U.S. Army Corps of Engineers
Omaha District

Draft Technical Project Planning Memorandum
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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Draft Technical Project Planning Memorandum

Site Inspection
Bruneau Precision Bombing Range No. 2
Formerly Used Defense Site
FUDS ID F10IO0141

Military Munitions Response Program

Documentation for Technical Project Planning Meeting
Idaho Department Environmental Quality, Boise, ID and Follow-Up Conference Calls
April 24, May 15 and 17, 2007

Hosted by U.S. Army Corps of Engineers

Prepared by Shaw Environmental, Inc.

May 25, 2007

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ABBREVIATIONS AND ACRONYMS

AOC	area of concern
AAF	Army Airfield
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
DoD	Department of Defense
DOI	Department of the Interior
DQO	Data Quality Objective
DWMA	Drinking Water Mapping Application
EPA	Environmental Protection Agency
ft	feet
FUDS	Formerly Used Defense Site
GGR	Ground Gunnery Range
GP	General Purpose
GPS	Global Positioning System
HE	high explosives
HRS	Hazard Ranking System
ID	Idaho
IDEQ	Idaho Department of Environmental Quality
IDFG	Idaho Department Fish and Game
IEP	Important Ecological Places
INPR	Inventory Project Report
lb	pound
MC	munitions constituents
MD	munitions debris
MEC	munitions and explosives of concern
µg/L	micrograms per liter
MMRP	Military Munitions Response Program
MRSPP	Munitions Response Site Prioritization Protocol
NAD83	1983 North American Datum
NDAI	No Department of Defense Action Indicated
PA	Preliminary Assessment
PBR	Precision Bombing Range
RAC	Risk Assessment Code
RI/FS	Remedial Investigation/Feasibility Study
ROE(s)	Right(s) of Entry
SDWIS	Safe Drinking Water Information System
Shaw	Shaw Environmental, Inc.
SHPO	State Historic Preservation Office
SI	Site Inspection
SLERA	Screening Level Risk Assessment

ABBREVIATIONS AND ACRONYMS (cont.)

SSWP	Site-Specific Work Plan
TNT	2,4,6-trinitrotoluene
TPP	Technical Project Planning
USACE	U.S. Army Corps of Engineers
USGS	United States Geological Survey
UTM	Universal Transverse Mercator
UXO	unexploded ordnance

Administrative Information

The Technical Project Planning (TPP) Memorandum is one in a series of documents used during the Site Inspection (SI) process to document the information collected and processes used to evaluate Formerly Used Defense Sites (FUDS) for the possible presence of munitions and explosives of concern (MEC) and/or munitions constituents (MC). TPP Meeting information provided in the Memorandum reflects both the original version of information shared with meeting participants, as well as changes/updates to site-specific information obtained during the TPP Meeting.

The TPP Meeting for the former Bruneau Precision Bombing Range (PBR) No. 2 was conducted on April 24, 2007, at the Idaho Department Environmental Quality (IDEQ) offices located in Boise, Idaho (ID). Two follow-up conference calls hosted by the USACE were held on May 15 and 17, 2007, to finalize TPP Meeting agreements. Representatives from the U.S. Army Corps of Engineers (USACE) – Omaha Design Center and Seattle District, the IDEQ, and Shaw Environmental, Inc. (Shaw) were in attendance at all meetings. By agreement with the USACE, landowners were not present at these meetings. A separate meeting with landowners may be held in the future. A windshield site tour of the former range area was conducted as part of the April 24 meeting.

The TPP Memorandum documents discussions for the TPP meeting and includes the sections described below:

- **Administrative Information:** includes meeting logistics and the list of attendees;
- **Site Inspection Objectives:** provides the goal and objectives of the SI, roles and responsibilities, the SI process, and the TPP process;
- **Background Information:** includes site and project history, area physical setting, a summary of previous environmental work, and an introduction to the areas of concern (AOCs) addressed by the SI;
- **Conceptual Site Model (CSM):** used to identify environmental attributes, potential human and ecological receptors in the area's environment, and the relationships between these factors;
- **Proposed Sampling Scheme:** used to describe the type and quantity of samples to be taken, and the analytical methods to be used for characterizing the AOC;
- **TPP Notes and Data Quality Objectives (DQOs):** used to capture project and site-specific information as discussed during the TPP Meeting to ensure the necessary and appropriate information is shared among meeting participants, and that meeting participants concur with the identified goal, objectives, and approach used to complete the SI process; and
- **Worksheets:** includes the Site Information Worksheet, Draft Munitions Response Site Prioritization Protocol (MRSPP) Data Gaps, and Hazard Ranking System (HRS) Data Gaps.

Technical Project Planning Meeting
Summary of Agreements

The TPP Meeting for the Bruneau PBR No. 2 was held at the IDEQ offices located in Boise, ID, on April 24. Two follow-up conference calls hosted by the USACE were held on May 15 and 17, 2007, to finalize TPP Meeting agreements. The following is a summary of all three meetings.

In attendance were representatives of the following:

- USACE - Omaha Design Center
- IDEQ
- U.S. Environmental Protection Agency (EPA) Region 10 (1st and 2nd meetings only)
- Shaw

Note: The Bureau of Land Management (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.

Shaw reviewed site information and presented a summary of the proposed SI approach for Bruneau PBR No. 2, addressing MEC reconnaissance and MC sampling. The CSM presented for Bruneau PBR No. 2 characterized the site as a precision bombing range where practice bombs, general purpose bombs, and small arms (.50-caliber) were used.

A visit to the range was conducted as part of the April 24 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. Halfway Gulch no longer appears to exist in channels as depicted in topographic maps of the area (see Figure 2). This ephemeral 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 and the two follow-up conference calls. However, both the IDEQ and EPA reserved the right to provide further review and comments on the approach and decision rules as documented in the TPP Memorandum and Site-Specific Work Plan (SSWP). Key agreements reached at the meetings include:

Site Inspection Area of Concern

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 may 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. Initially, the USACE proposed sampling site media only for explosive compounds. However, the IDEQ and EPA requested that metals and perchlorate be included in the list of MC of concern. The EPA indicated perchlorate has been found at the Boardman and Cold Springs bombing ranges and believes practice bomb spotting charges and fuzes for general purpose bombs contained perchlorate. In addition, EPA stated that groundwater sampling for perchlorate is currently the EPA Region 10 standard sampling regime for all military sites including bombing ranges. The USACE subsequently agreed to the regulators' request to sample groundwater for perchlorate.

MEC Reconnaissance Objectives

The TPP stakeholders agreed that the SI would include reconnaissance activity to:

- Observe evidence of MEC and munitions debris.
- Confirm site conditions and land usage,
- Confirm the CSM,
- Select optimal sample locations (biased toward evidence of munitions debris, if observed)

The MEC reconnaissance would primarily be conducted within the AOC but would extend to surrounding land to inspect for munitions debris 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.

- Eight 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. A set of 10 soil samples will be collected and analyzed for metals. One sample will be analyzed for explosives. 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 anticipate 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

Both EPA and USACE inquired if HRS information would be collected. Shaw confirmed that 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.

Data Quality Objectives / Decision Rules

The decision rules agreed to by the TPP stakeholders are outlined in Section 7.0 of this document. These rules were revised with a caveat indicating that the final decision to recommend the site for additional investigation (i.e., remedial investigation) will be made by the

TPP stakeholders during the 2nd TPP Meeting, which will occur following submittal of the Draft Final SI Report.

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 Department of Defense (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.

Sign-in Sheet

Technical Project Planning Meeting

Bruneau Precision Bombing Range No. 2

April 24, 2007

Name	Affiliation	Address	Phone Number	E-mail
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Conference Call Attendees

Technical Project Planning Meeting 1st Follow-up

Bruneau Precision Bombing Range No. 2

May 15, 2007

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Conference Call Attendees

Technical Project Planning Meeting 2nd Follow-up

Bruneau Precision Bombing Range No. 2

May 17, 2007

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1.0 Site Inspection Objectives

1.1 Goal

The USACE is conducting SIs of FUDS properties to determine if any munitions and MEC or related MC are present on property formerly owned or leased by the DoD.

1.2 Objectives

- Determine if the site requires further response action under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) due to the presence of MEC or MC.
- Collect minimum information needed to:
  - Eliminate a site from further consideration if:
    - No evidence of MEC and
    - Concentrations of MC in site media are below background or below risk-based screening levels.
  - Determine the potential need for initiation of the Remedial Investigation/Feasibility Study (RI/FS) if:
    - Evidence of MEC identified or
    - Concentrations of MC in site media exceed background and risk-based screening levels.
  - Determine the potential need for Time Critical Removal Action or Non-Time Critical Removal Action based on risk to site users from MEC.
  - Provide sufficient data for the EPA to complete the HRS.
  - Evaluate the FUDS using the MRSPP.

1.3 Roles & Responsibilities

- USACE: Acts as the executing agency for the DoD with regard to the FUDS program. In this role, the USACE has decision making authority and is responsible for ensuring work is conducted in accordance with applicable USACE and federal guidance. Additionally, USACE coordinates and works with project team members to meet needs expressed by regulatory agencies and stakeholders.
- Regulatory Agency: Participates in planning of SI activities to ensure the project meets applicable state standards and requirements.
- Property Owner(s): Provides available and pertinent information about the area, provides insight on current and anticipated future land uses for the property, and participates in project team discussions.
- Shaw: As a contractor to the USACE, conducts work on behalf of the USACE, provides TPP materials, makes site information available to the project team through a web-based information portal, and conducts and reports SI activities.

1.4 Site Inspection Process

- Data review,
- TPP,
- Site-Specific Work Plan (SSWP),
- SI field activities – reconnaissance, sampling, and analysis, and
- SI Report.

