



State of Utah
Department of Environmental Quality
Division of Environmental Response and Remediation

Leaking Underground Storage Tank (LUST) Risk Assessment Proposal Guide

A Customer Guide to assist Utah owners and operators of underground storage tanks in their preparation of a risk assessment proposal for petroleum contamination from LUST sites.

July 1999

TABLE OF CONTENTS AND STANDARD REPORT FORMAT COMPONENTS

<u>Section</u>	<u>Page</u>
1 EXECUTIVE SUMMARY	2
2 SOURCE ELIMINATION	2
3 DATA REQUIREMENTS	2
4 EXPOSURE CONTROL	2
5 CORRECTIVE ACTION TECHNOLOGY AND COST EVALUATION	4
6 REFERENCES AND APPENDICES	4
WORKSHEET #1 SITE CONCEPTUAL EXPOSURE MODEL	5

Introduction

As an alternative to performing cleanup to established standards, the Owner/Operator may propose to conduct a Tier 2 Risk Assessment to develop site-specific cleanup levels (SSCLs) for affected soil and groundwater by initially submitting this Risk Assessment Proposal (RAP). The RAP is due within **90 days** of receiving the guide. The purpose of the RAP is to ensure that a Tier 2 Risk Assessment appears to be the most feasible and cost-effective approach for Owners/Operators to meet the criteria outlined in Utah's Cleanup Standards Policy ([Utah Admin. Code R311-211](#)). If the RAP is approved, the Owner/Operator may proceed with a Tier 2 Risk Assessment as outlined in "Guidelines for Utah's Corrective Action Process for Leaking Underground Storage Tank Sites" which is available at Alpha Graphics (located at 140 South Main Street, SLC, Utah) at an approximate cost of \$50.00 per manual. Call Alpha Graphics at (801) 364-8451 to ensure sufficient copies are available (copies can be mailed if requested). Upon completion of the Tier 2 Risk Assessment, a Corrective Action Plan (CAP) must be provided for those areas of affected soil and/or groundwater that exceed the SSCLs. If the RAP is not approved, the Owner/Operator is required to submit a CAP to clean up affected areas to the previously state-established cleanup levels.

To complete the RAP, the Owner/Operator must meet the requirements shown in this RAP guide. The results of the RAP will help form the basis for conducting the site-specific Tier 2 Risk Assessment if approved by the Executive Secretary (UST). For this purpose, the Owner/Operator must complete and submit the enclosed Worksheet #1 for all complete exposure pathways at the site.

INSTRUCTIONS FOR COMPLETING THE RISK ASSESSMENT PROPOSAL (RAP)

1. Complete the Site Conceptual Exposure Model (Worksheet #1 of this guide).
2. Prepare a Risk Assessment Proposal using Sections 1 through 6 shown below as a standard report format.
3. Submit the Risk Assessment Proposal to the DERR within **90 days** of receiving the letter requiring a Corrective Action Plan or a Risk Assessment Proposal.

Section 1: Executive Summary

The Executive Summary is a summary of the Risk Assessment Proposal (RAP). The Executive Summary should be brief (one to two pages in length) and should provide a brief summary and description of:

- a. The name of the facility;
- b. The DERR facility identification number;
- c. The location of the site;
- d. The site history;
- e. Cause, location, nature and extent of contamination, and;
- f. Why a RAP was chosen instead of conducting cleanup or implementing corrective action measures to meet state-established cleanup standards.

Section 2: Source Elimination

Briefly describe how the sources of contamination were eliminated by removal or control. Sources may include the UST system, or any soil or groundwater contamination exceeding Utah's Tier 1 criteria or other applicable standards.

Section 3: Data Requirements

Review Worksheet #2 of DERR's "Guidelines for Utah's Corrective Action Process for Leaking Underground Storage Tanks" to aid in identifying the site-specific data required for a Tier 2 Risk Assessment. Site-specific parameter values are required for each of the four options for conducting a Tier 2 Risk Assessment. Identify the following in the RAP:

- a. The extent and degree of contamination, and the affected area and media for which the Tier 2 Risk Assessment is proposed;
- b. Which option in the Tier 2 Risk Assessment will be used (Options 1, 2, 3, and 4 are available);
- c. Data requirements for the applicable option that have **NOT** been met (see data requirements in Worksheet #2), and;
- d. Transient models that will be used for Option 3 and Option 4.

Section 4: Exposure Control

This section must contain the following:

- a. A completed Site Conceptual Exposure Model (SCEM, Worksheet #1 of this guide);

- b. A description of why exposure pathways marked incomplete on the SCEM are considered incomplete;
- c. A discussion of any current or potential exposures to human health and the environment, and;
- d. Identification and explanation of interim abatement measures and response actions that were implemented or are planned.

