

1. INTRODUCTION

This Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) report documents the Phase II activities and results for the Group 3 suspected releases solid waste management units (SWMUs) at the Deseret Chemical Depot (DCD). Science Applications International Corporation (SAIC) conducted the Phase II RFI activities at the Group 3 SWMU for the U.S. Army Environmental Center (USAEC) under Contract No. DAAA15-91-D-0017, Delivery Order 0007. This investigation was designed to meet the requirements outlined in Module VII of the Utah Hazardous Waste Part B Permit No. UT5210090002, which governs activities related to environmental investigations conducted at DCD (Utah 1989).

Twenty-nine SWMU are located at DCD: 2 known releases SWMU and 27 suspected releases SWMUs. The suspected releases SWMU have been subdivided into Groups 1, 2, and 3 for scheduling and contracting purposes. Phase I RFI activities were initiated at the 27 suspected releases SWMU in 1990. SAIC was responsible for conducting the Phase II RFI for the Group 3 SWMU listed in Table 1-1.

**Table 1-1. Group 3 Phase II RFI SWMUs
Deseret Chemical Depot, Tooele, Utah**

SWMU	SWMU Number
Chemical Munitions Storage Area	11
Building 533 Foundation (Empty Drum Storage Area)	19
Building 520 (Crating Facility)	20
Building 536 (Chemical Agent Munitions Disposal System [CAMDS] Salt Storage)	33
Slag Piles and Bomb Fragments	37

1.1 PURPOSE AND SCOPE

The primary purpose and objective of the Group 3 Phase II RFI at DCD was to augment the findings of the Phase I investigation and to determine the presence, type, concentration, and extent of contamination identified at each SWMU under investigation. In addition, it was necessary that sufficient data be obtained to:

- Evaluate the potential for contaminant release and migration
- Evaluate the need for conducting a Corrective Measures Study (CMS)
- Conduct human health and ecological risk assessments.

The scope of the Phase II RFI project activities included preparing project-specific planning documents, conducting field investigation and sampling activities, and generating data presentation/evaluation reports. A Data Collection Quality Assurance Plan (DCQAP) (SAIC 1995a), and a Project Management Plan (PMP), Data Management Plan (DMP), and

Health and Safety Plan (HASP) (SAIC 1995b) were developed prior to the Phase II activities. These documents served as the functional guidelines under which all Phase II activities were conducted. DCQAP Addendum 1 (SAIC 1999a) and DCQAP Addendum 2 (SAIC 1999b) were prepared for the Phase IIA and Phase IIB sampling activities, respectively. These DCQAP addenda present the sampling and analysis plan for the additional field investigation activities, any deviations or modifications to the existing procedures in the Phase II planning documents, and any new or additional procedures or requirements. All planning documents were reviewed and approved by USAEC, DCD, and the Utah Department of Environmental Quality (UDEQ) prior to initiation of field activities. Phase II RFI data reports submitted to UDEQ for review and comment include the Phase II Final Draft RFI Report (SAIC 1995c) and technical memoranda summarizing the findings of the Phase IIA (SAIC 1999c) and Phase IIB (SAIC 2000) field activities.

1.1.1 Investigation Objectives

The data gathered during the field investigation activities and the associated analytical results were used to evaluate the presence, type, extent, and concentration of contamination. This information also was used in the evaluation and determination of human health and ecological risk assessments. These assessments compare identified risks against ARARs and identify remedial action levels for contaminants that pose a threat to human health and/or the environment. The current and future intended uses of DCD are considered when the preliminary remediation goals and their impact at DCD are determined. DCD is currently a secure Army installation under Army control and populated by Army personnel. Since a future land use plan has not been established, it is assumed that DCD will remain under Army control. The results of the risk assessments and the recommendations at the SWMU under investigation were based on the assumption that the installation would remain an industrial site under Army control in the future. In accordance with the Utah Hazardous Waste Management Rules (UDEQ 1999), a residential scenario was evaluated at all Group 3 SWMUs, although this currently is considered an unlikely future land use scenario.

1.2 REPORT ORGANIZATION

This report presents an evaluation and analysis of all of the data that were collected as part of the Group 3 Phase II RFI in addition to applicable pre-Phase I and Phase I activities. Information on the history and environmental setting of the installation; a summary of the sampling and analytical program; the methodologies used in conducting the human health and ecological risk assessments; and results, conclusions, and recommendations for each Group 3 SWMU are included. The report includes 13 sections and appendices containing field and laboratory data and risk assessment calculations. The information included in each section is summarized below.

Section 1. Introduction—The remainder of this section summarizes the history and regulatory background of the installation, describes the SWMU under investigation, and provides information from previous investigations conducted at the Group 3 SWMUs.

