

EXECUTIVE SUMMARY

Purpose

The purpose of this report is to provide decisionmakers with relevant information pertaining to the implementation of various remedial action alternatives at Operable Unit 2, Hill Air Force Base, Utah (Hill AFB).

Background

Hill AFB was placed on the National Priorities List in July 1987. Operable Unit 2 (OU 2) is one of seven operable units being investigated for contamination associated with the improper disposal of hazardous waste. OU 2 consists of two different areas: Perimeter Road and Chemical Disposal Pit #3 (Chem Pit 3). The Perimeter Road area has been investigated and found free of contamination, except in those areas currently being investigated as part of other operable units. Therefore, while the title of this report refers to OU 2, the primary purpose of this report is to present information relating to potential remedial action alternatives for those environmental media affected by past waste disposal activities at Chem Pit 3.

Base records indicate that at Chem Pit 3 from 1967 to 1975, two unlined earthen trenches received unknown quantities of various chlorinated solvents primarily including trichloroethylene (TCE), tetrachloroethylene (PCE), 1,1,1-trichloroethane (TCA), and methylene chloride. Because these solvents are heavier than water and are only slightly soluble, a dense non-aqueous phase liquid (DNAPL) several feet thick has settled on top of the underlying low permeability zone at OU 2. This layer is located beneath the water table at a depth of approximately 60 to 70 ft and has resulted in a groundwater contamination plume extending over approximately 36 acres. As further studies are performed, and the level of understanding of the site are revised and enhanced, amendments to the remedial investigation and this feasibility study will be developed.

A remedial investigation and baseline risk assessment have indicated that this site represents a threat to human health and the environment. Accordingly, an interim remedial action designed to remove the bulk of contamination has been approved and is scheduled for construction during May 1992 through May 1993. This feasibility study was developed to evaluate what further actions should be taken to remediate the site.

Report Contents

This report presents the following:

- Review of investigations and evaluations performed through May 1992;
- Remedial action objectives and the possible general response actions;
- Identification and screening of remedial technologies;
- Development and screening of remedial alternatives;
- Detailed analysis of individual alternatives; and
- Comparative analysis of all alternatives.

To simplify the alternative development and evaluation process, the site was administratively divided into two separate and distinct areas, source area and non-source area; see Figure ES-1. In general, the source area is characterized as the immediate area underlain by DNAPL and contiguous areas west of Perimeter Road. This area has the highest contaminant concentrations, occupies a relatively small area (approximately 6 acres), and will be very difficult to remediate to a high degree. Accordingly, several energy-intensive and innovative removal technologies were proposed and evaluated for this area. The non-source area is characterized as the groundwater contamination plume downgradient from the DNAPL (i.e., the source of contamination) and east of Perimeter Road. This area generally has lower contaminant concentrations, but occupies a much larger tract (approximately 30 acres). Accordingly, more conventional and reliable technologies were proposed and evaluated for this area. Therefore, although the remedial action objectives (i.e., protectiveness of human health and the environment) are the same for the two areas, the technologies implemented in the two areas likely will be different.

Remedial action alternatives were developed by combining a variety of containment and treatment technologies. A total of 12 source area alternatives and 7 non-source area alternatives were developed and screened in Section 3.0. Of these, 5 source area alternatives and 4 non-source area alternatives were promising enough to warrant a detailed analysis (see Section 4.0). In the detailed analysis, the alternatives were evaluated based on the following criteria:

- Overall Protection of Human Health and the Environment;
- Compliance with Applicable or Relevant and Appropriate Requirements (ARARs);
- Long-term Effectiveness and Permanence;
- Reduction of Toxicity, Mobility, or Volume Through Treatment;
- Short-term Effectiveness;
- Implementability; and
- Cost.

State and community acceptance will be addressed in the Record Of Decision (ROD) once comments from the regulatory agencies and interested public on the RI/FS reports and the Proposed Plan have been received. A summary of the results of the evaluation process for each of the alternatives carried through the detailed analysis is given in Table ES-1. The determination of whether an alternative satisfies the evaluation criteria is subjective. Many of the evaluation criteria do not have quantitative values which must be satisfied. The purpose of this table is to concisely communicate which alternatives are considered the most promising in relation to the evaluation criteria.

It is anticipated that one source area alternative and one non-source area alternative will be selected for implementation. The combination of these two area-specific alternatives will comprise the site-wide alternative.

