Department of Environmental Protection
Bureau of Remediation & Waste Management
RCRA Program

Standard Operating Procedure Change Record

Title: DEVELOPMENT OF A SAMPLING AND ANALYSIS PLAN

Identification #: RWM-DR 014

SOP Originator: Brian Beneski

Author	Revision	Description of Change	Date
Erika Bonenfant	RCRA 01	Substitute MEDEP/RCRA in the place of MEDEP/DR, and Division of Oil and Hazardous Waste Facilities Regulation in the place of Division of Remediation. Section 2.0: Change first sentence to "MEDEP/RCRA is responsible for the investigation and subsequent corrective actions for RCRA facilities throughout Maine."	8/1/2009

Approved by:

Scott Whittier, RCRA Program Director Date:

COVER SHEET
STANDARD OPERATING PROCEDURE

OPERATION TITLE: **DEVELOPMENT OF A SAMPLING AND ANALYSIS PLAN**

ORIGINATOR NAME: **Brian Beneski**
Quality Assurance Coordinator
Division of Remediation
Bureau of Remediation and Waste Management

Standard Operating Procedure: **RWM-DR-014**
Revision: **02**
Effective Date: **April 3, 2009**
Revised by: **Jean Firth**
Reviewed by: **Brian Beneski**

Five Year Review No Changes Needed:

Print Name:_____ Signature:_____ Date:_____

Print Name:_____ Signature:_____ Date:_____

Print Name:_____ Signature:_____ Date:_____

Print Name:_____ Signature:_____ Date:_____

1.0 PURPOSE

The purpose of this document is to describe the Maine Department of Environmental Protection, Bureau of Remediation and Waste Management, Division of Remediation's (MEDEP/DR) procedure for developing a Sampling and Analysis Plan (SAP).

2.0 APPLICABILITY

MEDEP/DR is responsible for the investigation and remediation of hazardous substance, petroleum, and landfill sites throughout Maine. Prior to conducting investigative field work, a SAP is developed that outlines the goals of the activity and methodology to achieve that goal. With the phrase "Never start a vast project from half vast ideas" in mind, a well developed SAP that is reviewed by all field activity team members should assure that the goals are obtainable, the methodology is consistent, and the data generated will meet the Data Quality Objectives (DQOs) for the project.

3.0 RESPONSIBILITIES

All MEDEP/DR staff will follow the procedures outlined in this SOP for the development of a SAP. The project manager for a site is generally responsible for the development of the SAP, with input as appropriate from the field staff (MEDEP OHMS and MEDEP/Division of Technical Support (MEDEP/TS) Geologists). Their respective supervisors and managers are responsible for ensuring that they are familiar with and adhere to this procedure, and receive the appropriate training and guidance for developing SAPs.

4.0 GUIDELINES

A SAP may be developed as a narrative document or staff may use the standard sampling and analysis form located with the Quality Assurance Plan on the Division of Remediation's Web page (a copy of the SAP form is also found as Attachment A of this SOP). A SAP will, at a minimum, contain the following elements.

4.1 ASSESSMENT OF EXISTING DATA

The project manager for the site will review any existing information on the site. Analytical data will be analyzed for completeness, quality and usability.

4.1.1 Site Reconnaissance

Prior to sampling events, particularly large multi - day events or multi media events, it is recommended that a site reconnaissance be conducted to work out any logistical problems that may arise during sampling. This would include site access issues, physical impediments to sampling, access issues with surface water sampling, etc. Any logistical issues discovered during the site reconnaissance should be mentioned in the SAP along with recommendations for overcoming these issues.

4.1.2 Conceptual Site Model

The first step in developing any sampling plan is to develop a conceptual site model (CSM). ASTM defines a CSM as "*a written or pictorial representation of an environmental system and the biological, physical and chemical processes that determine the transport of contaminants*

from, sources through environmental media to environmental receptors within the system." The CSM is a dynamic tool to be updated as new information becomes available, and therefore it should be amended, as appropriate, after each stage of investigation.

The CSM should be site-specific and take into consideration the following information:

- What are the COCs associated with the site?
- How were the chemicals were released into the environment? Where are the sources located? Was the release due to a surface spill of a liquid, a subsurface spill from piping or a tank, improper storage of materials such as chemical soaked filters at a drycleaner, through a floor drain to the subsurface beneath a building, or through a floor drain to a surface location? Is there a NAPL?
- What are the chemical characteristics that will influence how the chemicals will act in the environment? Do they dissolve readily in water? Are they very volatile or less volatile? How much was released?
- How does the geology, preferential pathways, groundwater flow, depth to groundwater, proximity to impermeable surfaces, and chemical attenuation influence contaminant migration?
- Where are the potential receptors and how might contaminants reach them? Have all of the migration pathways been identified? Has future construction been considered?

