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CERTIFIED MAIL - RETURN RECEIPT REQUESTED

January 22, 2009

Mark Patterson
Ravenna Army Ammunition Plant
Building 1037
8451 State Route 5
Ravenna, OH 44266

Steve Smith
CESWF-PER-DD
819 Taylor Street, Room 3A12
PO Box 17300
Fort Worth, TX 76102-0300

RE: APPROVAL WITH DIRECTION
RELEASE ASSESSMENT REPORT FOR PARCEL 22
FORT WINGATE DEPOT ACTIVITY
EPA ID# NM6213820974
FWDA-07-010

Dear Messrs. Patterson and Smith:

The New Mexico Environment Department (NMED) received the Department of the Army's (the Permittee) *Release Assessment Report for Parcel 22* (the Report), dated June 9, 2008. The submittal is a requirement of Section VII.F of the *Fort Wingate Depot Activity RCRA Permit (RCRA Permit)*. NMED hereby approves this Report with the following direction.

NMED received the Permittee's RCRA Facility Investigation (RFI) Work Plan for Parcel 22 (Work Plan), dated June 9, 2008, which is currently under review. The Areas of Concern (AOCs) 30, 69, 75, and 88 included in the Report must be addressed and characterized in detail in the revised Work Plan. Additional requirements for the Work Plan will be addressed in NMED's comments for Parcel 22 which will be mailed under separate cover.

In addition, NMED understands that AOC 71 will be addressed as part of the investigation for Parcel 21 (refer to Comment 77 of NMED's NOD for the Parcel 21 RFI Work Plan, dated September 5, 2007) and therefore does not need to be included as part of the Parcel 22 investigation.

If you have any questions regarding this letter, please contact Tammy Diaz-Martinez at (505) 476-6056.

Sincerely,

John E. Kieling
Manager
Permits Management Program
Hazardous Waste Bureau

cc: Tammy Diaz-Martinez, NMED HWB
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Laurie King, U.S EPA Region 6
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File: FWDA 2009 & Reading File
FWDA-07-010

RELEASE ASSESSMENT REPORT
PARCEL 22
FINAL

FORT WINGATE DEPOT ACTIVITY
McKinley County, New Mexico

09 June 2008

Contract No. W9126G-06-D-0016
Task Order No. 0001

Prepared for:

U.S. Army Corps of Engineers
Fort Worth, Texas

Prepared by:

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Requests for this document must be referred to:
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Fort Worth District
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Fort Worth, TX 76112

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LIST OF ACRONYMS

ACM	Asbestos Containing Material
AOC	Area of Concern
ASTM	American Society for Testing and Materials
BRAC	Base Realignment and Closure
BRACD	BRAC Office
CFR	Code of Federal Regulations
CY	Cubic Yards
DOI	Department of the Interior
FWDA	Fort Wingate Depot Activity
GPS	Global Positioning System
HE	High Explosives
HWB	Hazardous Waste Bureau
HWMU	Hazardous Waste Management Unit
LBP	Lead-Based Paint
NARA	National Archives and Records Administration
NMED	New Mexico Environmental Department
OB/OD	Open Burning/Open Detonation
PCB	Polychlorinated Biphenyl
ppb	Parts Per Billion
ppm	Parts Per Million
RCRA	Resource Conservation and Recovery Act
RFI	RCRA Facility Investigation
SRHI	Summary Report of Historical Information
SUXOS	Senior Unexploded Ordnance Supervisor
SVOC	Semi-Volatile Organic Compound
SWMU	Solid Waste Management Unit
TEAD	Tooele Army Depot
TM	Technical Manual
TPL	TPL, Inc.
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
WSMR	White Sands Missile Range

ES.0 EXECUTIVE SUMMARY

This Release Assessment Report for Parcel 22 at Fort Wingate Depot Activity (FWDA) describes release assessment activities conducted as part of the environmental restoration program at FWDA. This document has been prepared for submission to the New Mexico Environment Department (NMED) Hazardous Waste Bureau (HWB), as required by Section VII.F.1 of the Resource Conservation and Recovery Act (RCRA) Permit No. NM 6213820974.

ES.1 PURPOSE

The purpose of this document is to compile and present available information regarding the possibility of releases from Areas of Concern (AOCs) located within Parcel 22. As required by the Permit, this document was prepared in conjunction with and is submitted as a companion to the Summary Report of Historical Information (SRHI) for Parcel 22 and the RCRA Facility Investigation (RFI) Work Plan for Parcel 22.

The Permit lists a total of five AOCs within Parcel 22, as follows (Figure 3):

- AOC 30 Igloo Block D;
- AOC 69 Buildings 301, 302, and 312 (Standard Magazines); and Building 316 (Field Lunch Room);
- AOC 71 Former rectangular structure near TMW-5 and north of Building 528;
- AOC 75 Electrical Transformers within Parcel 22; and
- AOC 88 Former buildings or structures and disposal areas southwest, south, and southeast of Building 528.

ES.2 CONCLUSIONS

Based on the release assessments conducted as described in this document, conclusions were reached as follows.

- AOC 30 There are 103 igloos, 17 open storage Y-sites, and two safety shelters in AOC 30, Igloo Block D. Of these, 53 igloos and 13 Y-sites are located within Parcel 22, with the remaining structures located in Parcel 19.

  Based on the known operations conducted within the portions of AOC 30 located in Parcel 19, review of historical information, and the findings of the site reconnaissance, it is concluded that it is unlikely that a release of a hazardous waste or hazardous constituents to the environment occurred within the portions of AOC 30 located in Parcel 19 (former munitions storage igloos operated

by FWDA only). Further, there is no evidence to suggest the portions of AOC 30 located in Parcel 19 pose an unacceptable risk to human health or the environment from releases outside the building. However, supplemental investigations are proposed for AOC 30 to provide additional data. Planned investigations are described in the companion RFI Work Plan for Parcel 22.

Based on the known operations conducted at AOC 30 located in Parcel 22 and the findings of the site reconnaissance, it is concluded that a release of a hazardous waste or hazardous constituents occurred at five igloos within Parcel 22, specifically Igloos D-1138, D-1171, D-1182, D-1183, and D-1186, where the site reconnaissance found propellant grains on the ground surface. Because these types of materials were not observed outside igloos in Parcel 19 (former munitions storage igloos operated by FWDA only) and because the storage operations conducted by TPL, Inc. (TPL) were different from those conducted by FWDA, it is concluded that the propellant grains originated from TPL storage operations rather than FWDA storage operations. The Army plans to evaluate these releases by collecting additional surface soil samples outside the five igloos. Planned investigations are described in the companion RFI Work Plan for Parcel 22.

Additionally, the Army proposes to collect soil samples from surface soil around D-1144 and D-1147 (reported locations of propellant burn conducted by TPL) to provide additional data for evaluation of potential risk to human health and the environment from the propellant burn. Planned investigations are described in the companion RFI Work Plan for Parcel 22.

An appropriate response action will be implemented to remove propellant grains from the surface soil.

Other debris, such as the empty metal drums being used as road markers and drainage culverts, will be removed prior to land transfer as part of a “housekeeping” action (as opposed to an environmental restoration action).

- AOC 69 Based on the known use of the buildings within AOC 69, a review of historical information, and the findings of the site reconnaissance, it is concluded that it is unlikely that a release of a hazardous waste or hazardous constituents occurred at these buildings. Further, there is no evidence to suggest this AOC poses a threat to human health or the environment.

  Coal bottom ash was placed by FWDA south of Building 302 as part of the former railroad spur. Analytical results from samples of similar coal bottom ash materials at FWDA showed metals and trace levels of semi-volatile organic compounds (SVOCs) below

applicable RCRA limits, indicating that material was classified as non-hazardous/non-regulated material. Arsenic concentrations in the previous coal bottom ash samples ranged from 4.92 to 8.42 mg/kg, exceeding the Permit cleanup level of 3.90 mg/kg; however, the detected arsenic concentrations are of the same magnitude as the maximum concentration of arsenic detected in soil samples collected from unimpacted areas of FWDA (Malcolm Pirnie, 2000, Table 4-4). There is no evidence to suggest that the coal bottom ash poses a threat to human health or the environment.

Loose asbestos-containing material (ACM) on the ground surface around the buildings will be removed and ACM and lead-based paint (LBP) remaining on the buildings will be evaluated and addressed in accordance with Army policies, encompassing and in accordance with applicable federal, state, and local requirements. The Army will address these issues under a program separate from the RCRA compliance program, and will do so in consultation with the Department of the Interior (DOI), Navajo Nation, and Pueblo of Zuni.

Therefore, no further RCRA corrective action activities are warranted or proposed for AOC 69, and the Army proposes that AOC 69 be designated "Corrective Action Complete Without Controls".

- AOC 71 As discussed in the companion SRHI for Parcel 22, because part of AOC 71 is located within Parcel 21, AOC 71 was evaluated as part of the Parcel 21 release assessment, as reported in a document entitled *Release Assessment Report, Parcel 21, Fort Wingate Depot Activity* (TPMC, 2008, Section 10.0).

- AOC 75 Based on the findings of this release assessment, there is no evidence to suggest that any of the AOC 75 locations in Parcel 22 pose a threat to human health or the environment.

  Surface soil around the Building 519 transformer location will be sampled as part of the planned investigations for Solid Waste Management Unit (SWMU) 70. The analytical program will include PCBs to evaluate any potential releases from the AOC 75 location at Building 519. Planned investigations are described in the companion RFI Work Plan for Parcel 22.

- AOC 88 AOC 88 is listed in the Permit as "Former Buildings or Structures and Disposal Areas Southwest, South, and Southeast of Building 528". The "former buildings or structures" portion of AOC 88 consists of two former open storage areas (also known as "X-sites"). The "disposal areas" portion of AOC 88 refers to an area south of Building 528 where debris including ACM was disposed on the ground surface. For simplicity, the former X-sites will be called

AOC 88A (the eastern location) and AOC 88B (the western location), and the ACM debris area will be called AOC 88C.

Historical documents indicate that AOC 88A and AOC 88B locations were open storage X-sites, used for temporary storage of military munitions.

It is possible that some of the munitions stored at AOC 88A were damaged bombs filled with Napalm-B. Napalm-B contained polystyrene, benzene, and gasoline. The aerial photo analysis did not identify any staining indicative of a significant release in any of the photos analyzed, including a 1973 color photo. The aerial photo analysis showed no materials stored in this location in 1966, and none again in 1973, so if potentially damaged munitions were stored at his location, that use was for less than 7 years, more than 33 years ago. However, the Army proposes to collect samples from surface soil across AOC 88A to provide additional data for evaluation of risk to human health and the environment. Planned investigations are described in the companion RFI Work Plan for Parcel 22.

Observations made during the site reconnaissance did not suggest that releases of hazardous wastes or hazardous constituents occurred from operations at AOC 88B. However, the Army proposes to collect samples from surface soil across AOC 88B to provide additional data for evaluation of risk to human health and the environment. Planned investigations are described in the companion RFI Work Plan for Parcel 22.

The suspect ACM observed in AOC 88C will be removed and disposed when asbestos abatement is completed at FWDA.

Additional Areas Evaluated:

- Several former storage magazines (typically known as pre-1940s magazines) were included as part of the site reconnaissance. These sites included Y-361, Y-362, Y-363, and U-360 as well as two formerly unlisted sites (one just south of Building 527 and the second just west of AOC 88B). Additionally, an open storage area north of Building 528 was included in the site reconnaissance. All sites, except U-360 and the site north of Building 528, consist of concrete foundations with tie bolts. Site U-360 and the open storage area north of Building 528 consist of cleared and leveled areas with no apparent foundations. No other significant findings were observed during the site reconnaissance. No metallic objects, except nails, were detected during the magnetometer assisted walkover. The Army performed a facility-wide investigation of former storage sites in 2007, as documented in a report entitled *Report of Investigation for Potential Environmental Areas of Concern* (USACE, 2007). As described in the report (USACE, 2007, page 6), soil samples from the pre-1940s magazine sites were collected and analyzed for

explosives (SW846 8330B). Although the sites noted above were not included in the sampling effort, because only trace levels of explosives were detected at three of 111 former storage sites sampled, it is believed that there is no evidence to suggest that any of the locations in Parcel 22 pose a threat to human health or the environment.

- Several ground scars noted within Parcel 22 during the aerial photograph analysis (ERI, 2006, Parcel 22 findings presented in Appendix B of the companion SRHI for Parcel 22) were included as part of the site reconnaissance. These sites included former Building 534 (former water tank south of Building 536), a ground scar located east of Building 536, a ground scar located northeast of Building 528, and a ground scar located south of Building 520.

  The former Building 534 (former water tank south of Building 536) was located during the site reconnaissance. The tank was removed at some point prior to the site reconnaissance and only several pieces of rebar and concrete remained at the location. No other significant findings were observed during the site reconnaissance.

  A ground scar northeast of Building 536 was reported in the aerial photo analysis and included as part of the site reconnaissance. The area appeared to have been used for placement of large rocks, most likely those removed during the construction of Building 536. No other significant findings were observed during the site reconnaissance.

