U.S. Army Corps of Engineers
Omaha District

Draft Site-Specific Work Plan
Bruneau Precision Bombing Range No. 2
FUDS Property No. F10ID0141

Site Inspections at Multiple Sites, NWO Region Formerly Used Defense Sites, Military Munitions Response Program

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ABBREVIATIONS AND ACRONYMS

AAF	Army Airfield
AOC	area of concern
ASR	Archives Search Report
bgs	below ground surface
BLM	Bureau of Land Management
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CSM	Conceptual Site Model
DERP	Defense Environmental Restoration Program
DMM	discarded military munitions
DoD	U.S. Department of Defense
DOI	U.S. Department of the Interior
EOD	Explosive Ordnance Disposal
EPA	U.S. Environmental Protection Agency
FS	Feasibility Study
ft	feet
FUDS	Formerly Used Defense Site
GP	General Purpose
GPS	Global Positioning System
HRS	Hazard Ranking System
ICDC	Idaho Conservation Data Center
ID	Idaho
IDEQ	Idaho Department of Environmental Quality
IDFG	Idaho Department of Fish and Game
IDW	investigation-derived waste
IEP	Important Ecological Places
INPR	Inventory Project Report
ISHS	Idaho State Historical Society
lb(s)	pound(s)
MC	munitions constituents
MD	munitions debris
MDL	Method Detection Limit
MEC	munitions and explosives of concern
µg/L	micrograms per liter
MMRP	Military Munitions Response Program
MRA	Munitions Response Area
MRS	Munitions Response Site
MRSPP	Munitions Response Site Prioritization Protocol
MS/MSD	matrix spike/matrix spike duplicate
NCP	National Contingency Plan
NDAI	No Department of Defense Action Indicated
NWO	U.S. Army Corps of Engineers, Omaha District Military Munitions Design Center
PA	Preliminary Assessment
PBR	Precision Bombing Range
PQL	Practical Quantitation Limit

ABBREVIATIONS AND ACRONYMS (Cont.)

QA/QC	Quality Assurance/Quality Control
QAPP	Quality Assurance Project Plan
RAC	Risk Assessment Code
RI	Remedial Investigation
ROE	Right of Entry
SAP	Sampling and Analysis Plan
Shaw	Shaw Environmental, Inc.
SI	Site Inspection
SLERA	Screening-Level Ecological Risk Assessment
SOP	Standard Operating Procedure
SSHP	Site Safety and Health Plan
SSWP	Site-Specific Work Plan
TNT	trinitrotoluene
TPP	Technical Project Planning
U.S.	United States
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
UXO	unexploded ordnance
Final Type I Work Plan	*Final Type I Work Plan, Site Inspections at Multiple Sites, NWO Region*

1.0 INTRODUCTION

This Site-Specific Work Plan (SSWP) presents the information necessary to conduct field activities associated with a Site Inspection (SI) planned at the Bruneau Precision Bombing Range (PBR) No. 2.

1.1 Project Authorization

The United States (U.S.) Army Corps of Engineers (USACE) is conducting environmental response activities at Formerly Used Defense Sites (FUDS) in accordance with Engineer Regulation 200-3-1 (USACE, 2004a) and U.S. Department of Defense (DoD) guidance document, *Management Guidance for the Defense Environmental Restoration Program* (DERP) (DoD, 2001). USACE is conducting these activities under provision of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), Executive Orders 12580 and 13016, and the National Oil and Hazardous Substances Pollution Control Plan, which is commonly referred to as the National Contingency Plan (NCP) (40CFR 300). As such, USACE is required to conduct remedial preliminary assessments (PAs) and SIs (U.S. Environmental Protection Agency [EPA], 2005a, 2005b) to evaluate hazardous substance releases or threatened releases from eligible FUDS.

USACE is evaluating FUDS that were historically used for military training and testing under the DERP's Military Munitions Response Program (MMRP). Based on historical records, these FUDS may contain munitions and explosives of concern (MEC) or munitions constituents (MC). MEC are military munitions that may pose unique explosives safety risks, such as unexploded ordnance (UXO), discarded military munitions (DMM), or MC present in high enough concentrations to pose an explosive hazard. MC are any materials originating from UXO, DMM, or other military munitions, including explosive and non-explosive materials, and emission, degradation, or breakdown elements of such ordnance or munitions (U.S. Department of Army, 2005, and DoD, 2003).

Shaw Environmental, Inc. (Shaw) has prepared this SSWP for the USACE, under USACE Contract No. W912DY-04-D-0010, as a supplement to the *Final Type I Work Plan, Site Inspections at Multiple Sites, NWO Region, Formerly Used Defense Sites, Military Munitions Response Program* (Shaw, 2006a). This document is hereafter referred to as the *Final Type I Work Plan.* Shaw is responsible for conducting SIs at FUDS in the Northwest Region (Omaha District Military Munitions Design Center [NWO]).

1.2 Site Name and Location

The former Bruneau PBR No. 2 (property number F10ID0141) is located in Owyhee County, Idaho (ID), 7 miles southwest of Bruneau, ID, and 22 miles southwest of Mountain Home Air Force Base, ID. The property is located in Sections 2 and 3 of Township 7 South, Range 4 East, and Sections 34 and 35 of Township 6 South, Range 4 East.

The former range is located in the southwestern portion of the state and is situated on 2,552.2 acres consisting of United States Department of Interior Bureau of Land Management (BLM) and private land. The property boundary of the range is shown in Figure 1.

The former Bruneau PBR No. 2 was used as a practice bombing range by various Bombardment Groups such as the 467th, 490th, and the 494th between 1943 and 1953. The "Bombing Range" is represented as a 3,000-foot radius circle with the bombing target at the center of the circle. Aerial photographs show that the bombing range had a target center consisting of concentric circles, with each circle approximately 200 feet (ft) larger in diameter than the preceding circle, out to a final diameter of 1,000 ft. Munitions used on the range consisted of Practice bombs, high-explosive bombs, and .50-caliber munitions.

1.3 Scope and Objectives

The scope of the SI is restricted to evaluation of the presence of MEC or MC related to historical use of the FUDS prior to transfer of the property. Potential releases of hazardous, toxic, or radioactive wastes are not addressed within this scope. The intent of the SI is to confirm the presence or absence of contamination from MEC and/or MC. The general approach for each SI is to conduct records review and site reconnaissance in order to evaluate the presence or absence of MEC, and to collect samples at locations where MC might be expected based on the conceptual site model (CSM) (Appendix A).

The primary objective of the SI is to determine whether conditions at the Bruneau PBR No. 2 warrant further response action pursuant to CERCLA and the NCP. The SI will collect the minimum amount of information necessary to (i) eliminate from further consideration those releases that pose no significant threat to public health or the environment; (ii) determine the potential need for removal action; (iii) collect or develop additional data, as appropriate, for Hazard Ranking System (HRS) scoring by the EPA (EPA, 1990); and (iv) collect data, as appropriate, to characterize the release for effective and rapid initiation of the remedial investigation (RI) and feasibility study (FS) process. A secondary objective of the SI is to collect the appropriate data to complete the Munitions Response Site Prioritization Protocol (MRSPP) (DoD, 2005).

1.4 Site Inspection Process

The steps involved in conducting an SI include the following:

- Review of existing data,
- Application of the Technical Project Planning (TPP) process,
- Preparation of an SSWP,
- Performance of SI field activities (site reconnaissance, media sampling, and analysis),
- Preparation of an SI Report.

The TPP process is one through which project objectives and data collection processes are identified, and site stakeholders are brought together to discuss goals and objectives. This process includes the following phases: identification of the current project area, determination of data needs, development of data collection options, and finalization of the data collection program. A multi-disciplinary team of key stakeholders attends a TPP meeting(s) in order to participate in the process so SI activities can be conducted in a timely and efficient manner.

1.5 Munitions Response Site Prioritization Protocol

The DoD is required to assign a relative priority for each Munitions Response Site (MRS) within a Munitions Response Area (MRA). This process is to be completed for all DoD sites including FUDS which are known or suspected of containing UXO, DMM or MC.

Definitions:

- A Defense Site refers to the entire property that was owned, leased, or otherwise possessed or used by the DoD. This definition includes FUDS.
- An MRA refers to any area on a Defense Site that is known or suspected to contain UXO, DMM, or MC. An MRA can be comprised of one or more MRSs.
- An MRS is a discrete location within an MRA that is known to require a munitions response (e.g., remedial response). An MRSPP scoring is completed for each MRS.

1.6 TPP Summary

The TPP Meeting for the Bruneau PBR No. 2 was held at the Idaho Department of Environmental Quality (IDEQ) offices located in Boise, ID, on April 24, 2007. Two follow-up conference calls hosted by the USACE were held on May 15 and 17, 2007, to finalize TPP Meeting agreements. The meeting was attended by representatives from the USACE, IDEQ, EPA Region 10, and Shaw. The BLM and landowners did not participate in these meetings. The USACE is considering conducting a separate TPP meeting with BLM and landowners to review the SI.

A visit to the range was conducted as part of the April 24, 2007 meeting. This visit, attended by USACE, IDEQ, and Shaw representatives, revealed that the former range area is primarily farmed with equipment storage areas or stock feeding areas on corners of fields. Most agricultural fields appear to have pivot wells located at the center for irrigation. One residence, which appears to have been newly built, is located very near the center of the bombing target. One small surface water pond (stock water pond) was observed. This pond was filled with water from a pumping groundwater well. An ephemeral stream, Halfway Gulch, no longer appears to exist in channels as depicted in topographic maps of the area. This stream has likely been rerouted in ditches surrounding the agricultural fields. No naturally occurring surface water was observed.

The USACE, IDEQ, and EPA came to mutual agreement with the approach and the decision rules that were developed during the TPP Meeting, two follow-up conference calls, and review of the Draft TPP Memorandum. Key TPP agreements include:

Site Inspection Area of Concern (AOC): The TPP stakeholders agreed that the AOC consisted of the former bombing range as identified in the MMRP Inventory consisting of the area encompassed by a 3,000-foot radius circle with the bombing target at the center of the circle. It was agreed that inspection activities can extend beyond this area if features of interest (e.g., craters) are observed beyond this area.

MEC: TPP stakeholders agreed, based on historical records and aerial photographs, that general purpose bombs, practice bombs, and small arms (.50-caliber) were used at the former PBR.

MC of Concern: The TPP stakeholders agreed to a list of MC of concern derived from the ordnance that is believed to have been used on the range. The agreed to MC of concern consists of metals (antimony, copper, lead, and zinc), explosive compounds (including nitroglycerin) and perchlorate.

MEC Reconnaissance Objectives: The TPP stakeholders agreed that the SI would include reconnaissance activity to: (a) observe evidence of MEC and munitions debris (MD), (b) confirm site conditions and land usage, (c) confirm the CSM, and (d) select optimal sample locations (biased toward evidence of MD, if observed).

The MEC reconnaissance would primarily be conducted within the AOC but would extend to surrounding land to inspect for MD and craters. Areas of cratering within and outside the AOC, as determined from historical aerial photographs, will be inspected.

MC Sampling: The TPP stakeholders agreed to sample site media for MC of concern. The following is a summary for each media.

- Sixteen soil samples will be collected and analyzed for explosives and metals. Soil is believed to be the medium that potentially was directly impacted by MC. Multi-increment (7-point) soil samples will be collected from depths of 0 to 6 inches below ground surface (bgs). Soil samples will be analyzed for metals and explosives.
- Background soil samples will be obtained from the west side of the AOC within BLM land. This area is believed to be unaffected by bombing range and farming activities. A set of two soil samples will be collected and analyzed for metals. One of the two samples will be analyzed for explosives to check that the background location is not impacted by bombing range activities. The multi-increment (7-point) soil samples will be collected from depths of 0 to 6 inches bgs.
- Sediment is a potential migration pathway for MC that will be addressed by sampling sediment for analysis MC of concern (explosives and metals). The ephemeral stream, Halfway Gulch, flows through the former range area and, based on map location, is ideal for sampling. However, based on the current status of the range as observed during the April 24 range visit, it appears Halfway Gulch has been rerouted through ditches surrounding agricultural fields. It was agreed by TPP stakeholders that two sediment samples will be obtained, one upgradient and one downgradient of the AOC, along the rerouted Halfway Gulch. Sampling locations will be chosen by the sampling team based on site conditions. Samples will be analyzed for metals and explosives. It was further understood that surface water samples would not be obtained since Halfway Gulch is anticipated to be dry at the time of the site inspection.
- Groundwater is a potential migration pathway for MC. A reasonable effort will be made to locate one groundwater well within or directly downgradient of the AOC and one well upgradient for sampling provided that rights of entry (ROEs) for suitable locations are obtained. Domestic water wells will be preferred over agricultural irrigation wells. Regional groundwater is believed to flow northward toward the Snake River. The upgradient well is considered to represent

background conditions. The groundwater samples will be analyzed for MC of concern (explosives, metals, and perchlorate). Installation of monitoring wells or groundwater sampling points is not within the agreed scope of work.

Screening-Level Ecological Risk Assessment: Based on the current available information on the former range, the TPP stakeholders agreed that a Screening-Level Ecological Risk Assessment (SLERA) is not required because the range is not a known Important Ecological Place (IEP) nor is it managed for ecological purposes. If further research of the range or evidence from field work indicates the range is an IEP or managed for ecological purposes, then a SLERA will be conducted as part of the SI.

HRS Scoring Information: Information needed to compete the HRS scoring will be provided in the SI Report. However, the SI report will not include the HRS scoring sheets.

Perchlorate Action Level: Groundwater will be sampled and analyzed for perchlorate. The USACE stated that results will be compared to a groundwater action level of 24 micrograms per liter (µg/L) in accordance with DoD policy. The EPA and IDEQ indicated their preference for a screening value of 3.6 µg/L based on EPA Region 9 Preliminary Remedial Goals for tap water.

1.7 Decision Rules

The following is a list of decision rules that will guide Shaw's technical approach at various stages of the SI as the specific AOC is being evaluated:

Objective 1: Determine if the site requires additional investigation or can be recommended for No DoD Action Indicated (NDAI) based on the presence or absence of MEC.

DQO #1 – Utilizing trained UXO personnel and handheld magnetometers, a visual search will be conducted searching for physical evidence to indicate the presence of MEC, (e.g. MEC on the surface, MD, craters, soil discoloration indicative of explosives). The visual search will consist of the bombing range AOC and surrounding area. The following decision rules will apply:

- The following reconnaissance results would support a recommendation for further action with respect to MEC:
  - Direct evidence is found of the presence of MEC (from historical records or SI activities), or evidence of potential MEC that is inconsistent with the bombing range CSM (e.g. use of munitions other than practice and general purpose [GP] bombs).
  - Direct evidence of MEC is not found, but abundant MD is identified suggesting a potential for the presence of MEC.
- The following reconnaissance results would support a recommendation for NDAI with respect to MEC:
  - Direct evidence of MEC is not found; MD is isolated and consistent with the Bombing Range CSM.
  - No evidence of MEC, MD, or magnetic anomalies is identified.

- If there is indication that site users are exposed to MEC hazard, the site will be recommended for a removal action.

Objective 2: Determine if the site requires additional investigation or can be recommended for NDAI based on the presence or absence of MC above screening values.

DQO#2 – Soil, surface water, sediment, and groundwater samples will be collected and analyzed for explosives (including nitroglycerin) and metals. Groundwater samples will also be analyzed for perchlorate. Analytical results will be compared to screening values for human health and ecological risk screening values and to background values. The following decision rules will apply:

- If sample results do not exceed background, the site will be recommended for NDAI relative to MC.
- If sample results (metals and explosives) exceed background but are less than human health and ecological screening values, the site will be recommended for NDAI relative to MC.
- If sample results exceed either human health or ecological screening values and background values, the site will be recommended for additional investigation.
- If sample results are below background but exceed either human health or ecological screening values then the site will be recommended for additional investigation.

Objective 3: Obtain data required for HRS scoring.

Data required for HRS scoring are identified in the HRS Data Gaps worksheet.

Objective 4: Obtain data required for MRSPP ranking.

Data required for MRSPP ranking are identified in the MRSPP worksheet.

1.8 MEC Technical Approach

If MEC is found during SI field activities, the following excerpted procedures will be followed, per Interim Guidance Document 06-05 and Safety Advisory 06-2 (see Appendix C for complete document):

- The property owner or individual granting ROEs to the property will be notified of the hazard and advised to call the local emergency response authority (i.e., police, sheriff, or fire department). The individual will also be informed that if they do not call the local response authority within one hour, the individual who identified the UXO item will notify the local emergency response authority.
- The local response authority will decide how to respond to the reported incident, including deciding not to respond (e.g., if the local response authority is already aware of the hazards on the property). If the local response authority decides to respond, the individual who identified the item or his designee will mark the location of the item and provide accurate location information to the emergency response authority. The individual who identified the item or his designee will generally

remain in the area until the local response authority arrives, unless specifically indicated by the appropriate response authority that the individual may leave the area.

