Community Environmental Response Facilitation Act (CERFA) Report

Fort Des Moines
Des Moines, Iowa

Prepared for:

U.S. ARMY ENVIRONMENTAL CENTER
ABERDEEN PROVING GROUND, MARYLAND 21010

Prepared by:

THE EARTH TECHNOLOGY CORPORATION
1420 King Street, Suite 600
Alexandria, Virginia 22314

April 1994

040R.RPT

AEC Form 45, 1 Feb 93 replaces THAMA Form 45 which is obsolete.

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REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

1. AGENCY USE ONLY *(Leave Blank)*	2. REPORT DATE	3. REPORT TYPE AND DATES COVERED
	April 1994	Final

4. TITLE AND SUBTITLE

Community Environmental Response Facilitation Act (CERFA) Report, Fort Des Moines, Des Moines, Iowa

5. FUNDING NUMBERS

Contract No. DAAA15-91-D-0009; Delivery Order 0010

6. AUTHOR(S)

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7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)

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8. PERFORMING ORGANIZATION REPORT NUMBER

N/A

9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)

U.S. Army Environmental Center
Aberdeen Proving Ground, MD 21010

10. SPONSORING/MONITORING AGENCY REPORT NUMBER

N/A

11. SUPPLEMENTARY NOTES

Report is contained in one volume.

12a. DISTRIBUTION/AVAILABILITY STATEMENT

Distribution Unlimited

12b. DISTRIBUTION CODE

13. ABSTRACT *(Maximum 200 words)*

This report presents the results of the Community Environmental Response Facilitation Act (CERFA) investigation conducted by The Earth Technology Corporation (TETC) at the Fort Des Moines, a U.S. Government property selected for closure by the Base Realignment and Closure (BRAC) Commission under Public Laws 100-526 and 101-510. Under CERFA (Public Law 102-426), Federal agencies are required to identify real property that can be immediately reused and redeveloped. Satisfying this objective requires the identification of real property where no hazardous substances or petroleum products, regulated by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), were stored for one year or more, known to have been released, or disposed.

Fort Des Moines is a 53.28-acre site located in Polk County, Iowa, within the city limits of Des Moines. The installation's primary mission is to provide support and shelter for the U.S. Army Reserve. Activities associated with the property that have environmental significance are photographic processing, vehicle maintenance, printing, and fuel storage.

TETC reviewed existing investigation documents; U.S. Environmental Protection Agency (USEPA), State, and county regulatory records, environmental data bases; and title documents pertaining to Fort Des Moines during this investigation. In addition, TETC conducted interviews and visual inspections of Fort Des Moines as well as visual inspections and data base searches for the surrounding properties.

Information in this CERFA Report was current as of April 1994. This information was used to divide the installation into four categories of parcels: CERFA Parcels, CERFA Parcels with Qualifiers, CERFA Disqualified Parcels, and CERFA Excluded Parcels, as defined by the Army.

The total BRAC property acreage at Fort Des Moines is 52 acres. Areas of the facility that have no history of CERCLA regulated hazardous substance or petroleum product release, disposal, or storage are categorized as CERFA Parcels. TETC determined that approximately 10 acres of the 52 acre property fall within the CERFA Parcel category, predominantly in the east part of the installation.

14. SUBJECT TERMS	15. NUMBER OF PAGES 94
Fort Des Moines, CERFA, Base Closure, BRAC	16. PRICE CODE

17. SECURITY CLASSIFICATION OF REPORT	18. SECURITY CLASSIFICATION OF THIS PAGE	19. SECURITY CLASSIFICATION OF ABSTRACT	20. LIMITATION OF ABSTRACT
Unclassified	Unclassified	Unclassified	SAR

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LIST OF ACRONYMS & ABBREVIATIONS

ARAR	Applicable Regulations and Requirement
AREE	Areas Requiring Environmental Evaluation
BRAC	Base Realignment and Closure
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERFA	Community Environmental Response Facilitation Act
ERIIS	Environmental Risk Information and Imaging Services
PA	Preliminary Assessment
PCB	Polychlorinated Biphenyls
PCE	Tetrachloroethylene
pCi/L	PicoCuries per liter
POL	Petroleum, Oil, and Lubricant
RCRA	Resource Conservation and Recovery Act
TAL	Target Analyte List
TCE	Trichloroethylene
1,1,1-TCE	1,1,1-Trichloroethylene
TCL	Target Compound List
TETC	The Earth Technology Corporation
TPH	Total Petroleum Hydrocarbon
UDA	Unrestricted Disposal Area
µg/g	Micrograms per gram
µg/L	Micrograms per liter
USAEC	U.S. Army Environmental Center
USATHAMA	U.S. Army Toxic and Hazardous Material Agency

EXECUTIVE SUMMARY

This report presents the results of the Community Environmental Response Facilitation Act (CERFA) investigation conducted by The Earth Technology Corporation (TETC) at the Fort Des Moines, a U.S. Government property selected for closure by the Base Realignment and Closure (BRAC) Commission under Public Laws 100-526 and 101-510. Under CERFA (Public Law 102-426), Federal agencies are required to identify real property that can be immediately reused and redeveloped. Satisfying this objective requires the identification of real property where no hazardous substances or petroleum products, regulated by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), were stored for one year or more, known to have been released, or disposed.

Fort Des Moines is a 52-acre site (more or less) located in Polk County, Iowa, within the city limits of Des Moines. The installation's primary mission is to provide support and shelter for the U.S. Army Reserve. Activities associated with the property that have environmental significance are photographic processing, vehicle maintenance, printing, and fuel storage.

TETC reviewed existing investigation documents; U.S. Environmental Protection Agency (USEPA), State, and county regulatory records; environmental data bases; and title documents pertaining to Fort Des Moines during this investigation. In addition, TETC conducted interviews and visual inspections of Fort Des Moines as well as visual inspections and data base searches for the surrounding properties.

Information in this CERFA Report was current as of April 1994. This information was used to divide the installation into four categories of parcels: CERFA Parcels, CERFA Parcels with Qualifiers, CERFA Disqualified Parcels, and CERFA-Excluded Parcels, as defined by the Army.

The total BRAC property acreage at Fort Des Moines is 52 acres. Areas of the facility that have no history of CERCLA-regulated hazardous substance or petroleum product release, disposal, or storage are categorized as CERFA Parcels. TETC determined that approximately 10 acres of the 52-acre property fall within the CERFA Parcel category, predominantly in the east part of the installation.

Areas of the facility that had no evidence of such release, disposal, or storage, but contained hazards not regulated by CERCLA (such as asbestos, radon gas, lead-based paint, unexploded ordnance, radionuclides, or not in-use equipment containing polychlorinated biphenyl) were categorized as CERFA Parcels with Qualifiers. Approximately 5 acres of the facility were identified as CERFA Parcels with Qualifiers.

Areas of the facility for which there is a history of release, disposal, or storage for one year or more of CERCLA-regulated hazardous substances or petroleum products were categorized as CERFA Disqualified Parcels. Thirty-seven (37) acres of installation property are identified as CERFA Disqualified Parcels.

Areas on the facility that will be retained by the Federal Government or that have already been transferred by deed are categorized as CERFA-Excluded Parcels. None of the property was identified as CERFA-Excluded Parcels.

The primary objective of CERFA is satisfied by the identification of CERFA Parcels and CERFA Parcels with Qualifiers. As a result, concurrence has been sought from the regulatory agencies on these two categories of parcels. This CERFA Report has been reviewed by the U.S. Army Environmental Center (USAEC), Fort Des Moines, Region X USEPA, and the State of Iowa Department of Natural Resources. Comments from these organizations have been incorporated into this final report. Any unresolved issues from the regulatory agencies are identified.

This report contains maps that summarize the categorization of Fort Des Moines on the basis of the above definitions. This Executive Summary should be read only in conjunction with the complete CERFA Report for this installation. The CERFA Report provides the relevant environmental history to substantiate the parcel categorization. This report does not address other property transfer requirements that may be applicable under the National Environmental Policy Act, nor does it address natural resource considerations such as the threat to plant or animal life.

1.0 INTRODUCTION

This Community Environmental Response Facilitation Act (CERFA) Report for Fort Des Moines was prepared by The Earth Technology Corporation (TETC) under Contract No. DAAA15-91-0009, Delivery Order 0010, for the U.S. Army Environmental Center (USAEC), Base Closure Division. The purpose and scope of the work are presented in this section. The sources used to conduct the investigations for the CERFA Report are identified in Section 2. Background information for the Fort Des Moines is provided in Section 3. CERFA investigation results are discussed in Section 4. Finally, Section 5 includes maps that delineate Fort Des Moines boundaries, land transfers, and the parcels of the facility according to CERFA Parcel identification requirements.

1.1 PURPOSE AND SCOPE

Public Laws 100-526 and 101-510 designated more than 100 Army facilities for closure and realignment. As a result, it became necessary to expedite the environmental investigation and cleanup process prior to the release and reuse of Army Base Realignment and Closure (BRAC) property. The BRAC environmental restoration program was established with the first round of base closures (BRAC 88) and continued with subsequent rounds (BRAC 91, BRAC 93, etc.). The BRAC program is similar to the Army's Installation Restoration Program, but it has been expanded to include such categories of contamination as asbestos, radon, polychlorinated biphenyls (PCBs), and others that are not normally addressed under the program.

The first step in the BRAC environmental restoration program was the preparation of Enhanced Preliminary Assessments (PAs). The term "enhanced" is used to distinguish these assessments from previous restoration program PAs: The BRAC PAs are conducted from a property transfer perspective and evaluate substances (e.g., asbestos, radon, PCBs) that are not included in the previous PAs. The Enhanced PAs include reviews of existing installation documents, regulatory records, and aerial photographs; a site visit and visual inspection; and employee interviews. Enhanced PAs were conducted for BRAC 88 and BRAC 91 installations and are currently underway at BRAC 93 installations. An Enhanced PA was prepared for Fort Des Moines in December 1989 by Roy F. Weston, under the direction of USAEC (formerly the U.S. Army Toxic and Hazardous Material Agency [USATHAMA]).

In October 1992, Public Law 102-426, CERFA, amended Section 120(h) of Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and established new requirements for contamination assessment and regulatory agency notification/concurrence for Federal facility closures. CERFA requires the Federal Government to identify property where no hazardous substances or petroleum products regulated by CERCLA were stored, released, or disposed before ending activities on real property owned. The Government's assessment of a facility as uncontaminated must be concurred with by the appropriate regulatory agencies (U.S. Environmental Protection Agency (USEPA) on National Priorities List bases and the State on non-National Priorities List bases). These requirements retroactively affect the Army BRAC 88 and BRAC 91 environmental restoration activities and are being implemented at BRAC 93 sites

concurrently with their Enhanced PAs. The primary objective of the CERFA is that Federal agencies expeditiously identify real property that can be rapidly reused and redeveloped. (However, CERFA does not mandate that the Army transfer real property so identified.)

TETC was awarded the task to identify real property where no hazardous substances or petroleum products regulated by CERCLA were stored, released, or disposed at 12 BRAC 88 sites. This report presents the findings of this CERFA response for Fort Des Moines, Des Moines, Iowa.

1.2 Definition of Terms

The following definitions are used to categorize and label parcels identified on the installation:

- CERFA Parcel -- A portion of the installation real property for which investigation reveals no evidence of storage for one year or more, release, or disposal of CERCLA hazardous substances, petroleum, or petroleum derivatives and no evidence of being threatened by migration of such substances. CERFA Parcels include areas where PCB-containing equipment is in operation, but there is no evidence of release. CERFA Parcels also include any portion of the installation which once contained related environmental, hazard, or safety issues including unexploded ordnance (UXO) located on firing ranges or impact areas, radon, stored (not in-use) PCB-containing equipment, asbestos contained within building materials, and lead-based paint applied to building material surfaces, but which have since been fully remediated or removed.

- CERFA Parcel with Qualifier(s) -- A portion of the installation real property for which investigation reveals no evidence of storage for one year or more, release, or disposal of CERCLA hazardous substances, petroleum, or petroleum derivatives and no evidence of being threatened by migration of such substances. Parcel does however contain related environmental, hazard, or safety issues including unexploded ordnance (UXO) located on firing ranges or impact areas, radon, radionuclides contained within products being used for their intended purposes, asbestos contained within building materials, lead-based paint applied to building material surfaces, or stored (not in-use) PCB-containing equipment.

- CERFA Disqualified Parcel -- A portion of the installation real property for which investigation reveals evidence of a release, disposal, or storage for more than one year of a CERCLA hazardous substance, petroleum, or petroleum derivatives; or a portion of the installation threatened by such a release or disposal. CERFA Disqualified Parcels also include any portion of the installation where PCB, asbestos-containing material, lead-based paint residue, or any ordnance has been disposed of, and any locations where chemical ordnance has been stored. Additionally, CERFA Disqualified Parcels include any areas in which CERCLA hazardous substances or petroleum products have been released or disposed of and subsequently fully remediated.

- CERFA-Excluded Parcel -- A portion of the installation real property retained by the Department of Defense, and therefore not explicitly investigated for CERFA. CERFA-Excluded Parcels also include any portions of the installation which have already been transferred by deed to a party outside the Federal Government, or by transfer assembly to another Federal agency.

The following labels are used in conjunction with the identified parcels:

- P = CERFA Parcel
- Q = CERFA Parcel with Qualifier(s)
- D = CERFA Disqualified Parcel
- E = CERFA-Excluded Parcel

Each parcel has been given a unique number to which the appropriate labels are attached. For example, 4P indicates that the fourth parcel is in the CERFA Parcel category.

The presence of hazards not regulated by CERCLA places a parcel in the CERFA Parcel with Qualifier category. This is indicated by the following labels:

- A = Asbestos
- L = Lead-based Paint
- P = PCB
- R = Radon
- X = Unexploded Ordnance
- RD = Radionuclides

For example, the designation 5Q-L indicates that the fifth parcel is in the CERFA Parcel with Qualifiers category because of the presence of lead-based paint. Similarly, parcel label 8Q-X/R indicates that the 8th parcel is in the CERFA Parcel with Qualifiers category because of the presence of unexploded ordnance and radon.

The following designations are used to indicate the type of contamination or storage present in a parcel that has been placed in the CERFA Disqualified category:

- PR = Petroleum Release
- PS = Petroleum Storage
- HR = Hazardous Substance Release
- HS = Hazardous Substance Storage

For example, 12D-HR indicates that the twelfth parcel is in the CERFA Disqualified category because of evidence of hazardous substance release.

For all parcels, "(P)" is used to indicate that the presence of a contaminant is possible, but that data are unavailable for verification. For example, 9Q-A(P) indicates that the ninth parcel is in the CERFA Parcel with Qualifiers category because of the possible presence (unverified) of asbestos-containing material. Similarly, parcel label 15D-HR/PS/A(P) indicates that the 15th

parcel is classified as a CERFA Disqualified Parcel on the basis of evidence of a hazardous substance release and petroleum storage. It may also have asbestos-containing material.

1.3 GEOGRAPHICAL AND ENVIRONMENTAL SETTING

Fort Des Moines is situated within the Des Moines city limits in southern Polk County, Iowa. The facility is located 1 mile east of the Des Moines Municipal Airport along the south side of Army Post Road (see Figure 1-1). Fort Des Moines is bounded by a commercial/residential area to the north, a golf course to the east and south, Blank Park Zoo to the south, and Blank Park to the west.

The BRAC property that is the subject of this report (hereafter identified as the BRAC property) is the current 52-acre Fort Des Moines facility. The facility represents the major remaining portion of a former U.S. Army cavalry post that was established on 640 acres of donated land in 1903. Much of the original property, approximately 557 acres, has already been excised by the Army and is now used for commercial, residential, and recreational purposes. A 30.02-acre parcel of the installation not under consideration for property transfer is occupied by the U.S. Army Reserve Center. This property is located to the northeast of the BRAC property. It will remain active despite closure of the adjoining Fort Des Moines facility.

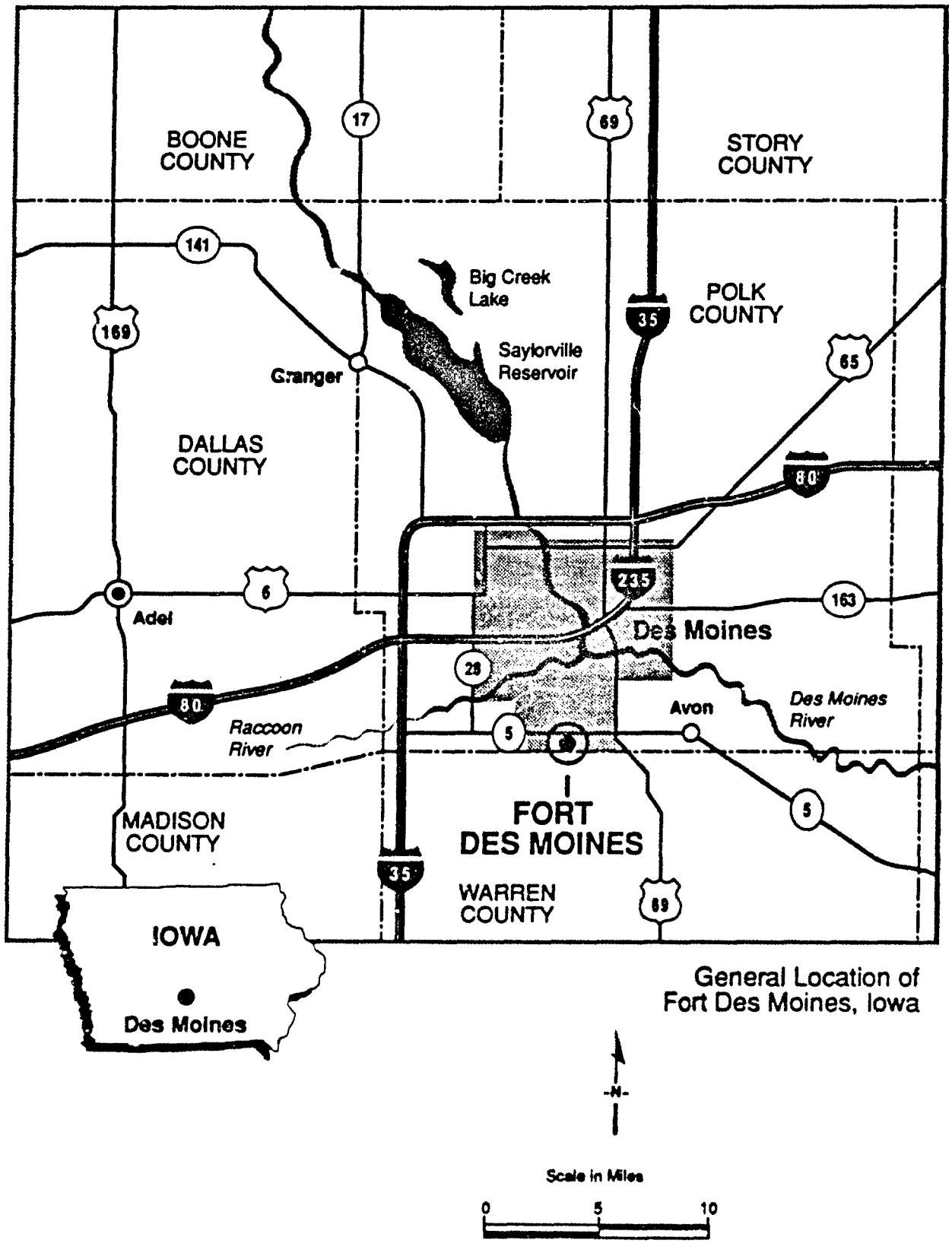
Fort Des Moines is registered as a National Historic Landmark. Based on a Memorandum of Agreement signed in 1984 by the Army, the Advisory Council on Historic Preservation, and the Iowa State Historic Preservation Office, any proposed uses for the buildings will consider their historic value.

1.3.1 Physical Setting

Fort Des Moines is located within the Glaciated Central Plains physiographic province, in an area classified as the Southern Iowa Drift Plain. Topography across the site is gently sloping toward the south and southwest, with elevations varying from approximately 950 feet above mean sea level in the central and northern areas of the facility to approximately 940 feet above mean sea level in the central areas. Slope increases as elevation decreases to about 920 feet above mean sea level in the south-central and southwest portions of the site near the boundary with the Blank Park Zoo.

1.3.2 Surface Water

Fort Des Moines is nearest to the Des Moines River and its tributary, the Raccoon River. The juncture of these rivers is approximately 4 miles north of the site. Municipal water for Des Moines is drawn from these two rivers. All of the streams associated with the site appear to be primarily wet weather channels that may receive some base flow discharge, with collected runoff ultimately draining to the southwest of Blank Park Zoo.



General Location of
Fort Des Moines, Iowa

Some of the surface water runoff from the facility is discharged from a stormwater outfall pipe into an incised channel in Unrestricted Disposal Area No. 1 (UDA-1), which then drains south into Blank Park Zoo. A second ephemeral stream with a southwest trend and originating from the vicinity of Unrestricted Disposal Area No. 2 (UDA-2) joins the UDA-1 channel immediately prior to flowing off the BRAC property. Blank Park Creek is located off the BRAC property in Blank Park. The source of this stream is composed of two components. The first component is a base flow within the glacial till north and northwest of the beginning of the creek. The second component is surface water discharge from vicinity of the creek. This third ephemeral stream flows to the south for a distance of approximately 400 feet until it enters another underground pipe that carries the water, when flowing, beneath the Blank Park Zoo parking lot, around the west side of the zoo, and eventually into the stormwater culvert draining the zoo property. A diversion gate was erected in the fall of 1990, so that surface water from Blank Park Creek could be controlled to fill Lagoon Pond. Because the diversion gate is no longer used, surface water from Blank Park Creek is channeled off of the zoo property.

The nearest permanent surface water bodies are five created ponds located in Blank Park Zoo: Flamingo, Australian Outback, Lagoon, Sea Lion, and Penguin Ponds. The Penguin and Sea Loin Ponds are concrete-lined and are filled with municipal water. Surface water entering zoo property from UDA-1 is carried first aboveground within a stream channel, then underground in a pipe, and finally into an aboveground concrete-lined culvert leading to the Lagoon Pond, which is a waterfowl pond filled primarily with municipal water. The other ponds do not receive surface water from Fort Des Moines.

There has been no industrial wastewater treatment or sewage treatment at Fort Des Moines; the facility is tied into the Des Moines municipal sewer system.

1.3.3 Geology and Soils

The Fort Des Moines area is approximately 3 miles south of the Bemis Moraine, a terminal moraine associated with the Des Moines Lobe of the Wisconsin glaciation. Surficial geology in the area consists of Quaternary Age glacial-drift materials (i.e., tills and other ice-contact deposits) associated with loess, a wind-deposited silty clay/silty sand mixture. Tills consist of poorly sorted silt/clay mixtures with some sand and gravel deposits and may be interbedded in some areas with buried channel outwash deposits that consist predominantly of sand and gravel. The total thickness of overburden materials, including soils, glacial drift deposits, and buried outwash channels, has been estimated to be approximately 50 feet.

The underlying bedrock is reportedly composed of shale and limestone units (with some interbedded sandstone and coal beds) of the Pennsylvanian Cherokee and Marmaton Groups. These lithologic groups may reach a thickness of 500 feet in some areas of Polk County. The Cherokee and Marmaton Groups are underlain by Mississippian limestone and dolomite deposits of the Meramac, Osage, and Kinderhook series.

Site-specific geologic information for Fort Des Moines reveals that deposits of silty and sandy clay or silty sand are present to a depth of 45 feet below existing grade. Thin layers or lenses of outwash sand sandwiched between clay layers typical to glacial deposits are also present.

Limestone bedrock is encountered at a depth of 45 feet below existing grade as indicated by the installation of a well within the Blank Park Zoo parking lot. The encountered materials coincide with the Quaternary and Pennsylvanian deposits of Polk County noted above. The unconsolidated Quaternary materials, classified according to the United Soils Classification System, include soil types: CL (inorganic clays of low to medium plasticity), CH (inorganic clays of high plasticity), ML (inorganic silts and very fine sands), SP (poorly graded sands), SW (well graded sands), and SM (silty sands).

Surface soils at Fort Des Moines are grayish-brown silty loams or silty clay loams of the Ladogas series. These soils are typically associated with loess deposits, and are slightly to moderately acidic. Ladogas series soils are generally 60 to 70 inches thick, and exhibit highly variable drainage characteristics, ranging from good to imperfect. These soil types occur in areas with slopes of 2 to 30 percent, and erosion is considered a potential hazard in more steeply sloping areas.

1.3.4 Hydrogeology

The groundwater within the glacial deposits in Polk County is commonly encountered between 10 to 50 feet below existing grade. The unconsolidated glacial drift materials that are found near the surface are considered to be poor aquifers, with yields of less than 10 gallons per minute. In general, low yields can be expected from deposits comprised predominantly of loess, silt/clay, till, or other fine-grained materials with some of these deposits not yielding sufficient water to be considered aquifers. In some areas, however, where buried channel outwash deposits or other sand and gravel deposits are present, yields from the surficial aquifer may be much greater. Such coarser grained deposits are highly localized and cannot be readily identified except by soil-test drilling or sophisticated geophysical exploration.

The uppermost bedrock units that underlie Fort Des Moines (i.e., shales and limestone of the Cherokee and Marmaton Groups) are considered to behave as an aquiclude or confining unit, yielding only small quantities of water from the limestone and sandstone layers. The nearest wells to Fort Des Moines, for which records are available, were drilled at the A.H. Blank Golf Course located to the south and east of the facility. These wells are reported to have not yielded significant amounts of water until a bedrock aquifer was encountered at 450 to 460 feet below existing grade.

Groundwater flow within the surficial aquifer at Fort Des Moines is generally to the southwest, controlled by surface topography. The presence and distribution of more permeable units such as buried channel deposits, and the location of nearby surface-water bodies that may sometimes serve as groundwater discharge points can also affect groundwater flow. Based on these factors, groundwater flow in the uppermost unconsolidated materials (and possibly the upper weathered/fractured zones of the underlying bedrock units) is predominantly to the south and southwest, toward surface drainage features and small ponds and lakes located at the nearby zoo, golf course, and park. The Des Moines and the Raccoon Rivers are considered too distant to affect local groundwater flow patterns at Fort Des Moines.

The groundwater within the surficial glacial drift aquifer contains hardness ions (i.e., calcium and magnesium) and undesirable concentrations of iron and manganese. In some areas, sulfates, nitrates, and bacteria in drinking water exceed recommended limits as a result of contaminated wells or infiltration of agricultural wastewater and runoff into the shallow drift aquifer. As a result, groundwater produced from the surficial aquifer has use restrictions.

2.0 SCOPE OF INVESTIGATION

The scope of this CERFA investigation followed the protocol established in Public Law 102-426 supplemented by Department of Defense Policy on the Implementation of CERFA dated May 19, 1993. This section describes the sources that were used during the CERFA investigation conducted for Fort Des Moines. Relevant information available from previous environmental studies are presented. Findings from Federal, State, and local government regulatory records, installation documents, aerial photographs, and personnel interviews are addressed. The inspection methods used during the site survey are identified.

2.1 EXISTING DOCUMENTS

Investigation documents and aerial photographs were reviewed to evaluate pertinent information that could be used as part of the CERFA Report. These documents are summarized below and listed in Appendix A, "Reference List for Fort Des Moines." Primary source documents containing CERFA criteria information include the Enhanced PA, Environmental Investigation, Risk Assessment, and Alternative Analysis, which are summarized in Table 2-1.

2.1.1 Archives Search Report (May 1985)

The purpose of the Archives Search Report was to determine the existence of toxic and hazardous materials and related contamination of Fort Des Moines. Preparation of the report included record searches at Federal, State, and local agency offices, as well as on-site record searches and personnel interviews. The report addressed a variety of environmentally significant operations at the facility including industrial operations, laboratory operations, ranges, toxic/hazardous materials handling, petroleum, oil, and lubricant (POL) handling and storage, sanitary and industrial wastewater treatment, landfilling and solid waste disposal, wastes and air quality.

Findings relative to these operations were identified as environmentally significant operations/areas requiring environmental evaluation (AREE) in subsequent Enhanced PA and Draft Final Environmental Investigation/Risk Assessment/Alternatives Analysis reports. The only significant environmentally significant operations not specifically addressed in the following investigation comments was the Archives Search Report's finding that waste oil was used to suppress dust on installation roads and to control weeds around buildings. The activity reportedly occurred until approximately 1982, when a waste oil disposal program was instituted.

2.1.2 Enhanced Preliminary Assessment Report (December 1989)

An Enhanced PA was prepared during the autumn of 1989 to assess the environmental quality at Fort Des Moines. The Enhanced PA is expanded to cover topics not normally addressed in a PA. The Enhanced PA evaluated a number of programmatic and building specific environmentally significant operations associated with the historical and current use of the facility. Information contained in the Enhanced PA was obtained through visual inspection of

TABLE 2-1
SUMMARY OF ENHANCED PRELIMINARY ASSESSMENT AND DRAFT FINAL ENVIRONMENTAL INVESTIGATION/RISK ASSESSMENT/ALTERNATIVES ANALYSIS REPORT, FORT DES MOINES

CERFA Label	Enhanced Preliminary Assessment (December 1989)	Draft Final Environmental Investigation/Risk Assessment/Alternatives Analysis (July 1993)
Asbestos	Asbestos used in heating, and sewage systems reported by the maintenance staff to exist in most buildings. Suspected asbestos in a heating and sewage system were identified in Buildings 307 and 309, respectively. Suspected asbestos-wrapped pipe covering used to insulate an overhead fill pipe connecting Buildings 122 and 123.	An asbestos-containing materials survey was conducted for all buildings except Building 138 and 133. Asbestos-containing material found in a friable condition included linear feet of pipe insulation, 1,217 pipe elbows, and 5,530 square feet of boiler and tank insulation.
Lead-based paint	Not addressed.	Interior paint sampling was completed for all buildings except Building 138. Due to both the age of the buildings and the results of the facility-wide sampling, all the structures are assumed to contain quantities of lead-based paint.
Polychlorinated biphenyls	Twenty pole-mounted transformers suspected of containing PCBs were identified. Three PCB-contaminated transformers were found stored in Building 309 awaiting shipment to Fort McCoy. Building 138 was also used as a previous storage location for electrical transformers prior to shipment to Fort McCoy. PCB releases were suspected at Building 138, and at a transformer used at Building 307.	Thirty-two transformers at Fort Des Moines were sampled. Of the 32 transformers tested, five are "PCB transformers" and eight are "PCB contaminated". Soil and wipe samples were collected from Building 138. Soil sampling was conducted at Buildings 126, 139, and 307.
Radon	Not addressed.	An indoor radon survey was conducted for all buildings except Building 138. The sampling confirmed the presence of radon gas at levels slightly above the regulatory level of 4 picoCuries per liter with the highest recording occurring at 7.8 picoCuries per liter in Building 72. Buildings 63 and 72 were sampled twice.
Unexploded ordnance	Not addressed.	Activities that may have resulted in the presence of unexploded ordnance are not applicable to the Fort Des Moines facility.
Radionuclides	Not addressed.	Use, storage or disposal of radionuclides is not applicable to the Fort Des Moines facility.
Petroleum release or disposal	Unidentified waste oil disposal behind Building 117 was identified and cleanup was described. A potential for release was indicated in 2 unrestricted disposal areas. Possible releases from underground storage tanks were suspected due to the presence of water reported in tanks.	Total petroleum hydrocarbon analysis conducted on soil samples at 2 unrestricted disposal areas, Buildings 126/127, Building 55, and Building 68. Groundwater samples collected for Phase I wells, surface water and sediment samples collected at streams in 2 unrestricted disposal areas, and Building 138 storm drains. Contamination above Iowa's allowable limit was found in soil samples at Unrestricted Disposal Area 2. Waste oil release for underground storage tank removal at Building 117 and associated clean up was also documented.

