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U.S. Army Environmental Center

Delivery Order No. 6
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DAAM01-94-D-0020

ENHANCED PRELIMINARY ASSESSMENT SCREENING
(ENVIRONMENTAL BASELINE SURVEY)

SECOND LAND TRANSFER TO U.S. DEPARTMENT OF AGRICULTURE

JOLIET ARMY AMMUNITION PLANT WILL COUNTY, ILLINOIS

Volume 1 of 2

Prepared for:

U.S. ARMY ENVIRONMENTAL CENTER
Aberdeen Proving Ground, Maryland 21010-5401

September 1997

PLEXUS scientific

AEC Form 45, 1 Feb 93 replaces THAMA Form 45 which is obsolete.

ENHANCED PRELIMINARY ASSESSMENT SCREENING
(Environmental Baseline Survey)
Second Land Transfer to
U.S. Department of Agriculture
Joliet Army Ammunition Plant
Will County, Illinois

Prepared for:

U.S. Army Environmental Center
Aberdeen Proving Ground, Maryland 21010-5401

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LIST OF ACRONYMS

ACM	Asbestos containing material
AEHA	Army Environmental Hygiene Agency (now CHPPM)
AFR	Acid fume recovery
AHERA	Asbestos Hazardous Emergency Response Act
AMCCOM	Armament Munitions and Chemical Command
AOP	Ammonia oxidation plant
ARAR	Applicable or relevant and appropriate requirements
AST	Aboveground storage tank
ASTM	American Society for Testing and Materials
BLU	Bomb live unit
C	Celsius
CBU	Cluster bomb unit
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
CFR	Code of Federal Regulations
cfs	Cubic feet per second
CHPPM	Center for Health Promotion and Preventive Medicine
DDESB	Department of Defense Explosive Safety Board
DMAS	Dimethylanaline sulfate
DNT	Dinitrotoluene
DOD	Department of Defense
DU	Depleted uranium
DWEL	Drinking water equivalent levels
EPIC	Environmental Photographic Interpretation Center
ERNS	Emergency Response Notification System
F	Fahrenheit
FEMA	Federal Emergency Management Agency
FFA	Federal Facility Agreement
FINDS	Facility Index System
FPMR	Federal Property Management Regulations
FS	Feasibility study
ft	Foot
g	Gram
GOCO	Government owned contractor operated
gal/d	Gallons per day
gal/m	Gallons per minute
HE	High explosive
HMX	High Melting Explosive (cyclotetramethylenetetranitramine)
HRS	Hazard ranking system
IAC	Illinois Administrative Code
IEPA	Illinois Environmental Protection Agency

I&M	Illinois & Michigan
IOC	Industrial Operations Command
IR	Installation Restoration
IRDMIS	Installation Restoration Data Management Information System
IRP	Installation restoration program
JOAAP	Joliet Army Ammunition Plant
JATA	Joliet Army Training Area
kg	Kilogram
l	liter
LAP	Load-assemble-pack
LQG	Large quantity generator
MCL	Maximum Contaminant Level
MFG	Manufacturing
mg	Milligram
µg	Micrograms
Mgal/d	Million gallons per day
mm	Millimeter
msl	Mean sea level
NAC	Nitric Acid Concentrator
NCP	National Contingency Plan
NEPA	National Environmental Policy Act
NESHAP	National Emissions Standards for Hazardous Air Pollutants
NHC	National Heritage Corridor
NPDES	National Pollution Discharge Elimination System
NPL	National Priorities List
NRC	Nuclear Regulatory Commission
NRDC	Natural Resources Defense Council
NS	Nitroxylenes
OSHA	Occupational Safety and Health Administration
OU	Operable unit
PAS	Preliminary Assessment Screening
PBX	Plastic bonded explosive
PCB	Polychlorinated biphenyl
pCi	Picocurries
ppm	Parts per million
PRG	Preliminary remediation goals
RAATS	RCRA Administrative Action Tracking System
RCRA	Resource Conservation and Recovery Act
RCRIS	Resource Conservation and Recovery Information System
RDX	Royal demolition explosive (hexahydro-1,3,5-trinitro-1,3,5-triazine)
RI	Remedial investigation
RME	Reasonable Maximum Exposure
RQ	Reportable quantity

RU	Remedial unit
SAR	Sulfuric acid regeneration
SARA	Superfund Amendments and Reauthorization Act
SMCL	Secondary Maximum Contaminant Level
SOC	Statement of conditions
SPCC	Spill control and countermeasures plan
SQG	Small quantity generator
STP	Sewage treatment plant
TCLP	Toxicity Characteristic Leaching Procedure
TETRYL	Trinitrophenylmethylnitramine
TNT	Trinitrotoluene
TPHC	Total Petroleum Hydrocarbon
TSCA	Toxic Substances Control Act
TSD	Treatment, Storage and Disposal
USACE	U.S. Army Corps of Engineers
USAEC	U.S. Army Environmental Center
USATHAMA	U.S. Army Toxic and Hazardous Materials Agency (now USAEC)
USC	United States Code
USDA	U.S. Department of Agriculture
USEPA	U.S. Environmental Protection Agency
USGS	U.S. Geological Survey
UST	Underground storage tank
UXO	Unexploded ordnance

EXECUTIVE SUMMARY

This report documents a Preliminary Assessment Screening (PAS) of the Joliet Army Ammunition Plant (JOAAP) initiated by the U.S. Army Environmental Center (USAEC). The PAS involved an evaluation of the existing facility and environmental conditions on remaining land identified for transfer to the U.S. Department of Agriculture (i.e., the "USDA2 parcel"). It is in compliance with Title 40 of the Code of Federal Regulations, Part 373, Section 1, and with U.S. Army Regulation 200–1, which require identification of the types of hazardous or toxic substances used, or stored in excess of one year, or disposed of or released on federal properties designated for transfer of ownership.

JOAAP is near the city of Wilmington, Will County, northeastern Illinois. The entire facility has been declared excess, and land transfer to future owners is directed by Public Law 104–106, Fiscal Year 1996 Department of Defense Authorization Act. The future owners and land uses include: USDA for establishment of a National Tallgrass Prairie; the Department of Veterans Affairs for a Veterans Cemetery; Will County for a landfill; and the State of Illinois for establishment of industrial parks (BILL01). Two industrial parks will be established, one in the Manufacturing (MFG) Area of the facility (Village of Elwood Industrial Park) and the other in the Load-Assemble-Pack (LAP) Area (City of Wilmington Industrial Park).

JOAAP operated as a government-owned, contractor operated military industrial installation and is currently considered excess. The facility, constructed in the 1940s, has two distinct operational areas divided by State Route 53: the explosives-manufacturing Area (MFG Area) west of Route 53, and encompassing approximately 14 square miles; the LAP Area east of Route 53, and comprising approximately 22 square miles. Operations in the MFG Area included production of trinitrotoluene (TNT), dinitrotoluene (DNT), trinitrophenylmethylnitramine (tetryl), lead azide, TNT demolition blocks, nitroxylenes, and explosive manufacturing process chemicals such as nitric and sulfuric acids, oleum, ammonium nitrate, and sellite (sodium sulfite). Production facilities were clustered in the northern half of the MFG Area, and an explosives storage facility was in the southern half.

The LAP Area contained facilities for the loading, assembling, and packaging of high-explosive artillery projectiles, aerial bombs, mines, and a variety of ammunition components. A variety of facilities operated in support of the principal activities at the two portions of the plant: motor pools, laundries, landfills, burn areas, hospitals, X-ray facilities, locomotive service areas, water treatment and distribution systems, and explosive storage areas, among others. Approximately 1500 buildings of either permanent or semipermanent construction remain standing on the facility.

A review of readily available records was conducted to identify documentation of potential environmental concerns relating to the excess parcel or to nearby properties whose condition could impact the excess parcel. The record search focused on review of files and records at USAEC, files in storage at JOAAP, and records contained at the National Archives in College Park, Maryland. Records, files, maps, and other documents reviewed are presented in the Bibliography (Section 6). State and federal environmental databases were also searched. It is assumed that all the documents obtained from government sources contain accurate information.

Several informal interviews of past and current JOAAP employees were conducted. These interviews concerned specific areas of interest identified from the site reconnaissance and records review. In addition, questionnaires were mailed to all current agricultural leaseholders (covering about 16,700 acres) in order to help identify any unusual conditions or potential environmental concerns.

A limited site reconnaissance involving a driving tour of the facility and its perimeter, and a random survey by vehicle and on foot through each section of the property, was conducted to field-verify information yielded by the document review and to identify potential environmental concerns. Within the USDA2 parcel, 136 buildings were visually inspected. These buildings were selected as a representative sample from groups of similar buildings.

Historical aerial photographs of JOAAP were reviewed by the USEPA Environmental Photographic Interpretation Center (EPIC) in 1986. Photographs from 1939 through 1979 were included in that review. This study identified areas of concern that became the IR study areas. The findings of the EPIC review were incorporated into the PAS.

An analysis of historical land use patterns was conducted to identify those uses that may have resulted in, or contributed to, environmental contamination or other environmental concerns. The analysis entailed informal interviews and a review of site plans, historical documents, and aerial photographs. Historical analysis revealed that a number of structures have been demolished. All available information on demolished buildings is included in Appendix D.

Environmental concerns at JOAAP were evaluated facility-wide, and findings were compiled into an electronic database. The information contained in the database for each study section and building is presented as profiles in Appendices B and C. The profile information is used to summarize the nature, magnitude, and extent of environmental contamination or concern, regarding use of the property considered for transfer.

A list of environmental concerns identified during the PAS, together with description of the potential for environmental contamination, is provided in Section 4. Further definition of these concerns is provided in Appendices B, C, and D.

1. INTRODUCTION

This report documents one of four Preliminary Assessment Screenings (PASs) of the Joliet Army Ammunition Plant (JOAAP) initiated by the U.S. Army Environmental Center (USAEC), Aberdeen Proving Ground, Maryland. The PAS involved an evaluation of existing facility and environmental conditions to determine and document whether hazardous or toxic substances were used, released, stored in excess of one year, or disposed of on land designated for transfer to the U.S. Department of Agriculture (USDA) for use as a tallgrass prairie. A portion of the tallgrass prairie property covered in the initial USDA PAS was has already been transferred to USDA. This report covers the remainder of the property designated for transfer to USDA and not covered in the initial USDA PAS (i.e., the "USDA2 parcel").

JOAAP is in Will County near the city of Wilmington, northeastern Illinois (Figure 1–1). The entire facility has been declared excess, and transfer of the land to other owners is directed by Public Law 104–106, Fiscal Year 1996 Department of Defense Authorization Act. The future owners and land uses include: USDA for establishment of a National Tallgrass Prairie; the Department of Veterans Affairs for a Veterans Cemetery; Will County for a landfill; and the State of Illinois for establishment of industrial parks (BILL01).

For each of the future owners' parcels, depicted in Figure 1-2, separate PAS reports were developed. Approximately 15,080 acres transferred to USDA in March 1997 were covered in an earlier PAS report. Portions of the USDA parcel not covered in the initial USDA PAS are addressed in this report. Property addressed in each report is shown in Figure 1–3.

Issues raised in this PAS and findings thereof, are discussed in Section 4 of this report. A summary of findings for the USDA2 parcel is presented in Section 5. Required actions and specific restrictions on future use will be presented in a separate Statement of Conditions (SOC). All boundaries and areas discussed or depicted in this report should be considered approximate as no land survey has been conducted.

This report is submitted by Plexus Scientific Corporation, 12501 Prosperity Drive, Suite 401, Silver Spring, Maryland 20904, under Contract DAAM01–94–D–0020 (Delivery Order 0006).

1.1 Purpose

The PAS for the USDA2 parcel was required for compliance with Title 40, Code of Federal Regulations, Part 373, Section 373.1 (40 CFR 373.1), and U.S. Army Regulation 200–1, *Environmental Protection and Enhancement.* The provisions of 40 CFR 373 require that a Notice accompany contracts of sale and deeds entered into for the transfer of federal property on which hazardous substances may have been stored, released or disposed of. The requirement is stipulated in the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). Section 120(h) of that Act requires a Notice on condition that certain hazardous substances have been stored for one year or more, and the quantities exceed (1) 1000 kilograms or the reportable quantity (RQ) for the substances as specified in 40 CFR 302.4, whichever is greater, or (2) one kilogram for acutely hazardous waste, as defined in 40 CFR 261.30. A Notice is also required if hazardous substances have been disposed of or released on the property in an amount greater than or equal to the RQ. Army Regulation 200–1 requires that a PAS address asbestos, lead-based paint, radon, and other substances, potentially hazardous to health.

1.2 Scope and Limitations

This PAS report presents such information as is available on the environmental conditions and concerns relative to the land, facilities, and real property assets of the USDA2 parcel at JOAAP. Its findings are based on a record search of several thousand documents, a thorough review of over 500 of these documents, and site reconnaissance of JOAAP conducted between 1995 and 1997. A complete title search was not conducted. Extensive environmental investigations and reports previously prepared for JOAAP, as well as site historical

documents, were reviewed during the PAS and in support of this report. Information obtained from other studies is reflected within this PAS by a coded reference. A complete list of references by code number is provided as Section 6 of this report. Discrepancies identified during document review were reconciled where possible.

Plexus contacted and interviewed many people familiar with JOAAP during development of the PAS. Contacts included: Tom Erdman, Art Holz, Bob Zerboglio and Nancy Yates—all of the JOAAP staff; Janet Beavers, USAEC Project Officer; Norman Demarais, former Plant Manager; Bernie Kavanaugh, former Uniroyal Environmental Coordinator; John Csikos, former Uniroyal supervisor for red water, tetryl, and TNT areas; Keith Corbin, former Uniroyal employee; Henry Miller, former Uniroyal employee; Tim McHale, Alliant Techsystems, Inc.; representatives of Dames & Moore and OHM Remediation Services Corporation, project managers for other environmental studies at JOAAP; and the Industrial Operations Command (IOC) historian.

Summaries of various ongoing environmental studies and investigations at JOAAP are presented in Sections 2.2.4 and 4.1.3.

1.3 Organization of the PAS Report

The remainder of this report expounds on the PAS setting, method, and findings. Section 2.0 provides a description of the JOAAP environment, an overview of plant operations and history, and a summary of previous environmental investigations. Section 3.0 describes the method used to conduct the PAS. Findings of the PAS organized by relevant environmental "issues" (e.g., contaminant, contamination matrix, plant operation) are elaborated in Section 4.0 and summarized in Section 5.0. The corresponding structures (i.e., Section 4.8 presents all of the findings relating to PCBs and Section 5.1.8 provides a brief summary of the significant findings) of these two sections will make it easier for the reader to obtain all available information on a particular issue and to determine its significance. A bibliography is provided in Section 6.0.

The appendices are arranged to allow the reader to determine the full range of environmental issues relating to a portion of JOAAP (Appendix B) or an individual building (Appendix C). Appendices B and C were generated from a database developed to manage site information. Additional information concerning the Installation Restoration Program (IRP) sites is presented in Appendix D. Appendix E contains a table intended for use in meeting CERCLA 120(h) Notice requirements. The following appendices are included in Volume II of this report:

- Appendix A: Questionnaire Sent to Agricultural Lessees
- Appendix B: Profiles of Study Sections
- Appendix C: Profiles of Buildings
- Appendix D: Profiles of IRP Sites
- Appendix E: Chemicals Known to Have Been Used, Stored, Disposed or Released

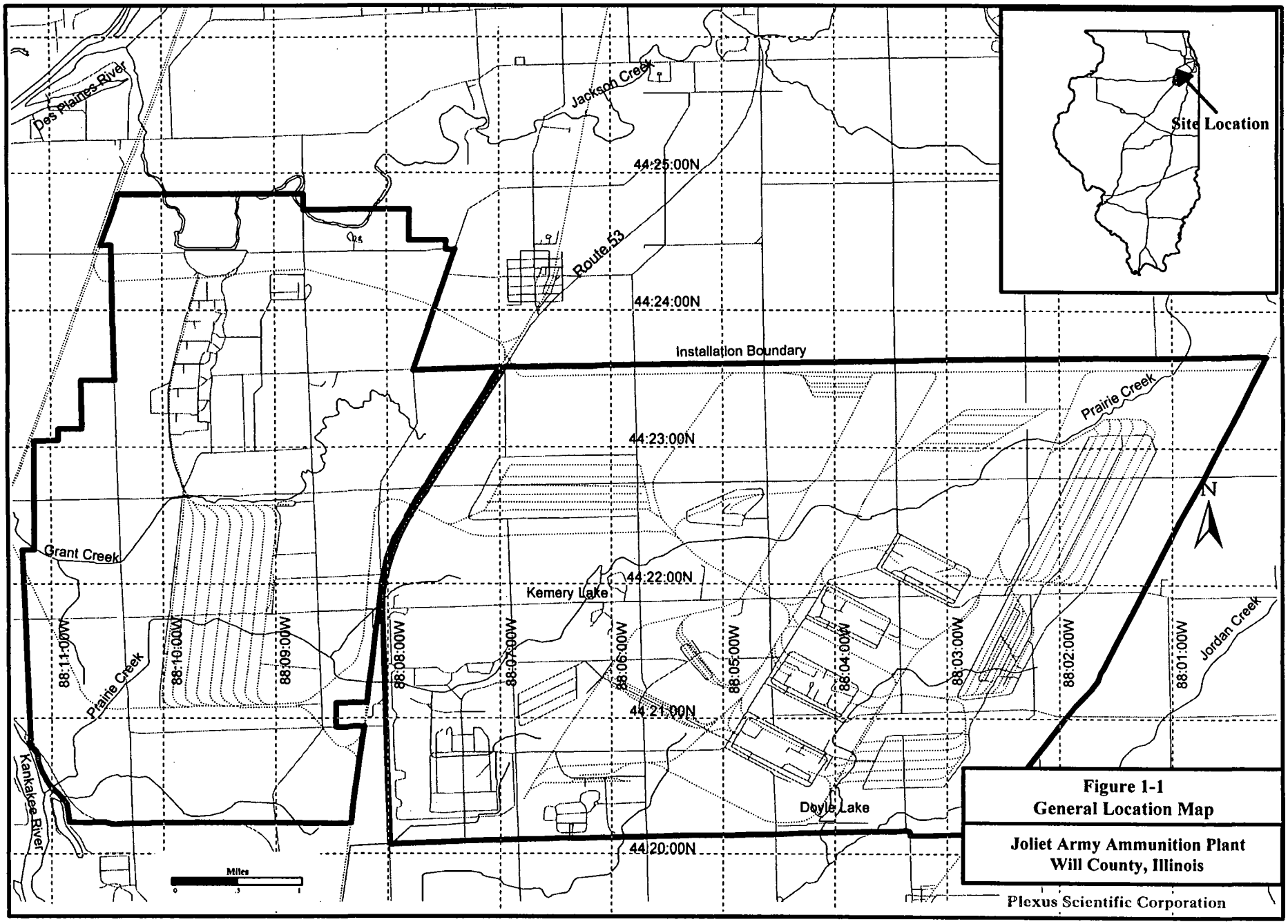

Figure 1-1
General Location Map

Joliet Army Ammunition Plant
Will County, Illinois

Plexus Scientific Corporation

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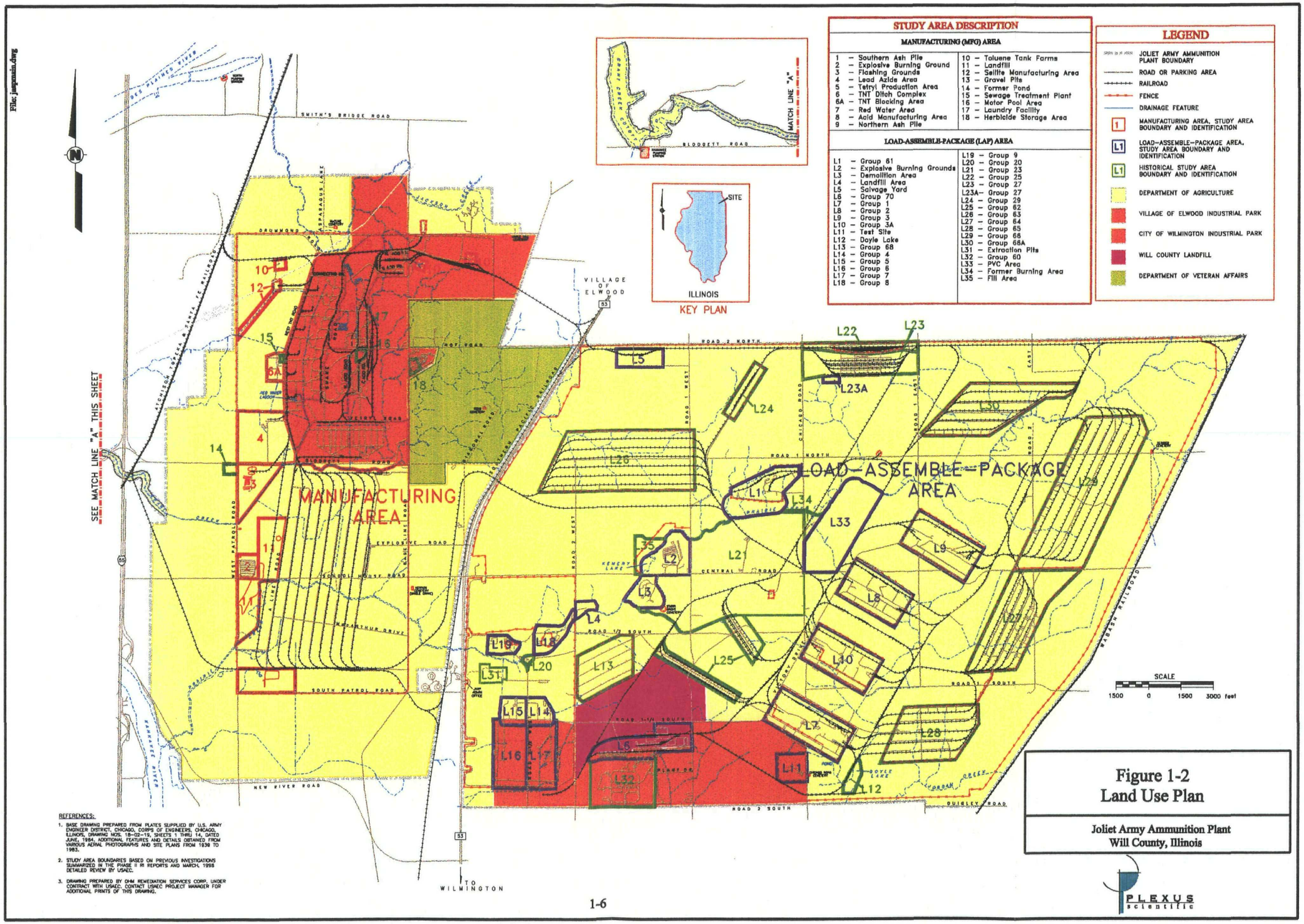

STUDY AREA DESCRIPTION

MANUFACTURING (MFG) AREA

1 – Southern Ash Pile	10 – Toluene Tank Farms
2 – Explosive Burning Ground	11 – Landfill
3 – Flashing Grounds	12 – Sellite Manufacturing Area
4 – Lead Azide Area	13 – Gravel Pits
5 – Tetryl Production Area	14 – Former Pond
6 – TNT Ditch Complex	15 – Sewage Treatment Plant
6A – TNT Blocking Area	16 – Motor Pool Area
7 – Red Water Area	17 – Laundry Facility
8 – Acid Manufacturing Area	18 – Herbicide Storage Area
9 – Northern Ash Pile	

LOAD-ASSEMBLE-PACKAGE (LAP) AREA

L1 – Group 61	L19 – Group 9
L2 – Explosive Burning Grounds	L20 – Group 20
L3 – Demolition Area	L21 – Group 23
L4 – Landfill Area	L22 – Group 25
L5 – Salvage Yard	L23 – Group 27
L6 – Group 70	L23A– Group 27
L7 – Group 1	L24 – Group 29
L8 – Group 2	L25 – Group 62
L9 – Group 3	L26 – Group 63
L10 – Group 3A	L27 – Group 64
L11 – Test Site	L28 – Group 65
L12 – Doyle Lake	L29 – Group 66
L13 – Group 68	L30 – Group 66A
L14 – Group 4	L31 – Extraction Pits
L15 – Group 5	L32 – Group 60
L16 – Group 6	L33 – PVC Area
L17 – Group 7	L34 – Former Burning Area
L18 – Group 8	L35 – Fill Area

LEGEND

- JOLIET ARMY AMMUNITION PLANT BOUNDARY
- ROAD OR PARKING AREA
- RAILROAD
- FENCE
- DRAINAGE FEATURE
- 1 – MANUFACTURING AREA, STUDY AREA BOUNDARY AND IDENTIFICATION
- L1 – LOAD-ASSEMBLE-PACKAGE AREA, STUDY AREA BOUNDARY AND IDENTIFICATION
- L1 – HISTORICAL STUDY AREA BOUNDARY AND IDENTIFICATION
- DEPARTMENT OF AGRICULTURE
- VILLAGE OF ELWOOD INDUSTRIAL PARK
- CITY OF WILMINGTON INDUSTRIAL PARK
- WILL COUNTY LANDFILL
- DEPARTMENT OF VETERAN AFFAIRS

REFERENCES:

1. BASE DRAWING PREPARED FROM PLATES SUPPLIED BY U.S. ARMY ENGINEER DISTRICT, CHICAGO, CORPS OF ENGINEERS, CHICAGO, ILLINOIS, DRAWING NOS. 18-02-19, SHEETS 1 THRU 14, DATED JUNE, 1984. ADDITIONAL FEATURES AND DETAILS OBTAINED FROM VARIOUS AERIAL PHOTOGRAPHS AND SITE PLANS FROM 1939 TO 1983.
2. STUDY AREA BOUNDARIES BASED ON PREVIOUS INVESTIGATIONS SUMMARIZED IN THE PHASE II RI REPORTS AND MARCH, 1998 DETAILED REVIEW BY USAEC.
3. DRAWING PREPARED BY OHM REMEDIATION SERVICES CORP. UNDER CONTRACT WITH USAEC. CONTACT USAEC PROJECT MANAGER FOR ADDITIONAL PRINTS OF THIS DRAWING.

Figure 1-2
Land Use Plan

Joliet Army Ammunition Plant
Will County, Illinois

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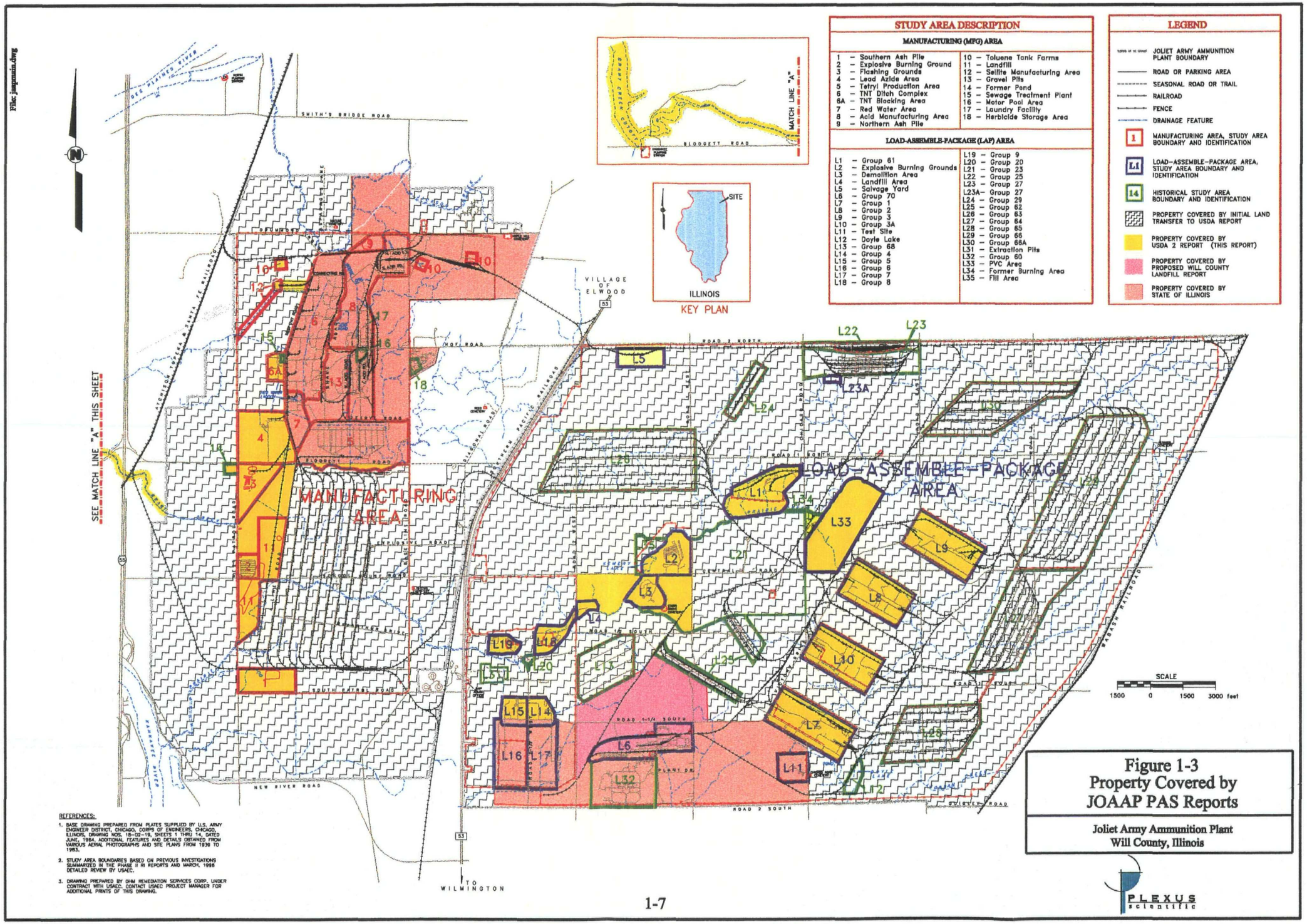


Figure 1-3
Property Covered by JOAAP PAS Reports

Joliet Army Ammunition Plant
Will County, Illinois

2. SITE BACKGROUND

This section provides a description of JOAAP, including location, property, and operational history; physical environment; and biological and cultural resources. Issues pertaining specifically to the USDA2 parcel are addressed in subsequent sections.

2.1 Plant Location and Description

JOAAP is in Will County, near Wilmington, Illinois. The facility is 10 miles south of Joliet, 22 miles northwest of Kankakee, and 57 miles southwest of Chicago. Towns adjacent to JOAAP include Elwood, two miles to the north and Wilmington, eight miles to the south (ARMY01). The northern boundary of the manufacturing area adjoins the Joliet Army Training Area (JATA) and is within two miles of the Amoco Chemicals Superfund site (BICO01). An active Mobil Oil Refinery is located at the northwest corner of JOAAP. The Des Plains Conservation Area borders JOAAP on the west and south. Farming and grazing are conducted along other perimeter areas of JOAAP, and a large portion of the facility consists of pasture and cropland with scattered woodlands (ARMY01). The topography is flat to gently rolling (ANLA01).

JOAAP is a government-owned, contractor-operated (GOCO) military industrial installation that has been declared excess. It is part of IOC, formerly the U.S. Army Armament, Munitions and Chemical Command (AMCCOM) (ANLA01, FIEL01). JOAAP no longer has a mobilization mission, and no maintenance is required except for those sites currently leased to Alliant Techsystems, Inc. (AEST01).

The plant has two distinct operational areas divided by State Route 53: the explosives manufacturing area (MFG Area) west of Route 53, encompassing approximately 14 square miles; and the Load-Assemble-Pack area (LAP Area) east of Route 53, comprising approximately 22 square miles. The MFG Area produced trinitrotoluene (TNT),

dinitrotoluene (DNT), trinitrophenylmethylnitramine (tetryl), lead azide, TNT demolition blocks, as well as chemicals used in explosives manufacturing, such as nitric and sulfuric acids, oleum, ammonium nitrate, and sellite (sodium sulfite). The production facilities were clustered in the northern half of the MFG Area, and an explosives storage facility was in the southern half. The LAP Area contained facilities for the loading, assembling, and packaging of high-explosive (HE) artillery projectiles, aerial bombs, and a variety of ammunition components. Approximately 1500 buildings of either permanent or semi-permanent construction remain standing on JOAAP (ARMY01).

2.2 Facility History

This discussion of facility history is in several parts. An operational history includes an overview of the activities at the plant and descriptions of the manufacturing processes for many of the items produced. Information—some of it incomplete—on the occupancy and lease history is also provided. A regulatory history provides information concerning permits held and enforcement activities. The section concludes with general descriptions of previous environmental investigations.

2.2.1 Operational History

JOAAP was constructed in the early 1940s on land purchased by the U.S. Government for exclusive use by the U.S. Army as an arsenal and manufacturing facility. Earlier, the entire area had been used for agricultural purposes (ARMY01). The JOAAP mission was production of munitions in support of the nation's World War II effort. JOAAP was constructed as two separate facilities with distinct production missions: the Kankakee Unit, which manufactured explosives, and the Elwood Unit, an industrial munitions–loading plant (load-assemble-pack area). These two areas became known, respectively, as the MFG Area and the LAP Area. Construction contracts for the Kankakee Unit were signed on September 12, 1940; those of the Elwood Unit, on September 19, 1940. Production operations began in September 1941 and by the end of World War II, JOAAP was the nation's largest ammunition

manufacturer, producing more than 500,300 tons of explosives during the war (ANLA01). Peak employment reached 5,000 people at the Kankakee Unit in 1942 and 14,000 at the Elwood Unit in 1945 (ACOE06).

In August 1945, both units were placed in standby status when ammunition production was halted. Standby activities focused on keeping the units prepared for any necessary reactivation of production. This included leasing areas (discussed in Section 2.2.2) such as the sulfuric acid and ammonium nitrate plants (ANLA01). In 1946 the Kankakee and Elwood Units were combined to form the Joliet Arsenal (ACOE01). From about 1946 through 1950, while the government operated the arsenal, the Elwood Unit was engaged in demilitarization of large amounts of deteriorated and obsolete ammunition items. In addition, from 1949 through 1957, Elwood Unit activities were directed primarily toward renovation and new loading of ammunition items (JAAP63). The plant was reactivated for the Korean Conflict in 1952 and remained in operation until 1957 (AAMC02, ALSI01).

In the early 1950s, the JOAAP mission was expanded to include loading of nonstandard research and development ammunition items, principally experimental bombs, which required considerable development of equipment and processing techniques (HIST01). In the 1950s, various research and development projects, together with nonstandard items assigned the arsenal, were completed, the bulk of which involved loading various kinds of bombs ranging from 100 to 42,000 pounds (JAAP63). An experimental division conducted investigations in design and manufactured product testing, development of techniques for new and unusual items, and process development. From the mid-1950s through the early 1960s, JOAAP was authorized by the Ordnance Ammunition Command to operate a production development division to gather and initiate ideas applicable industry-wide and conduct development projects in the fields of design, techniques, and process development (HIST01). A list of munitions and components manufactured or handled at JOAAP is presented as Table 2–1.

In 1963, the facility was officially renamed the Joliet Army Ammunition Plant (ACOE01). On November 19, 1965, U.S. Rubber became responsible for operation of the entire facility.

The facility was reactivated for the Vietnam Conflict in 1966 and continued operation until 1976, when it was placed in an inactive status (AAMC02, ALSI01).

The LAP Area continued to conduct various assembly activities involving bombs, projectiles, fuzes, and supplementary charges almost continuously from World War II through 1975 (DAMO06). This area contains load line groups capable of producing the standard 105-mm HE M1 cartridge, the 8-inch Howitzer HE projectile, 40-mm cartridges, M14 mines, bombs, and supplementary charges (ARMY01, AEST01). The MFG Area contains 10 of the 12 original World War II batch-type TNT lines, six newer "continuous flow" TNT lines, 6 of the 12 original tetryl lines (six have been demolished) and five DNT lines (AEST01).

During the last activation (1966–1976), the lead azide and TNT demolition block areas were declared excess and not used for production. They were subsequently demolished. Nitration of DNT also ceased during this time, since it was more convenient to purchase it commercially in crude form and purify it at the plant (ARMY01). JOAAP was placed in a nonoperating status in 1977 and was placed in Inactive-Modified Caretaker Status in 1993 (ACOE01). The facility was recently declared excess.

Alliant Techsystems, Inc., is currently producing, test firing and storing 25- and 30-millimeter (mm) cartridges and the AT–4 (84-mm M136 antiarmor weapon). In June 1989, a facilities contract was issued to Talley Defense Systems for use of Group 3 (AAMC03). Talley Defense Systems used the area for the manufacture of the 155-mm M864 Base Burner Assembly until 1994 (AEST01, DOTA04).

Disposal operations were conducted at several locations throughout the facility. These included open combustion of explosive materials and demolition debris, incineration, landfilling, and discharging of contaminated process wastewater (DAMO04). Other significant activities included: maintenance of ordnance and automotive vehicles; use of radioactive materials—i.e., depleted uranium and cobalt 60 and cesium 137 (in instrumentation); use of biomedical materials; use of photochemical materials; pesticide

application and storage; and the operation of transformers and other electrical equipment that may contain polychlorinated biphenyls (PCBs) (ARMY01). Munitions filling, maintenance and disposal operations at JOAAP may also have resulted in surface discharge of explosive materials and production byproducts (DOAS06).

2.2.1.1 TNT Manufacturing Process

Twelve production lines were originally associated with TNT manufacturing at JOAAP. During full operations, 10 lines were active, one was in active standby, and one was committed to preventive maintenance. Primary components of each line included a Mono-, a Bi-, and a Tri-Nitration House, a Wash House, and an Acid Fume Recovery House. One Packing House, administrative facilities, and raw materials storage tanks were shared between two lines (JAAP09, ARMY01). Six DNT lines served the 12 TNT lines (JAAP09).

Most TNT was manufactured using a batch-type operation that involved direct manual process control. Each batch converted 1600 pounds of toluene to 3360 pounds of purified product in a period of 40–45 minutes. Total TNT-manufacturing capacity was close to 1700 tons per month when all lines were in operation (ARMY01). TNT lines 11 and 12 were demolished and replaced with six continuous TNT lines in 1974. The continuous lines were only operated through a prove-out period; they were never used for active production (ARMY01, MEMO04).

In the batch production process, TNT was made by the successive chemical addition of three nitrite radicals to toluene using mixtures of nitric and sulfuric acids. The nitric acid acted as the nitrating agent, and sulfuric acid acted as a catalyst and dehydrant. Nitrating was done in three separate batch operations in three separate buildings. The first nitration was performed in the Mono-House with the addition of toluene to a mixture of weak nitric acid (60 percent) and waste acid from the Bi-House to produce mono-nitro-toluene ("mono-oil"). Mono-oil was transferred to the Bi-House and added to a mixture of weak nitric acid and waste acid from the Tri-House to form DNT ("Bi-oil"). Bi-oil was transferred to the Tri-House and

added to a mixture of TNT, mixed acid (nitric and sulfuric), and oleum to produce TNT ("Tri-oil"). Tri-oil was transferred to the Wash House, where it was neutralized by the addition of water, soda ash, and purified by addition of sodium sulfite solution (selliting). The TNT slurry was transferred to a filter tank, where it was washed and filtered on a screen, leaving a layer of TNT crystals. Crystallized TNT was washed with water, melted, and dried. The TNT was solidified on a water-cooled flaker drum, and the film was removed in the form of flakes by scraping with a beryllium knife. Flaked TNT was loaded into paper-lined cardboard boxes and sent, via conveyor, to the Nail House for sealing before shipment. Spent acid from the mono-nitrating step was sent to the Acid Recovery Building along with acid fumes and vapors emitted during various stages of production. There the nitric and sulfuric acids were separated for concentration and reuse (AEHA09, TRWI01).

Process cooling waters used in each production step, and during acid recovery, were discharged into a trough system which flowed into the TNT Ditch Complex. Occasionally, large volumes of highly contaminated water were discharged when, due to operational problems, a batch was drowned (flooded with water) in the large drowning tanks outside the nitrating houses. The frequency of these drowning procedures is not currently known. The drowned batch was discharged into the gutter system and subsequently to the TNT ditch. Water contaminated with nitrobodies, resulting from operation of a dust scrubber in the Wash House, was also discharged to the TNT ditch (AEHA09). Red water and wastewater from building washdowns, were collected in a sump, pumped to a settling tank, and sent to the Red Water Disposal Plant south of the TNT-manufacturing area (AEHA09, TRWI01). Sellite washwater, used to remove impurities from TNT, was concentrated by evaporation, and the remaining thick liquor was incinerated at the Red Water Plant (ARMY01). The resulting ash was deposited in one of two ash disposal areas in the MFG Area. In the evaporation process, condensate contaminated with nitrobodies was recovered and eventually discharged to the TNT ditch (AEHA09). Before installation of the incinerator in 1966, all red water waste was discharged into open drainage ditches. This red water may have contained TNT, nitrobodies, sulfates, and nitrates (AEHA09).

As of 1972, there was no treatment of wastewater entering the TNT ditch until it reached Grant Creek, where soda ash was added (AEHA09). Samples of combined cooling water and scrubber water effluent from the Wash House were collected from TNT line 10 in 1972. These samples contained TNT at levels averaging 36 mg/L (ARMY01).

2.2.1.2 DNT Production Process

In 1978, Joliet was the only Army Ammunition Plant with the capability to manufacture 2,4-DNT. As of 1978, the manufacturing capability had not been exploited for several years, and the plant had been purchasing crude DNT from commercial sources and purifying it before use (ARMY01, TRWI01).

During the manufacturing of DNT, a fractional crystallization process was used for purification. Crude DNT was charged to a "sweat" pan and heated to 75°C. The temperature was then decreased in 5°C increments. When a temperature of 25°C was reached, most of the pure DNT was in crystal form, and the liquid phase containing most of the impurities was drained off to storage. Small amounts of impurities adhering to the crystals were removed by gradually increasing the temperature and draining the "sweat." When the freeze point reached 34°C, sweating was discontinued and the charge was rapidly heated to 95°C with additional draining of impurities until tests indicated that the freezing point of the remaining charge was above 63°C. Molten, purified DNT was then transferred to a water-cooled kettle, where graining was induced by agitation as the charge cooled (ARMY01, TRWI01). Powdered DNT crystals were discharged to a hopper, screened and packaged in fiber drums for storage and shipment (ARMY01, HIST01).

Purification of DNT was essentially a pollution-free operation. Separated impurities (low-oil) were stored and reused in manufacturing of TNT. Aqueous effluent from the purification process was limited to the uncontaminated cooling water, which was discharged to the TNT ditch (ARMY01, TRWI01).

2.2.1.3 Nitroxylene Production

Production of nitroxylene (NS) was started on December 10, 1943. Original instructions were to convert TNT lines 9 to 12 to NS production. However after conversion was started, it was determined that only Lines 9 and 10 should be converted (HIST39).

The alterations to the lines were not extensive. Production involved a single-step nitration, and the spent acid was not fortified for reuse. Three nitrators were used on each line, two tri-nitrators and a mono-nitrator. Xylene and mixed acid were supplied to each nitrator, and waste acid lines delivered the spent acid from the nitrators to the acid recovery building. Crude NS was pumped to a HCI holding tank and then to the wash house. Crude NS was then washed and neutralized with soda ash in wash and slurry tanks at the wash house and dried with hot air in the TNT dryer. Purified NS was pumped from the wash house to former oleum bulk storage tanks for storage prior to tank car shipment (HIST39). A total of 1.3 million pounds of NS were produced (AMCI13).

The spent acid was denitrified, and the sulfuric acid was recovered in the acid recovery building. No attempt was made to recover the nitric acid, as quantities were small. Neither the absorption nor the acid fume recovery system was used (HIST39).

2.2.1.4 Tetryl Production

Tetryl was produced intermittently from the 1940s through July 1973 (ARMY01, DAMO04). A total of 12 tetryl production lines had a capacity of approximately 0.59 million kilograms per month. Six of these lines were razed in 1985 (ARMY01, BICO01). Each production line consisted of separate buildings for nitration and refining. Each group of six tetryl lines was served by four buildings, one each for drying, packing and shipping, sulfating, and acid and fume recovery (ARMY01, TRWI01).

Tetryl was produced at JOAAP by a batch process. In the Sulfating House, dimethylaniline was sulfated with 94 percent sulfuric acid to produce dimethylaniline sulfate (DMAS), which was destined for use as an aid in process control during nitration. The resulting dilute DMAS was transferred to the Nitrating House and mixed with nitric and sulfuric acids under controlled conditions to produce a crude tetryl. Crude tetryl mix was cooled and transferred to a stainless neutch (a container with a filter), where the free acid was separated. Crude tetryl was neutralized, washed four times and transferred to the Refining House. At the Refining House, it was washed and slurried through a tank, filtered, and transferred to a dissolving tank, where it was dissolved by acetone and washed into a still charged with 45 percent acetone. The acetone was removed by evaporation, and refined tetryl crystals were slurried, partially dried, screened to remove lumps and outsized particles, and transferred to the wet storage area (Lag Storage). Wet storage tetryl was transported by powder buggy to the Drying House, placed on screens, and dried with hot air. The tetryl was transferred from the Drying House to the Pack House for packaging prior to shipment (AEHA09, ARMY01).

Spent acid and fumes from tetryl manufacture were treated in the Acid Fume Recovery (AFR) House; dilute nitric and sulfuric acids were recovered and transported to respective concentration facilities. Major sources of concentrated wastewater in the production of tetryl included: a continuous flow of cooling water from the AFR, the Nitrating, and Refining Houses; wash water contaminated with acid and nitrobodies; and water from cleaning of acid holding tanks in the Nitrating House. Washwater from the Refining House and floor washwater from both the Nitrating and Refining Houses were also significant wastewater discharges. Cleaning of drying screens with sellite in the Drying House and general floor washing of the Drying and Pack Houses contributed smaller amounts of wastewater contaminated with tetryl particles (ARMY01, AEHA09). Catch boxes were provided in the Nitrating, Refining, and Drying Houses to allow settling of large tetryl particles, which were sent for reprocessing. Wastewater generated in the production of tetryl was discharged into the tetryl ditch through the Nitrating, Refining, and Drying House ditches (ARMY01). The majority of wastewater in the Nitrating and Refining House ditches were cooling waters discharged from the AFR, Nitrating, and Refining Houses. It was only during short periods at

the end of the nitration and refining processes that concentrated process wastewaters were discharged to these ditches. The AFR Houses discharged bubble cap water, cooling water, and washwater and sellite solution used in cleaning operations through three separate effluent lines. In the Drying Houses, wastewater containing tetryl particles was generated from sellite washing of drying screens (TRWI01). The tetryl ditch emptied into Grant Creek (ARMY01).

Wastewater was treated by settling in catch tanks. Occasionally, sellite or soda ash was added to a ditch to neutralize acid waste. Acid waste was generated from draining of waste acid storage tanks in the Nitrator Buildings and from acid wastewaters produced during crude tetryl washing (AEHA09).

A tetryl ditch neutralized with soda ash was sampled in 1972. The ditch was found to contain tetryl at an average concentration of over 400 mg/L prior to dilution with cooling water. The pH averaged 3.1 and sulfate was present at a concentration of 779 mg/L (ARMY01).

In 1957, a pilot refining unit was added to the continuous tetryl nitration unit. The equipment produced tetryl from dinitromethylanaline. The nitrification was conducted in dichloroethane with subsequent separation of the solvent and crystallization of the tetryl (HIST20).

2.2.1.5 Acid and Fume Recovery Process

Every TNT line and each group of six tetryl lines employed an AFR House. The exhaust fumes from the three Nitrating Houses were cleaned in scrubbers and discharged to the atmosphere through stacks. Scrubbers were ring-packed towers that operated in series. Liquid wastes from the AFR operation included cooling water and water used for floor washing and spill cleanup (ARMY01). In the TNT area, these wastewaters were discharged into the TNT ditch, which empties into Grant Creek. In the tetryl area, they were discharged into tetryl and nitrating ditches, which empty into the same creek (TRWI01).

2.2.1.6 Nitric Acid Concentration

Seventeen nitric acid concentrators were in operation at JOAAP (six in Acid Area 1, five in Acid Area 2, and six in Acid Area 3) with a total rated capacity of 22.8 million pounds per month as 100 percent nitric acid. These units produced concentrated nitric acid (98 percent nitric acid) from dilute acids produced in the Ammonia Oxidation Plant (AOP) and AFR systems (ARMY01, TRWI01).

The nitric acid concentration process was a continuous process in which dilute acid from the AOP or AFR systems was distilled in the presence of sulfuric acid. Diluted sulfuric acid (75 percent) was removed and concentrated in the sulfuric acid concentration facilities (TRWI01).

Wastewaters in the nitric acid concentration process originated from occasional acid spills, floor washings, and water used for cooling (ARMY01, TRWI01). The nitric acid concentration units in Acid Areas 1 and 2 discharged wastewaters through the Acid Ditch into the Tetryl Ditch which empties into Grant Creek. Wastewater from Acid Area 3 entered Goose Creek which empties into Jackson Creek (TRWI01).

2.2.1.7 Sulfuric Acid Concentration Process

Twenty sulfuric acid concentrators were operated at JOAAP (3 in Acid Area 1, 4 in Acid Area 2, and 13 in Acid Area 3) with a total rated production capacity of 103.8 million pounds per month as 100 percent sulfuric acid. Acid Area 4 was capable of producing strong (109 percent) sulfuric acid and oleum by the sulfuric acid regeneration (SAR) method (ARMY01, TRWI01).

The original sulfuric acid concentration operation was a continuous process in which dilute acid (68–75 percent) was concentrated to 93 percent in an evaporator drum, where hot gases (650°C) from an oil-fired furnace passed countercurrent over the acid (ARMY01, TRWI01).

Wastewater originated from occasional acid spills, floor washings, and water used for cooling. Low pH and high sulfate content were major characteristics of this wastewater (ARMY01, TRWI01). The sulfuric acid concentration units in Acid Areas 1 and 2 discharged wastewater through the acid ditch into the tetryl ditch, which empties into Grant Creek. Wastewater from Acid Area 3 entered Goose Creek which empties into Jackson Creek (TRWI01).

2.2.1.8 Nitric Acid Production

Both TNT and tetryl manufacturing consume nitric acid. The acid recovered in the AFR process was supplemented by make-up acid from 14 AOPs (4 in Acid Area 1, 4 in Acid Area 2, and 6 in Acid Area 3) which produced weak (60 percent) nitric acid by the ammonia oxidation process. The production capacity was 37.4 million pounds per month of 100 percent nitric acid when all units were operating. Acid Area 4 had sufficient capacity to replace the AOP in the other acid areas. The new AOP and direct Strong Nitric Acid Plant added production capacities of 7.8 and 7.6 million kilograms of 100 percent nitric acid respectively per month (ARMY01, TRWI01).

In the ammonia oxidation process, a mixture of ammonia gas and air was combusted in the presence of a catalyst (90 percent platinum, 5 percent palladium, and 5 percent rhodium) to produce nitric oxide. The gas was cooled, and excess air was added to convert nitric oxide to nitrogen dioxide. Water formed in the ammonia oxidation step reacted with nitrogen dioxide, producing nitric acid and nitric oxide. Dilute nitric acid (52 percent) was formed from cooling and condensing. The acid was then sent to an absorption column for concentration. Nitric oxide produced in the last reaction was oxidized by excess air to form nitrogen dioxide. The gases were then removed by aqueous scrubbing in countercurrent absorption towers. The acid produced in the towers contained 60 percent nitric acid, which was concentrated to 98 percent in the nitric acid concentration units as needed (TRWI01).

Acid Area 4 produced weak and strong acid in a single operational sequence. The system produced 98 percent nitric acid directly from ammonia oxidation and without the use of

sulfuric acid. The nitric oxide from the combustion of ammonia was cooled and compressed. It was then converted to nitrogen dioxide by oxidation with air followed by strong nitric acid. Oxidation with nitric acid produced weak nitric acid, which was removed from the process. The gas phase containing nitrogen dioxide was cooled in a brine cooler and absorbed within concentrated nitric acid. The exit gases were scrubbed and vented. Nitrogen dioxide–containing nitric acid was heated in a "bleaching" tower to distill the nitrogen dioxide, which was cooled in a brine cooler. This cooling resulted in the formation of dinitrogen tetroxide, which was distilled, liquefied, mixed with weak acid, and reacted with pure oxygen to form strong nitric acid (TRWI01).

Wastewaters from the AOP facilities in Acid Areas 1, 2, and 3 included cooling water, water used for cleanup of spills, and water from floor and equipment washing (ARMY01, TRWI01). The wastewaters in Acid Areas 1 and 2 were discharged through the acid ditch into the tetryl ditch, which empties into Grant Creek. Those from Acid Area 3 entered Goose Creek, which empties into Jackson Creek. Acid spills and drips from Acid Area 4 were routed to a sump and pumped to the product acid line. Wastewater from Acid Area 4 was generated from cooling tower and boiler blowdowns, water used for cleanup, and regenerant waste from water demineralization units. The regenerant and blowdown wastewaters were handled in the Acid Area 4 wastewater treatment facilities (TRWI01).

In 1955, several solvents were investigated as substitutes for the carbon tetrachloride used for cleaning AOP filters. Vythene, Penolene 643, Solvent M–6, and Dow Chlorethane were found to be suitable replacement solvents (HIST43).

2.2.1.9 Oleum and Sulfuric Acid Production

Oleum (a mixture of sulfuric acid, and sulfur trioxide) was manufactured in Acid Area 3 until January 1974 (ARMY01, TRWI01). Three oleum production units operated by Wilson Chemical Company supported TNT production lines (AEHA09, ARMY01).

Oleum was produced by melting sulfur, burning the sulfur to produce a sulfate gas, and filtering the gas to remove dirt. The gas was cooled prior to entering absorption towers. Sulfuric acid towers dried exhaust gases, which were then heated and passed over a vanadium pentoxide catalyst for conversion of the sulfur dioxide to sulfur trioxide. Oleum (109 percent sulfuric acid) exiting the absorption towers was continuously mixed with antifreeze (nitric acid) (AEHA09, TRWI01).

Wastewaters generated in this area were mostly cooling water and water from the scrubbers. Other discharges included acid spills, blowdown containing water softeners (including organophosphates), and acid tank car drainage and washout (AEHA09, TRWI01). When Acid Area 4 was operated, wastewater was sent to the Acid Area 4 wastewater treatment facilities (TRWI01).

2.2.1.10 Sellite Production

Sellite is a solution of sodium sulfite that was used to remove impurities from TNT. The Sellite Production Area is in the northwest section of the MFG Area. Two sellite production units were operated at JOAAP (ARMY01, TRWI01).

Sellite was manufactured by burning sulfur to produce sulfite, which then passed into a spiral, packed scrubber tower. Sulfite gas was cooled and countercurrent scrubbed to remove sulfur trioxide and other impurities. Cooled scrubbed gas passed into an absorption tower where the sulfite was absorbed by a solution of sodium carbonate (soda ash) in a countercurrent, packed tower. The balance of the gas stream passed through a venturi, a cyclone separator, and then a stack to the atmosphere. Liquid discharged from the tower flowed into a batch tank and was recirculated until the desired strength (16 percent sodium bisulfate) was obtained. The finished product was then pumped into one of the four storage tanks at the plant. The soda ash solution used in the process was about 22 percent in strength and was prepared by dissolving commercial soda ash in water (ARMY01, AEHA09, TRWI01).

Wastewaters from gas scrubbing in the Sellite Area contained sulfur, ash, sulfate and impurities. Other wastes included spills of soda ash and sellite solutions, and wastewater from floor washing and spill cleanups (ARMY01, AEHA09). Sellite effluent was characterized by a widely fluctuating pH, low dissolved oxygen, and high concentrations of sulfite and sulfate (ARMY01, TRWI01). Sellite wastewater was treated by adjustment of the pH with soda ash and oxygenation by mechanical surface aeration in a small flow-through lagoon. This wastewater was then discharged to the sellite ditch that flows into Grant Creek (ARMY01, AEHA09, TRWI01).

2.2.1.11 Lead Azide Process

In preparation for lead azide production, sodium azide crystals and flaked lead acetate were dissolved in deionized water in separate tanks. In a third dissolving tank, deionized water, sodium carboxymethylcellulose, and a small amount (one percent) of sodium azide solution were mixed. Lead azide was precipitated by piping solutions from the three dissolving tanks to a precipitator containing a heel solution of deionized water, a 10 percent Empilon soap solution, and sodium carboxymethylcellulose (HIST01). Washing then purified precipitated lead azide (ARMY01). It was then placed into bags, tied, overpacked in plastic bags, and packed in drums. The bags were surrounded with a mixture of sawdust and alcohol (HIST01). In later years, lead azide was repacked into ceramic containers due to drum deterioration.

Process waste from lead azide production was neutralized in two steps: (1) waste was treated with sodium nitrite and nitric acid; and (2) this mixture was then neutralized with sodium carbonate and sodium hydroxide. Subsequently, the material was routed to a holding pond north of the facility. The waste was neutralized prior to release into Grant Creek (ARMY01).

2.2.1.12 Asbestos Putty Production

Two types of asbestos putty, Red Asbestos Putty and Blue African Asbestos Putty, were manufactured for use as a sealant in recovery towers, packing glands, and other such places

(UCCI31). The putty was manufactured in Building 739-1 north of the Box Factory (MEMO13). Red Asbestos Putty was a mixture of 12.6 percent white lead with linseed oil, 3.4 percent red lead, 11 percent barium sulfate (barytes), 45 percent white asbestos fiber (36L grade), and 28 percent raw linseed oil. Blue African Asbestos Putty consisted of 17.7 percent china clay, 35.4 percent white asbestos powder 25 PM, 29.2 percent raw linseed oil, and 17.7 percent blue African asbestos fiber (UCCI34, USOP23). The putty was sealed in pails immediately following the mixing. Typical orders were 1170 pounds of Red Asbestos Putty and 900 pounds of Blue African Asbestos Putty (USOP23).

2.2.1.13 LAP Area Production Processes

Past production processes in the LAP Area included loading, assembly, and packing of 40- and 105-mm cartridges, 8-inch projectiles, cluster bomb units, fuses, supplementary charges, and M14 mines. The melt-load operations were usually carried out in Groups 1, 2, 3, 3A, and 4, the basic process and procedures being the same for all HE cast ammunition items. For example, in Group 4 where the 40-mm HE cartridge (M406) was produced, Composition B, a mixture of TNT and RDX, was melted and loaded into projectiles. The loaded projectiles were cooled, and then transferred to an assembly building for installation of end items and inspection. Acceptable rounds were packed for shipment and storage (ARMY01). Groups 4, 5, 6, 7, 8, and 9 were involved in fuze, booster, primer, or detonator loading (SPED01). Support activities in the LAP Area included maintenance shops, a laundry building, a test range, and storage facilities (TRWI01).

Wastewaters from LAP Area operations originated mainly from steam-out and washout of rejected bombs, and from washing of equipment, floors, and the ventilation system. Wastewater accumulated in concrete sumps measuring approximately 20 feet long and eight feet deep. Sump wastewater was either trucked or pumped to a central sump/feed basin. The remaining sludge was shoveled out and transported to the Burning Grounds for disposal. Wastewater from this area, tinted pink owing to the presence of nitrobodies, is referred to as "pink water." Pink water was treated in a two-step process: (1) filtering in diatomaceous

earth to remove gross and suspended solids (the filter required replacement weekly); and (2) treating water in activated-carbon columns (1000 pounds of carbon per column) to remove dissolved explosives (TNT and RDX). This water was then discharged into Prairie or Jordan Creek (ARMY01, AEHA09). Wastewater from Group 4 was hauled by truck to Group 3 for treatment (AEHA09, TRWI01).

Solid wastes generated in the LAP Area included waste explosives, propellants, spent carbon, spent diatomaceous earth, sludge from pink water treatment systems, and inert combustible wastes contaminated with explosives (ARMY01). Typically, one column of spent carbon was produced each month and disposed of at the LAP Area Burning Ground (AEHA09). The spent diatomaceous earth was also burned at the Burning Grounds (TRWI01). Solid waste processing/disposal methods used at the LAP Area included: (1) sale of excess wood as kindling, (2) sale of wire banding as metal scrap, and (3) open burning of explosives and explosives-contaminated wastes (ARMY01). There were three Burning Grounds in the LAP Area, one for burning explosives (L2), another for burning contaminated wastes (L3), and a third (L34) for burning unknown types of materials (ARMY01, DAMO06).

Effluent from the wastewater treatment plant in the LAP Area was sampled in 1972. The water contained TNT at a concentration of 3.7 mg/L and RDX at a concentration of 19.5 mg/L (ARMY01).

2.2.2 Occupancy and Lease History

The entire JOAAP facility originally encompassed approximately 36,000 acres. The LAP Area comprised 14,820 acres and the MFG Area, 21,272 acres (HIST01). Land area available for ordnance production activities was reduced over the years as various parcels were turned over to other entities or excessed. Portions of the entire facility have been used for "agricultural purposes" since 1942. Currently, certain land tracts are included in the federal government's public outlease program, which permits farmers to lease unused land on selected military installations for agricultural activities. In 1964, the USDA held a permit to

conduct crop rotation experiments on 140 acres at JOAAP (JAAP09). In 1978, there were over 80 agricultural leases associated with JOAAP (ARMY01, ANAL01). As of 1990, agricultural activities were permitted on approximately 60 percent of the entire facility. Approximately 8,740 acres of land were leased for cropland and 5,477 acres leased for grazing (ANLA01). In 1995, there were 103 agricultural tracts encompassing 17,006.5 acres (MEMO04). Other areas on JOAAP were managed as woodlands and vacant areas have been managed as wildlife habitat (JAAP09). Hunting is allowed on a restricted basis (DAMO05).

The Kankakee Ordnance Plant (MFG Area) was operated by E.I. DuPont de Nemours & Company until April, 1944 at which time U.S. Rubber (later Uniroyal) became the operating contractor. The Sanderson and Porter Company operated the Elwood Ordnance Plant (LAP Area) until November 30, 1945 (HIST01). The government then assumed operating responsibility and operated the LAP Area until 1965, when Uniroyal became the operating contractor (HIST01). A facilities contract was issued to Honeywell in June 1981 for use of lines in Groups 4, 5, 6, 7, 8, and 9 (HIST36, AAMC01). Many buildings were reconstructed or rehabilitated to meet production needs for 25- and 30-millimeter ammunition. Honeywell was also assigned storage in Groups 62, 64, and 68 for its own use (AAMC01). As of 1984, Honeywell was using Group 4 for production of the 25-mm Bushmaster, Group 5 for production of the 30-mm GAU–8, and Group 7 for production of the 30-mm lightweight HEDP (HYWL04). In 1989, Honeywell began using Group 3A, Group 64 (partially), and Group 65 for production of the AT-4 (AAMC03). Honeywell Defense Systems was purchased by Alliant Techsystems, Inc., which is still present at JOAAP.

Table 2–1 includes a thorough list of materials manufactured as complete units (either ammunition or weapons systems) at JOAAP and many of the other munitions components produced.

From May 1988 through 1990, A–Z Technology operated in Group 2 and Buildings 66–45 and 66–47 (UCCI01, MEMO09). A–Z manufactured the Lightfoot rocket system which was

designed for mine clearing. The system consisted of a rocket, 1000 feet of detonating cord, and four blasting caps (MEMO09).

In 1951, the Armour Research Foundation of the Illinois Institute of Technology was contracted (CPFF DA–11–173–ORD–160) to develop a process for casting TNT (JAAP63).

Wilson Chemical Company leased the sulfuric acid production facility from 1958 to 1974 (AMMC02). In 1959, Wabash Chemical Corporation leased the oleum facilities (HIST23). In October 1962, Wabash defaulted on the lease and ceased operating (HIST31). As of 1972, the oleum facility was operated by the Central Chemical Division of Wilson Pharmaceutical and Chemical Corporation (AEHA09). From the early 1950s to 1958, Armour Company leased the ammonium nitrate facility (Group 61) in the LAP Area for the production of fertilizer (ARMY01). In 1965, U.S. Rubber was given the responsibility for maintenance of the Elwood Unit (LAP Area) (AMCI02).

In the 1950s, the Acid Areas were leased to DuPont and used to produce ammonium nitrate solution (ACOE06).

Also in the 1950s, the western portion of the MFG Area was deeded to the State of Illinois for use as a wildlife refuge (ARMY01). This property extends west to the Des Plaines and Kankakee Rivers. During the 1960s, a northern parcel of the MFG Area was deeded to the U.S. Army as JATA (ARMY01). Between 1946 and 1965, a parcel on the eastern border was also excessed (BICO01). It has been established that these areas were never used for manufacturing, and that there are no records of manufacturing activity within the property (ARMY01).

Talley Defense Systems was issued a facilities contract for Group 3 and Buildings 64–3 through 64–8 for the manufacture of the 155-mm M864 Base Burner Assembly in June 1989 (AAMC03, AEST01, DOTA04, UCCI01). Production was scheduled to start in 1991 (AAMC03). Operations by Talley ceased in November 1994 (DOTA04).

Various utility rights-of-way (e.g., a 765-kilovolt transmission line) have been granted within the JOAAP under long-term lease agreements. Holders of other easements or permits include Tenneco Gasoline Transmission Company; Commonwealth Edison Public Service Company; the Alton Railroad Company; the Atchison, Topeka & Santa Fe Railroad Company; and the State of Illinois (JAAP09).

In the first half of 1955, the Atomic Energy Commission reconverted an existing building at the Kankakee Unit for use. In connection with that reconversion, a guard headquarters was erected, and a security fence and appurtenances were installed to provide maximum protection. The entire job was handled as an emergency (HIST43, HIST49). Argonne National Laboratory leased two buildings: 713 in May 1959, and 25,000 square feet of 814 in November 1959. The buildings were used for equipment and machinery storage under permits issued to the Atomic Energy Commission (HIST23, HIST24, HIST25). Atomic bomb components were stored in these buildings. It is unclear if the building referred to in the 1955 annual histories is one of those identified as being used for storage in 1959 (FIEL01).

Records of existing outgrants are maintained by the U.S. Army Corps of Engineers (USACE). A listing of the existing nonagricultural outgrants was obtained from the Corps and is presented as Table 2–2.

2.2.3 Regulatory History

As an industrial facility, JOAAP has been subject to various regulations. Alliant Techsystems at JOAAP is currently operating under a Resource Conservation and Recovery Act (RCRA) permit. The U.S. Environmental Protection Agency (USEPA) identifier for this facility is IL7213820460 (JAAP16). However, the facility is identified in USEPA databases by several identification numbers and names:

• Uniroyal Chem. Co-Joliet Army Ammunition Plant	FINDS	IL0000222430
• US Army Joliet Army Ammunition Plant Uniroyal	RCRIS–LQG	IL7213820460
(a.k.a. Joliet Army Ammo Plt. MFG Area)	RCRIS–TSD	
	RAATS	
• Joliet Army Ammunition Plant	FINDS	IL0000918243
• Joliet Army Ammunition Plant Honeywell Facility	ERNS	
• Talley Defense Systems JOAAP GP3	FINDS	ILD984774463
	RCRIS–LQG	
• Talley Defense Systems JOAAP GP64	RCRIS–SQG	ILD984775510
	RCRIS–TSD	
• Alliant Techsystems, Inc.	FINDS	0000090894
• Joliet Army Ammunition Plant LAP Area	CERCLIS (NPL)	IL0210090049
(a.k.a. Alliant Techsystems, Inc., Alliant Techsystems Inc., Joliet LAP Area Facility)		

Within the RCRIS database, the types of wastes produced are identified. This information has been tabulated and is presented as Table 2–3.

Five National Pollutant Discharge Elimination Systems (NPDES) permits have been issued to JOAAP. The permits are as follows (ARMY01):

- IL0033031 LAP Area Sewage Treatment Plant
- IL0033049 Septic Tank
- IL0033057 MFG Area Sewage Treatment Plant
- IL0033065 Brown Circle Sewage Treatment Plant
- IL0002666 Industrial Waste

JOAAP was subject to 52 industrial waste effluent violations during one 3-month period in 1977. These violations included wastewater permit exceedances for chemical oxygen demand, pH, and levels of nitrates, nitrites, sulfates, iron, and suspended solids (ARMY01). Notices of Violations from the Army Compliance Tracking System are summarized in Table 2–4.

CERCLA, as amended by the Superfund Amendments and Reauthorization Act (SARA), addresses the cleanup of inactive hazardous waste sites. The ongoing remediation efforts at

JOAAP are guided by these acts and are part of the U.S. Army's IRP. Remedial Investigations (RIs) have been completed, and Feasibility Studies (FSs) associated with several of the former operational units are currently being conducted at JOAAP.

In October 1984, the MFG Area was proposed for placement on the National Priority List (NPL) and designated as a Superfund site on the basis of a Hazard Ranking System (HRS) score of 32.08. The area was placed on the NPL in July 1987 (DAMO05, EPAV15). In April 1985, the LAP Area was also proposed for NPL placement, given a HRS score of 35.23. The LAP Area was placed on the NPL in March 1989 (DAMO06, EPAV15).

USEPA, the state, and the Army signed a Federal Facility Agreement (FFA) for cleanup activities at JOAAP in May 1989 (EPAV01).

On January 6, 1995, the State of Illinois granted clean closure for three hazardous waste storage areas: Bunkers 66–86, 66–87 and 66–88) (JAAP16). Alliant Techsystems has obtained an RCRA permit to use seven igloos in Group 68 (L13) for hazardous waste storage (MEMO05, MEMO15).

In 1972, the Citizens for a Better Environment initiated a water pollution action against JOAAP before the Illinois Pollution Control Board (ARMY01). This action was in response to observations of high concentrations of mercury in water discharges on the land used by Uniroyal, Inc. (HIST09, EPAV03). In 1973, the State of Illinois filed a complaint against JOAAP for violation of the 1970 Federal Clean Air Act. USEPA filed a similar complaint in 1977 (ARMY01), as well as a Notice of Violation that same year for water pollution. These actions were eventually settled and by 1978 there were no legal actions pending against JOAAP (ARMY01). The mercury contamination was eventually traced to tainted sodium hydroxide used for treating boiler feed water.

2.2.4 Previous Environmental Investigations

Past environmental studies at JOAAP include Installation Restoration Surveys, Phase II contamination surveys, a surface water–sampling investigation, historical aerial photographic interpretation, the Midwest Site Confirmatory Survey, soil–sampling and baseline studies, an underground storage tank (UST) investigation, outfall monitoring, and sampling of PCBs in soil (DAMO12). Summaries of the major investigations are presented below. The significant findings of the investigations are presented in Section 4 and Appendices B, C, and D of the PAS.

Installation Assessment (ARMY01). The purpose of the 1978 Installation Assessment at JOAAP was to identify and assess past operations with the potential for hazardous material/waste production and contaminant migration. This investigation, performed by the U.S. Army, included a site reconnaissance, a records search, interviews with JOAAP personnel knowledgeable about the history and operations of the installation, and contact with various Federal Government agencies. No analytical samples were collected during this investigation.

Review and analysis of information collected compelled the conclusion that a number of previous manufacturing and disposal operations at JOAAP could have resulted in contamination and migration of contaminants. These operations included open combustion, incineration, burning, landfilling, discharge to streams, and spills of process chemicals. The main contaminants of potential concern were explosives, anions, metals, and PCBs. It was recommended that a survey be performed to determine if contamination was migrating beyond JOAAP boundaries.

Installation Restoration Surveys (DOAS01, DOAS03). As recommended by the Installation Assessment team, the Installation Restoration Surveys were performed to determine if potentially hazardous materials had contaminated or could contaminate the environment off-site through migration via surface or subsurface routes. These investigations

resulted in delineation of nine study areas in the MFG Area based on the production, manufacturing, disposal, or storage operations that had been conducted in the area.

Phase II Technical Reports (DOAS04, DOAS05, DOAS06). The Phase II Technical Reports investigation conducted by Donohue & Associates, Inc., included an environmental survey to determine if industrial chemicals, explosives, or other toxic/hazardous materials had migrated beyond the boundaries of JOAAP via surface or subsurface routes. Also included was an assessment of the potential for future migration. The investigation addressed areas targeted for further investigation during the Installation Restoration Surveys, including the Explosives Burning Grounds, the TNT Ditch Complex, and the Red Water Area.

The Phase II investigation also addressed environmental conditions on six parcels of land along the western and southern boundaries of the MFG Area. The parcels were proposed for excess. As a result of the investigation, it was concluded that contaminated soils present in the TNT Ditch Complex should be remediated and that surface water and groundwater should be monitored. It was also recommended that the contaminated liquid and sediment in the Red Water Lagoon and any contaminated soils beneath the lagoon be remediated. Erosion control measures were recommended for both the TNT Ditch Complex and the Explosives Burning Ground to minimize contaminant migration.

Low concentrations of potentially TNT-related organic compounds were identified in some areas beyond the installation boundary. These results suggested that migration of contaminants was occurring or could occur. On the basis of the investigation, three of the parcels were recommended for release. However, because of uncertain water quality, retention of the other three parcels was recommended until the source of surface water contamination could be identified and remediated. Additional groundwater sampling or geologic investigations were recommended as a means of forecasting groundwater quality in the vicinity of these parcels.

Investigation of Groundwater Contamination (DAMO01). Sixteen existing monitoring wells in the MFG Area were sampled by the Army Environmental Hygiene Agency (AEHA, now known as the U.S. Army Center for Health Promotion and Preventative Medicine [CHPPM]) in 1983, 1984, and 1985. All previous groundwater monitoring included typical drinking water parameters (e.g., pH, specific conductivity). Explosive analyses were first performed in 1983, and were repeated in 1984 and 1985. Analyses for some anions and metals were also conducted on groundwater samples during these investigations.

Red Water Lagoon Sampling and Analysis: Remedial Action (DOAS07). The Phase II investigation disclosed contaminants in significant amounts of contaminants in the Red Water Lagoon and determined that the lagoon was impacting surrounding areas. It was recommended that the liquid and sludge contained in the lagoon be remediated. As part of the remedial action plan for the lagoon removal, pre– and post–remedial action sampling and analysis studies were performed by Donohue & Associates, Inc., in 1983 and 1985, respectively.

Pre–remedial action sampling and analysis program focused on 30 soil core samples, four groundwater samples from existing monitoring wells, 13 surface water samples, and 13 sediment samples. The post–remedial action study involved collection and analysis of 21 soil core samples, five surface water samples, and five sediment samples. The samples in both studies were analyzed for the same parameters: explosives, anions, and metals. These studies indicated the presence of contaminants in groundwater, surface water, sediment, and soil cores. No conclusions were drawn or recommendations made in the report.

Midwest Site Confirmatory Survey (DAMO01). Although water quality data had been collected during previous investigations, the U.S. Army Toxic and Hazardous Material Agency (USATHAMA), now USAEC, determined that the database would have to be expanded. Therefore, two rounds of groundwater monitoring and surface water sampling were performed at the MFG Area in 1985 and 1986. The data from these and the earlier investigations were reviewed to assess the impact of former production and disposal

operations. These data were also used to define site conditions, identify potential sources of contamination, and to assess the potential for contaminant migration. Also evaluated were the completeness of existing data and information, and determined the necessity and feasibility of remedial actions at the sites.

The Assessment Report identified various migration pathways at JOAAP and potential receptors for any contaminated groundwater migrating from the plant. Contamination was detected in the soil, groundwater, surface water, and sediment, although conditions did not indicate the need for immediate removal/treatment. However, data gaps were identified, and it was recommended that these gaps be filled to permit an accurate assessment of existing contaminant conditions and an evaluation of potential remedial alternatives.

Phase 1 Remedial Investigations (DAMO01, DAMO06). The RI sampling performed in 1988 for the MFG Area and 1991 for the LAP Area aimed at filling the data gaps identified during previous investigations. A site reconnaissance, records search, and review of the study areas were conducted in order to develop a technical approach for the RI sampling.

The field investigation included a geophysical survey, drilling of exploratory boreholes, installation of monitoring wells, collection of environmental samples, and chemical analysis of the samples.

Environmental samples collected during the Phase 1 RI sampling programs were analyzed for explosives, anions, metals, volatile organic compounds, basic neutral acids, PCBs, pesticides and total petroleum hydrocarbons (TPHCs).

Investigation and Evaluation of Underground Storage Tanks (ACOE02). An investigation of USTs at JOAAP was performed by the USAEC. This study, conducted between July and September 1989 in accordance with 40 CFR 280, involved an inventory of all USTs in the MFG and LAP Areas of JOAAP. During this investigation, 70 USTs were

identified, inventoried, and evaluated for potential leakage. Less than one-half of these tanks were in the MFG Area.

Based on the investigation, seven USTs were identified as having potential leakage, one of them in the MFG Area. This tank was a 15,000-gallon tank (Tank 21) in the Acid Manufacturing Area. The potentially leaking tanks in the LAP Area were not detailed in this report.

Phase 2 Remedial Investigations (DAMO05, DAMO11). Results of the Phase 1 RI indicated a need for additional data on various sites. Accordingly, detailed field studies involving sampling and analysis of soil, sediment, surface water, and groundwater were conducted. The reports of these studies include summaries of studies completed by other investigators.

Baseline Human Health Risk Assessments (DAMO23, DAMO26). The 1994 and 1995 risk assessments entailed quantitative assessment of the risks to human health posed by chemical contamination at each of the IRP sites. Current and likely exposure scenarios were evaluated to determine if the sites could pose a threat to human health.

Ecological Risk Assessment (AEHA10). In 1994, a study was conducted to assess the risks of chemical contamination of flora and fauna at JOAAP. That study comprised examination of existing environmental data, collection of additional samples where necessary, literature review, toxicity testing, and field surveys. Three study areas in the MFG Area (M2, M4, M6) and three in the LAP Area (L1, L2, L7) were selected for field investigation. Study area selection was based on the presence of contaminants and on habitat viability; industrial areas were not evaluated. An ecological risk assessment was also performed for each of the creeks at JOAAP.

Several additional ecological assessments have been performed at JOAAP. These include a Phase II aquatic study (CHPP01), deer tissue collection and analysis (AEHA11), and determinations of risk to the Upland Sandpiper.

Remediation Site Release and Survey (SEGI01, SEGI02, SAHC01). Cleanup of depleted uranium (DU, specifically, uranium-238) contamination was conducted by Alliant Techsystems in IRP Study Area L18 (Group 8). Sand contaminated with DU projectiles was stockpiled outside the ranges and was overlooked during decommissioning activities. The cleanup included actions necessary to survey and remediate affected facility structures and their environs. The cleanup involved excavating and removing contaminated materials in order to reduce radioactivity to U.S. Nuclear Regulatory Commission (NRC) accepted cleanup levels. NRC Region 3 completed a confirmatory survey in support of license termination. No areas above background were noted and the final site release was to be prepared. Final NRC unrestricted site release documentation was not available at the time of the PAS.

Field Screening Activities. Dames & Moore conducted field screening activities in 1995 to better characterize sites at JOAAP. Samples were collected in L1, L2, L7, L8, L9, L10, M2, M3, and M7. Test pits were dug at M11 and in the north gravel pit at M13 to characterize the wastes at these landfills. At M4, the Lead Azide Area, field screening for lead was conducted. At many of the sites, moreover, samples were collected in order to determine if the materials would be considered RCRA hazardous wastes. The results of this additional screening were incorporated into the FS.

2.3 Utilities

The following sections present information on the utilities (water, electricity, sewers, and gas) at JOAAP. Most of the utilities at the plant date from the time of construction and are generally in poor condition.

2.3.1 Water Systems

The MFG and LAP Areas have separate water systems: the MFG Area is served by river water and deep wells; the LAP Area only deep wells. Doyle and Kemery Lakes provide flood control for the LAP Area (DOAS03). Kemery Lake also provides fire protection water (BICO01).

Naturally occurring levels of radium above USEPA Drinking Water Standards are present in groundwater at JOAAP (AEHA05). Elevated gross-alpha and radon-226 levels have been observed in northeastern Illinois (ARMY01). Further details are provided in Section 4.1.20.

Six nonfunctional water systems are situated in the MFG Area. The pump motors have been removed and placed in storage pending further disposition. Distribution piping for the systems is over 50 years old, 101.5 miles in length, and ranges in size from 4 to 42 inches in diameter. The six water systems (i.e., river, well, filtered, mixed, potable, and fire protection water) have been recognized as having no value for future nonmilitary use at the site (AEST01).

The river water system begins at two locations: the Des Plaines River and the Kankakee. During JOAAP operations, raw water from these sources was used as cooling water for various manufacturing processes and as a supply for the treatment plants. River water was also one of the supply sources for the mixed water system (AEST01).

The well water system begins at 12 deep wells in the MFG Area. In the period of plant operations, pumps were used to draw water into two elevated, 300,000-gallon tanks and two 500,000-gallon reservoirs. This water was used to supply the potable water system and was a backup for the filtered and mixed water systems (AEST01).

The potable water system is an extension of the well water system. Water from the wells was chlorinated, pumped to a booster pump, and then sent to two adjacent elevated tanks with

capacities of 50,000 gallons and 100,000 gallons. The system supplied potable water to the entire MFG Area and was a backup for the fire protection water system (AEST01).

The filtered water system begins at the water treatment plant. There river water was filtered and treated, then circulated by booster pumps. This water was used as boiler feed water at the two power plants, TNT wash water, and makeup water for the cooling towers in the TNT lines and the acid plant (AEST01).

The mixed water system consisted of a combination of raw river water and well water mixed in the ratio necessary to maintain required cooling water temperatures. No pumps were used in this system (AEST01).

Another seven wells were drilled to supply water to individual farm houses occupied by plant personnel in the MFG Area. Two temporary water supply wells (363 and 500 feet in depth) were installed on the MFG Area during construction (ACOE06).

The LAP Area water treatment, storage, and distribution system is operational but is in a marginal state of repair with excessive leakage. Maintaining water quality poses significant problems. An engineering study will be required to determine the feasibility of future use of the water distribution system in the area (AEST01).

Industrial and domestic water demands of the LAP Area are served primarily by one potable water system, which includes fire protection water. Water is obtained from two deep wells, treated, and stored in a 1.2 million-gallon, aboveground, covered reservoir, then pumped to four elevated storage tanks of 150,000 gallons each. The system is in use and is operated by the LAP Area contractor, Alliant Techsystems (AEST01).

Two additional shallow wells in the LAP Area, G26 and G65, serviced the north railroad classification yard and the southeast magazine storage area. They were not connected to the distribution system and were available for operation during the summer months (AEST01).

Each of the explosives-loading lines, Groups 1, 2, 3, and 3A, is equipped with a low-capacity well, which in an emergency can be connected to the general distribution system. These wells range in depth from 135 to 834 feet and have a combined pumping capacity of 350 gallons per minute (gal/m) (AEST01, ACOE06).

The main sources of water for distribution in the LAP Area are two deep wells about 2350 feet apart. Each well has a 1025 gal/m line shaft pump driven by an electric motor. For standby purposes, there is 1000-gal/m gasoline-engine-powered auxiliary pump (AEST01).

Water treatment and distribution piping require major upgrading; filter equipment has been removed from service. Although the treated water was rated potable while the plant was active, it was not consumed; bottled water was provided for drinking. Pumps with 500- and 1000 gal/m capacities were installed to pump water from the 1.2 million-gallon covered reservoir to four elevated storage tanks. Due to the poor condition of the water distribution system, only the 500-gal/m pump could be used, and leaks within the water distribution lines required constant repair (AEST01).