  A ground scar north of Building 528 was reported in the aerial photo analysis and included as part of the site reconnaissance. The area appeared to have been used for either drainage improvement or as a soil borrow area, most likely for the construction of Building 528. No other significant findings were observed during the site reconnaissance.

  A ground scar south of Building 520 was reported in the aerial photo analysis and included as part of the site reconnaissance. The area appeared to have been used as a soil borrow area, most likely for the construction of the Disassembly Plant Area. No other significant findings were observed during the site reconnaissance

1.0 INTRODUCTION

This Release Assessment Report for Parcel 22 at Fort Wingate Depot Activity (FWDA) describes release assessment activities conducted as part of the environmental restoration program at FWDA. This document was prepared by TerranearPMC, LLC (TPMC) of Exton, Pennsylvania, in partial fulfillment of the requirements of Task Order No. 0005 under contract W9126G-06-D-0016. Contracting Officer's Representative and technical oversight responsibilities for the tasks described in this document were provided by the U.S. Army Corps of Engineers (USACE), Fort Worth District.

This document has been prepared for submission to the New Mexico Environment Department (NMED) Hazardous Waste Bureau (HWB), as required by Section VII.F.1 of the Resource Conservation and Recovery Act (RCRA) Permit (hereinafter referred to as "the Permit") for FWDA. The Permit (NM 6213820974) was finalized in December 2005 and became effective 31 December 2005.

1.1 PURPOSE/OBJECTIVE

The purpose of this document is to compile and present available information regarding the possibility of releases from Areas of Concern (AOCs) located within Parcel 22. As required by the Permit, this document was prepared in conjunction with and is submitted as a companion to the Summary Report of Historical Information (SRHI) for Parcel 22 and the RCRA Facility Investigation (RFI) Work Plan for Parcel 22.

1.2 PERMIT RELEASE ASSESSMENT REPORT REQUIREMENTS

As outlined in Permit Section VII.F.1, a Release Assessment Report must, at a minimum, include the following information:

1. Location of unit(s) on a topographic map of appropriate scale such as required under 20.4.1.900 New Mexico Administrative Code (NMAC) [incorporating 40 Code of Federal Regulations (CFR) 270.14(b)(19)];

2. Designation of type and function of unit(s);

3. General dimensions, capacities and structural description of unit(s) (supply any available plans/drawings);

4. Dates that the unit(s) operated;

5. All available site history information;

6. Specification of all wastes that have been managed at/in the unit(s) to the extent available (include any available data on hazardous waste or hazardous constituents in the wastes); and

7. All available information pertaining to any release of hazardous waste or hazardous constituents from such unit(s) (to include ground water data, soil analyses, air, and surface water data).

According to Permit Section VII.F.2, NMED will review the information presented herein to determine whether any further investigative action is required. NMED will notify FWDA of a corrective action complete decision, the need for confirmatory sampling, or the need to perform an RFI.

2.0 INSTALLATION DESCRIPTION AND HISTORY

FWDA is a closed U.S. Army depot whose former mission was to receive, store, maintain, and ship assigned materials (primarily explosives and military munitions), and to dispose of obsolete or deteriorated explosives and military munitions. Since 1975, the installation has been under the administrative command of Tooele Army Depot (TEAD), located near Salt Lake City, Utah. The active mission of FWDA ceased and the installation closed in January 1993, as a result of the Defense Authorization Amendments and Base Realignment and Closure (BRAC) Act of 1988. In 2002, the Army reassigned many functions at FWDA to the BRAC Division (BRACD), including property disposal, caretaker duties, management of caretaker staff, and performance of environmental restoration and compliance activities. TEAD retained command and control responsibilities, and continued to provide support services to FWDA until January 31, 2008. On January 31, 2008, command and control and support functions were transferred to White Sands Missile Range (WSMR).

FWDA currently occupies approximately 24 square miles (approximately 15,277 acres) of land in northwestern New Mexico, in McKinley County. The installation is located 8 miles east of Gallup on U.S. Route 66 and approximately 130 miles west of Albuquerque on Interstate 40 (Figure 1). FWDA contains facilities formerly used to operate a reserve storage activity providing for the care, preservation, and minor maintenance of assigned commodities, primarily conventional military munitions. The installation mission included the disassembly and demilitarization of unserviceable and obsolete military munitions. Ammunition maintenance facilities existed for the clipping, linking, and repackaging of small arms ammunition.

The installation is almost entirely surrounded by federally owned or administered lands, including both national forest and Tribal lands. The installation can be divided into several areas based upon location and historical land use. As shown in Figure 2, these historical land-use areas include:

- The Administration Area - located in the northern portion of the installation and encompassing approximately 800 acres; contains former office facilities, housing, equipment maintenance facilities, warehouse buildings, and utility support facilities;

- The Workshop Area - located south of the Administration Area and encompassing approximately 700 acres; consisting of an industrial area containing former ammunition maintenance and renovation facilities, the former TNT washout facility, and the TNT Leaching Beds Area;

- The Magazine (Igloo) Area - covering approximately 7,400 acres in the central portion of the installation and encompassing ten Igloo Blocks (A through H, J and K) consisting of 732 earth-covered igloos and 241 earthen revetments previously used for storage of munitions;

- Protection and Buffer Areas - encompassing approximately 4,050 acres consisting of buffer zones surrounding the former magazine and demolition areas; these areas are located adjacent to the eastern, northern, and western boundaries of the installation; and

- The Open Burning/Open Detonation (OB/OD) Area - located within the west central portion of the installation and encompassing approximately 1,800 acres; the OB/OD Area can be separated into two subareas based on period of operation, the Closed OB/OD Area and the Current OB/OD Area. The OB/OD Unit Hazardous Waste Management Unit (HWMU) is an area within the Current OB/OD Area.

FWDA operations in Parcel 22 ended with the closure of FWDA in January 1993. Tenant operations within Parcel 22 were conducted by TPL, Inc. (TPL), under various contracts. TPL performed demilitarization of military munitions with an emphasis on resource recovery and reuse. Demilitarization operations ranged from simple mechanical separation of munitions into their components to chemical processes to further extract reusable materials.

TPL's original facilities use contract was issued in 1994, and TPL began to occupy FWDA facilities in late 1994. The original contract consisted of five buildings (Building 527, Building 528, Buildings 528A and 528B, and Building 529), plus 19 igloos in Igloo Block B. TPL also installed a modular office trailer adjacent to Building 527.

Later contracts/modifications added additional buildings/facilities, including: Buildings 550 and 551; Buildings 535 and 536 (plus surrounding area); Buildings 518 and 519 (plus surrounding area); Buildings 301, 302, and 312; and 53 igloos in Igloo Block D. The 53 igloos in Igloo Block D were returned to Army control in 2005. The remaining facilities used by TPL in Parcel 22 were returned to Army control in 2007.

FWDA has been undergoing final environmental restoration prior to property transfer/reuse. As part of planned property transfer to the Department of the Interior (DOI), the installation has been divided into reuse parcels (Figure 2). Parcels transferred to date consist of Parcels 1, 15, and 17.

As shown in Figure 3, the northern portion of lands identified as Parcel 22 are a portion of the former FWDA Workshop Area, and the southern portion is a portion of the Magazine (Igloo) Area. According to the most recent reuse plan (DOI, 2005), Parcel 22 planned reuse is commercial.

This report contains release assessment information for AOCs within Parcel 22. The Permit lists a total of five AOCs within Parcel 22, as follows (Figure 3):

- AOC 30 Igloo Block D;

- AOC 69 Buildings 301, 302, and 312 (Standard Magazines), and building 316 (Field Lunch Room);

- AOC 71 Former rectangular structure near TMW-5 and north of Building 528;
- AOC 75 Electrical Transformers within Parcel 22; and
- AOC 88 Former buildings or structures and disposal areas southwest, south, and southeast of Building 528.

As shown in Figure 3, only a portion of AOC 30 (Igloo Block D) is located in Parcel 22; the remaining portion of AOC 30 is located in Parcel 19.

The Permit also lists a total of three Solid Waste Management Units (SWMUs) within Parcel 22, as follows (Figure 3):

- SWMU 12 Building 536 (Inspectors Workshop and Ammunition Renovation Depot);
- SWMU 27 Building 528 Complex (Includes Building 528 [Ammunition Normal Maintenance Building], Building 528A [temporary storage igloo], AOC 121 [Building 528B, temporary storage igloo], AOC 122 [Building 529], AOC 125 [Building 550, vacuum collector barricade], and AOC 126 [Building 551, service magazine]); and
- SWMU 70 Disassembly Plant and TPL QA Test Area (includes Building 517, Structure 518, Building 519, Structure 520, Structure 521, and Structure 547).

Specific operations/activities conducted at the AOCs located in Parcel 22 are discussed in the section for each respective AOC in this report. Specific operations and investigations conducted at the three SWMUs located in Parcel 22 are discussed in the Parcel 22 RFI Work Plan.

3.0 RELEASE ASSESSMENT METHODOLOGY

There is no specific release assessment methodology for AOCs under RCRA. During Permit implementation discussions, NMED HWB described an approach generally similar to the American Society for Testing and Materials (ASTM) Phase I Environmental Site Assessment (ESA) process. The current version of ASTM guidance for conducting a Phase I ESA is entitled *Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process*, designated as ASTM Standard E 1527-05; this standard is available for download from the ASTM website, www.astm.org.

3.1 RECORDS REVIEW

All available records pertaining to operations at the AOCs within Parcel 22 were reviewed as part of this release assessment.

Records reviewed included:

- A historical aerial photograph analysis for FWDA (ERI, 2006; Parcel 22 findings included in Appendix B of the companion SRHI for Parcel 22);
- Historical maps, drawings, and records located at FWDA;
- Historical records and documents, obtained from the National Archives and Records Administration (NARA) Rocky Mountain Region Federal Records Center;
- Historical records and documents obtained from the NARA College Park, Maryland, location;
- Historical records obtained from Army Field Support Command/Joint Munitions Command History Office's archives and document collection; and
- Other historical documents contained in the FWDA Information Repository.

When information included herein was found in a document already in the FWDA Information Repository, the full citation in Section 10.0 of this document includes the Information Repository index number for the cited document. When information cited herein was found in another location, copies of relevant portions of the cited document have been included in an appendix of the companion SRHI for Parcel 22.

3.2 SITE RECONNAISSANCE AND CONFIRMATORY SAMPLING

A site reconnaissance of the Parcel 22 AOCs was conducted during the week of 7 May 2007. A team consisting of an environmental professional and a Senior Unexploded Ordnance Supervisor (SUXOS)-qualified professional performed the site reconnaissance. Representative photographs of each AOC (or suspected AOC location) are included in Appendix A.

For locations where munitions and/or munitions components were possibly handled, a handheld magnetometer (Schonstedt MAC-51Bx) was used to augment the visual reconnaissance.

AOC boundaries, site features, and sampling locations were surveyed, as applicable, using a Trimble Pro XRS Global Positioning System (GPS) to accurately place them on a map of FWDA.

4.0 AOC 30 – IGLOO BLOCK D

4.1 LOCATION, DESCRIPTION, AND OPERATIONAL HISTORY

AOC 30 is Igloo Block D. Igloo Block D consists of 103 earth-covered magazines (igloos) and 17 open storage sites (earthen revetments, also known as "Y-Sites") constructed in 1941 and used for storage of munitions. The Parcel 22 portion of AOC 30 contains 53 igloos and 13 open storage sites; the remaining 50 igloos and four open storage sites are located in Parcel 19. All buildings and structures within AOC 30 will be discussed in this section, regardless of the parcel they may occupy. The location of AOC 30 is shown in Figure 4. Representative photographs are included in Appendix A.

Each igloo is a reinforced concrete arch, approximately 20 feet wide by 42 feet long by 12 feet high, with concrete ends and a concrete floor (see FWDA Drawing Nos. A-15-62, A-15-63, and A-15-8, included in Appendix F of the companion SRHI for Parcel 22), has an earth covering over the sides and top. Some igloos have a ground level floor and entrance door; others have an elevated floor and entrance with an attached loading dock. As shown in the design drawings, each igloo was waterproofed to prevent precipitation from entering the igloo, and each igloo has drain gutters at the base of the interior walls which were designed to collect any moisture which might accumulate on the walls, and drain to the front (exposed) side of the igloo. Each igloo is ventilated via a roof vent, and has a lightning protection system.

The open storage Y-sites range in size from approximately 25 feet wide by 50 feet long to approximately 50 feet wide by 75 feet long. Y-sites consist of a flat area surrounded by earthen berms ranging in height from 4 to 6 feet in height with a single open entrance on the north side.

As shown in Figure 4, two small concrete safety shelters (Buildings 404 and 405) are located within AOC 30 (see FWDA Drawing Nos. C-9-15, A-4-13, and A-7-45, included in Appendix F of the companion SRHI for Parcel 22). These structures consisted of a single small reinforced concrete room, approximately 10 feet wide and 25 feet long, with two small entrances. These safety shelters were intended to provide safe refuge for personnel in the event of an emergency during operations in Igloo Block D.

There are no electrical, sanitary sewer, natural gas or water utilities serving Igloo Block D. Surface runoff is conveyed via open ditches and culverts generally to the north-northwest, ultimately draining to an arroyo west of Igloo Block D (FWDA Drawing A-2-15, included in Appendix F of the companion SRHI for Parcel 22).