TABLE 2-1
SUMMARY OF ENHANCED PRELIMINARY ASSESSMENT AND DRAFT FINAL ENVIRONMENTAL INVESTIGATION/RISK ASSESSMENT/ALTERNATIVES ANALYSIS REPORT, FORT DES MOINES

Continued

CERFA Label	Enhanced Preliminary Assessment (December 1989)	Draft Final Environmental Investigation/Risk Assessment/Alternatives Analysis (July 1993)
Petroleum storage	Eight underground storage tanks containing leftover, unusable, and contaminated gasoline, fuel oil, waste oil and water were identified at the site.	Underground storage tank contents analysis was completed for 4 tanks. Magnetometer and ground penetrating radar survey was conducted to verify non-presence of an underground storage tank at Building 122. Removal of underground storage tanks at Buildings 129 and 117 was described.
Hazardous substance release or disposal	Former Barco Chemical Company pesticide blending operation was within Building 138. Approximately a 4,000 square foot building and contents was known to be contaminated with various pesticides. Building 138 also contains an abandoned elevator shaft containing an estimated 2,200 gallons of waste hydraulic fluid reported to be PCB-contaminated by previous transformer storage. Road expansion and crack sealant used on Rodgers Road was suspected of containing PCBs. Buildings 58 and 81 containing firing ranges were cluttered with debris, casings, and lead. Two unrestricted disposal areas used for tree litter, scrap material, and appliances may have received other materials. Unidentified waste oil disposal behind Building 117 was identified and cleanup was described. Asbestos reportedly was abated in Building 138 buried near building.	The following investigation/sampling activities were completed regarding hazardous releases: sampling of Building 138 for pesticide/herbicide and PCB contamination including ambient air quality, surficial and subsurface soil sampling, surface water sampling, soil vapor analysis, groundwater sampling, aquifer testing; smoke test to determine sewer line layout; sediment sampling; sampling of sealant in Rodgers Road to analyze for PCB content; debris sampling for metals at small arms firing range. The following investigation/sampling activities were completed regarding hazardous disposal: surface and subsurface soil sampling, surface water sampling, soil vapor analysis, groundwater sampling, aquifer testing, and sediment sampling.
Hazardous substance storage	Building 55 was identified as being used for the storage of chemicals in the basement.	Prepared an inventory of stored chemicals at Fort Des Moines. Sampled unlabeled drums.

Key: CERFA = Community Environmental Response Facilitation Act
PCB = Polychlorinated Biphenyls

the facility, review of available information from current property owners, review of related regulatory agency files at the local, State, and Federal levels, and interviews with available current and former personnel associated with the facility. A summary of Enhanced PA environmentally significant operations include:

- ★ ***Building 55.*** Barracks reportedly had the storage of chemicals in basement.

- ★ ***Underground Storage Tank.*** Eight tanks containing leftover, unusable, and contaminated gasoline, fuel oil, and waste oil were identified at the facility.

- ★ ***Building 138.*** This building housed a former Barco Chemical Company pesticide blending operation. The approximately 4,000 square foot building is contaminated with various pesticides. An abandoned elevator shaft located in the building contains an estimated 2,200 gallons of waste hydraulic fluid. The building has also been used as a storage location for electrical transformers prior to shipment to Fort McCoy, Wisconsin.

- ★ ***Open Dump Areas.*** Two unrestricted disposal areas (UDA-1 and UDA-2) were used to dump tree litter, scrap material, and appliances and possibly other solid/liquid wastes. Open dumping of unidentified waste oil reportedly occurred behind Building 117. The contaminated soil was reportedly excavated and removed from the site. Asbestos from an abatement operation in Building 138 was reportedly buried near the building.

- ★ ***Asbestos.*** Asbestos, used in heating and sewage systems, was reported by the maintenance staff to be in most buildings (including the insulated pipe connecting Building 122 and 123, a heating system pipe in Building 307, and a sewage system pipe in Building 309).

- ★ ***Buildings 58 and 81.*** These two buildings were identified as containing firing ranges cluttered with debris, casings, and lead.

- ★ ***Electrical Transformers.*** Twenty pole-mounted transformers suspected of containing PCBs were identified. In addition, at the time of the Enhanced PA, three PCB-contaminated transformers were stored in Building 309 awaiting shipment to Fort McCoy, Wisconsin.

- ★ ***Rodgers Road.*** Road expansion and crack sealant used on Rodgers Road was suspected of containing PCBs.

The Enhanced PA reported that no conditions were observed on the property that presented an imminent threat to human health or the environment. However, long-term threats to human health were possible as a result of leaking transformers and potential pesticide dispersal. The potential for environmental degradation was related to PCB leakage, pesticide migration, and open dumping. AREEs included the immediate confirmation of the presence or absence of friable asbestos and implementation of any necessary abatement measures; the immediate repair

or replacement of materials to secure access to Building 138 and to control building deterioration and contaminant migration; and further characterization of environmentally significant operations through site investigations.

2.1.3 Installation Assessment, Army Base Closure Program (June 1990)

In 1990, USEPA conducted an analysis of historical aerial photography of Fort Des Moines. The analysis focused on locating and identifying any potential contamination sources within the study area using photographs from 1950 to 1986.

No evidence of potential contamination sources was noted within the BRAC property; however, several environmentally significant features were noted to the south and east. These features included a large landfill, a probable firing range, a depression possibly used to hold liquid, open storage areas, containers, possible debris and pits, and probable staining.

2.1.4 Draft Final Environmental Investigation, Risk Assessment, and Alternatives Analysis (July 1993)

A Draft Final Environmental Investigation/Risk Assessment/Alternatives Analysis was performed to identify existing and potential environmental contamination at Fort Des Moines, assess the human health and environmental risks, and evaluate remedial alternatives to allow the imminent closure and potential transfer or sale of the property. The investigations concentrated on AREEs identified in the Enhanced PA. A Technical Plan for the work included a site visit conducted in 1990. Draft Final Environmental Investigation/Risk Assessment/Alternatives Analysis investigations were carried out in four phases between March 1991 and February 1993.

During the Environmental Investigation, 21 groundwater monitoring wells were installed both on-site and offsite to determine impact of past activities on site environmental quality. The investigation included the activities summarized in Table 2-1. Laboratory analyses were used to develop a baseline risk and hazard assessment of the site.

The Risk Assessment quantified the potential risks to present and future populations on the site. The receptor populations used were residents, recreational users, commercial users, or construction workers at baseline conditions. The following areas were found to have hazards above the acceptable threshold value (i.e., 1) and risks above the acceptable risk range of 1×10^{-4} to 1×10^{-6} (considering factors such as receptors, background concentrations and other circumstances):

- Dust exposure from the interior of Building 138,
- A surface soil "hot spot" south of Building 138, and
- Shallow groundwater in the vicinity of Building 138.

Several areas of Fort Des Moines were not specifically included in the risk assessment because the remediation of these areas is mandated by specific regulation or because no specific receptor population exists. The areas excluded from the risk assessment because of these criteria included:

- ★ UDA-1
- ★ Underground storage tanks
- ★ Electrical transformers
- ★ Storm sewer line sediments between former Building 67 and Building 138
- ★ Lead-contaminated sand from indoor small arms firing ranges
- ★ Stored inventory of chemicals
- ★ Indoor radon gas
- ★ Asbestos-containing Materials
- ★ Lead-based paints.

During the Alternative Analysis, applicable remedial action technologies were assessed. Various technologies were selected for each area of concern based on the general implementability and effectiveness. The most appropriate technologies were then combined into various site-wide remediation alternatives. Finally, 10 alternatives were identified for detailed analysis considering several criteria, including compliance with Applicable Regulations and Requirements (ARARs), long- and short-term effectiveness, and cost. This process is described in more detail below.

The remedial technologies retained through the screening process were separated into three categories based on the remedial action objectives. The first category of proposed remedial actions includes areas of concern where only a single technology was determined to be feasible. Areas of concern grouped into this category of remediation include:

- ★ ***Building 138.*** Remove surface contaminants (dust), steam clean applicable building materials, demolish building, dispose of as primarily construction debris with some hazardous waste disposal. Excavate surface soil "hot spot" south of Building 138, transport for offsite incineration.

- ★ ***Unrestricted Disposal Area 1.*** Debris removal from UDA-1.

- ★ ***Underground Storage Tanks.*** Tanks closed by excavation and removal.

- ★ ***Electrical Transformers.*** Drain and dispose of transformers.

- ★ ***Small Arms Firing Ranges.*** Perform hazard analysis on sand from the two sand pits and dispose of the material in accordance with applicable regulations.

- ★ ***Stored Chemicals.*** Collect, lab-pack, and transport for offsite disposal.

The second category of site-specific remediation addresses future human habitation or occupancy of existing buildings. Environmental concerns associated with this remediation category involve asbestos, radon, and lead-based paint. Until the ultimate future reuse of the BRAC property has been approved, specific remediation for these concerns cannot be determined. Potential remediation ranges from "no action" in the event that the Army maintains ownership of the BRAC property to complete removal of friable asbestos and lead-based paint in the event that the property is transferred.

The third category of remediation at Fort Des Moines addressed the areas that are affected by groundwater removal and treatment. The following four options were retained for the groundwater remediation:

- ★ No action
- ★ Source reduction (excavation of storm sewer line)
- ★ Monitoring with source reduction
- ★ Pump and discharge to sewage treatment plant.

The three categories of remediation were combined into 10 separate site-wide alternatives. Costs for implementation ranged from approximately $1.1 million to $3.7 million, depending on the extent of remediation considered.

2.1.5 Final Environmental Assessment, Partial Closure of Fort Des Moines (April 1991)

An Environmental Assessment for the partial closure of Fort Des Moines was prepared to assess the environmental and economic impacts of installation closure. Generalized reuse alternatives for Fort Des Moines were considered in the assessment. The assessment report included pertinent information regarding asbestos, PCB transformers, underground storage tanks, pesticide contamination, and waste disposal.

2.2 Federal, State, and Local Government Regulatory Records

Information regarding permit and compliance status, enforcement actions, and the hazardous waste generator status of Fort Des Moines was obtained through on-site and telephone interviews, an electronic data base search, and record reviews at various Federal, State, and local regulatory agencies.

Record reviews and interviews were conducted at the Iowa Department of Natural Resources and the U.S. Environmental Protection Agency Region VII. Federal and Army records made available by USAEC and Fort Des Moines were also reviewed.

An electronic data base search of Federal and State records resulted in a Federal/State Data Report and Map containing information from the following data bases:

- ★ National Priorities List
- ★ Comprehensive Environmental Response Compensation, and Liability Information System
- ★ Toxic Release Inventory
- ★ Resource Conservation and Recovery Information System Treatment and Storage Facility
- ★ Resource Conservation and Recovery Information System Large Quantity Generators
- ★ Resource Conservation and Recovery Information System Small Quantity Generators
- ★ Civil Enforcement Docket

- ★ Emergency Response Notifications System
- ★ Facility Index System
- ★ Nuclear Facilities
- ★ Underground Storage Tanks
- ★ Solid Waste Facilities
- ★ Open Dump System.

The search encompassed the properties within a 1-mile radius from the center of the installation. A copy of the data base search results are included in Appendix B. A summary of relevant regulatory information obtained during the record review process is presented below.

2.2.1 Permits and Permit Applications

Prior environmental document reviews indicated that no permit applications had been filed and no environmental permits had been issued to Fort Des Moines by USEPA or the Iowa Department of Natural Resources.

Record reviews conducted at the USEPA Region VII offices revealed that Fort Des Moines was issued an emergency Resource Conservation and Recovery Act (RCRA) Permit (Permit Number IAP000001234) on July 29, 1993. The permit was for the temporary storage of hazardous waste generated and collected as a result of emergency response efforts regarding flooding in and around the State of Iowa. Facility personnel indicated that the orphan drum accumulation area was requested by USEPA to help coordinate their postflood cleanup activities. The area was reportedly managed by USEPA and did not involve the storage of any Fort Des Moines wastes. The estimated quantity of materials handled in the area was 150 80-gallon overpack drums; storage was reportedly for less than 90 days.

2.2.2 Inspection Reports and Enforcement Actions

The data base search conducted prior to the CERFA investigation (see Part 2.4.2) revealed that Fort Des Moines has a USEPA ID Number IA4211890021; however, the data base search did not indicate that the installation was a hazardous waste generator, storage, or disposal facility. Installation personnel confirmed that with the exception of one-time waste generation activities such as soil excavations associated with tanks removal coordinated through Fort McCoy, there are no hazardous waste activities on-site.

Fort Des Moines was included on the USEPA CERCLA List of Potential Hazardous Waste Sites as a result of the pesticide problem identified at Fort Des Moines. This resulted in a PA dated December 10, 1984, and a Preliminary Assessment Reevaluation dated May 1988. Both assessments concentrated on pesticide contamination associated with Building 138. The PA also addressed potential releases of lead at Building 67 (not in the BRAC property). The PA recommended that soil sampling be conducted outside Building 138. The reevaluation report recommended that the Army continue plans to monitor Fort Des Moines.

2.3 INTERVIEWS

TETC conducted a site visit at Fort Des Moines on November 4, 1993, to collect information and interview individuals associated with the installation. TETC's team consisted of Kurt Rausch.

Individuals interviewed at the installation included Russell Fendick, Garry Bianchi, Steve Gunson, and Steve Drane. In addition, Kurt Rausch of TETC visited regulatory agencies to obtain information not available at the installation. A complete list of the agencies visited or contacted and the people interviewed is provided in Table 2-2.

2.4 VISUAL INSPECTIONS

During the site visit, visual inspections were conducted throughout the facility and at adjacent properties. The purpose was to confirm findings reported in previous studies and information collected through interviews, as well as to identify new areas of concern. The visual inspection consisted of automobile drive-through and walk-through surveys of areas in which CERCLA-regulated and non-regulated substances may be stored, released, or disposed. During the visual inspection, contamination sources were noted and leaks, spills, and other evidence of releases were observed and quantified; no samples were collected.

Some buildings were not inspected for the following reasons. Access to the interior of several buildings could not be gained because keys to building locks were not available on the day of the site visit. Finally, Building 138 was not entered because of the health hazard associated with the pesticide concern. In addition, when appropriate, representative buildings were visited. For example, Buildings 61 and 62 were representative of Buildings 59 and 60 and Buildings 71 and 73 were representative of Buildings 81 and 83. Additional buildings that were inspected include 55, 58, 59, 63-68, 70, 72, 81, 83, 86, 117, 123, 126, 127, 135, 137, 139, and 309.

2.4.1 Inspection of Fort Des Moines

Evidence was gathered regarding current or past contamination with the following substances:

Asbestos-containing material: The presence of asbestos-containing material in most of the Fort Des Moines buildings was identified in prior asbestos surveys. Asbestos-containing material (floor tile and pipe insulation) was observed in the buildings inspected.

Lead-based paint: A lead-based paint survey was conducted at Fort Des Moines during the Draft Final Environmental Investigation/Risk Assessment/Alternatives Analysis. The survey indicated the presence of lead-based paint in most buildings. The paint appeared to be cracked, peeling, and deteriorated.

Polychlorinated biphenyls: Information on PCB storage areas, releases, and transformers was gathered through document reviews and searches. Investigations at Fort Des Moines included the identification and inspection of PCB storage areas at the facility, in particular Building 309, which was used for the storage of off-line transformers. Currently, there are no transformers

TABLE 2-2
LIST OF PERSONNEL INTERVIEWED, FORT DES MOINES, IOWA

Reference	Name/Phone	Location	Job Position
a	Michael Gaborek (515) 235-7589	Department of Army, U.S. Army Environmental Center	U.S. Army Environmental Center Installation Point of Contact
b	Garry Bianchi (515) 285-6767	Department of Army, Fort Des Moines	Installation Point of Contact, Facility Manager
c	Dennis Stone	Fort McCoy	Project Manager for Fort Des Moines at Fort McCoy, Wisconsin
d	Linda Norris	U.S. Environmental Protection Agency Region VII, Superfund Records Center	File Clerk
e	Richard Thomas	U.S. Environmental Protection Agency Region VII, Resource Conservation and Recovery Act Records Center	File Clerk
f	Diana Newman (913) 551-7887	U.S. Environmental Protection Agency Region VII, Waste Management Division	U.S. Environmental Protection Agency Region VII Installation Point of Contact
g	Lambert Nnadi (515) 281-4117	Iowa Department of Natural Resources	State of Iowa Installation Point of Contact
h	Steve Gunson (515) 237-1612	City of Des Moines Office of Environmental Health	City of Des Moines Installation Point of Contact
i	Steve Drane (515) 237-1612	City of Des Moines Office of Environmental Health	City of Des Moines Assistant Installation Point of Contact
j	Doug Howell	General Services Administration	Shop Foreman, General Services Administration Garage, Building 87
k	Lee Evans	830th Hospital Station Army Regulation Unit	Unit Commander

stored at Building 309. The building was inspected to verify current condition and identify evidence of past PCB releases. In addition, the ground below 15 pole-mounted PCB contaminated transformers at the site were visually inspected to identify evidence of release. The area of the former transformer leak at Building 307 was also inspected. The interior of Building 138, a building historically used for transformer storage and the location of a PCB contaminated elevator shaft, was not inspected due to its interior pesticide dust hazard.

Radon: Sampling was conducted during Draft Final Environmental Investigation/Risk Assessment/Alternatives Analysis investigations. Information on the testing methodology and test results was obtained through document review.

Unexploded ordnance: There were no unexploded ordnance locations at Fort Des Moines identified through document and record reviews and interviews.

Radionuclides: Installation personnel were interviewed and installation files searched to obtain data on radioactive material storage and use. In addition, the U.S. Army Environmental Hygiene Agency Health Physics Division provided the contractor with information obtained from installation files and U.S. Army Environmental Hygiene Agency archival report files. This information included Nuclear Regulatory Commission licenses and Department of the Army Radioactive Material Authorizations, and U.S. Army Environmental Hygiene Agency reports on radioactive material decommissioning.

Petroleum release or disposal: Areas of potential releases that were identified during document reviews and records search were visually inspected. Evidence of discoloration or spills was noted, as well as any sheen on nearby bodies of water (i.e., drainage culverts, streams). Drainage swales, culvert, and streams on the Fort Des Moines facility and on immediately adjacent properties were inspected. Documented and potential sites of dumping, such as the two UDA drainages, were observed. Areas inspected included UDA-1 and UDA-2, Rodgers Road, the area surrounding Building 138, the location of a former leaking PCB transformer near Building 307, and a tank and soil removal excavation behind Building 117. Access was not gained to the two former indoor firing ranges in Buildings 55 and 81, respectively, which have been identified as contaminated with lead.

Petroleum storage: Information on storage tanks was gathered through document reviews and searches, and includes location, volume, past and present contents, and removal actions. Information was verified during the inspections to the extent possible. Evidence of underground storage tank excavation and removals including changes in vegetation patterns, rectangular areas of disturbed soil, and open excavations were noted at Building 139 and 117, respectively. Aboveground tank locations at Building 139 were also inspected for evidence of past releases.

Hazardous substance storage: Pesticide contamination resulting from operations associated with operations historically conducted in Building 138 (and former Building 67, which is not in the BRAC property) has been documented in prior environmental documents. Outdoor areas at the installation associated with these operations were inspected for evidence of release such as stressed vegetation. The interior of Building 138 was not entered due to current residual

pesticide dust hazard. The current facility maintenance shop, Building 117, was inspected for the presence of pesticide storage areas.

Hazardous substance release or disposal: Evidence of discolored soils, unusual odors, and stressed vegetation was assessed at Fort Des Moines. In addition, the Draft Final Environmental Investigation, Risk Assessment and Alternatives Assessment Report addressed soil and groundwater contamination in areas of concern.

2.4.2 Inspection of the Adjacent Property

A visual inspection of the adjacent property was conducted. Prior to the site visit, a data base search was performed for the area adjacent to Fort Des Moines within a 1.5-mile radius to identify small- and large-quantity waste generators, underground storage tanks, and leaking underground storage tanks. Both Federal and State data bases were searched (see Section 2.2 of this report). Information obtained from the search was verified through visual inspections. Possible areas of environmental concern were visually inspected to determine their potential for contamination.

Adjacent properties examined during the CERFA investigation included the Landmark South Residential Apartment complex to the north, the U.S. Army Reserve facilities to the northeast, the General Services Administration facility (Building 87) to the east, the A.H. Blank Golf Course to the east and south, the Blank Park Zoo to the south and southwest, the Blank Park to the west and the Polk County Correctional facilities (Buildings 65 and 66) to the northwest. With the exception of the General Services Administration facility Motor Pool, the interior of buildings were not inspected. The golf course and the zoo have routinely applied large amounts of pesticides, fungicides, and rodenticides. The zoo veterinary clinic contains x-ray equipment.

The data base search conducted prior to the site visit did not identify any hazardous waste generators, or leaking underground storage tanks within a 2.5-mile radius of the Fort Des Moines. Therefore, no investigations beyond the immediately adjacent properties of the Fort Des Moines facility were conducted.

2.5 Title Documents

TETC conducted a review of tract maps and transfer documents to identify the former property owners of BRAC property at the time of its transfer to the Army. The purpose of this review was to determine the property's prior use and environmental condition at the time of its transfer. This review did not result in additional information. Previous ownership and the dates of transfer to the Army are indicated on Figure 5-2.

2.6 Newspaper Articles and Medical Records

A search of the Fort Des Moines facility records was conducted at a number of locations including Fort Des Moines, USAEC, and regulatory agencies. This search did not reveal any newspaper articles or medical/biohazardous waste records concerning operations at the facility.

3.0 PROPERTY BACKGROUND INFORMATION

This section presents an overview of past and current operations at Fort Des Moines and a discussion of environmental changes associated with the facility. It addresses activities relevant to waste management practices and significant environmental incidents that occurred since the Draft Final Environmental Investigation/Risk Assessment/Alternatives Analysis was conducted.

3.1 GENERAL BACKGROUND

Fort Des Moines was established as a cavalry post in 1903 on 400 acres of donated land in Polk County, on the outskirts of the city of Des Moines. In 1908, the Army purchased an additional 240 acres along with perpetual easement for a sewer line right-of-way.

In 1917, the Provisional Army Officer Training School was established at Fort Des Moines as the first training camp for black officers in the U.S. Army. At the completion of training in 1920, the post was converted into the U.S. General Hospital #26. The hospital was closed in the same year.

From 1920 to 1940, the 14th Cavalry Squadron was headquartered at Fort Des Moines. During this period extensive rehabilitation, alterations, and construction occurred. In 1941, Fort Des Moines became an Army Induction Center.

In 1942, Fort Des Moines became a training center for the Women's Army Auxiliary Corps. One hundred seventy-three new buildings were constructed to support 5,900 women. During the next 3 years, 65,000 women and officers were trained. Following the end of World War II in 1946, the Fort provided housing for returning veterans.

In 1948, Fort Des Moines began supporting the Army Reserve Program. This activity has continued as the major mission of the installation up to the present time. In 1975, a new Army Reserve Center was built at the installation to support reserve operations. An addition to the center was constructed in 1983. Fort Des Moines has served as headquarters for the 103rd Corps Support Command as well as a home for the following other tenant reserve units:

- 312th General Supply Command
- 372nd Engineer Group
- 830th Station Hospital
- 974th Personnel Service Company
- 5040th U.S. Army Reserve School
- 304th Transportation Detachment
- 366th Public Affairs Detachment
- 448th Medical Detachment
- 605th Medical Detachment
- 416th Engineer Team
- 29th Area Maintenance Support Activity

A number of civilian and governmental organizations have also used building space at Fort Des Moines on a lease basis. The most environmentally significant past lease activity at Fort Des Moines was that of Barco Chemical Company. Barco used Building 138 from 1951 to 1958/59, according to available records.

In 1961, the Army authorized excessing of much of the Fort Des Moines facility and in 1962, 340.58 acres were declared excess. Parcels were deeded to the College of Osteopathic Medicine and Surgery, the city of Des Moines, the Des Moines Independent Community School District, and to private ownership. A second major declaration of excess was in 1971 and involved 198.00 acres, which were deeded to the city of Des Moines and to the Polk County Conservation Board. Several other smaller parcels have also been excessed. Parcels have been deeded to the Department of Navy and Air Force, Iowa Department of Social Services, Polk County Conservation Board, the City of Des Moines and the Government Services Administration. These small parcel excesses (which total more than 20 acres) occurred at various times from 1956 to present.

Because Fort Des Moines served as the first training facility for black officers in the U.S. Army and was used as a training center for the Women's Army Auxiliary Corps in 1942, it is listed on the National Register of Historic Places. Barracks, stables, and warehouses constructed prior to 1917 contribute to the overall historical nature of the installation and are afforded special protection with respect to demolition and the nature and extent of alterations and repairs that may be performed. Buildings constructed after 1917 are considered noncontributing and are not subject to special restrictions associated with historic preservation. Of the 33 structures included in the 52-acre BRAC property, 27 buildings are considered contributing structures subject to special protection.

3.1.1 Past Activities

Fort Des Moines has served as a training camp for black officers and the Women's Army Auxiliary Corps, as a hospital, and as an Army Reserve support installation. Throughout its 90-year history the various buildings at Fort Des Moines have served a variety of functions, dependent upon the activity at the installation at the time. In general, these activities can be grouped in the following four categories: industrial, administrative, general facility support, and hospital activities.

Industrial Operations: According to the Archives Search Report, a majority of the industrial operations that occurred on Fort Des Moines are associated with lessee activities. Few details regarding these operations are available, due to the absence of lease documents and inspection reports.

The most significant lessee industrial operation was that of Barco Chemical Company. Barco used Buildings 67 and 138 for the blending and bagging of pesticides for sales to local farmers. The operation was active from 1951 to the 1958-1959 period. During this period, Building 67 was reportedly used for production of the pesticide that was then blended and bagged in Building 138. Other records indicate that both buildings were used only for blending and bagging and that no production occurred. No details are available regarding the operation or waste handling

at these two buildings; however, information indicates that some dumping of wastes outside both buildings did occur and that some wastes may have entered the storm drainage system. Building 67 was demolished in 1961. The parcel on which the building was situated has since been leased to the city of Des Moines.

Other lessee industrial operations at Fort Des Moines included manufacturing of storm doors and windows, manufacturing of luggage, furniture building, auto repairing and refinishing, manufacturing of plastic signs, and the assembly of electronic equipment. Again, few details are available regarding waste generation and disposal methods used during these operations.

Industrial operations conducted by Army personnel have historically been limited to motor vehicle support operations, machine and maintenance shops, and POL/solvent storage. Building 83 was used in 1940 as a 36-vehicle garage. Although exact activities conducted in the building during this period are not documented, they may have included POL and solvent storage and handling.

According to environmental documents, both Buildings 86 and 117 have been used as full service motorpools in the past. The exact date that Building 86 was used as a motorpool was not specified. The building is currently vacant. Building 117 began as the Civilian Conservation Corps Motorpool in 1942. It has since been used as the AMSA 29 Motorpool and more recently, since 1984, as RNU Shop 63, providing light vehicle maintenance and shop facilities for facility management operations.

Activities historically conducted in the two motorpool buildings included POL storage and handling, degreasing, vehicle painting and bodywork, waste oil generation, and other environmentally significant operations. According to the Archives Search Report, waste oil generated at Building 117 prior to 1982 was used on roads to suppress dust and to control weeds. After 1982, an oil recovery program was developed for the installation. Waste oil was collected in drums or a 500-gallon waste oil tank behind the Building 117 and was disposed via licensed disposal contractor. Operations at Building 117 have since been reduced to the point where waste oil is reportedly no longer generated.

According to the Archives Search Report, Enhanced PA and Environmental Investigation, a number of POL distribution points have historically been located at the site. These include facilities at Building 119, a former oil station, Building 139, Building 122, and Building 127. Fuel storage facilities at these locations reportedly consisted of underground storage tanks. As the time of the Archives Search Report in 1985, only the Building 139 facilities were still in operation. These activities were discontinued prior to the time of the Enhanced PA in 1989.

In addition to the POL distribution points, several buildings have been used for the storage POL products and hazardous materials in support of on-site motorpool and facility maintenance operations. These include Buildings 84, 133, 139, and 309. Other environmentally significant industrial operations which have occurred at Fort Des Moines include the use of Buildings 123, 126, and 135 as a Former Machine Shop, Maintenance Shop, and Coal Storage Building, respectively. Details on the operations conducted in these buildings is not available in existing

environmental documents. Operations at the former two buildings may have included POL and solvent/hazardous materials handling/storage.

Past industrial operations at Fort Des Moines also included the use of Buildings 138 and 309 for out of service transformers and PCB-contaminated materials. The former building was used until 1982 when storage operations were transferred to Building 309. Building 309 is still used for that purpose. Building 126 was for the temporary storage of orphan hazardous waste drums and tanks during the summer and fall of 1993. The activities were conducted by USEPA Region VII and involved cleanup activities being conducted in the area in response to recent flooding in the area. The storage area was reportedly well managed, there were no reports of releases as a result of the activities; drums were reportedly shipped offsite within 90 days. At the time of the CERFA site visit, the only remains of the operation were several aboveground tanks located outside the Building 126 awaiting disposal. There was no evidence of releases in the area.

Two open disposal area sites are located south of Building 135 (UDA-1) and west of Building 127 (UDA-2). These disposal areas were unofficially operated until approximately 1979. They reportedly contain general trash dumped by the public, although some of the surrounding buildings may also have used these sites for trash disposal. During the site visit for the 1985 Archives Search, "No Dumping" signs were posted. UDA-2 also contained an incinerator at one time. The incinerator was reportedly used to burn wastes from the horse stables.

The former Fort Des Moines landfill was located off the BRAC property on property that has been excessed to the Polk County Conservation Board. The landfill was operated from early in the history of Fort Des Moines to the mid-1960s. While few details about waste types or quantities are available, the landfill did receive asbestos, ash from boilers, and transformers.

Hospital Operations: A number of buildings at Fort Des Moines have been used as a hospital wards, physical exam stations, and other medical support facilities. During World War I Buildings 55, 56, 58, 59, 60, 61, 62, 63, and 64 were used as hospital wards. Building 139 has been more recently used for storage of materials such as medical supplies for a Mobile Army Surgical Hospital unit and most recently the 830th Hospital Station Army Reserve Unit. Buildings 63 and 64 are currently used for administrative/storage purposes for the 830th Hospital Station. Building 63 reportedly has an x-ray machine that may contain radiological materials.

Administrative and General Facility: Most of the Fort Des Moines buildings have been used for administrative and general facility operations. These include use as barracks, commissary, induction stations, offices, and Army and Army Reserve dry goods warehouses. Several buildings have also been leased for similar purposes. These include Building 137, used by the Iowa Surplus Property Department since the 1950s, and Building 72, used for a short period in or around 1972 by the Civil Air Patrol.

Administrative and general facility support operations typically did not involve activities that would be considered environmentally hazardous. Environmentally significant operations relative to these activities were limited to photographic laboratory usage, firing ranges, and radiac meter storage.

Laboratory operations reported to have occurred on Fort Des Moines were conducted in photographic laboratories located in Buildings 59 and 63. According to installation personnel interviewed during the Archives Search, waste solutions went into the sanitary sewer system. Quantities of waste photoprocessing chemicals disposed of are unavailable.

Two firing ranges were located in Buildings 58 and 81. These ranges include approximately 12 cubic yards of sand located behind the former targets that were used to stop the slugs. These sands may contain sufficient lead and powder residues to be considered hazardous.

Building 137 was reportedly used for a period by the Civil Air Patrol for personnel radiac meter storage. It was reported that the units contained low level radioactive sources.

3.1.2 Current Activities

Operations at Fort Des Moines continue to decline in anticipation of BRAC closure. Most of the buildings at Fort Des Moines are currently vacant. Activities on the installation are limited primarily to the use of Building 117 for very light vehicle maintenance and facility management and the use of Building 309 for temporary storage of PCB waste as well as facility management materials storage. Other current operations include administrative and storage activities by the 830th Hospital Station Army Reserve unit in Buildings 63 and 64, 830th Storage in the basement of Building 139, miscellaneous POL storage by the Army Reserve in Building 86 (330 gallons), and minor nonhazardous dry goods storage by several miscellaneous materials storage by the Army reserve units and the General Services Administration in two other buildings at the installation.

3.2 Environmental Changes at Fort Des Moines

Since the time of the Environmental Investigation a number of minor environmental changes have occurred at Fort Des Moines. These are as follows:

- Additional soil removal and contaminated telephone pole removal has occurred in association with the former transformer leak at Building 307. The waste material has been drummed and is currently being stored in Building 309, awaiting proper disposal.

- All transformers being stored in Building 309 and at Building 117 at the time of Environmental Investigation site visit have been transported offsite and properly disposed.

- In October 1993, approximately 3 cubic yards of contaminated soil were removed in the area of the former 500-gallon waste oil underground storage tank at Building 117. The material was transported offsite for proper disposal. At the time of the CERFA site visit on November 4, the excavation remained open, awaiting closure certification form the State of Iowa.

- All pole mounted transformers at the installation were taken offline in or around September 1993 when the facility was able to tie into a new electrical system installed at the Army Reserve Center.

- In response to the continued reduction of activity at the installation in response to upcoming inactivation and in response to the continued expansion of the adjacent Army Reserve Center, use of Fort Des Moines buildings for POL, hazardous materials and dry good storage has been reduced. Buildings 55, 58, 59, 84, 133, and 135 are reportedly no longer active storage facilities.