2.3.2 Sanitary Sewer

All major areas of JOAAP are served by a sanitary sewer system constructed of vitreous clay tile with hand-caulked joints (ARMY01). Individual Sewage Treatment Plants (STP) serve the MFG and LAP Areas on the western side of the respective areas. One additional STP on the north end of the MFG Area serves the Brown Circle Housing Area (HIST18). The LAP Area plant still services the area operated by Alliant Techsystems (FIEL01).

During plant operations, there was a total of 574,292 linear feet of sanitary and industrial waste lines at JOAAP (HIST18). In 1979, there were 39,000 linear feet of sanitary waste lines (HIST35, PESI01, PESI02). In many cases, isolated buildings were not connected to the sanitary sewage system; instead septic tanks and drain tile fields were used for sewage

disposal (JAAP08). Septic tanks were located in both the MFG and LAP Areas (AEHA09). A plant master plan indicates that 55 septic tanks served isolated buildings in the MFG Area (ACOE06). The MFG Area septic tanks serving residential areas were replaced by a central sewage system in 1959 (JAAP08).

Cooling water drains constructed of concrete and vitrified clay pipes served the tetryl and Acid Areas. All pipe 24 inches and larger in diameter was encased in concrete. Wastewater sewers served the TNT and Tetryl Areas for disposal of waste cooling water and wastewater from manufacturing processes. Hand-caulked, vitrified clay pipe was used throughout the system. Prior to construction of the Red Water Plant, the wastewater sewers emptied into an open flume (wooden box flume 3 by 4 by 3000 feet) constructed as a contour ditch on the west side of the ridge where the plants are located. The flume discharged into Grant Creek west of the 811 Magazine Area (ACOE06).

Detailed descriptions of all the treatment plants and the areas from which they received waste have been provided by the Army (AEHA09). The MFG Area STP lies on a 5-acre tract immediately west of the TNT ditch and is not currently active. The plant, designed as a primary treatment plant in the 1940s, was converted to secondary (modified activated sludge) treatment in 1967. The treated sludge was conveyed to drying beds. This plant includes two grit collectors and an aeration structure. The condition of the sewer lines, which are over 50 years old, is unknown. The eastern leg of the sewer line terminates at the Administration Area, 1.3 miles east of the treatment plant (AEST01, TRWI01).

The first STP for the MFG Area was shut down in 1982 after a new treatment plant had been constructed approximately 50 yards to the north. The former STP was removed from operation because it could no longer meet the NPDES requirements (AEST01). JOAAP personnel had determined that it was more economical to build a new system than to refurbish the old one (TRWI01, AEST01). The former plant received waste from the operational areas within the MFG Area and from the Administration Area. A television inspection of the sewer

system in 1967 had revealed extensive groundwater infiltration in certain sections of the sanitary sewer lines throughout the installation (AEHA09).

Built in the 1940s, the first LAP Area STP used Imhoff tanks and a trickling filter to provide treatment. Its design capacity was 0.65 million gallons per day (Mgal/d). The plant received waste from several of the LAP Area groups, from the Group 60 Administration Area, and from the White Circle Housing Area in Group 60 (AEHA09). The sewer system consisted of 18 miles of sewer lines in 1959 (ACOE06). A television inspection in 1967 revealed groundwater infiltration in portions of this system due to broken and leaking pipes, especially along the line from Groups 2 and 3. Flow in excess of the design capacity bypassed the treatment plant and was discharged directly to Prairie Creek. A treatment plant to serve Groups 2 and 3 was scheduled for completion in 1973 and was to remove from service much of the damaged line (AEHA09).

A new LAP Area STP with a design capacity of 1.2 Mgal/d was built in 1984. The new STP used the Imhoff tank process, which includes a trickling filter, secondary settling, chlorine contact, and effluent pumping to adjacent Prairie Creek (ACOE03).

The Brown Circle STP, a package sewage treatment plant, received waste solely from the Brown Circle Housing Area. The plant was built in the early 1950s and used the activated sludge process for treatment. Design flow was reportedly 7500 gal/d. A 1967 television inspection of the sanitary sewer lines serving the Brown Circle Plant substantiated infiltration into the system (AEHA09). Effluent from this plant was discharged into Jackson Creek until 1986. After 1984, effluent was pumped to the new MFG Area STP (ACOE01).

2.3.3 Storm System

The storm drainage system at JOAAP consists of natural drainage features, but storm sewers and ditches used to increase the runoff rates in areas where the rapid removal of stormwater is considered essential, or in areas where the natural runoff is exceptionally slow. Sewers and

ditches extend only as far as necessary to connect with adequate natural drainage features. The storm sewer systems were abandoned with the termination of explosive production (AEST01, JAAP08, ACOE06). There are approximately 16.5 miles of clay tile sewer pipe ranging from 8 to 24 inches in diameter, and about 29 miles of ditches (ACOE06).

Surface drainage in the MFG Area is generally from the east to the west and southwest. Runoff is discharged by Jackson and Grant Creeks into the Des Plaines River and by Prairie Creek into the Kankakee River. Drainage conditions are generally good except in the Acid Areas and the lowland immediately west of the TNT Area. Ditches and drains conduct surface water from the Acid Areas to Jackson and Grant Creeks and from the western portion of the TNT Area to a point outside the MFG Area (JAAP08). An underground drain consisting of approximately 2180 feet of 36-inch corrugated metal pipe runs along the east side of the MFG Area to carry water draining from the high ground to the east along the Acid and Power Areas to Grant Creek (ACOE06).

The LAP Area uses sewer pipe and drainage ditches to accelerate natural runoff. Ditches conduct water to Prairie and Jordan Creeks. In 1989, JOAAP had eight NPDES-permitted stormwater outfalls (AEHA06). Vitrified clay pipe was used in all of the groups to collect stormwater and discharge it to the nearby drainage ditches (ACOE06).

2.3.4 Electrical System

JOAAP receives electric power from the Commonwealth Edison Power generating grid. This power is produced by Dresden Station 12, Joliet Stations 9 and 29, and Will County Station 22, Romeoville. The electrical distribution system at JOAAP is in good operating condition; however, the distribution system in the MFG Area has been shut down for several years. The main supply line to the site enters at the northwestern boundary of the property on the MFG Area side, crosses JOAAP through the northwest quarter of the Wilmington quadrangle, passes over the Mobil Oil transmission pipeline in a northeasterly direction, and crosses the Atchison, Topeka and Santa Fe Railway to the northwest boundary of the MFG Area. It then

passes across Jackson Creek and into Joliet and Romeoville. The main supply line is divided and distributed to two substations: the new Acid Area Substation and the North Power Substation. Power is transformed from 34.5 to 6.9 kilovolts (kV) at a South Power Substation for the South and North Powerhouse Station bus tie lines. The tie breaker interconnects are located at the high-tension transmission line of Commonwealth Edison. The primary line segment numbers for the transmission line are 0903 and 1210. Line 1210 also distributes power to the Mobil Oil Refinery northwest of JOAAP (AEST01).

The Public Service Company of Northern Illinois owned the main transformer bank—two 10,000 kilovoltampere (kVA) transformers—in the MFG South Substation. The transformer banks were oil-insulated and self-cooled. There were two incoming line oil circuit breakers (132 kVA/600 A) and 13 feeder oil circuit breakers. The MFG North Substation was of similar design. There were 554 distribution transformers on the system (ACOE06).

There are two electrical substations in the LAP Area, one serving the north and the other, the south. While the North Substation is no longer in service, the South Substation serves the needs of Alliant Techsystems (AEST01, MCHL01). The North Substation consisted of one 5000-kVA transformer and necessary switchgear (ACOE06). The LAP Area South Substation is currently operated by Alliant, which also operated the MFG Area North Substation until early 1995, when it was taken out of service following an electrical fire (MCHL01). Information on PCBs and PCB-containing equipment at JOAAP is presented in Section 4.1.8.

2.3.5 Natural Gas System

The natural gas distribution pipeline remains buried in place, but has been terminated and stubbed by Northern Illinois Gas in the Arsenal Gate 10 area. Its exact size is not known. Natural gas may have been used at the site for power generation, steam for manufacturing, and other purposes. One use for natural gas in the explosive and fertilizer industries is the

conversion of natural gas into ammonia (AEST01). Given the age and prolonged disuse of this system, its integrity is questionable.

2.4 Demography and Land Use

As discussed in Section 2.1 of this report, JOAAP is divided into two major functional areas, the MFG Area to the west and the LAP Area to the east. The two areas are divided by Route 53 (ACOE01). The facility is about 10 miles south of Joliet, adjacent to Elwood, and 2 miles north of Wilmington (ACOE01, MAPS08). Various rights-of-way and easements have been granted within JOAAP, as discussed in Section 2.2.2.

Portions of the plant have been used for agriculture since 1942. Major crops include soybeans and corn. Areas with erodible soils are placed either in hay production or used primarily for cattle grazing and some limited use for horses. Brush control is accomplished by cutting and piling. Hunting of game species is permitted on a restricted basis (ACOE01). Fishing is not permitted on-site but is permitted off-site in the three creeks and the Kankakee and Des Plaines Rivers. Groundwater is not used for irrigation (DAMO26) but is used for livestock.

Property north of the MFG Area is currently known as the JATA, which is used for Army Reserve training (ACOE01). Approximately 1000 acres adjacent to the east side of the MFG Area have been transferred to the Veterans Administration for development of a cemetery (PSCO01). Property west and south of the MFG Area (i.e., the Des Plaines Conservation Area) was deeded by the U.S. Government to the State of Illinois and has been used as a wildlife refuge since the 1950s. A Mobile Oil refinery lies northwest of the MFG Area (ACOE01).

A portion of the USDA2 parcel in the LAP Area is currently operated by Alliant Techsystems, but the facility is otherwise inactive.

In accordance with the Illinois Land Conservation Act of 1995, excess parcels at JOAAP are allocated for the following uses: a veterans cemetery, the Midewin National Tallgrass Prairie, two industrial parks, and a county landfill. The Midewin Tallgrass Prairie will be a national preserve with outdoor recreation areas.

2.5 Physical Environment

In this section, the physical environment (climate, topography, geology, soils, groundwater, and surface water) of the JOAAP area is considered as background for evaluating potential migration pathways for contaminants. Additional details or local variations, where relevant, are provided in the individual site discussions.

2.5.1 Meteorology

The environs of JOAAP have a predominantly continental climate characterized by relatively warm summers and cold winters. Climatic conditions are somewhat modified by Lake Michigan, which is approximately 40 miles northeast of the installation. The mean annual temperature reported at the Joliet Weather Station, 13 miles northwest of JOAAP, is about 50 degrees Fahrenheit (°F), the mean maximum being about 61°F and the mean minimum, about 40°F. The highest recorded temperature was 109°F in July 1936, and the lowest, -25°F in December, 1872. Prevailing winds are from the southwest, with an average speed of 10.2 miles per hour (DAMO04, DAMO05). Windstorms have intermittently damaged buildings and interfered with operations at JOAAP (HIST40, HIST31, HIST07).

Average annual precipitation in the vicinity of JOAAP is 33.4 inches. Between 1959 and 1988, the highest recorded monthly precipitation was 17.10 inches in August 1987, and the lowest, 0.02 inch in September 1979 (ACOE01). Seasonal floods occur in the spring during periods of heavy rainfall and have periodically caused extensive damage to fences, railroads, and buildings at JOAAP (ACOE01, HIST08, HIST09). In 1957, Prairie Creek overflowed and caused flood damage to buildings in Group 9 (ACOE01). In June 1978, flood waters

entered magazines in Groups 63 and 65 (HIST34). Tornadoes are also prevalent in the installation area (ARMY01).

2.5.2 Topography

JOAAP is within the northern part of the Central Lowlands physiographic province. Elevations vary from about 520 to 650 feet above mean sea level (msl). Largely the result of relatively recent glaciations, the topography of this area is characterized by rather flat land and low relief. Figure 2–1 reflects the principal topographic subdivisions within the installation, as well as the geological units present at the surface (DAMO04, DAMO05).

An escarpment, approximately 50 feet high the most prominent topographic feature at JOAAP. It trends generally north to south through the installation (Figure 2–1), extending from north of the TNT lines in the MFG Area to the south-central boundary of the LAP Area. The land surface elevation east of the escarpment is higher than that to the west (DAMO04, DAMO05).

The land to the east of the escarpment, including part of the MFG Area and most of the LAP Area, is a till upland underlain by glacial till, a heterogeneous mixture of clay, silt, and coarser particles deposited directly from glacial ice. This surface feature is generally 610 to 650 feet above msl. Local relief in the upland till area consists of rolling hills and small stream valleys (DAMO04, DAMO05).

An outwash plain extends immediately west of the escarpment throughout most of the MFG Area. This plain is underlain by glacial outwash composed of fairly clean sands and gravel deposited by streams near the edge of a melting glacier. The outwash plain is rather level, with elevations generally between 540 and 560 feet above msl (DAMO04, DAMO05).

A low, level plain occurs west of the outwash plain beyond the MFG Area. This plain is underlain by Silurian dolomite bedrock, with a cover of 5 to 10 feet of alluvial or residual soil.

Its elevations range from 520 to 540 feet above msl. The LAP Area lands are dissected and drained by four westward-flowing streams (DAMO04, DAMO05).

2.5.3 Surface Water Hydrology

JOAAP lies within the Illinois River and Mississippi River drainage basins near the confluence of the Des Plaines (west of the plant) and Kankakee Rivers (southwest of the plant) (DAMO04). The Grant Creek basin drains approximately 15 square miles, and the Prairie Creek basin, approximately 19 square miles. Together these two basins cover approximately 70 percent of the JOAAP installation (DAMO11). According to studies of historic floods in the area by the U.S. Geological Survey (USGS), as well as 100-year flood maps, portions of the LAP Area are subject to flooding. The streams at JOAAP, at least under low-flow conditions, apparently act as sources of recharge to groundwater; that is, they are losing streams. Locally however, they may be gaining streams (DAMO22).

Surface drainage at JOAAP is controlled primarily by open ditches flowing into creeks, and streams draining the facility (Figure 2–2). There are four major drainage basins at JOAAP (i.e., Grant Creek, Jackson Creek, Prairie Creek, and Jordan Creek), all of which flow east to west into the Kankakee and Des Plaines River (Figure 2–3). Discharges from the plant are monitored under a 1993 NPDES Permit (DOTA04).

Grant Creek flows through the central section of JOAAP and drains most of the MFG Area and a small portion of the LAP Area (DAMO04). During plant operation, this creek received industrial waste from Acid Areas 1 and 2, the Tetryl Area, the TNT Area, and the Sellite Plant; boiler blowdown from the power plant; and the backwash and effluent from the MFG Area STP (AEHA09). After leaving JOAAP, Grant Creek discharges into the Grant Creek cutoff, which flows into the Des Plaines River (DAMO04).

Jackson Creek flows through the northern section of the installation to the Des Plaines River (DAMO04). This creek received waste from the Brown Circle STP, the Oleum Plant (the

waste included acid tank car washout and ash pile runoff); and Acid Area 3 (via Goose Creek) (ARMY01, AEHA09).

Prairie Creek and an unnamed creek, both tributaries to the Kankakee River, drain the remainder of the MFG Area and most of the LAP Area (DAMO04, DAMO22). In the operational period, Prairie Creek received wastes from the LAP Area STP and from some operations in the LAP Area. Jordan Creek received minor discharges of wastewater from operations in the LAP Area (AHEA09).

Nine areas throughout the installation have been used as holding or settling ponds. The MFG Area had two acid-holding ponds, a sellite pond, a gravel pond, and a red water pond that was removed and covered with clay. The north acid-holding pond was constructed in the late 1960s. It had a bentonite bottom and concrete sides with a 160-mil vulcanized rubber cover on sidewalls only (ARMY01, ACOE01). The south acid pond was constructed with a 20-mil polyvinylchloride (PVC) liner (ARMY01). The gravel pit (IRP Site 13) received filter water from the water treatment plant, boiler blowdown waste, and laundry waste (ARMY01). The red water pond, constructed in 1969, was lined. Lead azide was stored in a brick-lined settling pond northwest of the lead azide facility (This facility was used during three periods: 1941-1945, 1955-1957, and 1968-1970.) The LAP Area contains a holding pond (constructed in the late 1960s with a bentonite bottom), a demilitarization settling pond, and Doyle Lake. A holding pond northeast of the Group 23 Burning Ground was used until 1961 to dispose of solvents, acids, and oils (ACOE01).

The MFG Area power plants and treatment plant discharges flowed into Grant Creek. Discharges from the two steam-operating power plants on the MFG Area contained fly ash, boiler blowdown, and waste regenerated from ion exchange treatment. Filter backwash water and lime sludge were discharged from a water treatment plant into the acid and tetryl ditches, which flow into Grant Creek. Effluent from the STP flowed directly into Grant Creek (ARMY01).

Other miscellaneous discharges in the LAP Area included a laundry building with a holding basin that discharged into Forked Creek and eventually the Kankakee River. Nine oil-fired power plants discharged blowdown high in phosphates and dissolved solids into the sewer. A motor pool discharged oily wastewater into a storm sewer emptying into the Kankakee River through Forked Creek (ARMY01). The motor pool is no longer in service.

Major sources of aqueous wastes from production operations at JOAAP were cooling water, process wastewater, chemical spills and wash water from equipment and plant cleanup. Major aqueous waste contributors were the 12 batch TNT lines, 12 batch tetryl lines, AFR systems, 14 AOPs, 17 nitric acid concentrators (NACs), three Oleum Plants, 20 sulfuric acid concentrators, two Sellite Plants and 12 red water incinerators (ACOE01).

Studies of historic floods in the area by USGS and 100-year flood maps produced by the Federal Emergency Management Agency (FEMA) indicate that portions of the JOAAP are subject to flooding. Significant portions of the MFG Area were inundated during the flood of July 1957, which local residents believe to be the worst in the last 50 years. Because no other flooding information is available, it is assumed that these particular areas are historically flooded or are within the 100-year-flood plain (DAMO04).

Kemery and Doyle Lakes in the LAP Area are used for flood control. Kemery Lake is a 27 million-gallon impoundment originally constructed in 1942 as a source of firefighting water (ANLA01, AEST01, ARMY01). Kemery Dam has sidewalls incorporating a 160-mil vulcanized rubber cover (ACOE01). Twelve-acre Doyle Lake situated on a tributary of Jordan Creek was constructed to control surface water runoff. Compounds such as TNT, RDX, and Composition B, washed out in the southeastern portion of the LAP Area may have migrated to and impacted Doyle Lake sediment (AEST01).

The area west of the TNT lines would flood from TNT ditch overflow and create a pond of 0.4 by 1.8 kilometers. This area continued to flood through 1978. It remains wet and marshy, and may be heavily contaminated (ARMY01).

The Illinois State Water Survey has determined 7-day, 10-year low flows of Illinois streams, including several creeks located within JOAAP. Grant Creek's 7-day, 10-year low flow is reported as 0.0 cubic feet per second (f^3/s) throughout its watershed. Prairie Creek has a 7-day, 10-year low flow of 0.0 f^3/s in its uppermost reaches and 0.10 f^3/s above the installation's industrial wastewater outfall. This outfall contributed 0.53 f^3/s to the creek during a 1970 low-flow period. The 7-day, 10-year low flow in Prairie Creek, just above its confluence with the Kankakee River, is reported as 0.70 f^3/s. Viewed in the context of groundwater data yielded by the Phase 2 RI, these data suggest that, at least under low flow conditions, JOAAP streams are losing streams which act as sources of groundwater recharge over much of their length. Locally, however, they may be gaining streams (DAMO11).

2.5.4 Wetlands

National Wetlands Inventory maps of JOAAP developed in 1987 reflect various wetlands areas at and in the vicinity of JOAAP. Most of these areas can be classified as palustrine forested, emergent, unconsolidated bottom or scrub-shrub; or riverine lower perennial unconsolidated bottom or intermittent streambed. The palustrine system consists of vegetated wetlands (marshes, swamps, bogs, fens, and prairies). Its flora is dominated by trees, shrubs, persistent emergents, emergent mosses, or lichens. The riverine system includes wetlands and deepwater habitats contained within a channel, except where wetlands are dominated by the flora described above for the palustrine system (DAMO12).

2.5.5 Soils

JOAAP contains five distinct soil associations (Figure 2–4). Groups I and II are upland soils, developed over unstratified, calcareous, silty clay loam and glacial till. Groups III, IV, and V are lowland soils that developed west of the escarpment. Group III has developed over five feet of medium-textured glacial outwash; Group IV, over five feet of medium-textured

outwash; and Group V, over a stringer of calcareous, porous, loamy gravel outwash. The five soil associations at JOAAP have been described as follows (DAMO12):

Elliott-Ashkum Soil Association (Group I). The surface consists of 12 to 15 inches of dark-gray silt loam to silty clay loam; the subsoil, 15 to 20 inches of firm, brown, silty clay. These soils were developed under prairie vegetation and are high in organic matter and water-holding capacity, slightly acidic to neutral, and have low permeability.

Blount Soil Association (Group II). The surface consists of nine inches of dark-gray, friable, silt loam; the subsoil, 21 inches of firm, brown, silty clay. This soil group developed under a deciduous hardwood forest and is low in organic matter, water holding capacity, pH (4.7–6.0), and permeability.

Drummer-Brenton Soil Association (Group III). The surface consists of 14 inches of black silt loam to silty clay loam; the subsoil, 21 to 27 inches of firm, dark-gray, silty clay loam. These soils developed under marsh and prairie vegetation and are high in organic matter and water-holding capacity, slightly acidic to neutral, and of moderately low permeability.

Joliet-Millsdale Soil Association (Group IV). The surface consists of 14 inches of black, friable, silty clay loam; the subsoil, 6 to 20 inches of grayish-brown, firm, silty clay loam. These soils, developed under prairie vegetation, and are high in organic matter and water-holding capacity, slightly acidic to neutral, and have moderately low permeability.

Lorenzo-Rodman Soil Association (Group V). These soils consist of 7 to 17 inches of dark-brown, friable, silty to gravely loam. They are approximately neutral, moderately high in organic matter, low in water-holding capacity, and have a high permeability.

2.5.6 Geology

Previous reports on the hydrogeology of northeastern Illinois subdivide the rock units of this area into four aquifer systems and two major confining beds. The aquifer systems, from the uppermost downward, are (1) the glacial drift (Pleistocene glacial deposits), (2) shallow bedrock (Silurian dolomites), (3) Cambrian-Ordovician (sandstone and dolomites), and (4) Mount Simon (Cambrian sandstone). Maquoketa Group shales (Ordovician) act as a confining bed between the shallow bedrock aquifer system and the Cambrian-Ordovician aquifer system. Shales of the middle and upper Eau Claire Ordovician aquifer system, and the middle and upper Eau Claire Formation divide the Cambrian-Ordovician aquifer system from

the underlying Mt. Simon. Only the glacial drift and shallow bedrock aquifers are at or near the surface at JOAAP. However, water supply wells may reach lower aquifers (DAMO08).

The glacial drift aquifer system, composed of the Henry and Wedron Formations, is the uppermost aquifer throughout most of the JOAAP area (Figure 2-1). The Henry Formation, the youngest geologic unit at JOAAP, consists of 5 to 25 feet of glacial outwash. It is approximately 10 percent gravel, 40 percent sand, 35 percent silt, and 15 percent clay, with localized stringers of sand and gravel deposited from glacial braided streams. The Wedron Formation is glacial till deposited during the Late Wisconsin Stage of the Pleistocene Epoch. It is approximately 13 percent fine sand, 44 percent silt, and 43 percent clay. The Wedron Formation forms the till upland described in Section 2.5.2. Because of its low yield, the glacial till unit is considered a Class II aquifer (DAMO08).

The shallow bedrock aquifer system at JOAAP consists of undifferentiated Silurian dolomites. In the vicinity of JOAAP, this system is considered a Class I aquifer (DAMO08). Lithologic logs of monitoring wells located just west of the Henry Formation outcrop at JOAAP indicate that 5 to 10 feet of unconsolidated clays, silts, and sands overlie the dolomite. These unconsolidated materials are partly residuum, developed from weathering of the dolomite, and partly alluvium. As indicated in Figure 2–5, the thickness of the Silurian dolomite at JOAAP varies from approximately 50 feet in the west to approximately 100 feet at the eastern boundary. The Silurian dolomite thins to a feather edge a few miles west of JOAAP, where the Maquoketa Formation outcrops, and it thickens northeast to over 450 feet in the vicinity of Chicago Heights (DAMO22).

The Ordovician Maquoketa Group underlies the Silurian dolomite and acts as a confining bed between the shallow bedrock aquifer system and the Cambrian-Ordovician aquifer system. The Maquoketa Group is composed primarily of plastic shales with interbedded limestone and dolomite (Figures 2–5 and 2–6). Interbedded carbonate rocks are more common in the upper portion of the group, while shale predominates at its base. The Maquoketa Group is approximately 150 feet thick in the vicinity of JOAAP (DAMO08).

The Cambrian-Ordovician aquifer system is the most important source of groundwater in northeastern Illinois. It consists primarily of sandstone and dolomite, with some limestone and shale. The Galena-Platteville dolomite and Glenwood-St. Peter sandstone are rock units within the Cambrian-Ordovician aquifer (Figures 2–5 and 2–6). Separating the Cambrian-Ordovician aquifer from the underlying Mt. Simon aquifer system is the Eau Claire Formation, consisting of shale and siltstones. The Eau Claire Formation and the Mt. Simon aquifer system are not shown in the figures (DAMO22, DAMO08).

Northeastern Illinois is on a structural high called the Kankakee Arch, between the Michigan Basin to the northeast and the Illinois Basin to the south. The regional dip is to the east and south at approximately 10 ft/mi. An anticlinal axis trending northeast-southwest passes through the western portion of JOAAP. This trend is opposite to that of other anticlines and synclines in the region (DAMO22).

The principal fault zone in the region, the Sandwich Fault Zone, trends northwest to southeast and passes through the eastern portion of the plant. This is a gravity fault, with the northern block being the upthrown block. Northwest along the fault, where the Sandwich Fault is known to be fully developed, a series of parallel faults are present in a zone up to 10 miles wide on either side of the main fault. Structural contour maps indicate that vertical displacement of the fault increases with depth in the vicinity of the plant. Displacement is approximately 100 feet on top of the Eau Claire Formation and approximately 50 feet at the top of the Glenwood-St. Peter sandstone. The Sandwich Fault Zone may locally restrict groundwater flow; however, potentiometric contour maps do not indicate any regional effects (DAMO22).

A review of 1939 aerial photographs showed a system of linear patterns of differing soil coloration or vegetation type and density. Near JOAAP, these lineations are believed to represent bedrock fractures. There are two major lineation trends northwest to southeast and northeast to southwest, the fractures trending northwest being more numerous than those

trending northeast. The depths of the fractures are unknown; however, they probably do not extend through the plastic shales of the Maquoketa Group, because these shales reportedly seal fractures in underlying carbonate rocks. Consequently, fractures within the shales themselves are expected to be self-sealing. The fracture traces vary from approximately 600 feet to slightly over 2.5 miles long; however, most of them are on the order of 2000 feet long (DAMO06).

2.5.7 Hydrogeology

Monitoring well locations are shown in Figure 2–7. The horizontal component of groundwater flow in the glacial drift and shallow bedrock aquifer systems is predominantly westward, toward major surface water drainage features. Locally, however, the larger streams in the area modify this flow direction (DAMO22).

The available hydrologic data was derived from studies and slug tests carried out by various Army contractors. The slug tests have been performed on 38 monitoring wells, 29 in the MFG Area and nine wells in the LAP Area (DAMO22).

Hydraulic conductivity of the bedrock and overburden at JOAAP has been calculated from various slug tests performed as part of previous studies. The hydraulic conductivity values of the overburden ranges from 1.5×10^{-6} to 1.8×10^{-2} centimeters per second (cm/s). This range demonstrates the variability of the glacial deposits at the site, which range from clays and silt deposits to gravely sands in the outwash plain. The average hydraulic conductivity of the overburden was calculated to be approximately 1.7×10^{-3} cm/s. In comparison, the hydraulic conductivity of the bedrock appeared to be less variable, ranging from 2.0×10^{-4} to 1.6×10^{-3} cm/s, with an average of approximately 4.9×10^{-4} cm/s. Slug tests were also performed on wells screened within both overburden and bedrock. The hydraulic conductivity calculated for these wells appears to be reflective of the greater variability of the overburden wells. General statements relating the average hydraulic conductivity of combined wells are not appropriate because the amount of overburden and bedrock screen varies from well to well.

The hydraulic conductivity of the overburden generally appears to be greater than that of the bedrock (DAMO22).

The average porosity of soils at JOAAP, as provided by physical testing of the Wedron and Henry Formations, is 35 percent. Given a hydraulic gradient of 0.004 across the entire site and an average hydraulic conductivity of 1.7×10^{-3} cm/s, the average velocity of groundwater in the overburden is 0.06 ft/d (DAMO06).

Groundwater flow in bedrock has been calculated using the same equation, although the porosity of the bedrock has been estimated at 0.01, and the average hydraulic conductivity (from slug tests in bedrock wells) at 4.9×10^{-4} cm/s. From these data, the velocity of groundwater within the bedrock has been calculated to be approximately 0.06 ft/d (DAMO06).

This velocity calculation should be considered accurate within an order of magnitude at best. It is based on the assumption that the bedrock behaves as a classical porous medium. However, solution cavities have been observed (during well installation) in the shallow dolomite in two wells (MW401 and MW214), and fractures are known to be present. Groundwater flow along such conduits can be much faster than would be indicated by the gradient and bulk hydraulic conductivity. Furthermore, flow through conduits does not obey Darcy's Law and, therefore, is not subject to calculation on this basis. In any case, the actual porosity of bedrock at JOAAP has merely been estimated on the basis of rock type; it has not been actually measured. The value used is probably only within a factor of five of the actual value (DAMO06).

Water level measurements collected in November 1991 were used to calculate vertical gradients between the overburden and bedrock for well pairs throughout JOAAP. According to these data, a downward component of flow between the overburden and bedrock is generally present east of the outwash plain. Exceptions have been noted in well pairs adjacent to Prairie Creek in the LAP Area, indicating that this creek is an area of shallow groundwater

discharge. Another exception is well pair MW166 and MW320 at the TNT ditch in the MFG Area, where the vertical gradient indicates upward flow. This well pair was observed to be under artesian conditions when the water level was measured (DAMO06).

In contrast, vertical gradients west of the outwash plain are generally considerably lower than those to the east. These western gradients indicate that groundwater tends to flow horizontally within both the overburden and the bedrock. It should be noted that west of the outwash plain, the overburden thins to less than 5 feet thick in some places, and the water table in this area is often encountered at or near the point of overburden-bedrock contact (DAMO06).

Because the Wedron Formation is composed primarily of silt and clay, this aquifer system is used by only a few wells in the area. However, local precipitation does percolate downward through the glacial deposits as recharge to the underlying shallow bedrock aquifer system. In the vicinity of JOAAP, the shallow bedrock aquifer is recharged directly by rainfall in the area west of the scarp, and by downgradient seepage from the glacial drift aquifer east of the scarp. Specific drawdown capacities of wells pumping water from the shallow bedrock aquifer system in Will County vary from 0.1 to 87.6 gallons per minute per foot (gal/min-ft) of drawdown and average 13.1 gal/min-ft. This average specific capacity amounts to a transmissivity of approximately 14,000 gallons per day per foot (gal/d-ft) (DAMO06).

The Cambrian-Ordovician aquifer is recharged directly by rainfall in north-central Illinois, where the Maquoketa shale is absent; in the vicinity of JOAAP, however, it may be recharged by vertical leakage through the Maquoketa shale. The vertical leakage is driven by the difference in vertical head between the Cambrian-Ordovician aquifer and the shallow bedrock aquifer, as indicated by the water table elevation surface on Figure 2–9 (DAMO06).

The productivity of the subdivisions of the Cambrian-Ordovician aquifer increases with depth below the Galena-Platteville dolomites. The most productive subdivision is the Ironton-Galesville sandstone, to which more than half the transmissivity of the Cambrian-Ordovician

aquifer is attributed. The average transmissivity tends toward a lower value (0.00006) over a long period of pumping (DAMO06).

Use of the Cambrian-Ordovician aquifer has been intense. According to one study, the potentiometric surface in the vicinity of the plant declined by approximately 300 feet between 1864 and 1958. By 1980, it had declined by an additional 150 to 250 feet. The heavy pumping from this aquifer has also altered the natural horizontal hydraulic gradient. Groundwater in the aquifer now tends to flow northeast from JOAAP toward centers of pumping near the cities of Joliet and Chicago, rather than to the south or southeast as it did under natural conditions. By late 1980, the major pumping center in Joliet had dewatered all of the Galena-Platteville and portions of the underlying Glenwood-St. Peter sandstone. The effects of this overdrafting of the Cambrian-Ordovician aquifer are evident at JOAAP, as shown on Figure 2–9. The depression in the potentiometric surface of the Cambrian-Ordovician aquifer is apparently due to heavy local pumping at or near the installation (DAMO06).

Groundwater from the glacial till is not considered potable without prior treatment, given the high levels of naturally occurring anions and metals. This aquifer is currently not used for domestic purposes by residents in the vicinity of JOAAP. The underlying Silurian dolomite and Cambrian-Ordovician aquifer system appear to meet the yield requirements for Class I aquifers, although groundwater from the dolomite may require treatment prior to use (DAMO08).

A total of 20 wells for water production currently exist at JOAAP. Fourteen are deep (completed at 1500 to 1700 feet); six are shallow (AEST01, AEHA05). A study conducted for the State of Illinois revealed that 10 of the deep wells, all installed in 1941 and 1942, are of similar construction (AEST01).

All well borings include a surface casing (typically 22 inches in diameter) set into the uppermost bedrock unit to seal off unconsolidated deposits. Then, either one or two

additional lengths of smaller-diameter casing are telescoped into the borings to seal off the upper bedrock aquifer and underlying confining layer (i.e., Maquoketa shale). The remainder of the boring in most wells is not cased except for a short liner at a depth of approximately 900 feet. Other borings do not have the liner section (AEST01).

All of the pumps have been removed and placed in storage, except those for the east and west wells in the LAP Area. When the deep well pumps were in place, the pumping capacities ranged from 1000 to 1400 gallons per minute (gal/min) each and the pump depths ranged from 450 to 750 feet (AEST01).

2.5.7.1 Groundwater Use

Two deep water supply wells (East Well and West Well) in the LAP Area, which provide drinking water to the JOAAP facility, are completed at depths of 1649 and 1672 feet, respectively (AEHA05, DAMO08). These wells draw water from the deep Cambrian-Ordovician aquifer. During active operations, the MFG Area was also supplied with drinking water by deep wells tapping this aquifer. There are several shallower wells at JOAAP that draw (or drew) water from the Silurian dolomite for nonpotable uses. Wells 1, 2, and 3 at IR Site L5 were used for industrial water supply for a cement plant operation. Several other wells elsewhere in the LAP Area are used by farmers for livestock water. No production wells at JOAAP draw water from the glacial till (DAMO08).

In 1991, a well survey was conducted as part of the Phase 2 RI for the MFG Area. The survey area encompassed approximately a 1-mile perimeter around the current JOAAP boundary. Most of the wells identified in the survey (165 of 214) were found to use shallow groundwater from the Silurian dolomite. For the purposes of the study, wells less than 300 feet in depth were interpreted as using shallow groundwater. The glacial till did not appear to be used as a groundwater source. As part of the study, 13 of the wells were sampled for groundwater quality. The sampling results are summarized in the following section (DAMO08, DAMO16).

2.5.7.2 Groundwater Quality

In general, groundwater from the glacial till and Silurian dolomite is not potable because of extremely high concentrations of naturally occurring minerals and metals. No residential wells are known to be installed in the glacial till. Almost all of the residents with shallow wells in the dolomite purchase bottled water for drinking purposes due to the objectionable taste, odor, and potential physiological effects of this groundwater. During the well sampling, residents noted that use of the shallow groundwater results in chronic problems with clogged pipes and holding tanks, clogged coffee makers, stained laundry and fixtures. Most well water samples collected during the Phase 2 RI had a sulfur odor (DAMO08).

Table 2–5 presents the maximum concentrations of various analytes found in the background glacial till and Silurian dolomite aquifer samples during the Phase 1 and Phase 2 RIs, as well as concentrations detected during residential well sampling. All of these analytes were found to naturally exceed either the Illinois Class I Groundwater standards or Federal applicable or relevant and appropriate requirements (ARARs), or to have a negative effect on groundwater use. As indicated in Table 2–5, concentrations of many anions and metals are naturally high in groundwater from the glacial till. Detected at particularly high levels were:

- Calcium
- Iron (present at levels above the secondary maximum contaminant level)
- Magnesium
- Sodium (present at levels above the drinking water equivalent level)
- Water-soluble nitrate/nitrite (present at a concentration above the maximum contaminant level and the Illinois Class I Groundwater standard)
- Water-soluble sulfur (present at a concentration above the secondary maximum contaminant level and the Illinois Class I Groundwater standard)

These elevated concentrations of metals and anions may be considered background concentrations for JOAAP when evaluating cleanup levels for site remediation (DAMO08).

2.5.7.3 Areas Of Contaminated Groundwater

As a result of the RIs conducted at JOAAP, several areas of contaminated groundwater have been identified in the MFG and LAP Areas. The extent of contamination is limited to shallow groundwater present within either the glacial till or the upper portion of the Silurian dolomite, and in most instances the contamination is extremely localized. Table 2–6 summarizes the analytes detected at elevated levels at each of the study sites within the MFG and LAP Areas (DAMO08).

2.6 Biological Resources

JOAAP represents the ancient natural community of an Illinois tallgrass prairie. It lies within two subdivisions of the Grand Prairie Natural Division: the Grand Prairie Section and the Kankakee Sand Area Section. The latter is differentiated from the Grand Prairie Section by having sandy soils that were deposited during the Kankakee torrent. Prior to settlement approximately 86 percent of the installation was prairie, 14 percent was forested, and less than one percent was swamp. Predominately agricultural land use practices have drastically changed these proportions. Less than one percent of original prairie remains. The upland woods were removed years ago and replaced with such crops as corn, soybeans, and alfalfa. Areas less suitable for cropping due to soil type, rockiness, or drainage were committed to grazing (IDOC01).

Aquatic habitat consists primarily of the four creeks (Jackson, Grant, Prairie, and a branch of Jordan Creek), which discharge into the Des Plaines or Kankakee River. The National Wetlands Inventory (1987) identified various wetland areas at and in the vicinity of JOAAP. Most are classified as palustrine forested, emergent, unconsolidated bottom or scrub-shrub, or riverine lower perennial unconsolidated bottom or intermittent streambed. The palustrine system consists of vegetated wetlands—marshes, swamps, bogs, fens, and prairies. Its flora is dominated by trees, shrubs, persistent emergents, emergent mosses, or lichens. The riverine

system includes wetlands and deep water habitats contained within a channel, except where wetlands are dominated by the flora described above for the palustrine system (IDOC01).

Natural resource areas of JOAAP are: Drummond Dolomite Prairie, TNT Wetland, Hof Woods, Star Grove, and Prairie Creek Woods. The Grant Creek Prairie Nature Preserve is located between the Des Plaines Wildlife Conservation Area and the western boundary of JOAAP. Its size, about 119 acres, makes it one of the largest tracts of wet prairie remaining in Illinois. It is under the control of the Illinois Nature Preserves Commission. The presence of natural areas and management of disturbed areas containing Eurasian grasses and old croplands is considered essential to the maintenance of animals species at JOAAP (IDOC01).

A total of 401 plant species have been identified at JOAAP and JATA, including 347 native to Illinois species. Although this is a large number, the inventory is not considered complete. Insects identified at JOAAP include two candidates for federal and state designation as endangered species: the Eryngium root borer moth (*Papipema eryngii*) and the red-veined leafhopper (*Aflexia rubranura*). Nineteen other insects have been identified in the JOAAP/JATA complex, and it is believed that additional surveys will identify more. A total of 32 fish and mussel species have also been identified, but none of federal or state concern. Previous studies have identified 27 mammals at JOAAP. A total of 108 avian species are known to breed at JOAAP; in fact, JOAAP provides important breeding and wintering habitat for these species. The extensive grasslands at JOAAP provide a large prey base for these species during the breeding season and winter. Few other areas in the state provide as large a foraging habitat as the JOAAP/JATA complex for breeding and wintering of raptors. The scattered pine plantations of the JOAAP provide roosting sites for some of these raptors. Cooper's hawks and great-horned owls have used these pine plantings (IDOC01).

2.7 Cultural Resources

In 1985, an archaeological overview report summarized the results of a limited reconnaissance survey at Joliet arsenal. This survey identified two known prehistoric and one historic

archaeological site, at least two and possibly five potential historic sites, and 250 potential historic resources. One known historic archaeological site, Reed Cemetery, lies in the eastern portion of the MFG Area (AEST01).

Two known prehistoric sites have been identified in the MFG Area by the Illinois Archaeological Survey. The dates of these sites are unknown, but one is from the Woodland or Mississippian Cultural Period. The Woodland Period lasted from approximately 1000 BC to AD 1000, and was characterized by the use of large burial mounds, a widespread trading network, a period of population increase, and ceramic technology improvements. The Mississippian Period was contiguous with the Woodland Period, beginning about AD 1000 and lasting until AD 1673, when the first Frenchmen visited the area. Characteristic of this period were large fortified towns, flat-topped platform mounds, and chiefdom-level sociopolitical organization (AEST01).

A second limited archaeological study performed at JOAAP in 1987 defined two additional cultural resources. One site, Plenenuk Mounds, contains not only a buried archaic component but also a late prehistoric mortuary facility with body bags and other artifacts. This site dates from the so-called Aceramic Period, which lasted from the end of the Pleistocene Era until about 1000 BC (AEST01).

The second site is from the Upper Mississippian Langford Tradition Period. This period is characterized by ceramic jars decorated with incised or trail designs with punctuation and having a distinctive black grit temper. Both of these sites are in the MFG Area (AEST01).

In a limited survey conducted by Midwest Archeological Research Services, Inc., 27 prehistoric and 11 historic sites were identified at JOAAP. The historic sites are thought to be part of Reeds Grove, the earliest pioneer settlement in Will County (ACOE01).

One of the main historical features near JOAAP is the Illinois and Michigan (I&M) Canal National Heritage Corridor (NHC). The MFG Area lies along the eastern boundary of the

NHC. This canal was the first officially designated NHC in the United States. Constructed in the 1800s to provide a link between the Great Lakes and the Illinois River, it was officially opened in 1849. The canal consisted of 15 locks, three dams, and four aqueducts, and provided transportation that was cheaper than overland horse and wagon. It was in use for two decades, until the introduction of faster railroad transportation. In 1890 the Chicago Sanitary and Ship Canal replaced the I&M Canal between Chicago and Lockport for both waste removal and barge traffic. The I&M was completely abandoned as a waterway in 1933, when the present waterway system was completed (AEST01).

USACE is currently conducting a survey of all the historic and prehistoric sites at JOAAP.

TABLE 2-1
MUNITIONS AND COMPONENTS MANUFACTURED/HANDLED
JOAAP, WILL COUNTY, ILLINOIS

Munition/Component	Area	Comment	Reference
Large Caliber Munitions			
240mm HE (M114)		Blueprint only	ANOM01
155mm, baseburner (M864)	L9	Talley	DOTA04, DAMO06
155 projectile	L8		DAMO22
155mm HE (M101, M101B1)		Blueprint only	ANOM01
155mm, HE Howitzer (M102)	L8		ANOM01, HIST51
155mm HE (M107, M107B1)		Blueprint only	ANOM01
155mm WP (M110, M110B1)		Blueprint only	ANOM01
155mm AP HE (M112, M112B1)		Blueprint only	ANOM01
155mm AP (M112B2)		Blueprint only	ANOM01
155mm HE (MK1)		Blueprint only	ANOM01
155mm, Shrapnel (MK1)	L2/3		ANOM01
155mm HE (MK1A1)		Blueprint only	ANOM01
155mm CHEM (HS) (MKIIA1 Mod1)		Blueprint only	ANOM01
120mm (M73) w/o fuze	L7	Demilitarized	HIST12
120mm propellant charge (M15)	L7	Demilitarized	HIST12
8" Howitzer HE projectile (M106)	L8		AEST01, HIST02
8" Howitzer HE (M106, WSC w/o fuze)	L8		UCCI04, HIST01
Medium Caliber Munitions			
106mm (M94)		Blueprint only	ANOM01
106mm (T75)		Blueprint only	ANOM01
105mm Cartridge (171, WSC without fuze)	L7		DAMO22
105mm, HE, ICM (M444)	L7, L11, L16, L21 (61-7), L27	Loaded (L16), Assembled (L7), Tested (L11), and Demilitarized (L21)	HIST34, JAAP47, MEMO22, USOP66
105mm, HE, M1 Cartridge	L7		ARMY01, JAAP63, USOP86
105mm HE (M1, WSC)	L9		DAMO06
105mm HE (M1) w/fuze PD M51A5, MTSQ M54 and M500		Blueprint only	ANOM01
105mm Cartridge, HE, M1, Dualgran with Supplementary Charge W/O fuze for Howitzer M2A1, M2A2, M103, and M137 (C445)	L7, L9		HIST02
Shell Semi-fixed Projectile (M1-W/F empty)			AMCI13, JAAP60
105mm Howitzer (M2, M2A1)	L7		FIEL01, HIST18, HIST51
105mm (M3)			FIEL01
105mm Howitzer (M4)			FIEL01
105mm HEAT (M67)		Blueprint only	ANOM01

TABLE 2-1
MUNITIONS AND COMPONENTS MANUFACTURED/HANDLED
JOAAP, WILL COUNTY, ILLINOIS

Munition/Component	Area	Comment	Reference
105mm HEAT (M67) w/fuze BD M91		Blueprint only	ANOM01
105mm ILL (M314, M314B1)		Blueprint only	ANOM01
105mm WP (M325) w/fuze PD M51A5		Blueprint only	ANOM01
105mm HEAT (M341) w/fuze PI BD M509		Blueprint only	ANOM01
105mm Cartridge Case (M14, M14B1)		Blueprint only	ANOM01
105mm Propelling Charge		Blueprint only	ANOM01
90mm, HE (M71)	L1, L8, L9, L21, L27	Manufactured and Demilitarized	ACOE06, HIST01, JAAP47, JAAP63, USOP37, USOP38
90mm HE (M71) w/fuze M51A5		Blueprint only	ANOM01
90mm HE (M71) w/fuze MTSQ M500		Blueprint only	ANOM01
90mm, HE-T (M71E1)	L2/3		ANOM01
90mm HVAP-T (M304)		Blueprint only	ANOM01
90mm WP-T (M313E1)		Blueprint only	ANOM01
90mm HVAP-T (M332, M332B1)		Blueprint only	ANOM01
90mm HVTP-T (M333)		Blueprint only	ANOM01
90mm TP-T (M353, M353E1)	L9		ANOM01, JAAP63
90mm Cartridge Case (M19, M19B1)		Blueprint only	ANOM01
90mm Cartridge Case (M108B1)		Blueprint only	ANOM01
90mm Cartridge Case (T24, T24B1)		Blueprint only	ANOM01
90mm Cartridge TP-T (M353A1)	L9		HIST64, JAAP63
90mm Dummy w/Fuze Dummy (M80)	L27		JAAP47
90mm Cartridge Blank (M394)		Blueprint only	ANOM01
90mm Blank			HIST64
90mm Canister (M336)		Blueprint only	ANOM01
90mm Charge Propelling (T91)		Blueprint only	ANOM01
76mm HE (M42A1)		Blueprint only	ANOM01
76mm APC (M62) w/fuze BD M66A1		Blueprint only	ANOM01
76mm HE and TP (M352 w/fuze		Blueprint only	ANOM01
75mm	L1, L9	Manufactured and Demilitarized	DAMO22, HIST01, JAAP63, MEMO22
75mm HE (M48)		Blueprint only	ANOM01
75mm Shell Fixed HE (M48) w/fuze M51A4		Blueprint only	ANOM01
75mm TP (M48) w/fuze PD M48 inert		Blueprint only	ANOM01
75mm HE (M48) w/Supp Charge, w/o fuze		Blueprint only	ANOM01

TABLE 2-1
MUNITIONS AND COMPONENTS MANUFACTURED/HANDLED
JOAAP, WILL COUNTY, ILLINOIS

Munition/Component	Area	Comment	Reference
75mm TP w/fuze PD M51A5		Blueprint only	ANOM01
75mm HEAT (M66)		Blueprint only	ANOM01
75mm APC-T (M61A1) w/Fuze BD (M66A1)	L2/3		ANOM01
75mm Shot AP-T		Blueprint only	ANOM01
75mm (M334)	L7	Demilitarized	HIST12
75mm Cartridge HE (T50E2) w/Sup Charge, w/Fuze			HIST64
75mm Cartridge case (M5A1)		Blueprint only	ANOM01
75mm Cartridge case (M18, M18B1)		Blueprint only	ANOM01
75mm Cartridge case (M31A1B1)		Blueprint only	ANOM01
75mm Cartridge case (T6E3, T6E3B1)		Blueprint only	ANOM01
75mm Canister (T30E2)		Blueprint only	ANOM01
75mm Propelling Charge		Blueprint only	ANOM01
4.7 inch Cartridge Case (M24)		Blueprint only	ANOM01
4.5 inch HE (M65)		Blueprint only	ANOM01
Small Caliber Munitions			
70 mm			AMMO04
57 mm			AMMO04
57mm TP (M76)		Blueprint only	ANOM01
57mm HE (M306A1) and M306A1B1 w/fuze M503		Blueprint only	ANOM01
57mm HEAT (M307) w/Fuze PI M90		Blueprint only	ANOM01
57mm Cartridge case (M30A1B1)		Blueprint only	ANOM01
57mm Cartridge case (T22)		Blueprint only	ANOM01
49mm HE (M406-W/F)			ANOM01, HIST01
40mm, Cartridge case (M118)	L17	Part of M406	USOP79
40mm Cartridge case (M25)		Blueprint only	ANOM01
40mm (M385)			HIST01
40mm (M397)			ANOM01
40mm HE (M397E2)	L17		DAMO25
40mm (M406)	L11, L14		AEST01,USOP82, USOP84
40mm (M407)			ANOM01
40mm (XM576E1)	L17		ANOM01, HIST01, USOP87
37mm Canister (M2)		Blueprint only	ANOM01
37mm TP (M51)		Blueprint only	ANOM01
37mm TP-T (M51A2)		Blueprint only	ANOM01
37mm HE (M54)		Blueprint only	ANOM01
37mm TP-T (M55A1) w/fuze dummy M50		Blueprint only	ANOM01
37mm Shell Fixed HE (M63)		Blueprint only	ANOM01
37mm, TP (M63 Mod 1)	L2/3		ANOM01

TABLE 2-1
MUNITIONS AND COMPONENTS MANUFACTURED/HANDLED
JOAAP, WILL COUNTY, ILLINOIS

Munition/Component	Area	Comment	Reference
37 mm AP (M74)		Blueprint only	ANOM01
30mm (TP - PGU-15)		Alliant Techsystems	MEMO20
30mm (HE-I - PGU-14)		Alliant Techsystems	MEMO20
30mm (AP-I - PGU-13)		Alliant Techsystems	MEMO20
LW30mm (TP - M789)	L17	Alliant Techsystems	HWYL04, MEMO20
LW30mm (HEI - M788)	L17	Alliant Techsystems	HWYL04, MEMO20
25mm (M791 APDS-T)		Alliant Techsystems	MEMO20
25mm (M793 HEI-T)		Alliant Techsystems	MEMO20
25mm (M793 TP-T)		Alliant Techsystems	MEMO20
25mm (M910-TPDS-T)		Alliant Techsystems	MEMO20
25mm (MOD-210 HEI-T)		Alliant Techsystems	MEMO20
25mm (PGU-23 TP)		Alliant Techsystems	MEMO20
25mm (PGU-25 HE)		Alliant Techsystems	MEMO20
25mm (PGU-32 HEI-T)		Alliant Techsystems	MEMO20
25mm (PGU-38 HEI)		Alliant Techsystems	MEMO20
20mm Cartridge Case Hispano Gun /A/ (M21)		Blueprint only	ANOM01
3 inch HE Shells	L1	Demilitarized	ACOE06
3 inch HE (M42A1) w/fuze M43A5		Blueprint only	ANOM01
3 inch APC-T (M62A1) w/Fuze BD M66A1		Blueprint only	ANOM01
Mines			
Mine, Antitank	L8		UCCI04
Mine, Antitank (M1)	L8		WDEP01, HIST51
Mine, Antitank (M1A1, M1A2)		Blueprints only	ANOM01
Mine, Antitank (M4)	L2/3		ANOM01
Mine, Antitank, NM (M5)	L2, L3, L34		AMCI13, ANOM01, FIEL01
Mine, Chemical (AT M5)			AMCI13
Mine, Antitank Practice (M10)		Blueprints only	ANOM01
Mine, APERS, NM (M14) /integral fuze	L16		AEST01, ANOM01, DAMO11, HIST01, HIST64
Grenades			
Grenades	L8		UCCI04
Grenade, Hand, Frag (M33) w/fuze	L27		HIST67, JAAP47
Grenade (M39)			HIST66
Demolition Charges			
Chain Demolition Block (M-1)	L9		ANOM01, HIST56, HIST59
Demolition Block 1/4 pound			HIST64
Demolition Block 1/2 pound	M6A, L28 (65-4)		JAAP47, JAAP63
Demolition Block TNT Cast 10 pound			HIST64
Demolition Block TNT Cast 20 pound			HIST64

TABLE 2-1
MUNITIONS AND COMPONENTS MANUFACTURED/HANDLED
JOAAP, WILL COUNTY, ILLINOIS

Munition/Component	Area	Comment	Reference
Demolition Block TNT Cast 100 pound			HIST64
Demolition, Shaped Charge 40 pounds (M3)		Blueprints only	ANOM01
Demolition, Shaped Charge 40 pounds (M3E2)	L9		ANOM01, HIST40, HIST68
Submunitions and Dispensers			
Cluster Container for ADU-272/B and ADU-256/B		Blueprints only	ANOM01
ADU 272A/B		6002720	HIST01
ADU 285A/B		6002850	HIST01
Dispenser and Bomb Aircraft CBU 24 (E1814)	L10		HIST02
Dispenser and Bomb Aircraft CBU 29 (E178)	L10		HIST02
Dispenser and Bomb Aircraft CBU 49 (E174)	L10		HIST02
BLU-26/B	L2/3, L10		ANOM01, HIST01, USOP31
BLU-36/B	L10		HIST01, USOP31
BLU-59/B	L10		HIST01, USOP31
BLU-91/B		Blueprints only	ANOM01
BLU-92/B (Gator)		Blueprints only	ANOM01
CBU Bomb ACFT	L10		ACOE06, HIST01, HIST18
CBU-24B/B	L10	6000220	HIST01, DAMO06
CBU-29A/B	L10		USOP31
CBU-29/B	L10	6000290	USOP31
CBU-29B/B	L10		USOP31
CBU-29C/B	L10		USOP31
CBU-49A/B	L10		USOP31
CBU-49/B	L10		USOP31
CBU-49B/B	L10	Loaded	DAMO06, USOP31
CBU-49C/B	L10		USOP31
M43 submunitions for M444	L7, L11, L16	Loaded, assembled, tested	MEMO22
PBX for M406	L10		HIST06
Fuzes and Detonators			
Fuze, MT (M43A3)	L2/3		ANOM01
Fuze, Base Practice (M38)		Blueprints only	ANOM01
Fuze, BD (M38A1)		Blueprints only	ANOM01
Fuze, MT (M43A4)	L2/3		ANOM01
Fuze, P.D. (M48) for 105mm Howitzer	L7, L14		ANOM01, DAMO11, HIST18, HIST51
Fuze (M48A1)			AMCI13, JAAP60
Fuze, PD (M48A3) without booster			ANOM01, USOP42

TABLE 2-1
MUNITIONS AND COMPONENTS MANUFACTURED/HANDLED
JOAAP, WILL COUNTY, ILLINOIS

Munition/Component	Area	Comment	Reference
Fuze, P.D. (M51)	L14, L15		DAMO11, HIST51, JAAP60
Fuze, PD (M51A1, M51A5 Mod 3)		Blueprints only	ANOM01
Fuze, PD (M51A5)	L14	renovated	JAAP63
Fuze (M51A5) with M21A4 booster	L8		HIST67, USOP42
Fuze, PD (M52A1, M52A1B1)		Blueprints only	ANOM01
Fuze (M53A1)		Blueprints only	ANOM01
Fuze, TF (M54) for 105mm Howitzer	L7, L14		ANOM01, HIST18
Fuze (M55A1, M55A3, T13)		Blueprints only	ANOM01
Fuze T83 (M56)		Blueprints only	ANOM01
Fuze, PD (M57)		Blueprints only	ANOM01
Fuze, BD (M58)		Blueprints only	ANOM01
Fuze, BD (M60)		Blueprints only	ANOM01
Fuze, MT (M61A1, M61A2)		Blueprints only	ANOM01
Fuze, BD (M66)	L2/3		ANOM01
Fuze, BD (M66A1)	L2/3		ANOM01
Fuze, MT (M67 A1) and Booster (M21A1)		Blueprints only	ANOM01
Fuze, BD (M68)	L2/3		ANOM01
Fuze, Dummy (M73)		Blueprints only	ANOM01
Fuze, Dummy (M80)		Blueprints only	ANOM01
Fuze (M82)		Blueprints only	ANOM01
Fuze, PD (M84)		Blueprints only	ANOM01
Fuze, BD (M91)		Blueprints only	ANOM01
Fuze (M103)	L14 (4-14)	Demilitarized	DOTA11
Fuze, Dummy (T73)	L7	Demilitarized	HIST12
Fuze, Bomb, Tail (M102A2)		Blueprints only	ANOM01
Fuze, Bomb, Nose (AN-M103, AN-M103A1)		Blueprints only	ANOM01
Fuze (M103)	L16		ACOE06, JAAP08
Fuze, MTSQ (M105 A1) without booster	L21 (61-7)		USOP77
Fuze, Bomb, Tail (M106)		Blueprints only	ANOM01
Fuze, Bomb, Nose (M108)		Blueprints only	ANOM01
Fuze, Bomb, Nose (M110)		Blueprints only	ANOM01
Fuze, Bomb, Tail (M112A1)		Blueprints only	ANOM01
Fuze, Bomb, Tail (M123A1, M124A1, M125A1)		Blueprints only	ANOM01
Fuze, Bomb, Nose (AN-M126A1)		Blueprints only	ANOM01
Fuze, Bomb, Nose (M135, M136)		Blueprints only	ANOM01
Fuze, Bomb, Nose (AN- M139A1)		Blueprints only	ANOM01
Fuze, Bomb, Nose (AN-M140A1)		Blueprints only	ANOM01
Fuze, Bomb, Nose (AN-M146)		Blueprints only	ANOM01
Fuze, Bomb, Nose (M149)		Blueprints only	ANOM01

TABLE 2-1
MUNITIONS AND COMPONENTS MANUFACTURED/HANDLED
JOAAP, WILL COUNTY, ILLINOIS

Munition/Component	Area	Comment	Reference
Fuze, Bomb, Tail (M160, M161, M162)		Blueprints only	ANOM01
Fuze, Bomb, Nose (M163, M164, M165)		Blueprints only	ANOM01
Fuze, Hand Grenade (M204A1, M205A1, M206A1, M206A1 ModA)		Blueprints only	ANOM01
Fuze (M217)			HIST67
Fuze (M219)	L10		USOP33
Fuze (M219E1)	L10		USOP33
Fuze (M421)	L28		USOP75
Fuze (M500, (M500A1)		Blueprints only	ANOM01
Fuze (M501A1)			ANOM01, HIST68
Fuze (M502, M502A1)		Blueprints only	ANOM01
Fuze, PD (M503)		Blueprints only	ANOM01
Fuze P.D. T237E1 (M508)			HIST64
Fuze, PI, BD (M509)		Blueprints only	ANOM01
Fuze VT T178 (M517) F/81mm mortar			HIST64
Fuze, MTSQ (M518) with booster (M125)	L7	Demilitarized	HIST12, USOP19, USOP49
Fuze, P.D. (M551)	L14		USOP33
Fuze, Hand Grenade (M10 series)	L10		USOP48
Fuze, Proximity (M517) arming mechanism	L2	Destroyed in popping furnace	USOP90
Fuze, Bomb, Nose MT (T7E1) and Flare MT M111		Blueprints only	ANOM01
Fuze, MTSQ with booster (T23) for 75mm			HIST64
Fuze, PD (T24)		Blueprints only	ANOM01
Fuze, Dummy (T126)		Blueprints only	ANOM01
Fuze, PD (T186E10)		Blueprints only	ANOM01
Fuze, PD (T263E8)		Blueprints only	ANOM01
Fuze, PD (T319)		Blueprints only	ANOM01
Fuze (XM218)	L10		USOP33
Fuze (XM224)	L10		HIST06, USOP33
Fuze, Antitank mine (M1)	L8		WDEP01
Fuze, Antitank Mine (M1A1)	L17		HIST53
Fuze, Antitank Mine (M1A2)	L17		AMCI13, HIST53, JAAP60
Fuze, Antitank Mine (M4)		Blueprints only	ANOM01
Fuze, Antitank Mine (M5)	L2/3		ANOM01
Fuze-Mine Combination (M6A1, M7A1)		Blueprints only	ANOM01
Fuze, Antitank Mine NM Practice (M12)		Blueprints only	ANOM01

TABLE 2-1
MUNITIONS AND COMPONENTS MANUFACTURED/HANDLED
JOAAP, WILL COUNTY, ILLINOIS

Munition/Component	Area	Comment	Reference
Fuze, Antitank Mine (M600, M601)		Blueprints only	ANOM01
Fuze, Antitank Mine NM, Practice (T-3E1)	L2/3		ANOM01
Fuze, Bomb Nose (AN-M103)	L16		AMCI13, HIST51, JAAP60
Fuze, Inert (M48)			JAAP60
Fuze, Dummy (M73)	L5		HIST67
Detonator (M13, M15A2, M17, M18, M19A2, M20, M24, M28, M31A1, M32, M34, M35, M37, M41, M42, M45, M47)		Blueprints only	ANOM01
Detonator (M15)	L19		HIST51
Detonator for M20 Booster	L19		ACOE06, HIST18, HIST51
Detonator (M21, M22, M23, M25, M29, M30A1, M44, T34, T33E1)		Blueprints only	ANOM01
Detonator (M46)		Blueprints only	ANOM01
Detonator for M48 Fuze	L19		ACOE06, HIST18, HIST51
Detonator for M51 Fuze	L19		ACOE06, HIST18
Detonator (T34E1)		Blueprint only	ANOM01
Detonator (T36, T37)		Blueprints only	ANOM01
Relay Assembly for M48 Fuze	L19		ACOE06, HIST18, JAAP60
Primers and Boosters			
Primer (M1A2)	L2/3		AMCI13, ANOM01, JAAP60t
Primer (M1B1A1)	L18		HIST51, JAAP60
Primer (M1B1A2)	L2, L18	Destroyed in popping furnace in L2	ANOM01, ACOE06, HIST18, HIST51, UCCI41
Primer, Percussion (M22A2)	L2/3		ANOM01
Primer (M22A3)	L2	Destroyed in popping furnace	UCCI41
Primer (M28A2)	L2	Destroyed in popping furnace	ANOM01, UCCI41
Primer (M31)	L18		ACOE06, HIST18, JAAP60
Primer, Percussion (M31A1, M32, M36A1)		Blueprints only	ANOM01
Primer (M31A2)	L2	Destroyed in popping furnace	UCCI41
Primer (M40A1)	L2	Destroyed in popping furnace	UCCI41
Primer (M42)		Blueprint only	ANOM01
Primer (M46)	L2	Destroyed in popping furnace	UCCI41
Primer (M47)	L2	Destroyed in popping furnace	UCCI41
Primer (M48)	L2	Destroyed in popping furnace	UCCI41

TABLE 2-1
MUNITIONS AND COMPONENTS MANUFACTURED/HANDLED
JOAAP, WILL COUNTY, ILLINOIS

Munition/Component	Area	Comment	Reference
Primer (M49)	L2	Destroyed in popping furnace	UCCI41
Primer (M58)	L2	Destroyed in popping furnace	UCCI41
Primer, Percussion (M61)		Blueprints only	ANOM01
Primer, Percussion (M71)	L2/3		ANOM01
Primer, Percussion (T93)		Blueprints only	ANOM01
Primer, Percussion, Federal 100	L21 (61-7)		USOP72
Primer No. 4		Blueprint only	ANOM01
Booster (M20)	L16, L17		AMCI13, HIST51, JAAP60
Booster (M20A1)	L16, L17		HIST51, JAAP60, AMCI13
Booster, Inert (M20A1)			JAAP60
Booster (M20A2)		Blueprints only	ANOM01
Booster (M21)	L17		HIST51
Booster (M21A1)			AMCI13, JAAP60
Booster (M21A4)	L2/3, L14, L17		ANOM01, JAAP63
Booster (M25)	L2/3		ANOM01
Booster 100 pound (AN-M65)			AMCI13, JAAP60
Booster (M102)	L16		ACOE06, JAAP08
Booster (M104)	L16		ACOE06, JAAP08
Booster, Adapter (M102A1)		Blueprints only	ANOM01
Booster, Adapter (M104)			AMCI13
Booster, Adapter (M115)			AMCI13, JAAP60
Booster, Adapter (T56)		Blueprints only	ANOM01
Booster, Auxiliary (M111)			ANOM01, AMCI13, JAAP60
Booster, Auxiliary (M104)	L16, L17		HIST51, JAAP60
Bombs			
100 pound Bomb			HIST64
100 pound G.P. AN Bomb (M30A1)		Blueprint only	ANOM01
115 pound Bomb CHEM (M70A1)		Blueprint only	ANOM01
100 pound TP Bomb (M75A1)		Blueprint only	ANOM01
125 pound Bomb CHEM (T3E1)		Blueprint only	ANOM01
150 pound GP Bomb (T2)		Blueprint only	ANOM01
220 pound Bomb Frag AN (M88)		Blueprint only	ANOM01
250 pound Bomb	L8		JAAP60
250 pound GP AN (M57)		Blueprint only	ANOM01
250 pound Practice Bomb (T/68)		Blueprint only	ANOM01
300 pound Demolition Bomb (M31)	L9		HIST51, JAAP60
500 pound Demolition (M43)		Blueprint only	ANOM01
500 pound Bomb S.A.P (M58)	L9		HIST51, JAAP60
500 pound GP AN Bomb (M64)		Blueprint only	ANOM01

TABLE 2-1
MUNITIONS AND COMPONENTS MANUFACTURED/HANDLED
JOAAP, WILL COUNTY, ILLINOIS

Munition/Component	Area	Comment	Reference
600 pound AP Bomb (M62, M62A1, M62A2)		Blueprint only	ANOM01
750 pound Demolition Bomb (T54E3)		Blueprint only	ANOM01
800 pound AP Bomb (M61)		Blueprint only	ANOM01
900 pound AP Bomb (M60)		Blueprint only	ANOM01
1000 pound bomb			JAAP60
1000 pound Demolition Bomb (M44 and AN-M44)	L9		ANOM01, HIST51
1000 pound G.P. Bomb (M44)	L10		HIST51
1000 pound AP Bomb (M52, M52A1)		Blueprint only	ANOM01
1000 pound SAP AN Bomb (M59)		Blueprint only	ANOM01
1000 pound GP AN Bomb (M65A1)		Blueprint only	ANOM01
2000 pound Bomb			JAAP60
2000 pound SAP Bomb (T7)		Blueprint only	ANOM01
2000 pound G.P. AN Bomb (M66, M66A2)		Blueprint only	ANOM01
3000 pound Demolition Bomb (T55E5)		Blueprint only	ANOM01
4000 pound HE AN Demolition Bomb (M56)	L10		ANOM01, HIST51, JAAP60
10,000 pound Demolition Bomb (T56E4)		Blueprint only	ANOM01
12,000 pound Bomb	L10	Loaded with tritonal	MEMO22
14,000 pound Bomb	L10	Loaded with tritonal	MEMO22
25,000 pound SAP Bomb (T28E4)		Blueprint only	ANOM01
42,000 pound GP Bomb (T12)	L10	Loaded with tritonal	HIST64, MEMO22
Mortars and Rockets			
81mm Mortar, Cartridge HE, M362 (T28) without fuze	L2/3, L9, L13, L14	Loaded (L9), test and rework	ANOM01, HIST64, JAAP63, MEMO22, USOP43
81mm Mortar, HE (M362) w/fuze PD M519		Blueprint only	ANOM01
81mm HE (M43A1) w/fuze PD M52A2		Blueprint only	ANOM01
81mm ILL (M301A2) w/fuze PTTF M84		Blueprint only	ANOM01
81mm Increment Propelling (M1A1, M5)		Blueprint only	ANOM01
4.2 inch Mortar	L7	Assembled	MEMO22
4.2 inch HE (M3A2)		Blueprint only	ANOM01
4.2 inch HE (M329, M329B1) w/fuzes		Blueprint only	ANOM01
4.5 inch Rocket (M16)	L2/3		ANOM01

TABLE 2-1
MUNITIONS AND COMPONENTS MANUFACTURED/HANDLED
JOAAP, WILL COUNTY, ILLINOIS

Munition/Component	Area	Comment	Reference
318mm Warhead Section, HE (M146)	L28		JAAP47
318mm Warhead Section, HE (XM185)	L28		JAAP47
762mm Rocket, Head, HE (M6)	L28	Loaded, stored	MEMO22, USOP70
762mm Rocket, Warhead Section (M6E1)	L28		JAAP47
762mm Rocket, Warhead Section (XM186)	L28		JAAP47
AT-4 (84mm, M136)	L33	Alliant Techsystems	AAMC03
AT8 WEAPON, HE No known "M" number		Alliant Techsystems	MEMO20
SMAW, Cartridge, P-T No known "M" number		Alliant Techsystems	MEMO20
Lightfoot Rocket System	L8	A-Z Technology	UCCI01, MEMO09
Miscellaneous			
Supplementary Charges	L16	Manufacturing, assembly and packing	AEST01, DAMO11
Activator (M1)		Blueprint only	ANOM01
Activator Practice (M1)		Blueprint only	ANOM01
Adapter and Booster (MKIII AM2)	L2/3		ANOM01
Adapter and Booster (T3, T3E1, M118)		Blueprint only	ANOM01
Burster (T17)		Blueprint only	ANOM01
Delay Plunger (M1)		Blueprint only	ANOM01
Delay Elements (M2)			JAAP63
Demolition Kit (M37) for Block Demolition (M5E1) Assembly		Blueprint only	ANOM01
Flare, Aircraft (M8A1) container (M40A1)		Blueprint only	ANOM01
Flare (M24, M26)		Blueprint only	ANOM01
Priming Assembly (M15)		Blueprint only	ANOM01
Primer Detonator (M14A1)		Blueprint only	ANOM01
Relay (M1, M2, M3, M4, M5, M6, M7)		Blueprint only	ANOM01
Tracer (XM10)		Blueprint only	ANOM01

Note: Some of the items listed above are included solely because blue prints were found on-site. No additional information is available at this time to confirm the item was physically present at JOAAP. Areas listed are those which documentation indicates the item was located or physical evidence has been found. The areas are not a comprehensive list of locations where the item may have been located.

TABLE 2-2
NON-AGRICULTURAL OUTGRANTS
JOAAP, WILL COUNTY, ILLINOIS

Grantee's Name	Contract Number	Expiration Date	Purpose of Outgrant	Remarks
Illinois Bell	JAAP042-10	October 23, 2002	Telephone line right of way	Telephone line
Commonwealth Edison	JAAP042-14	July 26, 2006	Electric line right of way	Electric and telephone
Northern Illinois Gas Co.	042-16	October 28, 2006	Pipeline right of way	8-inch gas
State of Illinois Adjutant General	042-17		Road right of way	Road
Amoco Pipeline Company	JAAP042-3		Pipeline right of way	Gas
Public Service Co. of Northern Illinois	JAAP042-6		Electric line right of way	Electric transmission lines
State of Illinois Adjutant General	JAAP042-8		Road right of way	Extended roadway
State of Illinois Adjutant General	JAAP042-9		Road right of way	Road
Midwestern Gas	DA-11-032-ENG-7087	August 13, 2009	Pipeline right of way	Gas
State of Illinois Adjutant General	DA-11-932-ENG-7118		Road right of way	
Midwestern Gas	DA-11-032-ENG-8162	August 13, 2009	Pipeline right of way	
Northern Illinois Gas Co.	DA-11-032-ENG-8958	May 30, 2011	Pipeline right of way	Gas
Northern Illinois Gas Co.	DA-11-032-ENG-12867	July 12, 2015	Pipeline right of way	Gas pipelines
Mobil Oil Corp.	DACA2217106018		Pipeline right of way	
Will County Highway	DACA23-2-68-142		Road right of way	Road
Illinois Bell Telephone Co.	DACA45-2-71-6113	May 18, 2021	Electric line right of way	Buried cables
Natural Gas Pipeline Co.	DACA45-2-73-6026	September 7, 2022	Pipeline right of way	42-inch pipeline
Mobil Oil Corp.	DACA-45-3-71-6169		Pipeline right of way	18-inch oil pipeline
Illinois Division of Criminal Investigation	DACA27-1-85-1	November 30, 1995	Storage	Building 61-2
Mobil Pipe Line Co.	DA-11-032-ENG-1732	February 3, 2003	Pipeline right of way	Crude petroleum, oil, gas & by-products pipe line
Illinois Bell	DA-11-032-ENG-6962	March 24, 2010	Telephone line right of way	Underground cable
Arco Pipeline Co.	DA-11-032-ENG-7088	September 23, 2001	Right of way	Cathodic protection system
Arco pipe Line Co.	JAAP042-2	September 23, 2001	Pipeline right of way	Gas

TABLE 2-2
NON-AGRICULTURAL OUTGRANTS
JOAAP, WILL COUNTY, ILLINOIS

Grantee's Name	Contract Number	Expiration Date	Purpose of Outgrant	Remarks
State of Illinois Adjutant General	JAAP042-13		Road right of way	Road
Commonwealth Edison	DACA45-2-73-6063	January 10, 2024	Electric line right of way	Electric transmission lines
Commonwealth Edison	DACA45-2-74-6075	April 23, 2023	Electric line right of way	Electric transmission lines
Commonwealth Edison	DACA45-2-75-6171	December 28, 2025	Electric line right of way	Electric transmission lines
Commonwealth Edison	DACA45-2-72-6121		Electric line right of way	Electric transmission lines
Northern Illinois Gas Co.	DACA45-2-73-6009	August 14, 2022	Pipeline right of way	Gas
Department of Justice, FBI	DACA45-4-79-6244	August 31, 1994	Other	Building 27-22
Department of the Treasury Bureau of Alcohol, Tobacco, and Firearms	DACA27-4-82-4	May 31, 1992	Other	Storage, Buildings 811-1 through 4
RSIX Management Inc.	DACA27-1-88-57	June 24, 1998	Storage	Storage of empty rail cars, Groups 25, 63, and 66A
National Starch-Chem Co. Custom Farm Seed Division	DACA45-1-82-6062	April 30, 1993	Storage	SA 2 Buildings 66-81, through 84
National Starch-Chem Co.	DACA27-1-84-55	May 31, 1994	Storage	Magazines for storage (10 total)
Amoco Pipeline Company	JAAP-042-1		Other	Crude petroleum, oil, gas & by-products pipe line
Scheer James	DACA27-2-94-9	October 31, 1998	Other	Power poles for electrical line
Department of the Interior Fish and Wildlife Service	DACA27-4-87-16	September 30, 1997	Other	Building 27-3
Commonwealth Edison	DACA27-2-88-75	July 19, 2029	Electric line right of way	40 year term with 5 year renewals
U.S. Forest Service	DACA27-4-95-79			Buildings 62-9, 74-2, 74-2B, and Brown Circle Area

Source: LEAS01

TABLE 2-3
RCRA WASTES GENERATED
JOAAP, WILL COUNTY, ILLINOIS

RCRA Waste	Quantity	Information Source	RCRA Waste	Quantity	Information Source
US Army Joliet Ammo Plt Uniroyal (USEPA IL7213820460)					
D002	-	Notification	D003	-	Notification
F001	-	Notification	F003	-	Notification
K044	-	Notification	K045	-	Notification
K047	-	Notification	P120	-	Notification
U002	-	Notification	U019	-	Notification
U105	-	Notification	D002	999999.999	Part A
D003	111.99	Part A	F001	27.216	Part A
K044	830.496	Part A	K045	4.314	Part A
K047	114437.836	Part A	P120	9.07200	Part A
U002	24.129	Part A	U019	46.192	Part A
U105	0.816	Part A	-	-	-
Talley Defense Systems JAAP GP3 (USEPA ILD984774463)					
D003	-	Notification	F001	-	Notification
F003	-	Notification	-	-	-
Alliant Techsystems Inc. (USEPA IL0210090049)					
D001	-	Notification	D003	-	Notification
K044	-	Notification	K045	-	Notification

Source: database searches (refer to Section 3.0 for databases searched)

Note: Units for quantities were not specified in the database records.

D001 ignitable hazardous wastes are those wastes which have a flashpoint of less than 140 degrees Fahrenheit as determined by a pensky-martens closed cup flash point tester. another method of determining the flash point of a waste is to review the material safety data sheet, which can be obtained from the manufacturer or distributor of the material. lacquer thinner is an example of a commonly used solvent which would be considered as ignitable hazardous waste.

D002 A waste which has a pH of less than 2 or greater than 12.5 is considered to be a corrosive hazardous waste. sodium hydroxide, a caustic solution with a high pH, is often used by industries to clean or degrease parts. hydrochloric acid, a solution with a low pH, is used by many industries to clean metal parts prior to painting. when these caustic or acid solutions become contaminated and must be disposed, the waste would be a corrosive hazardous waste.

D003 A material is considered to be a reactive hazardous waste if it is normally unstable, reacts violently with water, generates toxic gases when exposed to water or corrosive materials, or if it is capable of detonation or explosion when exposed to heat or a flame. one example of such waste would by waste gunpowder.

F001 The following spent halogenated solvents used in degreasing: tetrachloroethylene, trichloroethylene, methylene chloride, 1,1,1-trichloroethane, carbon tetrachloride, and chlorinated fluorocarbons; all spent solvent mixtures/blends used in degreasing containing, before use, a total of ten percent or more (by volume) of one or more of the above halogenated solvents or those solvents listed in F002, F004, and F005, and still bottoms from the recovery of these spent solvents and spent solvent mixtures.

F003 The following spent non-halogenated solvents: xylene, acetone, ethyl acetate, ethyl benzene, ethyl ether, methyl isobutyl ketone, n-butyl alcohol, cyclohexanone, and methanol; all spent solvent mixtures/blends containing, before use, only the above spent non-halogenated solvents; and all spent solvent mixtures/blends containing, before use, one or more of the above non-halogenated solvents, and, a total of ten percent or more (by volume) of one or more of those solvents listed in F001, F002, F004, and F005, and still bottoms from the recovery of these spent solvents and spent solvent mixtures.

K044 Wastewater treatment sludges from the manufacturing and processing of explosives

K045 Spent carbon from the treatment of wastewater containing explosives

K047 Pink/red water from TNT operations

P120 Vanadium oxide V205, vanadium pentoxide

U002 Acetone (I), 2-propanone (I)

U019 Benzene (I,T)

U105 benzene, l-methyl-2,4-dinitro-, 2,4-dinitrotoluene

TABLE 2-4
RECORDS FROM ARMY COMPLIANCE TRACKING SYSTEM
JOAAP, WILL COUNTY, ILLINOIS

Record Number	Regulatory Requirement	Date of Action	Action Type	Date of Status	Enforcement Authority	Findings	Milestones
1	CWA	8/22/88	INOV	11/29/93	Federal	Inadequate drinking water standards Raise well levels	Complete project Complete modification Receive state approval Pending Resolved
3	CWA	4/9/90	INOV	6/30/90	State	Failure to submit groundwater monitoring annual report	Resolved
8	CWA	11/19/93	INOV	4/26/94	Federal	Continued non-compliance of the NPDES permit The piping was still connected to the tanks	Disconnecting piping from tanks relieving requirement to list tanks in SPCC plan Update SPCC plan Resolved
9	CWA	5/21/92	LS	9/1/93	Other	Continued non-compliance of the NPDES permit	Turned situation over to the DOA legal office Signed settlement - resolved
13	CWA	11/25/91	LS	9/1/93	Other	Violations of NPDES permit	Notice of intent to file law suit vs. JAAP Signed settlement - resolved
7	RCRA_C	12/10/91	INOV	11/29/93	State	Storing hazardous waste not specified in Part A Part A permit not submitted for new Hazerdous Waste in storage Facility operating records do not contain closure costs Facility annual report for 1988, 1989 & 1990 not available	Attend Pre-enforcement hearing for discussion of violations Resolved
10	RCRA_C	1/19/94	INOV	2/15/94	State	Emergency equipment list not up to date Failed to have date of accumulation on waste contract Hazardous waste containers not clearly marked 1991 & 1992 manifest not available for review	Letter from Illinois EPA determining JAAP returning to compliance Comply with all state requirements Resolved
2	RCRA_D	9/21/88	INOV	7/12/90	Federal	?	Joliet contacted state and this issued in error Discussed at IAG meeting of June 1989 Now Completed...Date: 3/90 on 7/12/90
5	RCRA_D	7/2/90	WL	9/26/90	State	Inadequate depth daily cover Improper handling of waste at landfills	By July 17, 1990 - sent report to state on violations Letter from Uniroyal to COR JAAP on 6 corrections Reinspection occured and found all adequated. Completed
6	SDWA	11/12/91	INOV	11/29/93	State	Water supply does not have acceptable cross-connection End of vent pipe not downturned No records to record radioactive material removed from drinking water Chlorination equipment not completely isolated	Have licensed plumer approve cross-section control program Install a reduced pressure zone backflow Downturn vent pipes Begin keeping records of radioactive materials removed from water. Isolate chlorine equipment Resolved
4	TSCA	6/10/89	INOV	9/30/90	Federal	TSCA Violation	EPA Region V notification of needed Uniroyal letter says all corrected Resolved
14	TSCA	11/3/94	INOV	12/5/94	Federal	Failure to provide quarterly inspection reports on PCB transformers Failure to provide proof that PCB transformers registered with fire department	Provide copies of inspection reports as required Provide proof that PCB transformers were registered with fire depatment Resolved

Source: ACTS01
INOV=Inst. Notice of Violation
LS=Law Suit
WL=Warning Letter

TABLE 2-5
GROUNDWATER QUALITY PARAMETERS, µg/l
JOAAP, WILL COUNTY, ILLINOIS

	Concentrations in Area			Groundwater Quality Standards		Effects on Groundwater Use	
Analyte	Maximum Glacial Till Facility-Wide Background Concentration	Maximum Dolomite Facility-Wide Background Concentration	Maximum Residential Well Concentration	Illinois Class I Standard	Federal Standard	Concentration Range That Affects Use	Effect
Antimony	7.32	7.14	Not Detected	None	6[a]		No information available
Calcium	158,000	150,000	101,000	None	None	25,000-50,000	Principle cause of hardness, boiler scale, and deposits in hot water heaters. Inhibits sudsing.
Iron	634	532	4,590	5,000	300 [b]	>300	Stains laundry and fixtures. More than 100 µg/l precipitates upon exposure to air; causes turbidity and imparts objectionable taste and color to foods and drinks. Is objectionable in many industrial processes.
Magnesium	104,000	74,000	50,100	None	None	25,000-50,000	Principle cause of hardness, boiler scale, and deposits in hot water heaters. High concentration have a laxative effect.
Manganese	198	13.1	89.1	150	50 [b]	>50	Stains laundry and fixtures. More than 200 µg/l precipitates upon oxidation; causes undesirable tastes, deposits on food during cooking, fosters growth in filters and water lines. Is objectionable in many industrial processes.
Sodium	71,500	81,000	394,000	None	2,000 [c]	69,000 (irrigation) 20,000-170,000 (health)	May affect persons with certain medical conditions. In combination with calcium and magnesium may be detrimental to certain irrigated crops.
Water-soluble nitrate/nitrite	178	360,000	1,900	10,000	10,000 [c]		Water with more than 100,000 µg/l is bitter tasting and may cause physiological distress. Water from shallow wells containing more than 45, 000 µg/l has been reported to cause methemoglobinemia in infants.
Water-soluble sulfate	15,000,000	8,300,000	211,000	400,000	50,000 [b]	300,000-400,000 (taste) 600,000-1,000,000 (laxative)	Gives water a bitter taste, has a laxative effect at higher concentrations. Forms hard scale in combination with calcium.

