

WORK PLAN AND SAMPLING AND ANALYSIS PLAN ADDENDUM

RMU-4



Prepared for:

Camp Stanley Storage Activity Boerne, Texas

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ADDENDUM TO WORK PLAN AND SAMPLING AND ANALYSIS PLAN SITE CLOSURE INVESTIGATION FOR RMU-4

Parsons is currently under contract to provide an investigation at Range Management Unit-4 (RMU-4), Camp Stanley Storage Activity (CSSA), Boerne, Texas. This document serves as both an addendum to the existing CSSA *Work Plan*, February, 1996 (see CSSA Environmental Encyclopedia (www.stanley.army.mil), Volume 1-1) and Work Plan Addenda and an addendum to the existing CSSA *Field Sampling Plan*, February 1996 (see CSSA Environmental Encyclopedia, Volume 1-4) and Sampling and Analysis Plan Addenda contained therein.

Previous investigations show that metals concentrations in soils at RMU-4 are in excess of identified Texas Risk Reduction Program (TRRP) protective concentration limits (PCLs) (see Section 2.3). The goal of the investigation is the removal of all soils that exceed those criteria. It is expected that upon completion of this investigation, a Release Investigation Report (RIR) will be prepared. Both the identified PCLs and the type of closure report may be modified based on the investigation findings.

This Addendum describes additional activities to be conducted as part of this investigation, and addresses specific Sampling and Analysis Plan (SAP) items related to those activities. Work will be performed in accordance with the requirements of the Resource Conservation and Recovery Act (RCRA) 3008(h) Order in effect for CSSA and in accordance with 30 Texas Administrative Code (TAC) §350, the TRRP administered by the Texas Commission on Environmental Quality (TCEQ).

Additional specific activities associated with this investigation are described in the *Storm Water Pollution Prevention Plan for RMU-4*, September 2012 and *RCRA Facility Investigation Interim Measures Waste Management Plan (RFI/IM WMP) Addendum for RMU-4*, September 2012.

1.0 SITE DESCRIPTION AND BACKGROUND

1.1 Description

RMU-4 is a 3.74 acre site located in the western portion of CSSA's East Pasture (**Figure 1**). The site was identified as a rifle range on a 1953 map of CSSA. A 1957 historical photo shows disturbed ground as well as a possible road through the area.

There are two features of interest located in the vicinity of RMU-4 that have been investigated for potential historic interest: a small arms range abutment consisting of a concrete wall abutted to the south by a large berm of soils; and a series of military training trenches (zig-zag trenches) (see **Figure 2**). The 1998 *Archeological Survey and Testing Report* (CSSA Environmental Encyclopedia, Volume 1-6) stated that, although the concrete abutment is associated with World War I training activities, it was determined not to be significant because the integrity of the site has been compromised. The abutment was therefore considered ineligible for National Register nomination. The

identified zigzag trenches were used as World War I training devices and were most likely used in the filming of the 1926 movie *Wings*. Based on the 1998 archeological assessment, these trenches were determined to be historically significant and were considered eligible for listing in the National Register of Historic Places.

1.2 Previous Investigations

A field survey was conducted at the site in 1997. No spent ammunition was observed in the area, but the aforementioned small arms range abutment was identified. In 2006, the road that runs along the very northern portion of RMU-4 was included in unexploded ordnance (UXO) construction support and investigation activities. The purpose of the investigation was to reduce the risk associated with possible remaining munitions items during future construction activities in the East Pasture. Several munitions debris (MD) items and bullets were identified during the roadway investigation in 2006, but only five were found within the northern RMU-4 boundary (**Figure 3**). Another 15 MD contacts were identified along the perimeter of RMU-4 along what is now the paved roadway leading into the east pasture.

A total of 27 surface soil samples were collected at RMU-4 in June 2011 to delineate potential metals contamination at the site. Three sample results exceeded the Tier 1 PCL for copper of 61 milligram per kilogram (mg/kg), 11 sample results exceeded the Tier 1 PCL for lead of 84.5 mg/kg, and one sample result exceeded the Tier 1 PCL for nickel of 35.5 mg/kg. These results, including the results of an XRF survey conducted in January 2012, are shown on **Figure 4**.

During a site walk in the summer of 2011, an unfuzed stokes mortar was discovered at the site by a UXO technician. The mortar was removed and disposed of by the CSSA Surveillance Section. The location of the mortar is depicted on both **Figure 4** (Previous Investigations) and **Figure 5** (Estimated Excavation Extent).