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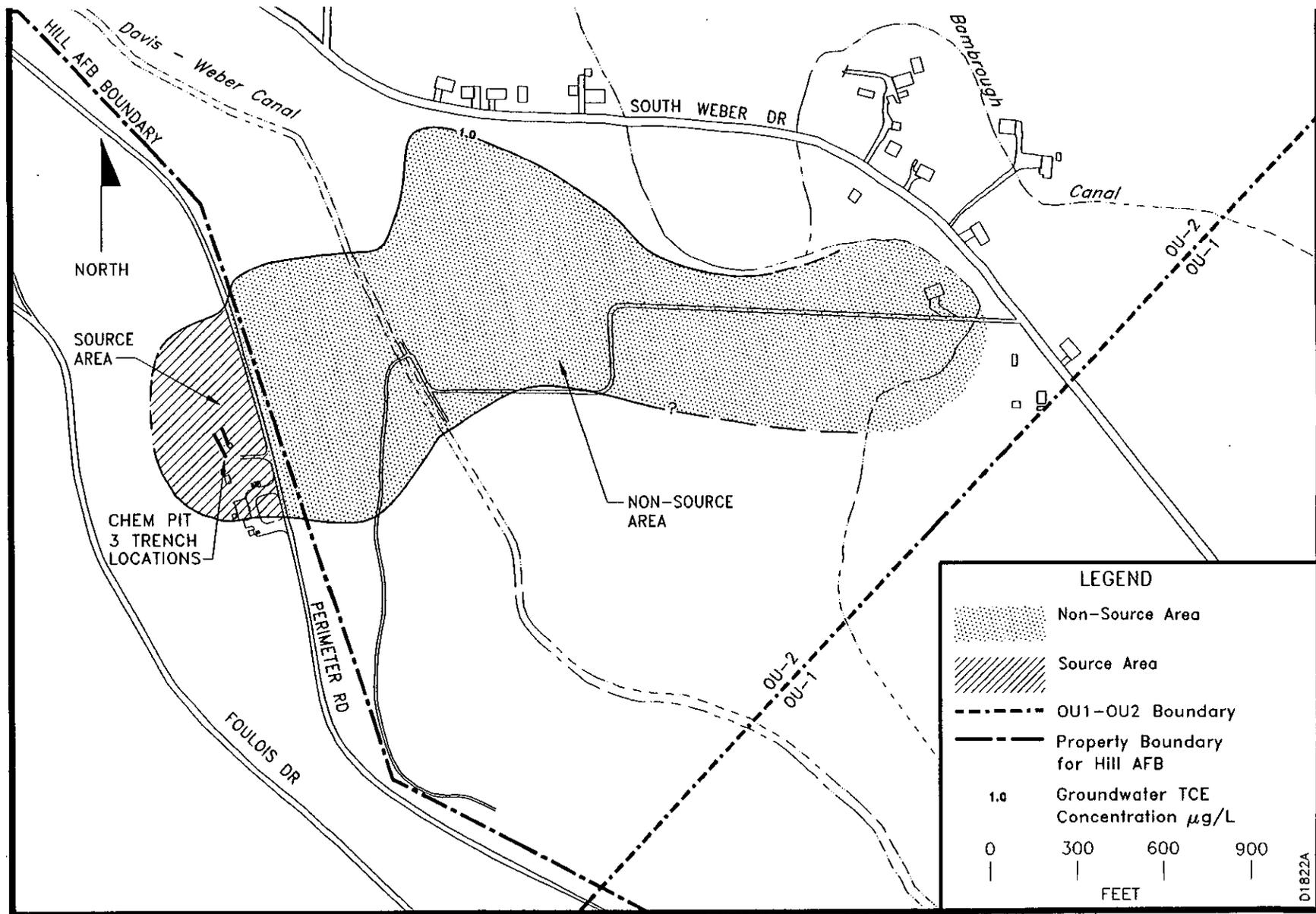


Figure ES-1. Delineation of Source Area and Non-Source Area

Table ES-1

Executive Summary of Remedial Alternatives for Hill AFB, OU 2

Evaluation Criteria	Source Area Alternatives					Non-Source Area Alternatives			
	1	4	5	11	12	1	3	5	7
Protectiveness	x	o	o	o	o	x	•	•	•
ARAR Compliance	x	o	o	o	x	x	•	•	•
Long-term Effectiveness and Permanence	x	o	o	•	•	x	•	•	•
Reduction of Contaminant Toxicity, Mobility, and Volume Through Treatment	x	o	o	o	o	x	o	•	•
Short-term Effectiveness	x	o	o	o	x	x	•	•	•
Implementability	•	•	o	o	o	•	•	•	•
Total Present Worth Cost	\$443,000	\$15,448,000	\$18,495,000	\$20,773,000	\$25,768,000	\$2,700,000	\$20,594,000	\$14,530,000	\$20,010,000
State Acceptance	--	--	--	--	--	--	--	--	--
Community Acceptance	--	--	--	--	--	--	--	--	--

- High potential to satisfy criterion. (Some minor issues may need to be resolved. Remediation time expected to be less than 30 years.)
- o Medium potential to satisfy criterion. (Some uncertainty, but not considered substantial. Remediation time expected to be between 30 and 250 years.)
- x Low potential to satisfy criterion. (Major problems in alternative's approach. Remediation time expected to be greater than 250 years.)
- Not yet evaluated. (Criterion will be addressed in the ROD once comments on the RI/FS report and proposed plan have been received.)

Source Area Alternatives Descriptions	Non-Source Area Alternatives Descriptions
<p>1. No Action</p> <p>4. No containment, groundwater extraction/treatment, in-situ treatment of vadose and saturated zones (steam stripping/vacuum extraction).</p> <p>5. Downgradient vertical barrier, groundwater extraction/treatment, in-situ treatment of groundwater, vadose zone, and saturated zone (steam stripping/vacuum extraction).</p> <p>11. Encapsulation, groundwater extraction/treatment, and in-situ treatment of saturated and vadose zone (steam stripping/vacuum extraction).</p> <p>12. Encapsulation, groundwater extraction/treatment, in-situ treatment of saturated zone (soil flushing), shallow excavation/treatment/landfill of vadose zone.</p>	<p>1. No Action</p> <p>3. No groundwater extraction, in-situ treatment of groundwater, saturated zone and vadose zone, surface water collection/treatment/stream discharge.</p> <p>5. Groundwater extraction/subsurface drain/treatment/IWTP, surface water collection/treatment/stream discharge.</p> <p>7. Groundwater extraction/subsurface drain/treatment/IWTP, in-situ treatment of groundwater, saturated zone and vadose zone, surface water collection/treatment/stream discharge.</p>

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