



Proposed Plan
March 2019
Small Arms Range Complex Munitions Response Site
Great Bend Air-to-Ground Gunnery Range Formerly Used Defense Site
Barton County, Kansas
FUDS Project Number: B07KS021804

Underlined and bolded text is included in the glossary at the end of this Proposed Plan.

Introduction

The United States (U.S.) Army Corps of Engineers (USACE) proposes No Action for the Small Arms Range Complex Munitions Response Site (MRS) located in Barton County, Kansas, Formerly Used Defense Sites (FUDS) Project Number B07KS021804, and provides the rationale for this preference in this Proposed Plan.

The FUDS program addresses the potential explosives safety, health, and environmental issues resulting from past munitions use at former defense sites under the Department of Defense (DoD) Military Munitions Response Program (MMRP), established by the U.S. Congress under the Defense Environmental Restoration Program (DERP). The first priority of USACE is the protection of human health and safety and the environment. USACE is the lead agency for investigation/reporting and remedial decision making at this MRS, with regulatory support provided by the Kansas Department of Health and the Environment.

The FUDS program follows the requirements of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980 and its amendments of 1986, and the National Oil and Hazardous Substances Pollution Contingency Plan¹ (NCP).

¹ Section 300.430(f)(1)(ii) and 300.430(f)(3)(i) of the NCP requires public participation in the process of approving a proposed decision document. This Proposed Plan summarizes the technical documents available in the project information repositories located at the Great Bend Public Library (1409 Williams St., Great Bend, Kansas 67530) and

MARK YOUR CALENDARS!

PUBLIC COMMENT PERIOD:

1 March 2019 – 1 April 2019

USACE invites comments on the Proposed Plan during this public comment period. Comment letters must be postmarked or emailed by midnight on 1 April 2019 and should be submitted to:

U.S. Army Corps of Engineers – Kansas City District

Name: Mr. Adrian Goettemoeller
Title: Project Manager
Address: STE 463 Federal Building,
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PUBLIC MEETING: A public meeting will be held on 21 March 2019 at 7:00 pm for USACE to explain the Proposed Plan to the public and address questions and comments. A public availability session will begin at 6:00 pm prior to the public meeting. Both events will be held at Kansas Wetlands Education Center, 592 NE K-156 Highway, Great Bend, Kansas 67530.

PROJECT INFORMATION REPOSITORY: This Proposed Plan is available in the Administrative Record file for this project which is available in the project information repositories physically located at the Great Bend Public Library and Hoisington Public Library and online at <http://www.nwk.usace.army.mil/Missions/Environmental/Environmental-Projects/Great-Bend-Air-to-Ground-Gunnery-Range/>. The library location, phone number, and hours of operation are shown at the end of this Proposed Plan. The repositories contain technical reports and community outreach materials prepared for the project. The online repository only contains major decision documents.

the Hoisington Public Library (169 S. Walnut St., Hoisington, Kansas 67544).

The purpose of this Proposed Plan is to satisfy the requirements of Section 117(a) of CERCLA and Section 300.430(f)(3)(i) of the NCP to facilitate public participation in the remedy selection process.

A final remedy will be selected for the Small Arms Range Complex MRS after considering all public comments. USACE may modify the No Action proposal or select another response action based on new information or public comments. Therefore, the public is encouraged to review and comment on all aspects of this Proposed Plan.

Under the MMRP, a FUDS is addressed for its potential or established **explosive hazard** as related to **munitions and explosives of concern (MEC)**, in addition to human health and/or ecological risks relative to **munitions constituents (MC)** in environmental media. For the Small Arms Range Complex MRS at the Great Bend Air-to-Ground Gunnery Range (AGGR) FUDS, the No Action proposal addresses both the MEC and MC components of the MRS based on all characterization data collected and evaluated to date.

This Proposed Plan summarizes information that can be found in greater detail in the **Site Inspection (SI)** and **Remedial Investigation (RI)** reports and other documents contained in the project **information repository**, which is located near the MRS in the Great Bend Public Library and Hoisington Public Library and online at: <http://www.nwk.usace.army.mil/Missions/Environmental/Environmental-Projects/Great-Bend-Air-to-Ground-Gunnery-Range/>.

The online and local repositories provide copies of major documents that have led to this proposal of No Action for the Small Arms Range Complex MRS. A complete record of documentation pertaining to the MRS is included in the **Administrative Record file**. The Administrative Record file for the Great Bend AGGR FUDS is stored at USACE—Kansas City District (601 E. 12th Street, Kansas City, Missouri 64106) and is maintained by USACE. USACE encourages

the public to review these documents to better understand the MRS and investigation activities conducted there.

Following comment resolution on this Proposed Plan (as necessary), the selected remedy will be announced in local newspapers and documented in the final **Decision Document (DD)**.

Site Background

The Great Bend AGGR FUDS (Property Number B07KS0218) is located approximately 7 miles northeast of Great Bend, Kansas, in Barton County (**Figure 1** and **Figure 2**). Encompassing approximately 1,272 acres, the Small Arms Range Complex MRS is located in the southwest portion of the FUDS property.

The land is primarily owned/operated by the Kansas Department of Wildlife, Parks, and Tourism (KDWPT) and is currently managed as a wildlife area and wetland (Cheyenne Bottoms) with no anticipated changes to this condition. No buildings are located on the MRS. The land is used for hunting, fishing, trapping, and bird-watching. There are five water pools at Cheyenne Bottoms that were created by installing dikes and are managed for water birds. Hunting is only allowed in Pools 3 and 4 and a portion of Pool 2. Pools 1 and 5 and the remaining portion of Pool 2 are refuge areas and are closed to all activities. Shooting is not allowed on or from the dikes. Portions of Pools 2 and 5 are located within the Small Arms Range Complex MRS. A portion of the acreage in the southwest corner of the Great Bend AGGR FUDS is leased to farmers by the KDWPT. A small portion of the southwestern extent of the MRS is owned by a private entity.