Note: Shading indicates analytes that exceeded Illinois Class I or Federal groundwater standards and/or contribute to non-potability of groundwater.

Source: DAMO08

[a] Maximum Contaminant Level

[b] Secondary Maximum Contaminant Level

[c] Drinking Water Equivalent Level

TABLE 2-6
SUMMARY OF ANALYTES DETECTED AT ELEVATED LEVELS IN SHALLOW GROUNDWATER
JOAAP, WILL COUNTY, ILLINOIS

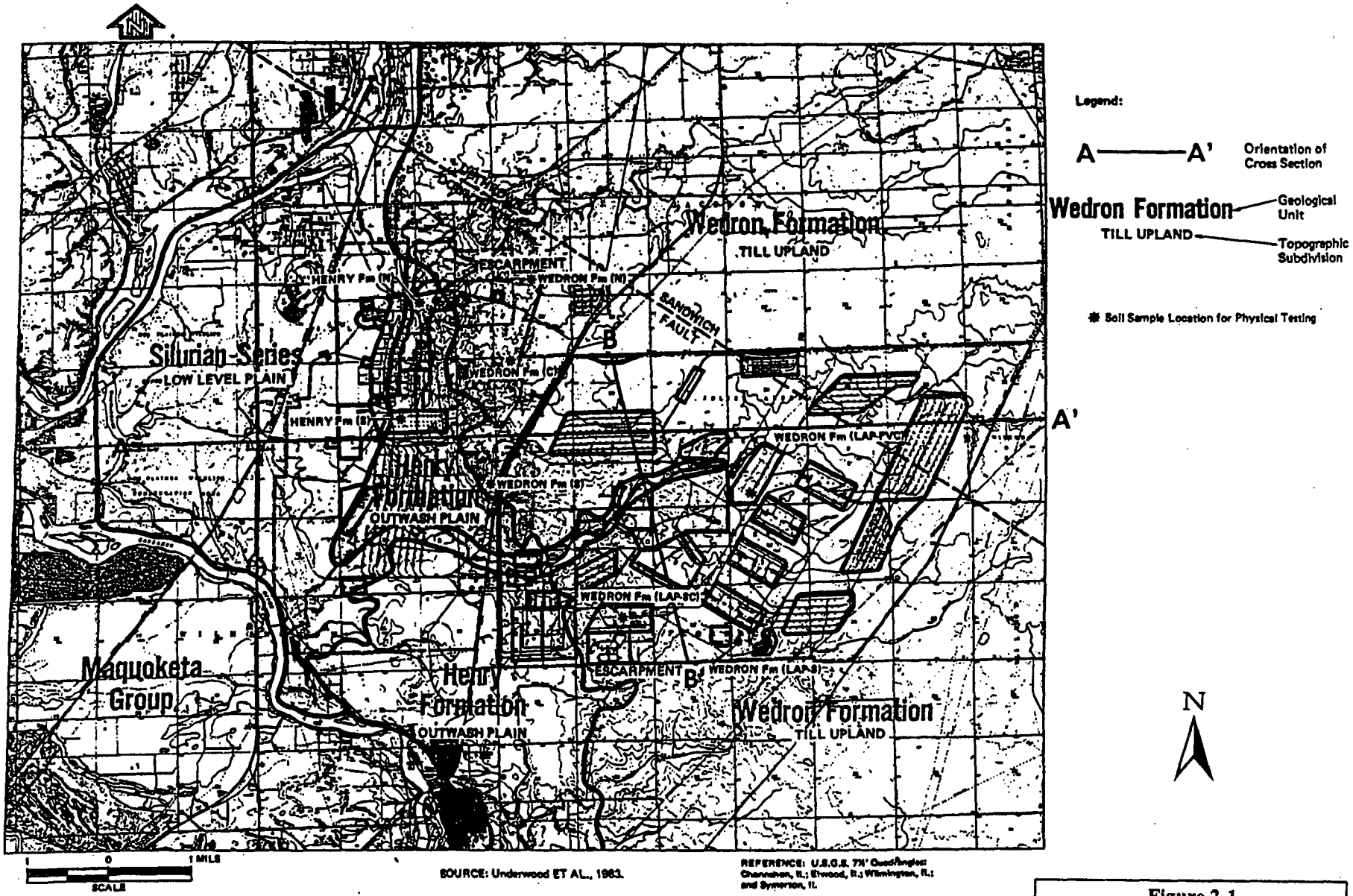
Study Area	Analyte	Maximum Value (µg/l)
M1	Antimony	31
	Magnesium	252,000
	Silver	200
	Sodium	15,000,000
	Sulfate	24,000,000
	Total Phosphorous	200
M2	Sulfate	1,600,000
M3	1,1-Dichloroethane	3.87
	1,2-Dichloroethene	0.932
	Benzene	15.8
	Toluene	392
	Benzyl alcohol	3.6
	2-Methylphenol	15.5
	4-Methylphenol	10.8
M5	1,3,5-Trinitrobenzene	1.91
	2,4,6-TNT	16.7
	2,4-DNT	0.136
	2,6-DNT	5.35
	Tetryl	67
M6		
North Plume	1,3,5-Trinitrobenzene	240
	1,3-Dinitrobenzene	8.76
	2,4,6-TNT	2,600
	2,4-DNT	3,200
	2,6-DNT	2,700
	2-Nitrotoluene	21,000
	RDX	52.7
	Tetryl	34.5
	Nitrobenzene	81.8
	Nitrate/nitrite	35,000
Middle Plume	2,4-DNT	0.701
	2,6-DNT	0.456
South Plume	2,4,6-TNT	21.6
	2,4-DNT	25
	2,6-DNT	38
	2-Nitrotoluene	5.75
	RDX	1.09
	Nitrobenzene	11.4
M7	2,4-DNT	2.05
	2,6-DNT	1.11
	RDX	21.3
	1,1,1-Trichloroethane	4.95
	1,1-Dichloroethene	1.93
	1,2-Dichloroethene	0.641
	Tetrachloroethylene	3.96
	Nitrate/nitrite	2,200
	Sulfate	1,100,000
M8	1,1,1-Trichloroethane	50
	1,1-Dichloroethane	27.5
	Nitrate/nitrite	500
M10		
West Tank Farm	Benzene	20
	Ethylbenzene	286
	Toluene	19,600
	Xylenes	4,720
East Tank Farm	Benzene	2
	Ethylbenzene	3
	Tolueene	20,000
	Xylenes	500
M11	Magnesium	290,000
	Nitrate/nitrite	1,700
	Sulfate	2,100,000
M12	Sulfate	680,000
M13	Nitrate/nitrite	1,100

Source: DAMO08

TABLE 2-6
SUMMARY OF ANALYTES DETECTED AT ELEVATED LEVELS IN SHALLOW GROUNDWATER
JOAAP, WILL COUNTY, ILLINOIS

Study Area	Analyte	Maximum Value (µg/l)
L1	1,3,5-Trinitrobenzene	1,610
	2,4,6-TNT	2,250
	2,4-DNT	2.01
	2,6-DNT	8.54
	1,3-Dinitrobenzene	5
	Tetryl	58.6
	RDX	56.5
	HMX	43.8
	Nitrate/nitrite	80,800
L2		
Burning Pad	HMX	110
	RDX	640
South Oil Pit	1,2-Dichloroethane	1.81
	Alumnium	651
	Iron	1,080
	Nitrate/nitrite	1,200
L3		
Burning Cage	RDX	22.2
	HMX	2.94
	Nitrate/nitrite	440
Bermed Area	RDX	77.9
	HMX	10.6
	Nitrate/nitrite	1,900
	Lead	9.33
L4	1,1,1-Trichloroethane	0.713
	1,1,2-Trichloroethane	1.5
	1,2-Dichloroethane	4.87
L5	1,1-Dichloroethane	2.34
	Alumnium	233
	Antimony	6.74
	Manganese	622
L6	Chlorobenzene	1.92
	Benzyl alcohol	1.28
	Butylbenzyl phthalate	6.32
	Arsenic	13.4
L7	Nitrate/nitrite	820
	Sulfate	750,000
L8	Nitrate/nitrite	1,100
	Manganese	347
	Silver	3.74
L10	1,3-Dinitortoluene	1.57
	RDX	2.27
	1,2-Dichloroethane	2.52
	Nitrate/nitrite	430
	Phosphate	5,000
	Iron	5,430
	Lead	4.77
	Manganese	2,260
	Zinc	877
L14	2,4,6-TNT	1.15
	Nitrobenzene	1.08
	HMX	130
	RDX	840
L18 & L19	Nitrate	15,300
	Chromium	14.6
	Manganese	439

Source: DAMO08



Source: Dames & Moore

Figure 2-1
Topographic & Geologic Map

Joliet Army Ammunition Plant
Will County, Illinois

Plexus Scientific Corporation

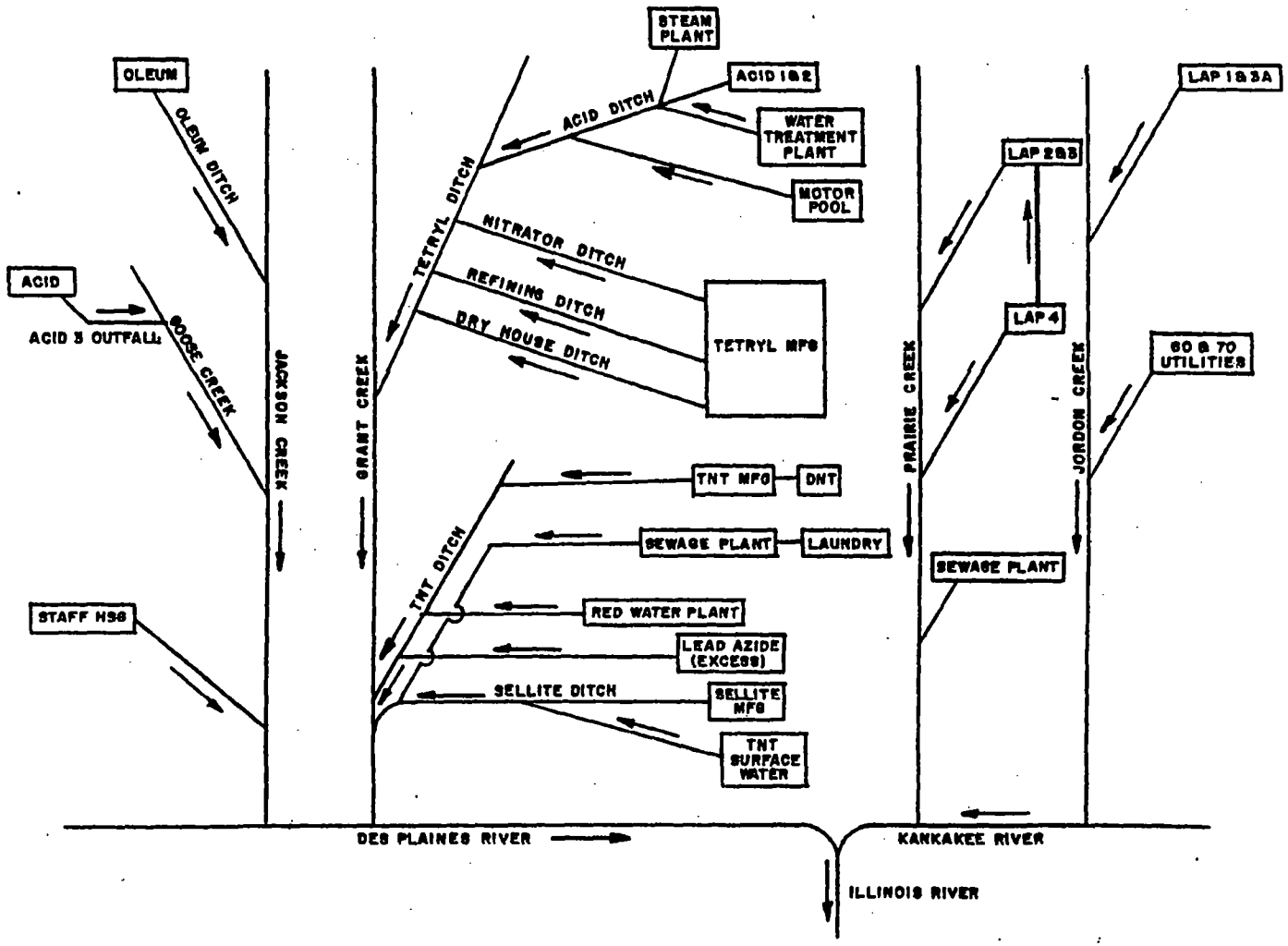
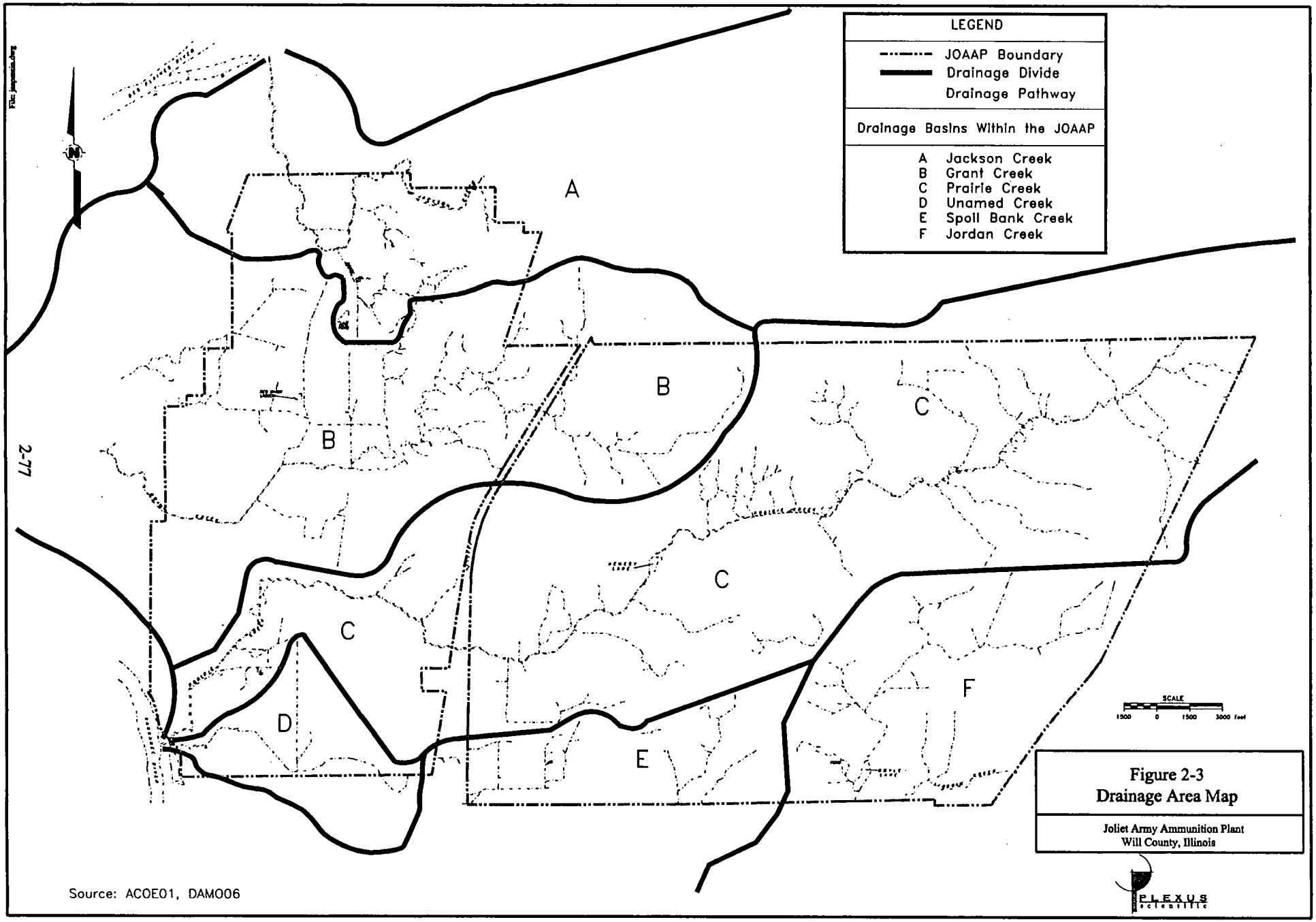


Figure 2-2
Schematic of Wastewater and the System of Receiving Streams

Joliet Army Am[illegible]ition Plant
Will Coun[illegible]ois

Plexus Scientific [illegible]orporation

[illegible]MY01



Source: ACOE01, DAMO06

Figure 2-3
Drainage Area Map

Joliet Army Ammunition Plant
Will County, Illinois

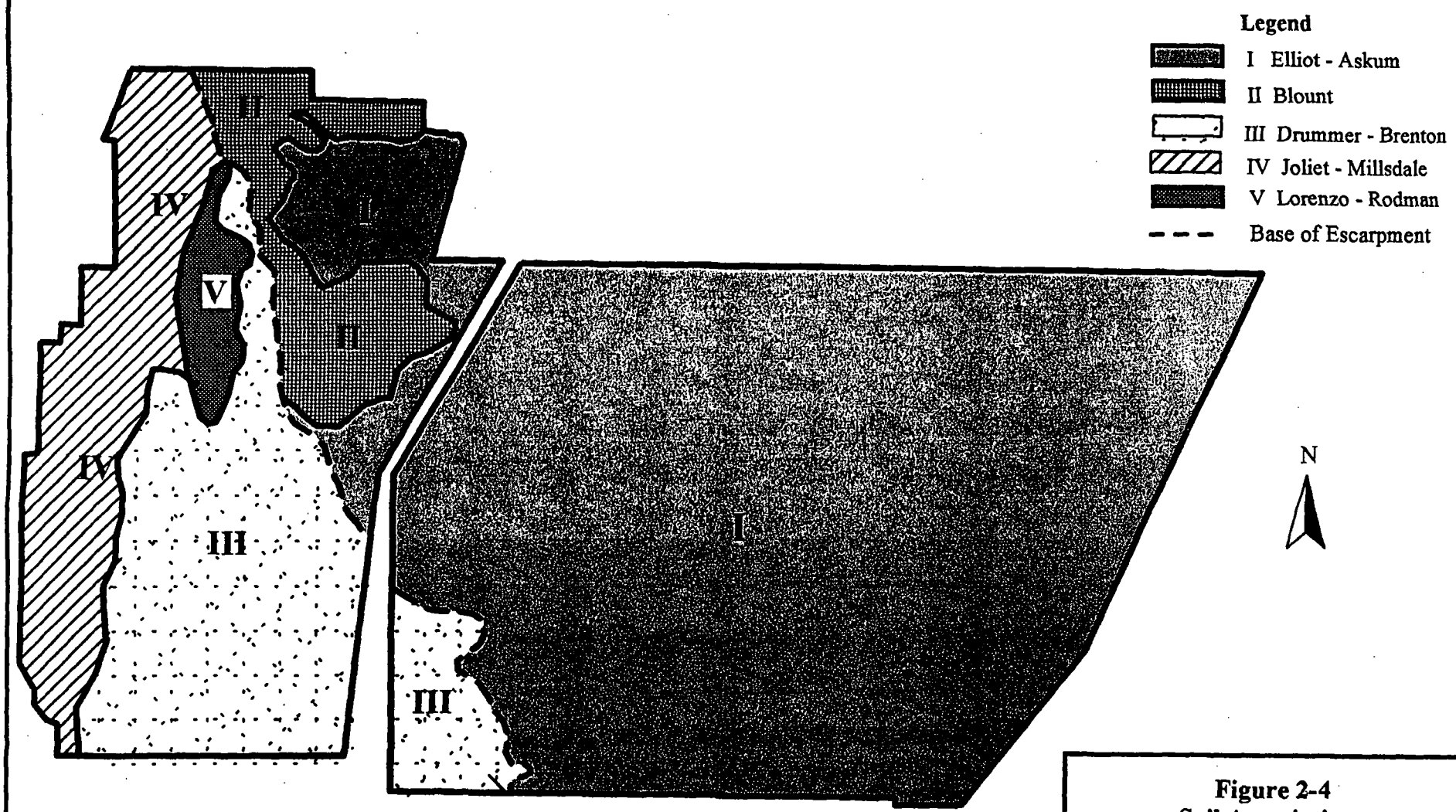


Figure 2-4
Soil Associations

Joliet Army Ammunition Plant
Will County, Illinois

Source: Dames & Moore

Plexus Scientific Corporation

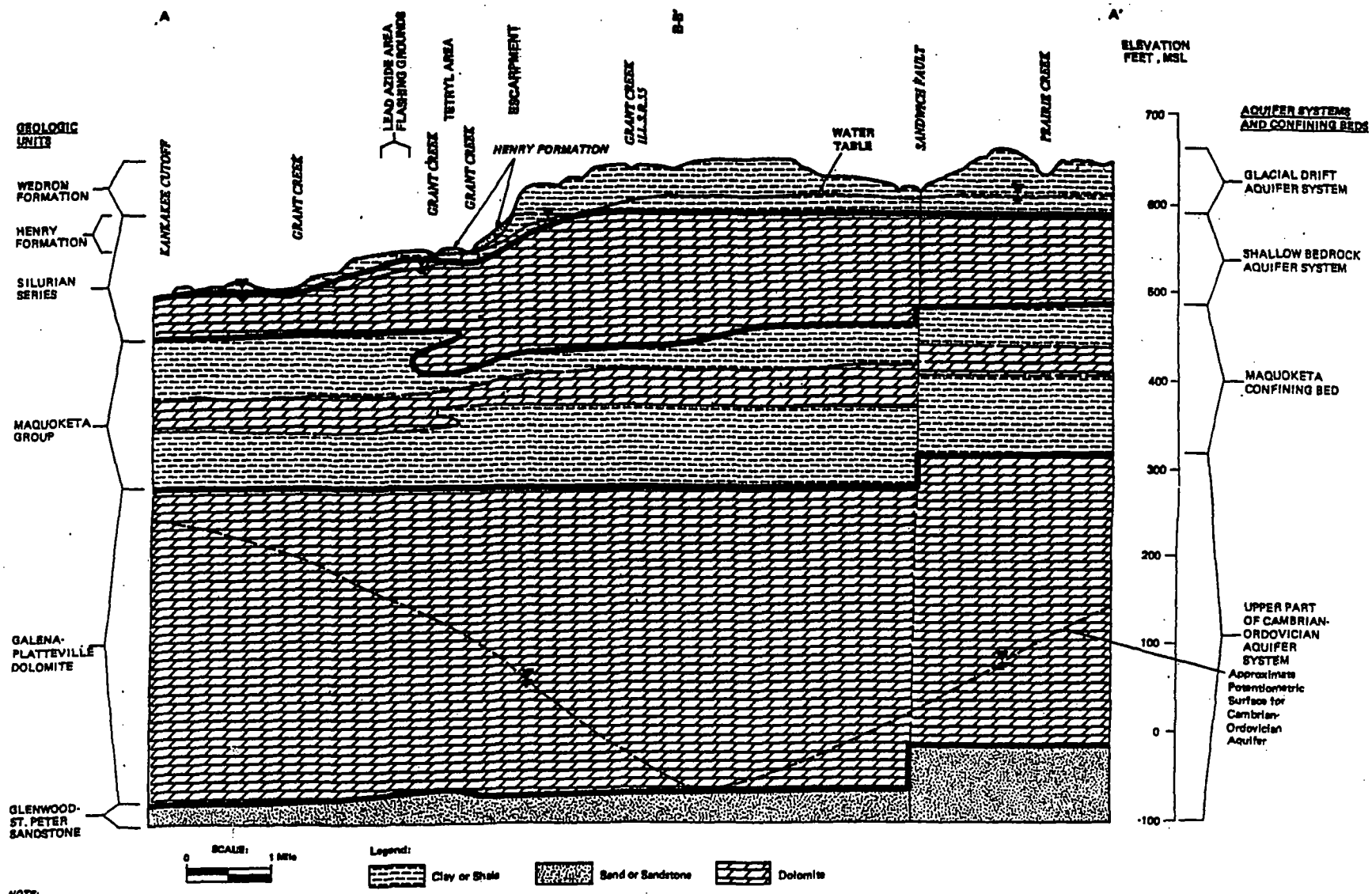
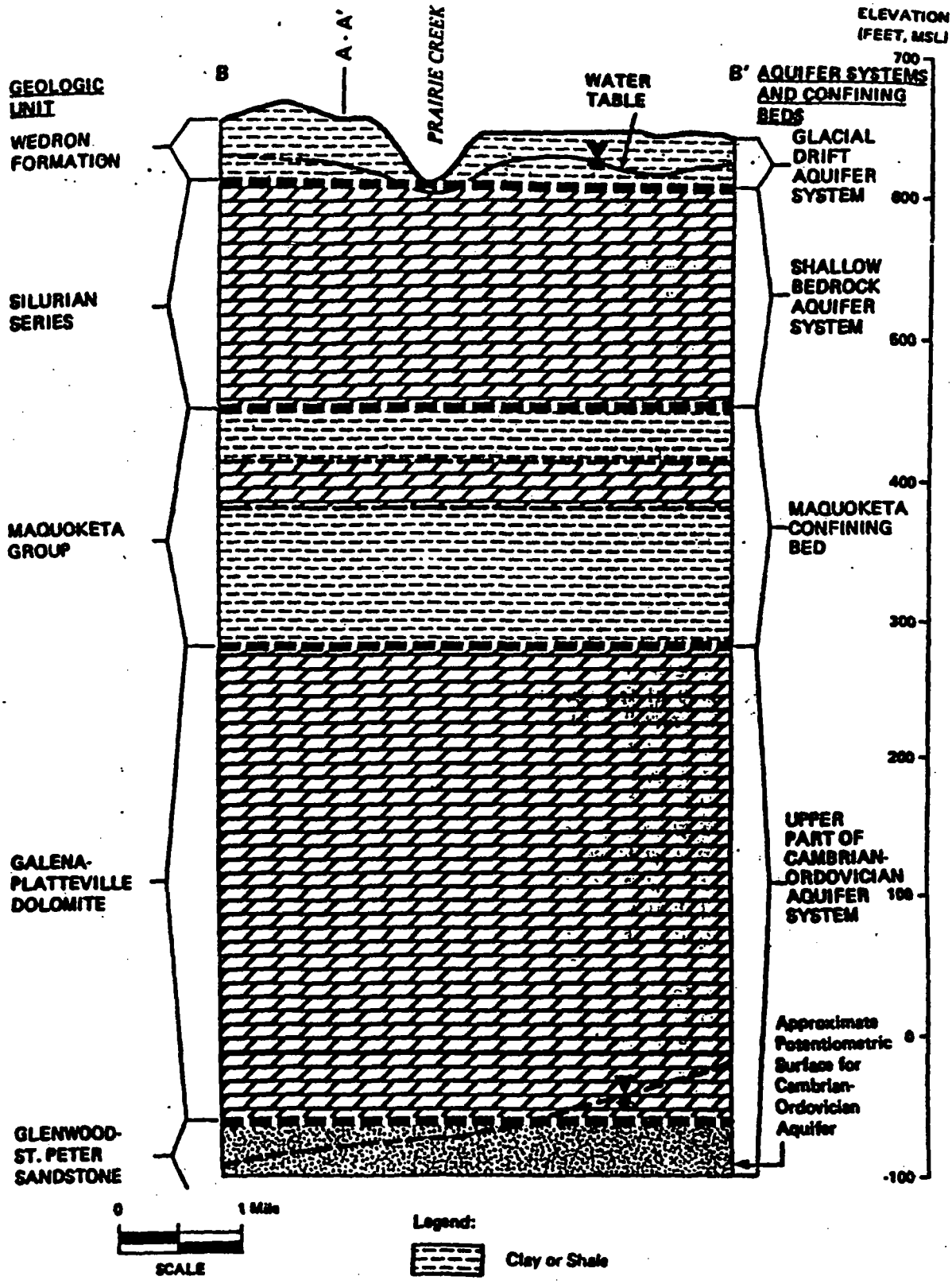


Figure 2-5
Geologic Cross-Section A-A'

Joliet Army Ammunition Plant
Will County, Illinois

Source: Dames & Moore

Plexus Scientific Corporation



NOTE:

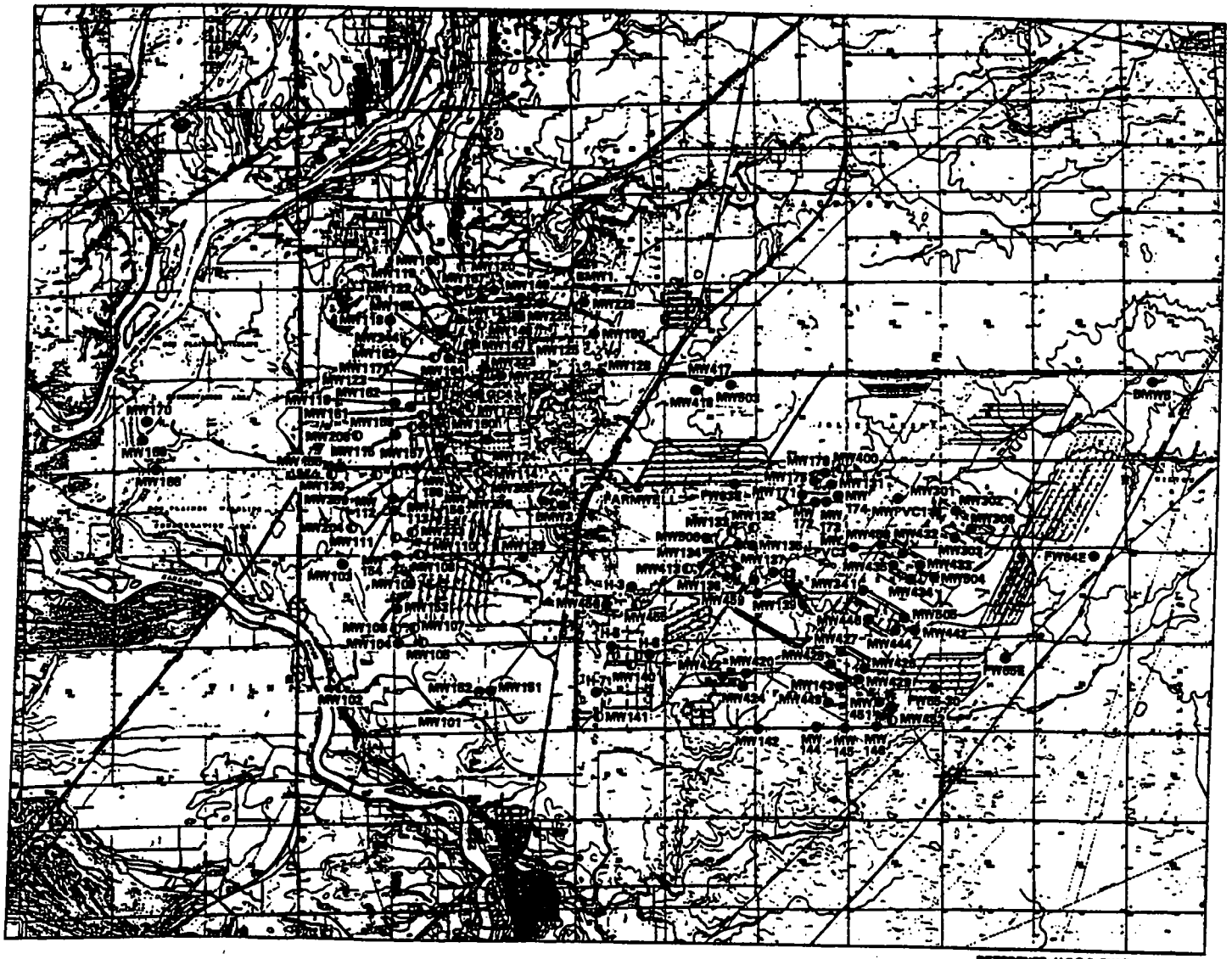
Cross-section prepared by reference to well logs available from the Illinois State Water Survey, Illinois State Geological Survey. Information contained in various references and data collected by Dames & Moore.

Source: Dames & Moore

Figure 2-6
Geologic Cross-Section B-B'

Joliet Army Ammunition Plant
Will County, Illinois

Plexus Scientific Corporation



REFERENCE: U.S.G.S. 7½' Quadrangles: Channahon, Ill.; Elwood, Ill.; Wilmington, Ill.; and Symerton, Ill.

Legend

MW101 Well Number

- Well Screened in Glacial Till
- Well Screened in Shallow Bedrock only
- Well Screened in Both Soil and Shallow Bedrock

N

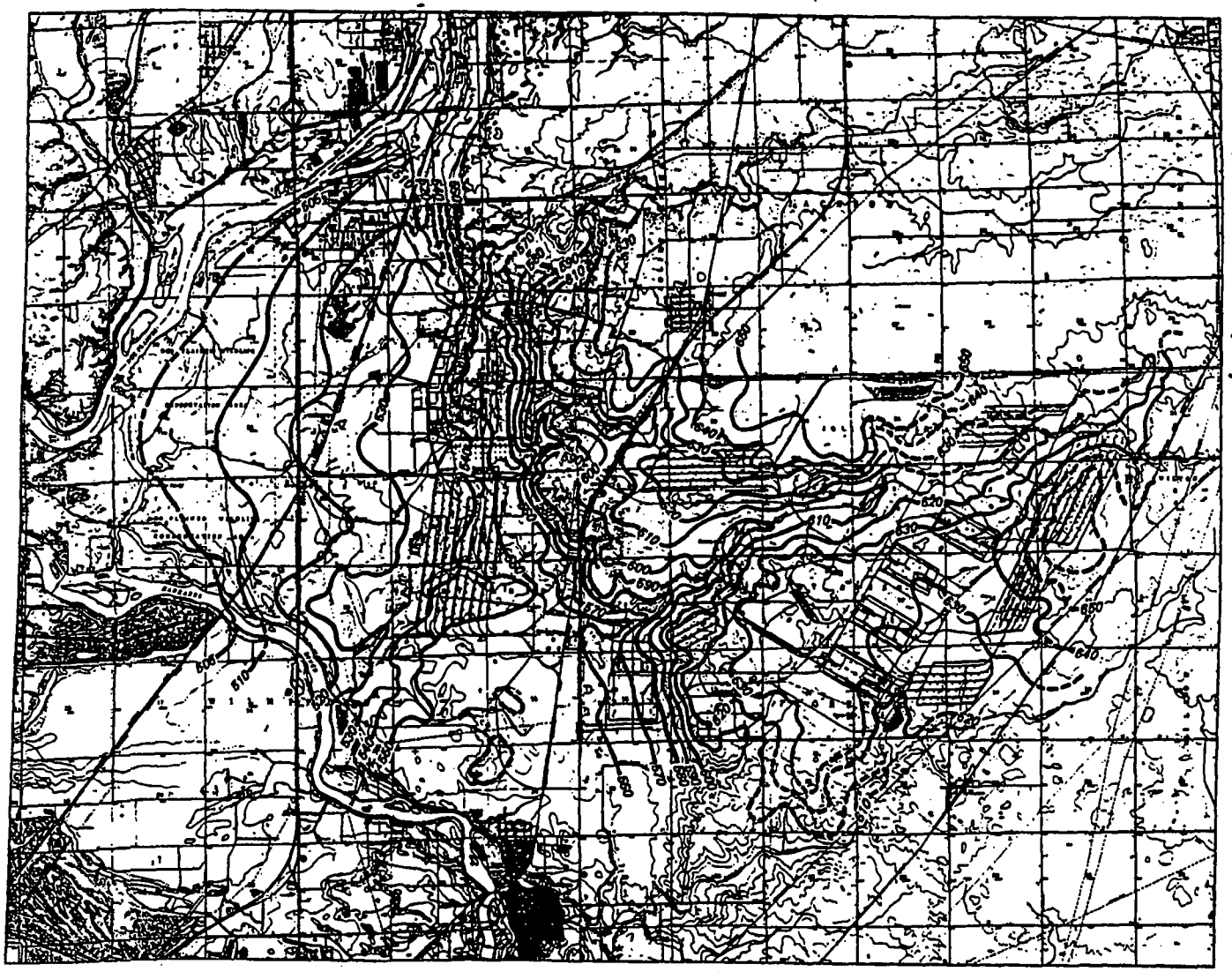
1 0 1 Mile
SCALE

Figure 2-7
Locations of Monitoring Wells Used for Preparation of Water Table Map

Joliet Army Ammunition Plant
Will County, Illinois

Plexus Scientific Corporation

Source: Dames & Moore



LEGEND:

605 — Groundwater elevation contour; dashed where inferred

630 — Contour

Groundwater contour interval 10 Feet

Elevation referenced to sea level.

Water levels measured November 18 and 19, 1991.

N

REFERENCE: U.S.G.S. 7½' Quadrangles: Channahon, Il.; Elwood, Il.; Wilmington, Il.; and Symerton, Il.

1 0 1 Mile
SCALE

Figure 2-8
Water Table Contour Map

Joliet Army Ammunition Plant
Will County, Illinois

Plexus Scientific Corporation

S[illegible]s & Moore

3. SCREENING METHOD

This PAS report identifies site contamination, including the type and quantity of hazardous substances, and the period of time over which storage, release, or disposal of such hazardous substances took place on the USDA parcel covered by this report, to the extent such information was available from existing records. It also describes areas of environmental concern. Methods employed during conduct of this PAS are outlined in this section.

3.1 Approach

3.1.1 Development of Study Sections

To facilitate data collection, management, and retrieval, JOAAP was divided into 97 study sections (Table 3–1 and Figure 3–1). Site information was collected and is referenced by study section. Section development was based on the following considerations:

- Boundaries had to be readily identifiable in the field.
- Boundaries had to correspond closely with future property transfers.
- Boundaries had to be of a manageable size for survey.
- All the JOAAP property had to be encompassed by a study section.
- No land area could fall into more than one section.
- Sections had to correspond with existing IRP study areas.

Therefore, section boundaries were generally designated at the center of roads or, streams, along fences, and along township section lines. In the field, it was found that many roads chosen for study boundaries on the LAP Area no longer exist. Generally, however, the location of these former roads was easily discernible from tree lines. An accurate land survey of the study areas has not been performed.

The previously identified IRP study areas and their names have been retained. PAS study sections are labeled by an initial letter—L for sections in the LAP Area and M for those in the MFG Area—and a two- or three-digit number. Sections in the LAP Area are labeled L100 to L122; sections in the MFG Area, M99 to M119. All IRP study area designations consist of a letter followed by either one or two digits. Thus, a letter followed by three digits is a non-IRP/CERCLA parcel.

Following completion of the field work for the report on the *Initial Land Transfer to USDA PAS*, several of the IRP area boundaries were redrawn and thus the areas made smaller. This left several sites within transfer-eligible parcels that had not been included in a site reconnaissance. The redrawing resulted in the addition of property to Sections L21, L110, M4, M105, and M108. Accordingly, portions of four of those sections—i.e., L21, L110, M105 and M108—that were not covered in the initial report are addressed in this report. For clarity, all of the property within the redrawn sections is included in this report. However, only those buildings not addressed in the initial report are addressed in this report. For example, the only portion of M108 not previously addressed is the property between sections M2, M3, and M11. As no buildings lie within this area, only information relating to the property is addressed in this report. All findings relating to the land (i.e., transformer locations) are included in the report.

3.1.2 Records Search

A search of readily available records was conducted to identify documentation of potential environmental concerns relating to the USDA2 parcel or to nearby properties whose conditions could impact the USDA2 parcel. That search focused on a review of files and records at USAEC, Aberdeen Proving Ground, Maryland; files in storage at JOAAP in Buildings 61-7, 703-5, and 74-3; and records at the National Archives in College Park, Maryland. Additional records were obtained from the IOC historian in Rock Island, and from the IOC Explosive Safety Office. Records, files, maps, and other documents reviewed in detail are cited in the Bibliography (Section 6). It is assumed that all the documents obtained from government sources contain accurate information.

In accordance with *Standard Practice for Environmental Site Assessments* (E–1527–94) of the American Society for Testing and Materials (ASTM), a search was conducted of reasonably ascertainable government records on the excess parcel within the ASTM specified radii. Table 3–2 lists the state and federal databases searched, and Table 3–3, nearby facilities found in the databases searched.

3.1.3 Aerial Photograph Analysis

A 1986 report prepared by the USEPA Environmental Photographic Interpretation Center (EPIC) presents the findings of a review of aerial photographs of JOAAP from 1939, 1946, 1952, 1954, 1961, 1967, 1973, 1974, 1978, and 1979. In its study, EPIC identified 24 areas of concern at the site (BICO01). These areas became IR study areas, and the findings of the EPIC review were used to target IRP areas of investigation. The EPIC findings were also incorporated into the PAS.

3.1.4 Interviews and Agricultural Lessee Questionnaires

Several informal interviews of past and current JOAAP employees were conducted. These interviews concerned specific areas of interest identified from the site reconnaissance and records review.

Moreover, to expand on the site reconnaissance, questionnaires were mailed to all current agricultural leaseholders at JOAAP. (Approximately 16,700 acres of land at JOAAP are under agricultural leases for crops and grazing.) The questionnaire elicited information on any unusual conditions and lessee environmental concerns. A facsimile of the questionnaire form is presented as Appendix A.

3.1.5 Site Reconnaissance

A limited site reconnaissance involving a driving tour of the facility and its perimeter, as well as random survey by vehicle and on foot through each section of the property, was conducted to field-verify information found in the document review and to identify potential environmental concerns. Within the USDA2 parcel, 136 buildings were visually inspected (Table 3–4). These buildings were selected as a representative sample from groups of similar buildings. Buildings currently in use by Alliant Techsystems, Inc., were generally not

surveyed, as conditions within the buildings are expected to change. The areas occupied by Alliant will be inspected prior to return of the facilities to the government, and a revision of the PAS will be generated at that time. Specific findings of the site reconnaissance may be found in Appendices B, C, and D.

During the site reconnaissance, coordinates for the buildings surveyed and environmental findings were collected. A Trimble Scoutmaster global positioning system (GPS) unit was used to determine coordinates. The unit is accurate to approximately 25 meters.

A reconnaissance of the base perimeter was conducted to evaluate adjacent property uses that could contribute to environmental contamination detected on-site. Typical of such uses are dry cleaners, gas stations, and industrial plants. The findings of the perimeter survey are presented in Section 4.1.21.

3.1.6 Historical Land Use Analysis

An analysis of historical land use patterns was conducted to identify those uses that may have resulted in, or contributed to, environmental contamination or other environmental concerns. The analysis involved informal interviews and a review of site plans, historical documents, and aerial photographs. Historical analysis revealed that a number of structures have been demolished. All available information on demolished buildings is included in Appendix D.

3.2 Data Management

Environmental concerns at JOAAP were evaluated facility-wide, and findings were compiled in an electronic database. Database-derived profiles on each study section and building in the proposed landfill parcel are presented as Appendixes B and C. These profiles will prove useful in determining the environmental consequences of converting the property to a landfill.

Environmental concerns identified during the PAS are defined in terms of their potential for environmental contamination in Section 4. Further definition of these concerns is provided in Appendixes B, C, and D.

TABLE 3-1
SURVEY SECTION FUTURE OWNERS
JOAAP, WILL COUNTY, ILLINOIS

Section	Section Description	Future Owner		
		USDA (Tallgrass Prairie)	State of Illinois (Industrial Parks)	Will County (Landfill)
L1	Group 61	•		
L2	Explosive Burning Ground	•		
L3	Demolition Area	•		
L4	Landfill Area	•		
L5	Salvage Yard	•		
L6	Group 70		•	•
L7	Group 1	•		
L8	Group 2	•		
L9	Group 3	•		
L10	Group 3A	•		
L11	Test Site		•	
L12	Doyle Lake Area	•		
L13	Group 68	•		
L14	Group 4	•	•	
L15	Group 5	•	•	
L16	Group 6		•	
L17	Group 7		•	
L18	Group 8	•		
L19	Group 9	•		
L20	Group 20	•		
L21	Group 23	•		
L22	Group 25	•		
L23	Group 27	•		
L24	Group 29	•		
L25	Group 62	•		
L26	Group 63	•		
L27	Group 64	•		
L28	Group 65	•		
L29	Group 66	•		
L30	Group 66A	•		
L31	Extraction Pits	•		
L32	Group 60		•	
L33	PVC Area	•		
L34	Former Burning Area	•		
L35	Fill Area	•		
L100	PAS Survey Section L100	•		
L101	PAS Survey Section L101	•		
L102	PAS Survey Section L102	•		
L103	PAS Survey Section L103	•		
L104	PAS Survey Section L104	•		

TABLE 3-1
SURVEY SECTION FUTURE OWNERS
JOAAP, WILL COUNTY, ILLINOIS

Section	Section Description	Future Owner		
		USDA (Tallgrass Prairie)	State of Illinois (Industrial Parks)	Will County (Landfill)
L105	PAS Survey Section L105	•		
L106	PAS Survey Section L106	•		
L107	PAS Survey Section L107	•		
L108	PAS Survey Section L108	•		
L109	PAS Survey Section L109	•		
L110	PAS Survey Section L110	•		
L111	PAS Survey Section L111	•		
L112	PAS Survey Section L112	•		
L113	PAS Survey Section L113	•		
L114	PAS Survey Section L114			•
L115	PAS Survey Section L115		•	
L116	PAS Survey Section L116	•		
L117	PAS Survey Section L117	•		
L118	PAS Survey Section L118	•		
L119	PAS Survey Section L119	•		
L120	PAS Survey Section L120	•		
L121	PAS Survey Section L121	•		
L122	PAS Survey Section L122		•	
L999	Orphan LAP area Buildings			
M1	Southern Ash Pile	•		
M2	Explosive Burning Ground	•		
M3	Flashing Grounds	•		
M4	Lead Azide Area	•		
M5	Tetryl Production Area	•	•	
M6	TNT Ditch Complex		•	
M6A	TNT Blocking Area	•		
M7	Red Water Area		•	
M8	Acid Manufacturing Area		•	
M9	Northern Ash Pile		•	
M10	Toluene Tank Farms	•	•	
M11	Landfill	•		
M12	Sellite Manufacturing Area	•		
M13	Gravel Pits		•	
M14	Former Pond Area	•		
M15	Sewage Treatment Plant	•		
M16	Motor Pool Area		•	
M17	Laundry Facility		•	
M18	Herbicide Storage Area		•	
M99	TNT Block Area (M6A)	•		
M100	PAS Survey Section M100	•		

TABLE 3-1
SURVEY SECTION FUTURE OWNERS
JOAAP, WILL COUNTY, ILLINOIS

Section	Section Description	Future Owner		
		USDA (Tallgrass Prairie)	State of Illinois (Industrial Parks)	Will County (Landfill)
M101	PAS Survey Section M101	•		
M102	PAS Survey Section M102	•		
M103	PAS Survey Section M103		•	
M104	PAS Survey Section M104		•	
M105	PAS Survey Section M105	•		
M106	PAS Survey Section M106	•		
M107	PAS Survey Section M107	•		
M108	PAS Survey Section M108	•		
M109	PAS Survey Section M109	•		
M110	PAS Survey Section M110	•		
M111	PAS Survey Section M111	•		
M112	PAS Survey Section M112	•		
M113	PAS Survey Section M113	•		
M114	PAS Survey Section M114	•		
M115	PAS Survey Section M115		•	
M116	North Pump Station		•	
M117	South Pump Station		•	
M118	Grant Creek Corridor	•		
M119	Grant Creek Corridor	•		
M999	Orphan MFG area Buildings			

Note: Sections L999 and M999 contain buildings at JOAAP for which the physical locations are not known other than what can be surmised from the numbering system. Section L6 will be divided between USDA and Will County. Sections L14, L15, and M5 will be divided between USDA and State of Illinois. Shaded sections are those covered by this report. Portions of L14, L15, L21, L110, M5, M10, M105, and M108 are presented in other reports.

TABLE 3-2
DATABASES SEARCHED
JOAAP, WILL COUNTY, ILLINOIS

Database	Date of Government Version
STATE/LOCAL	
IEPA Leaking Underground Storage Tank Incident Reports	6/1/95
IEPA State Hazardous Waste Sites	6/1/95
IEPA Solid Waste Landfills Subject to State Surcharge	6/30/94
Illinois State Fire Marshal underground storage tank facility list	8/7/95
Northeastern Illinois Planning Commission - Solid Waste Landfill Inventory	8/1/88
FEDERAL	
Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS)	6/30/95
Emergency Response Notification System (ERNS)	12/31/94
National Priority List	9/1/95
Resource Conservation and Recovery Information System (RCRIS)	5/31/95
Superfund Consent Decrees	varies
Corrective Action Reports (CORRACTS)	4/10/95
Facility Index System (FINDS)	7/27/94
Hazardous Materials Information Reporting System (HMIRS)	12/31/94
Materials Licensing Tracking System (nuclear materials)	8/1/95
National Priorities List Liens	10/15/91
PCB Activity Data Base System (PADS)	10/14/94
RCRA Administrative Action Tracking System (RAATS)	4/17/95
Superfund Records of Decision (ROD)	3/31/95
Toxic Chemical Release Inventory System (TRIS)	12/31/92
Toxic Substances and Control Act (Manufacturers and importers)	1/31/95
OTHER	
Former Manufactured Gas Sites	--
Federal Reporting Data System (public water supplies)	--
USGS Water Wells	--

TABLE 3-3
DATABASE RECORDS REGARDING NEARBY FACILITIES
JOAAP, WILL COUNTY, ILLINOIS

Site Name	Site Address	Zip code	Database(s)	Facility ID
Channahon				
NORTHERN ILLINOIS GAS CO	REXALL RT 66	60410	FINDS	
PITMAN MOORE INC	YOUNG RD	60410	RCRIS-SQG, FINDS	
Elwood				
ILDOT BRG NO 048 0053	TR 253 OVER I74	60421	FINDS, RCRIS-LQG	
ILDOT BRG NO 072 0032	IL 78 OVER I74	60421	FINDS. RCRIS-LQG	
ILDOT BRG NO 048 0035	CO HWY 18 OVER I74	60421	FINDS, RCRIS-LQG	
ILDOT BRG NO 048 0058 0055	174 OVER FRENCH CREEK	60421	FINDS, RCRIS-LQG	
UNIROYAL CHEMICAL CO INC	RT 53 & HOF RD	60421	FINDS	
TYLER JAMES & SONS ELEVATOR INC	RT 53 S 3MI	60421	FINDS	
ELWOOD STP	MISSISSIPPI ST PO BOX 435	60421	FINDS	
IL BELL TEL CO ELWOOD C D O	N SI MISS BETW PARK & MADISON	60421	FINDS, RCRIS-LQG	
Joliet				
PATTERSON RD I MILE WEST BRANDON RD			ERNS	
SOUTH MADISON AND BEACH STREET			ERNS	
JOLIET REFINERY I-55 AND ARSENAL ROAD			ERNS	
MOBIL OIL			ERNS	
MOBILE OIL CO I-55 ARSENAL RD			ERNS	
ILLINOIS RIVER MOBILE OIL DOCK			ERNS	
JOLIET REFINERY I-55 AND ARSENAL ROAD			ERNS	
JOLIET REFINERY I-55 AND ARSENAL ROAD			ERNS	
MOBIL DOCK			ERNS	
JOUET REFINERY I-55 AND ARSENAL ROAD			ERNS	
1415 LANGFIELD RD			ERNS	
JOLIET REFINERY I-55 AND ARSENAL ROAD			ERNS	
	I-55 & ARSENAL		HMIRS	
	I-55 & ARSENAL RD		HMIRS	
MOBIL JOLIET REFINING	I 55 & SMITH BRIDGE	60434	FINDS	
UNION CARBIDE CORP PLT 767	I 55 AND ARSENAL RD	60434	RCRIS-SQG, FINDS	

TABLE 3-3
DATABASE RECORDS REGARDING NEARBY FACILITIES
JOAAP, WILL COUNTY, ILLINOIS

Site Name	Site Address	Zip code	Database(s)	Facility ID
	300 W ALLEN ST		UST	2-016158
	1500 AMHERST CT		UST	2-013112
AT THE PLANT REFINERY	I-55 AND ARSENAL ROAD		ERNS	
	I-55 AND ARSENAL RD/ E. FRONT		HMIRS	
UNIROYAL, INC.	ATT: R. MILLER, PLANT MANAGER	60434	TSCA	
JACKSON CREEK METERING STATION	1 MI E OF IH 55 ON ARSENAL RD	60434	RCRIS-SQG	
	300 EARL ROAD		HMIRS	
ILLINOIS CANAL	OUTFALL AT PLANT		ERNS	
	UNKNOWN		UST	2-029413
Wilmington				
AMOCO FERTILIZER PLANT	RR 3	60481	RCRIS-SQG, FINDS	
SMITH OIL CO.	RT. 53 / WEST RIVER RD.	60481	LUST	901106
CAVANAUGH, FRANCIS	200 BALTIMORE ST.	60481	LUST	903271
CELOTEX CORP	CANAL & WATER STS	60481	FINDS	
MIDWESTERN GAS TRANSMISSION CO	FIRST ST IBLK FROM IL 53	60481	RCRIS-SQG, FINDS	
ILL BELL TEL CO WILMINGTON C D	N OF JACKSON E OF MAIN	60481	FINDS, RCRIS-LQG	
COMMUNITY OLDS PONTIAC	W RIVER RD S RTE 53	60481	RCRIS-SQG, FINDS	

TABLE 3-4
BUILDINGS SURVEYED
SECOND USDA REPORT
JOAAP, WILL COUNTY, ILLINOIS

Section Number	Building Number		Section Number	Building Number	
L1	61-2	61-9	L10	3A-2A	3A-43
	61-3	61-25		3A-7B	3A-44
	61-4	61-35		3A-12	3A-46
	61-5	61-38	L14	4-4	
L2	23-26	23-35	L15	None	
	23-27	23-40	L18	8-1	8-10
	23-29A			8-4	8-12
L3	23-31	23-39		8-5	8-13
	23-33			8-6	8-14
L4	None		L19	9-2B	9-12A
L5	26-1	26-5		9-2D	9-12D
	26-2	26-7		9-3A	9-12E
	26-3	26-8		9-3B	9-12F
	26-4	26-9		9-4	9-14
L7	1-3	1-14		9-5	9-15
	1-3A	1-15		9-6	9-16
	1-4	1-16		9-7	9-20B
	1-5A	1-17		9-8	9-21
	1-6	1-24		9-9	9-33
	1-7	1-31		9-10	9-35
	1-10	1-38C		9-11	
	1-11	1-38-D	L21*	None	
	1-12	1-38-F	L33	41-4	
	1-13	1-40C	L34	None	
L8	2-1	2-24	L110*	None	
	2-2	2-33	M1	None	
	2-3	2-38A	M2	None	
	2-3A	2-38C	M3	None	
	2-4	2-38C-1	M4	TS1242	TS1245
	2-5B	2-38D		TS1243	
	2-6	2-40B	M5*	None	
	2-18F	2-43	M10	None	
	2-20A		M11	None	
L9	3-A	3-38E-1	M12	307	307-1
	3-1	3-38F	M14	None	
	3-3	3-38F-1	M15	505-3	706-1
	3-3A	3-45		505-3-1	
	3-16	3-62	M6A	None	
	3-37	3-63	M105*	706-14	739-1
	3-38B	3-64		715-10	814
	3-38B-1	3-65	M108*	None	
	3-38C	3-67	M118	None	
	3-38C1	3-71	M119	None	
	3-38E	3-72			

* These sections are partially covered in other reports and additional buildings maybe addressed in those reports refer to Figure 1-3.

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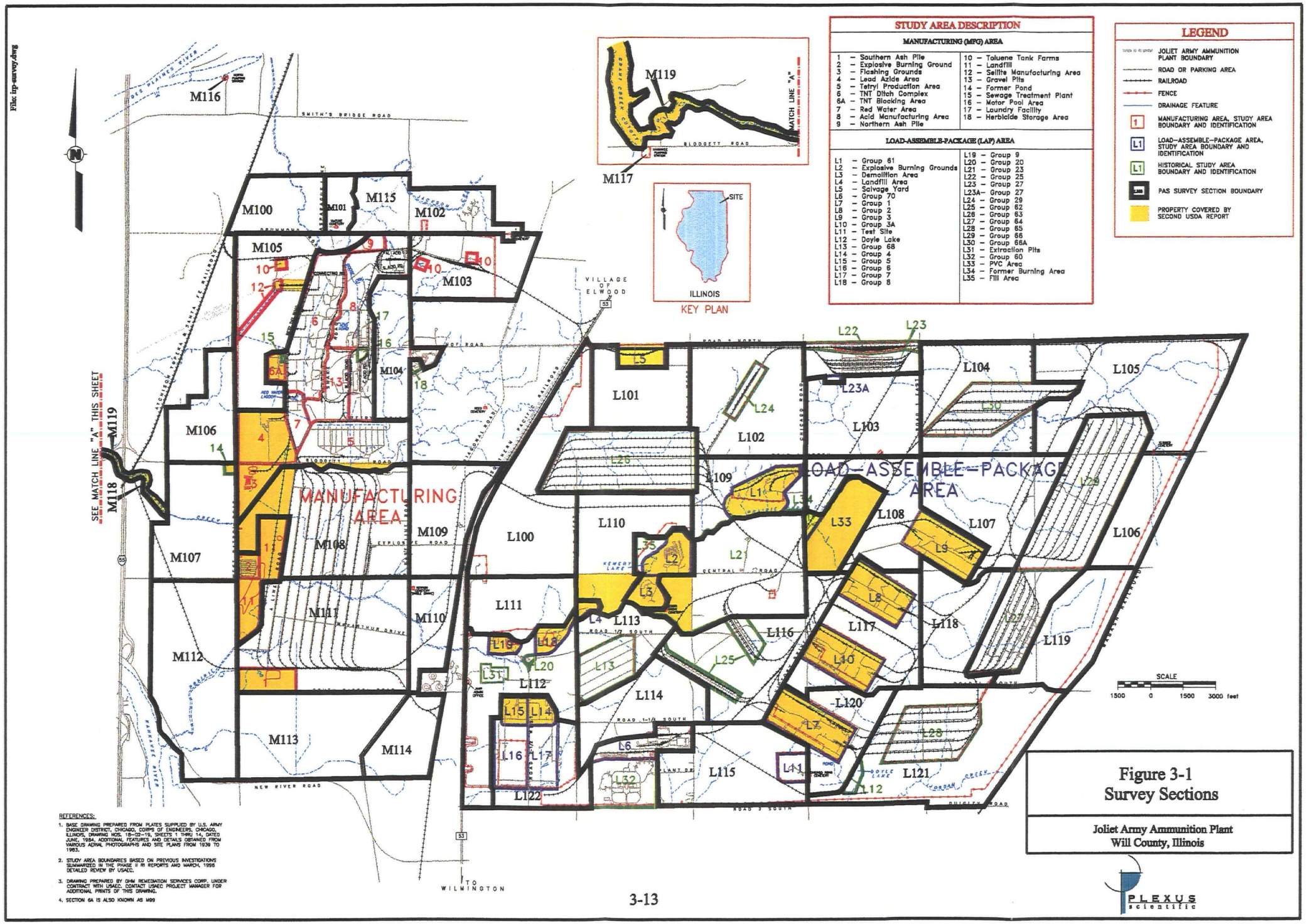

Figure 3-1
Survey Sections

Joliet Army Ammunition Plant
Will County, Illinois

4. ENVIRONMENTAL CONDITIONS

This chapter summarizes environmental conditions on the JOAAP parcels to be included in the second USDA transfer (USDA2). The data presented are based on a file search, interviews with cognizant personnel, and site surveys conducted in December, 1995, September, 1996, and April 1997, as part of the PAS for JOAAP.

Significant findings and an overview of relevant regulations are presented in the following subsections. All findings are presented by section or building number in the appendices and are summarized by finding type in tables at the end of this section. Findings in the tables are designated as "present," "absent," "suspected" or "removed." These designations are intended to provide a quick method of identifying potentially significant findings in the tables.

- Present identifies findings that do not fall into one of the other categories.
- Absent is used infrequently when there is definitive evidence that the condition is not present (e.g., when documentation indicates that a particular building has never been contaminated with explosives).
- Suspected refers to an environmental concern that may be present but cannot be confirmed or refuted based upon existing information (e.g., a transformer that is not marked as to the presence or absence of PCBs).
- Removed refers to an environmental condition that was present but has since been eliminated (e.g., a tank whose removal has been confirmed).

Drawings of each of the major areas are provided at the end of Appendix D.

4.1 Hazardous Materials and Waste Management

This section discusses the environmental conditions associated with use, storage and disposal of hazardous materials. This includes identification, to the extent possible, of the type, quantity, and location of hazardous materials and treatment and storage areas associated with hazardous materials and wastes. A summary of chemicals used, stored, disposed of, or released on the USDA2 property is presented in Appendix E.

Historically, much of JOAAP was used for the manufacture, handling and shipping of primary and secondary explosives, propellants, munitions, and components. The plant provided infrastructure services such as water, steam, power, and sewage treatment, for manufacturing and LAP activities. The likely use, storage, or disposal of hazardous materials/wastes can be inferred from the group or area names and the types of buildings present. Table 4-1 lists the group or area name, description, and provides the PAS study section number. Chemicals used at JOAAP were documented under the Toxic Substance Disclosure to Employees Act and Written Standard Practice (WSP) Saf. 6-1. These lists documented the chemicals used at the site but not the location where they were used (UCCI33, UCCI72).

Manufacturing operations involving chemicals and explosives occurred in L1, L7, L8, L9, L10, L14, L15, L18, L19, M4, M5, M6A (a.k.a. M99), and M12. Significant storage operations occurred at M10. Twelve sites (L1, L2, L3, L4, L5, L34, M1, M2, M3, M11, M12, and M15) were involved in treatment/disposal of wastes, and munitions testing occurred at L33. Issues specific to IR sites are addressed in Section 4.3.

Hazardous materials and waste management are governed by specific environmental regulations. For the purpose of the following discussion, the terms hazardous waste or hazardous materials are those substances defined as hazardous by CERCLA; 42 USC 9601-9675, as amended; and the Solid Waste Disposal Act, as amended by RCRA, 42 USC 6901-6992, as amended. In general this includes substances that because of their quantity, concentration, or physical, chemical, or infectious characteristics may present substantial danger to public health or welfare or the environment when released into the environment. A discussion of the regulatory history and permits issued to the facility and its tenants is presented in Section 2.2.3.

Although JOAAP has been declared excess, a variety of materials such as motor fuels, oils, industrial solvents, paints, and acids are used by current tenants (i.e., the agricultural lessees and Alliant Techsystems) on the facility. The 1994 *Spill Prevention Control and*

Countermeasures (SPCC) Plan and Installation Spill Contingency Plan addresses the prevention of pollutant discharge and includes contingency plans to address unauthorized releases. The plan also identifies hazardous waste storage locations (ALSI01). Hazardous wastes generated on-site are disposed of off-site through contracts with hazardous waste disposal firms.

An Alliant Techsystems representative reported that Alliant does not use any acutely toxic materials and that all of their stocks of hazardous substances/materials are consumed, rotated, or sent off-site so that nothing remains on-site for over a 1-year period. Alliant has used L10, L14, L15, L18, L19 and L33 which lie in the USDA2 property. Alliant has used the following areas as satellite hazardous waste accumulation areas: Buildings 3A-5, 3A-7, 4-5, and 5-3 (MEMO05).

During the PAS site survey, various chemical containers that were full, partially full, or empty were observed in several locations at JOAAP. Although some of the containers were labeled, the contents of these were not positively identified. Appendix B contains more information about the locations of these containers and the labeling (FIEL01). Findings relating to hazardous materials and chemicals are presented in Table 4-2.

4.2 Solid Waste

Solid waste disposal and management is regulated under the Illinois Solid and Special Waste Management Regulations. Closure and postclosure requirements for disposal units are specified in 35 IAC 811.110 and 811.111. Postclosure requirements include groundwater monitoring.

In the event that any materials are removed from the solid waste disposal sites, it should be noted that soils, sediments, or other media contaminated with hazardous substances or PCBs are considered special wastes pursuant to 35 IAC 808 and 809. When transported on public

highways, special wastes must be manifested and the truck must be a licensed special waste hauling vehicle.

All areas identified as having been regularly used for disposal of solid waste (M11, M13, L4, and L21) have been studied as part of the IRP. The capacity of these areas would have been sufficient to handle the wastes generated by the site. Detailed descriptions of each of these areas can be found in Appendix D and a brief overview of those on the USDA2 property are presented below. It appears that these disposal areas had sufficient capacity for all of the facility solid waste.

LAP AREA: Between 1960 and 1977, inert material and construction rubble were placed in a landfill located along the north side of Prairie Creek just east of Road 2 West (L4 in the USDA2 parcel) (ARMY01, ACOE01). Once filling was completed at this site, a compacted soil cover was put in place (ARMY01).

A state permitted sanitary landfill (Will County Permit 1982-034-OP 19780401) was located on the LAP Area northeast of the intersection of Road 1/2 south and Road 1 West (L21, in portion covered by the previous USDA PAS). This landfill was operated from 1982 to 1992 and as of early 1993, a closure plan was submitted for regulatory approval. Closure was completed in 1994, and the property is now in a post-closure period (ACOE01, DAMO06).

MFG AREA: Between 1950 and 1953, asbestos, insulation, and construction rubble were placed in a low area located east of the MFG Area Burning Ground, west of the 811 Magazine Area, and north of Prairie Creek Schoolhouse Road and covered with soil (M11, USDA2 parcel)(ACOE01, ARMY01). A third MFG Area disposal site (M13, in Industrial Park Parcel) was located just west of Acid Area 1 in an abandoned gravel pit (ACOE01, ARMY01).

The north and south ash piles (M9, Industrial Park parcel and M1, USDA2 parcel) were capped by covering with a plastic barrier, approximately 12 inches of clay and 6 inches of top

soil and seeded with grass (ACOE01, ARMY01). The south pile was used from 1967 to 1976 (ARMY01). Red water ash was also buried in the north portion of M2 (which is within the USDA2 parcel) in a manner similar to that of the north and south ash piles (ARMY01).

Burning Grounds: Five areas (L2, L3, L34, M2, and M3) were identified as burning grounds for explosive wastes and all lie on the USDA2 property. Site L2 operated from the early 1940s through 1977 as an open burning open detonation area (DAMO11, DAMO25). L3 was used for burning during the late 1950s and early 1960s. Some demolition operations were also conducted in this area (ACOE01). M2 was used for open burning of explosive materials from the early 1940s through 1965 (DOAS06). Red water ash was also buried at M2 (ACOE01). M3 was used for flashing of equipment and demolition materials from 1942 through 1988 (DAMO26).

The fifth area (L34) is located in the central portion of the LAP Area. This burning area is shown on maps dating back to 1944. The 1944 maps show two burning sites and access to the burning area via a railroad spur (WDEP04). However, the RI identified three separate burning sites within the area. No information is available concerning the types of materials burned at the site (DAMO06). A field visit conducted during September 1996 found numerous piles of crushed ceramic items and glass slag in one of the burning areas. This material is eroding from the stream bank into Prairie Creek. The ceramic items were subsequently identified as the bodies of nonmetallic mines and were determined through a wipe test to have explosive residues present. A former Uniroyal employee indicated that demilitarization of mines included the crushing of the housings and they may have been disposed of in this area (FIEL01). The Army will remove UXO prior to property transfer.

Treated Wood Products: Treated wood products were used in a number of construction applications at JOAAP: buildings, earthen barricades, railroad ties, and utility poles. These items had been treated to resist decomposition by rot, decay, fungus, and insects. Typical wood treatment compounds included creosote and associated derivatives, pentachlorophenol and chromated copper arsenate. Aged treated wood products no longer in use are subject to

waste classification procedures in 35 IAC 722.111 and 721.104(b)(9). The primary consideration for classification is whether the materials demonstrate characteristic hazardous waste properties, especially if prohibited levels of arsenic, chromium, cresols, benzene, or pentachlorophenol are present. This would be determined through Toxicity Characteristic Leaching Procedure (TCLP) analysis.

The Illinois Environmental Protection Agency (IEPA) has determined, in accordance with USEPA guidance, that weathered treated wood products may be disposed of as solid waste. The agency has defined weathered as follows: "treated wood that is old, it has been in obvious use, exposed to the elements for some time, has no surface globules and is not sticky to the touch, the surface is dry and the dark staining that occurs when wood is freshly treated with these compounds is not present." The Agency has indicated that weathered treated wood products do not exhibit hazardous characteristics, so visual determination and knowledge of historical use could be used in lieu of TCLP testing. In this case, the material may be handled and disposed of as a nonspecial solid waste.

The bulk of the treated wood at JOAAP consists of railroad ties along the greater than 150 miles of tracks at the plant. The tracks have not been serviced in over ten years, so all ties would have been exposed to the weather for at least that duration. The other treated wood was used in construction, in utility poles, and in blast protection barricades that are also generally over ten years old. It is therefore believed that these items are appropriately classified as nonspecial solid wastes. IEPA indicates that treated wood products considered a nonspecial solid waste can be abandoned in place (MEMO06). Therefore, railroad ties, barricades, treated wood buildings, and utility poles may be left in place.

4.3 IRP Sites

JOAAP has 53 separate IRP sites, as shown in Figure 4-1. General descriptions and environmental conditions at LAP Area IRP sites are presented in Appendix D. RIs have been performed at all of the sites, and where appropriate, a risk assessment has been conducted.

The risk was calculated based on a reasonable maximum exposure (RME). The RME, defined as the highest exposure that could reasonably be expected to occur, is intended to account for uncertainty in contaminant concentrations and variability in exposure parameters. It is a conservative exposure case (i.e., well above average) that is still within the range of possible exposures. A summary of the results of the risk assessment is presented in Table 4-3.

USEPA has generally defined carcinogenic risk values greater than 1×10^{-4} as unacceptable, and risks below 1×10^{-6} as acceptable for most hazardous waste facilities under CERCLA. Residual carcinogenic risks on the order of 1×10^{-6} are used as the "point of departure" or target level for site remediation, but they may be modified by regulatory requirements or site-specific considerations. The Hazard Index evaluates the potential for non-carcinogenic effects from long-term chemical exposure. A Hazard Index above one indicates that noncarcinogenic health effects are possible (DAMO23).

There are 35 IRP sites located in the LAP Area and all or part of 16 (L1, L2, L3, L4, L5, L7, L8, L9, L10, L14, L15 L18, L19, L21 (part), L33, and L34) are included in the USDA2 parcel (DAMO06). A total of 18 IRP study areas lie in the MFG Area and all or part of 11 (M1, M2, M3, M4, M5, M6A, M10, M11, M12, M14 and M15) are included in the USDA2 parcel. During conduct of the PAS, the former TNT Blocking Area was identified as an additional area of possible environmental concern and was subsequently designated M6A (OHMC09).

Interim remedial actions (capping) have been conducted at the Southern Ash Pile in the MFG Area. Specific information related to the sites including analytical data can be found in the RI reports and is summarized in Appendix D of this report (DAMO05, DAMO11). A removal action has also been completed for the oil pits in L2.

The Army has determined that 23 IRP sites require no further remedial action. These sites are discussed in the JOAAP FSs and regulatory concurrence is expected. The sites are M14 through M18, L12, L13, L19 through L22, L24 through L32, L35, and L35. Following

completion of the non-time critical removal action in L6 in the Fall of 1997, no further remedial action will be required in that area.

The 1994 ecological risk assessment was conducted to determine if the chemical contamination is deleterious to flora and fauna at JOAAP. This was accomplished through the examination of existing environmental data, collection of additional samples where necessary, literature review, toxicity testing, and field surveys. Three study areas in the MFG Area (M2, M4, and M6) and three in the LAP Area (L1, L2, and L7) were selected for field investigation. M6 is the only area not within the USDA2 parcel. Selection was based upon the presence of contaminants, and habitat viability. (Industrial areas were not evaluated.) In addition, an ecological risk evaluation was performed for each of the creeks at JOAAP (AEHA10).

This assessment involved the evaluation of plants grown in site soils, earthworm toxicity, Microtox testing, and rodent evaluations. Effects on plant growth were noted, as were lethal and sublethal effects on earthworms in some locations. No statistical differences were found between heavy metal levels in mice collected at JOAAP and those in the control group. TNT was detected at trace levels in the tissues of three mice and at 0.300 mg/kg in the tissues of two of the 61 mice collected at M6 (AEHA10).

Soil testing identified areas of M2 (MFG Burning Ground), L2 (LAP Burning Ground) and L7 (Group 1) as the sites with the highest levels of soil toxicity. Rodents on these sites are not accumulating metals above natural levels, and no abnormal histopathological effects were seen in mice sampled. Potential plant community shifts were found at L1 (Group 61) and at the M2 (MFG Burning Grounds). Adverse impacts on threatened and endangered species at JOAAP via terrestrial chemical exposure routes are expected to be minimal (AEHA10).

Potential ecological exposure pathways to humans include the consumption of contaminated crops, game, and fish. Crops are not grown on any contaminated sites, and therefore a complete pathway does not exist. Deer meat was collected (as an indicator of game species),

and a separate report by AEHA concluded that consumption does not pose a health risk under current hunting conditions. Fish tissue analysis did not reveal the presence of explosives or PCBs. Although low levels of barium, zinc, iron, and DDE were detected, no human health risk is expected from the ingestion of fish (AEHA10).

The aquatic evaluation determined that stream health and quality (based on benthic macroinvertebrate analysis) is improved as Jackson, Prairie, and Grant Creeks exit JOAAP. The health of Jordan Creek is unaffected by JOAAP. Spoil Bank Creek quality is moderately low immediately downstream of JOAAP, and moderate about one mile off-post (AEHA10).

In summary, the Army ecological risk assessment program determined that the structure and function of the important aquatic and terrestrial components of the JOAAP ecological landscape are not vulnerable to significant reduction from the adverse health effects of contamination. Fish and crayfish are not accumulating explosives, and potential food chain exposures are not occurring. For the terrestrial components, neither rodents nor deer meat are accumulating metals above natural levels or explosives. Limited (considered *de minimus)* impact on plants, earthworms, and micro-organisms has resulted from residual soil contamination (CHPM01, CHPM02, OHMC08).

4.4 Asbestos

Asbestos-containing material (ACM) is regulated by USEPA, the Occupational Safety and Health Administration (OSHA), and the State of Illinois. Asbestos fiber emissions into the ambient air are regulated in accordance with Section 112 of the Clean Air Act, which established the National Emissions Standards for Hazardous Air Pollutants (NESHAP). These standards address the demolition or renovation of buildings with ACM. Regulations of Asbestos Hazard Emergency Response Act (AHERA) and OSHA cover protection for employees who work around ACM.

There are two primary categories of ACM. Friable ACM is any material containing more than one percent asbestos that, when dry, can be crumbled, pulverized or reduced to powder by hand pressure (Appendix A, Subpart F, 40 CFR Part 763, Section 1, polarized light microscopy). Nonfriable ACM is any material that contains more than one percent asbestos, but does not meet the other criteria for friable ACM. Asbestos is considered a special waste if it is friable; however, if it is wetted and managed in accordance with NESHAP, it is a solid waste.

A basewide survey for ACM is required by the Federal Property Management Regulations (FPMR) disclosure law prior to base disposal. Professional Service Industries, Inc., completed a survey of all existing JOAAP facilities for asbestos in 1993. The survey report is based on the inspection of building construction, including pipes, walls and flooring. The survey identified 246,112 linear feet of asbestos insulation material on pipe of various dimensions, ranging from one to 18 inches in diameter, and 88,477 square feet of asbestos insulation material on various equipment items in approximately 815 buildings (ROCK01). Detailed information obtained in the survey, including locations within buildings and type of asbestos found, is maintained by JOAAP personnel in Building 74-3 (29401 South Route 53).

The personal property liquidation contract (DAAA08-96-C-0007, Section C) for JOAAP requires the liquidator to remove all friable type asbestos from the plant as identified in the base-wide asbestos survey. The liquidator will not perform asbestos removal in active buildings. The asbestos abatement is currently underway and will be completed, installation-wide, by August 1998.

Renovation or demolition of ACM-containing structures could release asbestos fibers into the air. ACM present at JOAAP is associated with pipe or boiler insulation, acoustical ceilings, asbestos cement board building materials, sprayed-on fireproofing material, and other soundproofing or insulation. Asbestos was widely used in building construction prior to 1978. Virtually all JOAAP buildings were constructed between the early 1940s and 1978.

4.5 Storage Tanks

Storage tanks were used at JOAAP to store various raw materials, process intermediates, products, fuels and wastes. The USTs and above ground storage tanks (ASTs) at JOAAP are constructed of steel, concrete, stainless steel and other materials. Most of the storage tanks at JOAAP were emptied and laid away as of 1993.

4.5.1 USTs

USTs are subject to federal regulations within RCRA, 40 CFR Part 289, Technical Standards and Corrective Action Requirement for Owners and Operator of USTs. These regulations were mandated by the Hazardous and Solid Waste Amendments of 1984. The State of Illinois leaking-UST program and the federal corrective action requirement is implemented by USEPA. Illinois state law and IEPA regulations are still in effect.

In 1989, the U.S. Army Corps of Engineers (USACE) completed an *Investigation and Evaluation of Underground Storage Tanks* at JOAAP. The study encompassed all known USTs, as defined in 40 CFR 280, and all heating oil tanks. Seventy tanks were identified through interviews with site personnel (ACOE02). Thirty-seven additional tanks have been identified since the USACE investigation (AEST01). Table 4-4 includes facility identification numbers; the tank location, size, and construction; substances stored; and removal date, as available. Specific information concerning tank condition at the time of removal and remedial actions taken is contained within tank removal reports. UST removal was conducted on an "as-funded" basis.

As indicated in Table 4-4, all but 1 of the 23 USTs in the USDA2 parcel were removed between 1991 and 1994. No documentation on the removal of Tank Number 63 in Group 4 was found. Due to the age of the USTs, it is assumed that any that may remain do not comply with current regulations.

In cases where soils were impacted by spills or leaks associated with the tanks, affected soils were removed and disposed of in accordance with applicable regulations. Samples were collected from the excavations to ensure that the remaining soils were below the appropriate criteria for tank excavation clean-ups. In most cases, the excavations were refilled using soils from an on-site borrow pit.

4.5.2 ASTs

A large number of ASTs previously used for process materials, fuel oil, gasoline, and wastes are present at JOAAP. ASTs with any contents are visually inspected monthly by the Army. Drains in dikes around the ASTs were kept closed, and whenever the dikes require drainage, the procedure was closely monitored to ensure that no product is released (ACOE01). Details concerning the layaway procedures for ASTs have not been stipulated. Some of the tanks may not be empty, and the residual materials may pose a hazard to human health or the environment.

During the PAS field reconnaissance, a number of ASTs were noted including two 268,000 gallon toluene tanks in the west toluene tank farm (M10) (FIEL01). This tank farm originally contained four tanks but lightning destroyed two. The other ASTs observed were generally small (under 300 gallons) and are believed to have contained fuel oil. The only tanks observed which appear to have had some spillage were located in Group 61 (L1). Table 4-5 provides a summary of AST findings. The liquidator will remove all ASTs by August 1998.

4.6 Sumps, Dry Wells, Oil/Water Separators, and Septic Systems

Sumps, dry wells, oil/water separators, and septic systems can serve as traps for contaminants or can provide a conduit for environmental contamination. Sumps are present throughout the operational areas within the USDA2 parcel. Dry wells are used for disposal of waste liquids and rain water. No oil/water separators, which are generally associated with shop areas and

gasoline stations, were identified in the USDA2 parcel. Findings for sumps, dry wells, oil/water separators, and septic tanks on the USDA2 parcel are presented in Table 4-6.

Some buildings at JOAAP were connected to septic systems as it was not economically feasible to provide sanitary sewer service. Additionally, it is likely that many of the existing farmsteads converted for military use were served by septic systems in the early years of the plant even if later connected to the sanitary sewer system. Septic systems are regulated by the Will County Health Department. Alliant Techsystems has no knowledge of any septic systems or oil water separators in areas in which they operate (MEMO05). No information was found to indicate that any septic systems were used for disposal of industrial wastes.

Sumps are present in LAP production Groups 1, 2, 3, 3A, 4, 61 and at the demolition grounds (L3). Sumps in the LAP production groups were periodically cleaned out and residue was disposed of at the burning grounds. During peak production years, sumps occasionally overflowed and discharged directly into open drainages (ACOE01).

A 1959 Master Plan for JOAAP indicates that there were 55 septic tank serving isolated buildings on the MFG Area but locations were not given (ACOE06). A number of septic tanks were identified as part of the PAS associated with latrines or isolated buildings.

A French drain is located in the southern portion of the Tetryl Area (M5), north of Blodgett Road and another French drain is located on the east side of Building 1009-1-1. These drains cross the portion of M5 included in the USDA2 parcel.

JOAAP drawings indicate that a dry well was located at M4. In several of the LAP groups, it appears that condensate lines discharged to dry well near the buildings. Several sumps were located at each of the LAP groups and have been studied during RI/FS process. Refer to the FS or Appendix D for details.

4.7 Radon Gas

Radon gas is a colorless, odorless naturally occurring radioactive gas generated from the radioactive decay in the uranium/radium pathway. Radon gas emanating from oils, soil gas, and groundwater can enter through cracks and other openings in building structures and become a component of breathable air within buildings. Exposure to radon is associated with an increased risk of lung cancer. USEPA suggests that remedial action be considered if the average annual radon level in the living area of a residence exceeds 4 pCi/l.

In spring of 1989, the Army conducted radon testing on 44 separate buildings at JOAAP. The radon canisters were left in place over approximately a one year period. Although no samples were collected on the USDA2 parcel, several results on both the LAP and MFG Areas showed radon concentrations above the USEPA level of 4.0 pCi/l.

4.8 PCBs

A general class of chemicals produced by chlorination of biphenyls, PCBs persist in the environment, accumulate in organisms, and concentrate in the food chain. They are used in electrical equipment, primarily in capacitors and transformers, because they are electrically nonconductive and stable at high temperatures. At JOAAP, oil filled electrical switches were used to eliminate electrical sparks in areas where there was a potential explosion hazard.

PCBs are regulated under TSCA, which banned the manufacture and distribution of PCBs with the exception of PCBs used in enclosed systems. By definition, "PCB equipment" contains 500 ppm PCBs or greater. "PCB-contaminated equipment" contains PCB concentrations of 50 ppm or greater, but less than 500 ppm (40 CFR 761.3).

