CAMP BONNEVILLE
BONNEVILLE CONSERVATION, RESTORATION, AND RENEWAL TEAM (BCRRT)
INTERIM ACTION WORK PLAN

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LIST OF ACRONYMS/ABBREVIATIONS

AAR	After Action Report
ASB	Anomaly Selection Board
BCRRT	Bonneville Conservation Restoration and Renewal Team, LLC
BRAC	Base Realignment and Closure
CBMR	Camp Bonneville Military Reservation
CITA	Central Impact Target Area
CM	Construction Manager
DA	Department of the Army
DDESB	Department of Defense Explosive Safety Board
DoD	Department of Defense
EAWP	Emergency Action Work Plan
EOD	Explosive Ordnance Disposal
ESCA	Environmental Services Cooperative Agreement
ESS	Explosive Safety Submission
FBI	Federal Bureau of Investigation
FTP	File Transfer Protocol
GDL	Grid Data Log
GIS	Geographical Information Systems
GPS	Global Positioning System
HASP	Health and Safety Plan
IAWP	Interim Action Work Plan
MD	Munitions Debris
MEC	Munitions and Explosives of Concern
MPPEH	Materials Potentially Presenting Explosive Hazard
MRS	Munitions Response Site
MTCA	Washington State Model Toxics Control Act
OB/OD	Open Burn/Open Detonation
OSHA	Occupational Health and Safety Association
POC	Point of Contact
PPCD	Prospective Purchaser Consent Decree
QA	Quality Assurance
QA/QC	Quality Assurance/Quality Control
QC	Quality Control
RAU	Remedial Action Unit
SUXOS	Senior Unexploded Ordnance Supervisor
TBD	To Be Determined
TCRA	Time Critical Removal Action
USATCES	U.S. Army Technical Center for Explosive Safety
UTM	Universal Transverse Mercator
UXO	Unexploded Ordnance
UXOQCS	Unexploded Ordnance Quality Control Supervisor
WDNR	Washington State Department of Natural Resources
WDOE	Washington State Department of Ecology

1.0 INTRODUCTION

1.1 General Introduction

This Interim Action Work Plan (IAWP) has been prepared on behalf of the Bonneville Conservation Restoration and Renewal Team, LLC (BCRRT) to meet the requirements of the Prospective Purchaser Consent Decree (PPCD) concerning the remediation of the former Camp Bonneville, located in Clark County, Washington (the Property). The IAWP defines the nature, procedures to be employed and extent of certain interim actions associated with Remedial Action Unit (RAU) 3 and RAU 2A. These interim actions are intended to investigate and aid in the cleanup of the Property and to reduce the threat to human health and safety associated with Military Munitions and other contamination located within the Property.

1.1.1 Status of this Interim Action per the PPCD

The mutual objectives of the PPCD, as agreed to by the Washington Department of Ecology (WDOE), Clark County, and the BCRRT, are to provide for remedial actions at the Property where there have been releases or threatened releases of hazardous substances and to resolve the potential liability of Clark County and the BCRRT for remedial actions within the Property. This Decree requires Clark County and the BCRRT to remediate the former Camp Bonneville as defined in the Decree. The overall interim actions described in this IAWP and its subsequent amendments are the activities to be conducted under the Camp Bonneville PPCD. The interim actions will follow the brush clearance procedures established in the Emergency Action Work Plan (EAWP) for the Perimeter and Central Impact Target Area (CITA) (BCRRT, 2006). These interim actions are intended to investigate and aid in the cleanup of the Property and to reduce the threat to human health and safety associated with Military Munitions and other contamination located within the Property.

The complete listing of the interim actions to be conducted, under this IAWP, is presented below. This document will be used in conjunction with the Explosives Safety Submittal (ESS) for these actions (MKM, 2007).

This document contains the procedures for MEC surface clearance of the roads and trails areas in RAU 3 and firing ranges in RAU 2A, but the procedures for the Munitions and Explosives of Concern (MEC) investigation, removal, and disposal are not addressed since these procedures are presented for approval through the submission of the ESS. Once ESS approval has been obtained, the MEC investigation, removal and disposal procedures specified in the ESS will be used to perform these operations within this IAWP.

1.1.2 Interim Actions to be Performed

The interim actions to be performed include clearance of a 20-foot area on either side of all roads and trails in RAU 3 and those firing ranges in RAU 2A designated for cleanup action as part of RAU 2A remediation. The actions include:

- Brush clearance out to twenty feet on each side of roads and trails and of the firing range investigation areas (following anomaly avoidance procedures as detailed in the EAWP for the Perimeter and CITA emergency actions until ESS approval is obtained and this plan amended with MEC surface clearance procedures); and

- A surface clearance for MEC (see **Section 3.3** for additional specifications regarding MEC the MEC surface clearance and step-out procedures).

1.1.3 Contribution of This Interim Action to Meeting the Overall Cleanup Goals Set Forth in the Model Toxics Control Act (MTCA) and the PPCD

The brush and MEC surface clearance that will be conducted as part of the overall interim actions will be used to increase the BCRRT's understanding of the presence of MEC across the Property and will assist in the reduction of risk to human health and safety associated with MEC on the Property. These activities are protective of human health and safety and further the objectives of the PPCD (see **Section 1.1.1**).

1.2 General Statement of Work under this Interim Action

1.2.1 Vegetation and MEC Surface Clearance of Roads and Trails, Buffer Zones, and Firing Ranges

Over the last 10 years, following the Base Realignment and Closure (BRAC) closure of Camp Bonneville, the growth of vegetation has overtaken a number of the roads, trails, and firing ranges. In order to safely complete remedial actions, an extensive amount of brush clearance will be required. In addition, to reduce the threat to human health and safety associated with military munitions and other contamination located within the Property, a MEC surface clearance will be conducted where vegetation clearance/anomaly avoidance has been accomplished once the ESS is approved. The PPCD requires brush and MEC surface clearance within the 20-foot wide area in areas adjacent to all roads and trails and across the firing ranges. In addition, these actions are required to allow for the subsequent safe remediation of lead impacted soils at the firing ranges included in RAU 2A cleanup actions.

1.3 Legal and Regulatory Basis

1.3.1 Prospective Purchaser Consent Decree

The actions detailed in this IAWP are defined in Section X-C of the PPCD and are interim actions associated with RAU 2A and RAU 3 for the purpose investigating and aiding in the cleanup of the Property and to reduce the threat to human health and safety associated with Military Munitions and other contamination located within the Property.

1.3.2 Washington State Model Toxics Control Act

The actions detailed in this IAWP are compliant with the requirements of Washington State Model Toxics Control Act (MTCA).

1.4 Documents Incorporated by Reference

1.4.1 Site-Wide Health and Safety Plan

A site-wide HASP has been developed for the Camp Bonneville project to cover all remedial activities required to achieve site closure as defined in the PPCD. A Health and Safety Plan (HASP) was developed in compliance with WDOE and Occupational Health and Safety Association (OSHA) requirements and was submitted under separate cover to WDOE for review. The requirements of the HASP will be followed throughout the implementation of the interim actions defined in this IAWP (Baker 2006).

1.4.2 Cultural and Historical Resources Protection Plan

As required by the PPCD, BCRRT has prepared a Cultural and Historical Resources Protection Plan to be used during all fieldwork. This plan includes information and guidance for workers to identify cultural and historical resources encountered during the implementation of activities detailed in this IAWP and plans for the protection of any cultural and historical resources identified during the course of this work. A training session for site workers has been developed and presented to site workers by members of the Cowlitz tribe and associated archaeological experts to address the history of Native American cultures at the Property and provide guidance as to the identification and protection of artifacts that may be encountered during the implementation of interim actions at the Property (Baker 2006).

1.5 Summary of Site History and Status

The Property was established in 1909 as a drill field and rifle range for Vancouver Barracks. In 1912, an appropriation was made to expand facilities to include target ranges and a road leading to the installation. There are two cantonment areas in Camp Bonneville: Camp Bonneville and Camp Killpack. These cantonments were built during the 1920s and 1930s and include 49 buildings. Camp Bonneville consists of 3,020 acres formerly owned by the Army and transferred by deed transfer to Clark County and then to the BCRRT on October 4, 2006 (see **Figure 1-1**). The Army leased an additional 820 acres from the Washington Department of Natural Resources (WDNR). The WDNR leased property will be remediated in accordance with the PPCD and the ESCA. The Army's lease of this property is ending and will be replaced by a lease between WDNR and Clark County.

Camp Bonneville's mission was to provide a training camp for active, reserve, and guard units of the United States Army, Navy, Marine Corps, and Coast Guard. Training exercises generally included weapons training with small arms ammunition, assault weapons, and field and air defense artillery. Between 1909 and 1995, live and practice munitions including artillery and mortar rounds, shoulder-fired rockets, land mines (practice only), grenades, and small-arms ammunition were stored and used on the Property. In the 1980s, the Property was also used for non-military purposes including religious retreats, picnicking, camping, educational purposes, and pistol training for the State Police. The Federal Bureau of Investigation (FBI) currently operates a small-arms range on the Property. Records indicate that military munitions were disposed of by Open Burn/Open Detonation (OB/OD). The Property was closed in 1995 under the authority of the BRAC laws. Since 1995, the Property has been maintained in caretaker status. On October 4, 2006, the deed for the Property was transferred from the Army to Clark County and immediately into BCRRT as part of a conservation

conveyance. In accordance with the PPCD and ESCA, BCRRT will remain the interim owner until regulatory closure of the three remedial action units associated with the Property is achieved.

The Property includes the following site improvements (buildings, facilities, utilities, and ranges):

Camp Bonneville

- **Cantonment Buildings:** 1815, 1826, 1828, 1833, 1837, 1847, 1848, 1857, 1864, 1867, 1911, 1920, 1922, 1923, 1930, 1932, 1934, 1940, 1942, 1980, and 1997.

- **Facilities:** 1981-flagpole, 1992-water well pump house, 1995-sewage lift station, 1999-sewage lagoons, 2663-water reservoir, 2950-ammunition magazine, 2951-ammunition magazine, and 2953-ammunition magazine.

- **Utilities**: electric, gas, sanitary and water.

Camp Killpack Cantonment

- Buildings: 4125, 4126, 4155, 4314, 4316, 4325, 4327, 4337, 4345, 4348, 4356, 4364, 4366, 4368, 4377, 4378, 4387, 4389, 4398, 4475, 4475A, 4475B, 4476, 4476A, and 4483.

- Facilities: 4522 - water well pump house and 4532 -water reservoir.

- Utilities: electric, gas, sanitary and water.

- Ranges: U001A-observation tower, U001B-covered training area, U001C-bleachers, U002A-observation tower, U002B-observation tower, U003B-covered training area, U004A-observation tower, U004B-covered training area, U004C-bleachers, U005A-observation tower, U006A-observation tower, U006B-observation tower,U007A-observation tower, U008A-observation tower, U008B-covered training area, U010A-observation tower, U010B-covered training area..

- Other: An underground natural gas pipeline (owned by the Northwest Pipeline) traverses the southwestern corner of the Property. The right of way was issued by Bureau of Land Management in 1992 for a 30 year term. The Army transferred all other property, inclusive of all buildings, facilities, and utilities, in “as-is” condition.

2.0 SITE DESCRIPTION

2.1 General Description

The Site is comprised of two former military barracks, administrative buildings, facilities, utilities and numerous ranges. The two former military barracks are the Camp Bonneville and Camp Killpack cantonments. These cantonments cover approximately 30 acres of the 3,020 acres. The Camp Bonneville cantonment contains 21 buildings, eight facilities, electric, gas, sanitary and water utilities. The Camp Killpack cantonment contains 26 buildings, two facilities, and electric, gas, sanitary and water utilities. Further, Camp Killpack cantonment contains 10 observation towers, five covered training areas, and two bleachers.

