

## EXECUTIVE SUMMARY

The Resource Conservation and Recovery Act of 1976 (RCRA) was promulgated to regulate the generation, transportation, storage, treatment and disposal of hazardous wastes. Simultaneous to the passage of RCRA, the Department of Defense (DOD) devised a Comprehensive Installation Restoration Program (IRP) to identify, assess and correct potential environmental deficiencies that could result in ground water contamination and probable migration of contaminants beyond DOD installation boundaries. The IRP has been developed as a three phase program:

- Phase I - Problem Identification/Records Search
- Phase II - Problem Confirmation and Quantification
- Phase III - Corrective Action

Engineering-Science (ES) was retained by the Air Force Engineering and Services Center on 15 July 1981, to conduct the Hill AFB Records Search under Contract No. F08637-80-G0009, Call No. 0011, using funding provided by the Air Force Logistics Command.

The on-site portion of Phase I was performed at Hill AFB on September 3 and 4, and September 21 through September 25, 1981. During this period formal interviews were conducted with base personnel familiar with past waste disposal practices, and file searches were performed for identified facilities which have generated, handled, transported, and disposed of waste materials.

### INSTALLATION DESCRIPTION

Hill AFB is located in northern Utah approximately 25 miles north of Salt Lake City and 5 miles south of Ogden. The base covers nearly 6,666 acres and is situated on a plateau which is approximately 300 feet above the valley floor. The base is bordered on the west by Interstate 15, the south by State Route 193, and the northeast and north by the Davis & Weber Canal.

## ENVIRONMENTAL SETTING

As a result of our on-site visit, the following observations have been made with regard to the environmental sensitivity of Hill AFB:

- o The primary regional aquifer, the Delta Aquifer, underlies Hill Air Force Base at great depth (418-515 feet). The Delta Aquifer is confined by thick clay layers overlying it.
- o Hill Air Force Base and most adjacent municipalities obtain water supplies from wells screened into the Delta Aquifer. An exception to this is the shallow aquifer at Roy, west of Hill AFB.
- o Area precipitation is 18.9 inches and evapotranspiration averages 40 inches. Soils tend to be moderately permeable.
- o The Davis & Weber Canal marks the northeastern and northern perimeter of the base boundary and provides a potential for surface water contamination.

Based on these regional characteristics, it is concluded that the potential for the migration of contamination to deep aquifers, caused by past waste disposal practices is low. With regard to the shallow aquifer at Roy, it is unlikely that installation-generated contamination would impact local ground water quality because of the following:

- o the localized extent of the shallow aquifer
- o the isolation of the aquifer from the ground surface by a confining layer
- o the aquifer is four miles from the bases' waste sites and separated by a vertical distance of some 300 feet.

Perched water tables are known to develop locally in the study area due to the presence of near-surface clay layers at shallow depths. These clay layers tend to impede the downward migration of infiltrating precipitation, which then may flow down-dip along the clay layer, emerging at a point where the clay intersects the topographic surface as springs. Installation-generated contamination would thus typically appear in these springs before contaminating underlying aquifers.

## PROCEDURES

A review of past and present waste generation sources at the base was conducted to determine past disposal methods for hazardous wastes. This review included industrial shop areas, pesticide and herbicide utilization, radioactive waste sources, fire control training area, hazardous waste storage areas and Fuels Management areas. Past and present waste materials were identified and the disposal methods used for each source were determined according to base records or interviews. The waste management facilities included on-site landfills (five sites), evaporation ponds, wastewater treatment plants, sanitary sewers, storm sewers, septic tanks, and off-site waste contract disposal.

Thirteen areas located on Air Force property were identified as warranting further evaluation into this study. These sites were assessed using a rating system which takes into account factors such as site characteristics, waste characteristics, potential for contaminant and waste management practices. The details of the rating procedure are presented in Appendix F and the results of the assessment are given in Table 1. Rating scores were developed for the individual sites and the sites are listed in order of ranking. The rating system is designed to indicate the relative need for more detailed site assessment under Phase II.