- Neither the USACE personnel, nor their contractors have the authority to call Explosive Ordnance Disposal (EOD) to respond to an explosive hazard. This call is the responsibility of the local emergency response authority for FUDS properties and it must come through the proper chain of command on installations.

The technical approach is based on the *Final Type I Work Plan* (Shaw, 2006a), *Final Technical Project Planning Memorandum, Bruneau Precision Bombing Range No. 2* (Shaw, 2006b) and the *Formerly Used Defense Sites, Military Munitions Response Program, Site Inspections, Program Management Plan* (USACE, 2005).

1.9 SSWP Organization

This SSWP supplements the *Final Type I Work Plan* (Shaw, 2006a), which includes an Accident Prevention Plan and Site Safety and Health Plan (SSHP, Appendix D), and a Sampling and Analysis Plan (SAP, Appendix E) that includes both the USACE SAP and the Shaw SAP. The SAPs contain the Field Sampling Plan and the Quality Assurance Project Plan (QAPP). The *Final Type I Work Plan* (Shaw, 2006a), as amended by this SSWP, governs work that will be implemented during the SI at the Bruneau PBR No. 2. This SSWP provides additional information not available in the, including site information (background information, summary of historical documents evaluated, and resulting data needs), a discussion of activities to be conducted prior to mobilizing to the field, a presentation of field data to be collected, and appendices with supporting documents. Specifically, this SSWP includes the following sections:

- Section 1.0 Introduction,
- Section 2.0 Site Information,
- Section 3.0 Pre-Field Activities,
- Section 4.0 Site Inspection Activities,
- Section 5.0 Investigation-Derived Waste,
- Section 6.0 Proposed Schedule,
- Section 7.0 References,
- Figures,
- Tables,
- Appendix A Conceptual Site Model,
- Appendix B Site Safety and Health Plan Addendum, and
- Appendix C USACE Interim Guidance Document 06-05 and Safety Advisory 06-2.

2.0 SITE INFORMATION

2.1 Installation History

The land that Bruneau PBR No. 2 occupied was originally undeveloped rangeland that belonged to the Department of the Interior (DOI). After the land was declared excess, it was relinquished

to the DOI, BLM, who conveyed most of the usable land to private owners through the Desert Land Act. Two hundred forty acres were retained and are currently under the control of the BLM. The majority of the land is used for agricultural purposes. There are homesteads with farming buildings within 2 miles of the property. Cattle guards and fences inhibit access to the property but do not prevent it.

In November 1942, following acquisition of the property, the Army Air Corps started construction of Mountain Home Army Airfield (AAF). Construction was completed in August 1943. The War Department indicated a need for the property in June 1943, and in September 1943, acquired the land from the DOI for use as Mountain Home PBR No. 2.

In 1946, Mountain Home AAF became a sub-base of Walla Walla AAF in Idaho and Petersen Field in Colorado. After creation of the U.S. Air Force, the property became known as Bruneau PBR No. 2.

The site was used as a practice bombing range by various Bombardment Groups such as the 467th, 490th, and the 494th. Aerial photographs show that the bombing range had a target center consisting of concentric circles, with each circle approximately 200 ft larger in diameter than the preceding circle, out to a final diameter of 1,000 ft. Construction at the range consisted of earth-filled emplacements confined by planks for 10-foot tall identifying squares, circles, and symbols, and a 30- by 30-foot target center, lath construction, painted white. No other improvements were made to the range during the range's existence.

The property was declared excess in November 1953 and relinquished to the BLM in November 1955. Current property owners of the former Bruneau PBR No. 2 are the BLM and private landowners.

2.2 Physical Setting

2.2.1 Access and Land Use

The former Bruneau PBR No. 2 is located in the southwestern portion of the state, in Owyhee County, ID, 7 miles southwest of Bruneau, ID, and 22 miles southwest of Mountain Home Air Force Base, ID. The former property boundary of the range consists of an off-set square that is approximately 2 miles by 2 miles. Currently the majority of the land is used for agricultural purposes. The area is comprised of agricultural fields, cattle feed lots, new and used farm equipment storage, and farm buildings. One homestead, which appears to have been recently built, resides near the center of the AOC. There are homesteads with farming buildings within 2 miles of the property. Cattle guards and fences inhibit access to the property but do not prevent it.

2.2.2 Climate

Bruneau PBR No. 2 is located in an area where the climate is highly variable. In general, winter weather is cloudy and unsettled. There are frequent periods of persistent wind from the southwest that result in mild temperatures, but there are also a few periods where temperatures stay below freezing and approach or fall below zero degrees Fahrenheit. During the winter, measurable amounts of precipitation fall on about one-third of the days. Continuous home heating is generally not needed until mid-October and generally ceases around the beginning of June. Intermittent heating may continue until July.

The Bruneau area averages approximately 8.4 inches of precipitation per year.

Temperatures warm gradually in the spring months, which normally are the wettest and windiest of the year. Sustained winds of 20 to 30 miles per hour for days at a time are not unusual. Summer temperatures start out mild but by July and August may reach into the 90s. Long periods of extremely hot temperatures are uncommon. Summer nights are generally cool with average temperatures in the 50s. Fall is characterized by mild days and cool nights. The first cold wave does not generally occur until late December.

2.2.3 Geologic and Hydrogeologic Setting

2.2.3.1 Bedrock Geology

The former Bruneau PBR No. 2 is located in the Malheur-Boise section of the High Lava Plains subprovince in the Columbia Intermontane physiographic province. The High Lava Plan subprovince is a crescent-shaped belt, convex to the south that extends from the Teton Mountains on the east to the Cascade Mountains on the west.

The Malheur-Boise is the lowest in altitude of the three sections that make up the High Plains Lava. The Malheur-Boise is composed of lavas interbedded with fluviatile and lacustrine sediments. The interbedding of weak and strong beds has resulted in considerable erosion and stream dissection. Plain-like expanses do exist, but they are the exception, not the rule. Numerous mesa-like tracts occur where Quaternary basalts cap the lacustrine sediments.

Unconsolidated deposits along stream valleys consist of sand and gravel that form productive aquifers. The thickness of the deposits along present stream valleys commonly is less than 250 ft.

2.2.3.2 Overburden Soils

Soil at Bruneau PBR No.2 consist is a silty sandy. The soil is very deep and well drained. The runoff is slow to medium, the permeability is moderately rapid, and the available water capacity is high. The hazard of water erosion is slight and wind erosion is high.

2.2.3.3 Overburden Soils

Bruneau PBR No.2 is underlain by discontinuous volcanic- and sedimentary-rock aquifers. The rocks that comprise these aquifers consist of silicic volcanic rocks. The sedimentary rocks consist primarily of semi consolidated sand and gravel eroded from volcanic rocks. The permeability of the various rocks that compose the aquifer is extremely variable. Interflow zones and faults of basaltic lava flows; fractures of tuffaceous, welded silicic volcanic rocks; and interstices in coarse ash, sand, and gravel mostly yield less than 100 gallons per minute. Where major faults are present, the rocks commonly contain geothermal water under confined conditions.

Little is known about the hydrogeologic characteristics of the aquifers underlying the site. According to the Idaho Department of Water Resources, there are five domestic and four irrigation wells within the former bombing range AOC. The total depths of the domestic wells range from 110 ft to 1,142 ft bgs. Static water levels of the domestic wells range from 30 to 127 ft bgs. The depths of the irrigation wells range from 329 ft to 955 ft bgs. Static water levels

within the irrigation wells range from 28 ft to 125 ft bgs. The aquifers that underlie the site tend to flow north towards the CJ Strike Reservoir, Bruneau River, and Snake River. Quality of the ground water is generally good enough for any use.

There are several wells that flow at the ground surface directly to the east of the site. These artesian wells are drilled into aquifers where the potentiometric surface is above the land surface.

2.3 Previous Investigations

2.3.1 Historical Records Searches

Historical documents reviewed to collect information about the former Bruneau PBR No. 2: A summary of these documents is provided below.

Two Certificates of Clearance were issued for Bruneau PBR No. 2 by Headquarters, 2700th Explosive Ordnance Disposal Squadron, McClellan Air Force Base, California.

- The first certificate was issued September 17, 1954. A total of 2,600 man-hours were spent and 52,000 pounds (lbs) of scrap metal were recovered. The only explosives that were recovered were 400 lbs of black powder that came from the spotting charges. The report recommended that the southern half of Section 3, T7S, R4E be restricted to surface use only (USACE, 2004b).
- The second certificate was issued July 24, 1964 for the restricted use portion specified for the 1954 Certificate of Clearance. A total of 576 man-hours were spent and 500 lbs of inert ordnance residue were recovered and piled in a central location on the range for future disposition. No hazardous items were recovered (USACE, 2004b).

The USACE Walla Walla District completed an initial Inventory Project Report (INPR) in November 1988 (USACE, 1988).

A reevaluation of the 1988 INPR was completed August 2003. The 1988 INPR stated that the site had been used as a precision bombing range and .50-caliber gunnery range, and that locals had reported finding bomb debris and .50-caliber rounds. The INPR did not rule out the use of bombs containing high explosives. The 1988 INPR site determined that the site was eligible under DERP as a FUDS and assigned a Risk Assessment Code (RAC) score of 4 to the range.

On August 24, 2004, a site inspection was conducted at the target. The site inspection was part of the 2004 PA that USACE was conducting at the range. The purpose of the site inspection was to collect sufficient field evidence to determine the potential for MEC. The inspection was limited to visual, non-intrusive methods; no sampling and analysis of site media was conducted. No evidence of MEC or MD was observed on the surface at the target site.

In December 2004, the PA was completed at the range (USACE 2004b). The PA was conducted by USACE, St. Louis District, and compiled information collected from historical documents, interviews, and site visits. The purpose of the PA was to determine if MEC were present. The PA found that there was a potential for MEC at Bruneau PBR No. 2. According to the PA, historical evidence indicated that practice bombs and .50-caliber ammunition had been used at the range, and that there was the possibility high explosives had been used as well. The report concluded that the sort of cratering seen in a 1950 aerial photograph could not be attributed solely to the use of practice bombs. In addition, there were reports that over the years, landowners had found live and expended .50-caliber rounds on the range. The report concluded

that the historic presence of .50-caliber rounds at the range, and the presence of ranges in the vicinity with strafing ranges, indicated that the range may have been mistakenly used for strafing. The PA assigned a RAC score of 3 to the site.

An *Archives Search Report* (ASR) *Supplement* was issued in November 2004. The risk assessment assigned a RAC score of 3 for the Bruneau PBR No. 2.

An ASR does not appear to have been completed for this range.

2.4 Munitions and Explosives of Concern and Munitions Constituents

According to the ASR Supplement (USACE, 2004a) the munitions used at Bruneau PBR No. 2 included:

- 100- lb general purpose (GP) (AN-M30) with bomb tail fuzes (AN-M100 Series) and bomb nose fuzes (AN-M103A1),
- 100-lb practice bombs (M38A2) with spotting charges (M1A1, M3, and M5), and
- .50-caliber cartridges.

The old-series GP bomb was a relatively thin-cased bomb with parallel sidewalls, and a tapered aft section. Nose and tail fuzes, both separately and in combination, were used for a majority of operations. The GP and M-series 100-lb bombs had the same dimensions. The weight of the case was 42.1 lbs and the fins weighed between 5.6 to 17.5 lbs.

The AN-M30 GP bomb was fuzed in the nose with the AN-M103 fuze and in the tail with the ANM100A2 fuze. The alternate fuzes that were used as substitutes or for special purposes were the M103, M118, or M119 nose fuzes, and the M112, M100, M106 or its modifications, or the ANM100A1 tail fuzes

The M38A2 practice bomb simulated a GP bomb of the same size. It was constructed of light sheet metal, approximately 22 gauge, formed by rolling a rectangular sheet of metal into the form of a cylinder approximately 8 inches in diameter, and spot-welding the seam. The rounded nose was pressed from the same metal, as was the tail, which was formed in the shape of a cone. The spotting charge was assembled in a sleeve at the base of the bomb, within the fin box. Authorized spotting charges were the M1A1, M3, and M5.

Small arms munitions consisting of .50-caliber were reportedly used on the range in air-to-ground gunnery practice.

MC chemicals of concern associated with the MEC consist of explosive compounds, metals and perchlorate. A full discussion of MEC and associated MC for the Bruneau PBR No. 2 is provided in the CSM provide in Appendix A. The MC associated with the type of munitions used on the ranges is summarized in Table 1.

3.0 PRE-FIELD ACTIVITIES

3.1 Coordination with State Historic Preservation Office

The Preliminary Assessment of the Bruneau PBR No. 2 completed in 2004 indicated there are no significant historic or archeological sites in the vicinity of the range (USACE, 2004b). The

Idaho State Historical Society (ISHS) will be contacted as part of this SI to obtain the latest information on cultural properties at the PBR.

3.2 Coordination Regarding Natural Resources

The Idaho Conservation Data Center (ICDC), Idaho Department of Fish and Game (IDFG) and the U.S. Fish and Wildlife Service (USFWS) were contacted to determine the presence of threatened or endangered species present at the former Bruneau PBR No. 2. According to these resources, there is no Federally Listed Threatened, Endangered, Candidate, or Proposed-for-listing species within or within the vicinity of the former Bruneau PBR No. 2. The ICDC list several species of "greatest conservation need" within the former range area. The USFWS indicates the range is located in an area identified as a wintering and nesting area for the Bald Eagle (IDFG, 2007; ICDC, 2007; USFWS 2007).

3.3 Review of Historical Aerial Photographs

A review of current and historical aerial photographs of the former Bruneau PBR No. 2 has been completed as part of preparation of this SSWP. Aerial photographs from 1950 and 1998 were interpreted.

The bombing target is clearly visible in the 1950 aerial photograph. Five concentric circles with diameters of 200-ft, 400-ft, 600-ft, 800-ft, and 1,000-ft, indicate the location of the bombing target. Craters within and surrounding the target are visible. The highest density of craters are greatest at the bombing target center and become less numerous with distance from the target center. A large number "2" is seen on the north side of the target. A small building resides northwest of the bombing target in an area of scraped soils.

The 1998 aerial photograph indicates the land are been significantly modified by farming activities. Agricultural fields, mostly irrigated with pivot wells, dominate the area. Features of the bombing range visible in the 1950 aerial photograph, including the bombing target rings, craters, and building are no longer visible in the 1998 aerial photograph.

3.4 Coordination of Rights of Entry

Per section 2.5.2 of the *Final Type I Work Plan* (Shaw, 2006a) and as the geographic USACE District office for the former Bruneau PBR No 2, the Project Manager from the USACE, Seattle District is responsible for obtaining the ROEs for the property where the SI activities will be performed. Access to identified property is necessary for conducting field activities. Table 2 identifies the property of interest and the status of obtaining the ROE.

3.5 Equipment

A four-wheel drive vehicle will not be necessary for access since improved dirt roads exist within the former range area. All investigation areas can be reached from roads within the area. A Schonstedt instrument will be used to conduct the MEC reconnaissance. A hand-held global positioning system (GPS) receiver unit will be used for traverses and to document any surface remains, document the reconnaissance survey, and identify the location of MEC, if found.

3.6 Communications

The primary means of on-site communication will be cellular telephones or radios. A satellite phone will be carried as a backup form of communication. The two-person Field Team (and any other accompanying parties) will remain together throughout all aspects of the field activities.

3.7 Training and Briefing

Any additional training will be conducted onsite during the Daily Tailgate Safety Briefing, to include awareness of endangered species, culturally sensitive areas, and anticipated ordnance types. In addition, emphasis will be placed on the known presence of biota at the site.

4.0 SITE INSPECTION ACTIVITIES

The bombing range is the AOC for the former Bruneau PBR No. 2 as indicated in Figures 2 and 3. A site inspection of the AOC will be conducted, which will include the following activities:

- Site reconnaissance,
- Soil sampling,
- Surface water sampling (if surface water is present),
- Sediment sampling
- Recording sampling and site information (using a hand-held GPS unit), and
- Photo documentation.

All SI field activities will be conducted in accordance with the *Final Type I Work Plan* (Shaw, 2006a) and SSHP Addendum (Appendix B). The SSHP Addendum is a supplement to the program-wide Accident Prevention Plan and Site Safety and Health Plan contained in the *Final Type I Work Plan* (Shaw, 2006a). All SI field activities will be documented in the field log book.

4.1 Key Personnel

This section identifies key project personnel and their specific roles and responsibilities for each SI activity conducted at the Bruneau PBR No. 2. Additionally, this section defines the responsibilities, authority, and the interrelationships of all personnel who manage, perform, and verify activities affecting quality, particularly for personnel who need the organizational freedom and authority to:

- Initiate action to prevent the occurrence of non-conformance,
- Identify and record and quality problems,
- Initiate, recommend, or provide solutions through designated channels,
- Verify the implementation of solutions, and
- Control further processing, delivery, or installation of non-conforming items until the deficiency or unsatisfactory condition has been corrected.