Vehicular access to the main (west) gate into the Site is provided by Pluss Road and numerous other two-lane paved County roads. These rural roads connect to State Road 500 (SR 500), which runs to the west and south of the Property. An underground natural gas pipeline (owned by Northwest Pipeline) traverses the southwestern corner of the Property. The right-of-way was issued by the Bureau of Land Management in 1992 for a 30-year term.

2.2 Property Description

The Site is a subset 3,020-acre parcel of a larger 3,840-acre parcel located in Clark County, Washington in the western foothills of the Cascade Mountain Range between Camp Hill and Little Elkhorn Mountain to the northwest, Munsell Hill to the west, and Little Baldy Mountain to the south. The Site can be found in Sections 34 and 35, Township 3 N Range 3 East. The Site Postal address is 23201 NE Pluss Road, Vancouver Washington, 98682.

2.3 Roads and Trails

There are approximately 46 miles of roads and trails found within RAU 3 of the Property (See **Figure 2-1**). MEC surface clearance, with vegetation removal, will be conducted of a buffer zone extending 20 foot from the road edge on both side of the road. The roads and trails that fall under the same area as the valley floor and CITA are not included in this task but will be completed under said tasks. Actual clearance of the roads will not be done due to their long term use and as a result of regular road maintenance activities, including grading, cut and fill. Buffer zones will be surface cleared because the roads and trails represent a high use area throughout the area whether for the public or county rangers and maintenance personnel.

2.4 Firing Ranges

There are nine firing ranges located within RAU 2A of the Property (See **Figure 2-1**). MEC surface clearance, with vegetation removal, will be conducted over the areas of planned for remediation under the lead removal actions at all Firing Ranges. The ranges include the following locations:

- At the Combat Pistol Range (RAU 2A-4), MKM will excavate and process approximately 1,015 cubic yards of soil from the berm and range floor.

- At the Undocumented Pistol Range (RAU 2A-15), MKM will excavate and process approximately 50 cubic yards of soil from the range footprint

- At the 1,000-foot Rifle Range/Machine Gun Range (RAU 2A -16), MKM will excavate and process approximately 850 cubic yards of soils from the face of the berm.

- At the 25-meter M60/Pistol Range (RAU 2A-17), MKM will excavate and process approximately 800 cubic yards from the face of the berm.

- At the 25-meter Machine Gun Range (RAU 2A-18), MKM will excavate and process approximately 4,968 cubic yards of soil from the berm, range firing area, range floor, and the area behind the berm.

- At the 25-meter Record Firing/Field Firing Range (RAU 2A-19), MKM will excavate and process approximately 553 cubic yards of soils from the range footprint.

- At Field Ranges No. 1 and No. 2 (RAU 2A-20), MKM will excavate and process approximately 550 cubic yards of soils from the face of the berm and the range floor.

- At Rifle Ranges No. 1 and No. 2 (RAU 2A-21), MKM will excavate and process approximately 1,850 cubic yards of soils from two berms known as the "Long Berm" and the "Short Berm" at this range.

- At Field Fire Ranges No. 1 and No. 2 (RAU 2A-22), MKM will excavate and process approximately 276 cubic yards of soils from the face of the berm and the range floor.

2.5 Communications

2.5.1 Telephone

An existing telephone and fax line are located in the Range Headquarters building of Camp Killpack. Telephone availability will be supplemented with personnel cell phones. A T-1 line for voice and data transmission was installed in November, 2006 to provide expanded service to the Camp Bonneville area.

2.5.2 Radio

A radio communication system consisting of two-way radios with a base station and repeater located at the Range Headquarters building of Camp Killpack has been installed to insure continuous communication across the entire site. For safety, radios will be assigned to each team working on the site to maintain a direct line of communication.

2.5.3 Internet Access

A dedicated high speed broadband internet access line was installed in November, 2006.

3.0 DETAILED DESCRIPTION OF TASKS

3.1 Vegetation Clearance and Anomaly Avoidance

WDOE has indicated in the PPCD that interim actions for RAU 3 will include a MEC surface clearance of a 20-foot wide buffer zone adjacent to both sides of all roads and trails and from the firing range investigation areas in RAU 2A. To meet this requirement a 20-foot wide area on either side of all roads and trails and in the investigation areas of the firing ranges will be cleared of vegetation to a sufficient level to allow for MEC surface clearance surveys to be performed. The procedures of the EAWP for the perimeter and CITA will be used for brush clearance and anomaly avoidance (BCRRT, 2006).

3.2 Grid Establishment

For the documentation of surveys of the roads and trails, 500 feet by 500 feet digital grid system will be established over the Property. **Figure 3-1** shows the grid pattern to be used to document the road and trail surface clearance activities. For the firing ranges, 100 feet by 100 feet digital grid system will be established over each firing ranges' footprint. Additional grids will be added to all sides to encompass a buffer zone. **Figure 3-2** shows the grid pattern that will be used to document the firing ranges surface clearance activities. The grids use the Universal Transverse Mercator (UTM) Washington South coordinate system. In the event that anomalies are found within the investigation grid areas, 100 feet by 100 feet step-out grids will be established in areas adjacent to the location of identified MEC items. **Section 5.0** details the step-out procedures in detail.

For the roads and trails, the investigation areas were established as an area 20 feet wide area on either side of roads and trails, therefore the actual clearance will be 500 foot by 20 foot on either side of a road or trail (10,000 square feet) in most cases. In the event that an investigation grid is larger than 10,000 square feet, the grid will be subdivided. **Figure 3-3** shows an example of an investigation grid. Grid cell rows will be labeled in an alphanumeric pattern based upon grid cells running West to East being labeled A through GG. Grid cell columns running South to North will be labeled numerically, 1 through 28. The nomenclature for a grid cell intersecting Column B, Row 17 will be B17 (**Figure 3-1).** Field personnel will be supplied with GPS coordinates at the intersections of the boundaries of the grids. Field personnel will install survey stakes with the grid number written on the stakes at the start and stop point of each grid. When another team arrives at the adjacent grid the start and or stop point will always be the stakes irregardless of their GPS coordinates. This will ensure 100% coverage of areas has been surveyed. Field personnel will use the hand-held GPS units for the identification of grid locations during survey activities using these coordinates.

For the firing ranges, the grid system will be identified per the RAU unit designation and numbered sequentially (**Figure 3-2**). As an example, the grids for the 25 meter firing range (RAU 2A-18), will be reported as 2A-18- (1 through 45).

3.3 Surface Clearance Procedures

The PPCD requires that a 20-foot buffer zone adjacent to both sides of roads and trails (RAU-3) and from the firing range investigation areas in RAU 2A are MEC surfaced cleared. This activity will be accomplished only after approval of the ESS is obtained. Surface clearance shall be accomplished on the entire 20 foot buffer zones cleared of vegetation along the road and trails and of the range investigation area. The following general procedures will be followed for MEC surface clearance

unless required to be changed by the approved ESS. In that case an amendment to the Interim Action Work Plan will be prepared.

- All areas to be MEC surface cleared will be prepared by vegetation removal as outlined above.

- Qualified unexploded ordnance (UXO) Technicians will traverse 100% of areas to be surface cleared using magnetometers ensuring that all MEC items that are on the surface of the ground, or penetrate the plane of the ground surface are located. Linear progression of the technicians will be judged by establishing search grids that are the width of the vegetation cleared buffer zone and 500 feet in length.

- For the 20-foot roads and trails buffer zones adjacent to either side of roads and trails and in each firing range, two UXO technicians will be spaced five feet apart with each technician responsible for a five foot lane. Field personnel will be given a reference point for the grid or area to be investigated. The grid establishment system is discussed in **Section 3.2**.

- For the firing ranges, nylon ropes will be used to establish 5 feet lanes within the grid. The technicians will visually observe the surface for the presence of potential MEC items, with this visual inspection being assisted by the use of magnetometers. As technicians complete each area, ropes will be relocated for the next lane.

- Grid teams will maintain a safety separation distance of 500 feet (1 grid) for the roads and trails and 300 feet (3 grids) for the firing ranges.

- Several grids will not be completed due to their proximity to residential housing or seasonal flooding. These grids will be completed along with the perimeter fence areas at a later date to be determined (TBD) by BCRRT, WDOE and Clark County. The vacating process will require a separate addendum to this IAWP. Currently grids not planned for surface clearance activities area A1-A4, A8-A17, B8, B9, C8, C9, F1, G1, U6, V6, FF7, FF8, and FF13-FF16.

- Prior to the technicians beginning each search grid, the team leader will align the technicians in such a manner as to ensure that they do not interfere with the search of the technician in the adjacent lane. The UXO technicians will advance in a slow, continuous pace, visually inspecting the surface for MEC until the assigned search lane is completed. Additionally, each UXO technician will use the magnetometer in a side to side sweeping motion and will scan the search lane for the presence of ferrous anomalies in areas where visual observation is obstructed by ground cover.

- All MEC items will be investigated by team leader and the Senior Unexploded Ordnance Supervisor (SUXOS) for determination of MEC type, and fuzing, if applicable. If the item is determined “safe-to-move” it will be transported to a secure and sited storage facility for disposition in accordance with the approved ESS. If items are not “safe-to-move,” a disposition plan shall be prepared and coordinated with BCRRT, WDOE, and Clark County. Disposal of MEC items will be conducted according to the approved procedures in the ESS.

- A description of all MEC items will be documented per requirements set forth in **Section 3.5.**

- A description of all MEC items and Materials Potentially Presenting Explosive Hazard (MPPEH) will be recorded in the daily reports and project data base including type and Global Positioning System (GPS) location.

- After MEC surface clearance has been completed, a separate, quality control (QC) inspection of the cleared areas shall be conducted in accordance with the MEC QC procedures presented in the ESS. All areas passing QC shall be reported to WDOE for further quality assurance (QA) inspection and acceptance by WDOE. To perform the QC, the Unexploded Ordnance Quality Control Supervisor (UXOQCS) will perform an independent surface sweep of the roads and trails and firing range investigation areas that will cover a minimum of 10% of each grid area.

- If, during the QC sweep, a MEC item is found by the UXOQCS on the surface or penetrating the surface, the grid in which the item is found will be failed. The grid will be re-surface cleared by the surface clearance team to ensure no additional items in the area were missed.

- Additionally, a roads and trails or firing range grid may fail QC for quality of product if more then four MD items greater then two inches square are located on the surface by the UXOQCS. If a roads and trails or firing range grid is failed due the presence of excessive MD in the grid, the MEC surface clearance team will re-sweep the grid prior to re-inspection by the UXOQCS.

- All QC failures and secondary surface clearances will be reported to the WDOE prior to QA by the WDOE.

- All areas passing QC shall be reported to WDOE for final determination.

- All MEC and MPPEH data shall be maintained and included in after-action and/or site closure reports.

3.4 Coverage Areas

3.4.1 Roads and Trails

There is a requirement in the PPCD for a 20 foot buffer zone on either side of roads and trails. Since the perimeter road runs adjacent or near the fence line for much of the property, there will ultimately be a vegetation cleared area that will be between 10 feet and 30 feet around the camp boundary. This fact, however, will give the UXO Technicians doing construction support a certain degree of flexibility in providing an anomaly free corridor to the mechanical vegetation removal crews, especially since the mechanized vegetation removal equipment has a boom with a 20-30 foot reach.