## FINDINGS AND CONCLUSIONS

Based on the results of the project team's field inspection, review of records and files, and interviews with base personnel, the following conclusions have been developed. The conclusions are listed by category.

### Landfills

a. Landfill No. 4 has the greatest potential for off-site migration of contaminants and has received a score of 77.

b. Landfill No. 3 received a score of 70 because it received large quantities of industrial sludge and chemicals; however, no specific leachate has been observed coming from this area.

TABLE 1  
SUMMARY RANKING OF POTENTIAL  
CONTAMINATION SOURCES

RANK	SITE NAME	PERIOD OF OPERATION	SCORE
1	Landfill No. 4	1967-1973	77
2	Chemical Disposal Pit No. 1 & 2	1954-1973	72
3	Landfill No. 3	1947-1967	70
4	Sodium Hydroxide Leak	1980 <sup>1</sup>	62
5	Berman Pond	1940-1956	61
6	IWTP - Drying Beds	1956-1976	57
7	Chemical Disposal Pit No. 3	1967-1975	56
8	Little Mtn. - Drying Beds	1973-1978	53
9	Fire Training Area No. 1	1958-1973	50
10	Landfill No. 5	1977-Present	43
11	Landfill No. 2	1963-1965	40
12	Landfill No. 1	1955-1967	38
13	Herbicide Orange Test Plot	1973 <sup>2</sup>	20

<sup>1</sup>Leak occurred over a 12 month period.

<sup>2</sup>Small scale test procedure conducted on a remote portion of the Utah Test and Training Range.

c. Landfill No. 5, the hazardous waste landfill located at Lakeside, received a score of 43 because of its remote location from population and distance from the base boundary.

#### Chemical Disposal Pits

a. Chemical Disposal Pits No. 1 and No. 2 received a combined score of 72 because they received large quantities of solvents, oils and paint strippers.

b. Chemical Disposal Pit No. 3, which was operated from 1967 to 1975, received large quantities of TCE bottoms from the solvent recovery unit and vapor degreasers and received a rating of 56.

#### Leak Incident

The only major leak incident which has been identified is a sodium hydroxide leak at the industrial wastewater treatment plant occurred in 1980. This leak received a score of 62.

#### Evaporation Pond

Berman Pond received industrial plating wastewater from 1940 to 1956. The site received a score of 61 because of its potential for contaminant migration.

#### Sludge Drying Beds

a. The sludge drying beds located at the industrial wastewater treatment plant were operated from 1956 to 1976. During that time they received large quantities of metallic sludges. Filtrate from the sludge entered the ground and could possibly have contaminated the ground water. The site received a score of 57.

b. Sludge drying beds located adjacent to the industrial water treatment plant at Little Mountain were utilized in the 70's as a disposal area for phenolic paint strippers. The site received a score of 53.

#### Fire Training Area

Fire Training Area No. 1 received a score of 50.

#### Herbicide Orange Test Plot

The Herbicide Orange Test Plot area located adjacent to target 21 at the UTTR received a score of 20. The testing was on a very small scale, and the test area is remote, received small amounts of chemical and has soils which are relatively impermeable. The site poses little or no contamination potential.

RECOMMENDATIONS

The following recommendations are made to further assess potential for contaminant migration from waste disposal areas at Hill Air Force Base. The recommended monitoring program for Phase II is summarized as follows:

<u>Site</u>	<u>Parameters</u>
Landfill No. 4	Electrical resistivity survey
Chemical Disposal Pits No. 1 and No. 2	Electrical resistivity survey combined with a ground water monitoring program
Landfill No. 3	Electrical resistivity survey combined with a ground water monitoring program
Sodium Hydroxide Leak	Site monitoring using lysimeters
Berman Pond	Site monitoring using lysimeters
IWTP Sludge Beds	Site monitoring using lysimeters
Chemical Disposal Pit	Site monitoring using lysimeters

Other recommendations address the operation of Landfill No. 5 at Lakeside, and the analyzing of samples from Wells No. 3 and No. 4 for all organic parameters from EPA's priority pollutant list.