1.5 Technical Project Planning Process

- Conduct TPP meetings* with key organizations and stakeholders;
- Identify stakeholders concerns;
- Identify all AOCs for this SI;
- Review site information;
- Verify current and anticipated future land use;
- Develop CSM;
- Identify data gaps;
- Plan how to address data gaps;
- Develop DQOs for meeting SI requirements; and
- Concur on SI field work approach.

* Second TPP meeting to be determined by team members during the 1st TPP meeting.

2.0 Background Information

Historical information (including references to interviews and historical documents) contained in this package was obtained from the *Inventory Project Report* (INPR) (USACE, 1988), the *Preliminary Assessment* (PA) (USACE, 2004b), and *Archives Search Report* (ASR) *Supplement* for Bruneau PBR No. 2 (USACE, 2004a).

2.1 Site Name and Location

The former Bruneau PBR No. 2 consisted of 2,552.20 acres of land located in Owyhee County, ID, 7 miles southwest of Bruneau, ID, and 22 miles southwest of Mountain Home Air Force Base, ID (Figure 1). 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 site layout is shown on Figure 2.

The former range is also referred to as

- Bruneau PBR No. 2;
- Mountain Home Army Airfield (AAF);
- Mountain Home PBR No. 2; and
- Mountain Home Air Force Range No. 2.

2.2 Range Inventory

The Bruneau PBR No. 2 is included in the MMRP Inventory in the *Defense Environmental Programs Fiscal Year 2006 Annual Report to Congress* (DoD, 2006) with range information as follows:

Range Name	Federal Facility Identification	Range Total Acres
Bruneau Precision Bombing Range No. 2	ID09799F304500	649

Range areas and coordinates are listed in the ASR Supplement (USACE, 2004a) as follows:

Range Name	Range ID	Range Total (acres)	UTM Coordinates (meters)
Bombing Range	F10ID014101R01	649	X 584880.30 Y 4743790.10

Coordinates for the ranges are in Universal Transverse Mercator (UTM) Zone 11N, North American Datum (NAD) 83.

The "**Bombing Range**" is represented as a 3,000-foot radius circle with the bombing target at the center of the circle. According to studies cited in the ASR Supplement, 99 percent of the bombs dropped on the PBR should have landed with 3,000 feet (ft) of the bombing target.

2.3 Property 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.

2.3.1 Historical Military Use

In November 1942, following acquisition of the property, the Army Air Corps started construction of Mountain Home 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.

2.3.2 Munitions Information

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

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

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 was its explosive filler of Amatol 50-50, 2,4,6-trinitrotoluene (TNT), Tritonal, or Composition B.

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 filler is 50/50 amatol, 2,4,6-TNT, or Tritonal. Percentage of filler was approximately 49 percent.

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 are 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.

2.4 Physical Setting

Bruneau PBR No. 2 is located in the Snake River Plain, approximately 4 miles south of the Strike Reservoir which is situated on the Snake River.

2.4.1 Topography and Vegetation

Topography at the site is flat with gorges and gullies. The ground surface at the site gently slopes to the east and southeast. Elevation at the site ranges from 2,700 ft in the southeast corner to 2,800 ft in the northeast corner.

2.4.2 Surface Water

Bruneau PBR No. 2 is centered over Halfway Gulch. Runoff from the gulch generally flows east into Little Valley, which is orientated southwest to northeast. From Little Valley, runoff flows into Jacks Creek, which flows southwest to northeast through Little Valley. Jacks Creek flows into the Bruneau River, which is located southeast of the Bruneau Arm of the Strike Reservoir.

Halfway Gulch is identified as a ephemeral stream and likely only flows during storm events. The channel of Halfway Gulch may have been recently altered due to agricultural activities.

2.4.3 Sensitive Environments

The USFWS indicated that the bald eagle may nest or winter in the area of Bruneau PBR No. 2. The Idaho Department Fish and Game (IDFG) Conservation Data Center indicates three species may occur within one mile of the range. The status of threatened or endangered species in the area of Bruneau PBR No. 2 is shown in the table below (USFWS, 2006 and 2007).

Class	Status	Common Name	Scientific Name
Federal	Threatened	Bald Eagle	*Haliaeetus leucocephalus*
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*

According to the 2004 PA, there are no significant historic or archaeological sites in the vicinity of Bruneau PBR No.2 (USACE, 2004b).

2.4.4 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, and but there are also a few periods where temperatures stay below freezing and approach or fall below zero degrees. 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, and normally spring months 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.

2.5 Geologic and Hydrogeologic Setting

2.5.1 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 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.

2.5.2 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

2.5.3 Hydrogeology

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. Based on the Idaho Department of Water Resources there are five domestic and four irrigation wells within the former PBR bombing range AOC. The total depths of the domestic wells range from 110 ft bgs 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.

2.6 Population and Land Use

2.6.1 Nearby Population

Bruneau, ID, is the town located closest to the Bruneau PBR No. 2; however, there are no U.S. Census data available for the town. Bruneau PBR No. 2 is located in Owyhee County, ID, which had a population of 11,073 in 2000, and a population density of 1.4 persons per square mile (U.S. Census, 2000).

2.6.2 Land Use

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

Currently the majority of the land is used for agricultural purposes. The area is comprised of agricultural fields, cattle feed lots, new and used storage of farm equipment, 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. Parcel ownership is shown on Figure 3.

2.6.3 Area Water Supply

The EPA Safe Drinking Water Information System (SDWIS) Drinking Water Mapping Application (DWMA) indicates that no groundwater drinking wells are within 4 miles of the former Bruneau PBR No. 2. The DWMA indicates the nearest drinking water well is more than 6 miles from the range (EPA, 2006).

The USGS National Water Information System indicates that there are eight other groundwater wells within 4 miles of the range. It is assumed these wells are used for irrigation and/or stock watering since they are not listed in the SDWIS DWMA.

A review of the Idaho Department of Water Resources database complete as part of this TPP Memorandum identifies the presence of five domestic water wells within the boundary of the AOC and a total of approximately six domestic wells within the property boundary of the FUDS. It is assumed that the Idaho Department of Water Resources database is the most complete information regarding water wells within the FUDS.

2.7 Previous Investigations for MC and MEC

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 was issued September 17, 1954. A total of 2,600 man-hours were spent and 52,000 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 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 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 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 evidence of MEC or munitions debris was observed on the surface at the target site.

In December 2004, a PA was completed at the range. The 2004 PA was conducted by USACE, St. Louis District, and compiled information collected from historical documents, interviews, and site visits. The purpose of the 2004 PA was to determine if MEC were present. The 2004 PA found that there was a potential for MEC at Bruneau PBR No. 2. According to the 2004 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.

The 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.

2.8 Other Land Uses that May Have Contributed to Contamination

Agricultural chemicals (e.g., fertilizers and pesticides) may contain or breakdown to low levels of explosive compounds such as nitrobenzene.

2.9 Summary of Previous Investigations

- **MEC** - 400 lbs of black powder that came from the spotting charges were found and removed during a site clearance conducted in 1954. No MEC was found during a second site clearance conducted in 1964.
- Live .50-caliber rounds have been found on the range as reported by landowners.
- Known use or suspected use of MEC on the former Bruneau PBR No. 2 consists of:
  - 100-lb general purpose (GP) (AN-M30)
  - 100-lb practice bombs (M38A2)
  - spotting charges (M1A1)
  - bomb tail fuzes (AN-M100 Series),
  - bomb nose fuzes (AN-M103A1), and
  - .50-caliber cartridges.

- **MC** - No analytical sampling has been conducted at the former range. Therefore the presence of MC in site media is unknown.

3.0 Conceptual Site Model – Bombing Range AOC

3.1 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.

3.2 Background

3.2.1 History of use

The former Bruneau 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.

3.2.2 Munitions and Associated MC

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).
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).

3.2.3 Previous MEC Finds

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

3.2.4 Previous MC Sample Results

- No sampling for MC has been conducted at the range

3.2.5 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 not human movement

3.2.6 Ecological Receptors

- Mammals and birds.

3.3 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 present 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 general-purpose bomb of the same size (Figure 4-2). 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 findings evidence of GP bombs. There is no record of ordnance clearance, decontamination, or dedudding for 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.

3.4 MC Pathway Evaluation

3.4.1 Terrestrial Pathway

3.4.1.1 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 PBR has not previously been sampled or analyzed for MC.

3.4.1.2 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.

3.4.1.3 Land use and access

- Land currently and is expected to be used in the future for agriculture and livestock grazing. A small portion of the land is expected to be used for homesteads.

3.4.1.4 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.

3.4.1.5 Ecological Assessment

- The Bruneau PBR No. 2 is not considered an important ecological place or sensitive environment (Table 1).
- The USFWS indicated that the bald eagle may nest or winter in the area Bruneau PBR No. 2. The IDFG Conservation Data Center indicates three species may occur within one mile of the range. The status of threatened or endangered species in the area of Bruneau PBR No. 2 is shown in the table below.

Class	Status	Common Name	Scientific Name
Federal	Threatened	Bald Eagle	*Haliaeetus leucocephalus*
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.

3.4.2 Surface Water/Sediment Pathway

3.4.2.1 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.

3.4.2.2 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.

3.4.2.3 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.

3.4.2.4 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.

3.4.2.5 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).

3.4.3 Groundwater Pathway

3.4.3.1 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.

3.4.3.2 *Migration Pathway*

- There is possibility that MC have migrated to groundwater; however:
  - Metals and explosive compounds have generally low solubilities;
  - Perchlorate has a high solubility and high mobility,
  - Depth to groundwater within the area is 300 to 500 ft bgs; and
  - Surface soils are a mixture of sands, silts, and clays, and silts and clays readily inhibit the movement of metals and explosives. Perchlorate is readily mobile due to high solubility.
- Irrigation of the current range area may promote the movement of MC to groundwater.
- Groundwater flows northerly within the area.

