



THE MEMPHIS DEPOT TENNESSEE

ADMINISTRATIVE RECORD COVER SHEET

AR File Number 95



US Army Corps
of Engineers

HUNTSVILLE DIVISION

95

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Defense Environmental Restoration Program
for
Department of Defense Sites

Ordnance and Explosive Waste
Chemical Warfare Materials

ARCHIVES SEARCH REPORT

CONCLUSIONS & RECOMMENDATIONS

MEMPHIS DEFENSE DEPOT
Memphis, TN

Defense Logistics Agency

JANUARY 1995

Prepared by
US ARMY CORPS OF ENGINEERS
ST. LOUIS DISTRICT

**ORDNANCE AND EXPLOSIVE WASTE
CHEMICAL WARFARE MATERIALS
ARCHIVES SEARCH REPORT
FOR
MEMPHIS DEFENSE DEPOT
MEMPHIS, TN**

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1.0 Introduction

1.1 Authority

In 1980, Congress enacted the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) 42 USC 9601 et seq. Ordnance and explosive wastes are included in the CERCLA definition of pollutants and contaminants that require a remedial response.

In 1983, Public Law 98-212 established the Environmental Restoration Defense Account (ERDA). This Congressionally directed fund was to be used for environmental restoration at Department of Defense (DoD) active installations and formerly used properties. The DOD designated the Army as the sole manager for environmental restoration at closed installations and formerly used properties. The Secretary of the Army assigned this mission to the Corps of Engineers (USACE) in 1984.

The 1986 Superfund Amendments and Reauthorization Act (SARA) amended certain aspects of CERCLA, including some directly related to OEW contamination. Chapter 160 of the SARA established the Defense Environmental Restoration Program (DERP). One of the goals specified for the DERP is "correction of environmental damage (such as detection and disposal of unexploded ordnance) which creates an imminent and substantial endangerment to the public health or welfare or to the environment."

The DERP requires that a CERCLA response action be undertaken whenever such "imminent and substantial endangerment" is found at:

- A. A facility or site that is owned by, leased to, or otherwise possessed by the United States and under the jurisdiction of the Secretary of Defense.
- B. A facility or site that was under the jurisdiction of the Secretary of Defense and owned by, leased to, or otherwise possessed by the United States at the time of actions leading to contamination.
- C. A vessel owned or operated by the Department of Defense.

Passage of the Clean Water Act in 1972 established the National Contingency Plan (NCP) which has since been revised and broadened several times. The NCP provides the organizational structure and procedures for remedial actions to be taken in response to the presence of hazardous substances, pollutants, and contaminants at a site. Section 105 of the 1980 CERCLA states that the NCP shall apply to all response actions taken as a result of CERCLA requirements.

The March 1990 National Oil and Hazardous Substances Pollution Contingency Plan given in 40 CFR part 300 is the latest version of the NCP. Paragraph 300.120 states that "DOD will be the removal response authority with respect to incidents involving DOD military weapons and munitions under the jurisdiction, custody, and control of DOD."

On April 5, 1990, U.S. Army Engineer Division, Huntsville (USAEDH) was designated as the USACE Mandatory Center of Expertise (MCX) and Design Center for Ordnance and Explosive Waste (OEW). As the MCX and Design Center for OEW, USAEDH is responsible for the design and successful implementation of all Department of the Army OEW remediations required by CERCLA. USAEDH will also design and implement OEW remediation programs for other branches of the Department of Defense when requested.

1.2 Subject

Memphis Defense Depot is located in Memphis, Tennessee approximately six miles southeast of downtown Memphis and two miles northwest of the Memphis International Airport.

1.3 Purpose

This Archives Search Report (ASR) compiles information obtained through historical research at various archives and records holding facilities, interviews with persons associated with the site or its operations, and personal visits to the site. All efforts were directed towards determining possible use or disposal of chemical warfare materials on the site. Particular emphasis was placed on establishing the type (agent), munitions or container, quantities and area of disposal. Information obtained during this process was used in developing recommendations for further actions at the site.

1.4 Scope

The scope of this ASR is limited to burials and disposals performed by the Chemical Warfare Service (CWS) in association with Memphis Defense Depot.

2.0 Conclusions and Recommendations

2.1 Conclusions

Main Depot Area

No evidence of the burial or destruction of Conventional Ordnance or Chemical Warfare Materials on the main depot could be found. The pistol range has been removed. The area where the boxcars containing German Mustard Bombs, which leaked Mustard onto the ground was decontaminated and tested with negative results for a year.

Dunn Avenue Area

All records indicate that only the Dunn Avenue Area was used to destroy or bury, Conventional Ordnance or Chemical Warfare Materials (CWM). The first known destruction of CWM is in 1946, with the neutralization/destruction of the German Mustard Bombs. The last known destruction is the burial of Chemical Agent Identification Sets (CAIS) in 1955 or 1956. Between 1946 and 1956, other chemicals associated with the Chemical Warfare Service were also buried. These include Impregnite (both CC-2 & XXCC-3), Decontamination Agent, Non-Corrosive (DANC) and RH195. Most likely contaminated or low grade Chloride of Lime was also buried in the Dunn Avenue Area. Conventional Ordnance was also destroyed in the Dunn Avenue Area following World War II.

2.2 Recommendations

Main Depot Area

Recommend no further actions for the Main Depot Area.

The Pistol Range was close to other facilities that would have precluded its use for any explosive ordnance. Most likely it was used only as a pistol range and occasionally rifles may have been fired on the range. The small depth of the range would have eliminated any serious rifle marksmanship training. There are no records covering the removal of the range, but given the above use, it is extremely doubtful there is any ordnance or Chemical Warfare Material hazard at this location. Ground samples may show a higher level of Copper and Lead from the bullets used on the Pistol Range.

The area of the Depot where the train was sided with the leaking German Mustard Bombs was thoroughly decontaminated. Reports indicated that as soon as Mustard was spotted laying on the ground it was immediately neutralized with either DANC or Chlorinated Lime slurry. The entire area was checked the following year for any traces of Mustard.