For exposure pathways that indicate either potential or current exposure, the Owner/Operator may need to implement interim measures to abate or control the exposure to human health and the environment. The Owner/Operator must evaluate the need for interim abatement measures when the contaminants are at levels that may be hazardous to human health and the environment. Abatement measures will be needed to control near-term impacts while the site evaluation effort proceeds. Abatement measures should be practical and reliable control actions which can be promptly implemented by the Owner/Operator. Examples of abatement measures may include placement of interim soil covers, installation of a vapor extraction system to control vapors, or installation of groundwater recovery wells to achieve hydraulic control of off-site plume migration.

The SCEM identifies the source of the release, the impacted media, the transport mechanisms, the exposure pathways and any potential receptors. The SCEM also identifies the combination of factors that could result in complete exposure pathways and potential human and environmental receptors that could result in potential harmful exposure to the contamination at the site. For the purposes of evaluating whether or not an exposure pathway is complete, the SCEM must also consider short-term construction worker exposure and long-term effects of an expanding or migrating contaminant plume. The Owner/Operator must evaluate the SCEM for all combinations of potential exposure pathways and indicate those that are not complete. For incomplete exposure pathways, the Owner/Operator must provide a brief explanation in this section of their rationale for eliminating the pathway.

The Tier 2 Risk Assessment considers several standard exposure pathways for contaminant migration from the source to receptor(s) via air, soil or groundwater transport mechanisms. Exposure pathways are grouped according to the medium in which the receptor contacts the site contaminants. For a given site, the assessment of any of the exposure pathways is a function of the physical site conditions, which include the transport mechanisms and concentration of the constituents of concern, and the presence and proximity of receptors.

For the purpose of the RAP *only*, an exposure pathway is considered complete when a contaminant concentration in the source zone exceeds the applicable Tier 1 criteria (Utah Tier 1 screening levels and distance to receptors), *and if one or both* of the following conditions exist at the site:

- The mechanism for contaminant transport would be active in the absence of any existing or future control measures, **or**;
- Receptors (points of exposure or “POEs”) could be potentially in contact with the affected media. Note: “Potential” means anticipated changes in site conditions or land use within five to ten years. The POE is defined as the point at which an individual or population may come in contact with contamination originating from a LUST site. For the purpose of this document, the Executive Secretary (UST) has determined that POEs shall include: water supply wells; surface water bodies; structures; and, underground utilities. For risk management purposes, the Executive Secretary (UST) has determined that the first down-gradient property line is to be considered a POE.

All exposure pathways meeting these criteria should be evaluated during the Tier 2 Risk Assessment. For the purpose of the Tier 2 Risk Assessment, for an actual risk to human health or the environment to be present, all three of the following components of a complete exposure pathway must be present at a site:

- An affected source medium;
- A mechanism for contaminant transport, *and*;
- A receptor.

For each exposure pathway, the SCEM has three possible outcomes:

- *Incomplete Pathway*: Exposure pathway does not apply under current site conditions.
- *Complete Pathway/Current Exposure*: Exposure pathway may pose an on-going exposure to receptors at a POE. The Owner/Operator must implement interim response measures, as necessary, and either propose a CAP to conduct cleanup or submit a RAP to conduct a Tier 2 Risk Assessment to calculate/derive SSCLs and to assess the need for possible corrective action.
- *Complete Pathway/Potential Exposure*: Exposure pathway could result in exposure to receptors at a POE under a potential exposure scenario. The Owner/Operator must either propose a CAP to conduct cleanup or propose a RAP to conduct a Tier 2 Risk Assessment to calculate/derive SSCLs and to assess the need for possible corrective action.

Section 5: Corrective Action Technology and Cost Evaluation

Evaluate and compare all applicable and appropriate corrective action technologies for the site which include the economic (cost-effectiveness) and technical feasibility of each technology evaluated, and the ability of each technology to protect human health and the environment. At least three or four technologies should be evaluated, if appropriate. The feasibility analyses must be completed, and should be presented in a simple format like the one shown below:

Corrective Action Technology Evaluated <i>(identify technologies below)</i>	Overall Effectiveness of Cleanup Technology <i>(check one below)</i>			Estimated Cost (U.S. dollars, \$) <i>(show estimated cost of each technology below)</i>
	<i>High</i>	<i>Medium</i>	<i>Low</i>	
Technology 1: _____	_____	_____	_____	\$ _____
Technology 2: _____	_____	_____	_____	\$ _____
Technology 3: _____	_____	_____	_____	\$ _____
Technology 4: _____	_____	_____	_____	\$ _____