Project Manager – The Shaw Project Manager will have overall responsibility, authority, and accountability for the project. Mr. Peter Kelsall, Shaw, is the Project Manager. He will provide

additional management or technical support when needed and will serve as the final reviewer on all technical documents produced for the project.

Chemical Quality Control Officer – The Shaw Chemical Quality Control Officer shall ensure that all chemistry-related objectives, including responsibilities for data quality objective definitions, sampling and analysis, project requirements for data documentation and validation, and final project reports are attained. Mr. Tim Roth will serve as the Chemical Quality Control Officer for this project.

Health and Safety Manager – The Shaw Health and Safety Manager is responsible for the development and implementation of the SSHP for this SI. Ms. Pamela Moore will serve as the Health and Safety Manager for this project.

Technical Lead – The Shaw Technical Lead will oversee the technical aspects of the inspection activities. Mr. Andrew Ellison will serve as the Technical Lead for this site.

Field Team Leader – The Shaw Field Team Leader will be responsible for the management and execution of all field project activities in accordance with the approved work plan, and federal, state, and local laws and regulations. Mr. Andrew Ellison will serve as the Field Team Leader for this site. Mr. Ellison will function as the primary point of contact for the stakeholders and field personnel. He will advise the Technical Lead of technical progress, needs, potential problems, and recommended solutions.

UXO Technician – The UXO technician will be responsible for the UXO avoidance measures to be implemented during field activities.

4.2 Field Reconnaissance

A visual reconnaissance of the former Bruneau AOC, as shown on Figures 2 and 3, will be conducted to identify evidence of MEC and/or range activities (presence of MEC or MD and ground-scarring suggestive of practice bombs, demolition bombs, impact craters, and .50-caliber munitions). The reconnaissance team will locate, identify, and stake sampling locations within the AOC. The density and type of MD observed on the ground will be noted.

The following conditions at each planned sampling location will be documented in the field log book and recorded by digital photographs as necessary:

- Presence or absence of MEC and MD,
- Coordinates of staked sampling locations (using a hand-held GPS unit),
- Access limitations,
- Vegetative cover,
- Soil conditions,
- Presence or absence of water for surface water samples, and
- Other conditions encountered that impact sample collection.

The site reconnaissance will be performed by conducting a visual and geophysical inspection of the range. The UXO technician will perform the geophysical inspection using a Schonstedt. The path walked during the visual reconnaissance will be recorded using a hand-held GPS unit. Reconnaissance will not include detailed mapping.

Shaw will document any MEC found, and proceed with MC sampling as described in the following sections.

4.3 Sampling

This SSWP details sampling by media planned at the former Bruneau PBR No. 2, as discussed during the TPP Meetings and documented in the Final TPP Memorandum. Soil, groundwater and sediment samples will be collected based on the decision matrix described in the following sections and in Table 3.

In all instances, samples will be collected using clean, new, disposable sampling equipment, i.e., a spoon or scoop and bowl. Non-disposable tools, such as a spade, shovel, or trowel, may be used to remove vegetation and roots prior to collection of the soil or sediment sample. Groundwater samples will be collected directly from faucets.

All soil, groundwater, and sediment samples will be collected in accordance with Sections 6.1, 6.4, and Shaw Standard Operating Procedures (SOPs) T-FS-101, T-FS-110, and T-FS-124 of Appendix E of the *Final Type I Work Plan* (Shaw, 2006a). Sample designations and quality assurance/quality control (QA/QC) sample requirements are summarized in Table 4.

4.3.1 Soil

A total of 16 composite surface soil samples will be collected from the Bruneau PBR No. 2 AOC. These samples will be obtained from the following locations:

(a) Six of the soil samples will be obtained within 500 ft of the bombing target center.

(b) Four soil samples will be obtained at a distance of between 500 ft and 1,000 ft from the bombing target center.

(c) Four soil samples will be obtained at a distance of between 1,000 ft and 3,000 ft from the bombing target center.

(d) Two additional soil samples will be reserved for the collection of soils at special locations including: within 200 ft of residences, homes, schools, or day care centers; craters; or unusual soil staining. One residential property is known to exist near the center of the AOC.

The exact locations of soil samples will be determined during the site inspection based on the visual identification of the AOC. The general areas of soil sample collection are illustrated in Figure 4.

Surface soil samples will be collected at a depth of approximately 0 to 6 inches bgs. Each surface soil sample will be composite sample (7-point, wheel pattern with a 2-ft radius). No subsurface samples are planned. All soil samples will be analyzed for explosives (including nitroglycerine), and metals (antimony, copper, lead, and zinc).

4.3.2 Sediment

The rationale for collection of sediment samples at the Bruneau PBR No. 2 is to assess possible contamination of surface water from runoff associated with surface soil at the range. Samples will be collected from Halfway Gulch. This ephemeral stream consists of two branches which flow around the northern and southern portion of the former range and combine into a single

branch east of the range. Surface water sampling is not proposed since Halfway Gulch is expected to be dry.

Two sediment samples will be collected from Halfway Gulch, one from a location upgradient and the other downgradient of the bombing range AOC. The exact locations of these samples will be determined during the site inspection. Sample collection locations will account for recent realignment of Halfway Gulch around farm fields within the former range area. Sediment samples will be collected in the same manner as described above for the soil samples since Halfway Gulch is anticipated to be dry when sampled. All sediment samples will be analyzed for explosives (including nitroglycerine) and metals (antimony, copper, lead, and zinc). Sediment sampling locations are illustrated in Figure 4.

4.3.3 Groundwater

Two groundwater samples will be obtained. One groundwater sample will be obtained from one well located within the AOC and a background groundwater sample will be obtained from a well upgradient of the AOC. Domestic water supplies wells will be preferred for sampling if available. Irrigation wells will be sampled if domestic wells are not available for sampling. Groundwater samples will be analyzed for explosives (including nitroglycerine), metals (antimony, copper, lead, and zinc), and perchlorate.

Currently, ROEs have not been completed for well sampling from the Bruneau PBR No. 2 area. Five domestic water wells are known to exist within the bombing range AOC and several domestic water wells exist upgradient of the bombing range. It is the intent of the SI to sample the well closest to the center of the former bombing range as possible, depending on which well owner grants access. The upgradient well will be chosen from an area upgradient/south of the former AOC.

Figures 2, 3, and 5 present wells identified as sampling candidates for the SI. Actual wells ROE for well sampling will be in place prior to conducting SI field activities.

4.3.4 Background

Background surface soil sample will be collected from an undisturbed area within BLM lands adjacent to the AOC. The preferred background location will be located on BLM lands located to the west of the AOC (See Figure 4). Two samples will be analyzed for metals. One of the two samples will also be analyzed for explosives (including nitroglycerine).

Actual sample locations will be chosen in the field. Sampling will be collected from undisturbed areas away from anthropogenic impacted areas. Surface soil samples will be collected at a depth of approximately 0 to 6 inches bgs. Each surface soil sample will be composite sample (7-point, wheel pattern with a 2-ft radius).

The determination of background concentrations for site evaluation will be in accordance with HRS criteria (40 CFR Appendix A to Part 300, Table 2-3). The background threshold level will be equivalent to three times the maximum detected background concentration. For analytes not detected in background samples, the background threshold will be equal to the quantitation limit of the analytical method.)

4.3.5 Analytical Program

Definitive target analyses for samples collected from Bruneau PBR No. 2 consist of the following list of analytical suites:

- Explosives – EPA SW-846 Method 8330A
- Metals (antimony, copper, lead, and zinc) EPA SW-846 Method 6020A
- Perchlorate – EPA SW-846 Method 6850

Soils, groundwater, and sediment samples will be analyzed using EPA SW-846 methodology as presented in Section 5.0 of the USACE QAPP. Tables 5 through 8 compare laboratory target analyte practical quantitation limits (PQLs) to human health and ecological risk based screening concentrations. Method Detection Limits (MDLs) with the groundwater table. Final risk screening levels are included on these tables.

Chemical data will be reported via a hard-copy data package and electronic format following the requirements referenced in Section 7.1 of the USACE QAPP. These data deliverables will be validated in accordance to the requirements referenced in Section 8.2 of the USACE QAPP.

4.3.6 Quality Assurance/Quality Control Samples

In accordance with the USACE Programmatic SAP, QA/QC samples will be collected. The locations planned for the collection of QA/QC samples are noted on Table 4.

The QC samples to be collected include one field duplicate for soil and one matrix spike/matrix spike duplicate (MS/MSD) sample each for water and soil. The Omaha Design Center has directed that no QA field split samples will be collected for this site.

4.3.7 Sample Preservation, Packaging, and Shipping

Sample preservation and packaging are provided in Table 4-1 and Table 4-2 of the USACE QAPP. Sample shipment will follow the procedures specified in Section 4.0 of the USACE QAPP. Completed analysis request/chain of custody records per Section 7.1.3 of the USACE SAP will be secured and included with each shipment of coolers to GPL Laboratories, LLC.

All samples will be shipped to the following:

GPL Laboratories, LLC
7210A Corporate Court
Frederick, MD 21703
Phone: 301.694.5310
Fax: 301.620.0731
Attention: Sample Receiving/Virginia Zusman

5.0 INVESTIGATION-DERIVED WASTE

Investigation-derived waste (IDW) will be managed in accordance with the *Final Type I Work Plan* (Shaw, 2006a) (Section 3.7, and Appendix E, Shaw's SAP Section 9.0). All IDW is presumed non-hazardous unless field observations indicate otherwise. The following types of IDW will be managed as specified in the *Final Type I Work Plan* (Shaw, 2006a), Appendix E, and the USACE Field Sampling Plan:

- Personal protective equipment and disposable equipment (i.e., disposable sampling scoop): bagged and routed to a municipal landfill;
- Excess surface soil, groundwater, and sediment material: returned to source (i.e., ground surface).

6.0 PROPOSED SCHEDULE

The proposed schedule for field activities and reporting is provided below. The timing of the field activities assumes there will be no delays because of inclement weather.

August 2007 – Submittal of Final SSWP

October 2007 – Field activities

December 2007 – Submittal of Draft SI Report;

January 2008 – Review of Draft SI Report;

February 2008 – Submittal of Draft Final SI Report;

March 2008 – Review of Draft Final SI Report; and

May 2007 – Submittal of Final SI Report.

7.0 REFERENCES

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FIGURES

DRAWING NUMBER: Bruneau_014_fig1_Site_Location_SSWP

DRAWN BY: K.Masterson 07/02/07

OFFICE: CEN

560000 000000 580000 000000 600000 000000

4760000 000000

4740000 000000

4720000 000000

Mountain Home

Grand View

Snake River

Flying H Pond

Tom Pond

Crane Falls Lake

Bruneau River

C J Strike Reservoir

Indian Cove Lake

Dunes Lake

Bruneau Dunes State Park

Bruneau

Hot Springs

Broken Wagon Flat Reservoir

67 78 3804 84 78 78 51

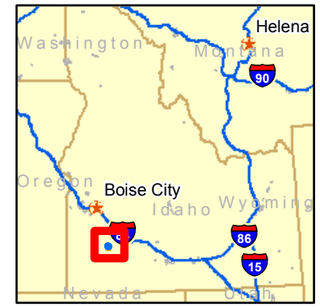
Legend

Bruneau PBR NO. 2 FUDS Boundary

NOTES:

1) FUDS boundary derived from the Bruneau PBR ASR Supplement.
2) This property is located within the C. J. Strike Reservoir Watershed.
3) USGS topographic map was obtained from the U.S. Department of Agriculture, Service Center Agencies and is dated 2002.

N



0 1.75 3.5 7 Miles

REFERENCE/PROJECTION: State Plane NAD 83 UTM Zone 11N

U.S. ARMY CORPS OF ENGINEERS
OMAHA DESIGN CENTER

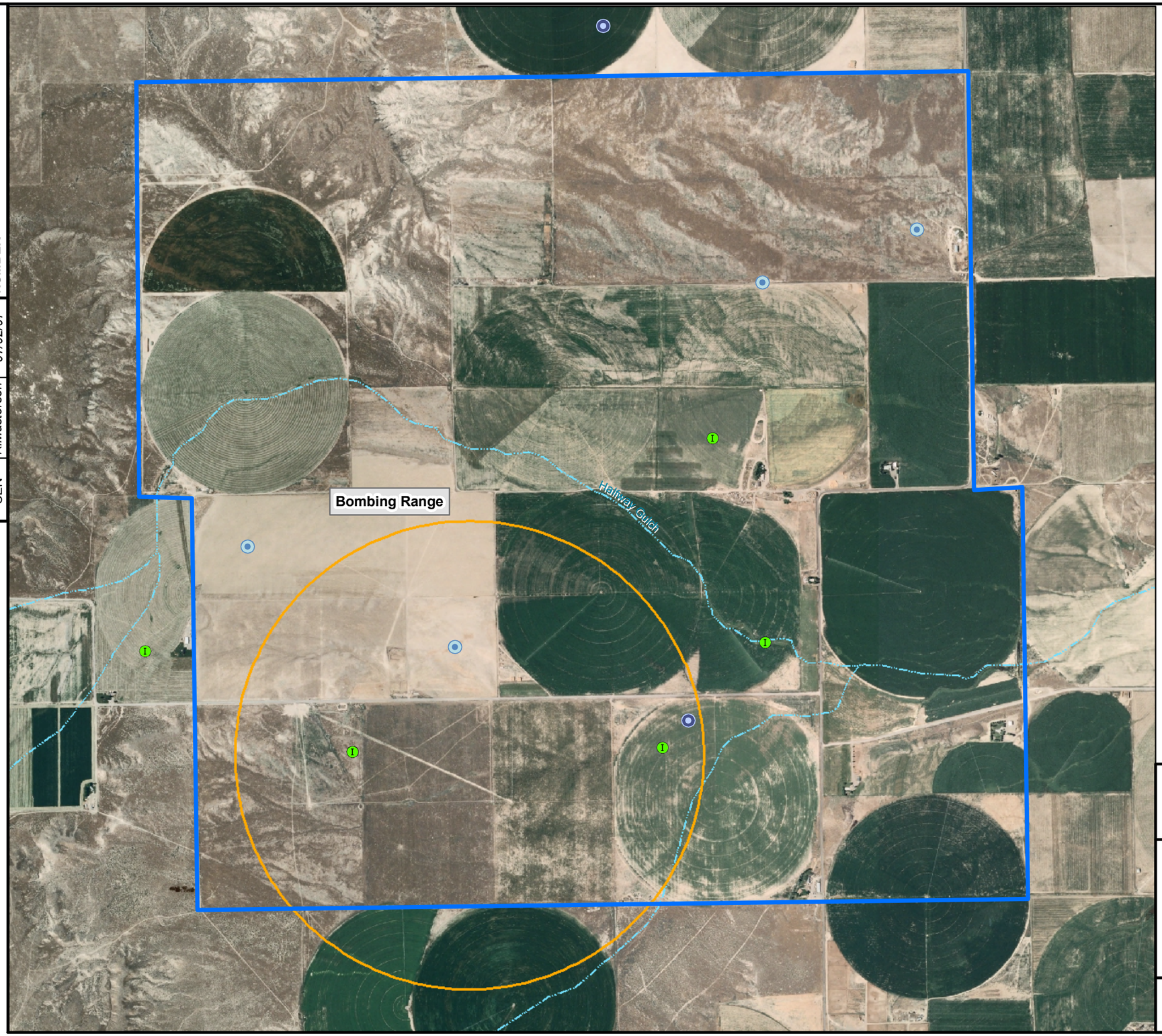
FIGURE 1

SITE LOCATION

BRUNEAU PBR NO. 2

Shaw® Shaw Environmental, Inc.

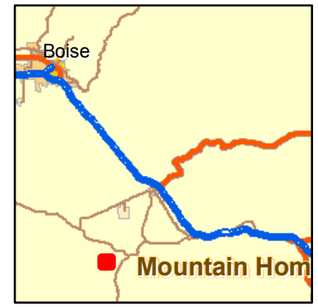
OFFICE: CEN
DRAWN BY: K.Masterson 07/02/07
DRAWING NUMBER: Bruneau_013_fig2_SiteLayoutAerail_SSWP



Legend

- Bruneau PBR No. 2 FUDS Boundary
- Bombing Range Area of Concern
- Irrigation Well
- Domestic Well
- Domestic-Single Residence Well

NOTES:
1) AOC boundaries were derived from the Bruneau PBR ASR Supplement.
2) Groundwater well data were obtained from Idaho Dept. of Water Resources (http://www.idwr.idaho.gov/gisdata/new%20data%20download/wells.htm).
3) This property is located within the C. J. Strike Reservoir Watershed.
4) Aerial photo was obtained from the U.S. Department of Agriculture, Service Center Agencies; photo is from the USDA-AFPO National Agricultural Inventory Project (NAIP), Elmore County, Idaho, 2006.