FWDA utilized Igloo Block D from 1942 through base closure in 1993. In order to ensure safety and maintain the usability of stored munitions, storage operations in FWDA igloo blocks/magazine areas were conducted in accordance with established procedures and standards as outlined in documents such as Technical Manual (TM) 9-1900 (Ammunition, General) and TM 9-1300-200

(Ammunition – General). Relevant portions of these TMs are included in Appendix A of the companion SRHI for Parcel 22. As shown in the TMs, boxes, cases, and other containers of munitions stored in a magazine were:

- to be clean and dry before being stored;
- not to be opened in a magazine;
- not to be stored after having been opened unless they had been securely re-closed; and
- not to be repaired in a magazine.

The TMs also detail magazine inspection requirements, including:

- Magazines should be inspected once a month, or more frequently as required, to see that all conditions are normal, that neither humidity nor temperature has been too high within the magazine, and that containers are in satisfactory condition;
- The magazines should be in good repair, dry, and well ventilated;
- Interiors of magazines should be clean and neat with stores arranged in orderly fashion;
- Outer containers should be securely closed;
- Loose munitions, damaged containers, empty containers, paint, oil, gasoline, waste, rags, tools and other prohibited articles should not be present in magazines; and
- Exudate (leakage) should be removed from magazines promptly.

The TMs specifically prohibit other operations, such as munitions maintenance/renovation, within magazine areas. As noted above, physically damaged munitions or munitions exuding (leaking) explosive fillers would be removed from storage, and materials used to clean up any exudate/leakage would likewise not remain in a storage area; these items would have been transported to the OB/OD Area for further treatment. Simply stated, accumulation or releases of hazardous materials inside or around an igloo was not permitted because the resulting safety hazard would endanger other munitions in storage, and by extension the associated facilities and personnel.

Outside storage in the Y-sites generally followed the same requirements. As noted in the TMs, outside storage was only to be used temporarily and only as an emergency expedient (e.g., before, during, or following a war, when munitions were received faster than they could be safely placed in storage within an igloo or when igloos were filled to capacity). When outdoor storage was used, the TMs state that bombs and separate-loading shells were to be given preference

over packaged munitions, and that frequent inspections for signs of deterioration or loose components were to be performed.

Following FWDA closure in 1993, the 53 igloos in Parcel 22 were used by an FWDA tenant, TPL, Inc., for storage of munitions and munitions components. TPL's original facilities use contract was issued in 1994, and TPL began to occupy FWDA facilities in late 1994. TPL's storage operations in the igloos differed from that of the Army; TPL stored propellant removed from munitions in TPL demilitarization operations in SWMU 27. Rather than being present inside munitions and their shipping containers, the removed propellant was stored in bags and other containers, and was stored awaiting reuse or recycling. Inspection and housekeeping practices utilized by TPL were not documented. The 53 igloos in Igloo Block D used by TPL were emptied of stored propellant and returned to Army control in 2005.

4.2 WASTE MANAGEMENT INFORMATION

There is no information suggesting hazardous wastes were handled at this AOC. Military munitions were stored in the igloos and Y-sites. These items may have contained hazardous constituents including high explosives (HE) and propellants.

4.3 RELEASE ASSESSMENT

The potential for a release of hazardous waste or hazardous constituents at this AOC was assessed by combining review of available records and documents with observations made during site reconnaissance.

4.3.1 Historical Records/Document Review

No detailed records of munitions stored over the period of Army use (1942 to 1993) were found. Although records (in the form of magazine data cards detailing type and lot information for stored munitions, as well as dates of storage and inspections) were maintained during FWDA operations as required by the TMs, none of these records were archived following FWDA closure. One historic document (USATHAMA, 1980; Page 26) reported storage of bulk TNT and M15 mines in Igloo Block D. A more general list of types of munitions that could have been stored is included in Appendix A of the companion SRHI for Parcel 22.

Several historical drawings were reviewed that provided general details about AOC 30. Historical drawings are provided in Appendix F of the companion SRHI for Parcel 22. FWDA Drawing A-14-3, dated September 1945, shows AOC 30 and provides details of the number of igloos (103 total) and open storage sites (17 total). FWDA Drawings A-15-62, A-15-63, and A-15-8 provide general construction details for the earth-covered igloos. Additionally, FWDA Drawings A-15-62 and A-15-8 show the internal gutter and outside drains of the igloos. FWDA Drawing A-15-1 provides general information for the open storage Y-sites.

As noted in the aerial photo analysis report (ERI, 2006; Parcel 22 findings included in Appendix B of the companion SRHI for Parcel 22), there were no

significant findings for AOC 30 on any of the photos reviewed, spanning the years 1935 through 1997.

As described in the companion SRHI for Parcel 22, potential contamination within FWDA igloo blocks was evaluated as part of a facility-wide environmental investigation (EI) following FWDA closure. Igloos and open storage sites within Igloo Block D where samples were collected are highlighted in Figure 4. Interior surface wipe samples and surface soil samples were collected from Igloos D-1153, D-1163, D-1179 (all located in Parcel 22) and Igloos D-1188, D-1216, D-1220, D-1221, and D-1229 (all located in Parcel 19). Surface soil samples were collected from open storage sites Y-D1146 and Y-D1158 (both located in Parcel 22). Typical sample location schematics and sample results are presented in a document entitled *Final Remedial Investigation/Feasibility Study Report & RCRA Corrective Action Program Document* (ERM PMC, 1997, Section 7.2).

A total of 24 interior surface wipe samples (three per igloo) were collected and analyzed for explosives. Three of the eight igloos sampled had detectable concentrations of explosives on interior surfaces; however; no Permit cleanup level exists for interior surfaces of a building.

A total of 30 surface soil samples (four per igloo and three per Y-site) were collected and analyzed for explosives and total phosphorus. No explosives were detected in any of the surface soil samples. As shown in Table 1, phosphorus was detected in all 30 samples. Although total phosphorus was detected in each surface soil sample and munitions containing white phosphorus (WP) could have been stored in Igloo Block D, it is very unlikely that white phosphorus could have been released to the environment during storage. As noted in Section 4.1, the established standards and procedures for munitions storage followed by FWDA did not permit opening containers and/or disassembly of munitions within the magazines or surrounding areas. As noted in TM 9-1904 (War Department, 1944, page 818; a copy is included in Appendix A of the companion SRHI for Parcel 22), WP filler in munitions was wax-like substance, solid below 111 °F and therefore would not leak from said munitions in storage below that temperature. Potential WP releases from munitions with WP fillers in storage at FWDA do not require further evaluation.

In 1997, USACE conducted an igloo pilot wash program to evaluate the effectiveness and estimate costs of washing interior surfaces of igloos to remove any residual constituents from FWDA storage operations. This effort was reported in a document entitled *Fort Wingate Igloo Pilot Wash Final Report* (SAIC, 1997). As noted in the report (SAIC, 1997, pages 3-2 and 3-5) explosives and metals (primarily lead) were detected in the collected wash water. No soil samples for lead analysis were collected to confirm that lead impacts were limited to the igloo interiors, and the wash water was discharged to the ground surface outside the igloo being washed, with approval from the NMED Ground Water Quality Bureau (SAIC, 1997, page 3-5).

The detection of explosives and lead on interior igloo surfaces led the Army (in consultation with other stakeholders) to request a health consultation from the

U.S. Department of Health and Human Services, Public Health Service, Agency for Toxic Substances and Disease Registry (ATSDR). This health consultation was documented in a report entitled *Health Consultation, Public Health Implications for Reuse of Munitions Storage Magazines (Igloos), Fort Wingate Depot Activity* (ATSDR, 2000). A copy of this document is included in Appendix F of the companion SRHI for Parcel 22. The presence of lead on the igloo interior surfaces was attributed to a number of possible sources, including lead bullets, lead foil on munitions, and/or fork lift exhaust. ATSDR recommended additional sampling, using vacuum sampling methodology (rather than wipes or rinses) to further evaluate risks associated with reuse of the igloos.

From 1998 to 2000, a DOI BLM environmental contractor documented conditions within Parcel 22 as part of a Phase I ESA of Parcels 6 and 22; this effort was documented in a report entitled *Phase I Environmental Site Assessment, Final Report, Fort Wingate (Parcels 6 and 22)* (TTNUS, 2000). The contractor performed a visual inspection of the interior and exterior of 11 igloos in Igloo Block D; six of the igloos contained propellant stored by TPL, while the other five were empty (TTNUS, 2000, pages 4-4 and 4-5). The Phase I ESA did not note any concerns with the exterior of the igloos.

In 2000, TEAD personnel conducted final inspections of all FWDA igloos not included in TPL's facilities use contract. The 50 igloos in Igloo Block D that are located in Parcel 19 were inspected in October and December 2000. Other than floor cracks in three igloos (D-1190, D-1211, and D-1229) which did not have any visible evidence of contamination (e.g., staining), there were no significant findings during the inspections. Following completion of the interior inspection, TEAD personnel locked each igloo access door with a cable lock.

Review of records associated with TPL confirmed that TPL used some or all of the 53 igloos in the Parcel 22 portion of Igloo Block D to store munitions and munitions components under their facilities use contract from sometime after 1994 until 2005.

TPL performed an open burn of unstable propellant on the road in front of Igloo D-1147 (reported as D-1144 in Caretaker log books) in December 2001. Both reported locations are shown in Figure 4-1. The propellant became unstable after TPL personnel applied a chlorine solution to disinfect rodent droppings present in the propellant bags. As described in a 19 December 2001 letter from TPL (included in Appendix F of the companion SRHI for Parcel 22), the amount burned was reported as approximately 300 lbs, poured in a pile 6 inches wide by 1 inch high by 100 feet long down the center of the asphalt paved road. In a November 2004 response to an NMED HWB Request for Information (dated 29 July 2004, included in Appendix F of the companion SRHI for Parcel 22), TPL listed the amount burned as 5,000 lbs and the burn date in 2002. It is unclear if more than one burning event took place and exactly how much was burned. There was no documented post-burn cleanup or sampling.

The 53 igloos in the Parcel 22 portion of Igloo Block D were returned to Army control in 2005. In June 2005, TEAD personnel conducted final inspections of

these igloos. Other than floor cracks in approximately 14 igloos which did not have any visible evidence of contamination (e.g., staining), there were no significant findings during the inspections. Following completion of the interior inspection, TEAD personnel locked each igloo access door with a cable lock.

4.3.2 Site Reconnaissance Findings

The site reconnaissance conducted at AOC 30 in May 2007 included the observation of the exterior/surrounding area (all sides) of each igloo and Y-site in AOC 30, located in Parcels 22 and 19. Because the igloo doors were secured with non-removable security seals (cable locks), the interiors of the igloos were not observed. Representative photographs of an igloo without a dock, an igloo with a dock, and a revetment in AOC 30 are included as Photo 4-1 through Photo 4-9, Appendix A.

An inspection/release assessment form was completed for each igloo and revetment in AOC 30 during the site reconnaissance. The completed forms are included in Appendix F of the companion SRHI for Parcel 22.

Propellant grains were observed on the ground surface near five igloos:(D-1138, D-1171, D-1182, D-1183, and D-1186). As shown in Figure 4, these igloos were located in Parcel 22 and were among those used by TPL. There were no significant findings for the remaining 98 igloos or 17 Y-sites.

A single empty small-caliber rifle casing was observed near D-1234, most likely from a hunter, when hunting was permitted at FWDA. Small pieces of banding (metal strapping used to secure munitions containers to pallets) and nails were observed at many igloos. Clay drain pipe was observed at several igloos (Photo 4-11, Appendix A), which would be the exterior perimeter drainage pipe shown in the historical drawings.

Several drums were observed near the ends of dead-end roads. The drums were painted yellow and appear to have been used to mark the ends of these roadways. The drums were mostly empty at the time of the site reconnaissance, and only contain a minor amount of household trash (i.e. bottles, etc.). A drainage culvert, made from empty drums welded end-to-end, was also observed in Igloo Block D.

No evidence of the reported TPL burn (e.g., burn residue) was noted at D-1144 or D-1147 during the site reconnaissance.

A representative photograph of a safety shelter is included as Photo 4-12, Appendix A. There were no significant findings associated with any of the safety shelters. Based on the design of the safety shelters within AOC 30 (i.e. small physical size, with small entrances which provide personnel access only, as shown in historical drawings included in Appendix F of the companion SRHI for Parcel 22) and the lack of significant findings during the site reconnaissance, it is concluded that these buildings were not used for any purpose other than as designed.

4.3.3 Confirmatory Sampling

No confirmatory sampling was completed during the May 2007 release assessment.

4.4 RELEASE ASSESSMENT CONCLUSION

As noted in Section 4.1, there are 103 igloos, 17 open storage Y-sites, and two safety shelters in AOC 30, Igloo Block D. Of these, 53 igloos and 13 Y-sites are located within Parcel 22, with the remaining structures located in Parcel 19.