2.0 INVESTIGATION PROCEDURES

This investigation will include the removal of contaminated soil and the collection of confirmation samples for laboratory analysis to verify the successful removal of all contaminated soils from the site. All removal work will be performed in Level D personal protective equipment and under the health and safety protocol outlined in the *Health and Safety Plan*, May 2012.

2.1 Excavation Effort

Due to the potential presence of additional UXO items at the site, UXO clearance activities will be performed at the staging areas prior to the commencement of the excavation effort. In addition, a UXO technician will be present during the excavation effort to provide UXO support. Passenger vehicles and equipment trailers will not enter the excavated area. Excavating equipment will be parked on a trailer prior to leaving CSSA.

Soil identified as contaminated (criteria described in Section 2.3) through field screening efforts and confirmation sampling will be excavated and managed accordingly. An estimated 4,500 cubic yards (CY) may be excavated. The excavated soil will be moved directly to the respective staging area (**Figure 5**) and placed into 500 CY piles.

2.2 Waste Management

Contaminated soils will be managed in accordance with CSSA's *RFI Interim Measures Waste Management Plan*, Parsons, 2006 and the *RFI/IM Addendum for RMU-4*, September 2012.

For excavated soils, waste characterization sampling will occur at a frequency of 1 sample per 500 CY. Waste characterization samples will be analyzed by the toxicity characteristic leaching procedure (TCLP) for RCRA 8 metals. Impacted soil media which is believed to contain potential contaminants of concern (COCs) greater than 20 times the regulated TCLP criteria (*i.e.*, 20 times rule) will undergo waste characterization sampling at a frequency of 1 sample per 200 CY. Any soil media identified above characteristic hazardous criteria (40 Code of Federal Regulations [CFR] 261.24) will be treated in accordance with the *RFI/Interim Measures Waste Management Plan* (*i.e.* with use of PIMS, etc.) to non-hazardous levels and managed at the East Pasture berm or off-post as appropriate.

All impacted soil media that meets non-hazardous criteria, and CSSA standards for berm reuse (*e.g.* no pieces of metal greater than six inches, no materials identified as MEC items, etc.), will be transported to the East Pasture berm for reuse. Parsons will coordinate the transportation of soils to the East Pasture berm with CSSA personnel.

2.3 Soil Sampling

The TRRP Tier 1 PCL identified for this investigation is defined as the lowest value among following: 1) the TRRP Tier 1 Residential 30-acre PCL for total soil combined ($^{Tot}Soil_{Comb}$); 2) the TRRP Tier 1 Residential 30-acre PCL for groundwater protection ($^{GW}Soil_{Ing}$); and 3) the TCEQ Ecological Benchmark for Soil. If the lowest value is less than the CSSA soil background value, the soil background value becomes the Tier 1 PCL. Table 1 outlines these values and identifies the PCLs for the CSSA 9 metal analytes. The identified PCLs may be modified based on investigation findings, if necessary.

Soil samples for laboratory analysis will be collected during and post-excavation, as necessary, to confirm the successful removal of contaminated soils. Soil samples with results lower than the identified PCLs will be used to confirm contamination removal at a rate of approximately 1 sample per 50 feet along the horizontal excavation boundary, and 1 sample per 10,000 square feet to confirm the vertical excavation boundary. If any results indicate contamination above the identified PCLs, the excavation of soils will be expanded in that direction until confirmation samples show no indication of metal

contamination above PCLs. The number and location of confirmation samples will be dependent on the extent of excavation.

Confirmation soil samples will be collected and analyzed for CSSA 9 metals and explosives. Soil samples will be discrete grab samples and will be collected as described in the *CSSA SAP*, February 1996. The collection and analysis of quality assurance/quality control (QA/QC) samples is described in the *CSSA Base-wide Quality Assurance Project Plan, Version 1.0*, January 2003 (see CSSA Environmental Encyclopedia, Volume 1-4). The QA/QC samples and their collection frequency are as follows:

- One Field Duplicate (FD) per 10 samples
- One Matrix Spike (MS) and one Matrix Spike Duplicate (MSD) per 20 samples
- One Equipment Blank (EB) per site.

Full QA/QC will be performed on these samples and 100% of the results will be validated/verified by a chemist.