3.4.3.3 ***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 two domestic water wells within the boundary of the AOC and a total of four domestic wells within the property boundary of the FUDS.

3.4.3.4 ***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.

3.4.4 *Air Pathway*

3.4.4.1 *Sources of MC*

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

3.4.4.2 *Migration Pathway*

- The MC are considered non-volatile. Exposure to air born MC would be from MC impacted dust.
- Agricultural activities on the range area actively promote the growth of vegetation which would limit dust production.

3.4.4.3 *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, non-volatility of the MC, and exposure to the air pathway is considered in the human health screening values.

3.5 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

4.0 Proposed Field Investigation

The proposed field investigation is presented below. The actual investigative approach will be defined in detail in a SSWP that will be submitted to IDEQ and other stakeholders for review. The SSWP will reference technical details including sampling and analytical methods that are described in the *Type I Work Plan, Site Inspections at Multiple Sites* (Shaw, 2006), prepared by Shaw, and submitted to USACE as final in February 2006.

4.1 Reconnaissance

A visual reconnaissance of the AOC (bombing range) and surrounding area will be performed prior to any sampling. Although MEC is not expected to be present on the land surface, a magnetometer-assisted (Schonstedt), visual inspection will be conducted by a qualified unexploded ordnance (UXO) technician. Special attention will be given to any draws or craters within the area. A global positioning system (GPS) will be used to record discovered MEC, munitions debris (MD), and sample point locations. Digital photographs will be taken to document significant features.

Historical aerial photographs will be reviewed for craters which may indicate the use of HE munitions. Locations of significantly sized craters will be determined and investigated visually with the magnetometer as part of the reconnaissance.

4.2 Sampling

A summary of the proposed sampling is presented in Table 3. Human health and ecological screening levels are presented in Tables 4-9.

4.2.1 Soils

Eight surface soil samples will be collected within the target center adjacent to MEC or MD concentrated areas. Four surface soil samples will be obtained from the center of the former bombing range and one from each quadrant surrounding the bombing range center. The exact locations of these samples will be determined during the site inspection based on the visual identification of MEC or MD. All samples will be analyzed for explosives (including nitroglycerine), and metals.

Surface soil samples will be collected at a depth of approximately 0 to 6 inches bgs. Surface soil samples will be composite samples (7-point, wheel pattern with a 2-ft radius). No subsurface samples are planned.

Selection of soil sample locations will be adjusted to ensure one sample is obtained within 200 ft of any residential property within the AOC. At this time, one residential property is known to exist near the center of the AOC.

4.2.2 Sediment

Two sediment samples will be collected from Halfway Gulch at a location upgradient and downgradient of the bombing range AOC. The exact locations of these samples will be determined during the site inspection. It is assumed that Halfway Gulch will be dry; therefore, sediment samples will be collected in the same manner as described above for the soil samples. All samples will be analyzed for explosives (including nitroglycerine) and metals.

Sample collection locations will account for recent realignment of Halfway Gulch around farm fields within the area.

4.2.3 Groundwater

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

Currently, five domestic water wells are know to exist within the former PBR AOC and several domestic water wells exist upgradient of the former PBR AOC. It is the intent of the SI to sample the well closest to the center of the former PBR AOC as possible, depending on which well owner grants access. The upgradient well will be chosen from an area south of the former PBR. The wells selected for sampling will be presented in the Site Specific Work Plan.

4.2.4 Background Soil Sampling

Background 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. Ten samples will be analyzed for metals and one sample will be analyzed for explosives (including nitroglycerine).

5.0 TPP and Development of Data Quality Objectives

- The USACE TPP process is a four-phase process:
  - Identify the current project,
  - Determine data needs,
  - Develop data collection options, and
  - Finalize data collection program.
- The purpose of TPP is to develop DQOs that document how the project makes decisions.
- DQOs are intended to capture project-specific information such as the intended data use(s), data needs, and how these items will be achieved.
- Information captured through DQOs will be used as a benchmark for determining whether identified objectives are met.

TPP Phases

Phase I: Identify the Current Project

Question: Is there any person or organization missing from this Team?

The USACE is considering conducting a separate TPP meeting with local residents to present the SI and obtain feedback.

Question: Are there any other AOCs to be identified?

No other AOC are known.

Question: Are there additional concerns or issues from landowners or other stakeholders regarding the Bombing Range site?

None are known at this time.

Question: Are there any administrative or stakeholder concerns or constraints that would prevent site inspection activities from going forward on the decision path for this site?

The USACE must obtain land and water well access from landowners to conduct the SI.

Phase II: Determine Data Needs

Question: Are there any other pertinent documents relating to the site available?

No outstanding documents related to the site are known to exist at this time.

Question: Are there any other site aspects/information that should be considered?

None at this time.

Question: Do team members concur with the CSM?

TPP participants are in agreement with the CSM.

- **Are any data missing?**

  No previous data for the site has been collected.

- **What is the nature of needed data?**

  Data needs consist of determining the presence of any remaining MEC or munitions debris on the range and the presence of MC of concern within site soils, sediment, and groundwater.

- **What data gaps would additional data meet for making a decision about the site?**

  None.

- **Are there any considerations/constraints that need to be addressed for collecting additional data?**

  Land access agreements from landowners will need to be obtained.

Phase III: Develop Data Collection Options

Question: Based on the desired decision endpoints and information known to date, what additional information is needed to reach a determination of No DoD Action Indicated (NDAI) or further action?

No additional data is needed beyond what is planned for collection as presented in Section 5 of this TPP Memorandum.

Question: Are the stakeholders in agreement with the sampling approach program?

Yes.

Question: Are the stakeholders in agreement with the proposed approach for collecting background data?

Yes.

Phase IV: Finalize Data Collection Program

Background data

Background data will be obtained for explosives, metals, and perchlorate (groundwater only).

Human Health Screening Level Risk Assessment

Sample results that exceed background will be compared to screening values. Site will be considered NDAI for MC if site results do not exceed screening values (depending also on ecological evaluation).

What concentrations of potential contaminants of concern (metals and explosives) lead to decision end-points for human health (see Human Health Screening Level Tables)?

> **Question:** Are these the correct standards to be applied as screening values for human health risk assessment?
>
> *Proposed human health screening values are provided in Tables 5 and 6 of this TPP Memorandum. TPP meeting participants were in tentative agreement to screening values, however, these values will be review as part of the overall review of this memorandum.*

Ecological Screening Level Risk Assessment

The USACE has defined a process for conducting SLERA. A determination is first made whether the site qualifies as an IEP. A second determination is made whether the site is managed for ecological purposes. If neither criterion is met then a SLERA is not required and the process is limited to making observations during the site visit of any acute effects to flora and fauna that may be related to MC. If the site does qualify as an IEP or is managed for ecological purposes, site results that exceed background will be compared to ecological screening values. The site will be considered NDAI for MC if site results do not exceed screening values (depending also on human health evaluation) (see Ecological Screening Level Tables).

> **Question:** Does the site qualify as an IEP?
>
> *No.*
>
> **Question:** Is the site managed for ecological purposes?
>
> *No.*
>
> **Question:** Are these the correct standards to be applied as screening values for ecological risk assessment?

Proposed ecological screening values are provided in Tables 7, 8 and 9 of this TPP Memorandum. TPP meeting participants were in tentative agreement to screening values, however, these values will be reviewed as part of the overall review of this memorandum.

Other Sampling Issues

Question: Are there any additional sampling and analysis methodologies needed for all team members to arrive at a decision end-point?

No.

Question: Given the additional sampling and analysis methodologies, are there impacts to the project schedule that need to be accommodated?

No.

6.0 Proposed Data Quality Objectives

Upon agreement at the TPP meeting, the following decision rules will be applied with regard to MC sampling results:

- Below risk-based screening levels = NDAI;
- Above risk-based screening levels and/or background = RI/FS.

The IDEQ and EPA reserved the right to reconsider the decision rules in evaluating SI recommendations following review of sampling results.

The following expanded project objectives and decision rules are proposed:

Objective 1: Determine if the site requires additional investigation or can be recommended for 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 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.

Next Steps

- Shaw will prepare the TPP Memorandum and distribute for concurrence.
- Shaw will prepare the SSWP for review and comment.
- Shaw will conduct field work; site reconnaissance and collect/analyze samples.
- Shaw will prepare the SI Report.
- Conduct 2nd TPP meeting to review SI findings and finalize recommendations.

7.0 References

Department of Defense (DoD). 2006. *Defense Environmental Programs Fiscal Year 2006 Annual Report to Congress*. Website: http://deparc.egovservices.net/deparc/do/home.

Idaho Fish and Game (IFG). 2006. Personal communication between C. Harris (IFG) and G.. McGraw (Shaw). Subject: The possible presence of any Threatened or Endangered Species at two Idaho sites. August 17, 2006.

Shaw Environmental, Inc. (Shaw). 2006. *Final Type I Work Plan, Site Inspections at Multiple Sites, NWO Region, Formerly Used Defense Sites, Military Munitions Response Program*. Prepared for U.S. Army Corps of Engineers. February 2006.

U.S. Army Corp of Engineers (USACE). 1988. *DERP-FUDS, Inventory Project Report for Site No. F10ID0141, Bruneau Precision Bombing Range No. 2, Owyhee County, ID.* November 1988.

U.S. Army Corps of Engineers (USACE). 2004a. *Archives Search Report Supplement, Bruneau Precision Bombing Range No. 2, Owyhee County, ID.* November 2004.

U.S. Army Corps of Engineers (USACE). 2004b. *Preliminary Assessment for the Bruneau Precision Bombing Range No. 2, Owyhee County, ID*. Prepared by USACE St. Louis District. December 2004.