Based on the known operations conducted within the portions of AOC 30 located in Parcel 19, review of historical information, and the findings of the site reconnaissance, it is concluded that it is unlikely that a release of a hazardous waste or hazardous constituents to the environment occurred within the portions of AOC 30 located in Parcel 19 (former munitions storage igloos operated by FWDA only). Further, there is no evidence to suggest the portions of AOC 30 located in Parcel 19 pose an unacceptable risk to human health or the environment from releases outside the building. However, supplemental investigations are proposed for AOC 30 to provide additional data. Planned investigations are described in the companion RFI Work Plan for Parcel 22.

Based on the known operations conducted at AOC 30 located in Parcel 22 and the findings of the site reconnaissance, it is concluded that a release of a hazardous waste or hazardous constituents occurred at five igloos within Parcel 22, specifically Igloos D-1138, D-1171, D-1182, D-1183, and D-1186, where the site reconnaissance found propellant grains on the ground surface. Because these types of materials were not observed outside igloos in Parcel 19 (former munitions storage igloos operated by FWDA only) and because the storage operations conducted by TPL were different from those conducted by FWDA, it is concluded that the propellant grains originated from TPL storage operations rather than FWDA storage operations. The Army plans to evaluate these releases by collecting additional surface soil samples outside the five igloos. Planned investigations are described in the companion RFI Work Plan for Parcel 22.

Additionally, the Army proposes to collect soil samples from surface soil around D-1144 and D-1147 (reported locations of propellant burn conducted by TPL, as discussed in Section 4.3.1) to provide additional data for evaluation of potential risk to human health and the environment from the propellant burn. Planned investigations are described in the companion RFI Work Plan for Parcel 22.

An appropriate response action will be implemented to remove propellant grains from the surface soil.

Other debris, such as the empty metal drums being used as road markers and drainage culverts, will be removed prior to land transfer as part of a "housekeeping" action (as opposed to an environmental restoration action).

5.0 AOC 69 – BUILDINGS 301, 302, AND 312 (STANDARD MAGAZINES), AND BUILDING 316 (FIELD LUNCH ROOM)

5.1 LOCATION, DESCRIPTION, AND OPERATIONAL HISTORY

AOC 69 includes Buildings 301, 302, and 312 (Standard Magazines), and Building 316 (Field Lunch Room) north of and adjacent to Igloo Block D (AOC 30). AOC 69 is shown in Figure 5. Representative photographs are included in Appendix A.

Buildings 301, 302, and 312 are large single-story warehouse style buildings, approximately 218 feet long by 52 feet wide, constructed in 1941. The buildings have reinforced concrete floors, clay-tile block walls and, as shown in FWDA Drawing No. A-15-53 (included in Appendix G of the companion SRHI for Parcel 22), corrugated asbestos roofing. The buildings are adjacent to a railroad siding and have loading docks along the south side of the structures. These buildings are standard above ground magazines used for storage of munitions. Each magazine is ventilated and has a lightning protection system. There are no electrical, sanitary sewer, natural gas or water utilities serving the magazines.

Building 316 is a single-story building, approximately 64 feet long by 40 feet wide, constructed in 1944. The building has a concrete floor, stone and mortar walls, and a wood-framed, asphaltic-shingle roof. This building was initially a field lunch room, where personnel from the magazine area could gather and eat. Later uses may have included storage of inert materials. There are no electrical, sanitary sewer, natural gas or water utilities serving the Building 316. Access to Building 316 is via three single doors, one on the center of the north side of the building, and two on the ends of the south side.

The Army utilized the Standard Magazines (Buildings 301, 302, and 312) from 1942 through base closure in 1993. The same standards and procedures for munitions storage described in detail in detail for AOC 30, Igloo Block D (Section 4.1) were employed during Army storage operations at the Standard Magazines.

Buildings 301, 302, and 312 were used by an FWDA tenant, TPL, Inc., for storage. TPL's original facilities use contract was issued in 1994, and TPL began to occupy FWDA facilities in late 1994, and TPL continued operations at FWDA until late 2006. Materials stored by TPL in the Standard Magazines were not documented. TPL did not use Building 316.

5.2 WASTE MANAGEMENT INFORMATION

There is no information suggesting hazardous wastes were handled at this AOC during FWDA operations. Military munitions were stored in the Standard Magazines. These items may have contained hazardous constituents including HE and propellants.

There is no information documenting the materials stored by TPL in the Standard Magazines.

5.3 RELEASE ASSESSMENT

The potential for a release of hazardous waste or hazardous constituents at this AOC was assessed by combining review of available records and documents with observations made during site reconnaissance.

5.3.1 Historical Records/Document Review

None of the historical documents reviewed suggested that releases of hazardous wastes or hazardous constituents occurred from AOC 69.

No detailed records of munitions stored over the period of Army use (1942 to 1993) were found. Although records (in the form of magazine data cards detailing type and lot information for stored munitions, as well as dates of storage and inspections) were maintained during FWDA operations as required by the TMs, none of these records were archived following FWDA closure.. A review of TM 9-1904 (War Department, 1944, page 780; a copy is included in Appendix A of the companion SRHI for Parcel 22) indicated standard above ground magazines were used for storage of less explosive munitions, such as fixed cartridge-type and small arms munitions in shipping containers. There were no significant findings for AOC 69 in any of the historical records reviewed.

Several historical drawings were reviewed that provided general details about AOC 69. Historical drawings are provided in Appendix G of the companion SRHI for Parcel 22. FWDA Drawing B-11-16, dated October 1970, provides locations of the standard magazines. FWDA Drawings B-11-89, A-15-49, A-15-50, A-15-53, and A-15-55 provide general construction details for the standard magazines. FWDA Drawing A-5-199 shows details for magazine area lunch rooms, including Building 316. FWDA Drawing C-6-30 shows details for addition of electric lighting, water and sanitary sewer service, and natural gas for heating to Building 316.

As noted in the aerial photo analysis report (ERI, 2006; Parcel 22 findings included in Appendix b of the companion SRHI for Parcel 22), findings for AOC 69 included an area of disturbed ground in the 1935 aerial photo, south of where the magazines were constructed in 1941. In the 1952 aerial photo, the magazines are first noted. Dark-toned material or staining is noted south of the magazines in the 1973, 1978, 1985, 1991, 1993, and 1997 aerial photos. No significant findings were noted in the other aerial photos reviewed.

No information regarding TPL operations in Buildings 301, 302, and 312 was found for review.

From 1998 to 2000, a DOI BLM environmental contractor documented conditions within Parcel 22 as part of a Phase I ESA of Parcels 6 and 22; this effort was documented in a report entitled *Phase I Environmental Site Assessment, Final Report, Fort Wingate (Parcels 6 and 22)* (TTNUS, 2000, pages 5-1, 5-2, and inspection forms in Appendix B of the report; copies included in Appendix G of the companion SRHI for Parcel 22). The contractor performed a visual inspection of the interior and exterior of Buildings 301, 302, 312, and 316. Other

than the presence of ACM and potential lead-based paint (LBP), the Phase I ESA did not note any concerns with the buildings.

5.3.2 Site Reconnaissance Findings

The site reconnaissance conducted at AOC 69 in May 2007 included the observation of the exterior/surrounding area and interior of each Standard Magazine (Buildings 301, 302, and 312) and Building 316. Representative photographs are included as Photos 5-1 through 5-10, Appendix A.

Overall, all three standard magazines were in fair condition (Photos 5-1 through 5-4, Appendix A). Several munition shipping containers were observed near the corners of the magazines, being used as extensions on downspouts for the buildings' rain gutters (Photo 5-5, Appendix A). Several pieces of asbestos tile roofing were observed on the ground surface around Building 301 and Building 312 (Photos 5-6 and 5-7, Appendix A. Several clay-tile drain-pipe (Photo 5-8, Appendix A) for the rain gutters were observed near the magazines. The magazines were empty and the concrete floors were in good condition and did not have visible staining (Photo 5-9, Appendix A).

Overall, Building 316 was in poor condition (Photo 5-10, Appendix A). Portions of the roof were rotted or missing, and some of the roofing material was on the ground surface around the building exterior. The interior of the building was a single room with a concrete floor and was being used to store straw (Photo 5-11, Appendix A). A floor drain was observed in Building 316 (Photo 5-12, Appendix A), which was in the approximate location shown in FWDA Drawing A-5-199 (included in Appendix G of the companion SRHI for Parcel 22). No evidence of a cesspool (to which the floor drain was to discharge, according to notes at the bottom of FWDA Drawing No. A-5-199) was observed, and the floor drain discharge location could not be confirmed. However, because the building was a lunch room and there is no evidence of other operations with the potential to release hazardous constituents, this potential discharge location was not evaluated further.

On the exterior south side of Building 316 (approximately opposite the floor drain) is a concrete slab, with a small diameter wall penetration approximately 12 inches above the slab (Photo 5-13, Appendix A); the use of this slab and any former piping into the building from the slab could not be determined, but it is possible that a water storage tank (to allow personnel to wash hands before eating) was located on the slab. No evidence of electrical lighting, restroom facilities, or other improvements shown in FWDA Drawing C-6-30 (included in Appendix G of the companion SRHI for Parcel 22) were observed, so it is possible that the additional utility services were planned but not completed.

The stained areas noted in the open area south of Building 302 (as described in discussion of the aerial photograph analysis, Section 5.3.1) were observed and determined to be coal bottom ash used for the railroad base.

5.3.3 Confirmatory Sampling

No confirmatory sampling was completed during the May 2007 release assessment.

5.4 RELEASE ASSESSMENT CONCLUSION

Based on the known use of the buildings within AOC 69, a review of historical information, and the findings of the site reconnaissance, it is concluded that it is unlikely that a release of a hazardous waste or hazardous constituents occurred at these buildings. Further, there is no evidence to suggest this AOC poses a threat to human health or the environment.

As noted in Section 5.3.2, coal bottom ash was placed by FWDA south of Building 302 as part of the former railroad spur. Analytical results from samples of similar coal bottom ash materials at FWDA showed metals and trace levels of semi-volatile organic compounds (SVOCs) below applicable RCRA limits, indicating that material was classified as non-hazardous/non-regulated material. Arsenic concentrations in the previous coal bottom ash samples ranged from 4.92 to 8.42 mg/kg, exceeding the Permit cleanup level of 3.90 mg/kg; however, the detected arsenic concentrations are of the same magnitude as the maximum concentration of arsenic detected in soil samples collected from unimpacted areas of FWDA (Malcolm Pirnie, 2000, Table 4-4). There is no evidence to suggest that the coal bottom ash poses a threat to human health or the environment.

Loose ACM on the ground surface around the buildings will be removed and ACM and LBP remaining on the buildings will be evaluated and addressed in accordance with Army policies, encompassing and in accordance with applicable federal, state, and local requirements. The Army will address these issues under a program separate from the RCRA compliance program, and will do so in consultation with the DOI, Navajo Nation, and Pueblo of Zuni.

Therefore, no further RCRA corrective action activities are warranted or proposed for AOC 69, and the Army proposes that AOC 69 be designated "Corrective Action Complete Without Controls".

6.0 AOC 71 – FORMER RECTANGULAR STRUCTURE

6.1 LOCATION, DESCRIPTION, AND OPERATIONAL HISTORY

AOC 71 is listed in the Permit as a "Former rectangular structure near TMW-5 and north of Building 528." Because the Permit description and the map location for AOC 71 differed and two possible locations existed, AOC 71 was divided into AOC 71A and AOC 71B. For purposes of the release assessment, the location near TMW05, north of Building 528 was designated 71A. The location south of Arterial Road No. 6 and west of Normal Maintenance Avenue was designated 71B. AOC 71 is shown in Figure 5.

As discussed in the companion SRHI for Parcel 22, because part of AOC 71 is located within Parcel 21, both AOC 71A and AOC 71B were evaluated as part of the Parcel 21 release assessment, as reported in a document entitled *Release Assessment Report, Parcel 21, Fort Wingate Depot Activity* (TPMC, 2008, Section 10.0).

7.0 AOC 75 –ELECTRICAL TRANSFORMER LOCATIONS

7.1 LOCATION, DESCRIPTION, AND OPERATIONAL HISTORY

AOC 75 is listed in the Permit as "Electrical Transformers (at least 65 former or existing transformers)". FWDA records (included in Appendix I of the companion SRHI for Parcel 22) show 65 transformers in 29 locations throughout FWDA. As shown in Figure 5, a number of these locations are within Parcel 22.

7.2 WASTE MANAGEMENT INFORMATION

There is no information suggesting hazardous wastes were handled at any location in this AOC.

7.3 RELEASE ASSESSMENT

The potential for a release of PCBs at locations in AOC 75 was assessed by combining review of available records and documents and observations made during site reconnaissance.

7.3.1 Historical Records/Document Review

According to FWDA records (included in Appendix I of the companion SRHI for Parcel 22), a number of transformers are or were present within Parcel 22. AOC 75 locations within Parcel 22 are shown in Figure 5.

7.3.1.1 Building 536 Pole-Mounted Transformer

According to FWDA records (included in Appendix I of the companion SRHI for Parcel 22), three pole-mounted electrical transformers were located at Building 536 (SWMU 12, Figure 5). Two of the transformers were classified as PCB-contaminated transformers, with PCB concentrations of 180 parts per million (ppm) and 270 ppm, respectively. The third transformer was classified as a PCB transformer, with a PCB concentration of 770 ppm. These transformers were removed and manifested for disposal in January 1993.

Soil was removed at Building 536 as part of a soil remediation effort in 1996 (CCC Group, 1996). Approximately 7 cubic yards (CY) of soil were removed near the pole-mounted transformers associated with Building 536. The soil was manifested and transported to the US Ecology Landfill near Beatty, Nevada for disposal. Three post-removal samples collected from the excavation exceeded the conservative 1 mg/kg cleanup standard. Copies of documentation are included in Appendix I of the companion SRHI for Parcel 22.

Additional PCB-impacted soil exceeding 1 mg/kg was removed in 1998 (CCC Group, 1998). Soil was removed from depths between 2 feet and 4 feet below ground surface (bgs) under the former pole-mounted transformers at Building 536. The soil was manifested and transported to the U.S. Ecology Landfill near Beatty, Nevada for disposal. Eight post-removal samples collected from the

excavation were below the 1 mg/kg cleanup standard. The excavation was backfilled with clean soil obtained off-site. Copies of documentation are included in Appendix I of the companion SRHI for Parcel 22.

7.3.1.2 Building 527 Transformers

According to FWDA records (included in Appendix I of the companion SRHI for Parcel 22), three pole-mounted electrical transformers were located at Building 527 (Figure 5). These transformers were considered non-PCB (PCB concentrations less than 10 ppm). These transformers were relocated to Vault A near Building 15 in 1992.

7.3.1.3 Building 528 Transformers

According to FWDA records (included in Appendix I of the companion SRHI for Parcel 22), three pole-mounted electrical transformers were located at Building 528 (Figure 5). These transformers were considered non-PCB (PCB concentrations less than 10 ppm). These transformers were removed and manifested for disposal in January 1993.

7.3.1.4 Building 519 Transformers

According to FWDA records (included in Appendix I of the companion SRHI for Parcel 22), two electrical transformers were located inside Building 519 (Figure 5). These transformers were considered PCB transformers, with PCB concentrations of 770,000 ppm and 990,000 ppm. Based on professional knowledge of PCB concentrations in electrical transformers, it is believed the PCB results from these transformers are either reported incorrectly (i.e. laboratory error) or in the wrong units (i.e. parts per billion [ppb]). These transformers were reported as leaking in 1990 and as being stored in Building 15 prior to disposal in 1992. These transformers were manifested for disposal in January 1993.

7.3.2 Site Reconnaissance Findings

Existing or former electrical transformer locations in Parcel 22 that are part of AOC 75 were inspected for stained surfaces and/or stained soil in May 2007. Representative photographs are included as Photos 7-1 through 7-9, Appendix A.

7.3.2.1 Building 536 Transformers

As noted in Section 7.3.1.1, three transformers were removed from the Building 536 area by FWDA in 1993. However, three pole-mounted transformers were present on a single pole located east of Building 536 (Photo 7-1). These transformers were labeled as non-PCB transformers, and it is believed they were installed by TPL.

In addition, two pad-mounted transformers were observed at Building 536 during the site reconnaissance. A large single transformer was located just to the east

of the building (Photo 7-2, Appendix A). It had no markings, however; this transformer appeared fairly new and appeared to be a large air-cooled unit. A small transformer was located inside Building 536 (Photo 7-3, Appendix A) and appeared to be a non-PCB, air-cooled unit. Both transformers are believed to have been installed by TPL to support their operations in Building 536.

7.3.2.2 Building 527 Transformers

As noted in Section 7.3.1.2, three pole-mounted transformers were removed from the Building 527 location by FWDA in 1993. A single pole-mounted transformer was located on the northeast corner of the building (Photo 7-4, Appendix A) during the site reconnaissance. This transformer was marked as non-PCB. This transformer is believed to have been installed by TPL.

7.3.2.3 Building 528 Transformers

As noted in Section 7.3.1.3, three pole-mounted transformers were removed from the Building 528 location by FWDA in 1993. Two groups of three pole-mounted transformers were located on the northwest corner of Building 528 (Photos 7-5 and 7-6, Appendix A) during the site reconnaissance. All six transformers were labeled non-PCB. These transformers are believed to have been installed by TPL to support their operations in Building 528.

A small pad-mounted transformer was located on the south side of Building 528 (Photo 7-7, Appendix A) and appeared to be a non-PCB, air-cooled unit. The transformer is believed to have been installed by TPL to support their operations in Building 528.

7.3.2.4 Building 519 Transformers

No transformer was observed in Building 519 during the site reconnaissance, however; a transformer pad was observed within the building (Photo 7-8, Appendix A). The pad was obscured by dust/soil/debris on the building floor, and therefore could not be observed.

During the site reconnaissance, a pole-mounted transformer was observed on the southwest corner of the Disassembly Plant Area (Photo 7-9, Appendix A). No markings were observed on this transformer; however, it is assumed to have been installed by TPL to support their operations.

7.3.3 Confirmatory Sampling

No samples were collected from transformer locations, primarily because those transformers were either non-PCB transformers or showed no evidence of a release to the environment.

7.4 RELEASE ASSESSMENT CONCLUSION

Based on the findings of this release assessment, there is no evidence to suggest that any of the AOC 75 locations in Parcel 22 pose a threat to human health or the environment.

Surface soil around the Building 519 transformer location will be sampled as part of the planned investigations for SWMU 70. The analytical program will include PCBs to evaluate any potential releases from the AOC 75 location at Building 519. Planned investigations are described in the companion RFI Work Plan for Parcel 22.

8.0 AOC 88 – FORMER BUILDINGS OR STRUCTURES AND DISPOSAL AREAS SOUTHWEST, SOUTH, AND SOUTHEAST OF BUILDING 528

8.1 LOCATION, DESCRIPTION, AND OPERATIONAL HISTORY

AOC 88 is listed in the Permit as "Former Buildings or Structures and Disposal Areas Southwest, South, and Southeast of Building 528". The "former buildings or structures" portion of AOC 88 consists of two former open storage areas (also known as "X-sites"). The "disposal areas" portion of AOC 88 refers to an area south of Building 528 where debris including ACM were disposed on the ground surface.

For simplicity, the former X-sites will be called AOC 88A (the eastern location) and AOC 88B (the western location), and the ACM debris area will be called AOC 88C. AOC 88 locations are shown in Figure 5. Representative photographs are included in Appendix A.

As described in Section 8.3.1, the X-site at AOC 88A appears to have been used periodically between 1945 and the late 1960s/early 1970s, while the X-site at AOC 88B appears to have been used periodically between 1945 and the late 1950s/early 1960s. The same standards and procedures for munitions storage described in detail in detail for AOC 30, Igloo Block D (Section 4.1) were employed during Army storage operations at the X-sites.

It is not known when the ACM debris was placed at AOC 88C. As noted below, the ACM debris was removed in 2001.

8.2 WASTE MANAGEMENT INFORMATION

There is no information suggesting hazardous wastes were handled at any of the three locations in this AOC. Military munitions were temporarily stored in AOCs 88A and 88B. These items may have contained hazardous constituents including HE, napalm, and propellants.

Debris including ACM were disposed on the ground surface in AOC 88C. As noted below, the ACM debris was removed in 2001.

8.3 RELEASE INFORMATION

The potential for a release of hazardous waste or hazardous constituents at this AOC was assessed by combining review of available records and documents and observations made during site reconnaissance.

8.3.1 Historical Records/Document Review

A historical map from 1945 (FWDA Drawing No. A-7-70, included in Appendix J of the companion SRHI for Parcel 22) shows the AOC 88 locations as temporary storage areas T-325 (AOC 88A) and T-326 (AOC 88B).

A historical map from 1955 (FWDA Drawing No. A-3-4, included in Appendix J of the companion SRHI for Parcel 22) shows AOC 88B as T-32 (X-15) and is noted as an X-Site with a 3,000 ton capacity. No feature is present in the AOC 88A location on historical map A-3-4.

Historical maps from 1963 (FWDA Drawing No. C-9-13, included in Appendix J of the companion SRHI for Parcel 22) and 1966 (FWDA Drawing Nos. C-10-4 and A-14-4, included in Appendix J of the companion SRHI for Parcel 22) show the AOC 88A location (T-325) as temporary open storage area Z-551. No AOC 88B location is present on either historical map.

A historical map from 1966 (FWDA Drawing No. A-14-4, included in Appendix J of the companion SRHI for Parcel 22), appears to have been used by FWDA personnel to track status of each open storage site shown, with push pins used to identify a given site's status. The handwritten legend included the classification "leakers awaiting disposition", and it is possible that open storage site Z-551 (AOC 88A) was one of the sites used to store "leakers." The AOC 88B location is not shown on the historical map.

A review of the *Installation Assessment of Fort Wingate Army Depot Activity* (USATHAMA, 1980, Page 27, Section d) found a statement regarding "large quantities of Napalm bombs stored at FWDA during the SEA conflict. Any rejects or leakers among these fire bombs were destroyed by burning in the demolition area." SEA was an abbreviation of Southeast Asia, and the "SEA conflict" was also known as the Vietnam War or Vietnam Conflict. The time period of the Vietnam War corresponds to the approximate date (1966) of the map described above.

Based on this information, it is possible that damaged munitions containing napalm were stored at AOC 88A. Information on Vietnam-era napalm weapons is included in Appendix J of the companion SRHI for Parcel 22. There is no record of the exact types of munitions containing napalm stored at FWDA. However, only two types of the eight weapons were pre-filled at the factory, with Napalm-B filler. Napalm-B was a mixture of polystyrene thickener, benzene, and gasoline. The remaining six types of weapons were shipped empty and filled in the field.

As noted in the aerial photo analysis report (ERI, 2006; Parcel 22 findings are included in Appendix B of the companion SRHI for Parcel 22), a low building or building foundation was present at AOC 88A in the 1948 photo. The 1952 photo showed a graded area with probable disposal area at AOC 88A. In the 1966 photo, an access road leads to an area of light-toned material and disturbed ground at AOC 88A. In analysis of the 1973, 1978, 1985, and 1991 photos found that scarred and disturbed areas with probable debris present at AOC 88A. There were no significant findings for the remaining photos analyzed and no coverage in the 1991 photo.

ACM debris were removed from AOC 88C in 2001, as documented in a report entitled *Report of Asbestos Abatement and Asbestos Inspection at Selected*

Buildings, Fort Wingate Depot Activity (USACE, 2002). Asbestos was not detected in five confirmatory soil samples following removal.

8.3.2 Site Reconnaissance Findings

AOC 88A and AOC 88B were inspected for stained soil, munitions, and munitions components. Representative photographs are included as Photos 8-1 through 8-4, Appendix A.

Several pieces of metal debris (non-ordnance related) were present at the AOC 88B location (Photo 8-2, Appendix A). A single ordnance-related component (100-pound bomb end-ring) was observed at AOC 88B (Photo 8-3, Appendix A). Several pieces of roofing material were present at the west end of the AOC 88A location (Photo 8-4, Appendix A). Several pieces of metal debris (non-ordnance related) were also present at AOC 88A.

AOC 88C was inspected for remaining debris. This area is approximately 100 feet long and varies from very narrow to less than 15 feet wide (Photo 8-5, Appendix A). The asbestos disposal area was remediated as part of a larger ACM abatement project (USACE, 2002). A single piece of suspect ACM was observed near the south end of the arroyo channel (Photo 8-6, Appendix A). No other significant findings were observed during the site reconnaissance.

8.3.3 Confirmatory Sampling

Samples were not collected as part of the release assessment for this AOC.

8.4 RELEASE ASSESSMENT CONCLUSION

Historical documents indicate that AOC 88A and AOC 88B locations were open storage X-sites, used for temporary storage of military munitions.

As noted in Section 8.3.1, it is possible that some of the munitions stored at AOC 88A were damaged bombs filled with Napalm-B. Napalm-B contained polystyrene, benzene, and gasoline. The aerial photo analysis did not identify any staining indicative of a significant release in any of the photos analyzed, including a 1973 color photo. The aerial photo analysis showed no materials stored in this location in 1966, and none again in 1973, so if potentially damaged munitions were stored at this location, that use was for less than 7 years, more than 33 years ago. However, the Army proposes to collect samples from surface soil across AOC 88A to provide additional data for evaluation of risk to human health and the environment. Planned investigations are described in the companion RFI Work Plan for Parcel 22.

Observations made during the site reconnaissance did not suggest that releases of hazardous wastes or hazardous constituents occurred from operations at AOC 88B. However, the Army proposes to collect samples from surface soil across AOC 88B to provide additional data for evaluation of risk to human health and the environment. Planned investigations are described in the companion RFI Work Plan for Parcel 22.

The suspect ACM observed in AOC 88C will be removed and disposed when asbestos abatement is completed at FWDA.

9.0 ADDITIONAL AREAS EVALUATED

Several additional areas were investigated based on the aerial photo review findings.

9.1.1 Cleared Area South of Building 528

A cleared area south of Building 528 noted on a 1973 aerial photo (ERI, 2006; Parcel 22 findings are included in Appendix B of the companion SRHI for Parcel 22) was included as part of the site reconnaissance. A roadway leading to the area from Building 528 was observed (Photo 9-1, Appendix A). The cleared area was approximately 75 feet wide by 150 feet long (Photo 9-2, Appendix A) and appears to be a borrow area; the area appears around the same timeframe as the construction of storage magazines B528A and B528B, and may have been the source of soil used for the covering the magazines.

No significant findings were observed during the site reconnaissance. No metallic objects were detected during the magnetometer assisted walkover. No evidence of waste disposal activities was observed.

9.1.2 Former Storage Locations

Several former storage magazines (typically known as pre-1940s magazines) were included as part of the site reconnaissance. These sites included Y-361, Y-362, Y-363, and U-360 (Figure 3) as well as two formerly unlisted sites (one just south of Building 527 and the second just west of AOC 88B). Additionally, an open storage area north of Building 528 was included in the site reconnaissance.

All sites, except U-360 and the site north of Building 528, consist of concrete foundations with tie bolts (Photo 9-3 and Photo 9-4, Appendix A). Site U-360 and the open storage area north of Building 528 consist of cleared and leveled areas with no apparent foundations.

No other significant findings were observed during the site reconnaissance. No metallic objects, except nails, were detected during the magnetometer assisted walkover.

The Army performed a facility-wide investigation of former storage sites in 2007, as documented in a report entitled *Report of Investigation for Potential Environmental Areas of Concern* (USACE, 2007). As described in the report (USACE, 2007, page 6), soil samples from the pre-1940s magazine sites were collected and analyzed for explosives (SW846 8330B). Although the sites noted above were not included in the sampling effort, because only trace levels of explosives were detected at three of 111 former storage sites sampled, it is believed that there is no evidence to suggest that any of the locations in Parcel 22 pose a threat to human health or the environment.

9.1.3 Former Structures and Ground Scars - Various Locations

Several ground scars noted within Parcel 22 during the aerial photograph analysis (ERI, 2006, Parcel 22 findings presented in Appendix B of the companion SRHI for Parcel 22) were included as part of the site reconnaissance. These sites included former Building 534 (former water tank south of Building 536), a ground scar located east of B536, a ground scar located northeast of Building 528, and a ground scar located south of Building 520.

The former Building 534 (former water tank south of Building 536) was located during the site reconnaissance. The tank was removed at some point prior to the site reconnaissance and only several pieces of rebar and concrete remained at the location (Photo 9-5, Appendix A). No other significant findings were observed during the site reconnaissance.

A ground scar northeast of Building 536 was reported in the aerial photo analysis and included as part of the site reconnaissance. The area appeared to have been used for placement of large rocks (Photo 9-6, Appendix A), most likely those removed during the construction of Building 536. No other significant findings were observed during the site reconnaissance.

A ground scar north of Building 528 was reported in the aerial photo analysis and included as part of the site reconnaissance. The area appeared to have been used for either drainage improvement or as a soil borrow area (Photo 9-7, Appendix A), most likely for the construction of Building 528. No other significant findings were observed during the site reconnaissance.

A ground scar south of Building 520 was reported in the aerial photo analysis and included as part of the site reconnaissance. The area appeared to have been used as a soil borrow area (Photo 9-8, Appendix A), most likely for the construction of the Disassembly Plant Area. No other significant findings were observed during the site reconnaissance.

10.0 REFERENCES

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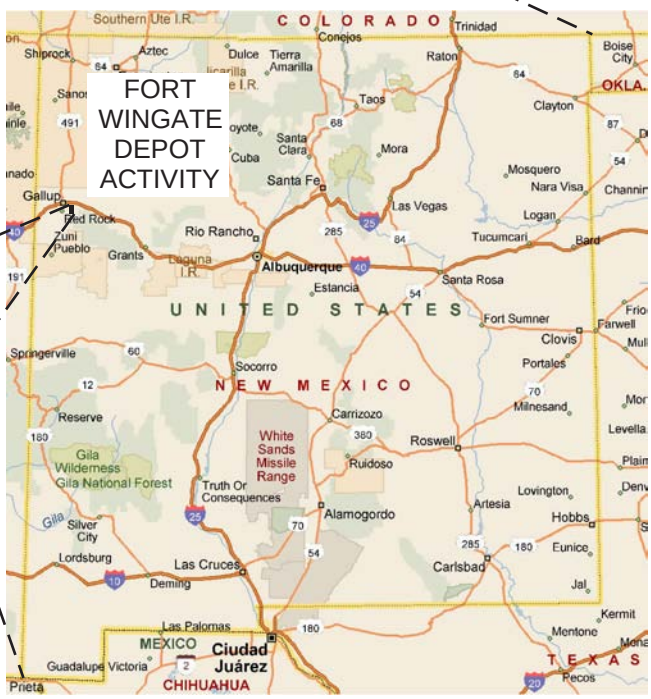
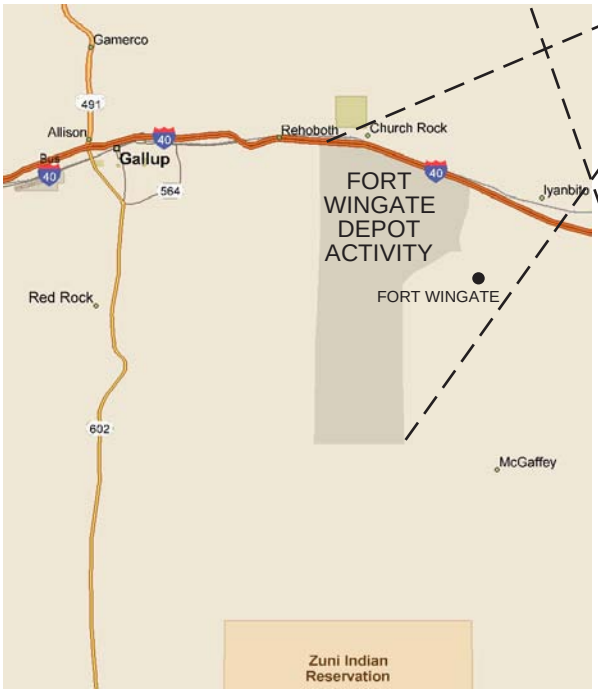
FIGURES

Figure 1
Installation Location
Fort Wingate Depot Activity
McKinley County, New Mexico



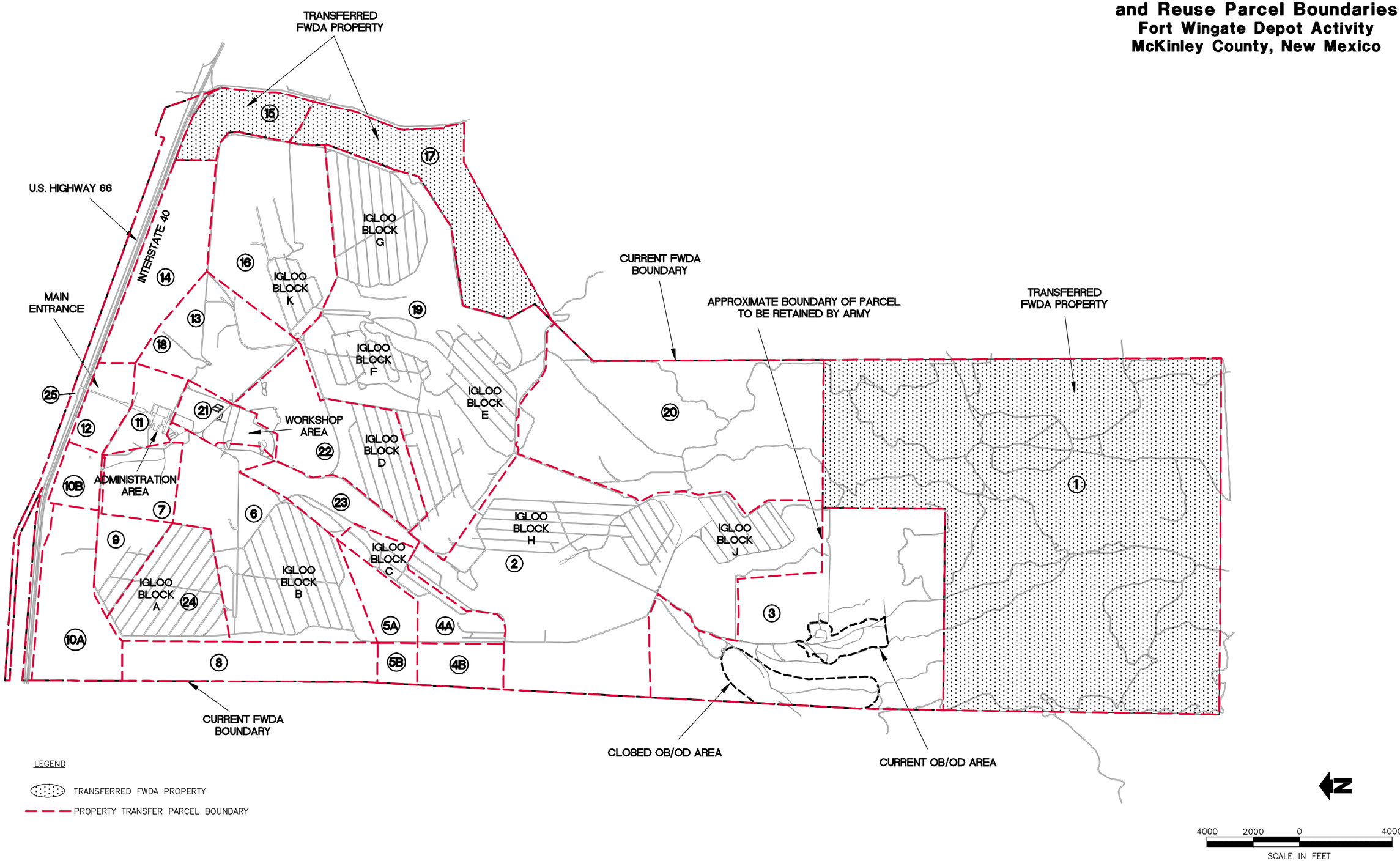


N

NOT TO SCALE

SOURCE: MICROSOFT STREETS & TRIPS, 2006.

Figure 2
Historical Land Use and Reuse Parcel Boundaries
Fort Wingate Depot Activity
McKinley County, New Mexico



REV. NO.	DATE	DESCRIPTION OF REVISION	REV. BY	ENG	CHKD BY	APPVD BY

PROJECT MANAGER: E. KAMMERER | DRAWN BY: D. TAYLOR | DATE: 02.21.08

TerranearPMC, LLC
222 VALLEY CREEK BLVD., SUITE 210
EXTON, PA 19341-2843
(610) 862-5000 PHONE
(610) 862-5050 FAX

Figure 3
SWMU and AOC Locations
Parcel 22

Fort Wingate Depot Activity
McKinley County, New Mexico

PROJECT NO.	FILE NO.	CHKD:	DRAWING NUMBER	REV. NO.
33210		ENG.	501401-1C	0
		APPVD:	SCALE: 1" = 300'	

LEGEND

- SWMU/AOC BOUNDARY
- PARCEL 22 BOUNDARY
- ARROYOS
- 6800 TOPOGRAPHIC CONTOUR (FT. MSL)
- PROPERTY TRANSFER PARCEL BOUNDARIES
- SWMU 14 SWMUs OR AOCs THAT REQUIRE CORRECTIVE ACTION

SWMU 70
DISASSEMBLY PLANT AND TPL QA TEST AREA
INCLUDES BUILDING 517, STRUCTURE 518,
BUILDING 519, STRUCTURES 520, 521, AND 547,
DISASSEMBLY PLANT AND TPL QA TEST AND OB/OD AREA

AOC 71A
GPS SURVEYED
FORMER MAGAZINE
FOUNDATION

AOC 71B
FORMER
RECTANGULAR
STRUCTURE

SWMU 12
BUILDING 536
(INSPECTORS WORKSHOP,
AMMUNITION RENOVATION DEPOT
AND FORMER PCB TRANFORMER)

PART OF AOC 75
TRANSFORMERS

AOC 88B
FORMER BUILDING/STRUCTURE

SWMU 27
BUILDING 528 COMPLEX
BUILDING 528 (AMMUNITION
NORMAL MAINTENANCE BUILDING)
BUILDING 528A AND 528B
(TEMPORARY STORAGE IGLOOS)
BUILDING 529
FLAMMABLE MATERIALS STORAGE
BUILDING 550
VACUUM COLLECTOR BARRICADE
BUILDING 551
SERVICE MAGAZINE

PART OF AOC 75
TRANSFORMERS

PART OF AOC 75
TRANSFORMERS

AOC 88A
FORMER BUILDING/STRUCTURE

AOC 88C
FORMER ASBESTOS DISPOSAL AREA

AOC 69
BUILDINGS 301, 302, 312
(STANDARD MAGAZINES)
AND BUILDING 316
(FIELD LUNCH ROOM)