Section 2. Environmental Setting—This section describes the geographic and environmental setting of DCD. The physiography, climate, land use, regional and local geology, hydrogeology, soils, background soils and groundwater characteristics, and vegetation and wildlife are discussed.

Section 3. Sampling and Analytical Program—This section presents the sampling methodology and field investigation procedures that were implemented as part of the field activities; an overview of the laboratory chemical analysis program; and the data quality assessment, which details the data precision, accuracy, representativeness, comparability, and completeness (PARCC).

Section 4. Risk Assessment Methodology—This section provides the methodologies and technical basis for the human health and ecological risk assessments. Chemicals of potential concern (COPCs), exposure and toxicity assessment, risk characterization, and uncertainty analysis are discussed.

Sections 5 through 10. Background and SWMU-specific Phase II Results—Sections 5 through 10 present the site-specific results for background and SWMU 11, 19, 20, 33, and 37, respectively. The current SWMU-specific site conditions, geology and hydrology, results from previous investigations, Phase II field approach and results, nature and extent of contamination, results of the human health and ecological risk assessments, and conclusions and recommendations are included.

Section 11. Conclusions and Recommendations—This section presents conclusions and recommendations for each Group 3 SWMU that was investigated as part of the Phase II activities.

Section 12. References—This section lists the guidelines, specifications, and other materials that were used to supplement and support the preparation of this report and the evaluation and analysis of the data.

Section 13. Glossary of Acronyms—This section lists the acronyms and abbreviations used in this report.

Appendices—The appendices contain field data (i.e., soil boring and well logs, groundwater modeling results, and sampling and measurement forms), slug test data, land survey data, laboratory records, soil organic vapor (SOV) survey results, chemical data, site photographs, the SWMU 20 and 37 reconnaissance report, toxicological profiles, and risk assessment calculations.

1.3 FACILITY LOCATION AND HISTORY

DCD is located in Tooele County, Utah, approximately 35 miles southwest of Salt Lake City. DCD encompasses 19,355 acres in the northern portion of Rush Valley and is located at an average elevation of approximately 5,240 feet above mean sea level (msl). The valley is bounded to the east by the Oquirrh Mountains, which rise from the valley floor to a maximum elevation of 10,630 feet above msl. The northern boundary of Rush Valley is formed by the Stockton Bar, a Lake Bonneville Pleistocene depositional feature, and South Mountain, a

relatively low-lying uplift separating Rush Valley from Tooele Valley to the north. The Stansbury and Onaqui Mountains border Rush Valley to the west at approximately 6,600 feet above msl and reach a maximum elevation of 11,031 and 9,067 feet above msl, respectively. Figure 1-1 shows the location of DCD.

The construction of DCD began in early 1942 and was completed in 1943. DCD was designed for the storage and shipment of all types of chemical warfare material, poisonous gases, chemicals, and chemically filled ammunition. During World War II, the facility also served as a backup depot for the Stockton Ordnance Depot and Benicia Arsenal, both of which were located in California. Small arms, vehicles, and other military equipment were stored on the property until they were transported to the Pacific theater of operations.

Following World War II, the Depot was reduced to a military chemicals storage facility, employing only a small staff for maintenance and security. In July 1950, the Depot was reactivated for the Korean Conflict, and in May 1955, DCD was redesignated the Deseret Depot Activity and placed under the command of Tooele Army Depot (TEAD) and underwent a major expansion. The Depot Activity was discontinued in 1962, at which time the Depot became part of TEAD and was designated as the TEAD-South Area. In 1995, the facility was placed under the Chemical Biological Defense Command and was named Tooele Chemical Activity (TCA). In October 1996, TCA officially was changed back to the original name of DCD.