The necessary turnaround time (TAT) for the samples will be based on the current timeframe of the excavation and may range from expedited (3-day) to the standard TAT (21-day).

2.4 Erosion Control Measures and Site Rehabilitation

Erosion control and site rehabilitation will follow the *Storm Water Pollution Prevention Plan for RMU-4*, September 2012. The area to be disturbed during the excavation is less than 5 acres, so a Notice of Intent is not required.

There will be no permanent storm water controls. Once the excavation is complete, the site will be restored in coordination with CSSA's future plans for the area. If the area is to remain free of construction, native grasses will be planted to help control erosion.

2.5 Site-Specific Explosive Safety Submission

An ESS annex for this site will be developed in accordance with Department of Defense Instruction 6055.9F. The UXO technician on site will coordinate the ESS with CSSA's Safety and Environmental Office. The ESS will outline site-specific requirements and will incorporate all health and safety protocol included in the *Health and Safety Plan*, May 2012. All personnel entering the site will sign an entry log every day that they work on the site and routine safety briefings will be conducted. In the event that an UXO is encountered, the call down tree found in the ESS will be activated and all operations will halt until the UXO technician or the supporting Explosive Ordinance Disposal (EOD) team gives a green light for the project to continue.

3.0 SCHEDULE

This investigation may take place at any time and is anticipated to take approximately 14 weeks. All excavation work will be coordinated and scheduled in advance with CSSA. Since the site is adjacent to a live firing range at RMU-1, the work area is subjected to periodic “Red Flag” closures in support of the CSSA military mission. During Red Flag operations, all work will cease at RMU-4 and the field crew will demobilize from the East Pasture. Red Flag operations are typically posted well in advance of the activity, and Parsons will coordinate daily with Environmental Office to work around these range closures. Parsons and its subcontractors will make every reasonable effort to re-locate to ongoing Inner Cantonment remediation sites to minimize downtime.

Upon completion of the field effort, a Release Investigation Report (RIR) will be completed for RMU-4. As discussed previously, if the investigation results warrant, another type of closure report may be completed instead.

Table 1. Assessment Levels for Chemicals of Potential Concern
 CSSA 9 Metals
 RMU-4

Chemical of Potential Concern	Residential Tier 1 ^{Tot} Soil _{Comb} (mg/kg) ¹	Residential Tier 1 ^{GW} Soil _{Ing} (mg/kg) ²	CSSA Soil Background (mg/kg) ³	Texas-Specific Soil Background (mg/kg) ⁴	EcoBenchmark (mg/kg) ⁵
Arsenic	24.2	2.51	19.6	5.9	18
Barium	8,095	221.9	186	300	330
Cadmium	52.4	0.75	3.0	NA	32
Chromium	26,569	1,200	40.2	30	0.4
Copper	548.2	521.2	23.2	15	61
Lead	500	1.51	84.5	15	120
Mercury	2.09	0.0039	0.77	0.04	0.1
Nickel	832.1	78.68	35.5	NA	30
Zinc	9,921	1,180.2	73.2	30	120

1) Texas Risk Reduction Program Rule Tier 1 Protective Concentration Levels (PCLs) ^{Tot}Soil_{Comb}, for 30-acre source area, June 2012, (<http://www.tceq.state.tx.us/remediation/trrp/trppcls.html>).

2) Texas Risk Reduction Program Rule Tier 1 Protective Concentration Levels (PCLs) ^{GW}Soil_{Ing}, for 30-acre source area, June 2012, (<http://www.tceq.state.tx.us/remediation/trrp/trppcls.html>).

3) Second Revision to Evaluation of Background Metals Concentrations in Soils and Bedrock, February 2002.

4) Background Geochemistry of Some Rocks, Soils, Plants, and Vegetables in the Conterminous United States, Jon J. Connor, Hansford T. Shacklette, and Richard J. Ebens, Geological Survey Professional Paper 574-F, United States Geological Survey, 1975.

5) TCEQ Ecological Benchmark for Soil as stated in Update to Guidance for Conducting Ecological Risk Assessments at Remediation Sites in Texas, Regulatory Guidance (RG)-263, Revised January 2006, (<http://www.tceq.state.tx.us/assets/public/remediations/eco/0106eragupdate.pdf>).

Identified PCLs are shown in **bold**.