AOC 30
IGLOO BLOCK D

300 150 0 300 600
SCALE IN FEET

Figure 4
AOC 30
Fort Wingate Depot Activity
McKinley County, New Mexico

APPROXIMATE REPORTED LOCATION OF TPL PROPELLANT BURN

AOC 30
IGLOO BLOCK D

EAST FRINGE ROAD

"D" CONNECTION ROAD

WEST FRINGE ROAD

CONNECTION ROAD

LEGEND

- ARROYOS
- 6740 TOPOGRAPHIC CONTOUR (FT. MSL)
- PROPERTY TRANSFER PARCEL BOUNDARY
- SAFETY SHELTER
- IGLOO
- OPEN STORAGE Y-SITE
- IGLOO PREVIOUSLY SAMPLED
- OPEN STORAGE Y-SITE PREVIOUSLY SAMPLED
- IGLOO WITH OBSERVED PROPELLANT GRAINS

N

600 300 0 600

SCALE IN FEET

Figure 5
AOC 69, AOC 71, AOC 75 and AOC 88
Fort Wingate Depot Activity
McKinley County, New Mexico

AOC 71A
GPS SURVEYED
FORMER MAGAZINE
FOUNDATION

AOC 71B
FORMER
RECTANGULAR
STRUCTURE

PART OF AOC 75
TRANSFORMERS

AOC 88A
FORMER BUILDING/STRUCTURE

AOC 88B
FORMER BUILDING/STRUCTURE

PART OF AOC 75
TRANSFORMERS

AOC 88C
FORMER ASBESTOS DISPOSAL AREA

PART OF AOC 75
TRANSFORMERS

SWMU 70
DISASSEMBLY PLANT AND
TPL QA TEST AREA
INCLUDES BUILDING 517,
STRUCTURE 518, BUILDING 519,
STRUCTURES 520, 521, AND 547,
DISASSEMBLY PLANT AND
TPL QA TEST AND OB/OD AREA

SWMU 27
BUILDING 528 COMPLEX
BUILDING 528 (AMMUNITION
NORMAL MAINTENANCE BUILDING)
BUILDING 528A AND 528B
(TEMPORARY STORAGE IGLOOS)
BUILDING 529
FLAMMABLE MATERIALS STORAGE
BUILDING 550
VACUUM COLLECTOR BARRICADE
BUILDING 551
SERVICE MAGAZINE

SWMU 12
BUILDING 536
(INSPECTORS WORKSHOP,
AMMUNITION RENOVATION
DEPOT AND FORMER
PCB TRANFORMER)

AOC 69
BUILDINGS 301, 302, 312
(STANDARD MAGAZINES)
AND BUILDING 316
(FIELD LUNCH ROOM)

B-6
SERVICE ROAD NO. 6
NORMAL MAIN AVE.
ARTERIAL RD. 4
ARTERIAL ROAD NO. 2
ARTERIAL ROAD NO. 5
ARTERIAL ROAD NO. 3
6740
6800
6860

LEGEND
- AOC BOUNDARY
- ARROYOS
- 6800 TOPOGRAPHIC CONTOUR (FT. MSL)
- PROPERTY TRANSFER PARCEL BOUNDARY

N

450 225 0 450
SCALE IN FEET

TerranearPMC, LLC

33210.50/02.21.08-DST/1202 -1C

APPENDIX A
SITE RECONNAISSANCE PHOTOGRAPHS

Photographs
Parcel 22 Release Assessment Site Reconnaissance
Fort Wingate Depot Activity
McKinley County, New Mexico

Photo 4-1: AOC 30, Igloo Block D, looking south at typical igloo.

Photo 4-2: AOC 30, Igloo Block D, looking south at typical igloo with ground level apron.

Photographs
Parcel 22 Release Assessment Site Reconnaissance
Fort Wingate Depot Activity
McKinley County, New Mexico

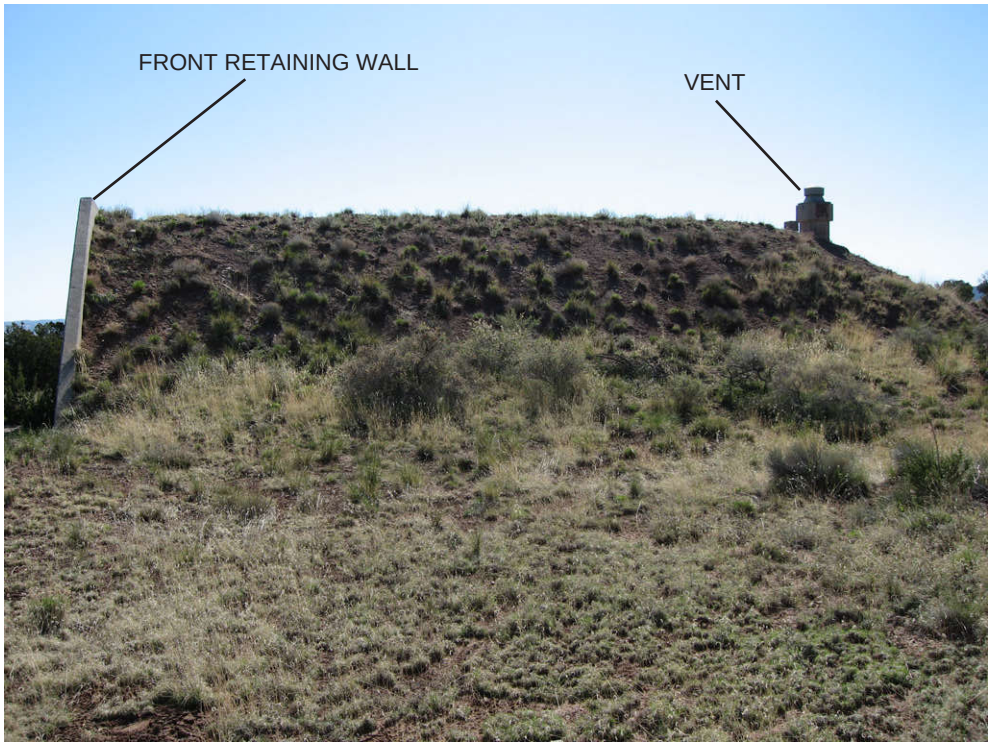


Photo 4-3: AOC 30, Igloo Block D, looking east at typical igloo.

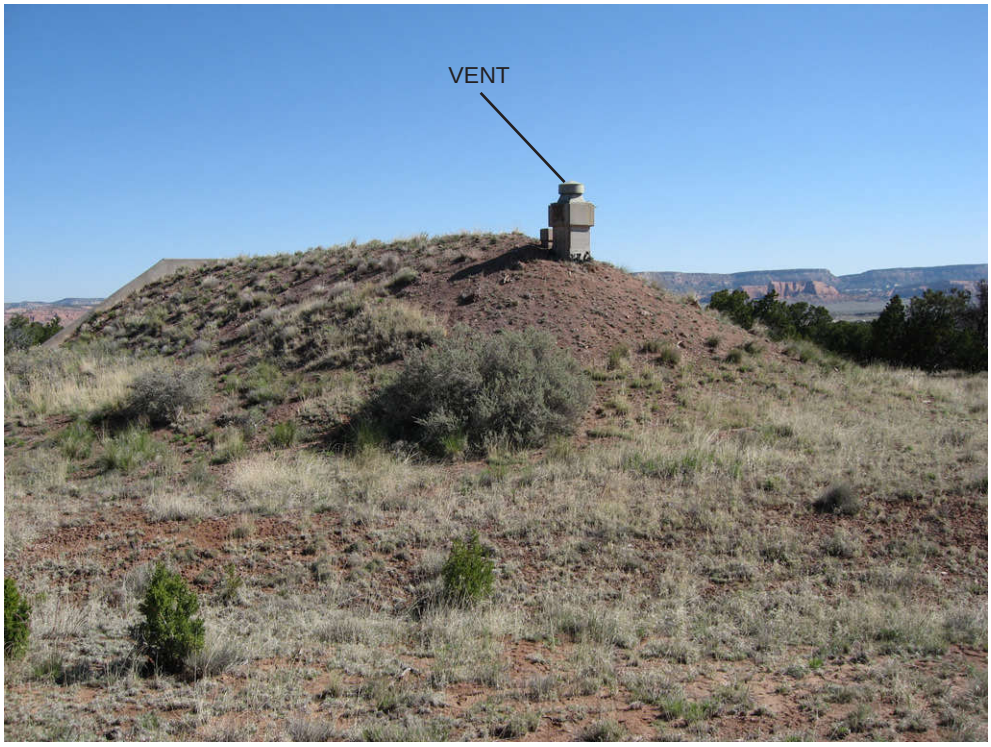


Photo 4-4: AOC 30, Igloo Block D, looking northeast at typical igloo.

Photographs
Parcel 22 Release Assessment Site Reconnaissance
Fort Wingate Depot Activity
McKinley County, New Mexico

Photo 4-5: AOC 30, Igloo Block D, looking southwest at typical igloo with elevated dock.

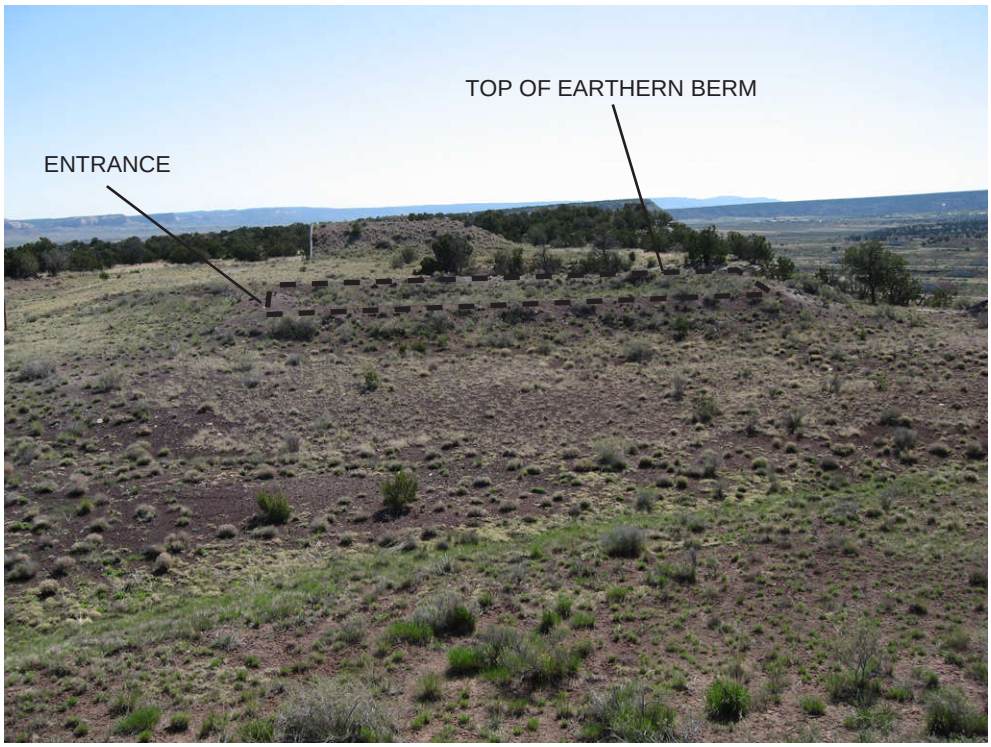


Photo 4-6: AOC 30, Igloo Block D, looking east at typical open storage area (Y-site).

Photographs
Parcel 22 Release Assessment Site Reconnaissance
Fort Wingate Depot Activity
McKinley County, New Mexico

Photo 4-7: AOC 30, Igloo Block D, looking south at typical open storage area (Y-site).

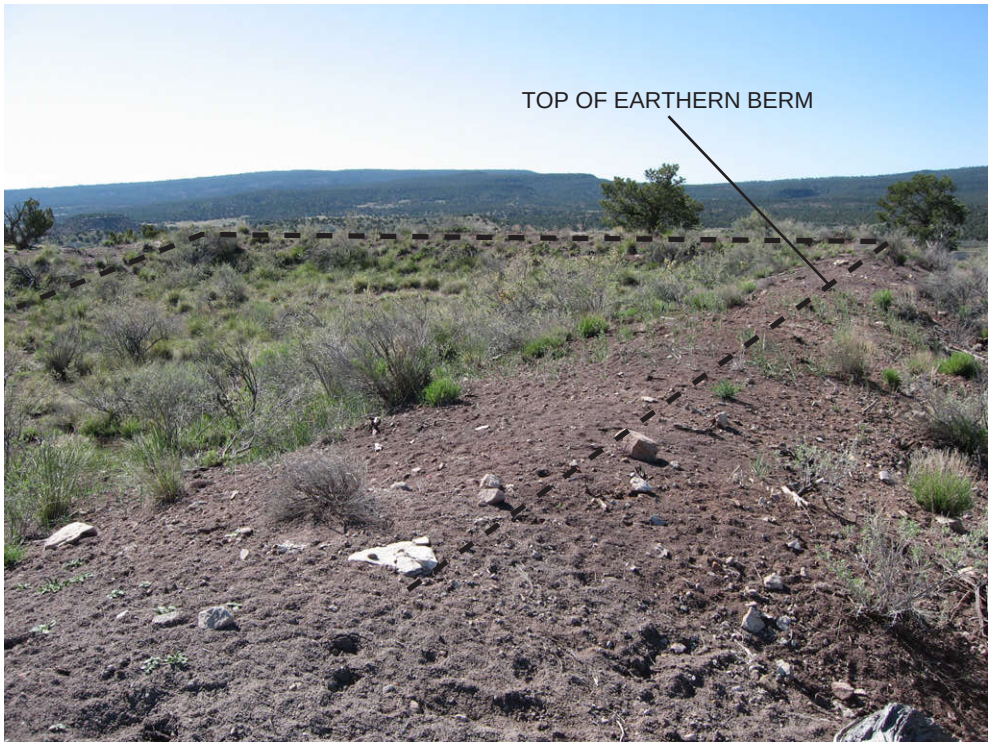


Photo 4-8: AOC 30, Igloo Block D, looking south at typical open storage area (Y-site).