3.4.2 Firing Ranges

There is a requirement in the PPCD for the firing ranges to be cleared of vegetation and MEC to allow for the subsequent, safe removal of lead from the firing range berms and adjacent areas. The firing ranges that are included in this requirement are the Combat Pistol Range (RAU 2A-4), Undocumented Pistol Range (RAU 2A-15), 1,000-foot Rifle Range/Machine Gun Range (RAU 2A -16), 25-meter M60/Pistol Range (RAU 2A-17), 25-meter Machine Gun Range (RAU 2A-18), 25-meter Record Firing/Field Firing Range (RAU 2A-19), Field Ranges No. 1 and No. 2 (RAU 2A-20), Rifle Ranges No. 1 and No. 2 (RAU 2A-21), Field Fire Ranges No. 1 and No. 2 (RAU 2A-22).

3.5 Procedure When MEC is Encountered

In the event that MEC is encountered by UXO personnel within the roads and trails and firing range grids, the item will be marked with two crossed pin flags and a circle painted with ground marking fluorescing paint then its location recorded on the hand-held Garmin eTrex® GPS. MEC items located will be reported immediately to Baker, WDOE, and BCRRT.

Based upon the ESS, the MEC contractor is able to address and dispose of all MEC hazards internally. MEC items will either be moved to an approved storage location or blown in place using approved MEC disposal procedures. The MEC contractor will be responsible for reporting the location and description of any MEC items to WDOE, Baker and the BCRRT. The BCRRT will be responsible for notification to the proper authorities.

The location and disposition of all MEC items located will be recorded in the SUXOS log and the grid forms generated by the MEC contractor. The location and data on all discovered MEC items will be entered into the project Geographical Information Systems (GIS) database.

3.5.1 Reporting prior to ESS Approval

Prior to ESS approval, any MEC item encountered that cannot be avoided or, based on its fuzing or current condition, presents an imminent hazard requiring immediate attention will be reported by the UXO team to the BCRRT point of contact (POC). The BCRRT POC will then be responsible for requesting military EOD support. The location and disposition of all MEC items located will be recorded in the SUXOS log and the Daily Report generated by the MEC contractor.

3.5.2 Reporting after ESS Approval

Once ESS approval has been obtained, the MEC contractor will be able to address and dispose of all MEC hazards internally. Once the ESS is approved, MEC items will either be moved to an approved storage location or blown in place using approved MEC disposal procedures. The MEC contractor will be responsible for reporting the location and description of any MEC items to the BCRRT POC on an informational basis and prior to any demolition operations once the ESS is approved. The location and disposition of all MEC items located will be recorded in the SUXOS log and the Daily Report generated by the MEC contractor. The location and data on all discovered MEC items will be entered into the project GIS database.

3.6 Survey Equipment

The instrument assisted surface clearance will be performed using the (Schonstedt 52-cx flux gate magnetometer). This instrument was selected based on the results of the calibration grid/prove-out designed by MKM and WDOE.

The positioning and reacquisition equipment will be performed using the Garmin eTrex hand held GPS system. This instrument was selected by MKM and WDOE as the most reliable and cost effective solution for initial positioning and reacquiring of targets.

Equipment to be used during the emergency action was tested on 6 January 2007. Tests were performed by MKM and approved by WDOE. Testing results identified instruments to be acceptable instruments for surface clearance activities.

4.0 DATA MANAGEMENT PLAN

4.1 General Description

The IAWP and this data management plan establish a method for the documentation of activities performed in support of the interim actions for areas of RAU 3 and RAU 2A. **Figure 4-1** provides the data management flow chart for information gathered during interim actions. The data management plan describes the following elements:

- Surface clearance documentation (**Section 4.2**); and
- Quality control and quality assurance survey documentation (**Section 4.3**).

4.2 Surface Clearance Survey Documentation

Field personnel will be supplied with Grid Data Log (GDL) forms for the purpose of documenting surface clearance activities (Attachment B). GDL forms will contain both general information about the grid and specific information if MEC items are found in the grid. GDL forms will be completed by the field personnel with the following information for each grid:

- Task (e.g. Roads and trails task);
- Grid Number;
- Grid Size;
- Date Completed;
- Team Number;
- Team leader;
- GPS Grid Start Survey Location or previously installed stake;
- GPS Grid End Survey Location or previously installed stake;
- Total number of MEC items identified in each grid;
- Any suspicious subsurface anomaly's detected or forensic evidence (i.e., frag) found and it's GPS location; and
- Any terrain, vegetation or water features that prevent 100% coverage of investigation grid.

In the event that MEC items are found within the grid, field personnel will be responsible for completing the sections of the GDL forms relevant to MEC. The information required to be gathered is:

- Assignment of item number;

- Item description;
- Photograph number;
- GPS coordinates;
- Actions taken for the MEC item (whether the item is moved or blown in place);
- Final disposition of item;
- Total number of fuzed, fuzed and armed, and unfuzed items found in the grid.

The GDL forms will be reviewed and signed by the SUXOS for completeness and accuracy. Information gathered on forms will be considered original draft field copies and will be retained in the project files and scanned and saved as PDF files. Files will be uploaded into the Baker File Transfer Protocol (FTP) site within one working day of completion of the grid. Information on the forms will be updated and presented in the Completion Report for emergency actions for RAU 3.

4.3 QA/QC Survey Documentation

Upon completion of surface clearance of a grid, the GDL forms and associated photo documentation will be provided to the MKM QC representative, Baker CM and the WDOE QA representative. Information will be used for the assessment of the quality of work performed. The MKM QC representative, Baker CM and the WDOE QA will perform surveys to assess the effectiveness of surface clearance activities. The QC and QA surveys will be coordinated to be conducted together by the MKM QC, Baker CM and a WDOE QA representative for safety purposes. Areas surveyed for quality assessment within the grid will be documented by the QC/QA surveyors by recording the starting and ending GPS coordinates for the areas surveyed. The information will be documented according to the example form shown in **Attachment B**.

QC/QA forms will be completed by the MKM QC representative, Baker CM and WDOE QA representative with the following information for each grid:

- Task (e.g. Roads and trails task);
- Grid Number;
- Percentage surveyed;
- GPS Grid Start Survey Location;
- GPS Grid End Survey Location;
- Date Completed:
- QC Representative;

- QA Manager;
- Total number of MEC items identified in the grid; and
- Total number of munitions debris items over 2-inches x 2-inches surface mass identified in the grid.

All field forms will be considered draft field copies and be retained in the project files. Information on the forms will be updated and finalized in the Completion Report for interim actions for RAU 3 and RAU 2A. Forms will follow the procedures set forth in **Section 4.2**.

5.0 STEP OUT APPROACH

Due to the establishment of the grid pattern as described in **Section 3.2**, the step out approach required updating based upon the grid pattern. **Figure 5-1** and **Figure 5-2** show the approach for establishing a step out grid patterns in the event that a MEC item is found within a road and trail grid and a firing range grid, respectively. Each step out grid will encompass a total area of 10,000 square feet (i.e., the 100 by 100 foot step out requirement of the PPCD). Step out procedures will be conducted in accordance with the PPCD. Step out grids will be approved by the ASB prior to implementation. In the event that step out grids extends beyond property boundaries, notification will be given to Baker, BCRRT, Clark County, WDOE, and the U.S. Army Corp of Engineers.

6.0 SCHEDULE

Brush and MEC surface clearance work will commence with 30 days of the approval of this IAWP by WDOE. Roads and trails and firing range clearance activities will be completed within 365 days of the start of fieldwork.

7.0 AFTER ACTION REPORTING

Upon completion of the MEC Surface Clearance portion of the interim actions for RAU 3 and 2A, an After Action Report (AAR) is required by the PPCD. It is to be submitted to WDOE within 30 days upon completion of the interim action fieldwork. For the AAR, the final GDL forms, QC/QA forms, and their photo attachments will be included. All updated and completed forms will be signed for approval by MKM, Baker, and WDOE were applicable on the forms provided in Attachment B. In addition, a final site map will be generated that identifies all MEC item locations found during the interim actions.

8.0 REFERENCES

BCRRT. Emergency Action Work Plan, Remedial Action Unit 3. October 2006.

MKM Engineers, Inc. Time Critical Removal Action – Explosive Safety Submission. December 2006

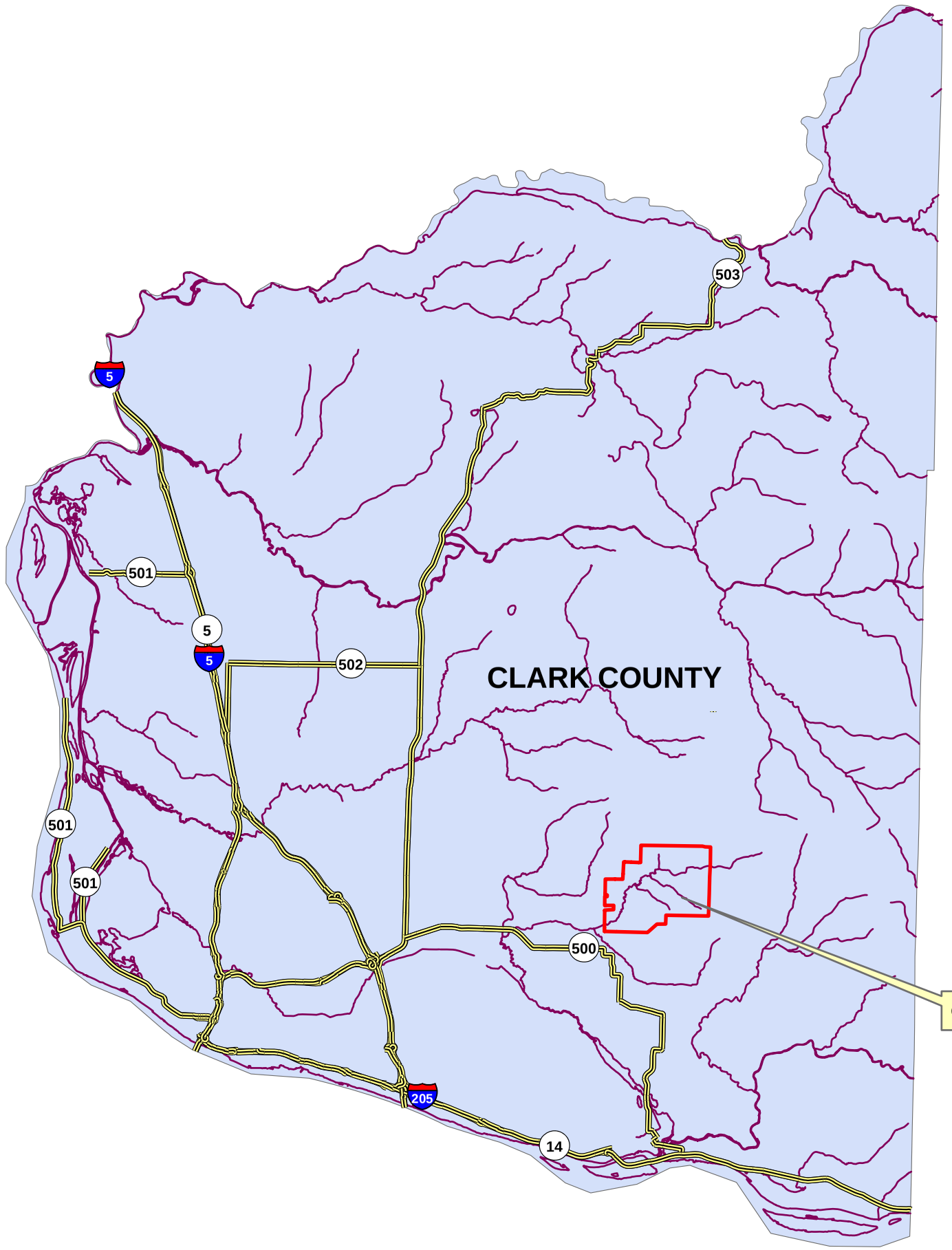
MKM Engineers, Inc. Explosive Safety Submission. January 2007.