TSCA (40 CFR 761.40) requires that all PCB transformers (transformers containing over 500 ppm PCBs) be clearly marked. By implication, a determination as to the PCB status of transformers is required. Those PCB transformers "in use" in a facility that is not totally

enclosed must be inspected quarterly (40 CFR 761.30). Any PCB and PCB-contaminated equipment that is out of service awaiting disposal can be stored for up to one year in a properly constructed PCB storage for disposal area (40 CFR 761.65). USEPA, under TSCA, regulates the removal and disposal of all sources of PCBs containing 50 ppm or more; the regulations are more stringent for PCB equipment than for PCB-contaminated equipment. The disposal of transformers containing oil with over 50 ppm PCBs is regulated under TSCA (40 CFR 761.60).

USEPA has established criteria for PCB spill cleanups under TSCA (40 CFR 761.120). Cleanup levels of ten mg/kg PCBs have been established for soils of nonrestricted-access areas (provided the upper ten inches of soil contains less than one mg/kg PCBs) and 25 mg/kg PCBs for areas where access is restricted. The nonrestricted-access cleanup level of ten mg/kg was recommended for JOAAP in the *Preliminary Remediation Goals, Final Report* for the site. The report indicated that a preliminary remediation goal of one mg/kg was selected for all surface soils (upper ten inches of soil) (OHMC08).

A 1986 document indicates that all transformers at facilities used by Honeywell, Inc., (now Alliant Techsystems) were tested for PCBs. The survey determined that no PCB containing transformers remained in the Honeywell area (DOTA03).

In 1993, an extensive PCB survey was conducted at JOAAP by United Power. The survey included identifying, sampling, and analyzing equipment potentially containing PCB-contaminated fluids. Transformers, breaker boxes, and a variety of other machinery were included in the United Power survey. Some of the sampled units reflected PCB contamination (UCCI02). Personnel at JOAAP report that this PCB survey was on an "as funded" basis and may not be complete.

During November 1995, USEPA conducted a survey of oil filled switch gear boxes. The survey identified switches mainly in the TNT (M6), DNT (M6), and tetryl (M5) production areas. It is not known if or how often the fluid was changed nor is the disposition of those

fluids known (EPAV14). Ecology Services, Inc removed a total of 1,119 exterior switch gear boxes from the MFG Area in August and September 1996. The interior switch gear boxes remain. The liquidator will remove all inactive boxes by August 1998. The majority of the boxes were located in the industrial park parcel. The boxes were believed to have contained PCBs based on the age of the facility and the type of function the switches served. Soils around the switch gear boxes were sampled and PCB contamination detected in soil was remediated (ECSI01). During the PAS field survey, additional switch gear boxes were identified inside of buildings in the LAP groups (FIEL01). Refer to Table 4-7 for the switch gear box locations.

The locations of pole and ground transformers were identified during the PAS field surveys. The locations and related information can be found on Table 4-7. The presence or absence of PCBs in these transformers was not determined as part of this PAS. The RIs and FSs identified several areas where soils are contaminated with PCBs. Refer to Appendix D for soil sampling information.

4.9 Pesticide/Herbicide Use and Storage

The Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) regulates the registration and use of pesticides. Pesticide management activities are subject to federal regulations contained in 40 CFR 162, 165, 166, 170, and 171. Enacted in October 1972, the Federal Environmental Pesticide Control Act regulates the manufacture and sales of pesticides. Soils contaminated by the storage, mixing, or handling (but not application) of pesticides/herbicides are a special waste and may be a RCRA hazardous waste due to the characteristic of toxicity.

JOAAP is in a high-yielding agricultural area. Prior to 1973, only nonsurplus crops were grown, including popcorn and hay. Corn, wheat, and soybeans were grown between 1973 and 1978 (ARMY01). In 1995, there were 103 tracts totaling 17,066.5 acres in the agriculture outlease program. Prior to the 1990s, no records of pesticide use by lessees were maintained. Lessees have always been required to comply with applicable regulations concerning

pesticides. Since at least 1980, lessees have been required to dispose of excess pesticides and empty containers off-site in compliance with applicable regulations. Lessees typically perform sprayer maintenance and calibration off-site (MEMO04).

Alliant Techsystems is currently operating portions of the LAP Area under contract. Pesticide use by Alliant is very limited; it is restricted to pesticides specified in that contract (MEMO05).

A 1966 document indicates that spraying of herbicides (Nalco H-174K) was conducted annually along railroad tracks. The herbicide contains eight percent 3-(3,4-dichlorophenyl)-1-1-dimethylurea, 87 percent sodium tetraborate, and five percent inerts (UCCI15).

Prior to 1972, dieldrin, aldrin, DDT, and other chlorinated hydrocarbons were used on the crops. Malathion was used for mosquito control, while Nalco and atrotol herbicides were used along railroad right-of-ways. Brulin was used in 1962 as a soil sterilant along the installation fences. Although spraying of this herbicide resulted in arsenic poisoning and the death of 21 cattle over a 14-month period, none of the deaths occurred on the USDA2 parcel (ARMY01).

Pesticides are known to have been mixed, stored, or dispersed at five locations at JOAAP (L6, M8, M16, M18, and M103); none of which are on the USDA2 parcel (DAMO12, ARMY01, ACOE04). In 1993, the remaining herbicides on-site were either consumed or those that were not consumed were sent to off-site facilities for their use (MEMO09). Stored pesticides were not found on the USDA2 parcel during the PAS site surveys except for some bags of weed and feed in Building 814 (M105)(FIEL01).

By 1978, only herbicides were used at JOAAP. Herbicides were used only along railroad rights-of-way and dispersed with a 5-ton lowboy sprayer in 1978. A certified-pesticide-agent license was issued to the Road and Grounds supervisor in 1973 who, as of 1978, was still overseeing the post pesticide programs (ARMY01).

The following pesticides were in use at JOAAP between 1978 and the mid-1980s (ARMY01, SOPP08):

Atrex (atrazine)	Primitol
Banavel	Princep 4G (simazine)
Chlordane	Ramrod (propachlor)
Chlorpyrifos	Slo Gro (maleic hydrazide)
Counter	Sutan (butylate)
Cyanazine	Treflan (trifluralin)
Diazinon	2,4D-amine
Hyvar-XL	2,4,5-T
Lasso (alachlor)	

When nonstandard herbicides were required, annual written approval was required. Empty herbicide containers were disposed of in the sanitary landfill (M13, not part of the USDA2 parcel) as of 1978 (ARMY01).

No information was found relating to fertilizer usage prior to 1978. Fertilizer usage in 1978 consisted of nitrogen, potassium and phosphates. Recommendations for fertilizer usage was directed by the Land Management Office based on soil tests and crop needs (ARMY01).

4.10 Lead Based Paint

Lead was originally added to paint to increase the paint's durability and its ability to withstand the elements (DOTA05). Lead can cause permanent damage to the brain and many other organs, and causes reduced intelligence and behavioral problems. It can also cause abnormal fetal development in pregnant women. The Consumer Product Safety Commission banned the use of lead-based paint in residential applications in 1978.

To protect the public from exposure to lead from paint, dust, and soil, the Congress passed the Residential Lead Based Paint Hazard Reduction Act of 1992, also known as Title X. Section 1018 of the law directed the Department of Housing and Urban Development and USEPA to

require disclosure of known information on lead-based paint an lead-based paint hazards before the sale or lease of most housing built before 1978.

The Act requires that buyers of residential property (excepting efficiencies, elderly housing, housing for the handicapped, and short-term lessees) be informed that buildings built prior to 1978 may contain lead-based paint. Notice requirements are specified in the Act. Testing is not required, nor is there a notification requirement for nonresidential properties. No buildings on the USDA2 parcel have been identified as possible future residences.

Lead-based paint and contaminated soils or debris containing lead-based paint from nonresidential structures are a special waste and may be a may be a RCRA hazardous waste due to the characteristic of toxicity. The Illinois Bureau of Air has requirements governing the removal of lead-based paint.

Most facilities/buildings constructed prior to the Department of Defense ban on the use of lead-based paint in 1978 are likely to contain one or more coats of such paint. In addition, some facilities constructed immediately following the ban may also contain lead-based paint, because inventories of such paints that were in the supply network were likely to have been used up on these facilities.

Virtually all structures (e.g., buildings, tanks) at JOAAP were constructed prior to 1978 (JAAP10). All painted surfaces on structures built prior to 1979 should be assumed to be painted with lead-based paint unless analytical testing indicates otherwise. Exterior surfaces that were painted with lead-based paint may have caused some localized soil contamination due to deterioration of the paint (i.e., leaching, chalking, or flaking). The levels of lead in soil from paint deterioration are generally highest along the dripline.

Lead PRGs for JOAAP were developed for recreational and industrial scenarios. A PRG of 1,000 ppm was developed for site soils (OHMC08).

Metal structures such as water towers or tanks were sandblasted and painted regularly (MEMO09). Sandblasting of structures generates fine particles of paint. Metal surfaces were often painted with paints containing heavy metals such as lead for corrosion protection. The sandblasting of an elevated structure could spread the chips generated over a fairly wide area, but the greatest concentration of chips would be expected immediately beneath the structure.

Observations were made during the PAS field surveys regarding the presence and condition of paint on various surfaces inspected. The condition of painted surfaces ranged from good to poor (FIEL01).

4.11 Explosive Ordnance/Residues

JOAAP produced, packaged, assembled and loaded explosive constituents. The explosive contamination status of buildings and equipment at JOAAP has been determined in accordance with IOC PAM 385-5 and marked for level of contamination by signs with black letters on a yellow field. The buildings and equipment are classified as having either a 0, 1X, 3X, or 5X level of contamination.

Buildings and equipment with a 0 level of contamination were never contaminated with explosives; do not pose an explosive safety hazard; and may be welded, drilled, sawed, and sold to the public.

A 5X (XXXXX) level of contamination indicates that contaminant(s) are not present in quantities sufficient to pose an explosive safety hazard. A 5X article may be welded, drilled, sawed, and sold to the public.

A 3X (XXX) level of contamination indicates that surface contamination has been removed, but amounts sufficient to pose an explosive safety hazard may still be present in less obvious places. Although 3X articles may be safe for their intended purpose, they should not be subjected to processes that may generate enough heat to ignite residual contamination. A

building or piece of equipment with 3X contamination is considered safe for routine maintenance and careful disassembly, but it may not be sold to the general public.

A 1X (X) level of contamination generally applies to articles, equipment, and buildings subjected to routine, after-use cleaning. Substantial explosive contamination may exist, and maintenance should be limited to minor adjustments.

Each time production was ceased, it was assumed that the equipment and buildings would be needed at some time in the future and should be preserved. Since the equipment and buildings were being retained for their original purpose, the simplest and most economical course of action was to classify all items 3X even if that item was not contaminated by explosives.

Army regulation 385-64 states:

> DOD [Department of Defense] real property that is known to be contaminated with ammunition and explosives that may endanger the general public may not be released from DOD custody until the most stringent efforts have been made to ensure appropriate protection of the public. Some contamination is, however, so extensive that removal of the hazard is beyond the scope of existing technology and resources. Such properties shall be retained until rendered innocuous.

In compliance with Army Regulations, explosive classifications for many of the buildings at JOAAP were assigned by Uniroyal and were obtained from work plans for plant demolition (UCCI04). In 1996 as part of the personal property liquidation at JOAAP, equipment and buildings were classified for level of explosive contamination (DOTA32). The purpose of the classifications was to determine which buildings were safe to enter for equipment evaluation. Although the same codes were utilized by both the liquidation contractor and Uniroyal, the same criteria were not utilized for the evaluation and therefore the codes are not interchangeable. A building classified 3X or 0 by the liquidation contractor may still have significant contamination present in inaccessible areas. The explosive classifications assigned

by the liquidation contractor have not been adopted by the Army and are not considered official.

Explosive contamination classifications have been made for many of the buildings in the USDA2 parcel. Uniroyal classified approximately 80 buildings as 3X, 170 as 0, and 31 as 5X. No explosive classifications were available for many of the buildings in the parcel. In particular, no classifications were found for building in Groups 3A (L10), 4 (L14) or 5 (L15). Sixteen buildings were identified which the liquidation contractor had assigned a 3X classification to buildings which Uniroyal had assigned 0. There were also an additional 12 which the liquidator assigned a 0 classification that were classified 3X by Uniroyal. Refer to Table 4-8 for specific information.

Explosives have been detected in soil, groundwater, surface water and sediment in the USDA2 parcel. Explosives were detected in soils in 13 sections (L1, L2, L3, L5, L7, L8, L9, L10, L14, M1, M2, M3, and M4), in groundwater in nine sections (L1, L2, L3, L10, L14, M1, M3, M4, and M6A), in surface water in ten sections (L1, L2, L7, L8, L9, L10, L14, L19, M1, M12, and M15), and in sediment in nine sections (L1, L2, L7, L8, L9, L10, L14, M4, and M12). The results of environmental sampling are summarized in Appendix D.

Media contaminated with explosives residues are a special waste and may be a RCRA hazardous waste due the to ignitability or toxicity. There is the possibility that the contaminated media could achieve the PRGs and still be a RCRA hazardous waste. For example, materials from backstops at the firing ranges would be a special waste if disposed and could be a RCRA hazardous waste due to the presence of lead.

Another possible source of explosive contamination is broken or abandoned waste lines. Throughout the years, waste products (i.e., red water) were discharged to open ditches via lagoons, sumps or underground waste lines. Old plant drawings indicate that broken or leaking underground waste lines were generally replaced with new lines that ran parallel to the old lines. The old lines were abandoned in place (ACOE01).

There are several areas at JOAAP where UXO or other explosive items such as fuses or primers may be present. These areas include the burning grounds (L2, L3, and L34), the test range (L11, not on USDA parcel), the AT-4 test range (L33) and Group 8 (L18)(DAMO09, FIEL01, MEMO05).

Alliant Techsystems currently operates three indoor firing ranges in Group 8 (L18). Spent sand from the range backstops was stored outside and Alliant has conducted a sifting operation to remove UXO from the sand. However, adjacent to buildings on the north side of the group several dozen spent 25 to 30 mm target practice projectiles were observed on the ground and in sand piles (FIEL01). Ordnance related scrap remains at the AT-4 test range (L33). Alliant representatives indicated that ordnance related material would be removed prior to return of the site to the Army (FIEL01).

A summary of findings relating to UXO and explosives on the land included in the USDA2 parcel is presented in Table 4-8.

4.12 Biomedical/Biohazardous/Chemical Warfare Materials and Wastes

Biological and chemical agents were never developed, tested, manufactured or stored at JOAAP (ARMY01). Each of the major groups had a first aid station (MAPS06, MAPS11, JAAP10) but, due to the period of time that the base has been closed it is unlikely that biohazardous materials remain at any of the former medical facilities.

A 1978 SOP for surveillance inspection of industrial stocks in storage states that "All lots of industrial stock (conventional and chemical ammunition (non-toxic),...will be inspected to determine current degree of serviceability." (UCCI04). This implies that nonlethal chemical materials such as riot control agents were kept in storage at JOAAP. The storage could have occurred on the USDA2 parcel.

4.13 Radioactive Materials/Wastes

Several facilities at JOAAP had permits from the Nuclear Regulatory Commission (NRC) for radioactive sources. Isotopic materials were used in analysis of artillery shells or in tracer components. In the past, radiological sources such as cobalt-60 and cesium-137 were used in instrumentation within the LAP Area Groups 1 (L7), 2 (L8) and 3 (L9). All sources have been removed from JOAAP and NRC license #12-148-28-01 which covered these sources is no longer active (ARMY01). X-ray operations were also conducted in Groups 3A (L10), 4 (L14), 5 (L15), and 8 (L18) (FIEL01, MEMO05, UCCI46, USOP82). In several of these areas, equipment associated with the radiography is still in place. Findings relating to radioactive materials/wastes are presented in Table 4-9.

Depleted uranium (DU) was a component of munitions produced and tested at JOAAP by Alliant Techsystems. DU was handled or stored in L15 (USDA2), L18 (on USDA2) and L27 (not on USDA2 parcel). DU projectiles manufactured off-site were brought to Group 64 (L27) where they were stored prior to assembly into munitions. During storage in Group 64, the projectiles were in Department of Transportation approved packaging. Munitions with the DU projectiles were assembled in Group 5 (L15) and were test fired at Group 8 (L18). In about 1986, surface scans for radioactivity were conducted by Alliant in Groups 5 and 8. No elevated readings were found. The equipment used for assembly in Group 5 has been removed and shipped off-site for use at other plants (MEMO05).

USEPA and the NRC established a release criterion for DU in soil for unrestricted use of the property at 15 pCi/g. Activity above 15 pCi/g was found within the perimeter road around Group 8 but away from the stockpiled sand (MEMO05). The cleanup entailed a radiological survey followed by excavation and removal of the DU contamination and a post removal radiological survey. Alliant Techsystems has completed an investigation and cleanup of this contamination in accordance with NRC regulations (SEGI01, MEMO05, SAHC01).

DU munitions testing was conducted by Alliant Techsystems at range 3 in Group 8 between 1983 and 1987 (FIEL01, SEGI01). Spent sand from the range was stockpiled outside of the range and some was subsequently moved to the projectile catcher at range 2 where DU contamination was identified. Some of the sand was scattered along the road when the sand was moved from the stockpile to range 2. Some residual contamination was also identified in the sally port of range 1 (SEGI01). Alliant Techsystems conducted a investigation and clean-up of this contamination (SEGI01, MEMO05). Outside areas with readings above 15 pCi/g are all within the Group 8 perimeter road (MEMO05).

During the December 1995 survey, numerous large sealed bags containing sand and piles of sand associated with the firing range at which DU munitions were fired were present around the Group 8 perimeter. These bags contained sand from DU clean-up activities. Some of these bags were observed east of Group 8. Alliant reported that 320 cubic yards of sand had been removed and removal of an additional 280 cubic yards was planned by mid-1996 (FIEL01). By June 1996, all DU contaminated areas except those where UXO was suspected had been remediated (SEGI02). UXO removal and DU cleanup was completed in December 1996. This cleanup phase included removal of approximately 850 cubic yards of contaminated sand and soil. The NRC Region 3 completed a confirmatory survey in support of license termination in July 1997. No areas above background were noted and the final site release was to be prepared (SAHC01). No chemical analysis of the sand is available. Final NRC unrestricted site release documentation was not available at the time of the PAS.

The other two test ranges are currently in operation but have not been used to test DU munitions (FIEL01). As part of the cleanup effort, an area within L33 was also surveyed for the presence of elevated radioactivity, but none was found (SEGI02).

In the first half of 1955, an existing building at the Kankakee Unit (MFG Area) was reconverted for use by the Atomic Energy Commission. In addition to reconversion of the building, a guard headquarters was erected and a security fence and appurtenance were installed to provide maximum protection. The entire job was handled as an emergency

(HIST49). It is not known where this building was located. Argonne National Laboratory leased two buildings (713 in M8 [not in the USDA parcel] and a portion of 814 in M105 [USDA2 parcel]) for equipment and machinery storage sometime prior to 1959 under permits issued to the Atomic Energy Commission (HIST24, HIST25). It is unclear if the building referred to in the 1955 document is one of those identified as being used for storage in 1959 or is another building. In August 1996, USEPA conducted a radiological survey of Buildings 713 and 814. Only localized areas with elevated radiation levels were encountered, and therse were explained as naturally occurring radioactive materials (EPAV20).

4.14 Laboratory Operations

Many laboratories were operational at JOAAP during production years. Several laboratories operated to support manufacturing and environmental monitoring operations. Two laboratories were identified on the USDA2 parcel. One was at Building 505-3 (MFG STP) and the other was Building 4-21 which has since been demolished. The field laboratory in Building 4-21 (L14) was used to mix adhesives and sealants used in munitions production through about 1966. Early operations at this laboratory are unknown. Explosives from all the laboratories were destroyed at the burning ground, and liquid wastes were sent to the STP. Some material was reportedly washed into the drainage ditches (ARMY01, KOWS01).

4.15 Wastewater Treatment and Discharge

Discharges to the Waters of the United States are required to comply with 40 CFR 122, and discharges of treated effluent to waters of the State of Illinois must meet the requirements of 35 IAC 309.

Section 2.3.1 provides a general summary of wastewater activities at JOAAP. The NPDES permit for JOAAP was issued on September 22, 1993 (IL0002666). That permit covers 17 discharges to various receiving waters. One is the treatment discharge water from the sanitary wastewater treatment plant Group 20 (L20) and the other 16 are stormwater discharges from

the facility (DOTA04). The Group 20 plant is currently the only operating wastewater treatment plant for JOAAP (FIEL01). Around February 1995 a liquid chlorination system replaced the chlorine gas system at this facility. Ultraviolet light treatment is planned to reduce chlorine concentrations in the plant effluent (JAAP16). Effluent from the secondary settling tanks is discharged directly into Prairie Creek. Sludge is collected from this tank and removed off-site by a contractor (FIEL01). This sludge had previously been disposed at the former sanitary landfill at L21 (ACOE01). Additional information concerning the LAP STP is presented in Appendix D. The LAP STP is not within the USDA parcel covered by this PAS.

Over the years, waste products were discharged to open ditches via lagoons, sumps, or underground waste lines. Old plant drawings indicate that broken or leaking underground wastewater lines were generally replaced with new lines that ran parallel to the old. The old lines were abandoned in place (ACOE01).

4.16 Surface Water Resources

A general discussion involving surface water resources and discharges to surface water at JOAAP is included in Section 2.5.3. Water and sediment sampling has been conducted in various streams and lakes at JOAAP to determine if site-related contaminants are present. Sampling results specific to IRP sites are discussed in Appendix D. Drainage basins are depicted in Figure 2-3.

Shallow groundwater discharges to surface water at JOAAP and may impact surface water and sediment quality. For example, the groundwater FS for the LAP Area indicates that groundwater present in the overburden and within the bedrock at site L1 is discharging to Prairie Creek. Given the groundwater flow velocity at L2, it is probable that the groundwater contaminant plume extends to Prairie Creek, although explosives were not detected in soil or sediment samples from Prairie Creek or Kemery Lake. At L3, a plume of groundwater contamination is present and shallow groundwater discharges to Prairie Creek. At L14, contaminated groundwater appears to be seeping into the storm sewer, which discharges to a

nearby drainage ditch (DAMO22). It has not been determined what impact groundwater discharge to surface water will have on sediment and surface water quality in the future.

The following site-related contaminants of potential concern have been identified in the LAP Area in Prairie Creek and Kemery Lake, which is considered part of the Prairie Creek system:

> Surface water: 1,3,5-trinitrobenzene, RDX, bromodichloromethane, chloroform, nitrate/nitrite, phosphate and aluminum, arsenic, barium, beryllium, copper, iron, lead, magnesium, nickel, vanadium, and zinc.
>
> Sediments: fluoranthene, phenanthrene, pyrene, DDE, DDT, dieldrin, heptachlor, TPHs, water-soluble sulfate, total phosphate, aluminum, arsenic, copper, lead, and silver (DAMO12, DAMO13).

No site-related contaminants appear to be migrating from the LAP Area or the MFG Area via Prairie Creek, although some may have in the past. No contamination was detected in Prairie Creek in the MFG Area (DAMO12).

The following site-related contaminants of potential concern have been identified for Jordan Creek and Doyle Lake:

> Surface water: 2,4,6-TNT, HMX, RDX, water soluble sulfate, iron lead, manganese, and silver.
>
> Sediments: 2,4,6-TNT, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, fluoranthene, indeno(1,2,3-cd)pyrene, phenanthrene, pyrene, 2-chloronaphthalene, naphthalene, water-soluble sulfate, lead, silver, and zinc (DAMO13).

The presence of contaminants in Grant Creek appears to be episodic and localized within specific study areas. Identified contaminants of concern in Grant Creek and tributaries are:

> Surface water: 2,4,6-TNT, 2,4-dinitrotoluene and 2,6-dinitrotoluene.
>
> Sediment: Fluoranthene, lead and mercury (DAMO26).

The presence of contaminants in Jackson Creek appears to be episodic and localized within specific study areas. Identified contaminants of concern in Jackson Creek are:

Surface water: 1,3-dinitrobenzene, arsenic and sulfate.

Sediment: 2,6-dinitrotoluene, sulfate and lead (DAMO26).

No site-related compounds appear to be present in surface water or sediment in Jackson Creek downstream from the MFG Area (DAMO12).

The baseline risk assessment evaluated the potential risks to fishermen and resident children of contact with water in Jordan, Prairie, Jackson and Grant Creeks, and Kemery Lake. The carcinogenic risks to future fishermen and resident exceeded the 1×10^{-6} criterion for Grant Creek and Kemery Lake. The assessment determined that consumption of fish from Jackson and Grant Creeks and Kemery Lake could potentially result in an unacceptable cancer risk and indicated that fish tissue samples should be collected. The assessment also determined that noncarcinogenic risks for consumers of fish from Prairie Creek and Kemery Lake could potentially result in adverse health impacts (DAMO26).

Fish tissue samples were collected and analyzed for heavy metals, PCBs, pesticides and explosives. Sampling detected barium, copper, iron and zinc in fish tissue from Grant Creek in the MFG Area; iron and zinc in fish tissue from Prairie Creek in the MFG Area; barium, iron and zinc in fish tissue from Prairie Creek in the LAP Area; and iron and zinc in fish tissue from Doyle Lake. Neither PCBs nor explosives were detected in any of the fish tissue samples. DDE was detected, but at levels well below the Food and Drug Administrations action level. The tissue analysis indicated "no human health risk . . . from ingesting fish" (AEHA10). No compounds that would contribute the majority of risks if bioaccumulated by fish as hypothesized, were detected in the fish tissue samples.

The aquatic evaluation conducted during the ecological assessment determined that stream health and quality (based on benthic macroinvertebrate analysis) improves as Jackson, Prairie

and Grant Creeks flow across JOAAP. The evaluation further concluded that the health of Jordan Creek is unaffected by JOAAP. Spoil Bank Creek quality is moderately low immediately off-post and moderate about one mile off-post (AEHA10).

In the event that any materials are removed from the solid waste disposal sites, it should be noted that soils, sediments, or other media contaminated with hazardous substances or PCBs are considered special wastes pursuant to 35 IAC 808 and 809. When transported on public highways, special wastes must be manifested, and the truck must be a licensed special waste-hauling vehicle.

If sediments contaminated with hazardous substances are excavated, it should be noted that they would be a special waste and possibly even an RCRA hazardous waste due to the characteristic of toxicity. Contaminants could conceivably meet the PRGs and still exhibit characteristics of a hazardous waste.

4.17 Soils

A major concern at many of the IR sites is the presence of soil contamination. A discussion of the soil types at JOAAP is presented in Section 2 and discussions of contaminants of concern in soil at the individual IR sites are presented in Appendix D. Windborne dust, surface water runoff, or groundwater migration from the IR sites could result in secondary soil contamination. The possibility of secondary soil contamination will be reduced or eliminated once remedial measures are complete.

Abandoned wastewater lines present a potential continuing source of soil contamination as do prior leakage from leaking or broken lines. When underground waste lines (industrial, sanitary, and storm sewers) broke or started leaking, new lines were installed. Generally, the old lines were abandoned in place (ARMY01, ACOE01). Television surveys of the sanitary sewer lines in 1967 revealed leaking sewer lines connected to each of the STPs (AEHA09).

Another possible source of soil contamination is sediment excavated from ditches. Wastewater and potentially contaminated stormwater runoff was discharged to ditches throughout the facility. Periodically, sediment deposited in the ditches was removed to improve flow. The removed sediment was reportedly spread on the ground adjacent to the ditches (FIEL01).

Listed below are the contaminants found in IRP site soils included in USDA2 parcel. The estimated volume of soils requiring remediation is also shown (DAMO34, DAMO35, OHMC13).

Site	Contaminated Area	Contaminant	Volume Estimation (cubic yards)
L1	Ridge and Furrow system	Explosives	6,010
	Near Building 61-4 and sump		
	Soil near transformer pole east of Building 61-4	PCBs	60
	Soil near ASTs at Buildings 61-1	Organics	1,275
L2	Soils near popping furnaces	Metals	4,440
	Soils with elevated arsenic		
	Burning Pads	Explosives and Metals	16,350
L3	Soil east of demolition pits	Metals	185
	Fire Training Area		
	Bermed Area	Explosives and Metals	1,070
	Burning areas (berms) along Prairie Creek	Landfill	34,110
L4	Landfill	Landfill	NA
L5	Open storage	Metals	1,070
	Junk pile	Metals and Organics	1,965
	Drainage ditch		
	Oil stain area	Organics	850
	Soil below railroad ties		
L7	Stained soils around and beneath buildings and sumps	Explosives	2,225
	Soils around transformer pads	PCBs	330
L8	Stained soils around and beneath buildings and sumps	Explosives	505
	Soils around transformer pads	PCBs	94
L9	Stained soils around and beneath buildings and sumps	Explosives	1,500

	Soils around transformer pads	PCBs	310
L10	Stained soils around and beneath buildings and sumps	Explosives	915
	Sediment in drainage ditch of Building 3A-10		
	Soils around transformer pads	PCBs	505
L14	Soil near sump at Building 4-5	Explosives	410
M1	Ash pile	Red Water Ash	199,800
	Impacted soils/sediment west of ash pile and ditches extending to north and west	Red Water Ash	5,400
M2	Stained soils in north portion of site and "ash pillow"	Explosives	1,600
M3	Truck wash area, explosive hotspots, and spills	Explosives/Other organics	330
	Shallow soils within fenced area	Metals	5,600
M4	Vicinity of former lagoon	Lead	4,200
	Hotspot about 600 feet west of lagoon	Arsenic	1,800
M11	Northern portion of landfill	Lead/PAHs	66,600
M12	Wastewater outfall, ditches and lagoon	Lead/PAHs	3,700
	Wastewater outfall and lagoon	Sulfur	1,400

Areas that were identified as having concentrations below the established PRGs have been proposed for no action. The Army has proposed no further action for the following areas in the LAP Area (DAMO34):

- L1 soil below the clay conduit line which runs from Building 61-35 to the ridge-and-furrow system, the former western lagoon soil, and the soil in the ditch which drains the ridge-and-furrow on the southern side;
- L3 soil in the area south of Central Road and east of the burning cage, the demolition pit area, and the ditch between the bermed area and the fire training area;
- L5 soil near Building 26-2, Storage Building;
- L7 soils beneath Building 1-40B, the Washout Building; soils along the sewer line; soil adjacent to Building 1-14; and sediments in the North and South Drainage Ditch.

- L8 soil beneath Building 2-37, the Washout Building; and the southern drainage ditch and a section of the Jordan Creek tributary adjacent to the site.
- L9 soil adjacent to Building 3-16, the Propellant Loading Building; soil beneath Building 3-37, the Washout Building; soil beneath Building 3-45, the Washout Building; soil adjacent to Building 3-5B a service magazine; soil adjacent to the southwest side of Building 3-6, the TNT Screening Building; soil around the USTs near Building 3-1; and sediment in the drainage ditch north of L9.
- L10 soil adjacent to Building 3A-10, the Assembly, Packing and Shipping Building; soil adjacent to Building 3A-16B, the Cooling Building; soil beneath Building 3A-47, the Pumphouse; soil beneath Building 3A-43, the Vacuum Collection Building; soil within the Oil Pit located southeast of L10; and sediment at the outfall of the sewer line south of L10.
- L14 soil south of Building 4-5 and the sediment in the ditch south of Group 4 and south and west of Group 5.
- L16 soil beneath the flume for Building 6-4 and soil in the ditch at the outfall of Building 6-2 sump.
- L17 soil adjacent to the sump near Building 7-4.
- L19 soil adjacent to Building 9-3A, the Lead Azide Dry House; and Building 9-6, the Mercury Fulminate Dry House.

4.18 Groundwater

Groundwater and geological features at JOAAP are included in Section 2.5 of this report. In summary, only the glacial drift aquifer and the shallow Silurian dolomite aquifers are at or near the ground surface at the plant. A deep aquifer, the Cambrian-Ordovician, is utilized at JOAAP.

The Illinois Groundwater Protection Act (Illinois Public Act 85-863) was created to protect the chemical quality of the state's groundwater. This act empowers the IEPA to set quality standards for groundwater within the state. Illinois Groundwater Quality Standards, IAC 35,

Subpart D, regulate various aspects of groundwater quality. Included are criteria for groundwater classification, nondegradation provisions, standards for groundwater quality, and various procedures and protocols for the management and protection of groundwater. In accordance with Subpart B of the standards, groundwaters of the State of Illinois are designated as any of four classes of groundwaters or groundwater management zones.

Class I: Potable Resource Groundwater
Class II: General Resource Groundwater
Class III: Special Resource Groundwater
Class IV: Other Groundwater

The classification allows for determination of the appropriate level of protection and thus the appropriate groundwater quality standards. Typically, aquifers are assumed to be Class I, and any change involves a process of reclassification.

The glacial till aquifer is not utilized at JOAAP. A survey of 214 residential wells conducted by the Army as part of the Phase 2 RI indicated that this aquifer is not used in the surrounding area. Elevated concentrations of naturally occurring antimony, calcium, iron, magnesium, manganese, water-soluble nitrate/nitrite, sulfates, and sodium were found in the glacial till groundwater. This renders the water undesirable for domestic use, and in many cases, agricultural or industrial uses. All JOAAP-related groundwater contamination is found in the glacial till and portions of the Silurian dolomite aquifer. The contamination is in most cases localized. In addition, the low yield (one gal/m) associated with the glacial till aquifer makes it undesirable for any usage. The glacial till groundwater is not considered potable and has been designated a Class II aquifer. The underlying Silurian dolomite aquifer appears to meet the yield requirements for Class I aquifers, although groundwater from the dolomite may require treatment prior to use (DAMO08).

Groundwater contamination has been identified in the glacial till aquifer at the following IRP sites (DAMO33, OHMC12):

M1	Explosives, metals and sulfate	L1	Explosives and nitrate/nitrite
M2	Sulfate	L2	Explosives and nitrate/nitrite
M5	Explosives	L3	Explosives and nitrate/nitrite
M6	Explosives and VOCs	L4	Organics (nonexplosive)
M7	Explosives and metals	L5	Organics (nonexplosive) and metals
M8	Explosives, VOCs and sulfate	L6	Organics (nonexplosive)
M10	Toluene	L7	Nitrate/nitrite and sulfate
M11	Sulfate	L8	Nitrate/nitrite and metals
M12	Sulfate	L10	Explosives, nitrate/nitrite and metals
M13	Explosives and metals	L14	Explosives
		L18	Nitrate/nitrite and metals
		L19	Nitrate/nitrite

Groundwater contaminant plumes are depicted on Figure 4-2. The groundwater contamination at M10, L2, L5, L6, L10 and L14 is considered localized. Groundwater contaminant plumes extend beyond the IRP site boundaries at M1, and M7. The sulfate plume from M1 extends north into M111. A plume of explosive contamination extends from L3 to Prairie Creek (DAMO08, OHMC12). IRP sites which require no further action for groundwater include M2, M3, M4, M6A, M9, M11, M12, L2, L4, L5, L6, L7, L8, L10, L18 and L19 (OHMC12, DAMO33).

Background concentrations of sulfate at JOAAP are elevated and it is unlikely that the glacial till aquifer or dolomite aquifer will be used for drinking water. Therefore sulfate contamination was not included in the contaminant plumes (OHMC12). Facility-wide groundwater issues are discussed in *Determination of Class II Groundwater,* and some descriptive information is available in the IRP site histories presented as Appendix D (DAMO08, DAMO33). IRP sites which require no further action for groundwater include L2, L4, L5, L6, L7, L8, L10, L18, and L19 (DAMO33).

The Cambrian-Ordovician (deep) aquifer, an important source of groundwater in northeastern Illinois, is considered Class I. At JOAAP this aquifer is used for drinking and industrial uses. Groundwater samples from the aquifer indicate that it has not been impacted by activities at JOAAP. Some area residents use the dolomite aquifer but most of the users obtain bottled

water for drinking due to the objectionable taste and odor of water from this aquifer (DAMO08).

There are numerous wells at JOAAP: deep production wells, monitoring wells, shallow wells throughout the LAP Area for fire protection and agricultural well pits. The use, modification, and abandonment of wells are regulated under the Illinois Well Water Construction Code (Section ILCS 30/1 through 9).

4.19 Noise

Noise is not considered a major issue at JOAAP as it is located in a rural area and most facilities and operations are removed from residential areas (MAPS08). Some level of construction and demolition noise attended to remedial actions is to be expected. The noise will depend on the remedy selected.

Three indoor firing ranges are in use by Alliant Techsystems in Group 8 (L18) and testing is expected to continue on the ranges as long as Alliant occupies the property. The test ranges are used on a regular basis.

4.20 Drinking Water

Public water systems, regulated under 40 CFR 141, are those systems that serve 15 or more connections or 25 or more people and whose water is used for drinking, cooking, bathing, or hand washing. Drinking water quality standards, Maximum Contaminant Levels (MCLs), appear in 40 CFR 143. An overview of the water systems at JOAAP was presented in Section 2.3.1.

Potable water in the MFG Area is obtained from four deep wells (Wells 6, 7, 9, and 10) ranging in depth from 1,569 to 1,649 feet. The wells completed in the Cambrian-Ordovician aquifer and are located along Base Line Road (AEHA05, DAMO08). Sampling in 1989 and

1992 found radon-222 in the MFG Area water supply at levels up to 120 +/- 20 pCi/L. However, radon levels up to 1,090 pCi/L were found in the distribution system. It is thought that the elevated radon levels may be related to deposits of naturally occurring minerals within the water system. An ion exchange system was installed to lower the high naturally occurring levels of radium-226 in the potable water (AHEA05).

Samples from the MFG Area water supply wells have been collected and analyzed for explosives, anions, and metals. No site related contaminants were detected in the samples. Slightly elevated levels of lead (1.41 μg/L in well 7) and zinc (125 μg/L in well 9) were detected but this maybe related to the well casing or the fact that the background wells used for comparison were completed in a different aquifer (DAMO12). Sampling indicates the Cambrian-Ordovician aquifer has not been impacted by current or previous activities at JOAAP (DAMO08).

Potable water in the LAP Area is obtained from two deep wells (Wells East and West) with depths of 1,649 to 1,672 feet, respectively. The wells are near the intersection of Central and Chicago Roads. Water from these wells was pumped to a treatment facility where some of it passed through an ion exchange unit to lower the hardness and the concentrations of radium-226. The water was then aerated and chlorinated prior to storage in a 1.2 million–gallon reservoir. Polyphosphate and soda ash were added for pH and corrosion control when the water was pumped into the reservoir. Sampling in 1989 and 1992 found radon-222 in the LAP Area water supplies at levels of 70–90 pCi/L. However, radon levels up to 480 pCi/L were found in the distribution system (at the wastewater treatment plant). Elevated sodium, chloride, and total dissolved solids were found within the distribution system, but are thought to be related to the water-softening process that utilizes sodium chloride (AHEA05).

Copper piping and lead-containing solder were used in general plumbing applications for many years. The construction and operation of JOAAP coincided with the period during which these materials were used. Thus, these materials are presumed to be present in buildings at JOAAP (ACOE05).

4.21 Perimeter Survey

The area surrounding JOAAP is primarily agricultural and residential with limited industry. Most industries on the JOAAP perimeter are northwest of the facility. A survey of the JOAAP perimeter was conducted as part of the December 1995 field survey. The purpose of that survey was to identify local industry that could impact environmental conditions at JOAAP. Table 4-10 summarizes the findings of this survey.

An industrial park is located west of JOAAP, east of Route 55 and south of the Mobil facility. The survey team was unable to gain access to the industrial park. The exact nature of the operations conducted at these facilities are unknown. A sign at the entrance to this park lists the industries present (FIEL01):

Ambitech	BMW	Johnson Control
Consolidated FAB	Brieser Construction	Lindblad
PETROLITE	Chellino Crane	Meade Pritt
Port-O-Let	Conam	NTC
STARCON	Furmanite	Spike Enterprises
TEAM Inc.	Insulco	Hager
Banner Western	J.L. Manta	

Another industrial area is located west of Route 53 almost directly across from the current JOAAP administration building (74-3). There are three business located there on property that was formerly a large petroleum facility served by a pipeline. The businesses are Tyler Enterprises which manufactures herbicides and fertilizers, Tyler and Sons which is a grain company, and Tyler Realty (MEMO09).

4.22 Spills

During the operational life of JOAAP, numerous spills of process chemicals have occurred within the USDA2 parcel. Quantities of sulfur, toluene, sellite and petroleum products were released from broken pipes, overflowing or leaking storage tanks and equipment

malfunctions. Little information on spills that occurred prior to 1970 is available. The most comprehensive information on spills was collected in the 1970s. Spills occurring in the early 1970s are considered typical of spills that occurred throughout the operation of the facility (ARMY01).

Although the records are incomplete, documented spills are known to have occurred at the MFG Flashing Ground (M3), West Toluene Tank Farm (M10), the sellite area (M12), Group 3 (L9), Group 3A (L10), Group 5 (L15), and Group 8 (L18). The majority of recorded spills in the USDA2 parcel occurred in the sellite plant. The spills totaled approximately 640,000 pounds of sellite, 160,000 pounds of sulfur, and 70,000 pounds of soda ash. Spills of approximately 1.3 million pounds of toluene were documented in the West Toluene Tank Farm (M10). A summary of significant spills can be found in Table 4-11.

4.23 Miscellaneous Findings and Observations

Numerous other findings and observations were made during the field or document review. These findings are presented in Table 4-12.

During the PAS field survey, a fire training demonstration area was identified on the north side of L18. The area consisted of a slab from a former building with a row of cinder blocks around the edge. A number of burned tires and ash were present on the slab. No samples have been collected here for laboratory analysis (FIEL01).

Since lead was commonly used in ceramic coatings, it may be present in the ceramic coatings of sinks at JOAAP. Additionally, several of the buildings have lead floor finishes and lead piping (KOWS01, UCCI04). Asbestos putty containing a high percentage of lead was used for packing and caulking at the facility.

4.24 Responses to Agricultural Lessee Questionnaire

Questionnaires were sent to all 42 current agricultural lessees and 15 questionnaires relating to 25 tracts were completed and returned. Lessees were asked to provide information concerning both current and past leases. Lessees for the following tracts have not observed on their tracts any of the potential problems specified in the questionnaire: 23 (LESQ13), 30 (LESQ01), 37 (LESQ02), 48 (LESQ13), 54 (LESQ12), 57 (LESQ04), 60 (LESQ15), 69 (LESQ05), 70 (LESQ03), 76 (LESQ07), 78 (LESQ03), 79 (LESQ13), 108 (LESQ08), 109 (LESQ09), 150 (LESQ03), 154 (LESQ11), 157 (LESQ03), and 169 (LESQ04).

Lessees identified potential concerns relating to seven agricultural tracts. The concerns that potentially apply to the USDA2 parcel are as follows:

- Debris (bricks and rebar) were observed in a field on tract 28 (L21)(LESQ14).
- Cattle had died on tract 41 (L33) sometime prior to 1968. The deaths were presumably caused by something in a ditch that enters the southeast corner of the tract and flows northwest. USACERL sampling of this area in 1993 revealed no problems (LESQ12).
- The tract 110 (M105) lessee observed small pipes on the east side of the tract (LESQ10).
- On tract 111 (M105), the lessee reports a small hole with stained soil around the top. The hole is located near a pond at the east end of the pasture outside of the pasture fence (LESQ10).

TABLE 4-1
IR AND MAJOR OPERATIONAL AREAS
JOAAP, WILL COUNTY, ILLINOIS

PAS Study Section	IR Site Number	IR Site Name	Group Number	Functional Title
MFG Area				
M1	1	Southern Ash Pile		
M2	2	Explosive Burning Ground		
M3	3	Flashing Grounds		
M4	4	Lead Azide Area		
M5	5	Tetryl Production Area		
M6	6	TNT Ditch Complex		
M7	7	Red Water Area		
M8	8	Acid Manufacturing Area		
M9	9	Northern Ash Pile		
M10	10	Toluene Tank Farms		
M11	11	Landfill		
M12	12	Sellite Manufacturing Area		
M13	13	Gravel Pits		
M14	14	Former Pond Area		
M15	15	Sewage Treatment Plant		
M16	16	Motor Pool Area		
M17	17	Laundry Facility		
M18	18	Herbicide Storage Area		
M6A/M99				TNT Block Area
M111				South Railroad Classification Yard
M108/M111				811 Magazine Area
M102				Brown Circle Residences
LAP Area				
L1	L1	Group 61	61	Shell Renovation Plant
L2	L2	Explosive Burning Ground	23	Surface Storage Reservoir Area
L3	L3	Demolition Area	23	
L4	L4	Landfill Area		
L5	L5	Salvage Yard	26	Salvage Yard
L6	L6	Group 70	70	Shop Area
L7	L7	Group 1	1	Semi-fixed & Fixed Ammunition Loading Line
L8	L8	Group 2	2	Medium Caliber Loading Line
L9	L9	Group 3	3	Demolition Bomb & Fixed Ammunition Loading Line
L10	L10	Group 3A	3A	Demolition Bomb & Experimental Loading Line
L11	L11	Test Site		
L12	L12	Doyle Lake		
L13	L13	Group 68	68	Fuse-Booster-Primer Magazine Area

TABLE 4-1
IR AND MAJOR OPERATIONAL AREAS
JOAAP, WILL COUNTY, ILLINOIS

PAS Study Section	IR Site Number	IR Site Name	Group Number	Functional Title
L14	L14	Group 4	4	Fuse Loading Line
L15	L15	Group 5	5	Fuse Loading Line
L16	L16	Group 6	6	Booster Loading Line
L17	L17	Group 7	7	Booster Loading Line
L18	L18	Group 8	8	Primer Loading Line
L19	L19	Group 9	9	Detonator Loading Line
L20	L20	Group 20	20	Sewage Treatment Area
L21	L21	Group 23	23	Surface Storage Reservoir Area/Burning Ground/ Miscellaneous Buildings
L22	L22	Group 25	25	RR Classification Yard
L23	L23	Group 27	27	Inert Storage Warehouses
L24	L24	Group 29	29	High Explosive Classification Yard
L25	L25	Group 62	62	Inert Material Storage Area
L26	L26	Group 63	63	High Explosive Magazine Area
L27	L27	Group 64	64	Standard Fixed Ammunition Storage Area
L28	L28	Group 65	65	Smokeless Powder Magazine Area
L29	L29	Group 66	66	Finished Ammunition Storage Area
L30	L30	Group 66A	66A	Finished Ammunition Storage Area
L31	L31	Extraction Pits		
L32	L32	Group 60	60	Administration Group Area
L33	L33	PVC Area	41	AT-4 Test Range
L34	L34	Former Burning Area		
L35	L35	Fill Area		
L103			21	North Transformer/Substation
L6			22	South Transformer/Substation
L21			24	Fire Station
L121			28	Pistol Range
L112			45	Auxiliary Fuse Loading Line
Various			67	Radio Transmitter/ Water Towers
Various			71	Chemical Lab/Miscellaneous Buildings
L115			73	Construction Headquarters/Residence
L100/L111/ L112			74	Residences along Route 66
Various			86	Road Bridges
Various			87	Railroad Structures

Sources: (JAAP11, SPED01, DAMO11, DAMO12)

TABLE 4-2
SUMMARY OF CHEMICAL FINDINGS
SECOND LAND TRANSFER TO USDA
JOAAP, WILL COUNTY, ILLINOIS

Section	Building	DESCRIPTION	Status	Latitude	Longitude	Comments
1		Group 61	P			Pyrene detected at 2 of 14 soil sampling points.
2		Explosive Burning Ground	S			Chlorobenzene detected in Well MW501 below certified reporting level. B2EHP detected in groundwater and Well MW135.
			R			In November 1983 permission was granted to burn 22 drums of tetramethylene tetranitramine at this burning ground.
			S			One column of spent carbon was produced each month and disposed of at this area.
			P			According to a 1970 Standard Operating Procedures, picric acid was prepared and burned on a burning pad at the mine pit. No more than one gallon of picric acid was hand poured onto a burning pad at a time.
L3		Demolition Area	P	041:21:36.8	88:06:09.8	There are 2 rusted 55 gallon drums with holes in them toward the south end of the site. (11/96)
L4		Landfill Area				
L5		Salvage Yard	P			Benzyl Alcohol detected in well 26-9. The reason for its presence is unknown.
			P			There is a 55 gallon drum 50 feet east of MW419. The drum is labeled "Mineral Spirits"
	26-2	Baling Building	P			Used for storage of spent battery acid and non-PCB transformer oil; cracks exist in floor.
			P			There is one car battery and 8 empty 55 gallon drums, most marked "Waste Oil Non-Regulated Waste", in this building. One is unlabeled. One is marked "Texaco Rando Oil 46".
L7		Group 1				
	1-10	Drilling & Boostering and X-Ray	S	041:20:37.6	88:04:23.1	Acetone was used to clean shells in this building.
			S	041:20:37.6	88:04:23.1	Inert shells containing polychloronaphthalene were washed out in this building.
						Acid proof black paint pigments and thinner vapors were generated during the spray painting of shell interiors in this building.
			P	041:20:37.6	88:04:23.1	According to a 1975 Standard Operating Procedures, 2 gallons of acetone was stored in Bay 2 to clean exterior of projectiles.
			P	041:20:37.6	88:04:23.1	X-ray facility at north end of building several large oily stains on floor and around equipment. (about 200 square feet). (11/96)
	1-11	Fuze Storage Service Magazine	P	041:20:35.5	88:04:18.4	Concrete is stained around air compressor, about 50 square feet. (11/96)
	1-14	Propellant Charge Building	P	041:20:38.5	88:04:14.0	Oil stains on floor around equipment at east end of building. (11/96)
	1-16	Cooling Building	P	041:20:21.7	88:04:52.3	A 1982 energy analysis indicates corrosive atmosphere and acid spills in this building.
	1-31	Fiber Container Storage	P	041:20:35.8	88:04:12.1	Ten by twenty foot oil stain at the end of building. (11/96)
			P	041:20:35.8	88:04:12.1	There is an oil reservoir for the conveyor in the building, reservoir holds approximately 75 gallons. (11/96)
	1-38C	Vacuum Pump House	S			Motor with oil stains beneath. (11/96)
	1-38D	Vacuum Pump House	S			Motor with oil stains beneath. (11/96)
	1-38F	Vacuum Pump House	P			Two 5 gallon buckets, one labeled "xylol", one labeled "gray phenol 10". Both at least partially full. (11/96)

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TABLE 4-2
SUMMARY OF CHEMICAL FINDINGS
SECOND LAND TRANSFER TO USDA
JOAAP, WILL COUNTY, ILLINOIS

Section	Building	DESCRIPTION	Status	Latitude	Longitude	Comments
L7	1-40C	Sump Platform & Washout Building	P	041:20:43.8	88:04:26.5	Several oil stains in building. (11/96)
L8		Group 2	A			According to a 1970 Standard Operating Procedures, "No carbon tetrachloride fire extinguishers will be used anywhere within the group."
	2-1	Power House	P	041:21:48.4	88:04:11.5	About 20 bags of "High Capacity Synthetic Cation Exchange Resin (sodium form)" were present. (11/96)
	2-16	Cooling & Loading Building	P			A 1982 energy analysis indicates corrosive atmosphere and acid spills in this building.
	2-3A	Inert Storage	P	041:21:49.4	88:04:07.9	Pouring of inert projectiles and riser knockouts involved polychloronapthalene(PCN) and its vapors.
	2-5A	N.A. Service Magazine	P			Sealing of pellets involved ethyl cellulose and butyl acetate dye.
L9		Group 3	P			A sample taken from this group effluent contained mercury higher than State standards.
			P			According to a 1973 Group 3 Standard Operating Procedures, tetryl, TNT, and RDX Pelleting Presses were cleaned with acetone or a suitable substitute. Tracers and incendiary Pelleting presses were cleaned with a petroleum solvent similar to stanisol.
	3-3	Receiving & Painting Building	S	041:22:07.3	88:03:33.8	In this building, paint mist and thinner vapors were generated during spray-painting and drying of projectiles. Cleaning bright cartridge cases involved dilute alkaline and phosphoric acid solutions.
			S	041:22:07.3	88:03:33.8	Paint mist and thinner vapors were generated dur spray-painting and drying of projectiles. An alkaline solution was used to clean cartridge cases.
	3-3A	Inert Storage Building	P	041:22:07.3	88:03:33.8	Outside building at Bay 49 a partially filled 5 gallon container labeled "paint" was found. A box of Manox iron blue dye was found at the north west entrance to the building. This box was addressed to Talley Defense System, Mesa, Arizona 85205. (11/96)
	3-4	Melt Load Building	S			A sign on this building indicates that this building was used for hazardous waste storage. (11/96)
	3-5A	Supplementary Charge Manufacture	P			A 1982 energy analysis indicates corrosive atmosphere and acid spills in this building.
	3-5B	Propellant Powder Service Building	P			A 1982 energy analysis indicates corrosive atmosphere and acid spills in this building.
	3-10	Drilling, Boostering & Shipping	S			Pigments and thinner vapors were present during roll stenciling in this building.
			S			Acetone was used in Bay 13 for wiping projectiles. Ethyl alcohol and Butyl alcohol were used during stenciling of projectiles.
	3-16	Propellant Loading Building	S	041:22:08.0	88:03:05.5	Paint pigment and thinner vapor were generated during stenciling in this building.
			S	041:22:08.0	88:03:05.5	Paint mists and thinner vapors were generated during spray-painting of ammunition boxes and projectiles.

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TABLE 4-2
SUMMARY OF CHEMICAL FINDINGS
SECOND LAND TRANSFER TO USDA
JOAAP, WILL COUNTY, ILLINOIS

Section	Building	DESCRIPTION	Status	Latitude	Longitude	Comments
9	3-62	Grinder Building	S	041:22:05.4	88:02:56.8	A sign on the door of the building indicated that the building could be used to store up to 4,000 pounds of ammonium perchlorate. (11/96)
	3-64	Mixer Building	P	041:22:20.1	88:03:22.7	A pile of material possibly from sweepings was seen at the east entrance of this building. (11/96)
L10		Group 3A	P			A small pocket of oil was detected at Group 3A lift station on February 21, 1977.
	3A-3	Receiving & Painting	S			Inert shells containing polychloronaphthalene, sellite and iron oxide were drilled in this building.
	3A-4	Melting & Pour Building	S			Paint mist and solvent vapor were generated while spray painting.
	3A-5	N.A. Service Magazine	P			This building was used by Alliant as a hazardous waste satellite accumulation area. As of 1996, the area was no longer in use.
	3A-7	TNT Service Magazine	P			This building was used by Alliant as a hazardous waste satellite accumulation area. As of 1996, the area was no longer in use.
	3A-11B	Inert Storage	S			As of 1991, Alliant used this building as a satellite accumulation area for hazardous waste. An inspection found that hazardous waste was being accumulated in open containers.
			S			In 1991, Alliant was demilitarizing AT4 rockets in this building. This involved sawing of the casings into section prior to disposal. Some of the cuts were through metal parts which did not appear to be aluminum. Sampling of the redidue for heavy metals was recommended prior to disposal in the landfill.
	3A-12	Topping Building	S			In this building, cleaning of inert shells and threads lead to worker exposure to polychloronaphthalene. Stenciling involved solvent vapors.
			S			There is a room with a fume hood and it has a sign indicating that Toluene diisocyanate was used. (4/97)
	3A-13	H. E. Screening Building	P			At this location, tetrachloroethylene was detected in sample SC643B (soil). Pyrene was detected in SC632A and SC33A.
	3A-16	Cooling Building	S			Hydrochloric acid and lead were used during soldering of shell casings in this building.
			S			Drilling and cleaning of inert shells involved polychloronaphthalene in this building.
	3A-38B	Vacuum Pump House	P			According to a 1971 Standard Operating Procedures; paint, acetone, paint thinner, lacquer thinner, and other flammable materials were stored in this building.
	3A-43	Vacuum Collection Building	P			This building has fourteen vacuum units. (4/97)
L13		Group 68	P			The Risk Assessment evaluation for this site, indicates that none of the estimated risk or hazard values exceed the targeted criteria for the future heat exposure scenario that were considered.
			P			According to an undated Standard Operating Procedures, handling and storage of oxidizing chemical agents took place in Igloo Areas. Types of chemicals included: Fuzed Calcium Resinate, Type 1;

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TABLE 4-2
SUMMARY OF CHEMICAL FINDINGS
SECOND LAND TRANSFER TO USDA
JOAAP, WILL COUNTY, ILLINOIS

Section	Building	DESCRIPTION	Status	Latitude	Longitude	Comments
L13		Group 68				Strontium Nitrate, Grade B; Barium Nitrate, Grade Class A; Strontium Peroxide, Grade B; and Barium Peroxide. These chemicals are of the granular type and were stored separately. Cans or drums were from 5 to 50 pound capacity. If any chemicals were spilled, the unloading operation was stopped and the spill was swept up immediately. Spilled chemicals were not salvaged. Chemicals cleaned up from the ground were transferred to the Burning Ground. Damaged containers were not repaired or repacked in storage. Replacing of damaged containers took place at least 100 feet from the carrier or igloo. Empty, damaged containers were sent to the Burning Area and burned. All sweepage and scrap lumber was also sent to the Burning Area.
	68-1	Storage for Fuzes, Primers & Building	S			This is one of seven igloos in Group 68 permitted under RCRA for hazardous waste storage. This unit is no longer in active use by Alliant. IEPA inspected site in December 1995 and no violations were noted.
	68-2	Storage for Fuzes, Primers & Building	S			This is one of seven igloos in Group 68 permitted under RCRA for hazardous waste storage. This unit is no longer in active use by Alliant. IEPA inspected site in December 1995 and no violations were noted.
	68-3	Storage for Fuzes, Primers & Building	S			This is one of seven igloos in Group 68 permitted under RCRA for hazardous waste storage. This unit is no longer in active use by Alliant. IEPA inspected site in December 1995 and no violations were noted.
	68-14	Storage for Fuzes, Primers & Building	S			This is one of seven igloos in Group 68 permitted under RCRA for hazardous waste storage. This unit is no longer in active use by Alliant. IEPA inspected site in December 1995 and no violations were noted.
	68-15	Storage for Fuzes, Primers & Building	P			This is one of seven igloos in Group 68 permitted under RCRA for hazardous waste storage. This unit is currently in active use by Alliant for storage of explosives, propellants, fuses, partial rounds, warheads, and other components. IEPA inspected site in December 1995 and no violations were noted.
	68-18	Storage for Fuzes, Primers & Building	P			This is one of seven igloos in Group 68 permitted under RCRA for hazardous waste storage. This unit is currently in active use by Alliant for storage of explosives, propellants, fuses, partial rounds, warheads, and other components. IEPA inspected site in December 1995 and no violations were noted.
			P			Oil, hydraulic fuel, and anti-freeze for truck maintenance are stored in this building.

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TABLE 4-2
SUMMARY OF CHEMICAL FINDINGS
SECOND LAND TRANSFER TO USDA
JOAAP, WILL COUNTY, ILLINOIS

Section	Building	DESCRIPTION	Status	Latitude	Longitude	Comments
13	68-23	Storage for Fuzes, Primers & Building	P			This is one of seven igloos in Group 68 permitted under RCRA for hazardous waste storage. This unit is currently in active use by Alliant for storage of explosives, propellants, fuses, partial rounds, warheads, and other components. IEPA inspected site in December 1995 and no violations were noted. During the PAS site survey, a Hazardous Waste Storage sign was observed on the metal door of this building.
L14		Group 4	P			Two complete Pyles dispensing units for polysulphide cement application were fabricated and installed here.
	4-3	Fulminate Dry House	P			According to a 1970 Standard Operating Procedures, sealant, laminac, methylene chloride solvent, acetone, polysulfide rubber, loctite, and LP-2 were stored at this building.
	4-4	Fulminate Screen & Blend	P			A 1982 energy analysis indicates corrosive atmosphere and acid spills in this building.
	4-5	Primer Loading	P			This building is used by Alliant as a hazardous waste satellite accumulation area.
			P			According to a 1970 Standard Operating Procedures, this building was supplied with Comp "B" and calcium silicate.
	4-6	Delay Loading	P			According to a 1970 Standard Operating Procedures, cartridge cases, ogives, calcium silicate, propellant cups, laminac, silicone grease, polysulfide rubber, loctite, and LP-2 were stored at this building.
	4-14	Fuse Assembly	S			As part of 40 mm loading, primers and Ogives were sealed and cartridges were coated. Toluene, acetone and methylene chloride were used.
			P			According to a 1970 Standard Operating Procedures, phenol-formaldehyde varnish was applied to primers and base plug joints.
			P			According to a 1970 Standard Operating Procedures, ogive was cleaned with acetone and polysulfide was then applied.
	4-21	Testing Laboratory	S			Small quantities of reagents were used intermittently in surveillance laboratory.
			P			A 1982 energy analysis indicates corrosive atmosphere and acid spills in this building.
L15		Group 5				
	5-3	Fulminate Dry House	P			This building is used by Alliant as a hazardous waste satellite accumulation area.
	5-4	Fulminate Screen & Blend	S			Solvent vapor was present, while lacquering delay holders.
			P			A 1982 energy analysis indicates corrosive atmosphere and acid spills in this building.
	5-14	Fuse Assembly	S			In 1949, acid tanks containing caustic soda, phosphoric acid and chromic acid were used for paint stripping and cleaning. Spray painting was conducted in a water curtain paint booth.
			S			In 1953, dust (72% Cadmium) was generated from buffing fuses. Dust settled on the floors and fixtures.

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SUMMARY OF CHEMICAL FINDINGS
SECOND LAND TRANSFER TO USDA
JOAAP, WILL COUNTY, ILLINOIS

Section	Building	DESCRIPTION	Status	Latitude	Longitude	Comments
L15	5-14	Fuse Assembly				Varnishing delay holders generated varnish thinn vapor. While applying identification marking, lacqu thinner vapor was generated.
	5-15	Detonator Service Magazine	S			Atmosphere tests for thinner solvent in 1953 showed that workers were exposed to excessive vapor concentrations while obtaining and preparing supplies.
L18		Group 8	S	041:21:25.7	88:07:11.3	A fire training area measuring about 20 by 60 feet, and containing burned tires and ash; is located north of Building 8-10. The area consists of a cement slab surrounded by a row of cinder blocks. PCB field screening showed less than 0.5 ppm. Cattle have access to this area.
	8-1	Black Powder Service Magazine	P			There are 8 empty 55 gallon drums. (4/97)
	8-12	Power House	P			There are three empty 55 gallon drums. (4/97)
	8-14	Change House - Women	P			This building has one 1 gallon can and two 1 gallon jugs in the bathroom. (4/97)
L19		Group 9				
	9-12E	Administration Buildings	S	041:21:16.8	88:07:40.6	Amber glass quart bottle one-fourth full with a 2 phase liquid- one clear- one white, in mechanical room. (11/96)
	9-16	Power House	P	041:21:24.4	88:07:45.2	A 55-gallon drum marked "sodium hydroxide" is rusting with a pile of white material around it. There are also two 30-gallon trash cans both about half full of white powder, a 5-gallon bucket 3/4 full of white powder, and a 55-gallon drum with an illegible label. There is a 250-gallon tank on the cat walk, similar to fuel tanks elsewhere on-site. (11/9
L21		Group 23	P	041:21:36.0	88:04:53.0	55 gallon drum empty; labeled "Antifreeze and Coolent" contains ethylene glycol.
			P	041:21:53.0	88:04:40.5	Foundations at southwest corner of Chicago and Center Road, broken transite, black residue, bottles, graduated cylinder, test tube, clay pipe, black slag inside newer foundation also 1/2 drum partly buried, glass slag, black glassy slag 1/2-3 inch diameter at southwest corner of one foundation, broken white ceramic container and possible reagent jars, 10-15 dirt mounds with building and metal debris at intersection.
			P	041:21:54.6	88:05:09.0	About 100 cubic yards of coal ash, pit about 40 by 20 by 4 feet, 6 large dirt piles with metal pipes protruding from bottom, west of 23-7B.
			P			Manganese and sodium were detected at slightly elevated levels in groundwater downgradient of the landfill. This may indicate site-related contamination. No other contaminants of concern have been identified.
	23-1	Surface Storage Reservoir	P			One ton cylinder of chlorine is located in this building.
	23-2	Reservoir Pumping Station	S			Water chlorination occurred here. Testing of water involved standard chemical reagents.
	23-7	Radio Maintenance Shop	S			Spray painting was conducted in a room exhausted to the outside. Paint mists and thinner were generated.

U=USDA
P=Present, R=Removed, A=Absent, S=Suspected
Blanks in the comment column indicate no findings.
References for each finding are cited in the profile sheets in the Appendix.
Details on IRP site sampling are provided in Appendix D.

TABLE 4-2
SUMMARY OF CHEMICAL FINDINGS
SECOND LAND TRANSFER TO USDA
JOAAP, WILL COUNTY, ILLINOIS

Section	Building	DESCRIPTION	Status	Latitude	Longitude	Comments
21	23-7B	Storage Shed	P	041:21:55.5	88:05:04.5	There are two 5-gallon pails of asphalt at this building.
	23-29	Workshop	P	041:21:40.7	88:04:58.3	This building was used to store chemicals to support the water treatment plant operations. It contained limited quantities of sodium hypochlorite, oil, nitric and hydrochloric acids.
	61-7	Crushing & Drying	P	041:21:07.8	88:05:09.2	Various chemicals were found at this building: a 40-gallon drum marked "Ice Control", one fiber drum of red powder, eleven reliable rubber printing plate products, and a 50 lb box of white powder.
			S	041:21:07.8	88:05:09.2	This building was originally constructed and used for ammonium nitrate crushing and drying. As of 1959, it was occupied by Armour Research Foundation.
	61-39	Blast Building	P	041:22:11.3	88:05:10.8	There is an empty 35 gallon drum at this building with no markings. The soil around the drum is dark, possibly stained.
L33		PVC Area				
L34		Former Burning Area	P			Benzyl alcohol detected in upstream sample SW581 at 1.28 ug/L (not detected in duplicate sample). Calcium and magnesium were elevated across the entire site, while lead, silver and zinc were elevated only in Burning Area 1.
			P	041:22:18.4	88:04:26.2	There are 3 drums adjacent to the access road. A green salvage drum has a non-hazardous waste sticker on it and is labeled "OHM Chicago, IL PO# 1013003". The other two are an empty "smokeless powder" drum and an unmarked drum. There is also a 5 foot by 5 foot oil stain adjacent to drums.
			P	041:22:16.7	88:04:26.6	Adjacent to the access road, there is a 3 by 4 by 2 feet metal box containing 7 one gallon cans which may be full. There is a 5 gallon bucket almost full of oily material labeled "Texaco Marfak Multipurpose 2".
			P			Marfak Multi Purpose 2 is a lithium based grease.
L110		PAS Survey Section L110	P			An empty, rusted out 55-gallon drum lies near the head of a small drainage, south of east end of Group 63.
M1		Southern Ash Pile				
M2		Explosive Burning Ground	P			Red water ash was buried here.
M3		Flashing Grounds	P			There are twelve 55 gallon drums around fenced area. All of the drums seem empty and are rusted. (11/96)
M4		Lead Azide Area	P			On March 11, 1944, an explosion occurred in #1 Autoclave, in which crude sodium azide was made. The explosion was caused by feeding nitrous oxide into the autoclave when it contained approximately 50 pounds of unrested sodium, almost no liquid ammonia, and an atmosphere of ammonia vapors and some hydrogen.
			S			The southern portion of agricultural tract 109 west of the Lead Azide area (M4) was used for storage of barrels containing DNT, the duration and extent of storage are unknown. Five soil samples were collected in this area in 1981.

U=USDA
P=Present, R=Removed, A=Absent, S=Suspected
Blanks in the comment column indicate no findings.
References for each finding are cited in the profile sheets in the Appendix.
Details on IRP site sampling are provided in Appendix D.

TABLE 4-2
SUMMARY OF CHEMICAL FINDINGS
SECOND LAND TRANSFER TO USDA
JOAAP, WILL COUNTY, ILLINOIS

Section	Building	DESCRIPTION	Status	Latitude	Longitude	Comments
M4		Lead Azide Area	S			Low levels of TNT, nitrotoluene, sulfate, phospha and a variety of inorganics were detected at most locations. TNT was detected in 12 of the 15 samples and nitrotoluene was detected in five of the samples. The lead azide and sellite ditches cross M105 and were excluded from agricultural leasing. It was recommended that the area between the ditch and Blodgett Road be removed form the leasing program.
M5 U		Tetryl Production Area-USDA Portion				
M10 U		Toluene Tank Farms USDA Portion				
M11		Landfill	P	041:21:40.7	88:10:12.7	Sitting on top of a pile of asphalt rubble is what appears to be yellow blocks of sulfur (2 to 4 inches in diameter). Other clumps of sulfur were also seen in neighboring grounds. There are some bare areas also in the south east portion of M11. (11/96)
			P	041:21:46.9	88:10:15.6	M11, northeast quadrant, immediately adjacent to M2 is some half buried rubble. Seven feet on the other side of the M2 perimeter fence, there's a pile of what appears to be sulfur. Also there is sulfur on the M11 side. (11/96)
M12		Sellite Manufacturing Area	P			The addition of Calgon to each batch of sellite produced was instituted during April 1 to June 30, 1943 in an effort to reduce the frequency of clogging of the filter screen in the Wash House.
	307	Sellite Storage & Mixing House	P			There are chunks of sulfur-like rock (yellow in co in the field around this building. (11/96)
	307-1	Process House	P			Chunks of sulfur-like rocks are in the field around this building. (11/96)
M14		Former Pond Area				
M15		Sewage Treatment Plant	P			Chrysene accounts for the carcinogenic risks calculated. Carcinogenic risks for soils are exceeded, but beryllium accounts for most of this risk. Soils and sediments may pose a health threat to future residents at this site.
			P			In 1972, the following emissions were produced as by-products/waste: treated manufacturing sewage averaged 420,00 gallons/day for July 1972. Studies of the content of this outfall were underway to better define pollutants.
M99		TNT Block Area (M6A)				
M105		PAS Survey Section M105				
M108		PAS Survey Section M108				
M118		Grant Creek East				
M119		Grant Creek West				

U=USDA
P=Present, R=Removed, A=Absent, S=Suspected
Blanks in the comment column indicate no findings.
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Details on IRP site sampling are provided in Appendix D.

TABLE 4-3
SUMMARY OF REASONABLE MAXIMUM EXPOSURE RISK CHARACTERIZATION
JOAAP, WILL COUNTY, ILLINOIS

Land Use	Receptor	Media	Pathway	Major Chemicals Contributing to Exceedences	Total Carcinogenic Risk	Hazard Index
M1						
Current	Maintenance worker	Soil	Ingestion, Inhalation		5.8E-10	1.2E-04
		Sediment	Ingestion, Inhalation		NC	1.0E-06
		Surface water	Dermal		9.5E-09	3.5E-04
		Ash	Ingestion, Inhalation		1.1E-08	6.5E-05
	Security worker	Soil	Ingestion, Inhalation		5.8E-11	1.2E-05
		Sediment	Ingestion, Inhalation		NC	1.0E-07
		Surface water	Dermal		9.5E-09	3.5E-04
		Ash	Ingestion, Inhalation		1.1E-09	6.5E-06
Future	Maintenance worker	Soil	Ingestion, Inhalation		1.1E-08	2.3E-03
		Sediment	Ingestion, Inhalation		NC	1.9E-05
		Ash	Ingestion, Inhalation		2.0E-07	1.2E-03
	Construction worker	Soil	Ingestion, Inhalation		4.2E-09	1.0E-02
		Sediment	Ingestion, Inhalation		NC	9.4E-05
		Groundwater	Ingestion		NC	8.2E-03
		Ash	Ingestion, Inhalation		7.6E-08	5.8E-03
	Residents	Soil	Ingestion, Inhalation		6.5E-08	1.2E-02
		Sediment	Ingestion, Inhalation		NC	9.7E-05
		Groundwater	Ingestion, Inhalation, Dermal	Antimony	NC	3.1E+00
		Ash	Ingestion, Inhalation	2,6-DNT	1.2E-06	6.0E-03
	Resident child	Surface water	Dermal		1.6E-07	4.7E-03
M2						
Current	Maintenance worker	Soil	Ingestion, Inhalation		3.7E-09	7.8E-04
	Security worker	Soil	Ingestion, Inhalation		3.7E-10	7.8E-05
Future	Maintenance worker	Soil	Ingestion, Inhalation		6.9E-08	1.5E-02
	Construction worker	Soil	Ingestion, Inhalation		4.5E-07	2.9E-01
		Soil (hotspot)	Ingestion, Inhalation	2,4-DNT, 2,4,6-TNT	2.4E-06	1.6E+00
		Groundwater	Ingestion		NC	NC
	Industrial worker	Soil	Ingestion, Inhalation		4.6E-08	9.8E-03
	Residents	Soil	Ingestion, Inhalation		4.1E-07	7.3E-02
		Groundwater	Ingestion, Inhalation, Dermal		NC	NC
M3						
Current	Maintenance worker	Soil	Ingestion, Inhalation, Dermal	Lead, 2,4,6-TNT	1.2E-07	7.4E-02
	Security worker	Soil	Ingestion, Inhalation, Dermal	Lead, 2,4,6-TNT	9.7E-08	6.0E-02
Future	Maintenance worker	Soil	Ingestion, Inhalation, Dermal	Lead, 2,4,6-TNT, 1,3,5-DNB	2.3E-06	1.5E+00
	Construction worker	Soil	Ingestion, Inhalation, Dermal	Cadmium, Nickel, 2,4,6-TNT, Lead	3.5E-06	2.9E+00
		Groundwater	Ingestion		9.6E-10	3.2E-05
	Industrial worker	Soil	Ingestion, Inhalation, Dermal	Lead, 1,3,5-DNB	1.5E-06	1.1E+00
	Residents	Soil	Ingestion, Inhalation, Dermal	2,4,6-TNT, 2,4-DNT, 2,6-DNT, 1,3,5-TNB, Antimony, Lead, Thallium	1.4E-05	7.2E+00
		Groundwater	Ingestion, Inhalation, Dermal	Benzene	1.4E-05	2.5E-01
M4						
Risks not calculated for this site as cancer slope factors and RfDs were not available for the COCs. Lead is a concern for both current and future receptors exposed to soil.						
M5						
Current	Maintenance worker	Soil (E-W ditch)	Ingestion, Inhalation	Lead	2.6E-07	3.5E-01
		Soil (Tetryl Line)	Ingestion, Inhalation		1.4E-07	1.1E-02
		Sediment	Ingestion, Inhalation, Dermal		2.5E-07	7.3E-05
	Security worker	Soil (E-W ditch)	Ingestion, Inhalation	Lead	2.6E-08	3.5E-02
		Soil (Tetryl Line)	Ingestion, Inhalation		1.4E-08	1.1E-03
		Sediment	Ingestion, Inhalation, Dermal		7.4E-07	7.3E-06
	Hunter	Soil (E-W ditch)	Ingestion, Inhalation	Tetryl, Lead	9.4E-07	1.1E+00
		Sediment	Ingestion, Inhalation, Dermal		8.9E-07	2.2E-04
Future	Maintenance worker	Soil (E-W ditch)	Ingestion, Inhalation	2,6-DNT, 2,4-DNT, 2,4,6-TNT, Tetryl, Lead	4.9E-06	6.6E+00
		Soil (Tetryl Line)	Ingestion, Inhalation	2,4-DNT	2.6E-06	2.1E-01
		Sediment	Ingestion, Inhalation, Dermal	PCB 1254	4.6E-06	1.4E-03

NC- Not caculated as the cancer slope factors and/or RfDs are not available.
Shaded values exceed acceptable risks levels.
Source: DAMO23, DAMO26.

TABLE 4-3
SUMMARY OF REASONABLE MAXIMUM EXPOSURE RISK CHARACTERIZATION
JOAAP, WILL COUNTY, ILLINOIS

Land Use	Receptor	Media	Pathway	Major Chemicals Contributing to Exceedences	Total Carcinogenic Risk	Hazard Index
M5						
Future	Industrial worker	Soil (E-W ditch)	Ingestion, Inhalation	2,6,-DNT, 2,4-DNT, 2,4,6-TNT, Tetryl, Lead	3.3E-06	4.4E+00
	Industrial worker	Soil (Tetryl Line)	Ingestion, Inhalation	2,4-DNT	1.8E-06	1.4E-01
		Sediment	Ingestion, Inhalation, Dermal	PCB 1254	5.5E-06	9.1E-04
	Construction worker	Soil (E-W ditch)	Ingestion, Inhalation	2,6-DNT, 2,4-DNT, 2,4,6-TNT, Tetryl, Lead	1.1E-06	2.0E+00
		Soil (Tetryl Line)	Ingestion, Inhalation	2,4,6-TNT, 2,4-DNT	4.5E-06	9.5E+00
		Sediment	Ingestion, Inhalation, Dermal		6.6E-07	1.2E-02
		Groundwater	Ingestion		9.2E-09	3.2E-03
	Resident	Soil (E-W ditch)	Ingestion, Inhalation	2,6-DNT, 2,4-DNT, 2,4,6-TNT, Tetryl, Lead	2.9E-05	3.3E+01
		Soil (Tetryl Line)	Ingestion, Inhalation	1,3-DNB, 2,4-DNT	1.5E-05	1.0E+00
		Sediment	Ingestion, Inhalation, Dermal	PCB 1254	1.4E-05	6.8E-03
		Groundwater	Ingestion, Inhalation, Dermal	2,6-DNT, 2,4,6-TNT, 2,4-DNT, 1,3,5-DNB	5.3E-05	2.4E+00
	Resident child	Surfece water	Dermal		1.7E-09	2.4E-03
M6						
Current	Maintenance worker	Soil (TNT ditch)	Ingestion, Inhalation	2,6-DNT, 2,4,6-TNT, 2,4-DNT	4.4E-05	4.9E+00
		Soil (other)	Ingestion, Inhalation	2,4,6-TNT, 2,4-DNT, 2,6-DNT	1.4E-05	1.7E+00
		Sediment	Ingestion, Inhalation		7.7E-07	8.7E-02
		Sediment (hotspot)	Ingestion, Inhalation	2,4,6-TNT	1.6E-06	2.7E-01
	Security worker	Soil (TNT ditch)	Ingestion, Inhalation	2,6-DNT, 2,4,6-TNT, 2,4-DNT	4.4E-06	4.9E-01
		Soil (other)	Ingestion, Inhalation	2,4,6-TNT, 2,4-DNT, 2,6-DNT	1.4E-06	1.7E-01
		Sediment	Ingestion, Inhalation		7.7E-08	8.7E-03
		Sediment (hotspot)	Ingestion, Inhalation		1.7E-07	2.7E-02
Future	Maintenance worker	Soil (TNT ditch)	Ingestion, Inhalation	2,4,6-TNT, 2,4-DNT, 2,6-DNT	8.3E-04	9.3E+01
		Soil (other)	Ingestion, Inhalation	2,4,6-TNT, 2,4-DNT, 2,6-DNT	2.7E-04	3.2E+01
		Sediment	Ingestion, Inhalation	2,4,6-TNT, Benzo(b)fluoranthene, Benzo(a)pyrene, Chrysene, Benzo(a)anthracene, 2,4-DNT	1.4E-05	1.6E+00
		Sediment (hotspot)	Ingestion, Inhalation		3.0E-05	5.1E+00
	Construction worker	Soil (TNT ditch)	Ingestion, Inhalation	2,4,6-TNT, 2,4-DNT, 2,6-DNT	3.2E-04	4.4E+02
		Soil (other)	Ingestion, Inhalation	2,4,6-TNT, 2,4-DNT, 2,6-DNT	6.5E-05	9.8E+01
		Sediment	Ingestion, Inhalation	2,4,6-TNT, Benzo(a)fluoranthene, Benzo(a)pyrene, Chrysene	5.9E-06	7.9E+00
		Sediment (hotspot)	Ingestion, Inhalation		1.1E-05	2.5E+01
		Groundwater (N plume)	Ingestion	2,4-DNT	2.1E-06	2.2E-01
		Groundwater (Ctr plume)	Ingestion		1.7E-09	5.9E-05
		Groundwater (S plume)	Ingestion		9.1E-08	1.9E-04
	Industrial worker	Soil (TNT ditch)	Ingestion, Inhalation	2,4,6-TNT, 2,4-DNT, 2,6-DNT	5.4E-04	6.2E+01
		Soil (other)	Ingestion, Inhalation	2,4,6-TNT, 2,4-DNT, 2,6-DNT	1.8E-04	2.2E+01
		Sediment	Ingestion, Inhalation	2,4,6-TNT, Benzo(b)fluoranthene, Benzo(a)pyrene, Chrysene, Benzo(a)anthracene, 2,4-DNT	9.6E-06	1.1E+00
		Sediment (hotspot)	Ingestion, Inhalation		2.1E-05	3.4E+00
	Resident	Soil (TNT ditch)	Ingestion, Inhalation	2,4,6-TNT, 2,4-DNT, 2,6-DNT, 1,3,5-TNB	4.9E-03	4.6E+02
		Soil (other)	Ingestion, Inhalation	2,4,6-TNT, 2,4-DNT, 2,6-DNT, 1,3,5-TNB	1.6E-03	1.6E+02
		Sediment	Ingestion, Inhalation	2,4,6-TNT, Benzo(b)fluoranthene, Benzo(a)anthracecene, 2,4-DNT, Benzo(a)Pyrene, Chrysene	8.6E-05	8.1E+00
		Sediment (hotspot)	Ingestion, Inhalation		1.8E-04	2.5E+01
		Groundwater (N plume)	Ingestion, Inhalation, Dermal	2,4-DNT, 2,6-DNT, 2,4,6-TNT, RDX, 1,3,5-TNB	1.3E-02	1.3E+02
		Groundwater (Ctr plume)	Ingestion, Inhalation, Dermal	2,4-DNT, 2,6-DNT	9.7E-06	2.3E-02
		Groundwater (S plume)	Ingestion, Inhalation, Dermal	2,6-DNT, 2,4-DNT, 2,4,6-TNT, RDX, Nitrobenzene	5.3E-04	3.5E+00
	Resident child	Surface water	Dermal	2,6-DNT, 2,4-DNT	6.3E-06	2.9E-01

NC- Not caculated as the cancer slope factors and/or RfDs are not available.
Shaded values exceed acceptable risks levels.
Source: DAMO23, DAMO26.