The RAC Worksheet gave a RAC 4 score. Given the low probability of explosive ordnance ever being used on the range and the later removal of the range, recommend a RAC 5, no further action be used.

Dunn Avenue Area

There is a risk that unexploded Conventional Ordnance may not have been properly disposed of in the Dunn Avenue Area (Map 3, Area A). The possibility exists, that others may have disposed of conventional ordnance in the pits used by Mr. Traut of the Chemical Supply Section. Mr. Traut used the area to dispose of Conventional Ordnance, which was confiscated from returning service members and brought to the Depot by the local Military Police.

There may be Mustard residue in the trench/pits used in the destruction of the German Mustard bombs. The draining of the bombs may not have removed all of the Mustard from the case¹. The use of dynamite to detonate the bursters may not have removed any residue Mustard. The final burning of all materials in the trench/pits using fuel oil would not have produced the temperatures necessary to cause the Mustard to be incinerated.

¹The draining of Mustard from bombs in a test at Black Hills Depot, only resulted in 65% being drained. The rest remained in the casing until incineration. Given the higher air temperatures in Memphis during July, a lower percentage of residue would be expected.

The remains of any Chemical Agent Identification Sets (CAIS) intact in Dunn Field (Map 3, Area B and possibly Area A) may still contain Chemical Agents in glass vials. Vials which were broken at the time of burial may also present a danger, along with contaminated soil.

The burials of Impregnite, Chloride of Lime, DANC and RH195 may present a Hazardous and Toxic Waste problem, but not a Chemical Warfare Material problem.

Any sub-surface type activities in the Dunn Avenue Area, should consider both the Conventional Ordnance and Chemical Warfare Materials reported above.

The RAC Worksheet gave a RAC 2 score. Concur with this scoring. The area is fenced with controlled access. All known hazards are buried.

3.0 Evaluation of Ordnance and Chemical Warfare Materials Contamination

3.1 Main Depot

The Main Depot has four areas that have an ordnance association. They are the pistol range area, the area used during the 1946 German Bomb Destruction and the two areas used to test Flamethrowers.

The Pistol Range was close to other facilities that would have precluded its use for any explosive ordnance. Most likely it was used only as a pistol range and occasionally rifles may have been fired on the range. The small depth of the range would have eliminated any serious rifle marksmanship training. There are no records covering the removal of the range, but given the above use it is extremely doubtful there is any ordnance or Chemical Warfare Material hazard at this location. Ground samples may show a higher level of Copper and Lead from the bullets used on the Pistol Range.

The area of the Depot where the train was sided with the leaking German Mustard Bombs was thoroughly decontaminated. Reports indicated that as soon as Mustard was spotted laying on the ground it was immediately neutralized with either DANC or Chlorinated Lime slurry. The entire area was checked the following year after for any traces of Mustard. Further testing for the presence of Mustard or its breakdown components would probably continue to give negative tests.

The two areas identified as being used to test Flamethrowers do not present an ordnance hazard. The only hazard would be from the residue of the burned diesel fuel which was used in the testing process.

3.2 Dunn Avenue Area

There are many areas in the Dunn Avenue Area which contain known burials and destructions. There may be more burials/destruction areas which were not captured by the Archives Search Report process. Extreme caution should be used in any intrusive type operations in Areas A, B & C identified on Map 3 of this report. Known and probable disposals are discussed in later paragraphs.

The remains of conventional ordnance which was destroyed or partially destroyed is in pits located in Area A. This includes at least one mortar round, smoke pots & hand grenades (smoke) and other conventional ordnance not specified in interviews.

The remnants of four 250 KG and twenty five 500 KG German Mustard Bomb Casings are located in either the covered up trench used to neutralize the Mustard or in the covered up pit used to destroy the bursters in the bombs¹. The trench and pit also contain the remains of dunnage and clothing which was burned due to Mustard contamination. The trench and pit are assumed to be in Area A (Map 3).

The remains of Chlorinated Lime buried in three trenches in Area A (Map 3).

The remains of 86,100 pounds of Impregnite (CC-2), is buried in a single trench in Area A (MAP 3).

The remains of 300,000 pounds of Impregnite (XX-CC-3) is located in two trenches in Area C (Map 3).

The remains of an unknown quantity of Impregnite (XX-CC-3) is located in one or more trenches in Area B (Map 3).

The remains of 32,636 pounds of Acetylene Tetrachloride in one or more trenches in Area A or B (Map 3).

The remains of an unknown quantity of RH195 most likely buried in Areas A or B (Map 3).

The remains of Chemical Agent Identification Sets (CAIS) either broken up and neutralized with Chlorinated lime or thrown in to the trench "in tact" are located in Area B and possibly Area A (Map 3).

The area identified as being used to test Flamethrowers does not present an ordnance hazard. The only hazard would be from the residue of the burned diesel fuel which was used in the testing process.

Although not documented, there exists the possibility that Gas Mask "canisters" may have also been buried in the Dunn Avenue Area.

¹The documents indicate that only the 250 KG bombs had bursters and that these were destroyed using dynamite. It is not known if all twenty nine bombs were actually checked or exploded.