Aerial Photo Date: 2010



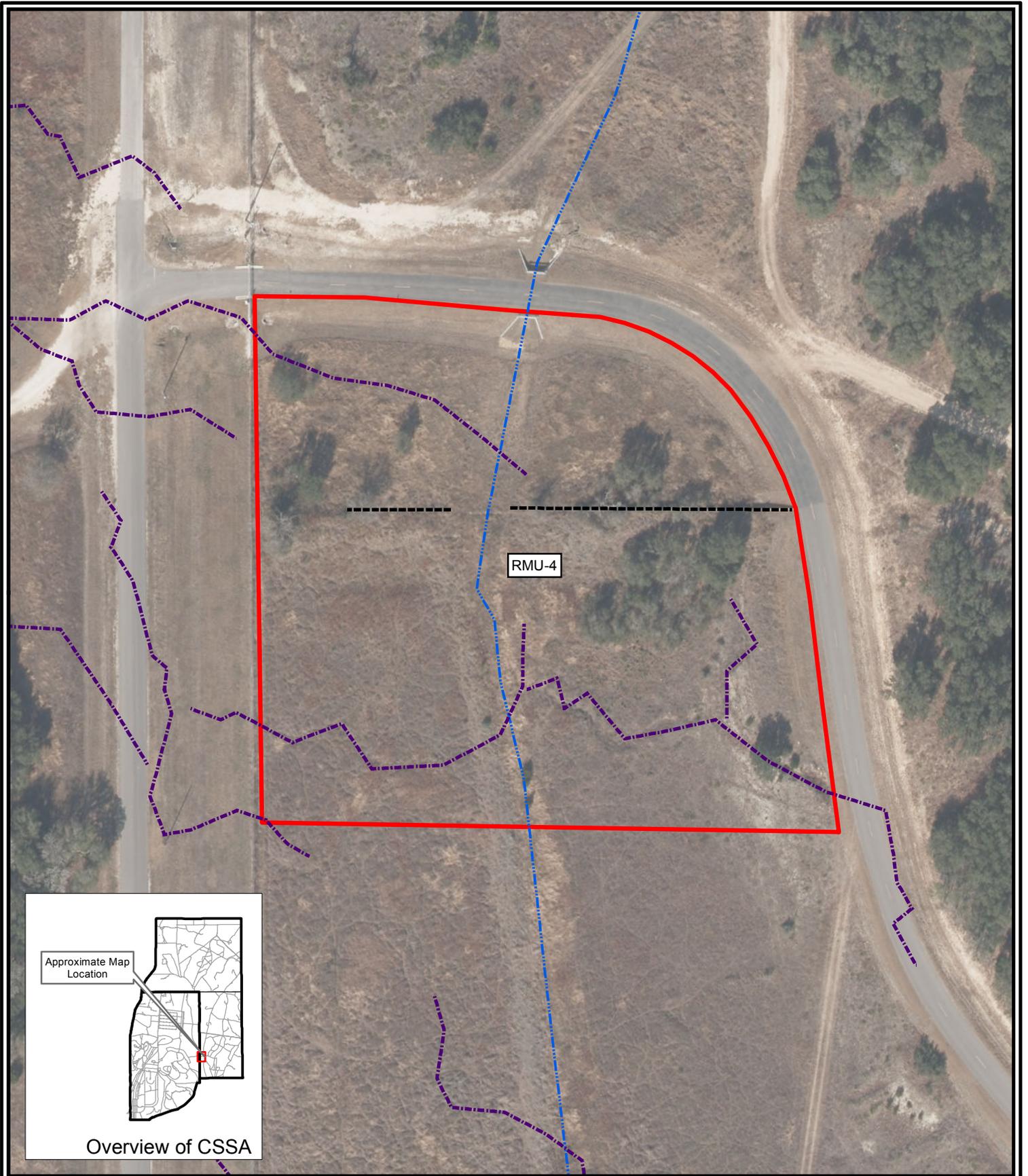
--- Intermittent Stream
 Site Boundary

0 50 100 200 Feet

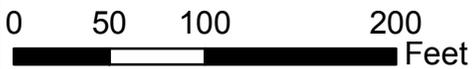
Figure 1

RMU-4
 Site Location Map
 Camp Stanley Storage Activity