N

0 650 1,300 2,600
Feet

REFERENCE/PROJECTION: State Plane NAD 83 UTM Zone 11N

U.S. ARMY CORPS OF ENGINEERS
OMAHA DESIGN CENTER

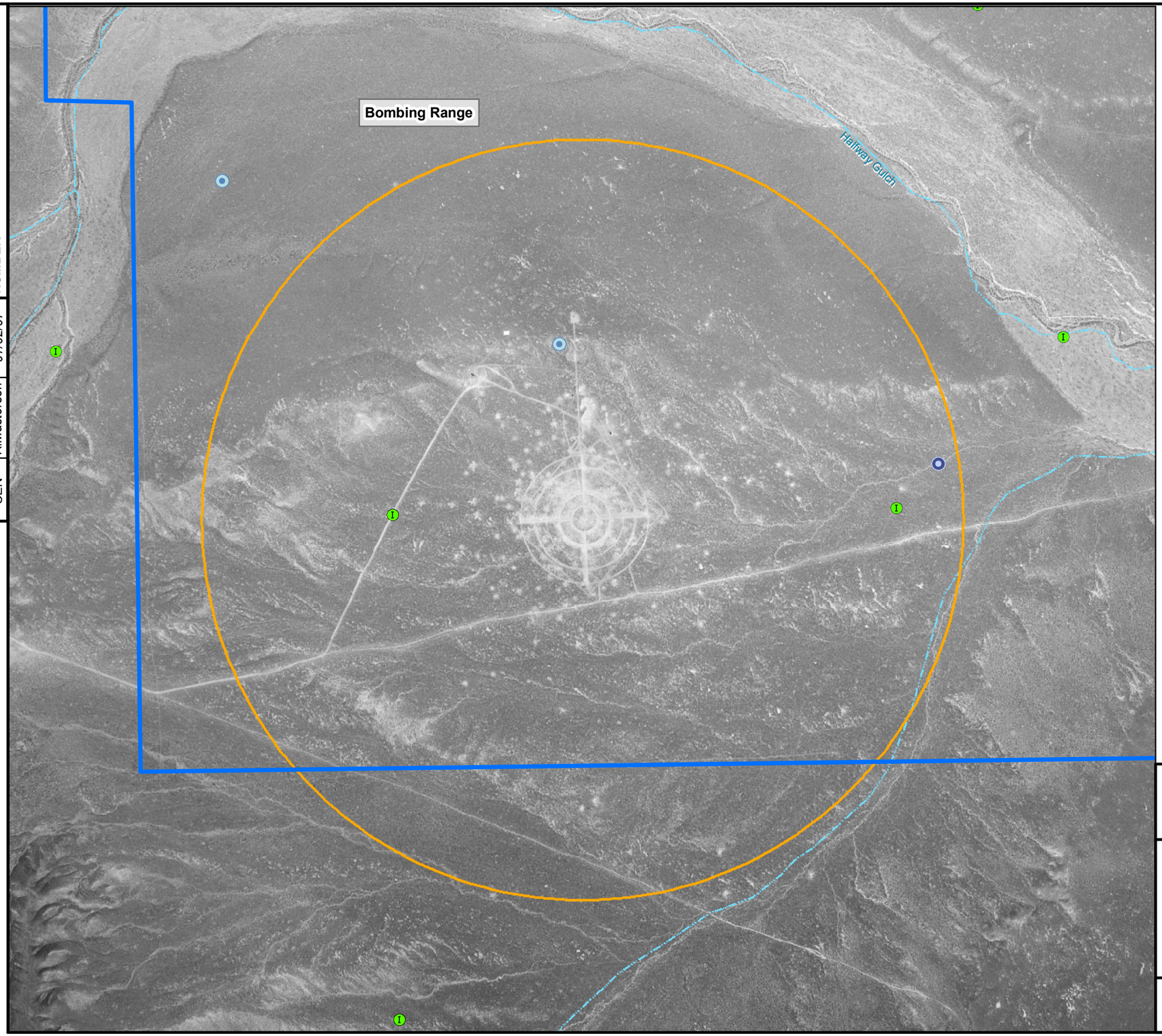
FIGURE 2

SITE LAYOUT AND AREA OF CONCERN AERIAL PHOTOGRAPH

BRUNEAU NO. 2 PBR

Shaw® Shaw Environmental, Inc.

OFFICE	DRAWN BY		DRAWING NUMBER
CEN	K.Masterson	07/02/07	Bruneau_014_fig3_SiteLayout HistAerail_SSWP



Legend

- Bruneau PBR No. 2 FUDS Boundary
- Bombing Range Area of Concern
- Irrigation Well
- Domestic Well
- Domestic-Single Residence Well

NOTES:
1) AOC Boundaries were derived from the Bruneau PBR ASR Supplement.
2) Groundwater well data were obtained from Idaho Dept. of Water Resources (http://www.idwr.idaho.gov/gisdata/new%20data%20download/wells.htm).
3) This property is located within the C. J. Strike Reservoir Watershed.
4) Historical Aerial photo was obtained from the U.S.G.S and is dated 1946.

0 400 800 1,600
Feet

REFERENCE/PROJECTION: State Plane NAD 83 UTM Zone 11N

U.S. ARMY CORPS OF ENGINEERS
OMAHA DESIGN CENTER

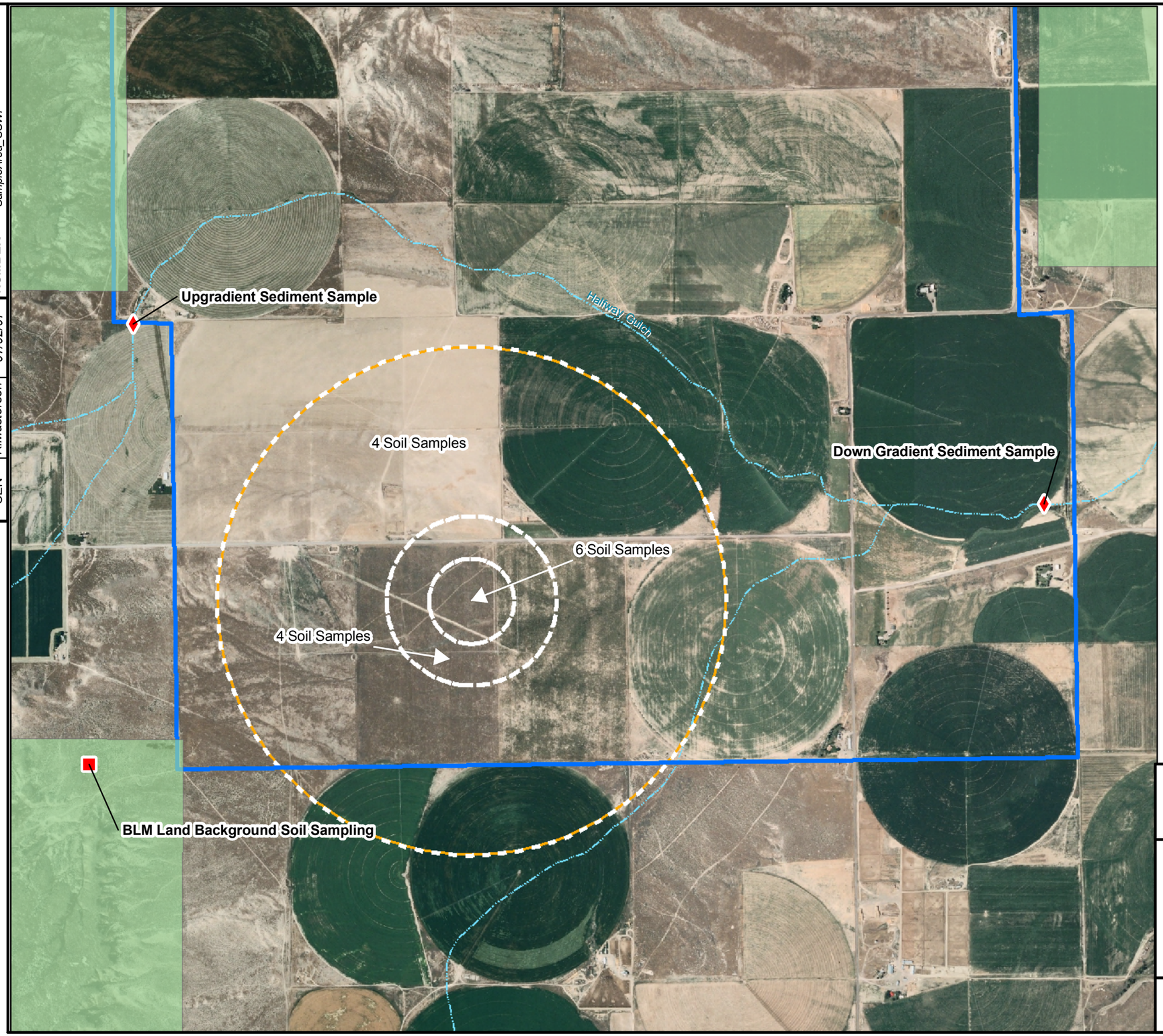
FIGURE 3

AREA OF CONCERN
1946 AERIAL PHOTOGRAPH

BRUNEAU PBR NO. 2

Shaw Environmental, Inc.

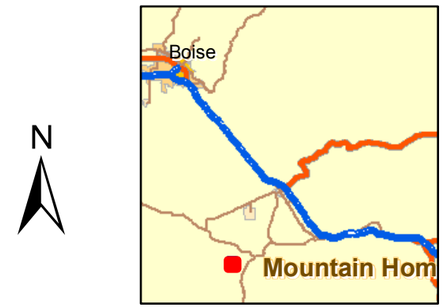
OFFICE	DRAWN BY		DRAWING NUMBER
CEN	K.Masterson	07/02/07	Bruneau_015_fig4_SampleArea_SSWP



Legend

- Bruneau PBR No. 2 FUDS Boundary
- Bombing Range Area of Concern
- BLM Land
- Proposed Background Soil
- Proposed Sediment

NOTES:
1) AOC boundaries were derived from the Bruneau PBR ASR Supplement.
2) This property is located within the C. J. Strike Reservoir Watershed.
3) Aerial photo was obtained from the U.S. Department of Agriculture, Service Center Agencies; photo is from the USDA-AFPO National Agricultural Inventory Project (NAIP), Elmore County, Idaho, 2006.



0 600 1,200 2,400 Feet

REFERENCE/PROJECTION: State Plane NAD 83 UTM Zone 11N

U.S. ARMY CORPS OF ENGINEERS
OMAHA DESIGN CENTER

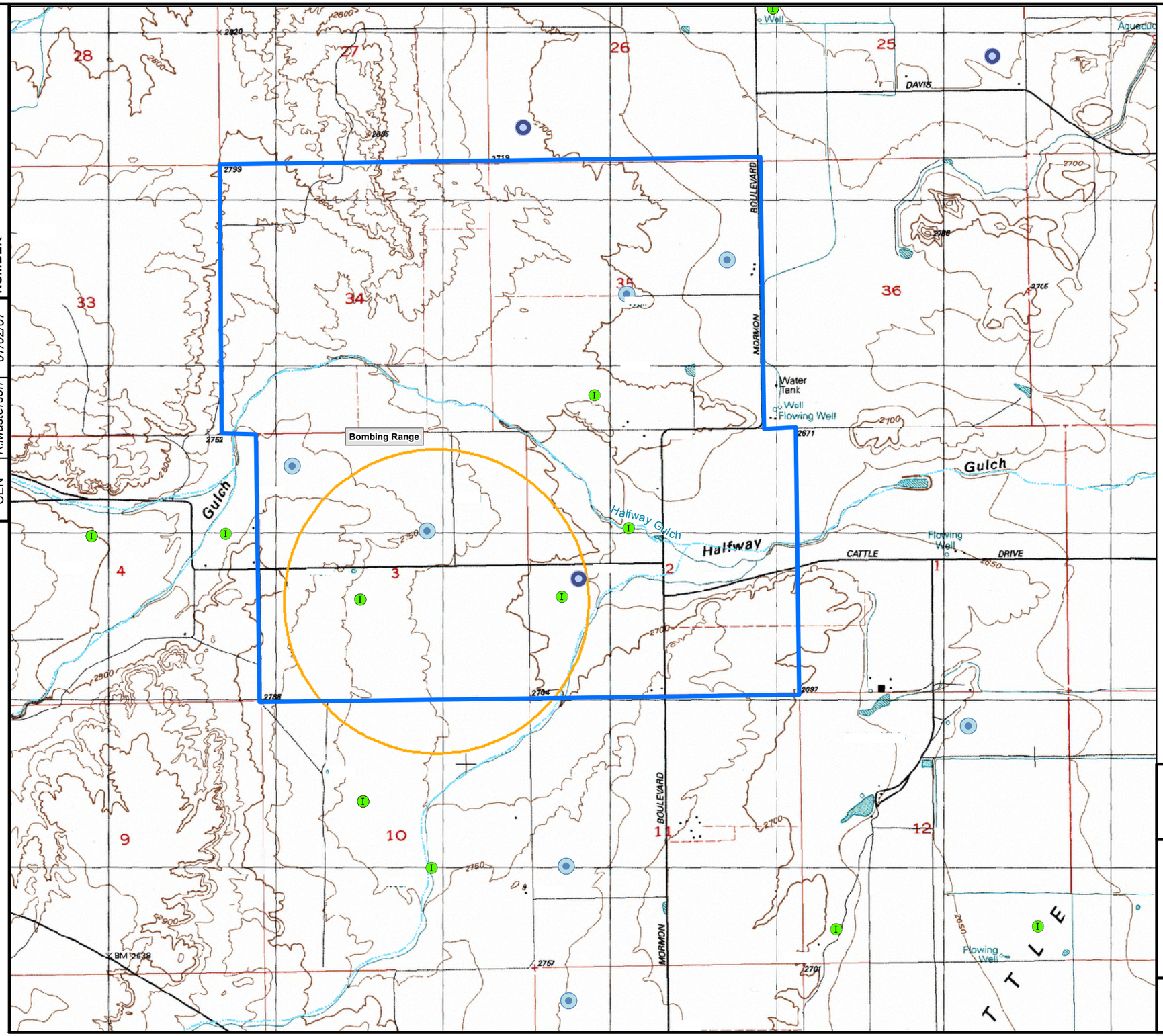
FIGURE 4

SOIL AND SEDIMENT SAMPLING AREAS

BRUNEAU PBR NO. 2

Shaw® Shaw Environmental, Inc.

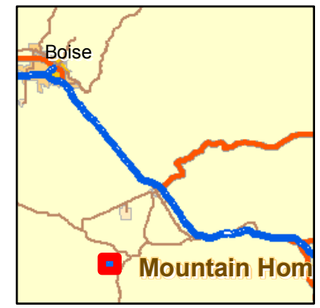
OFFICE	DRAWN BY		DRAWING NUMBER
CEN	K.Masterson	07/02/07	Bruneau_014_fig3_SiteLayoutTopo_SSWR



Legend

- Bruneau PBR No. 2 FUDS Boundary
- Bombing Range Area of Concern
- Irrigation Well
- Domestic Well
- Domestic-Single Residence Well

NOTES:
1) AOC boundy was derived from the Bruneau PBR ASR Supplement.
2) Groundwater well data were obtained from Idaho Dept. of Water Resources (http://www.idwr.idaho.gov/gisdata/new%20data%20download/wells.htm).
3) This property is located within the C. J. Strike Reservoir Watershed.
4) USGS topographic map was obtained from the U.S. Department of Agriculture, Service Center Agencies and is dated 2002.



0 1,000 2,000 4,000 Feet

REFERENCE/PROJECTION: State Plane NAD 83 UTM Zone 11N

U.S. ARMY CORPS OF ENGINEERS
OMAHA DESIGN CENTER

FIGURE 5

SITE LAYOUT TOPOGRAPHIC MAP AND WELL LOCATIONS

BRUNEAU PBR NO. 2

Shaw® Shaw Environmental, Inc.

TABLES

Table 1
Munitions Information

Ordnance	Description	Filler	Munitions Constituents
100-lb GP Bomb (AN-M30)	The old-series GP bomb was a relatively thin-cased bomb with parallel sidewalls, and a tapered aft section. Both nose and tail fuzes were used for a majority of operations.	Approximately 50 percent of the complete weight of the round consists of explosives.	TNT, 50/50 Amatol and TNT, Amatol (ammonium nitrate and TNT mixture), Tritonal (TNT and aluminum powder mixture). Composition B (59.5% RDX, 39.5 TNT, and 1% wax)
100-lb Practice Bomb (M38A2)	Light sheet metal (approximately 22 gauge), with sand and spotting charge.	Sand.	Metals from steel.
Spotting Charge, (M1A1)	Large can, 11.18 inches long by 3.43 inches diameter; 28-gauge blank shotgun shell primer.	3 lbs black powder (produced flame & white smoke).	Black powder (potassium nitrate, sulfur, charcoal), Anthracene, Hexachlorethane, Perchlorate
Bomb Tail Fuze, (AN-M100 Series)	Located in tail section of GP bomb. Initiation of the igniters and fuzes results from impact or impact inertia requiring a force to cause the firing pin to strike a primer/detonator.		Minute quantities of perchlorate, lead azide, lead thiocyanate, lead styphnate, mercury-fulminate, black powder, lead chromate, silicon, barium, manganese, sulfur, red lead oxide.
Bomb Nose Fuze (AN-M103A1)	Located in nose section of GP bomb. Initiation of the igniters and fuzes results from impact or impact inertia requiring a force to cause the firing pin to strike a primer/detonator.		
Small Arms (.50-caliber)	Lead or steel core with metal jacket	Single- or double-based powder, tracer composition.	Nitrocellulose, nitroglycerin; Lead, copper, antimony, zinc; Perchlorate (in .50-caliber tracer rounds).