Michael Baker Jr., Inc. Camp Bonneville Cultural and Historical Resources Protection Plan. Prepared for Bonneville Conservation, Restoration and Renewal Team, LLC. November 2006.

Michael Baker Jr., Inc. Health and Safety Plan. Prepared for Bonneville Conservation, Restoration and Renewal Team, LLC. October 2006.

ATTACHMENT A

FIGURES



Legend

- Stream
- Highway
- Boundary

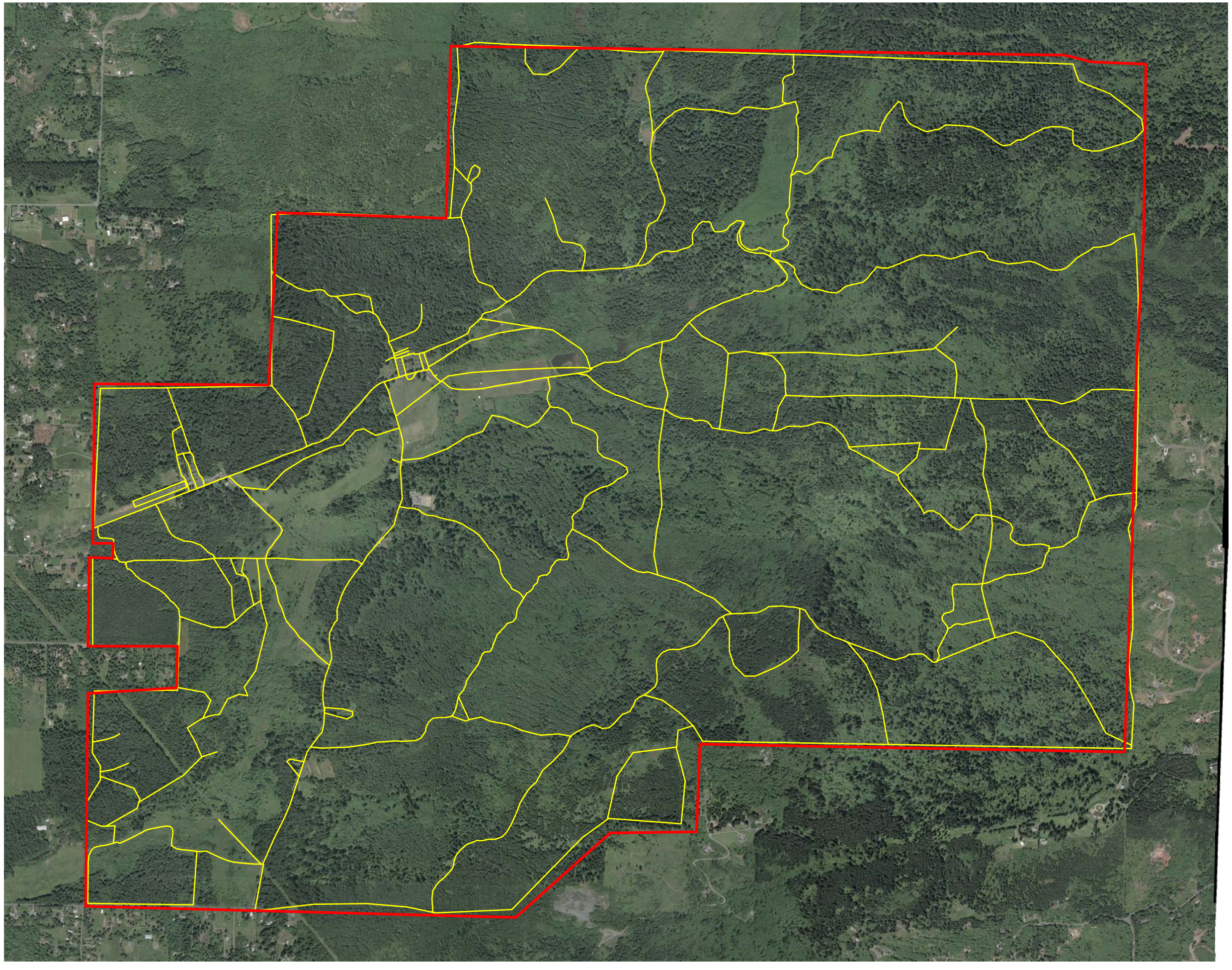
N
W E
S

0 7,000 14,000 28,000 42,000 56,000
Feet

MKM Engineers, Inc.
4153 Bluebonnett Drive
Stafford, TX 77477

Figure 1-1. Camp Bonneville Military Reservation, Washington

Drawn On: 11/09/2006 Drawn By: QX Reviewed By: ES



Legend

- Boundary
- Road_Trails

N
W E
S

0 500 1,000 2,000 3,000 4,000
Feet

MKM Engineers, Inc.
4153 Bluebonnett Drive
Stafford, TX 77477

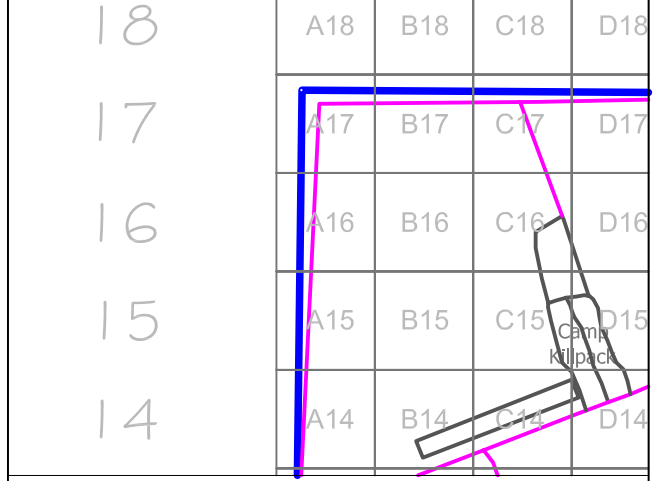
Figure 2-1. Camp Bonneville Military Reservation Roads and Trails for Interim Actions

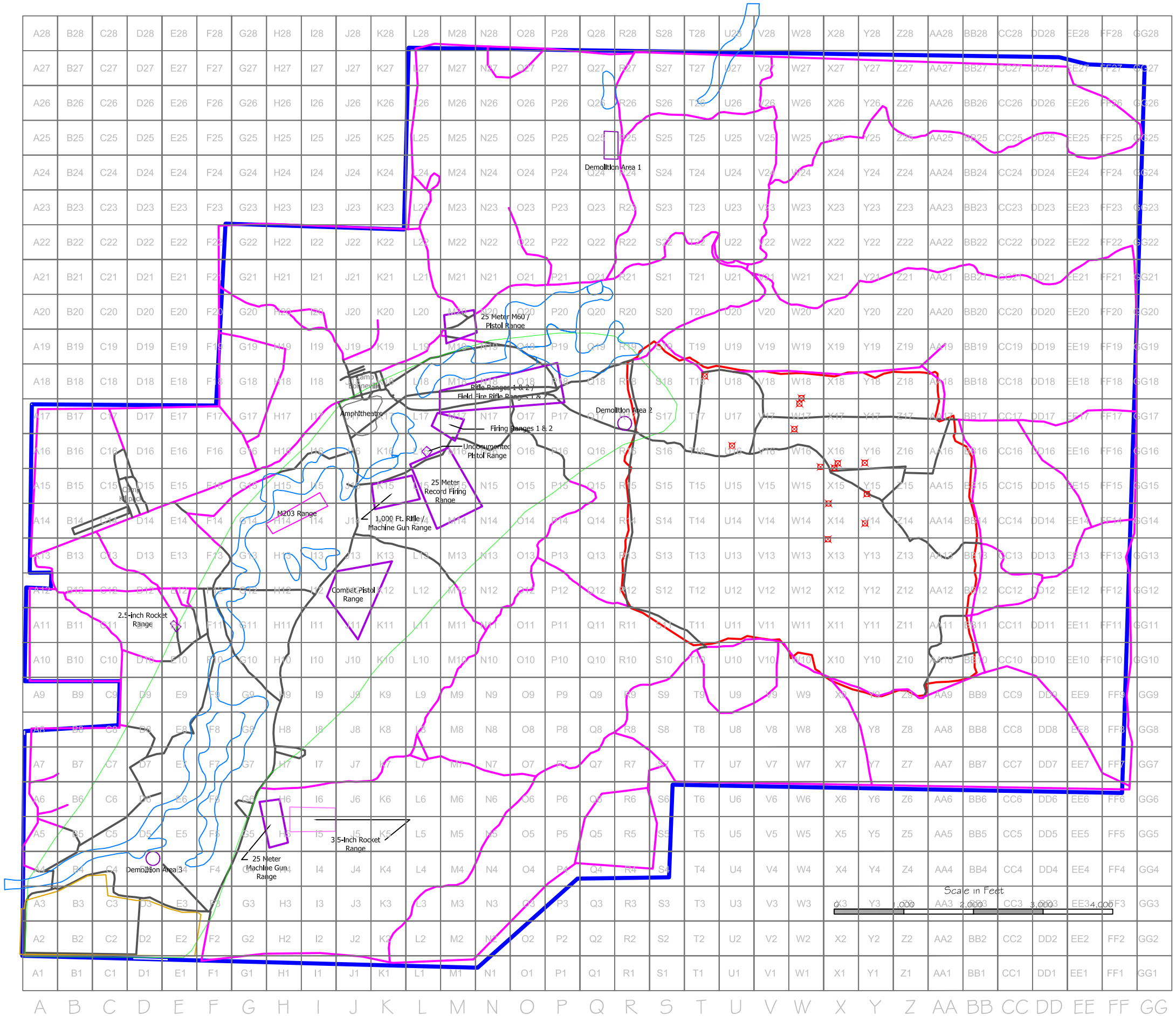
Drawn On: 11/09/2006 Drawn By: QX Reviewed By: ES

Base Boundary
Roads and Trails Covered Under 8146 task
Roads and Trails Not Covered Under 8146 task
Central Impact Target Area Boundary
CITA Target
Firing Ranges
Central Valley Floor
Wetlands
Environmental Study Area
Investigation Ranges

N
W E
S

View of Grid Pattern





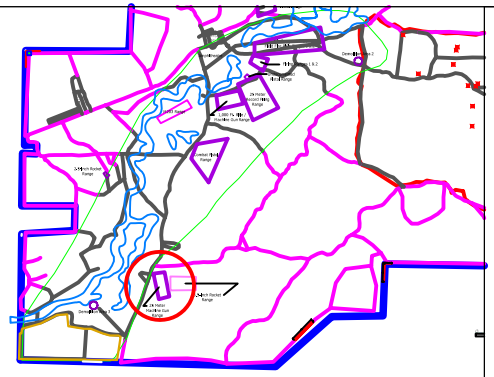
MKM

Figure 3-1. Grid Pattern For Roads and Trails.

Dimensions: feet

Drawn by: MKM Engineers, Inc.

Date: 17 January 2007
Updated:
Client: Michael Baker Jr., Inc.
Project: Camp Bonneville MEC Remdiation
Tasks: 8146 Roads and Trails



Base Boundary

Roads and Trails

Firing Range

Investigation Range

Central Valley Floor

Grid (100ft x 100ft)

N

W E

S

0 100 200 300

MKM

Figure 3-2. Grid Pattern for Firing Ranges.