MAPS/DRAWINGS

4.0



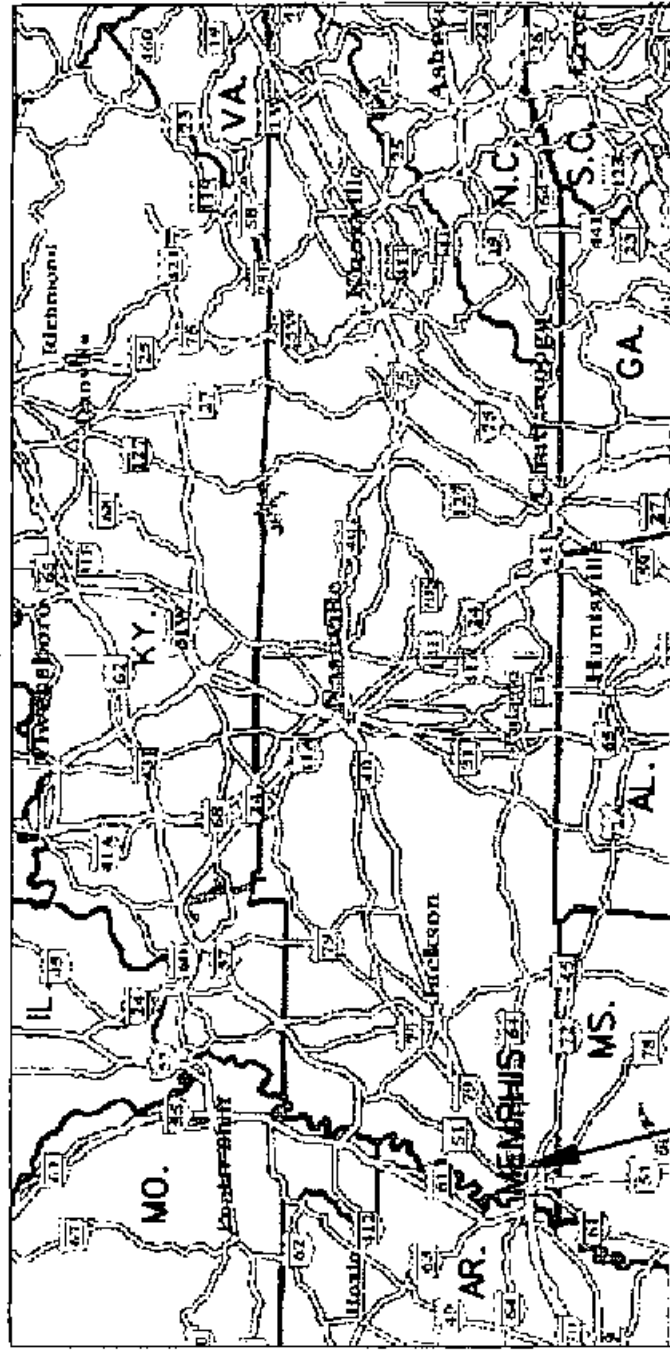
LEGEND

Population Center	County Boundary
State Route	Major Street/Road
Geographic Feature	State Route
Town, Small City	Interstate Highway
Large City	US Highway
Interstate, Impike	Land Mass
US Highway	Open Water
Airfield	

Scale 1:150,000 (at center)

