of public bodies pertaining to possible violations of statute, rule or regulation other than records of final actions taken provided that all records prior to formal notification of violations or noncompliance shall not be deemed public; and
- (e) Records, reports, opinions, information, and statements required to be kept confidential by federal or state law, rule, rule of court, or regulation by state statute.

## **12.0 CORRECTIVE ACTION**

Corrective actions must be taken immediately when data or field procedures are of questionable quality. These corrections may range from modifying certain procedures to reconducting an entire field investigation or resampling. Any suspected problems will be brought to the attention of the Project QA Chemist, Senior Hydrogeologist or Environmental Engineer as applicable.

The need for corrective action may be identified during performance audits, standard QC procedures, or when data seems erroneous. The steps in the corrective action are:

- (a) Identification and definition of the problem;
- (b) Investigation of the problem;
- (c) Determining the cause of the problem and appropriate corrective action;
- (d) Implementing the corrective action; and
- (e) Verifying the problem has been corrected.

The Senior Hydrogeologist or Environmental Engineer is responsible for ensuring effective corrective actions have been taken regarding sampling activities and other field work. The Project QA Chemist is responsible for ensuring effective corrective actions have been taken regarding laboratory activities.

## **13.0 IMPLEMENTATION SCHEDULE**

This QAP will be implemented by MEDEP/LUST Program upon USEPA approval. This QAP is to be considered a working document and will be periodically updated as technology, policy and protocol change.

## **14.0 DISTRIBUTION LIST**

Upon approval and implementation of this QAP, the original shall be kept with the MEDEP/LUST Quality Assurance Chemist, and copies sent to the MEDEP/LUST Program Manager, MEDEP Quality Assurance Officer and USEPA. Copies will also be made available to all personnel responsible for implementing the QAP (see Section 3.2) who will be required to review this QAP within 120 days of implementation and sign the QAP Log Sheet found in Appendix E. The remaining MEDEP/LUST Program staff will be required to review and sign within 360 days of implementation. New staff hired by the MEDEP/LUST Program, will be required to review the QAP within 90 days of the hiring date and sign the QAP



Log Sheet found in Appendix E. The completed signature page is kept by the Quality Assurance Chemist.

A copy of the approved QAP is available on the MEDEP website at <http://www.maine.gov/dep/spills/petroleum/lustqaplan.html>.

## **15.0 USEPA REPORTING**

### **15.1 LUST 4 Report**

The MEDEP LUST Program Manager completes the LUST 4 Report on a semi-annual basis with data provided from MEDEP/RS, MEDEP/TS and MEDEP/PM. The data includes UST universe performance measures, UST inspections performance measure, UST compliance performance measures, and LUST performance measures.

### **15.2 Public Record**

The Public Record is completed by the MEDEP LUST Program Manager annually with data provided by MEDEP/RS and MEDEP/PM. The Public Record is a record of information relating to underground storage tanks regulated under Subtitle I. See Appendix J, Process for the Collection of EPA LUST Trust Data for Motor Fuel Discharges for additional information on the Public Record. The Public Record is posted on MEDEP's webpage at <http://www.maine.gov/dep/waste/ust/pubs.html>.

**16.0 LIST OF ACRONYMS**

<b>Acronym</b>	<b>Description</b>
APH	Air-Phase Petroleum Hydrocarbons
DD	Division Director
DQ	Data Quality
DQO	Data Quality Objectives
DR	Division of Remediation
EE	Environmental Engineer
EPH	Extractable Petroleum Hydrocarbons
ES	Environmental Specialist
FID	Flame Ionization Detector
HASP	Health and Safety Plan
HETL	State of Maine Health and Environmental Testing Laboratory
LTCAP	Long-Term Corrective Action Plan
LUST	Leaking Underground Storage Tank
MEDEP	Maine Department of Environmental Protection
OHMS	Oil and Hazardous Materials Responder
PID	Photoionization Detector
PM	Division of Petroleum Management
QA	Quality Assurance
QC	Quality Control
QAP	Quality Assurance Plan
RPD	Relative Percent Difference
RS	Division of Response Services
project scientist	Environmental hydrogeologist, quality assurance chemist or environmental engineer assigned to the project
SOP	Standard Operating Procedure
TS	Division of Technical Services
USEPA	United States Environmental Protection Agency, Region I
UST	Underground Storage Tank
VOC	Volatile Organic Compounds
VPH	Volatile Petroleum Hydrocarbons