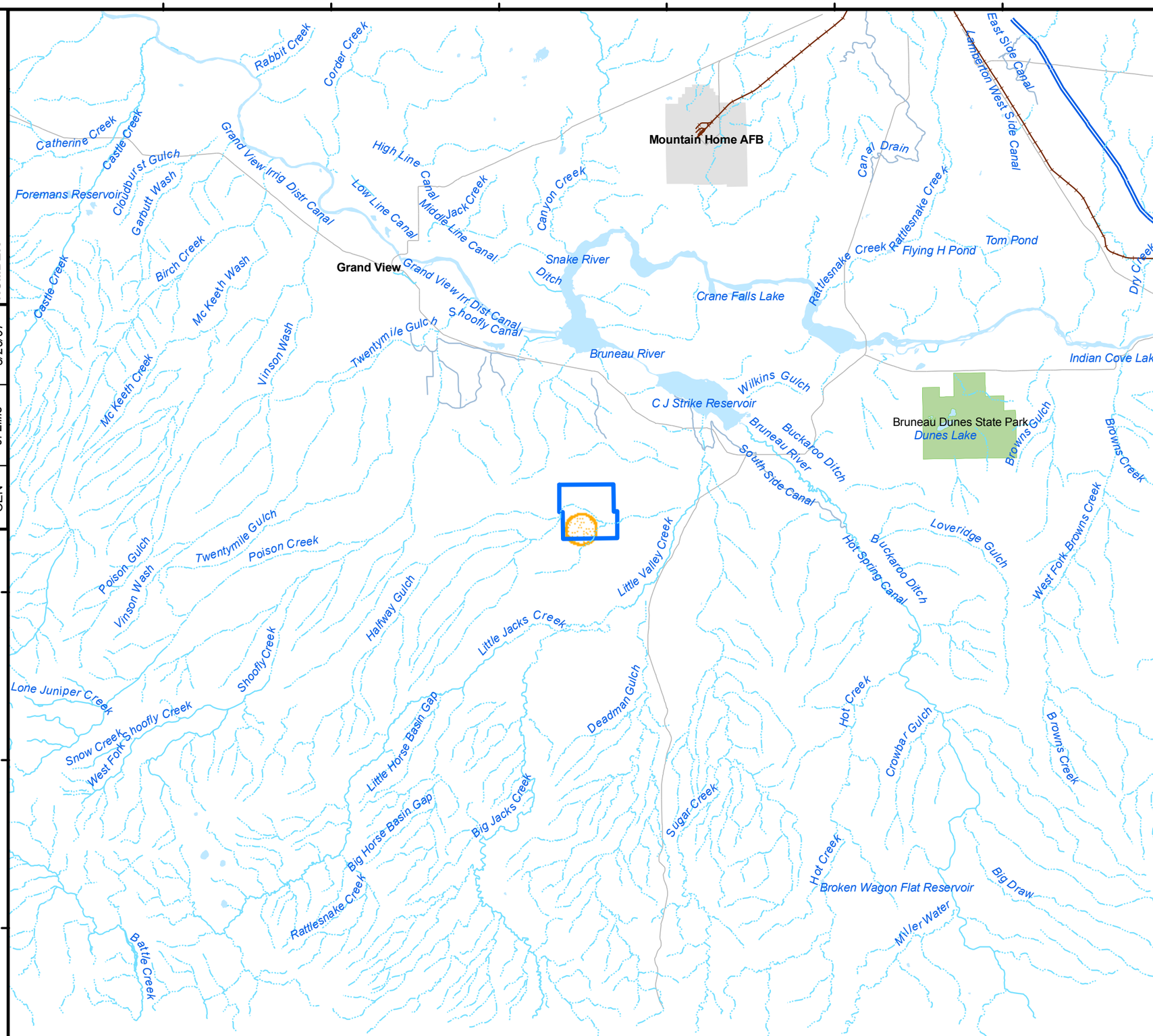
U.S. Census. 2000. Website: http://www.census.gov/main/www/cen2000.html.

U.S. Environmental Protection Agency (EPA). 2006. *Safe Drinking Water Information System (SDWIS)*. Website: http://www.epa.gov/enviro/html/sdwis/index.html. March 12, 2006.

U.S. Fish and Wildlife Service (USFWS). 2006. Personal communication between R. Baker (USFWS) and G. McGraw (Shaw). Subject: Threatened and Endangered Species at two Idaho Sites and USFWS requirements. August 21, 2006.

U.S. Fish and Wildlife Service (USFWS). 2007. *Idaho Endangered, Threatened, Proposed and Candidate Species by County.* http://www.fws.gov/idahoes/County/Owyhee.htm

Figures



Legend

- Bruneau PBR Property Boundary
- Bruneau PBR Areas of Concern

NOTES:
1) Site Property Boundaries were derived from the Bruneau PBR ASR Supplement.
2) This property is located within the C. J. Strike Reservoir Watershed.

N

0 2 4 8 Miles

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

U.S. ARMY CORPS OF ENGINEERS
OMAHA DESIGN CENTER

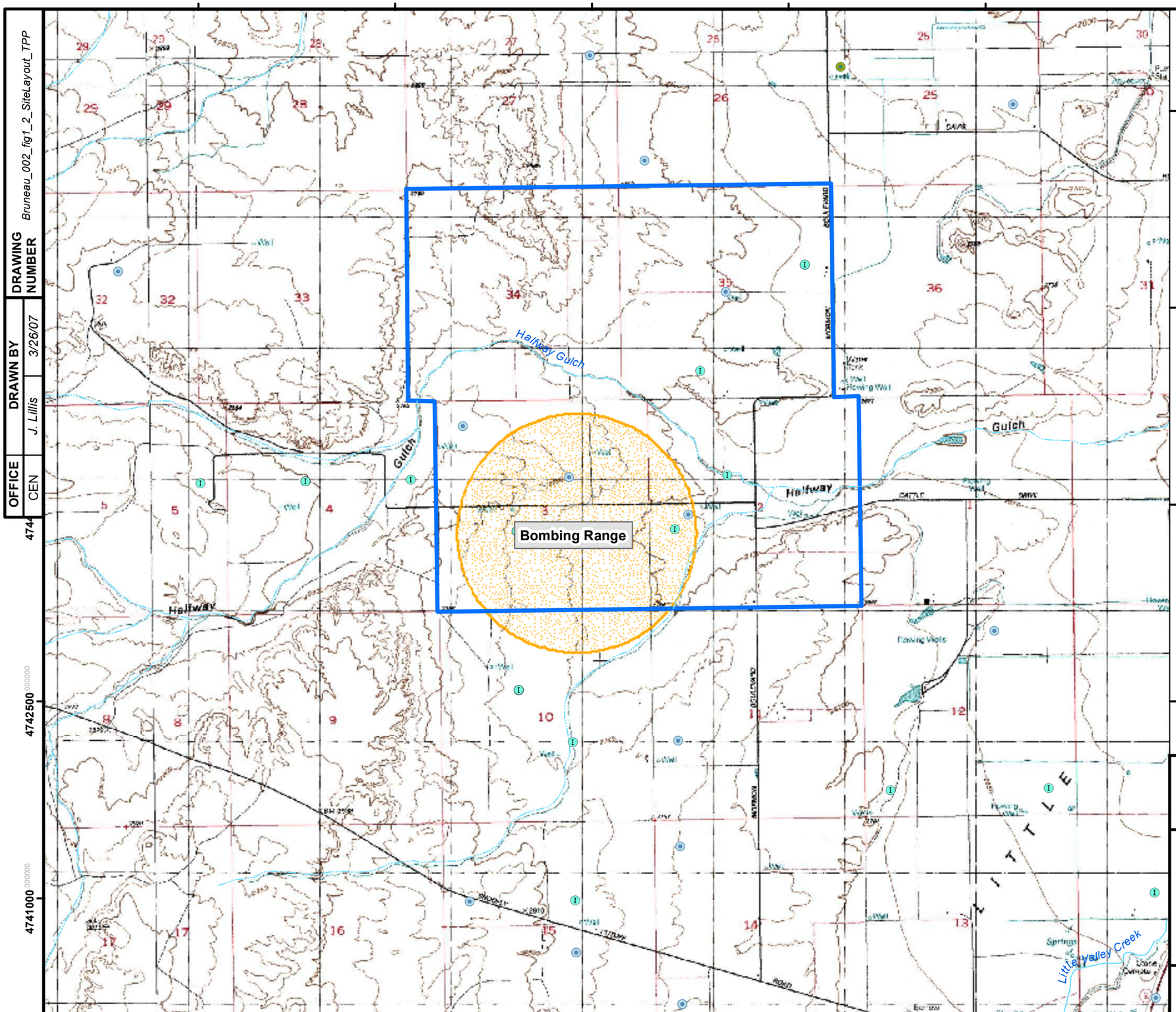
FIGURE 1

SITE LOCATION

BRUNEAU PBR

Shaw Environmental, Inc.

OFFICE	DRAWN BY		DRAWING NUMBER
CEN	J. Lillis	3/26/07	Bruneau_001_fig1_1_SiteLocation_TPP



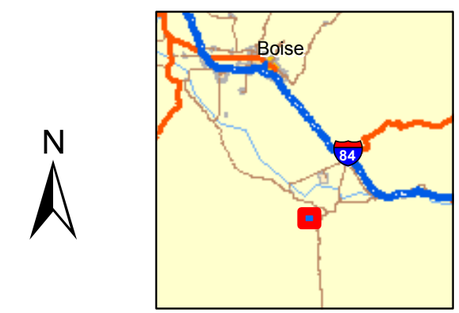
Legend

- Bruneau PBR Installation Boundary
- Bruneau PBR Areas of Concern

Groundwater Wells

- Domestic
- Irrigation
- Stockwater

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) Topographic map was obtained from USGS Terra Server; it is dated June 20, 1998.