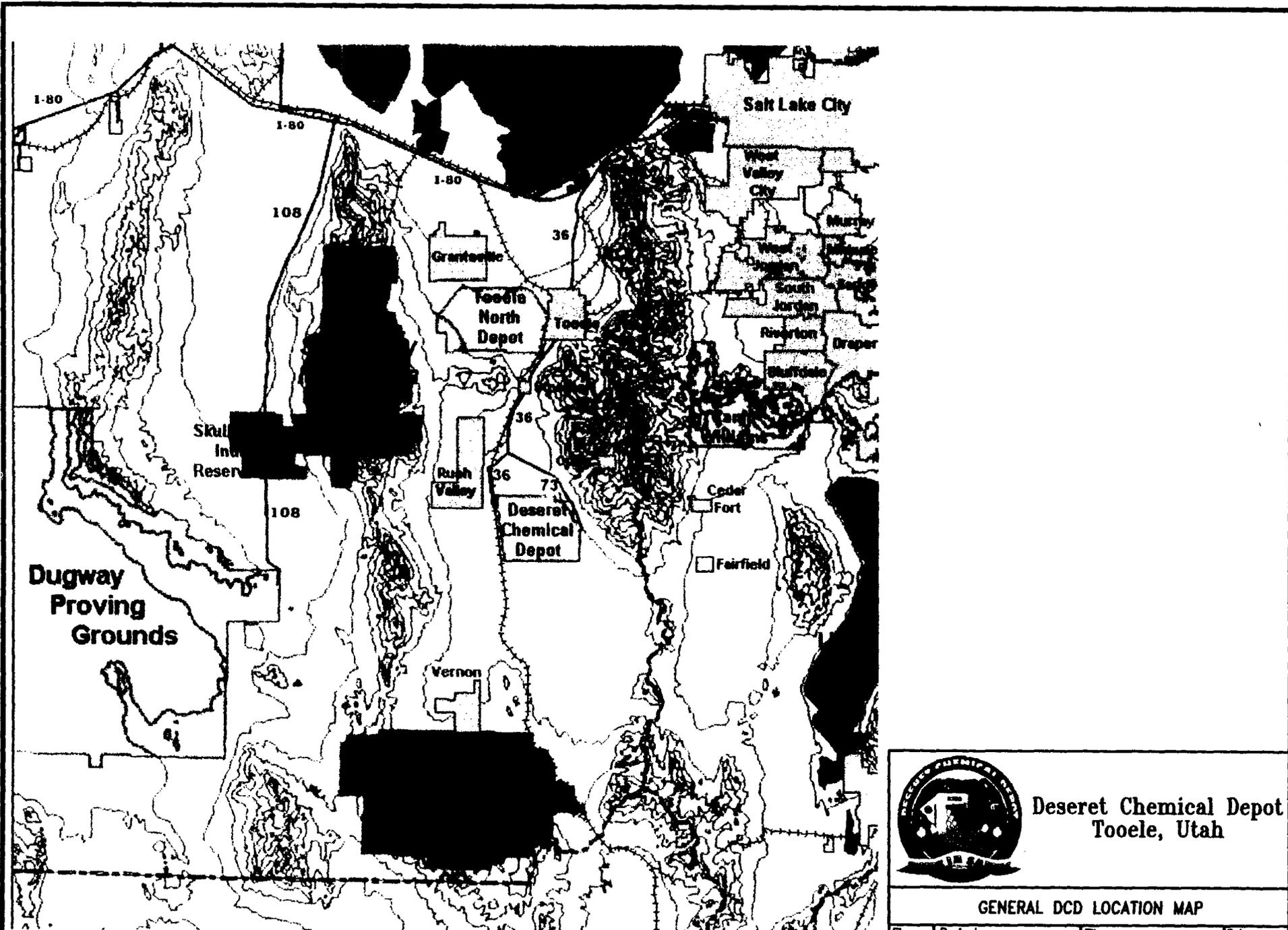
Since the end of World War II, TEAD's mission has expanded gradually to include the support of other U.S. Army installations in the western United States. Over time, the North Area assumed the missions of Ogden Arsenal (Ogden, Utah), Benicia Arsenal (near Sacramento, California), and Mount Rainier Ordnance Depot (near Tacoma, Washington). Activities have included rebuilding guided missiles, rebuilding inner tubes and tires, and calibrating test equipment.

Since the 1940s, DCD has been used for the storage, renovation, disposal, and burial of many types of chemical agent munitions. These munitions have included mustard (H, HD, and HT), Lewisite (L), Sarin (GB), Tabun (GA), nerve gas (VX), phosgene (CG), o-chloro-benzylidene malononitrile (CS), cyanogen chloride (CK), smoke agent (FS), HC smoke, white phosphorus (WP), thermate, and napalm (NUS 1987). Table 1-2 lists the chemical name, chemical formula, and common uses for each chemical listed above.

The current mission of DCD is the storage, surveillance, and demilitarization of chemical surety ammunition. In 1996, DCD began disposing of its chemical munitions stockpiles at the Tooele Chemical Agent Disposal Facility (TOCDF). The TOCDF is a full-scale incinerator and treatment facility that includes four incinerators used for various decontamination activities associated with chemical agent and munitions. The operation of the TOCDF is performed by EG&G under the direction of the Program Manager for Chemical Demilitarization (PMCD).