TABLE 4-3
SUMMARY OF REASONABLE MAXIMUM EXPOSURE RISK CHARACTERIZATION
JOAAP, WILL COUNTY, ILLINOIS

Land Use	Receptor	Media	Pathway	Major Chemicals Contributing to Exceedences	Total Carcinogenic Risk	Hazard Index
M7						
Current	Maintenance worker	Soil (TNT ditch)	Ingestion, Inhalation		1.5E-08	1.9E-03
		Soil (open tank area)	Ingestion, Inhalation	2,4,6-TNT	1.4E-05	2.6E+00
		Sediment	Ingestion, Inhalation		1.7E-08	3.0E-04
		Surface water (small intermittent pond)	Ingestion, Inhalation	2,4-DNT	9.3E-06	2.2E-02
	Security worker	Soil (TNT ditch)	Ingestion, Inhalation		1.5E-09	1.9E-04
		Soil (open tank area)	Ingestion, Inhalation	2,4,6-TNT	1.4E-06	2.6E-01
		Sediment	Ingestion, Inhalation		1.7E-09	3.0E-05
Future	Maintenance worker	Soil (TNT ditch)	Ingestion, Inhalation		2.9E-07	3.5E-02
		Soil (open tank area)	Ingestion, Inhalation	2,4,6-TNT, 2,4-DNT, 1,3,5-TNB	2.7E-04	4.8E+01
		Sediment	Ingestion, Inhalation		3.2E-07	5.6E-03
	Construction worker	Soil (TNT ditch)	Ingestion, Inhalation		1.5E-07	7.3E-02
		Soil (TNT ditch hotspot)	Ingestion, Inhalation		2.5E-07	6.1E-01
		Soil (open tank area)	Ingestion, Inhalation	2,4,6-TNT, 2,4-DNT	7.4E-05	1.6E+02
		Sediment	Ingestion, Inhalation		1.2E-07	3.2E-02
		Groundwater	Ingestion		3.8E-08	1.6E-03
	Industrial worker	Soil (TNT ditch)	Ingestion, Inhalation		1.9E-07	2.3E-02
		Soil (open tank area)	Ingestion, Inhalation	2,4,6-TNT, 2,4-DNT	1.8E-04	3.2E+01
		Sediment	Ingestion, Inhalation		2.1E-07	3.7E-03
	Resident	Soil (TNT ditch)	Ingestion, Inhalation	2,6-DNT	1.7E-06	1.8E-01
		Soil (open tank area)	Ingestion, Inhalation	2,4,6-TNT, 2,4-DNT, RDX, 1,3,5-TNB	1.6E-03	2.4E+02
		Sediment	Ingestion, Inhalation	2,4-DNT	1.9E-06	2.8E-02
		Groundwater	Ingestion, Inhalation, Dermal	2,4-DNT, 2,6-DNT, PCE, RDX, 1,3-DNB	2.3E-04	1.2E+00
	Resident child	Surface water (small intermittent pond)	Dermal	2,4-DNT	3.3E-04	9.4E-01
M8						
Current	Maintenance worker	Soil	Ingestion, Inhalation	Lead	NC	9.3E-04
		Sediment (S acid ditch)	Ingestion, Inhalation	Chrysene, Benzo(b)fluoranthene, Benzo(a)anthracene, Benzo(a)pyrene, Benzo(k)fluoanthene	4.9E-06	1.0E-03
		Sediment (N acid ditch and acid ponds)	Ingestion, Inhalation		NC	2.2E-02
		Sediment (Jackson Creek tributaries)	Ingestion, Inhalation		NC	3.0E-04
		Surface water (South acid ditch)	Dermal		2.0E-08	1.1E-04
		Surface water (N acid ditch acid and pond	Dermal		4.5E-09	2.3E-05
		Surface water (Jackson Creek tributaries)	Dermal		NC	6.4E-07
	Security worker	Soil	Ingestion, Inhalation	Lead	NC	4.9E-06
		Sediment (S acid ditch)	Ingestion, Inhalation		2.6E-08	5.4E-06
		Sediment (N acid ditch and acid ponds)	Ingestion, Inhalation		NC	1.2E-04
	Hunter	Soil	Ingestion, Inhalation	Lead	NC	1.5E-04
		Sediment (S acid ditch)	Ingestion, Inhalation	Chrysene	9.4E-07	1.6E-04
		Sediment (N acid ditch and acid ponds)	Ingestion, Inhalation		NC	3.5E-03
		Sediment (Jackson Creek tributaries)	Ingestion, Inhalation		NC	4.8E-05
Future	Maintenance worker	Soil	Ingestion, Inhalation	Lead	NC	9.3E-04
		Sediment (S acid ditch)	Ingestion, Inhalation	Chrysene, Benzo(b)fluoranthene, Benzo(a)anthracene, Benzo(a)pyrene, Benzo(k)fluoranthene	4.9E-06	1.0E-03
		Sediment (N acid ditch and acid ponds)	Ingestion, Inhalation		NC	2.2E-02
	Maintenance worker	Sediment (Jackson Creek tributaries)	Ingestion, Inhalation		NC	3.0E-03

NC- Not caculated as the cancer slope factors and/or RfDs are not available.
Shaded values exceed acceptable risks levels.
Source: DAMO23, DAMO26.

TABLE 4-3
SUMMARY OF REASONABLE MAXIMUM EXPOSURE RISK CHARACTERIZATION
JOAAP, WILL COUNTY, ILLINOIS

Land Use	Receptor	Media	Pathway	Major Chemicals Contributing to Exceedences	Total Carcinogenic Risk	Hazard Index
M8						
Future	Construction worker	Soil	Ingestion, Inhalation	Lead	NC	8.1E-03
		Sediment (S acid ditch)	Ingestion, Inhalation	Chrysene, Benzo(b)fluoranthene, Benzo(a)anthracene, Benzo(a)pyrene, Benzo(k)fluoranthene	2.3E-06	6.9E-03
		Sediment (N acid ditch and acid ponds)	Ingestion, Inhalation		NC	1.9E-01
		Sediment (Jackson Creek tributaries)	Ingestion, Inhalation		NC	2.6E-03
		Groundwater	Ingestion		NC	2.3E-05
	Industrial worker	Soil	Ingestion, Inhalation	Lead	NC	6.2E-04
		Sediment (S acid ditch)	Ingestion, Inhalation	Chrysene, Benzo(b)fluoranthene, Benzo(a)anthracene, Benzo(a)pyrene, Benzo(k)fluoranthene	3.3E-06	6.8E-04
		Sediment (N acid ditch and acid ponds)	Ingestion, Inhalation		NC	1.4E-02
	Resident	Soil	Ingestion, Inhalation	Lead	NC	4.6E-03
		Sediment (S acid ditch)	Ingestion, Inhalation	Chrysene, Benzo(b)fluoranthene, Benzo(a)anthracene, Benzo(a)pyrene, Benzo(k)fluoranthene	2.9E-05	5.1E-03
		Sediment (N acid ditch and acid ponds)	Ingestion, Inhalation		NC	1.1E-01
		Sediment (Jackson Creek tributaries)	Ingestion, Inhalation		NC	1.5E-03
		Groundwater	Ingestion, Inhalation, Dermal		NC	4.8E-02
	Resident child	Surface water (South acid ditch)	Dermal		3.4E-07	1.6E-03
		Surface water (N acid ditch acid and pond	Dermal		7.5E-08	8.0E-04
		Surface water (Jackson Creek tributaries)	Dermal		NC	8.9E-06
M9						
Current	Maintenance worker	Surface water	Dermal		NC	5.4E-06
Future	Resident child	Surface water	Dermal		NC	7.4E-05
Soil/ash exposure was considered for maintenance/security workers and residents but cancer slope factors and RfDs were not available for COCs and risks could not be calculated.						
M10						
Future	Construction worker	Groundwater (west farm)	Ingestion		1.2E-09	6.0E-04
		Groundwater (Ctr farm)	Ingestion		1.2E-10	7.5E-04
	Resident	Groundwater (west farm)	Ingestion, Inhalation, Dermal	Benzene, Toluene	1.8E-05	8.9E+00
		Groundwater (Ctr farm)	Ingestion, Inhalation, Dermal	Benzene, Toluene	1.8E-06	1.2E+01
M11						
Current	Maintenance worker	Sediment	Ingestion, Inhalation		4.3E-11	1.5E-04
	Security worker	Sediment	Ingestion, Inhalation		4.3E-12	1.5E-05
Future	Maintenance worker	Sediment	Ingestion, Inhalation		8.1E-10	2.9E-03
	Construction worker	Groundwater	Ingestion		NC	6.6E-05
		Sediment	Ingestion, Inhalation		7.1E-07	1.4E-01
	Resident	Groundwater	Ingestion, Inhalation, Dermal		NC	2.5E-02
		Sediment	Ingestion, Inhalation		1.5E-09	1.4E-02
	Resident child	Surface water	Dermal		NC	1.8E-03
M12						
Current	Maintenance worker	Soil	Ingestion, Inhalation		NC	1.1E-04
		Sediment	Ingestion, Inhalation	Lead	NC	9.2E-04
	Security worker	Soil	Ingestion, Inhalation		NC	1.1E-05
		Sediment	Ingestion, Inhalation	Lead	NC	9.2E-04
Future	Maintenance worker	Soil	Ingestion, Inhalation		NC	2.0E-03
		Sediment	Ingestion, Inhalation	Lead	NC	1.7E-02
	Construction worker	Soil	Ingestion, Inhalation		NC	8.2E-03
		Sediment	Ingestion, Inhalation	Lead	NC	2.6E-01
		Groundwater	Ingestion		NC	NC
	Industrial worker	Soil	Ingestion, Inhalation		NC	1.4E-03
		Sediment	Ingestion, Inhalation	Lead	NC	1.2E-02

NC- Not caculated as the cancer slope factors and/or RfDs are not available.
Shaded values exceed acceptable risks levels.
Source: DAMO23, DAMO26.

TABLE 4-3
SUMMARY OF REASONABLE MAXIMUM EXPOSURE RISK CHARACTERIZATION
JOAAP, WILL COUNTY, ILLINOIS

Land Use	Receptor	Media	Pathway	Major Chemicals Contributing to Exceedences	Total Carcinogenic Risk	Hazard Index
M12						
Future	Resident	Soil	Ingestion, Inhalation		NC	1.0E-02
		Sediment	Ingestion, Inhalation	Lead	NC	8.5E-02
		Groundwater	Ingestion, Inhalation, Dermal		NC	NC
	Resident child	Surface water	Dermal		1.0E-07	1.0E-03
M13						
Future	Construction worker	Groundwater	Ingestion		NC	5.1E-05
	Resident	Groundwater	Ingestion, Inhalation, Dermal		NC	1.9E-02
M14						
Current	Maintenance worker	Soil	Ingestion, Inhalation		NC	1.6E-05
	Security worker	Soil	Ingestion, Inhalation		NC	1.6E-06
Future	Maintenance worker	Soil	Ingestion, Inhalation		NC	3.1E-04
	Construction worker	Soil	Ingestion, Inhalation		NC	1.4E-03
	Resident	Soil	Ingestion, Inhalation		NC	1.5E-03
M15						
Current	Maintenance worker	Soil	Ingestion, Inhalation	Chrysene	8.4E-09	7.9E-03
		Sediment (north ditch)	Ingestion, Inhalation		NC	1.0E-03
		Sediment (south ditch)	Ingestion, Inhalation	Beryllium	8.7E-06	5.7E-02
		Surface water (N ditch)	Dermal		2.2E-09	1.4E-05
		Surface water (S ditch)	Dermal		3.1E-09	1.1E-05
	Security worker	Soil	Ingestion, Inhalation		1.1E-08	4.2E-05
		Sediment (north ditch)	Ingestion, Inhalation		NC	5.5E-06
		Sediment (south ditch)	Ingestion, Inhalation		4.6E-08	3.0E-04
Future	Maintenance worker	Soil	Ingestion, Inhalation	Chrysene	8.4E-09	7.9E-03
		Sediment (north ditch)	Ingestion, Inhalation		NC	1.0E-03
		Sediment (south ditch)	Ingestion, Inhalation	Beryllium	8.7E-06	5.7E-02
	Construction worker	Soil	Ingestion, Inhalation	Chrysene	9.8E-07	6.7E-02
		Sediment (north ditch)	Ingestion, Inhalation		NC	7.8E-03
		Sediment (south ditch)	Ingestion, Inhalation	Beryllium	5.0E-06	5.6E-01
	Industrial worker	Soil	Ingestion, Inhalation	Chrysene	6.0E-09	5.3E-05
		Sediment (north ditch)	Ingestion, Inhalation		NC	6.9E-04
		Sediment (south ditch)	Ingestion, Inhalation	Beryllium	5.8E-06	3.8E-02
	Resident	Soil	Ingestion, Inhalation	Chrysene	5.0E-08	3.9E-02
		Sediment (north ditch)	Ingestion, Inhalation		NC	5.1E-03
		Sediment (south ditch)	Ingestion, Inhalation	Beryllium	5.2E-05	2.8E-01
	Resident child	Surface water (N ditch)	Dermal		8.5E-08	3.3E-04
		Surface water (S ditch)	Dermal		1.2E-07	3.2E-04
Jackson Creek (MFG area)						
Current	Fish consumer	Surface water	Ingestion	Arsenic	6.1E-05	3.2E-01
Future	Fisherman	Surface water	Dermal		1.5E-07	4.1E-03
	Resident child	Surface water	Dermal		5.3E-07	3.3E-03
Grant Creek (MFG area)						
Current	Fish consumer	Surface water	Ingestion	2,6-DNT,2,4-DNT	6.6E-06	3.6E-02
Future	Fisherman	Surface water	Dermal	2,4,6-TNT	7.9E-06	1.8E-03
	Resident child	Surface water	Dermal	2,4,6-TNT	8.3E-06	8.0E-04
L1						
Current	Security worker	Soil	Inhalation, ingestion, dermal		1.0E-07	4.0E-02
Future	Industrial worker	Soil	Inhalation, ingestion, dermal	2,4,6-TNT, Cadmium	1.0E-05	7.0E+00
	Construction worker	Soil	Inhalation, ingestion, dermal	PCB 1260, 2,4,6-TNT	1.0E-05	8.0E+00
	Resident	Soil	Inhalation, ingestion, dermal	2,4,6-TNT, Cadmium	1.0E-04	2.0E+01
	Hunter	Soil	Inhalation, ingestion, dermal	2,4,6-TNT, Cadmium	4.0E-06	1.0E+00
	Resident	Groundwater	Inhalation, ingestion, dermal	2,4,6-TNT, 1,3,5-TNB	4.0E-04	4.0E+02

NC- Not caculated as the cancer slope factors and/or RfDs are not available.
Shaded values exceed acceptable risks levels.
Source: DAMO23, DAMO26.

TABLE 4-3
SUMMARY OF REASONABLE MAXIMUM EXPOSURE RISK CHARACTERIZATION
JOAAP, WILL COUNTY, ILLINOIS

Land Use	Receptor	Media	Pathway	Major Chemicals Contributing to Exceedences	Total Carcinogenic Risk	Hazard Index
L2						
Current	Security worker	Soil (burning pad)	Inhalation, ingestion, dermal		2.0E-07	2.0E-02
		Soil (popping furnace)	Inhalation, ingestion, dermal		2.0E-07	1.0E-03
		Soil (oils pits)	Inhalation, ingestion, dermal	PCBs	3.0E-04	4.0E-02
	Hunter	Soil (burning pad)	Inhalation, ingestion, dermal	2,4,6-TNT	6.0E-06	6.0E-01
		Soil (popping furnace)	Inhalation, ingestion, dermal		6.0E-06	3.0E-02
		Soil (oils pits)	Inhalation, ingestion, dermal	PCBs	1.0E-02	1.0E+00
Future	Industrial worker	Soil (burning pad)	Inhalation, ingestion, dermal	2,4,6-TNT	2.0E-05	3.0E+00
		Soil (popping furnace)	Inhalation, ingestion, dermal		2.0E-05	7.0E-01
		Soil (oils pits)	Inhalation, ingestion, dermal	PCBs, Heptachlor epoxide	6.0E-02	5.0E+00
	Construction worker	Soil (burning pad)	Inhalation, ingestion, dermal	2,4,6-TNT	2.0E-05	6.0E+00
		Soil (popping furnace)	Inhalation, ingestion, dermal	Cadmium	4.0E-05	1.0E-01
		Soil (oils pits)	Inhalation, ingestion, dermal	PCBs, Heptachlor epoxide	2.0E-03	2.0E+01
	Resident	Soil (burning pad)	Inhalation, ingestion, dermal	2,4,6-TNT	2.0E-04	2.0E+01
		Soil (popping furnace)	Inhalation, ingestion, dermal		2.0E-04	1.0E+00
		Soil (oils pits)	Inhalation, ingestion, dermal	PCBs, Heptachlor epoxide	2.0E-01	3.0E+01
	Resident	Groundwater (burning pad)	Inhalation, ingestion, dermal	RDX	8.0E-04	6.0E+00
		Groundwater (oil pits)	Inhalation, ingestion, dermal	1,2-Dichloroethane	5.0E-06	6.0E-02
	Resident (child)	Surface water	Dermal	PCBs	3.0E-02	7.0E-02
L3						
Current	Security worker	Soil	Inhalation, ingestion, dermal		1.0E-07	3.0E-03
		Soil (northeast area)	Inhalation, ingestion, dermal		8.0E-08	5.0E-03
		Soil (bermed area)	Inhalation, ingestion, dermal		3.0E-07	7.0E-03
Future	Industrial worker	Soil	Inhalation, ingestion, dermal	Arsenic, RDX	2.0E-05	5.0E-01
		Soil (northeast area)	Inhalation, ingestion, dermal	Arsenic, 2,6-DNT	9.0E-06	8.0E-01
		Soil (bermed area)	Inhalation, ingestion, dermal	RDX	4.0E-05	1.0E+00
	Construction worker	Soil	Inhalation, ingestion, dermal	Arsenic, RDX	2.0E-05	1.0E+00
	Resident	Soil	Inhalation, ingestion, dermal	Arsenic, RDX	1.0E-04	3.0E+00
		Soil (northeast area)	Inhalation, ingestion, dermal	Arsenic, 2,6,-DNT, Thallium, 1,3,5-TNB	8.0E-05	5.0E+00
		Soil (bermed area)	Inhalation, ingestion, dermal	RDX	3.0E-04	6.0E+00
	Hunter	Soil	Inhalation, ingestion, dermal	Arsenic, RDX	5.0E-06	1.0E-01
		Soil (northeast area)	Inhalation, ingestion, dermal	Arsenic, 2,6-DNT	3.0E-06	2.0E-01
		Soil (bermed area)	Inhalation, ingestion, dermal	RDX	1.0E-05	2.0E-01
	Resident	Groundwater (bermed area)	Inhalation, ingestion, dermal	RDX	1.0E-04	8.0E-01
		Groundwater (burn cage plume)	Inhalation, ingestion, dermal	RDX	3.0E-05	2.0E-01
L4						
Current	Security worker	Soil	Inhalation, ingestion, dermal		2.0E-08	4.0E-04
Future	Industrial worker	Soil	Inhalation, ingestion, dermal	PAHs, PCB 1260	3.0E-06	8.0E-02
	Construction worker	Soil	Inhalation, ingestion, dermal		2.0E-06	2.0E-01
	Resident	Soil	Inhalation, ingestion, dermal	PAHs, PCB 1260	2.0E-05	2.0E-01
	Hunter	Soil	Inhalation, ingestion, dermal		7.0E-07	1.0E-02
	Resident	Groundwater	Inhalation, ingestion, dermal	1,2-Dichlorethane	2.0E-05	1.0E-04
L5						
Current	Security worker	Soil	Inhalation, ingestion, dermal	PCBs	7.0E-04	1.0E-02
		Soil (junk pile)	Inhalation, ingestion, dermal	PCBs	1.0E-03	3.0E-02
Future	Industrial worker	Soil	Inhalation, ingestion, dermal	PCBs,Cadmium	1.0E-01	3.0E+00
		Soil (junk pile)	Inhalation, ingestion, dermal	PCBs.Cadmium	3.0E-01	6.0E+00
	Construction worker	Soil	Inhalation, ingestion, dermal	PCBs	8.0E-03	2.0E+00
	Resident	Soil	Inhalation, ingestion, dermal	PCBs,Cadmium	3.0E-01	7.0E+00
		Soil (junk pile)	Inhalation, ingestion, dermal	PCBs,Cadmium	6.0E-01	1.0E+01
	Hunter	Soil	Inhalation, ingestion, dermal	PCBs	2.0E-02	4.0E-01
		Soil (junk pile)	Inhalation, ingestion, dermal	PCBs	5.0E-02	9.0E-01
	Resident	Grounwater	Inhalation, ingestion, dermal	Manganese	NC	3.0E+00

NC- Not caculated as the cancer slope factors and/or RfDs are not available.
Shaded values exceed acceptable risks levels.
Source: DAMO23, DAMO26.

TABLE 4-3
SUMMARY OF REASONABLE MAXIMUM EXPOSURE RISK CHARACTERIZATION
JOAAP, WILL COUNTY, ILLINOIS

Land Use	Receptor	Media	Pathway	Major Chemicals Contributing to Exceedences	Total Carcinogenic Risk	Hazard Index
E6						
Current	Security worker	Soil	Inhalation, ingestion, dermal		2.0E-06	2.0E-04
		Soil (PCB spill area)	Inhalation, ingestion, dermal		2.0E-06	3.0E-04
	Industrial worker	Soil	Inhalation, ingestion, dermal	PCBs, PAHs	3.0E-04	2.0E-02
		Soil (PCB spill area)	Inhalation, ingestion, dermal	PCBs, PAHs	4.0E-04	3.0E-02
	Construction worker	Soil	Inhalation, ingestion, dermal	PAHs, PCBs	9.0E-05	2.0E-01
	Resident	Soil	Inhalation, ingestion, dermal	PCBs, PAHs	1.0E-03	1.0E-01
		Soil (PCB spill area)	Inhalation, ingestion, dermal	PCBs, PAHs	2.0E-03	2.0E-01
	Hunter	Soil	Inhalation, ingestion, dermal	PCBs, PAHs	6.0E-05	5.0E-03
		Soil (PCB spill area)	Inhalation, ingestion, dermal	PCBs, PAHs	7.0E-05	8.0E-03
	Resident	Groundwater	Inhalation, ingestion, dermal	Arsenic	3.0E-04	1.0E+00
	Resident (child)	Surface water	Dermal		6.0E-09	8.0E-05
E7						
Current	Security worker	Soil	Inhalation, ingestion, dermal	PCBs	4.0E-06	3.0E-05
	Construction worker	Soil	Inhalation, ingestion, dermal	PCBs	8.0E-05	3.0E-02
	Resident	Soil	Inhalation, ingestion, dermal	PCBs	2.0E-03	3.0E-02
	Hunter	Soil	Inhalation, ingestion, dermal	PCBs	1.0E-04	8.0E-04
	Resident	Groundwater	Inhalation, ingestion, dermal		NC	1.0E-02
	Resident (child)	Surface water	Dermal		1.0E-07	3.0E-02
E8						
Current	Security worker	Soil	Inhalation, ingestion, dermal		4.0E-07	4.0E-05
Future	Industrial worker	Soil	Inhalation, ingestion, dermal	PCBs	1.0E-04	5.0E-03
	Construction worker	Soil	Inhalation, ingestion, dermal	PCBs	1.0E-05	1.0E-02
	Resident	Soil	Inhalation, ingestion, dermal	PCBs	2.0E-04	4.0E-02
	Hunter	Soil	Inhalation, ingestion, dermal	PCBs	2.0E-05	1.0E-03
	Resident	Groundwater	Inhalation, ingestion, dermal		NC	2.0E+00
	Resident (child)	Surface water	Dermal		7.0E-08	3.0E-02
E9						
Current	Security worker	Soil	Inhalation, ingestion		6.0E-07	8.0E-02
		Soil (building 3-4)	Inhalation, ingestion	RDX	1.0E-06	5.0E-02
		Soil (building 3-5A)	Inhalation, ingestion	2,4,6-TNT	1.0E-06	3.0E-01
Future	Industrial Worker	Soil	Inhalation, ingestion	2,4,6-TNT, RDX	8.0E-05	9.0E+00
		Soil (building 3-4)	Inhalation, ingestion	2,4,6-TNT, RDX	2.0E-04	6.0E+00
		Soil (building 3-5A)	Inhalation, ingestion	2,4,6-TNT	2.0E-04	3.0E+01
	Construction worker	Soil	Inhalation, ingestion	2,4,6-TNT, RDX	2.0E-05	4.0E+01
	Resident	Soil	Inhalation, ingestion	2,4,6-TNT, RDX	7.0E-04	7.0E+01
		Soil (building 3-4)	Inhalation, ingestion	RDX, 2,4,6-TNT	2.0E-03	5.0E+01
		Soil (building 3-5A)	Inhalation, ingestion	2,4,6-TNT	2.0E-03	2.0E+02
	Hunter	Soil	Inhalation, ingestion	2,4,6-TNT, RDX	2.0E-05	2.0E+00
		Soil (building 3-4)	Inhalation, ingestion	2,4,6-TNT, RDX	5.0E-05	1.0E+00
		Soil (building 3-5A)	Inhalation, ingestion	2,4,6-TNT	5.0E-05	8.0E+00
	Resident (child)	Surface water	Dermal		3.0E-07	1.0E-01
	Hunter	Sediment	Inhalation, ingestion		2.0E-08	3.0E-03
E10						
Current	Security worker	Soil	Inhalation, ingestion, dermal	PCBs, RDX	1.0E-05	2.0E-02
		Soil (Hotspot)	Inhalation, ingestion, dermal	RDX, 2,4,6-TNT	4.0E-06	1.0E-01
	Industrial worker	Soil	Inhalation, ingestion, dermal	PCBs, RDX, 2,4,6-TNT	2.0E-03	2.0E+00
		Soil (Hotspot)	Inhalation, ingestion, dermal	RDX, 2,4,6-TNT	5.0E-04	1.0E+01
Furture	Construction worker	Soil	Inhalation, ingestion, dermal	PCBs, RDX, 2,4,6-TNT	2.0E-04	5.0E+00
	Resident	Soil	Inhalation, ingestion, dermal	PCBs, RDX, 2,4,6-TNT	6.0E-03	1.0E+01
		Soil (Hotspot)	Inhalation, ingestion, dermal	RDX, 2,4,6-TNT	5.0E-03	1.0E+02
		Groundwater	Inhalation, ingestion, dermal	1,2-Dichloroethane, RDX, Manganese	1.0E-05	9.0E+00
	Hunter	Soil	Inhalation, ingestion, dermal	PCBs, RDX	5.0E-04	5.0E-01
		Soil (Hotspot)	Inhalation, ingestion, dermal	RDX, 2,4,6-TNT	2.0E-04	4.0E+00
	Resident (child)	Surface water	Dermal		2.0E-07	7.0E-03

NC- Not caculated as the cancer slope factors and/or RfDs are not available.
Shaded values exceed acceptable risks levels.
Source: DAMO23, DAMO26.

TABLE 4-3
SUMMARY OF REASONABLE MAXIMUM EXPOSURE RISK CHARACTERIZATION
JOAAP, WILL COUNTY, ILLINOIS

Land Use	Receptor	Media	Pathway	Major Chemicals Contributing to Exceedences	Total Carcinogenic Risk	Hazard Index
L11						
Current	Security worker	Soil	Inhalation, ingestion, dermal		7.0E-08	9.0E-04
Future	Industrial worker	Soil	Inhalation, ingestion, dermal	Arsenic	9.0E-06	2.0E-01
	Construction worker	Soil	Inhalation, ingestion, dermal	Arsenic	1.0E-05	4.0E-01
	Resident	Soil	Inhalation, ingestion, dermal	Arsenic	8.0E-05	5.0E-01
	Hunter	Soil	Inhalation, ingestion, dermal	Arsenic	2.0E-06	3.0E-02
L13						
Current	Security worker	Soil	Inhalation, ingestion		7.0E-10	1.0E-05
Future	Industrial worker	Soil	Inhalation, ingestion		8.0E-08	1.0E-03
	Construction worker	Soil	Inhalation, ingestion		3.0E-08	6.0E-03
	Resident	Soil	Inhalation, ingestion		7.0E-07	9.0E-03
	Hunter	Soil	Inhalation, ingestion		2.0E-08	3.0E-04
L14						
Current	Security worker	Soil	Inhalation, ingestion, dermal	RDX	1.0E-06	4.0E-02
		Soil (hotspots)	Inhalation, ingestion, dermal	RDX	7.0E-06	2.0E-01
Future	Industrial worker	Soil	Inhalation, ingestion, dermal	RDX, 2,4,6-TNT	1.0E-04	5.0E+00
		Soil (hotspots)	Inhalation, ingestion, dermal	RDX, 2,4,6-TNT	9.0E-04	3.0E+01
	Construction worker	Soil	Inhalation, ingestion, dermal	RDX, 2,4,6-TNT	4.0E-05	2.0E+01
	Resident	Soil	Inhalation, ingestion, dermal	RDX, 2,4,6-TNT	1.0E-03	3.0E+01
		Soil (hotspots)	Inhalation, ingestion, dermal	RDX, 2,4,6-TNT	8.0E-03	2.0E+02
	Hunter	Soil	Inhalation, ingestion, dermal	RDX,2,4,6-TNT	4.0E-05	1.0E+00
		Soil (hotspots)	Inhalation, ingestion, dermal	RDX, 2,4,6-TNT	3.0E-04	7.0E+00
	Resident	Groundwater	Inhalation, ingestion, dermal	RDX	1.0E-03	8.0E+00
	Resident (child)	Surface water	Dermal		2.0E-08	4.0E-03
L15						
Current	Security worker	Soil	Inhalation, ingestion		4.0E-10	4.0E-05
Future	Industrial worker	Soil	Inhalation, ingestion		5.0E-08	5.0E-03
L15						
Future	Construction worker	Soil	Inhalation, ingestion		2.0E-08	2.0E-02
	Resident	Soil	Inhalation, ingestion		4.0E-07	4.0E-02
	Hunter	Soil	Inhalation, ingestion		1.0E-08	1.0E-03
L16						
Current	Security worker	Soil	Inhalation, ingestion, dermal	RDX	2.0E-06	2.0E-02
		Soil (hotspots)	Inhalation, ingestion, dermal	RDX	1.0E-05	9.0E-02
	Industrial worker	Soil	Inhalation, ingestion, dermal	RDX	3.0E-04	3.0E+00
		Soil (hotspots)	Inhalation, ingestion, dermal	RDX	1.0E-03	1.0E+01
Future	Construction worker	Soil	Inhalation, ingestion, dermal	RDX	9.0E-05	1.0E+01
	Resident	Soil	Inhalation, ingestion, dermal	RDX	3.0E-03	2.0E+01
		Soil (hotspots)	Inhalation, ingestion, dermal	RDX	1.0E-02	8.0E+01
	Hunter	Soil	Inhalation, ingestion, dermal	RDX	8.0E-05	6.0E-01
		Soil (hotspots)	Inhalation, ingestion, dermal	RDX	4.0E-04	3.0E+00
	Resident (child)	Surface water	Dermal		4.0E-08	1.0E-03
L17						
Current	Security worker	Soil	Inhalation, ingestion, dermal	PCBs	5.0E-06	7.0E-05
		Soil (hotspots)	Inhalation, ingestion, dermal	PCBs	7.0E-05	4.0E-04
	Industrial worker	Soil	Inhalation, ingestion, dermal	PCBs	1.0E-03	2.0E-02
		Soil (hotspots)	Inhalation, ingestion, dermal	PCBs	2.0E-02	9.0E-02
Future	Construction worker	Soil	Inhalation, ingestion, dermal	PCBs	3.0E-04	3.0E-02
	Resident	Soil	Inhalation, ingestion, dermal	PCBs	1.0E-03	3.0E-02
		Soil (hotspots)	Inhalation, ingestion, dermal	PCBs	4.0E-02	1.0E-01
	Hunter	Soil	Inhalation, ingestion, dermal	PCBs	2.0E-04	2.0E-03
		Soil (hotspots)	Inhalation, ingestion, dermal	PCBs	9.0E-03	1.0E-02
	Resident (child)	Surface water	Dermal		NC	4.0E-04
L18 & L19						
Future	Resident	Groundwater	Inhalation, ingestion, dermal	Manganese	NC	3.0E+00

NC- Not caculated as the cancer slope factors and/or RfDs are not available.
Shaded values exceed acceptable risks levels.
Source: DAMO23, DAMO26.

TABLE 4-3
SUMMARY OF REASONABLE MAXIMUM EXPOSURE RISK CHARACTERIZATION
JOAAP, WILL COUNTY, ILLINOIS

Land Use	Receptor	Media	Pathway	Major Chemicals Contributing to Exceedences	Total Carcinogenic Risk	Hazard Index
L23						
Current	Security worker	Soil	Inhalation, ingestion		4.0E-10	4.0E-03
Future	Industrial worker	Soil	Inhalation, ingestion		9.0E-08	7.0E-01
	Construction worker	Soil	Inhalation, ingestion	Cadmium, Nickel, Manganese, Antimony	5.0E-06	9.0E+00
	Resident	Soil	Inhalation, ingestion	Antimony	3.0E-07	3.0E+00
	Hunter	Soil	Inhalation, ingestion		2.0E-08	1.0E-01
L32						
Current	Security worker	Soil	Inhalation, ingestion		NC	2.0E-06
Future	Industrial worker	Soil	Inhalation, ingestion		NC	2.0E-04
	Construction worker	Soil	Inhalation, ingestion		NC	1.0E-03
	Resident	Soil	Inhalation, ingestion		NC	1.0E-03
	Hunter	Soil	Inhalation, ingestion		NC	5.0E-05
L33						
Current	Security worker	Soil	Inhalation, ingestion		2.0E-10	9.0E-06
Future	Industrial worker	Soil	Inhalation, ingestion		2.0E-08	1.0E-03
	Construction worker	Soil	Inhalation, ingestion		1.0E-08	7.0E-03
	Resident	Soil	Inhalation, ingestion		2.0E-07	9.0E-03
	Hunter	Soil	Inhalation, ingestion		6.0E-09	3.0E-04
L34						
Current	Security worker	Soil	Inhalation, ingestion		NC	2.0E-06
Future	Industrial worker	Soil	Inhalation, ingestion		NC	2.0E-04
	Construction worker	Soil	Inhalation, ingestion		NC	2.0E-03
	Resident	Soil	Inhalation, ingestion		NC	2.0E-03
	Hunter	Soil	Inhalation, ingestion		NC	6.0E-05
Jordan Creek (LAP area)						
urrent	Fishermen	Surface water	Ingestion, dermal		2.0E-07	8.0E-02
	Fish consumer	Surface water	Ingestion		5.0E-07	1.0E-01
Future	Resident child	Surface water	Ingestion, dermal		9.0E-08	1.0E-01
Prairie Creek (LAP area)						
Current	Fishermen	Surface water	Ingestion, dermal		6.0E-08	7.0E-01
	Fish consumer	Surface water	Ingestion	1,3,5-TNB	2.0E-07	2.0E+00
Future	Resident child	Surface water	Ingestion, dermal		2.0E-08	9.0E-01
Kemery Lake (LAP area)						
Current	Fishermen	Surface water	Ingestion, dermal	Beryllium, Arsenic	2.0E-05	6.0E-01
	Fish consumer	Surface water	Ingestion	Beryllium, Arsenic	3.0E-04	2.0E+00
Future	Resident child	Surface water	Ingestion, dermal	Beryllium, Arsenic	6.0E-06	8.0E-01

NC- Not caculated as the cancer slope factors and/or RfDs are not available.
Shaded values exceed acceptable risks levels.
Source: DAMO23, DAMO26.

TABLE 4-4
INVENTORY OF UNDERGROUND STORAGE TANKS
JOAAP, WILL COUNTY, ILLINOIS

USCOE UST Survey Tank Number (JAAP-)	Facility Tank Identification Number	Year Installed	Capacity (gallons)	Location (PAS Section)	Substance Stored	Construction Material		Removal Date
						Tank	Piping	
1	1-1-1	1941	20,000	L7	Fuel Oil	Steel	Bare steel	September, 1991[1]
2	1-1-2	1942	20,000	L7	Fuel Oil	Steel	Bare steel	September, 1991[1]
3	2-1-1	1941	20,000	L8	Fuel Oil	Steel	Bare steel	October, 1991[1]
4	2-1-2	1942	20,000	L8	Fuel Oil	Steel	Bare steel	October, 1991[1]
5	2-1-3	1941	260	L8	Diesel	Steel	Bare steel	October, 1991[1]
6	3-1-1	1941	20,000	L9	Fuel Oil	Steel	Bare steel	November, 1991[1]
7	3-1-2	1942	20,000	L9	Fuel Oil	Steel	Bare steel	November, 1991[1]
8	3-1-3	1954	20,000	L9	Fuel Oil	Steel	Bare steel	November, 1991[1]
9	3-1-4	1954	20,000	L9	Fuel Oil	Steel	Bare steel	November, 1991[1]
10	3A-1-1	1942	20,000	L10	Fuel Oil	Steel	Bare steel	October, 1991[1]
11	3A-1-2	1943	20,000	L10	Fuel Oil	Steel	Bare steel	October, 1991[1]
12	20-19-1	1984	4,000	L20	Diesel	Fiberglass	Bare steel	September, 1993[2]
13	23-35-1	1952	8,000	L2	Fuel Oil	Steel	Bare steel	August, 1991[1]
14	23-39-1	1979	250	L3	Fuel Oil	Steel	Bare steel	August, 1991[1]
15	23-40-1	1976	2,000	L2	Fuel Oil	Steel	Bare steel	September, 1993[2]
16	26-7-1	1952	10,000	L5	Waste Oil	Steel	Bare steel	December, 1990[4]
17	60-11-2	1943	280	L32	Diesel	Steel	Bare steel	September, 1991[1]
18	70-16-1	1966?	1,500	L6	Gasoline	Steel	Bare steel	March, 1994[12]
19	308-1-3-1	1941	1,000	M8	Diesel	Steel	Bare steel	September, 1991[1]
20	401-1-1	1941	15,000	M8	Fuel Oil	Steel	Bare steel	September, 1991[1]
21	401-2-1	1941	15,000	M104	Fuel Oil	Steel	Bare steel	September, 1991[1]
22	505-12-2	1984	560	M105	Diesel	Steel	Bare steel	
23	601-96-1	1964	7,500	M8	Acetone	Steel	Bare steel	December, 1990[4]
24	601-96-2	1964	7,500	M8	Acetone	Steel	Bare steel	December, 1990[4]
25	716-1-2	1968	8,000	M18	Diesel	Steel	Bare steel	September, 1991[1]
26	716-1-3	1969	3,000	M18	Fuel Oil	Steel	Bare steel	September, 1991[1]
27	718-1-1	1943	10,000	M8	Diesel	Steel	Bare steel	Removed[5]

TABLE 4-4
INVENTORY OF UNDERGROUND STORAGE TANKS
JOAAP, WILL COUNTY, ILLINOIS

USCOE UST Survey Tank Number (JAAP-)	Facility Tank Identification Number	Year Installed	Capacity (gallons)	Location (PAS Section)	Substance Stored	Construction Material		Removal Date
						Tank	Piping	
28	718-2-1	1943	8,000	M108	Diesel	Steel	Bare steel	December, 1990[4]
29	718-2-2	1943	8,000	M108	Diesel	Steel	Bare steel	December, 1990[4]
30	861-1	1966	16,000	M7	Fuel Oil	Steel	Bare steel	August, 1991[1]
31	861-2	1966	16,000	M7	Fuel Oil	Steel	Bare steel	August, 1991[1]
32	861-3	1966	16,000	M7	Fuel Oil	Steel	Bare steel	August, 1991[1]
33	861-4	1966	26,000	M7	Fuel Oil	Steel	Bare steel	August, 1991[1]
34	861-5	1966	21,000	M7	Fuel Oil	Steel	Bare steel	August, 1991[1]
35	861-6	1966	21,000	M7	Fuel Oil	Steel	Bare steel	August, 1991[1]
36	861-7	1966	21,000	M7	Fuel Oil	Steel	Bare steel	August, 1991[1]
37	1181-1	1972	8,000	M8	Gasoline	Steel	Bare steel	Removed[5]
38	1181-2	1972	8,000	M8	Gasoline	Steel	Bare steel	Removed[5]
39	TNT 3-1-1	1943	1,000	M6	Sulfuric Acid	Steel	Bare steel	September, 1993[2]
40	TNT 6 A&B-1	1943	1,000	M6	Sulfuric Acid	Steel	Bare steel	September, 1993[2]
41	23-2	1942	2,000	L21	Fuel Oil	Steel	Bare steel	Removed[19]
42	23-34	1941	565	L21	Fuel Oil	Steel	Bare steel	August, 1991[1]
43	60-7-1	1941	1,000	L32	Fuel Oil	Steel	Bare steel	September, 1991[1]
44	60-11-1	1941	17,000	L32	Fuel Oil	Steel	Bare steel	September, 1991[1]
45	61-11	1941	4,000	L21	Fuel Oil	Steel	Bare steel	September, 1993[2]
46	64-36	1978	2,000	L118	Fuel Oil	Unknown	Unknown	September, 1993[2]
47	70-43-1	1941	20,000	L6	Fuel Oil	Steel	Bare steel	August, 1991[1]
48	70-43-2	1941	20,000	L6	Fuel Oil	Steel	Bare steel	August, 1991[1]
49	70-43-3	1941	20,000	L6	Fuel Oil	Steel	Bare steel	August, 1991[1]
50	412-1	1941	1,000	M117	Fuel Oil	Steel	Bare steel	August, 1991[1]
51	412-2	1941	1,000	M116	Fuel Oil	Steel	Bare steel	August, 1991[1]
52	505-12-1	1984	3,000	M105	Fuel Oil	Unknown	Unknown	

TABLE 4-4
INVENTORY OF UNDERGROUND STORAGE TANKS
JOAAP, WILL COUNTY, ILLINOIS

USCOE UST Survey Tank Number (JAAP-)	Facility Tank Identification Number	Year Installed	Capacity (gallons)	Location (PAS Section)	Substance Stored	Construction Material		Removal Date
						Tank	Piping	
53	707-13	1941	1,000	M108	Fuel Oil	Unknown	Bare steel	September, 1991[1]
54	709-1	1942	750	M104	Fuel Oil	Steel	Bare steel	March, 1994[7]
55	716-1-1	1941	8,000	M18	Fuel Oil	Steel	Bare steel	September, 1991[1]
56	716-2-1	unknown	unknown	M16	Waste Oil	Steel	Bare steel	Closed in place?[18, 19]
57	716-3	unknown	unknown	M16	Gasoline	Steel	Bare steel	Not found[18]
58	308-2-3-1	1941	1,000	M8	Fuel Oil	Steel	Bare steel	September, 1991[1]
59	6-10-1	1942	15,000	L16	Fuel Oil	Steel	Bare steel	August, 1991[1]
60	6-10-2	1942	15,000	L16	Fuel Oil	Steel	Bare steel	August, 1991[1]
61	5-7-1	1941	15,000	L15	Fuel Oil	Steel	Bare steel	September, 1993[2]
62	4-7-1	1942	15,000	L14	Fuel Oil	Steel	Bare steel	September, 1993[2]
63	4-7-2	1941	unknown	L14	Diesel	Steel	Bare steel	
64	7-10-1	1942	15,000	L17	Fuel Oil	Steel	Bare steel	September, 1993[2]
65	8-12-1	1942	15,000	L18	Fuel Oil	Steel	Bare steel	August, 1991[1]
66	8-11-1	1941	unknown	L18	Fuel Oil	Steel	Bare steel	August, 1991[1]
67	9-16-1	1941	20,000	L19	Fuel Oil	Steel	Bare steel	August, 1991[1]
68	4-21-1	1941	20,000	L14	Fuel Oil	Steel	Bare steel	March, 1994[14]
69	3A-1-3	1941	2,500	L10	Diesel	Steel	Bare steel	October, 1991[1]
70	100-1	1941	3,000	M104[17]	Fuel Oil	Steel	Bare steel	March, 1994[15]
71	716-3-2		4,000	M16	Waste Oil			March, 1994[18]
72	716-3-3		1,500	M16	Waste Oil	Concrete		March, 1994[8]
73	70-13-1		6,000	L6	Waste Oil			March, 1994[19]
74	70-13-2		1,500	L6	Waste Oil	Steel		March, 1994[9]
75	718-2-3		1,000	M108	Fuel Oil	Steel		March, 1994[10]
76	1101-1		1,000	M102	Fuel Oil	Steel	Galvanized steel	December, 1993[3]
77	1101-2		1,000	M102	Fuel Oil	Steel	Galvanized steel	December, 1993[3]
78	1101-3		1,000	M102	Fuel Oil	Steel	Galvanized steel	December, 1993[3]
79	1101-4		1,000	M102	Fuel Oil	Steel	Galvanized steel	December, 1993[3]

TABLE 4-4
INVENTORY OF UNDERGROUND STORAGE TANKS
JOAAP, WILL COUNTY, ILLINOIS

USCOE UST Survey Tank Number (JAAP-)	Facility Tank Identification Number	Year Installed	Capacity (gallons)	Location (PAS Section)	Substance Stored	Construction Material		Removal Date
						Tank	Piping	
80	1101-5		1,000	M102	Fuel Oil	Steel	Galvanized steel	December, 1993[3]
81	1101-6		1,000	M102	Fuel Oil	Steel	Galvanized steel	December, 1993[3]
82	1101-7		1,000	M102	Fuel Oil	Steel	Galvanized steel	December, 1993[3]
83	1101-8		1,000	M102	Fuel Oil	Steel	Galvanized steel	December, 1993[3]
84	1101-9		1,000	M102	Fuel Oil	Steel	Galvanized steel	December, 1993[3]
85	1101-10		1,000	M102	Fuel Oil	Steel	Galvanized steel	December, 1993[3]
86	1101-11		1,000	M102	Fuel Oil	Steel	Galvanized steel	December, 1993[3]
87	1101-12		1,000	M102	Fuel Oil	Steel	Galvanized steel	December, 1993[3]
88	1101-13		1,000	M102	Fuel Oil	Steel	Galvanized steel	December, 1993[3]
89	721-4-1		2,000	M102	Fuel Oil	Steel		December, 1994[11]
90	803-1-1			M6				
91	803-2-1			M6				
92	803-3-1			M6				
93	803-4-1			M6				
94	803-5-1			M6				
95	803-6-1			M6				
96	803-7-1			M6				
97	803-8-1			M6				
98	803-9-1			M6				
99	803-10-1			M6				
100	OL-1			M102				Removed[16]
101	713-1-1			M8	Gasoline			Not found[18]
102	713-1-2			M8	Gasoline			Not found[18]
103	722-4-1		1,300	M6	Sodium Sulfate	Steel		March, 1994[13]
104	722-4-2		2,500	M6	Sodium Sulfate	Steel		March, 1994[13]

TABLE 4-4
INVENTORY OF UNDERGROUND STORAGE TANKS
JOAAP, WILL COUNTY, ILLINOIS

USCOE UST Survey Tank Number (JAAP-)	Facility Tank Identification Number	Year Installed	Capacity (gallons)	Location (PAS Section)	Substance Stored	Construction Material		Removal Date
						Tank	Piping	
105	1101-14		1,000	M102	Fuel Oil			Removed[19]
106	7-10-2		15,000	L17	Fuel Oil			
107	70-5-1			L6	Fuel Oil			June, 1993[16]
	70-10-2		200	L6				September, 1993[6]
	70-10-1		15,000	L6				September, 1993[6]
	24-1-1[16]			L116				

Source: ACOE02, AEST01, JAAP01, ACOE04, UCCI69

Note: Empty cells in the table indicate ithat the information was not available at the time of this report. Some tanks were in poor condition at the time of removal. Refer to the tank removal reports for remedial actions taken.

Shaded rows represent tanks in the USDA2 parcel.

1 BEST02
2 BEST01
3 ATEC13
4 BRAN01
5 UCCI56
6 DOTA10
7 ATEC02
8 ATEC03
9 ATEC04
10 ATEC05
11 ATEC06
12 ATEC07
13 ATEC08
14 ATEC09
15 ATEC10
16 FIEL01
17 Located about 25 feet west of road west of building 709, along fence line (ACOE02).
18 MEMO21
19 DOTA35

TABLE 4-5
SUMMARY OF AST FINDINGS
SECOND LAND TRANSFER TO USDA
JOAAP, WILL COUNTY, ILLINOIS

Section	Building	DESCRIPTION	Status	Latitude	Longitude	Comments
1		Group 61	P	041:22:30.4	088:04:58.6	West end of Building 61-1 is a converted tanker car used as a above ground storage tank.
	61-2	Cleaning, Painting & Shipping	P			Two former railroad tankers were used as aboveground storage tanks on northeast end of building (outside). There is evidence of spillage beneath.
L2		Explosive Burning Ground	P	041:21:55.2	088:05:59.4	There is a 250 gallon above ground storage tank in the south central portion of this section, across from Building 23-26. (11/96)
L3		Demolition Area	P	041:21:37.6	088:06:10.3	There is a propane tank 8 by 3 feet and one unknown tank 3 by 8 feet.(11/96)
L4		Landfill Area				
L5		Salvage Yard				
	26-1	Scale House & Office	P			There is a 250 gallon aboveground storage tank on the south side of building.
L7		Group 1	P	041:20:55.7	088:04:52.9	There is a 200 gallon tank north of Building 1-1. (11/96)
L8		Group 2				
	2-1	Power House	P	041:21:48.4	088:04:11.5	A 250 gallon above ground storage tank was seen in this building. The tank appeared to be empty. (11/96)
L9		Group 3				
			P			There is a 200 gallon above ground storage tank on the east side of the building and another on the north side.
L10		Group 3A	P			There are two 24 foot tall by 10 foot diameter above ground storage tanks at the southeast end of this section, behind Building 3A-1. They appear to be coated with sheet lead. (11/96)
			P	041:21:17.0	088:04:11.8	There is a 250 gallon aboveground storage tank north of building 3A-32B. (11/96)
			P			A 1991 inspection indicates that there was a 9 by 1 foot stain on the ground outside the the dike and under the fill for the two 15,000 gallon #2 fuel oil tanks used by Alliant Techsystems. There were also two 6 by 3 foot stains within the dikes on the soil.
	3A-2A	Paint & Oil Storage	P			Two 250 gallon plastic tanks. One is marked developer and one is marked fixer. (4/97)
L14		Group 4				
L15		Group 5				
L18		Group 8	P	041:21:22.4	088:07:07.6	There is a 500 gallon above ground storage tank for compressed gas (propane). The paint is peeling on the tank. (11/96)
			P	041:21:17.3	088:07:08.7	There is a 500 gallon above ground storage tank for compressed fluid (propane) at this location. (11/96)
L19		Group 9				
L21		Group 23	P	041:21:46.8	088:04:53.5	Generator with fuel tank adjacent to Pole 63.
	23-1	Surface Storage Reservoir	P			A tank with about 30 gallons of gasoline is attached to the side of the building. A large propane tank is on a concrete slab adjacent to the building. This building was locked.
	61-11	Power House for Crushing Plant	P	041:22:06.9	088:05:09.8	There is a pressure (vessel 3 foot diameter by 10 foot) outside the building. NFPA symbol indicates that water is not to be used.

U=USDA
P=Present, R=Removed, A=Absent, S=Suspected
Blanks in the comment column indicate no findings.
References for each finding are cited in the profile sheets in the Appendix.

TABLE 4-5
SUMMARY OF AST FINDINGS
SECOND LAND TRANSFER TO USDA
JOAAP, WILL COUNTY, ILLINOIS

Section	Building	DESCRIPTION	Status	Latitude	Longitude	Comments
L31		Extraction Pits	P	041:21:07.5	088:07:38.8	500 gallon fuel tank, appears to be empty, according to lessee never used on-site and is owned by him.
L33		PVC Area				
L34		Former Burning Area				
L110		PAS Survey Section L110				
M1		Southern Ash Pile				
M2		Explosive Burning Ground				
M3		Flashing Grounds	P	041:22:36.7	088:09:56.4	There is a tank adjacent to the neutralization station on Grant Creek at the northeast corner of the section. The tank is about 18 by 5 feet. The discharge pipes apparently lead to the creek. (11/96)
M3		Flashing Grounds	P	041:22:34.0	088:10:16.0	There are twenty-one empty 250 gallon above ground storage tanks near the northwest corner of fenced area. No stains were noted. (11/96)
M4		Lead Azide Area				
M5 U		Tetryl Production Area-USDA Portion				
M10 U		Toluene Tank Farms USDA Portion				
M11		Landfill				
M12		Sellite Manufacturing Area				
	307	Sellite Storage & Mixing House	P			This building is surrounded by four above ground storage tanks or large processing tanks. (11/96)
M14		Former Pond Area				
M15		Sewage Treatment Plant				
M99		TNT Block Area (M6A)				
M105		PAS Survey Section M105				
M108		PAS Survey Section M108	P	041:22:00.8	088:09:06.2	1000 gallon tank for heater.
			P	041:21:57.9	088:09:03.6	1000 gallon tank for heater.
			P	041:21:53.2	088:09:04.4	1000 gallon tank for heater.
M118		Grant Creek East				
M119		Grant Creek West				

U=USDA
P=Present, R=Removed, A=Absent, S=Suspected
Blanks in the comment column indicate no findings.
References for each finding are cited in the profile sheets in the Appendix.

TABLE 4-6
SUMMARY OF SUMP/DRY WELL/FLOOR DRAIN/OIL-WATER SEPARATOR FINDINGS
SECOND LAND TRANSFER TO USDA
JOAAP, WILL COUNTY, ILLINOIS

Section	Building	DESCRIPTION	Status	Latitude	Longitude	Comments
		Group 61	P			On the south side of Building 61-1 there were four concrete boxes in ground with pipes within. There is remnant of coal pile between building 61-1 and 61-4. There is also a deep valve pit in this area.
	61-2	Cleaning, Painting & Shipping	S			There are floor drains inside this building. A 24 inch clay sump is on the center of the south side of building, about 1 foot from building. There is a latrine near the southeast corner of the building.
	61-5	Evaporating Building	P			There are drain pipes beneath mounts for machines.
	61-35	Sump Building	P			This structure consisted of a deep partitioned sump with baffling that may function to capture sediments.
L2		Explosive Burning Ground				
L3		Demolition Area	P	041:21:49.5	88:06:10.4	There is an open water filled sump 8 by 16 feet adjacent to the burning cage, on the South end of the group. The sump takes drainage from bermed concrete pad. (11/96)
L4		Landfill Area				
L5		Salvage Yard				
	26-2	Baling Building	P			Bailing device on east end of building set over sump about 12 feet deep with about 8.5 feet to water, 42 inches of water. Sump pump discharges to northeast corner of building. Sump is partly filled with water, with an opening of 12 feet by 12 feet. There is no oil sheen.
L7		Group 1	P	041:20:43.8	88:04:26.5	A 60 by 3 foot sump extends from Building 1-40C to the south. There is some red-stained soil around the perimeter.
			S			Beneath the ramp east of the sump connected to Building 1-40C is a pump and settling box for red water. Access area beneath the southwest corner of Building 1-10 appears to be related to the red water pump.
	1-40C	Sump Platform & Washout Building	P	041:20:43.8	88:04:26.5	In 1966, a Fluoroscope was located in this building.
L8		Group 2	P			Sumps in this area were periodically cleaned out and residue was disposed of at the burning grounds. During peak production years, sumps occasionally overflowed and discharged directly into open drainages.
	2-1	Power House	P	041:21:48.4	88:04:11.5	There are floor drains crisscrossing the floor of this building. A sump was seen behind this building on the west end. Another sump half full of water was seen inside the rear of this building about 20 feet deep. (11/96)
	2-4	Melt Load	P	041:21:48.8	88:05:57.1	There is a septic tank and a septic drain field on the southwest side of this building.
	2-6	TNT Screening	P	041:21:49.6	88:03:51.8	An underground chamber which is beneath the southwest corner of this building is flooded to ground surface. (11/96)
			P	041:21:49.6	88:03:51.8	There is a septic tank and a septic drain field on the west side of this building.
	2-12	Assembling & Shipping	A			Building is on a raised concrete slab and contains no sump or other drainage.

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TABLE 4-6
SUMMARY OF SUMP/DRY WELL/FLOOR DRAIN/OIL-WATER SEPARATOR FINDINGS
SECOND LAND TRANSFER TO USDA
JOAAP, WILL COUNTY, ILLINOIS

Section	Building	DESCRIPTION	Status	Latitude	Longitude	Comments
L8	2-12	Assembling & Shipping	P			There is a septic tank and a septic drain field on southwest side of this building.
	2-16	Cooling & Loading Building	P			There is a septic tank and a septic drain field on the southwest side of this building.
	2-20A	Change House	P	041:21:16.5	88:04:09.5	Two sumps in rear of building. (11/96)
	2-37	Washout Building	S			A 1970 Standard Operating Procedures included Contaminated Water Filtration System for this building. Filter cake was removed to the Burning Grounds.
	2-40B	Settling Chamber	P	041:21:48.8	88:03:57.1	There are sumps associated with this annex. (11/96)
L9		Group 3	P			Sumps in this area were periodically cleaned out and residue was disposed of at the burning grounds. During peak production years, sumps occasionally overflowed and discharged directly into open drainages.
	3-1	Power House	P	041:22:66.0	88:03:20.6	There is a sump on the southeast corner of this building (outside the wall). (11/96)
	3-3	Receiving & Painting Building	P	041:22:07.3	88:03:33.8	There is a septic tank on the northeast side of this building.
	3-4	Melt Load Building	P			There is a septic tank on the east side of this building.
	3-5A	Supplementary Charge Manufacture	P			According to a 1973 Standard Operating Procedures, red water from sumps or settlement tanks was transferred to tank trucks for disposal. Scrap TNT (sump residue) was transferred to the Burning Grounds. Tanks were cleaned at Building 3-4 sump.
			P			There is a septic tank and a septic drain field south of this building.
	3-7	TNT Service Magazine	P			There is a septic tank and a septic drain field south of this building.
	3-10	Drilling, Boostering & Shipping	P			There is a septic tank on the northwest side of this building.
	3-16	Propellant Loading Building	P	041:22:08.0	88:03:05.5	There is a septic tank on the northeast side of this building.
	3-37	Washout Building & Sump	P	041:21:11.5	88:03:17.7	North of this building is a large washing container in concrete which may flow to a nearby sewer. There is extensive sumps and drains here. One of the sump covers is smashed. (11/96)
	3-45	Washout Building & Sump	P	041:22:05.0	88:03:07.4	Sump is present. (11/96)
L10		Group 3A	P			Sumps in this area were periodically cleaned out and residue was disposed of at the burning grounds. During peak production years, sumps occasionally overflowed and discharged directly into open drainages.
			P	041:21:17.5	88:04:05.3	There is a sump on the east side of Building 3A-43. The sump is open, (4 by 8 foot opening), but fenced in. (11/96)
			P	041:21:17.5	88:04:53.0	There is a sump on the east side of building 3A-43 (4 by 8 foot opening). This sump is open, but fenced in. (11/96)
	3A-10	Assembly, Packing & Shipping Building	P			There is a septic tank and a septic drain field south of this building.

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TABLE 4-6
SUMMARY OF SUMP/DRY WELL/FLOOR DRAIN/OIL-WATER SEPARATOR FINDINGS
SECOND LAND TRANSFER TO USDA
JOAAP, WILL COUNTY, ILLINOIS

Section	Building	DESCRIPTION	Status	Latitude	Longitude	Comments
10	3A-16A	Cooling Building	P			There is a septic tank and a septic drain field south of this building.
	3A-43	Vacuum Collection Building	P			Floor drains run around perimeter of building. (4/97)
	3A-44	Screen & Blend Building	P			The floor drains discharge to sump on north side of building. (4/97)
L14		Group 4	P			Sumps in this area were periodically cleaned out and residue was disposed of at the burning grounds. During peak production years, sumps occasionally overflowed and discharged directly into open drainages.
			S			According to the Draft Feasibility Study, contaminated groundwater appears to be seeping into the storm sewer which discharges to a nearby drainage ditch.
	4-5	Primer Loading	P			Proposed add-on to existing building includes floor drains, outside trenches, oil piping, and sumps.
			P			According to a 1970 Standard Operating Procedures, this building contains a sump. Red water from recirculating tank was pumped to tanker. Residue from bottom of tank was sent to Burning Grounds.
L15		Group 5				
L18		Group 8				
L19		Group 9				
	9-3A	Lead Azide Dry House	P	041:21:13.7	88:07:46.6	Floor drains along perimeter discharge to ground on south side. (11/96)
	9-3B	Lead Azide Dry House	P	041:21:16.9	88:07:40.6	Floor drains along perimeter, discharge to the north onto ground. (11/96)
	9-6	Mercury Fulminate Dry House	P	041:21:10.3	88:07:35.4	Floor drains around perimeter of building discharge to ground on south side of building. (11/96)
	9-16	Power House	P	041:21:24.4	88:07:45.2	A pipe trench in the floor, drains to the sump along the north side of this building. (11/96)
L21		Group 23	P			There is a septic tank located at the intersection of Chicago Road and Central Road. Another septic tank is next to the water treatment plant, in the south of region L21.
	23-7B	Storage Shed	P	041:21:55.5	88:05:04.5	There is a latrine adjacent to this building at 23-23A.
	61-11	Power House for Crushing Plant	P	041:22:06.9	88:05:09.8	There are pipe chases in the floor of this building.
	62-27	Sentry Station (At Landfill)	S	041:21:34.9	88:05:37.0	We could not determine if this building is connected to a sanitary system or not.
L33		PVC Area				
L34		Former Burning Area				
L110		PAS Survey Section L110				
M1		Southern Ash Pile				
M2		Explosive Burning Ground				
M3		Flashing Grounds				
M4		Lead Azide Area	P			This section contains a drywell that appears to have served the Lead Azide area, at the central portion of M4.
M5 U		Tetryl Production Area-USDA Portion				
M10 U		Toluene Tank Farms USDA Portion				
11		Landfill				

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TABLE 4-6
SUMMARY OF SUMP/DRY WELL/FLOOR DRAIN/OIL-WATER SEPARATOR FINDINGS
SECOND LAND TRANSFER TO USDA
JOAAP, WILL COUNTY, ILLINOIS

Section	Building	DESCRIPTION	Status	Latitude	Longitude	Comments
M12		Sellite Manufacturing Area				
	307	Sellite Storage & Mixing House	P			There are sumps inside and outside of this building that lead to the adjacent fields. A sump inside the building is filled with water. (11/96)
	307-1	Process House	P			There are sumps inside the building that discharge to other sumps outside the building and into the field. (11/96)
M14		Former Pond Area				
M15		Sewage Treatment Plant				
M99		TNT Block Area (M6A)	S			There is a 3 foot diameter vitreous clay pipe on end beneath the pipeline on the south side of the site. This is possibly a dry well with condensate drained into the pipe. (11/96)
M105		PAS Survey Section M105	P			There is a septic tank located on Barrel House Road, at the box factory.
M108		PAS Survey Section M108	P	041:21:58.2	88:09:06.4	Septic - A latrine is located across from 811-124
			P	041:21:58.0	88:08:41.9	Septic - A latrine is located adjacent to 704-23.
M118		Grant Creek East				
M119		Grant Creek West				

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TABLE 4-7
SUMMARY OF PCB FINDINGS
SECOND LAND TRANSFER TO USDA
JOAAP, WILL COUNTY, ILLINOIS

Section	Building	DESCRIPTION	Status	Latitude	Longitude	Comments
L1		Group 61	S			PCBs are a contaminant of concern in this area according to the Installation Action Plan. Soil remediation is anticipated to address PCB contamination.
	61-38	Vacuum Pump House	S			There is an oil filled electrical switch inside building.
L2		Explosive Burning Ground	S			PCBs are a contaminant of concern in this area according to the Installation Action Plan.
			S			PCBs detected in Northern Oil Pit at less than 0.1 ug/g and could not be confirmed at this low level.
			A	041:21:53.9	88:05:55.3	Pole #207 - 3 transformers with "No PCBs" sticker. (11/96)
L3		Demolition Area	S	041:21:49.9	88:06:05.6	Pole #226- 1 transformer. No sticker is visible.(11/96)
			S	041:21:37.2	88:06:10.4	Pole #236- 3 transformers with no stickers. (11/96)
L4		Landfill Area	S			PCB 1260 is a contaminant of concern in this area according to the Installation Action Plan.
L5		Salvage Yard	P			Spills of PCB have occurred in this area in the past. Media of concern for contaminants: groundwater, soil. Remediation may be necessary.
	26-2	Baling Building	S			Bailing press on east end of Building indicates equipment takes Gargoyle Vactra Oil 88, Gargoyle Compound No.7, Dorcia No.150, Grease SolveRex LO.
	26-7	Pump House, Well No. 1	S			Pump with fill for oil inside building.
L7		Group 1	P			Group 1 exhibited high (less than 50ppm) PCB concentrations around its seven transformer pads and therefore cannot be released for agriculture or livestock use until extent of PCB concentration is determined.
			S			PCBs are a contaminant of concern in this area according to the Installation Action Plan.
			S	041:20:59.1	88:04:35.4	Pole #409- 1 transformer north of Building 1-5A. (11/96)
			P	041:20:50.9	88:04:30.5	A ground mounted transformer north of Building 1-18C was removed. Two electrical boxes remain on the west side. One has remnants of a "Contains PCB" sticker. (11/96)
			S			There is a transformer east of Building 1-3A. (11/96)
			S	041:20:44.6	88:04:37.4	There are 3 pole mounted transformers northeast of Building 1-8. (11/96)
			S	041:20:44.0	88:04:36.6	Pole #481- 1 transformer southeast of Building 1-8. (11/96)
			S	041:20:40.6	88:04:26.9	There is a ground mounted transformer southwest of Building 1-42C. (11/96)
			S	041:20:35.5	88:04:18.4	There is a ground mounted transformer west of Building 1-11. There are oil stains on the concrete around the transformer. (11/96)
			S	041:20:34.7	88:04:09.1	There is a pole mounted transformer with no sticker southeast of Building 1-13. (11/96)
			S	041:20:35.4	88:04:08.5	Pole #287- 1 transformer east of Building 1-13. (11/96)
			S	041:20:44.6	88:04:07.7	Pole #380- 1 transformer adjacent to north fence in northeast section of area. (11/96)

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TABLE 4-7
SUMMARY OF PCB FINDINGS
SECOND LAND TRANSFER TO USDA
JOAAP, WILL COUNTY, ILLINOIS

Section	Building	DESCRIPTION	Status	Latitude	Longitude	Comments
L7		Group 1	S	041:20:42.3	88:04:14.4	There is a ground mounted transformer and 2 electrical cabinets south of Building 1-14. (11/96)
			S	041:20:46.1	88:04:16.5	Pole #421- 1 transformer. (11/96)
			S	041:20:43.0	88:04:46.5	Pole mounted transformer with no sticker west of Building 1-27A, adjacent to south fence. (11/96)
			S	041:20:42.1	88:04:44.8	Pole mounted transformer with no sticker east of Building 1-27A, adjacent to south fence. (11/96)
			S	041:20:35.1	88:04:29.1	Pole mounted transformer adjacent to south fence. (11/96)
			S	041:20:33.6	88:04:25.2	Pole mounted transformer west of Building 1-27B, adjacent to south fence. (11/96)
			S	041:20:58.4	88:04:53.2	Pole mounted transformer northwest of Building 1-1, adjacent to west fence. (11/96)
			S	041:20:53.4	88:04:54.0	Ground mounted transformer south of Building 1-1. (11/96)
			S	041:20:55.7	88:04:52.9	Two oil filled circuit breakers were observed, possibly as many as 7 may be present. Other cabinets were locked. (11/96)
			P	041:20:51.6	88:04:47.4	South of Building 1-21A there are two electrical cabinets on west concrete pad. One is marked "contains PCBs". (11/96)
			S	041:20:51.8	88:04:50.3	Pole mounted transformer south of Building 1-21A. (11/96)
	1-4	Melt Load Building	S	041:20:49.8	88:04:29.2	Some equipment contains oil, tagged as tested for PCBs. No results. (11/96)
	1-24	Well House & Rig	S	041:20:52.9	88:04:51.5	Oil lubricated pump for well. (11/96)
	1-38C	Vacuum Pump House	S			Two oil filled electrical switches- oil stains beneath. (11/96)
	1-38D	Vacuum Pump House	S			Two oil filled electrical switches- oil stains beneath (11/96)
L8		Group 2	S			PCBs are a contaminant of concern in this area according to the Installation Action Plan.
			S	041:21:37.0	88:03:41.8	Pole #233- 3 transformers south of Building 2-14. (11/96)
			S	041:21:43.1	88:03:48.9	Poles #408/238 - 2 ground mounted transformers with no stickers visible. (11/96)
			S	041:21:46.5	88:04:11.7	Pole #297- 1 transformer with no stickers visible. (11/96)
			S	041:21:40.4	88:04:07.1	Pole #270- 1 transformer with no stickers visible. (11/96)
			S	041:21:48.4	88:04:11.5	Ground mounted transformer on the northeast perimeter fence, adjacent to Building 2-33. (11/96)
			S	041:22:10.0	88:03:58.2	Pole #662- 1 transformer with no stickers visible. (11/96)
			S	041:21:50.7	88:03:46.1	Pole #618- 3 transformers with no stickers visible. (11/96)
			S	041:21:49.4	88:04:07.9	Pole #649- 3 transformers near the east entrance of Building 2-3A. (11/96)
			S	041:21:36.7	88:03:36.1	Pole #207- 1 transformer with no stickers visible near west perimeter fence. (11/96)
	2-1	Power House	P	041:21:48.4	88:04:11.5	Equipment USA-JAAP E-61604 and USA-JAAP E-61098 are labeled "+ 50ppm PCB test 3/16/93". (11/96)
	2-33	Street Light Substation	S	041:21:48.4	88:04:11.5	What appears to be a large transformer is located behind this building. (11/96)
	2-38A	Vacuum Pump House	S	041:21:41.8	88:03:45.2	There is an oil filled electric switch inside this building. (11/96)

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TABLE 4-7
SUMMARY OF PCB FINDINGS
SECOND LAND TRANSFER TO USDA
JOAAP, WILL COUNTY, ILLINOIS

Section	Building	DESCRIPTION	Status	Latitude	Longitude	Comments
L8	2-38C	Vacuum Pump House	S	041:21:47.8	88:03:56.2	There is an oil filled electric switch inside this building. (11/96)
	2-38C-1	Barricade	S	041:21:47.8	88:03:56.2	There is an oil filled electric switch inside this building. (11/96)
	2-38D	Vacuum Pump House	S	041:21:44.2	88:03:47.4	There is an oil filled electric switch inside this building. (11/96)
L9		Group 3	S			PCBs are a contaminant of concern in this area according to the Installation Action Plan.
			S	041:22:00.3	88:02:57.5	Pole #421- 1 transformer with no stickers visible. (11/96)
			S	041:22:00.3	88:02:57.5	Pole #422 - 2 transformers with no stickers visible. (11/96)
			S	041:22:04.9	88:03:10.9	Pole #572- 2 transformers. (11/96)
			S	041:22:05.8	88:03:19.6	Poles #711/514 - 2 transformers on the ground between poles with no stickers visible. (11/96)
			S	041:21:58.8	88:03:15.3	Pole #544 - 2 transformers. (11/96)
			S	041:21:54.3	88:03:13.6	Pole #545 - 2 transformers. (11/96)
			S	041:21:55.6	88:03:06.1	Pole #551 - 1 transformer. (11/96)
			S	041:22:11.1	88:03:25.3	Pole #605- 1 transformer with no stickers visible. (11/96)
			S	041:22:10.7	88:03:23.7	Pole #unknown - 1 transformer 100 feet from northwest corner of Building 3-31. (11/96)
			S	041:22:08.1	88:03:21.6	Pole #unknown - 3 transformers 10 feet away southeast of Building 3-65, no stickers were visible. (11/96)
			S	041:22:09.4	88:05:27.5	Pole #524- 2 transformers with no stickers visible. (11/96)
			S	041:22:14.0	88:03:31.8	Pole #498- 1 transformer with no stickers visible. (11/96)
			S	041:22:15.5	88:03:29.8	Pole #491- 1 transformer with no stickers visible. (11/96)
			S	041:22:18.0	88:03:20.0	Pole #489- 1 transformer with no stickers visible. (11/96)
			S	041:22:15.4	88:03:07.4	Pole #462- 3 transformers with no stickers visible. (11/96)
			S	041:22:15.0	88:03:15.7	Pole #467- 3 transformers with no stickers visible near building 3-5A. (11/96)
			S	041:22:10.9	88:03:04.6	Pole #458- 2 transformers with no stickers visible. (11/96)
			S	041:22:08.6	88:02:53.3	Pole #443- 1 transformer with no stickers visible. (11/96)
	3-1	Power House	P	041:22:66.0	88:03:20.6	Machines USA-JAAP E-61942 and USA-JAAP-61946 have labels reading "+50ppm PCB 3/17/93." Machine USA-JAAP E-61438 has a label reading "50ppm PCB 3/17/93". Multiple oil stains were observed throughout the building. (11/96)
			S	041:22:66.0	88:03:20.6	A transformer was found behind this building on the north wall. (11/96)
	3-38B	Vacuum Collectors	S			There is an oil filled electric switch inside this building. (11/96)
L10		Group 3A	S			PCBs are a contaminant of concern in this area according to the Installation Action Plan.
			S	041:21:05.2	88:04:25.8	Poles #904/387 - 3 transformers with no stickers visible, they are energized. (11/96)
			S	041:21:08.1	88:04:19.5	Pole #385- 1 transformer with no stickers visible. It is disconnected. (11/96)

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SUMMARY OF PCB FINDINGS
SECOND LAND TRANSFER TO USDA
JOAAP, WILL COUNTY, ILLINOIS

Section	Building	DESCRIPTION	Status	Latitude	Longitude	Comments
L10		Group 3A	S	041:21:05.4	88:04:12.2	Pole #372/373 - 3 transformers with no stickers visible, may be live. (11/96)
			S	041:21:04.0	88:04:08.0	Pole #369 - 1 transformer with no stickers visible. It is disconnected. (11/96)
			S	041:21:09.6	88:04:12.8	Pole #358 - 1 transformer with no stickers visible. (11/96)
			S	041:21:18.7	88:04:23.5	There are 2 possible substations in the southwest corner of this section. One is on the ground next to Building 3A-33, the second is across from Building 3A-1. (11/96)
			S	041:21:18.7		Pole #unknown - 3 transformers next to Building 3A-1. (11/96)
			S			Pole #30 - 2 transformers north of Building 3A-11A are apparently active. (11/96)
			S	041:21:20.7	88:04:21.4	Pole #330 - 3 transformers next to pole. (11/96)
			S	041:21:23.8	88:04:08.1	Pole #818- 1 transformer with no stickers visible. (11/96)
			S	041:21:13.4	88:03:52.4	Pole #331- 3 transformers with no stickers visible. (11/96)
			S	041:21:15.1	88:03:57.3	3 transformers in the field at the northwest portion of this section. (11/96)
			A	041:21:17.5	88:04:02.2	Pole #348 - 8 transformers, 2 are tagged "less than 50ppm". (11/96)
			S	041:21:05.1	88:03:55.4	Pole #313- 1 transformer with no stickers visible. (11/96)
			S	041:21:03.8	88:03:56.4	Pole #312- 1 transformer with no stickers visible. (11/96)
			S	041:21:14.7	88:04:15.0	Poles #331/361 - 3 energized transformers with no stickers visible. (11/96)
			S	041:21:14.7	88:04:15.0	Pole #933- 2 transformers with no stickers visible. (11/96)
			S	041:21:23.8	88:04:08.1	Pole #818- 1 transformer with no sticker visible. (11/96)
			S	041:21:13.4	88:03:52.4	Pole #331- 3 transformers with no sticker visible. (11/96)
			S	041:21:15.1	88:03:57.3	There are 3 transformers in the field (northwest portion).
			P	041:21:18.3	88:04:02.2	Pole #348-has 8 transformers at its foot. Two are tagged PCB less than 50ppm. (11/96)
			S	041:21:05.1	88:03:55.4	Pole #313- 1 transformer with no stickers visible. At this location there is a ditch receiving drainage from adjacent buildings. (11/96)
			S	041:21:03.8	88:03:56.4	Pole #312- 1 transformer atop of pole with no stickers visible. (11/96)
			S	041:21:14.7	88:04:15.0	Poles #331 & 361- 3 transformers with no stickers visible. (11/96)
			S	041:21:14.7	88:04:15.0	Pole #933- 2 transformers at its foot with no stickers visible. (11/96)
	3A-43	Vacuum Collection Building	S			There is an oil filled electrical switch. (4/97)
L14		Group 4	S	041:20:44.3	88:07:09.2	Poles #518/519- 3 transformers west of Building 4-8. (11/96)
			S	041:20:45.8	88:07:07.1	Pole #563/564 - 3 transformers west of Building 4-7. (11/96)
			S	041:20:51.9	88:07:14.9	Poles #745/746 - 3 transformers north of Building 4-34. (11/96)
			S	041:20:51.7	88:07:14.0	Three ground mounted transformers surrounded by building annexes. (11/96)
			S	041:20:48.4	88:07:08.8	Pole #565- 1 transformer. (11/96)

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TABLE 4-7
SUMMARY OF PCB FINDINGS
SECOND LAND TRANSFER TO USDA
JOAAP, WILL COUNTY, ILLINOIS

Section	Building	DESCRIPTION	Status	Latitude	Longitude	Comments
L15		Group 5	S	041:20:41.7	88:07:33.9	Pole # unknown: Three transformers, 20 feet from west side of Building 5-7. Located in the southwest. (11/96)
			S	041:20:51.4	88:07:30.7	Two pole mounted transformers, one on a pole 10 feet and the other 30 feet southeast of Building 5-20.(11/96)
			S	041:20:46.6	88:07:29.6	Poles # 867/468- 3 transformers, poles 20 feet from east side of Building 5-7. (11/96)
			S	041:20:48.4	88:07:28.7	There are 3 banks of 3 transformers at this location, 20 feet east of Building 5-14. 11/96
			S			There are 2 banks of 3 transformers, surrounded by various buildings in the central area of L15 (would not enter). (11/96)
			S	041:20:55.1	88:07:21.2	Poles # 483 and 484- 3 transformers atop (on northeast border of section). (11/96)
L18		Group 8	S	041:21:22.6	88:07:23.6	Pole #197 - 1 transformers. (11/96)
			S	041:21:24.7	88:07:15.6	Poles #190/191 - 3 transformers. (11/96)
			S	041:21:26.4	88:07:07.9	Poles #179/180 - 3 transformers. (11/96)
			S	041:21:21.4	88:07:10.3	2 banks- 3 transformers in front of the east entrance of Building 8-8. (11/96)
	8-12	Power House	P			Outside, on the southeast corner of the building, there is an electrical unit with a drain valve. Believed to be an oil filled galvanic protection unit. (4/97)
L19		Group 9	P			PCBs levels were below detection limits.
			S	041:21:24.1	88:07:36.6	Pole #268 - 1 transformer north of Building 9-55 with no sticker visible. (11/96)
			S	041:21:24.0	88:07:37.5	Ground mounted transformer west of Building 9-42. There were no visible stickers. (11/96)
			S	041:21:26.0	88:07:36.9	Pole #270 - 1 transformer north of Building 9-20A. There were no visible stickers. (11/96)
			S	041:21:16.1	88:07:41.2	Poles #244/245 - 3 transformer west of Building 9-22. There were no visible stickers. (11/96)
L21		Group 23	S	041:22:09.2	88:05:11.8	Pole 271 and 272: 3 transformers near Building 61-11.
			S	041:21:34.4	88:05:37.5	Pole 802: transformer at landfill.
			S	041:21:36.1	88:04:35.5	Poles 52 and 53: 4 pole mounted transformers; adjacent to east deep well, 3 at about 15 kVA and 1 at 5 kVA.
			A	041:21:46.8	88:04:53.5	Pole 63: 3 transformers "no-PCB" sticker.
			S	041:21:45.0	88:04:52.4	Pole 64: transformers
			S	041:21:52.4	88:05:04.2	Pole 288 and 289: 3 transformers "non-PCB"; and one transformer without sticker.
			S	041:21:52.4	88:05:13.8	Pole 28: transformer
L33		PVC Area	S			There is a fenced in area 70 by 80 feet, 50 yards north of manhole with suspected transformer. The manhole is northeast of the L33 targeting pile. (11/96)
L34		Former Burning Area				
L110		PAS Survey Section L110				
M1		Southern Ash Pile	S	041:21:05.0	88:10:01.7	Pole #1053- 1 transformer on north west corner of M1. (11/96)
			S	041:20:82.7	88:09:53.9	Pole #113- 1 transformer on it, 300 yards south of the pile, on South Patrol Road. (11/96)
M2		Explosive Burning Ground				
M3		Flashing Grounds	S	041:22:35.5	88:10:09.9	Pole mounted transformer near northeast corner of fenced area. (11/96)

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TABLE 4-7
SUMMARY OF PCB FINDINGS
SECOND LAND TRANSFER TO USDA
JOAAP, WILL COUNTY, ILLINOIS

Section	Building	DESCRIPTION	Status	Latitude	Longitude	Comments
M4		Lead Azide Area	A	041:22:35.4	88:10:24.8	Ground mounted transformer with tag indicating les than 50ppm PCBs adjacent to Building 411-2. (11/96)
			A	041:22:36.2	88:09:48.7	3 pole mounted transformer with tag indicating less than 50ppm PCBs adjacent to Building 411-1. (11/96)
			A	041:23:00.3	88:10:00.7	Pole #2603- 2 transformers with "No PCB" stickers near Building TS1242. (11/96)
			S	041:23:07.5	88:10:11.6	Pole #033T- 1 transformer along north boundary of section. (11/96)
			S	041:22:57.2	88:10:02.2	Two oil filled electrical switch boxes on the west side of Building 1201. (11/96)
			A			Pole #2603T - 3 transformers with "No PCBs" stickers. (11/96)
M5 U		Tetryl Production Area-USDA Portion				
M10 U		Toluene Tank Farms USDA Portion				
M11		Landfill				
M12		Sellite Manufacturing Area				
	307	Sellite Storage & Mixing House	S			There are some switch boxes inside this building. There is no indication whether PCBs are present. (11/96)
	307-1	Process House	A			Huge machinery inside the building all tagged "PCB, no oil." (11/96)
M14		Former Pond Area	A	041:23:00.0	88:09:10.6	Pole # 1458S - three transformers are tagged "contains no PCB."
			S	041:23:24.9	88:09:10.7	Pole # 1188- 3 transformers with no tags. (11/96)
			S	041:23:24.7	88:09:07.6	Pole 1197A- 1 transformer. (11/96)
			S	041:23:31.3	88:09:16.9	Pole #1167B-1 transformer and one transformer or Pole #1167. Both with no tags. (11/96)
			A	041:23:33.8	88:09:34.1	Pole #813- 1 transformer. This transformer is tagged "no PCB." (11/96)
M15		Sewage Treatment Plant				
M99		TNT Block Area (M6A)	S	041:23:19.0	88:09:58.5	Pole 1689: transformer located on western perimeter of M99.
			A			Pole #1689 - 1 transformer with "No PCBs" sticker adjacent to the road on east side of site. (11/96)
M105		PAS Survey Section M105	A	041:22:43.2	88:10:22.5	A ground surface transformer is located adjacent to the Well House at 411-2. The transformer has a green sticker indicating less that 50 ppm PCBs.
			S	041:23:26.0	88:10:27.2	Pole # 229: transformer in eastern section of area.
M105		PAS Survey Section M105	S	041:23:30.9	88:10:28.0	Pole # 332: 300 feet north of pole 229, also has a transformer.
			S	041:24:09.2	88:09:42.2	Pole # 1896: transformer located on eastern edge of M105.
			S	041:23:46.5	88:09:52.3	Pole #1357: transformer located on eastern M105, 1,000 feet south of Sellite and Box Factory.
			S	041:23:52.8	88:09:51.7	Pole #1348: transformer on located eastern M105, 100 feet south of Sellite and Box Factory.
			S	041:23:34.8	88:09:55.8	Pole #1341: transformer located on eastern M105, approximately 200 yards north of Sewage Treatment Plant.
			S	041:23:27.5	88:09:57.7	Pole #1336: transformer located on eastern M105 in front of 505-12 near Sewage Treatment Plant.
			S	041:23:15.1	88:09:57.6	Pole #1683: transformer on west TNT Road just south of M99 (M6A).
			S	041:23:06.9	88:09:50.4	Pole #1673: transformer on west TNT road.