4.1.3 Specific Requirements for USEPA Pre - Remedial Site Assessment

For federal site assessment reports (PAs, SIs, SIPs, ESIs and HRS) if scoresheets are available from a previous site assessment report, these will be reviewed. The goal in reviewing the score sheets is to identify outstanding data needs (data gaps) for accurately assess the site. If no scoresheets are available, the project manager will complete SI scoresheets for the site. Information that is available will be used. If information is unavailable, the most conservative assumption in each scenario will be used.

Specific attention will be paid to pathways which score greater than 57. If data is incomplete for these pathways the sampling plan should focus on collecting samples which will clarify, confirm or disprove previous assumptions.

4.2 TITLE SECTION

The title section of an SAP will contain the name and town of project, the name and title of the person developing the SAP, and the expected date of the field work and field personnel.

4.3 INTRODUCTION

The introduction will state the DQOs which includes:

- Goals of the sampling plan;
- End use of data.

4.4 BACKGROUND INFORMATION

A brief explanation of the background of the Site will be presented.

4.4.1 Specific Background Requirements for Pre - Remedial Site Assessment Activities

For pre - remedial site assessment activities, a pathway analysis will be included in the SAP. Included in this analysis will be a discussion regarding the rationale for sampling or not sampling specific pathways and/or media.

4.5 SITE SPECIFIC HEALTH AND SAFETY PLAN

A Site Specific Health and Safety plan (HASP) will be developed and included with the SAP. The most current MEDEP/DR HASP form, which contains the minimum requirements for a HASP, can be found located with the Quality Assurance Plan on the Division of Remediation's Web page (A copy of the HASP is also found as Attachment B of this SOP).

If below grade sampling is part of the SAP, Dig - Safe must be notified at least 3 working days prior to the sampling event. Sample locations must be marked on the ground prior to calling Dig-Safe.

4.6 SAMPLING METHODOLOGY/EQUIPMENT

A description of the sampling methodology will be included in the SAP. In instances were a MEDEP/DR Standard Operating Procedures are available, reference to these procedures by either name or document number is sufficient. Also included will be an equipment checklist; a copy of the MEDEP/DR standard check list can be found located with the Quality Assurance Plan on the Division of Remediation's Web page.. This checklist will be used for loading equipment in preparation of the sampling event.

4.7 SAMPLES AND PARAMETERS

4.7.1 Sample Locations

A map showing planned sampling locations shall be included in the sampling plan. If locations are not pre - determined, the method that samples will be chosen and collected (field observations, random, etc.) will be outlined in the SAP. Also outlined will be any composite procedures, if applicable.

This section should also indicate sampling collection priority and order, to assure that the most important samples are obtained, and that sampling is generally done from low areas of contamination to higher levels of contamination. It is recommended that critical samples be collected in duplicate.

4.7.2 Media Sampled

A chart outlining the media collected and sample analysis will be included in the SAP. Generally, the media sampled will be:

- Soil;
- Groundwater (via monitoring wells and residential wells);
- Soil gas;
- Indoor air;
- Surface Water;
- Sediment; and
- Neat waste material.

4.7.3 Analytical Parameters

Parameters will be identified by either laboratory analysis methodology number, or generally accepted name of analysis.

Containers, preservation, and holding times will be as recommended by the laboratory providing analytical services. Laboratories and methods approved for use by the Division of Remediation QAPP can be found located with our Quality Assurance Plan on the Division of Remedaiton's Web site. DR staff may also use the Maine Health and Environmental Testing Laboratory (HETL).

4.8 FIELD QC SAMPLES

The specific needs for QC samples for the project will be outlined; including, but not limited to: background samples;

- Replicates;
- Trip blanks; and
- Equipment blanks

4.9 REPORT GENERATION

A Field Event Trip Report (FETR) will be developed for every sampling event (See MEDEP/DR SOP RWM-DR-013). Staff person responsible for developing the FETR will be stated in the SAP.

5.0 ACRONMYMS

- MEDEP/DR - Maine Department of Environmental Protection, Division of Remediation
- MEDEP/TS - Maine Department of Environmental Protection, Division of Technical Services
- SAP - Sampling and Analysis Plan
- DQO - Data Quality Objectives
- USEPA - United States Environmental Protection Agency Region I
- PA - Preliminary Assessment
- SI - Site Inspection
- SIP - Site Inspection Prioritization
- ESI - Expanded Site Inspection
- HRS - Hazard Ranking System
- HASP - Health and Safety Plan
- FETR - Field Event Trip Report

ATTACHMENT A
SAMPLING AND ANALYSIS PLAN FORM

ATTACHMENT B
HEALTH AND SAFETY PLAN FORM