Dimensions: feet
Grid Size: 100 feet x 100 feet
Drawn by: MKM Engineers, Inc.

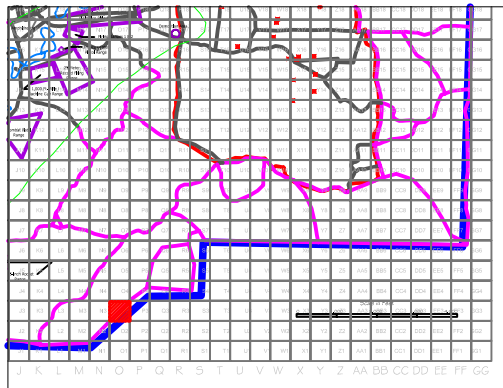
Date: 17 January 2007
Updated:
Client: Michael Baker Jr., Inc.
Project: Camp Bonneville MEC Remdiation
Tasks: 7000 Firing Ranges

2A-18-41 2A-18-42 2A-18-43 2A-18-44 2A-18-45
2A-18-36 2A-18-37 2A-18-38 2A-18-39 2A-18-40
2A-18-31 2A-18-32 2A-18-33 2A-18-34 2A-18-35
2A-18-26 2A-18-27 2A-18-28 2A-18-29 2A-18-30
2A-18-20 2A-18-21 2A-18-23 2A-18-24 2A-18-25
2A-18-16 2A-18-17 2A-18-18 2A-18-19 2A-18-19
2A-18-11 2A-18-12 2A-18-13 2A-18-14 2A-18-15
2A-18-6 2A-18-7 2A-18-8 2A-18-9 2A-18-10
2A-18-1 2A-18-2 2A-18-3 2A-18-4 2A-18-5

100.0ft

100.0ft

25 Meter Machine Gun Range



Base Boundary

Roads and Trails

Investigation Grid

Note. Grid will be subdivided into O3-A and O3-B.

N

W E

S

0 100 200 300

678.3191

3

O3

MKM

Figure 3-3. Investigation Grid Pattern

Dimensions: feet
Grid Size: 500 feet x 500 feet
Drawn by: MKM Engineers, Inc.

Date: 16 January 2007
Updated:
Client: Michael Baker Jr., Inc.
Project: Camp Bonneville MEC Remdiation
Tasks: 8146 Roads and Trails

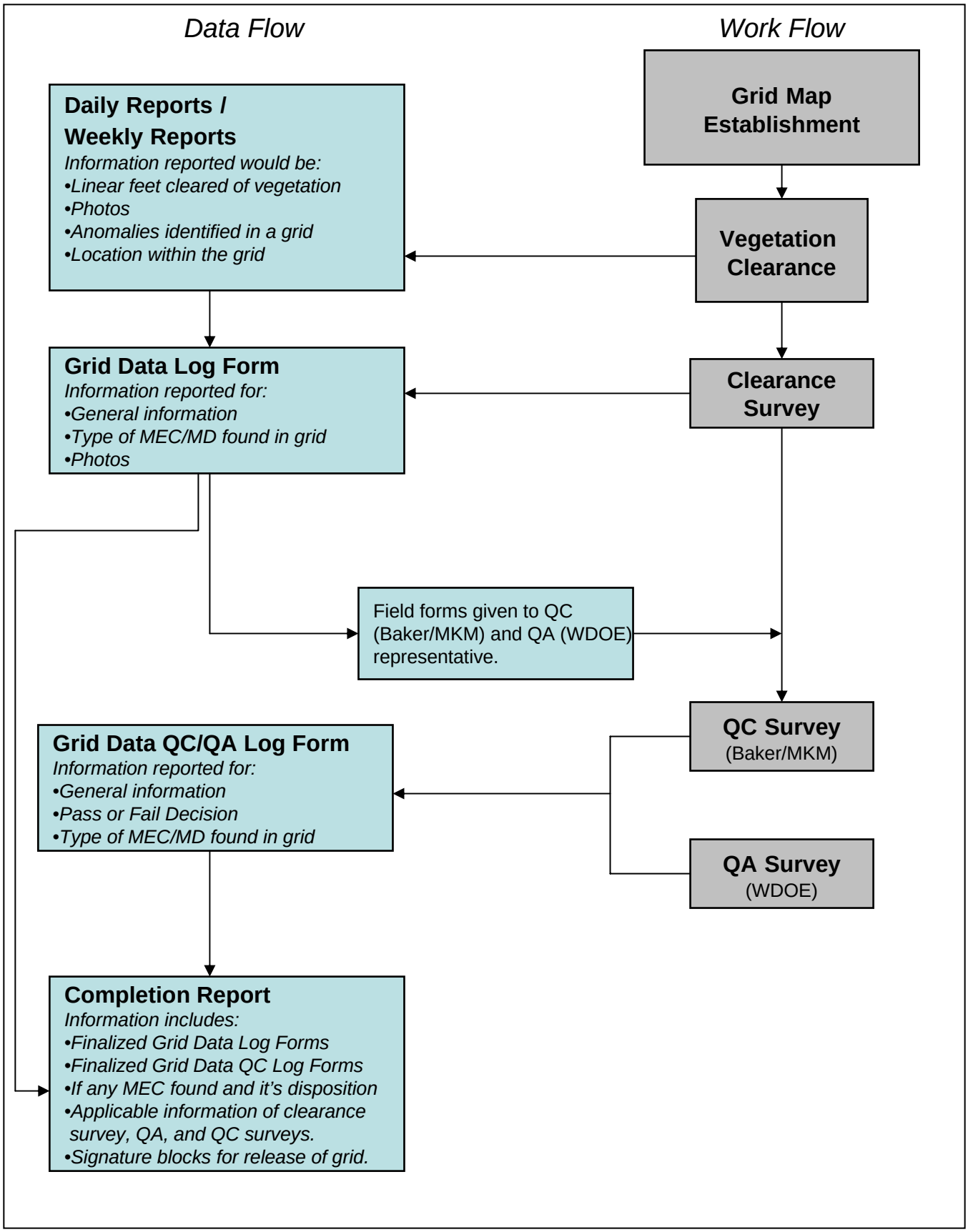
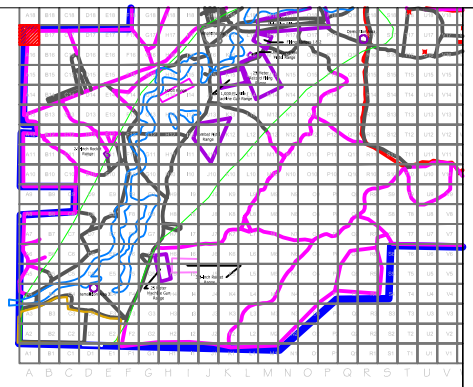


Figure 4-1. Interim Actions for RAU 3 and 2A Data Management Plan Flow Chart



Base Boundary

Roads and Trails

Investigation Grid

Step Out Grid

MEC Item

N

W E

S

0 100 200 300

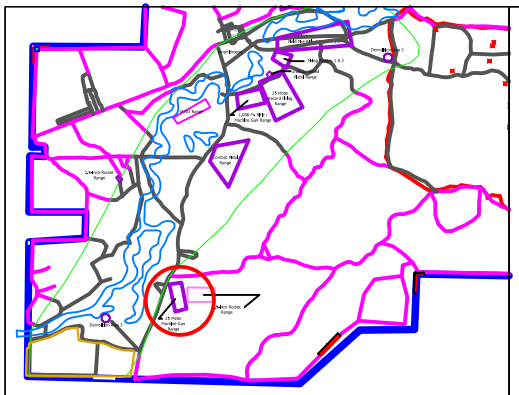
A17

MKM

Figure 5-1. Step Out Grid Pattern

Dimensions: feet
Grid Size: 500 feet x 500 feet
Drawn by: MKM Engineers, Inc.

Date: 16 January 2007
Updated:
Client: Michael Baker Jr., Inc.
Project: Camp Bonneville MEC Remdiation
Tasks: 8146 Roads and Trails



Base Boundary

Roads and Trails

Firing Range

Investigation Range

Central Valley Floor

Step Out Grid

MEC Item

Grid (100ft x 100ft)

N

W E

S

0 50 100 150

MKM

Figure 5-2. Step Out Pattern for Firing Ranges.

Dimensions: feet
Grid Size: 100 feet x 100 feet
Drawn by: MKM Engineers, Inc.

Date: 17 January 2007
Updated:
Client: Michael Baker Jr., Inc.
Project: Camp Bonneville MEC Remdiation
Tasks: 7000 Firing Ranges

2A-18-0

2A-18-1

2A-18

ATTACHMENT B

SAMPLE FIELD FORMS

GRID DATA FIELD LOG

Project:	Camp Bonneville Conservation & Restoration Project, Vancouver, WA		
Task	8161 - Perimeter Fence		
Grid No.	A6	**Size**	500' x 10'
Team Number	2	**Date Completed**	01/09/07
UXO Supervisor	Derrick		

Item #	Item Description	Photo #	N Coordinate	E Coordinate	Move/BIP	Disposition

Summary	
Total Number of Fuzed items	0
Number of Unfuzed items	0
Munitions Debris	0
Other Scrap	0

Quality Control		
Action	Date	Name/Signature
Surface Clearance		
Quality Control Complete		
WDOE Q/A Complete		
Baker Acceptance		