2 Miles 5 KM

Mag 12.00
Fr Jan 06 13:20:41 1995



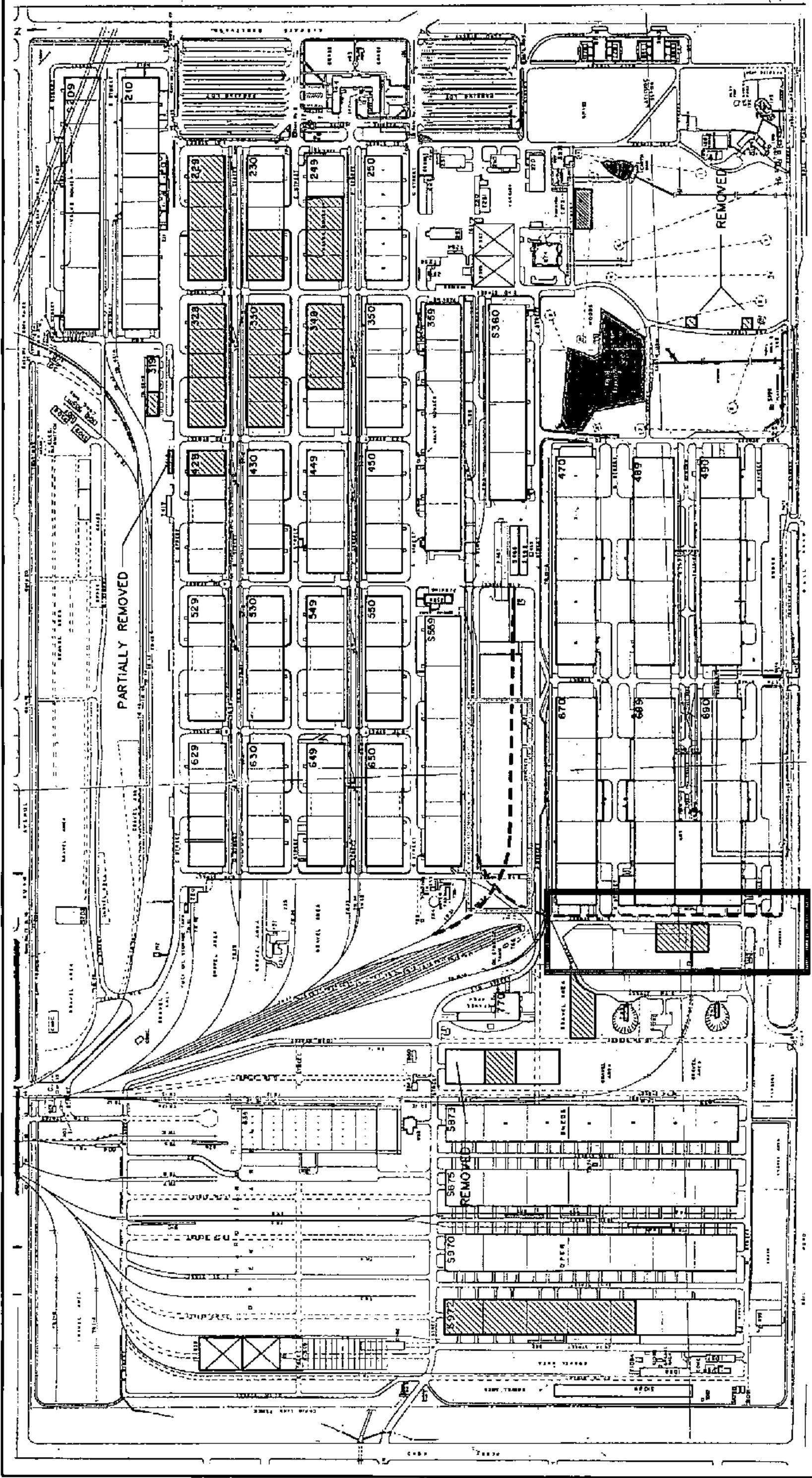
PROJECT
LOCATION

MEMPHIS DEFENSE DEPOT

MEMPHIS, TENNESSEE

VICINITY MAP

M-1



M-2

MEMPHIS ORDNANCE DEPOT
MEMPHIS, TENNESSEE
DEPOT MAP

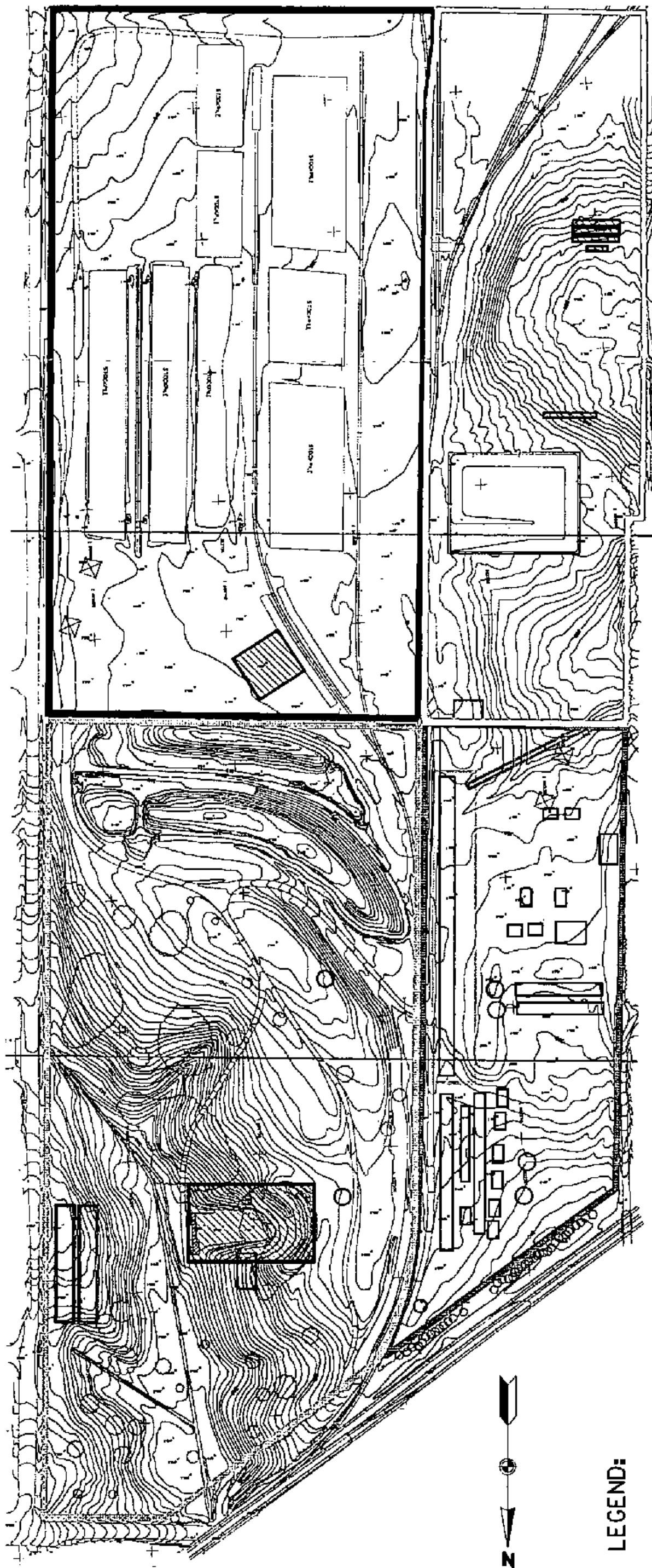


- LEGEND:
- TRACK 27A
 - TRACK 28
 - ORIGINAL LOCATION OF CHEMICAL TRAIN.
 - PROBABLE UNLOADING / RELOADING LOCATION OF CHEMICAL TRAIN.
 - ▨ BUILDINGS AND AREAS USED BY CHEMICAL WARFARE SERVICE
 - ▨ PISTOL RANGE
 - ▨ FLAMETHROWER TEST AREA

NOT TO SCALE

PROJ DATE: JAN. 1985

DATE OF MAP: X



LEGEND:

- POSSIBLE SITE OF JULY 1946 DESTRUCTION OF GERMAN MUSTARD BOMBS.
- 85,100 LBS CC-2 IMPREGNITE (18 FEB. 1947).
- 300,000 LBS XX-CC-3 IMPREGNITE
- 1955-1956 AREA USED TO BURY CHEMICAL ID SETS AND XX-CC-3 IMPREGNITE, POSSIBLE BURIAL OF DANC. CHLORINATED LIME AND RH195.
- CHLORINATE LIME PITS.
- FLAME THROWER TEST AREA.
- USATHAMA IDENTIFIED BURIAL OF CHEMICAL ID SETS.
- BURIALS PREVIOUSLY IDENTIFIED BY USATHAMA.
- UNIDENTIFIED CLEARED AREA (LOCATED ON 1958 AERIAL PHOTO).
- PISTOL RANGE

CANISTERS (POSSIBLE GAS MASK FILTERS)

AREA A

AREA B - SEE NOTE 2

AREA C

AREA D

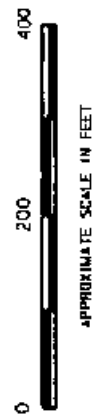
BURIALS NOT LOCATED:

AREA A: PITS USED TO DESTROY ORDNANCE.

AREAS A, B, OR C: 1947 BURIAL OF 32,636 LBS OF ACETYLENE TETRACHLORIDE.

NOTE 1: LOCATIONS ARE APPROXIMATE

NOTE 2: AREA USED AS A BORROW PIT, TO TEST HEAVY ENGINEER EQUIPMENT, AND AS A VEHICLE HOLDING AREA.



M-3

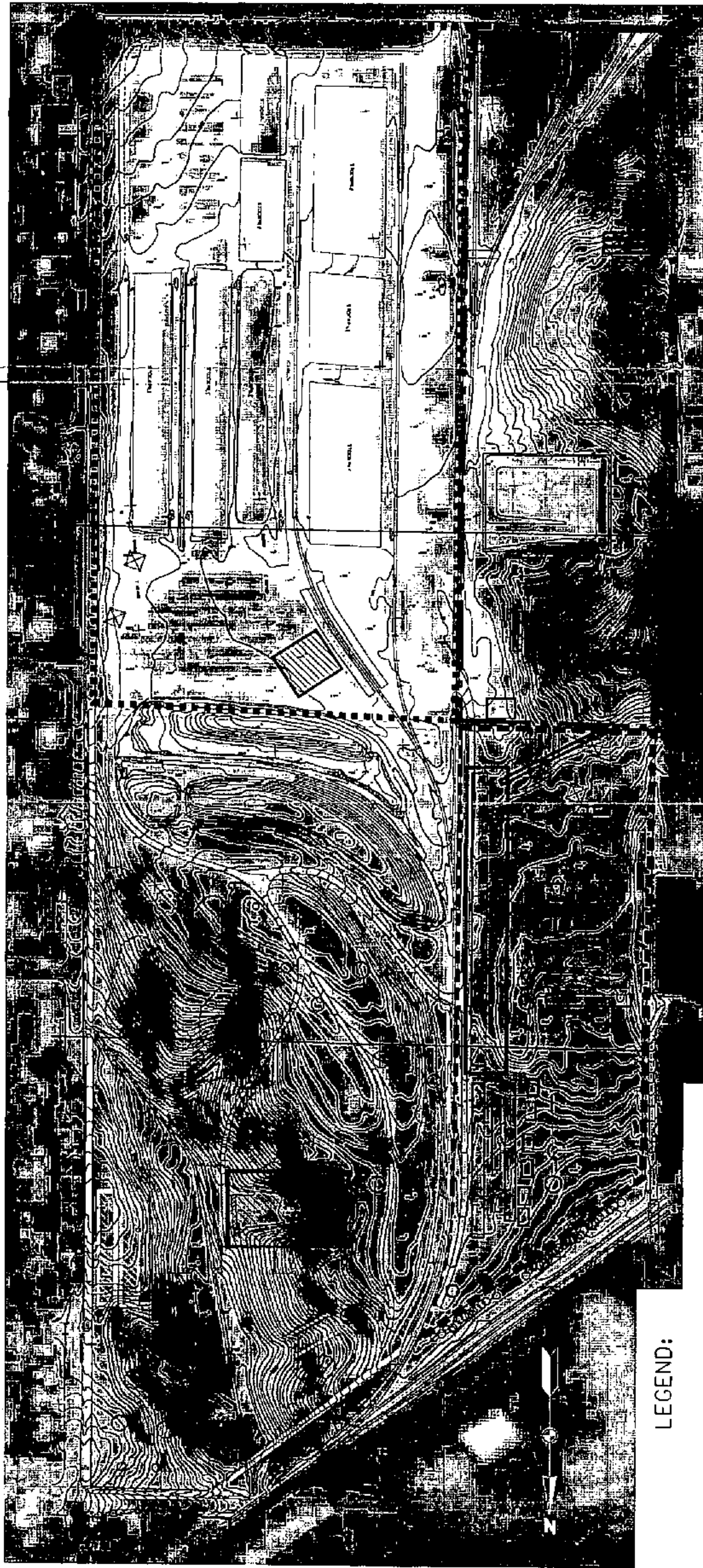
MEMPHIS ORDNANCE DEPOT

MEMPHIS, TENNESSEE

GARVER AND GARVER DRAWING

PROJ. DATE: JAN. 1995

DATE OF MAP:



LEGEND:

- POSSIBLE SITE OF JULY 1946 DESTRUCTION OF GERMAN MUSTARD BOMBS
- 86,100 LBS CC-2 IMPREGNITE (18 FEB. 1947)
- 300,000 LBS XX-CC-3 IMPREGNITE
- 1955-1956 AREA USED TO BURY CHEMICAL ID SETS AND XX-CC-3 IMPREGNITE. POSSIBLE BURIAL OF DAMC, CHLORINATED LIME AND RH195.
- CHLORINATE LIME PITS.
- FLAME THROWER TEST AREA.
- USATHAMA IDENTIFIED BURIAL OF CHEMICAL ID SETS.
- BURIALS PREVIOUSLY IDENTIFIED BY USATHAMA.
- UNIDENTIFIED CLEARED AREA (LOCATED ON 1958 AERIAL PHOTO).

CANISTERS (POSSIBLE GAS MASK FILTERS)

- AREA A
- AREA B - SEE NOTE 2
- AREA C
- AREA D

BURIALS NOT LOCATED:

AREA A: PITS USED TO DESTROY ORDNANCE.

AREAS A, B, OR C: 1947 BURIAL OF 32,636 LBS OF ACETYLENE TETRACHLORIDE.

- NOTE 1: LOCATIONS ARE APPROXIMATE
- NOTE 2: AREA USED AS A BORROW PIT, TO TEST HEAVY ENGINEER EQUIPMENT.

M-4

MEMPHIS ORDNANCE DEPOT
MEMPHIS, TENNESSEE
1990 AERIAL PHOTO

RAC WORKSHEETS

5.0

18 Apr 94
Previous editions obsoleteRISK ASSESSMENT PROCEDURES FOR
ORDNANCE AND EXPLOSIVE WASTE (OEW) SITES

Site Name	<u>MEMPHIS DEFENSE DEPT</u>	Rater's Name	<u>THOMAS MURRELL</u>
Site Location	<u>MEMPHIS, TN</u>	Phone No.	<u>(314) 331-8787</u>
DERP Project #	<u>DUNN AVE. AREA</u>	Organization	<u>CEHNS-P.M.M. (OEW)</u>
Date Completed	<u>11 JAN 95</u>	RAC Score	<u>2</u>

OEW RISK ASSESSMENT:

This risk assessment procedure was developed in accordance with MIL-STD 882C and AR 385-10. The RAC score will be used by CEHND to prioritize the remedial action at Formerly Used Defense Sites. The OEW risk assessment should be based upon best available information resulting from records searches, reports of Explosive Ordnance Disposal (EOD) detachment actions, and field observations, interviews, and measurements. This information is used to assess the risk involved based upon the potential OEW hazards identified at the site. The risk assessment is composed of two factors, hazard severity and hazard probability. Personnel involved in visits to potential OEW sites should view the CEHND videotape entitled "A Life Threatening Encounter: OEW."

Part I. Hazard Severity. Hazard severity categories are defined to provide a qualitative measure of the worst credible mishap resulting from personnel exposure to various types and quantities of unexploded ordnance items.

TYPE OF ORDNANCE
(Circle all values that apply)

A. Conventional Ordnance and Ammunition	VALUE
Medium/Large Caliber (20 mm and larger)	<u>10</u>
Bombs, Explosive	10
Grenades, Hand and Rifle, Explosive	10
Landmines, Explosive	10
Rockets, Guided Missiles, Explosive	10
Detonators, Blasting Caps, Fuzes, Boosters, Bursterns	6
Bombs, Practice (w/spotting charges)	6
Grenades, Practice (w/spotting charges)	4
Landmines, Practice (w/spotting charges)	4
Small Arms (.22 cal - .50 cal)	1
Conventional Ordnance and Ammunition (Select the largest single value)	<u>10</u>

What evidence do you have regarding conventional OEW?
DISPOSAL ACTIVITIES BY MR. TRAUT.

B. Pyrotechnics (For munitions not described above.)

VALUE

Munition (Container) Containing
White Phosphorus (WP) or other
Pyrophoric Material (i.e.,
Spontaneously Flammable)

10

Munition Containing A Flame
or Incendiary Material (i.e., Napalm,
Triethylaluminum Metal Incendiaries)

6

Flares, Signals, Simulators, Screening
Smokes (other than WP)

④

Pyrotechnics (Select the largest single value)

4

What evidence do you have regarding pyrotechnics?

BASE INTERVIEW INDICATED SMOKE MUNITIONS MAY HAVE BEEN
DISPOSED.

C. Bulk High Explosives (Not an integral part of conventional ordnance; uncontainerized.)

VALUE

Primary or Initiating Explosives
(Lead Styphnate, Lead Azide,
Nitroglycerin, Mercury Azide,
Mercury Fulminate, Tetracene, etc.)

10

Demolition Charges

10

Secondary Explosives
(PETN, Compositions A, B, C,
Tetryl, TNT, RDX, HMX, HBX,
Black Powder, etc.)

8

Military Dynamite

6

Less Sensitive Explosives
(Ammonium Nitrate, Explosive D, etc.)

3

High Explosives (Select the largest single value)

⑤

What evidence do you have regarding bulk explosives?

D. Bulk Propellants (Not an integral part of rockets, guided missiles, or other conventional ordnance; uncontainerized)

VALUE

Solid or Liquid Propellants

6

Propellants

⑥

What evidence do you have regarding bulk propellants?

E. Chemical Warfare Materiel and Radiological Weapons

	VALUE
Toxic Chemical Agents (Choking, Nerve, Blood, Blister)	(25)
War Gas Identification Sets	(20)
Radiological	15
Riot Control Agents (Vomiting, Tear)	5
Chemical and Radiological <u>(Select the largest single value)</u>	<u>25</u>

What evidence do you have of chemical/radiological OE? SEE REPORT

TOTAL HAZARD SEVERITY VALUE

(Sum of Largest Values for A through E--Maximum of 61)

Apply this value to Table 1 to determine Hazard Severity Category.

TABLE 1

HAZARD SEVERITY*

Description	Category	Hazard Severity Value
CATASTROPHIC	<u>I</u>	21 and greater <u>39</u>
CRITICAL	II	10 to 20
MARGINAL	III	5 to 9
NEGLIGIBLE	IV	1 to 4
**NONE		0

* Apply Hazard Severity Category to Table 3.

**If Hazard Severity Value is 0, you do not need to complete Part II. Proceed to Part III and use a RAC Score of 5 to determine your appropriate action.

Part II. Hazard Probability. The probability that a hazard has been or will be created due to the presence and other rated factors of unexploded ordnance or explosive materials on a formerly used DOD site.

AREA, EXTENT, ACCESSIBILITY OF OEW HAZARD
(Circle all values that apply)

A. Locations of OEW Hazards

VALUE

On the surface

5

Within Tanks, Pipes, Vessels
or Other confined locations.

4

Inside walls, ceilings, or other
parts of Buildings or Structures.

3

Subsurface

2

Location (Select the single largest value)

2

What evidence do you have regarding location of OEW?

KNOWN BURIALS

B. Distance to nearest inhabited locations or structures likely to be at risk from OEW hazard (roads, parks, playgrounds, and buildings).

VALUE

Less than 1250 feet

(5)

1250 feet to 0.5 miles

4

0.5 miles to 1.0 mile

3

1.0 mile to 2.0 miles

2

Over 2 miles

1

Distance (Select the single largest value)

5

What are the nearest inhabited structures? RESIDENTIAL HOMES

C. Numbers of buildings within a 2 mile radius measured from the OEW hazard area, not the installation boundary.

	VALUE
26 and over	5
16 to 25	4
11 to 15	3
6 to 10	2
1 to 5	1
0	0
Number of Buildings <u>(Select the single largest value)</u>	5
Narrative _____	

D. Types of Buildings (within a 2 mile radius)

	VALUE
Educational, Child Care, Residential, Hospitals, Hotels, Commercial, Shopping Centers	5
Industrial, Warehouse, etc.	4
Agricultural, Forestry, etc.	3
Detention, Correctional	2
No Buildings	0
Types of Buildings <u>(Select the largest single value)</u>	5
Describe types of buildings in the area. _____	