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M105		PAS Survey Section M105	S	041:22:57.2	88:10:06.2	Pole #033T: transformer
			A	041:23:58.1	88:10:02.7	Pole #1372 A&B- 3 transformers with tags reading "no PCB"
	814	Factory & Shook Storage	S			Bay 27 contains- 4 pulley driven machine and other equipment, some read "PCB Test, 24 August 1993, oil, sample". Some also read "PCB Test, 24 August 1993, no oil". Some equipment is not tagged. (11/96)
			S			Bay 28 contains- diverse equipment, tags say 'PCB, 23 August 1993, no oil'. Also an unlabeled 4 gallon drum (full). (11/96)
			S			Large machine with PCB testing tag. (11/96)
			A			Large pieces of machinery and traffic lights are also stored here. The machines have tags that read: PCB test, 25 August 1993, no oil. (11/96)
M108		PAS Survey Section M108	S	041:22:01.1	88:09:06.5	Pole 0528: 3 transformers
			S	041:22:00.8	88:09:06.2	Pole 2406: electrical switch, oil filled
			S	041:21:58.2	88:09:06.4	Pole 0523: 3 transformers
			S	041:21:57.9	88:09:03.6	Pole 2405: oil electrical switch
			S	041:21:53.2	88:09:04.4	Pole 0512: 3 transformers and electrical switch
			S	041:22:32.7	88:09:52.5	Pole 2496: transformer west of 811-1
			S	041:22:27.4	88:09:52.8	Pole 2501: transformer west of 811-2
			S	041:22:15.1	88:09:55.5	Pole A9: transformer west of 811-4
			S	041:22:14.7	88:09:45.5	Pole B10: transformer
			S	041:22:14.8	88:09:39.2	Pole C11: transformer near 811-33
			S	041:21:56.4	88:09:43.8	Pole C26: transformer near 811-37
			S	041:21:38.4	88:08:51.3	Pole 1561: 2 transformers
			S	041:21:58.0	88:08:41.9	Pole 0263B: 3 transformers adjacent to 704-23
			S	041:21:58.9	88:08:39.9	Pole 0264: 1 transformer near 704-23
			S	041:22:01.4	88:08:38.6	Pole 28: 1 transformer adjacent to gate 10
			S	041:22:13.6	88:08:40.5	Pole 0254A: transformer adjacent to 411-5 Pump House.
			S	041:22:35.5	88:08:51.5	Pole 1562: transformer
			S	041:22:41.8	88:08:41.5	Pole 1530: transformer adjacent to 707-13.
			P			Pole 0517: soils beneath the electrical box were field screened for PCBs (12/11/95) and contained between 4.1 and 15 ppm. Pole is south of 811-125.
			A			Pole 2406: Soil beneath electrical box was field screened for PCBs (12/11/95) and contained less than 0.5 ppm. The pole was stained but the soil was not. Pole is near 811-123.
M118		Grant Creek East				
M119		Grant Creek West				

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TABLE 4-8
SUMMARY OF EXPLOSIVE ORDNANCE/MATERIAL FINDINGS
SECOND LAND TRANSFER TO USDA
JOAAP, WILL COUNTY, ILLINOIS

Section	Building	DESCRIPTION	Status	Condition	Comments
L1		Group 61	P		Tetryl and Nitrobenzene detected at several soil sampling locations, but at concentrations below the certified reporting limit.
			S		The east ditch in Group 61 drains the area of highest explosive contamination within the Group. Within the woodlands, the flow is isolated from Prairie Creek by a series of levees. During storm events, the woodland area floods and the water appears to infiltrate to ground water. During extreme storm water events, the levees are over topped.
			S		Explosives are a contaminant of concern in this area according to the Installation Action Plan. Soil remediation is anticipated to address explosives contamination. Ground water remediation of explosive may require limited action only (i.e. deed restrictions and monitoring).
			R		An Ammonium Nitrate Crystallization Plant was converted into an Ammunition Plant. The Ammonium Nitrate Plant was shut down in May 1943 when the use of amatol mixture was discontinued in favor of TNT as the high explosive in ammunition.
	61-1	Power House (In use by Justice	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
	61-2	Cleaning, Painting & Shipping	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
			P	3X	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 3X.
	61-3	Receiving & Deboostering Building	P	3X	Explosives were processed in this building. The building was decontaminated to XXX after shutdown but must be tested for residues.
	61-4	Washout, Dryer & Flaker Building	P	3X	Explosives were processed in this building. The building was decontaminated to XXX after shutdown but must be tested for residues.
			P	3X	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 3X.
	61-5	Evaporating Building	P	3X	Explosives were processed in this building. The building was decontaminated to XXX after shutdown but must be tested for residues.
	61-6	Evaporating Building	P	3X	Explosives were processed in this building. The building was decontaminated to XXX after shutdown but must be tested for residues.
	61-8	Storage Shed (use to be building	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
	61-9		A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
			A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
	61-25	Superintendent's Office	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
	61-33	Booster Storage Building	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
	61-35	Sump Building	P	3X	Explosives were processed in this building. The building was decontaminated to XXX after shutdown but must be tested for residues.
			R		A 3-inch shell without nose or explosive charge was found in northwest corner of building. The shell was recovered by ETSC for disposal.
	61-38	Vacuum Pump House	P	3X	Explosives were processed in this building. The building was decontaminated to XXX after shutdown but must be tested for residues.
	61-61A	Latrine (Reported Excess)	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
	61-61B	Latrine (Reported Excess)	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
	61-61C	Latrine (Reported Excess)	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
	61-T61	Latrine (Reported Excess)	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.

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Section	Building	DESCRIPTION	Status	Condition	Comments
2		Explosive Burning Ground	S		Explosives are a contaminant of concern in this area according to the Installation Action Plan. Remediation of soil may be necessary to address explosives. It is also expected that groundwater remediation of explosives contamination will require limited action only.
			P		Unexploded ordnance found in the ground near MW 404. Site SC 563 was heavily contaminated with munitions residue and intact projectile fuzes.
			S		Detonators containing smokeless powder were burned in the popping furnace.
			R		The destruction of 152,000 M 125 Booster Bodies and 16,035 Rotor Assemblies was completed at the Munitions Department Burning Grounds in August 1973.
			P		This area was identified as a burning ground for explosive wastes.
			R		M219E1 fuzes (1605) were sent to the burning ground to be disposed of by burning.
			P		According to a 1969 Standard Operating Procedures, destruction of arming mechanism assembly for M517 proximity fuze occurred in Small Popping Furnaces #26 and #27.
			P		Scrap TNT and Composition B collapsible boxes, scrap 105mm fiber containers, and scrap 105mm and 40mm wooden boxes were buried in an available pit.
			S		There is a popping furnace north of Building 23-27. (11/96)
			S		The practice at the LAP Burning ground was to dispose of scrap materials which might have slight explosives contamination by open burning. Joliet Army Ammunition Plant proposed a system to aid in decreasing the poundage of materials burned, scrap TNT and Composition B collapsible boxes, scrap 105mm fiber containers, and scrap 105mm and 40mm wooden boxes. They proposed to bury the materials burned in a pit available to the LAP Burning Ground. Any flakes or scrap explosives remaining in the boxes were considered extremely minute. Department of the Army granted Joliet Army Ammunition Plant permission to burn and bury the materials.
			P		In 1980, the procedure for burning out of TNT loaded 90mm, M71 Shell was provided.
			P		According to a 1972, Standard Operating Procedures, burning bulk Composition B explosive waste from plants or storage areas took place at explosive burning pads. Approximately 200 pounds of Composition B was placed every 10 feet along pads.
			P		According to an undated Standard Operating Procedures, burning of bulk TNT took place at the explosive burning pads. Approximately 200 pounds of TNT was placed every ten feet along the pads prior to burning. Dry hay was placed on top of the TNT and smokeless powder at each ignition end to insure complete burning. Pads were cleaned and inspected each morning after burning. Residue from burning was transferred to the burning pit.
			P		According to an undated Standard Operating Procedures, burning of propellant powder took place at the burning pads. Cans of propellant were placed feet apart on the explosive burning pads.
			P		In 1980, on the Burning Pads of this building, wood boxes were placed equally alongside each side of the burning pads to place the 90mm, M71 shells on them in preparation for burning.
	23-26	Destruction Chamber	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
			P		Building contains a popping furnace surrounded with barbed wire. Mound of dirt west of building may contain primers, lead and other chemical hazards. (11/96)
	23-27	Destruction Chamber	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.

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Section	Building	DESCRIPTION	Status	Condition	Comments
L2	23-27	Destruction Chamber	P		Building contains a popping furnace surrounded with barbed wire. Moun of dirt west of building may contain primers, lead and other chemical hazards. (11/96)
	23-28	Drill House	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
	23-29A	Storage Magazine	P	3X	Explosives were processed in this building. The building was decontaminated to XXX after shutdown but must be tested for residues.
	23-30A	Igloo	P	3X	Used for explosive storage; decontaminated to XXX.
	23-32	Bomb Shelter	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
	23-35	Destruction Chamber	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
			P		Building contains a popping furnace surrounded with barbed wire. Mound of dirt west of building may contain primers, lead and other chemical hazards. (11/96)
	23-36	Control House	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
	23-38	Latrine	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
	23-39	Burning Ground Field Office	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
			A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
	23-40	Decontamination Oven Bldg.	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
			S		This concrete structure appears to have been used as a furnace. (11/96)
	23-41	Control Panel Building	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
	23-42	Incinerator, Open Pit	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
L3		Demolition Area	P		The site is described as a large landfill and site where ordnance residue was dumped until the site was full. "Once the trench was filled, the area was covered with a thin cap of soil and additional ordnance activities were carried out on that surface. On the stream side of the site, metal debris is visibly protruding from the soil bank and putrid liquid is seeping from the pile into a stream." Projectile fuse and ordnance related items were removed from the Prairie Creek stream bank adjacent to the site.
			P		Explosives are considered a contaminant of concern for this area according to the Installation Action Plan. Explosives are anticipated to be addressed in soil and groundwater remediation.
			P		This area was identified as a burning ground for explosive wastes. Some demolition operations were conducted in this area.
			P		According to a 1969 Standard Operating Procedures, Comp C3 explosive and blasting caps were picked up at Burning Grounds and transferred to the Demolition Grounds (L3). BLUs were wrapped in C3, placed into a refrigerator, and detonated at the Demolition Grounds (L3) for demonstration purposes.
			A		In 1977, all materials that were to be disposed of by detonation, were to be destroyed in the demolition pits (6 demolition pits), one pit at a time.
			P		According to a 1967 Standard Operating Procedures, burning of contaminated liners from TNT boxes took place at the barricaded mine pit on the south side of Central Road.
	23-33	Remote Control Shelter	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
L4		Landfill Area	P		According to a 1967 Standard Operating Procedures, burning of inert trash took place in a burning pit on the North side of Prairie Creek and East of Road 2 West. Inert trash was only burned in this burning pit.

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Section	Building	DESCRIPTION	Status	Condition	Comments
L5		Salvage Yard	S		Explosives are a contaminant of concern in this area according to the Installation Action Plan. Media of concern for contaminants: groundwater, soil. Remediation may be necessary.
	26-1	Scale House & Office	A		A 1982 energy analysis does not indicate explosive hazards in this building.
			A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
	26-2	Baling Building	A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
	26-3	Sorting Building	A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
	26-4	Storage Building	A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
	26-7	Pump House, Well No. 1	A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
	26-8	Pump House, Well No. 3	A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
	26-9	Pump House, Well No. 2	A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
L7		Group 1	P		Sludges (RDX) taken from sumps (Group 1 and others) placed in Red Water Lagoon.
			S		Explosives are a contaminant of concern for this site according to the Installation Action Plan. Remediation of groundwater, sediment and soil may be necessary.
			P		This area was below MAP standards due to excessive projectiles with TNT on the exterior.
			R		The use of TNT as explosive filler was stopped during the month of September 1970 in Group 1. During this month, Group 1 was closed down and all 105MM loading was accomplished in Group 3 only using Composition B as an explosive filler.
			P		A small Demil line was maintained here in 1966. The following items were demilitarized during the year: Propellant Charge 120MM M15 Series, Projectiles 120MM M73 without fuze, Fuze MTSQ M518, 75MM M334, and reconditioned Dummy M73 Fuze.
			P		Red Water Filtration Systems have been installed and are operational. These systems were designed to remove the explosive contaminates from the water, prior to releasing the water into existing streams. Prior to the installation of these units, the Red Water generated in the LAP Operating lines was transported to the MFG Area Disposal Plant.
			P		Remarking of 7,410 90MM rounds was completed during washdown periods.
			P		The melt-load operations were usually carried out in this area.
			S		Load, assemble and pack cartridge, HE, M1 without fuze for 105MM Howitzer operations took place in this area.
			P		According to a 1968 Technical Department Training Syllabus, 105MM, HE, MI were produced here.
			P		The M444 grenade was assembled in Group 1.
			P		In 1959, the loading, assembly and packing of Cartridge, HE M1 for 105MM Howitzer was done.
	1-1	Power House	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
			A		A 1982 energy analysis does not indicate explosive hazards in this building.

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L7	1-1	Power House	A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
	1-2	Paint and Oil Storage	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
			P		A 1982 energy analysis indicates explosive hazards in this building.
			A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
	1-3	Receiving and Painting	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
			P		A 1982 energy analysis indicates explosive hazards in this building.
			A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
	1-3A	Inert Storage	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
			P	3X	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 3X.
	1-4	Melt Load Building	P	3X	Explosives were processed in this building. The building was decontaminated to XXX after shutdown but must be tested for residues.
			S		TNT was received and dumped on third floor, melted and mixed on second floor, and drawn off for filling shells on first floor.
			P		Excessive amounts of explosive dust were noted here.
			P		Pipes and beams overhead in Bays 1 and 3 were covered with TNT dust and inch-long crystallized TNT in cobwebs.
			P		A 1982 energy analysis indicates explosive hazards in this building.
			P		Pouring and melting of Composition "B" (40% TNT, 59% RDX, 1% wax) took place here.
			P		Pouring and melting of Composition "B" (40% TNT, 59% RDX, 1% wax) took place here.
			R		TNT was melted and transferred into dopp kettles on the second floor of this building. Scrap TNT (sump residue) recovered from sumps or settlement tanks was placed in rubber tubs or rubber buckets with lids and transferred to burning ground.
			P	3X	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 3X.
			P	b	Assorted equipment stored in this building - all equipment tagged as contaminated with Composition B and decontaminated to 3X. (11/96)
			P	b	In upper 2 levels all melt-pour equipment is in place - tags indicate equipment decontaminated to 3X. (11/96)
			S	b	Red stained soil on north and south side of building. (11/96)
			S		Three Hoffman wet scrubbers on south side of building - red stained soil below. (11/96)
	1-5A	Service Magazine	P	3X	Explosives were processed in this building. The building was decontaminated to XXX after shutdown but must be tested for residues.
			P	3X	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 3X.
			P	3X	Sign on door indicates Composition B contaminant area - decontaminated to 3X. (11/96)
	1-5B	Service Magazine	P	3X	Explosives were processed in this building. The building was decontaminated to XXX after shutdown but must be tested for residues.
			S		TNT was received and unloaded at this building.
			P	3X	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 3X.

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TABLE 4-8
SUMMARY OF EXPLOSIVE ORDNANCE/MATERIAL FINDINGS
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Section	Building	DESCRIPTION	Status	Condition	Comments
L7	1-6	TNT Screening	P	3X	Explosives were processed in this building. The building was decontaminated to XXX after shutdown but must be tested for residues.
			S		Filling cartons and dumping boxes at this building generated TNT dust.
			P		A 1982 energy analysis indicates explosive hazards in this building.
			S		TNT received via conveyor from Building 1-5B was screened on the second floor of this building. Scrap TNT (sump residue) recovered from sumps or settlement tanks was placed in rubber tubs or rubber buckets with lids and transferred to burning ground.
			P	3X	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 3X.
			S	b	Settling tub for red water in and outside of building. (11/96)
			S	b	Reddish stained soil around outside of building. (11/96)
			P	b	*Piping labeled "contaminated waste do not dismantle". (11/96)*
			S		Reddish stained soil beneath conveyor on northern side of building. (11/96)
	1-7	TNT Screening Magazine	P	3X	Explosives were processed in this building. The building was decontaminated to XXX after shutdown but must be tested for residues.
			P	3X	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 3X.
			P	3X	Sign on the door indicates that this building is contaminated with Composition B decontaminated to 3X. (11/96)
	1-8	Change House - Men & Women	P	3X	Explosives were processed in this building. The building was decontaminated to XXX after shutdown but must be tested for residues.
			A		A 1982 energy analysis does not indicate explosive hazards in this building.
			P	3X	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 3X.
	1-9	Tool & Equipment	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
			A		A 1982 energy analysis does not indicate explosive hazards in this building.
			A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
	1-10	Drilling & Boostering and X-Ra	P	3X	Explosives were processed in this building. The building was decontaminated to XXX after shutdown but must be tested for residues.
			S		This building had some potential for exposure of workers to TNT during riser knock-off, shell facing using vacuum exhausted drills, insertion of supplementary charges, and gaging.
			P		In 1996, it was noted that this building contained gross contamination of TNT.
			P		A 1982 energy analysis indicates explosive hazards in this building.
			R		Scrap TNT (sump residue) recovered from sumps or settlement tanks was placed in rubber tubs or rubber buckets with lids and transferred to burning ground.
			P	3X	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 3X.
			S	b	One projectile probably 105mm - painted blue in x-ray room. (11/96)
			S	b	Basement- beneath x-ray unit service pit adjacent to elevator filled with red colored water. (11/96)
			P	3X	*Two automated lines for 105mm loading located in this building.* System was decontaminated to 3X. (11/96)
			S		Eleven Hoffman wet scrubbers on south side of building. (11/96)
	1-11	Fuze Storage Service Magazine	P	3X	Explosives were processed in this building. The building was decontaminated to XXX after shutdown but must be tested for residues.

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Section	Building	DESCRIPTION	Status	Condition	Comments
L7	1-11	Fuze Storage Service Magazine	P	3X	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 3X.
	1-12	Primer Service Magazine	P	3X	Explosives were processed in this building. The building was decontaminated to XXX after shutdown but must be tested for residues.
			P	3X	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 3X.
	1-13	Assembly & Shipping	P	3X	Explosives were processed in this building. The building was decontaminated to XXX after shutdown but must be tested for residues.
			S		In this building, workers were potentially exposed to TNT solvent vapors, and smokeless powder during final assembly and packing. Shell closing, assembly of shell and case and stencilling was done here.
			S		Smokeless powder dust was generated during powder pour-out and 90MM inert shell pull-apart in this building.
			P		A 1982 energy analysis indicates explosive hazards in this building.
			P	3X	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 3X.
			P	b	Forty-five 105 mm shells painted blue, all of which have poured material inside, some have black, some white, some red material inside, some have liners - in east end of building. Ward Stern, ETSC, stated that the poured material in the shells was tested and did not indicate explosives. (11/96)
			P	3X	Sign on door indicates building is decontaminated to 3X. (11/96)
	1-14	Propellant Charge Building	P	3X	Explosives were processed in this building. The building was decontaminated to XXX after shutdown but must be tested for residues.
			S		Primers were inserted and pressed into M1 cartridge cases, propellant powder bags were placed in cases, cans of propellant were opened, and QC samples were collected in this building. These processes involved black and smokeless powder, and solvents.
			P		A 1982 energy analysis indicates explosive hazards in this building.
			P	3X	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 3X.
	1-15	Maintenance Building	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
			A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
	1-16	Cooling Building	P	3X	Explosives were processed in this building. The building was decontaminated to XXX after shutdown but must be tested for residues.
			S		TNT was received and dumped on the third floor of this building, melted and mixed on the second floor, and drawn-off on the first floor. Shells were topped off in Bay 1. Cores were melted on the first floor.
			P		A 1982 energy analysis indicates explosive hazards in this building.
			R		Scrap TNT (sump residue) recovered from sumps or settlement tanks was placed in rubber tubs or rubber buckets with lids and transferred to burning ground.
			P	3X	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 3X.
			P		In 1962, a 40 pound shape charge line was established in Building 1-16.
			P	3X	Projectile probe equipment is contaminated with TNT, decontaminated to 3X. (11/96)
			S		There are yellowish red chips under the building on the northwest end and along the north side of the building. The chips are approximately 1/2 inch in length and are suspected explosives. There is red stained soil on both sides of the building. (11/96)
	1-17	Smokeless Powder Service Magazine	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.

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L7	1-17	Smokeless Powder Service Magazine	P		A 1982 energy analysis indicates explosive hazards in this building.
			P		According to a 1974 Standard Operating Procedures, drums of propellant charges were stored in this building.
			P	3X	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 3X.
			P	3X	Sign on the door reads "Contaminant Area Propellant XXX". (11/96)
			P	b	There are several hand trucks in this building tagged decontaminated to 3X. Building is otherwise empty. (11/96)
	1-18A	Bomb Proofs	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
			A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
	1-18B	Bomb Proofs	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
			A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
	1-18C	Bomb Proofs	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
			A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
	1-18D	Bomb Proofs	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
			A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
	1-18E	Bomb Proofs	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
			A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
	1-18F	Bomb Proofs	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
			A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
	1-18G	Bomb Proofs	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
			A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
	1-18H	Bomb Proofs	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
			A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
	1-19	First Aid Building	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
			A		A 1982 energy analysis does not indicate explosive hazards in this building.
			A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
	1-20A	Change House (Men)	P	3X	Explosives were processed in this building. The building was decontaminated to XXX after shutdown but must be tested for residues.
			A		A 1982 energy analysis does not indicate explosive hazards in this building.

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Section	Building	DESCRIPTION	Status	Condition	Comments
L7	1-20A	Change House (Men)	A	0	ETSC for Best Group, Inc. conducted inspections during December 199 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
	1-20B	Change House (Men)	P	3X	Explosives were processed in this building. The building was decontaminated to XXX after shutdown but must be tested for residues.
			A		A 1982 energy analysis does not indicate explosive hazards in this building.
			A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
	1-21	Change House (Men)	P	3X	Explosives were processed in this building. The building was decontaminated to XXX after shutdown but must be tested for residues.
			A		A 1982 energy analysis does not indicate explosive hazards in this building.
			A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
	1-22	Booster Service Storage Magazine	A	0	This facility is considered to be in 0 condition. It was not contaminated with explosives.
			P	3X	This is an open fenced-in yard with above ground storage tanks of multiple sizes. (11/96)
	1-23	Pump Control House	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
			A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
	1-24	Well House & Rig	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
			A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
	1-25	Superintendent's Office	A	0	This building is considered to be in 0 condition. It was not contaminate with explosives.
			A		A 1982 energy analysis does not indicate explosive hazards in this building.
			A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
	1-26	Sewage Pump Station	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
			A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
	1-27A	Guard House	A		This building is considered to be in 0 condition. It was not contaminated with explosives.
			A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
	1-29A	Clock House	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
			A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
	1-29B	Clock House	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
			A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
	1-29C	Clock House	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.

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Section	Building	DESCRIPTION	Status	Condition	Comments
L7	1-29C	Clock House	A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
	1-29D	Clock House	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
			A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
	1-29E	Clock House (Special)	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
			A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
	1-30	Packing Box Receiving & Storage	A	0	Operated for prove-out in 1970's then decontaminated to XXX but must be tested for nitrate residues.
			A		A 1982 energy analysis does not indicate explosive hazards in this building.
			A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
	1-31	Fiber Container Storage	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
			A		A 1982 energy analysis does not indicate explosive hazards in this building.
			A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
	1-32	Change House, Women	P	3X	Explosives were processed in this building. The building was decontaminated to XXX after shutdown but must be tested for residues.
			A		A 1982 energy analysis does not indicate explosive hazards in this building.
			A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
	1-33	Street Light Substation	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
			A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
	1-38A	Vacuum Pump House	P	3X	Explosives were processed in this building. The building was decontaminated to XXX after shutdown but must be tested for residues.
			P	3X	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 3X.
	1-38A-1	Barricade	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
			A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
	1-38A-2	Barricade	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
			A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
	1-38A-3	Barricade	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
			A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
	1-38B	Vacuum Pump House	P	3X	Explosives were processed in this building. The building was decontaminated to XXX after shutdown but must be tested for residues.

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L7	1-38B	Vacuum Pump House	P	3X	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 3X.
	1-38B-1	Barricade	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
			A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
	1-38B-2	Barricade	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
			A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
	1-38C	Vacuum Pump House	P	3X	Explosives were processed in this building. The building was decontaminated to XXX after shutdown but must be tested for residues.
			P	3X	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 3X.
			S		Vacuum tank within building for collection of explosive dust. (11/96)
	1-38C-1	Barricade	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
			A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
	1-38C-2	Barricade	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
			A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
	1-38D	Vacuum Pump House	P	3X	Explosives were processed in this building. The building was decontaminated to XXX after shutdown but must be tested for residues.
			P	3X	ETSC for Best Group, Inc. conducted inspections during December 199 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 3X.
			P	b	Vacuum tank within building for collection of explosive dust. (11/96)
	1-38D-1	Barricade	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
			A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
	1-38D-2	Barricade	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
			A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
	1-38D-3	Barricade	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
			A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
	1-38E	Vacuum Pump House	P	3X	Explosives were processed in this building. The building was decontaminated to XXX after shutdown but must be tested for residues.
			P	3X	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 3X.
	1-38E-1	Barricade	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
			A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.

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7	1-38E-2	Barricade	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
			A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
	1-38F	Vacuum Pump House	P	3X	Explosives were processed in this building. The building was decontaminated to XXX after shutdown but must be tested for residues.
			P	3X	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 3X.
			P		Vacuum equipment in this building tagged as contaminated with Composition B decontaminated to 3X. (11/96)
	1-38F-1	Barricade	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
			A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
	1-38F-2	Barricade	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
			A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
	1-38F-3	Barricade	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
			A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
	1-38F-4	Barricade	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
			A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
	1-40A	Sump Platform & Washout Building	P	3X	Explosives were processed in this building. The building was decontaminated to XXX after shutdown but must be tested for residues.
			P	3X	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 3X.
	1-40B	Sump Platform & Washout Building	P	3X	Explosives were processed in this building. The building was decontaminated to XXX after shutdown but must be tested for residues.
			P	3X	The ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 3X.
	1-40C	Sump Platform & Washout Building	P	3X	Explosives were processed in this building. The building was decontaminated to XXX after shutdown but must be tested for residues.
			P		In 1996, it was noted that this building contained gross contamination of TNT.
			R		Testing of one skid (60 shells) of 105 shells with Composition B in melt out oven. All scrap Composition B generated was sent to the Burning Grounds. All TNT and Group 1 projectiles were removed from this building.
			P	3X	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 3X.
	1-40C	Sump Platform & Washout Building	P	3X	Acetone storage container, tagged as contaminated with Composition B decontaminated to 3X. Other equipment present also tagged as decontaminated to 3X (11/96)
	1-42	Plant & Oil Storage	A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
	1-42A	Storehouse, Material	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.

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TABLE 4-8
SUMMARY OF EXPLOSIVE ORDNANCE/MATERIAL FINDINGS
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Section	Building	DESCRIPTION	Status	Condition	Comments
L7	1-42A	Storehouse, Material	A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
	1-42B	Storehouse, Oil	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
	1-42C	Material Storehouse	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
			A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
	1-43	Oil Pump House	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
			A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
	1-44A	Storage Building (Paint & Turp	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
	1-A1	Platform, Unloading	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
	1-B1	Platform, Unloading	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
	1-C1	Platform, Unloading	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
	1-D1	Platform, Unloading	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
L8		Group 2	P		Sludges (RDX) taken from sumps (Group 2) placed in Red Water Lagoon.
			P		Surface water contamination documented in several referenced studies (TNT, RDX, DNT). LAP wastewater (containing pink water) from Groups 2 and 3 flowed to Prairie Creek.
			P		Explosives are a contaminant of concern in this area according to the Installation Action Plan. Remediation of groundwater, sediment and so may be necessary.
			S		On June 5, 1942, an explosion near the Drilling and Shipping Building caused heavy loss of life and property damage estimated at $484,000. The damage was repaired and the group continued in use to the end of the war.
			P		Production of 8-inch HE ammunition occurred at Group 2. This involved loading of projectiles (melt-load) with Composition B, cleaning of the loaded projectiles in a wash house, and transfer of the projectiles to other facilities for final assembly. Red water waste from site activities was sent to a sump where particulates settled out. The sediment was sent to the explosive burning ground for disposal.
			P		This group was able to undertake the defusing of a number of 90mm rounds.
			P		The use of Span 85 was introduced to TNT mix in 1968.
			P		The melt-load operations were usually carried out in this area.
			P		According to a 1968 Technical Department Training Syllabus, 8 inch M106 were produced here for the Army and the Navy.
			S		Two vacuum units appear to be connected to Building 2-38C. (11/96)
			S		Vacuum units 2-38-D-1 and 2-38-D-2 are located in the south central portion of this section. (11/96)
			S		Vacuum units associated with several of the buildings in this section were seen. Red stained soil was noted around similar units in other areas. (11/96)
			P		Production activities for Area 2 were at a minimum with renovation of the 90mm, which was completed in February 1976.
			P		In 1963, equipment required for the loading and assembly of Proving Ground items such as M21A4 Boosters, M51A5 Fuzes, and various components, have been installed in Group 2.

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Section	Building	DESCRIPTION	Status	Condition	Comments
L8		Group 2	P		In 1959, Group 2 was engaged in the loading, assembly and packing of shell, HE, 90MM Ammunition through February 26, 1954, on a one-shift basis. (11/96)
	2-1	Power House	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
			A		A 1982 energy analysis does not indicate explosive hazards in this building.
			A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
	2-2	Paint & Oil Storage	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
			P		A 1982 energy analysis indicates explosive hazards in this building.
			A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
	2-3	Receiving & Painting	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
			P		A 1982 energy analysis indicates explosive hazards in this building.
			P		According to a 1970 Standard Operating Procedures, spray painting of projectiles and hand painting of shells took place here.
			A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
			P	3X	Some equipment inside is marked 3X. (11/96)
	2-3A	Inert Storage	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
			P	3X	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 3X.
			S		A box of what could be emptied 155mm shells was found. They were stored next to a box of pouring funnels that fit the shell cones perfectly. Explosive hazardous residue suspected. (11/96)
	2-4	Melt Load	P	3X	Explosives were processed in this building. The building was decontaminated to XXX after shutdown but must be tested for residues.
			P		A 1982 energy analysis indicates explosive hazards in this building.
			S		According to a 1970 Standard Operating Procedures, "Frothing that does not readily break may indicate 'foaming TNT'...Foaming TNT can be rectified by the addition of 0.10% of SPAN 85 to the weight of charge." If the charge did not appear to be improved it was disposed of at the Burning Ground.
			P		According to a 1970 Standard Operating Procedures, explosive contaminated equipment and tools were cleaned here.
			P		According to a 1970 Standard Operating Procedures, by use of steam injector, red water from washout facility or settlement tanks was transferred to a tank truck. The loaded tank truck was transferred to the red water disposal unit for final disposition. If the level of red water was to high to accept the red water, then the red water tanks were taken to the Red Water facility on the manufacturing side. Scrap TNT (washout facility residue) recovered from the washout facility of settlement tanks were placed in rubber tubs with lids and transferred to the Burning Ground as required. Scrap TNT stored in washout facility (from dry collectors) was removed to Burning Ground as required. The tank from the tank truck was cleaned in Building 2-37.
			P	3X	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 3X.
			S		This building was a LAP area and has conveyors and other arrangement associated with loading operations for ordnance. (11/96)

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Section	Building	DESCRIPTION	Status	Condition	Comments
L8	2-5A	N.A. Service Magazine	P	3X	Explosives were processed in this building. The building was decontaminated to XXX after shutdown but must be tested for residues
			P	3X	ETSC for Best Group, Inc. conducted inspections during December 199 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 3X.
	2-5B	N.A. Service Magazine	P	3X	Explosives were processed in this building. The building was decontaminated to XXX after shutdown but must be tested for residues.
			P		Sign at door indicates XXX TNT contamination. Building contained 2500 square (5 yards). Nonmetallic bucket believed to have been used to hold energetic materials. It is not known if these buckets were new or used. (11/96)
	2-6	TNT Screening	P	3X	Explosives were processed in this building. The building was decontaminated to XXX after shutdown but must be tested for residues.
			P		A 1982 energy analysis indicates explosive hazards in this building.
			P		According to a 1970 Standard Operating Procedures, TNT from Building 2 7 was screened here. The box of TNT was opened, inverted and emptied into the hopper. The boxes were returned to Building 2-7 via conveyor. Tote boxes were filled with 50 lbs of TNT and transferred to loading station for Buildings 2-4 or 2-16 and Group 3. Roto-Clone Exhaust Systems were used.
			P	3X	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 3X.
			P	3X	The soil is red at the door on west entrance. Inside of the building is a machine which functioned as a hopper to funnel material down to a central point. Portals from conveyor belts are marked 3X. (11/96)
	2-7	TNT Service Magazine	P	3X	Explosives were processed in this building. The building was decontaminated to XXX after shutdown but must be tested for residues.
			S		According to a 1970 Standard Operating Procedures, boxes of TNT were received, unloaded and transferred to this building. The boxes of TNT were then transferred to conveyor for shipment to Building 2-6. Paper liner from boxes were removed and the liners were loaded onto explosive trailer. Liners were removed to Burning Grounds when necessary.
			P	3X	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 3X.
	2-8	Change House	P	3X	Explosives were processed in this building. The building was decontaminated to XXX after shutdown but must be tested for residues.
			A		A 1982 energy analysis does not indicate explosive hazards in this building.
			A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
	2-9	Tool & Equipment Storage	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
			A		A 1982 energy analysis does not indicate explosive hazards in this building.
			A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
	2-10	Anti-Tank Mine Assembly & Ship	S		60,000 pounds of TNT/Tetryl packed in anti-tank mines and loaded in 3 box cars adjacent to the building and 2,600 pounds of Tetryl in fuzes within the building exploded on June 5, 1942. (115 people dead or injured). Structural damage was done to a distance of 700 feet and missile damage was done to 3,700 feet.
			P		Bay 10 of this building was used for storage of fuze-booster assembly. There were between 15,000 and 20,000 of these fuzes.
	2-11	Fuse Storage Service Magazine	P	3X	Explosives were processed in this building. The building was decontaminated to XXX after shutdown but must be tested for residues

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L8	2-11	Fuse Storage Service Magazine	P	3X	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 3X.
	2-12	Assembling & Shipping	P	3X	Explosives were processed in this building. The building was decontaminated to XXX after shutdown but must be tested for residues.
			P	3X	Explosives were processed in this building. The building was decontaminated to XXX after shutdown but must be tested for residues.
			P		A 1982 energy analysis indicates explosive hazards in this building.
			P		According to a 1970 Standard Operating Procedures, supplementary charges were inserted into the nose of projectiles. Exterior of shells were cleaned using a Safety approved solvent.
			P	3X	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 3X.
	2-14	Box & Container Storage	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
			A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
	2-16	Cooling & Loading Building	P	3X	Explosives were processed in this building. The building was decontaminated to XXX after shutdown but must be tested for residues.
			P		A 1982 energy analysis indicates explosive hazards in this building.
			P		According to a 1970 Standard Operating Procedures, explosive contaminated canvas filter bags in primary and secondary units were replaced. Contaminated bags were shaken out in the sump and placed in a canvas sack for removal to laundry. Catch boxes were cleaned out. Explosives were placed into rubber buckets with lids for transfer to the Burning Ground.
			P	3X	The ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 3X.
			P		In 1963, the assembly and packing of 90 MM, HE, complete rounds on the AMF unit in Group 2, Building 16, was completed.
	2-17	Maintenance Building	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
			A		A 1982 energy analysis does not indicate explosive hazards in this building.
			A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
	2-18A	Bomb Proof	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
			A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
	2-18B	Bomb Proof	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
			A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
	2-18C	Bomb Proof	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
			A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
	2-18D	Bomb Proof	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
			A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.

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Section	Building	DESCRIPTION	Status	Condition	Comments
L8	2-18E	Bomb Proof	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
			A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
	2-18F	Bomb Proof	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
			A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
	2-19	First Aid	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
			A		A 1982 energy analysis does not indicate explosive hazards in this building.
			A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
	2-20A	Change House	P	3X	Explosives were processed in this building. The building was decontaminated to XXX after shutdown but must be tested for residues.
			A		A 1982 energy analysis does not indicate explosive hazards in this building.
			A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
	2-20B	Change House	P	3X	Explosives were processed in this building. The building was decontaminated to XXX after shutdown but must be tested for residues.
			A		A 1982 energy analysis does not indicate explosive hazards in this building.
			A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
	2-21	Storage Building	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
	2-22	Primer Service	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
			P	3X	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 3X.
	2-23A	Condensate Pump House	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
			P	3X	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 3X.
	2-23B	Condensate Pump House	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
			P	3X	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 3X.
	2-23C	Condensate Pump House	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
			P	3X	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 3X.
	2-23D	Condensate Pump House	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
			P	3X	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 3X.
	2-24	Well House	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.

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L8	2-24	Well House	A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
	2-25	Superintendent's Office	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
			A		A 1982 energy analysis does not indicate explosive hazards in this building.
			A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
	2-27B	Guard House	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
	2-29A	Clock House	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
			A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
	2-29B	Clock House	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
			A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
	2-29C	Clock House	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
			A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
	2-33	Street Light Substation	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
			A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
	2-37	Washout Building	P		In 1996, it was noted that this building contained gross contamination of TNT.
			P		A 1982 energy analysis indicates explosive hazards in this building.
			P		According to a 1970 Standard Operating Procedures, equipment and tools were cleaned here. Shells were also steamed out. A valve was operated, turning on saturated steam and allowing explosives to be washed out of shells. This occurred in washout facility only.
			P		According to a 1970 Standard Operating Procedures, by use of steam injector, red water from washout facility or settlement tanks was transferred to a tank truck. The loaded tank truck was transferred to 'the red water disposal unit for final disposition. If the level of red water was to high to accept the red water, then the red water tanks were taken to the Red Water facility on the manufacturing side. Scrap TNT (washout facility residue) recovered from the washout facility of settlement tanks were placed in rubber tubs with lids and transferred to the Burning Ground as required. Scrap TNT stored in washout facility (from dry collectors) was removed to Burning Ground as required. The tank from the tank truck was also cleaned here.
			P	b	According to a 1970 Standard Operating Procedures, TNT casts were sectioned here. Casts from split shell were removed and placed in a miter box in the sump. Casts were sectioned as required by Production. After inspection of sections, cast were scrapped.
			P	3X	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 3X.

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L8	2-37	Washout Building	P		According to 1970 Standard Operating Procedures, a tanker used for red transport was cleaned in Building 2-37.
	2-38A	Vacuum Pump House	P	3X	Explosives were processed in this building. The building was decontaminated to XXX after shutdown but must be tested for residues.
			P	3X	A vacuum unit is present inside this building along with a pump. They may be contaminated with explosives. A sign at the door indicates that the contaminant of concern is Composition B at 3X level. This building is connected to building 2-38A-1, 2-38A-2, 2-38A-3 and 2-16 by a pipe line. The earth within 10 feet of this building has a slightly different color (possible contamination). (11/96)
			P	3X	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 3X.
	2-38A-1	Barricade	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
	2-38A-2	Barricade	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
	2-38A-3	Barricade	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
	2-38B	Vacuum Pump House	P	3X	Explosives were processed in this building. The building was decontaminated to XXX after shutdown but must be tested for residues.
			P	3X	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 3X.
	2-38B-1	Barricade	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
	2-38B-2	Barricade	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
	2-38B-3	Barricade	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
	2-38C	Vacuum Pump House	P	3X	Explosives were processed in this building. The building was decontaminated to XXX after shutdown but must be tested for residues.
			P	3X	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 3X.
			P	3X	A vacuum unit is present inside this building along with a pump. They may be contaminated with explosives. A sign at the door indicates that the contaminant of concern is Composition B at 3X level. This building is connected to building 2-38C-1 by a pipe line. The earth within 10 feet of this building has a slightly different color (possible contamination). (11/96)
	2-38C-1	Barricade	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
	2-38C-2	Barricade	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
	2-38C-3	Barricade	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
	2-38D	Vacuum Pump House	P	3X	Explosives were processed in this building. The building was decontaminated to XXX after shutdown but must be tested for residues.
			P	3X	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 3X.
			P	3X	A vacuum unit is present inside this building along with a pump. They may be contaminated with explosives. A sign at the door indicates that the contaminant of concern is TNT at 3X level. This building is connected to the main vacuum line in south central L8 by a pipe line. The earth within 10 feet of this building has a slightly different color (possible contamination). (11/96)
	2-38D-1	Barricade	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.

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L8	2-38D-2	Barricade	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
	2-38E	Vacuum Pump House	P	3X	Explosives were processed in this building. The building was decontaminated to XXX after shutdown but must be tested for residues.
			P	3X	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 3X.
	2-38E-1	Barricade	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
	2-38E-2	Barricade	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
	2-38E-3	Barricade	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
	2-38E-4	Barricade	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
	2-40B	Settling Chamber	P	3X	Explosives were processed in this building. The building was decontaminated to XXX after shutdown but must be tested for residues.
			P	3X	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 3X.
			S		A 3 by 4 by 8 foot washing tub is adjacent to the indoor sumps. A very large sump is nearby. The annex is attached to a shell conveyor line. (11/96)
	2-41	Paint & Oil Storage	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
			A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
	2-41A	Material Storehouse	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
			A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
	2-43	Oil Pump House	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
			A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
L9		Group 3	S		Group 3 surface drainage flows to Prairie Creek. Composition B (RDX) loaded at all groups. Overflow of sumps, discharge to Prairie Creek. Standing pink water in parking area adjacent to sump.
			P		Surface water contamination is documented in several referenced studies (TNT, RDX, DNT). LAP waste water (containing pink water) from Group 3 flowed to Prairie Creek.
			P		Explosives are a contaminant of concern in this area according to the Installation Action Plan. Remediation of groundwater, sediment and soil may be necessary.
			P		The use of TNT as explosive filler was stopped during the month of September 1970 in Group 1. During this month, Group 1 was closed down and all 105MM loading was accomplished in Group 3 only using Composition B as an explosive filler.
			P		The changeover to Composition B with Grade B Petrolite Wax as the explosive load for the 105mm, HE, M1 item was accomplished on May 4, 1973.
			P		Special tests on Composition B were run from August 7-15, 1973. The ratio of Composition B was three parts Witco Grade A/B wax to one part Sunoco Grade A wax.
			S		In November this Group switched from Composition B containing 1290B wax to Composition B containing Petrolite wax.

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L9		Group 3	R		Red Water Filtration Systems have been installed and are operational. These systems were designed to remove the explosive contaminants from the water, prior to releasing the water into existing streams. Prior to the installation of these units in 1970, the Red Water generated in the LAP Operating lines was transported to the MFG Area Disposal Plant.
			P		Remarking of 7,410 90MM rounds was completed here during washdown periods. 2,500 PG rounds were also completed during 1968.
			A		Talley Defense Systems used this area for the manufacture of the 155 mm, M864 Base Burner Assembly from 1989 until 1994.
			P		The melt-load operations were usually carried out in this area.
			P		According to a 1974 Group 3 Standard Operating Procedures, loading of inert item with PCN took place at this group. Operations included: receive, transfer and store PCN and inert items and materials; transfer sellite and iron oxide; prepare, melt, pour, drill and inspect PCN; stencil, pack, transfer, load and ship items.
			P		According to a 1968 Technical Department Training Syllabus, 105MM, HE, MI were produced here.
			P		In 1972, the following emissions were produced as by-products/waste: particulates from power house-30 lbs/day; sulfur dioxide-245 lbs/day; boiler and softener blowdowns-2.5 million lbs/day; shell steam outs-1.1 million lbs/day; and used carbon.
			S		Group 3 was to load 105 H. E. shell, instead of 155 shell, with a capacity of 600,000 per month, as provided by a change order to the contractor.
			P		The 81mm mortar was loaded with Composition B in Group 3 and the 762 rocket was loaded. The 75mm rounds were made in Group 3.
			P		In 1959, alterations and additions, necessary for the re-tooling of Group 3 for loading of 90MM M-71 has been completed.
			P		In 1959, Group 3 was engaged in the loading, assembly and packing of Cartridge, 90MM, TP-T, M353; also Cartridge, HE M362, for 81MM Mortar.
	3-1	Power House	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
			A		A 1982 energy analysis does not indicate explosive hazards in this building.
			A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
	3-2	Paint & Oil Storage Building	P		A 1982 energy analysis indicates explosive hazards in this building.
			A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
	3-3	Receiving & Painting Building	P		A 1982 energy analysis indicates explosive hazards in this building.
			P		According to a 1974 Group 3 Standard Operating Procedures, loading of inert items with PCN took place at this group. Operations included: receive, transfer and store PCN and inert items and materials; transfer celite and iron oxide; prepare, melt, pour, drill and inspect PCN; stencil and pack items; and transfer, load and ship items.
			A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
	3-3A	Inert Storage Building	P		Polychloronaphthylene unit was installed for pouring inert loaded projectiles.
			P		Pouring of inert projectiles involved polychloronaphthalene and its vapors and fumes.
			A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.

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L9	3-3A	Inert Storage Building	S		Ducts that ventilated this building crisscross the ceiling and led outside. Those ducts could possibly be contaminated with explosive powder residue.
					A sign on the building indicated the following hazardous materials "propellant, grains, base burn assemblies, and igniter cup (12630572)". The explosive limit for the building was 2100 pounds. (11/96)
	3-4	Melt Load Building	P	3X	Explosives were processed in this building. The building was decontaminated to XXX after shutdown but must be tested for residues.
			S		In this building, TNT fumes were released during the melting, pouring into 75MM shells, hot probing, and shell vein venting. TNT dust was generated when solid TNT was knocked from funnels with a mallet.
			S		In this building TNT fumes and dust were released during pouring of 75MM shells, melting and mixing TNT, core melting, and cavity facing.
			S		In this building, TNT fumes and dust were released during melting and mixing of TNT, pouring of 75MM and 90MM shells, core melting, removing riser funnels from shells, riser knockout, and cavity facing.
			S		TNT dust and fumes were generated during melting TNT, mixing solid and liquid TNT, filling shells with TNT, melting cores, riser pullout, riser knockout and cavity facing.
			S		Workers were exposed to Composition B and fumes during 105 mm loading. Specific operations were filling Dopp kettles, melting, and pouring Composition B, riser knock-out, drilling for fuze inserts and brushing of projectile threads.
			S		On July 11, 1944 a fire started at this facility which resulted in an explosion and detonation. Four operators were removing solidified TNT from two settling tanks used in connection with steam-out operation when the fire started.
			P		A fire and explosion occurred on July 11, 1944, causing complete destruction of this building and its contents. This building was being utilized in the production of M-1 Chain Demolition Blocks, with a steam and a washout unit located on the first floor for cleaning 105mm shells. The explosion originated in a washout tank after TNT in the steamout or settling tanks was ignited. The explosion travelled upward detonating the explosive contents on the floor above.
			P		A 1982 energy analysis indicates explosive hazards in this building.
			P		A 1971 industrial hygiene survey indicates filling Dopp Kettles, melting and pouring Composition B, drilling fuze inserts, and power brushing projectile threads took place in this building.
			P	3X	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 3X.
	3-5A	Supplementary Charge Manufacture	P	3X	Explosives were processed in this building. The building was decontaminated to XXX after shutdown but must be tested for residues.
			S		TNT and its dust were generated pelleting, handling, and inserting TNT pellets into supplementary charge bodies.
			S		TNT dust was generated during pelleting of TNT and inserting of TNT pellets in charge cases. Thinner vapors were generated from cementing felt pads on charge cases.
			P		Special tests to develop a process to manufacture the Supplementary Charge Pellet utilizing the new process TNT were completed with favorable results.
			P		The production operation of the Supplementary Charge Assembly proceeded through 1968 with no major problems encountered.
			S		Supplemental TNT charges were loaded here. Emptying of TNT boxes and capping of charges generated TNT dust.
			P		A 1982 energy analysis indicates explosive hazards in this building.
			P		Sealing of RDX pellets took place here.
			P		A 1971 industrial hygiene survey indicates emptying of TNT boxes, filling of transfer pots, and capping of supplemental charges took place in this building.

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L9	3-5A	Supplementary Charge Manufacture	P		According to a 1973 Standard Operating Procedures, scrap TNT was sent to manufacturing side of plant for recycling.
			P	3X	ETSC for Best Group, Inc. conducted inspections during December 199 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 3X.
	3-5B	Propellant Powder Service Building	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
			P		A 1982 energy analysis indicates explosive hazards in this building.
			P	3X	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 3X.
	3-6	TNT Screening Building	P	3X	Explosives were processed in this building. The building was decontaminated to XXX after shutdown but must be tested for residues.
			S		Fifty pound boxes of flaked TNT were emptied into a hopper on the second floor and were released to a vibrating screen on the first floor. Both operations generated TNT dust.
			S		TNT dust was generated during hopper filling, screening, and box filling.
			S		TNT and its dust were generated while dumping TNT into hoppers and screening, collecting and packaging of TNT.
			S		TNT dust was generated during loading TNT into fuel hopper, and screening and boxing TNT.
			P		A 1982 energy analysis indicates explosive hazards in this building.
			P	3X	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 3X.
	3-7	TNT Service Magazine	P	3X	Explosives were processed in this building. The building was decontaminated to XXX after shutdown but must be tested for residues.
			P	3X	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 3X.
	3-8	Change House	P	3X	Explosives were processed in this building. The building was decontaminated to XXX after shutdown but must be tested for residues
			A		A 1982 energy analysis does not indicate explosive hazards in this building.
			A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
	3-9	Storage Building	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
			A		A 1982 energy analysis does not indicate explosive hazards in this building.
			A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
	3-10	Drilling, Boostering & Shipping	P	3X	Explosives were processed in this building. The building was decontaminated to XXX after shutdown but must be tested for residues.
			P		A 1982 energy analysis indicates explosive hazards in this building.
			P		A 1971 industrial hygiene survey indicates stencilling of projectiles and wiping of projectiles with acetone took place in this building.
			P	3X	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 3X.
	3-15	Storage Building	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
			A		A 1982 energy analysis does not indicate explosive hazards in this building.
			A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
	3-16	Propellant Loading Building	P	3X	Explosives were processed in this building. The building was decontaminated to XXX after shutdown but must be tested for residues

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L9	3-16	Propellant Loading Building	S		Smokeless powder dust was present during propellant portioning and weighing in this building .
			S		Smokeless powder and its dust were present during handling and weighing of propellant in this building.
			P		In 1996, it was noted that the pipes in this building are contaminated with Nitrocellulose.
			S		Filling of cans with triple base powder pellets containing nitroglycerin, nitroguanadine and nitrocellulose occurred here.
			P		A 1982 energy analysis indicates explosive hazards in this building.
			P	3X	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 3X.
			S	3X	Building is marked XXX at door. Building contained a priming machine. Signs inside building indicate that propellent powder was handled here. (11/96)
	3-18A	Bomb Shelter	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
			A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
	3-18B	Bomb Shelter	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
			A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
	3-18C	Bomb Shelter	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
			A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
	3-18D	Bomb Shelter	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
			A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
	3-18E	Bomb Shelter	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
			A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
	3-18F	Bomb Shelter	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
			A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
	3-19	First Aid Building	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
			A		A 1982 energy analysis does not indicate explosive hazards in this building.
			A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
	3-20A	Change House	A		A 1982 energy analysis does not indicate explosive hazards in this building.
			A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
	3-20B	Change House	P	3X	Explosives were processed in this building. The building was decontaminated to XXX after shutdown but must be tested for residues.
			A		A 1982 energy analysis does not indicate explosive hazards in this building.

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L9	3-20B	Change House	A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
	3-22	Booster Service Magazine	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
			P	3X	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 3X.
	3-23	Pump Control House	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
			A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
	3-24	Well House & Rig	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
			A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
	3-25	Superintendent's Office	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
			A		A 1982 energy analysis does not indicate explosive hazards in this building.
			A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
	3-29A	Clock House	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
			A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
	3-29B	Clock House	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
			A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
	3-29C	Clock House	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
			A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
	3-30B	Condensate Pump House	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
			P	3X	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 3X.
	3-30C	Condensate Pump House	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
			P	3X	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 3X.
	3-30E	Condensate Pump House	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
			P	3X	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 3X.
	3-30F	Condensate Pump House	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
			P	3X	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 3X.

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L9	3-30G	Condensate Pump House	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
			P	3X	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 3X.
	3-33	Street Light Substation	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
			A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
	3-34	Oil Storage	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
	3-37	Washout Building & Sump	P	3X	Explosives were processed in this building. The building was decontaminated to XXX after shutdown but must be tested for residues.
			S		Steam-out of rejected 55 and 75MM shells and cleaning of equipment used in TNT loading were performed in a room (40 by 20 feet). Trays, kettles, ladles and carts from the load line were cleaned with hot water and steam on the floor by a side wall. The washout unit held eleven shells. The washout tank was vented to the outside through a gravity exhaust stack.
			P		A 1982 energy analysis indicates explosive hazards in this building.
			P	3X	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 3X.
			S		Sumps, underneath building, floors, and washing tubs may be contaminated. The adjacent soil may also be explosively contaminated. (11/96)
	3-38B	Vacuum Collectors	P	3X	Explosives were processed in this building. The building was decontaminated to XXX after shutdown but must be tested for residues.
			P	3X	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 3X.
			P	3X	A vacuum unit is present inside this building along with a pump. They may be contaminated with explosives. A sign at the door indicates that the contaminant of concern is Composition B at 3X level. This building is connected to Building 3-38B-1 by a pipe line. The earth within 10 feet of this building has a slightly different color (possible contamination). (11/96)
	3-38B-1	Barricade	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
			S		Building has 2 vacuum units with possible explosive residue on the building perimeter. (11/96)
	3-38C	Vacuum Collectors	P	3X	Explosives were processed in this building. The building was decontaminated to XXX after shutdown but must be tested for residues.
			P	3X	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 3X.
			S		A pipeline connects this building to 3 vacuum collectors located 25 feet away in a partitioned concrete structure east of Building 3-38C. Explosive contamination of pipes is suspected. (11/96)
			P	3X	A sign on the door indicates a 3X hazard inside this building due to Composition B. (11/96)
	3-38C-1	Barricade	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
			S		Vacuum unit and the associated piping, soil adjacent to similar units in the area was stained therefore contamination is suspected. (11/96)
	3-38E	Vacuum Collectors	P	3X	Explosives were processed in this building. The building was decontaminated to XXX after shutdown but must be tested for residues.
			P		In 1996, it was noted that this building contained gross contamination of TNT.

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L9	3-38E	Vacuum Collectors	P	3X	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 3X.
			S		Pipes, equipment and building may be contaminated with explosive residues. The piping connects to an adjacent building where munitions were processed. It appears that these pipes removed dusts from the production building. (11/96)
	3-38E-1	Barricade	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
			S		Gravel bed on east side is very red. Also the pipe and rest unit could be contaminated. It connects via pipes to 3-38E and 3-4. (11/96)
	3-38F	Vacuum Collectors	P	3X	Explosives were processed in this building. The building was decontaminated to XXX after shutdown but must be tested for residues.
			P		In 1996, it was noted that this building contained gross contamination of TNT.
			P	3X	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 3X.
			P	3X	Building has a sign at door indicating a 3X hazard due to Composition B. (11/96)
	3-38F-1	Barricade	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
			S		Explosive residues may be present in piping, concrete pad, and adjacent land. The piping connects to an adjacent building where munitions were processed. It is believed that these pipes removed dust from the production building. (11/96)
	3-38G	Vacuum Collectors	P	3X	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 3X.
	3-38G-1	Barricade	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
	3-39	Pump House	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
			A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
	3-41	Supply Charge Service Building	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
			A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
	3-42	Compressor House	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
			A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
	3-43	Oil Pump House	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
			A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
	3-44	Electric Control & Heater Building	A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
	3-45	Washout Building & Sump	P	3X	Explosives were processed in this building. The building was decontaminated to XXX after shutdown but must be tested for residues.
			A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
			S		Sump could be contaminated with explosive residues. (11/96)

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TABLE 4-8
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L9	3-47	Storage Building	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
			A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
	3-48	Grease & Solvent Building	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
			A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
	3-48A	Material Storehouse	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
			A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
	3-49	Electric Control Building	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
			A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
	3-50	Receiving Building	P	3X	Explosives were processed in this building. The building was decontaminated to XXX after shutdown but must be tested for residues.
			A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
	3-62	Grinder Building	S		A duct coming out of the building on the east end may contain explosive residues. Based upon the construction of building, it appears that energetic materials were processed here. Any duct which may have handled air and dust is suspected as a locale for explosive residues. (11/96)
	3-64	Mixer Building	P		A duct coming out of the building on the east end may contain explosive residues, since the bays were labeled grain (suspected propellents) storage. (11/96)
	3-65	Curing	P		The interior of this building is composed of separate bays partitioned by what appears to be concrete. There is a residue remaining on the floor. The grains are labeled grain storage. (11/96)
	3-72	Igniter Mixer Muller	S	b	The outer east wall of building is equipped with a series of air handling units(4), with concrete partitions between them. Because the building processed munitions, any air handling units are to be suspected to be explosive contaminated. (11/96)
			S		A sign on the door lists the following hazardous materials as having been stored in the building: "TALI-12 Igniter Material, Magnesium Powder, Pressed Igniter Cups." The explosive limit for the building is indicated as 15 pounds. (11/96)
L10		Group 3A	P		Explosives are a contaminant of concern for this site according to the Installation Action Plan. Remediation of groundwater, sediment and soil may be necessary.
			P		The low density of the poured cyclotol in the CBU Lines developed into a serious situation.
			P		Assigned schedules for the CBU 24B/Bs and CBU 49B/Bs were delayed due to an explosive incident which required the closing of this Group from March 22-29, 1971. A bomblet loaded with a delay XM224 detonated. A work schedule was received for 1000 each 90MM, HE M71 rounds inert loaded with PCN, deep fuze cavity with installed and expanded liner. A P-17 layaway project was used for the entire group which included Buildings 41, 44, 45 and 46 for the manufacture of PBX pellets in support of Cartridge, 40MM, M406 production in Group 4. In 1971, the group was decontaminated except for the pelletizing operations which were to stay operative in support of M406 production.

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L10		Group 3A	R		Red Water Filtration Systems have been installed and are operational. These systems were designed to remove the explosive contaminants from the water, prior to releasing the water into existing streams. Prior to the installation of these units, the Red Water generated in the LAP Operating lines was transported to the MFG Area Disposal Plant.
			P		Decontamination of the line except for the pelletizing operations which were approved to stay operative in support of M406 production.
			P		Dispenser and Bomb Aircrafts CBU 24 (E1814), CBU 29 (E178), and CBU 49 (E174) were produced here and ran throughout 1968 with no major problems. A forty pound shape charge, 800 in number, were reconditioned and filled with inert material.
			P		This area was used by the Atomic Energy Commission to make dummy bombs to test drop. Alliant will be finished in January 1996 and will return the area to the army.
			P		The melt-load operations were usually carried out in this area.
			P		In 1989, Honeywell began using this area for the production of AT4.
			P		During 1944, pilot models for a "new fuze Chemical Mine AT M5 and fuze mine practice T3E1" were made, tested and put into production. The production of the M5 fuze was halted in January 1945 because it did not meet requirements. This group undertook the activities of loading one of the practice-type bombs in addition to storage and ammunition reclamation duties.
			P		According to a 1968 Technical Department Training Syllabus, BLU and CBU were produced here.
			P		A large amount of washout work was conducted in Group 3A from the late 1940s through the early 1960s. Many munitions loaded with Torpex were washed out. The buildings in which the wash out was conducted have been demolished. Inert bombs were loaded in Group 3 with hydrocal. A mock up of Big Boy 12,000 pound bomb was loaded with an inert filler. Bombs of varying sizes (12,000, 14,000, and 42,000 pounds) were loaded with tritonal in Group 3A.
			P		In 1959, Group 3 was engaged in the loading, assembling and packing of high explosives bomb and various types of ammunition for proving ground tests. (11/96)
	3A-4	Melting & Pour Building	S		Tritonal (50/50 mix of TNT and Aluminum dust) was melted on the second floor and poured to the ground floor. TNT dust and fumes are generated from this operation causing some atmospheric contamination. Raw materials were added to the third floor. A spill at time of survey was cleaned using a floor buffer which generates TNT dust. It was indicated that future spills would be cleaned up with hot water when possible. Polychloronaphtalene and sellite were melted here for inert loading of shells. Sublimed material collected and condensed on sides of pipe.
			S		TNT and Tritonal (TNT/Aluminum dust) were used for experiment bomb melt mixing.
			P		A program to rework Cyclotol filled hemispheres in storage prior to changeover to Composition B was completed.
			P		An explosion of BLU or BLUs 59/B in cubicle #1, Cell #1 was experienced in the loading of a CBU 49. An investigation was held to the extent of damages and causes.
			P		Melting and dumping of Composition B took place here.
			P		According to a 1971 Standard Operating Procedures, Composition B was received in cartons via elevator. Composition B casts and clean scrap were screened in this building. Foreign materials were disposed of as contaminated trash via Building 3A-5. Composition B was also melted, poured into funnels, and removed from Dopp Kettles. All scrap explosives were stored in building 3A-47.
	3A-5	N.A. Service Magazine	S		Fifty pound boxes of TNT were emptied into carrying carts. This generated TNT dust. Ventilation was used to reduce dust concentrations.
	3A-7	TNT Service Magazine	S		Aluminum dust was weighed in this building.

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L10	3A-7B	TNT Service Magazine	P		There are 33 carry boxes marked "PBX test." Two boxes with Exspray are positive for group B explosives. (4/97)
	3A-10	Assembly, Packing & Shipping Building	S		Fuses containing ammonium picrate were demilitarized here.
	3A-12	Topping Building	S		An explosion of BLU or BLUs 591B in cubical #1, cell #1 was experienced in loading of CBU 49. An investigation was held to the extent of damages and causes.
			S		This building was used for loading of BLUs. (4/97)
	3A-13	H. E. Screening Building	S		TNT dust is generated from screening. A wet collector was used to remove dust but some still escaped to the room.
			S		TNT screening continued.
	3A-16B	Cooling Building	P		According to a 1954 Standard Operating Procedures, fuzes were tested and tabulated in this building.
	3A-41	Pelleting Building	P		A P-17 layaway project was used for the entire group which included Buildings 41, 44, 45 and 46 for the manufacture of PBX pellets in support of Cartridge, 40MM, M406 production in Group 4.
			P		RDX pellets were packed here.
			P		According to a 1971 Standard Operating Procedures, PBX was transferred and pelleted here.
	3A-43	Vacuum Collection Building	P		According to a 1970 Standard Operating Procedures, explosive dust was packed here.
			P	3X	Vacuum collector pot on west side of building contains several pounds of yellowish/ white powder which tested positive for Group B explosives w/Exspray building door has sign 3X "Contaminated Area Composition B". (4/97)
	3A-44	Screen & Blend Building	P		A P-17 layaway project was used for the entire group which included Buildings 41, 44, 45 and 46 for the manufacture of PBX pellets in support of Cartridge, 40MM, M406 production in Group 4.
			P		RDX pellets were washed here.
			P		According to a 1971 Standard Operating Procedures, PBX was screened and blended here.
			S		The mixer in one of two blast protected work bays. The equipment tested positive for Group B explosives. (4/97)
	3A-45	Wash & Dry Building	P		A P-17 layaway project was used for the entire group which included Buildings 41, 44, 45 and 46 for the manufacture of PBX pellets in support of Cartridge, 40MM, M406 production in Group 4.
	3A-46	Receiving Building	P		A P-17 layaway project was used for the entire group which included Buildings 41, 44, 45 and 46 for the manufacture of PBX pellets in support of Cartridge, 40MM, M406 production in Group 4.
			P		According to a 1971 Standard Operating Procedures, PBX and PBX pellets were received, transferred and stored here.
			P		Alliant used the building for storage of fuzes, and had a room for conditioning of propellent (nitrocellulose sheets). (4/97)
	3A-47	Sump Building & Pump House	P		According to a 1971 Standard Operating Procedures, Composition B was transferred to the sump in this building. All scrap explosives were stored in this building.
			S		A 1991 inspection noted that the octal pour area washdown drained to a 500-gallon concrete sump from which liquid was piped through to the treatment process. This sump was not double lined. Sludge was collected and handled as a hazardous waste.
L14		Group 4	S		Remediation of soil may be necessary for explosives. Groundwater remediation of explosives will require limited action only (i.e., deed restrictions and monitoring).
			P		According to historical reports, PBX pellets were used in support of Cartridge, 40MM, M406 production in Group 4.
			R		Red Water Filtration Systems have been installed and are operational. These systems were designed to remove the explosive contaminants from the water, prior to releasing the water into existing streams. Prior to the installation of these units, the Red Water generated in the LAP Operating lines was transported to the MFG Area Disposal Plant.

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L14		Group 4	P		In 1972, pouring and drilling operations were consolidated, an automati ogive feeder installed, and a pellet sensor installed here.
			P		During 1968, the 40MM, M406 and the 40MM, XM576E1 items were assigned to this plant. Initial production of the M406 was scheduled for February 1969 and start-up on the XM576E1 was scheduled for March 1969.
					Groups 4 and 7 were reactivated for production of these two items. A contract was negotiated with Gilman Engineering and Manufacturing Company to provide an automated assembly line for the M406.
			P		A project for the Rehabilitation of this group for the production of 40MM, M406 was nearing completion in 1969. Phase I incorporated the first assembly lines and the pouring equipment in Building 5 was placed in shakedown and production during the month of April. Phase II, a second line, was placed in shakedown and operation during the month of June.
			S		Alliant packs tracer materials in Group 4 on an as needed basis. The tracer material consists of powered metals which are received in a pellet form.
			P		The melt-load operations were usually carried out in this area.
			P		Historically, this area was involved in fuse, booster, primer, or detonator loading.
			P		According to a 1970 Standard Operating Procedures, loading, assembly, and packing of cartridge, 40MM,HE, M406 was conducted at this group.
			P		According to a 1970 Standard Operating Procedures, there is a Primer Testing Building adjacent to Building 4-14.
			P		According to a 1968 Technical Department Training Syllabus, M406 were produced here.
			P		In 1959, Group 4 was engaged in the assembly of M21A4 Booster to MTSQ Fuzes, packaging for overseas shipment as well as the renovation of PD, M51A5 Fuzes. (11/96)
	4-1	Fulminate Service Magazine	P		According to a 1970 Standard Operating Procedures, Composition B w stored in this building.
	4-4	Fulminate Screen & Blend	P		A 1982 energy analysis indicates explosive hazards in this building.
			S		Alliant stored HE projectiles in this building. (4/97)
	4-5	Primer Loading	S		Black powder in delay-relay elements was fired here in an enclosed operation.
			S		Composition B was used to load 40 mm projectiles here. Melting, pouring and drilling of composition B occurred here. No TNT was detected in air samples.
			P		A 1982 energy analysis indicates explosive hazards in this building.
			P		A 1971 industrial hygiene survey indicates filling Dopp Kettles, melting and pouring Composition B, and removing Composition B from molds took place in this building.
	4-6	Delay Loading	S		Tetryl and a sodium sulfide solution were present when booster bodies were washed out.
			P		A 1982 energy analysis indicates explosive hazards in this building.
	4-7	Power House	A		A 1982 energy analysis does not indicate explosive hazards in this building.
	4-9	Black Powder Pelleting	S		M-48 heads were fired here. This process released Nitrocellulose.
			S		Containers were filled with M9 propellant(Nitrocellulose, Nitroglycerine, Potassium Nitrate, Ethlyl Centralite) as part of the 40 mm loading. Nitroglycerine was detected in air during this operation.
			P		A 1971 industrial hygiene survey indicates filling containers with M-9 propellant took place in this building.
			P		According to a 1970 Standard Operating Procedures, storage and handling of M-9 Propellant took place here.
			P		According to a 1970 Standard Operating Procedures, M9 propellant was stored in this building.
	4-14	Fuse Assembly	S		Tetryl was present while removing boosters from fuzes.
			S		Tetryl pellets were removed by hand during disassembly of M-103 bomb fuses. This generated tetryl dust.

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L14	4-14	Fuse Assembly	P		A 1982 energy analysis indicates explosive hazards in this building.
			P		This building contained HE Pellet Holding Cubicles, Fuze Assembly Room, Trace and Projectile Charging Operation, Projectile Storage Area, Propellant Handling Room, and a Load and Assembly Bay. Propellant cases received contained 22.5 pounds of explosives. Fuzes were mated to HE Projectiles by a fully automated machine in an isolated room. A quantity of rejected projectiles, scheduled for rework was observed in this building. It could not be determined specifically if the explosive limit was violated and it was recommended that all reject materials be removed. Tracer pellets were pressed into projectiles by a remotely operated indexing machine. A limit of 30 pounds of explosives was established consisting of igniters and tracer pellets. PBXN-5 pellets were also pressed into projectiles by a remotely operated automated load and conducting press. Housekeeping was unacceptable in this area. Explosive materials were in excess of posted limits.
			P		A 1971 industrial hygiene survey indicates sealing casing threads, primers, and ogives took place in this building. Cartridge case coating and fuze cap gluing also occurred.
			P		According to a 1970 Standard Operating Procedures, this station automatically dispensed propellant (M9) into each propellant cup.
	4-16	Jumble & Jolt Fuse Test	P		A 1982 energy analysis indicates explosive hazards in this building.
			S		This area was posted for 3,000 pounds of 1.1 explosives. Materials were maintained for conditioning prior to transfer to the assembly line service magazine. Containers were open and packing residue, paper and wood had not been removed.
	4-19	First Aid Building	A		A 1982 energy analysis does not indicate explosive hazards in this building.
	4-20	Change House, Men	A		A 1982 energy analysis does not indicate explosive hazards in this building.
	4-21	Testing Laboratory	P		A 1982 energy analysis indicates explosive hazards in this building.
L15		Group 5	P		Work was started on Antitank Mines on February 11, 1943. This operation covers loading the fuze and booster into mines which had been loaded the previous summer.
			S		Alliant packs tracer materials in Group 5 on an as needed basis. The tracer material consists of powdered metals which are received in a pellet form.
			P		Components such as primed cases, projectiles, high explosive materials and propellant were fed into the line and completed rounds were loaded, assembled, and packed for shipment. As of 1984, Honeywell was using this area for the production of 30 mm GAU-8.
			P		This area was involved in fuse, booster, primer, or detonator loading.
			P		In 1959, Group 5 was engaged in the manufacture, assembly and packaging of fuzes.
	5-1	Fulminate Service Magazine	P		Primers in military packaging were stored in this magazine until required on the assembly line. In 1984, waste materials and packaging residue was noted in this area. Housekeeping was unacceptable in the Primer Service Magazine.
	5-3	Fulminate Dry House	S		Completed flashtubes were stored in this building awaiting transfer to the production area.
	5-4	Fulminate Screen & Blend	P		A 1982 energy analysis indicates explosive hazards in this building.
			P		Based upon the name of this building it is assumed that mercury fulminate was handled here.
	5-5	Primer Loading	P		A 1982 energy analysis indicates explosive hazards in this building.
			P		In 1984, cartridge cases received a primer in one room and in the other BP-1 pellets were pressed and sealed into flashtubes. Both machines are automatic.

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L15	5-6	Delay Loading	A		In 1985, Hercules smokeless propellant (Explosive B, Class 1.3C) was transferred to Building 5-14. While in progress, an explosive incident occurred. One drum of propellant deflagrated.
			P		A 1982 energy analysis indicates explosive hazards in this building.
			S		Containers of propellant were stored and conditioned prior to use on the assembly line. This area was posted for 14,000 pounds.
	5-7	Power House	A		A 1982 energy analysis does not indicate explosive hazards in this building.
	5-8	Change House, Women	A		A 1982 energy analysis does not indicate explosive hazards in this building.
	5-12	Black Powder Service Magazine	S		Scrap explosives, explosive loaded components and contaminated waste scheduled for destruction were placed in this magazine until removed to the magazine farm. The building was posted for 200 pounds.
	5-13	Primer Dry House	P		BP-1 Pellets used in the manufacture of flashtubes were stored in this building. It was noted that containers had been left open and packing materials were left lying on the floor in violation of DoDM 4145.26M. Housekeeping was unacceptable in BP-1 pellet storage area.
	5-14	Fuse Assembly	P		Explosive sludge drying, shipping, and packaging operations were performed in this building.
			S		Mercury fulminate and lead azide were present while percursion caps were inserted. Black powder was present while pelleting delay holders.
			P		A 1982 energy analysis indicates explosive hazards in this building.
			P		A-4 pellets for use on the production line were maintained in cubicles adjacent to the assembly line. Each cubicle was posted for 15 pounds. HE pellets were observed in these cubicles even though the charging machine was not operating due to an explosive incident. Projectiles were passed into the HE charging room on a conveyor where HE pellets were fed into the projectile cavity and pressed. Projectiles going into this room first received a zirconium incendiary plate. Zirconium is a flammable solid and under certain conditions can be hazardous. The load-assemble and pack machine was also located in this building. Primed cases, various projectiles and propellant were fed into this machine. Propellant was dumped from cases and returned to the loading hopper. Propellant feed were installed to aid in the prevention of overfill. The Propellant Handling Room was posted for 700 pounds of propellant.
	5-15	Detonator Service Magazine	P		In 1984, A-4 pellets for use on the production line were stored in this magazine. The quantity established was 175 pounds. Explosive materials were in excess of posted limits.
	5-16	Jumble and Jolt Fuse Test	P		A 1982 energy analysis indicates explosive hazards in this building.
			P		In 1984, A-4 pellets used in the loading of HE projectiles were stored and conditioned in this magazine. Materials were removed from this building to the Line Service Magazine. Housekeeping was unacceptable in this building.
	5-20	Change House, Men	A		A 1982 energy analysis does not indicate explosive hazards in this building.
L18		Group 8	S		Explosives are a contaminant of concern in this area according to the Installation Action Plan. Remediation of groundwater may be necessary. Groundwater remediation of explosives and metals will probably require limited action only (i.e., deed restrictions and monitoring).
			P		Small caliber conventional munitions (up to 30 mm) are currently being tested on the three ranges that were constructed here in the early 1980s. Spent sand containing projectiles from the range backstops has been periodically removed and stockpiled outside the ranges. Unexploded projectiles are present in the sand piles. Alliant Techsystems is currently soliciting bids to identify the extent of UXO contamination and to remove all projectiles and fragments.

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L18		Group 8	P		This facility consists of 3 firing ranges opening into a common control and administrative area. Rounds containing DU were fired on 1 range and special operating procedures were established for control and handling of this type of ammunition.
			P		This area was involved in fuse, booster, primer, or detonator loading.
			P		South of Building 8-8 there are several plastic crates containing spent 25mm and 30mm cartridge cases and projectiles. (11/96)
			S		There are several dozen spent 30 millimeter projectiles (for target practice). It appears that a large amount of ordnance scrap may be present on the west side of the covered walkway between 8-3 and 8-4. (4/97)
	8-1	Black Powder Service Magazine	P	3X	Explosives were processed in this building. The building was decontaminated to XXX after shutdown but must be tested for residues.
			S		There are nine 30 millimeter ammunition boxes containing sweepings (it is empty otherwise). (4/97)
	8-2	Black Powder Heater House	R	5X	Building is not contaminated with explosives and/or has been converted to office building for administrative personnel and is considered to be in XXXXX condition.
	8-3	Black Powder Screening	P	3X	Explosives were processed in this building. The building was decontaminated to XXX after shutdown but must be tested for residues.
	8-4	Black Powder Rest House	P	3X	Explosives were processed in this building. The building was decontaminated to XXX after shutdown but must be tested for residues.
	8-5	Black Powder Dry House	P	3X	Explosives were processed in this building. The building was decontaminated to XXX after shutdown but must be tested for residues.
	8-6	Black Powder Fan House	R	5X	Building is not contaminated with explosives and/or has been converted to office building for administrative personnel and is considered to be in XXXXX condition.
	8-9	Primer Rest House	R	5X	Building is not contaminated with explosives and/or has been converted to office building for administrative personnel and is considered to be in XXXXX condition.
			P		25MM cartridge cases were demilled and 400 primers simultaneously detonated on December 2, 1986.
	8-10	Service Magazine Percussion	R	5X	Building is not contaminated with explosives and/or has been converted to office building for administrative personnel and is considered to be in XXXXX condition.
	8-11	Primer Preparation	R	5X	Building is not contaminated with explosives and/or has been converted to office building for administrative personnel and is considered to be in XXXXX condition.
	8-12	Power House	R	5X	Building is not contaminated with explosives and/or has been converted to office building for administrative personnel and is considered to be in XXXXX condition.
	8-13	Change House - Men	R	5X	Building is not contaminated with explosives and/or has been converted to office building for administrative personnel and is considered to be in XXXXX condition.
	8-14	Change House - Women	R	5X	Building is not contaminated with explosives and/or has been converted to office building for administrative personnel and is considered to be in XXXXX condition.
	8-19	Guard House	R	5X	Building is not contaminated with explosives and/or has been converted to office building for administrative personnel and is considered to be in XXXXX condition.
	8-29A	Clock House	R	5X	Building is not contaminated with explosives and/or has been converted to office building for administrative personnel and is considered to be in XXXXX condition.
	8-29B	Clock House	R	5X	Building is not contaminated with explosives and/or has been converted to office building for administrative personnel and is considered to be in XXXXX condition.
L19		Group 9	S		Explosives are a contaminant of concern in this area according to the Installation Action Plan. Media of concern: Groundwater, sediment. Remediation of groundwater may be necessary. Groundwater remediation of explosives and metals will probably require limited action only (i.e., deed restrictions and monitoring).

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L19		Group 9	P P		This area was involved in fuse, booster, primer, or detonator loading. Southeast of Building 9-16 is a fenced lot used by Alliant for storage of trailers containing explosives. (11/96)
	9-1	Lead Azide Service Magazine	P	3X	Explosives were processed in this building. The building was decontaminated to XXX after shutdown but must be tested for residues.
	9-2A	Heater House	R	5X	Building is not contaminated with explosives and/or has been converted to office building for administrative personnel and is considered to be in XXXXX condition.
	9-2B	Heater House	R	5X	Building is not contaminated with explosives and/or has been converted to office building for administrative personnel and is considered to be in XXXXX condition.
	9-2C	Heater House	R	5X	Building is not contaminated with explosives and/or has been converted to office building for administrative personnel and is considered to be in XXXXX condition.
	9-2D	Heater House	R	5X	Building is not contaminated with explosives and/or has been converted to office building for administrative personnel and is considered to be in XXXXX condition.
	9-2E	Heater House	R	5X	Building is not contaminated with explosives and/or has been converted to office building for administrative personnel and is considered to be in XXXXX condition.
	9-5	Mercury Fulminate Screen & Ble	P	3X	Explosives were processed in this building. The building was decontaminated to XXX after shutdown but must be tested for residues.
	9-6	Mercury Fulminate Dry House	P	3X	Explosives were processed in this building. The building was decontaminated to XXX after shutdown but must be tested for residues.
	9-7	Mercury Fulminate Service Magazine	P	3X	Explosives were processed in this building. The building was decontaminated to XXX after shutdown but must be tested for residues.
	9-8	Prepared Primer Mix House	P	3X	Explosives were processed in this building. The building was decontaminated to XXX after shutdown but must be tested for residues.
	9-9	Tetryl Service Magazine	P	3X	Explosives were processed in this building. The building was decontaminated to XXX after shutdown but must be tested for residues.
	9-10	Tetryl Blending Building	P	3X	Explosives were processed in this building. The building was decontaminated to XXX after shutdown but must be tested for residues.
	9-11	Tetryl Pelleting Building	P	3X	Explosives were processed in this building. The building was decontaminated to XXX after shutdown but must be tested for residues.
	9-12A	Administration Buildings	R	5X	Building not contaminated with explosives and/or has been converted to office building for administrative personnel and is considered to be in XXXXX condition.
	9-12B	Administration Buildings	R	5X	Building not contaminated with explosives and/or has been converted to office building for administrative personnel and is considered to be in XXXXX condition.
	9-12C	Administration Buildings	R	5X	Building not contaminated with explosives and/or has been converted to office building for administrative personnel and is considered to be in XXXXX condition.
	9-12D	Administration Buildings	R	5X	Building not contaminated with explosives and/or has been converted to office building for administrative personnel and is considered to be in XXXXX condition.
	9-12E	Administration Buildings	R	5X	Building not contaminated with explosives and/or has been converted to office building for administrative personnel and is considered to be in XXXXX condition.
	9-12F	General Storage	R	5X	Building not contaminated with explosives and/or has been converted to office building for administrative personnel and is considered to be in XXXXX condition.
	9-13	Detonator Rest House	P	3X	Explosives were processed in this building. The building was decontaminated to XXX after shutdown but must be tested for residues.
	9-14	Detonator Rumbling Building	R	5X	Building is not contaminated with explosives and/or has been converted to office building for administrative personnel and is considered to be in XXXXX condition.
	9-15	Final Inspection - Packing & S	R	5X	Building is not contaminated with explosives and/or has been converted to office building for administrative personnel and is considered to be in XXXXX condition.

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L19	9-16	Power House	R	5X	Building is not contaminated with explosives and/or has been converted to office building for administrative personnel and is considered to be in XXXXX condition.
	9-17	Detonator Testing	R	5X	Building is not contaminated with explosives and/or has been converted to office building for administrative personnel and is considered to be in XXXXX condition.
	9-20A	Change House, Men, - Clock House	R	5X	Building is not contaminated with explosives and/or has been converted to office building for administrative personnel and is considered to be in XXXXX condition.
	9-20B	Change House, Women, - Clock H	R	5X	Building is not contaminated with explosives and/or has been converted to office building for administrative personnel and is considered to be in XXXXX condition.
	9-21	Booster Detonator Building	R	5X	Building is not contaminated with explosives and/or has been converted to office building for administrative personnel and is considered to be in XXXXX condition.
	9-22	Public Toilet	R	5X	Building is not contaminated with explosives and/or has been converted to office building for administrative personnel and is considered to be in XXXXX condition.
	9-27A	Guard House	R	5X	Building is not contaminated with explosives and/or has been converted to office building for administrative personnel and is considered to be in XXXXX condition.
	9-30A	Vacuum & Condensate Pump House	R	5X	Building is not contaminated with explosives and/or has been converted to office building for administrative personnel and is considered to be in XXXXX condition.
	9-30B	Vacuum & Condensate Pump House	R	5X	Building is not contaminated with explosives and/or has been converted to office building for administrative personnel and is considered to be in XXXXX condition.
	9-30C	Vacuum & Condensate Pump House	R	5X	Building is not contaminated with explosives and/or has been converted to office building for administrative personnel and is considered to be in XXXXX condition.
	9-30D	Vacuum & Condensate Pump House	R	5X	Building is not contaminated with explosives and/or has been converted to office building for administrative personnel and is considered to be in XXXXX condition.
	9-30F	Vacuum & Condensate Pump House	R	5X	Building is not contaminated with explosives and/or has been converted to office building for administrative personnel and is considered to be in XXXXX condition.
	9-30G	Vacuum & Condensate Pump House	R	5X	Building is not contaminated with explosives and/or has been converted to office building for administrative personnel and is considered to be in XXXXX condition.
	9-30H	Vacuum & Condensate Pump House	R	5X	Building is not contaminated with explosives and/or has been converted to office building for administrative personnel and is considered to be in XXXXX condition.
	9-30I	Vacuum & Condensate Pump House	R	5X	Building is not contaminated with explosives and/or has been converted to office building for administrative personnel and is considered to be in XXXXX condition.
	9-30J	Vacuum & Condensate Pump House	R	5X	Building is not contaminated with explosives and/or has been converted to office building for administrative personnel and is considered to be in XXXXX condition.
	9-30K	Vacuum & Condensate Pump House	R	5X	Building is not contaminated with explosives and/or has been converted to office building for administrative personnel and is considered to be in XXXXX condition.
	9-30L	Vacuum & Condensate Pump House	R	5X	Building is not contaminated with explosives and/or has been converted to office building for administrative personnel and is considered to be in XXXXX condition.
	9-33	Change House, Women (Adm.)	R	5X	Building is not contaminated with explosives and/or has been converted to office building for administrative personnel and is considered to be in XXXXX condition.
	9-35	Detonator Service Magazine	P	3X	Explosives were processed in this building. The building was decontaminated to XXX after shutdown but must be tested for residues.

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L19	9-36	Office, Administration	R	5X	Building is not contaminated with explosives and/or has been converted to office building for administrative personnel and is considered to be in XXXXX condition.
	9-37	Cloak Room & Guard House	R	5X	Building is not contaminated with explosives and/or has been converted to office building for administrative personnel and is considered to be in XXXXX condition.
	9-38	Incinerator	R	5X	Building is not contaminated with explosives and/or has been converted to office building for administrative personnel and is considered to be in XXXXX condition.
	9-38B	Emergency Load Center	R	5X	Building is not contaminated with explosives and/or has been converted to office building for administrative personnel and is considered to be in XXXXX condition.
	9-3A	Lead Azide Dry House	P	3X	Explosives were processed in this building. The building was decontaminated to XXX after shutdown but must be tested for residues.
	9-3B	Lead Azide Dry House	P	3X	Explosives were processed in this building. The building was decontaminated to XXX after shutdown but must be tested for residues.
	9-4	Lead Azide Screen & Blend	P	3X	Explosives were processed in this building. The building was decontaminated to XXX after shutdown but must be tested for residues.
	9-40	Auxiliary Boiler House	R	5X	Building is not contaminated with explosives and/or has been converted to office building for administrative personnel and is considered to be in XXXXX condition.
	9-41	Latrine	R	5X	Building is not contaminated with explosives and/or has been converted to office building for administrative personnel and is considered to be in XXXXX condition.
	9-51		R	5X	Building is not contaminated with explosives and/or has been converted to office building for administrative personnel and is considered to be in XXXXX condition.
L21		Group 23	P		Tetryl - Sealed bags, containing potentially contaminated coveralls worn by demolition workers, disposed in landfill. This is believed to be the landfill in L21.
			S		From the master plan dated July 1959, "Group 23 includes the two deep wells, water treatment plant, and the post burning ground (L2).
			P		In 1980, these items were acceptable for deposit in the Sanitary Landfill: reject TNT boxes, uncontaminated TNT liners, Composition B boxes, 105mm wood boxes, 105mm pallets and fiber containers; uncontaminated scrap lumber, clothing and metal; scrap projectile pallets; projectile sleeves; nose plug boxes; scrap banding, scrap spacers and boxes; scrap felt and boxes; scrap filler materials and boxes; garbage (food processing waste), miscellaneous uncontaminated packaging materials, uncontaminated construction debris, and scrap paper.
	23-2	Reservoir Pumping Station	A		A 1982 energy analysis does not indicate explosive hazards in this building.
	23-31A	Igloo	P	3X	Used for explosive storage; decontaminated to XXX.
	23-34	Superintendent's Office & Chan	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
			A		A 1982 energy analysis does not indicate explosive hazards in this building.
	61-7	Crushing & Drying	P	3X	Explosives were processed in this building. The building was decontaminated to XXX after shutdown but must be tested for residues.
			S		On September 25, 1978 rework of 109,000 105mm HE, 1CM, M444 complete rounds was begun. The ammunition was rejected due to defective propellant charges. The estimated completion date was April 9, 1978.
			P		A 1982 energy analysis indicates explosive hazards in this building.
			P		Reworked shells containing explosives and repackaging depriming presses are located here.
			P		Ammunition was demilitarized in this building. Operations included pouring out powder propellant.

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Section	Building	DESCRIPTION	Status	Condition	Comments
L21	61-7	Crushing & Drying	S		Rework of 105MM, HE, M444 was performed here. Powder bags were removed from shells, cut and powder was poured into metal powder drums. MK7 and M2 powder drums were used for this operation.
					This building was also used to stencil projectiles and apply markings. When 200 primers accumulated, they were transferred to Burning Grounds for disposal.
					Spilled propellant powder was vacuumed and transferred to propellant drum.
			S		Sample boxes for additional local test firing from Lot JA-16-113 were stored in this building.
			P		According to a 1977 Standard Operating Procedures, projectiles were loaded with explosives here.
			P		According to a 1971 Standard Operating Procedures, moisture, non-functional and functional testing of M28B2 percussion primers exceeding two years in age and/or suspected of deterioation took place here.
					Excess black powder was transported to the Burning Grounds for destruction. Samples were sent to the Laboratory, Building 704-7.
			P	3X	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 3X.
	61-11	Power House for Crushing Plant	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
			A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
	61-39	Blast Building	S		Ammunition was disassembled outside of this building.
			S		This building is a 3-sided concrete structure whose open side is in line with the opening of a large steel pipe. The pipe is perpendicular to the building and terminates in a box containing deflectors.
					A small indentation in a steel plate of the box indicate that projectiles were fired here.
	62-27	Sentry Station (At Landfill)	P	3X	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 3X.
L33		PVC Area	S		Explosives are a contaminant of concern in this area according to the Installation Action Plan. This area is/was a firing range for AT4 anti-tank rockets.
					Contamination significant enough to warrant remediation was not detected during the investigation phase. No further action planned.
			S		AT-4-PVC shoulder fired anti-armor weapon system test firing range proposed for construction on 55 acres in this area (1987).
			P		This area was used by Alliant for test firing the AT-4 Tactical Weapon System and Warheads.
			P		Clusters of expended small arms shell casings were seen 200 yards and 400 yards due south of entrance of pile. (11/96)
			P		All firing was filmed and analyzed to determine if warhead was consumed. If it was not consumed, then the item was collected or detonated in place. (4/97)
L34		Former Burning Area	S		A glass mine body was found on the east side of Burn Area 2, similar to ceramic M5 mine bodies found in this area. (11/96)
L110		PAS Survey Section L110			
M1		Southern Ash Pile	S		Formed by landfilling ash residues from incineration of TNT manufacturing wastes. Active between 1965 and 1974. Covers 8 acres; 10 to 15 feet high.
					Covered with 20 mils of PVC, 12 inches of clay fill, 6 inches of topsoil and vegetation, surrounded by berms. New clay cap installed 1985. Red water visible in ditch north of pile.
					Depth to groundwater: 4-6 feet.
					Soils: silts, clays, coarse sand, and gravel.
M2		Explosive Burning Ground	P		Visible ponding of Red Water in depressions around the Explosive burning ground.

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M2		Explosive Burning Ground	P		Used for open combustion of explosive waters from early 1940's to 1965 (15 acre site). Burning pads constructed of gravel over topsoil. 428 ton: of red water ash buried in an impermeable membrane in 1977. Depth to groundwater: 7-11 feet. Soils: Topsoil, clay, sand, and gravel. Depth to bedrock: 5-18 feet. From previous sampling: Explosives detected in soil.
			P		TNT concentrations up to 72,300 ppm detected in the soil. Remediation of explosive contaminated soil will be necessary.
			P		6 explosives detected in 39 soil samples. Concentrations of TNT were in most cases less than 100 ug/g; although 3 samples contained more than 1% TNT.
			R		During the first six months of 1955, 600 pounds of Tetryl and 28,850 pounds of TNT were destroyed here.
			R		During the first six months of 1957, 33,500 pounds of TNT and 1,450 pounds of Tetryl were destroyed here.
			R		During the last six months of 1955, 1,250 pounds of Tetryl and 51,050 pounds of TNT were destroyed here.
			R		During the first six months of 1956, 3,150 pounds of Tetryl and 36,000 pounds of TNT were destroyed here.
			R		During the last six months of 1956, 1,350 pounds of Tetryl and 20,600 pounds of TNT were destroyed here.
			P		In 1977 this area was used as the burial site for red water ash. The ash by-product resulted from the incineration of the red water produced during a prove-out run of TNT manufacturing line No. 16.
			R		During the first six months of 1954; 215,150 pounds of explosives were destroyed here by burning. 9,400 gallons of waste acetone and 500 contaminated Lead Azide bags were also destroyed.
			P		This area was identified as a burning ground for explosive wastes.
			P		Trucks and trailers requiring decontamination prior to service were brought to this area for cleaning. The cleaning involved sweeping the equipment to remove all visible explosive particles. The sweepings were placed in scrap powder containers.
M3		Flashing Grounds	P		Explosives were detected in soil, groundwater and surface water. Flashing grounds used to burn equipment and demolition materials to remove residues from 1942-1985. Located on 10 acres. Depth to groundwater: 6-7 feet. Soils: primarily clays. Located within 100 year floodplain. Suspected soil, groundwater and surface water contamination migration.
			S		Explosives are a contaminant of concern in this area according to the Installation Action Plan. Remediation of soil is necessary. Soil and groundwater remediation are anticipated to address explosive contamination.
			R		During the first six months of 1955, 220 tons of scrap metal were flashed and stored in this yard. All previously flashed and decontaminated low-oil drums were sold and removed from this location.
			P		During the last six months of 1955, 204 tons of scrap metal were prepared for flashing.
			R		During the first six months of 1956, 315 tons of scrap metal were flashed and sold.
			R		During the last six months of 1956, 205 tons of scrap metal were flashed and sold.
			S		During the first six months of 1954, 1,080 tons of scrap metal were flashed.
			P		This area was identified as a burning ground for explosive wastes.
	TS-1171	Burning Ground Office	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
	TS-1248	Station, Water Sampling	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
M4		Lead Azide Area	S		It has been determined that a small section in the southwest corner of this area was utilized for storage of barrels containing DNT.

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M4		Lead Azide Area	S		Barrels containing DNT were temporarily stored in the southwest portion of this area. Typical storage operations included off-loading of the materials and storage of the barrels in areas which were immediately adjacent to West Patrol Road.
			S		The DNT in this area would have been only empty drums and liners in a building.
	505-5	Sewage Pump House	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
	601-176	Platform - Unloading	P	3X	Explosives were processed in this building. The building was decontaminated to XXX after shutdown but must be tested for residues.
	601-177-A	Platform	P	3X	Explosives were processed in this building. The building was decontaminated to XXX after shutdown but must be tested for residues.
	704-15	Supervisor's Office	S		Request for disposal (1970).
	707-15	Change House	P	3X	Explosives were processed in this building. The building was decontaminated to XXX after shutdown but must be tested for residues.
			A		During February 1981 this building was disposed of by controlled burning. Precautions were taken to ensure by-products from controlled burn were not a problem.
	721-5	Laboratory	P	3X	Explosives were processed in this building. The building was decontaminated to XXX after shutdown but must be tested for residues.
			A		During February 1981 this building was disposed of by controlled burning. Precautions were taken to ensure by-products from controlled burn were not a problem.
	722-11	Area Shop	P	3X	Explosives were processed in this building. The building was decontaminated to XXX after shutdown but must be tested for residues.
			A		During February 1981 this building was disposed of by controlled burning. Precautions were taken to ensure by-products from controlled burn were not a problem.
	861-13	Loading Salt Cake Ash	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
	1201	Store House	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
	1206	Ammonia Storage	P	3X	Explosives were processed in this building. The building was decontaminated to XXX after shutdown but must be tested for residues.
	1210	Sodium Azide Manufacture	P	3X	Explosives were processed in this building. The building was decontaminated to XXX after shutdown but must be tested for residues.
	1219	Lead Nitrate Storage	P	3X	Explosives were processed in this building. The building was decontaminated to XXX after shutdown but must be tested for residues.
	1220	Preparation Building	P	3X	Explosives were processed in this building. The building was decontaminated to XXX after shutdown but must be tested for residues.
	1221	Precipitation Building	P	3X	Explosives were processed in this building. The building was decontaminated to XXX after shutdown but must be tested for residues.
	1223	Finishing House	P	3X	Explosives were processed in this building. The building was decontaminated to XXX after shutdown but must be tested for residues.
	1230	Waste Cooling Water Pump House	P	3X	Explosives were processed in this building. The building was decontaminated to XXX after shutdown but must be tested for residues.
	TS-1242	Hut, Quonset	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
			A		A 1982 energy analysis does not indicate explosive hazards in this building.
M5 U		Tetryl Production Area-USDA Portion			
M10 U		Toluene Tank Farms USDA Portion			
M11		Landfill			
M12		Sellite Manufacturing Area	P		Two explosives found in sediment samples (none in soil). The explosives are Nitrotoluene and HMX.
			S		Explosives are a contaminant of concern in this area according to the Installation Action Plan. Remediation of explosives contaminated soil will be necessary.

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M12		Sellite Manufacturing Area	P		In 1972, the following emissions were produced as by-products/waste of acid and sellite production: liquid effluents polluted by sulfate and nitrat 13,000 pounds/day and ammonia and oil.
	307	Sellite Storage & Mixing House	A		A 1982 energy analysis does not indicate explosive hazards in this building.
			A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
	307-1	Process House	A		A 1982 energy analysis does not indicate explosive hazards in this building.
			A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
			P	3X	An above ground storage tank containing a funnel about 3 stories high is located outside of this building and is marked 3X. (11/96)
	307-2	Soda Ash Storage House	A		Request for disposal (1979). Building is now demolished.
M14		Former Pond Area			
M15		Sewage Treatment Plant	S		Explosives are contaminants of concern in this area according to the Installation Action Plan. Contamination significant enough to warrant remediation was not detected during investigation phase. No further action planned.
M99		TNT Block Area (M6A)	S		This section was formerly the TNT block area. All buildings have been demolished.
			S		An explosion occurred in the matrix of #3 press on February 15, 1944, causing a fire behind the barricade.
	704-16	Supervisor's Office	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
	707-17	Change House	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
	707-20	Change House	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
	715-4	Storage Building, Oil & Kerose	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
			A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
	719	Storage Building	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
			A		During February 1981 this building was disposed of by controlled burning. Precautions were taken to ensure by-products from controlled burn were not a problem.
			R	b	During February 1981, this building was disposed of by controlled burning.
	722-13	Area Shop	A	0	This building is considered to be in 0 condition. It was not contaminated with explosives.
	841-1	Receiving House	P	3X	Explosives were processed in this building. The building was decontaminated to XXX after shutdown but must be tested for residues.
			P	3X	Explosives were processed in this building. The building was decontaminated to XXX after shutdown but must be tested for residues.
			P		This building stored TNT flake powder for demolition blocks.
	841-2	Receiving House	P	3X	Explosives were processed in this building. The building was decontaminated to XXX after shutdown but must be tested for residues.
			P	3X	Explosives were processed in this building. The building was decontaminated to XXX after shutdown but must be tested for residues.
			P		This building stored TNT flake powder for demolition blocks.
	842-1	Pressing & Crimping House	P	3X	Explosives were processed in this building. The building was decontaminated to XXX after shutdown but must be tested for residues.
			R		During February 1981 this building was disposed of by controlled burning. Precautions were taken to ensure by-products from controlled burn were not a problem.

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M99	842-1	Pressing & Crimping House	P	3X	TNT- Contaminated soil in the vicinity of outside catch box. Explosives were processed in this building. The building was decontaminated to XXX after shutdown but must be tested for residues.
			R	b	During February 1981, this building was disposed of by controlled burning.
			P	3X	According to an undated Standard Operating Procedures, the TNT Block Pressing facilities have been demolished. TNT Block Pressing facilities have not been use for production purposes since April 1957. As a result, they were declared excess to the needs of the installation. Prior to demolition, this building was cleaned to a degree of 3X. A dust collector system transported explosive dust to a catch box outside the building. An overflow from these boxes released water carrying fine particles of TNT onto the ground, where it settled in low elevation sections within the confines of the production area. The earth of these sections is contaminated with TNT to unknown depths below grade. The demolition procedures included: distributing combustibles over the entire area, spraying the area with #2 fuel oil, and igniting by combustible train. After the building was burned, the catch box was excavated and burned. The area east of the catch box was heavily contaminated and needed to be burned over.
	842-2	Pressing & Crimping House	R		During February 1981 this building was disposed of by controlled burning. Precautions were taken to ensure by-products from controlled burn were not a problem.
			P	3X	Explosives were processed in this building. The building was decontaminated to XXX after shutdown but must be tested for residues.
			P	3X	TNT- Contaminated soil vicinity of outside catch box. Building decontaminated to XXX.
			R	b	During February 1981, this building was disposed of by controlled burning.
			P	3X	According to an undated Standard Operating Procedures, the TNT Block Pressing facilities have been demolished. TNT Block Pressing facilities have not been used for production purposes since April 1957. As a result, they were declared excess to the needs of the installation. Prior to demolition, this building was cleaned to a degree of 3X. A dust collector system transported explosive dust to a catch box outside the building. An overflow from these boxes released water carrying fine particles of TNT onto the ground, where it settled in low elevation sections within the confines of the production area. The earth of these sections is contaminated with TNT to unknown depths below grade. The demolition procedures included: distributing combustibles over the entire area, spraying the area with #2 fuel oil, and igniting by combustible train. After the building was burned, the catch box was excavated and burned. The area east of the catch box was heavily contaminated and needed to be burned over.
	842-3	Pressing & Crimping House	A		During February 1981 this building was disposed of by controlled burning. Precautions were taken to ensure by-products from controlled burn were not a problem.
			P	3X	Explosives were processed in this building. The building was decontaminated to XXX after shutdown but must be tested for residues.
			P	3X	TNT- Contaminated soil vicinity of outside catch box. Explosives were processed in this building. The building was decontaminated to a XXX after shutdown but must be tested for residues.
			R	b	During February 1981, this building was disposed of by controlled burning.
			P	3X	According to an undated Standard Operating Procedures, the TNT Block Pressing facilities have been demolished. TNT Block Pressing facilities have not been used for production purposes since April 1957.

U=USDA
P=Present, R=Removed, A=Absent, S=Suspected
Blanks in the comment column indicate no findings.
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Details on IRP site sampling are provided in Appendix D.

TABLE 4-8
SUMMARY OF EXPLOSIVE ORDNANCE/MATERIAL FINDINGS
SECOND LAND TRANSFER TO USDA
JOAAP, WILL COUNTY, ILLINOIS

Section	Building	DESCRIPTION	Status	Condition	Comments
M99	842-3	Pressing & Crimping House			As a result, they were declared excess to the needs of the installation. Prior to demolition, this building was cleaned to a degree of 3X. A dust collector system transported explosive dust to a catch box outside the building. An overflow from these boxes released water carrying fine particles of TNT onto the ground, where it settled in low elevation sections within the confines of the production area. The earth of these sections is contaminated with TNT to unknown depths below grade. The demolition procedures included: distributing combustibles over the entire area, spraying the area with #2 fuel oil, and igniting by combustible train. After the building was burned, the catch box was excavated and burned. The area east of the catch box was heavily contaminated and needed to be burned over.
	842-4	Pressing & Crimping House	R		This building was decontaminated by burning on February 28, 1977.
			P	3X	TNT- Contaminated soil vicinity of outside catch box. Explosives were processed in this building. The building was decontaminated to XXX after shutdown but must be tested for residues.
			P	3X	According to an undated Standard Operating Procedures, the TNT Block Pressing facilities have been demolished. TNT Block Pressing facilities have not been used for production purposes since April 1957. As a result, they were declared excess to the needs of the installation. Prior to demolition, this building was cleaned to a degree of 3X. A dust collector system transported explosive dust to a catch box outside the building. An overflow from these boxes released water carrying fine particles of TNT onto the ground, where it settled in low elevation sections within the confines of the production. The earth of these sections is contaminated with TNT to unknown depths below grade. The demolition procedures included: distributing combustibles over the entire area, spraying the area with #2 fuel oil, and igniting by combustible train. After the building was burned, the catch box was excavated and burned. The area east of the catch box was heavily contaminated and needed to be burned over.
	842-5	Pressing & Crimping House	R		This building was decontaminated by burning on February 18,1977.
			P	3X	TNT- Contaminated soil vicinity of outside catch box. Explosives were processed in this building. The building was decontaminated to XXX after shutdown but must be tested for residues.
			P	3X	According to an undated Standard Operating Procedures, the TNT Block Pressing facilities have been demolished. TNT Block Pressing facilities have not been used for production purposes since April 1957. As a result, they were declared excess to the needs of the installation. Prior to demolition, this building was cleaned to a degree of 3X. A dust collector system transported explosive dust to a catch box outside the building. An overflow from these boxes released water carrying fine particles of TNT onto the ground, where it settled in low elevation sections within the confines of the production area. The earth of these sections is contaminated with TNT to unknown depths below grade. The demolition procedures included: distributing combustibles over the entire area, spraying the area with #2 fuel oil, and igniting by combustible train. After the building was burned, the catch box was excavated and burned. The area east of the catch box was heavily contaminated and needed to be burned over.
	843	Nailing House	P	3X	Explosives were processed in this building. The building was decontaminated to XXX after shutdown but must be tested for residues.
			P	3X	Explosives were processed in this building. The building was decontaminated to XXX after shutdown but must be tested for residues.

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P=Present, R=Removed, A=Absent, S=Suspected
Blanks in the comment column indicate no findings.
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TABLE 4-8
SUMMARY OF EXPLOSIVE ORDNANCE/MATERIAL FINDINGS
SECOND LAND TRANSFER TO USDA
JOAAP, WILL COUNTY, ILLINOIS

Section	Building	DESCRIPTION	Status	Condition	Comments
M99	TS-1270	Storage Shelter	A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
M105		PAS Survey Section M105	P		Eight groundwater samples have been collected from MW118 on the west side of this section. In 1981, 2,4,6-TNT (0.90 ug/l) was detected. In 1986, 1,3,5-TNB (9.54 ug/l) and 2,4,6-TNT (9.74 ug/l) were detected.
	739-1	Acid Resistant Putty Building	A		A 1982 energy analysis does not indicate explosive hazards in this building.
	814	Factory & Shook Storage	P		Fiber drums were used for DNT packaging with returned used drums being utilized when available.
			P		All TNT production was packed in F.T.C. fiber boxes during the period July 1, 1954 thru December 31, 1954 with used lids and bottoms supplying most of the packaging. Returned used fiber drums furnished twenty-eight percent of DNT packaging requirements. Returns of used boxes from other Ordnance installations improved greatly.
			A		A 1982 energy analysis does not indicate explosive hazards in this building.
			R		According to a 1970 Standard Operating Procedures for Box Factory Operations, all materials rejected by the Production Lines were returned to this building. The rejected cartons were loaded into a trailer or truck for shipment to the Burning Ground. The acceptable material was returned to stock.
			A	0	ETSC for Best Group, Inc. conducted inspections during December 1996 to reclassify explosive condition relative to the ongoing property liquidation. This building was reclassified 0.
			P	3X	This building is marked XXX. (11/96)
M108		PAS Survey Section M108	S		The Ordnance Ammunition Command asked to be advised should any further weakening of DNT drums be evident because of oil soaking through the liners into the drums themselves.
M118		Grant Creek East			
M119		Grant Creek West			

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TABLE 4-9
SUMMARY OF RADIOACTIVE MATERIAL/WASTE FINDINGS
SECOND LAND TRANSFER TO USDA
JOAAP, WILL COUNTY, ILLINOIS

Section	Building	DESCRIPTION	Status	Latitude	Longitude	Comments
L1		Group 61				
L2		Explosive Burning Ground	P			There are two unnumbered popping furnaces west of building 23-35 in the south central portion of this section. (11/96)
L3		Demolition Area				
L4		Landfill Area				
L5		Salvage Yard				
L7		Group 1	S			The Group 1 X-Ray Unit was converted to a Cobalt source.
			R			In the past, radiological sources such as 60Co and 137Cs were used in instrumentation within this area. All sources have been removed.
	1-10	Drilling & Boostering and X-Ray	P	041:20:37.6	88:04:23.1	X-Ray was complete in April 1974.
			P	041:20:37.6	88:04:23.1	105MM projectiles from Groups 1,2,3,3A and storage were X-Rayed in this building.
			P	041:20:37.6	88:04:23.1	According to a 1969 Standard Operating Procedures, this building contains an x-ray wing. Loaded cartridge case assemblies, 40MM, M118 were x-rayed.
			P	041:20:37.6	88:04:23.1	In 1974, Cobalt 60 Isotope Operation was conducted.
			P	041:20:37.6	88:04:23.1	In 1966, 105mm X-Ray Units were in this building on the main floor.
			P	041:20:37.6	88:04:23.1	X-ray office in building - sign indicates source was Cobalt 60. (11/96)
L8		Group 2	R			In the past, radiological sources such as 60Co and 137Cs were used in instrumentation within this area. All sources have been removed.
	2-12	Assembling & Shipping	P			According to a 1970 Standard Operating Procedures ray samples were labeled and transferred, using air hoist, to sample skid.
			P			In 1966, a Gamma Unit was in this building.
L9		Group 3	R			In the past, radiological sources such as 60Co and 137Cs were used in instrumentation within this area. All sources have been removed.
	3-10	Drilling, Boostering & Shipping	P			In 1974, Cobalt 60 Isotope Operation was conducted.
			P			In 1966, 105mm X-Ray Units were in this building on the main floor.
	3-16	Propellant Loading Building	P	041:22:08.0	88:03:05.5	An SOP for radiation was found inside building. (11/96)
L10		Group 3A				
	3A-2A	Paint & Oil Storage	S			Building has a picker x-ray unit inside for ordnance radiography. (4/97)
	3A-2B	Paint & Oil Storage	P			In 1966, Fuze X-Ray equipment was located in this building.
	3A-4	Melting & Pour Building	R			The real time X-ray operations performed at 3A-4 are being moved to building 5-14.
	3A-7B	TNT Service Magazine	P			In 1966, a Flouroscope was located in this building.
			P			Building has ordnance radiography equipment. (4/97)
	3A-11C		R			The X-ray operations at 3A-11C are being moved to 8-8.
L14		Group 4				
	4-16	Jumble & Jolt Fuse Test	P			According to a 1970 Standard Operating Procedures, this building has an x-ray wing. X-Ray inspection of the P.D., M551 fuze took place here.

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TABLE 4-9
SUMMARY OF RADIOACTIVE MATERIAL/WASTE FINDINGS
SECOND LAND TRANSFER TO USDA
JOAAP, WILL COUNTY, ILLINOIS

Section	Building	DESCRIPTION	Status	Latitude	Longitude	Comments
L15		Group 5	R			Alliant assembled munitions with depleted uranium projectiles in Group 5. Surface scans for radioactivity conducted by Alliant in about 1986 did not find any areas with elevated readings. The equipment used in the munitions assembly has been removed and shipped off-site for use in other facilities.
	5-14	Fuse Assembly	P			The real time X-ray operations performed in 3A-4 are being moved to building 5-14.
L18		Group 8	R			In the past, Uranium projectiles were test fired in Range 3. Facility was decommissioned in the late 1980's and up to 15 picocuries per gram of depleted uranium (DU) was cleaned up. Subsequently, DU contaminated sand remains stockpiled north of Range 2 and 3 (up to 300 cubic yards); sand moved down to Range 2 catcher (some spilled in road during transfer). A survey by Alliant is currently in progress.
			R			Depleted uranium projectiles were test fired at Group 8. Surface radioactivity screening in areas where the projectiles were handled and fired did not reveal elevated readings. Note: it was subsequently discovered that radioactivity was present in other parts of this group.
			S	041:21:20.4	88:07:07.7	Bags containing sand contaminated with depleted uranium (DU) along with piles of sand suspected to have been used to stop DU projectiles are located 50 feet south of Group 8.
			P	041:21:17.8	88:07:14.1	Area on the south end of section south of Alliant test firing range is roped off. A sign states "CAUTION RADIOACTIVE MATERIALS". The area is 100 feet long and 50-75 feet wide. There are numerous piles of dirt with stakes. The piles appear to have had projectiles removed. (11/96)
			P	041:21:22.7	88:07:12.9	On the north side of Alliant test range there is a sign that says "CAUTION RADIOACTIVE MATERIAL". (11/96)
			S			Contaminated sand piles were present at an outside area at Firing Range 2. The sand piles were suspected of containing UXO. Some surveys were done, but the planned surveys were incomplete. During scanning surveys, one reading indicated the possibility of DU contamination in the sand. However, no further action was taken when UXO was identified as possibly present in this sand pile.
			S			A single hot spot was indicated on the graph of the data for an outdoor area located north of the Range 3 catcher area and sally port. No subsequent direct survey, beta scan, or soil sample was collected from this location.
			S			Heavy vegetation was not removed from the unaffected old paved area across the road from the parking lot in front of the main building for the LAP facility. As a result, the unaffected areas were not surveyed for beta radiation.

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TABLE 4-9
SUMMARY OF RADIOACTIVE MATERIAL/WASTE FINDINGS
SECOND LAND TRANSFER TO USDA
JOAAP, WILL COUNTY, ILLINOIS

Section	Building	DESCRIPTION	Status	Latitude	Longitude	Comments
L18		Group 8	A			DU munitions were not tested in Firing Range 1. The contaminated sand from the catcher area was remov
			S			Alliant found DU in the sand of Range 3. Initial scan surveys of the catcher identified significant contamination. The surveys were not repeated following the remediation work.
	8-5	Black Powder Dry House	S			This building may have been used to store DU-contaminated materials during the 1980's.
	8-6	Black Powder Fan House	S			This building may have been used to store DU-contaminated materials during the 1980's.
	8-8	Primer Loading	P			The X-ray activities conducted at 3A-11C are being moved to Building 8-8.
L19		Group 9				
L21		Group 23				
L33		PVC Area				
L34		Former Burning Area				
L110		PAS Survey Section L110				
M1		Southern Ash Pile				
M2		Explosive Burning Ground				
M3		Flashing Grounds				
M4		Lead Azide Area				
M5 U		Tetryl Production Area-USDA Portion				
M10 U		Toluene Tank Farms USDA Portion				
M11		Landfill				
M12		Sellite Manufacturing Area				
M14		Former Pond Area				
M15		Sewage Treatment Plant				
M99		TNT Block Area (M6A)				
M105		PAS Survey Section M105				
	814	Factory & Shook Storage	P			These radioactive sources were detected in this building: a gauge on one spent respirator cartridge, several separating brick walls, several wooden cases of ceramic cylinders, many large diameter steel pipes, a stack of refractory brick, and many drums of catalyst.
M108		PAS Survey Section M108				
M118		Grant Creek East				
M119		Grant Creek West				

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TABLE 4-9
SUMMARY OF RADIOACTIVE MATERIAL/WASTE FINDINGS
SECOND LAND TRANSFER TO USDA
JOAAP, WILL COUNTY, ILLINOIS

Section	Building	DESCRIPTION	Status	Latitude	Longitude	Comments
L18		Group 8	A			DU munitions were not tested in Firing Range 1. The contaminated sand from the catcher area was removed.
			S			Alliant found DU in the sand of Range 3. Initial scan surveys of the catcher identified significant contamination. The surveys were not repeated following the remediation work.
	8-5	Black Powder Dry House	S			This building may have been used to store DU-contaminated materials during the 1980's.
	8-6	Black Powder Fan House	S			This building may have been used to store DU-contaminated materials during the 1980's.
	8-8	Primer Loading	P			The X-ray activities conducted at 3A-11C are being moved to Building 8-8.
L19		Group 9				
L21		Group 23				
L33		PVC Area				
L34		Former Burning Area				
L110		PAS Survey Section L110				
M1		Southern Ash Pile				
M2		Explosive Burning Ground				
M3		Flashing Grounds				
M4		Lead Azide Area				
M5 U		Tetryl Production Area-USDA Portion				
M10 U		Toluene Tank Farms USDA Portion				
M11		Landfill				
M12		Sellite Manufacturing Area				
M14		Former Pond Area				
M15		Sewage Treatment Plant				
M99		TNT Block Area (M6A)				
M108		PAS Survey Section M108				
M118		Grant Creek East				
M119		Grant Creek West				

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Blanks in the comment column indicate no findings.
References for each finding are cited in the profile sheets in the Appendix.

TABLE 4-10
PERIMETER INDUSTRIAL FACILITIES IDENTIFIED
JOAAP, WILL COUNTY, ILLINOIS

Facility	Operation	Location	Comments
Amoco Station	Fuel Dispensing	Mississippi Street in Elwood	Likely has USTs for Gasoline
JATA	Truck Maintenance	Bridge Road North of M102	
SNG Plant	Gas Light & Coke	Millsdale Ext. North of MFG area	Several very large bermed storage tanks
Liquid Carbonic	Carbon dioxide	Millsdale Ext. North of MFG area	
Stepan	Appeared to be oil refining	Van Drielingn Strasse Road North of MFG area	
Mobil	Oil Refining	East Frontage Road	
Joliet Polystyrene operated by BASF	Polystyrene	West of Route 55 on access road	
Dow Chemical		West of Route 55 on access road	
Unknown	Not-operating	At confluence of Kankakee River and GM&O RR	Several very large tanks present (about 0.5 million gallons)
Johnson & Johnson	Personal Products	Southwest corner of Peotone and Route 53	
PHIBRO TECH	Unknown	1/2 mile west of Johnson & Johnson	
James Tyler & Sons	Grain Storage; Weed and Feed Production	South of MFG area just west of Route 53	Former petroleum pipeline facility
Highway Department	Fuel Dispensing	Elwood-North of MFG area	2-1,000 gal. ASTs 1-diesel; 1-gasoline
Private Residence	Farm	East of LAP area	5-1,000 gal. ASTs
Private Residence	Farm	Immediate southeast corner of LAP area	2-500 gal. ASTs
	Petroleum Facility	1/2 mile northeast of LAP area	

TABLE 4-11
SUMMARY OF SIGNIFICANT SPILLS
JOAAP, WILMINGTON, ILLINOIS

Date	Location	Quantity and Material Spilled	Reference
1943	Sellite	Wooden storage tanks were found to be so unsatisfactory due to excessive leakage that they were dismantled and removed.	HIST42
December 30, 1943	TNT Blocking Area	A single block detonated in the number 9 press demolishing the press matrix and causing minor damage to the building.	HIST39
February 15, 1944	TNT Blocking Area	An explosion occurred in the matrix of #3 press causing a fire behind the barricade. The explosion was believed to be due to TNT dust. The sprinkler system extinguished the fire.	HIST41
March 11, 1944	Lead Azide	An explosion occurred in the #1 Autoclave where sodium azide is made. The explosion was caused by feeding nitrous oxide into the autoclave when it contained about 50 pound of unreacted sodium and an atmosphere of ammonia vapor and some hydrogen.	HIST41
April 24, 1957	Prairie Creek	An oily film was reported on Prairie Creek at West Patrol Road, Baseline Road, and Highway 66A. No film was noted at North Patrol Road indicating the material,a mixture of saturated petroleum products, originated in the Elwood Unit.	HIST19
May 23, 1967	Lead Azide	1,000 pounds of anhydrous ammonia leaked off because of a popped rupture disc.	SPIL07
November 05, 1967	Lead Azide	18,700 pounds of ammonia was discharged.	SPIL07
November 30, 1967	Acid # 3, Toluene Tank Farm	1,380 pounds of toluene was spilled due to faulty outlet valve.	SPIL07
December 22, 1967	Acid # 3, Toluene Tank Farm	5,300 pounds of toluene were lost due to an operational error. The spill was washed down with water.	SPIL07
May 01, 1968	Acid # 3, Toluene Tank Farm	5,000 pounds of toluene were overloaded. The contaminated area was washed.	SPIL07
June 02, 1968	Acid # 3, Toluene Tank Farm	2,500 pounds of toluene were lost when a standpipe was installed. The surrounding dike was flooded with water.	SPIL07
June 10, 1968	Acid # 3, Toluene Tank Farm Group 3	1,000 pounds of toluene were lost because of a gasket leak. The area was flushed with water. Oil was released from the Group 3 Power house (Building 3-1) to Prairie Creek via the storm sewer. Grass on the banks of the drainage ditch were heavily coated with oil. Plans were made to have the sides cleaned with a drag chain.	SPIL07 JAAP26, UCCI95
August, 1968	West Toluene Tank Farm	A toluene storage tank was destroyed by lightning. This was reportedly the second such loss.	HIST03
December 16, 1969	Sellite	294,000 pounds of sellite solution were lost when steam and water coil ruptured.	SPIL07
June 08, 1970	Sellite	2,460 pounds of sulfur and 11,500 pounds of soda ash were lost due to operational problems.	SPIL07
September 06, 1970	West Toluene Farm	212,000 pounds of toluene was lost due to a fire.	SPIL07
September 17, 1970	Sellite	1,300 pounds of sulfur was lost due to operational error.	SPIL07
September 22, 1970	Sellite	8,567 pounds of soda ash sludge was lost when a tank was washed.	SPIL07
September 24, 1970	Sellite	10,000 pounds of soda ash was lost when a tank was washed.	SPIL07
December 01, 1970	Sellite	2,733 pounds of sellite sludge lost due to cleaning for maintenance.	ARMY01, SPIL07
December 16, 1970	Sellite	11,500 pounds of soda ash was lost due to batch contamination.	SPIL07
April 29, 1971	Sellite	12,479 pounds of sellite solution was lost due to mechanical failure.	SPIL07
July 08, 1971	Acid #3, West Toluene Farm	1,100,000 pounds of toluene was lost due to lighting striking tank Number 1.	ARMY01, HIST17, SPIL07

TABLE 4-11
SUMMARY OF SIGNIFICANT SPILLS
JOAAP, WILMINGTON, ILLINOIS

Date	Location	Quantity and Material Spilled	Reference
November 27, 1971	Sellite	9,706 pounds of sellite solution was lost due to equipment failure.	SPIL07
February 03, 1972	Sellite	8,319 pounds of sellite was lost at #6 sellite storage due to equipment failure.	UCCI09, SPIL07
March 18, 1972	Sellite #1	30,503 pounds of sellite solution was lost from #4 sellite storage tank due to crack or hole in coil bank. Solution drained through coils to sewer through steam trap and steam trap bypass lines.	UNUR01, SPIL07
March 27, 1972	Sellite	13,706 pounds of 16 percent sellite solution was lost from sellite storage tank #9 due to washing for maintenance.	UNUR01, SPIL07
May 04, 1972	Sellite	2,741 pounds of 16 percent sellite solution was lost due to tank cleaning for maintenance.	SPIL07
May 11, 1972	Sellite	22,845 pounds of 20 percent soda ash solution was lost due to tank car cleaning for maintenance.	SPIL07
August 09, 1972	Sellite Plant #1	74,871 pounds of sellite was lost from tank #2 South due to contaminated material. Solution was flushed with water.	UCCI09, UNUR01
August 21, 1972	Sellite Plant #1	74,871 pounds of sellite solution was lost from Tank #2 South due to contaminated material. Solution was flushed to the sewer with water.	UCCI09, UNUR01
August 22, 1972	Sellite Plant #2	1,800 pounds of sulfur was lost due to operator error.	UCCI09, UNUR01
September 18, 1972	Sellite Plant #1	11,200 pounds of soda ash was lost due to rupture of filtered water line which has resulted into contaminated sellite solution.	SPIL07
November 14, 1972	Sellite #1	33,251 pounds of sellite was lost due to rupture of circulating line.	SPIL07
December 15, 1972	Acid #3	3,500 gallons of soda ash was lost to Grant Creek when an automatic control value on tank opened due to a malfunctioning pH meter.	UNUR01, SPIL07
December 22, 1972	Sellite	16,638 pounds of sellite was lost at the #5 sellite tank due to equipment failure. Tank was emptied for repairs.	UNUR01, SPIL07
December 30 & 31, 1972	West Toluene Farm	3,600 pounds of toluene was lost due to operational error from Toluene Tank 4.	SPIL07
January 02, 1973	West Toluene Farm	500 gallons of toluene was found on the ground in the diked area around tank #4. No toluene went to the drain off ditches or sewers. The toluene was allowed to evaporate.	UNUR01
January 04, 1973	Sellite	22,184 pounds of sellite was lost due to ruptured steam coil in tank #6.	SPIL07
January 08, 1973	Sellite	9,706 pounds of 16 percent sellite solution was lost due to washing and maintenance of tank #6.	SPIL07
January 11, 1973	Sellite	19,412 pounds of 16 percent sellite solution was lost due to washing and maintenance of tank #4.	SPIL07
February 10, 1973	Sellite #1	10,000 pounds of soda ash and 9,800 pounds of sellite were lost due to operational error.	SPIL07
March 07, 1973	West Toluene Farm	Toluene was lost from a leaking tank car near the West Toluene Farm. The tanker car was moved to the Central Farm and was unloaded immediately.	UNUR01
March 27, 1973	Sellite #4	8,319 pounds of 16 percent sellite was lost due to maintenance.	SPIL07
April 13, 1973	Sellite	16,638 pounds of 16 percent sellite solution was lost due to maintenance of tank #4.	SPIL07
June 12, 1973	Sellite	5,000 pounds of soda ash was lost due to maintenance of #1 East Sellite tank.	SPIL07
September 12, 1973	Sellite	Sellite sludge was lost due to tank cleaning for maintenance.	SPIL07
December 18, 1973	Sellite	157,400 pounds of sulfur was lost from a tank car (at unloading spot) when a plugged valve was freed and could not be closed.	UNUR01, SPIL03, SPIL07
December 26, 1973	Group 3	50 gallons of fuel oil was lost at the boiler house due to over filling of a storage tank. Straw was used as a sorbent.	JAAP01, UNUR01, SPIL07, HIST09, SPIL03
January 24, 1974	Sellite	5,350 pounds of sellite was lost from the #3 sellite storage tank.	UNUR01, SPIL07
May 18, 1974	Sellite	Extensive fire damage to Building 307-1 occurred probably caused by spontaneous ignition in sulfur pit. A loss of materials was reported.	UNUR01
January, 1975		No significant spills reported.	UCCI09

TABLE 4-11
SUMMARY OF SIGNIFICANT SPILLS
JOAAP, WILMINGTON, ILLINOIS

Date	Location	Quantity and Material Spilled	Reference
February, 1975		No significant spills reported.	UCCI09
March, 1975		No significant spills reported.	UCCI09
April, 1975		No significant spills reported.	UCCI09
May, 1975		No significant spills reported.	UCCI09
June, 1975		No significant spills reported.	UCCI09
July, 1975		No significant spills reported.	UCCI09
August, 1975		No significant spills reported.	UCCI09
October, 1975		No significant spills reported.	UCCI09
November, 1975		No significant spills reported.	UCCI09
December, 1975		No significant spills reported.	UCCI09
January, 1976		No significant spills reported.	UCCI09
February, 1976		No significant spills reported.	UCCI09
March, 1976		No significant spills reported.	UCCI09
May 01, 1977	Sellite Area	Water was running out of the east door of building 307 into sellite from the aerator on the floor of the change house.	INCR01
March, 1980		An oil spill from the drum storage area affected Goose Creek. Plant personnel were able to prevent off-site migration.	HIST32
June 03, 1985	Group 5	During transport of 16 45-pound drums of Explosive B, Class 1.3C Hercules smokeless propellant along a ramp from building 5-6 to 5-14, 12 drums fell from the forklift. One drum of propellant deflagrated consuming the forklift. The fire was extinguished	HWYL06
December 01, 1986	Group 8	At the cartridge case demil machine in building 8-9, 11 primers from 25mm cartridge cases detonated.	HWYL03
December 02, 1986	Group 8	At the cartridge case demil machine in building 8-9, 400 primers from 25mm cartridge cases simultaneously detonated. The blown primers were scattered throughout the room.	HWYL03
1994	Group 3A	A discharge from an air compressor blowdown had an oily appearance. Dye testing was proposed to confirm the source so that remediation could be performed.	DOTA04
	Group 7	The group power house or cooling jacket appeared to be the source of a discharge emanating from the building. Dye testing was proposed to confirm the source so that remediation could be performed.	DOTA04
	Group 8	A discharge was noted from Building 8-8. Dye testing was proposed to confirm the source so that remediation could be performed.	DOTA04

Note: The summary presented in the table includes all of the significant spill reports found. However, not all of the monthly reports were found. Monthly spill reporting was discontinued in March 1976 and was then done as spills occurred.

TABLE 4-12
SUMMARY OF OTHER FINDINGS
SECOND LAND TRANSFER TO USDA
JOAAP, WILL COUNTY, ILLINOIS

Section	Building	DESCRIPTION	Status	Latitude	Longitude	Comments
L1		Group 61	S			Other contaminants of concern in this area according to the Installation Action Plan are anions, metals and SVOC's. Remediation of soil may be necessary.
			P			Group 61 was used for munitions demilitarization and reclamation activities.
			P			Groundwater contamination plumes (nitrite and explosives) from L1 are at/near Prairie Creek.
			P			From the early 1950's to 1958, Armour Company leased this facility for the production of fertilizer.
	61-1	Power House (In use by Justice	P			This building was leased to the Department of Justice (Lease Number: DACA-45-4-79-6244) from 09-01-84 to 08-31-89.
			P			This building is presently being used by the FBI, therefore it was not surveyed.
	61-2	Cleaning, Painting & Shipping	R			There are enclosures for transformers at northeast corner of building. The transformers were removed.
	61-3	Receiving & Deboostering Building	P			There are several work areas surrounded by about 3 foot thick concrete on south side of building. At the southwest corner of the building is a 2-bay Hoffman West Vacuum station on edge of about a half acre impounded area without vegetarian. Barricades between work stations in building appear to have been constructed of dirt filled 105mm shell boxes.
	61-4	Washout, Dryer & Flaker Building	P			In at least 2 locations the concrete was cored and soil removed. These holes have not been plugged.
	61-9		P			This building is empty.
	61-25	Superintendent's Office	P			This building is empty.
	61-35	Sump Building	P			Storm sewer running from building should be considered extremely contaminated with nitrates.
L2		Explosive Burning Ground	S			Other contaminants of concern in this area according to the installation action plan are anions, metals, SVOC's, VOC's - This site contains 3 solvent and oil disposal pits (each less than.25 acres), located adjacent to the burning pads. Media of Concern: groundwater, sediment, and soil. Remediation of soil may be necessary. Soil remediation may address organic contamination.
			R			Spent diatomaceous earth was burned at this site.
			R			In 1978, 238 loads of trash and 129,000 pounds of scrap steel to Salvage Yard were demolished. It is unclear about how much went to the Demolition Grounds and how much came here.
			R			In 1977, 768 loads of trash (from LAP and MFG), 5,000 pounds of primers and projectiles from 90mm Demil, 213,500 pounds of explosives 19,900 pounds of scrap metal to Salvage Yard and 3 loads of TNT scrap were demolished. It is unclear about how much went to the Demolition Grounds and how much came here.

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SUMMARY OF OTHER FINDINGS
SECOND LAND TRANSFER TO USDA
JOAAP, WILL COUNTY, ILLINOIS

Section	Building	DESCRIPTION	Status	Latitude	Longitude	Comments
L1		Group 61	S			Other contaminants of concern in this area according to the Installation Action Plan are anions, metals and SVOC's. Remediation of soil may be necessary.
			P			Group 61 was used for munitions demilitarization and reclamation activities.
			P			Groundwater contamination plumes (nitrite and explosives) from L1 are at/near Prairie Creek.
			P			From the early 1950's to 1958, Armour Company leased this facility for the production of fertilizer.
	61-1	Power House (In use by Justice	P			This building was leased to the Department of Justice (Lease Number: DACA-45-4-79-6244) from 09-01-84 to 08-31-89.
			P			This building is presently being used by the FBI, therefore it was not surveyed.
	61-2	Cleaning, Painting & Shipping	R			There are enclosures for transformers at northeast corner of building. The transformers were removed.
	61-3	Receiving & Deboostering Building	P			There are several work areas surrounded by about 3 foot thick concrete on south side of building. At the southwest corner of the building is a 2-bay Hoffman West Vacuum station on edge of about a half acre impounded area without vegetarian. Barricades between work stations in building appear to have been constructed of dirt filled 105mm shell boxes.
	61-4	Washout, Dryer & Flaker Building	P			In at least 2 locations the concrete was cored and soil removed. These holes have not been plugged.
	61-9		P			This building is empty.
	61-25	Superintendent's Office	P			This building is empty.
	61-35	Sump Building	P			Storm sewer running from building should be considered extremely contaminated with nitrates.
L2		Explosive Burning Ground	S			Other contaminants of concern in this area according to the installation action plan are anions, metals, SVOC's, VOC's - This site contains 3 solvent and oil disposal pits (each less than.25 acres), located adjacent to the burning pads. Media of Concern: groundwater, sediment, and soil. Remediation of soil may be necessary. Soil remediation may address organic contamination.
			R			Spent diatomaceous earth was burned at this site.
			R			In 1978, 238 loads of trash and 129,000 pounds of scrap steel to Salvage Yard were demolished. It is unclear about how much went to the Demolition Grounds and how much came here.
			R			In 1977, 768 loads of trash (from LAP and MFG), 5,000 pounds of primers and projectiles from 90mm Demil, 213,500 pounds of explosives 19,900 pounds of scrap metal to Salvage Yard and 3 loads of TNT scrap were demolished. It is unclear about how much went to the Demolition Grounds and how much came here.
			R			In 1976, 528 loads of trash (from LAP and MFG), 45,100 pounds of scrap steel to Salvage Yard, 2,000 pounds of TNT scrap, 480 pounds of scrap from red water and 4,485 pounds of contaminated sludge from red water were demolished. It is unclear about how much went to the Demolition Grounds and how much came here.

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JOAAP, WILL COUNTY, ILLINOIS

Section	Building	DESCRIPTION	Status	Latitude	Longitude	Comments
L2		Explosive Burning Ground	R			In 1972, emissions were produced as by-products/ waste of burning. Wastes burned include 1,000 pounds of carbon per month.
			P			There is an abandoned conveyor in the field 30 feet in front of Building 23-35. (11/96)
	23-26	Destruction Chamber	P	041:21:55.4 0	88:06:02.4	This is a concrete building with what looks like fuel or water pipes crisscrossing the ceiling. (11/96)
	23-27	Destruction Chamber	P			This is a concrete building with what looks like fuel or water pipes crisscrossing the ceiling. (11/96)
	23-29A	Storage Magazine	P	041:21:53.5 0	88:05:45.4	This bunker is empty. (11/96)
	23-32	Bomb Shelter	P			This shelter is being used for storage of equipment by OHM. (11/96)
	23-35	Destruction Chamber	P	041:21:55.0 0	88:06:07.0	This is a concrete building with what looks like fuel or water pipes crisscrossing the ceiling. (11/96)
	23-39	Burning Ground Field Office	P	041:21:46.6 0	88:06:10.9	No environmental concerns were noted. (11/96)
	23-40	Decontamination Oven Bldg.	P	041:21:54.2 0	88:05:55.7	There are twelve square galvanized metal posts stacked in front of this building. Appears to be in good condition. (11/96)
	23-41	Control Panel Building	P	041:21:53.9 0	88:05:55.5	Small concrete shack, locked. (11/96)
L3		Demolition Area	P			Other contaminants of concern in this area according to the Installation Action Plan include metals, volatile organic compounds, semivolatile organic compounds, and anions. Media of concern includes groundwater, sediment and soil. Soil remediation is anticipated to address metals and organic contamination.
			P			This is the portion L3 which is considered agricultural tract 28. The former lessee held a lease on this track for one year. The lessee noted that there were brick and rebar in the field. No other environmental concerns were addressed in the lessee questionnaire.
			P			A plume of groundwater contamination is present and shallow groundwater discharges to Prairie Creek.
			P			OHM is currently installing a fence in the area and erosion control along the creek. OHM indicates that live fuzes have been found in the area.(11/96)
			P	041:21:39.1 0	88:06:09.7	This area contains an incinerator.(11/86)
			P	041:21:38.6 0	88:06:16.1	There is a large steel structure on south end of road, apparently for burning wastes. No environmental concern was noted. (11/96)
			P	041:21:49.7 0	88:06:12.8	There are a lot of broken ceramics inside the burning cage. (11/96)
			P	041:21:47.6 0	88:06:13.0	There are several wooden crates (50 foot long pile) and stacks of ammunition boxes 200 yards south of burning cage. The plastic caps are intact. There is a second pile of pallets on the east side of the road, 10 feet tall and 30 feet long in the fire training area.
			P	041:21:43.9 0	88:06:16.0	There is a 30 foot long, rusted conveyor at the end of the paved road, north of large incinerator. (11/96)
			P	041:21:47.6 0	88:06:14.0	There are concrete pipes, metal culverts and transite concrete debris soft from creek at the south end of the site just east of the creek. (11/96)
			P			This group contained a live fire training area.

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SECOND LAND TRANSFER TO USDA
JOAAP, WILL COUNTY, ILLINOIS

Section	Building	DESCRIPTION	Status	Latitude	Longitude	Comments
L3	23-31	Igloo	P	041:21:44.2 0	88:06:07.8	Igloo is empty. No environmental concerns were noted. (11/96)
	23-33	Remote Control Shelter	P	041:21:41.0 0	88:06:06.7	This building is empty. (11/96)
L4		Landfill Area	S			VOC's, SVOC's, Metals are contaminants of concern according to the Installation Action Plan. Media of concern: soil, groundwater. Remediation of soil may be necessary. (Two former extraction pits excavated to bedrock are located in this area.)
			P	041:21:31.8 0	88:06:45.6	Along the creek much debris was evident. The area had multiple trench-like depressions on the terrain. Heavy construction timber debris and small baby food bottles were observed. A low-lying area was encountered. Half of it was a marshy area, the eastern part of the section. Half of it was bedrock. The marshy area was vegetated with soft native grass and was bouncy to the step. (11/96)
L5		Salvage Yard	S			Lead - Some lead materials, removed from Tetryl buildings prior to demolition, transported to plant Clearinghouse Salvage Yard for disposal.
			S			SVOCs and metals are considered a contaminant of concern in this area in the Installation Action Plan. Metals and organics are anticipated to be addressed in the soil remediation. Groundwater remediation of metals may also be necessary.
			P	041:23:32.4 0	88:06:23.4	There is an open concrete pit, about 4 by 4 feet concrete filled with 3 feet of water, 30 to 40 feet west of well #1. There are also concrete debris and a crushed drum in the vicinity.
			P	041:23:28.9 0	88:06:15.8	There are numerous piles of railroad ties in this area. This area is well vegetated. There is no other material readily visible.
			P	041:23:28.0 0	88:06:06.0	A small pile of miscellaneous small electrical and plumbing materials (lights, switches, pipe fittings, insulators) is present here. There is no apparent vegetative stress.
			P			An area of black/brown residue, 10 by 10 foot, mixed with gravel is located here. There is no vegetation midway between MW503 and MW419. There is miscellaneous scattered debris around general area.
	26-3	Sorting Building	P			There are 6 pallets of fire bricks "Greenlite 28 Insulating Firebricks".
	26-5	Storage Building	P			This building is empty.
	26-8	Pump House, Well No. 3	P			Pump still in place.
	26-9	Pump House, Well No. 2	R			Well with 10 inch diameter steel casing pump has been removed. Access to well not secured.
L7		Group 1	P			Classified Item - Loading of a classified item occurred here (July 1959).
			S			Metals, Anions and SVOC's are contaminants of concern for this site according to the Installation Action Plan. Remediation of groundwater, sediment and soil may be necessary.
			P			The equipment within the Group 1 105mm modernized line is currently being cycled utilizing inert components.

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SECOND LAND TRANSFER TO USDA
JOAAP, WILL COUNTY, ILLINOIS

Section	Building	DESCRIPTION	Status	Latitude	Longitude	Comments
L7		Group 1	P			A 1984 review showed that there were 126,651 linear feet of combined sewer on the LAP half of the plant. This sewer handles the sanitary and industrial waste. The industrial waste consisted of the boiler blow-down from the various boiler houses, wastes from the industrial laundry, and wastes from the motor pool.
			S			Many of the conveyors originating on the north side of the group have exposed soil beneath them. Spilled materials would fall onto the ground. (11/96)
	1-3	Receiving and Painting	S	041:20:48.9 0	88:04:49.2	Receive, store and transfer of inert projectiles occurred here.
			P	041:20:48.9 0	88:04:49.2	Pallets with sound proofing material and fiberglass insulator stored in this building. (11/96)
			P	041:20:48.9 0	88:04:49.2	Paint spray booths present. (11/96)
			P	041:20:48.9 0	88:04:49.2	Several large wooden crates stored. (11/96)
	1-3A	Inert Storage	R	041:20:54.5 0	88:04:47.1	Receive, store and transfer of inert projectiles occurred here.
			P	041:20:54.5 0	88:04:47.1	Pallets stored in this building. (11/96)
			P	041:20:54.5 0	88:04:47.1	At east end of building there is a battery room.
			P	041:20:54.5 0	88:04:47.1	Metal racks for 105MM stored in this building. (11/96)
			P	041:20:54.5 0	88:04:47.1	Several boxes/pallets of funnels stored in this building. (11/96)
	1-4	Melt Load Building	P	041:20:49.8 0	88:04:29.2	A fire on December 7, 1973 caused considerable damage and set back the completion of the conversion of the Melt Pour Area. Red Water filtrations system was activated in March 1974.
			P	041:20:49.8 0	88:04:29.2	On December 7, 1973, a fire occurred here. This building is inactive and decontaminated to a XXX condition. J.L Adler Company was under contract to modify this building for the 105mm modernization project. The fire was started from an arc welder. A piece of slag fell through a three inch hole in the floor, igniting residue in the crawspace beneath the building.
			P	041:20:49.8 0	88:04:29.2	Cuts in curbing around floors on upper level. Washdown water would discharge to roof of lower level. (11/96)
			P	041:20:49.8 0	88:04:29.2	Two elevator shafts in building. Shafts could be contaminated. (11/96)
	1-5A	Service Magazine	P	041:20:56.1 0	88:04:35.1	Four feet asbestos cement pipe stick up, painted yellow on west end of building- PID reading was zero. Two discharge pipes from building in same vicinity - discharge pipes appear to be condensate. (11/96)
	1-6	TNT Screening	P	041:20:52.7 0	88:04:36.3	In 1966, major repairs were to be accomplished at Central Shops.
			P	041:20:52.7 0	88:04:36.3	Some equipment remains in building. (11/96)
	1-11	Fuze Storage Service Magazine	P	041:20:35.5 0	88:04:18.4	Building converted to air compressor facility. (11/96)
	1-12	Primer Service Magazine	P	041:20:46.6 0	88:04:18.0	About 60 wooden boxes, most sealed, several that are open contain metal funnels and other small metal parts. Boxes are labeled "Time delayed fuzes". (11/96)

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SECOND LAND TRANSFER TO USDA
JOAAP, WILL COUNTY, ILLINOIS

Section	Building	DESCRIPTION	Status	Latitude	Longitude	Comments
L7	1-13	Assembly & Shipping	S	041:20:34.3 0	88:04:10.0	105MM, HE, M444 Fiber containers and boxes from storage were stenciled for out-of-plant shipment.
			P	041:20:34.3 0	88:04:10.0	Assembly equipment in place 2 oil reservoirs (75 gallons each) at east end of building. (11/96)
	1-14	Propellant Charge Building	P	041:20:38.5 0	88:04:14.0	Some equipment remains in building.(11/96)
			P	041:20:38.5 0	88:04:14.0	Concrete floor is cracked - some red staining around cracks. (11/96)
	1-16	Cooling Building	P	041:20:21.7 0	88:04:52.3	There is an elevator on the north side of this building. The shaft could be a contaminant trap. Most of the equipment in this building is still in place. The access pit under this building on the south side is flooded. There are gutters on the roof edge of this building. It appears that washwater would flow from the upper floors to the roof on the north side. (11/96)
	1-31	Fiber Container Storage	S	041:20:35.8 0	88:04:12.1	Aerosol paint cans were received from Building 1-31 and punctured with a puncturing tool.
	1-38F	Vacuum Pump House	P			Small shop or storage area. (11/96)
	1-40A	Sump Platform & Washout Building	P			Storm sewer running from building should be considered extremely contaminated with nitrates.
	1-40B	Sump Platform & Washout Building	P			Storm sewer running from building should be considered extremely contaminated with nitrates.
	1-40C	Sump Platform & Washout Building	P	041:20:43.8 0	88:04:26.5	Storm sewer running from building should be considered extremely contaminated with nitrates.
			P	041:20:43.8 0	88:04:26.5	Coring through concrete and hole in soil, several feet deep left open. (11/96)
			P	041:20:43.8 0	88:04:26.5	Shell melt out equipment is present. (11/96)
L8		Group 2	P			Classified Item - Loading of a classified item occurred here (July 1959).
			P			Lead, anions and SVOC's are contaminants of concern in this area according to the Installation Action Plan. Remediation of groundwater, sediment and soil may be necessary.
			P			Production activities were at a minimum with renovation of the 90mm. Renovation of the 90mm round was completed in February 1976.
			P			A 1984 review showed that there were 126,651 linear feet of combined sewer on the LAP half of the plant. This sewer handles the sanitary and industrial waste. The industrial waste consisted of the boiler blow-down from the various boiler houses, wastes from the industrial laundry, and wastes from the motor pool.
			P	041:21:33.0 0	88:03:43.0	There is a manhole with 3 valve wrenches sticking up out of the ground southeast of this section. (11/96)
	2-1	Power House	P	041:21:48.4 0	88:04:11.5	This 3 story brick building is in good physical condition. Overgrowth from the field and animal dropping cover the rear floor. (11/96)
	2-2	Paint & Oil Storage	R	041:21:51.4 0	88:04:07.4	According to a 1970 Standard Operating Procedures, paint was transferred in a covered container. Any spillage of paint was cleaned up immediately. Thinner was transferred from the barrel into safety cans by means of a funnel. Contaminated rags were transferred to the Burning Ground when feasible.

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SECOND LAND TRANSFER TO USDA
JOAAP, WILL COUNTY, ILLINOIS

Section	Building	DESCRIPTION	Status	Latitude	Longitude	Comments
L8	2-2	Paint & Oil Storage	P	041:21:51.4 0	88:04:07.4	Building is empty. Aside from paint, no concerns. (11/96)
	2-3	Receiving & Painting	P	041:21:49.4 0	88:04:07.9	Building is empty for the most part, except for some conveyor racks and belts still present inside. (11/96)
	2-3A	Inert Storage	P	041:21:49.4 0	88:04:07.9	Building is empty. Weed racks and other miscellaneous items are stored here. (11/96)
	2-4	Melt Load	P	041:21:48.8 0	88:05:57.1	This building has 3 stories with protection on subdivided Bay made of concrete partition. Two are melters, they were also observed. (11/96)
	2-6	TNT Screening	P	041:21:49.6 0	88:03:51.8	In 1966, major repairs were to be accomplished at Central Shops.
			P	041:21:49.6 0	88:03:51.8	This building has a collapsing roof and animal feces. (11/96)
	2-10	Anti-Tank Mine Assembly & Ship	P			The debris at the east end of Group 2 PAS study section L117 is believed to be the building debris from the 1942 explosion of this building.
			P			There were two cars with 4,000 mines each and a third car probably 7/8 full alongside this building detonated.
	2-12	Assembling & Shipping	P			In 1990, this building was operated by A-Z Technology, Inc.
			P			According to a 1970 Standard Operating Procedures, stencil marking die was cleaned with type cleaning fluid. Paint was removed with rag and solvent. All dirty rags were placed in properly marked and approved waste pail containing water. Fork lift was transferred to battery charger, Building 2-3.
	2-14	Box & Container Storage	P			In 1990, this building was operated by A-Z Technology, Inc.
	2-17	Maintenance Building	P			In 1990, this building was operated by A-Z Technology, Inc.
	2-18F	Bomb Proof	P	041:21:36.7 0	88:03:48.8	In 1990, this building was operated by A-Z Technology, Inc.
			P	041:21:36.7 0	88:03:48.8	This building is a bunker; it only contains doors and benches. No apparent concern. (11/96)
	2-24	Well House	P	041:21:51.4 0	88:04:07.4	This building is next to Building 2-1. It is surrounded by a tower of steel about 35 feet in height. No concerns were visible. This building also houses a well. (11/96)
	2-33	Street Light Substation	P	041:21:48.4 0	88:04:11.5	Building is empty except for some electrical wires that connect it to the large transformer behind. (11/96)
	2-40B	Settling Chamber	P	041:21:48.8 0	88:03:57.1	Storm sewer running from building should be considered extremely contaminated with nitrates.
			P	041:21:48.8 0	88:03:57.1	Three holes were drilled through the floor and were left open. (11/96)
	2-43	Oil Pump House	P	041:21:51.3 0	88:04:07.4	This is a small accessory building which appears to support the adjacent boiler building. This building only contains a pump and there are no visible concerns. (11/96)
L9		Group 3	P			Nitrates - Group 3 surface drainage flows to Prairie Creek.
			P			Metals and Anions - Soil sampling conducted in areas assigned to TDS and analyzed for Anions and Metals; concentrations detected were within the media ranges of those detected in earlier sampling.

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L9		Group 3	P			Lead, Anions and SVOC's are contaminants of concern in this area according to the Installation Action Plan. Remediation of groundwater, sediment and soil may be necessary.
			P			The debanding of the 90mm projectile was started in August 1973. This job was completed in November 1973 with a yield of 96,028 pounds of salvage brass and 2,842,433 pounds of salvage steel.
						Trial loadings of 105mm projectiles with various mixtures and variable conditions were conducted at JOAAP.
			P			A 1984 review showed that there were 126,651 linear feet of combined sewer on the LAP half of the plant. This sewer handles the sanitary and industrial waste.
						The industrial waste consisted of the boiler blow-down from the various boiler houses, wastes from the industrial laundry, and wastes from the motor pool.
			P			Drains from paint spray booths, condensate pits, drinking fountains and settling basins at Melt Loading and Cooling buildings (3-4 and 3-16) drain into storm sewers.
	3-1	Power House	P	041:22:66.0 0	88:03:20.6	On June 10, 1968 it was determined that oil in Prairie Creek was released from this building via the storm sewer. A heavy coating of oil was present on the sides of the drainage ditch.
			P	041:22:66.0 0	88:03:20.6	Twenty bags of abrasive sand and filter materials were in this building. (11/96)
	3-3	Receiving & Painting Building	P	041:22:07.3 0	88:03:33.8	In this building, alkali mists were generated during charging of Edison cells. Paint mists and thinner vapors were generated in water-fall paint during spray painting of 75MM inert shells in this building.
			S	041:22:07.3 0	88:03:33.8	Paint mists and thinner vapors were generated during spray painting of 90MM empty inert shells in this building.
			P	041:22:07.3 0	88:03:33.8	105 mm load line was located here.
			P	041:22:07.3 0	88:03:33.8	In 1990, this building was operated by the Talley Defense System, INC.
			P	041:22:07.3 0	88:03:33.8	Building was empty. (11/96)
			P	041:22:07.3 0	88:03:33.8	There is a condensate pit in this building.
	3-3A	Inert Storage Building	P	041:22:07.3 0	88:03:33.8	In 1990, this building was operated by the Talley Defense System, INC.
			P	041:22:07.3 0	88:03:33.8	Building was empty. (11/96)
	3-4	Melt Load Building	S			In April 1996, this building evidenced pigeon feces to a point where the possibility exists of a health hazard to workers.
			S			One half of this building is locked, the other half is opened, but empty. (11/96)
			P			There is a condensate pit in this building.
	3-5A	Supplementary Charge Manufacture	P			Storm sewer running from building should be considered extremely contaminated with nitrates.
	3-6	TNT Screening Building	P			In 1966, major repairs were to be accomplished at Central Shops.
	3-8	Change House	P			There is a settling tank for laundry outside of this building.

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TABLE 4-12
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SECOND LAND TRANSFER TO USDA
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Section	Building	DESCRIPTION	Status	Latitude	Longitude	Comments
L9	3-10	Drilling, Boostering & Shipping	P			The stencilling and banding operations in Bay 15 was combined resulting in the reduction of 1 MOB per shift.
			P			105 MM load line was located here.
			P			In 1996, it was noted that this building is contaminated with an unknown blue liquid in a basement area of the X-ray facility.
	3-16	Propellant Loading Building	P	041:22:08.0 0	88:03:05.5	Three story building contained conveyor and machinery. (11/96)
			P	041:22:08.0 0	88:03:05.5	There is a condensate pit in this building.
	3-20A	Change House	P			In 1990, this building was operated by the Talley Defense System, INC.
	3-37	Washout Building & Sump	P	041:21:11.5 0	88:03:17.7	Storm sewer running from building should be considered extremely contaminated with nitrates.
	3-37	Washout Building & Sump	P	041:21:11.5 0	88:03:17.7	A core of six inch diameter in floor slab is open and not plugged. Part of the sump cover has been smashed. (11/96)
	3-38B-1	Barricade	P			A pipeline connects this building to Building 3-38B and Building 3-4. (11/96)
	3-38C	Vacuum Collectors	P	041:22:05.0 0	88:03:07.4	This building contains a vacuum unit and another vacuum unit appears to have been stripped off the building. (11/96)
	3-38C-1	Barricade	P	041:22:05.5 0	88:03:07.4	A triple vacuum unit without number is located between 3-38C and 3-45 and 3-16. It also appears to be connected to 3-38C via a pipe and may have been connected to 3-16 and 3-45. (11/96)
	3-38F	Vacuum Collectors	P	041:22:06.0 0	88:03:16.1	A pipeline connects this building to three vacuum units located 25 feet away in a partitioned concrete structure south of building 3-38F. Building contains a vacuum unit. (11/96)
	3-45	Washout Building & Sump	P	041:22:05.0 0	88:03:07.4	Two 6 inch cores have been made in floor and left unplugged. (11/96)
	3-62	Grinder Building	P	041:22:05.4 0	88:02:56.8	Building was empty and stripped. It was surrounded by 20 feet barricades. Building is surrounded by 3-4 feet deep holes, into which grounding rods were driven. (11/96)
	3-63	Oxidizer Storage	P	041:22:10.5 0	88:03:06.8	Building is empty. (11/96)
	3-64	Mixer Building	P	041:22:20.1 0	88:03:22.7	This building has been completely stripped and is surrounded by 20 feet berms and 3-4 feet deep holes in which grounding rods have been driven. (11/96)
	3-64A	Mixer/Grinding Control	P	041:22:18.3 0	88:03:16.4	Building was locked and could not be surveyed. (11/96)
	3-66		P	041:22:15.5 0	88:03:28.8	Building was locked and could not be entered for survey. (11/96)
	3-67		P	041:22:06.6 0	88:03:25.5	No environmental concerns were identified. Building is in good shape. (11/96)
	3-71	Casting	P	041:22:10.3 0	88:03:21.6	Building was empty. Pigeon droppings and skeletons on floor. (11/96)
	3-72	Igniter Mixer Muller	P	041:22:05.0 0	88:03:19.8	Building is empty and inner partition walls have been broken indicating that the building has been stripped of large equipment. A series of grounding holes were observed outside the building. (11/96)
L10		Group 3A	P			Lead, anions and SVOC's are contaminants of concern in this area according to the Installation Action Plan. Remediation of groundwater, sediment and soil may be necessary.
			P			In 1990, this area was operated by Honeywell, Inc.

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L10		Group 3A	P			A 1984 review showed that there were 126,651 linear feet of combined sewer on the LAP half of the plant. This sewer handles the sanitary and industrial waste. The industrial waste consisted of the boiler blow-down from the various boiler houses, wastes from the industrial laundry, and wastes from the motor pool.
			P	041:21:24.2 0	88:04:31.2	The building next to building 3A-11 is being demolished, at the northwest corner of this section. (11/96)
			P	041:21:20.1 0	88:04:13.0	There is a pile of dirt 30 feet high, possibly blast protection, south of building 3A-5. (11/96)
			P	041:21:17.0 0	88:04:11.8	There is a depression in the ground across from building 3A-32B, fenced in by ropes. The size is 12 by 12 by 8 feet deep. (11/96)
			P	041:21:27.0 0	88:04:26.9	In the northwest corner of this section. There is a rubble pile with asphalt debris in a culvert. (11/96)
			P	041:21:27.0 0	88:04:26.9	In northwest corner there is a rubble pile with asphalt debris in a culvert.
			P			Alliant used 3A-11A, 11B, 3A-3, 4, 7A, 7B, 41, 46, 1, 20A, and 22 for LAP of the AT-4 and SMAW: 11B-inert assembly, 11A-LAP of AT-4 and SMAW, 3A-3-inert storage, 4-melt pour of octol, 41-pressure testing involving NC, 46-storage of propellent and fuzes, 7A-storage of octol, 7B-energetic storage, 1-boiler plant, 20-A-administration, 11C-climate testing of AT-4 and SMAW. (4/97)
	3A-3	Receiving & Painting	P			In this building gypsum and metal dusts were generated during buffing of shells. Mists and thinner vapor was generated during painting of bomb casings in a water-curtain booth.
			S			Lead dust was generated from sanding paint from shells. Spray painting was conducted in a water-curtain paint booth.
			S			Thinner vapors were generated during drying of painted ammunition boxes in a drying tunnel.
	3A-4	Melting & Pour Building	P			On March 24, 1945, an explosion occurred in the melt unit.
			P			In 1966, a Multiple Cyclotol Riser Knockout was located in this building.
	3A-6	TNT Screening	P			In 1966, major repairs were to be accomplished at Central Shops.
	3A-7B	TNT Service Magazine	P			This building has numerous boxes for boosters. (4/97)
	3A-10	Assembly, Packing & Shipping Building	P			According to a 1971 Standard Operating Procedures, batteries were transferred to battery chargers in Building 3A-11A.
	3A-11A	Inert Storage	P			According to a 1971 Standard Operating Procedures, batteries from Building 3A-10 were transferred to battery chargers in this building.
	3A-11B	Inert Storage	P			A 1991 inspection noted that aluminum grit from sandblasting (Black Beauty) of cartridge cases was disposed of on the ground adjacent to the building.
	3A-12	Topping Building	S			This building had eight loading bays. (4/97)

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Section	Building	DESCRIPTION	Status	Latitude	Longitude	Comments
L10	3A-13	H. E. Screening Building	S			A drum of waste oil was observed outside this building. Oily wastewater was observed going to storm sewer; from ECAS audit in 1994.
			P			As of 1978, all laboratory operations were conducted from the standards lab in this building. Operations included preparation of standard chemicals for other labs, water analysis for the STEP, and air pollution testing.
			P			A discharge apparently from an air compressor blowdown, with an oily appearance was identified near building 3A-13. Dye testing to confirm source and necessary work orders for remediation were proposed to be written in January 1995.
	3A-43	Vacuum Collection Building	P			Alliant used this building for storage of assembled off specification fuzes. (4/97)
L14		Group 4	S			Metals and Anions - Remediation of soil may be necessary for explosives. Ground water remediation of explosives will require limited action only (i.e., deed restrictions and monitoring).
			P			Station and primer pushout units were drilled and barricaded pull apart machines were fabricated and installed for the 40mm test site.
			P			According to historical reports, the production of 40MM Cartridges here marked the first use of an automated production lines at JOAAP.
			P			In 1990, this area was operated by Honeywell, Inc.
			P			Various metal parts, primed cases, projectiles, explosive pellets, and propellant are fed into the line from outlying support areas and the completed rod was loaded, assembled, and packed for shipment. As of 1984, Honeywell was using this area for the production of the 25 mm Bushmaster.
	4-4	Fulminate Screen & Blend	P			There are vacuum collectors in building. (4/97)
	4-5	Primer Loading	P			A project for the Rehabilitation of Group 4 for the production of 40MM, M406 was near completion in 1969. Phase I incorporated the first assembly lines, the pouring equipment in this building was placed in shakedown and production during the month of April. Phase II, a second line, was placed in shakedown and operation during the month of June.
	4-6	Delay Loading	P			Paint mists (2.4% lead) and thinner vapors were escaping from the paint booth during painting and stenciling of fuse boxes.
	4-13	Primer Dry House	P			Primers and flashtubes were pressed into cartridge cases by two automated machines in this building. A steel pellet/primer storage cabinet was provided that was properly vented.
	4-15	Detonator Service Magazine	S			Sludge from the Hoffman vacuums were placed in barrels and held until transferred to the scrap magazine.
	4-21	Testing Laboratory	S			Until about 1966, adhesives and sealants used in munition production were mixed here. Early operations in the building are unknown.
			P			In 1968 this building was used as a LAP X-Ray Office, Q.C. Chem. Lab, and Q.C. Training Classroom.

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Section	Building	DESCRIPTION	Status	Latitude	Longitude	Comments
L15		Group 5	S			Metals and Anions - Remediation of soil may be necessary for explosives. Ground water remediation of explosives will require limited action only (i.e., deed restrictions and monitoring).
			P			In 1990, this area was operated by Honeywell, Inc.
			A			In 1968 this group was dormant.
	5-14	Fuse Assembly	P			There are two paint booths in this building. Metal cleaning was conducted in tanks.
L18		Group 8	S			Nitrate and Metals are contaminants of concern in this area according to the Installation Action Plan. Media of concern: Groundwater, sediment. Remediation of groundwater may be necessary. Groundwater remediation of explosives and metals will probably require limited action only (i.e., deed restrictions and monitoring).
			P			In 1990, this area was operated by Honeywell, Inc.
			P			In 1968 this group was used for APSA.
			P	041:21:22.6 0	88:07:04.7	West of Building 8-12 there is a concrete slab with mounting boxes. It is possible that this area may have been a substation. (11/96)
			P			In 1959, Group 8 was converted to Administrative Offices for the Ordnance Ammunition Command.
	8-3	Black Powder Screening	P			There is a sign on the outside of the building that reads, "Gas Chamber". It may have been used for training. (4/97)
	8-4	Black Powder Rest House	P			This building is empty. (4/97)
	8-5	Black Powder Dry House	P			This building is empty. (4/97)
	8-6	Black Powder Fan House	P			This building is empty. (4/97)
	8-8	Primer Loading	P			Being used by Alliant Techsystems facility contractor (June 1993).
			P			Oily discharge from Building 8-8 has potential to impact the storm water system. Dye testing to confirm the source, and corrective action was scheduled for January 1995.
	8-10	Service Magazine Percussion El	P			This building contains stored doors. (4/97)
	8-13	Change House - Men	P			This building is empty. (4/97)
	8-14	Change House - Women	P			This building is empty. (4/97)
	8-16	Primer Reclamation Building	P			The slab from this building is the Fire Training Demonstration Area. The slab is surrounded with a row of cinder blocks. A number of burned tires and black ash are inside. (12/95)
L19		Group 9	S			Metals and Anions are contaminants of concern in this area according to the Installation Action Plan. Media of concern: Groundwater, sediment. Remediation of groundwater may be necessary. Groundwater remediation of explosives and metals will probably require limited action only (i.e., deed restrictions and monitoring).
			P			In 1990, this area was operated by Honeywell, Inc.
			A			Water and sediment samples were taken in August 1990. The samples appear to be environmentally sound.
			P	041:21:25.8 0	88:07:44.3	West of Building 9-16 there is a debris pile containing metal culverts, brush, and concrete curbs, immediately west of Group 9 perimeter road. (11/96)

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Section	Building	DESCRIPTION	Status	Latitude	Longitude	Comments
L19		Group 9	P	041:21:17.0 0	88:07:43.9	Immediately south of Group 9 perimeter road there is a pile of debris containing bricks, cinder block, concrete, metal, asphalt and concrete pipes south of Building 9-3A to 9-5. (11/96)
			P	041:21:21.0 0	88:07:34.2	North of Building 9-13 there is a small incinerator (9-38) set on a concrete pad. (11/96)
			P			In 1959, Group 9 was converted to Administrative Offices for Ordnance Ammunition Command.
	9-2B	Heater House	P			Room contains heater. (11/96)
	9-3A	Lead Azide Dry House	P	041:21:13.7 0	88:07:46.6	Exhaust pipe on south side of building rusted out. (11/96)
	9-3B	Lead Azide Dry House	P	041:21:16.9 0	88:07:40.6	Void spaces in walls and ceiling. (11/96)
	9-4	Lead Azide Screen & Blend	P	041:21:12.3 0	88:07:41.3	Wood framed screens stored here, other trash and debris. (11/96)
	9-5	Mercury Fulminate Screen & Ble	P	041:21:12.0 0	88:07:35.4	Building full of trash and debris. (11/96)
			P	041:21:12.0 0	88:07:35.4	Attic in building. (11/96)
	9-6	Mercury Fulminate Dry House	P	041:21:10.3 0	88:07:35.4	Void spaces between walls. (11/96)
			P	041:21:10.3 0	88:07:35.4	Two 4 ounce amber jars, both appear empty. (11/96)
			P	041:21:10.3 0	88:07:35.4	Exhaust stack rusted. Limited area of white deposits. (11/96)
	9-7	Mercury Fulminate Service Magazine	P	041:21:15.0 0	88:07:33.5	Building empty. (11/96)
	9-8	Prepared Primer Mix House	P	041:21:17.7 0	88:07:44.3	Peeling floor covering. (11/96)
			P	041:21:17.7 0	88:07:44.3	Void spaces in wall. (11/96)
	9-9	Tetryl Service Magazine	P			Building is full of wooden framed screens. (11/96)
	9-10	Tetryl Blending Building	P	041:21:19.4 0	88:07:41.6	Five gallon pail, with one 8 inch diameter wooden bushing. Two 8 inch wooden bushings on floor. (11/96)
			P	041:21:19.4 0	88:07:41.6	A two inch pipe penetrates the south wall. Several mounting bolts on south exterior wall as if equipment was mounted here, one bolt is grounded. (11/96)
	9-12A	Administration Buildings	P	041:21:17.5 0	88:07:41.5	In 1968 this building was used as an APSA Training Facility.
	9-12C	Administration Buildings	P			In 1968 this building was used as a cafeteria.
	9-12D	Administration Buildings	P	041:21:16.2 0	88:07:43.5	Sign indicates APSA offices were located in this building. (11/96)
	9-14	Detonator Rumbling Building	P	041:21:19.0 0	88:07:29.9	Rumbling bays have ventilated duct system. (11/96)
			P	041:21:19.0 0	88:07:29.9	Building is empty except for heater. (11/96)
	9-15	Final Inspection - Packing & Shipping	P	041:21:18.3 0	88:07:27.5	Building appears to have been converted to office and classroom space. (11/96)
			P	041:21:18.3 0	88:07:27.5	Building is empty. (11/96)
	9-16	Power House	P	041:21:24.4 0	88:07:45.2	There is about one cubic foot of rust and black material beneath stack from boiler. (11/96)
	9-20B	Change House, Women, - Clock House	P	041:22:21.7 0	88:07:34.2	Basement is flooded. (11/96)
			P	041:22:21.7 0	88:07:34.2	Red stains on floor. (11/96)
	9-21	Booster Detonator Building	P	041:21:21.0 0	88:07:34.2	Appears building was converted to office space. (11/96)
			P	041:21:21.0 0	88:07:34.2	Building is empty. (11/96)
	9-33	Change House, Women	P	041:21:21.0 0	88:07:35.1	Fallout shelter-basement flooded. (11/96)
	9-35	Detonator Service Magazine	P	041:21:21.6 0	88:07:26.8	Five gallon can (empty), some wood frame screens. (11/96)
L21		Group 23	P	041:22:10.4 0	88:05:11.0	Small test range operation adjacent to 61-11; dirt mound and large diameter pipe with scaffolding for lifting. Photo 2-1-16.