1.4 REGULATORY BACKGROUND AND PREVIOUS DCD INVESTIGATIONS

DCD currently is operating under a RCRA Hazardous Waste Part B Permit for Chemical Stockpile Disposal Plant, now the TOCDF (Permit No. UT5210090002), which the Utah Solid and Hazardous Waste Committee issued in 1989. Prior to the work that has been conducted



**Deseret Chemical Depot
Tooele, Utah**

GENERAL DCD LOCATION MAP

Figure: 1-1	Project: 01-0827-03-6523-042	File: 7109/RFIGEN	Date: NOV. 2000
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**Table 1-2. Chemical Agents Stored at SWMU 11
Deseret Chemical Depot, Tooele, Utah**

Common Name	Chemical Name	Chemical Formula	Use
H (Mustard), HD (Distilled Mustard), HT	Bis(2-chloroethyl)sulfides	(ClCH ₂ CH ₂) ₂ S	Blister Agent
L (Lewisite)	Dichloro(2-chlorovinyl)arsine	ClCH:CHAsCl ₂	Blister Agent
GB (Sarin)	Isopropyl methyl phosphonofluoridate	CH ₃ P(O) (F) OCH (CH ₃) ₂	Nerve Agent
GA (Tabun)	Ethyl N, N-dimethyl phosphoramidocyanidate	C ₂ H ₅ OP(O)(CN)N(CH ₃) ₂	Nerve Agent
VX (Nerve Gas)	O-ethyl-S-(2-diisopropylaminoethyl) methyl phosphonothiolate	CH ₃ P(O)(C ₂ H ₅ O)SCH ₂ CH ₂ N-CH(CH ₃) ₂	Nerve Agent
CG (Phosgene)	Carbonyl chloride	COCl ₂	Choking Agent
CS	O-chlorobenzylidene malononitrile	ClC ₆ H ₄ CHC (CN) ₂	Riot Control Agent
CK	Cyanogen chloride	CNCL	Blood Agent
FS (Smoke Agent)	Sulfur trioxide-chlorosulfonic acid solution (55-45 by wt)	(SO ₃) _n ; ClSO ₂ OH	Smoke
HC (Smoke Agent)	Mix of aluminum, zinc oxide, and hexachloroethane	Al, ZnO, C ₂ Cl ₆	Smoke
WP	White phosphorus	P ₄	Smoke
Thermate	Thermate with nitrate, sulfur, and binder	(Fe ₂ O ₃ + Al)	Incendiary Mix
M1 and M2 Thickeners (Napalm)	Mixed aluminum soap	(50% coconut oil acids) (25% naphthenic acids) (25% oleic acid)	Incendiary Thickener

Source: NUS 1987

under this permit, various investigations were initiated to evaluate, characterize, and assess the environmental conditions at DCD. The investigations that were conducted at DCD before the issuance of the Part B permit are summarized below. Table 1-3 summarizes the investigations conducted before and after issuance of the RCRA permit. Section 1.5 details the previous investigations that were conducted at the Group 3 SWMUs.

Installation Assessment (USATHAMA 1979)—The initial environmental investigation of DCD was performed by the U.S. Army Toxic and Hazardous Materials Agency (USATHAMA). This investigation was conducted as part of a program to identify potential contamination at Army installations with a history of hazardous materials usage or storage. The objective of the initial investigation was to assess environmental quality with regard to the use, storage, treatment, and disposal of toxic and hazardous materials and to define any conditions that might adversely affect human health or result in environmental degradation. The assessment was based on a review of available records and interviews with past and present employees; environmental sampling was not conducted. The report recommended locating and identifying the contents of former demolition pits 27 through 30 in SWMU 1, installing monitoring wells around landfills (SWMU 26 and 28), and establishing a sampling program for surface drainage systems.

**Table 1-3. Previous Environmental Investigations
Deseret Chemical Depot, Tooele, Utah**

Investigation	Reference
Installation Assessment	USATHAMA 1979
Aerial Photography Interpretation	EPIC 1982
Resource Evaluation	IPEC 1982
Exploratory Survey	ERTEC 1982
Aerial Photography Interpretation Addendum	EPIC 1986
SWMU Evaluation	USAEHA 1986
Final Interim RCRA Facility Assessment	NUS 1987
Preliminary Assessment, Site Investigation	EAES&T 1988
Remedial Investigation – SWMU 9, 13, 17, and the south and general perimeter areas; SWMU 1 and 25	Weston 1991
RFI Phase I Field Investigation – Field investigation activities at all 27 suspected releases SWMUs	EBASCO 1993a and b
RFI Phase II Known Releases SWMU – SWMU 13 and 17	Rust 1994a
RFI Phase II Suspected Releases SWMU – SWMU 1, 25, and 37	EBASCO 1994a
Remedial Action at the Metal Scrap Landfill Site – SWMU 29	Kvaerner 1998
Corrective Measures Study, Decision Document, RFI – Group 2 SWMU	Foster Wheeler 1999a, b, and c
Corrective Measures Study Report, Decision Document – SWMU 13 and 17	Dames & Moore 2000a, b, c, and d
Corrective Measure Study for Elevated Barium – SWMU 22	Kleinfelder 2000a

Aerial Photography Interpretation (EPIC 1982)—Through an interagency agreement between the U.S. Environmental Protection Agency (EPA) and the U.S. Army, the Environmental Photographic Interpretation Center (EPIC) published an interpretation of aerial photographs in 1982 as a follow-up to the USATHAMA Installation Assessment. The photographs available for DCD were limited to those from September 1974 and July 1981. Pits, ground scars, surface drainage, and other features of the SWMU were detailed to identify areas of potential contamination and contaminant migration. Photographs of SWMU 11 were included in the interpretation.