E. Accessibility to site refers to access by humans to ordnance and explosive wastes. Use the following guidance:

BARRIER	VALUE
No barrier or security system	5
Barrier is incomplete (e.g., in disrepair or does not completely surround the site). Barrier is intended to deny egress from the site, as for a barbed wire fence for grazing.	4
A barrier, (any kind of fence in good repair) but no separate means to control entry. Barrier is intended to deny access to the site.	3
Security guard, but no barrier	2
Isolated site	①
A 24-hour surveillance system (e.g., television monitoring or surveillance by guards or facility personnel) which continuously monitors and controls entry onto the facility; or An artificial or natural barrier (e.g., a fence combined with a cliff), which completely surrounds the facility; and a means to control entry, at all times, through the gates or other entrances to the facility (e.g., an attendant, television monitors, locked entrances, or controlled roadway access to the facility).	0

Accessibility (Select the single largest value)

1

Describe the site accessibility. FENCED AREA WITH CONTROLLED ACCESS

F. Site Dynamics - This deals with site conditions that are subject to change in the future, but may be stable at the present. Examples would be excessive soil erosion by beaches or streams, increasing land development that could reduce distances from the site to inhabited areas or otherwise increase accessibility.

	VALUE
Expected	5
None Anticipated	②
Site Dynamics (Select largest value)	③

Describe the site dynamics. DIGGING IS CURRENTLY NOT EXPECTED

TOTAL HAZARD PROBABILITY VALUE

(Sum of Largest Values for A through F--Maximum of 30)

Apply this value to Hazard Probability Table 2 to determine
Hazard Probability Level.

TABLE 2

HAZARD PROBABILITY

Description	Level	Hazard Probability Value
FREQUENT	A	27 or greater
PROBABLE	B	21 to 26
OCCASIONAL	C	15 17 to 20
REMOTE	D	8 to 14
IMPROBABLE	E	less than 8

* Apply Hazard Probability Level to Table 3.

Part III. Risk Assessment. The risk assessment value for this site is determined using the following Table 3. Enter with the results of the hazard probability and hazard severity values.

TABLE 3

Probability Level		FREQUENT A	PROBABLE B	OCCASIONAL C	REMOTE D	IMPROBABLE E
Severity Category:						
CATASTROPHIC	<u>I</u>	1	1	<u>2</u>	3	4
CRITICAL	II	1	2	3	4	5
MARGINAL	III	2	3	4	4	5
NEGLIGIBLE	IV	3	4	4	5	5

RISK ASSESSMENT CODE (RAC)

RAC 1 Expedite INPR, recommending further action by CEHND - Immediately call CEHND-ED-SY--commercial 205-955-4968 or DSN 645-4968.

RAC 2 High priority on completion of INPR - Recommend further action by CEHND.

RAC 3 Complete INPR - Recommend further action by CEHND.

RAC 4 Complete INPR - Recommend further action by CEHND.

RAC 5 Usually indicates that no further action (NOFA) is necessary. Submit NOFA and RAC to CEHND.

Part IV. Narrative. Summarize the documented evidence that supports this risk assessment. If no documented evidence was available, explain all the assumptions that you made.

AGREE WITH RAC2 SCORE, THE AREA IS CONTROLLED ACCESS AND ALL HAZARDS ARE BURIED.

18 Apr 94
Previous editions obsolete

RISK ASSESSMENT PROCEDURES FOR
ORDNANCE AND EXPLOSIVE WASTE (OEW) SITES

Site Name MEMPHIS DEFENSE DEPOT Rater's Name THOMAS MURKELL
Site Location MEMPHIS, TN Phone No. (313) 331-8787
DERP Project # MAIN DEPOT Organization CEHMS - PM-M (OEWS)
Date Completed 11 JAN 95 RAC Score 4

OEWS RISK ASSESSMENT:

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Bombs, Explosive	10
Grenades, Hand and Rifle, Explosive	10
Landmines, Explosive	10
Rockets, Guided Missiles, Explosive	10
Detonators, Blasting Caps, Fuzes, Boosters, Bursters	6
Bombs, Practice (w/spotting charges)	6
Grenades, Practice (w/spotting charges)	4
Landmines, Practice (w/spotting charges)	4
Small Arms (.22 cal - .50 cal)	1
Conventional Ordnance and Ammunition (Select the largest single value)	<u>1</u>

What evidence do you have regarding conventional OEW?

REMOVAL OF PISTOL RANGE

B. Pyrotechnics (For munitions not described above.)

VALUE

Munition (Container) Containing
White Phosphorus (WP) or other
Pyrophoric Material (i.e.,
Spontaneously Flammable)

10

Munition Containing A Flame
or Incendiary Material (i.e., Napalm,
Triethylaluminum Metal Incendiaries)

6

Flares, Signals, Simulators, Screening
Smokes (other than WP)

4

Pyrotechnics (Select the largest single value) /

What evidence do you have regarding pyrotechnics? _____

C. Bulk High Explosives (Not an integral part of conventional ordnance; uncontainerized.)

VALUE

Primary or Initiating Explosives
(Lead Styphnate, Lead Azide,
Nitroglycerin, Mercury Azide,
Mercury Fulminate, Tetracene, etc.)

10

Demolition Charges

10

Secondary Explosives
(PETN, Compositions A, B, C,
Tetryl, TNT, RDX, HMX, HBX,
Black Powder, etc.)

8

Military Dynamite

6

Less Sensitive Explosives
(Ammonium Nitrate, Explosive D, etc.)

3

High Explosives (Select the largest single value) /

What evidence do you have regarding bulk explosives? _____

D. Bulk Propellants (Not an integral part of rockets, guided missiles, or other conventional ordnance; uncontainerized)

VALUE

Solid or Liquid Propellants

6

Propellants /

What evidence do you have regarding bulk propellants? _____

E. Chemical Warfare Materiel and Radiological Weapons

	VALUE
Toxic Chemical Agents (Choking, Nerve, Blood, Blister)	25
War Gas Identification Sets	20
Radiological	15
Riot Control Agents (Vomiting, Tear)	5
Chemical and Radiological (Select the largest single value)	<u>25</u>

What evidence do you have of chemical/radiological CEW? _____

ALL SPILLS WERE IMMEDIATELY CLEANED UP.

TOTAL HAZARD SEVERITY VALUE

(Sum of Largest Values for A through E--Maximum of 61)

Apply this value to Table 1 to determine Hazard Severity Category.

TABLE 1

HAZARD SEVERITY*

Description	Category	Hazard Severity Value
CATASTROPHIC	I	21 and greater
CRITICAL	II	10 to 20
MARGINAL	III	5 to 9
NEGLIGIBLE	IV	<u>1</u> to 4
**NONE		0

* Apply Hazard Severity Category to Table 3.

**If Hazard Severity Value is 0, you do not need to complete Part II. Proceed to Part III and use a RAC Score of 5 to determine your appropriate action.

Part II. Hazard Probability. The probability that a hazard has been or will be created due to the presence and other rated factors of unexploded ordnance or explosive materials on a formerly used DOD site.

AREA, EXTENT, ACCESSIBILITY OF OEW HAZARD
(Circle all values that apply)

A. Locations of OEW Hazards

VALUE

On the surface

5

Within Tanks, Pipes, Vessels
or Other confined locations.

4

Inside walls, ceilings, or other
parts of Buildings or Structures.

3

Subsurface

2

Location (Select the single largest value)

2

What evidence do you have regarding location of OEW?

LOCATION OF PISTOL RANGE PRIOR TO REMOVAL

B. Distance to nearest inhabited locations or structures likely to be at risk from OEW hazard (roads, parks, playgrounds, and buildings).

VALUE

Less than 1250 feet

5

1250 feet to 0.5 miles

4

0.5 miles to 1.0 mile

3

1.0 mile to 2.0 miles

2

Over 2 miles

1

Distance (Select the single largest value)

5

What are the nearest inhabited structures?

BLDG 270

C. Numbers of buildings within a 2 mile radius measured from the OEW hazard area, not the installation boundary.

	VALUE
26 and over	(5)
16 to 25	4
11 to 15	3
6 to 10	2
1 to 5	1
0	0
Number of Buildings <u>(Select the single largest value)</u>	<u>5</u>
Narrative _____	

D. Types of Buildings (within a 2 mile radius)

	VALUE
Educational, Child Care, Residential, Hospitals, Hotels, Commercial, Shopping Centers	(5)
Industrial, Warehouse, etc.	4
Agricultural, Forestry, etc.	3
Detention, Correctional	2
No Buildings	0
Types of Buildings <u>(Select the largest single value)</u>	<u>5</u>
Describe types of buildings in the area. _____	

E. Accessibility to site refers to access by humans to ordnance and explosive wastes. Use the following guidance:

BARRIER	VALUE
No barrier or security system	5
Barrier is incomplete (e.g., in disrepair or does not completely surround the site). Barrier is intended to deny egress from the site, as for a barbed wire fence for grazing.	4
A barrier, (any kind of fence in good repair) but no separate means to control entry. Barrier is intended to deny access to the site.	3
Security guard, but no barrier	2
Isolated site	1
A 24-hour surveillance system (e.g., television monitoring or surveillance by guards or facility personnel) which continuously monitors and controls entry onto the facility; or An artificial or natural barrier (e.g., a fence combined with a cliff), which completely surrounds the facility; and a means to control entry, at all times, through the gates or other entrances to the facility (e.g., an attendant, television monitors, locked entrances, or controlled roadway access to the facility).	0
Accessibility (Select the single largest value)	5
Describe the site accessibility.	

F. Site Dynamics - This deals with site conditions that are subject to change in the future, but may be stable at the present. Examples would be excessive soil erosion by beaches or streams, increasing land development that could reduce distances from the site to inhabited areas or otherwise increase accessibility.

	VALUE
Expected	5
None Anticipated	0
Site Dynamics (Select largest value)	5
Describe the site dynamics.	AREA IS NOW PART OF GOLF COURSE

TOTAL HAZARD PROBABILITY VALUE

(Sum of Largest Values for A through F--Maximum of 30)

Apply this value to Hazard Probability Table 2 to determine
Hazard Probability Level.

TABLE 2

HAZARD PROBABILITY

Description	Level	Hazard Probability Value
FREQUENT	A	27 or greater
PROBABLE	(B)	21 ²² to 26
OCCASIONAL	C	15 to 20
REMOTE	D	8 to 14
IMPROBABLE	E	less than 8

* Apply Hazard Probability Level to Table 3.

Part III. Risk Assessment. The risk assessment value for this site is determined using the following Table 3. Enter with the results of the hazard probability and hazard severity values.

TABLE 3

Probability Level		FREQUENT A	PROBABLE (B)	OCCASIONAL C	REMOTE D	IMPROBABLE E
Severity Category:						
CATASTROPHIC	I	1	1	2	3	4
CRITICAL	II	1	2	3	4	5
MARGINAL	III	2	3	4	4	5
NEGLIGIBLE	(IV)	3	(4)	4	5	5

RISK ASSESSMENT CODE (RAC)

- RAC 1 Expedite INPR, recommending further action by CEHND - Immediately call CEHND-ED-SY--commercial 205-955-4968 or DSN 645-4968.
- RAC 2 High priority on completion of INPR - Recommend further action by CEHND.
- RAC 3 Complete INPR - Recommend further action by CEHND.
- RAC 4 Complete INPR - Recommend further action by CEHND.
- RAC 5 Usually indicates that no further action (NOFA) is necessary. Submit NOFA and RAC to CEHND.

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Part IV. Narrative. Summarize the documented evidence that supports this risk assessment. If no documented evidence was available, explain all the assumptions that you made.

THE FORM INDICATES A RAC 4 SCORE. GIVEN THE FACT THAT EXPLOSIVE ORDNANCE WAS PROBABLY NEVER USED ON THE PISTOL RANGE AND THAT THE RANGE WAS LATER REMOVED - RECOMMEND A RAC SCORE OF 5 BE ASSIGNED AND THAT NO FURTHER ACTION IS NECESSARY.

FINAL PAGE

ADMINISTRATIVE RECORD

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