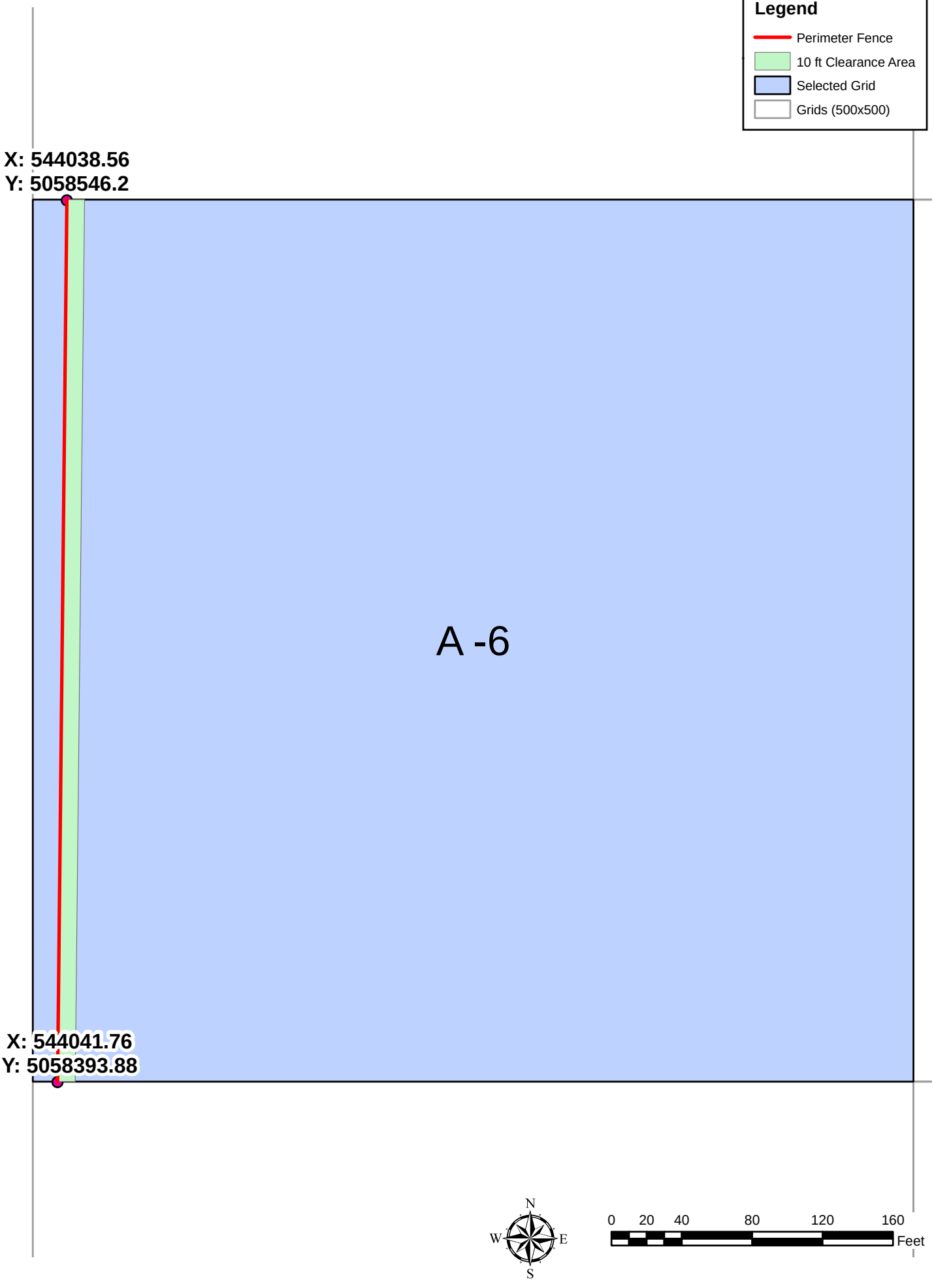

Legend
Perimeter Fence
10 ft Clearance Area
Selected Grid
Grids (500x500)
X: 544038.56
Y: 5058546.2
A -6
X: 544041.76
Y: 5058393.88
N
W
E
S
0 20 40 80 120 160
Feet

PHOTO LOG

GRID DATA QC/QA LOG

Project: Camp Bonneville Conservation & Restoration Project, Vancouver, WA

Grid Number: B17

Task: 8161 Perimeter Fence

Date Completed: 01/06/07

QC Manager: Scott Fleek **QA Manager:** Greg Johnson

GPS Start:

GPS End:

Item #	Item Description	Photo #	N Coordinate	E Coordinate	Move / BIP	Disposition
1	Damaged Scrap Flare	010607-1-001	544454.45	5059823.78		

Comments:

Action	Result	Date	Signature
MKM Q/C Complete	***Pass*** **/** ***Fail***		

Action	Date	Signature
Baker Approval		

Action	Result	Date	Signature
WDOE Q/A Complete	***Pass*** **/** ***Fail***		

QC/QA PHOTO LOG

Project: Camp Bonneville Conservation & Restoration Project, Vancouver, WA

Grid Number: B17

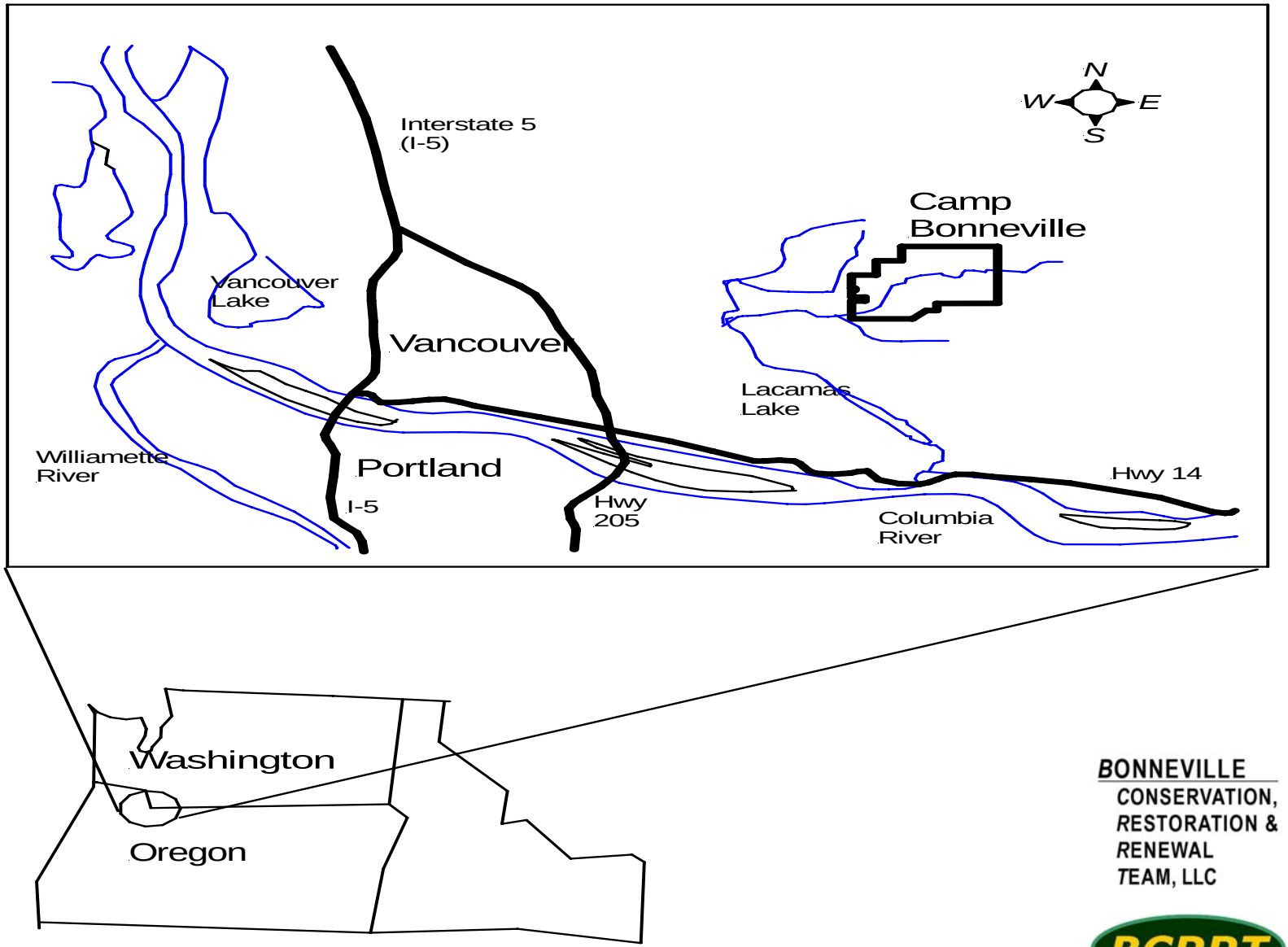
010607-1-001

_____

_____

_____

_____



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RENEWAL
TEAM, LLC

BCRRT

Figure 1. Camp Bonneville Site Location

Figure 2 Site Location Map

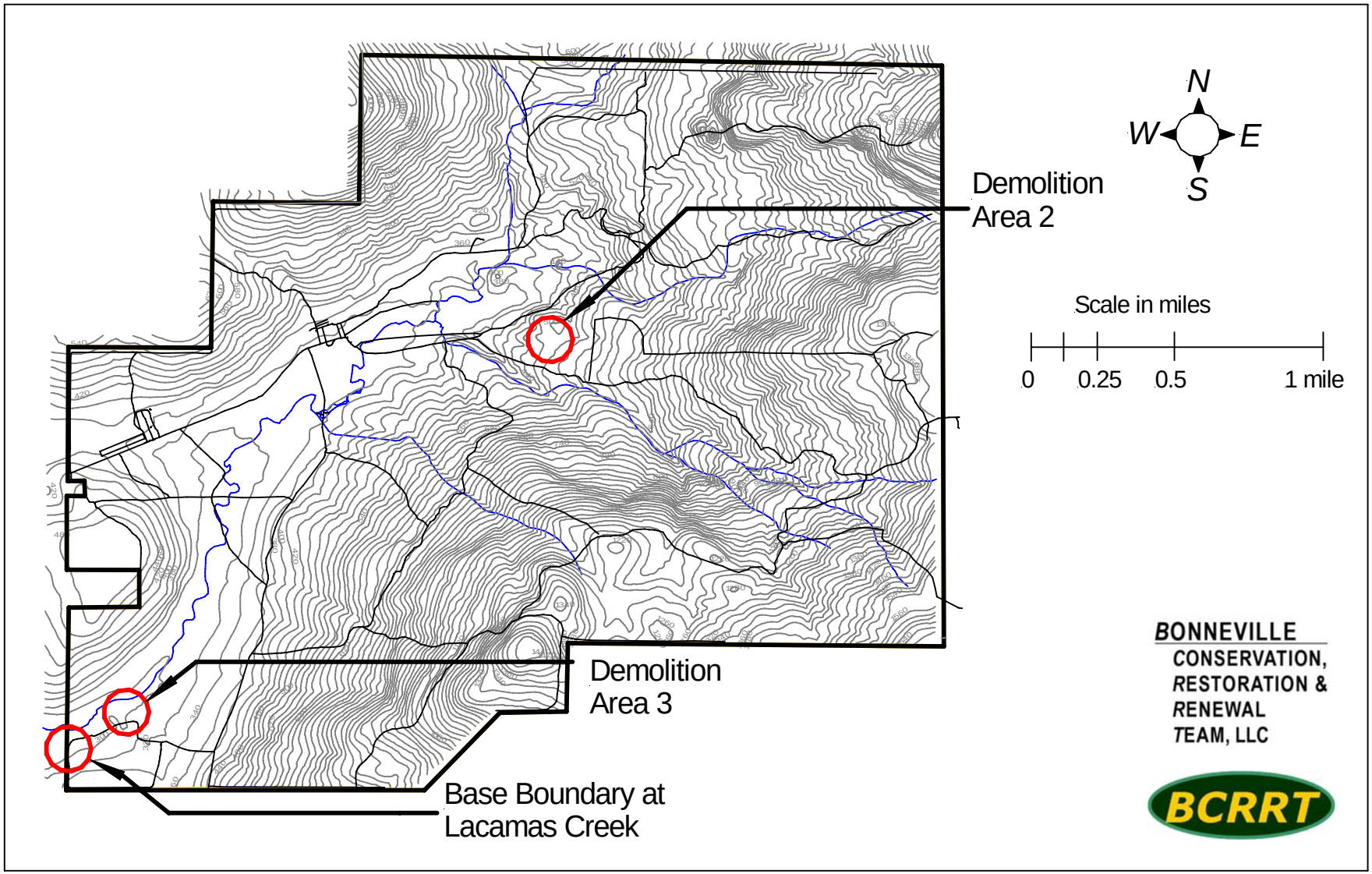


Figure 3 Location of Monitoring Wells at Demolition Area 2

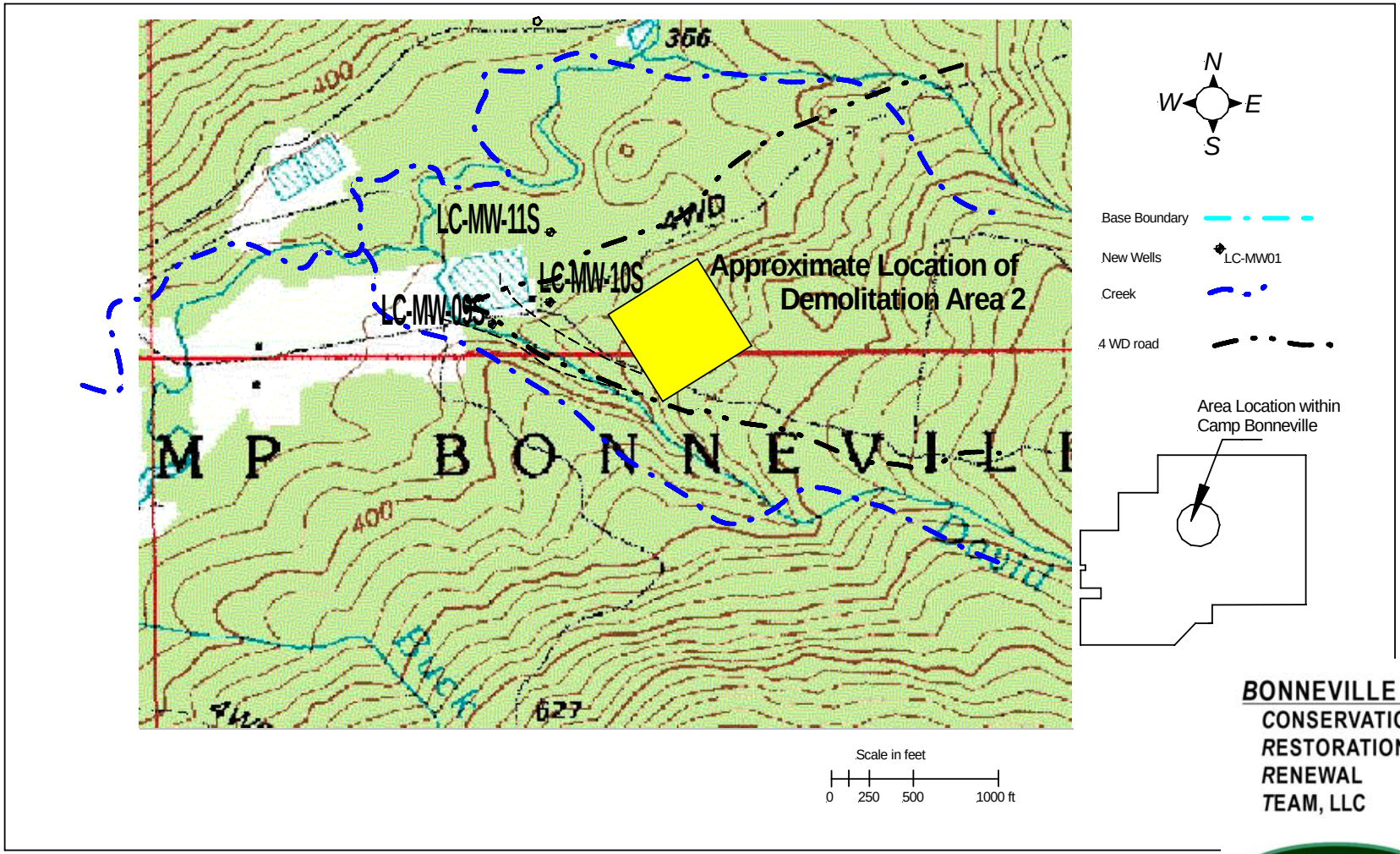


Figure 4 Location of Monitoring Wells at Demolition Area 3

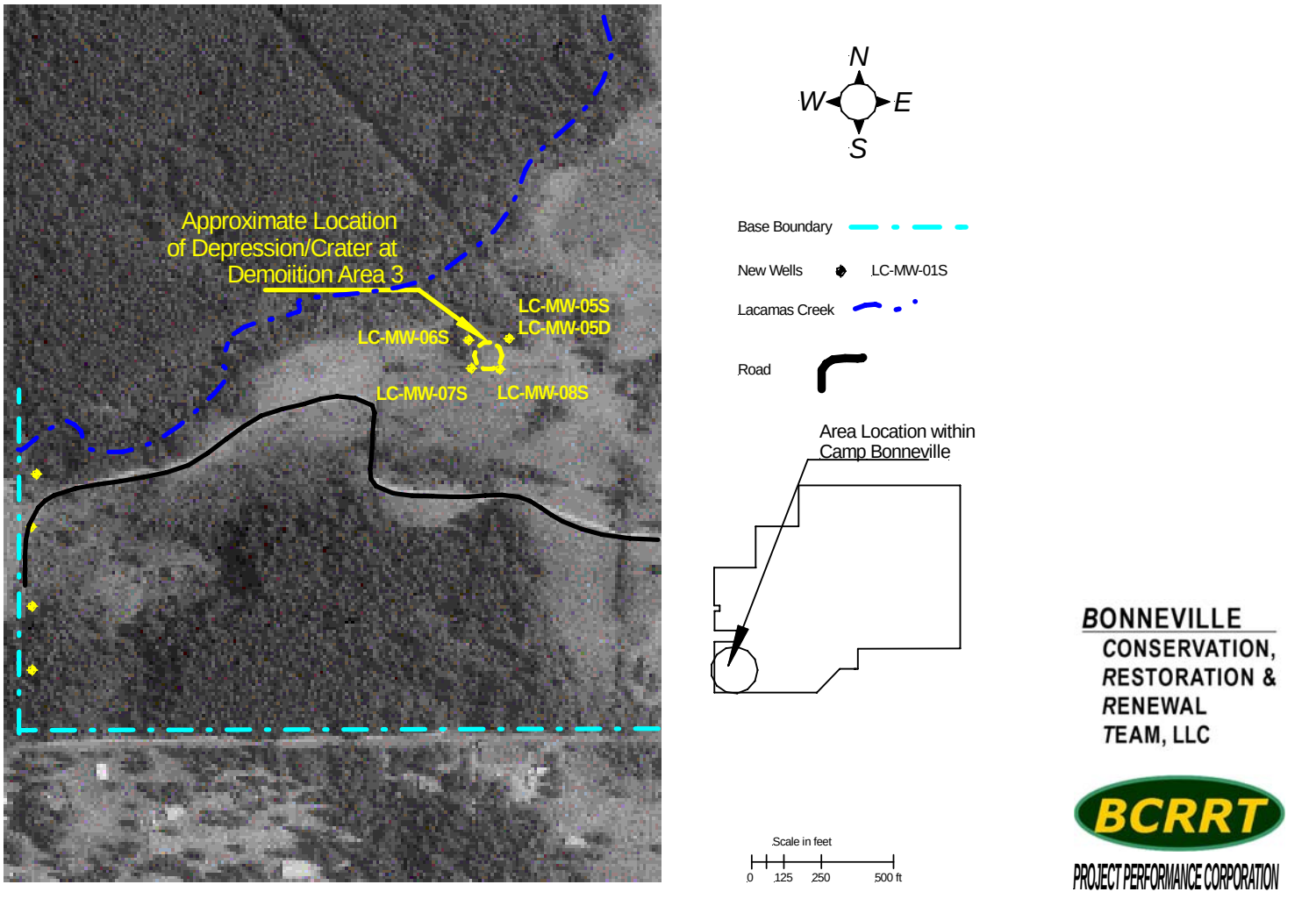
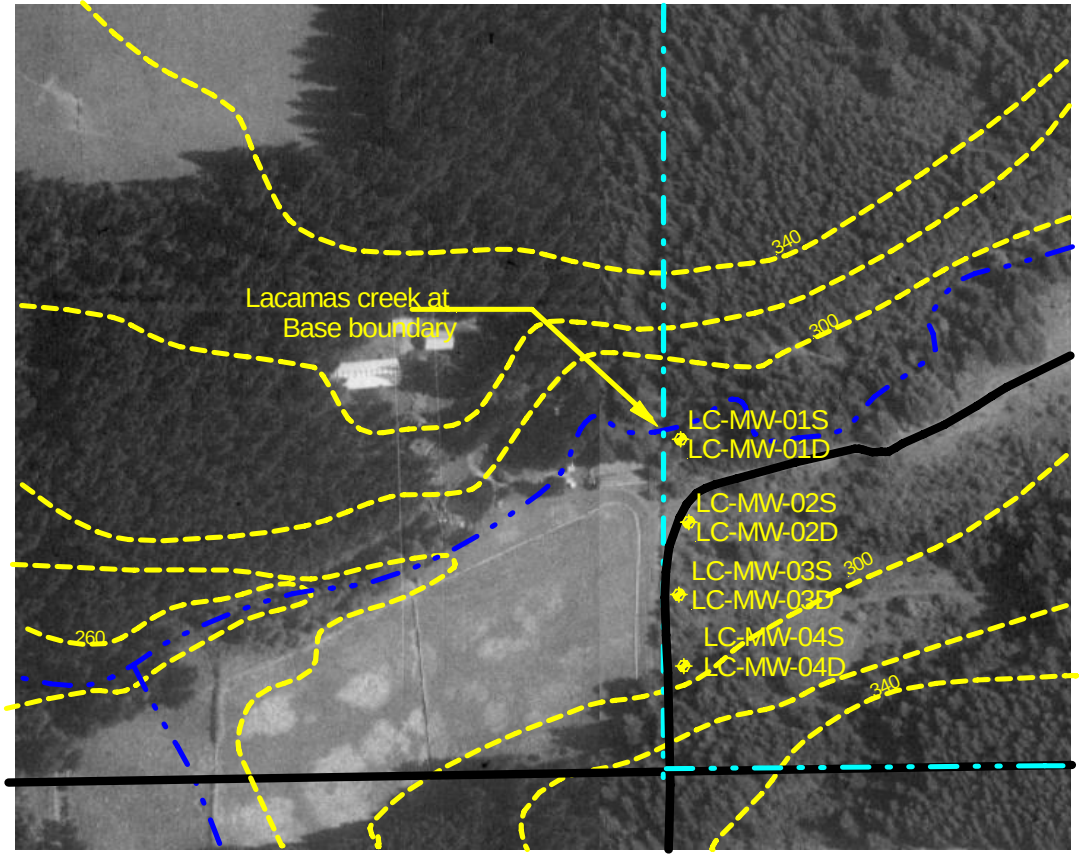


Figure 5 Location of Boundary Area Wells



N
W E
S

Base Boundary

New Wells LC-MW-01S

Lacamas Creek

Road

Area Location within
Camp Bonneville

Scale in feet

0 250 500 1000 ft

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RENEWAL
TEAM, LLC

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Figure 6 Shallow Groundwater Contours