Resource Evaluation (IPEC 1982)—Inland Pacific Engineering Company (IPEC) prepared a report summarizing all features at TEAD that were thought to be environmentally significant. Research for this study included an examination of resources in and around the installation, identification of onsite activities, and evaluation of the potential impacts of these activities on resources both onsite and offsite. Eleven areas at DCD were identified as being potentially contaminated.

Exploratory Survey (ERTEC 1982)—The Earth Technology Corporation (ERTEC) conducted a two-phase investigation of TEAD to determine the presence of contaminants and the potential for contaminant migration. The first phase of the investigation consisted of identifying sites with the greatest potential for surface and subsurface contamination. Potential sources of contamination identified at DCD included SWMU 11, 19, and 20. The second phase of the

investigation consisted of sampling and analyzing soil, sediment, surface water, and groundwater at sites identified during the first phase.

Aerial Photography Interpretation Addendum (EPIC 1986)—EPIC created an addendum to the 1982 report that provided a detailed study of selected sites using U.S. Geological Survey (USGS), Agricultural Stabilization and Conservation Service (ASCS), EPA, and commercial aerial photographs from 1952, 1959, and 1966. The report included relevant information depicting the physical changes to DCD.

SWMU Evaluation (USAEHA 1986)—The U.S. Army Environmental Hygiene Agency (USAEHA) prepared a report on all of the SWMU at DCD to identify data gaps in the existing data base. This report was prepared to provide information for the RCRA Part B permit application that was pending for the Chemical Agent Munitions Disposal System (CAMDS). Data from previous investigations were evaluated during USAEHA's review and it was concluded that SWMU 19 and 20 did not fit the definition of a SWMU and should be removed from the list of SWMUs. In addition, because of the low potential for release of hazardous wastes to the environment, no further investigation was recommended for SWMU 11.

Final Interim RCRA Facility Assessment (NUS 1987)—NUS Corporation conducted the Final Interim RCRA Facility Assessment (RFA) at DCD to evaluate releases of hazardous wastes or hazardous constituents and to identify corrective actions, as necessary, under the Hazardous and Solid Waste Amendments of 1984 (HSWA). The RFA provided information on SWMU at DCD, evaluated the potential for releases to the environment, and determined the need for further investigation. Further investigations were not recommended at SWMU 11, 19, and 33.

Preliminary Assessment, Site Investigation (EAES&T 1988)—EA Engineering Science and Technology (EAES&T) conducted a data base review and a preliminary field sampling and analysis program between September 1985 and November 1987. The review used existing data to develop a field sampling plan in which 17 sites at DCD were identified as potential sources of contamination. Limited field sampling was conducted, and the report stated that the data collected were insufficient to attribute contamination to a specific DCD site.