N

0 1,000 2,000 4,000 Feet

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

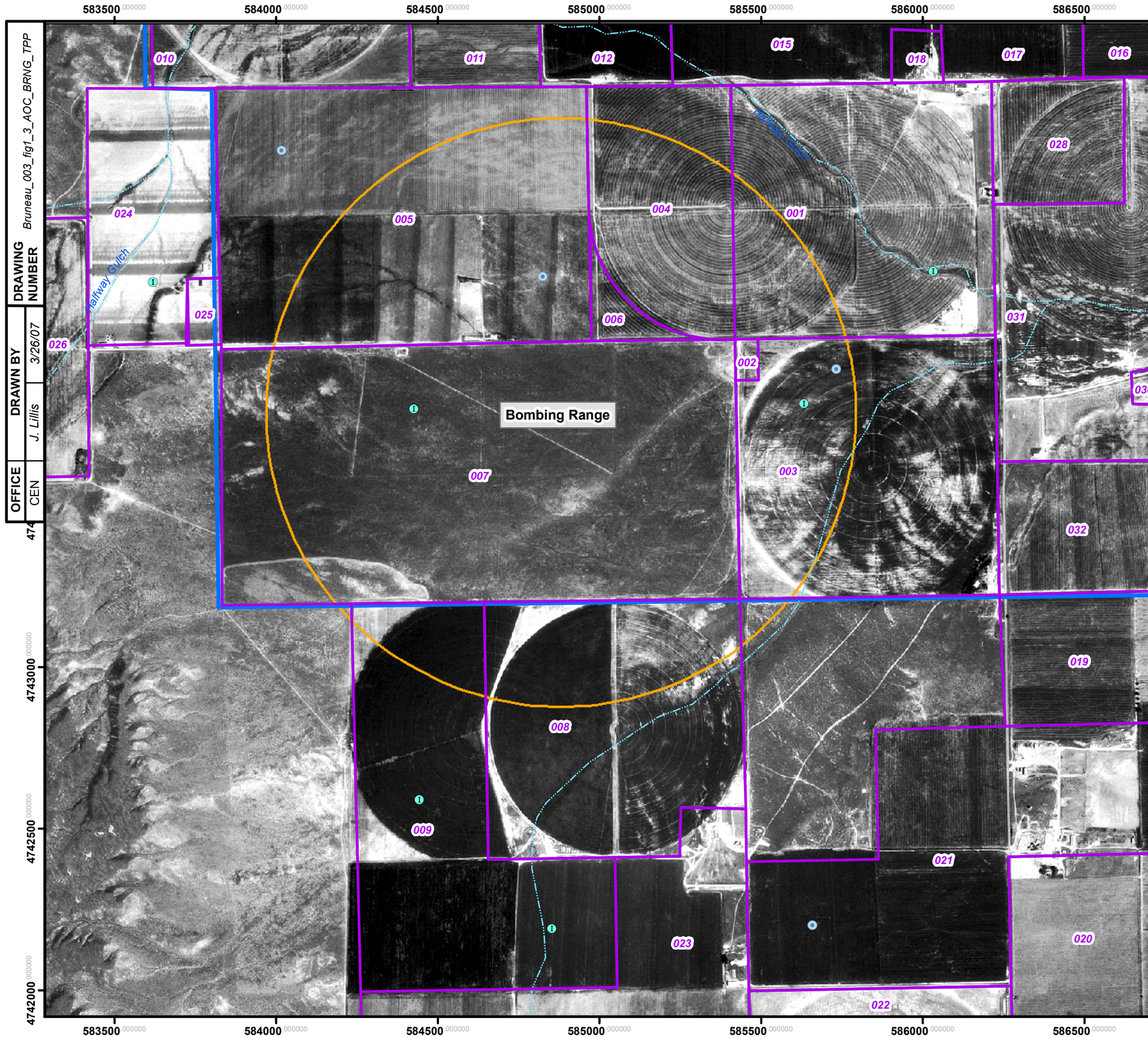
U.S. ARMY CORPS OF ENGINEERS
OMAHA DESIGN CENTER

FIGURE 2

SITE LAYOUT

BRUNEAU PBR

Shaw Environmental, Inc.



DRAWING NUMBER: Bruneau_003_fig1_3_AOC_BRNG_TPP

DRAWN BY: J. Lillis 3/26/07

OFFICE: CEN

Legend

- Bruneau PBR Installation Boundary
- Bruneau PBR Areas of Concern
- Taxlot Parcel

Groundwater Wells

- Domestic
- Irrigation

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 USGS Terra Server; it is dated June 20, 1998.

N

0 500 1,000 2,000 Feet

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

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FIGURE 3

PARCEL OWNERSHIP MAP

BRUNEAU PBR

Shaw Environmental, Inc.

XREF Files: IMAGE Files: airplane.jpg
File: N:\cad\DWG\116188-FUDS\116188SJ-a79.dwg Layout: Layout1 User: Karen.Black Apr 09, 2007 - 10:24am