Future land use is expected to remain the same as the current land use. The MRS is accessible to the public.

According to the Safe Drinking Water Information System (USEPA, 2018), there are three active community public water systems located in Barton County. The

systems supply water to cities and rural water districts. The source of water is groundwater or purchased surface water. According to the Kansas Geological Survey Water Well Completion Records Database, water wells consist of domestic, livestock, public water supply, irrigation, industrial, and monitoring wells. Nine monitoring wells are located within the FUDS boundaries.

History of Great Bend AGGR

A brief history of the FUDS and MRS, including investigative reporting, is presented in **Table 1** and described below. Additional details can be found in the Administrative Record file; copies of which are available for public review at the project information repository locations during the available times shown on **Page 7**.

Table 1—Historical Timeline	
Date	Activity
1943–1946	Air crews from the Great Bend Army Air Field use the FUDS as a machine gun range, an AGGR, and a practice bombing range. The Small Arms Range Complex MRS was used for machine gun training only.
1946	Declared surplus
1994	Site Survey Visit
2002	<u>Archive Search Report (ASR)</u>
2004	ASR Supplement
2008	SI Report
2017	RI Report

In general, the Great Bend AGGR was actively used from 1943 to 1946. The Great Bend AGGR was initially commissioned in 1943 and was used primarily for basic Air Corps cadet training. The area included an AGGR, a bombing range, the Small Arms Range Complex, and a chemical weapons training area.

Site Survey Visit (USACE, 1994)—A site survey visit was conducted in 1994. The field team reported to have found .50-caliber

casings and projectiles and machine gun firing positions.

ASRs (USACE, 2002, 2004)—The ASRs documented that the Great Bend AGGR had been used for conventional ordnance and chemical training. There were three types of ranges at the FUDS: small arms (Small Arms Range Complex), air-to-ground, and bombing. During a site clearance in 1946, two 20-millimeter (mm) propelling-charge containers, shrapnel and tail fins from high explosive bombs, practice bombs, and .50-caliber casings and projectiles were found in the AGGR and Bombing Range. Since then, only .50-caliber casings and projectiles and one 75mm howitzer round have been found.

Research also disclosed 75 pounds of liquid mustard gas were used in decontamination training at the chemical weapons training area. During its operational history, chemical warfare decontamination training using liquid mustard gas was possibly conducted at the Great Bend AGGR. However, no specific records identifying a location for use or identifying physical evidence of chemical weapons training has been found.

Aerial photos prior to the early 1950s were unavailable. By the time of the earliest photo date, the refuge area had already been flooded and a significant amount of construction had occurred at the wildlife refuge area in prior years.

Soil had been moved for the construction of duck blinds, dikes, and other water control structures; however, the concrete machine gun mounts were still located in the southwest corner of the former range. The presence of water, cattails, construction activities, and whooping cranes prevented the inspection team from making a thorough search. No hazards were found during the property visit.

SI Report (USACE, 2008)—The chemical weapons training area was recommended for no further action at the conclusion of the SI. Separate RIs are being completed for the AGGR and Bombing Range MRSs, so

they are not discussed further in this Proposed Plan.

The SI sampling at the Small Arms Range Complex included 16 surface (0 to 6 inches below ground surface [bgs]) soil samples and one sediment sample analyzed for metals and one surface water sample analyzed for metals and perchlorate. Project-specific metals (antimony, copper, lead, and zinc) typically associated with small arms ammunition were selected for analysis. The soil, sediment, and surface water samples were collected in the approximate locations of the machine gun range firing line, the rifle range and machine gun range suspected target areas, and in an area to the east of the ranges where an oval-shaped feature was identified during the review of the historical photographs.

Background samples were collected for surface soil (**discrete samples**), sediment, and surface water during the SI and were analyzed for the same parameters as the primary on-site samples. The background samples were collected from locations surrounding the Small Arms Range Complex MRS. For soil, background levels were calculated from a data set ($n = 10$) as the 95th upper tolerance limit for each analyte based on the normal or lognormal distribution of the data. For surface water and sediment, background levels represented results from a sample location upgradient of the FUDS.

The concentrations of antimony, lead, and zinc in surface soil exceeded background levels and ecological screening values (ESVs), but did not exceed human health screening values, indicating that potentially unacceptable MC exposure to sensitive species of wildlife could occur. The concentrations of metals in sediment did not exceed background levels, human health screening values, or ESVs. Perchlorate was not detected in the surface water sample collected at the Small Arms Range Complex, and the concentrations of metals did not exceed the human health screening values. The concentrations of copper and lead in the surface water exceeded the

background threshold levels; however, a geochemical evaluation indicated that the concentrations of copper and lead represented naturally occurring concentrations.

Because the SI sampling results, which are shown on **Figure 3**, indicated that antimony, lead, and zinc exceeded the project's ESVs and site-specific background levels, further investigation of MC was recommended for an RI. Based on the historical documentation reviewed and the on-site reconnaissance performed during the SI, only small arms training was performed at the Small Arms Range Complex MRS; therefore, no additional investigation for MEC was recommended.

RI Report (USACE, 2017a)—The RI included soil, sediment, and surface water sampling. RI sample locations are shown on **Figure 4**. A total of 63 discrete soil samples from 0 to 6 inches bgs, 6 to 12 inches bgs, and 12 to 24 inches bgs and 15 **incremental samples** from surface soil from 5 **decision units** (DUs) were collected for analysis of antimony, lead, zinc, and nitroglycerin. One of the DUs sampled was located off-site to determine background levels for soil samples collected using incremental sampling methodology. A total of six sediment and collocated surface water grab samples were collected for analysis of antimony, lead, and zinc.