Table 2
Rights of Entry Status

Land Owner	Parcel ID	Date ROE Prepared	Date Signed by Land Owner	Well Access Needed	Estimated Date to Contact Prior to Field Work
WARD, SAMUEL & MARINA	RP07S04E022400A				
MERRICK, AUSTIN & ASHLEY	RP07S04E025580A				
MERRICK, C A	RP07S04E024810A				
WARD, SAMUEL & MARINA	RP07S04E030002A				
MERRICK, C A	RP07S04E030600A				
YOUNG, GRANT & LAYCE	RP07S04E031900A				
ALLEN, HUBERT D & MARY B	RP08S04E034800A				
HEGERHORST, MARK W & MARLA F	RP07S04E100001A				
HEGERHORST, GRANT W & CATHLEEN	RP07S04E103000A				
MASTRE, BOB	RP06S04E343600A				
MERRICK, C A	RP06S04E348400A				
WARD, OPAL	RP06S04E341800A				
THOMAS, JAY D	RP06S04E350001A				
THOMAS, THOMAS W	RP06S04E351200A				
WARD, OPAL	RP06S04E354801A				
MASTRE, WILBUR C & BARBARA J LIVING TRUST	RP06S04E357200A				
WARD, SAMUEL & MARINA	RP06S04E358400A				
WARD, SAMUEL & MARINA	RP06S04E358800A				
MASTRE, BOB	RP07S04E040001A				
MASTRE, BOB	RP07S04E042250A				
MASTRE, WILBUR C & BARBARA J LIVING TRUST	RP07S04E020600A				
BRENT C. & RACHEL MASTRE	RP07S04E020004A				
BRADLEY M. & CONNIE J. MASTRE	RP07S04E020003A				
WILBUR C & BARBARA J. MASTRE LIVING TRUST	RP07S04E020002A				
CAL WORTHINGTON TRUST	RP07S04E028400A				

Table 3
Sample Location Rationale

AOC	Sample Location	Sample Media	Sample Location Rationale
Precision Bombing Range	066A001	Surface Soil	Surface soil samples from the target center of the bombing range target to assess possible contamination in surface soil. Sample will be obtained within 500 ft of the target center. Sampling locations to be determined in the field based on the presence of MEC, MD, stained soils, stressed vegetation, craters, or other indicators of potentially impacted soils.
	066A002	Surface Soil	
	066A003	Surface Soil	
	066A004	Surface Soil	
	066A005	Surface Soil	
	066A006	Surface Soil	
	066A007	Surface Soil	Four surface soils samples soil samples will be obtained at a distance of between 500 ft and 1,000 ft from the bombing target center to assess possible contamination in surface soil. Sampling locations to be determined in the field based on the presence of MEC, MD, stained soils, stressed vegetation, craters, or other indicators of potentially impacted soils.
	066A008	Surface Soil	
	066A009	Surface Soil	
	066A010	Surface Soil	
	066A011	Surface Soil	Four surface soils samples soil samples will be obtained at a distance of between 1,000 ft and 3,000 ft from the bombing target center to assess possible contamination in surface soil. Sampling locations to be determined in the field based on the presence of MEC, MD, stained soils, stressed vegetation, craters, or other indicators of potentially impacted soils.
	066A012	Surface Soil	
	066A013	Surface Soil	
	066A014	Surface Soil	
	066A015	Surface Soil	Two soil samples will be reserved for the collected of soils at special locations including; within 200 ft of residences, homes, schools, or day care centers; craters; or unusual soil staining. These samples will assess possible contamination in surface soil All four soil samples will be collected.
	066A016	Surface Soil	
	066A017	Sediment	Two sediment samples from Halfway Gulch to assess possible contamination of surface water from runoff associated with surface soil at the range. One upgradient and one downgradient sample will be collected. The exact sample locations to be determined in field to account for realignment of Halfway Gulch around farm fields
	066A018	Sediment	
	066A019	Groundwater	Two groundwater samples obtained from domestic water supply wells to asses site impact on groundwater. One sample well will be located within the AOC. The other well will be located upgradient of the AOC (south of range) to represent background conditions.
	066A020	Groundwater	
	066A021	Surface Soil	Background surface soil samples collected from undisturbed areas. BLM lands to the west of the AOC are the referred location for background samples.
	066A022	Surface Soil	

Table 4
Sample Designations, QA/QC, and Analyses

AOC	Sample Location	Sample Type	Sample Number	Sample Media	QA/QC Samples		Analysis / EPA Method
					Field Duplicate	MS/MSD	
Precision Bombing Range	066A001	Composite	NWO-066-0001	Soil		NWO-066-0001MS/MSD	Antimony, copper, lead, and zinc by SW-846 6020A Explosives by SW-846 8330A (including nitroglycerine)
	066A002	Composite	NWO-066-0002	Soil			
	066A003	Composite	NWO-066-0003	Soil			
	066A004	Composite	NWO-066-0004	Soil			
	066A005	Composite	NWO-066-0005	Soil			
	066A006	Composite	NWO-066-0006	Soil			
	066A007	Composite	NWO-066-0007	Soil			
	066A008	Composite	NWO-066-0008	Soil			
	066A009	Composite	NWO-066-0009	Soil	NWO-066-0017		
	066A010	Composite	NWO-066-0010	Soil			
	066A011	Composite	NWO-066-0011	Soil			
	066A012	Composite	NWO-066-0012	Soil			
	066A013	Composite	NWO-066-0013	Soil			
	066A014	Composite	NWO-066-0014	Soil			
	066A015	Composite	NWO-066-0015	Soil			
	066A016	Composite	NWO-066-0016	Soil	NWO-066-0018		
	066A017	Composite	NWO-066-1001	Sediment			
	066A018	Composite	NWO-066-1002	Sediment			
	066A019	Grab	NWO-066-3001	Groundwater	NWO-066-3003		Antimony, copper, lead, and zinc by SW-846 6020A Explosives by SW-846 8330A (including nitroglycerine) Perchlorate by SW-846 6850
	066A020	Grab	NWO-066-3002	Groundwater		NWO-066-3002MS/MSD	
Background	066A021	Composite	NWO-066-5001	Background Soil		NWO-066-5001MS/MSD	Antimony, copper, lead, and zinc by SW-846 6020A Explosives by SW-846 8330A (including nitroglycerine)
	066A022	Composite	NWO-066-5002	Background Soil			Antimony, copper, lead, and zinc by SW-846 6020A

Table 5
Human Health Screening Criteria for Soil/Sediment and Laboratory PQLs

Analyte	Abbreviation	PQL[a] Method 8330A, 6020A (mg/kg)	Region 9 Human Health Screening Values				Idaho IDTL for Soil[d] (mg/kg)	Selected Screening Value (mg/kg)
			Residential PRG[b] (mg/kg)	Industrial PRG[b] (mg/kg)	SSLs[c] DAF=1 (mg/kg)	SSLs[c] DAF=20 (mg/kg)		
Hexahydro-1,3,5-trinitro-1,3,5-triazine	RDX	0.080	4.4	16				4.4
Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	HMX	0.080	3,100	31,000				3,100
2,4,6-Trinitrotoluene	2,4,6-TNT	0.040	16	57			0.0134	0.0134
1,3,5-Trinitrobenzene	1,3,5-TNB	0.040	1,800	18,000				1,800
1,3-Dinitrobenzene	1,3-DNB	0.040	6.1	62				6.1
2,4-Dinitrotoluene	2,4-DNT	0.040	0.72[e]	2.5[e]	0.00004	0.0008	0.00029	0.00029
2,6-Dinitrotoluene	2,6-DNT	0.040	0.72[e]	2.5[e]	0.00004	0.0008	0.00021	0.00021
2-Amino-4,6-dinitrotoluene	2-Am-DNT	0.040	12	120				12
2-Nitrotoluene	2-NT	0.080	0.88	2.2				0.88
3-Nitrotoluene	3-NT	0.080	730	1,000				730
4-Amino-2,6-dinitrotoluene	4-Am-DNT	0.040	12	120				12
4-Nitrotoluene	4-NT	0.080	12	30				12
Nitrobenzene	NB	0.040	20	100	0.007	0.1	0.0218	0.0218
Nitroglycerin	NG	4.0	35	120				35
Methyl-2,4,6-trinitrophenylnitramine	Tetryl	0.080	610	6,200				610
Antimony	Sb	1.0	31	410	0.30	5	4.77	4.77
Copper	Cu	2.0	3,100	41,000			921	921
Lead	Pb	2.0	400	800			49.6	49.6
Zinc	Zn	10.0	23,000	100,000	620	12,000	886	886

DAF = Dilution Attenuation Factor
PRG = Preliminary Remediation Goal
PQL = Practical Quantitation Limit
SSL = Soil Screening Level
IDTL = Initial Default Target Level

mg/kg = milligrams per kilogram.
mg/L = milligrams per liter.

[a] If laboratory cannot meet any of the preferred QLs with routine SW 846 methodology (as supported by MDLs that are no greater than 1/3 QL), laboratory's QL must be identified in laboratory submittal as failing to meet the QL. Some screening values cannot be obtained with routine methodology to the QL. In those cases, the QL achievable with a routine SW 846 methodology would be accepted.

[b] PRGs from Region 9 PRG Table dated October 2004 and addendum dated 28 December 2004, based on single chemical.

[c] SSLs from Region 9 PRG Table dated October 2004 and revision note dated 28 December 2004.

[d] Idaho Initial Default Target Levels for Soil from *Idaho Risk Evaluation Manual* , Appendix A, dated July 2004, based on single chemical. In addition, values are based on groundwater protection via soils leaching to groundwater unless otherwise noted.

[e] Carconogenic DNT mixture values used if more conservative than noncarcinogenic isomer-specific values.

Table 6
Human Health Screening Criteria for Groundwater and Laboratory PQLs and MDLs

	Abbreviation	PQL Method 8330A, 6020A, 6850 (ug/kg)	MDL Method 8330A (ug/L)	Region 9 Tap Water PRG[b] (µg/L)	Federal Drinking Water Criteria MCLs[c] (µg/L)	Idaho IDTL for Groundwater[d] (µg/L)	Selected Screening Value (µg/L)
Hexahydro-1,3,5-trinitro-1,3,5-triazine	RDX	0.40	0.080	0.61			0.61
Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	HMX	0.40	0.021	1,800			1,800
2,4,6-Trinitrotoluene	2,4,6-TNT	0.20	0.050	2.2		1.86[f]	1.86[f]
1,3,5-Trinitrobenzene	1,3,5-TNB	0.20	0.042	1,100			1,100
1,3-Dinitrobenzene	1,3-DNB	0.20	0.028	3.6			3.6
2,4-Dinitrotoluene	2,4-DNT	0.20	0.022	0.099[e]		0.0822[f]	0.0822[f]
2,6-Dinitrotoluene	2,6-DNT	0.20	0.040	0.099[e]		0.0822[f]	0.0822[f]
2-Amino-4,6-dinitrotoluene	2-Am-DNT	0.20	0.044	7.3			7.3
2-Nitrotoluene	2-NT	0.40	0.076	0.049			0.049
3-Nitrotoluene	3-NT	0.40	0.110	120			120
4-Amino-2,6-dinitrotoluene	4-Am-DNT	0.20	0.034	7.3			7.3
4-Nitrotoluene	4-NT	0.40	0.079	0.66			0.66
Nitrobenzene	NB	0.20	0.017	3.4		5.21[f]	5.21[f]
Nitroglycerin	NG	20.0	0.2	4.8			4.8
Methyl-2,4,6-trinitrophenylnitramine	Tetryl	0.40	0.035	360			360
Perchlorate	CLO4	0.200	0.0612	3.6			24[h]
Antimony	Sb	1.0	0.13	15	6	6	6
Copper	Cu	2.0	0.43	1,500	1,000[g]		1,000[g]
Lead	Pb	2.0	0.18		15[i]	15	15
Zinc	Zn	10.0	1.80	11,000	5,000[g]	3,130[f]	3,130[f]

MCL = Maximum Contaminant Level

PRG = Preliminary Remediation Goal

PQL = Practical Quantitation Limit

µg/L = micrograms per liter

IDTL = Initial Default Target Level

SW 846 methodology (as supported by MDLs
that are no greater than 1/3 QL), laboratory's QL
must be identified in laboratory submittal as

[b] Region 9 PRG Table dated October 2004 and revision note dated 28 December 2004, based on single chemical.

[c] Primary MCL from the 2004 Edition of the Drinking Water Standards and Health Advisories, dated Winter 2004, is listed unless otherwise indicated.

[d] Idaho Initial Default Target Levels for Groundwater from Idaho Risk Evaluation Manual, Appendix A, dated July 2004, based on a single chemical. Values are based on MCLs unless otherwise noted.

[e] Carcinogenic DNT mixture values used if more conservative than noncarcinogenic isomer-specific values.

[f] IDTL is risk-based.

[g] Secondary MCL from the 2004 Edition of the Drinking Water Standards and Health Advisories, dated Winter 2004.

[h] Perchlorate value from DoD policy, June 26, 2006.

[i] Action level from the 2004 Edition of the Drinking Water Standards and Health Advisories, dated Winter 2004.

Table 7
Ecological Risk-Based Screening Levels for Soil and Laboratory PQLs

		SSLs (EPA, 2005)[a]	ODEQ Level II Screening Level [b]	Proposed Benchmarks									Final Ecological Screening Value Soil [j]
	PQL Method 8330A, 6020A (mg/kg)	Lowest Value for Plants/Invertebrates, Mammals and Birds (mg/kg)	(mg/kg)	Region 5 ESLs [c] (2003) (mg/kg)	Region 7 [d] (mg/kg)		Region 8 [e] (mg/kg)		Region 10 [f] (mg/kg)		Other Values: Talmage et al. (1999) [g] or LANL (2005) [h] (mg/kg)		(mg/kg)
Metals/Inorganics													
Antimony	1.0	0.27	5	0.142	0.27	SSL	0.27	SSL	0.27	SSL	0.05	LANL	5
Copper	2.0		50	5.4	60	ORNL	190	Dutch	60	ORNL	10	LANL	50
Lead	2.0	11	16	0.0537	11	SSL	11	SSL	11	SSL	14	LANL	11
Zinc	10.0		50	6.62	8.5	ORNL	8.5	ORNL	8.5	ORNL	10	LANL	50
Explosive													
2,4-Dinitrotoluene	0.040		NVA	1.28	1.28	EPA-R4	NVA		1.28	EPA-R4	0.52	LANL	0.52
2,6-Dinitrotoluene	0.040		NVA	0.0328	0.0328	EPA-R4	NVA		0.0328	EPA-R4	0.37	LANL	0.37
2-Amino-4,6-Dinitrotoluene	0.040		NVA	NVA	NVA		NVA		NVA		2.1	LANL	2.1
4-Amino-2,6-Dinitrotoluene	0.040		NVA	NVA	NVA		NVA		NVA		0.73	LANL	0.73
1,3-Dinitrobenzene	0.040		NVA	0.655	0.655	EPA-R4	NVA		0.655	EPA-R4	0.073	LANL	0.073
HMX	0.080		NVA	NVA	NVA		NVA		NVA		27	LANL	27
Nitrobenzene	0.040		8	1.31	1.31	EPA-R4	NVA		1.31	EPA-R4	2.2	LANL	8
RDX	0.080		NVA	NVA	NVA		NVA		NVA		7.5	LANL	7.5
1,3,5-Trinitrobenzene	0.040		NVA	0.376	0.376	EPA-R4	NVA		0.376	EPA-R4	6.6	LANL	6.6
2,4,6-Trinitrotoluene	0.040		NVA	NVA	NVA		NVA		NVA		6.4	LANL	6.4
2-Nitrotoluene	0.080		NVA	NVA	NVA		NVA		NVA		2.0	LANL	2.0
3-Nitrotoluene	0.080		NVA	NVA	NVA		NVA		NVA		2.4	LANL	2.4
4-Nitrotoluene	0.080		NVA	NVA	NVA		NVA		NVA		4.4	LANL	4.4
Nitroglycerin	4.0		NVA	NVA	NVA		NVA		NVA		71	LANL	71
Tetryl	0.080		NVA	NVA	NVA		NVA		NVA		0.99	LANL	0.99

Note: No Idaho Ecological Screening Values available.
PRG = Preliminary Remediation Goal
NVA: No value available

[a] U.S. Environmental Protection Agency (EPA), 2005, *Guidance for Developing Ecological Soil Screening Levels (Eco-SSLs)* , Office of Solid Waste and Emergency Response, Website version last updated March 15, 2005: http://www.epa.gov/ecotox/ecossl.