Section 6: References and Appendices

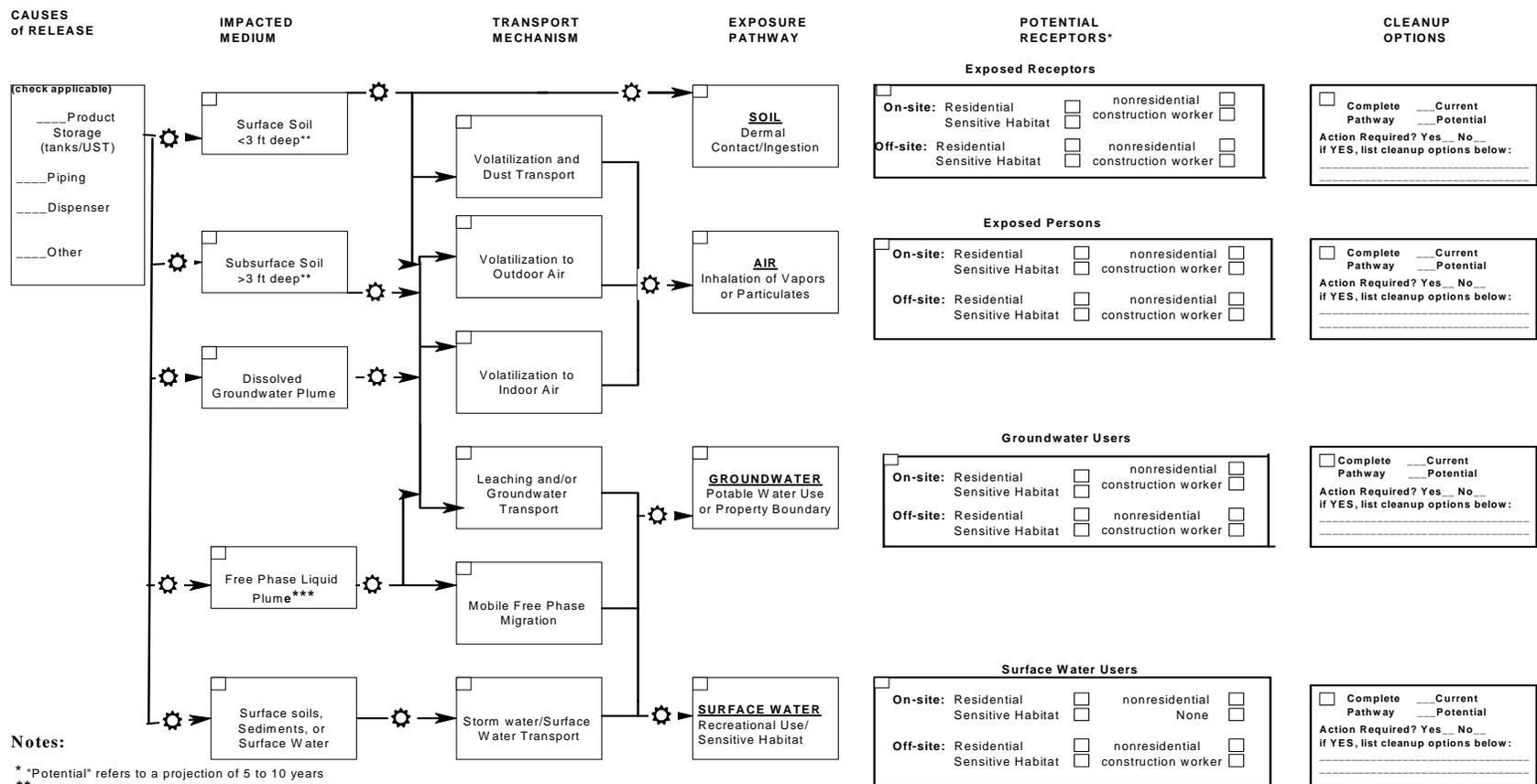
Refer to any outside publications, sources or information you used for preparing this proposal, or references to documents or reports previously submitted. Additional documents may be added as appendices, including:

- Soil boring and/or groundwater monitor well construction logs;
- Photographs and other supporting information;
- Engineering or technical drawings or schematics, and;
- Laboratory results and tabulated analytical data.

Worksheet #1: Site Conceptual Exposure Model (modified from GSI, 1995)

INSTRUCTIONS

1. Mark the small boxes if the specified condition is applicable
2. Fill in the shutoff valves to indicate that exposure pathway is **NOT** complete. Exposure pathway may not be complete due to source removal, control, and/or treatment
3. For each complete pathway, identify the cleanup options.



Notes:

* "Potential" refers to a projection of 5 to 10 years
 ** Evaluate potential for subsurface soil to be excavated and become surface soil
 *** Free Product is a source that must be eliminated or controlled. See Free Product Removal Report in Subsurface Investigation, Appendix D.