Photographs
Parcel 22 Release Assessment Site Reconnaissance
Fort Wingate Depot Activity
McKinley County, New Mexico

Photo 4-9: AOC 30, Igloo Block D, looking east at typical open storage area (Y-site).

Photo 4-10: AOC 30, Igloo Block D, showing typical example of a propellant grain observed at igloos shown in Figure 4.

Photographs
Parcel 22 Release Assessment Site Reconnaissance
Fort Wingate Depot Activity
McKinley County, New Mexico

Photo 4-11: AOC 30, Igloo Block D, showing typical example of a clay drain tile (exterior perimeter drain as shown in historical drawings) observed at several igloos.

Photo 4-12: Building 317, which is a typ. concrete safety shelter.

Photographs
Parcel 22 Release Assessment Site Reconnaissance
Fort Wingate Depot Activity
McKinley County, New Mexico

Photo 5-1: AOC 69, Building 302, Standard Magazine, looking northeast at exterior condition of building.

Photo 5-2: AOC 69, Building 301, Standard Magazine, looking northeast at exterior condition of building.

Photographs
Parcel 22 Release Assessment Site Reconnaissance
Fort Wingate Depot Activity
McKinley County, New Mexico

Photo 5-3: AOC 69, Building 312, Standard Magazine, looking northeast at exterior condition of building.

Photo 5-4: AOC 69, Standard Magazine, looking southeast at typical exterior condition of rear of building.

Photographs
Parcel 22 Release Assessment Site Reconnaissance
Fort Wingate Depot Activity
McKinley County, New Mexico

Photo 5-5: AOC 69, showing munitions shipping containers used as rain gutter drains.

Photo 5-6: AOC 69, showing potential ACM roof tile.

Photographs
Parcel 22 Release Assessment Site Reconnaissance
Fort Wingate Depot Activity
McKinley County, New Mexico

Photo 5-7: AOC 69, showing potential ACM roof tile.

Photo 5-8: AOC 69, showing clay tile pipe rain gutter drains.

Photographs
Parcel 22 Release Assessment Site Reconnaissance
Fort Wingate Depot Activity
McKinley County, New Mexico

Photo 5-9: AOC 69, Standard Magazine, looking west at typical condition of interior of building.

Photo 5-10: AOC 69, Building 316, Field Lunch Room, looking southwest at exterior condition of building.

Photographs
Parcel 22 Release Assessment Site Reconnaissance
Fort Wingate Depot Activity
McKinley County, New Mexico

Photo 5-11: AOC 69, Building 316, looking west at interior of building.

Photo 5-12: AOC 69, Building 316, showing floor drain.

Photographs
Parcel 22 Release Assessment Site Reconnaissance
Fort Wingate Depot Activity
McKinley County, New Mexico

Photo 5-13: AOC 69, Building 316, showing concrete pad.

Photographs
Parcel 22 Release Assessment Site Reconnaissance
Fort Wingate Depot Activity
McKinley County, New Mexico

Photo 7-1: Part of AOC 75, looking southeast at transformers at Building 536.

Photo 7-2: Part of AOC 75, looking northeast at transformer east of Building 536.

Photographs
Parcel 22 Release Assessment Site Reconnaissance
Fort Wingate Depot Activity
McKinley County, New Mexico

Photo 7-3: Part of AOC 75, showing air cooled transformer in Building 536.

Photo 7-4: Part of AOC 75, looking southwest at transformer north of Building 527.

Photographs
Parcel 22 Release Assessment Site Reconnaissance
Fort Wingate Depot Activity
McKinley County, New Mexico

Photo 7-5: Part of AOC 75, looking east at transformers northwest of Building 528.

Photo 7-6: Part of OAC 75, looking northwest at second group of transformers northwest of Building 528.

Photographs
Parcel 22 Release Assessment Site Reconnaissance
Fort Wingate Depot Activity
McKinley County, New Mexico

Photo 7-7: Part of AOC 75, showing transformer at south end of Building 528.

Photo 7-8: Part of AOC 75, showing former transformer pad in Building 519.

Photographs
Parcel 22 Release Assessment Site Reconnaissance
Fort Wingate Depot Activity
McKinley County, New Mexico

Photo 7-9: Part of AOC 75, looking north at transformer southwest of Disassembly Plant.

Photographs
Parcel 22 Release Assessment Site Reconnaissance
Fort Wingate Depot Activity
McKinley County, New Mexico

Photo 8-1: AOC 88B, looking east at site of former storage area southwest of B528.

Photo 8-2: AOC 88B, showing metal plates at site of former storage area southwest of B528.

Photographs
Parcel 22 Release Assessment Site Reconnaissance
Fort Wingate Depot Activity
McKinley County, New Mexico

Photo 8-3: AOC 88B, showing 100 pound bomb end ring at site of former storage area southwest of B528.

Photo 8-4: AOC 88B, showing roofing material at west end of site of former storage area southwest of B528.

Photographs
Parcel 22 Release Assessment Site Reconnaissance
Fort Wingate Depot Activity
McKinley County, New Mexico

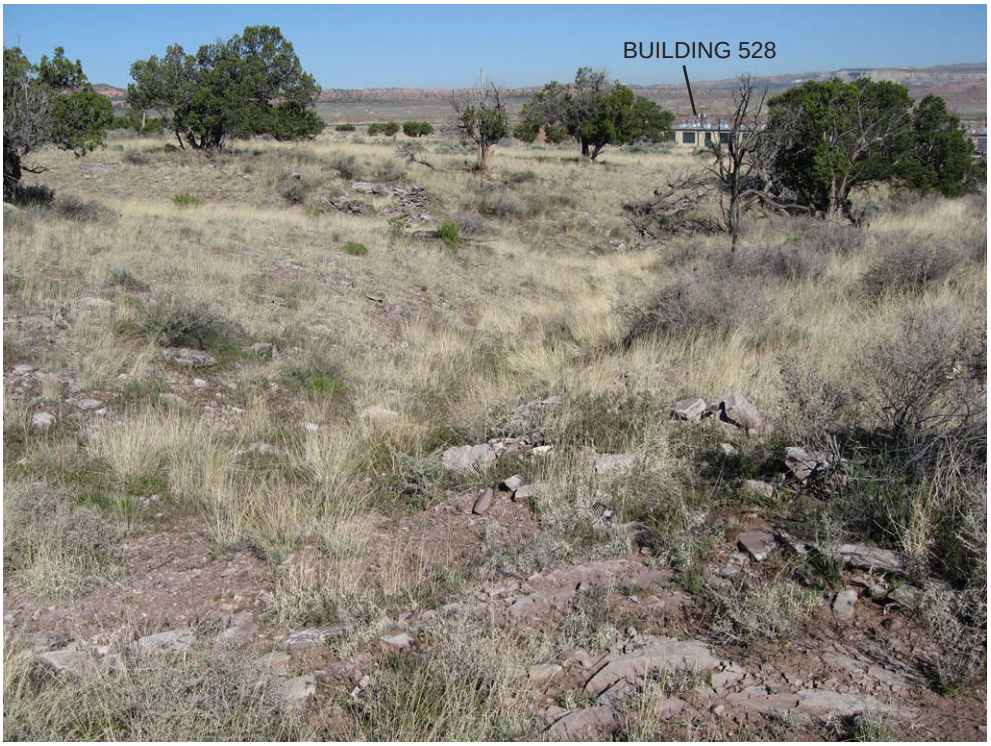


Photo 8-5: AOC 88C, looking northwest at former asbestos disposal area.

Photo 8-6: AOC 88C, showing suspect ACM at former asbestos disposal area.

Photographs
Parcel 22 Release Assessment Site Reconnaissance
Fort Wingate Depot Activity
McKinley County, New Mexico

Photo 9-1: Looking west at cleared area south of Building 528.

Photo 9-2: Looking northeast at cleared area south of Building 528.

Photographs
Parcel 22 Release Assessment Site Reconnaissance
Fort Wingate Depot Activity
McKinley County, New Mexico

Photo 9-3: Looking west at typical pre-1940's magazine, view of Y-362.

Photo 9-4: Looking northeast at typical pre-1940's magazine, view of Y-363.

Photographs
Parcel 22 Release Assessment Site Reconnaissance
Fort Wingate Depot Activity
McKinley County, New Mexico

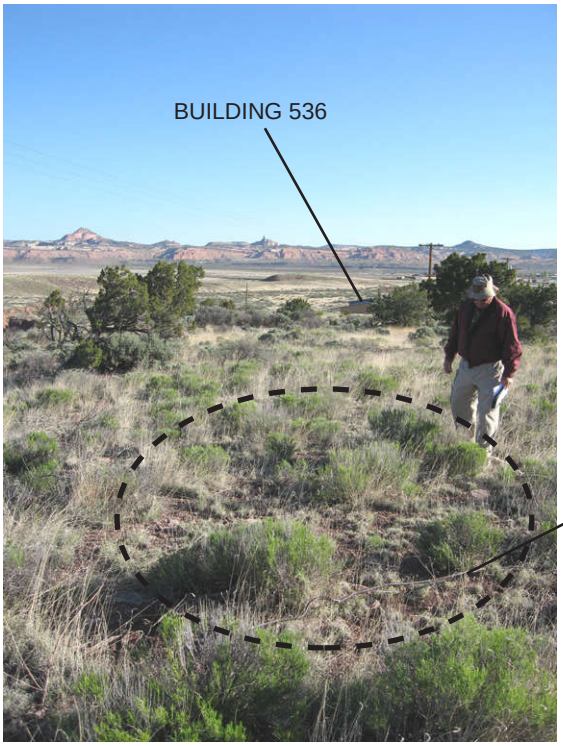


Photo 9-5: Looking north at former Building 534 water tank location.

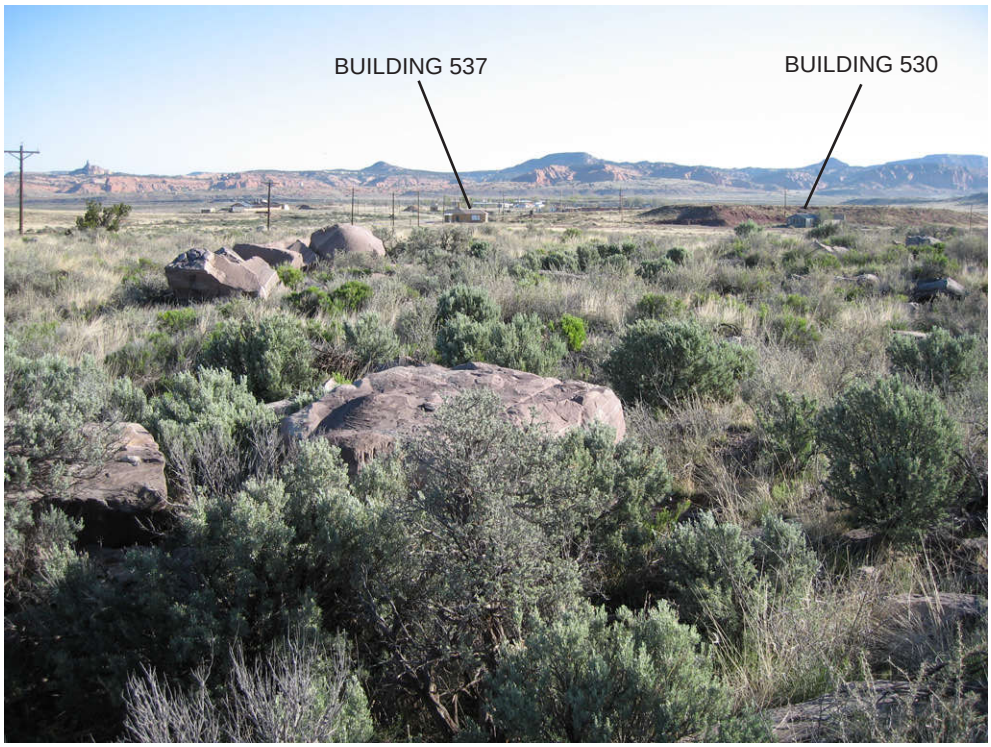


Photo 9-6: Looking north at area described as "disturbed ground and probable debris" in aerial photo analysis report.

Photographs
Parcel 22 Release Assessment Site Reconnaissance
Fort Wingate Depot Activity
McKinley County, New Mexico

Photo 9-7: Looking south at area described as "excavated area with light-toned material north of Building 528 complex" in aerial photo analysis report.

Photo 9-8: Looking northwest at area described as "linear scarred areas south of site" in aerial photo analysis report.