[b] Oregon Department of Environmental Quality Screening Level Values (December 2001).

[c] Ecological Screening Levels (ESLs), EPA Region V, August 2003.

[d] EPA Region 7: Catherine Wooster-Brown (Eco Risk Assessor) recommends the following hierarchy: EPA EcoSSLs; ORNL Effroymson values; EPA Region 4 values; other published values.

[e] EPA Region 8: Dale Hoff (Eco Risk Assessor) recommends the following hierarchy: EPA SSLs; Dutch Intervention Values or ORNL Effroymson values.

[f] EPA Region 10: Joseph Goulet (Eco Risk Assessor) says Region 10 has no recommended hierarchy, therefore, values from the EPA Region 7 Approach were used.

[g] Talmage, S.S., D.M. Opresko, C.J. Maxwell, C.J.E. Welsh, F.M. Cretella, P.H. Reno, and F.B. Daniel, 1999, Nitroaromatic Munition Compounds: Environmental Effects and Screening Values, **Rev. Environ. Contam. Toxicol.**

[h] Los Alamos National Laboratory (LANL), Eco Risk Database, Release 2.2, September 2005.

[i] Potential bioaccumulative constituents will be evaluated in more detail, as some screening values do not take into account bioaccumulation.

Table 7
Ecological Risk-Based Screening Levels for Soil and Laboratory PQLs

Potential bioaccumulative potential from: B*ioaccumulation and Interpretation for the Purposes of Sediment Quality Assessment: Status and Needs* (EPA, 2000) and ODEQ EQSLVs (ODEQ, 2001).

[j] Final Screening Value selected using the following hierarchy (Jeff Fromm, Idaho Dept of Environmental Quality, pers comm 2/27/2007):
1. SSL Values Developed by EPA (2005)
2. Oregon (2001) Values
3. Lower of LANL or ORNL Values
4. Other Available Values

EPA-R4=EPA Region 4
LANL= Los Alamos National Laboratory
SSL=EPA Eco Soil Screening Levels
Dutch=Dutch Intervention Values
ORNL= Oak Ridge National Laboratory Ecological PRGs (Efroymson et al)

Other References:

Efroymson, R.A., Suter II, G.W., Sample, B.E. and Jones, D.S., 1997. Preliminary Remediation Goals for Ecological Endpoints. Lockheed Martin Energy Systems, Inc. (ORNL) ES/ER/TM-162/R2.

Dutch Intervention Values:

Swartjes, F.A. 1999. R*isk-based Assessment of Soil and Groundwater Quality in the Netherlands: Standards and Remediation Urgency* . Risk Analysis 19(6): 1235-1249

The Netherlands Ministry of Housing, Spatial Planning and Environment's Circular on target values and intervention values for soil remediation http://www2.minvrom.nl/Docs/internationaal/S_I2000.pdf and Annex A: Target Values, Soil Remediation Intervention Values and Indicative Levels for Serious Contamination http://www2.minvrom.nl/Docs/internationaal/annexS_I2000.pdf were also consulted.

Table 8
Ecological Risk-Based Screening Levels for Sediment and Laboratory PQLs

Parameter	PQL Method 8330A, 6020A (mg/kg)	ODEQ Screening Level Values [a] (mg/kg) Freshwater	Region 5 Ecological Screening Levels [b] (mg/kg)	EPA Region 7 [c] (mg/kg)		EPA Region 8 [d] (mg/kg)		EPA Region 10 [e] (mg/kg)		Other Ecological Screening Levels [f] (mg/kg)		Final Ecological Screening Value Sediment [h] (mg/kg)
Metals/Inorganics												
Antimony	1.0	3.00E+00	NVA	NVA		NVA		NVA		3.60E-01	LANL	3.00E+00
Copper	2.0	1.00E+01	3.16E+01	3.16E+01	MAC	3.16E+01	MAC	3.16E+01	MAC	1.70E+01	LANL	1.00E+01
Lead	2.0	3.50E+01	3.58E+01	3.58E+01	MAC	3.58E+01	MAC	3.58E+01	MAC	2.70E+01	LANL	3.50E+01
Zinc	10.0	3.00E+00	1.21E+02	1.21E+02	MAC	1.21E+02	MAC	1.21E+02	MAC	3.70E+01	LANL	3.00E+00
Explosives												
RDX	0.080	NVA	NVA	NVA		NVA		NVA		1.30E-01	TAL	1.30E-01
HMX	0.080	NVA	NVA	NVA		NVA		NVA		4.70E-02	TAL	4.70E-02
1,3,5-Trinitrobenzene	0.040	NVA	NVA	NVA		NVA		NVA		2.40E-02	TAL	2.40E-02
1,3-Dinitrobenzene	0.040	NVA	8.61E-03	NVA		NVA		NVA		6.70E-02	TAL	6.70E-02
2,4-Dinitrotoluene	0.040	NVA	1.44E-03	NVA		NVA		NVA		2.90E-01	LANL	2.90E-01
2,6-Dinitrotoluene	0.040	NVA	3.98E-03	NVA		NVA		NVA		1.90E+00	LANL	1.90E+00
2,4,6-TNT	0.040	NVA	NVA	NVA		NVA		NVA		9.20E-01	TAL	9.20E-01
2-Amino-4,6,-Dintrotoluene	0.040	NVA	NVA	NVA		NVA		NVA		7.00E+00	LANL	7.00E+00
4-Amino-2,6,-Dintrotoluene	0.040	NVA	NVA	NVA		NVA		NVA		1.90E+00	LANL	1.90E+00
2-Nitrotoluene	0.080	NVA	NVA	NVA		NVA		NVA		5.60E+00	LANL	5.60E+00
3-Nitrotoluene	0.080	NVA	NVA	NVA		NVA		NVA		4.90E+00	LANL	4.90E+00
4-Nitrotoluene	0.080	NVA	NVA	NVA		NVA		NVA		1.00E+01	LANL	1.00E+01
Nitrobenzene	0.040	NVA	1.45E-01	NVA		NVA		NVA		3.20E+01	LANL	3.20E+01
Nitroglycerin	4.0	NVA	NVA	NVA		NVA		NVA		1.70E+03	LANL	1.70E+03
Tetryl	0.080	NVA	NVA	NVA		NVA		NVA		1.00E+02	LANL	1.00E+02

Note: No Idaho Ecological Screening Values available.
NVA = No Value Available
PQL = Practical Quantitation Limit

[a] Oregon Department of Environmental Quality Screening Level Values (December 2001).

[b] Ecological Screening Levels (ESLs), U.S.EPA Region V, August 2003.

[c] EPA Region 7: Catherine Wooster-Brown (Eco Risk Assessor) recommends the following hierarchy: MacDonald Consensus Values (MacDonald, 2000); ORNL Effroymson values (ORNL, 1977).

[d] EPA Region 8: Dale Hoff (Eco Risk Assessor) recommends the following hierarchy: MacDonald Consensus Values (MacDonald, 2000); Canadian ISQG values (CCME, 2003) or ORNL Effroymson values (ORNL, 1977).

[e] EPA Region 10: Joseph Goulet (Eco Risk Assessor) says Region 10 has no recommended hierarchy, therefore, values from the EPA Region 7 Approach were used.

[f] Talmage, S.S., D.M. Opresko, C.J. Maxwell, C.J.E. Welsh, F.M. Cretella, P.H. Reno, and F.B. Daniel (TAL), 1999, *Nitroaromatic Munition Compounds: Environmental Effects and Screening Values*, Rev. Environ. Contam. Toxicol. or Los Alamos National Laboratory (LANL), Eco Risk Database, Release 2.2, September 2005.

[g] Potential bioaccumulative constituents will be evaluated in more detail, as some screening values do not take into account bioaccumulation.

Potential bioaccumulative potential from: B*ioaccumulation and Interpretation for the Purposes of Sediment Quality Assessment: Status and Needs* (EPA, 2000) and ODEQ EQSLVs (ODEQ, 2001).

[h] Final Screening Value selected using the following hierarchy:
1. No Idaho Values Available; Values Developed by Oregon Recommended (Bruce Wicherski, Idaho Dept of Environmental Quality, pers comm 2/23/2007)
2. EPA Region State Located In (EPA Region 10)
3. Lower of Talmage et al. [TAL] (1999) or LANL (2005) values.

Note: The Talmage [TAL] screening values assume 10% organic carbon in the sediment.

MAC=MacDonald Consensus Values
LANL=Los Alamos National Laboratory
TAL=Talmage et al (1999)

Other References:

Efroymson, R.A., et al., 1997, P*reliminary Remediation Goals* (EPRGs), ORNL, ES/ER/TM-162/R2,
Canadian Interim Sediment Quality Guidelines (ISQGs) Summary Table, CCME, December 2003.
MacDonald, D.D, C.G. Ingersoll and T.A. Berger, 2000, *Development and Evaluation of Consensus-Based Sediment Quality Criteria for Freshwater Ecosystems*, Archives of Environmental Contamination and Toxicology 39:20-31.

APPENDIX A

CONCEPTUAL SITE MODEL

Conceptual Site Model – Bombing Range AOC

Overview

A site-specific CSM summarizes available site information and identifies relationships between exposure pathways and associated receptors. A CSM is used to determine the data types necessary to describe site conditions and quantify receptor exposure, and discusses the following information:

- Current site conditions and future land use;
- Potential contaminant sources (e.g., lead projectiles in an impact berm);
- Affected media;
- Governing fate and transport processes (e.g., surface water runoff and/or groundwater migration);
- Exposure media (i.e., media through which receptors could contact site-related contamination);
- Routes of exposure (e.g., inhalation, incidental ingestion, and dermal contact); and
- Potential human and/or representative ecological receptors at the exposure point. Receptors likely to be exposed to site contaminants are identified based on current and expected future land uses.

The CSM is evaluated for completeness and further developed as needed through TPP meetings and additional investigation. A graphic representation of a typical precision bombing range CSM is shown on Figure 4.

Background

History of Use

The former Bruneau PBR No. 2 was used as a precision bombing range from September 1943 to November 1955. The land was relinquished to the BLM in November 1955. The BLM has since conveyed most of the usable land to private owners through the Desert Land Act. The land has been and is currently used for agriculture and cattle grazing.

Ordnance	Description	Filler	Munitions Constituents
100-lb GP Bomb (AN-M30)	The old-series GP bomb was a relatively thin-cased bomb with parallel sidewalls, and a tapered aft section. Both nose and tail fuzes were used for a majority of operations.	Approximately 50 percent of the complete weight of the round consists of explosives.	TNT, 50/50 Amatol and TNT, Amatol (ammonium nitrate and TNT mixture), Tritonal (TNT and aluminum powder mixture). Composition B (59.5% RDX, 39.5 TNT, and 1% wax)
100-lb Practice Bomb (M38A2)	Light sheet metal (approximately 22 gauge), with sand and spotting charge.	Sand.	Metals from steel.
Spotting Charge, (M1A1)	Large can, 11.18 inches long by 3.43 inches diameter; 28-gauge blank shotgun shell primer.	3 lbs black powder (produced flame & white smoke).	Black powder (potassium nitrate, sulfur, charcoal), Anthracene, Hexachlorethane, Perchlorate
Bomb Tail Fuze, (AN-M100 Series)	Located in tail section of GP bomb. Initiation of the igniters and fuzes results from impact or impact inertia requiring a force to cause the firing pin to strike a primer/detonator.		Minute quantities of perchlorate, lead azide, lead thiocyanate, lead styphnate, mercury-fulminate, black powder, lead chromate, silicon, barium, manganese, sulfur, red lead oxide.
Bomb Nose Fuze (AN-M103A1)	Located in nose section of GP bomb. Initiation of the igniters and fuzes results from impact or impact inertia requiring a force to cause the firing pin to strike a primer/detonator.		
Small Arms (.50-caliber)	Lead or steel core with metal jacket	Single- or double-based powder, tracer composition.	Nitrocellulose, nitroglycerin; Lead, copper, antimony, zinc; Perchlorate (in .50-caliber tracer rounds).

Previous MEC Finds

- Spotting charges (removed)
- Live .50-caliber munitions

Previous MC Sample Results

- No sampling for MC has been conducted at the range

Current and Future Land Use

- The land currently comprising the former Bruneau PBR No. 2 is used for agricultural purposes, specifically livestock grazing and grain production.
- At least one homestead exists on a small portion of the range
- Use of the range for agricultural purposes and homesteading will likely continue into the foreseeable future.
- Barbed wire fencing controls livestock but does not prohibit human movement

Ecological Receptors

- Mammals and birds.

MEC Evaluation

- Potential MEC within the bombing range consists of:
  - Practice bombs with spotting charges (spotting charges not associated with sensitive fuzes);
  - GP bombs with high explosives (HE) (explosives not burned or detonated from impact); and
  - Small arms (.50-caliber) munitions.
- Small arms ammunition presents a very low risk because small arms rarely contain explosive projectiles and a deliberate effort must be applied (using tool resembling a firing pin) to a very specific and small point (the primer) to make the round function.
- The M38A2 100-lb practice bomb poses a low risk attributed to the attached spotting charge. The M38A2 100-lb practice bomb is 47.5 inches long and is designed to simulate a GP bomb of the same size (Figure 4). The spotting charge was designed to detonate on impact to mark the location of the practice bomb on the target range. Spotting charges used with the M38A2 100-lb practice bomb consisted of either the M1A1 or M3. The spotting charge produces a flash of flame and smoke for observation of bombing accuracy.
- Intact spotting charges, either the M1A1 or M3, are unlikely to be found. The force of impact with the ground and subsequent rusting of the charge and igniter would likely render the spotting charge inoperable. Spotting charges observed on other recently investigated PBRs were deformed to a degree from impact. The igniters were often bent or broken off of the spotting charge. Rust was visible on all surfaces of the spotting charges. For the spotting charge to function it would

have had to remain sealed through time and its container not have rusted through or been damaged by impact with the ground.

- Tampering with an intact spotting charge that contains unaltered black powder could result in bodily harm. Hammering or attempts to disassemble the black-powder filled canister may result in explosion resulting from shock or friction. An exploding spotting charge could cause burns, injury (possibly severe), and/or blinding.
- Evidence (craters) exists for the use of GP bombs containing HE on the bombing range. Range clearance reports do not state finding evidence of GP bombs. There is no record of ordnance clearance, decontamination, or dedudding of the range for GP bombs. Therefore, unexploded 100-lb HE bombs may be present below the surface of the cultivated and uncultivated areas of range area. Unexploded ordnance, if present, may migrate toward land surface through repeated frost cycles or agricultural activities.
- The initiation of the igniters and fuzes associated with the GP bombs is by impact or impact inertia requiring a force to cause the firing pin to strike a primer/detonator. The bomb fuzes can have a delay functioning.
- The GP bomb fuze may be caused to function by being tampered with, or being struck with farming equipment, causing the HE demolition bomb to detonate causing death, severe injury, blinding, and/or severe property damage.
- It is noted that the site is used for agricultural activities, and that no incidents with MEC have been recorded in over 60 years since the range was used.

MC Pathway Evaluation

Terrestrial Pathway

Sources of MC

- MC is derived from the use of practice bombs with spotting charges, GP practice bombs with HE, and small caliber ammunition as detailed in Section 4.2.2.
- Approximately 99 percent of the MC would have been initially deposited within 3,000 ft. of the target center.
- The bombing range has not previously been sampled or analyzed for MC.

Migration Pathway

- Soil is the primary medium of concern because possible MC were initially introduced to the soil. The soil also serves as a secondary source of potential air, surface water, or groundwater contamination.
- Explosive compounds may have degraded over time.
- Agricultural activities may have contributed to the migration of MC:
  - Soil mixing, and
  - Irrigation and fertilization of land may promote degradation and dispersion of MC.

- Wind and rain may have dispersed MC.

Land use and access

- Agriculture and livestock grazing are the current and expected future land uses for the AOC. A small portion of the land is expected to be used for homesteads.

Human Receptors

- The potential routes of human exposure to contaminated soil are dermal contact, ingestion, and inhalation of soil particulates during intrusive work.
- Potential receptors include ranch workers, agricultural workers, landowners, hunters, and trespassers.
- Terrestrial pathway is complete for human exposure if there is a source of MC.

Ecological Assessment

- The Bruneau PBR No. 2 is not considered an important ecological place or sensitive environment (Table 1).
- The IDFG Conservation Data Center indicates three species may occur within one mile of the range. There are no known federally listed threatened or endangered species within the range area. The status of species in the area of Bruneau PBR No. 2 is shown in the table below.