4.0 INVESTIGATION RESULTS

This section describes the results of the CERFA investigation. The first part describes all areas within the BRAC property that have been addressed in reports prior to the CERFA investigation, and the second part describes all areas within the BRAC property that have not been addressed in previous reports. The third part identifies adjacent properties that may be potential sources of contamination. The fourth part describes areas containing items not regulated by CERCLA, and the fifth part describes areas where remediation has occurred. Part six describes real property within the BRAC property that will be retained by the Army.

4.1 PREVIOUSLY IDENTIFIED AREAS REQUIRING ENVIRONMENTAL EVALUATIONS

This part describes both existing areas requiring environmental evaluations and those that have undergone change.

4.1.1 Existing Areas Requiring Environmental Evaluations

A list of the existing AREEs identified in these documents is provided in Table 4-1. Approximately 33 individual buildings, site areas, and programmatic AREEs were identified in the Archives Search Report, the Enhanced PA, and the Draft Final Environmental Investigation/Risk Assessment/Alternatives Analysis. These documents are described in Section 2.1 of this report. The risk identified in the "Risk" column in Table 4-1 is any risk above 1×10^{-6} for any exposure pathway. Brief descriptions of these AREEs are given below.

Building 138: Building 138, a former quartermaster warehouse located within the southwestern corner of the Fort Des Moines property, was leased to Barco Chemical Company from 1950 through 1959 and was used for the formulation (i.e., mixing) and bagging of organochlorine pesticides. The exact extent and types of formulation activities that were performed on site and the types of raw materials involved are not completely known.

Two additional activities conducted within Building 138 also have resulted in contamination of the structure and surrounding area. These were:

- An abandoned elevator shaft within the building was reportedly used for the dumping of oily wastes, possibly including PCB-contaminated liquids. This elevator shaft, located near the center of the building, is 8 feet by 8 feet in cross-section and approximately 20 feet deep. At the time of the Environmental Investigation, the shaft contained approximately 18 inches of liquid/sludge in three phases: a 2- to 3-inch thick black nonaqueous material; 12 inches of orange/brown colored petroleum oil; and 3 to 4 inches of solid/sediment sludge. The shaft extends below the basement level. Analysis of samples obtained from the oily material that was observed remaining at the bottom of the elevator shaft in Building 138 revealed no concentrations of PCBs above the detection limit of

TABLE 4-1
PREVIOUSLY IDENTIFIED AREAS REQUIRING ENVIRONMENTAL EVALUATION IN BRAC PROPERTY[1], FORT DES MOINES, IOWA

Name	Coordinate Location (x,y) Figure 5-1	Parcel Number	Source of Information			Baseline Risk Assessment (1993) (Noncarcinogenic: Hazard Index ≥ 1 or Carcinogenic Risk > 1×10^{-4})
			Archives Search Report (1985)	Enhanced Preliminary Assessment (1989)	Draft Final Environmental Investigation/ Risk Assessment/ Alternatives Analysis (1991-1993)	
Building 138 Former Pesticide Blending/Transformer Storage	(5,5)	5D	✓	✓	✓	Yes
Asbestos Installation-wide	Multiple	Multiple		✓	✓	NA[2]
Chemical Storage Installation-wide	Multiple	Multiple		✓	✓	NA[3]
Unrestricted Disposal Area 1 Municipal/Residential Solid Wastes, Pesticides, Waste Oil, Hazardous Waste	(8,4)	5D		✓	✓	No
Unrestricted Disposal Area 2 Solid Waste, Pesticides, Waste Oil, Herbicides Waste	(9,5)	5D	✓	✓	✓	Yes
Firing Ranges Buildings 58 and 81	(11,9) (11,7)	1D		✓	✓	NA[3]
Rodgers Road Sealant Containing PCBs	Not Mapped	Not Mapped		✓	✓	No
Transformers Installation-wide	Not Mapped	Not Mapped	✓	✓	✓	NA[3]
Underground Storage Tanks Installation-wide	Multiple	Multiple	✓	✓	✓	NA[3]
Lead-based Paint Installation-wide	Multiple	Multiple			✓	NA[2]

TABLE 4-1
PREVIOUSLY IDENTIFIED AREAS REQUIRING ENVIRONMENTAL EVALUATION IN BRAC PROPERTY[1], FORT DES MOINES, IOWA

Continued

Name	Coordinate Location (x,y) Figure 5-1	Parcel Number	Source of Information			Baseline Risk Assessment (1993) (Noncarcinogenic: Hazard Index ≥ 1 or Carcinogenic Risk > 1×10^{-4})
			Archives Search Report (1985)	Enhanced Preliminary Assessment (1989)	Draft Final Environmental Investigation/ Risk Assessment/ Alternative Analysis (1991-1993)	
Radon Installation-wide	Multiple	Multiple			✓	NA[2]
Water Distribution System Installation-wide	Not Mapped	Not Mapped			✓	NA[3]
Waste Oil Dumping for Dust-Suppression/ Weed Control Installation-wide	Not Mapped	Not Mapped	✓		✓ [4]	NA

Key: Yes = Human health carcinogenic or noncarcinogenic risk were found to exist above 1×10^{-4} and 1, respectively.
No = Human health carcinogenic or noncarcinogenic risk not found to exist above 1×10^{-4} and 1, respectively.

Note: Figure 5-1 is located at the end of Section 5.

(1) Building 67 is located outside the BRAC property. Discussion of this AREE is in Section 4.3.2.
(2) Not Addressed, no receptor population to evaluate risk for.
(3) Not Addressed, will already require remediation to comply with established regulatory actions.
(4) Evaluated in non-specific sampling in Buildings 63, 126, and 55.

20 micrograms per liter (μg/L). Other constituents detected in the samples included various metals and semivolatile organic compounds. Although the material in the shaft was not specifically analyzed for pesticide content, the gross contamination of pesticides noted throughout the building would make their presence in the oily material likely.

- The building was also used for the storage of PCB transformers, and it is possible that leakage could have occurred, potentially contaminating floors, walls, or stored equipment and materials with PCBs. Approximately 140 transformers were reported to have been stored in this area prior to 1982.

Currently, Building 138 is completely sealed, and health hazard warnings signs are posted at prominent locations on the building exterior. Because of potential health and safety hazards, the building was not entered during the Sampling Plan and Enhanced PA site visits. However, it was identified as an AREE in both reports.

Sampling studies by the U.S. Army Environmental Hygiene Agency during the period 1983 to 1984 determined that the building was heavily contaminated with various pesticides and pesticide byproducts, including DDT, DDD, DDE, dieldrin, aldrin, endrin, chlordane, lindane, and alpha-, beta-, and delta-BHC, as well as the chlorinated phenoxy herbicides 2,4-D, and 2,4,5-T. The predominant pesticide detected throughout the building was DDT, which was detected in dust samples at concentrations exceeding 50 percent by weight, and the total organochlorine pesticide concentration in one sample was approximately 93 percent by weight. In addition, wipe samples from interior surfaces (e.g., masonry walls, beams, etc.), equipment, and materials stored within the building showed significant contamination from the above-mentioned pesticides. Ambient air samples collected from within the building did not indicate a severe air contamination problem, and overall conditions were considered to be not readily conducive for the generation of pesticide vapors (i.e., little activity within the building and the low volatility of pesticides). U.S. Army Environmental Hygiene Agency, however, suggested that a potential problem could exist during hot weather.

The Environmental Investigation used the following types of sampling: dust and residue, wipe, building material, and oily liquid sampling at Building 138. Fifteen dust samples and one duplicate sample were collected. Eleven interior building material samples (including wood, brick, and plaster, etc.) and one duplicate sample were collected. These samples were analyzed for a variety of pesticides and herbicides. Two samples and one duplicate sample were collected from the oily pit located at the base of the elevator shaft in the basement of the building. These samples were analyzed for volatile organic compounds, semi-volatile organic compounds, PCBs, herbicides, and Target Analyte List (TAL) metals to determine the need for special disposal requirements.

The results of the dust and residue samples indicated that concentrations of pesticides and herbicides were detected throughout the building. Results from wipe samples and building material samples also indicated the presence of pesticides and herbicides. In each sample collected in the basement of Building 138, herbicides such as 2,4,5-T and 2,4-D and pesticides such as alpha-, beta-, and delta-BHC, dieldrin, lindane, DDT, DDE, DDD, and toxaphene were

detected. The greatest concentrations of these contaminants were found in a dust sample, wherein many parameters, including DDT, DDE, DDD, and alpha- and delta-BHC, were detected at levels greater than the detection range. The maximum detected values for the two herbicides were found in a dust sample that was collected in the basement near the stairwell. 2,4-D was detected at a concentration of 470 micrograms per gram (μg/g), and 2,4,5-T at greater than 280 μg/g.

A review of the results indicates that the types of herbicides and pesticides detected in the basement samples were similar to those found in the dust and residue and wipe samples collected on the two upper floors, but with generally higher concentrations occurring in the basement samples. A review of the herbicides concentrations found in the basement samples as opposed to those collected from the other two floors would suggest that herbicide handling was probably limited to the basement.

A soil sampling program during the Environmental Investigation involved 11 samples near Building 138. One sample had detectable concentrations of volatile organic compounds which were m-Xylene (0.26 μg/g) and toluene (0.37 μg/g). DDT and DDE were present in all samples, at concentrations of 0.0425 μg/g to 26.0 μg/g for DDT and 0.0259 μg/g to 4.46 μg/g for DDE. Other detected pesticides include alpha-BHC, aldrin, alpha-endosulfan, beta-BHC, beta endosulfan, dieldrin, endosulfan sulfate, heptachlor epoxide, lindane, methoxychlor, and DDD. Of the 10 metals detected above their respective background levels, lead was the most prevalent, occurring in 4 of the samples, ranging at concentrations of 70.1 μg/g to 149 μg/g.

Two soil vapor survey points detected tetrachloroethylene (PCE) at a maximum concentration of 0.5 μg/L. Fourteen hydropunch samples also showed elevated levels of PCE ranging from 1.3 μg/L to 28.5 μg/L, as well as trichloroethylene (TCE) (2.0 μg/L to 8.7 μg/L), chloroform (1.0 μg/L), carbon tetrachloride (1.0 μg/L), and toluene (2.0 μg/L).

The Environmental Investigation also states that Building 138 is the probable source of pesticides, PCE, volatile organic compounds, and metals detected in a number of downgradient monitoring wells.

The area of elevated pesticides in soils and groundwater associated with pesticide operations at Building 138 has been graphically displayed on Figure 5-1 in Section 5.0 of this CERFA Report. The extent of the area of concern was determined based on review of the Draft Final Environmental Investigation/Risk Assessment/Alternatives Analysis soil, groundwater and storm sewer sediment sample analysis results and after consultation with USAEC personnel. Although the area does not encompass all pesticide detections identified during the Draft Final Environmental Investigation/Risk Assessment/Alternatives Analysis, it encompasses the core pesticide contamination area which will be addressed in USAEC cleanup efforts. The area as depicted includes the area along the storm sewer line from Building 67 along Butner Road to Buildings 138 and 137 as well as the area to the south of Buildings 138 and 137. Sediments in the former sewer line were found to contain elevated levels of pesticides. The storm sewer line between Buildings 67 and 138 represent the source of pesticides detected in monitoring wells located in Blank Park.

Offsite areas southwest of Fort Des Moines have been found to contain blending activities associated with Buildings 67 and 138. Park Zoo and in shallow groundwater wells within Blank Park. All detected pesticides are limited to the shallow aquifer. Proposed remediation activities outlined in the Draft Final Environmental Investigation/Risk Assessment/Alternatives Analysis Report address remediation in these offsite areas.

Asbestos: The Enhanced PA indicated that asbestos-containing material was suspected in most Fort Des Moines buildings. In particular, it identified asbestos-containing material in pipe insulation at Buildings 122, 123, and 307, and in sewage pipe in Building 309. Personnel from Fort McCoy performed limited testing for asbestos in 1990. The results indicated that asbestos-containing material was present in nine Fort Des Moines buildings; however, it was not confirmed as to whether all on-site structures had been tested for the presence of asbestos-containing materials. In 1991, a complete inspection of the site (except for Building 138) was performed as part of the Environmental Investigation to confirm the initial findings and to determine the presence, locations, and conditions of asbestos-containing materials in all buildings at the facility.

All pipe, elbow, and boiler tank insulation present in Fort Des Moines was found to be in friable condition. The friable asbestos-containing material included 3,400 linear feet of pipe insulation, 1,217 pipe elbows, and 5,530 square feet of boiler tank insulation. The nonfriable asbestos-containing materials included 42,900 square feet of floor tile/linoleum flooring, and 17,592 square feet of transite panels. Much of the insulation appeared to be in poor condition with damaged and exposed friable asbestos evident. In total, asbestos in either friable or nonfriable form was found in 9 of 33 Fort Des Moines buildings.

Chemical Storage: Chemicals, POL products, and other potentially hazardous waste materials have been historically stored at several locations at Fort Des Moines. The stored chemicals may be grouped into four general categories:

- ★ Abandoned materials (e.g., paints, lubricants) in unoccupied buildings;
- ★ Chemicals in active inventory used by maintenance personnel (e.g., petroleum, oils, lubricants, etc.);
- ★ Military-unique compounds (e.g., DS-2, fog oil); and
- ★ Chemicals stored for disposal (e.g., waste oil, decommissioned transformers, etc.).

Chemicals that fall into the latter three categories are maintained in a controlled manner. Chemicals in abandoned buildings at the installation are stored in uncontrolled areas under deteriorating conditions (e.g., labels are becoming illegible, containers are rusting, etc.). Storage and handling of these materials were addressed while conducting the Archives Search Report and Enhanced PA. However, a comprehensible inventory of all chemicals found on the installation was not completed in either effort. The Enhanced PA specifically identified the uncontrolled storage of chemicals in the basement of Building 55 as an AREE. The report also

identified the storage of paint and antifreeze in Building 84, various hazardous materials, POL in Buildings 117 and 309, as well as POL and solvent storage in Building 133 in its description of environmentally significant operations.

A complete chemical inventory was performed as part of the Environmental Investigation. The inventory identified chemicals ranging from household cleaners to antiperspirant to lubricating oil. With the exception of 1,1,1-trichloroethylene (1,1,1-TCE) identified in Buildings 61 and 68, none of the containers appeared to contain chemicals consistent with those related to the environmental concerns on and around Fort Des Moines. Primary storage areas identified in the Environmental Investigation were consistent with Enhanced PA findings and included controlled storage in Buildings 84, 117, 133, and uncontrolled storage in Building 55. A number of smaller temporary storage areas for materials "in use" were also identified.

Disposal Areas. Two UDAs exist at Fort Des Moines and were identified as AREEs in the Archives Search Report and Enhanced PA: UDA-1, which is located southwest of Building 135 and within a drainageway that extends through a wooded area to the common boundary with the Blank Park Zoo; and UDA-2, which is located within a former rail car unloading area to the southeast of Building 135. Both areas were reportedly used for the uncontrolled disposal of trash and possibly liquid waste (e.g., waste oil).

During the Environmental Investigation, large trash items (e.g., washing machines, water heaters, stoves, bedsprings) and construction debris (e.g., concrete slabs) were found to be present in UDA-1. The trash and debris were observed throughout a 150-foot reach of the ephemeral stream that drains the southern portion of the site within an area immediately adjacent to the zoo boundary. The ground surface, standing water, and sediments within this area showed no obvious visual indications of potential contamination (e.g., staining or oily sheen).

UDA-2 was reported in the Enhanced PA to contain 3-foot mounds of residential and municipal-type solid waste. No waste of the type described in the Enhanced PA was visible at the time of the Environmental Investigation. Waste reportedly present in this area during the Sampling Plan site visit in February 1990 consisted of logs, creosote-treated utility poles, and wooden pallets. Site personnel reported possible unauthorized dumping of other types of wastes in this area.

As a result of the dumping observed/reported in UDA-1 and UDA-2, soil and groundwater sampling activities were performed in the areas during the Environmental Investigation. Two soil samples were collected from the edge of the ephemeral stream that runs through UDA-1. The purpose of these samples was to determine whether contaminants had migrated toward the Blank Park Zoo. These samples were analyzed for semivolatile organic compounds, pesticides/PCBs, TAL metals, and total petroleum hydrocarbons (TPHs). Laboratory analysis results indicated the presence of low-levels of TPH (27.9 and 20.3 $\mu g/g$, which are below the State of Iowa action level of 100 parts per million). Pesticides were detected above background concentration. The pesticides were hypothesized to be from site-wide spraying and pesticide blending operations topographically upgradient in Buildings 138 and 67.

Three soil samples were taken from the downgradient (southern) edge of a concrete pad in UDA-2. All three samples were analyzed for Target Compound List (TCL) volatile organic compounds, pesticides/PCBs, semivolatile organic compounds, TAL metals, and TPHs. Laboratory analysis results indicated the presence of semivolatile organic compounds ranging in concentration from 0.46 to 2.49 μg/g, TPH in concentrations ranging from 22.9 to 249 μg/g (the latter is above the State of Iowa 100 parts per million criteria), a single low-level pesticide detection (0.0183 μg/g for DDT), and low levels of beryllium, cadmium, and zinc in one sample and lead in two samples.

Surface water and sediment samples were also collected from two ephemeral streams that run through UDA-1 and UDA-2, respectively. Seven pesticides were detected in surface water samples in concentrations ranging from 0.00641 μg/g to 0.254 μg/g. Pesticides, semivolatile organic compounds, and metals including arsenic, chromium, and lead were detected in sediment samples. The pesticides and semivolatile organic compounds are suspected to have been from Building 138 and Building 67 via storm sewer outfalls. The metals are characteristic of the debris such as appliances dumped in the two unrestricted disposal areas.

Three other disposal operations in addition to UDA-1 and UDA-2 were identified in prior environmental documents. The Enhanced PA indicated that waste oil was dumped onto the ground outside Building 117. The date of dumping and the volume of waste disposed in this manner was not described. The Enhanced PA indicates that the site has been remediated via soil excavation disposal. The date of cleanup was also not identified. Because the site was reportedly remediated, it was not identified as an AREE.

The Enhanced PA also indicates that asbestos-containing material generated from abatement activities conducted in Building 138 was burned outside the building. Relative dates of disposal and volume disposed were not indicated in the report. The site was also not specifically identified as an AREE in the Enhanced PA. The last site disposal operation was conducted installation-wide. The Archives Search Report indicates that prior to 1982, waste oil was frequently used for dust suppression on installation roads and for weed control around installation buildings. This last disposal operation was not addressed in the Enhanced PA.

The waste oil disposal site, asbestos disposal site, and the waste oil dust-suppression/weed control site were not specifically investigated in the Draft Final Environmental Investigation/Risk Assessment/Alternatives Analysis. However, random soil sampling was conducted in a number of locations around the installation. Sites included locations near Buildings 55, 68, and 126. semivolatile organic compounds, herbicides, and pesticides were detected at the Building 55 site, cobalt and pesticides were detected at Building 68 site; subregulatory levels of PCBs, TPH, and lead were detected at Building 126 site. Pesticide/herbicide contamination may be related to former on-site pesticide application or former pesticide operations at Buildings 67 and 138. The origin of the other contaminants identified at the three sampling locations is more speculative. Some may have resulted from operations such as the use of waste oil for dust-suppression/weed control.

Firing Ranges: Two indoor small-arms firing ranges are contained within Buildings 58 and 81. The two firing ranges in the Enhanced PA were identified as AREEs. The ranges are cluttered

with debris, possibly including spent lead slugs and residues from powders that may contain antimony and barium compounds. The ranges also include approximately 12 cubic yards of sand that were used to stop the slugs. These sandy materials may contain sufficient lead and powder residues to be considered hazardous.

During the Environmental Investigation, seven sand samples were collected from the sand pit areas of this small arms firing ranges and were analyzed for lead, antimony, and barium.

Antimony levels ranged from a low of 754 μg/g to a high of 875 μg/g in Building 58, and 117 μg/g to 845 μg/g in Building 81. Barium levels ranged from 20.5 μg/g to 73.7 μg/g in Building 58, and from 16.9 μg/g to 23.4 μg/g in Building 81. Lead levels ranged from 73,000 μg/g to 100,000 μg/g in Building 58, and from 9,500 μg/g to 73,000 μg/g in Building 81.

Because the buildings containing the small arms firing ranges are not readily accessible to the public, the likelihood of human exposure to the metal contamination detected within the sand was considered low. The detected metal concentrations, however, indicate that the sand will eventually need to be remediated from the subject buildings under future use scenarios.

Rodgers Road: According to the Enhanced PA, a bituminous sealant that had been used in cracks and joints in Rodgers Road was reportedly mixed by using a PCB-containing oil as an emulsifier. As a result, the Enhanced PA identified the road as an AREE. Sampling of the road sealant material was performed as part of the Environmental Investigation to verify the presence and concentration of PCBs and to evaluate whether this material represented a potential hazard.

Road sealant samples were collected at four different locations on Rodgers Road and analyzed for pesticides and PCBs. Only one sample was found to contain PCBs (1.19 μg/g) at a concentration above its respective detection limits. However, the analyzed sample was road sealant, which is a heterogenous, complex petroleum-based matrix containing heavy-weight hydrocarbon chains. It is therefore difficult for a laboratory to have consistent detection limits between samples. Furthermore because PCBs are contained within the asphalt sealant and were detected in only one sample at a very low level, the associated risk was considered to be low and no further action regarding PCB-contaminated road sealant was recommended in the Environmental Investigation.

Pesticides were also detected in two of the Rodgers Road sealant samples. The pesticide DDT was detected at a concentration of 2.3 μg/g in a sample collected within the general vicinity of Building 138, a known source of DDT contamination. The other sample contained the pesticides DDT and endrin. Because of the low concentrations of pesticides/PCBs that were detected and the expected high immobility associated with the pesticides/PCBs by being bound within the asphalt, the Rodgers Road sealant was not evaluated in the Draft Final Environmental Investigation/Risk Assessment/Alternatives Analysis.

Transformers: The Enhanced PA and Environmental Investigation identified a release from one transformer at the site. The transformer, located south of Building 307, reportedly has been taken off-line and removed. Sampling in the area during the Environmental Investigation indicated no residual PCB contamination in soils.

Decommissioned transformers were reported by the facilities engineer to be stored in 55-gallon drums in Building 309 pending offsite shipment for disposal. The Enhanced PA reported that 8 or 9 transformers were stored at this location in October 1989. Three transformers were being stored in this building during their Sampling Plan site visit in February 1990. Two transformers were noted to still be in the subject building during the Environmental Investigation in January 1991. The Environmental Investigation also reported the storage of an off-line, PCB free transformer at Building 117 at the time of the site visit.

It should be noted that in addition to the PCB transformer storage in Building 309, approximately 140 transformers were reported to have been stored in Building 138 prior to 1982 (see prior AREE discussion for Building 138).

Although a CERFA investigation is only concerned with PCB material storage or release, both the Enhanced PA and Environmental Investigation also addressed active transformer condition. Transformers potentially containing PCBs were identified as an installation-wide AREE in the Enhanced PA. Nineteen pole-mounted transformer stations were identified within the Fort Des Moines study area during the Environmental Investigation. These 19 stations contained a total of 33 transformers of various ages, sizes, and models. Transformers were sampled for PCB analysis during the Environmental Investigation.

Of a total of 32 transformers sampled at Fort Des Moines, 5 were found to be PCB transformers, with concentrations ranging between 620 μg/g (parts per million) and 1,000 μg/g. Eight transformers were determined to be PCB-contaminated, with concentrations ranging between 90 μg/g and 300 μg/g. Two other transformers contained PCBs at 46 μg/g and 28 μg/g, respectively. Although these units contain less than 50 parts per million of PCBs, the Environmental Investigation recommended they still be considered as PCB-contaminated to minimize future potential liability. The transformers at the remaining sample locations were found to contain less than 5 μg/g of PCBs and can be considered as being PCB free. Currently, the condition of the PCB transformers and the PCB-contaminated transformers pose little risk; however, in the event of future transformer disposal or removal, proper consideration should be given to the handling and disposal of the PCB-containing oils.

Underground Storage Tanks. Eight underground storage tanks, which were formerly used for the storage of gasoline, diesel, fuel oil, and waste oil, were originally identified in the Enhanced PA as being present at Fort Des Moines. Seven of the tanks were reportedly installed prior to 1950. One underground storage tank located near Building 86 was reportedly installed in 1973. No records of underground storage tank registration with the Iowa Department of Natural Resources were identified, and it was reported that none of the underground storage tanks or associated piping had been pressure-tested to determine their integrity. These tanks are included in Table 5-1.

The Environmental Investigation reported that in September 1990 the 1,500-gallon diesel underground storage tank and one 1,500-gallon gasoline underground storage tank, both located near Building 139, were excavated and removed by the WGM Group of Casey, Iowa. No soil contamination was observed during the removal activities. Post excavation samples collected for chemical analysis confirmed that no petroleum contamination was present in the soil. The results

of these samples were forwarded to the Iowa Department of Natural Resources; however, no record of the State having granted closure on the tanks has been issued.

The Environmental Investigation also reported that in August 1992, the 500-gallon waste oil tank located near Building 117 was excavated and removed by Rafch Construction, Inc., of Fort Dodge, Iowa. Because there was no indication or evidence of a release within the tank excavation, a confirmatory soil sample was obtained, and the excavation was backfilled. Laboratory analysis revealed the presence of elevated concentrations of TPHs exceeding the State of Iowa guideline of 100 parts per million in soil. The State was notified by the Army, and additional site work to remove the remaining contaminated soil was determined necessary.

With the removal of the tanks mentioned above, four known underground storage tanks remained on site at the time of the Environmental Investigation. In addition, one other underground storage tank was reported to exist near Buildings 122 or 123, but the exact location was unknown and required verification. To assist in determining whether the latter tank was still present, a subsurface geophysical investigation (consisting of a Proton Magnetometer Survey and a Ground Penetrating Radar Survey) was performed during the Environmental Investigation. The results of the geophysical investigation determined conclusively that the underground storage tank in question was not present within the suspected area. As a result, this underground storage tank was removed from further consideration.

Although some testing of the tank contents had been performed prior to the Environmental Investigation, the results were reported to be inconclusive with regard to defining the types and quantities of petroleum products still remaining in each tank. General descriptions indicated that water, sediment, sludge, and biological growth may be present, along with hydrocarbon liquids. More definitive testing of the tank contents was performed as part of the Environmental Investigation to determine disposal requirements for these materials prior to tank removal activities.

The sampling of the underground storage tank contents consisted of collecting one composite sample from each of the four tanks still present at Fort Des Moines and also from the underground storage tank, which was removed in 1992. Because some samples were composed mostly of oil, the laboratory analyzed the samples for a variety of constituents. The Environmental Investigation determined that there was a limited risk associated with the existing tanks; however, the tanks must be removed in accordance with the State of Iowa Underground Storage Tank Regulations. Any environmental releases found during these tank removals will be addressed as part of the tank closure actions.

Lead-based Paint: Lead-based paint was not considered during the conduct of the Archives Search Report or the Enhanced PA. The presence of lead-based paint was evaluated during the Environmental Investigation. Many of the buildings at Fort Des Moines were constructed during the period between 1903 to 1907, and had not been used or maintained extensively (particularly with regard to building interiors) since the early 1970s. Based on the age of the buildings and the lack of interior maintenance, the Environmental Investigation considered the probability to be high that much of the paint exposed on interior walls and ceilings may be lead-based.

Composite samples were collected from the interiors of 30 buildings during the Environmental Investigation. Lead-based paint sampling was not conducted in Building 138.

Samples taken from Buildings 64, 68, 70, 83, 123, and 133 revealed lead concentrations that were below the Housing and Urban Development guideline criterion of 0.5 percent by weight (5,000 μg/g). All other buildings exceeded the Housing and Urban Development guideline criterion, with concentrations ranging from 7,300 μg/g in Building 308 to 200,000 μg/g in Building 122.

Radon: The presence of radon was not evaluated during the Enhanced PA. Radon levels were measured in the Fort Des Moines facilities as part of the Environmental Investigation. A total of 44 radon canisters were placed in 29 of the buildings at Fort Des Moines on April 10, 1991. Canisters were not placed in Building 133 (a small temporary storage shed not used for continuous human occupancy) or in Building 138, which was inaccessible because of the presence of pesticide residues in the interior.

The initial radon survey conducted in 1991 determined that only two buildings contained radon concentrations above the guidance level of 4.0 picoCuries per liter (pCi/L). One canister from Building 63 contained 5.2 pCi/L, and one canister from Building 72 contained 5.4 pCi/L. Three additional confirmatory canisters were placed in these two buildings in October 1992 and exhibited results that were consistent with levels detected previously. In Building 63, radon was detected at a concentration of 5.4 pCi/L, and in Building 72, it was detected at concentrations of 7.3 and 7.8 pCi/L. These concentrations of radon gas are considered only slightly elevated above USEPA guidance level.

Water Distribution System: Because of the age of many of the buildings at the installation, the possibility exists that lead solder, pipes, and fittings may be present in the Fort Des Moines potable water distribution system. This environmental hazard was not addressed in the Enhanced PA investigation but was considered during the conduct of the Environmental Investigation.

The water supply system was surveyed to determine worst-case situations from the standpoint of pipe construction and potential residence time. The water system has been inoperable in the Fort Des Moines buildings for several years; therefore, samples collected immediately after reestablishment of flow (i.e., first-draw samples) were assumed to represent the worst-case situation with respect to lead concentration (i.e., due to oxidation within the pipes and at solder joints). The pH, conductivity, redox potential, and "background" lead concentration of the water supply were measured so that the electrochemical effect could be estimated.

Two water samples and one duplicate sample were collected in January 1991 and analyzed for lead in the water supply system. One sample and one duplicate were taken from Building 117, and one sample was collected from Building 64.

The sample and duplicate from Building 117 had concentrations of 6.02 and 4.04 μg/L respectively, both of which were below the Safe Drinking Water Act action level of 15 μg/L for potable water. Based on these results, lead contamination does not appear to be a concern for the water distribution system in Building 117, which was in use up to the Environmental

Investigation. The lead concentrations in the water sample obtained in Building 64 indicated a concentration of 200 μg/L. As a result of this high value, the tap water in Building 64 was resampled in October 1992 to verify the original results. The lead concentration of this confirmatory sample was 5.75 μg/L, which is well below the Safe Drinking Water Act standard of 15 μg/L. The large difference in concentrations between the two samples from Building 64 was explained to have been caused by the long length of time that the original sample water sat in the pipes prior to the first sampling event. Based on conversations with site personnel during the Environmental Investigation, the water system in Building 64 had not been used in excess of approximately 10 years. The Environmental Investigation concluded that the water movement during the first sampling event appeared to be sufficient to lower the lead concentrations to within the acceptable range. Therefore, the low levels of lead detected in the tap water samples at Fort Des Moines was assumed to pose no risk threat, and was not evaluated in the risk assessment.

POL Distribution: The following buildings were identified as POL distribution points during the CERFA literature search:

- ★ Building 119
- ★ Building 139
- ★ Building 122
- ★ Building 127

Building 119 does not appear on Figure 5-1 because it was demolished and its locations is not known.

4.1.2 Existing Areas Requiring Environmental Evaluations That Have Expanded in Size

Some areas requiring environmental evaluation identified in the Enhanced PA and the Draft Final Environmental Investigation/Risk Assessment/Alternatives Analysis Report have changed in size. Areas requiring environmental evaluation or sites where remediation has occurred are discussed in Section 4.5. No areas were identified where size has expanded.

4.2 Additional Areas Identified by the CERFA Investigation

New environmental concerns described below were identified through CERFA investigation. These environmental concerns were not identified in the Enhanced PA.

4.2.1 Chemical Storage

Since the Environmental Investigation in 1992, the on-site storage of chemicals, POL products and waste, and other hazardous materials at the facility has undergone some changes due to the relocation of Army Reserve operations from Fort Des Moines to the neighboring Army Reserve Center as well as to other changes in materials management and storage at Fort Des Moines. In addition, CERFA investigations are required to identify potential past chemical, POL, and hazardous material storage locations as well as those currently used. As a result of these two factors, chemical storage as reported in this CERFA Report has a number of changes. The

following buildings have the potential to have had stored POL and hazardous materials during use due to past function:

- ★ Building 86: Former Motor Pool.
- ★ Building 139: Former Facility Maintenance Shop.
- ★ Building 83: Former Vehicle Garage.
- ★ Building 123: Former Machine Shop.
- ★ Building 126: Former Maintenance Shop.
- ★ Building 59: Former Photographic Laboratory
- ★ Building 63: Former Photographic Laboratory

The following buildings were identified as storage buildings for POL or hazardous materials based on CERFA investigations:

- ★ Building 63: Current 830th Hospital Station Army Reserve Command Facility--small volumes of hazardous hospital supplies stored in building.