OFFICE	DRAWN BY		DRAWING NUMBER	116188SJ-A79
SJ	K. Black	4-9-07		

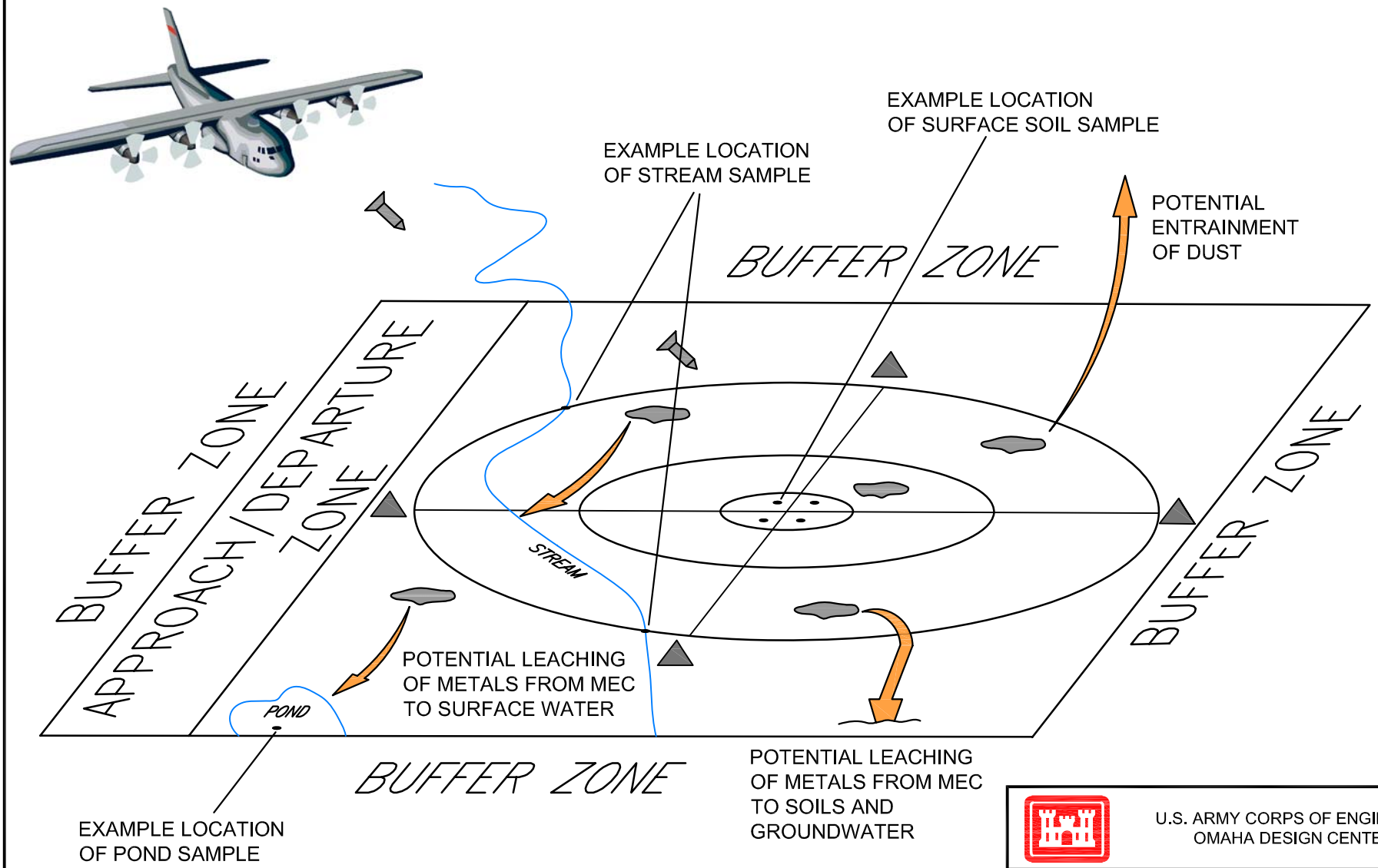

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FIGURE 4

CONCEPTUAL SITE MODEL
PRECISION BOMBING RANGE

BRUNEAU PRECISION BOMBING RANGE

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Tables

Table 1
Army Checklist for Important Ecological Places [a]
Bruneau PBR No. 2

	Criteria	Yes / No	Comments
1	Locally important ecological place identified by the Integrated Natural Resource Management Plan, BRAC Cleanup Plan or Redevelopment Plan, or other official land management plans	☐ / ☐	
2	Critical habitat for Federal designated endangered or threatened species	☐ / ☐	
3	Marine Sanctuary	☐ / ☐	
4	National Park	☐ / ☐	
5	Designated Federal Wilderness Area	☐ / ☐	
6	Areas identified under the Coastal Zone Management Act	☐ / ☐	
7	Sensitive Areas identified under the National Estuary Program or Near Coastal Waters Program	☐ / ☐	
8	Critical areas identified under the Clean Lakes Program	☐ / ☐	
9	National Monument	☐ / ☐	
10	National Seashore Recreational Area	☐ / ☐	
11	National Lakeshore Recreational Area	☐ / ☐	
12	Habitat known to be used by Federal designated or proposed endangered or threatened species	☐ / ☐	
13	National preserve	☐ / ☐	
14	National or State Wildlife Refuge	☐ / ☐	
15	Unit of Coastal Barrier Resources System	☐ / ☐	
16	Coastal Barrier (undeveloped)	☐ / ☐	
17	Federal land designated for protection of natural ecosystems	☐ / ☐	
18	Administratively Proposed Federal Wilderness Area	☐ / ☐	
19	Spawning areas critical for the maintenance of fish/shellfish species within river, lake, or coastal tidal waters	☐ / ☐	
20	Migratory pathways and feeding areas critical for maintenance of anadromous fish species within river reaches or areas in lakes or coastal tidal waters in which fish spend extended periods of time	☐ / ☐	
21	Terrestrial areas utilized for breeding by large or dense aggregations of animals	☐ / ☐	
22	National river reach designated as Recreational	☐ / ☐	
23	Habitat known to be used by state designated endangered or threatened species	☐ / ☐	
24	Habitat known to be used by species under review as to its Federal endangered or threatened status	☐ / ☐	
25	Coastal Barrier (partially developed)	☐ / ☐	
26	Federally designated Scenic or Wild River	☐ / ☐	
27	State land designated for wildlife or game management	☐ / ☐	
28	State-designated Scenic or Wild River	☐ / ☐	
29	State-designated Natural Areas	☐ / ☐	
30	Particular areas, relatively small in size, important to maintenance of unique biotic communities	☐ / ☐	
31	State-designated areas for protection or maintenance of aquatic life	☐ / ☐	
32	Wetlands	☐ / ☐	
33	Fragile landscapes, land sensitive to degradation if vegetative habitat or cover diminishes	☐ / ☐	

a – Based on EPA, 1990, 55 FR 51624, Table 4-23 – Sensitive Environments Rating Values, Dec. 14, 1990; EPA, 1997, ERAGS, Exhibit 1-1 List of Sensitive Environments

Table 2
MEC and MC Exposure Pathway Analysis – Precision Bombing Range
Bruneau Precision Bombing Range No. 2

Range Area	MMRP Concern	Potential Contaminant of Concern (PCOCs)	Affected Media (Potential Contaminant Sources) (Fate and Transport)	Exposure Routes and Potential Receptors			Data Gaps	Activities to Address Data Gaps (i.e., Sampling)
				Site Workers (ranch/agricultural) Landowners	Recreational & Trespassers (Hunters, etc.)	Biota		
Precision Bombing Range	MEC	• 100-lb General Purpose (GP) Bomb (AN-M30) • 100-lb Practice Bomb (M38A2) • Spotting Charge, (M1A1) • Bomb Tail Fuze, (AN-M100 Series) • Bomb Nose Fuze (AN-M103A1) • Small Arms (.50-caliber)	**Soil (Surface /Subsurface)** • Surface practice bomb debris cleared twice from range • Undetonated GP bombs may be buried due to impact - • Intact spotting charges, either the M1A1 or M3, are unlikely to be found • Unexploded ordnance, if present, may migrate toward land surface through repeated frost cycles or agricultural activities • Overall risk of injury from potential GP bombs at this site in considered moderate • Small arms rounds have low hazard	• Potentially complete pathway. • Exposure routes - Direct contact, - Intrusive activity.	• Potentially complete pathway. • Exposure routes: -Direct contact, - Intrusive activity.	• Potentially complete pathway. • Exposure routes: -Direct contact, -Burrowing.	Although surface of range has been cleared twice, the presence of remaining live munitions above or below ground is unknown.	Visual reconnaissance will be conducted to confirm the CSM.
	MC	Explosives Metals (antimony, copper, lead, and zinc) Perchlorate	**Soil** • Directly affected media. • Fate & Transport: secondary source of potential surface water, sediment, and groundwater contamination.	• Potentially complete pathway. • Exposure routes: -Dermal Contact, and -Inhalation of soil particulates during intrusive work.	• Potentially complete pathway. • Exposure routes: -Dermal Contact, and -Inhalation of soil particulates during intrusive work.	• Potentially complete pathway. • Exposure routes: - Ingestion, - Direct contact, and - Inhalation.	Analytical data do not exist.	Surface soil sampling. Visual reconnaissance will be conducted to select optimal sample locations.
			Surface Water / Sediment • Potential affected media. • Fate & Transport: infiltration to groundwater. • Potential incidental contact via ephemeral stream sediment.	• Potentially complete pathway. • Exposure routes: -Dermal Contact, and -Inhalation of soil particulates during intrusive work.	• Potentially complete pathway. • Exposure routes: -Dermal Contact, and -Inhalation of soil particulates during intrusive work.	• Potentially complete pathway. • Exposure routes: - Dermal contact, - Ingestion, and - Inhalation.	Analytical data do not exist.	Sediment sampling. Surface water not expected to be present due to dry climate.
			Groundwater • Potentially affected media. • Fate & Transport: migration potential is high for perchlorate, limited for metals.	• Potentially complete pathway. • Exposure routes: -Ingestion, -Dermal contact, and -Inhalation of water particles.	• Potentially complete pathway. • Exposure routes: -Ingestion, -Dermal contact, and -Inhalation of water particles.	• Incomplete pathway.	Analytical data do not exist.	Groundwater sampling from existing wells. Residential wells preferred if available and/or accessible.
			Air • Not an affected media under current land use.	Incomplete Pathway	Incomplete Pathway	Incomplete Pathway	None	None

Table 3
Proposed Sampling Approach
Bruneau PBR No. 2

AOC	Location to be Sampled	Number of Samples	Media to be Sampled			Contaminants of Concern						MEC Survey	Comments
			Surface Soil	Sediment	Ground-water	Explosives & Nitroglycerine		Metals (Sb, Cu, Pb, Zn)		Perchlorate			
						Soil/Sed	Ground-water	Soil/Sed	Ground-water	Soil/Sed	Ground-water		
1	Bombing Range	10	8	1	1	9	1	9	1	0	1	Yes	Four surface soil samples will be obtained from the center of the former bombing range and one from each quadrant surrounding the bombing range center. One sediment samples will be collected from Halfway Gulch at a location downgradient of the bombing range AOC One groundwater sample will be collected from well located within the bombing range AOC
	Background	12	10	1	1	2	1	11	1	0	1	Yes	Ten soil sample will be collected from BLM land located to the west of the bombing range AOC; 10 samples will be analyzed for metals while one sample will be analyze for explosives. One sediment sample will be collected from Halfway Gulch at a location upgradient (west) of the bombing range AOC. One groundwater sample will be collected upgradient (south or west) outside of the bombing range AOC
Sample Totals		**22**	**18**	**2**	**2**	**11**	**2**	**20**	**2**	**0**	**2**		
Quality Control Samples						1	1	2	1	0	1		
Total Samples to be Analyzed						**12**	**3**	**22**	**3**	**0**	**3**		

AOC = Areas of Concern

Surface soil and sediment samples are composite samples (7-point, wheel pattern with 2-foot radius – collected at depth of 0 to 6" below grade).

Table 4
Human Health Screening Criteria for Soil/Sediment at Idaho Sites [a]

Analyte	Abbreviation	CAS No.	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	121-82-4	4.4	16				4.4
Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	HMX	2691-41-0	3,100	31,000				3,100
2,4,6-Trinitrotoluene	2,4,6-TNT	118-96-7	16	57			0.0134	0.0134
1,3,5-Trinitrobenzene	1,3,5-TNB	99-35-4	1,800	18,000				1,800
1,3-Dinitrobenzene	1,3-DNB	99-65-0	6.1	62				6.1
2,4-Dinitrotoluene	2,4-DNT	121-14-2	0.72[e]	2.5[e]	0.00004	0.0008	0.00029	0.00029
2,6-Dinitrotoluene	2,6-DNT	606-20-2	0.72[e]	2.5[e]	0.00004	0.0008	0.00021	0.00021
2-Amino-4,6-dinitrotoluene	2-Am-DNT	35572-78-2	12	120				12
2-Nitrotoluene	2-NT	88-72-2	0.88	2.2				0.88
3-Nitrotoluene	3-NT	99-08-1	730	1,000				730
4-Amino-2,6-dinitrotoluene	4-Am-DNT	19406-51-0	12	120				12
4-Nitrotoluene	4-NT	99-99-0	12	30				12
Nitrobenzene	NB	98-05-3	20	100	0.007	0.1	0.0218	0.0218
Nitroglycerin	NG	55-63-0	35	120				35
Methyl-2,4,6-trinitrophenylnitramine	Tetryl	479-45-8	610	6,200				610
Pentaeryltritol tetranitrate	PENT	78-11-5						
Antimony	Sb	7440-36-0	31	410	0.30	5	4.77	4.77
Copper	Cu	7440-50-8	3,100	41,000			921	921
Lead	Pb	7439-92-1	400	800			49.6	49.6
Zinc	Zn	7440-66-6	23,000	100,000	620	12,000	886	886

DAF = Dilution Attenuation Factor
PRG = Preliminary Remediation Goal
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 5
Human Health Screening Criteria for Surface Water at Idaho Sites[a]