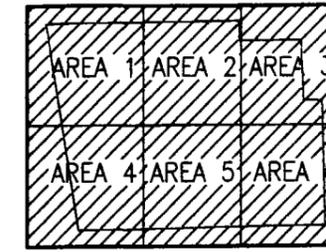
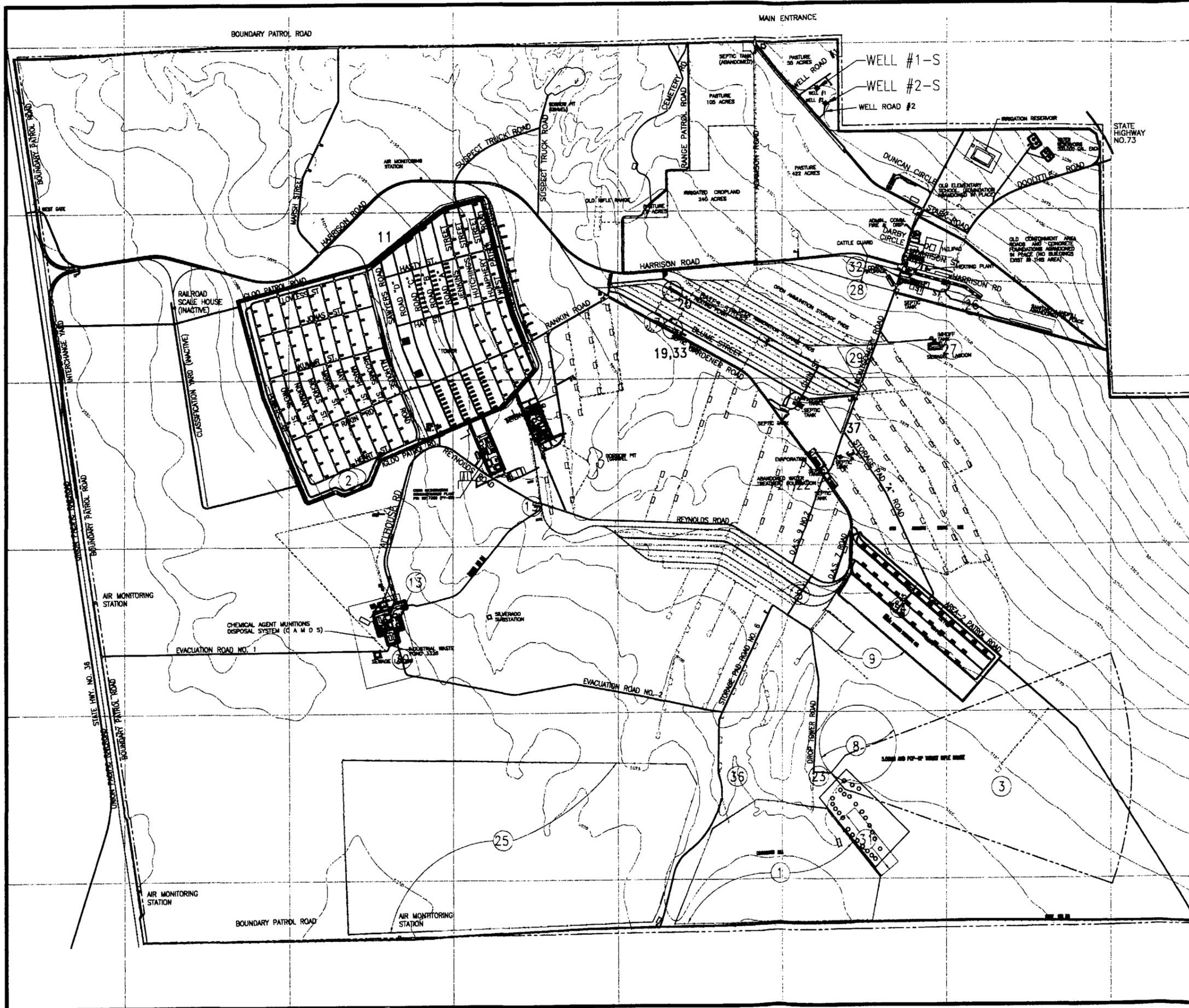
1.5 BACKGROUND OF GROUP 3 SUSPECTED RELEASES SWMUs

This section discusses the historical background and environmental setting for the five Group 3 SWMUs. Figure 1-2 shows the location of the SWMUs.

1.5.1 SWMU 11 – Chemical Munitions Storage Area

SWMU 11 – Chemical Munitions Storage Area is located within a highly secured portion of the northwest section of DCD. This area has been in operation since the mid-1940s and has stored various chemical agent munitions and materials, including mustard (H, HD, and HT), Lewisite (L), Sarin (GB), Tabun (GA), nerve gas (VX), phosgene (CG), o-chlorobenzylidene malononitrile (CS), cyanogen chloride (CK), smoke agent (FS, HC), white phosphorus (WP),

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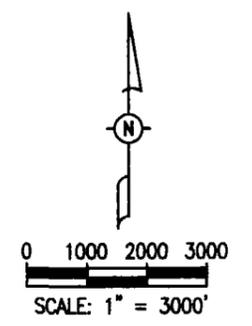
KEY MAP

LEGEND:

- EXISTING
- BUILDING
 - STRUCTURE, UNDERGROUND
 - ROADS & STRUCTURES ABANDONED IN PLACE
 - ROADS & PARKING
 - TRAIL OR EARTH ROAD
 - RAILROAD
 - FENCE
 - RESERVATION BOUNDARY
 - ELEVATION CONTOUR
 - OPEN REVETMENT STORAGE
 - SWMU
 - GROUP 3 SWMU

NOTES:

- 1.) TOTAL ACREAGE IS 19,364.
- 2.) BASE MAP INFO. WAS SCANNED AND IS ACCURATE TO 1:1000.



Deseret Chemical Depot
Tooele, Utah

PHASE II RFI SWMU LOCATION MAP

Figure: 1-2	Project: 01-0827-03-6523-042	File Name: 7109/RFIMAP11	Date: NOV. 2000
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thermate, and napalm. Mustard, Lewisite, Sarin, and VX currently are stored in this area. These materials and various other nonhazardous materials are stored under Army control in several different types of storage areas (e.g., open storage areas, concrete igloos, and steel arch igloos) pending their disposal.

Hazardous materials stored at SWMU 11 are maintained in the reinforced concrete storage igloos, which are designed and monitored closely to minimize the potential for release. The igloos have sloped concrete floors and drain toward a catchment basin within the igloos. Each igloo is a closed system and any liquids released are collected in plastic drums inside the catchment basins.

A former disposal area identified as SWMU 2 is located within the physical boundaries of SWMU 11. SWMU 2 is located in the southwest portion of SWMU 11 and covers 5.8 acres. SWMU 2 contains a gravel pit (an oval area approximately 150 feet long) used for munitions burial. The only documentation of the pit contents is an employee deposition referenced in the Installation Assessment (USATHAMA 1979). This deposition (dated April 1, 1959) documents that the covered gravel pit was used for the burial of nondemilitarized munitions. Munitions buried at the site include M-2 ignition cartridges, squibs, hand grenades, blasting caps, and M-21 incendiary bomb clusters. Other munitions potentially buried in the pit include mustard, smoke pots, trinitrotoluene (TNT) blocks, M-71 incendiary bombs, bottled FS smoke, and M-19 incendiary bombs. According to installation personnel, the munitions were covered with approximately 7 feet of soil (NUS 1987). Because of the close proximity of SWMU 2, its contents potentially could migrate into the area of SWMU 11 through surface runoff and/or migration into the groundwater. No samples were collected at SWMU 2 during the Group 3 Phase II activities, nor is SWMU 2 included in the evaluation of SWMU 11. Due to safety concerns, no investigation of SWMU 2 is recommended until the closure of SWMU 11 and the removal of all weapons stored within SWMU 11.

SWMU 11 is located on fairly flat topography covering approximately 640 acres and is underlain by Quaternary age alluvial deposits. Based on the logs of Phase I wells installed southwest of the SWMU, the near-surface soils in this area are composed of brown, loose to medium-dense silts and sands with a trace of organic material. The unsaturated zone consists of approximately 15 to 25 feet of loose to stiff, light gray to very dark grayish-brown, interbedded layers of silts, sands, and gravels. The saturated zone, located approximately 15 to 25 feet below land surface (BLS), consists of dense silts, sands, and gravels. The static water level in the SWMU 11 monitoring wells ranged from approximately 15 to 24 feet BLS in January 2000.

1.5.2 SWMU 19 – Building 533 Foundation (Empty Drum Storage Area)

SWMU 19 – Building 533 Foundation (Empty Drum Storage Area) comprises the concrete foundation of former Building 533, which the Army demolished in early 1992. The remnant foundation is located between Blume Street and Gardener Road in the north-central portion of DCD. The Deactivation Furnace – Mercury Contamination Area (SWMU 17), a known release SWMU, is located adjacent to the west side of the Building 533 foundation.

Building 533 formerly was used for railroad car maintenance (USAEHA 1986), but recently had been used primarily for empty drum storage (discussed as SWMU 35 by NUS 1987)

before its demolition. Although limited information is available on the wastes that were stored in Building 533, trash, wood, empty brass shell casings, 5-gallon paint containers, and unidentified drums were observed during a site inspection (NUS 1987). ERTEC (1982) also listed phosphoric acid, chromates, and titanates as compounds used at this site, although the source of this information is unknown. During the Phase I RFI conducted by EBASCO, empty drums were observed and a strong fuel odor was noted in Building 533.

SWMU 19 is located on slightly southwest-sloping topography at approximately 5,225 feet above msl. The site is underlain by Quaternary alluvial deposits of silt, sand, and clay. Surficial soil is composed of light grayish brown, silty gravel with some sand and a trace of clay. Subsurface soil is composed of brown to dark grayish-brown, silty and gravelly clay with some sand. The static water level in the SWMU 19 monitoring wells ranged from approximately 106 to 123 feet BLS in January 2000.

1.5.3 SWMU 20 – Building 520 (Crating Facility)

The area encompassing SWMU 20 is located in the north-central portion of DCD. SWMU 20 included Building 520 and the associated septic tank (Structure 521). Both the building and the septic tank were demolished and removed in 1999. The complete history of Building 520 was unknown; a site reconnaissance was conducted in 1998 with current and former DCD employees to gain additional information. Appendix A presents the site reconnaissance report and the results of the associated records search and personnel interviews.