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L21		Group 23	P	041:22:10.9 0	88:05:16.5	Two 5 inch clay stickup pipes about 3 foot tall adjacent to sewer junction box.
			P	041:21:47.6 0	88:05:41.2	Two foundations; one has 2 pairs of wide concrete pads 3 feet wide, 30 feet long, 1 foot high and set about 1.5 feet apart, the pairs separated by about 12 feet of flush concrete with a trough running between pairs near corner of Central and Road 1 West.
			P	041:21:34.4 0	88:05:37.5	Closed landfill; cap in good condition.
			P	041:21:53.7 0	88:05:06.0	Foundation and 8 inch diameter well casing (about 30 lengths) on ground west of 23-7B.
			A			This is the portion L21 which is considered agricultural tract 79. The lessee has held a lease on this track for ten years. No environmental concerns were identified in the lessee questionnaire.
			P			Sanitary landfill designated to handle domestic garbage and waste. Approximately 2000-3000 feet of pipe with asbestos insulation are being removed. All waste materials are being disposed of here. Permit Number 1982-034-0p 19780401 - Will County.
			A			Contaminants of concern were not identified here and therefore no risks were calculated.
			P			Household trash, plant trash, construction debris and sludge from the sewage treatment plant were disposed in the landfill. Two flooded pits and a berm are also located in this area. Areas of potential concern identified in historical aerial photos include a former coal storage area; a loading dock, and two concrete pads. No environmental impact was observed.
			A			Area west of Road 1 West and south of Central Road had no findings of environmental concern. (11/96)
	23-7	Radio Maintenance Shop	P			Acetylene welding was conducted here.
	61-7	Crushing & Drying	P	041:21:07.8 0	88:05:09.2	In 1977, activities related to demilitarization of 90 mm rounds were conducted here.
			P	041:21:07.8 0	88:05:09.2	This building was occupied by the Uniroyal safety office. There are grinding tools in the building and lead type. We were unable to determine if lead type was cast in the building.
			P	041:21:07.8 0	88:05:09.2	Rework operations were started here for the lots suspended due to light weightiments of PA-66-1 propellant powder.
			P	041:21:07.8 0	88:05:09.2	This building was originally a lab in World War II for Group 61. After the war it was used for a research project. Chicago Research throw away cartridge case was developed here.
			P	041:21:07.8 0	88:05:09.2	Uniroyal used this building for surveillance operations of Ordnance.
			S	041:21:07.8 0	88:05:09.2	Railroad car containing shells for demilitarization was located on northeast side of this building in No.1 car spot.
	61-7	Crushing & Drying	P	041:21:07.8 0	88:05:09.2	In 1968 this building was used as Surveillance Headquarters and Receiving Inspection Headquarters.

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L21	61-11	Power House for Crushing Plant	P	041:22:06.9 0	88:05:09.8	Lessee: IL Division of Criminal Investigation Lease Number: DACA-27-1-85-1 Effective Dates: 12-01-84 to 11-30-89
	61-39	Blast Building	P	041:22:11.3 0	88:05:10.8	This building has a sight in line, with unknown operation in the area, and is built for possible blast process. There is a pipe between this building and 61-7. No apparent environmental concerns in this poured concrete structure.
L33		PVC Area	A			This is the portion of L33 which is considered agricultural tract 41. The lessee has held a lease on this tract at some time during the last seven years. No environmental concerns addressed in lessee questionnaire found in the Appendix were observed by the lessee.
			P			Lessee held lease on tract around 1968. He stated that a prior lessee's cattle had died presumably from something in the ditch which enters the southeast corner of tract 41 and flows to the northwest. According to Art Holz, USACERL sampling in 1993 revealed no problems.
			P			The AT-4 test range has a soil backstop. At the end of their contract, Alliant is required to clean-up the area in accordance with applicable state and federal regulations.
			P			This area will be returned to the Army with Group 3A.
			P	041:22:12.6 0	88:04:13.5	The south central section of L33, contains a large pile of dirt, 20 feet in height, 100 by 30 yards. This appears to have been used for testing of ammunition based upon holes observed in ground and on the sides of the pile. Front of the pile is flanked by a 15 foot tall concrete wall with holes of various sizes in it. Around the above pile (south perimeter) there are broken sand bags and torn heavy duty steel plates. The steel plates constitute a physical hazard. Two of the steel plates are propped up and could fall. About 100 yards southeast of the above pile, there's a culvert with insulation (fiber glass) debris from a demolished tall building 200 yards, due south of pile (41-4). (11/96)
			P	041:22:17.6 0	88:04:01.9	There is a manhole northeast of the L33 backstop. (11/96)
			P	041:22:17.4 0	88:03:58.4	There is a concrete pad located centrally here with an access leading underground to a flooded manhole. There's a ladder equipped with a hand-powered wrench and cable. A box with an electric meter is to the east of the fenced-in area. A blue-green low column is present south of the access (3 foot diameter by 2.5 foot height) (11/96)
			P	041:22:20.2 0	88:03:59.6	There is a leaking manhole north of the fenced area. This manhole has created a stream flowing to the west of L33. (11/96)

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L33		PVC Area	P	041:22:35.6 0	88:04:03.6	There is a manhole with valve wrenches in place at northwest corner of L33. (11/96)
			S			Alliant plans to collect all ordnance related scrap prior to surrender of land. (4/97)
	41-1		P	041:22:05.8 0	88:04:15.3	Concrete building is locked. Access to the building was not gained. Appears to be in good shape from outside. (11/96)
	41-3		P	041:22:05.8 0	88:04:15.3	Concrete building is subdivided by 2 1/2 inch steel plate partitions. There are boxes, spools of wires in a cart and drum. Locked, could not enter. (11/96)
	41-4		P	041:21:54.4 0	88:04:25.4	Building is demolished and has been dismantled except for the steel frame which is still standing. A large quantity of fiber glass insulation that came off this building is spread around the perimeter up to 500 yards away in the field. (11/96)
L34		Former Burning Area	P			There are three separate burn areas within this site. No information is available concerning the type of materials burned here. No other areas of potential concern were identified.
			P			Burning area 2 has numerous dirt mounds, mounds of glass and a large amount of broken crockery. Some crockery and metal is eroding from stream bank. The crock lid has a 8.5 inch diameter and is 2.5 inches deep.
			P			There is a 22 inch diameter culvert discharge to the creek just east of railroad bridge drainage feeds.
			S			In 1942, Building 2-10 may have become a part of this area.
L110		PAS Survey Section L110	P	041:22:27.0 0	88:05:42.2	Culverts and minor construction rubble are piled here.
			P			Piles along east side of Group 63, little or no debris in piles.
			A			The current lessee for agricultural tract 23 which lies in L110, has held a lease on this tract for 5 years. No environmental concerns addressed in lessee questionnaire found in the Appendix were observed by the lessee.
			A			This is the portion of L110 which is considered agricultural tract 30. The current lessee has held the lease on this tract for two years. No environmental concerns addressed in lessee questionnaire found in the Appendix were observed by the lessee.
			P	041:21:43.8 0	88:06:32.9	In a forested area south of Central Road in the central part of L110, are a few foundations. One includes a depressed area which may have been a cellar. The foundations are primarily poured concrete, no wells or septic tanks were observed. It appears to be an old homestead. (11/96)
			P	041:21:36.8 0	88:06:36.9	In the Southern portion of L110, we encountered an east west running depression 400 yards long across and 40 yards across. It has banks on the southern boundary which range from 2 to 5 feet in height. The northern boundary banks are lower. It is very close to the power line on L4. No rubble or similar debris were observed here. (11/96)

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TABLE 4-12
SUMMARY OF OTHER FINDINGS
SECOND LAND TRANSFER TO USDA
JOAAP, WILL COUNTY, ILLINOIS

Section	Building	DESCRIPTION	Status	Latitude	Longitude	Comments
M1		Southern Ash Pile	P			Southern Ashpile covered with native soil and seeded since the Phase I Report.
			P			Sulphur, Sulfate are contaminants of concern in this area according to the Installation Action Plan. Further remediation and groundwater remediation may be required.
			P			Protective cover system on the ash pile was breached causing the release of sulfate and other ash-related chemicals resulting in high sulfate levels in soil, sediment, groundwater, and surface water. The cover system was repaired in 1993. Maximum sulfate concentration about 27,800 ug/g.
			P			The railroad track to the north is acting as a berm. The south side of the railroad track is directing water flow in westerly direction. No water way observed in it. (11/96)
			P	041:20:59.8 0	88:10:09.0	The standing water in the pond is about 20 by 80 yards. (11/96)
			P			A road leaving the magazine area north of M1 leads to an eroded track into the northwest corner of M1, half way to the top of the pile. Three sunken shallow pits were observed atop of the pile. It is not known if the cover has been breached in these locations. (11/96)
			P			Cattle are aggravating the erosion of the pile by trampling the bare spots. (11/96)
			P	041:21:00.0 0	88:09:54.3	Due south 50 yards of southern part of ash pile, there is a berm, vegetated nine foot high mound of dirt. (11/96)
M2		Explosive Burning Ground	P			Anions and metals detected in soil, ground water, and surface water; trace organics detected in groundwater and surface water.
			S			Sulfate in the ground water may be migrating from the ash pile north of the burning ground. Metals and anions are also contaminants of concern in this area according to the Installation Action Plan.
M3		Flashing Grounds	P			From previous sampling: Explosives, anions, and metals detected in soil, ground water, and surface water; trace organics detected in groundwater.
			P			1) VOC's - Results of several studies indicated the presence of low concentration (less than 1 ug/g) of explosives in one or two of more than 30 groundwater samples. Groundwater samples taken in wells near the fenced in area also had detectable levels of VOC's. Seven explosives detected in 23 soil sampling. Highest concentrations were 1,100 ug/g TNT and 300 ug/g TNB. Seven VOC's detected in 12 groundwater samples. Maximum concentrations ranged from 0.932 ug/g for 1,2-Dichloroethylene to 392 ug/g for Toluene. Four VOC's: 1,1 Dichloroethane; 1,2-DCE; Benzene; and Toluene are believed to be site related. These chemicals of concern were found downgradient from an oil spill in the fenced-in area.

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JOAAP, WILL COUNTY, ILLINOIS

Section	Building	DESCRIPTION	Status	Latitude	Longitude	Comments
M3		Flashing Grounds				2) Metals - 14 metals found in concentrations above background levels (e.g., iron, magnesium, calcium, lead, mercury, antimony, and cadmium).
			S			Volatile organic compounds, semivolatile organic compounds, metals and anions are all considered contaminants of concern for this area according to the Installation Action Plan. Soil remediation is anticipated to address metal contamination. Groundwater remediation is anticipated to address organic contamination.
			P			*Much of the east area in the fenced area has broken* ceramic insulators, wood pieces, scattered fire brick and small pieces of scrap metal. (11/96)
			P	041:22:30.2 0	88:10:16.9	On the south side of fenced area adjacent to gate there is broken concrete and clay pipe covering a large area, about 50 by 20 feet. Clay pipe has gray caulking material in joints. The fibers are visible. The caulking is suspected to be asbestos putty made on site. Other area debris include bricks, rebar, ceramic insulators, transite, pipe and metal, covering about 1 to 2 acres on the south side of fence. (11/96)
			P	041:22:31.3 0	88:10:15.1	There is a pile about 8 feet high 30 feet wide near the center of fenced area. The pile contains metal debris, ceramics, railroad ties and large amounts of wire. (11/96)
			P	041:22:30.1 0	88:10:15.5	A pile about 4 feet high 20 feet wide has metal scraps in it. (11/96)
			P	041:22:33.2 0	88:10:16.0	Northwest of fenced area there are very heavy pipes and heavy metal sheeting. Pipes and sheeting may be lead. Some pipes stamped "Tellurium", about ten 5-10 feet lengths of pipe. There is also a 2 by 2 foot pile that also appears to be lead. (11/96)
	TS-1171	Burning Ground Office	P			Battery charging unit was transferred from Magazine Section within the first six months of 1957.
M4		Lead Azide Area	S			Lead, TNT/RDX, Anions, Metals, and Organics - Area used for production and storage of lead azide wastes prior to neutralization and discharge to Grant Creek. Active from 1966-1968. Settling pond measured 45 by 45 by 4 feet (400 cubic yards). Southwest corner of area used to store barrels of DNT; duration and extent unknown. Area received overbank flooding from Red Water Lagoon and the North branch of Grant Creek. Depth to bedrock: 2 feet. Soils: clay.
						From previous sampling: Explosives, anions and metals detected in soil, ground water, surface water and sediments; trace organics detected in ground water and sediments.
			S			Lead is a contaminant of concern in this area according to the Installation Action Plan. The media of concern are soil and sediment. Remediation of metals contaminated soil will be necessary.
			P			During the last activation (1966-1976), this area was declared excess and not used for production. Subsequently it was demolished.

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SECOND LAND TRANSFER TO USDA
JOAAP, WILL COUNTY, ILLINOIS

Section	Building	DESCRIPTION	Status	Latitude	Longitude	Comments
M4		Lead Azide Area	A			Water and sediment samples were taken from agricultural track 109 in August 1990. Nitrate levels were not above those found in fertilized fields.
			P	041:22:55.9 0	88:09:59.5	There is an outside storage of 5 large pressure vessels, 2 large heat exchangers, and 9 lengths of pipe with fiberous insulation. (11/96)
	704-15	Supervisor's Office	P			Lab - portions of this building were used as labs.
			R			During February 1981, this building was disposed of by controlled burning.
	721-5	Laboratory	P			Lab - portions of this building were used as labs.
	861-13	Loading Salt Cake Ash	P			Red water ash was loaded into rail cars here. Ash particles in the air during this operation were too numerous to count.
			P			A 1971 industrial hygiene survey indicates loading of red water ash into railroad cars took place in this building.
	1206	Ammonia Storage	P	041:23:04.1 0	88:10:05.2	This is a 100 by 40 foot semicircular metal building that stored pump system equipment pipes and various lines. A cast iron stick-up, 2.5 feet above ground about 5 inches diameter at top, is located north of the building. The latter could not be opened. A 1954 map in the administration office depicts this building as "ammonia storage".
	1224		R			During February 1981, this building was disposed of by controlled burning.
	TS-1242	Hut, Quonset	P	041:22:57.5 0	88:09:58.0	This building and Building TS-1243 are connected. Miscellaneous equipment is stored inside. (11/96)
M5 U		Tetryl Production Area-USDA Portion				
M10 U		Toluene Tank Farms USDA Portion				
M11		Landfill	P			Landfill Cap Erosion - erosion of landfill cap observed at south end during ECAS Review on December 1, 1994 and on October 21, 1994 quarterly inspections.
			P			Study Area M11 includes a low ridge composed largely of gravel. This ridge was mined for gravel in several places. The excavated openings were used to dispose of a variety of wastes. Concentrations of sulfate in samples from 8 monitoring wells ranged from 45 to 2100 mg/L.
			P			Sulfur and Sulfate are the contaminants of concern in this area according to the Installation Action Plan. The medias of concern are groundwater, soil and sediment. The area was capped in 1985. At this time of the Installation Action Plan (6/12/95) it was unknown whether future remediation efforts would be necessary.
			P			The ash pile in this area was capped by a covering with a plastic barrier, approximately 12 inches of clay and 6 inches of top soil and seeded with grass. It was used from 1967 to 1976.
			P	041: : . 0	88:88:88.8	In the vicinity of piles of earth and gravel there is assorted debris (southeast of M11). (11/96)

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SECOND LAND TRANSFER TO USDA
JOAAP, WILL COUNTY, ILLINOIS

Section	Building	DESCRIPTION	Status	Latitude	Longitude	Comments
M11		Landfill	P	041:21:59.2 0	88:09:58.3	M11, northeast quadrant, low land bare area, probably a pond bed, no standing water. It is 75 by 100 feet, near A line road. It is natural, no indication of leaching as being the cause of the bare area, however cattle have trampled it. (11/96)
M12		Sellite Manufacturing Area	P			Sulfate may have entered the ground water via discharge of wastewater from the plant to ditches and the lagoon.
			P			A fire occurred in #2 Sellite Plant on May 18, 1974 that caused $20,000 structural damage to the building. The facility is inactive so there was no impact on the production schedule. The fire originated in the molten sulfur pit where it enters the wooden building and was probably due to spontaneous combustion.
			P			Wastewater from gas scrubbing in this area contained sulfur, ash, sulfate and impurities. Other wastes included spills of soda ash and sellite solutions, floor washing, and spill cleanups.
	307	Sellite Storage & Mixing House	P			There are some lead pipes inside this building. This building also contains large processing vats, boilers, heat exchangers and other equipment as tall as three stories. There is a grounded cathodic protection system on the side of the building. (11/96)
	307-1	Process House	P			There are lead pipes in this building. (11/96)
			P			There are foundation remnants of another building in front of this building. (11/96)
M14		Former Pond Area	P			Contaminant of concern for this area according to the Installation Action Plan are: metals, SVOC's, and Phosphorous - Contamination significant enough to warrant remediation was not detected during the investigation phase (media of concern: soil). No further action planned.
			P	041:23:00.0 0	88:09:10.6	There is a 9 by 10 by 6 feet deep sink hole with a foot of water running inside. The water flows into a steel culvert.
			P			There is a 20 by 20 foot (approximately) area covered by galvanized sheet metal in the north-east corner of M14. (11/96)
			P	041:22:35.0 0	88:10:34.2	There are old foundations observed in clump of trees at 100 yards south of northeast. There was 1 slab dated September 8, 1903. No physical hazards observed. (11/96)
			P	041:22:26.2 0	88:10:39.5	120 yards diagonal from northeast corner of section, encountered a stone wall. About 300 yards to the west we saw another stone wall.
			P	041:22:21.9 0	88:10:35.1	We encountered a 'pond' in the South West corner of section. We estimated the 'pond' to be 75 by 150 feet. There was no standing water, but the muddy bottom had been trampled by cattle. The terrain was relatively flat, well grazed grass, a few trees, primarily along the edges.
M15		Sewage Treatment Plant	S			Contaminants of concern for this area according to the Installation Action Plan: are metals, SVOC's, and anions. Contamination significant enough to warrant remediation was not detected during the investigation phase.

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Section	Building	DESCRIPTION	Status	Latitude	Longitude	Comments
M15		Sewage Treatment Plant	P			This sewage treatment plant receives sewage from the manufacturing side of the facility. The treated effluent discharges to Grant Creek via NPDES permitted outfall. NPDES Permit IL 002666.
			P			The Engineering Department accepted a recommendation consisting of a Red-Linseed-Oil Primer and a Red-Lead-Phenolic-Varnish top coat as a painting system for the precipitators.
			R			This plant shut down in 1982 when a new treatment plant was constructed approximately 50 yards to the north. This plant was removed from operation because it could no longer meet NPDES requirements. The treated effluent was discharged into a ditch and contained high levels of dissolved oxygen.
			P			This plant reportedly received wastes from operational areas within the MFG Area and from the Administrative Area. It was reported that sludge may have been dumped at the Southern Gravel Pit.
	505-3	Sewage Treatment Plant	P	041:23:24.5 0	88:09:57.7	Much progress has been made to reduce or eliminate the infiltration problem at this plant. The plant collection system is comprised of about 10 miles of gravity sewers, four lift stations and two miles of force mains. All flows above 0.775 MGD received primary settling and disinfection and were then bypassed to the red water ditch. New sand was put on the drying beds. However, these beds were constructed nearly 30 years ago (1941), and the condition of the underdrains is unknown.
			P	041:23:24.5 0	88:09:57.7	There is a small laboratory inside this building. The basement of this building is flooded. (11/96)
	505-3-1	Sewage Tank, Final Treatment	P	041:23:24.0 0	88:09:57.0	The sewage treatment tanks are filled with water. (11/96)
M99		TNT Block Area (M6A)	P	041:23:22.1 0	88:09:56.6	There are four 30 by 12 foot concrete pads just east, 12 feet from west TNT Road. They look old as evidenced by cracking and general weathered appearance.
			P	041:23:17.7 0	88:09:58.0	Wooden Junction Box Pipe (unknown type) evident crossing base. Unit has 1 foot of water in bottom. Dead animals present - southeast of M99.
			A			An exception was granted for the lack of quantity distance between Battery Station and Block Press Buildings in the Block Press Area.
			P			A muffler consisting of a drum packed with loose rock was installed on all presses to remove the oil from the press air exhaust.
			P			There are 5 concrete foundations along the east side of this area. (11/96)
			P			A 4 by 5 foot low wooden box, 4 to 5 feet deep with 6 to 12 inches of water is in line with valve. The water in the box is clear. This structure is located in the southeast portion of the section. (11/96)
M105		PAS Survey Section M105	P			Along the western perimeter of area, there are multiple piles that contain large rocks.

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Section	Building	DESCRIPTION	Status	Latitude	Longitude	Comments
M105		PAS Survey Section M105	P	041:22:54.6 0	88:10:25.8	Two concrete pillars are located in this area.
			P	041:23:12.2 0	88:10:26.2	A second set of pillars, 4 of them, is located north of previous. This set also has a 3 foot by 18 inches pad located 6 feet from the pillar. Pillars are only 6 inches tall.
			S	041:23:43.7 0	88:10:28.6	Another set of concrete pillars (pads western section) is located in this area.
			P	041:24:23.3 0	88:09:59.6	Another concrete pillar, pad in northern portion of site, 100 yards west of lever.
			P			Another set of concrete pillars, pad located in northern portion of site, 100 feet west of lever.
			P	041:24:17.2 0	88:09:40.6	Two large series of piles exist on both sides of Drummond Road as it heads NW/SE at the Northeast section of M105. Each pile is 250 feet long and 50 feet wide. Characterized almost exclusively with rocks and concrete, some pipe.
			P	041:22:58.4 0	88:10:01.7	Two by two inch metal cover encroached with vegetation, cannot access. Not sure what it is.
			P	041:22:47.9 0	88:10:30.8	Fifteen by fifteen foot pad area, has an access from the road and different vegetation covers than surrounding areas.
			P	041:23:06.9 0	88:10:26.1	Fifteen by fifteen foot pad area, has an access from the road and different vegetation covers than surrounding areas.
			S	041:23:26.1 0	88:10:26.9	Fifteen by fifteen foot pad area, has an access from the road and different vegetation covers than surrounding areas.
			S	041:23:55.3 0	88:10:28.6	Fifteen by fifteen foot pad area, has an access from the road and different vegetation covers than surrounding areas.
			P	041:23:40.6 0	88:10:25.6	Fifteen by fifteen foot pad area, has an access from the road and different vegetation covers than surrounding areas.
			A			This is the portion of M105 which is considered agricultural track 109. The current lessee has held the lease on the track for 5 years. No environmental concerns addressed in lessee questionnaire found in the Appendix were observed by the lessee.
			A			This is the portion M105 which is considered agricultural tract 111. The current lessee has held the lease on the tract for 5 years. No other environmental concerns addressed in lessee questionnaire found in the Appendix were observed by the lessee.
			P	041:23:06.0 0	88:10:27.2	There is a building containing glassware, and cords which gives the appearance of a laboratory, located 50 feet north of pole 229.
			P	041:24:02.5 0	88:09:47.2	There are 3 large (9 by10 by 15 foot) steel boxes at the eastern tip of the sellite manufacturing area, immediately north of bldg. 814. J. Ciskos stated these items were from the DNT manufacturing buildings. (11/96)
			P			There are steel structural building materials around the Box factory in the north east portion of M105. (11/96)
			P			There are 2 bare spots on the norhteastern tip of M105. The bare spot could possibly be clay.

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Section	Building	DESCRIPTION	Status	Latitude	Longitude	Comments
M105		PAS Survey Section M105	P			There are "oil scratches" (cattle rubs) near ruins of old walkway, north west of M6. There are 2 cylinders approximately 5' in high, both full of fluid which appeared to be petroleum based. There is also agricultural debris in this area.
	739-1	Acid Resistant Putty Building	P			This building was the putty plant.
			P			Building appears to be in good shape and contains some sort of a machinery for perhaps mixing. (11/96)
	814	Factory & Shook Storage	P			Box reconditioning, representing an appreciable supplement to the factory's output, was originally carried out in a building removed from the factory proper.
						Since this building was not suitable for tenancy in inclement weather, a new building, adjoining the box factory, was erected to house the reconditioning operation.
			R			Argonne National Laboratories cancelled the 3 year Permit No. Da-11-032-ENG-7188 to cover the use of storage space in the Box Factory Building.
						As of December 14, 1960, all machinery and equipment there had either been shipped to Argonne or moved to Building 713, under permit NO. DA-11-032-ENG-7028.
			P			In November 1959 approximately 25,000 square feet of floor area in this building, together with truck docks and rail facilities adjoining the building, were made available to Argonne National Laboratory in accordance with three year Permit No. DA-11-032-ENG-7188 issued to Atomic Energy Commision under date of November 20, 1959.
			P			The production of new boxes was greatly reduced during April 1 to June 30, 1943 because of an increased rate of return of used boxes from the loading plants. About 515,944 returned boxes were reconditioned for reuse
			P			Atomic bomb components were stored in this building.
			P			In bay 25, there are several racks of wood stacked inside, about 400 of them. Some steel doors and rolling racks are lying on the floor. (11/96)
			P			Bay 23 is mostly empty, except for some broken doors lying on the ground. There are about 15 empty drums here and about 5 drums with unknown materials. There is a trough that runs through bay 31 and 23. (11/96)
			P			Large iron tubes are on the floor of this building. (11/96)
			P			Bay 6 is empty except for some large machine parts. (11/96)
			S			Bay 25 has rolls of large belt like material. (11/96)
M108		PAS Survey Section M108	P	041:21:47.2 0	88:08:59.1	Broken tile drains have created open holes to several feet deep in the southeast portion of this section. Safety hazard.
			P	041:22:38.0 0	88:08:59.1	Rubble pile 30 by 20 by 6 feet
			P			ATF has Igloos 811-2,3,4
			P	041:22:01.9 0	88:10:01.4	Pit 50 by 50 by 15 foot, no debris, well vegetated area has been extensively reworked.

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Section	Building	DESCRIPTION	Status	Latitude	Longitude	Comments
M108		PAS Survey Section M108	P	041:21:54.2 0	88:08:43.6	6 foundations, numerous dirt piles, 2 piles of broken asphalt
			P			Relatively high levels of heavy metals found in soil samples. A stricter sampling is recommended based on the results of this study.
			A			This is agricultural tract 108. The current lessee has held a lease on this tract for 20 years. No environmental concerns addressed in lessee questionnaire found in the Appendix were observed by the lessee.
			P			This area contains igloos for storage of TNT, tetryl, DNT, and lead azide.
			P	041:21:55.6 0	88:10:17.5	There is a 10 foot high vegetated pile in the shape of a croissant, at the south west end of M108. This is an irregularity in the terrain, east of West Patrol Road due South. (11/96)
			P	041:22:34.4 0	88:09:54.9	Pile of bare dirt 4 foot in height and 15 foot diameter (100yds.) South of Blodgett Road. 100 yards west of A line Road. (11/96)
M118		Grant Creek East	P	041:22:31.6 0	88:11:17.2	There are 3 building foundations 50 feet from the creek. (11/96)
			P			There are dirt mounds along much of the east side of the creek. No debris was noted in the piles. (11/96) This section is a portion of parcel 5 which was studied during the Phase 2 RI. A soil core (3 samples), a groundwater, and a sediment sample were collected and analyzed for lead and explosives. Lead was only detected in the surface soil at 18 ppm. RDX (7.13 ppb) was detected in one of four samples collected from the well and copper was detected at 314 ppb in the one sample analyzed for additional metals.
M119		Grant Creek West	P	041:22:46.3 0	88:13:32.7	There is a metal box, 4 by 4 by 4 foot, in water on the east side of the creek. The metal box appears to be a refrigerator. (11/96)
			P	041:22:54.4 0	88:13:30.8	A structure, possibly an outfall or intake, is in a small inlet one fourth a mile from the bridge near the creek. (11/96)
			P	041:23:16.1 0	88:13:37.5	There is a marina on the east side of the cutoff at the bridge over the creek, on the west side. (11/96)
			P	041:22:39.1 0	88:13:26.8	There is a junk car in the creek beneath high tension wires near the intake building. (11/96) This section is a portion of parcel 5 which was studied during the Phase 2 RI. Four soil cores (10 samples), two groundwater samples, four surface water samples, and 24 sediment sample were collected and analyzed for lead and explosives. Lead was detected in 7 of 10 soil samples (12 to 172 ppm), 8 of 24 sediment samples (13 to 518 ppm), and 3 of 4 surface water samples (5 to 10 ppb). Explosives were only detected in one of the wells (0.35 ppb TNT) but only in the duplicate and not during previous sampling.

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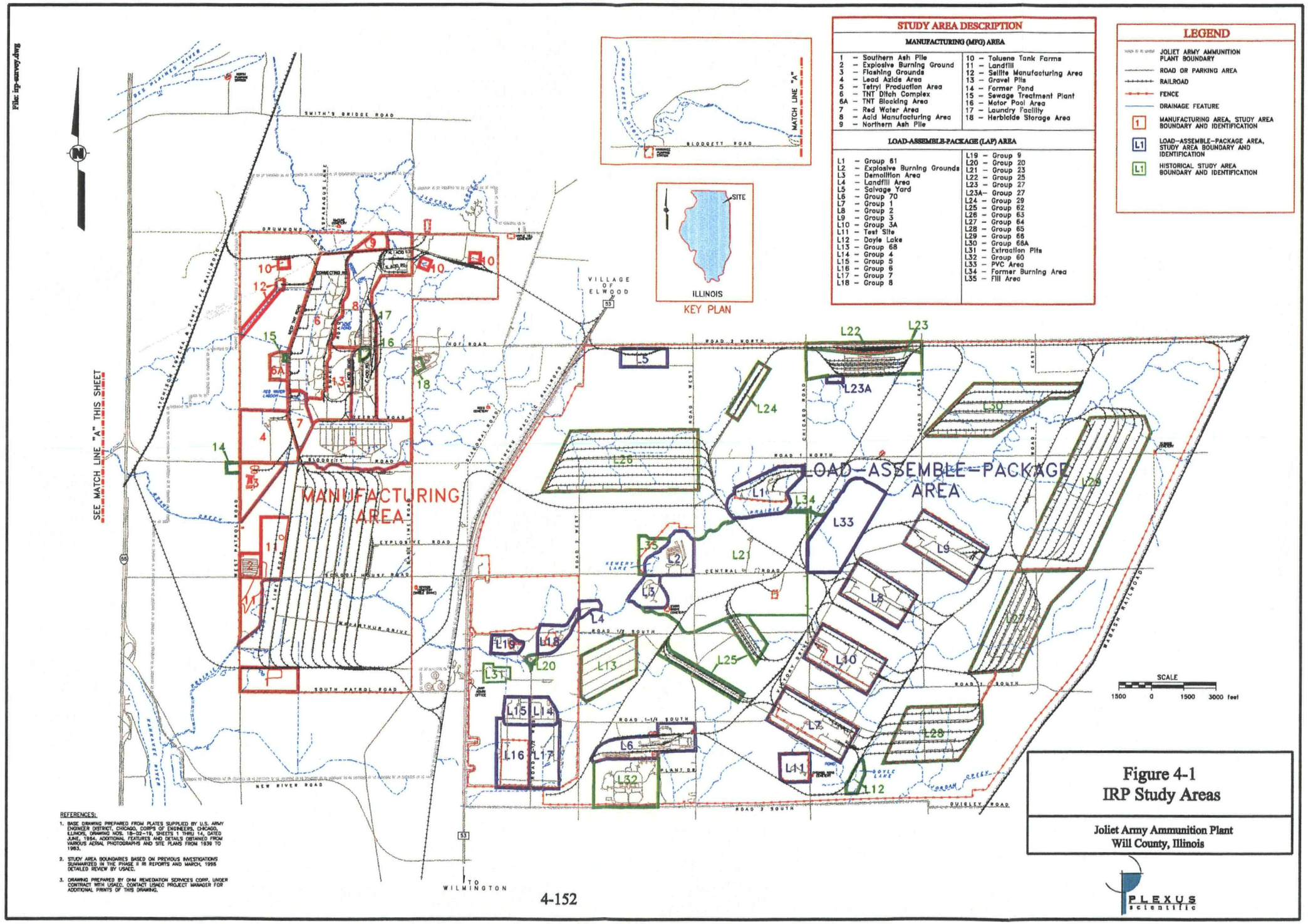


STUDY AREA DESCRIPTION

MANUFACTURING (MFG) AREA

1 – Southern Ash Pile	10 – Toluene Tank Farms
2 – Explosive Burning Ground	11 – Landfill
3 – Flashing Grounds	12 – Sellite Manufacturing Area
4 – Lead Azide Area	13 – Gravel Pits
5 – Tetryl Production Area	14 – Former Pond
6 – TNT Ditch Complex	15 – Sewage Treatment Plant
6A – TNT Blocking Area	16 – Motor Pool Area
7 – Red Water Area	17 – Laundry Facility
8 – Acid Manufacturing Area	18 – Herbicide Storage Area
9 – Northern Ash Pile	

LOAD-ASSEMBLE-PACKAGE (LAP) AREA

L1 – Group 61	L19 – Group 9
L2 – Explosive Burning Grounds	L20 – Group 20
L3 – Demolition Area	L21 – Group 23
L4 – Landfill Area	L22 – Group 25
L5 – Salvage Yard	L23 – Group 27
L6 – Group 70	L23A – Group 27
L7 – Group 1	L24 – Group 29
L8 – Group 2	L25 – Group 62
L9 – Group 3	L26 – Group 63
L10 – Group 3A	L27 – Group 64
L11 – Test Site	L28 – Group 65
L12 – Doyle Lake	L29 – Group 66
L13 – Group 68	L30 – Group 66A
L14 – Group 4	L31 – Extraction Pits
L15 – Group 5	L32 – Group 60
L16 – Group 6	L33 – PVC Area
L17 – Group 7	L34 – Former Burning Area
L18 – Group 8	L35 – Fill Area

LEGEND

- JOLIET ARMY AMMUNITION PLANT BOUNDARY
- ROAD OR PARKING AREA
- RAILROAD
- FENCE
- DRAINAGE FEATURE
- 1 – MANUFACTURING AREA, STUDY AREA BOUNDARY AND IDENTIFICATION
- L1 – LOAD-ASSEMBLE-PACKAGE AREA, STUDY AREA BOUNDARY AND IDENTIFICATION
- L1 – HISTORICAL STUDY AREA BOUNDARY AND IDENTIFICATION

REFERENCES:

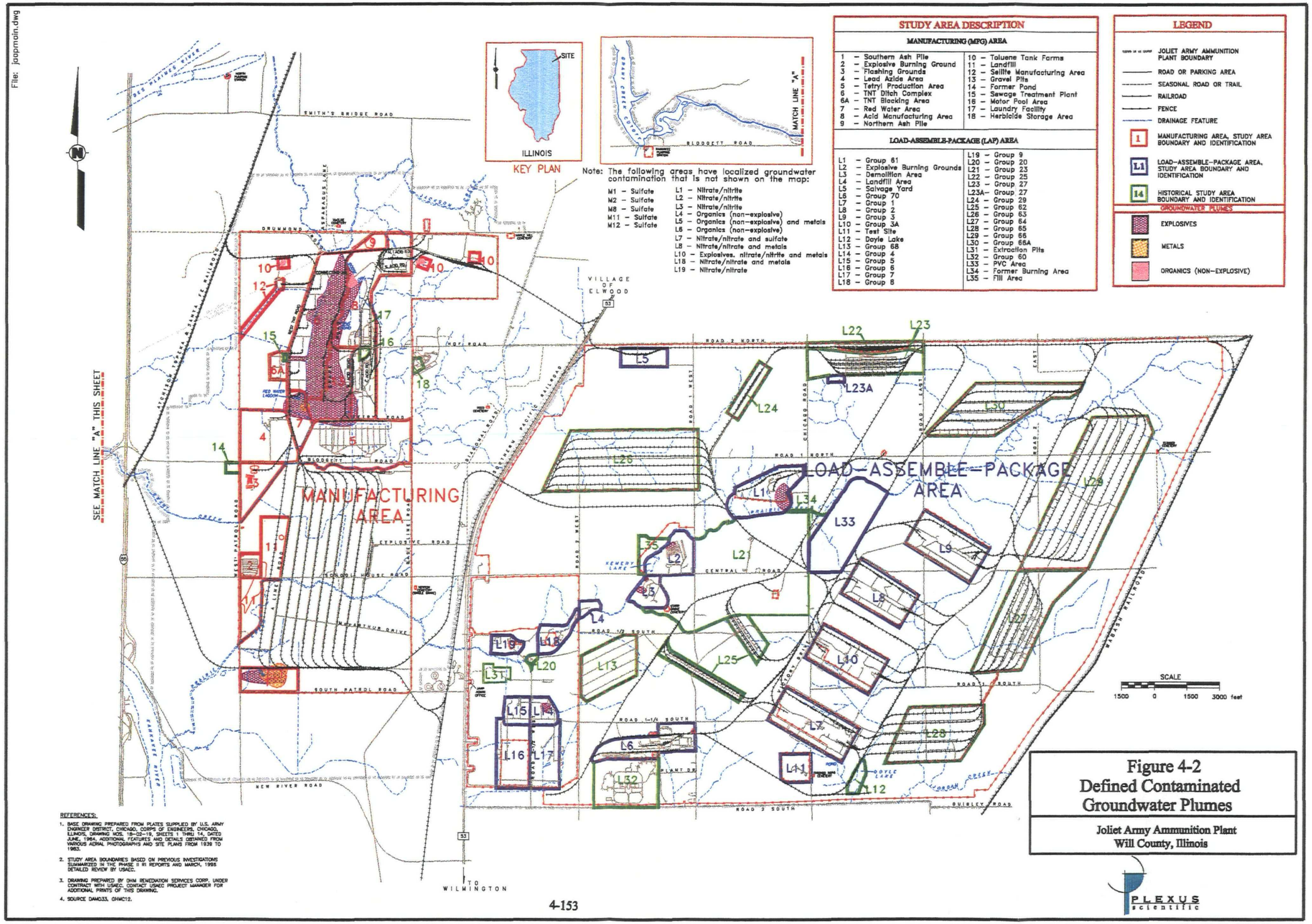
1. BASE DRAWING PREPARED FROM PLATES SUPPLIED BY U.S. ARMY ENGINEER DISTRICT, CHICAGO, CORPS OF ENGINEERS, CHICAGO, ILLINOIS, DRAWING NOS. 18-02-15, SHEETS 1 THRU 14, DATED JUNE, 1984. ADDITIONAL FEATURES AND DETAILS OBTAINED FROM VARIOUS AERIAL PHOTOGRAPHS AND SITE PLANS FROM 1939 TO 1983.
2. STUDY AREA BOUNDARIES BASED ON PREVIOUS INVESTIGATIONS SUMMARIZED IN THE PHASE II RI REPORTS AND MARCH, 1995 DETAILED REVIEW BY USAEC.
3. DRAWING PREPARED BY O+M REMEDIATION SERVICES CORP. UNDER CONTRACT WITH USAEC. CONTACT USAEC PROJECT MANAGER FOR ADDITIONAL PRINTS OF THIS DRAWING.

Figure 4-1
IRP Study Areas

Joliet Army Ammunition Plant
Will County, Illinois

PLEXUS scientific

File: jaapmain.dwg



STUDY AREA DESCRIPTION

MANUFACTURING (MFG) AREA

1 – Southern Ash Pile	10 – Toluene Tank Farms
2 – Explosive Burning Ground	11 – Landfill
3 – Flashing Grounds	12 – Sellite Manufacturing Area
4 – Lead Azide Area	13 – Gravel Pits
5 – Tetryl Production Area	14 – Former Pond
6 – TNT Ditch Complex	15 – Sewage Treatment Plant
6A – TNT Blocking Area	16 – Motor Pool Area
7 – Red Water Area	17 – Laundry Facility
8 – Acid Manufacturing Area	18 – Herbicide Storage Area
9 – Northern Ash Pile	

LOAD-ASSEMBLE-PACKAGE (LAP) AREA

L1 – Group 61	L19 – Group 9
L2 – Explosive Burning Grounds	L20 – Group 20
L3 – Demolition Area	L21 – Group 23
L4 – Landfill Area	L22 – Group 25
L5 – Salvage Yard	L23 – Group 27
L6 – Group 70	L23A – Group 27
L7 – Group 1	L24 – Group 29
L8 – Group 2	L25 – Group 62
L9 – Group 3	L26 – Group 63
L10 – Group 3A	L27 – Group 64
L11 – Test Site	L28 – Group 65
L12 – Doyle Lake	L29 – Group 66
L13 – Group 68	L30 – Group 66A
L14 – Group 4	L31 – Extraction Pits
L15 – Group 5	L32 – Group 60
L16 – Group 6	L33 – PVC Area
L17 – Group 7	L34 – Former Burning Area
L18 – Group 8	L35 – Fill Area

LEGEND

- JOLIET ARMY AMMUNITION PLANT BOUNDARY
- ROAD OR PARKING AREA
- SEASONAL ROAD OR TRAIL
- RAILROAD
- FENCE
- DRAINAGE FEATURE
- 1 – MANUFACTURING AREA, STUDY AREA BOUNDARY AND IDENTIFICATION
- L1 – LOAD-ASSEMBLE-PACKAGE AREA, STUDY AREA BOUNDARY AND IDENTIFICATION
- 14 – HISTORICAL STUDY AREA BOUNDARY AND IDENTIFICATION

GROUNDWATER PLUMES

- EXPLOSIVES
- METALS
- ORGANICS (NON-EXPLOSIVE)

REFERENCES:

1. BASE DRAWING PREPARED FROM PLATES SUPPLIED BY U.S. ARMY ENGINEER DISTRICT, CHICAGO, CORPS OF ENGINEERS, CHICAGO, ILLINOIS, DRAWING NOS. 18-02-19, SHEETS 1 THRU 14, DATED JUNE, 1964. ADDITIONAL FEATURES AND DETAILS OBTAINED FROM VARIOUS AERIAL PHOTOGRAPHS AND SITE PLANS FROM 1939 TO 1983.
2. STUDY AREA BOUNDARIES BASED ON PREVIOUS INVESTIGATIONS SUMMARIZED IN THE PHASE II RI REPORTS AND MARCH, 1996 DETAILED REVIEW BY USACC.
3. DRAWING PREPARED BY DHM REMEDIATION SERVICES CORP. UNDER CONTRACT WITH USACC. CONTACT USACC PROJECT MANAGER FOR ADDITIONAL PRINTS OF THIS DRAWING.
4. SOURCE DAMO33, OHMC12.

Figure 4-2
Defined Contaminated Groundwater Plumes

Joliet Army Ammunition Plant
Will County, Illinois

PLEXUS scientific

5. SUMMARY

This report documents the results of a USAEC Preliminary Assessment Screening of a portion of JOAAP, a U.S. Army facility in northeastern Illinois that has been declared excess. The PAS entails an evaluation of existing structures and environmental conditions on a portion of the JOAAP property consisting of the USDA2 parcel which by Act of Congress will be transferred to the USDA (BILL01). Separate reports cover property designated for transfer to other entities).

The Act transferring this property states that the Army will transfer only those portions of the Arsenal property that the Secretary of the Army and the Administrator of USEPA agree require no further action under any environmental law, and that, accordingly, are exempted from further study (BILL01). This report will be used to assist these parties in reaching an agreement.

The PAS involved four processes: (1) a review of practically obtainable and reasonably ascertainable records; (2) a site survey; (3) interviews with knowledgeable persons; and (4) generation of the final PAS report. Its objective was to uncover and document evidence of any hazardous or toxic substances that would require a CERCLA 120(h) Notice and to identify other areas of potential concern for human health and the environment. A list of compounds used, stored, released, or disposed of on the parcel covered by this PAS and potentially subject to the CERCLA 120(h) Notice requirement is presented in Appendix E. Contamination of environmental media is discussed in Appendix D.

Records concerning historic practices and operations that could have resulted in the release or disposal of hazardous materials are incomplete. Ongoing investigations continue to develop information relating to the nature and extent of contamination in previously identified areas of contamination. The PAS, however, involved a diligent effort to identify potential problems and thus enable appropriate decisions-making and agreements by future owners concerning

transfer of the property. Data gaps or discrepancies identified during the PAS were investigated to the extent possible; however, the project scope did not allow for verification of all findings.

Conditions that could adversely impact environmental quality or human health given the planned property uses (i.e., transient public access, waste disposal (landfill use), grazing, agricultural crops) are identified in this PAS report. Most of the environmental concerns relative to JOAAP have been previously identified and are being addressed by the IRP. Many of the rest involve conditions having only minor impact and can probably be resolved through Memoranda of Understanding or deed restrictions. Some, however, may involve nonquantifiable risks to human health. For example, transfer of buildings classified as having a 3X level of explosive contamination or property potentially containing UXO involves risks that are not quantifiable.

This section is organized broadly by category of environmental issues. Information organized by specific portions of and structures on the property is provided in Appendices B, C, and D. Findings are based upon currently available information, applicable regulations, and professional judgment. In some instances, information regarding a specific concern is incomplete.

General information regarding the nature and extent of contamination and regulations are provided in the report. However, a detailed analysis of the nature and extent of contamination and an elaboration of appropriate requirements are beyond its scope. References are given throughout the document to direct the reader to an appropriate source for more detailed information. The findings of this report reflect conditions in effect and documentation available at the time of the field surveys.

5.1 Summary of Environmental Conditions

The following subsections present a summary of significant findings. The subsections in Section 5.1 correspond with those in Section 4. More detail concerning the findings and regulations can be found in Section 4 and the Appendices.

5.1.1 Hazardous Materials and Wastes

Hazardous waste and hazardous materials are defined by CERCLA, 42 USC 9601-9675, as amended, and the Solid Waste Disposal Act, as amended by RCRA, 42 USC 6901-6992, as amended. In general, the term hazardous is used in reference to substances that because of their quantity, concentration, or physical, chemical, or infectious characteristics may present substantial danger to public health or welfare or the environment. Information concerning permits held is presented in Section 2.2.3.

Both the LAP and MFG Areas have been included on the NPL. Areas of environmental concern relating to hazardous materials and wastes have been studied since the 1970s under the IRP. Manufacturing operations involving chemicals and explosives occurred in L1, L7, L8, L9, L10, L14, L15, L18, L19, M4, M5, M6A (a.k.a. M99), and M12. Significant storage operations occurred at M10. Sites L1, L2, L3, L4, L5, L34, M1, M2, M3, M11, M12, and M15 were involved in treatment and disposal of wastes. Munitions testing occurred at L18 and L33. These areas are discussed in Section 5.1.3.

Information concerning the types, quantities and duration of storage of hazardous materials previously used at JOAAP is limited. In many cases, the only available documentation the types of materials potentially stored in an area is the description of that area or building (i.e., High-Explosive Storage Magazine). The information available has been collected (refer to Appendix E) so that the notice requirements of 40 CFR 373 can be met.

During the PAS site surveys, various full, partially full, or empty chemical containers were observed in several locations throughout the parcel. Although some of the containers were labeled, the contents of these were not positively identified. Table 4-2 and Appendixes B and C contain more information about the locations of these containers and the labeling (FIEL01).

Buildings 3A-5, 3A-7, 4-5, and 5-3 have been used by Alliant as hazardous waste satellite accumulation areas (MEMO05). During the PAS site survey drums or containers of potentially hazardous materials were observed in or adjacent a number of buildings. M10 was used for bulk storage of toluene and xylenes. Findings relating to hazardous materials and chemicals are presented in Table 4-2.

5.1.2 Solid Waste

Solid waste disposal and management is regulated under the Illinois Solid and Special Waste Management Regulations. Closure and postclosure requirements for disposal units are specified in 35 IAC 811.110 and 811.111.

Several issues relating to solid waste were identified. A number of dumps and disposal areas are located around the facility. All major disposal areas are within the existing IR sites. Disposal sites within the USDA2 parcel include L1, L2, L3, L4, M1, M2, M3, and M11. For further discussion of the IRP sites refer to Appendix D.

Aged, treated wood products no longer in use are subject to waste classification procedures under the Illinois Administrative Code at 35.722.111 and 721.104(b)(9). IEPA has determined, in accordance with USEPA guidance, that weathered treated wood products (refer to Section 4.1.2 of the PAS for further definition) may be disposed of as solid waste. According to the interpretation of regulations presented in Section 4.1.2 and discussions with state regulators (MEMO06), weathered, treated wood products present at JOAAP can be abandoned in place.

The Southern Ash Pile (M1) was generated through the incineration of TNT byproducts. The pile has been capped by covering with a plastic barrier, approximately 12 inches of clay and six inches of topsoil and seeded with grass (ACOE01, ARMY01).

5.1.3 IRP Sites

The object of the IRP is to identify potential threats to human health and the environment and subsequently to take the steps necessary to minimize or eliminate unacceptable risks. The IR studies are conducted in accordance with the requirements of CERCLA and the NCP. This includes determination of the nature and extent of contamination that defines the boundary of the CERCLA study areas. Descriptions of the IRP sites are provided in Appendix D.

JOAAP has 53 separate IRP sites, as shown in Figure 4-1. General descriptions and environmental conditions at IRP site areas are presented in Appendix D. RIs have been performed at all of the sites, and where appropriate, a risk assessment has also been conducted. A summary of the results of the risk assessment for JOAAP is presented as Table 4-3.

There are 35 IRP sites in the LAP Area and all or part of 16 (L1, L2, L3, L4, L5, L7, L8, L9, L10, L14, L15 L18, L19, L21(part), L33, and L34) are included in the USDA2 parcel (DAMO06). A total of 18 IRP study areas lie in the MFG Area and all or part of 11 (M1, M2, M3, M4, M5, M6A, M10, M11, M12, M14 and M15) are included in the USDA2 parcel. During conduct of the PAS, the former TNT Blocking Area was identified as an additional area of possible environmental concern and was subsequently designated M6A. The Army has determined that no further remedial action is required at five IRP sites (L19, L21, L34, M14, and M15) on the USDA2 parcel. These sites are discussed in the JOAAP FSs and regulatory concurrence is expected.

The baseline human health risk assessments were used in conjunction with the RIs to determine sites requiring no further action. At study areas where site related contaminants

were identified, potential risks to human health were calculated based upon RME scenarios. The RME provides a conservative estimate (i.e., well above average) of risk that is still within the range of possible exposures. Risks calculated for some scenarios at IRP sites M1, M2, M3, M5, M10 (west farm), M15, L1, L2, L3, L4, L5, L7, L8, L9, L10, L14, L18, and L19 were either above the USEPA point of departure for carcinogenic risks or at a level indicating that non-carcinogenic health effects are possible. Refer to Table 4-3 for risk characterizations.

The Proposed Plan for JOAAP is currently being developed and a Record of Decision is anticipated in June 1998. Sites potentially requiring further action have been grouped into OUs based upon the media of concern or type of site. The OUs have been further broken into RUs based upon the contaminants of concern.

PRGs were developed on the basis of human health risk. The Army ecological risk assessment program for JOAAP was conducted to evaluate the risks associated with various scenarios, including the absence of remediation (refer to Sections 2 and 4.3 of the PAS for a description of the Ecological Risk Assessment). The assessment determined that any adverse contamination-related toxic/health effect which are occurring or might occur in the future are not expected to significantly reduce the structure and function of any of the important aquatic and terrestrial components of the JOAAP ecological landscape. Limited (considered *de minimus)* impacts on plants, earthworms, and microorganisms have resulted from residual soil contamination.

In order to comply with CERCLA and the NCP, the ultimate cleanup levels must be protective of human health and the environment. According to the law mandating the property transfer, areas requiring further study or remediation cannot be transferred until it is agreed that no further action is necessary under any environmental law. Once the boundaries for the sites requiring further study or remediation have been agreed upon, the property available for immediate transfer to future owners can be identified. The boundaries of the IRP sites have not been established by land survey.

5.1.4 Asbestos

Remediation of ACM is regulated by USEPA, OSHA, and the State of Illinois. Asbestos fiber emissions into the ambient air are regulated in accordance with Section 112 of the Clean Air Act, which addresses the demolition or renovation of buildings with ACM. AHERA and OSHA cover protection for employees who work around ACM.

Compliance with the Federal Property Management Regulations (FPMR) disclosure law was achieved through a basewide asbestos survey conducted by Professional Service Industries, Inc., in 1993. This survey is available for review at Building 74-3. Army policy is to remove friable asbestos that presents a threat to human health. Nonfriable asbestos or friable asbestos which is encapsulated or in good condition is to be left in place and identified to the buyer per GSA precedent.

The personal property liquidation contract (DAAA08-96-C-0007, Section C) for JOAAP requires that the liquidator remove from the plant all friable type asbestos identified in the basewide asbestos survey by August 1998. The liquidator will not perform asbestos removal in active buildings.

Non-friable asbestos containing materials are present in many of the buildings at JOAAP. Such material include asbestos cement board building materials (i.e., siding and roofing), asbestos cement pipes, and asbestos-containing floor coverings. Activities such as the sanding, grinding, machining, and crushing of these materials may result in the release of asbestos fibers.

5.1.5 Storage Tanks

USTs are subject to federal regulations within RCRA, 40 CFR Part 289, Technical Standards and Corrective Action Requirement for Owners and Operator of USTs. The Hazardous and

Solid Waste Amendments of 1984 mandated these regulations. Permanent closure of USTs must be conducted in accordance with 40 CFR 280.70 and state regulations. The state of Illinois leaking UST program and the Federal corrective action requirement is implemented by USEPA. Illinois state law and IEPA regulations are still in effect.

A UST survey was conducted by USACE in 1989. Twenty-three USTs were located on the USDA2 parcel. Documentation was found concerning removal of all but one tank. Removal of Tank Number 63 in Group 4 could not be confirmed. Attempts are underway to confirm the removal this tank. Follow-on confirmation will be provided to future owners if and when available. An inventory of USTs present at JOAAP, including dates of removal, is presented as Table 4-4.

Most of the storage tanks at JOAAP were emptied and laid away as of 1993. Details concerning the layaway procedures for ASTs are not known. It is possible that some of the tanks may not be empty or that some residual materials remain which may pose a hazard to human health or the environment. It was not possible to see beneath some of the tanks. All ASTs will be removed by August 1998 as part of the site liquidation.

Drains in dikes around ASTs were kept closed and any time that the dikes required drainage, the procedure is closely monitored to assure that no product was released. Findings related to ASTs are presented in Table 4-5.

5.1.6 Sumps, Dry Wells, Oil/Water Separators, and Septic Systems

Several septic systems are located on the USDA2 parcel. No documented environmental concerns relating to the septic tanks on the parcel have been identified. County regulations specify that existing septic tanks be closed by pumping, collapsing at least one side so that the tank will not hold water, and filling with dirt. A representative of the Will County Health

Department must verify the work. Findings concerning sumps, dry wells, oil/water separators, and septic tanks on the USDA2 parcel are presented in Table 4-6.

Sumps are present in LAP Groups 1, 2, 3, 3A, 4, 61 and at the demolition grounds (L3). Sumps in the LAP production groups were periodically cleaned out and residue was disposed of at the burning grounds. During peak production years, sumps occasionally overflowed and discharged directly into open drainages.

A French drain is located in the southern portion of the tetryl area cross the portion of M5 included in the USDA2 parcel. A 1959 Master Plan for JOAAP indicates that there were 55 septic tank serving isolated buildings on the MFG Area but locations were not given.

5.1.7 Radon Gas

USEPA suggests that remedial action be considered if the average annual radon level in the living area of a residence exceeds 4 pCi/L. In spring of 1989, the Army conducted radon testing at 44 separate JOAAP buildings. The radon canisters were left in place over approximately a one year period. Although no samples were collected on the USDA2 parcel, several results on both the LAP and MFG Areas showed radon concentrations above the USEPA level of 4.0 pCi/L.

5.1.8 PCBs

Disposal of PCBs is regulated under TSCA, which banned the manufacture and distribution of all PCBs except those used in enclosed systems. By definition, "PCB equipment" contains 500 ppm PCBs or greater. "PCB-contaminated equipment" contains PCB concentrations of 50 ppm or greater, but less than 500 ppm (40 CFR 761.3).

TSCA (40 CFR 761.40) requires that all PCB transformers (transformers containing over 500 ppm PCBs) be clearly marked. By implication, a determination as to the PCB status of

transformers is required. Those PCB transformers "in use" in a facility that is not totally enclosed must be inspected quarterly (40 CFR 761.30). Any PCB and PCB-contaminated equipment that is "out of service for disposal" can be stored for up to one year in a properly constructed PCB storage for disposal area (40 CFR 761.65). Disposal of transformers containing oil with over 50 ppm PCBs is regulated under TSCA (40 CFR 761.60). USEPA regulates removal and disposal of all PCB sources containing 50 ppm or more under TSCA.

The PRGs developed for JOAAP soil included levels for PCB contaminated soils. Clean up levels of 10 mg/kg PCBs have been established for soils of nonrestricted-access (provided the 10 inches of soil contains less than 1 mg/kg PCBs), as recommended by the PRG.

During the field survey, numerous transformers, and several oil filled electrical circuit breakers not posted with sampling results were observed in the USDA2 parcel. It is not clear from the documentation reviewed and interviews whether all transformers and oil-filled electrical switches on-site have been tested for PCBs nor whether all transformers tested and found to contain PCBs over regulatory levels have been removed. All inactive transformers will be removed by August 1998 as part of the property liquidation effort. Oil-filled switch gear boxes were removed from the MFG Area in 1996. Soils around the switch gear boxes were sampled and subsequently removed if contamination was above PRGs or if staining was noticeable. A summary of findings relating to PCBs is presented as Table 4-7.

All of the locations from which PCB and PCB-contaminated equipment has been previously removed are not known. It is also not known if the equipment leaked prior to removal. Potential threats to human health and the environment from this can not be estimated.

5.1.9 Pesticide/Herbicide Use and Storage

The use of pesticides is regulated under FIFRA. Pesticide management activities are subject to federal regulations contained in 40 CFR 162, 165, 166, 170, and 171. Some pesticides used at JOAAP have been identified in Section 4.1.9. Pesticides have likely been

applied in and around buildings, along railroad tracks, along fencelines, and by lessees. The areas where pesticides are known to have been mixed lie within IR sites and are addressed as part of the studies in those areas. It is likely that some residuals remain from the use of pesticides on-site.

No pesticides are known to have been mixed, or dispersed from the USDA2 parcel. Stored weed and feed was noted in Building 814 (M105). In 1993, all herbicides remaining were either consumed or those that were not consumed were sent to off-site facilities.

5.1.10 Lead Based Paint

DOD banned the use of lead-based paint in 1978. Any items painted prior to 1978 should be assumed to have one or more coats of lead-based paint unless testing indicates otherwise. In addition, some facilities constructed immediately following the ban may also contain lead-based paint, because inventories of lead-based paints that were in the supply network were likely to have been used up on these facilities. The Residential Lead Based Paint Hazard Reduction Act of 1992, also known as Title X. Title X requires that buyers of residential property (excepting efficiencies, elderly housing, and housing for the handicapped) be informed that buildings built prior to 1978 may contain lead-based paint. Notice requirements are specified in the Act. Testing is not required, nor is there a notification requirement for non-residential properties.

The condition of painted surfaces at JOAAP varies from good to poor. Routine maintenance, flaking, peeling, and chalking of painted surfaces may have resulted in past contamination. Due to the lack of continued maintenance, flaking, peeling, and chalking of painted surfaces is likely to continue. High levels of lead (up to 1,278 mg/kg) were found in paint chips found on the ground at Group 64 (L27). Similar contamination is possible in other locations.

Metal structures at JOAAP were routinely sandblasted and painted. The Army has had the soil beneath several of the water towers on the LAP Area tested for the presence of lead and all detections were below site PRGs.

USEPA has developed some recommended action levels for lead in soil which are presented in Section 4.1.10. In residential scenarios, USEPA recommends using the Integrated Exposure Uptake Biokenetic Model to help determine appropriate action levels on a site specific basis.

5.1.11 Explosive Ordnance/Residues

Residue from the manufacture and disposal of explosives remains on-site. UXO is present at some locations on-site. Transfer of property and buildings potentially contaminated with explosives or UXO is contingent upon the approval of the DOD Explosive Safety Board (DDESB). AR 385-64 stipulates that real property contaminated with ammunition and explosives that may endanger the general public may not be released from DOD custody until appropriate efforts to ensure protection of the public have been made. Further, all contaminated locations must be placarded appropriately with permanent signs that prohibit entrance of unauthorized personnel and the signs must be maintained in legible condition by DOD.

Explosives and explosive wastes/residue may be present in process lines, tanks, sanitary and industrial sewer lines, and within buildings where explosives were handled. An attempt has been made to identify all areas where explosives were handled and disposed; however, due to the extended history of the facility, and the incomplete nature of the available records, it is not possible to positively identify all areas where explosives or munitions were used, stored, handled, or disposed.

Historically, when underground process or waste lines were replaced, the old lines were abandoned in place. Wastewater lines containing explosives could pose a safety hazard if

disturbed. No information relating to the decontamination or testing of wastewater lines potentially containing explosives or the cleanup of soil potentially contaminated by broken lines was found.

Documentation concerning the explosive-contamination status for all of the buildings and facilities at JOAAP was not available at the time of this report. Based on available documentation, numerous buildings on the USDA2 parcel have been assigned a XXX (3X) status. As discussed above, these buildings may not be released from DOD custody. Draft IOC 385-5 provides a mechanism for classifying and reclassifying the explosive-contamination status of buildings and equipment based on nondestructive inspection methods. It appears unlikely that many of the buildings involved in the manufacture or loading of explosives can be reclassified without a significant level of effort.

Explosive-contamination classifications have been made for many of the buildings in the USDA2 parcel. Approximately 80 buildings are classified as 3X, 170 as 0, and 31 as 5X. Explosive classifications were not available for many of the buildings in the parcel. In particular, classifications were not found for building in Groups 3A (L10), 4 (L14) or 5 (L15).

Explosives have been detected in soil, groundwater, surface water, and sediment in the USDA2 parcel. Explosives were detected in soils in 13 sections (L1, L2, L3, L5, L7, L8, L9, L10, L14, M1, M2, M3, and M4), in groundwater in nine sections (L1, L2, L3, L10, L14, M1, M3, M4, and M6A), in surface water in ten sections (L1, L2, L7, L8, L9, L10, L14, L19, M1, M12, and M15), and in sediment in nine sections (L1, L2, L7, L8, L9, L10, L14, M4, and M12). Appendix D summarizes environmental sampling results.

There are several areas at JOAAP where UXO or other explosive items such as fuses or primers may be present on the USDA2 parcel. These areas include the burning grounds (L2, L3, and M2) and the AT-4 range (L33). Alliant Techsystems currently operates three indoor firing ranges in Group 8 (L18). Spent sand from the range backstops was stored outside. Although Alliant recently conducted an operation to remove UXO from the sand, several

dozen spent 25- to 30-mm target practice projectiles were observed on the ground and in sand piles on the north side of the group. Ordnance related scrap remains at the AT-4 range (L33). Alliant representatives indicated that this material would be removed prior to return of the site to the army. A summary of findings relating to UXO and explosives on the USDA2 transfer parcel is presented in Table 4-8.

Hoffman Vacuum Sweeping System Secondary Separators were observed in many of the LAP groups. Sampling during the RI/FS has identified explosive contamination adjacent to many of these units. At other locations within the LAP Area, stained soils indicating potential explosive contamination were noted next to similar separators.

5.1.12 Biomedical/Biohazardous Materials and Wastes

No biological warfare agents have been used, stored, or tested at JOAAP. All medical facilities have been closed for an extended duration and no evidence has been found to indicate biohazardous conditions exist at the facility.

5.1.13 Radioactive Materials/Wastes

Several radioactive sources were present in instrumentation within several LAP and MFG Area groups. All sources have been removed and the NRC license for these sources is no longer active. Radiological sources such as cobalt-60 and cesium-137 were used in instrumentation within the LAP Area Groups 1 (L7), 2 (L8), and 3 (L9). X-ray operations were also conducted in Groups 3A (L10), 4 (L14), 5 (L15), and 8 (L18). In several of these areas, equipment associated with the radiography is still in place. Findings relating to radioactive materials/waste were summarized in Table 4-9.

The Atomic Energy Commission used several buildings at JOAAP during the 1950s. Neither the buildings used, nor are the types of activities performed by the commission at JOAAP known. Argonne National Laboratory leased Building 814 (M105) for equipment and

machinery storage sometime prior to 1959. Atomic bomb components were reportedly stored. In August 1996, USEPA surveyed this building for the presence of radioactive materials. No widespread contamination was encountered.

Munitions with the DU projectiles were assembled in Group 5 (L15) and were test fired at Group 8 (L18). In 1986, Alliant conducted surface scans for radioactivity in Groups 5 and 8; no elevated readings were found. It should be noted however, that a major clean-up of DU related contaminated was conducted within and around buildings in Group 8 between 1995 and 1997. The equipment used for assembly in Group 5 has been removed and shipped off-site for use at other plants.

Spent sand from the range at Group 8 was stockpiled outside. Alliant Techsystems has completed an investigation and cleanup of this contamination in accordance with NRC regulations. NRC Region 3 has completed a confirmatory survey in support of license termination. No areas above background were noted and the final site release was to be prepared. Final NRC unrestricted site release documentation was not available at the time of the PAS.

5.1.14 Laboratory Operations

Many laboratories were operational at the plant during production years. Several laboratories operated at JOAAP to support manufacturing and environmental monitoring operations. Two laboratories were identified on the USDA2 parcel; one at Building 505-3 (MFG STP) and the other at Building 4-21 which has since been demolished.

5.1.15 Wastewater Treatment and Discharge

Section 2.3.1 provides a general summary of wastewater activities at the JOAAP. The NPDES permit for JOAAP was issued on September 22, 1993 (IL0002666). The permit currently covers 17 discharges to various receiving waters. Over the years, waste products

were discharged to open ditches via lagoons, sumps, or underground waste lines. Old plant drawings indicate that broken or leaking underground waste lines were generally replaced with new lines that ran parallel to the old ones. The old lines were abandoned in place.

5.1.16 Surface Water Resources

Previous studies have identified numerous site related contaminants in surface water and sediments. A list of contaminants of concern was presented in Section 4.1.16. The calculated cancer and noncarcinogenic risks for several water bodies exceeded acceptable levels for fishermen, fish consumers and resident children. Specifically, the carcinogenic risks were greater than 1×10^{-6} for consumers of fish from Jackson Creek (due to arsenic), and Grant Creek (due to 2,6-DNT and 2,4-DNT); for fishermen in Grant Creek (due to 2,4,6-TNT); and for resident children Grant Creek (due to 2,4,6-TNT). The hazard index (noncarcinogenic risks) was greater than one for consumers of fish from Prairie Creek (1,3,5-trinitrobenzene). There are a number of uncertainties associated with the risk numbers that should be reviewed when using the numbers for decision making. For example, some of the unacceptable risks to fish consumers were due to arsenic and beryllium which accumulate in portions of fish (i.e., bones) not generally consumed by humans.

The Army has determined that the aquatic components of the ecological landscape at JOAAP are not significantly impacted by contamination as defined by the assessment endpoints of the ecological risk assessment program. Specifically, it has been determined that the fish and crayfish collected are not accumulating explosives and potential food-chain exposures are not occurring. In addition, it was determined that benthic macroinvertebrate communities are not significantly impacted.

Until primary and secondary contaminant sources have been remediated, the potential remains for contaminants from the IR sites to impact surface water and sediment quality. For example, at L1 surface water run off appears to be carrying contaminated soils along a

drainage ditch towards to Prairie Creek and groundwater at the site discharges to the creek. Potential future impacts have not been determined.

5.1.17 Soils

Soil contamination is a major concern at many of the IR sites. Contaminants of concern in soil at the IR sites are discussed in Appendix D. Windborne dust, surface water runoff, or groundwater migration from the IR sites could result in secondary soil contamination. The possibility of secondary soil contamination will be reduced or eliminated once remedial measures are complete.

Wastewater and potentially contaminated storm water runoff was discharged to ditches located throughout the facility. Periodically, sediment deposited in the ditches was removed to improve flow. The removed sediment was reportedly spread on the ground adjacent to the ditches.

A 1967 survey of the sewer system found severe infiltration problems. Pipes in a state of repair allowing infiltration are also likely to allow exfiltration. In addition, infiltration and exfiltration could occur in the same segment of pipe at different times (e.g., during droughts or wet weather) which could result in soil contamination. Wastewater lines may contain explosive residues. Plant demolition plans developed by Uniroyal identify specific procedures for closure of sewer lines within the groups and manufacturing areas. These plans also provide protocols for sampling soils near the lines. Historically, when lines were replaced, the old lines were abandoned in place.

Listed below are the contaminants found in IRP sites included in the USDA2 parcel that are above PRGs. The estimated volume of soils requiring remediation is also given.

Site	Contaminant	Volume Estimation (cubic yards)	Site	Contaminant	Volume Estimation (cubic yards)
L1	Explosives	6,010	M1	Red Water Ash	199,800
	PCBs	60		Soil	5,400
	Organics	1,275	M2	Explosives	1,600
L2	Metals	4,440	M3	Explosives/organics	330
	Explosives and Metals	16,350		Metals	5,600
L3	Metals	185	M4	Metals	6,000
	Explosives and Metals	1,070	M11	Lead/PAHs	66,000
	Landfill	34,110	M12	Lead/PAHs	3,700
L4	Landfill	Not available		Sulfur	1,400
L5	Metals	1,070			
	Metals and Organics	1,965			
	Organics	850			
L7	Explosives	2,225			
	PCBs	330			
L8	Explosives	505			
	PCBs	94			
L9	Explosives	1,500			
	PCBs	310			
L10	Explosives	915			
	PCBs	505			
L14	Explosives	410			

5.1.18 Groundwater

The Illinois Groundwater Protection Act (Illinois Public Act 85-863) was created to protect the chemical quality of the state's groundwater. This Act empowers the IEPA to set quality standards for groundwater within the state. Illinois Groundwater Quality Standards, IAC 35, Subpart D, regulate various aspects of groundwater quality including establishing criteria for groundwater classification, nondegradation provisions, standards for groundwater quality, and various procedures and protocols for the management and protection of groundwater.

Shallow groundwater quality at JOAAP has been extensively studied as part of the IRP and a number of areas of contamination have been identified. However, due to the types of activities and the duration during which they were carried out there is the possibility that some groundwater contamination has not been identified. According to data relating to known

areas of contamination, the extent of any unidentified plumes of groundwater contamination is likely to be limited.

The glacial till aquifer is not utilized at JOAAP. A survey of residences indicated this aquifer is not used in the surrounding area. Elevated concentrations of several naturally occurring compounds were found in the glacial till groundwater rendering the water undesirable for domestic use, and in many cases, agricultural or industrial uses. All of the JOAAP related groundwater contamination is found in the glacial till and portions of the Silurian dolomite aquifer. The contamination is in most cases localized. In addition, the low yield (one gal/m) associated with the glacial till aquifer makes it undesirable for any usage. The glacial till groundwater is not considered potable and has been designated a Class II (General Resource) aquifer. The underlying Silurian dolomite aquifer appears to meet the yield requirements for Class I (Potable Resource) aquifers, although groundwater from the dolomite may require treatment prior to use.

Groundwater contamination has been identified in the glacial till aquifer at the following IRP sites:

M1	Explosives, metals and sulfate	L1	Explosives and nitrate/nitrite
M2	Sulfate	L2	Explosives and nitrate/nitrite
M5	Explosives	L3	Explosives and nitrate/nitrite
M6	Explosives and VOCs	L4	Organics (nonexplosive)
M7	Explosives and metals	L5	Organics (nonexplosive) and metals
M8	Explosives, VOCs and sulfate	L6	Organics (nonexplosive)
M10	Toluene	L7	Nitrate/nitrite and sulfate
M11	Sulfate	L8	Nitrate/nitrite and metals
M12	Sulfate	L10	Explosives, nitrate/nitrite and metals
M13	Explosives and metals	L14	Explosives
		L18	Nitrate/nitrite and metals
		L19	Nitrate/nitrite

The groundwater contamination at M10, L2, L5, L6, L10 and L14 is considered localized. Groundwater contaminant plumes extend beyond the IRP site boundaries at M1 and M7. IRP sites that require no further action for groundwater include M2, M3, M4, M6A, M9, M11,

M12, L2, L4, L5, L6, L7, L8, L10, L18 and L19. Descriptive information concerning specific contaminants present and concentrations is available in the IRP site histories in Appendix D.

Production, monitoring, fire protection, and farm wells are present at JOAAP. The wells are identified in the RIs. The coordinates of all wells that have been sampled and the analytical results can be obtained from the Army Installation Restoration Data Management Information System (IRDMIS). Construction, modification, and abandonment of wells is regulated by the Illinois Water Well Construction Code (415 ILCS 30/1 et seq.). Modification of existing wells triggers the requirement that they be brought into compliance with current regulations. Information on the current condition of all wells, current well use, and likely future well use has not been compiled. The Will County Health Department is flexible in its determination of what constitutes an abandoned well. A rule of thumb used is that wells not used for a full year may be considered abandoned.

5.1.19 Noise

Ongoing activities of Alliant Techsystems, such as test firing of munitions and any associated noise are expected to continue for some time. In addition, some noise associated with demolition or remediation may also be generated. Until the specific types of activities to be conducted are known, the expected volume and duration of noise can not be determined.

5.1.20 Drinking Water

Public water systems are regulated under 40 CFR 141, are those systems that serve 15 or more connections or 25 or more people and whose water is used for drinking, cooking, bathing, or hand washing. Drinking water quality standards, including the stipulation of MCLs, appear in 40 CFR 143.

The future owner should be aware that due to the age of the facility, copper piping and lead bearing solder were probably used. Lead exceeded the USEPA action level and naturally occurring radon levels exceeded MCLs within portions of the potable water system piping.

5.1.21 Perimeter Survey

Airborne emissions from nearby industrial facilities may potentially impact environmental quality at JOAAP. There was no visual evidence of impacts from off-site facilities, nor was any documentation of impacts to JOAAP found.

5.1.22 Spills

Records concerning spills are incomplete. A number of spills have occurred on the USDA2 parcel with the greatest quantities lost at the sellite plant (M12) and the West Toluene Tank Farm (M10). Refer to Table 4-11 for a summary of significant spills. A large number of spills occurred at JOAAP adjacent to the USDA parcel (refer to the Industrial Parks PAS for details). Additionally, numerous releases from operations have occurred and these releases may have impacted sediment quality in streams and drainages.

5.1.23 Miscellaneous Findings

Lead was commonly used in ceramic coatings. Lead may be present in the ceramic coatings of bathtubs and sinks at JOAAP. Additionally, several of the buildings have a lead floor finishes and lead piping (KOWS01, UCCI04). Asbestos putty containing a high percentage of lead was used for packing and caulking at the facility.

Recently, tile drains at JOAAP were identified and mapped for USDA. These drains were installed to drain lands for agriculture or other purposes. Any drains present in areas of contamination could act as a conduit accelerating contaminant migration.

There were scattered empty drums around the facility. No environmental concerns were visually apparent relating to the drums. Locations of the drums are identified on Table 4-12.

5.2 Summary of Major Findings

A brief summary of major environmental conditions and findings on the USDA2 parcel is presented below. It is notable that no significant findings were identified on the non-IRP sections. The Army is currently addressing some of these findings and is developing plans to address others.

- Explosive classifications were not found for all buildings. Numerous buildings in the proposed transfer parcel are classified as 3X meaning that they pose a potential safety hazard. Under AR 385-64, areas posing a potential safety risk to the public may not be released from DOD custody.

- Spoils from the cleaning of sediment from drainage ditches that carried wastewater were reportedly deposited adjacent to the ditches. No characterization has been conducted to determine if the periodic clean out has resulted in redepositing of contamination adjacent to the drainage ditches.

- Wastewater lines may have explosive contamination that could pose an explosion hazard if disturbed.

- A dry well was identified in M4, but the types of materials discharged are unknown.

- Wastewater lines reportedly leaked extensively. Only limited sampling has been conducted along the wastewater lines to determine if soil contamination is present.

- UXO may be present at the burning grounds (L2, L3, L34), in test areas (L18), and in areas within the range of missile damage from the Group 2 explosion.

- In several of the surface water bodies, the human health risk assessment identified exposure scenarios with unacceptable risks.

- Illinois code requires that wells that are out of service be abandoned.

- Elevated radon levels (above MCLs) are present in some portions of the water distribution system. Lead-based solder may have been used on water pipes and the

USEPA action level for lead in water may also be exceeded in some portions of the water system.

- Lead-based paint is likely to be present on any surfaces painted prior to 1979.
- Non-friable asbestos is present throughout the facility in cement board siding, roofing, flooring and insulation.
- Transformers and oil-filled electrical switches are present on-site. It is not clear if documentation of sampling of the oils is available for all of these items. Oil-filled electrical switches on the MFG Area have been removed.
- ASTs are present on the parcel and removal of one UST has not been confirmed.

Detailed findings by study section number are provided in Table 5-1. This table lists the JOAAP study section (described in Section 3.0) and the findings relating to that parcel.

All actions taken on this property either in response to the environmental concerns identified within this report or those that are independent of environmental issues (i.e., general improvements and development activities) must comply with the requirements of NEPA and AR 200-2. Minimally, these requirements protect archeological and historically significant features that have been identified at JOAAP as well as ecological resources such as threatened and endangered species.

TABLE 5-1
SUMMARY OF FINDINGS BY SECTION
JOAAP, WILL COUNTY, ILLINOIS

Section Number	Description	Findings
L1	Group 61	Several buildings in this Group are designated XXX. The buildings must be re-classified or decontaminated to 5X prior to transfer. There is an electrical switch, and two sumps in this section. There are three ASTs, one with evidence of spillage. A 75 mm shell casing was found in one sump. Soils and groundwater require remediation.
L2	Explosive Burning Grounds	UXO is present here. One or more buildings in the group are designated XXX. The buildings must be re-classified or decontaminated to 5X prior to transfer. Soils require remediation.
L3	Demolition Area	UXO is present here. There is one sump and four transformers not marked as to PCB content. Soils require remediation.
L4	Landfill	Soils require remediation.
L5	Salvage Yard	There is a sump, and an AST in this section. Building do not have explosive classifications. Soils require remediation.
L7	Group 1	Several buildings in this Group are designated XXX. The buildings must be re-classified or decontaminated to 5X prior to transfer not marked as to PCB content. There are 23 transformers, and several electrical switches. There are several sumps and condensate pits in group. Soils require remediation.
L8	Group 2	Several buildings in this Group are designated XXX. The buildings must be re-classified or decontaminated to 5X prior to transfer. There are 17 transformers and several electrical switches not marked as to PCB content in the group. There is an AST, several sumps and septic fields in group. 'Soils require remediation. All or part of this section is within the missile damage radius from a 1942 accident at Group 2 involving M1 anti-tank mines. UXO clearance has not been verified.
L9	Group 3	Several buildings in this Group are designated XXX. The buildings must be re-classified or decontaminated to 5X prior to transfer. There are 32 transformers, and several electrical switches not marked as to PCB content in the group. There are three ASTs, several sumps and septic fields in group. Soils require remediation. All or part of this section is within the missile damage radius from a 1942 accident at Group 2 involving M1 anti-tank mines. UXO clearance has not been verified.
L10	Group 3A	Several buildings in this Group are designated XXX. The buildings must be re-classified or decontaminated to 5X prior to transfer. There are 57 transformers and several electrical switches not marked as to PCB content in the group. There are several septic tanks and fields in the group. Soils require remediation. Alliant still holds group and therefore conditions may change.

TABLE 5-1
SUMMARY OF FINDINGS BY SECTION
JOAAP, WILL COUNTY, ILLINOIS

Section Number	Description	Findings
		All or part of this section is within the missile damage radius from a 1942 accident at Group 2 involving M1 anti-tank mines. UXO clearance has not been verified.
L14	Group 4	Explosive classifications were not found for buildings in this group. There are 13 transformers and, several electrical switches not marked as to PCB content. Sumps in group. Removal of UST not confirmed. Soils and groundwater require remediation. Alliant active in group and therefore conditions may change.
L15	Group 5	Explosive classifications were not found for buildings in this group. There are 26 transformers and several electrical switches not marked as to PCB content. Alliant active in group and therefore conditions may change.
L18	Group 8	Several buildings in this Group are designated XXX. The buildings must be re-classified or decontaminated to 5X prior to transfer. There are 13 transformers not marked as to PCB content. Gas chamber in one building. DU cleanup and UXO removal must be verified. Former fire training demonstration area has not been sampled. Only limited soil sampling in group. Alliant active in group and therefore conditions may change.
L19	Group 9	Several buildings in this Group are designated XXX. The buildings must be re-classified or decontaminated to 5X prior to transfer. There are six transformers not marked as to PCB content. There are floor drains in group. Only limited soil sampling in group. Alliant active in group and therefore conditions may change.
L21 (portion not covered by previous report)	Group 23	No findings of environmental concern other than those noted in the Initial USDA PAS report.
L33	PVC Area	No explosive classifications are available for buildings in this group. Ordnance related scrap is present in the area. Soil sampling has not been conducted since firing stopped. Soils near the static fire area are of particular concern. Alliant active in group but is preparing to return to the group to the Army. All or part of this section is within the missile damage radius from a 1942 accident at Group 2 involving M1 anti-tank mines. UXO clearance has not been verified.
L34	Former Burning Area	All or part of this section is within the missile damage radius from a 1942 accident at Group 2 involving M1 anti-tank mines. UXO clearance has not been verified. There is little information on the burning that has taken place here since the 1940s.

TABLE 5-1
SUMMARY OF FINDINGS BY SECTION
JOAAP, WILL COUNTY, ILLINOIS

Section Number	Description	Findings
		Numerous ceramic mine components were observed in this area. Field tests indicate explosive residues may be present on these components. Army is preparing to assess the site for UXO.
L110 (portion not covered by previous report)	PAS Survey Section L110	No findings of environmental concern other than those noted in the Initial USDA PAS report.
M1	Southern Ash Pile	Two transformers not marked as to PCB content. Soils and groundwater require remediation.
M2	Explosive Burning Ground	Soils require remediation.
M3	Flashing Grounds	One transformer not marked as to PCB content. Lead slag and 23 ASTs in group. Lead/asbestos putty may be present on some ceramic pipes in area. Soils require remediation.
M4	Lead Azide Area	'One transformer and electrical switch not marked as to PCB content. Dry well in area. Soils require remediation. Vent pipe possibly for UST noted in area.
M5 (portion not covered by previous report)	Tetryl Area - USDA Portion	Pile of miscellaneous debris in area. French drain crosses area.
M6A (M99)	TNT Block Area	As this area has a high probability of contamination it has been redesignated M6A and is included as part of IR site M6. One transformer is present here. Several dead animals were observed in a wooden junction box. Dry well in area. Only limited soil sampling has been conducted here.
M10 (portion not covered by previous report)	West Toluene Tank Farm	Two 250,000 gallon ASTs. Several large volume spills. Groundwater requires remediation.
M11	Landfill	Soils require remediation.
M12	Sellite Manufacturing Area	Several sumps and four ASTs in area. Electric switch boxes in building. Several large volume spills. Soils require remediation.
M14	Former Pond	'Six transformers not marked as to PCB content.
M15	Sewage Treatment Plant	No further remedial action planned.
M105 (portion not covered by previous report)	PAS Study Section	Transformers in area. Stored chemicals in Building 814. Septic tank near 814 and former lead/asbestos putty shop here.
M108 (portion not covered by previous report)	PAS Study Section	No findings of environmental concern other than those noted in the Initial USDA PAS report.
M118	Grant Creek	No findings of environmental concern. Area previously sampled.
M119	Grant Creek	No findings of environmental concern. Area previously sampled.

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