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Aerial Photo Date: 2010

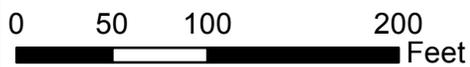
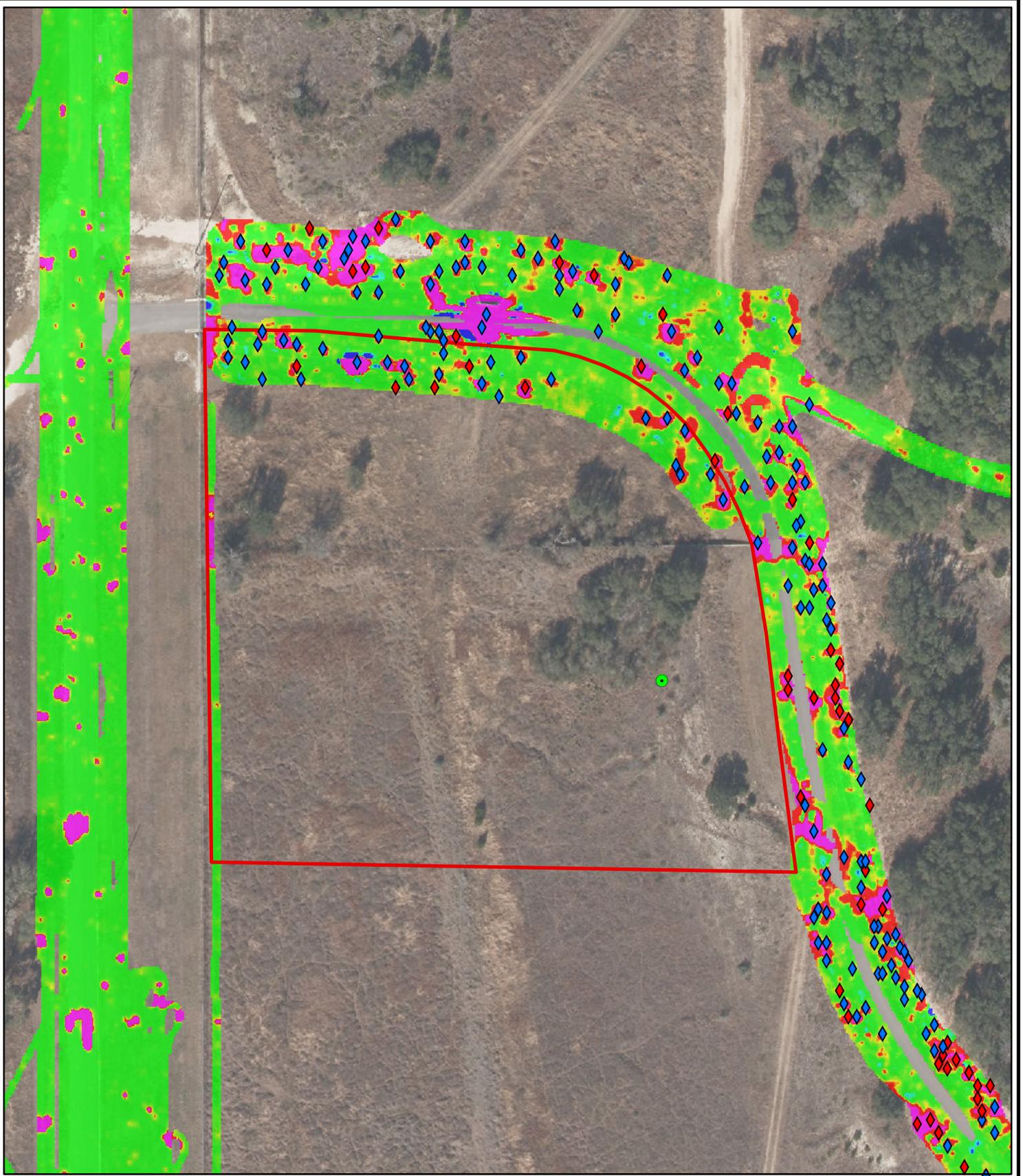


- · — · — · Intermittent Stream
- Site Boundary
- Approximate Location of Concrete Abutment
- · - · - · Zig-Zag Trenches