Building 520 was constructed in 1947 and served as a carpentry shop and a less-than-carload facility for inspecting smoke pots until the mid-1960s (EBASCO 1993a). From 1965 until the mid-1970s, the building was a Surveillance Change House in which the inspection of conventional small arms munitions such as hand grenades and land mines was conducted. Inspections were conducted on munitions prior to loading them onto railcars for shipment. Reportedly, chemical munitions were not inspected within the building (Sandoval 1998). From 1979 until 1985, the building remained as a Surveillance Change House where periodic inspections of conventional and chemical munitions were conducted in the western portion of Building 520. Conventional weapons were visually inspected for surface damage (e.g., rust, faded markings, and faded paint) and deficient munitions were repaired (e.g., re-painted) and then shipped (DuBois 1998). Inspection of the chemical munitions included removing a plug from the round and collecting an air sample from within the core/well chamber using an M-18 kit (DuBois 1998). Reportedly, chemical agent never was identified as part of these inspections (i.e., no leakers) (DuBois 1998). The building remained idle from 1985 until its demolition in 1999.

SWMU 20 is located on a southwest-sloping topography at approximately 5,250 feet above msl in the north central portion of DCD. The site is underlain by Quaternary alluvial deposits of predominantly gravels and sand with little silts and clays. The depth to groundwater is estimated to be approximately 120 feet BLS and flowing to the southwest.

1.5.4 SWMU 33 – Building 536 (CAMDS Salt Storage)

SWMU 33 – Building 536 (CAMDS Salt Storage) is a two and one-half story warehouse located in the north-central part of DCD, immediately adjacent to the east of SWMU 19. The building covers an area approximately 50 by 175 feet and is built on gravelly sandy soil. Building 536 currently is operating under an approved RCRA Part B hazardous waste storage permit.

NUS (1987) stated that Building 536 was being used as a storage facility for approximately 1,470 drums of “dried organic salts” that were byproducts of operations at CAMDS. The drums consisted of 55-gallon metal, cardboard, and/or cardboard overpacks filled with salts that potentially contained residual chemical warfare agent (CWA). The stored salts were a byproduct of treatment processes being evaluated at CAMDS; concentrations of lead and cadmium in the salts exceeded extraction procedure (EP) toxicity levels. The salts were removed from SWMU 33 before the Phase I RFI and were taken to an offsite hazardous waste landfill. Salts were stored in Building 536 from approximately 1983 to 1988. No additional salts are planned to be stored at SWMU 33; they are now taken directly from CAMDS to an offsite hazardous waste landfill (EBASCO 1993a). Building 536 currently is used to store used butyl rubber and decontaminated equipment pending shipment to an offsite landfill (Doan 2000).

For the purposes of the Phase II investigation, SWMU 33 is divided into three separate areas (33A, 33B, and 33C). The area inside Building 536 where the storage of the “dried organic salts” occurred is designated as SWMU 33A. SWMU 33B is the area immediately surrounding Building 536; there is no historical information regarding the previous use of the area. SWMU 33C is the drainage swale containing construction debris and solid waste immediately southeast of Building 536. The drainage swale was identified during the Phase II visual site inspection.

SWMU 33 is located at approximately 5,225 feet above msl and is underlain by Quaternary alluvial deposits of silt, clay, sand, and gravel. Surficial sediment is composed of light grayish brown, silty gravel with some sand and a trace of clay. The subsurface soil is composed of slightly moist, brown to dark grayish brown, silty and gravelly clay with some sand. The depth to the water table is approximately 120 feet BLS.

1.5.5 SWMU 37 – Slag Piles and Bomb Fragments

SWMU 37 – Slag Piles and Bomb Fragments occupies approximately 14 acres in a 20- to 30-foot deep gravel pit located directly southwest of the intersection of Montgomery Road and Blume Street in the northeastern quadrant of DCD. The history of SWMU 37 is unknown; however, slag and/or ash piles approximately 5 feet wide, 10 feet long, and 3 feet high were present on the floor of the gravel pit prior to the Phase II field activities. It is believed that the material that has been deposited in this area is the byproduct of a deactivation furnace (EBASCO 1993a). These piles were removed from the SWMU as part of the Phase II activities.

Rusted bomb fragments and pieces of metal of unknown origin are scattered on the northwestern slope of the pit in an area of stressed vegetation. Phase II investigation activities revealed a disposal trench of thermate bombs that had been detonated in-place. The origin and

history of these bombs is unknown. Appendix A presents a site reconnaissance report summarizing the results of records searches, personnel interviews, and visual inspections of the site. The site reconnaissance report also summarizes the "Study for Tooele Army Depot South Area, Thermate Bomb Residue Cleanup" (U.S. Army 1977).

SWMU 37 is located on a gently southwestern sloping topography and is underlain by unconsolidated Quaternary alluvial deposits. The unconsolidated soils identified in site borings consisted of yellowish-brown gravelly sand to silty gravel. The water table beneath SWMU 37 is believed to be approximately 115 feet BLS based on the water levels measured in the nearest monitoring well (S-36-90).