- ★ Building 139: Currently 830th Hospital Station Army Reserve Command Storage Building--small volumes of various hazardous materials such as paints, and 5-gallon jerry cans of gasoline (10 cans) stored in basement.

- ★ Building 86: Currently used for Reserve Unit and General Services Administration Storage--approximately 330 gallons of POL products stored in 55-gallon drums in building. A small amount of leakage/staining was noted in association with storage area. The release was contained within the building and therefore not characterized as a "new release."

4.3 ADJACENT AND SURROUNDING PROPERTIES

The following properties of various ownership are located around the current Fort Des Moines property:

- ★ To the north is the Landmark South Residential Apartment Complex.

- ★ The Blank Park Golf Course, owned by the City of Des Moines, occupies land to the east and southeast.

- ★ Blank Park Zoo is located to the south and west of the installation, and Blank Park occupies land to the west.

Other noteworthy adjacent properties include the Army Reserve Center northeast of the CERFA Parcel; Building 87, located to the west of the property currently occupied by a General Services Administration Motor Pool; the former Building 67, located west of the installation, previously used as a pesticide production and/or mixing/bagging facility and currently a gravel parking area; and Buildings 65 and 66, located northwest of the current installation boundary, currently used as a Polk County correctional facility.

4.3.1 Existing or Potential Pathways of Contamination Migration

Topographic and hydrogeological information for Fort Des Moines facility provided in existing environmental documents was reviewed to assess potential contamination migration pathways onto the installation from adjacent properties. This information was used in combination with data on potential contamination sources on adjacent and surrounding property to determine whether there were any existing or potential environmental impacts on Fort Des Moines facility from off-site sources. Contamination source data were obtained through record searches, review of existing environmental reports, personnel interviews, and property site visits. The results of these adjacent and surrounding property evaluations are described below.

Potential contamination pathways exist from offsite at Fort Des Moines. Hydrogeologic data provided in the Draft Final Environmental Investigation/Risk Assessment/Alternatives Analysis indicates that groundwater flow on-site is from the northeast, generally following site topography. In addition, sewer drainage system layouts provided in the Draft Final Environmental Investigation/Risk Assessment/Alternatives Analysis indicates that stormwater is directed north and west of the facility, through onsite sewer systems to outfalls at the heads of the two intermittent streams located in the southern portion of the property. The impact of these contamination pathways relative to potential/actual offsite contamination sources is described in the following sections.

4.3.2 Environmental Concerns from Adjacent and Surrounding Properties

To identify potential offsite contamination sources for Fort Des Moines facility, a records search of Federal and State data bases (see Section 2.2) was conducted. The results of this search are provided in Appendix B. The search indicated the following:

- ★ No National Priorities List sites within a 1.0-mile radius of the installation.
- ★ No RCRA treatment, storage, or disposal facilities within a 1.0-mile radius of the installation.
- ★ No Comprehensive Environmental Response, Compensation, and Liability Information System sites, other than Fort Des Moines itself, within a 1.0-mile radius.
- ★ No large quantity generators (generating more than 1,000 kilograms of hazardous waste per month) within a 1.0-mile radius of the site.
- ★ Nineteen small quantity generators (generating less than 1,000 kilograms of hazardous waste per month) located within a 1.0-mile radius of the installation. There are 5 small-quantity generators located within a 0.5-mile radius. The 5 generators are Army Post Amoco, Noahs Cleaners, Army Post Rentals, Sears Roebuck & Co., and Blacks Photography.

- ★ Twenty-six underground storage tanks located within a 0.5-mile radius of the site; 7 of these underground storage tanks are within a 0.5-mile radius. One of these, Mann Elementary School, is located within 0.25 miles of the boundary radius. Two of the 7 underground storage tanks within the 0.5 mile radius of the boundary are leaking. The two leaking underground storage tanks are located at the Army Post Amoco and Quiktrip #523R.

Based on these data base search results, it appears that there are no surrounding property environmental hazards within a close enough distance to impact the CERFA Parcel.

In addition to the data base search completed for the installation, adjacent property and owner/operator interviews, visual site inspections were conducted. These investigations identified the following potential documented contamination sources.

Building 67: Sources of pesticides at Fort Des Moines are former pesticide production and/or blending operations that occurred at Building 67. This building has been demolished and its former location is on excessed property. The site was identified as an AREE in the Draft Final Environmental Investigation/Risk Assessment/Alternatives Analysis. The former building site is a significant pesticides source and has pathways of migration via groundwater flow, and stormwater flow through the storm sewer system.

Building 87: This building has been a General Services Administration Motor Pool since 1963. The facility was a full vehicle shop until approximately 1986. Currently only minor body work is conducted at the building, and the only hazardous storage is less than 20 gallons of flammables. However, when in operation as a full shop, storage and handling of hazardous materials and POL products/wastes may have been more significant.

Although the presence of hazardous materials and POL product/waste at the building represents a potential contamination source, there is no documentation indicating releases from the b ilding. In addition, the groundwater flow identified in the Environmental Investigation indicates that any potential contamination at the site would not result in the onsite migration of contaminants.

Army Reserve Center: The Army Reserve Center is located to the northeast of the CERFA Parcel. There is hazardous material and POL storage at the facility. However like the General Services Administration Motor Pool, there is no documented evidence of release on-site, and groundwater from the site is not onto the installation.

Former Installation Landfill: A parcel of land to the east-southeast of the CERFA Parcel since deeded to the Polk County Conservation Board was the site of the installation landfill and salvage yard until the mid-1960s. According to the Archives Search Report, PCB transformers, ash from coal-fired boilers, and asbestos were disposed in the landfill. Samples collected from the landfill indicated detectable but below health risk concentrations of pesticides. Although the site is a potential contamination site, groundwater and surface water that flow from the site are away from the CERFA Parcel. The landfill is therefore not a potential contamination source for Fort Des Moines.

Blank Park Golf Course: The environmental impact caused by operations at Fort Des Moines on these two areas have been addressed by the Environmental Investigation. However, the routine use of pesticides and fungicides at the golf course and the use of insecticides, rodenticides, and veterinary chemicals at the zoo and their potential migration onto Fort Des Moines have not been studied. It should be noted, however, that since groundwater is controlled by surface topography (which slopes to the south and southwest), operations in these areas are not likely to significantly impact Fort Des Moines.

4.4 Related Environmental, Hazards, and Safety Issues

Military installations frequently contain issues that the USAEC believes fall outside of the provisions of CERFA. For example, while a release of lead-based paint onto the ground may be a CERCLA concern, the application of lead-based paint to a building surface is generally not. However, lead-based paint applied to buildings may represent a safety hazard to young children. Similarly, other substances or materials commonly applied to or found in buildings (for example, radon and asbestos) may not be explicitly regulated under CERCLA, but may require a notice to potential transferees and lessees that they exist.

USAEC has sought to balance the statutory requirements of CERFA with the law's intent to identify uncontaminated property to the public which can be expeditiously reused. Notice has been provided for those parcels which appear to be uncontaminated under the definition provided in CERFA, but which may contain environmental, hazard, or safety issues. Buildings which contain asbestos-containing materials, lead-based paint, or naturally occurring radon fall into this category and are identified as "CERFA Parcels with Qualifiers" in this CERFA Report. Parcels which contain stored (not in use) equipment which contain some level of PCB oil, stored low level radionuclide-containing equipment such as dials and weapon site posts, and unexploded ordnance are also designated "CERFA Parcels with Qualifiers".

In those cases, however, where for example, asbestos or PCBs have been disposed in the environment, the parcel has been identified as "CERFA Disqualified". In this example, the designation indicates that a CERCLA hazard may exist at this location. The following discussion addresses the presence of asbestos-containing material, lead-based paint, PCB storage, radon, unexploded ordnance, and radionuclides.

4.4.1 Asbestos

An asbestos survey was conducted as part of the Environmental Investigation in 1991 and included all Fort Des Moines buildings except Building 138. A detailed description of survey results is provided in Section 4.1.

4.4.2 Lead-based Paint

A lead-based paint survey was conducted as part of the Environmental Investigation. Thirty buildings were surveyed and only 6 of the buildings (Numbers 64, 68, 70, 83, 123, and 133) revealed lead concentrations that were below the guideline criteria of 0.5 percent by weight

(5,000 μg/g). Building 138, which was not surveyed, was assumed to have lead-based paint due to its age. A detailed description of survey results is provided in Section 4.1.

4.4.3 Polychlorinated Biphenyls

Decommissioned transformers were stored in Building 309, as stated in the Enhanced PA. The Environmental Investigation also described the storage of PCB-free transformers at Building 117. Prior to 1982, transformers were reportedly stored in Building 138. In the fall of 1993, all active transformers at Fort Des Moines were taken off-line. Transformers stored in Buildings 309 and outside Building 117 were taken offsite. Residual contamination in Building 117 has been excavated and drummed and is being stored in Building 309 awaiting shipment offsite. Therefore, PCB storage is not a concern at Fort Des Moines. The spill near Building 307 was associated with leakage resulting from a lighting strike. The transformer fluid was taken offsite prior to the Environmental Investigation. During the field effort of the Draft Final Environmental Investigation/Risk Assessment/Alternatives Analysis, three samples yielded nondetectable levels of PCBs.

4.4.4 Radon

A radon gas survey was conducted throughout the facility in 1991 as part of the Environmental Investigation. In October 1992, additional measurements were taken confirming the initial survey's results. Only Buildings 63 and 72 were found to have radon gas levels exceeding the EPA's 4 pCi/L guidance level. A detailed description of survey results is provided in Section 4.1.

4.4.5 Unexploded Ordnance

There were no unexploded ordnance locations at Fort Des Moines identified through document and record reviews and interviews.

4.4.6 Radionuclides

Buildings 63 and 64 are currently used by the 830th Station Hospital Army Reserve Unit. It was reported that an x-ray machine was located in Building 63 and that it was tested recently for residual radioactivity; the results were not available at the time of this CERFA Report. However, a U.S. Army Environmental Hygiene Agency radiation protection survey dated January 17, 1991 indicated that no health hazards resulted from the use of x-ray equipment at Fort Des Moines. It should also be noted that radiation kits were reportedly stored by the Civil Air Patrol in Building 137 in the past. The kits are no longer present.

4.5 Remediation Efforts

To date, remediation efforts conducted at Fort Des Moines are as follows:

- ★ Removal of two underground storage tanks at Building 139 and one underground storage tank at Building 117. The former site was reportedly closed clean.

Contamination was identified at the Building 117 site. Approximately 3 cubic yards of contaminated soil were removed from the site in October 1993. Fort Des Moines is currently preparing the required report addressing these tank removals and associated soil excavations. Upon receipt and review of the report, the State of Iowa will make a determination on the clean closure certification.

- ★ Removal and proper disposal of off-line transformers being stored in Building 309 and outside Building 117 at the time of the Environmental Investigation site visit.

- ★ The excavation/drumming of contaminated soil and contaminated wood and debris associated with the former PCB transformer leak at Building 307. The drums are currently being stored in Building 309 awaiting offsite disposal.

- ★ Reduction in hazardous materials/POL storage at the installation by various Army Reserve units (see Sections 3.1.1, 3.1.2, and 3.1.3).

- ★ Site characterization, risk assessment and alternatives analysis for the site and adjacent properties relative to pesticide, PCB, volatile organic compound, semivolatile organic compound, TPH, and metals contamination from various sources during the conduct of the Draft Final Environmental Investigation/Risk Assessment/Alternatives Analysis.

4.6 CERFA-EXCLUDED PARCELS

CERFA-Excluded parcels consist of those parcels to be retained by the Army or other Department of Defense agency or property that will be transferred to another Federal agency with restrictions by statute. At present, the Army does not have plans to retain any portion of Fort Des Moines.

5.0 SITE PARCELIZATION

After reviewing investigation documents, regulatory records, personnel interviews, and visual inspections, TETC identified parcels on the installation as CERFA Parcels, CERFA Parcels with Qualifiers, CERFA Disqualified Parcels, or CERFA-Excluded parcels in accordance with the definitions in Section 1.2. The parcels are delineated on a map of the BRAC portion of the installation using a 1-acre square grid for boundary definition. The Army chose a 1-acre grid system to aid in the presentation of data gathered during the CERFA Report investigation, and to facilitate use of the document by reuse groups and others. The 1-acre grid provided a consistent method to report and locate environmental or other concerns. In the many cases where the concerns are much smaller than 1-acre, the grid system simplifies the depiction of the concern. Accordingly, the areal extent of many small areas of concern, such as underground storage tank sites, are liberally depicted in the CERFA Report. Additionally, the 1-acre grid size was chosen as a generally redevelopable parcel size for either industrial or residential uses. However, the grid does not drive reuse nor restrict it. Reuse decisions should be made irrespective of the grid. The entire 1-acre grid square is colored or shaded to indicate the applicable parcel category on the basis of the history of storage or release for any portion of that square. Parcels are labelled according to a system outlined in Section 1.2 of this report to indicate the applicable parcel category and the contaminating circumstances. Parcel labels are connected to the respective parcel boundaries by a line or are located within the parcel boundaries.

Where CERFA Disqualified Parcels and CERFA Parcels with Qualifiers have coincided, the overlapped area has been designated CERFA Disqualified. Labels for any such overlapped parcels also indicate the presence of the qualifying hazards. CERFA-Excluded parcels have been excluded from this investigation of contaminant locations and therefore do not overlap with CERFA Disqualified Parcels or CERFA Parcels with Qualifiers. Structures within CERFA Disqualified Parcels that contain qualifying safety hazards are designated with the applicable qualifying label, where map scale permits this level of detail.

TETC's investigation and subsequent parcelization of Fort Des Moines determined that approximately 10 acres of the facility fall within the CERFA Parcel category. Approximately 5 acres of the facility are categorized as CERFA Parcels with Qualifiers. Thirty-seven (37) acres constitute the CERFA Disqualified portion of the installation. The CERFA Parcels are located predominantly in the east portion of the installation.

In determining the applicable parcel categories for the installation property, TETC observed the following guidelines provided by the USAEC for specific circumstances:

- Buildings constructed prior to 1978 are assumed to contain lead-based paint. A similar assumption is made for asbestos in buildings constructed prior to 1985.
- Storage of petroleum products, petroleum derivatives, and CERCLA-regulated hazardous substances will prevent an area from becoming a CERFA Parcel as

long as that storage is for one year or longer. The quantity of substances stored is not relevant to determining the applicable parcel category. However, if the operation requiring such substances is in the immediate area, and the storage is in limited quantities for immediate use, the area is not precluded from being a CERFA Parcel.

- Nonleaking equipment containing less than 50 parts per million PCBs does not preclude an area from becoming a CERFA Parcel. Nonleaking, out-of-service equipment with greater than 50 parts per million PCBs will place an area in the CERFA Parcel with Qualifier category. An area is designated CERFA Disqualified if there is a known release containing greater than 50 parts per million PCBs.

- Areas where there are transport systems or equipment that handle hazardous substances or petroleum products and on which there has been no release, storage, or disposal of these substances are categorized as CERFA Parcels.

- Ordnance disposal locations are designated CERFA Disqualified. This does not include ordnance impact areas that are designated CERFA Parcels with Qualifiers.

- Routine pesticide and herbicide application in accordance with manufacturer's directions and chlorofluorocarbons and halon in operational systems do not preclude an area from becoming a CERFA Parcel.

- Coal storage piles and railroad tracks do not automatically preclude an area from becoming a CERFA Parcel.

State and Federal (where applicable) comments on the draft CERFA Report were incorporated into the final CERFA Report. These comments are provided in Appendix C.

5.1 Parcel Designation Maps

Table 5-1 and Figure 5-1 identify the breakdown of Fort Des Moines property according to the criteria for parcel identification under CERFA. Appendix D contains the data base from which Table 5-1 and Figure 5-1 are generated.

5.2 Tract Map

The property boundaries and all property transfers including prior ownership information is shown in Figure 5-2.

5.3 Summary CERFA Maps

Figure 5-3 summarizes the breakdown of Fort Des Moines property according to the criteria for parcel identification under CERFA.

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TABLE 5-1. Parcel Descriptions, Fort Des Moines

PARCEL NUMBER	APPROX. SIZE (ACRES)	COORD (X,Y) ON FIG 5-1	LOCATION	CATEGORY	BASIS	APP. A REF(S)	REMEDIATION OR MITIGATION
[illegible]	[illegible]	14,8	Building 133	Qualified, Radon (P) Disqualified, Petroleum Storage Disqualified, Hazardous Substance Storage	Radon gas assumed since building wasn't tested Various POL Products stored in 275 gal Drums -- Inactivated in ~1992 (Gas Regulator House) Antifreeze, solvents stored in 220 gal Drums -- Used from 1930s to ~1992 (Gas Regulator House)	16, 17 4, 16 2, 4, 17	 No longer in operation No longer in operation
		13,9	Building 55	Qualified, Asbestos Qualified, Lead Disqualified, Hazardous Substance Release Disqualified, Hazardous Substance Storage	Asbestos Containing Material Lead based paint associated with structure built in 1903 Release of Lead, pesticides, SVOCs associated with Non-Source Specific Release Unknown chemicals stored in various containers (Former Hospital Ward)	16 4, 16 16 3, 16	 Active
		13,9	Building 56	Qualified, Asbestos Qualified, Lead	Asbestos Containing Material Lead-based paint associated with structure built in 1903	16 4, 16	
		11,9	Building 58	Qualified, Asbestos Qualified, Lead Disqualified, Hazardous Substance Release	Asbestos Containing Material Lead-based paint associated with structure built in 1904 Release of Metals associated with Small Arms Firing Range	16 4, 16 4, 16	
		10,9	Building 59	Qualified, Asbestos Qualified, Lead Disqualified, Hazardous Substance Storage (P)	Asbestos Containing Material Lead-based paint associated with structure built in 1904 Photographic chemicals stored in Cans(P) (Photographic Lab)	16 4, 16 2	 No longer in operation
		10,9	Building 60	Qualified, Lead	Lead-based paint associated with structure built in 1904	4, 16	
		9,9	Building 61	Qualified, Lead Disqualified, Hazardous Substance Storage	Lead-based paint associated with structure built in 1904 TCE stored in Cans (Former Hospital Ward)	4, 16 16	
		8,9	Building 62	Qualified, Asbestos Qualified, Lead	Asbestos Containing Material Lead-based paint associated with structure built in 1904	16 4, 16	
		8,8	Building 75	Qualified, Lead	Lead-based paint associated with structure built in 1904	4, 16	
		11,7	Building 81	Qualified, Lead Disqualified, Hazardous Substance Release	Lead-based paint associated with structure built in 1904 Release of Metals associated with Small Arms Firing Range	4, 16 4, 16	
		12,7	Building 83	Qualified, Asbestos Disqualified, Petroleum Storage Disqualified, Petroleum Storage (P) Disqualified, Hazardous Substance Storage (P)	Asbestos Containing Material Fuel Oil stored in 500 gal UST - First used in Pre-1950 (Tank 83) Various POL Products stored in Drums - First used in ~1940 (Former Vehicle Garage) Various hazardous materials stored in Drums - First used in ~1940 (Former Vehicle Garage)	16 2, 4, 16 4 2, 4	 Inoperative No longer in operation No longer in operation
		13,7	Building 84	Qualified, Lead Disqualified, Petroleum Storage Disqualified, Hazardous Substance Storage	Lead-based paint associated with structure built in 1958 Various POL Products stored in Drums -- Inactivated in ~1992 (Vehicle Maintenance Storage Bldg) Antifreeze, paint, other hazardous materials stored in 700 gal Drums -- Used from 1958 to ~1992 (Vehicle Maintenance Storage Bldg)	4, 16 4, 16, 17 2, 4, 16, 17	 No longer in operation No longer in operation
		13,7	Building 86	Qualified, Asbestos Disqualified, Petroleum Storage Disqualified, Petroleum Storage (P)	Asbestos Containing Material Fuel Oil stored in 500 gal UST - First used in 1973 (Tank 86) Various POL Products stored in 330 gal Drums (Former Motor Pool)	16 2, 4, 16 2, 4, 17	 Inoperative Active - Currently miscellanous Army Reserve Storage, no major storage

TABLE 5-1. Parcel Descriptions, Fort Des Moines

PARCEL NUMBER	APPROX. SIZE (ACRES)	COORD (X,Y) ON FIG 5-1	LOCATION	CATEGORY	BASIS	APP. A REF(S)	REMEDIATION OR MITIGATION
1D- A,L,R,P,PS,HR,HS	14	13,7	Building 6a	Disqualified, Hazardous Substance Storage (P)	Various hazardous materials stored in Drums (Former Motor Pool Building)	2, 4 17	Currently no hazardous materials storage
2Q- A,L	2	8,9	Building 62	Qualified, Asbestos Qualified, Lead	Asbestos Containing Material Lead-based paint associated with structure built in 1904	16 4, 16	
		8,8	Building 75	Qualified, Lead	Lead-based paint associated with structure built in 1904	4, 16	
3D- A,L,R,RD,P,HS	2	7,9	Building 63	Qualified, Asbestos Qualified, Lead Qualified, Radon Qualified, Radionuclides (P) Disqualified, Hazardous Substance Storage (P) Disqualified, Hazardous Substance Storage	Asbestos Containing Material Lead-based paint associated with structure built in 1905 Radon gas present based on results of measurements by alpha track canisters (Average concentration = 5.4 pCi/L) Presence of Residual radioactivity associated with 830th Hospital Photographic chemicals stored in Cans(P) (Photographic Lab) Hazardous medical supplies stored in ~50 gal Cans (Hospital Supply Storage)	16 4, 16 16 17 2 17	No longer in operation Most operations moved out of building
		6,7	Building 71	Qualified, Lead	Lead-based paint associated with structure built in 1905	4, 16	
		7,8	Building 72	Qualified, Lead Qualified, Radon	Lead-based paint associated with structure built in 1905 Radon gas present based on results of measurements by alpha track canisters (Average concentration = 7.8 pCi/L)	4, 16 16	
		7,7	Building 73	Qualified, Asbestos Qualified, Lead	Asbestos Containing Material Lead-based paint associated with structure built in 1905	16 4, 16	
4Q- A,L,R	2	6,7	Building 70	Qualified, Asbestos	Asbestos Containing Material	16	
		6,7	Building 71	Qualified, Lead	Lead-based paint associated with structure built in 1905	4, 16	
		7,8	Building 72	Qualified, Lead Qualified, Radon	Lead-based paint associated with structure built in 1905 Radon gas present based on results of measurements by alpha track canisters (Average concentration = 7.8 pCi/L)	4, 16 16	
		7,7	Building 73	Qualified, Asbestos Qualified, Lead	Asbestos Containing Material Lead-based paint associated with structure built in 1905	16 4, 16	
5D- A,L,P,R,P,S,PR,PS,HR,HS	20	12,5	Building 122	Qualified, Asbestos Qualified, Lead Disqualified, Petroleum Storage	Asbestos Containing Material Lead-based paint associated with structure built in 1907 Gasoline stored in 10000 gal UST - First used in Pre-1950(Tank 122)	16 4, 16 2, 4, 16	Non-presence verified through EI Magnetrometer & GPR Survey
		12,5	Building 123	Qualified, Asbestos Disqualified, Petroleum Storage (P) Disqualified, Hazardous Substance Storage (P)	Asbestos Containing Material Various POL Products stored in Drums(P) (Former Machine Shop) Various hazardous materials stored in Drums(P) (Former Machine Shop)	16 2, 4 2, 4, 17	No longer in operation No longer in operation
		12,4	Building 126	Qualified, Asbestos Qualified, Lead Disqualified, Petroleum Release Disqualified, Petroleum Storage (P)	Asbestos Containing Material Lead-based paint associated with structure built in 1907 Release of TPH associated with Maintenance Shop Releases Various POL Products stored in Drums(P) (Former Maintenance Shop)	16 4, 16 16 2, 4	No longer in operation

TABLE 5-1. Parcel Descriptions, Fort Des Moines

PARCEL NUMBER	APPROX. SIZE (ACRES)	COORD (X,Y) ON FIG 5-1	LOCATION	CATEGORY	BASIS	APP. A REF(S)	REMEDIATION OR MITIGATION
SD-ALPR(P)PRFSHRHS	20	12,4	Building 126	Disqualified, Hazardous Substance Release	Release of Metals, PCBs associated with Maintenance Shop R[illegible]ase	16	
				Disqualified, Hazardous Substance Storage (P)	Various hazardous materials stored in Drums(P) (Former Maintenance Shop)	2, 4, 16, 17	Used by USEPA for orphan drum storage in 1993
		11.5	Building 127	Qualified, Lead	Lead-based paint associated with structure built in 1910	4, 16	
				Disqualified, Petroleum Storage	Gasoline/Water stored in 10,000 gal UST - First used in Pre-1950 (Tank 127.1)	2, 4, 16	Inoperative
					Fuel Oil/Water stored in 1,500 gal UST - First used in Pre-1950 (Tank 127.2)	2, 4, 16	Inoperative
		9,5	Building 135	Qualified, Asbestos	Asbestos Containing Material	16	
				Qualified, Lead	Lead-based paint associated with structure built in 1904	4, 16	
		6,5	Building 137	Qualified, Asbestos	Asbestos Containing Material	16	
				Qualified, Lead	Lead-based paint associated with structure built in 1905	4, 16	
		5,5	Building 138	Qualified, Asbestos (P)	Asbestos Containing Material	16	
				Qualified, Lead (P)	Lead-based paint associated with structure built in 1908	17	
				Qualified, Radon (P)	Radon gas assumed since building wasn't tested	16, 17	
				Disqualified, Petroleum Storage	Various POL Products stored in Drums -- Inactivated in ~1992 (CCC Maintenance Storage)	4	No longer in operation
				Disqualified, Hazardous Substance Release	1950-1959 -- Release of Metals, pesticides associated with Pesticide Mixing Operations	16	
				Disqualified, Hazardous Substance Storage	Pesticides, herbicides, solvents stored in Drums -- Used from 1950 to 1959 (Pesticide Mixing Operations)	2, 4, 16, 17	No longer in operation
		6,5	Building 139	Qualified, Asbestos	Asbestos Containing Material	16	
				Qualified, Lead	Lead-based paint associated with structure built in 1937	4, 16	
				Disqualified, Petroleum Storage	Diesel Fuel stored in 1,500 gal UST - First used in Pre-1950 (Tank 139.1)	2, 4, 16	Removed 9/90, closed clean, awaiting IA Clean Close Certificate
					Gasoline stored in 1,500 gal UST - First used in Pre-1950 (Tank 139.2)	2, 4, 16	Removed 9/90, closed clean, awaiting IA Clean Close Certificate
					Various POL Products stored in 60 gal Cans - First used in ~1991 (830th Hospital AR Storage)	17	Active
					POL Products (P) stored in ~250 gal AGT -- Inactivated in 1975 (Tank 139.3)	17	No longer in operation, tank located on concrete dock behind Bldg
					POL Products (P) stored in ~250 gal AGT -- Inactivated in 1975 (Tank 139.4)	17	No longer in operation, tank located on concrete dock behind Bldg
					POL Products (P) stored in ~1,000 gal AGT -- Inactivated in 1975 (Tank 139.5)	17	No longer in operation, tank located on concrete dock behind Bldg
					POL Products (P) stored in ~500 gal AGT -- Inactivated in 1975 (Tank 139.6)	17	No longer in operation, tank in grass behind Bldg
					POL Products (P) stored in ~500 gal AGT -- Inactivated in 1975 (Tank 139.7)	17	No longer in operation, tank in grass behind Bldg
				Disqualified, Hazardous Substance Storage	Paint, other various hazardous materials stored in Cans - First used in ~1991 (830th Hospital AR Storage)	2, 4, 17	Active
		7,6	Building 307	Disqualified, Petroleum Release	Release of Oil associated with PCB Transformer-Oil Spill	4, 16	
				Disqualified, Hazardous Substance Release	Release of Pesticides, SVOCs associated with Reported PCB Transformer-Oil Spill	16	Contaminated material excavation/removal
		8,0	Building 308	Qualified, Lead	Lead-based paint associated with structure built in 1942	4, 16	
		8,6	Building 309	Qualified, Asbestos	Asbestos Containing Material	16	
				Qualified, Lead	Lead-based paint associated with structure built in 1942	4, 16	
				Disqualified, Petroleum Storage	Various POL Products stored in 330 gal Drums (Facility Maintenance Storage Building)	4, 16, 17	
				Disqualified, Hazardous Substance Storage	CFCs, solvents, other hazardous materials stored in Drums (Facility Maintenance Storage Building)	4, 16, 17	Active
		5,7	Building 68	Qualified, Asbestos	Asbestos Containing Material	16	
				Disqualified, Hazardous Substance Release	Release of Metals, pesticides associated with Non-Source Specific Release	16	

TABLE 5-1. Parcel Descriptions, Fort Des Moines

PARCEL NUMBER	APPROX. SIZE (ACRES)	COORD (X,Y) ON FIG 5-1	LOCATION	CATEGORY	BASIS	APP. A REF(S)	REMEDIATION OR MITIGATION
SD-A/L/P/R(P)/PR/PS/HR/HS	20	5,7	Building 68	Disqualified, Hazardous Substance Storage	TCE stored in Cans (Former CCC temporary warehouse)	16	
		5,8	Building 69	Qualified, Lead	Lead-based paint associated with structure built in 1905	4, 16	
		6,7	Building 70	Qualified, Asbestos	Asbestos Containing Material	16	
		9,4	Intermittent streams	Disqualified, Hazardous Substance Release	Release of Pesticides associated with Intermittent Streams	16	
		5,4	Pesticide contamination area	Disqualified, Petroleum Release	Release of TPH associated with Pesticide Contamination Area	2, 4, 16	
				Disqualified, Hazardous Substance Release	Release of Metals, PCE, pesticides, VOCs associated with Pesticide Contamination Area	16	
		8,4	Unrestricted disposal area 1	Disqualified, Hazardous Substance Release	Release of Lead, pesticides associated with Unrestricted Disposal area 1	4, 16	
		9,5	Unrestricted disposal area 2	Disqualified, Petroleum Release	Release of TPH associated with Unrestricted Disposal area 2	2, 4, 16	Contaminated material excavation/removal
				Disqualified, Hazardous Substance Release	Release of Lead, pesticides associated with Unrestricted Disposal area 2	4, 16	
oP	10	12,6		CERFA Parcel	No hazardous substances or petroleum products have been stored, released or disposed in this area.		
7Q-A/L	1	6,5	Building 137	Qualified, Asbestos Qualified, Lead	Asbestos Containing Material Lead-based paint associated with structure built in 1905	16 4, 16	
RD-L/PR/PS/HR/HS	1	14,5	Building 117	Qualified, Lead	Lead-based paint associated with structure built in 1942	4, 16	
				Disqualified, Petroleum Release	Release of Waste Oil associated with Waste Oil Dump Site	4	Soil excavation/removal
					8/92 – Release of TPH associated with Tank 117 Releases	4, 16, 17	Soil excavation/removal
				Disqualified, Petroleum Storage	Waste Oil stored in 500 gal UST – Used from Pre-1950 to 8/92 (Tank 117)	2, 4, 16	Removed 8/92, soil removed 10/93, awaiting IA Clean Close Cert.
					Various POL Products stored in 20 gal Drums(RNU Shop 63)	2, 4, 16, 17	Former CCC Motor Pool, POL Storage volume larger at this time
				Disqualified, Hazardous Substance Release	Release of Undetermined associated with Waste Oil Dump Site	4	Soil excavation/removal
					8/92 – Release of Undetermined associated with Tank 117 Releases	16, 17	Soil excavation/removal
				Disqualified, Hazardous Substance Storage	Paint, solvents stored in <20 gal Drums(RNU Shop 63)	2, 4, 17	Active - Former CCC Motor Pool, volume larger in past

D=CERFA DISQUALIFIED PARCEL
E=CERFA EXCLUDED PARCEL
P=CERFA PARCEL
Q=CERFA PARCEL WITH QUALIFIERS

A=ASBESTOS
L=LEAD-BASED PAINT
P=PCB STORAGE
R=RADON
RD=RADIONUCLIDES
X=UNEXPLODED ORDNANCE

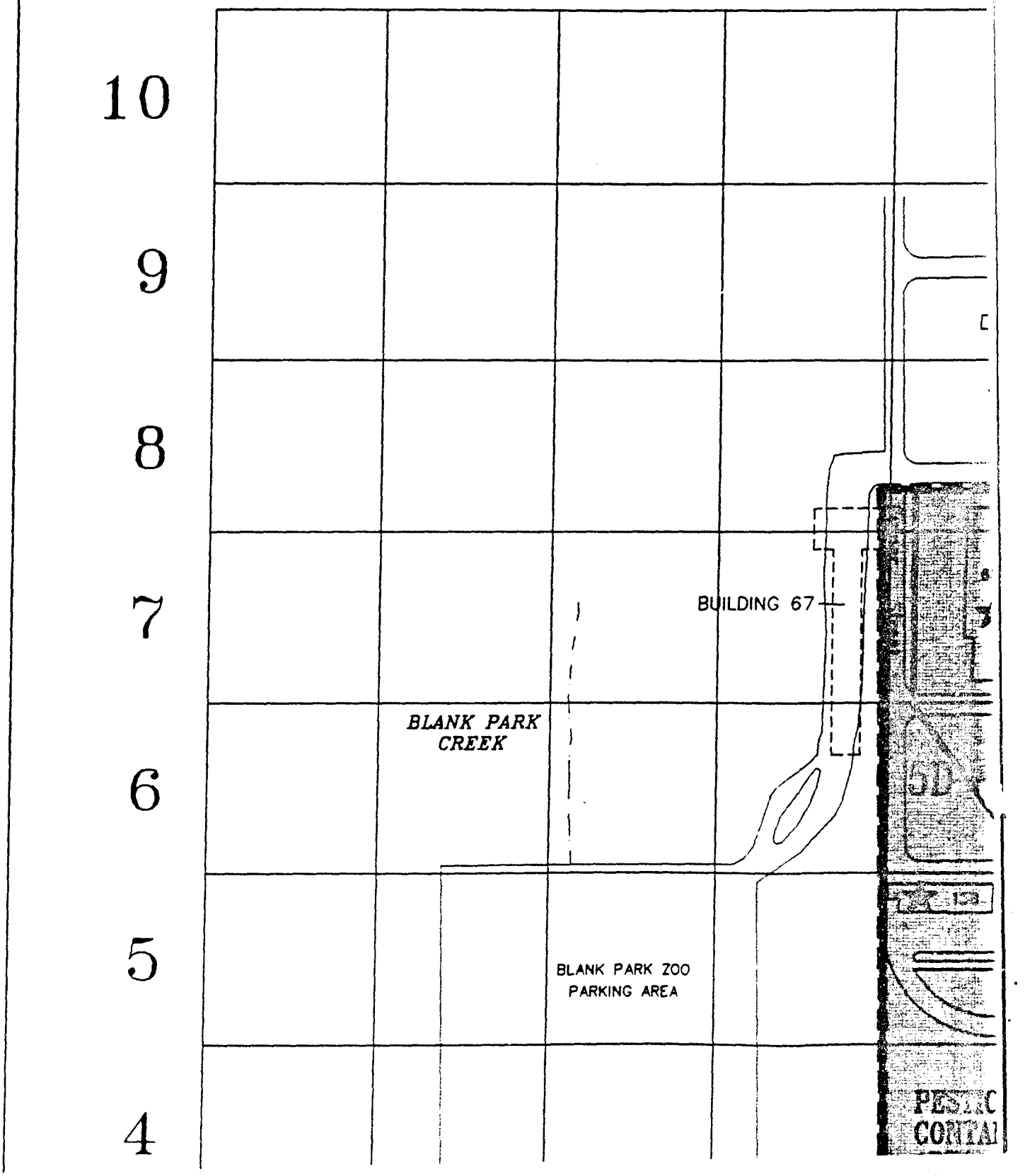
PR=PETROLEUM RELEASE
PS=PETROLEUM STORAGE
HR=HAZARDOUS SUBSTANCE RELEASE
HS=HAZARDOUS SUBSTANCE STORAGE

(P)=POSSIBLE QUALIFIER

FIGURE 5-1
PARCEL DESIGNATION MAP, FORT DES MOINES, IOWA

REVISION	DATE
0	12/15/93
1	04/14/94

(1)



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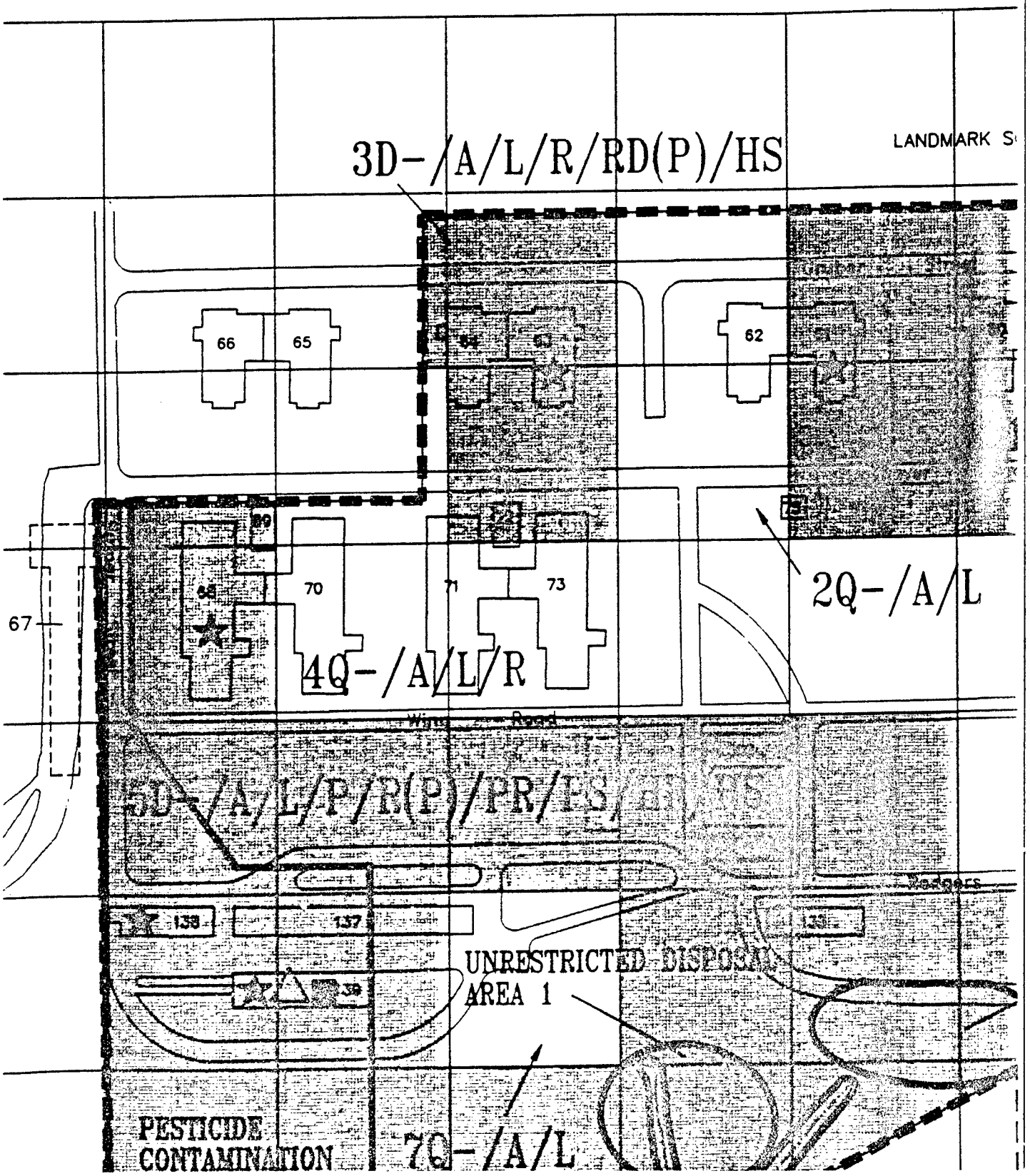
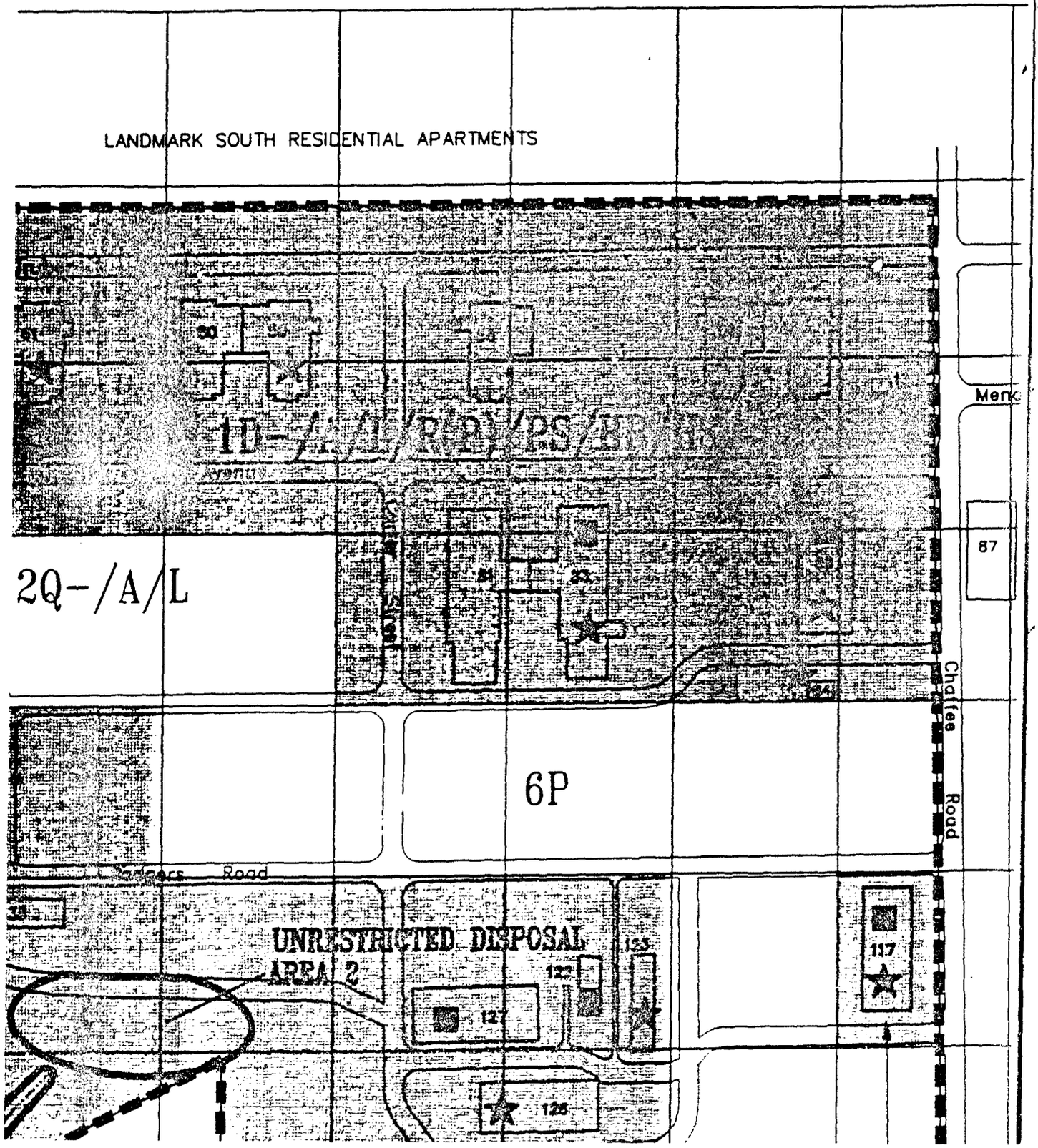
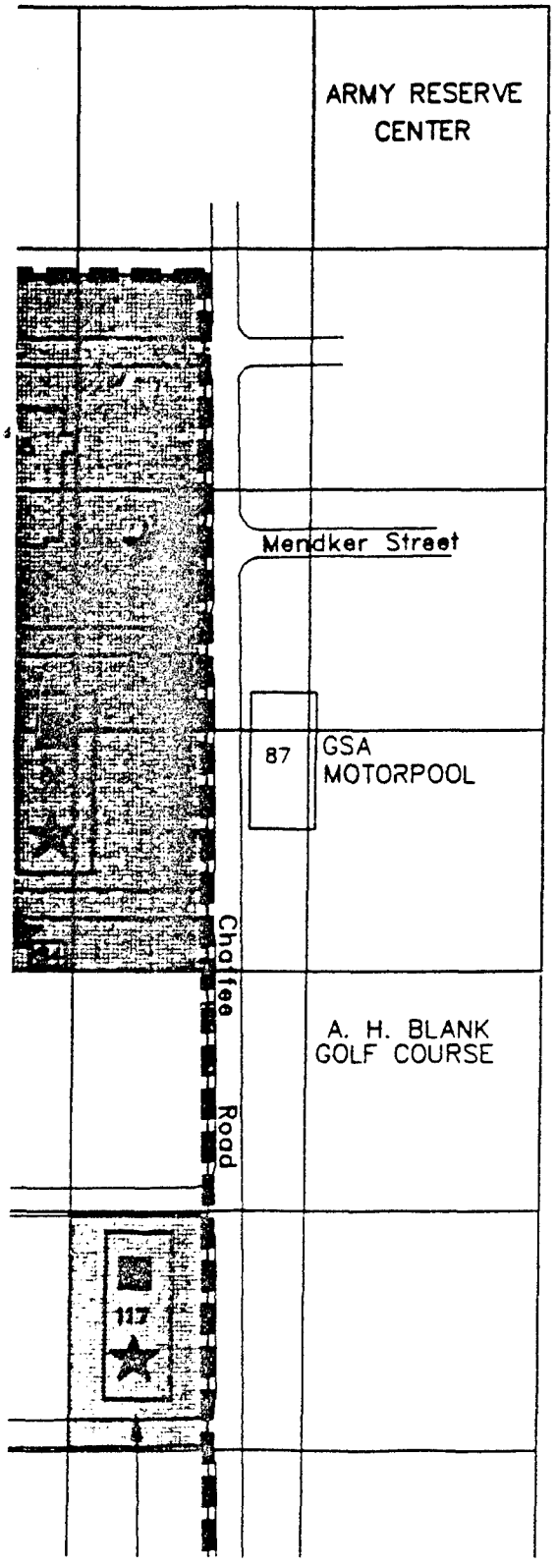
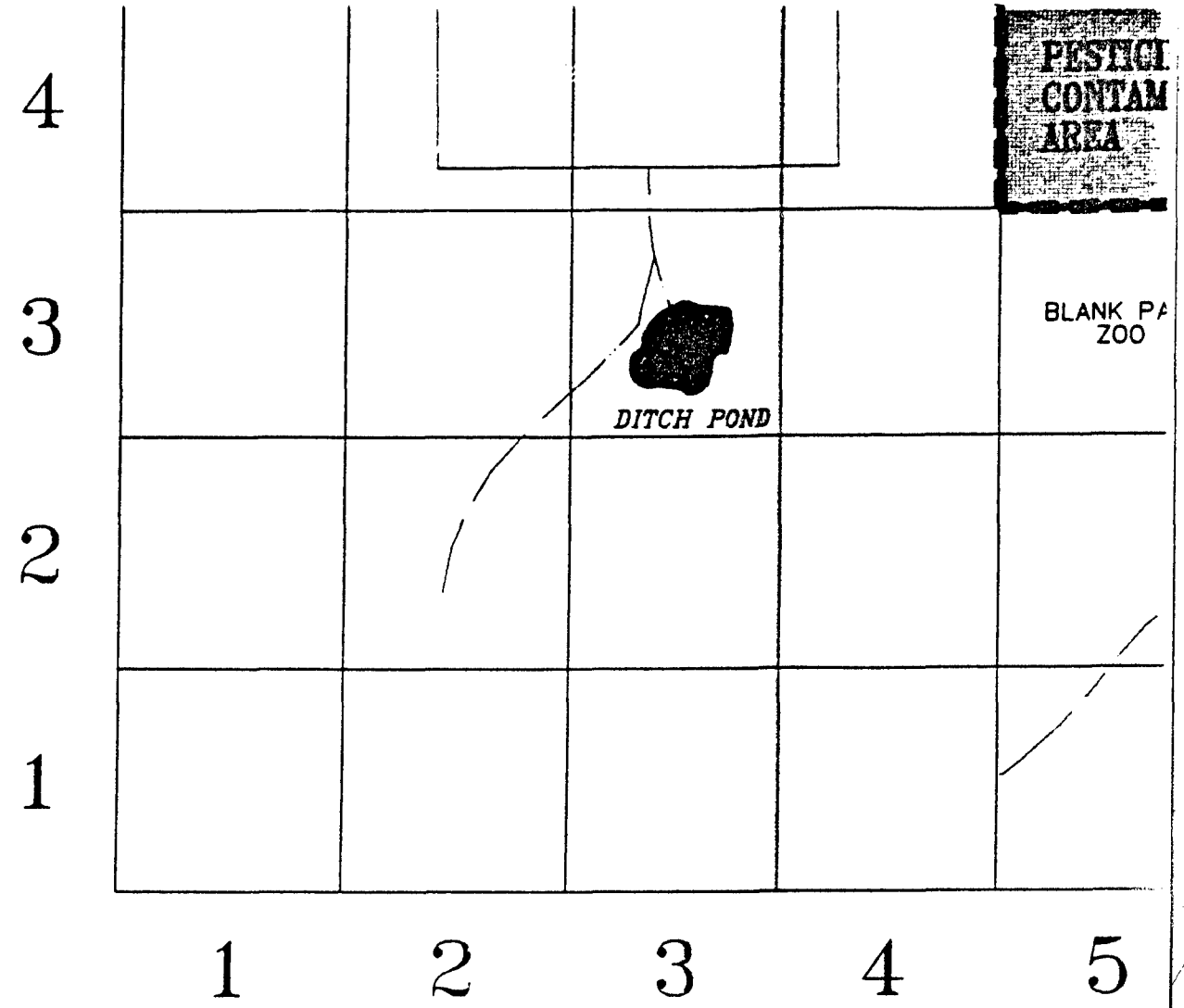

3D-/A/L/R/RD(P)/HS
LANDMARK S
66
65
64
63
62
69
68
70
71
73
67
2Q-/A/L
4Q-/A/L/R
Wigg Road
5D-/A/L/P/R(P)/PR/PS
138
137
133
UNRESTRICTED DISPOSAL
AREA 1
PESTICIDE
CONTAMINATION
7Q-/A/L

(3)

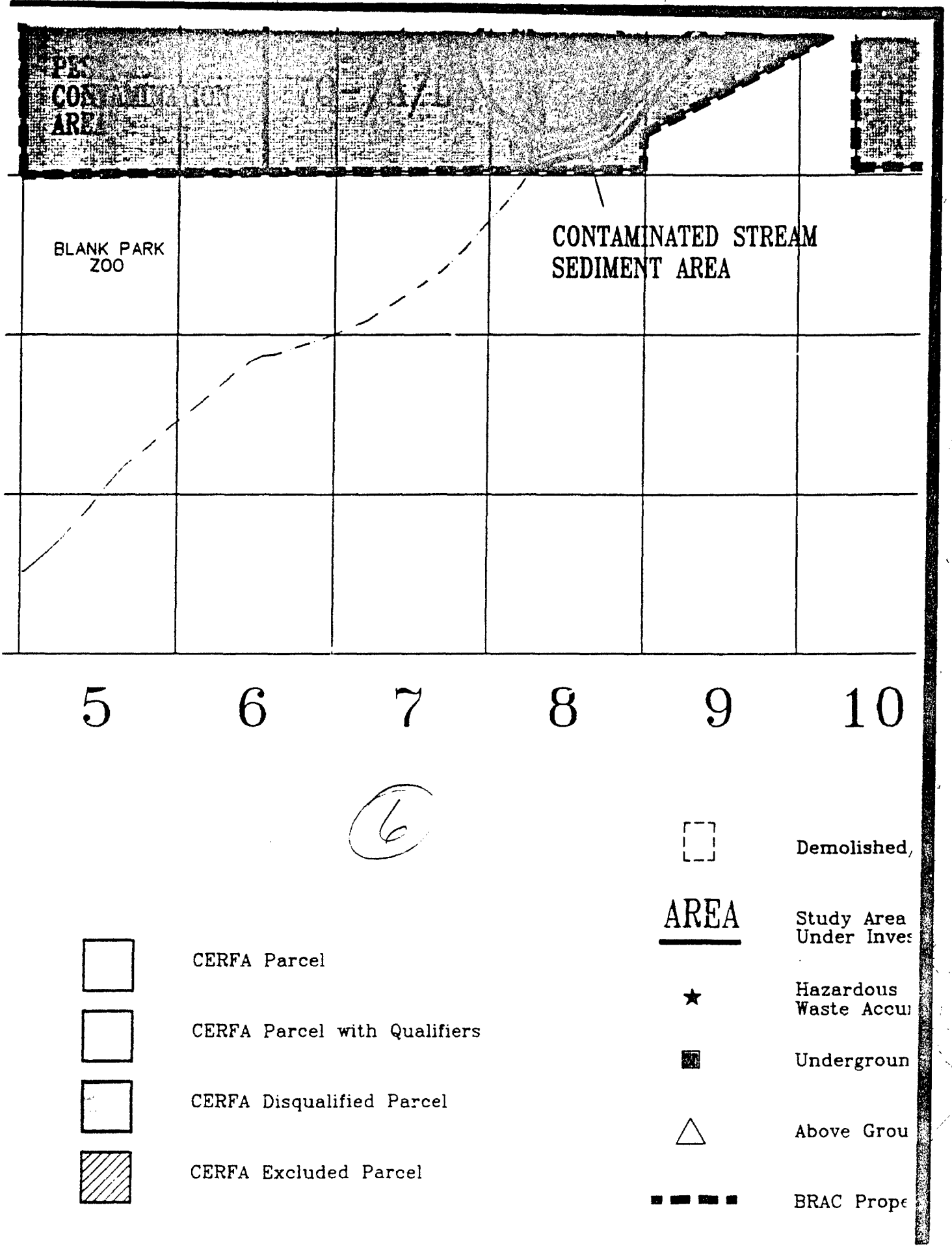

LANDMARK SOUTH RESIDENTIAL APARTMENTS
1D-/A/L/RP/PS/AP
2Q-/A/L
6P
Avenue
Merk
87
Chaffee
Road
Sievers Road
UNRESTRICTED DISPOSAL
AREA 2
117
122
123
127
128

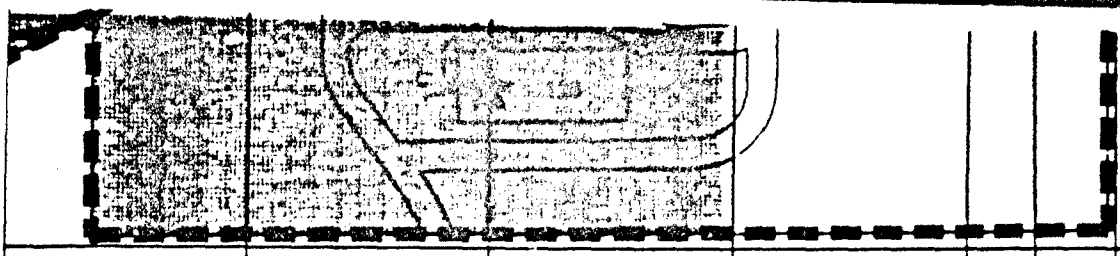
(7)


ARMY RESERVE CENTER
Mendker Street
87
GSA MOTORPOOL
Chaffee Road
A. H. BLANK GOLF COURSE
117



5


PE
CON
ARE
BLANK PARK
ZOO
CONTAMINATED STREAM
SEDIMENT AREA
5
6
7
8
9
10
6
Demolished,
AREA
Study Area
Under Inves
Hazardous
Waste Accu
Undergroun
Above Grou
BRAC Prope
CERFA Parcel
CERFA Parcel with Qualifiers
CERFA Disqualified Parcel
CERFA Excluded Parcel



M

A. H. BLANK
GOLF COURSE

8D-/L/PR/PS/HR/HS

10 11 12 13 14 15

Demolished/Removed Building

Study Area Currently
Under Investigation

Hazardous Substance Storage or
Waste Accumulation Area

Underground Storage Tank

Above Ground Storage Tank

BRAC Property Boundary

7

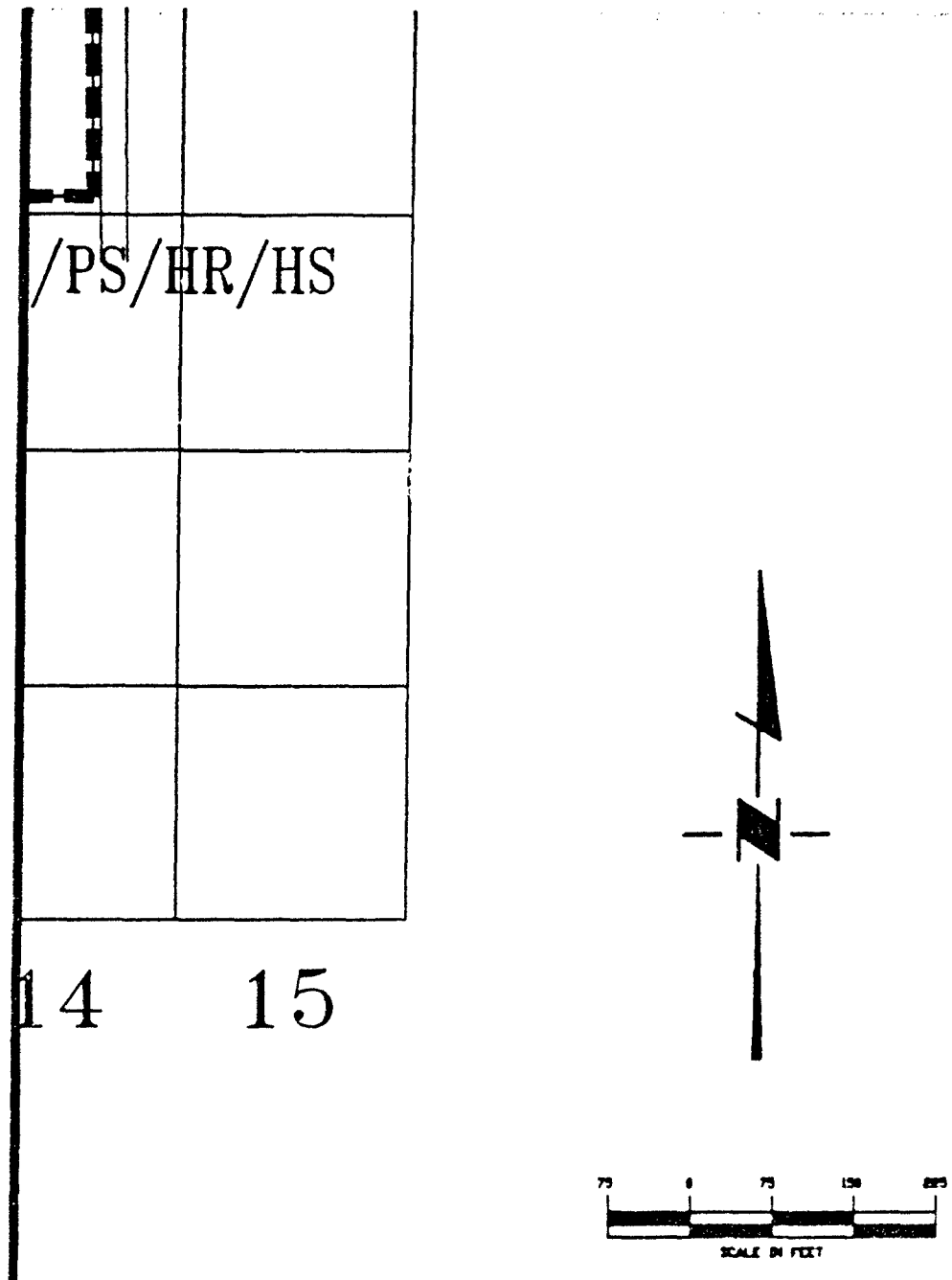
PARCEL LABEL DEFINITIONS

13P-/A/L

- A = ASBESTOS
- L = LEAD-BASED PAINT
- P = PCB
- R = RADON
- X = UNEXPLODED ORDNANCE
- RD = RADIONUCLIDES
- PR = PETROLEUM RELEASE
- PS = PETROLEUM STORAGE
- HR = HAZARDOUS SUBSTANCE RELEASE
- HS = HAZARDOUS SUBSTANCE STORAGE
- (P) = POSSIBLE QUALIFIER

- P = CERFA PARCEL
- Q = CERFA PARCEL WITH QUALIFIER(S)
- D = CERFA DISQUALIFIED PARCEL
- E = CERFA EXCLUDED PARCEL

- PARCEL NUMBER



NS

OS
ASED PAINT

ODED ORDNANCE
NUCLIDES
LEUM RELEASE
LEUM STORAGE
DOUS SUBSTANCE RELEASE
DOUS SUBSTANCE STORAGE
BLE QUALIFIER

PARCEL
PARCEL WITH QUALIFIER(S)
DISQUALIFIED PARCEL
EXCLUDED PARCEL

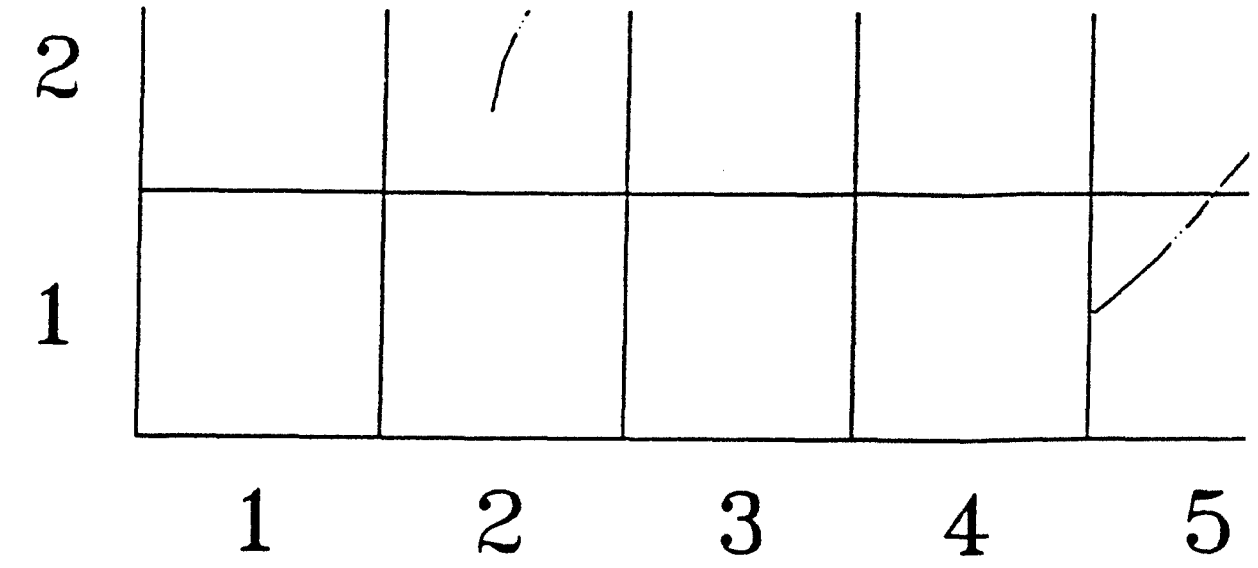
DER

The Earth Technology Corporation

1420 KING STREET SUITE 600, ALEXANDRIA, VIRGINIA 22314

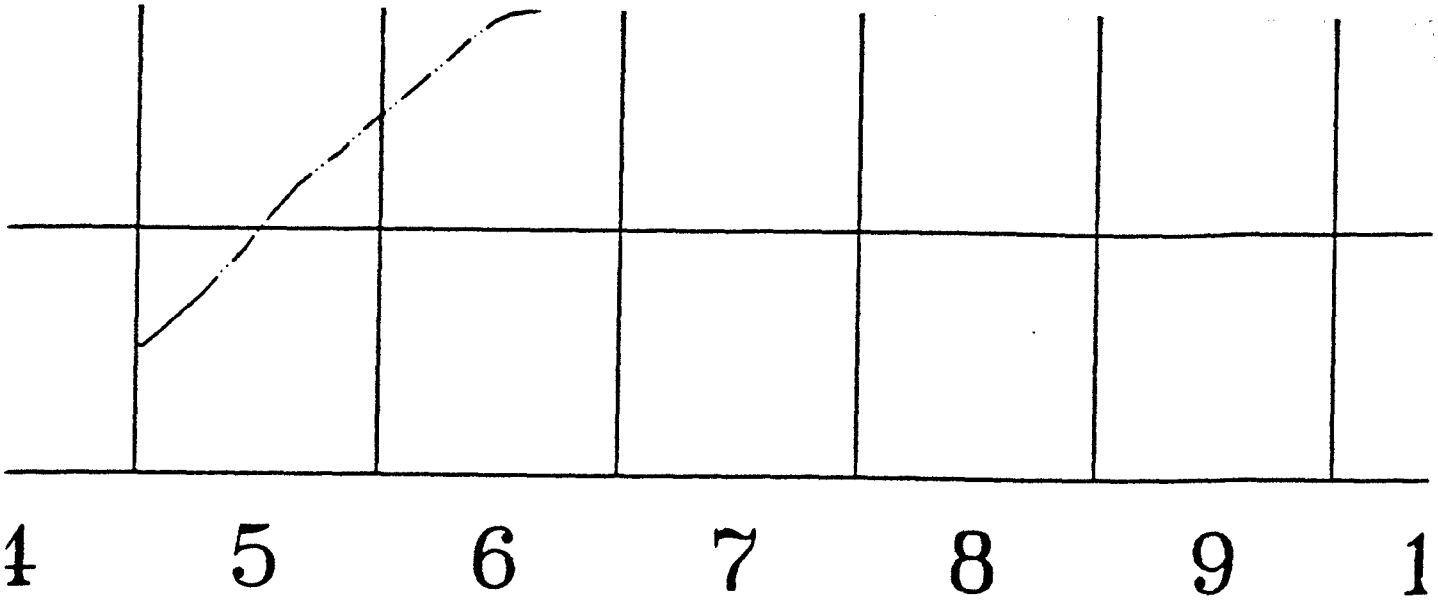
FIGURE 5-1
PARCEL DESIGNATION MAP
FORT DES MOINES
DES MOINES, IOWA

DRAWN BY: MTM, JGC	DESIGNED BY: N/A	SCALE: 1" = 150'



Source: CERFA Investigation, April 1994

(9)



CERFA Parcel

CERFA Parcel with Qualifiers

CERFA Disqualified Parcel

CERFA Excluded Parcel

Demoli

AREA

Study
Under

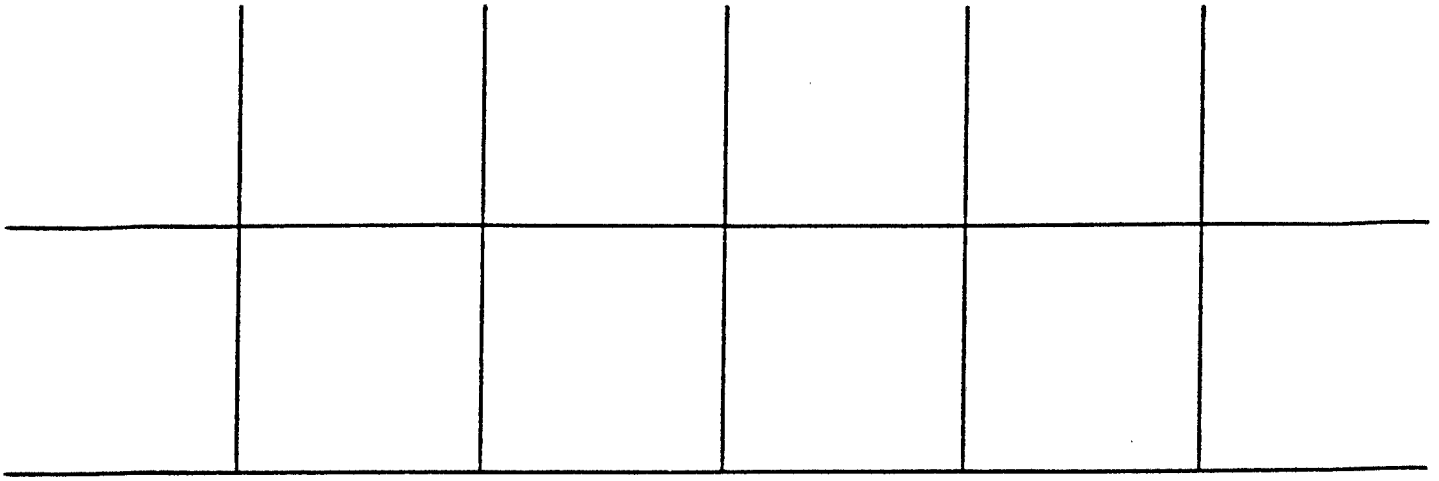
Hazarc
Waste

Under

Above

BRAC

10



9 10 11 12 13 14

Demolished/Removed Building

AREA — Study Area Currently Under Investigation

Hazardous Substance Storage or Waste Accumulation Area

Underground Storage Tank

Above Ground Storage Tank

BRAC Property Boundary

PARCEL LABEL DEFINITIONS

13P-/A/L

- A = ASBESTOS
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- P = PCB
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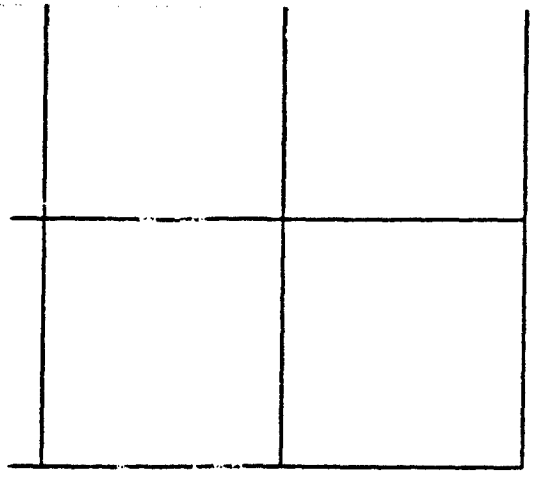
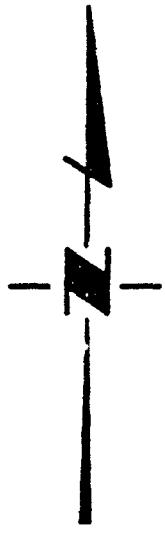
- X = UNEXPLODED ORDNANCE
- RD = RADIONUCLIDES
- PR = PETROLEUM RELEASE
- PS = PETROLEUM STORAGE
- HR = HAZARDOUS SUBSTANCE
- HS = HAZARDOUS SUBSTANCE
- (P) = POSSIBLE QUALIFIER

- P = CERFA PARCEL
- Q = CERFA PARCEL WITH QUA
- D = CERFA DISQUALIFIED PAR
- E = CERFA EXCLUDED PARCEL

PARCEL NUMBER

(11)





DEFINITIONS

- A = ASBESTOS
- L = LEAD-BASED PAINT
- P = PCB
- R = RADON
- X = UNEXPLODED ORDNANCE
- RD = RADIONUCLIDES
- PR = PETROLEUM RELEASE
- PS = PETROLEUM STORAGE
- HR = HAZARDOUS SUBSTANCE RELEASE
- HS = HAZARDOUS SUBSTANCE STORAGE
- (P) = POSSIBLE QUALIFIER

- P = CERFA PARCEL
- Q = CERFA PARCEL WITH QUALIFIER(S)
- D = CERFA DISQUALIFIED PARCEL
- E = CERFA EXCLUDED PARCEL

- PARCEL NUMBER

The Earth Technology Corporation

1420 KING STREET SUITE 600, ALEXANDRIA, VIRGINIA 22314

FIGURE 5-1
PARCEL DESIGNATION MAP
FORT DES MOINES
DES MOINES, IOWA

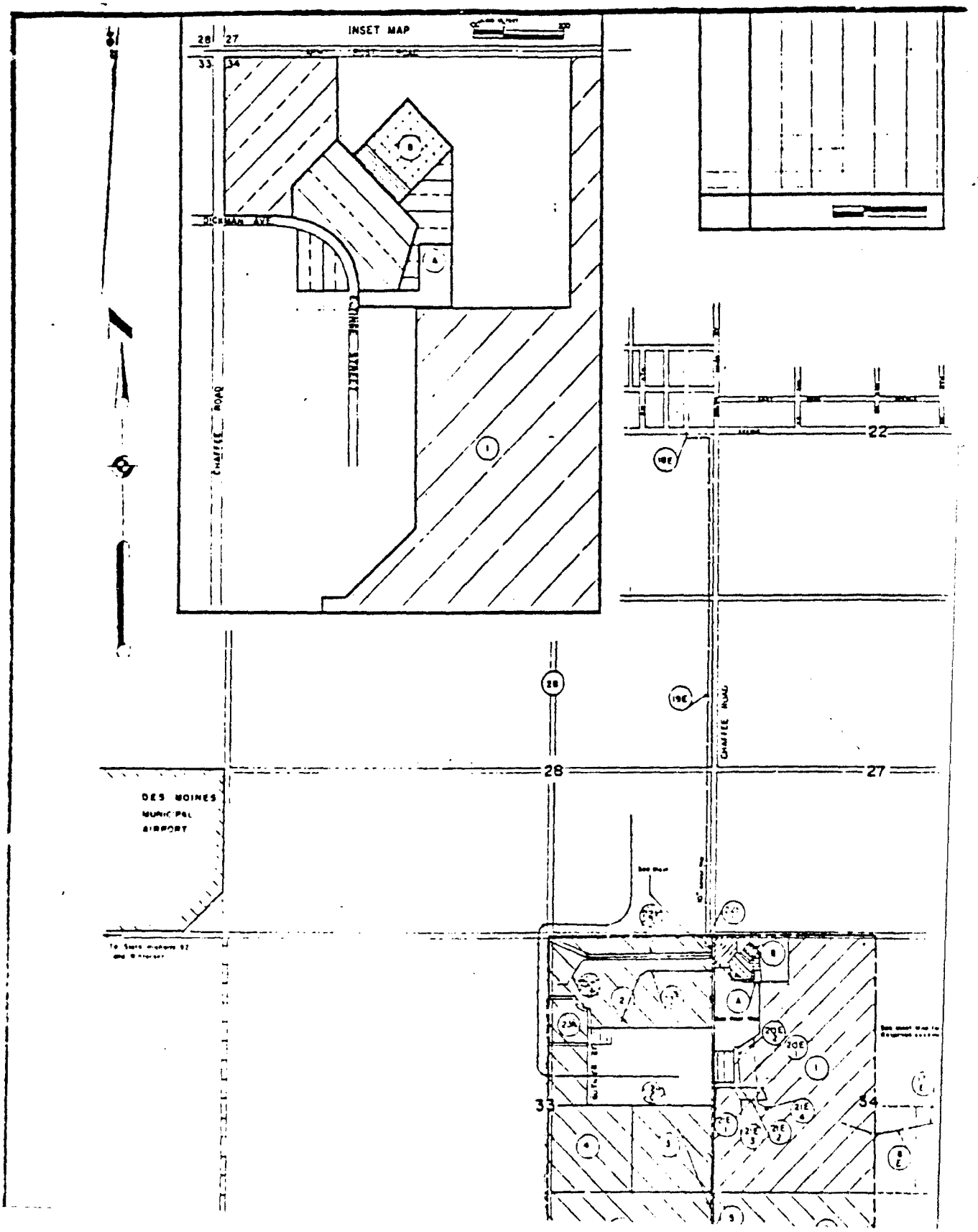
DRAWN BY: MTM, JCC	DESIGNED BY: N/A	SCALE: 1" = 150'
CHECKED BY: KR	APPROVED BY: BY	DATE: 04/14/94
TETC PROJECT NUMBER: 931977-05	DRAWING NUMBER: SHEET 1 OF 1	REV. NO.: 1

12

FIGURE 5-2
TRACT MAP, FORT DES MOINES, IOWA

(1)

Best Available Copy



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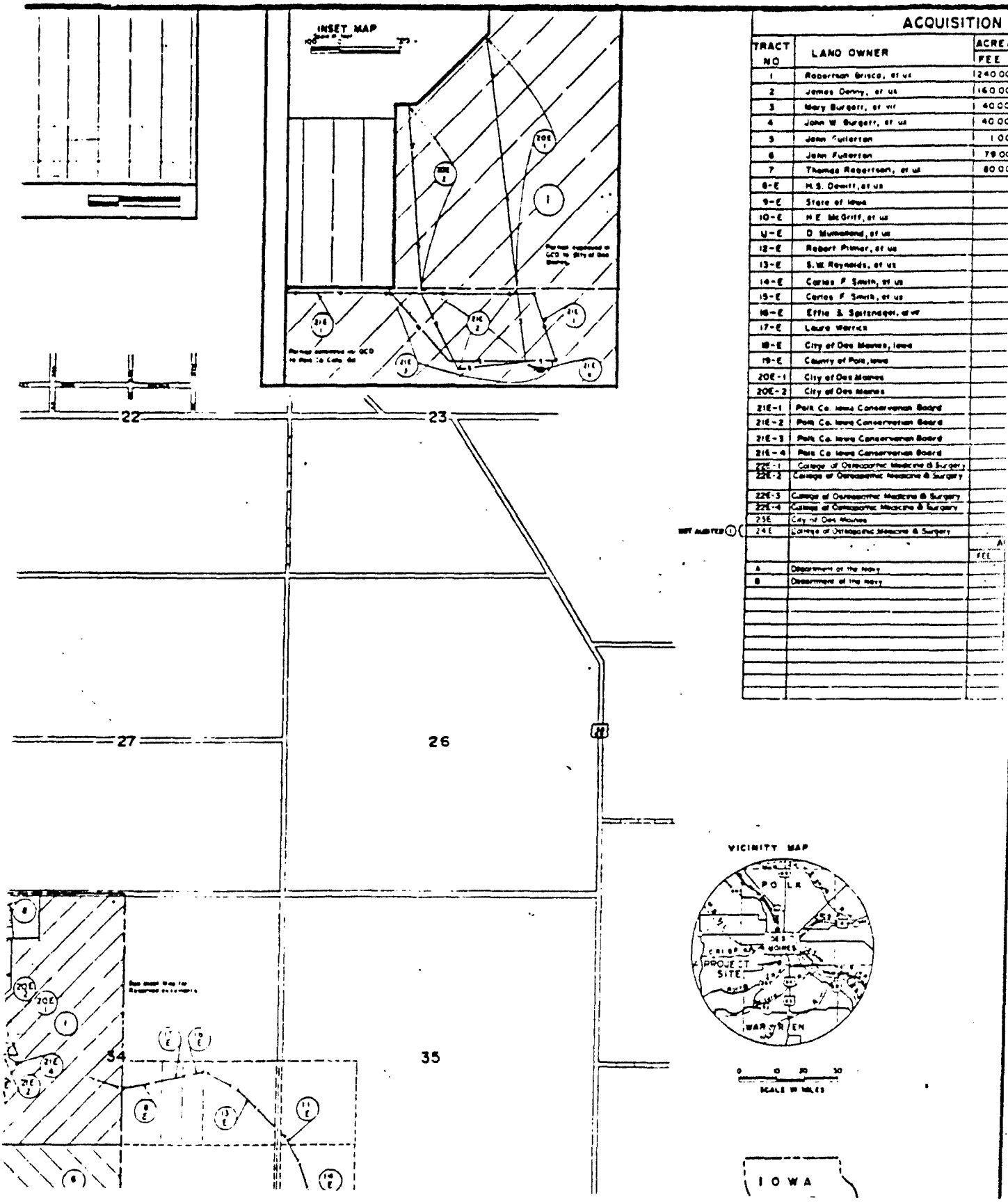


ACQUISITION

TRACT NO	LAND OWNER	ACREA FEE
1	Robertson Brisco, et ux	240.00
2	James Denny, et ux	160.00
3	Mary Burgarr, et vir	40.00
4	John W Burgarr, et ux	40.00
5	Jean Fullerton	1.00
6	John Fullerton	79.00
7	Thomas Robertson, et ux	80.00
8-E	H.S. Dewitt, et ux	
9-E	State of Iowa	
10-E	H E McGriff, et ux	
11-E	D Mumeland, et ux	
12-E	Robert Primer, et ux	
13-E	S.W. Reynolds, et ux	
14-E	Carlos F Smith, et ux	
15-E	Carlos F Smith, et ux	
16-E	Effie S. Spitznagel, et vir	
17-E	Laura Warrick	
18-E	City of Des Moines, Iowa	
19-E	County of Polk, Iowa	
20E-1	City of Des Moines	
20E-2	City of Des Moines	
21E-1	Polk Co. Iowa Conservation Board	
21E-2	Polk Co. Iowa Conservation Board	
21E-3	Polk Co. Iowa Conservation Board	
21E-4	Polk Co Iowa Conservation Board	
22E-1	College of Osteopathic Medicine & Surgery	
22E-2	College of Osteopathic Medicine & Surgery	
22E-3	College of Osteopathic Medicine & Surgery	
22E-4	College of Osteopathic Medicine & Surgery	
23E	City of Des Moines	
24E	College of Osteopathic Medicine & Surgery	

NOT ADDITED (1) (

		A FEE
A	Department of the Navy	
B	Department of the Navy	

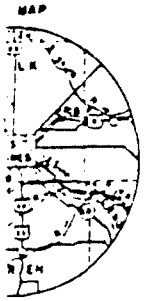
(13)

ACQUISITION TRACT REGISTER

CT	LAND OWNER	ACREAGE FEE	ACREAGE EASE	REMARKS
	Robertson Bruce, et ux	1.240 00		
	James Denny, et ux	1.60 00		
	Mary Burgett, et vir	1.40 00		
	John W Burgett, et ux	1.40 00		
	Joan Fullerton	1.00		
	Joan Fullerton	1.79 00		
	Thomas Robertson, et ux	1.80 00		
	H.S. Dewitt, et ux		no area	Perpetual Easement for 10" Sewer Line, dated 6-11-1902
	State of Iowa		no area	Perpetual Easement for 10" Sewer Line, dated 6-25-1902
	H E McGriff, et ux		no area	Perpetual Easement for 10" Sewer Line, dated 5-1-1902
	O Mumbrand, et ux		no area	Perpetual Easement for 10" Sewer Line, dated 6-17-1902
	Robert Primer, et ux		no area	Perpetual Easement for 10" Sewer Line, dated 9-3-1902
	S.W. Reynolds, et ux		no area	Perpetual Easement for 10" Sewer Line, dated 6-10-1902
	Carlos F Smith, et ux		no area	Perpetual Easement for 10" Sewer Line, dated 6-9-1902
	Carlos F Smith, et ux		no area	Perpetual Easement for 10" Sewer Line, dated 6-9-1902
	Effie S. Spitznagel, et vir		no area	Perpetual Easement for 10" Sewer Line, dated 6-14-1902
	Laura Warren		no area	Perpetual Easement for 10" Sewer Line, dated 6-14-1902
	City of Des Moines, Iowa		no area	Perpetual Easement for 10" Sewer Line, dated 7-17-41
	County of Polk, Iowa		no area	Perpetual Easement for 10" Sewer Line, dated 7-28-41
1	City of Des Moines		0.37	Perm UG Sewage Ease from 11-6-72 Reserved in fee disposal
2	City of Des Moines		0.27	Perm UG Sewage Ease, from 11-6-72 Reserved in fee disposal
1	Polk Co. Iowa Conservation Board		0.47	Perm elec Distribution Ease from 10-2-72 Reserved in fee disposal
2	Polk Co. Iowa Conservation Board		0.23	Perm UG Sewage Ease from 10-2-72 Reserved in fee disposal
3	Polk Co. Iowa Conservation Board		0.30	Perm UG Sewage Ease from 10-2-72 Reserved in fee disposal
4	Polk Co. Iowa Conservation Board		0.01	Perm Sewer Lift Station Ease fm 10-2-72 Reserved in fee disposal
	College of Osteopathic Medicine & Surgery		0.31	Perm Use Line Ease from 3-28-63 Reserved in Fee Disposal
	College of Osteopathic Medicine & Surgery		1.38	Perm Sanitary and Storm water Sewer Ease from 3-28-63 Reserved in Fee Disposal
	College of Osteopathic Medicine & Surgery		2.49	Perm Power and water Line Ease from 3-28-63 Reserved in Fee Disposal
	College of Osteopathic Medicine & Surgery		1.01	Perm Use line Ease from 3-28-63 Reserved in Fee Disposal
	City of Des Moines		0.43	Perm water line Ease from 12-16-63 Reserved in fee disposal
	College of Osteopathic Medicine & Surgery		1.00	Perm Access Road Ease from 3-28-63 Reserved in fee Disposal

	ACREAGE FEE	ACREAGE EASE	TRANS	Transfer
Department of the Navy			0.66	Letter dtd 4-13-81 Completed by GO Form 1354 dtd 11-16-84
Department of the Navy			0.96	Use Permit No DACA45-9-85-00005 dtd 16 Oct 84

MAP



WA

FINAL

PROJECT MAP

DEPT. OF THE ARMY

USING SERVICE USARC

LOCATION OF PROJECT

STATE IOWA

COUNTY POLK & WARREN

DIVISION MISSOURI RIVER

DISTRICT OMAHA

ARMY AREA FIFTH

5 MILES S OF DES MOINES

MILES OF

TRANSPORTATION FACILITIES

RAILROADS R.I., MILW., C.G.W., C.B.N.W.

STATE ROADS 28

FEDERAL ROADS 65 & 69

AIR LINES UAL, TRANIFF, OZARK

ACQUISITION

TOTAL ACRES ACQUIRED: 640.66

FEE 640.66

PUBLIC DOMAIN (WITHDRAWAL / USE PERMIT)

USE PERMIT (OTHER THAN P.D.)

TRANSFER

LEASE

LESSER INTERESTS: EASE (12) NO AREA

EASEMENTS RESERVED IN FEE DISPOSAL 8.75

DISPOSAL

TOTAL ACRES DISPOSED OF: 555.48

SOLD

PUBLIC DOMAIN: (WITHDRAWAL / USE PERMIT)

USE PERMIT (OTHER THAN P.D.)

TRANSFERRED: TO DEPT OF NAVY 4.50

LEASES TERMINATED

LESSER INTERESTS TERM.

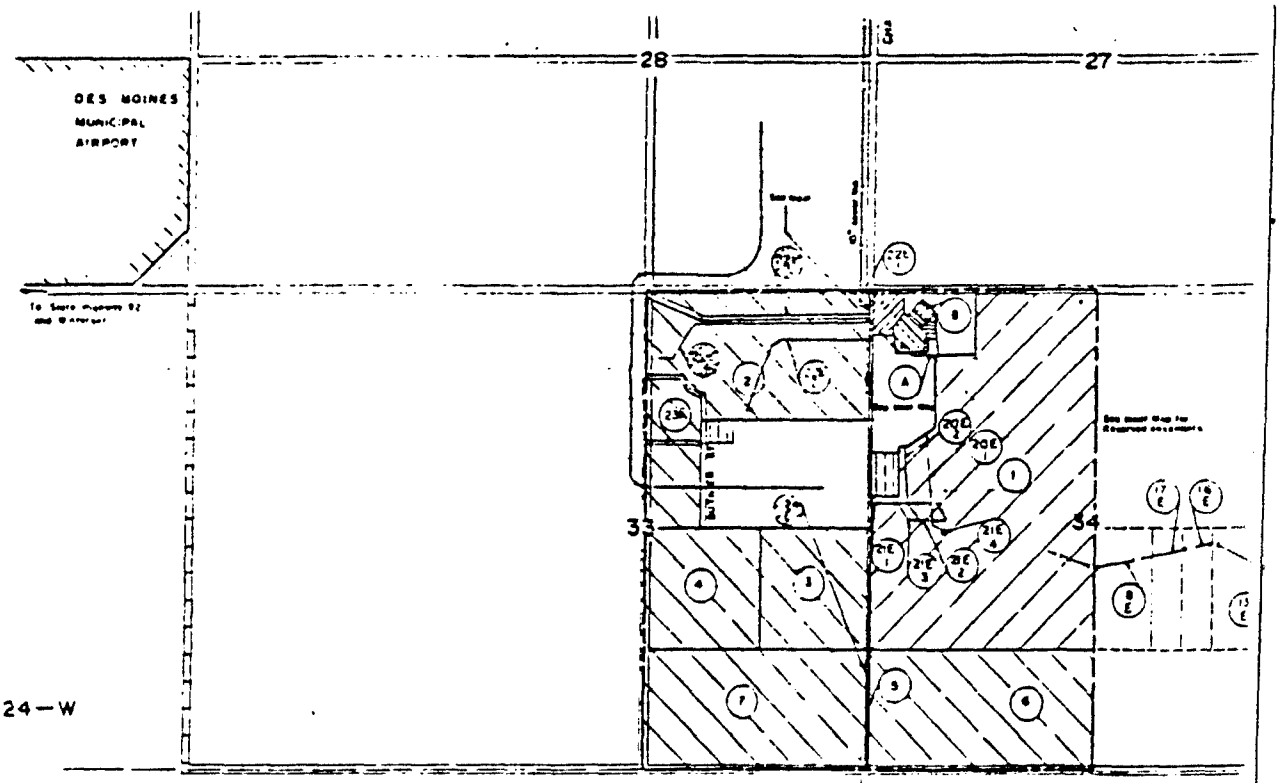
REASSIGNED

TO GSA ACRES FEE 549.98

EASEMENT RESERVED IN FEE DISPOSAL 4.50

LEGEND

EXCEPT FOR THE SPECIAL SYMBOLS SHOWN BELOW.



490 .0 acres reported excess (Fm SPB-5 No WD1148) to War Assets Administration 6-30-47
99 70 acres withdrawn from excess (Fm SPB-5 No WD1148A) 9-8-47
3 9 . acres withdrawn from excess (WAA Fm 1005 No WD1148B) 12-17-47
.046 acre withdrawn from excess (WAA Fm 1005 No WD1148C) 5-12-48
209 73 acres reported excess (WAA Fm 1005 No WD1148D) to War Assets Administration 9-14-48
1 24 acres withdrawn from excess (WAA Fm 1005 No WD1148F) 11-24-48
1 24 acres reported excess (GSA Fm 30 No MRO-1) to General Services Administration 4-28-80.
0 23 acres withdrawn from excess (GSA Fm 30 No MRO-201 6-20-51
7 50 acres withdrawn from excess (GSA Fm 30 No MRO-221 5-15-52

1 27 acres transferred by GSA to Dept of Navy effective 1-19-56 for Naval Training Center.
3 58 acres transferred by GSA to Dept of Air Force on 6-18-56 for Air Reserve Center
678 Lio acres withdrawn from excess (Std Fm 118 No MRM 79A) 3-27-58

2 50 acres transferred by Dept of Army to Dept of Navy on 8-12-52 for Naval Training Center

1 50 acres transferred by Dept of Army to Dept of Navy on 4-11-63 for Parking Area

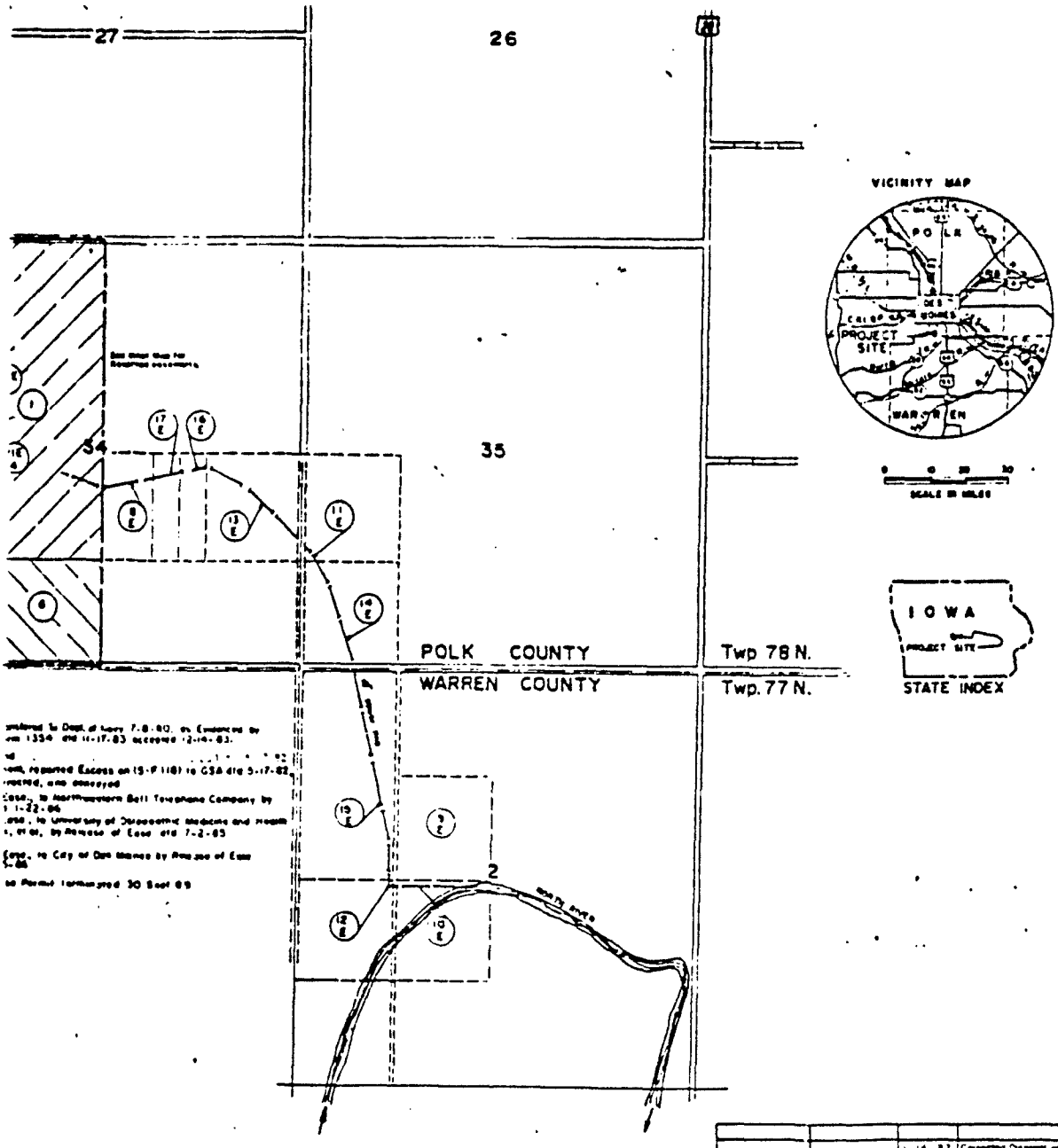
340 58 acres reported excess (Std Fm 118 as amended 1953) to GSA on 1-8-62 who disposed as follows
86 04 acres assigned to HEW 1-10-63 who conveyed to College of Osteopathic Medicine and Surgery by QC Deed dated 3-28-63, reserving to U S utility and sewer lines easements over 5.67 acres
11 02 acres assigned to HEW 2-20-63 who conveyed to Des Moines Independent Community School District by QC Deed dated 4-9-63
30 00 acres conveyed by GSA to Orville B Burris, Jr and Joe E Greenlee by QC Deed dated 7-11-63.
75 41 acres conveyed by GSA to Des Moines Independent Community School District by QC Deed dated 7-5-63
138 11 acres conveyed by GSA to City of Des Moines by QC Deed dated 12-16-63, reserving to U S. water line easement over 0 43 acre.

.98 00 Acres, Fee, reported excess (SF-118) to GSA dated 3-19-71. (See Disposal Discrepancy)
93 62 Acres, Fee conveyed by Dept HEW to City of Des Moines, Iowa, by QCD dated 11-6-72, reserving to the U S. two perm ug sewer ease over 0.64 acres of Tract 1
103 00 Acres, Fee, conveyed by Bureau of Outdoor Recreation to Polk County, Iowa Conservation Board by QCD dated 2 Oct 72, reserving to the U.S a perm elec dist ease over 0 47 acre, two perm ug sewer line ease over 0 53 acre, and a perm sewer lift station ease over .01 acre (all across Tract 1)

6 55 Acres, Fee, reported excess to GSA (SF-118) dated 1-8-75,
0 86 Acres, Fee, accountability accepted by GSA as evidenced by DD Form 1384 dated 8-19-76 accepted 8-24-76.
3 27 Acres, Fee, conveyed by Bureau of Outdoor Recreation [illegible] to Polk County Conservation Board by Deed without warranty dated 6-15-77
2 42 Acres Fee conveyed to HEW for the IA Department of Social Services by QCD dtd 12-14-79

0.50 Acres, Fee, transferred to Dept of Navy 7-8-80 as Exhibit DD Form 1354 and 11-17-83 accepted 12-16-83
1 00 Acres, Fee, and
4 50 Acres, Easement, reported Excess on 15-F 118) to GSA as corrected, and conveyed
1.01 Acres, Ease., to Northwestern Bell Telephone Co QCD dtd 1-22-86
2 49 Acres, Ease., to University of Osteopathic Medicine Services, et al, by Request of Ease dtd 7-2-85
1.00 Acres, Ease., to City of Des Moines by Request of and 3-5-86
0 98 Of an acre Use Permit terminated 30 Sept 85

11



		1-14-87	Corrected Disposal area of GSA to ... more accurate acreage
		8-29-84	Added Tract B
		8-3-79	Added Tract A
		5-6-75	Map revision from Drawing No. IOWA 4 and 11-15-4
MICROFILMED	DATE AUDIT APPROVED	DATE	REVISIONS

5

LEASE

LESSER INTERESTS: CASE (12) NO AREA

EASEMENTS RESERVED IN FEE DISPOSAL 8.75

DISPOSAL

TOTAL ACRES DISPOSED OF: 559.48

SOLD

PUBLIC DOMAIN.

USE PERMIT(OTHER THAN P.O.)

TRANSFERRED TO DEPT OF NAVY 4.50

LEASES TERMINATED

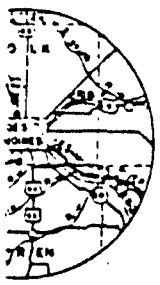
LESSER INTERESTS TERM.

REASSIGNED

TO GSA ACRES FEE 549.98

EASEMENT RESERVED IN FEE DISPOSAL 4.50

Y MAP



ALE IN MILES

O W A

ATE INDEX

LEGEND

EXCEPT FOR THE SPECIAL SYMBOLS SHOWN BELOW, MAP SYMBOLS ARE STANDARD IN ARMY MAP SERVICE TECHNICAL MANUAL NO 23.

RESERVATION LINE

RESERVATION LINE (Across Survey)

TRACT BOUNDARY LINE

TRACT NUMBER 1

CONTOUR LINE

DISPOSAL

EXTENDED OWNERSHIP LINE

RE-0 8237 dated 19 JULY 1979

Original Acquisition
Acquired Prior to 1 July 1940
Acres Fee 640.00
Ease (12) No Area

ACQUISITION AUTHORIZATION

Department of the Army
Office of the Omaha District Engineer
MISSOURI RIVER DIVISION

DRAWN BY W.A.S.
TRACED BY W.A.C.
CHECKED BY W.A.S.
SUBMITTED BY:

REAL ESTATE

FORT DES MOINES

MILITARY RESERVATION

RECOMMENDED BY:

APPROVED BY: Robert F. Willson DATE 5/26/50

OFFICE, CHIEF OF ENGINEERS, WASHINGTON 25, D.C.

AUDITED

INSTALLATION OR PROJECT NO 220

SHEET 1 OF 1 SHEETS NO 10WA-4

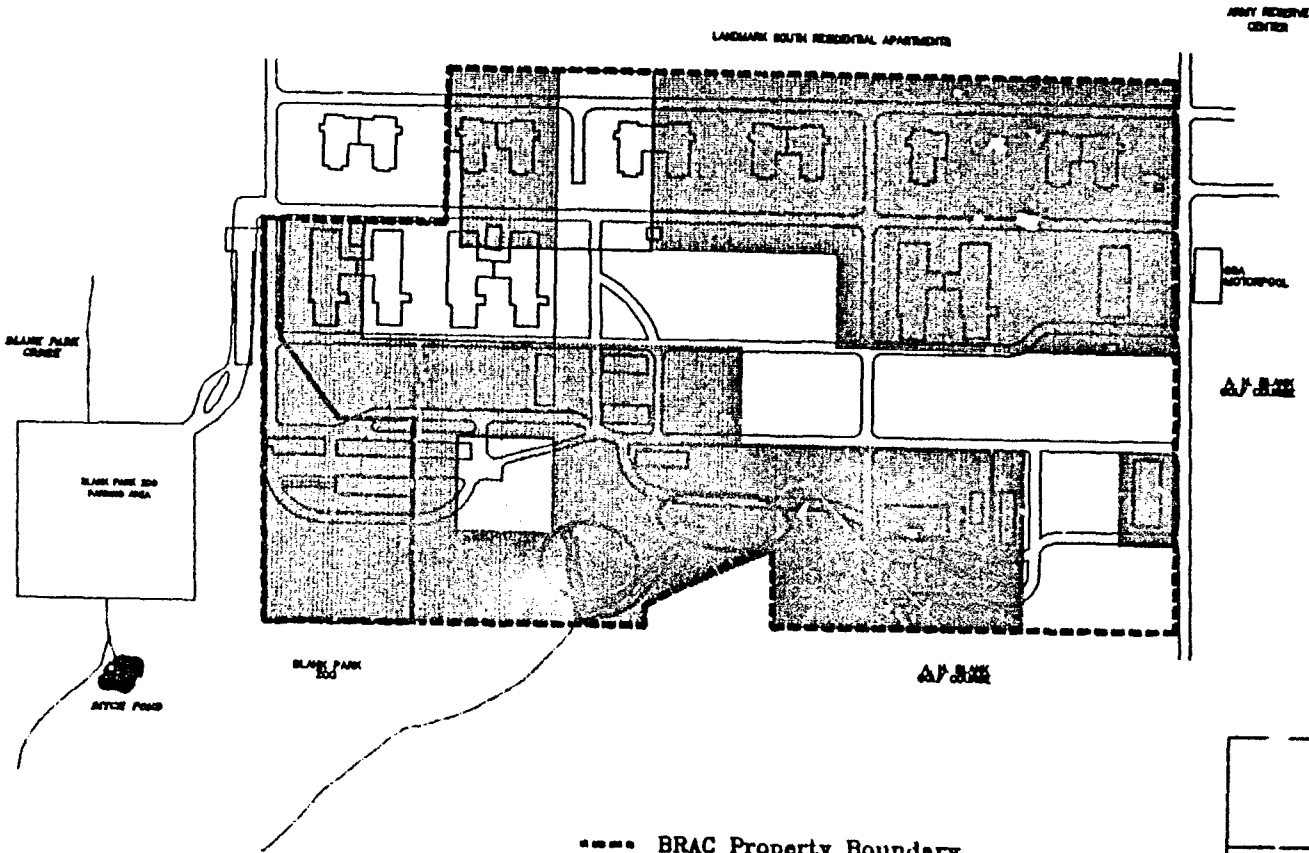
DATE	REVISIONS	BY
14-47	Corrected Disposal area of C.S.C. [illegible]	S.S.
19-48	Added Tract B	W.E.A.
3-79	Added Tract A	R.J.
6-79	Strip redrawn from Drawing No. 10WA-4 dtd 11-15-50	W.A.C.

F-1 10WA-111

6

FIGURE 5-3
SUMMARY CERFA MAP, FORT DES MOINES, IOWA

REVISION	DATE
0	12/15/93
1	04/14/94



Source: CERFA Investigation, April 1994

The Earth Technology Corporation

1430 K STREET SUITE 600, ALEXANDRIA, VIRGINIA 22314

FIGURE 5-3
SUMMARY CERFA MAP
FORT DES MOINES
DES MOINES, IOWA

DRAWN BY: MTM, JGC	DESIGNED BY: N/A	
CHECKED BY: KR	APPROVED BY: BY	DATE: 04/14/94
TET PROJECT NUMBER: 931977-05	DRAWING NUMBER: SHEET 1 OF 1	REV. NO. 1

APPENDIX A

REFERENCE LIST FOR FORT DES MOINES, IOWA

APPENDIX A
REFERENCE LIST FOR FORT DES MOINES, IOWA

Document	Date	Source
1. Potential Hazardous Waste Site Preliminary Assessment, U.S. Environmental Protection Agency, Region V	December 10, 1984	USEPA
2. Archives Search Report of Fort Des Moines, Polk County, Iowa, Report No. A024, Environmental Science and Engineering, Inc.	May 1985	USAEC
3. Enhanced Preliminary Assessment Report Fort Des Moines, Des Moines, Iowa	December 1989	USAEC
4. Preliminary Assessment, Fort Des Moines, U.S. Environmental Protection Agency Region VII	December 10, 1984	USEPA Region VII
5. Final Environmental Assessment, Partial Closure of Fort Des Moines, Iowa, Department of the Army Corps of Engineers Omaha District	April 1991	USAEC
6. Sampling Design Plan/Safety Plan, Remedial Investigation, Fort Des Moines, Dames and Moore	December 15, 1986	USEPA Region VII
7. Pesticide Monitoring Study No. 17-44-0986-85, Evaluation of Pesticide Contamination of Building 138, Fort Des Moines, Iowa	April 1984	USEPA Region VII
8. Historic Archeological Study, Fort Des Moines III, Des Moines, Polk County, Iowa DACA45-90-C-0129	1992	USAEC
9. Building Maintenance Plan, Fort Des Moines No. 3, Des Moines, Polk County, Iowa, Four Mile Research Company	1991	USAEC
10. National Register of Historic Places Inventory - Nomination Form Prepared by the Afro-American Bicentennial Corporation	December 1973	USAEC
11. Memorandum of Agreement between the U.S. Army, Advisory Council on Historic Preservation, and the Iowa State Historic Preservation Officer	1986	USAEC
12. U.S. Army Environmental Hygiene Agency Records Pertaining to Radioactive Materials at Community Environmental Response Facilitation Act Installations	March 25, 1994	USAEC
13. Installation Assessment Army Base Closure Program, U.S. Environmental Protection Agency (Aerial Photographs)	June 1990	USAEC
14. Real Estate Transfer Register		USAEC
15. Real Estate Tract Map		USAEC
16. Draft Final Environmental Investigation/Risk Assessment/Alternatives Analysis Report	July 1993	USAEC
17. Community Environmental Response Facilitation Act Site Visit	November 4, 1993	TETC
18. Personnel Interviews	Various	Various
19. Notification of Emergency Permit Authorization, U.S. Environmental Protection Agency Region VII to Mr. Gary Bianchid, Fort Des Moines	July 29, 1993	USEPA Region VII

APPENDIX A
REFERENCE LIST AT FORT DES MOINES, IOWA

Continued

Document	Date	Source
20. Telephone Conversation Record, Pat Frey WSTM/Resource Conservation and Recovery Act/Iowa regarding increased waste volume, Fort Des Moines Emergency Permit	August 4, 1993	USEPA Region VII
21. Resource Conservation and Recovery Information System Handler Module Data Entry Form for Emergency Permit, Fort Des Moines	August 9, 1993	USEPA Region VII
22. Provisional ID Number Request Questionnaire, Fort Des Moines	July 28, 1993	USEPA Region VII
23. U.S. Environmental Protection Agency Alternative Remedial Contracting Strategy, Regions VI, VII, and VIII, Summary Report, Fort Des Moines Base Closure, Jacobs Engineering Group	December 1992	USEPA Region VII
24. Base Realignment and Closure Progress Review, Fort Des Moines	March 24, 1993	USEPA Region VII
25. Preliminary Assessment Reassessment Results and Comments, Fort Des Moines, Ecology and Environment, Inc.	May 20, 1988	USEPA Region VII
26. Environmental Risk Information and Imaging Services Report, Fort Des Moines	August 20, 1993	TETC

Key: USAEC = U.S. Army Environmental Center
USEPA = U.S. Environmental Protection Agency
TETC = The Earth Technology Corporation

APPENDIX B

ERIIS DATA BASE SEARCH REPORT

ENVIRONMENTAL RISK INFORMATION & IMAGING SERVICES REPORT

PERTAINING TO:

FORT DES MOINES
DES MOINES, IA

ON BEHALF OF:

THE EARTH TECHNOLOGY CORP.
1420 KING ST., STE. 600
ALEXANDRIA, VA 22314

PREPARED ON:

August 20, 1993

ERIIS REPORT NUMBER:

23675

ERIIS DISCLAIMER

The information contained in this report has been obtained from publicly available sources and other secondary sources of information produced by entities other than Environmental Risk Information & Imaging Services (ERIIS). Although great care has been taken by ERIIS in compiling and checking the information contained in this report to insure that it is current and accurate, ERIIS disclaims any and all liability for any errors, omissions, or inaccuracies in such information and data, whether attributable to inadvertence or otherwise, and for any consequences arising therefrom. The data provided hereunder neither purports to be nor constitutes legal or medical advice. It is further understood that ERIIS MAKES NO REPRESENTATIONS OR WARRANTIES OF ANY KIND, INCLUDING, BUT NOT LIMITED TO, THE WARRANTIES OF FITNESS FOR A PARTICULAR PURPOSE OF MERCHANTABILITY, NOR ANY SUCH REPRESENTATIONS OR WARRANTIES TO BE IMPLIED WITH RESPECT TO THE DATA FURNISHED, AND ERIIS ASSUMES NO RESPONSIBILITY WITH RESPECT TO CUSTOMER'S, ITS EMPLOYEES', CLIENTS', OR CUSTOMERS' USE THEREOF. ERIIS SHALL NOT BE LIABLE FOR ANY SPECIAL, CONSEQUENTIAL, OR EXEMPLARY DAMAGES RESULTING, IN WHOLE OR IN PART, FROM CUSTOMER'S USE OF THE DATA. Liability on the part of the Environmental Risk Information & Imaging Services (ERIIS) is limited to the monetary value paid for this report. The report is valid only for the geographical parameters specified on the cover page of this report, and any alteration or deviation from this description will require a new report. This report does not constitute a legal opinion.

ENVIRONMENTAL RISK INFORMATION & IMAGING SERVICES

RADIUS REPORT

REPORT NUMBER: 28675

STATE: IA
LATITUDE: 41.519413
LONGITUDE: -93.615771
ZIP CODES SEARCHED: 50211 50321 50315 50320

DATABASE	RADIUS (MILES)	RADIUS REPORTED SITES					NOT RADIUS REPORTED		TOTAL SITES
		Property	Property-1/16	1/16-1/2	1/2-1	>1	ZIP CODE	CITY/COUNTY	
NPL	1.500	NO	0	0	0	0	0	0	0
CERCLIS	1.500	NO	0	0	1	0	2	0	3
TRI	1.500	NO	0	0	0	0	0	0	0
RCRIS_TS	1.500	NO	0	0	0	0	0	0	0
RCRIS_LG	1.500	NO	0	0	0	0	0	0	0
RCRIS_SG	1.500	NO	0	1	8	10	9	0	28
DOCKET	1.500	NO	0	0	0	0	0	0	0
NS	1.500	NO	0	0	0	0	2	6	8
DS	1.500	NO	0	1	14	15	26	0	56
NUCLEAR		NR	NR	NR	NR	NR	0	0	0
OPENDUMP		NR	NR	NR	NR	NR	0	0	0
UST	1.500	NO	0	0	14	12	33	8	67
SWF		NR	NR	NR	NR	NR	0	13	13
			0	2	37	37	72	27	175

STATE DATA IN PAPER FORMAT: LUST

Selection of PROPERTY records requires an accurate street address in the ERIIS job order.

ZIP CODE and CITY/COUNTY sites are not radius reportable due to insufficient and/or inaccurate addresses reported by federal/state agency. These sites are reported within the study site zip code(s) and/or city/county and may be within the study site radius. These sites require further investigation to accurately assess proximity to the study site.

Blank radius count indicates that the database was not searched by this radius per client instructions.

0 in a radius or zip code count indicates that the database cannot be reported by this search criteria due to insufficient and/or inaccurate addresses reported by a federal/state agency.

State data in paper format is sorted using the most specific secondary search criteria available (zip code, city, or county).

ERIIS Report Overview

The ERIIS Report consists of five (5) basic sections:

- Digital Custom Plotted Map
- Database Records
- Statistical Profile
- Sanborn Fire Insurance Map(s)
- Topographical Map

Digital Custom Map

Each site-specific Digital Custom Map is plotted using U.S. Census TIGER Files. The cross in the center of the map represents the study site. The red circle represents the study radius, usually one mile. Reported federal/state hazardous waste and toxic chemical sites are plotted on the map and are easily distinguished by different symbols.

Statistical Profile

The Statistical Profile is an at-a-glance numeric summary of the data included in the ERIIS Report.

Database Records

This section presents detailed federal and state database information for each site within the study radius. Sites are easily located on the digital map by using the number in the MAP ID column of the report.

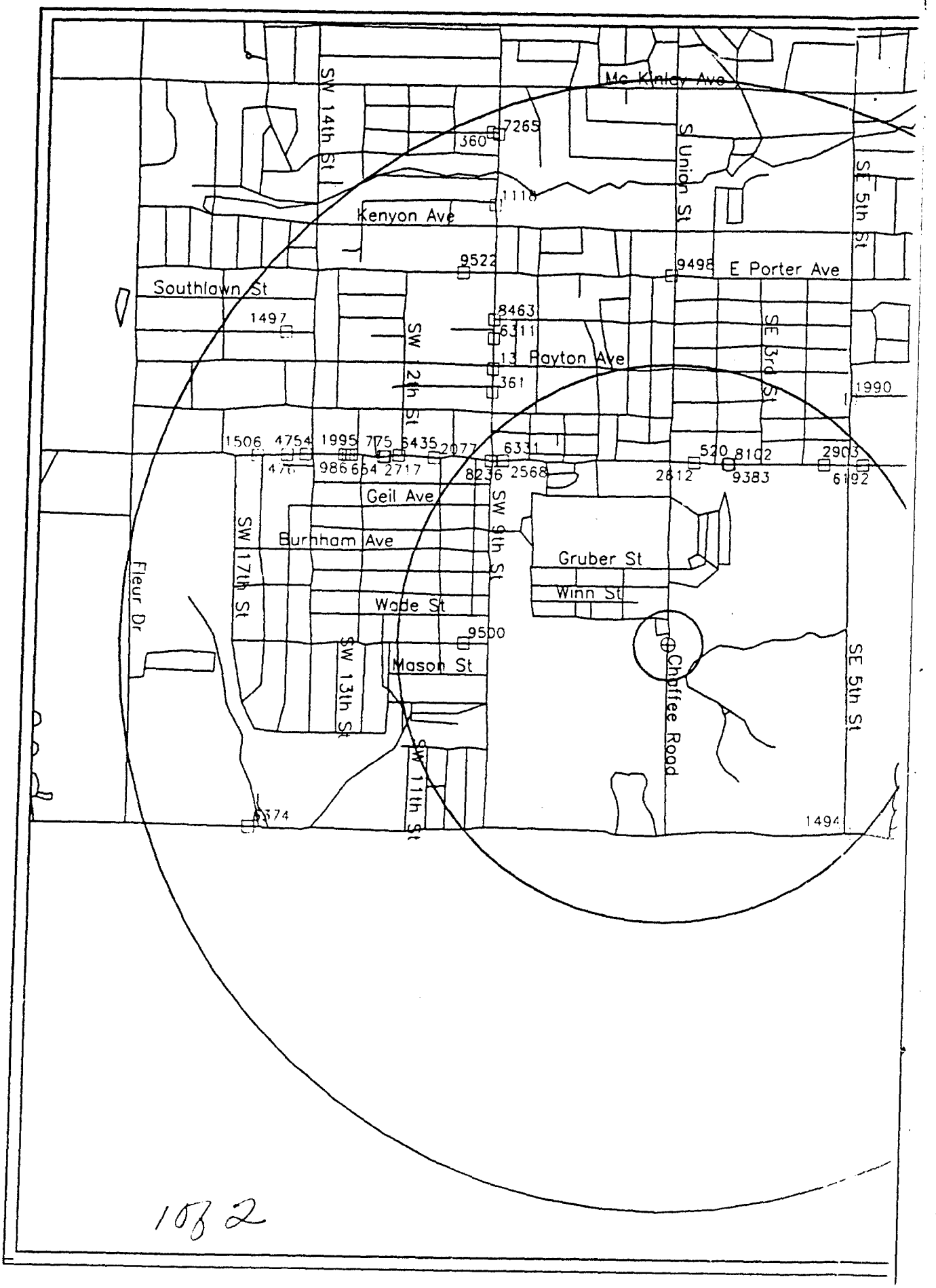
Note: Many of the sites reported in federal/state databases cannot be plotted due to inaccurate or incomplete addresses (e.g., PO Box number, street name with no number). Still, they are potentially within the study radius. ERIIS reports these sites using progressively broader search criteria to ensure that all potentially relevant hazardous sites are included. All zip codes within and intersected by the study radius are searched, as well as records that simply report the relevant city or county. Where applicable, federal and state database information is further subdivided.

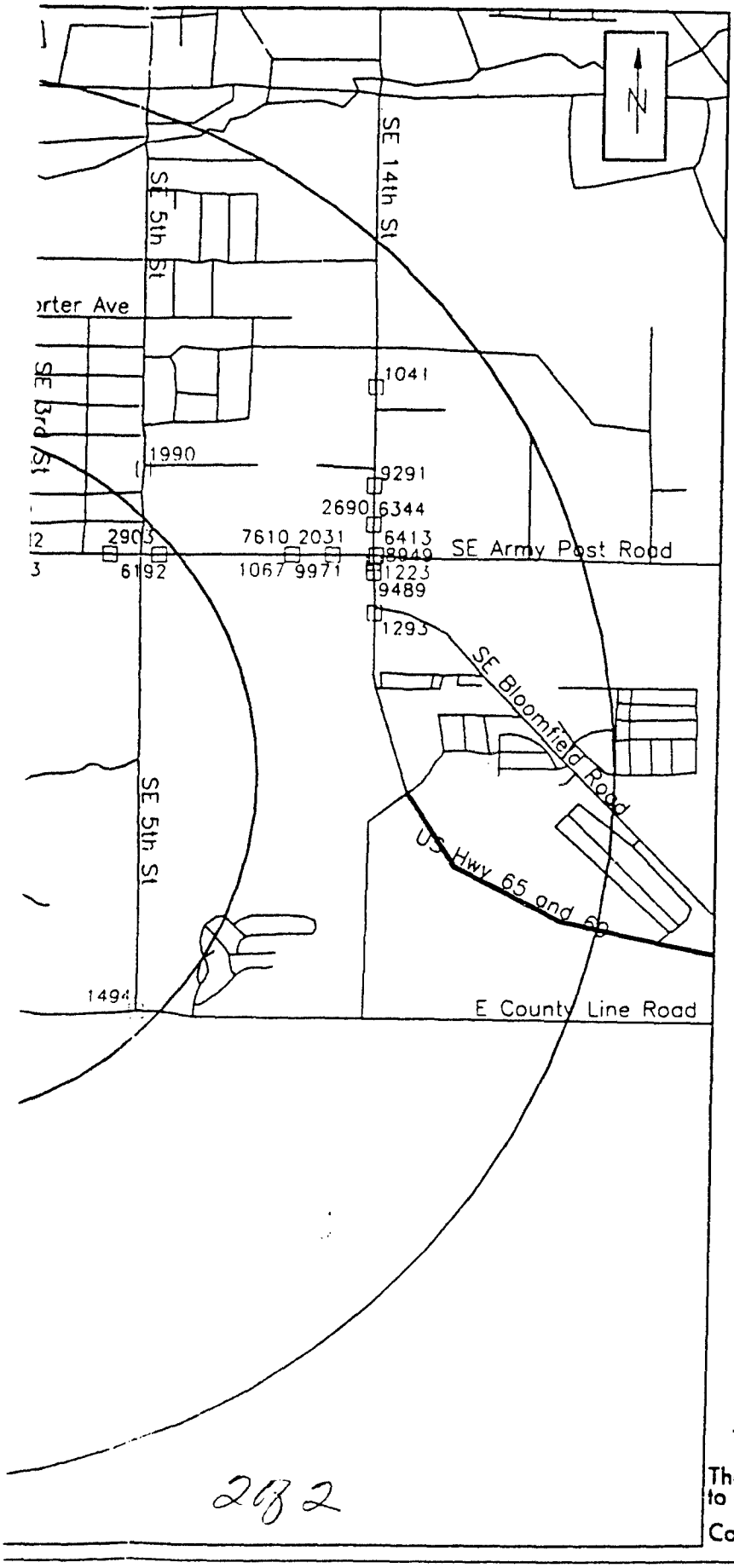
Sanborn Fire Insurance Maps

ERIIS has assembled a collection of Historical Sanborn Fire Insurance Maps covering 14,000 cities and towns. In some cases, however, the ERIIS Report will include a notice that no maps were found. This notice should serve as evidence of due diligence.

Topographic Map

ERIIS provides a topographic map with each report which accurately depicts the natural and man-made features of the land. The shape and elevation of the terrain are represented by contour lines and specific features, such as roads, towns, and vegetation, are portrayed by map symbols and colors. Standard topographic maps are produced at a 1:24,000 scale, or one inch represents 2000 feet.


Mc Kinley Ave
SW 14th St
7265
360
S Union St
SE 5th St
1118
Kenyon Ave
9522
9498
E Porter Ave
Southlawn St
1497
8463
6311
SW 12th St
13 Payton Ave
361
SE 3rd St
1990
1506
4754
1995
775
5435
2077
6331
520
8102
2903
986
664
2717
8236
2568
2612
9383
6192
Geil Ave
SW 17th St
Burnham Ave
SW 9th St
Gruber St
Fleur Dr
Winn St
Wade St
9500
SW 13th St
Mason St
Chiffee Road
SE 5th St
SW 11th St
1494
1052



ERIIS

1421 Prince Street, Ste 330
Alexandria, VA 22314
(703)836-0402 (800)989-0402
FAX: (703)836-0468

SITE INFORMATION

Fort Des Moines
Des Moines, IA
Polk County
Job Number: 28675
Map Plotted: Aug 19, 1993

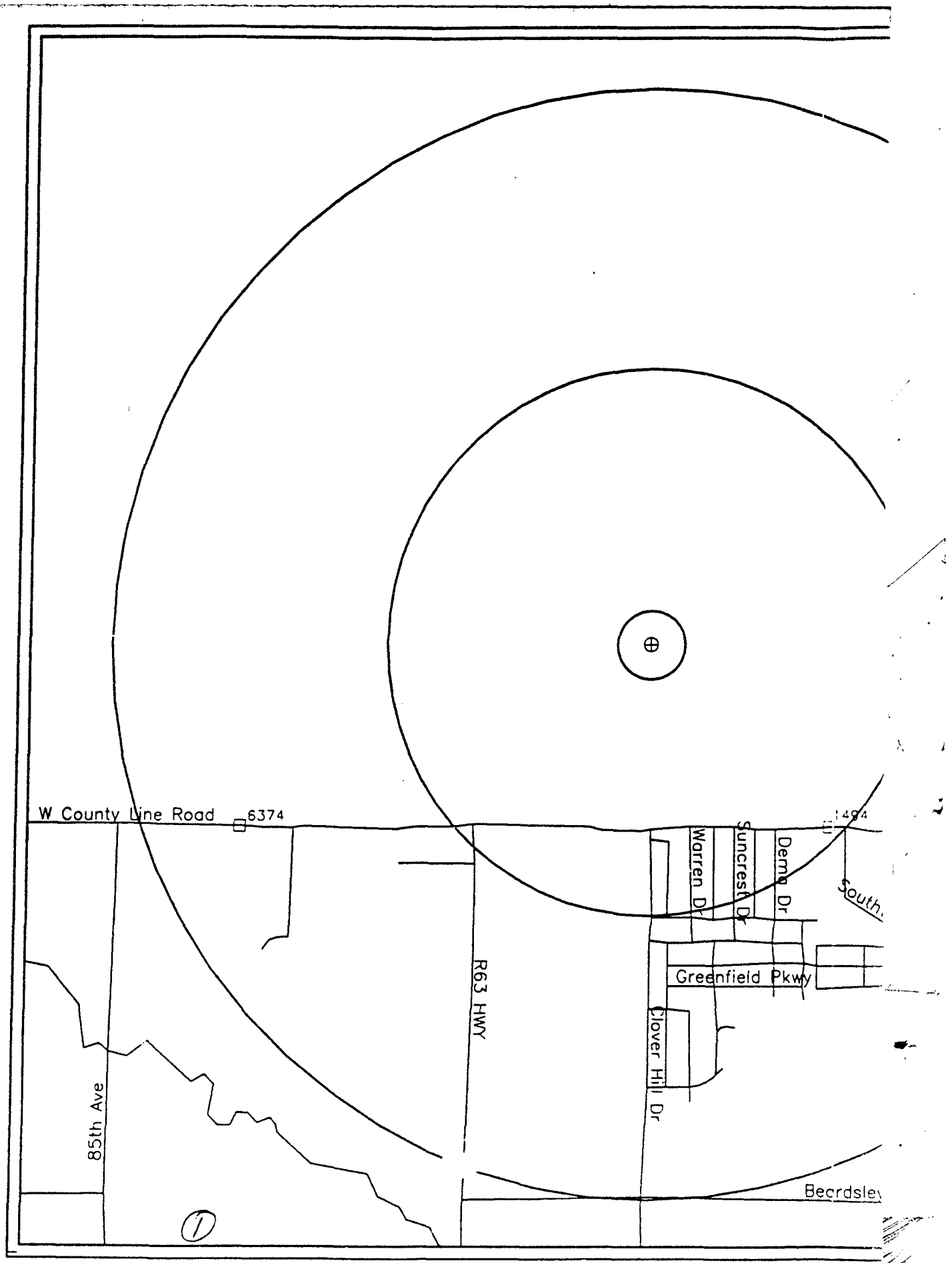
MAP LEGEND

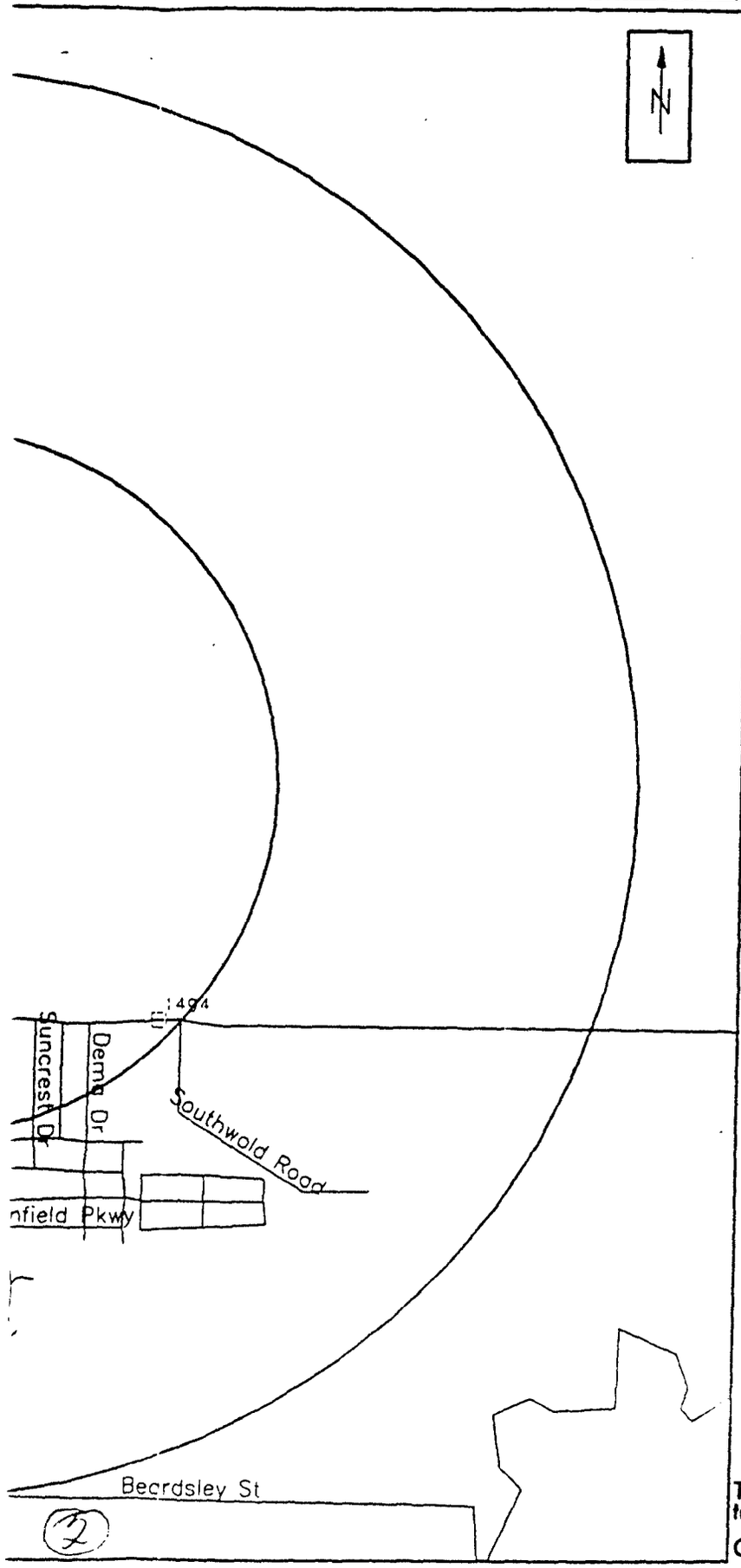
- Hydrography
- Railroads
- Roads
- Highways
- CERCLIS 1 Site(s)
- NPL 0 Site(s)
- RCRIS_LG 0 Site(s)
- RCRIS_SG 19 Site(s)
- RCRIS_TS 0 Site(s)
- TRI 0 Site(s)
- UST 26 Site(s)

Miles

0 0.25 0.5

282


W County Line Road
6374
1494
Warren Dr
Suncrest Dr
Dema Dr
South
Greenfield Pkwy
R63 HWY
Clover Hill Dr
85th Ave
Beardsley
1



ERIIS

1421 Prince Street, Ste 330
Alexandria, VA 22314
(703)836-0402 (800)989-0402
FAX: (703)836-0468

SITE INFORMATION

Fort Des Moines
Des Moines, IA
Warren County
Job Number: 28675
Map Plotted: Aug 19, 1993

MAP LEGEND

- Hydrography
- Railroads
- Roads
- Highways
- CERCLIS 1 Site(s)
- NPL 0 Site(s)
- RCRIS_LG 0 Site(s)
- RCRIS_SG 19 Site(s)
- RCRIS_TS 0 Site(s)
- TRI 0 Site(s)
- UST 26 Site(s)

Miles

0 0.25 0.5

APPENDIX C

REGULATORY COMMENTS TO DRAFT FORT DES MOINES CERFA REPORT

Fort Des Moines
CON 12-15

17

STATE OF IOWA

TERRY E. BRANSTAD, GOVERNOR

DEPARTMENT OF NATURAL RESOURCES
LARRY J. WILSON, DIRECTOR

February 3, 1994

Paul E. Wojciechowski
Lieutenant Colonel, U.S. Army
Acting Chief, Base Closure
Department of the Army
U.S. Army Environmental Center
APG, Maryland 21010-5401

Dear Lieutenant Colonel Wojciechowski:

The Iowa Department of Natural Resources has reviewed the report titled "Community Environmental Facilitation Act (CERFA) Report, Fort Des Moines, Des Moines, Iowa", dated December 15, 1994. There are several technical and non-technical errors in the report which need to be corrected prior to the draft final report. The report might have been better prepared if the information sources were confined to the document titled "Draft Final Project Technical Report, Environmental Investigation, Risk Assessment, and Alternatives Analysis (EI/RA/AA), Fort Des Moines, Des Moines, Iowa", dated December 1, 1993, and supplemented with the information obtained during the site inspection by your consultants, The Earth Technology Corporation (TETC). The EI/RA/AA draft final report is quite comprehensive and is the most current source information available for the site. The EI/RA/AA report has been reviewed by the State of Iowa and the U.S. Environmental Protection Agency.

Mike Gaborek of the U.S. Army Environmental Center, has reviewed the CERFA report and sent a copy of his comments to us. We agree with his comments and these should be incorporated into the CERFA report. We are also sending additional comments that need to be addressed. These specific comments are presented separately. This letter addresses the conclusions reached in the CERFA Report.

The CERFA report demarcates Fort Des Moines into three categories:

1. CERFA Parcel, defined as "a portion of the installation real property for which investigation reveals no evidence of storage for one year, release, or disposal of CERCLA hazardous substances, petroleum derivatives and no evidence of being threatened by migration of such contamination. CERFA Parcel also includes any portion of the installation which once contained non-CERCLA hazards such as asbestos, unexploded ordnance (UXO), lead-based paint, and radionuclides, but since been remediated".

2. CERFA Parcel with Qualifier(s), defined as "a portion of

the installation real property for which there is no evidence of CERCLA-hazardous substance, petroleum, or petroleum derivative storage for one year, release, or disposal or threatened by such contamination. This parcel does, however, contain non-CERCLA related hazards including the presence of asbestos, radon, UXO, lead-based paint, radionuclides, or stored (not in use) PCB-containing equipment".

3. CERFA Disqualified Parcel, defined as "a portion of the installation real property for which there is evidence of CERCLA hazardous substance, petroleum, or petroleum derivative storage for one year, ...or storage sites of chemical ordnance".

CERFA Parcel (Category 1) could conceivably be transferred to the State of Iowa in their present condition for unrestricted use. CERFA Parcel with Qualifier(s) (Category 2) contains areas "with non-CERCLA" related environmental or safety circumstances" that would limit or preclude the transfer of this property for unrestricted use. CERFA Disqualified Parcels cannot be transferred prior to remediation. We believe that all the buildings included in the CERFA Disqualified Parcel are appropriate. However, because of high lead content in the lead-based paint within the buildings, we have reservations about the inclusion of Buildings 75 and 117 in the CERFA Parcel . The site EI/RA/AA report dated December 1, 1993, showed lead concentrations in paint as 64,000 ug/g, and 50,000 ug/g for Buildings 75, 117, respectively. These lead levels are above the 5,000 ug/g level guidelines by the Department of Housing and Urban Development. Moreover the U.S Army Environmental Center, based on a site visit and inspection report prepared by TETC, concluded in its CERFA report that the lead-based paint in the installation buildings was in "poor" condition. Since these buildings have not been remediated and lead-based paint is not a CERCLA hazardous substance, the buildings should be categorized as CERFA Parcel with Qualifiers(s). Secondly, Buildings 75, 117, and 133 could have asbestos-containing materials (ACM) in poor conditions. Most of the buildings at the site have ACM in poor to fair condition or have a high hazard potential (Table 3-11, Vol 1 of 4 of the EI/RA/AA report). There are no asbestos data for Buildings 117 and 133. The data on Building 75 indicated the asbestos material is in a fair physical condition. ACM is also a non-CERCLA hazardous substance. The presence of ACM in poor to fair condition would further disqualify the buildings as CERFA Parcel.

Based on the information available to us from the site assessment report at Fort Des Moines, the Iowa Department of Natural Resources would like a modification of the report according to the above comments. We believe that no building at the site qualifies to be a CERFA Parcel at this time. However, the open spaces between some buildings could qualify as CERFA Parcel if it has been demonstrated that no release or hazardous waste disposal has

occurred.

If you have any comments you may contact Lavoy Haage (Supervisor, Solid Waste Section) at 515-281-4968 or Lambert A. Nnadi (Site Manager) at 515-281-4117.

Sincerely yours,

Lambert A. Nnadi

Lambert A. Nnadi
Environmental Specialist. Solid Waste Section, EPD/IDNR

CC: Steve Gunsen, Division of Environmental Health, City of Des Moines, 602 E 1st Street, Des Moines, Iowa 50307
David Crosson, Administrator and State Historical Preservation Officer, Capitol Complex, Des Moines, Iowa 50319
Diana Newman, U.S. Environmental Protection Agency, Region 7, 726 Minnesota Avenue, Kansas City, KS 66101
Mike Gaborek, U.S. Army Environmental Center, APG-EA, MD 21010-5401

ENC.

STATE OF IOWA
TERRY E. BRANSTAD, GOVERNOR
DEPARTMENT OF NATURAL RESOURCES
LARRY J. WILSON, DIRECTOR

February 3, 1994

Specific Comments on the Report Titled "Community Environmental Response Facilitation Act (CERFA) Report, Fort Des Moines, Des Moines, Iowa"

1. Pg. 2-4, Asbestos, l. 2-5. Rephrase the sentence "In particular .....Buildings 307 and 309, respectively.

2. Pg. 2-5, Installation Assessment, Army Base Program, l. 1. Watch syntax. Sentence should read "No evidence.....was noted...."

3. Pg. 2-6, Draft Final Environmental Investigation.....Alternatives Analysis" l. 4 - 5. Rephrase the sentence "Several areas.....population existed".

4. Pg. 2-9, Visual Inspections, l. 22. Be more specific as to the buildings that were inspected. List them.

5. Pg. 2-9, Lead-based Paint, l. 3. "Paint in poor condition....". How was the "poor" condition determined? Peel off of the paint, discoloration, etc? Please specify.

6. Pg. 2-10, Table 2-2. A greater effort should be made to obtain the information on "Dates of Employment" (4th column) or else the column should be deleted from the table. Also, the heading for the column might better read "Period of Involvement".

7. Pg.2-11, UXO. Since Buildings 58 and 81 do not represent UXO areas, why discuss them here. It will be sufficient to mention that there are no UXO areas as defined in CERFA.

8. Pg. 2-11, Radionuclides, l.2. How was the "current condition" of the x-ray equipment determined? Were they tested? If so, state who did the test and how it was conducted.

9. Pg. 4-2, Table 4-1. We made a random check of the coordinates for the buildings identified in the Table 4-1. The coordinates in the table do not match those in Figure 5-1. For instance the coordinates for Building 138 is given as (11,6). From Figure 5-1, we determined the coordinates to be (5,5). Also, the coordinates of Building 58 and 81 are given as (11,6), but these buildings are in very different

WALLACE STATE OFFICE BUILDING / DES MOINES, IOWA 50319 / 515-281-5145 / TDD 515-242-5967 / FAX 515-281-8895

locations.

Mike Gaborek's review has already pointed out some names that were wrongly spelled in Table 2-2 . Please note "Dianna" should be "Diana".

10. Pg. 4-3, Building 138, Second paragraph, first sentence. Clarify or rephrase the sentence.

11. Page. 4-11, Water Distribution System, The last paragraph under this section discusses the results of lead concentration in the water system in Buildings 64 and 117. Include a statement that Building 117 was in use up to EI period.

12. Pg. 4-13, Fuel Storage Tanks, Second sentence. Check syntax and punctuation. Sentence should read: Approximately 3 cubic yards of all contaminated soil, associated with former waste oil UST at Building 117, were excavated.....1993. With regard to the closure certification of the USTs, information availalble at the Underground Storage Tank Section indicates that the Iowa Department of Natural Resources is awaiting a report from the installation's consultants handling the tank removal.

13. Pg. 4-13, Adjacent and Surrounding Properties, last paragraph, line 2. No need for the comma after the word "property".

14. Pg. 4-14, Existing or Potential Pathways of Contamination Migration, Second paragraph. The second sentence states that groundwater flow is from the northwest. This is wrong and in disagreement with your statement on page 1-7. The flow direction is from the northeast to the southwest.

15. Pg. 4-15, Army Reserve Center. Your report states that the Army Reserve Center is northwest of the installation; the direction should be northeast.

Former Installation Landfill, Second sentence. Check your syntax.

16. Pg. 4-16, Polychlorinated Biphenyls, third sentence. Rephrase this sentence.

17. Pg. 4-17, Remediation Efforts, first paragraph. Check syntax in the sentence that begins with "Approximately 3 cubic.....". Also refer to comment #12 above on Clean Closure Certification.

18. Tables and Figures. Information in Tables should be checked for accuracy. Figures 5-1 and 5-3 should be amended to reflect the state's views on building and open designations.

U.S. Army Environmental Center
Response to Regulatory Comments
Fort Des Moines CERFA Report

Clayton T. Kim
14 April 1994

Comment from State of Iowa, Department of Natural Resources letter dated February 3, 1994

General Comments: All Text from the February 3, 1994 letter applies to this comment and will not be retyped. A copy of the letter is enclosed. An excerpt of this letter follows:

"The Iowa Department of Natural Resources has reviewed the report titled" Community Environmental Facilitation Act (CERFA) Report..... Based on the information available to us from the site assessment report, the Iowa DNR would like a modification of the report according to the above comments. We believe that no building at the site qualifies to be a CERFA Parcel at this time. However, the open spaces between some buildings could qualify as CERFA parcel if it has been demonstrated that no release or hazardous waste disposal has concurred."

Army Response:

In light of the information provided the Army's CERFA contractor has been instructed to reevaluate how buildings at Fort Des Moines were designated for the purposes of CERFA. Although the Army concurs that the open spaces between buildings could qualify as CERFA Parcels, if such spaces are adjacent to buildings containing asbestos, lead-based paint, or other safety concerns, such areas have been designated as CERFA Parcels with Qualifier(s). The Army has adopted the position that the presence of lead-based paint applied to buildings, asbestos contained within building material, and other safety concerns will not by themselves "disqualify" a parcel from being designated "uncontaminated" under CERFA. The Army has, however, recognized that the presence of these substances should be noted in the CERFA report and has created a special classification for such parcels entitled CERFA Parcel with Qualifier.

The Army's use of a one-acre grid system was adopted in order to facilitate the use of a Geographic Information System (GIS), and because it was felt that a one-acre grid was best suited for reuse planning purposes. If, during the seven step investigation mandated by CERFA, it was determined there had been a release, disposal, or storage for more than one year of a CERFA contaminant, then the entire one-acre grid was disqualified from being characterized as "uncontaminated." This conservative approach resulted in many areas being disqualified as

uncontaminated, even though they would have otherwise qualified as CERFA Parcels. It is important to note, however, that neither the characterization of a parcel nor the one-acre grid system necessarily drives or restricts reuse or transfer decisions regarding Fort Des Moines. For example, parcels upon which petroleum has been stored for one year or more may, in the absence of any release, be transferred without remediation under CERCLA, even though they must be characterized pursuant to CERFA as CERFA Disqualified Parcels. Therefore, the transferability of parcels identified in the CERFA report must be assessed on a case-by-case basis, based on what "disqualified" the parcel from being characterized as a "CERFA Parcel."

The Army is willing to discuss this issue in more detail with the State of Iowa, if necessary.

Following Responses are for specific regulatory comments on the CERFA Report:

1. Pg 2-4, Asbestos, 1. 2-5 Rephrase the sentence " In particular..... Buildings 307 and 309, respectively.

Army Response: Concur. The report will be changed as requested.

2. Pg. 2-5, Installation Assessment, Army Base Program, 1.1. Watch syntax. Sentence should read "no evidence..... was noted....

Army Response: Concur. The report will be changed as requested.

3. Pg. 2-6, Draft Environmental Investigation.... Alternatives Analysis"1.4-5 Repnrase the sentence "Several areas..... population existed".

Army Responses: Concur. The report will be changed as requested.

4. Pg. 2-9, Visual Inspection, 1.22.
Be more specific as to the buildings that were inspected, list them.

Army Response: Concur. The report will be changed as requested. Interviews, and list of each building visited for this CERFA investigation of suspected contaminants are to be narrated in sequence, or table-listed.

5. Pg. 2-9, Lead base paint, 1.3.
"Paint in poor condition..." How was the "poor" condition determined? Peel off of the paint, discoloration, etc? specify.

Army Response: Concur. The report will be modified to specify more descriptive paint condition.

6. Pg. 2-10, Table 2-2.
A greater effort should be made to obtain the information on "Dates of Employment" (4th Column) or else the column should be deleted from the table. Also, the heading for the column might better read "Period of Involvement."

Army Response: Concur. The report will be modified to delete this column.

7. Pg. 2-11, UXO.
Since buildings 58 and 81 do not represent UXO areas, why discuss them here. It will be sufficient to mention that there are no UXO areas as defined in CERFA.

Army Response: Concur. The report will be modified to address the UXO in a separate heading.

8. Pg. 2-11, Radionuclides, 1.2.
How was the "the current condition" of X-ray equipment determined? were they tested? If so, state who did the test and how it was conducted.

Army Response: Concur. This issue is to be treated in the same manner as the above UXO statements. The report will be modified to address Radionuclides in a separate heading.

9. Pg. 4-2, Table 4-1. We made a random check of the coordinates for the buildings identified in the Table 4-1. The coordinates in the table do not match those in figure 5-1. For instance the coordinates for building 138 are given as (11,6). From Figure 5-1, we determined the coordinates to be (5,5). Also, the coordinates of Building 58 and 81 are given as (11,6), but these buildings are in very different locations. Please note "Dianna" should be "Diana."

Army Responses: Concur. The report will be changed as required, and verify all other coordinates as well.

10. Pg. 4-3, Building 138, second paragraph, first sentence. Clarify or rephrase the sentence.

Army Response: Concur. The report will be modified.

11. Pg. 4-11, Water Distribution System. The last paragraph under this section discusses the results of lead concentration in the water system in Buildings 64 and 117. Include a statement that Building 117 was in use up to EI period.

Army Response: Concur. The report will be modified to include a statement.

12. Pg. 4-13, Fuel Storage Tanks, second sentence. Check syntax and punctuation. Sentence should read: Approximately 3 cubic yards of all contaminated soil, associated with former waste oil UST at Building 117, were excavated.... 1993. With regard to the closure certification of the USTs, information available at the Underground Storage Tank Section indicates that the Iowa Department of Natural resources is awaiting a report from the installation's consultants handling the tank removal.

Army Response: Concur. The Report will be changed as requested.

13. Pg 4-13, Adjacent and Surrounding Properties, last paragraph, Line 2. No need for the comma after the word "property."

Army Response: Concur. The report will be modified as required.

14. Pg. 4-14, Existing or Potential pathways of contamination Migration, second paragraph. The second sentence states that groundwater flow is from the northwest. This is wrong and in disagreement with your statement on page 1-7. The flow direction is from the northeast to the southwest.

Army Response: Concur. The report will be modified as required.

15. Pg. 4-15, Army Reserve Center. Your report states that the Army Reserve Center is northwest of the installation; the direction should be northeast.
Former Installation Landfill, second sentence. Check your syntax.

Army Response: Concur. The report will be changed as required.

16. Pg. 4-16, Polychorinated Bipheynls, third sentence. Rephrase this sentence.

Army Response: Concur. The report will be modified as required.

17. Pg. 4-17, Remediation Efforts, first paragraph. Check syntax in the sentence that begins with "approximately 3 cubic ....." Also refer comment #12 above on Clean Closure certification.

Army Response: Concur. The report will be modified as required.

18. Tables and Figures. Information in Tables should be checked for accuracy. Figure 5-1 and 5-3 should be amended to reflect the State's views on buildings and open designations.

Army Responses: Nonconcur. Information in Tables will be checked for accuracy, and accordingly the report will be modified. However, the figure 5-1 and 5-3 will not be amended for reasons identified in general comment responses above.

APPENDIX D

DETAILED DATA BASE, FORT DES MOINES

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FORT DES MOINES
CERFA CATEGORY MATRIX

LOCATION	CERFA PARCEL WITH QUALIFIERS CATEGORIES						CERFA DISQUALIFIED CATEGORIES			
	ASBESTOS	LEAD	RADON	RADIO-NUCLIDES	UNEXPLODED ORDNANCE	PCBs STORAGE	PETROLEUM RELEASE	PETROLEUM STORAGE	HAZARDOUS SUBSTANCE RELEASE	HAZARDOUS SUBSTANCE STORAGE
Building 117		Y					Y	Y	Y	Y
Building 119								Y		
Building 122	Y	Y						Y		
Building 123	Y							P		P
Building 126	Y	Y					Y	P	Y	P
Building 127		Y						Y		
Building 133			P					Y		Y
Building 135	Y	Y								
Building 137	Y	Y								
Building 138	P	P	P			Y		Y	Y	Y
Building 139	Y	Y						Y		Y
Building 307							Y		Y	
Building 308		Y								
Building 309	Y	Y				Y		Y		Y
Building 55	Y	Y							Y	Y
Building 56	Y	Y								
Building 58	Y	Y							Y	
Building 59	Y	Y								P
Building 60		Y								
Building 61		Y								Y
Building 62	Y	Y								
Building 63	Y	Y	Y	P						Y
Building 68	Y								Y	Y
Building 69		Y								
Building 70	Y									
Building 71		Y								
Building 72		Y	Y							

LOCATION	CERFA PARCEL WITH QUALIFIERS CATEGORIES						CERFA DISQUALIFIED CATEGORIES			
	ASBESTOS	LEAD	RADON	RADIO-NUCLIDES	UNEXPLODED ORDNANCE	PCBs STORAGE	PETROLEUM RELEASE	PETROLEUM STORAGE	HAZARDOUS SUBSTANCE RELEASE	HAZARDOUS SUBSTANCE STORAGE
Building 73	Y	Y								
Building 75		Y								
Building 81		Y							Y	
Building 83	Y							Y		P
Building 84		Y						Y		Y
Building 86	Y							Y		P
Pesticide contamination area							Y		Y	
Intermittent streams									Y	
Unrestricted disposal area 1									Y	
Unrestricted disposal area 2							Y		Y	

STATUS=Y - SUBSTANCE PRESENT
STATUS=P - POSSIBLE SUBSTANCE PRESENT

Records printed: 37

ASBESTOS-CONTAINING MATERIAL

LOCATION	STATUS	LOCATION COMMENTS	REMEDIATION OR MITIGATION	APPENDIX A REFERENCE(S)
Building 122	Y			16
Building 123	Y			16
Building 126	Y			16
Building 135	Y			16
Building 137	Y			16
Building 138	P			16
Building 139	Y			16
Building 309	Y			16
Building 55	Y			16
Building 56	Y			16
Building 58	Y			16
Building 59	Y			16
Building 62	Y			16
Building 63	Y			16
Building 68	Y			16
Building 70	Y			16
Building 73	Y			16
Building 83	Y			16
Building 86	Y			16

STATUS=Y - ASBESTOS CONTAINING MATERIAL PRESENT
STATUS=P- POSSIBLE ASBESTOS CONTAINING MATERIAL PRESENT

Records printed: 19

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LEAD-BASED PAINT

LOCATION	STATUS	LOCATION COMMENTS	YEAR BUILT	REMEDIATION OR MITIGATION	APPENDIX A REFERENCE(S)
Building 117	Y		1942		4, 16
Building 122	Y		1907		4, 16
Building 126	Y		1907		4, 16
Building 127	Y		1910		4, 16
Building 135	Y		1904		4, 16
Building 137	Y		1905		4, 16
Building 138	P		1908		17
Building 139	Y		1937		4, 16
Building 308	Y		1942		4, 16
Building 309	Y		1942		4, 16
Building 55	Y		1903		4, 16
Building 56	Y		1903		4, 16
Building 58	Y		1904		4, 16
Building 59	Y		1904		4, 16
Building 60	Y		1904		4, 16
Building 61	Y		1904		4, 16
Building 62	Y		1904		4, 16
Building 63	Y		1905		4, 16
Building 69	Y		1905		4, 16
Building 71	Y		1905		4, 16
Building 72	Y		1905		4, 16
Building 73	Y		1905		4, 16
Building 75	Y		1904		4, 16
Building 81	Y		1904		4, 16
Building 84	Y		1958		4, 16

STATUS=Y - LEAD-BASED PAINT PRESENT
STATUS=P - POSSIBLE LEAD-BASED PAINT PRESENT

Records printed: 25

RADON

LOCATION	STATUS	LOCATION COMMENTS	SUBSTANCE	DATE START	DATE END	APPENDIX A REFERENCE(S)
Building 133	P					16, 17
Building 138	P					16, 17
Building 63	Y	measurements by alpha track canisters	Average concentration = 5.4 pCi/L			16
Building 72	Y	measurements by alpha track canisters	Average concentration = 7.8 pCi/L			16

STATUS=Y - SUBSTANCE PRESENT
STATUS=P - POSSIBLE SUBSTANCE PRESENT

Records printed: 4

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RADIONUCLIDES

LOCATION	STATUS	LOCATION COMMENTS	TYPE	SUBSTANCE	DATE STARTED	DATE INACTIVATED	APPENDIX A REFERENCE	REMEDIATION OR MITIGATION
Building 63	P	830th Hospital	Xray equip	Residual radioactivity			17	

STATUS=Y - SUBSTANCE PRESENT
STATUS=P - POSSIBLE SUBSTANCE PRESENT

Records printed: 1

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PCBs STORAGE

LOCATION	STATUS	LOCATION COMMENTS	TYPE	SUBSTANCE	QUANTITY	DATE START	DATE INACTIVATED	APPENDIX A REFERENCE(S)	REMEDIATION OR MITIGATION
Building 138	Y	Transformer storage	Transformers	PCBs	140		1982	2, 4, 16	
Building 309	Y	Transformer storage	Transformers	PCBs	9			2, 4, 16, 17	No transformers during CERFA visit
Building 309	Y	PCB waste storage	Drums	PCBs	110 gal	1991		16, 17	Active - Drums properly labelled

STATUS=Y - SUBSTANCE PRESENT
STATUS=P - POSSIBLE SUBSTANCE PRESENT

Records printed: 3

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PETROLEUM RELEASE

LOCATION	STATUS	LOCATION COMMENTS	TYPE	SUBSTANCE	QUANTITY	DATE RELEASE	APPENDIX A REFERENCE(S)	REMEDIATION OR MITIGATION
Building 117	Y	Waste Oil Dump Site	Soil	Waste Oil			4	Soil excavation/removal
Building 117	Y	Tank 117 Releases	Soil	TPH		8/92	4, 16, 17	Soil excavation/removal
Building 126	Y	Maintenance Shop Releases	Soil	TPH			16	
Building 307	Y	PCB Transformer-Oil Spill	Groundwater/Soil	Oil			4, 16	
Pesticide contamination area	Y	Pesticide Contamination Area	Groundwater	TPH			2, 4, 16	
Unrestricted Disposal area 2	Y		Soil	TPH			2, 4, 16	Contaminated material excavation/removal

STATUS=Y - SUBSTANCE PRESENT
STATUS=P - POSSIBLE SUBSTANCE PRESENT

Records printed: 6

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PETROLEUM STORAGE

LOCATION	STATUS	LOCATION COMMENTS	TYPE	SUBSTANCE	QUANTITY	DATE INACTIVATED	APPENDIX A REFERENCE(S)	REMEDIATION OR MITIGATION
Building 117	Y	Tank 117	UST	Waste Oil	500 gal	8/92	2, 4, 16	Removed 8/92, soil removed 10/93, awaiting IA Clean Close Cert.
Building 117	Y	RNU Shop 63	Drums	Various POL Products	20 gal		2, 4, 16, 17	Former CCC Motor Pool, POL Storage volume larger at this time
Building 119	Y	Former Oil Station	Drums (P)	Various POL Products			2, 4	Activity discontinued, date undetermined, bldg demolished
Building 122	Y	Tank 122	UST	Gasoline	10000 gal		2, 4, 16	Non-presence verified through EI Magnetrometer & GPR Surv
Building 123	P	Former Machine Shop	Drums (P)	Various POL Products			2, 4	No longer in operation
Building 126	P	Former Maintenance Shop	Drums (P)	Various POL Products			2, 4	No longer in operation
Building 127	Y	Tank 127.1	UST	Gasoline/Water	10000 gal		2, 4, 16	Inoperative
Building 127	Y	Tank 127.2	UST	Fuel Oil/Water	1500 gal		2, 4, 16	Inoperative
Building 133	Y	Gas Regulator House	Drums	Various POL Products	275 gal	~1992	4, 16	No longer in operation
Building 138	Y	CCC Maintenance Storage	Drums	Various POL Products		~1992	4	No longer in operation
Building 139	Y	Tank 139.1	UST	Diesel Fuel	1500 gal		2, 4, 16	Removed 9/90, closed clean, awaiting IA Clean Close Certificate
Building 139	Y	Tank 139.2	UST	Gasoline	1500 gal		2, 4, 16	Removed 9/90, closed clean, awaiting IA Clean Close Certificate
Building 139	Y	830th Hospital AR Storage	Cans	Various POL Products	60 gal		17	Active
Building 139	Y	Tank 139.3	AGT	POL Products (P)	~250 gal	1975	17	No longer in operation, tank located on concrete dock behind Bldg
Building 139	Y	Tank 139.4	AGT	POL Products (P)	~250 gal	1975	17	No longer in operation, tank located on concrete dock behind Bldg

LOCATION	STATUS	LOCATION COMMENTS	TYPE	SUBSTANCE	QUANTITY	DATE INACTIVATED	APPENDIX A REFERENCE(S)	REMEDIATION OR MITIGATION
Building 139	Y	Tank 139.5	AGT	POL Products (P)	~1000 gal	1975	17	No longer in operation, tank located on concrete dock behind Bldg
Building 139	Y	Tank 139.6	AGT	POL Products (P)	~500 gal	1975	17	No longer in operation, tank in grass behind Bldg
Building 139	Y	Tank 139.7	AGT	POL Products (P)	~500 gal	1975	17	No longer in operation, tank in grass behind Bldg
Building 309	Y	Facility Maintenance Storage Building	Drums	Various POL Products	350 gal		4, 16, 17	
Building 83	Y	Tank 83	UST	Fuel Oil	500 gal		2, 4, 16	Inoperative
Building 83	P	Former Vehicle Garage	Drums	Various POL Products			4	No longer in operation
Building 84	Y	Vehicle Maintenance Storage Bldg	Drums	Various POL Products		~1992	4, 16, 17	No longer in operation
Building 86	Y	Tank 86	UST	Fuel Oil	500 gal		2, 4, 16	Inoperative
Building 86	P	Former Motor Pool	Drums	Various POL Products	330 gal		2, 4, 17	Active - Currently misc. Army Reserve Storage, no major storage

STATUS=Y - SUBSTANCE PRESENT
STATUS=P - POSSIBLE SUBSTANCE PRESENT

Records printed: 24

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HAZARDOUS SUBSTANCE STORAGE

LOCATION	STATUS	LOCATION COMMENTS	TYPE	SUBSTANCE	QUANTITY	DATE START	DATE INACTIVATED	APPENDIX A REFERENCE(S)	REMEDIATION OR MITIGATION
Building 117	Y	RNU Shop 63	Drums	Paint, solvents	<20 gal			2, 4, 17	Active - Former CCC Motor Pool, volume larger in past
Building 123	P	Former Machine Shop	Drums (P)	Various hazardous materials				2, 4, 17	No longer in operation
Building 126	P	Former Maintenance Shop	Drums (P)	Various hazardous materials				2, 4, 16, 17	Used by USEPA for orphan storage in 1993
Building 133	Y	Gas Regulator House	Drums	Antifreeze, solvents	220 gal	1930s	~1992	2, 4, 17	No longer in operation
Building 138	Y	Pesticide Mixing Operations	Drums	Pesticides, herbicides, solvents		1950	1959	2, 4, 16, 17	No longer in operation
Building 139	Y	830th Hospital AR Storage	Cans	Paint, other various hazardous materials		~1991		2, 4, 17	Active
Building 309	Y	Facility Maintenance Storage Building	Drums	CFCs, solvents, other hazardous materials				4, 16, 17	Active
Building 55	Y	Former Hospital Ward		Unknown chemicals				3, 16	Active
Building 59	P	Photographic Lab	Cans (P)	Photographic chemicals				2	No longer in operation
Building 61	Y	Former Hospital Ward	Cans	TCE				16	
Building 63	P	Photographic Lab	Cans (P)	Photographic chemicals				2	No longer in operation
Building 63	Y	Hospital Supply Storage	Cans	Hazardous medical supplies	~50 gal			17	Most operations moved out o building
Building 68	Y	Former CCC temporary warehouse	Cans	TCE				16	
Building 83	P	Former Vehicle Garage	Drums	Various hazardous materials		~1940		2, 4	No longer in operation
Building 84	Y	Vehicle Maintenance Storage Bldg	Drums	Antifreeze, paint, other hazardous materials	700 gal	1958	~1992	2, 4, 16, 17	No longer in operation
Building 86	P	Former Motor Pool Building	Drums	Various hazardous materials				2, 4 17	Currently no hazardous materials storage

STATUS=Y - SUBSTANCE PRESENT
STATUS=P - POSSIBLE SUBSTANCE PRESENT

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HAZARDOUS SUBSTANCE RELEASE

LOCATION	STATUS	LOCATION COMMENTS	TYPE	SUBSTANCE	QUANTITY	DATE RELEASE	APPENDIX A REFERENCE(S)	REMEDIATION OR MITIGATION
Building 117	Y	Waste Oil Dump Site	Soil	Undetermined			4	Soil excavation/removal
Building 117	Y	Tank 117 Releases	Soil	Undetermined		8/92	16, 17	Soil excavation/removal
Building 126	Y	Maintenance Shop Release	Soil	Metals, PCB			16	
Building 138	Y	Pesticide Mixing Operations	Soil	Metals, pesticides		1950-1959	16	
Building 307	Y	Reported PCB Transformer-Oil Spill	Soil/Groundwater	Pesticides, SVOCs			16	Contaminated material excavation/removal
Building 55	Y	Non-Source Specific Release	Soil	Lead, pesticides, SVOCs			16	
Building 58	Y	Small Arms Firing Range	Surface	Metals			4, 16	
Building 68	Y	Non-Source Specific Release	Soil	Metals, pesticides			16	
Building 81	Y	Small Arms Firing Range	Surface	Metals			4, 16	
Pesticide contamination area	Y	Pesticide Contamination Area	Soil/Groundwater	Metals, PCE, pesticides, VOCs			16	
Intermittent streams	Y	Intermittent Streams	Sediment	Pesticides			16	
Unrestricted Disposal area 1	Y		Sed/Soil/SW	Lead, pesticides			4, 16	
Unrestricted Disposal area 2	Y		Soil	Lead, pesticides			4, 16	

STATUS=Y - SUBSTANCE PRESENT
STATUS=P - POSSIBLE SUBSTANCE PRESENT

Records printed: 13