Figure 2

RMU-4
Features of Interest
Camp Stanley Storage Activity

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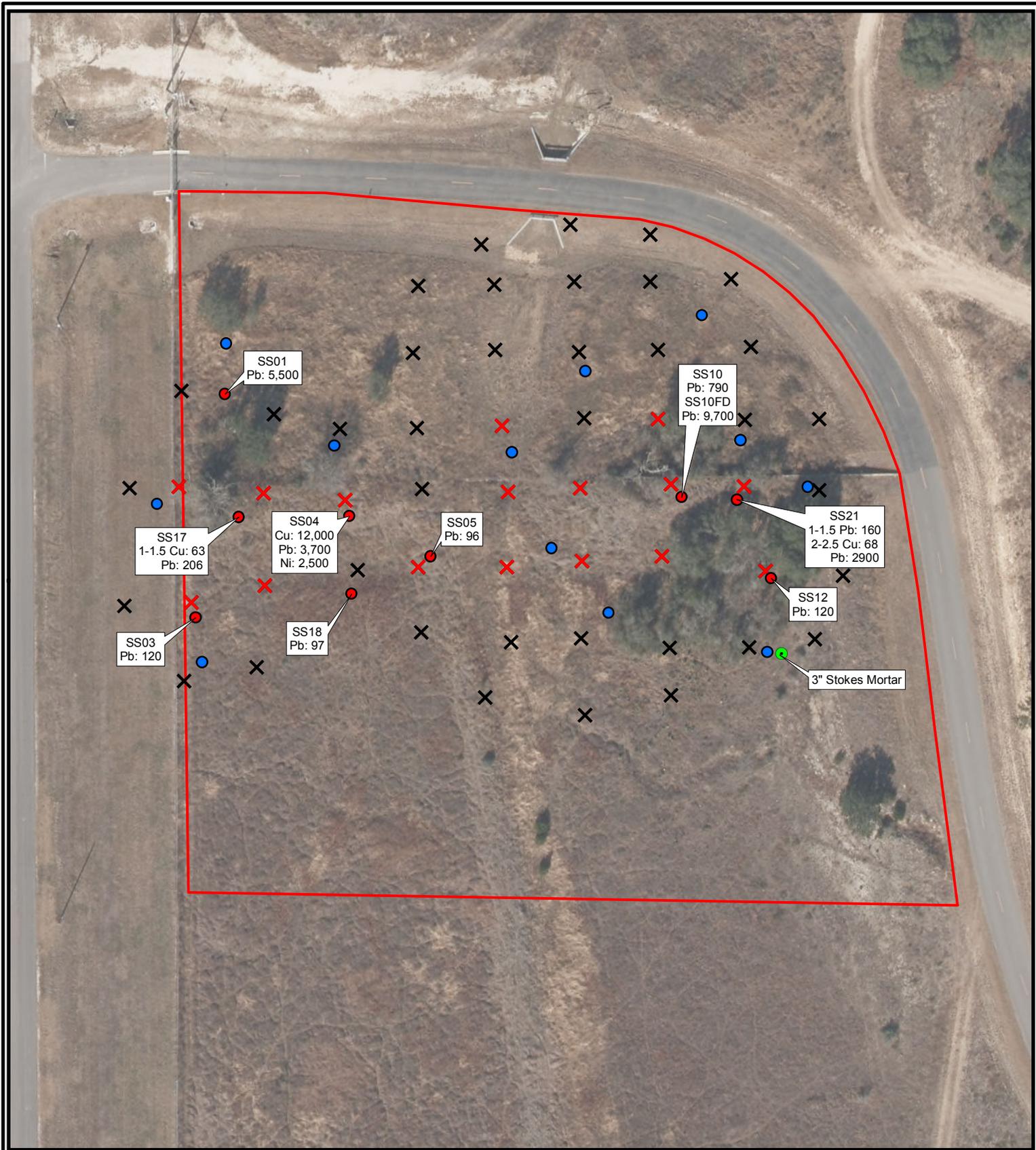


- 3" Stokes Mortar
- ◆ Geophysical Anomalies
- ◆ Geophysical Anomalies Identified as MD
- RMU-4 Boundary