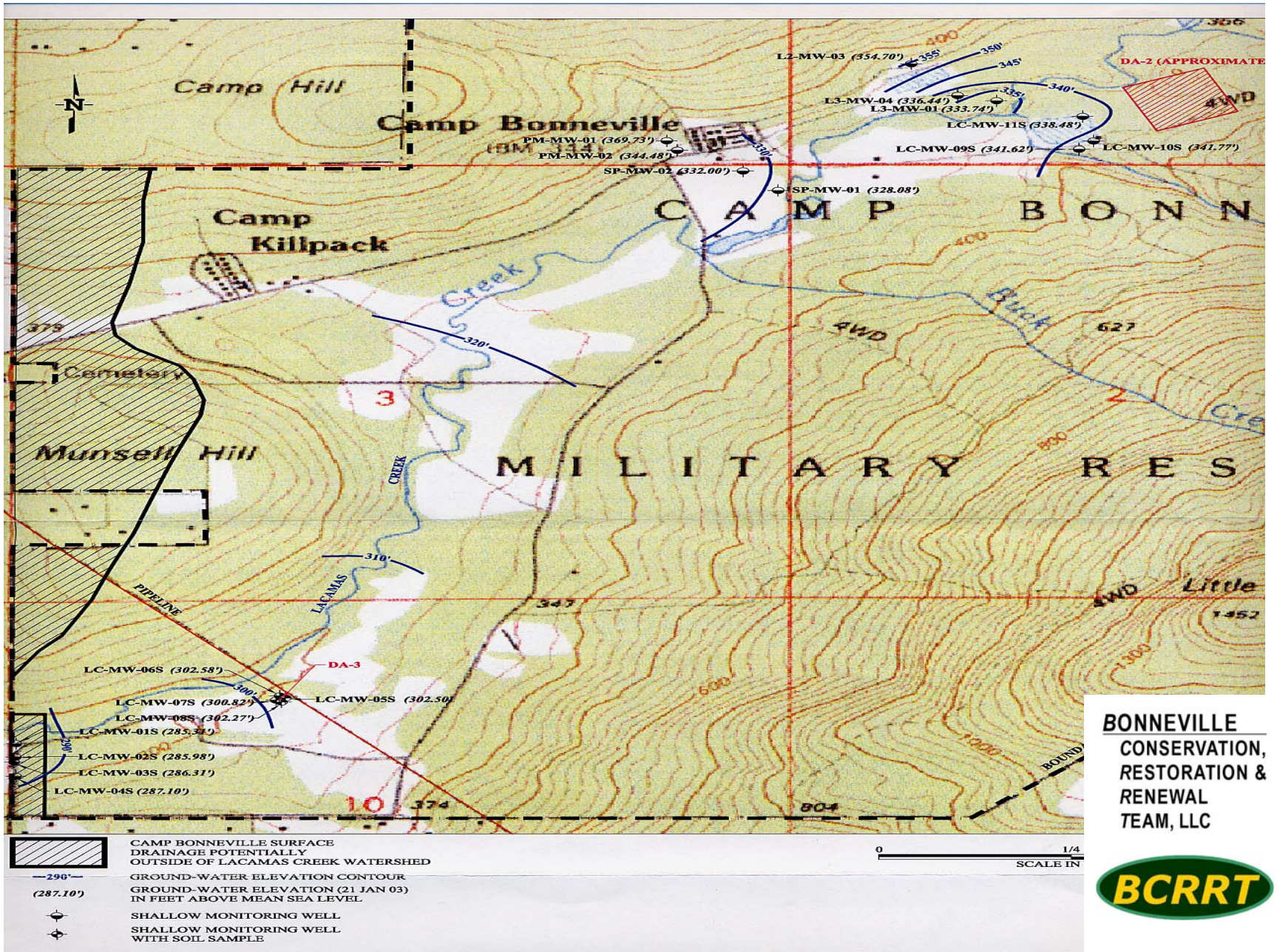


Figure 7 Deep Groundwater Contours

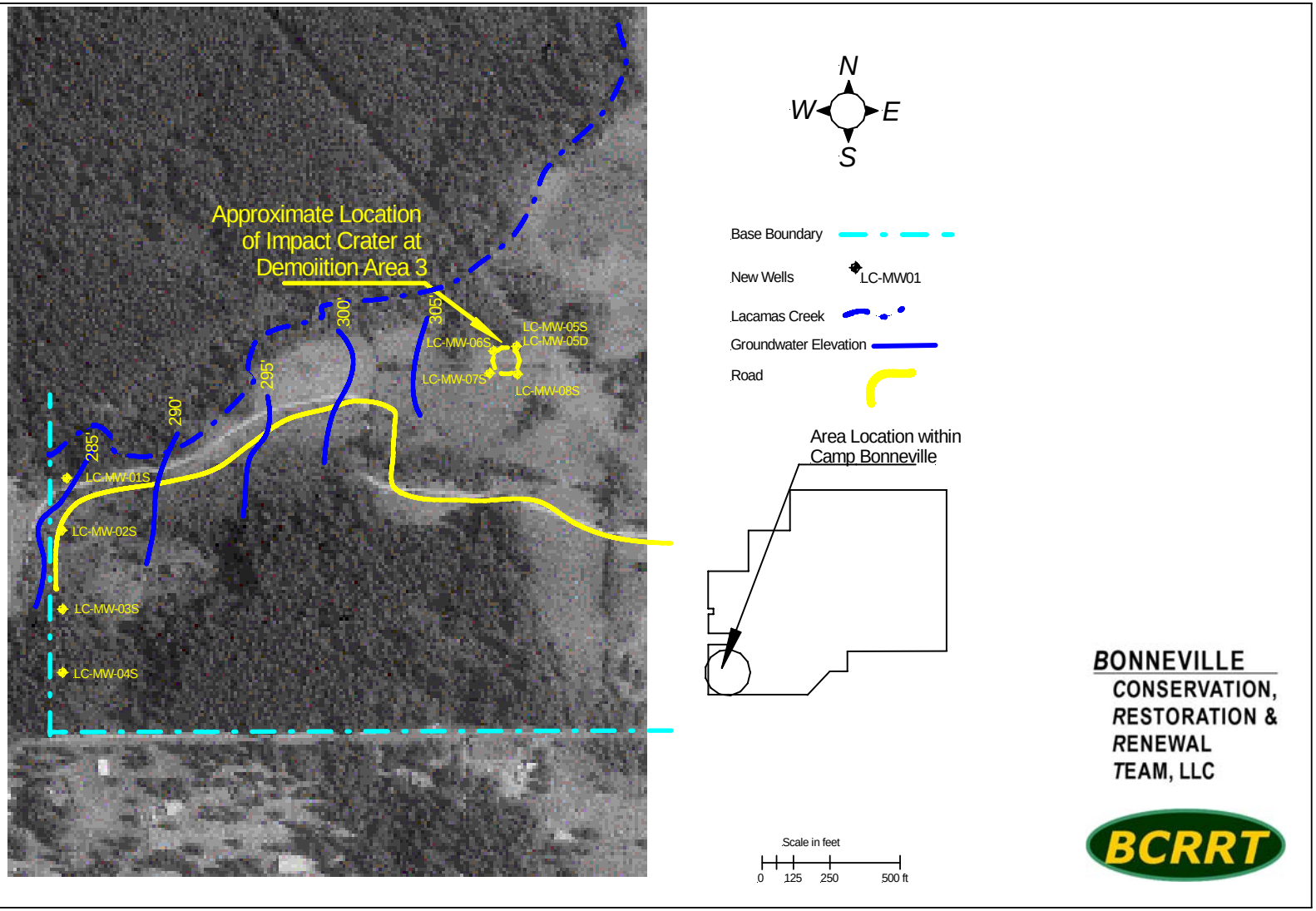


Figure 8
Soil Sample Locations at Demolition Area 2

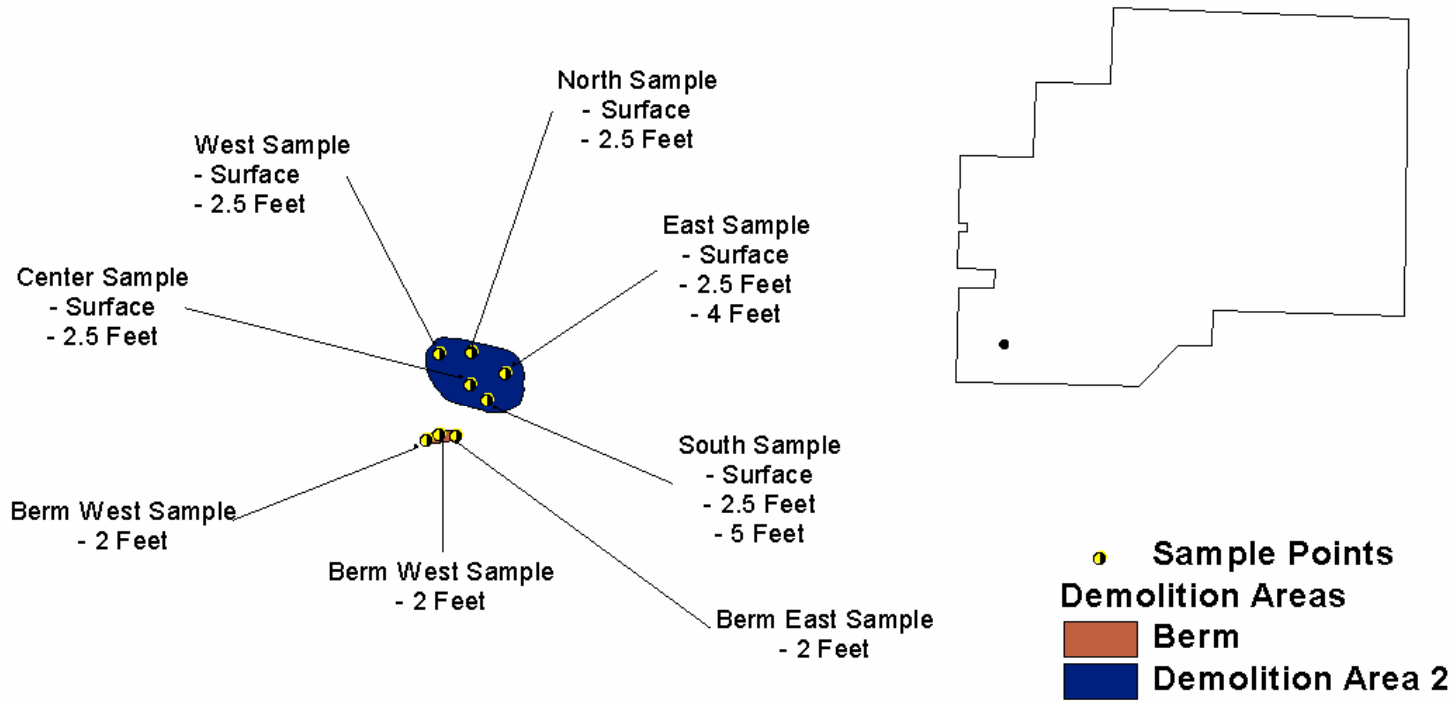
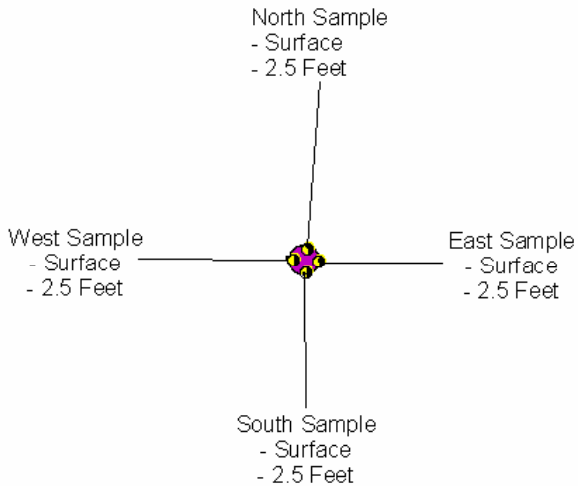
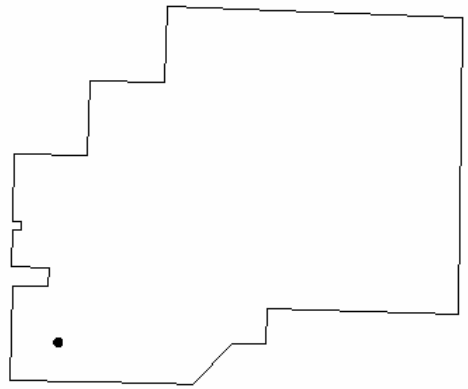


Figure 9

Soil Sample Locations at Demolition Area 3





BONNEVILLE CONSERVATION, RESTORATION & RENEWAL TEAM, LLC

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Sample Points

Demolition Areas

Demolition Area 3

400 0 400 800 Feet

N

W E

S