Class	Status	Common Name	Scientific Name
State	Protected – Non-Game Species	Ferruginous Hawk	*Buteo regalis*
State	Unprotected Non-Game Species	Woodhouse's toad	*Bufo woodhousii*
State	Species of Concern	Groundsnake	*Sonora semiannulata*

- The potential routes of pets, livestock, and wildlife exposure to contaminated soil are dermal contact, ingestion, and inhalation.
- Potential receptors include livestock and wildlife
- Terrestrial pathway is complete for ecological exposure to MC.

Surface Water/Sediment Pathway

Sources of MC

- MC impacted soils on the Bruneau PBR No. 2 could migrate to Halfway Gulch. This ephemeral stream begins as two branches to the west of the range. These braches flow eastward around the north and south boundary of the target range and merge into a single ephemeral stream to the east of the range.
- Local ditches along roads and fields are assumed to drain to Halfway Gulch.

- Sampling and analysis of surface water or sediment samples from Halfway Gulch has not been conducted.

Migration Pathway

- Migration would occur during storm events intense enough to cause surface runoff to Halfway Gulch.
- The area averages 8.4 inches of precipitation per year. As a result, surface runoff and flow within Halfway Gulch rarely occurs.
- Runoff from the Halfway Gulch flows easterly into Little Valley Creek, which discharges to C J Strike Reservoir approximately 10 miles downstream. This reservoir is located on the Bruneau River.
- Explosive compounds may have degraded over time.

Surface water use and access

- Surface water within the area of Bruneau is not used because it is ephemeral. Agricultural activities and domiciles utilize groundwater within the area. Manmade surface water bodes (i.e. ponds) are filled with groundwater from wells to water cattle.

Human Receptors

- The potential routes of human exposure to contaminated surface water and sediment include dermal contact, ingestion, and inhalation. Actual exposure to surface water would rarely occur because the environment is so dry that that surface water is ephemeral in nature. Sediment exposure would be similar to exposure to surface soils.
- Potential human receptors include ranch workers, agricultural workers, landowners, hunters, and trespassers.
- The surface water exposure pathway is incomplete for human exposure to MC because of the environment is so dry that surface water is ephemeral in nature.

Ecological Assessment

- The potential routes of livestock and wildlife (including aquatic organisms) exposure to contaminated surface water and sediment include dermal contact, ingestion, and inhalation. Primary exposure is assumed to be sediment and not surface water because of the environment is so dry that surface water is ephemeral in nature.
- Potential receptors include livestock and wildlife (including aquatic organisms).
- Surface water pathway is incomplete for ecological exposure to MC because the environment is so dry that surface water is ephemeral in nature.
- The sediment exposure pathway is complete for livestock and wildlife (including aquatic organisms).

Groundwater Pathway

Sources of MC

- Impacted soils on the Bruneau PBR No. 2 are the primary source of MC, and sediments are a secondary source of MC.
- Groundwater within the area has not been sampled for MC constituents.

Migration Pathway

- There is possibility that MC have migrated to groundwater because irrigation of the current range may promote transport of MC to deeper groundwater; however:
  - Metals and explosive compounds have generally low solubilities;
  - Depth to artesian groundwater within the area ranges from 28 to 127 ft bgs;
  - Surface soils are a mixture of sands, silts, and clays, and silts and clays readily inhibit the movement of metals and explosives; and
  - If present, perchlorate is readily mobile due to high solubility.
- Groundwater flows northerly within the area.

Groundwater use and access

- Groundwater within the area is used for domestic, agricultural, and livestock/ranching purposes.
- The Idaho Department of Water Resources identifies the presence of five domestic water wells within the boundary of the AOC and a total of six domestic wells within the property boundary of the FUDS.

Human Receptors

- Potential human receptors include ranch workers, agricultural workers, and landowners
- The potential routes of human exposure to contaminated water include dermal contact, ingestion, and inhalation.
- Human exposure to groundwater is considered complete primarily because domestic wells are present in the range AOC.

Air Pathway

Sources of MC

- Impacted soils are the primary source and sediments, the secondary source, of airborne MC on the Bruneau PBR No. 2.

Migration Pathway

- The MC are considered non-volatile. Exposure to airborne MC would be from MC impacted dust.
- Although agricultural activities such as planting and harvesting may create dust, actively promoting the growth of vegetation would limit overall dust production.

Human Receptors

- The potential routes of human exposure to MC contaminated dust are by dermal contact, ingestion, and inhalation.
- The air pathway is considered incomplete due to active vegetative growth on the range, and the non-volatility of the MC.
- The exposure to the air pathway is considered in the human health screening values.

CSM Summary/Data Gaps

Evaluation of the CSM indicates the following known conditions or data gaps.

Pathway	Presence of MEC	Presence of MC	Notes
Soil	Spotting charges found during site clearance; .50-caliber rounds reported by site owners; indirect evidence of GP bomb use (craters)	Unknown.	Two site clearances have been conducted. The area is currently used for agricultural purposes. Findings of MEC (besides small caliber) have not been reported by land owners
Sediment	Unknown	Unknown	No previous analytical work has been conducted.
Surface water	Unknown	Unknown	
Groundwater	Unknown	Unknown	
Air	NA	NA	Air not considered viable pathway

APPENDIX B

SITE SAFETY AND HEALTH PLAN ADDENDUM

ADDENDUM ID- 1 TO SITE SAFETY AND HEALTH PLAN (SSHP) **REVIEWS AND APPROVAL** US Army Corps of Engineers, Omaha District	This SSHP is a part of the Omaha District Safety Program. Please read and comply with USACE EM 385-1-1 and CENWO OM 385-1-1.	
Reviewer	**Date**	**Signatures**
Authored by: Pamela Moore	6/27/07	**Signature:** 
Peer Review by: Andrew Ellison	6/28/07	**Signature:** 
Quality Control Review (QCR) by: Paul Sadowski	7/2/07	**Signature:** 
Project Manager Reviewed by: Peter Kelsall	7/2/07	**Signature:** 
USACE Omaha District MM DC OE Safety Specialist Review: Andrew G. Marks		**Signature:**
USACE Omaha District MM DC Project Manager Approval: John Miller		**Signature:**

SITE SAFETY AND HEALTH PLAN ADDENDUM

Site Name:	Bruneau Precision Bombing Range (PBR) No. 2
Site Location:	The former Bruneau PBR No. 2 is located near Bruneau, ID, in Owyhee County. The area of concern is the bombing range.
Purpose of Visit:	Site Inspection to conduct site reconnaissance for munitions of explosive concern (MEC) and collect soil, sediment, and groundwater samples to evaluate the presence of explosives, metals, and perchlorate.
Date(s) of Site Visit:	October or November 2007

Office:	Shaw Environmental, Inc., Centennial, Colorado office
Address:	9201 E. Dry Creek Road Centennial, Colorado 80112
Telephone:	Commercial: (303) 741-7290

Date Prepared: June 14, 2007

Site inspection work at this FUDS will be conducted in accordance with the approved Accident Prevention Plan and Site Safety and Health Plan (SSHP) included in the "Final Type I Work Plan, Site Inspections at Multiple Sites, NWO Region" (Shaw, 2006). This Addendum provides details specific to activities at this FUDS that were not provided in the SSHP.

I. SITE DESCRIPTION AND PREVIOUS INVESTIGATIONS

(A site map is provided in the Site Specific Work Plan.)

A. SITE DESCRIPTION:

- Size: One Area of Concern (AOC) covering approximately 2,552 acres.
- Present Usage (Check all that apply)

☐ Military	☒ Recreational	☒ Agricultural
☒ Residential	☐ Commercial	☐ Landfill
☒ Natural Area	☐ Industrial	
☐ Other Specify		

☐ Secured	☐ Active	☐ Unknown
☒ Unsecured	☒ Inactive	

B. PAST USES:

Bruneau Precision Bombing Range No. 2 was operational from August 1943 to November 1953 and used primarily for precision bombing. During World War II, units assigned to Mountain Home Army Air Field used the PBR for training missions using B17 heavy bombardment aircraft. Historical documents indicate the Army-installed improvements at the site consisted of earthen berms built in concentric circles to form the targets.

Practice bombs and 0.50-caliber munitions were utilized on the range. Historical aerial photographs indicate the presence of large craters suggesting the use of high explosive (HE) bombs on the range.

C. SURROUNDING POPULATION:

☒ Rural	☒ Residential	☐ Commercial
☐ Urban	☐ Industrial	
☐ Other Specify		

D. PREVIOUS SAMPLING/INVESTIGATION RESULTS:

A Preliminary Assessment, conducted in 2004, assessed the presence or absence of contamination caused by facility activities. Use of aerial photographs, interviews, and a visual site inspection was performed. No sampling was conducted. No known ground scar and/or impact areas was observed or noted by the inspection team.

(1) MEC ENCOUNTERED: MEC has not be observed on the range. However munitions (practice bomb and .50-caliber) debris has been reported.

(2) SAMPLES: None collected

Chemical	Concentration	Media	Location
None.	None.	None.	None.

II. DESCRIPTION OF ON-SITE ACTIVITIES:

☒ Walk Through	☐ Drive Through	☐ Fly Over
☒ On-Road	☐ Off-Road	☒ On-Path
☒ Off-Path		
☐ Other Specify		

Activities/Tasks to be performed

Reconnaissance

A visual reconnaissance of the former bombing range AOC will be conducted to identify evidence of MEC and/or range activities (presence of MEC or munitions debris and ground-scarring suggestive of bombing activities). Suspect areas of interest, as indicated in the SSWP, will be inspected as part of the field reconnaissance. The reconnaissance team will locate, identify, and stake sampling locations within these areas. The density and type of MEC or munitions debris (e.g., practice bombs and .50 caliber ammunition) observed on the ground will be noted.

The following conditions at each planned sampling location will be documented or recorded in the field log book and/or by digital photographs:

- Presence or absence of MEC, shell casings, bullets, or debris,
- Coordinates of staked sampling locations (using a hand-held GPS unit),
- Access limitations,
- Vegetative cover,
- Soil conditions,
- Presence or absence of water for surface water samples, and
- Other conditions encountered that impact sample collection.

The site reconnaissance will be performed by conducting a visual and geophysical inspection of the range. The geophysical inspection will be accomplished using a Schonstedt by the UXO technician. The path walked during the visual reconnaissance will be recorded using a hand-held GPS unit. Reconnaissance will not include detailed mapping. Touching or handling of MEC or munitions debris will not be allowed.

Sampling (Soil, Surface Water, and Sediment)

A total of eight composite surface soil samples will be collected from the bombing range AOC. Four samples will be obtained from the center of target ranges. In addition, one soil sample will be collected from each quadrant surrounding the entire bombing range complex. The exact location of all soil samples will be determined during the site investigation based on the visual identification of MEC, munitions debris, or other suggestive features. Soil samples will be collected adjacent to MEC or munitions debris concentrated areas and other suggestive features such as craters.

Sediment samples will be collected from two locations. One sediment sample will be collected from the upgradient, in Halfway Gulch, of the AOC. The other sediment sample will be obtained from the downgradient where the location where it exits the MRA/MRS. Sediment samples will be collected regardless of the presence of water.

Two groundwater samples will be obtained from domestic well sources within and upgradient of the AOC. Water samples will be collected from taps; well sampling equipment such as pumps and generators will not be utilized.

III. SITE PERSONNEL AND RESPONSIBILITIES:

Name/Responsibility	Training					
	HAZWOPER 40-hour	8-hour HAZWOPER refresher	Hazardous Waste Site Supervisor	First Aid	Cardiopulmonary Resuscitation	UXO Specialist
Andrew Ellison Field Team Leader/SSHO	X	X	X	X	X	
Mark Brown Sampler	X	X		X	X	
UXO Technician Not determined at this time	X	X		X	X	X

IV. HAZARD ANALYSIS:

A. Safety and Health Hazards Anticipated:

☒ Heat Stress	☒ Cold Stress	☒ Tripping Hazard
☐ Noise	☐ Electrical	☐ Falling Objects
☒ Foot Hazard	☒ Biological	☐ Overhead Hazard
☐ Radiological	☐ Confined Space	☐ Water
☒ Explosive	☐ Climbing	☐ Flammable
☐ Other Specify		

B. Overall Hazard Evaluation:

☐ High	☐ Moderate	☒ Low	☐ Unknown

JUSTIFICATION:

Historical documentation indicates practice bombs with spotting charges and .50-caliber munitions were used at the bombing range. Historical aerial photographs suggest HE bombs were used at the range. The area is extensively farmed and only munitions debris from practice bombs and .50-caliber munitions have been report. Undetonated practice bomb spotting charges have never been observed. HE bombs have not been encountered.

V. SITE INSTRUCTIONS FOR MEC AVOIDANCE:

See Section 4.3 of the SSHP for full scope of MEC avoidance requirements.

a. DO NOT touch or move any ordnance items regardless of the marking or apparent condition.
b. DO NOT visit an ordnance site if an electrical storm is occurring or approaching. If a storm approaches during a site visit, leave the site immediately and seek shelter.
c. DO NOT use radio or cellular phones in the vicinity of suspect ordnance items.
d. DO NOT walk across an area where the ground cannot be seen. If dead vegetation or dead animals are observed, leave the area immediately due to potential chemical agent contamination.
e. DO NOT drive vehicles into suspected MEC areas; use clearly marked lanes.
f. DO NOT carry matches, lighted cigarettes, lighters or other flame producing devices into a MEC site.
g. DO NOT rely on color codes for positive identification of ordnance items or their contents.
h. Only the on-site UXO Specialist is allowed to approach suspected ordnance items to take photographs, and prepare a full description (take notes of the markings or any other identifiers/features).
i. The location of any ordnance items found during the site investigation should be clearly marked so it can be easily located and avoided.
j. Always assume ordnance items contain a live charge until it can be determined otherwise.

Section 4.3 of the SSHP defines on-site MEC avoidance requirements for FUDS properties. In general, the purpose of MEC or anomaly avoidance during SI activities is to avoid any potential surface or subsurface anomalies. Intrusive anomaly investigation is not authorized during MEC avoidance operations. The reconnaissance and sampling field work shall include a minimum of two people, one of whom shall be a UXO technician. This team will be on-site during all sampling activities. Sampling personnel must be escorted at all times in areas potentially containing MEC until the UXO team has completed the access surveys and the cleared areas are marked. If anomalies or MEC are detected, the UXO team will halt escorted personnel in place, select a course around the item, and instruct escorted personnel to follow. If MEC is encountered, Shaw will stop

work in the vicinity and make notifications as outlined in the Work Plan. Shaw is not to conduct further investigation or removal of any MEC.

VI. SITE CONTROL AND COMMUNICATIONS:

A. SITE WORK ZONES: Rigid demarcation of work zones, e.g., using barricades or caution tape, will generally not be required for this project. The Field Team Leader/SSHO, in consultation with the UXO Technician, will determine the boundary of an Exclusion Zone (EZ) to be established around a specific area of activity, appropriate to the potential hazards. The boundaries may be described by physical features, e.g., fences, tree lines, or topographic features, or may be defined by a radius around the center of activity. The EZ boundary will be verbally communicated to team members, who will maintain a watch to assure that only field team members are within the work zone. If a bystander or intruder approaches the EZ, the field team will cease work and ask the person to remain outside the area. A Contamination Reduction Zone (CRZ) will generally not be required because personnel decontamination is not anticipated. If required, a CRZ will be established in a manner similar to that described for the EZ. The support zone will consist of all portions of the site not defined as an EZ or CRZ.

B. COMMUNICATIONS:

(1) ON-SITE: Verbal communications will be used among team members to communicate to each other on-site. If this communication is not possible, the following hand signals will be used.

GRIP PARTNER'S WRIST OR BOTH HAND AROUND WAIST – Leave the area immediately.

HAND GRIPPING NOSE – Unusual smell detected.

THUMBS UP – OK, I am alright or I understand.

THUMBS DOWN – No, negative.

(2) OFF-SITE: Off-site communications will be established at the site and may be include an on-site cellular phone or the nearest public phone or private phone that may be readily accessed.

☒ Cellular Phone: (720) 254-9489

☐ Public/Private phone

TELEPHONE NUMBERS:	
1. MEDICAL FACILITY (Emergency Care): Elmore Medical Center	(208) 587-8401
2. MEDICAL FACILITY (Non-Emergency Care): Occupational Health Clinic, Boise, ID	(208) 367-4197
3. FIRE DEPARTMENT: Mountain Home Fire Department	208-587-2117 or 911
4. POLICE DEPARTMENT: Mountain Home Police Department	208-587-2100 or 911
5. POISON CONTROL CENTER:	(800) 222-1222
6. USACE MM DC PROJECT MANAGER: John Miller	(402) 221-1618
7. USACE DISTRICT PROJECT MANAGER: Rodney Taie	(206) 764-3498 (206) 617-0341 (cell)
8. USACE OE Safety: Glenn Marks	(402) 221-7683 (office) (402) 740-4954 (cell)
9. SHAW PROJECT MANAGER: Peter Kelsall	(303) 793-5252 (office) (303) 981-8435 (cell)
10. SHAW TECHNICAL LEAD: Andrew Ellison	(303) 741-7080 (office) (720)-254-9489 (cell)
11. SHAW FIELD LEADER: Andrew Ellison	(303) 741-7080 (office) (720)-254-9489 (cell)
12. SHAW SAMPLER: Mark Brown	(303) 741-7272
13. SHAW OE SAFETY: Brian Hamilton	(303) 690-3117 (office) (303) 809-0416 (cell)
14. SHAW UXO TECHNICIANS:	Not determined at this time

(3) EMERGENCY SIGNALS: In the case of small groups, a verbal signal for emergencies shall suffice. The emergency signal for large groups should be incorporated at the discretion of the UXO Technician.