Figure 3

RMU-4
Anomaly Location Map
Camp Stanley Storage Activity

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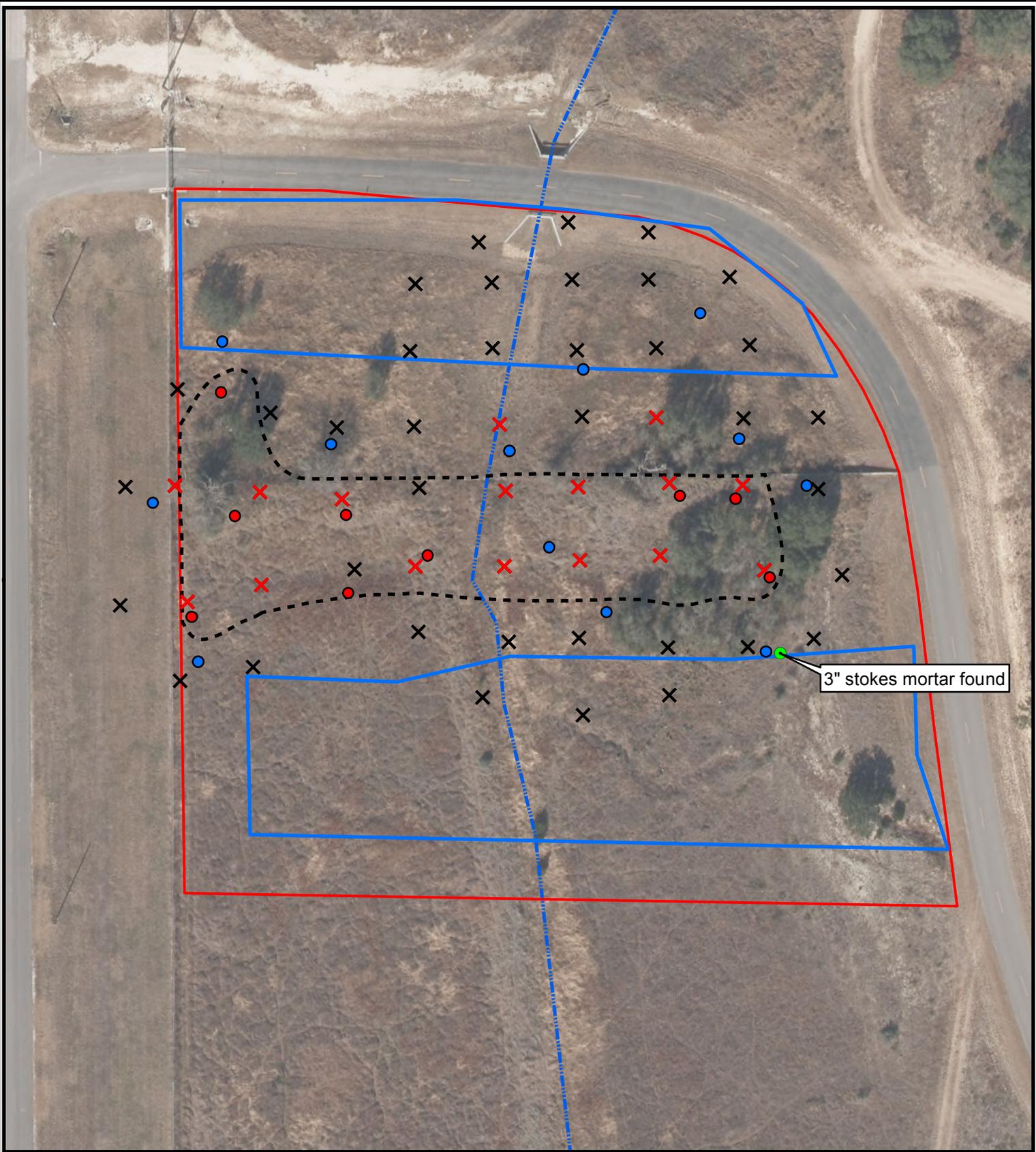


- Soil Sample
- Soil Sample with result above Tier 1 PCL in (mg/kg)
- ✕ XRF Sample
- ✕ XRF Sample with result above Tier 1 PCL for Pb or Zn (mg/kg)
- RMU-4 Boundary

Figure 4

RMU-4
Previous Sampling Locations
Camp Stanley Storage Activity

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3" stokes mortar found



- Proposed Excavation Area
- Staging Area
- RMU-4 Boundary
- Intermittent Stream

- Soil Sample
- Soil Sample with result above Tier 1 PCL in (mg/kg)
- XRF Sample
- XRF Sample with result above Tier 1 PCL for Pb or Zn (mg/kg)



Figure 5
RMU-4
Proposed Excavation Effort
Camp Stanley Storage Activity
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