			Region 9 Tap Water PRG[b] (µg/L)	Federal Ambient Water Criteria for Consumption of:		Idaho Surface Water Standards		Selected Screening Value (µg/L)
				Water and Organism[c] (µg/L)	Organism Only[c] (µg/L)	Water and Organism[d] (µg/L)	Organism Only[d] (µg/L)	
Hexahydro-1,3,5-trinitro-1,3,5-triazine	RDX	121-82-4	0.61					0.61
Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	HMX	2691-41-0	1,800					1,800
2,4,6-Trinitrotoluene	2,4,6-TNT	118-96-7	2.2					2.2
1,3,5-Trinitrobenzene	1,3,5-TNB	99-35-4	1,100					1,100
1,3-Dinitrobenzene	1,3-DNB	99-65-0	3.6					3.6
2,4-Dinitrotoluene[e]	2,4-DNT	121-14-2	0.099	0.11	3.4	0.11	9.1	0.11
2,6-Dinitrotoluene[e]	2,6-DNT	606-20-2	0.099					0.099
2-Amino-4,6-dinitrotoluene	2-Am-DNT	35572-78-2	7.3					7.3
2-Nitrotoluene	2-NT	88-72-2	0.049					0.049
3-Nitrotoluene	3-NT	99-08-1	120					120
4-Amino-2,6-dinitrotoluene	4-Am-DNT	19406-51-0	7.3					7.3
4-Nitrotoluene	4-NT	99-99-0	0.66					0.66
Nitrobenzene	NB	98-05-3	3.4	17	690[i]	17	1,900	17
Nitroglycerin	NG	55-63-0	4.8					4.8
Methyl-2,4,6-trinitrophenylnitramine	Tetryl	479-45-8	360					360
Pentaeryltritol tetranitrate	PETN	78-11-5						
Antimony	Sb	7440-36-0	15	5.6	640	14	4,300	5.6
Copper	Cu	7440-50-8	1,500	1,300[f]				1,300[f]
Lead	Pb	7439-92-1						
Zinc	Zn	7440-66-6	11,000	7,400[f]	26,000[f]			7,400[f]

PRG = Preliminary Remediation Goal
µg/L = micrograms per liter

[a] If laboratory cannot meet these 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.

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

[c] National Recommended Water Quality Criteria, U.S. Environmental Protection Agency (EPA), Office of Water, 2006. These constituents are considered priority pollutants unless indicated otherwise.

[d] Surface Water Standards from Idaho Risk Evaluation Manual, Table 3-5, dated July 2004, based on single chemical.

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

[f] The organoleptic effect criterion is more stringent than the value for priority toxic pollutants..

Table 6
Human Health Screening Criteria for Groundwater at Idaho Sites[a]

			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	121-82-4	0.61			0.61
Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	HMX	2691-41-0	1,800			1,800
2,4,6-Trinitrotoluene	2,4,6-TNT	118-96-7	2.2		1.86[f]	1.86[f]
1,3,5-Trinitrobenzene	1,3,5-TNB	99-35-4	1,100			1,100
1,3-Dinitrobenzene	1,3-DNB	99-65-0	3.6			3.6
2,4-Dinitrotoluene	2,4-DNT	121-14-2	0.099[e]		0.0822[f]	0.0822[f]
2,6-Dinitrotoluene	2,6-DNT	606-20-2	0.099[e]		0.0822[f]	0.0822[f]
2-Amino-4,6-dinitrotoluene	2-Am-DNT	35572-78-2	7.3			7.3
2-Nitrotoluene	2-NT	88-72-2	0.049			0.049
3-Nitrotoluene	3-NT	99-08-1	120			120
4-Amino-2,6-dinitrotoluene	4-Am-DNT	19406-51-0	7.3			7.3
4-Nitrotoluene	4-NT	99-99-0	0.66			0.66
Nitrobenzene	NB	98-05-3	3.4		5.21[f]	5.21[f]
Nitroglycerin	NG	55-63-0	4.8			4.8
Methyl-2,4,6-trinitrophenylnitramine	Tetryl	479-45-8	360			360
Pentaeryltritol tetranitrate	PETN	78-11-5				
Perchlorate	CLO4	14797-73-0	3.6			24[h]
Antimony	Sb	7440-36-0	15	6	6	6
Copper	Cu	7440-50-8	1,500	1,000[g]		1,000[g]
Lead	Pb	7439-92-1		15[i]	15	15
Zinc	Zn	7440-66-6	11,000	5,000[g]	3,130[f]	3,130[f]

MCL = Maximum Contaminant Level

PRG = Preliminary Remediation Goal

µg/L = micrograms per liter

IDTL = Initial Default Target Level

[a] If laboratory cannot meet these 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.

[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
Selection of Ecological Soil Screening Toxicity Values for Constituents of Potential Ecological Concern

	SSLs (EPA, 2005)[a]	ODEQ Level II Screening Level [b]	Proposed Benchmarks									Potential Bioaccumulative Constituent? [i]	Final Ecological Screening Value Soil [j]
	Lowest Value for Plants/Invertebrates, Mammals and Birds		Region 5 ESLs [c] (2003)	Region 7 [d]		Region 8 [e]		Region 10 [f]		Other Values: Talmage et al. (1999) [g] or LANL (2005) [h]			
	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)		(mg/kg)		(mg/kg)		(mg/kg)			(mg/kg)
Metals/Inorganics													
Antimony	0.27	5	0.142	0.27	SSL	0.27	SSL	0.27	SSL	0.05	LANL	Yes	5
Copper		50	5.4	60	ORNL	190	Dutch	60	ORNL	10	LANL	Yes	50
Lead	11	16	0.0537	11	SSL	11	SSL	11	SSL	14	LANL	Yes	11
Zinc		50	6.62	8.5	ORNL	8.5	ORNL	8.5	ORNL	10	LANL	Yes	50
Explosive													
2,4-Dinitrotoluene		NVA	1.28	1.28	EPA-R4	NVA		1.28	EPA-R4	0.52	LANL		0.52
2,6-Dinitrotoluene		NVA	0.0328	0.0328	EPA-R4	NVA		0.0328	EPA-R4	0.37	LANL		0.37
2-Amino-4,6-Dinitrotoluene		NVA	NVA	NVA		NVA		NVA		2.1	LANL		2.1
4-Amino-2,6-Dinitrotoluene		NVA	NVA	NVA		NVA		NVA		0.73	LANL		0.73
1,3-Dinitrobenzene		NVA	0.655	0.655	EPA-R4	NVA		0.655	EPA-R4	0.073	LANL		0.073
HMX		NVA	NVA	NVA		NVA		NVA		27	LANL		27
Nitrobenzene		8	1.31	1.31	EPA-R4	NVA		1.31	EPA-R4	2.2	LANL		8
RDX		NVA	NVA	NVA		NVA		NVA		7.5	LANL		7.5
1,3,5-Trinitrobenzene		NVA	0.376	0.376	EPA-R4	NVA		0.376	EPA-R4	6.6	LANL		6.6
2,4,6-Trinitrotoluene		NVA	NVA	NVA		NVA		NVA		6.4	LANL		6.4
2-Nitrotoluene		NVA	NVA	NVA		NVA		NVA		2.0	LANL		2.0
3-Nitrotoluene		NVA	NVA	NVA		NVA		NVA		2.4	LANL		2.4
4-Nitrotoluene		NVA	NVA	NVA		NVA		NVA		4.4	LANL		4.4
Nitroglycerin		NVA	NVA	NVA		NVA		NVA		71	LANL		71
Tetryl		NVA	NVA	NVA		NVA		NVA		0.99	LANL		0.99
PETN		NVA	NVA	NVA		NVA		NVA		8600	LANL		8600

Note: No Idaho Ecological Screening Values available.
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
Selection of Ecological Soil Screening Toxicity Values for Constituents of Potential Ecological Concern

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
Selection of Ecological Sediment Screening Toxicity Values for Constituents of Potential Ecological Concern

Parameter	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)		Potential Bioaccumulative Constituent? [g]	Final Ecological Screening Value Sediment [h] (mg/kg)
Metals/Inorganics												
Antimony	3.00E+00	NVA	NVA		NVA		NVA		3.60E-01	LANL	Yes	3.00E+00
Copper	1.00E+01	3.16E+01	3.16E+01	MAC	3.16E+01	MAC	3.16E+01	MAC	1.70E+01	LANL	Yes	1.00E+01
Lead	3.50E+01	3.58E+01	3.58E+01	MAC	3.58E+01	MAC	3.58E+01	MAC	2.70E+01	LANL	Yes	3.50E+01
Zinc	3.00E+00	1.21E+02	1.21E+02	MAC	1.21E+02	MAC	1.21E+02	MAC	3.70E+01	LANL	Yes	3.00E+00
Explosives												
RDX	NVA	NVA	NVA		NVA		NVA		1.30E-01	TAL		1.30E-01
HMX	NVA	NVA	NVA		NVA		NVA		4.70E-02	TAL		4.70E-02
1,3,5-Trinitrobenzene	NVA	NVA	NVA		NVA		NVA		2.40E-02	TAL		2.40E-02
1,3-Dinitrobenzene	NVA	8.61E-03	NVA		NVA		NVA		6.70E-02	TAL		6.70E-02
2,4-Dinitrotoluene	NVA	1.44E-03	NVA		NVA		NVA		2.90E-01	LANL		2.90E-01
2,6-Dinitrotoluene	NVA	3.98E-03	NVA		NVA		NVA		1.90E+00	LANL		1.90E+00
2,4,6-TNT	NVA	NVA	NVA		NVA		NVA		9.20E-01	TAL		9.20E-01
2-Amino-4,6,-Dintrotoluene	NVA	NVA	NVA		NVA		NVA		7.00E+00	LANL		7.00E+00
4-Amino-2,6,-Dintrotoluene	NVA	NVA	NVA		NVA		NVA		1.90E+00	LANL		1.90E+00
2-Nitrotoluene	NVA	NVA	NVA		NVA		NVA		5.60E+00	LANL		5.60E+00
3-Nitrotoluene	NVA	NVA	NVA		NVA		NVA		4.90E+00	LANL		4.90E+00
4-Nitrotoluene	NVA	NVA	NVA		NVA		NVA		1.00E+01	LANL		1.00E+01
Nitrobenzene	NVA	1.45E-01	NVA		NVA		NVA		3.20E+01	LANL		3.20E+01
Nitroglycerin	NVA	NVA	NVA		NVA		NVA		1.70E+03	LANL		1.70E+03
Tetryl	NVA	NVA	NVA		NVA		NVA		1.00E+02	LANL		1.00E+02
PETN	NVA	NVA	NVA		NVA		NVA		1.20E+05	LANL		1.20E+05

Note: No Idaho Ecological Screening Values available.
NVA = No Value Available

[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.