Antimony and lead were detected above the ecological soil screening levels (SSLs) in the discrete and incremental soil samples. Antimony in sediment and in one surface water sample was detected at an estimated concentration above the United States Environmental Protection Agency (USEPA) human health regional screening level (RSL). Zinc was within background ranges in all media, and lead was also within background ranges in surface water and sediment samples (**Figure 4**). Nitroglycerin, which was analyzed in the incremental samples collected from each of the range's firing lines, was not detected by the laboratory.

The sampling results were evaluated further in a baseline human health risk assessment (HHRA) and ecological risk assessment. The HHRA found no MC in soil, sediment, and surface water are of a potential human health concern at the Small Arms Range Complex MRS. Based on the completion of the screening level ecological risk assessment (SLERA), no MC releases to soil, sediment, and surface water was determined to create a potentially unacceptable risk to ecological receptors.

A **feasibility study (FS)** was not recommended or appropriate because no unacceptable hazards or risks are present.

Site Characteristics

Nature and Extent of MC

Antimony was detected at 17 discrete soil sample locations at concentrations above both the ecological SSL (0.27 milligrams per kilogram [mg/kg]) and background level (0.48 mg/kg). The maximum concentration of antimony detected was 11 mg/kg. Lead was detected at nine discrete soil sample locations at concentrations above both the ecological SSL (11 mg/kg) and background (32.4 mg/kg). The maximum concentration of lead detected was 260 mg/kg. None of the discrete soil samples detected concentrations of zinc above the ecological SSL and background.

Antimony and lead were also detected above the ecological SSLs and background in the incremental soil samples. Lead was detected above the ecological SSL (11 mg/kg) and incremental background (17.33 mg/kg) in three of the four incremental samples at concentrations of 18 mg/kg in DU4 (located in the combined ranges' safety fan), 20 mg/kg in DU1 (located in the machine gun range firing line), and 79.33 mg/kg in DU3 (located in the rifle range target area). Antimony exceeded the ecological SSL (0.27 mg/kg) and incremental background (0.57 mg/kg) in DU3 at a concentration of 1.36 mg/kg. No

analytes exceeded those levels at DU2 (located in the rifle range firing line).

In sediment, lead and zinc were within background ranges in all samples. Antimony in three samples at concentrations of 0.52 mg/kg, 0.55 mg/kg, and 0.57 mg/kg exceeded the ecological SSL of 0.27 mg/kg for protection of a mammalian ground insectivore. Although these sediment samples exceeded the ecological SSL, the concentrations of metals detected in the most downgradient samples in Pool 2 were equivalent to the upgradient sample and remaining samples collected within the MRS.

Only one surface water sample, which was collected from Pool 2, had an estimated result of 1 micrograms per liter ($\mu\text{g/L}$) reported for antimony (dissolved) above the USEPA human health tap water RSL of 0.78 $\mu\text{g/L}$. The total antimony concentration in the sample was nondetect. The rest of the surface water samples had metals results that were nondetect or below the USEPA human health tap water RSLs.

Nature and Extent of MEC

MEC is not known or suspected to be present at the MRS. RI activities did not investigate for MEC other than to ensure MEC and munitions debris could be identified at ground surface by use of an **Unexploded Ordnance (UXO) Technician** during the field effort. The UXO technician did not identify any MEC or evidence of MEC (e.g., practice munitions, craters) during the RI.

Scope and Role of the Response Action

MEC and MC

No Action is the proposed action at the MRS for MEC and MC. As presented below in the Summary of Site Risks, no explosive hazards or human/ecological risks remain at the MRS based on the results of the RI.

USACE anticipates that this will be the final action for the MRS.

Summary of Site Risks

A MEC risk analysis was not performed as no MEC explosive hazards were identified. However, a baseline human health and ecological risk assessment for MC was performed. The results from that assessment are summarized in this section. Note that current and future land and groundwater use is expected to remain the same as described above in the Site Background section.

The results of the human health risk characterization indicate concentrations of all analytes are below human health risk-based screening levels for all sampling locations and sampled media. Therefore, based on a comparison of maximum concentrations to residential (unrestricted use) and commercial/industrial screening levels, no MC or explosives in soil, sediment, and surface water are identified as being of potential human health concern at the Small Arms Range Complex MRS.

A SLERA was performed for the Small Arms Range Complex MRS to determine whether MC (i.e., antimony, lead, zinc, and nitroglycerin) released to surface water and sediment and/or soil from the Small Arms Range Complex MRS create a potentially unacceptable risk to ecological receptors in this managed wildlife area, including significant ecological receptors such as the snowy plover. No surface water locations require additional evaluation. MC concentrations in surface water do not exceed site-specific water quality benchmarks.

No sediment concentrations require additional evaluation. No MC concentrations in sediment exceed sediment benchmarks for protection of benthic organisms, plants, and invertebrates. Results for extracted lead and zinc in sediment do not exceed thresholds, indicating the metals are considered to be insoluble, largely unavailable to biota, and a low risk for

adverse biological effects. Food chain modeling indicates little or no population risk to wildlife is expected from exposure to antimony, lead, and zinc in the sediment. In addition, analysis of sediment sampled during the SI and RI indicated the detected concentrations of metals in the sediment did not exceed background threshold levels.

No soil concentrations require additional evaluation. No MC concentrations in soil exceed benchmarks for protection of plants, invertebrates, avian carnivores, and mammalian herbivores. Food chain evaluation indicates little to no potential population risk to avian herbivores (i.e., mourning dove), mammalian carnivores (i.e., long-tailed weasel), and mammalian insectivores (i.e., least shrew). Food chain modeling indicated little to no potential risk to significant insectivorous avian receptors (i.e., snowy plover).

Based on the results of the SLERA, no MC released to soil, sediment, and surface water was determined to create a potentially unacceptable risk to ecological receptors.

Community Participation

USACE provides information regarding the investigation and remedial decision making for the Small Arms Range Complex MRS to the public through this Proposed Plan, the Administrative Record file/local information repositories, and announcements published in the *Hoisington Dispatch* and the *Great Bend Tribune*. To date, two public notices have been published, including solicitation for interest in forming a Restoration Advisory Board (2016), and an announcement of the availability of the Administrative Record file at the local repositories (2016).

USACE encourages the public to gain a more comprehensive understanding of the Small Arms Range Complex MRS and the RI activities conducted at the MRS that lead to this proposal of No Action. The public has until 8 April 2019 to comment on this Proposed Plan for No Action. See the information on **Page 1** to find out how your opinion can be heard.

For further information on the Small Arms Range Complex MRS, please contact:

U.S. Army Corps of Engineers
Name: Mr. Adrian Goettemoeller
Title: Project Manager
Address: STE 463 Federal Building,
CENWK-PME-D
601 E. 12th Street
Kansas City, Missouri 64106
Email: Adrian.E.Goettemoeller
@usace.army.mil

Or visit and review a copy of the Administrative Record file and other project documentation at the following local information repositories:

Great Bend Public Library

Address: 1409 Williams St.
Great Bend, Kansas 67530
Hours: Mon–Thurs: 9 AM–8 PM
Fri–Sat: 10 AM–5 PM
Sun: 1 PM–5 PM
Phone: 620.792.2409

Hoisington Public Library

Address: 169 S. Walnut St.
Hoisington, Kansas 67544
Hours: Mon, Wed: 10 AM–6 PM
Tues, Thurs, Fri: 12 PM–6 PM
Sat: 12 PM–4 PM
Sun: Closed
Phone: 620.653.4128

Glossary of Terms

Specialized terms used in this Proposed Plan are defined below:

Administrative Record file: The documents that form the basis for the selection of a response action compiled and maintained by the lead agency (40 Code of Federal Regulations [CFR] 300.800). A copy of this file is available for public review at the locations on **Pages 1** and **7** of this Proposed Plan.

Archive Search Report (ASR): A detailed investigation to report on past MEC activities conducted on an installation. The principal purpose of the ASR is to assemble historical records and available field data, assess potential ordnance presence, and recommend follow-up actions at a DERP-FUDS. There are four general steps at this point in investigation: records search phase, site safety and health plan, site survey, and ASR including risk assessment.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA): A Federal law passed in 1980 and commonly referred to as the Superfund Program; provides for cleanup and emergency response in connection with hazardous waste sites that endanger public health and safety or the environment. CERCLA was modified in 1986 by the Superfund Amendments and Reauthorization Act.

Decision Document (DD): The DoD has adopted the term Decision Document (DD) to refer to a public document, similar to a Record of Decision completed for National Priorities List sites, that certifies that the remedy selection process was carried out in accordance with CERCLA and the NCP; provides a substantive summary of the technical rationale and background information in the Administrative Record file; provides information necessary in determining the conceptual engineering components to achieve the remedial action objective established for a site; and serves as a key communication tool for the public that explains the identified hazards that the selected remedy will address and the rationale for remedy selection. The DD will be maintained in the Administrative Record file.

Decision Unit: A specific area that is selected for sampling to make a decision for a site. Typically, the size of the area is relative to a potential

exposure area that is to be considering during risk assessment for a site.

Defense Environmental Restoration Program (DERP): Under DERP, DoD conducts environmental remediation at active installations, FUDS, and Base Realignment and Closure (BRAC) locations. The Army, Navy, Air Force, and Defense Logistics Agency manage the programs at their active installations and BRAC locations. The Army oversees USACE's execution of the FUDS cleanup program. The Office of the Secretary of Defense, through the Deputy Under Secretary of Defense (Installations and Environment), Environment, Safety, and Occupational Health Directorate, manages and oversees DERP and provides program guidance.

Discrete Samples: A type of environmental sample collected from a single location and at a single point in time.

Explosive Hazard: A condition where danger exists because explosives are present that may react (e.g., detonate, deflagrate) in a mishap with potential unacceptable effects (e.g., death, injury, damage) to people, property, operational capability, or the environment. (Department of the Army Office of the Assistant Secretary Installations and Environment, Memorandum for the Assistant Chief of Staff for Installation Management, Subject: Munitions Response Terminology, 21 April 2005.) The potential for an explosive safety hazard depends on the presence of three critical elements: a source (presence of MEC), a receptor or person, and an interaction between the source and the receptor (e.g., picking up the item, disturbing the item by digging). There is no explosive hazard if any one element is missing.

Feasibility Study (FS): A study undertaken by the lead agency to develop and evaluate options for remedial action if unacceptable risks and hazards exist. The RI data are used to define the objectives of the response action, to develop remedial action alternatives, and to undertake an initial screening and detailed analysis of the alternatives. The term also refers to a report that describes the results of the study.

Incremental Sample: An environmental sample comprised of at least 30 increments (also called

aliquots), which are of uniform size and have been collected within a specific area (i.e., a decision unit). The increments are combined and analyzed to provide a result that is evaluated for the entire area contained within the decision unit. A minimum of three replicate incremental samples are collected within a decision unit.

Information Repository: A repository, generally located at libraries or other publicly accessible locations in or near the community affected by the FUDS project that contains accurate and up-to-date documents reflecting the ongoing environmental restoration activities. Two information repositories were established for the project at the locations identified on **Pages 1 and 7** of this Proposed Plan.

Munitions Constituents (MC): Any materials originating from UXO, discarded military munitions, or other military munitions, including explosive and nonexplosive materials and emission, degradation, or breakdown elements of such ordnance or munitions.

Munitions and Explosives of Concern (MEC): Specific categories of military munitions that may pose unique explosives safety risks, specifically composed of (a) UXO, (b) discarded military munitions, or (c) MC (e.g., trinitrotoluene, hexahydro-1,3,5-trinitro-1,3,5-triazine) present in high enough concentrations to pose an explosive hazard.

Munitions Response Site (MRS): A discrete location that is known to require a munitions response due to suspected or known UXO, discarded military munitions, or MC. Examples include former ranges and munitions burial areas.

Military Munitions Response Program (MMRP): In 2001, the DoD established the MMRP to address sites (referred to as MRSs) known or suspected to contain UXO, discarded military munitions, or MC. Through the MMRP, DoD complies with environmental remediation laws, such as CERCLA.

National Oil and Hazardous Substances Pollution Contingency Plan (NCP): The plan revised pursuant to 42 U.S. Code 9605 and found at 40 CFR 300 that sets out the plan for hazardous substance remediation under CERCLA.

Proposed Plan: A document that presents a proposed remedial alternative, including rationale for selection, and requests public comments regarding the proposed alternative.

Remedial Investigation (RI): A process undertaken to determine the nature and extent of potential human health and/or environmental concern(s). The RI emphasizes data collection and site characterization. The RI includes sampling and monitoring, as necessary, and the gathering of sufficient information to determine the necessity for remedial action and to support the evaluation of remedial alternatives.

Site Inspection (SI): An on-site investigation to determine whether there is a release or potential release and the nature of the associated threats. The purpose is to augment the data collected during the ASR and to generate, if necessary, sampling and other field data to determine whether further action or investigation is appropriate.

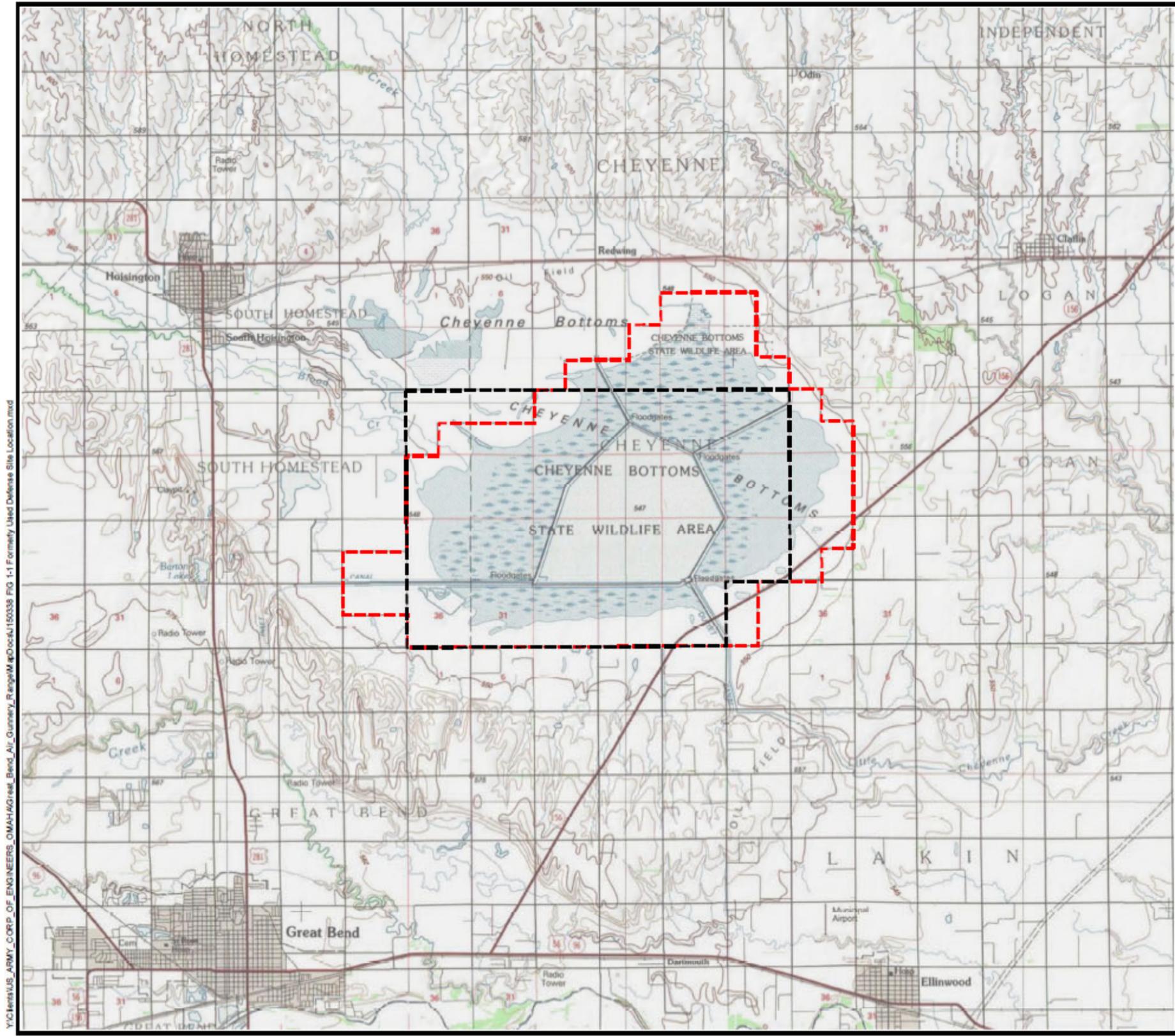
Unexploded Ordnance (UXO): Includes military munitions that have been primed, fuzed, armed, or otherwise prepared for action; have been fired, dropped, launched, projected, or placed in such a manner as to constitute a hazard to operations, installation, personnel, or material; and remain unexploded either by malfunction, design, or any other cause.

UXO Technician: Personnel who are qualified for and are filling Department of Labor, Service Contract Act, and Directory of Occupations contractor positions of UXO Technician I, UXO Technician II, and UXO Technician III.

Acronyms

µg/L	micrograms per liter	MEC.....	munitions and explosives of concern
AGGR	Air-to-Ground Gunnery Range	mg/kg	milligrams per kilogram
ASR.....	Archive Search Report	mm.....	millimeter
bgs	below ground surface	MMRP.....	Military Munitions Response Program
BRAC	Base Realignment and Closure	MRS.....	Munitions Response Site
CERCLA ..	Comprehensive Environmental Response, Compensation, and Liability Act	NCP	National Oil and Hazardous Substances Pollution Contingency Plan
CFR.....	Code of Federal Regulations	RI	Remedial Investigation
DD	Decision Document	RSL.....	regional screening level
DERP	Defense Environmental Restoration Program	SI	Site Inspection
DoD	Department of Defense	SLERA.....	screening level ecological risk assessment
DU	decision unit	SSL.....	soil screening level
ESV	ecological screening value	U.S.....	United States
FS.....	feasibility study	USACE	U.S. Army Corps of Engineers
FUDS	Formerly Used Defense Sites	USEPA	U.S. Environmental Protection Agency
HHRA.....	human health risk assessment	UXO.....	unexploded ordnance
KDWPT	Kansas Department of Wildlife, Parks, and Tourism		
MC	munitions constituents		

Figures

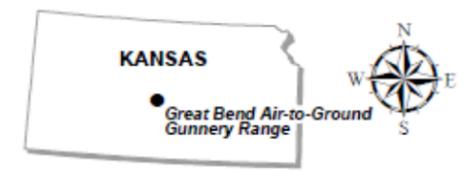


Y:\C:\env\US_ARMY_CORP_OF_ENGINEERS_OMAHA\Great Bend_Air_Gunnery_Range\Map\goc\oc\150338 FIG 1-1 Formerly Used Defense Site Location.mxd

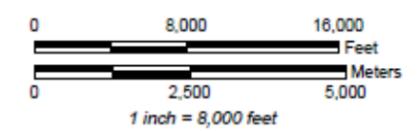
Figure 1

Formerly Used Defense Site Location

Great Bend Air-to-Ground Gunnery Range, Kansas



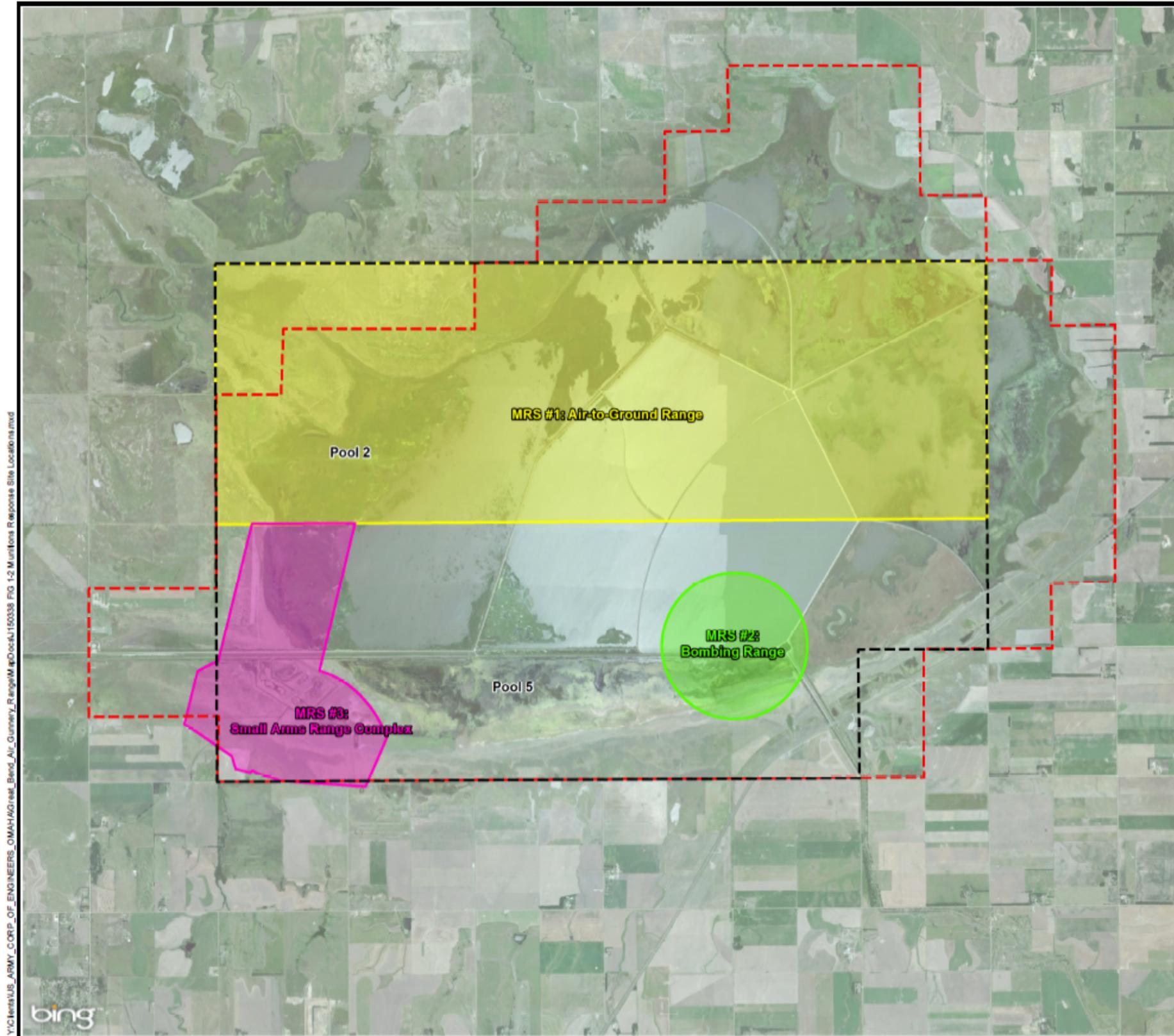
Coordinate System: NAD 1983 UTM Zone 4N
 Basemap: National Geographic Society, T-cubed



- Cheyenne Bottoms Wildlife Area
- Great Bend Air-to-Ground Gunnery Range FUDS Boundary



Drawn By: ML Date Drawn/Revised: 8/27/2015 Project No. J150338



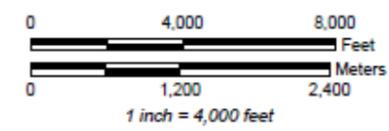
Y:\C\INTL\US_ARMY_CORP_OF_ENGINEERS_OMAHA\AGreal_Bend_Air_Gunnery_Range\MapDoc\AU150338 FIG 1-2 Munitions Response Site Locations.mxd

Figure 2
Munitions Response Site Locations

Great Bend Air-to-Ground Gunnery Range, Kansas
 FUDS Property No.: B07KS0218
 FUDS Project No.: B07KS021804



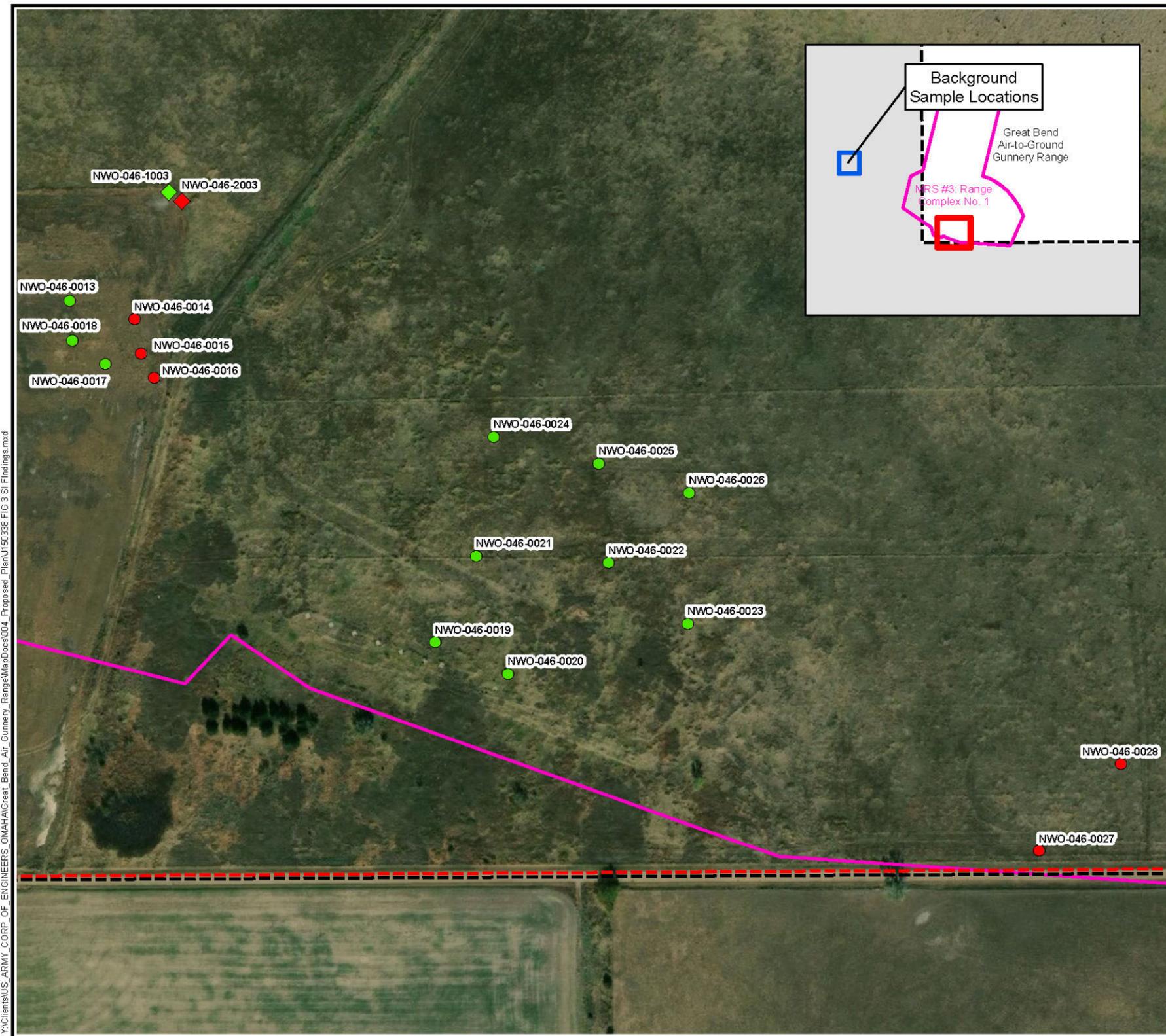
Coordinate System: NAD 1983 UTM Zone 4N
 Basemap: Bing Aerial Imagery WMS



- MRS #1: Air-to-Ground Range
- MRS #2: Bombing Range
- MRS #3: Small Arms Range Complex
- Cheyenne Bottoms Wildlife Area
- Great Bend Air-to-Ground Gunnery Range FUDS Boundary



Drawn By: ML Date Drawn/Revised: 10/15/2015 Project No. J150338



Y:\Clients\US_ARMY_CORP_OF_ENGINEERS_OMAHA\Great_Bend_Air_Gunnery_Range\MapDocs\004_Proposed_Plan\J150338 FIG 3 SI Findings.mxd

Figure 3

Site Inspection Findings

Great Bend Air-to-Ground Gunnery Range, Kansas

FUDS Property No.: B07KS0218
 FUDS Project No.: B07KS021804



Coordinate System: NAD 1983 UTM Zone 14N
 Basemap: Bing Aerial Imagery WMS



Soil Sample

- Soil sample results greater than both background and ecological screening values but less than human health screening values
- Soil sample results less than background screening values

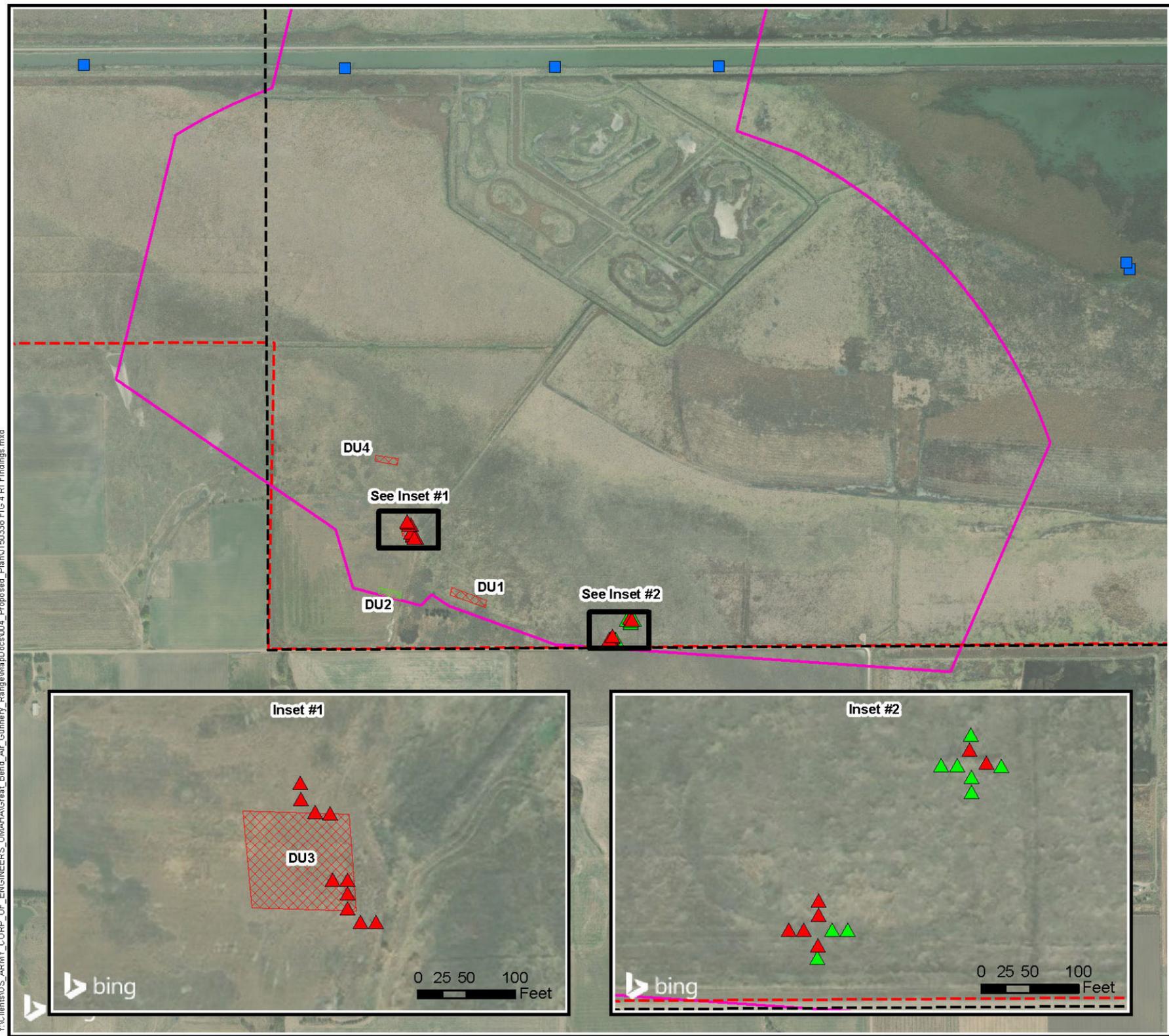
Sediment Sample

- Surface water sample above background screening values
- Sediment sample results less than background screening values

- FUDS Boundary
- Cheyenne Bottoms Wildlife
- MRS #3 Small Arms Range



Date Drawn/Revised: 12/14/2018 Project No. J150338



Y:\clients\US_ARMY_CORP_OF_ENGINEERS_01MAH\Great_Bend_Air_Gunnery_Range\MapDocs\004_Proposed_Plan\J150338 FIG 4 RI Findings.mxd

Figure 4

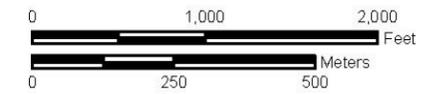
RI Findings

Great Bend Air-to-Ground Gunnery Range, Kansas

FUDS Property No.: B07KS0218
 FUDS Project No.: B07KS021804



Coordinate System: NAD 1983 UTM Zone 14N
 Basemap: Bing Aerial Imagery WMS



RI - Soil Samples

- ▲ Exceedance (sample results exceed PALs and background levels)
- ▲ No Exceedance (sample results do not exceed PALs and/or background levels)
- ▨ Exceedance (sample results exceed PALs and background levels)
- ▨ No Exceedance (sample results do not exceed PALs and/or background levels)

RI - Surface Water/Sediment Sample Results

- No Exceedance (sample results do not exceed PALs and/or background levels)
- ▭ FUDS Boundary
- ▭ Cheyenne Bottoms Wildlife Area
- ▭ MRS #3 Small Arms Range Complex

Note:

Project action levels (PALs) are conservative human health and ecological screening levels. Sample results that exceed PALs and background levels were further evaluated to determine if any unacceptable risk is present. Based on the results of the human health and ecological risk assessments, no unacceptable hazards or risks are present at the MRS.



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