☒ Verbal ☐ Nonverbal (Specify)

VII. EMERGENCY RESPONSE

(1) ACCIDENTS: Safety-related incidents and accidents will be immediately reported to the Shaw Project Manager and the USACE MM DC Project Manager. Additional notifications within the USACE organization will be coordinated by the USACE MM DC Project Manager. Additional accident reporting responsibilities of Shaw personnel are described in Section 1.9 of the Accident Prevention Plan."

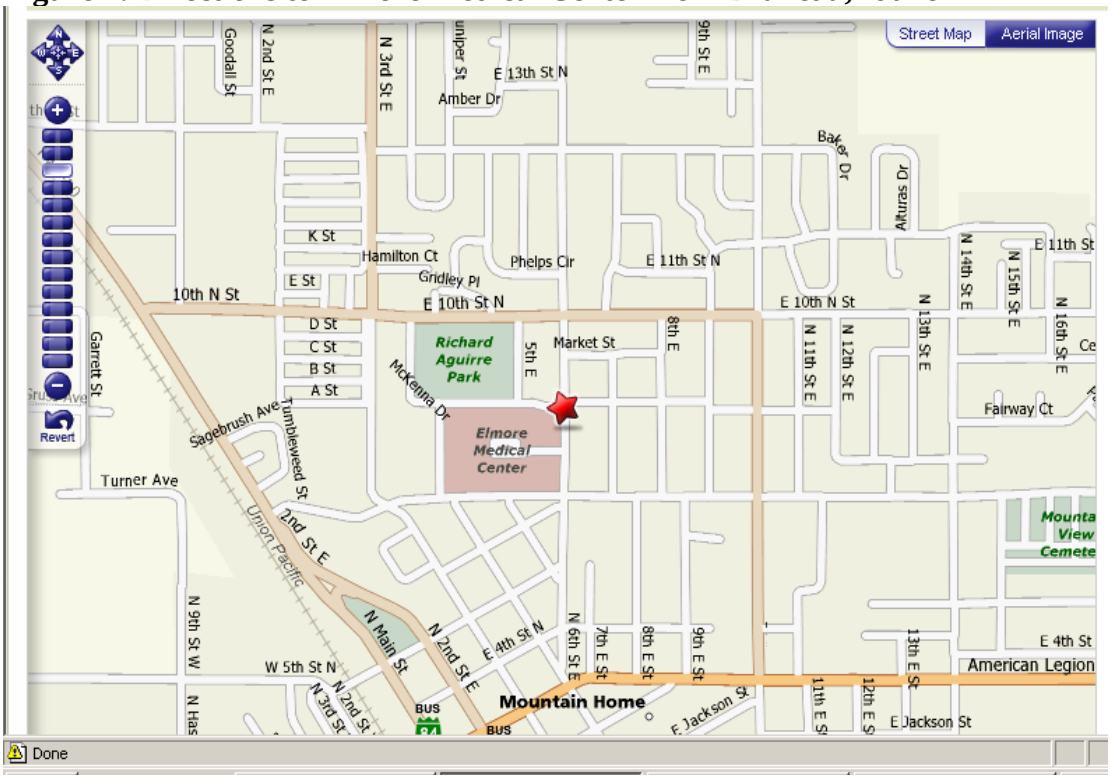
(2) DIRECTIONS TO THE NEAREST HOSPITAL/MEDICAL FACILITY:

Emergency medical care is available at Elmore Medical Center, 895 North 6th Street East, Bruneau, ID.

Directions to Elmore Medical Center from Bruneau, ID (see Figure 1):

- From Bruneau, take ID-51 northwest.
- Go straight on S I-84 BL.
- Turn Right on E. Jackson St.
- Turn left on N. 2nd St. E.
- Turn right on E 4th St N
- Turn left on N 6th St E
- Medical center is at 895 N 6th E

Figure 1: Directions to Elmore Medical Center from Bruneau, Idaho



(3) CLINIC FOR NON-EMERGENCY MEDICAL TREATMENT
In the event of a work-related, non-life threatening injury, the following occupational health clinics are approved by Health Resources for medical treatment of Shaw employees. Notifications per section VII. (1), above, and to Health Resources (800-350-4511) are required prior to transporting the employee to the clinic.

Directions from Bruneau, Idaho to Occupational Health Clinic in Boise, Idaho:

Maneuvers		Distance	Maps
START	**1:** Start out going NORTHWEST on HOT SPRINGS RD toward ID-51 / ID-78.	<0.1 miles	Map
	2: Turn RIGHT onto ID-51 / ID-78. Continue to follow ID-51.	18.8 miles	Map
	3: Turn RIGHT to stay on ID-51.	1.1 miles	Map
	4: Stay STRAIGHT to go onto S 3RD ST W / S I-84 BL / ID-51. Continue to follow S I-84 BL.	0.2 miles	Map
	5: Turn RIGHT onto E JACKSON ST / N I-84 BL / E ID-51.	<0.1 miles	Map
	6: Turn LEFT onto N 2ND ST E / N I-84 BL W / N ID-51 N. Continue to follow N I-84 BL W.	4.0 miles	Map
WEST 84	**7:** Merge onto I-84 W / US-30 W.	40.4 miles	Map
49 EXIT	**8:** Take the FRANKLIN RD / I-184 exit- EXIT 49- toward CITY CENTER.	0.5 miles	Map
EXIT	**9:** Take the FRANKLIN ROAD exit.	0.6 miles	Map
	10: Turn RIGHT onto W FRANKLIN RD.	0.1 miles	Map
	11: Turn LEFT onto N COLE RD.	0.5 miles	Map
	12: Turn RIGHT onto W EMERALD ST.	0.5 miles	Map
END	**13:** End at **6533 W Emerald St** Boise, ID 83704-8737, US		Map

Total Est. Time: 1 hour, 15 minutes **Total Est. Distance:** 67.39 miles

VIII. PERSONAL PROTECTIVE EQUIPMENT:

For field work to be performed at this site, Level D is required. Level D Protection requirements are defined in section 5.1.5 of the SSHP. In general, the use of hard hats is required on all USACE work sites, except on MEC-contaminated sites. At this FUDS, hard hats will only be worn if an overhead hazard is identified. If hard hats are worn, they will be securely fastened to the wearers head.

Contingency: Evacuate site if higher level of protection is needed.

IX. DECONTAMINATION PROCEDURES:

Decontamination procedures are not anticipated as Level D PPE is being used. If decontamination is deemed necessary, procedures defined in Section 7.0 of the SSHP of the Work Plan will be followed. Team members are cautioned not to walk, kneel or sit on any surface with potential leaks, spills or contamination.

X. TRAINING:

All site personnel and visitors will have completed the minimum training required by EM 385-1-1 and 29 CFR 1910.120(e). The Shaw Field Team Leader will verify that all on-site personnel and visitors have completed the appropriate training prior to admitting the individuals on site. Additionally, the UXO Technician assigned to this field reconnaissance will inform personnel before entering, of any potential site specific hazards and MEC safety procedures.

XI. GENERAL:

The number of persons visiting the site will be held to a minimum. The UXO Technician can supervise no more than six non-UXO qualified persons while on MEC sites performing intrusive or non-intrusive work. The Field Team Leader may modify this SSHP Addendum if site conditions warrant. All changes to the SSHP require USACE review and concurrence before new procedures can be applied in the field.

XII. SEVERE WEATHER CONTINGENCY PLAN

Sudden changes in the weather, extreme weather conditions, and natural disasters can create a number of subsequent hazards. Inclement weather may cause poor working conditions including slip, trip and fall hazards to exist. Natural disasters can create many secondary hazards such as release of hazardous materials to the environment, structure failure, and fires.

Weather conditions will be monitored throughout the day by all field team members. Additionally, field personnel should be aware of/informed of daily weather forecasts. Local weather broadcasts and information from a severe weather alert radio will be monitored by the Field Team Leader, Site Safety and Health Officer, or designee when

the likelihood for severe weather exists. The location of Tornado Shelters that may be located in the general area where field work is being performed will be identified. Severe weather may include:

- Tornadoes,
- Thunderstorms (lightning, rain, flash flooding),
- Hail, and
- High wind.

Generally, cellular telephone communication will be used to alert crews to threatening weather. The necessary precautions or response, as directed by the Field Team Leader, to implement the Severe Weather Contingency Plan include:

- Drilling and sampling operations will be suspended when the potential for lightning occurs. Operations may resume 30 minutes after the last observed lightning strike.
- For most types of severe weather, personnel should take refuge in vehicles or inside a designated office.
- In the event of a tornado, personnel should take cover in a basement, ditch, culvert, open "igloo," or interior room of a strong building. Personnel should be aware that ditches and culverts may fill up with water quickly and should only use these as shelters as a last resort.
- The Field Team Leader must decide what operations, if any, are safe to perform based on existing conditions and anticipated conditions.

Additional information will be developed and communicated to personnel before commencing new tasks or activities. It may be necessary to halt certain hazardous operations or stop work altogether to allow the weather situation to pass.

Routinely monitoring weather conditions and reports may help reduce the impact of severe weather and natural disasters. The best protection against most severe weather episodes and natural disasters is to avoid them. This means seeking shelter before the storm hits. If lightning is a threat, stay away from pipes and electrical equipment and watch for damage caused by nearby lightning strikes.

SAFETY BRIEFING CHECKLIST

SITE NAME: Bruneau Precision Bombing Range	DATE/TIME: /

GENERAL INFORMATION

(Check subjects discussed)

☐ PURPOSE OF VISIT

☐ IDENTIFY KEY SITE PERSONNEL

☐ TRAINING AND MEDICAL REQUIREMENTS

SPECIFIC INFORMATION

☐ SITE DESCRIPTION/PAST USES

☐ RESULTS OF PREVIOUS STUDIES

☐ POTENTIAL SITE HAZARDS

☐ MEC SAFETY PROCEDURES

☐ SITE SOPs

☐ SITE CONTROL AND COMMUNICATIONS

☐ EMERGENCY RESPONSE

- ☐ LOCATION OF FIRST AID KIT
- ☐ EMERGENCY PHONE NUMBERS & LOCATION
- ☐ LOCATION AND MAP TO NEAREST MEDICAL FACILITY
- ☐ PPE AND DECONTAMINATION

Stress the following during the briefing: If hazardous conditions arise, stop work, evacuate the area, and notify the SSHO and Shaw PM immediately.

PLAN ACCEPTANCE FORM

SITE SAFETY AND HEALTH PLAN ADDENDUM
FOR

_____

_____

Site Name: Bruneau Precision Bombing Range
Location: Bruneau, Idaho

I have read and agree to abide by the contents of the Site Safety and Health Plan and this Addendum and I have attended the Safety Briefing for the aforementioned site.

NAME (PRINTED)	OFFICE	SIGNATURE	DATE

Person presenting the safety briefing:

_____ _____

SIGNATURE DATE

APPENDIX C

USACE INTERIM GUIDANCE DOCUMENT 06-05

AND

SAFETY ADVISORY 06-2

DEPARTMENT OF THE ARMY
HUNTSVILLE CENTER, CORPS OF ENGINEERS
P.O. BOX 1600
HUNTSVILLE, ALABAMA 35807-4301

May 23, 2006

REPLY TO
ATTENTION OF:

OE Safety Division for Ordnance
and Explosives Directorate

Shaw Environmental
4171 Essen Lane
Baton Rouge, Louisiana 70809

Dear Sir/Madam:

This is Safety Advisory 06-2 – Munitions and Explosives of Concern (MEC) Safety During Site Inspections (SI), Pre-Work Plan Visits, Archive Search Reports (ASR) Investigations and Other Site Visits of a Non-Intrusive Nature.

Reference EP 75-1-1, EP 385-1-95a, and Interim Guidance Document (IGD), March 15, 2006.

The following procedures will be followed if an item is found that has an explosive hazard during the activities identified in the subject line:

a. MEC items are not to be moved or disturbed during the above subject SI, Pre-Work Plan visits, ASR Investigations and other site visits of a non-intrusive nature.

b. The locations of any discovered explosive hazardous items should be marked for accurate relocating purposes and the information provided to the designated Point of Contact (POC) and any emergency response authorities as may be required.

c. During site visits to active Installations and/or Base Realignment and Closure (BRAC) sites the identified Installation POC or the BRAC coordinator should be notified of discovered MEC hazards. They then will request any appropriate emergency response action as deemed necessary through their channels if required.

d. When a site visit is on a Formerly Utilized Defense Site, the property owner shall be notified in the event of finding any found explosive hazards along with the location of the explosive item(s) found, the property owner should then in turn notify their local emergency response authorities.

e. During these site visits all required MEC security requirements should be implemented as necessary and required. All team members are to be instructed in and made aware of any MEC security requirements.

f. All team members will be briefed on these procedures prior to any site investigations being performed and daily before any work begins.

This Safety Advisory is intended to serve as an explosives safety reminder.

Comments or questions about this Safety Advisory can be directed to the undersigned at (256) 895-1598/82.

Sincerely,

Wayne H. Galloway
Chief, OE Safety Division for
Ordnance and Explosives Directorate

DEPARTMENT OF THE ARMY
HUNTSVILLE CENTER, CORPS OF ENGINEERS
P.O. BOX 1600
HUNTSVILLE, ALABAMA 35807-4301

REPLY TO
ATTENTION OF:

MAR 1 6 2006

CEHNC-OE-CX

MEMORANDUM FOR SEE DISTRIBUTION

SUBJECT: Procedure for Preliminary Assessment (PA) and Site Inspection (SI) Teams that Encounter Unexploded Ordnance (UXO) While Gathering Non-UXO Field Data, Military Munitions Center of Expertise (MM CX) Interim Guidance Document (IGD) 06-05

1. PURPOSE: This procedure describes the responsibilities of project teams during the preliminary assessment and site investigation phases should unexploded ordnance (UXO) be discovered.

2. APPLICABILITY: This guidance is applicable to the geographic military Districts, Military Munitions Response Program (MMRP) Design Centers, Major Subordinate Commands (MSCs), and designated Remedial Action Districts performing MMRP response actions.

3. REQUIREMENTS AND PROCEDURES:

a. During site visits to formerly used defense site (FUDS) properties to gather PA or SI information, in the rare instance that a UXO-qualified individual identifies an item that is an explosive hazard, the following actions will occur:

(1) The property owner or individual granting rights of entry to the property will be notified of the hazard and advised to call the local emergency response authority (i.e., police, sheriff, or fire department). The individual will also be informed that if they do not call the local response authority within 1 hour, the individual who identified the UXO item will notify the local emergency response authority.

(2) The local response authority will decide how to respond to the reported incident, including deciding not to respond (e.g., if the local response authority is already aware of the hazards on the property). If the local response authority decides to respond, the individual who identified the item or his designee will mark the location of the item and provide accurate location information to the emergency response authority. The individual who identified the item or his designee will generally remain in the area until the local response authority arrives, unless specifically indicated by the appropriate response authority that the individual may leave the area.

(3) During the SI, the state regulator may also be notified at their request.

b. During site visits to active installations or Base Realignment and Closure (BRAC) sites to gather PA or SI information, in the rare instance that a UXO-qualified individual identifies an item that is an explosive hazard, the following actions will occur:

(1) The installation point of contact (POC) or the BRAC coordinator will be notified of the hazard and requested to notify explosive ordnance disposal (EOD) through their channels.

(2) The installation/EOD will make the determination if they are going to respond to the incident. The installation/EOD may be aware of the hazards at the site and make the decision not to respond. If the installation/EOD decides to respond, the individual who identified the item or his designee will mark the location and provide accurate location information to the installation/EOD unit and will remain in the area unless the installation/EOD unit requests otherwise.

c. Neither the US Army Corps of Engineers personnel, nor their contractors have the authority to call EOD to respond to an explosive hazard. This call is the responsibility of the local emergency response authority for FUDS properties and it must come through the proper chain of command on installations.

d. AR 75-14 and AR 75-15 contain the information on how EOD responds to explosives hazards.

4. EFFECTIVE DATES: The requirements and procedures set forth in this interim guidance are effective immediately. They will remain in effect indefinitely, unless superseded by other policy or regulation.

5. POINT OF CONTACT: If you need additional information, please contact Mr. Brad McCowan at 256-895-1174.

Carol G. Youkey

CAROL A. YOUKEY, P.E.
Chief, Center of Expertise for Ordnance
and Explosives Directorate