Table 9
Selection of Ecological Surface Water Screening Toxicity Values for Constituents of Potential Ecological Concern

Parameter	IDEQ Screening Level Values[a] (mg/L) Freshwater	Region 5 Ecological Screening Levels[b] (mg/L)	EPA Region 7 [c] (mg/L)		EPA Region 8 [d] (mg/L)		EPA Region 10 [e] (mg/L)		Other Ecological Screening Values[f] (mg/L)		Potential Bioaccumulative Constituent? [g]	Final Ecological Value Surface Water [h] (mg/L)
Metals/Inorganics												
Antimony	NVA	8.00E-02	3.00E-02	EPRG	3.00E-02	Tier II	3.00E-02	EPRG	1.00E-01	LANL	Yes	3.00E-02
Copper (dissolved)	1.14E-02	1.58E-03	9.00E-03	AWQC	9.00E-03	AWQC	9.00E-03	AWQC	5.00E-03	LANL	Yes	1.14E-02
Lead (dissolved)	2.51E-03	1.17E-03	2.50E-03	AWQC	2.50E-03	AWQC	2.50E-03	AWQC	1.20E-03	LANL	Yes	2.51E-03
Zinc (dissolved)	1.05E-01	6.57E-02	1.20E-01	AWQC	1.20E-01	AWQC	1.20E-01	AWQC	6.60E-02	LANL	Yes	1.05E-01
Explosives												
RDX	NVA	NVA	NVA		NVA		NVA		1.90E-01	TAL		1.90E-01
HMX	NVA	NVA	NVA		NVA		NVA		3.30E-01	TAL		3.30E-01
1,3-Dinitrobenzene	NVA	2.20E-02	NVA		NVA		NVA		2.00E-02	TAL		2.00E-02
1,3,5-Trinitrobenzene	NVA	NVA	NVA		NVA		NVA		1.00E-02	TAL		1.00E-02
2-Nitrotoluene	NVA	NVA	NVA		NVA		NVA		8.00E+00	LANL		8.00E+00
3-Nitrotoluene	NVA	NVA	NVA		NVA		NVA		9.60E+00	LANL		9.60E+00
4-Nitrotoluene	NVA	NVA	NVA		NVA		NVA		1.70E+01	LANL		1.70E+01
2,4-Dinitrotoluene	NVA	4.40E-02	NVA		NVA		NVA		3.10E-01	LANL		3.10E-01
2,6-Dinitrotoluene	NVA	8.10E-02	NVA		NVA		NVA		6.00E-02	LANL		6.00E-02
2-Amino,4,6-Dinitrotoluene	NVA	NVA	NVA		NVA		NVA		2.00E-02	TAL		2.00E-02
4-Amino-2,6-Dinitrotoluene	NVA	NVA	NVA		NVA		NVA		8.60E+00	LANL		8.60E+00
2,4,6-Trinitrotoluene	NVA	NVA	NVA		NVA		NVA		9.00E-02	TAL		9.00E-02
Nitrobenzene	NVA	2.20E-01	NVA		NVA		NVA		2.70E-01	LANL		2.70E-01
Nitroglycerin	NVA	NVA	NVA		NVA		NVA		4.30E+02	LANL		4.30E+02
PETN	NVA	NVA	NVA		NVA		NVA		2.60E+04	LANL		2.60E+04
Tetryl	NVA	NVA	NVA		NVA		NVA		5.80E+00	LANL		5.80E+00

NVA = No Value Available

[a] Idaho Department of Environmental Quality, *Risk Evaluation Manual*, Final, July 2004, Fresh Water Standards, Criterion Continuous. Hardness of 100 mgL $CaCO_3$ assumed.
[b] Ecological Screening Levels (ESLs), U.S.EPA Region 5, August 2003.
[c] EPA Region 7: Catherine Wooster-Brown (Eco Risk Assessor) recommends the following hierarchy: National Ambient Water Quality Criteria; ORNL Effroymson values (ORNL, 1977).
[d] EPA Region 8: Dale Hoff (Eco Risk Assessor) recommends the following hierarchy: National Ambient Water Quality Criteria; Great Lakes Tier II Values; Canadian Environmental Quality Guidelines (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. 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: *Bioaccumulation and Interpretation for the Purposes of Sediment Quality Assessment: Status and Needs* (EPA, 2000).
[h] Final Screening Value selected using the following hierarchy:
1. State Value (Idaho)
2. EPA Region State Located In (EPA Region 10)
3. Lower of Talmage et al. [TAL] (1999) or LANL (2005) values.

AWQC=National Ambient Water Quality Criteria
LANL= Los Alamos National Laboratory
Tier II=Great Lakes Tier II Water Quality Criteria
EPRGs=Oak Ridge National Laboratory Ecological PRGs
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 Environmental Quality Guidelines (for Freshwater) Summary Table, CCME, December 2003.

Great Lakes Tier II Values from Suter, G.W. and C.L. Tsao, 1996, *Toxicological Benchmarks for Screening Potential Contaminants of Concern for Effects on Aquatic Biota: 1996 Rev*, ES/ER/TM-96/R2.
National AWQC from EPA Water Quality Criteria Web Site: http://www.epa.gov/waterscience/criteria/wqcriteria.html

Draft Worksheets

Site Information Worksheet
MRSPP Data Gaps
HRS Data Gaps

Site Information Worksheet (in Progress)

Site: **Precision Bombing Range**

Project: **Bruneau PBR No. 2**

	Site Information Needed[a]	**Suggested Means to Obtain Site Information**	**Potential Source(s) of Site Information**	**Responsible for Obtaining**	**Deadline for Obtaining Site Information**
1	Local well information	Idaho Department of Water Resources	Idaho Department of Water Resources	Shaw	For completion of Site Specific Work Plan
2	Sensitive Environments	U.S. Fish and Wildlife Service	U.S. Fish and Wildlife Service	Shaw	For completion of Site Specific Work Plan
		Idaho Department of Fish and Game	Idaho Department of Fish and Game		

Munitions Response Site Prioritization Protocol (MRSPP) Data Gaps (in progress)
32 CFR Part 179

Installation: Bruneau PBR No. 2
AOC: Precision Bombing Range
RMIS Range ID: F10OR0172

Module	Table No.	Table Description	Data Gap	Potential Source of Information to Fill Data Gap	No Data Gap	Description of Known Data
Explosive Hazard Evaluation (EHE)	1	Munitions Type			x	Provided in Archive Search Report
	2	Source of Hazard			x	Provided in Archive Search Report
	3	Location of Munitions			x	Provided in Archive Search Report
	4	Ease of Access		Rights of Entry to be obtained by USACE	x	Provided in Archive Search Report
	5	Status of Property			x	Provided in Archive Search Report
	6	Population Density	x	Update information in PA (US Census)		
	7	Population Near Hazard	x	Update information in PA (US Census)		
	8	Activities/Structures			x	Provided in Archive Search Report
	9	Ecological and/or Cultural Resources	x	Update information in PA (USFWS & SHPO)		
	10	EHE Module Score	x	Evaluation pending filling of data gaps		
Chemical Warfare Materiel (CWM) Hazard Evaluation (CHE)	11	CWM Configuration			x	Historical evidence indicates that CWM are not present
	12	Sources of CWM			x	Historical evidence indicates that CWM are not present
	13	Location of CWM			x	Historical evidence indicates that CWM are not present
	14	Ease of Access			x	Historical evidence indicates that CWM are not present
	15	Status of Property			x	Historical evidence indicates that CWM are not present
	16	Population Density			x	Historical evidence indicates that CWM are not present
	17	Population Near Hazard			x	Historical evidence indicates that CWM are not present
	18	Activities/Structures			x	Historical evidence indicates that CWM are not present
	19	Ecological and/or Cultural Resources			x	Historical evidence indicates that CWM are not present
	20	CHE Module Score			x	Historical evidence indicates that CWM are not present
Health Hazard Evaluation (HHE)	21	HHE Factor Levels	x	Contaminant hazard evaluation pending analytical results		
	22	HHE Three-Letter Combination Levels	x	Contaminant hazard evaluation pending analytical results		
	23	HHE Module Ratings	x	Contaminant hazard evaluation pending analytical results		
	24	HHE Module Rating	x	Contaminant hazard evaluation pending analytical results		
MRS Priority	**25**	**MRS Priority (Based on Highest Hazard Evaluation Module Rating)**	**x**	**Evaluation pending filling of data gaps**		

To be completed by USACE once all data gaps are filled.

Bruneau PBR No. 2 HRS Data Gaps[a]

Item	Number	Comment – Missing Data Element
1	1.8	Confirm the latitude / longitude of potential source(s) and the accuracy of the information (in meters)
2		Source scale (i.e., 1:24,000, etc.)
3	1.12	Site Permits
4	2.4	Confirm if there are other NPL sites within 1 mile of the site
5	5.3	Population within 1 mile, within 4 miles
6	6	Water use (GW within 4 miles, SW within 15 miles)
7	6.1	Total drinking water population served
8	6.2	Type of drinking water supply system (GW or SW?)
9	6.3	Other water uses of GW within 4 miles
10	6.5	Surface water uses
11	6.6	Type of SW adjacent to (within 2 miles) of the site
12	8.1	Types of action(s) that have occurred at or near the site
13	8.2	Who did the action? (EPA, Private parties, other, etc.?)

[a] Information required to complete the MEC-HRS data collection form: