

FEASIBILITY STUDY
DOLLY SODS WILDERNESS AREA
Davis, West Virginia
Contract DACA 87-90-D-0018

FINAL
WORK PLAN
for
SURFACE AND SUBSURFACE INVESTIGATION
AND ON-SITE DISPOSAL OF ORDNANCE

JULY 19, 1991

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For:

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SECTION 1.0 INTRODUCTION

1.1 PROJECT DESCRIPTION

The Dolly Sods Wilderness Area Feasibility Study was authorized under the Department of Defense Environmental Restoration Program (DERP) for Formerly Used Defense Sites (FUDS) which is administered by the Ordnance and Technical Programs Division of the Army Corps of Engineers, Huntsville, Alabama.

Dolly Sods is located in Grant, Tucker and Randolph Counties, West Virginia. The Forest Service operates the wilderness area which contains 10,215 acres and is open to the public at all times. The area was used for maneuvers during World War II by the Department of the Army and, in the past, the public has discovered abandoned shells from these military exercises.

This site was selected for study based on the findings of the Huntington District Corps of Engineers that ordnance still may remain in the wilderness area creating a severe hazard to the public. The project's Scope of Work (SOW) is included in the Work Plan as Appendix A.

1.2 OBJECTIVE

The feasibility study will characterize the nature and extent of ordnance and explosive waste (OEW) contamination. In addition it will identify remedial actions to alleviate OEW which will be cost effective, protect the environment of the wilderness area and provide safety for the public.

1.3 EXPECTED RESULTS

The uncertainty of the location of OEW in 10,215 acres of wilderness provides a significant challenge and it is expected that the results of the study will eliminate many of these uncertainties.

Based on the planned and systematic search activities ten one-acre areas can be expected to be cleared of all ordnance and explosive waste of a dangerous nature. Fifty five-acre sites will be cleared of all surface OEW.

1.4 SUMMARY

Unexploded military munitions present an imminent and substantial danger to the public welfare. The Department of Defense (DOD) under the National Contingency Plan has the removal response authority for munitions under the jurisdiction, custody or control of DOD. For this study the DOD provides for the removal by onsite disposal (detonation) of unexploded munitions discovered during the investigations. All methods and procedures for disposal work described in Section 5.7 will be performed to protect the environment from unnecessary damage.

The results of the investigation of the study's sample areas will be used in estimating the extent and amount of ordnance contamination throughout the wilderness area. Remedial action alternatives will be evaluated for the project site based on the OEW encountered in the sample areas and the results of the methods used to dispose of unexploded ordnance. The Engineering Report will present an analysis of alternative actions and recommendations for corrective measures within the project site and recommendations for further study of areas outside the wilderness.

SECTION 2.0
SITE BACKGROUND AND SETTING

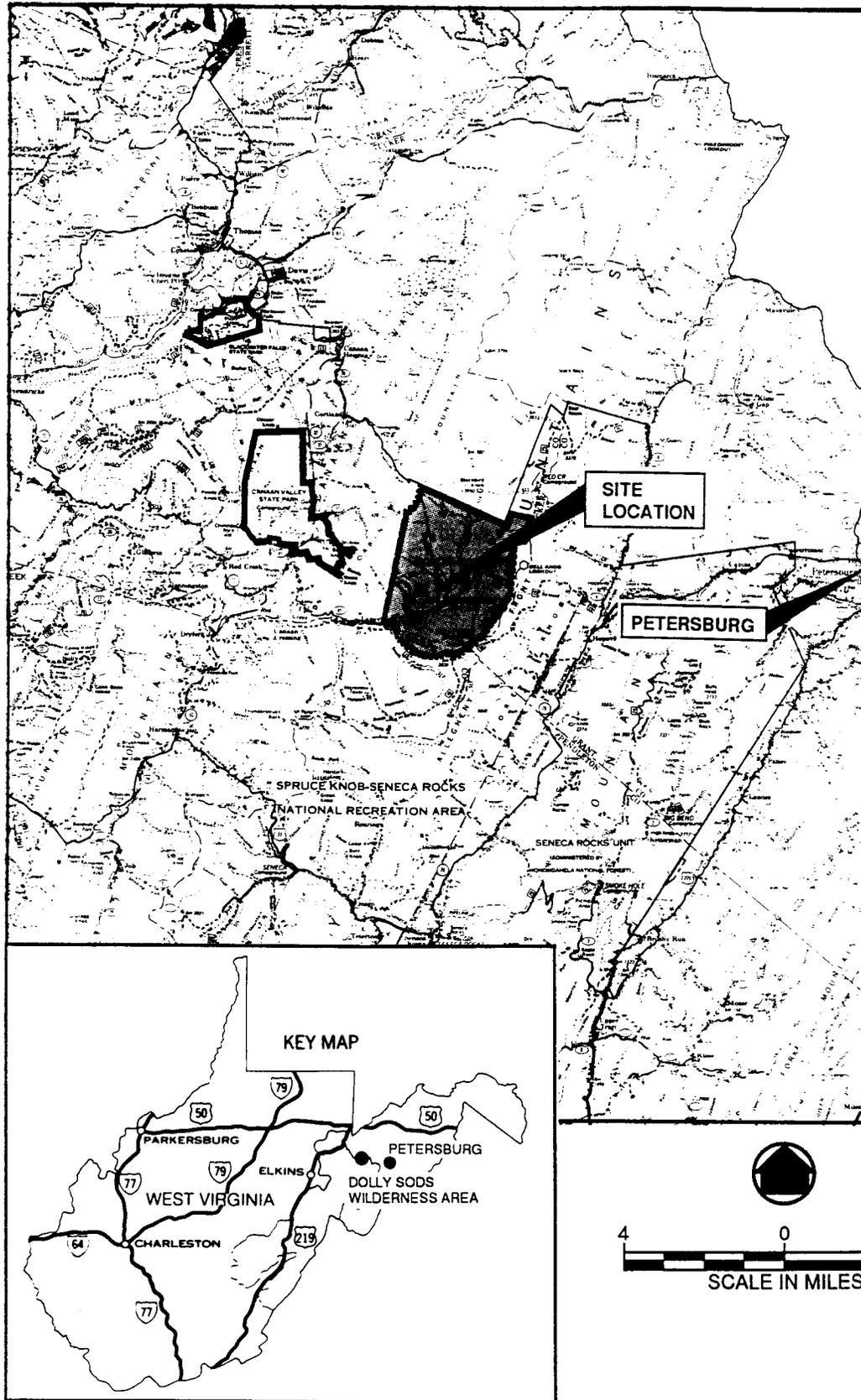
2.1 SITE LOCATION AND DESCRIPTION

The Dolly Sods Wilderness Area is a 10,215-acre site in the Monongahela National Forest, which is contained in Grant, Tucker, and Randolph counties in West Virginia. The wilderness area remains in a natural, undisturbed condition and is open to the public. A Forest Service information pamphlet describes Dolly Sods as an "area of high elevation wind-swept plains on the Allegheny Plateau." The location of Dolly Sods Wilderness area is shown in Figure 2-1. Figure 2-2 is a topographic map of Dolly Sods.

Dolly Sods Wilderness Area is located between 2,600 and 4,100 feet above sea level. In general, the terrain is quite rocky and rugged and the plant and animal life is comparable to that of Northern Canada. Several notable topographic features include the Red Creek and its tributary runs, Breathed Mountain and other knobs, and the "sods" or bogs in the more level areas of the wilderness area.

Red Creek runs from the northern boundary to the south-west corner of Dolly Sods Wilderness Area dividing the wilderness area roughly in half. Its several tributaries include the Stonecoal Run and Fisher Spring Run. The Stonecoal run is the longest tributary of the Red Creek in the Dolly Sods Wilderness Area. It runs from the north-west corner of the wilderness area to the southern part of the wilderness, where it separates from the Red Creek around Breathed Mountain. The Little Stonecoal Run is to the west of the larger Stonecoal Run and runs roughly parallel to it. Fisher Spring Run runs from the bogs in the north-east corner of the wilderness area south-west to the center of the wilderness where it meets the Red Creek. Close to the northern edge of Dolly Sods Wilderness Area, the Red Creek separates from the Left Branch of the Red Creek.

Breathed Mountain is in the south-central area of Dolly Sods Wilderness Area and separates the Red Creek from Stonecoal Run. It rises to over 3800 feet



**FIGURE 2-1. DOLLY SODS WILDERNESS AREA
SITE LOCATION PLAN**

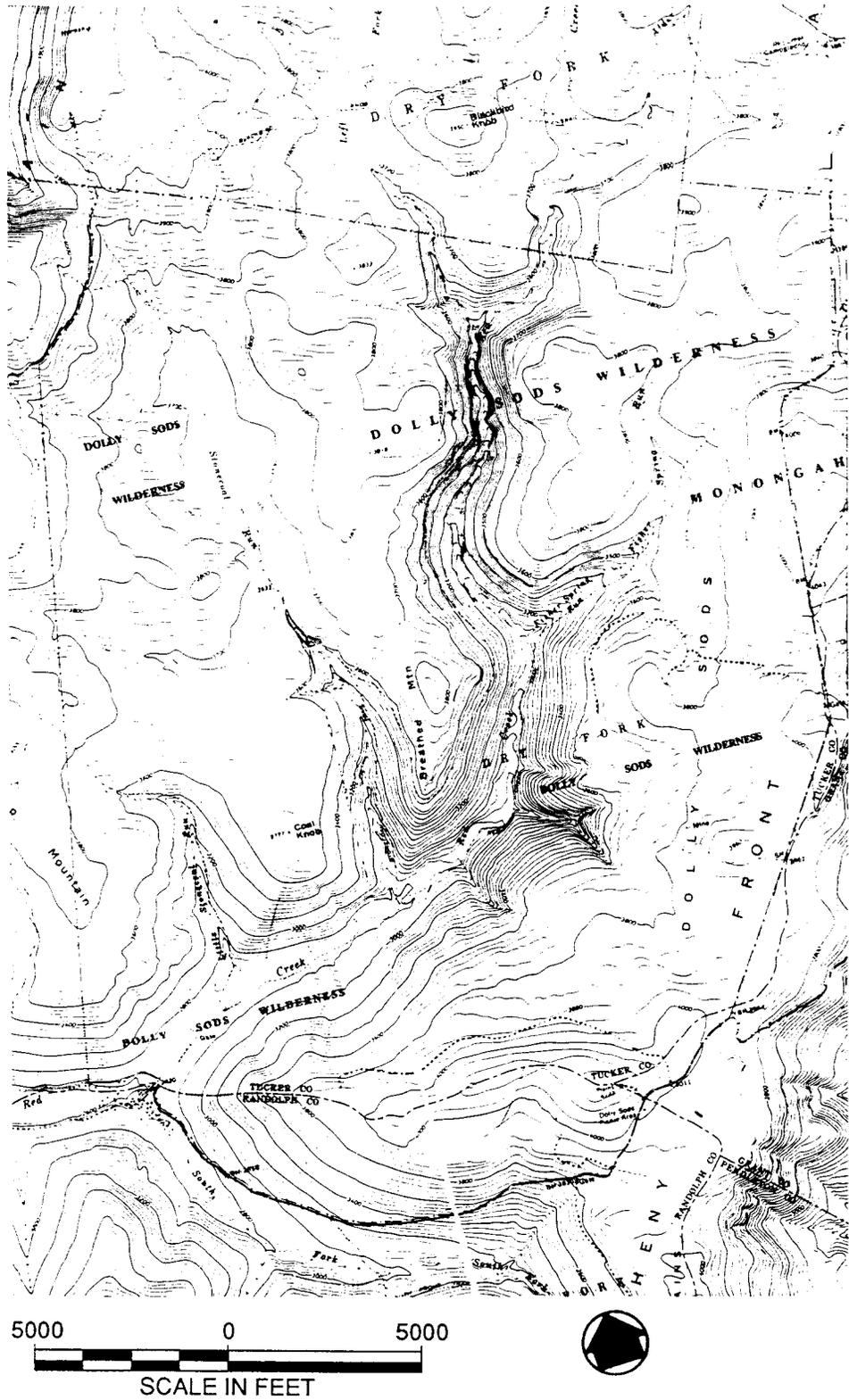


FIGURE 2-2.
DOLLY SODS WILDERNESS AREA

and drops steeply to the Red Creek and Stonecoal Run. Blackbird Knob is not actually in the Dolly Sods Wilderness Area but is just to the north of where the Red Creek meets the Left Branch. Bell Knob is just to the east of the wilderness area and is in the Dolly Sods Scenic Area. A look-out tower is located on the top of Bell Knob. Cabin Mountain is located just beyond the north-west corner of Dolly Sods Wilderness Area.

The sods, or bogs, are located mostly in the northern part of the wilderness area and can be located primarily at the headwaters of the runs and streams of the area. Large areas of sods are located in the level areas at the head of the Fisher Spring Run and an unnamed tributary of the Red Creek. These sods are marshy and contain different types of vegetation than the surrounding forest.

There are no roads in the wilderness area. Forest Service Road 75 is located just outside of the boundaries of the site. It is a one-and-a-half lane gravel road and runs along the southern and eastern boundaries of the wilderness area. Along the road are several trail heads to the many hiking trails going into the wilderness area.

The vegetation in the Dolly Sods Wilderness Area is similar to that of northern Canada. Typical plants in the Dolly Sods area, as described in the Dolly Sods information pamphlet, include "one-sided" red spruce, sphagnum bogs, yellow birch, heath barrens and patches of aspen. Much of the plateau is heath barrens where predominant plant species include azaleas, mountain laurel, rhododendron, and blueberries. The plants in the sods include cranberries and the carnivorous sundew plant which grows on mats of sphagnum moss. In the lower lying areas, hardwoods and plantations of red pines can be found.

Animal life in Dolly Sods is diverse. Common species found in the area include deer, squirrels, chipmunks, and a variety of birds. Less common species include various turtles, white hare, some frogs and black bear. Endangered species include Cheat Mountain Salamander in the Cabin Mountain area and, possibly, Northern Virginia Flying Squirrel. There have been reports of mountain lion and Peregrin Falcon sighted in the area.

The Dolly Sods Wilderness Area is currently allowed to remain undeveloped, and the primary use of the area is for recreational purposes. There are several hiking trails through the wilderness and, camping is allowed with restrictions upon activities which might damage the wilderness area. A picnic area has been created next to Forest Service Road 75 at the southern end of the wilderness area, and hunting is allowed during the West Virginia hunting season.

2.2 SITE HISTORY

Before logging occurred in the late 1800s, the plains in the Dolly Sods area were covered by a red spruce and hemlock forest. The majority of logging occurred between 1890 and 1910. After these trees were logged, the humus layer was destroyed by fires leaving the current, relatively infertile, rocky terrain.

Local farmers burned the plains to create grazing land called "sods" and grazing had continued until about 1980. One of the first inhabitants of the area was the pioneer Dahle family. This name was altered to become the "Dolly" of "Dolly Sods."

The Forest Service bought the land which is now the Dolly Sods Wilderness Area as logging came to an end from 1910 to 1913. In the 1930s, the Civilian Conservation Corps planted red pine and other conifers as well as aiding with the construction of Forest Service Road 75. Military maneuvering and training was performed in the Dolly Sods area during World War II from 1943 to 1944 and the land was returned to the Forest Service in 1950. Dolly Sods Wilderness Area was created by an act of congress in 1975.

2.3 WWII MILITARY OPERATIONS

During World War II, about 2,181,000 acres in the vicinity of Dolly Sods were used by the Thirteenth Army Corps of the Third Army for mountain training and maneuvers including the firing of artillery and mortars. This training continued from October, 15, 1943, to July, 1, 1944, with several divisions taking part in training and then shipping out. These divisions included the

77th infantry from October 15, 1943 to January 2, 1944, the 28th infantry from August 2, 1943, to September 30, 1943, the 31st infantry from September 9, 1943 to November 17, 1943, the 35th infantry from February 4, 1944 to March 28, 1944, and the 95th infantry from May 1, 1944 to July 1, 1944.

Records on all of the military operations in the area are scarce because of lost and destroyed records, but it is known that the targets of the artillery fire near the Dolly Sods Wilderness Area included the southern face of Blackbird Knob to the north and the eastern face of Cabin Mountain at the north-west corner. There were, apparently, three groups of gun emplacements. One was in the Canaan Valley, although the exact locations of these guns are not known. A second was along Forest Service Road 75 from "a point near the Bell Knob tower, north to the end of the road." Finally, there were gun emplacements "on the east side of the mountain on the Allegheny Front... north of the Dolly Sods Wilderness Area." The gun emplacements to the west (the Canaan Valley) would have fired upon Blackbird Knob only while the positions to the east apparently fired at both Blackbird Knob and Cabin Mountain. The firing locations and targets are shown in Figure 2-3. It can be seen that some of the artillery fire would have been across the northern end of the wilderness area.

In addition to artillery fire, mortar fire took place in the area. The targets are unknown; however, it is likely that the open, high ground would have been targeted so as to lessen the possibility of fires started by the explosion and to make the impact more visible. The mortars were probably fired from a multitude of locations around the Dolly Sods area.

It is known from retired forest rangers that fires, possibly from artillery fire, occurred in several locations along the northern edge of what is now Dolly Sods Wilderness Area.

2.4 CURRENT STATUS OF THE SITE

It is known that the artillery range was grid-searched and decontaminated of unexploded ordnance following the end of operations in the area (see

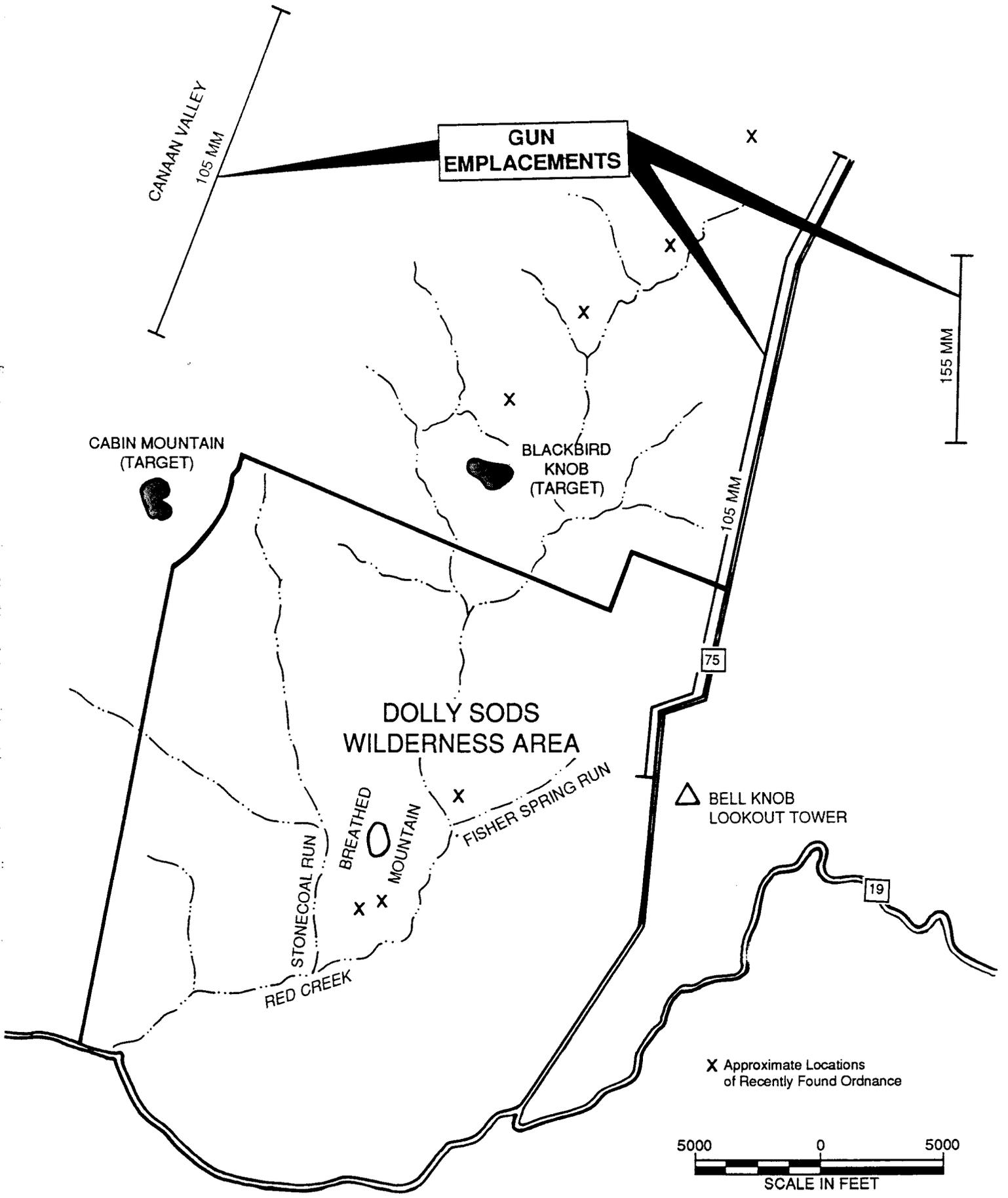


FIGURE 2-3. FIRING LOCATIONS AND TARGETS AT DOLLY SODS

Appendix C). At some later time, as persons hiking into the area continued to discover isolated ordnance, military EOD (Explosive Ordnance Disposal) teams were used again to clear the area of unexploded ordnance. The exact location and extent of these disposal operations are unknown. Despite these past efforts, ordnance has been discovered several times in the recent past. Seven separate locations of recently discovered ordnance were provided by two forest service rangers who have worked in the Dolly Sods Wilderness Area. Three of these mortar rounds were in the Dolly Sods Wilderness Area itself and four were found further to the north, in the Blackbird Knob area which is privately owned land. The locations are shown in Figure 2-3. None of this ordnance were discovered previous to 1983 although the dates of two of the finds are unknown. All of the recently found ordnance was indicated as 81 mm mortar shells although 105 mm artillery ordnance appears to have been found in the past (see Appendix C). Information brochures and bulletin boards in the wilderness continue to provide information warning the public not to touch or move mortar or artillery shells found in the wilderness.

SECTION 3.0
PROJECT MANAGEMENT

3.1 PROJECT ORGANIZATION AND RESPONSIBILITY

Figure 3-1 presents the project organization chart which identifies the individuals responsible for the overall study. The key individual responsible for overseeing the project is the project manager who reports directly to the project director and deputy project director. Mr. William Mooney in Metcalf & Eddy's Hazardous Waste Division will be the project manager for this study. Investigation results are reported directly to the project manager who reviews and evaluates the data.

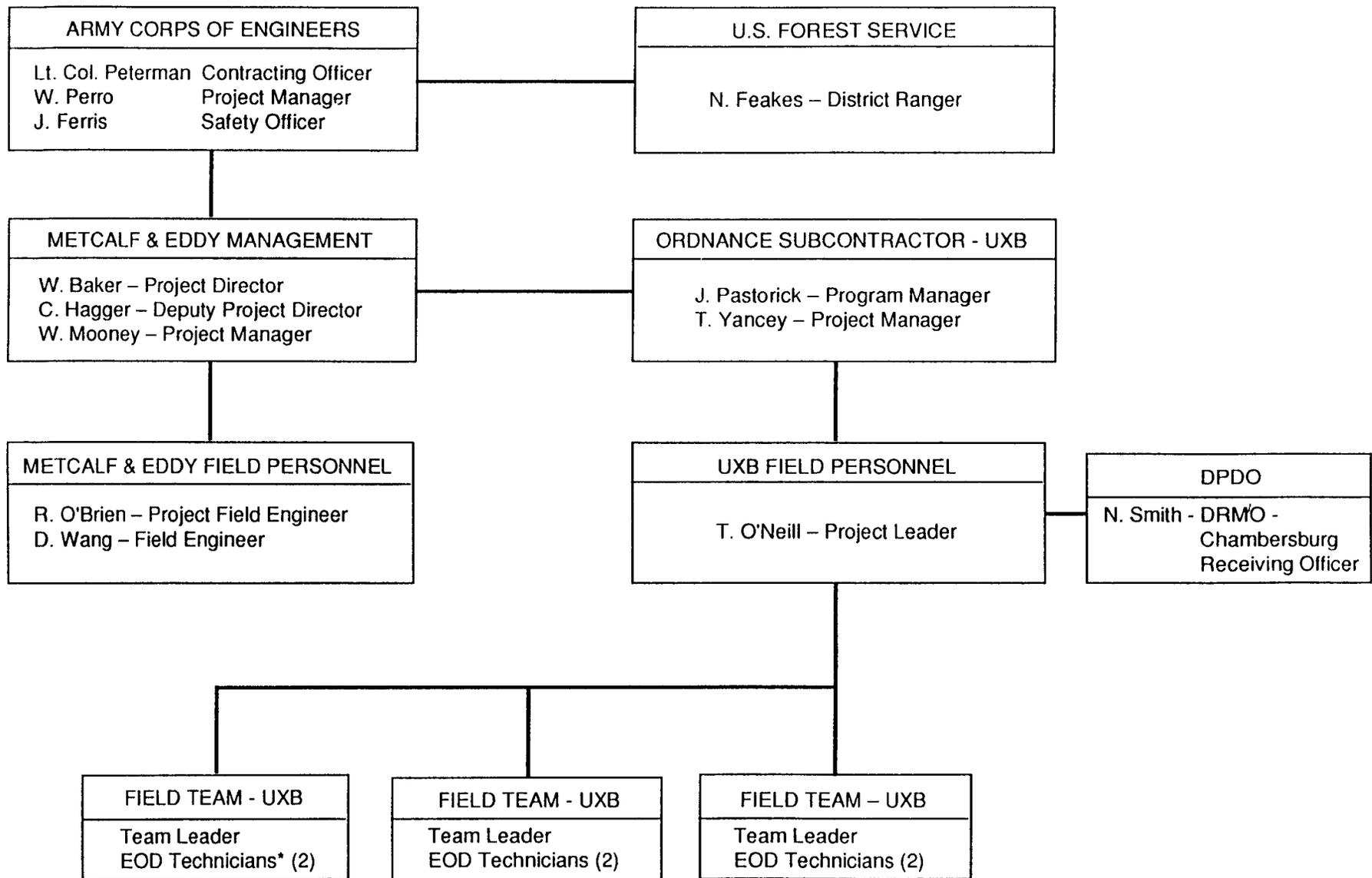
The project field engineers will be responsible for overseeing the implementation of the objectives while conducting the field investigations and report directly to the project manager. For this project Mr. Ronald O'Brien, civil engineer in Metcalf & Eddy's Hazardous Waste Division will be charged with overseeing all on-site activities.

The ordnance subcontractor which will provide ordnance survey, handling and disposal services during the field investigations will be UXB International Inc. of Chantilly, Virginia.

Figure 3-1 also depicts the reporting responsibilities of key individuals within UXB. Resumes of all UXO personnel, EODs certificates, EOD assignments and contractor UXO experienced are included in the Appendices D and E. The key individuals responsible for implementation of the feasibility study and their specific responsibilities are as follows:

Project Director. Willard Baker, P.E., Metcalf & Eddy.

- Reports to corporate management
- Ensures the appropriate corporate resources are dedicated to the Dolly Sods Wilderness Area feasibility study



* One Technician to be Certified EMT

FIGURE 3-1. PROJECT ORGANIZATION

- Serves as senior technical adviser and quality control manager for project

Deputy Project Director. Christopher Hagger, P.E., Metcalf & Eddy.

- Reports to project director
- Serves as program manager
- Monitors progress of work
- Performs review of field activities and technical work
- Responsible for resolving program management problems

Project Manager. William Mooney, P.E., Metcalf & Eddy.

- Reports to deputy project director
- Responsible for coordination with ACOE project manager
- Reviews and approves field operating procedures
- Assures that approved procedures meet project objectives
- Coordinates field activities
- Responsible for implementation of recommendations of project directors

Project Field Engineer. Ronald O'Brien, Metcalf & Eddy.

- Reports to project manager
- Responsible for coordination with ACOE safety officer
- Oversees field work and coordinates activities with UXB's project leader
- Assures that all documentation of field activities is complete and accurate
- Records and reports any problems or changes associated with field activities

UXB International Program Manager. Jim Pastorick

- Overall responsibility for UXB field activities

UXB International Project Manager. Robert T. Yancey

- Reports to project manager, Metcalf & Eddy, Inc.
- Coordinates UXB's field activities
- Acts as the collection point for proposed changes and initiates changes in the field activities

UXB International Project Leader. Thomas O'Neil

- Fulfills responsibilities of senior UXO supervisor in accordance with SOW
- Reports to project manager UXB
- Responsible for coordination with Metcalf & Eddy's project field engineer
- Supervises UXB's field activities
- Recommends to UXB program manger changes to field activities

3.2 METCALF & EDDY PERSONNEL

Qualifications for Metcalf & Eddy personnel involved in the Dolly Sods project are given below.

Project Director - Mr. Willard Baker, P.E. will be Metcalf & Eddy's Project Director for the Dolly Sods Project. He is Vice President of the Hazardous Waste Division at Metcalf & Eddy.

He has 20 years of experience in solving industrial and hazardous waste problems including remedial investigations, feasibility studies and design and implementation of remedial actions.

Deputy Project Director - Mr. Christopher Hagger, P.E. is an associate in M&E's Hazardous Waste Division. He has more than 17 years of technical, field and management experience including 10 years of direct involvement in hazardous waste projects. Mr. Hagger was manager of a remedial investigation for a large Superfund Site contaminated with waste byproducts from the production of chemical warfare agents and unexploded ordnance.

Project Manager - Mr. William Mooney, P.E. has more than 20 years of experience in design and managing site investigations and cleanups. Mr. Mooney has managed conceptual, preliminary and final design tasks for the remediation Superfund sites under direction of USACE.

Project Field Engineer - Mr. Ronald O'Brien has supervised subcontractors performing construction related activities on various hazardous waste sites. Mr. O'Brien has performed numerous surveys and managed subcontractors performing surveys at Superfund sites. He has extensive design experience pertaining to hazardous waste remediation projects.

Technical Advisory Team

All projects conducted by Metcalf & Eddy are reviewed by a team of senior technical experts assembled specifically for each project. These specialists review the technical and quality aspects at key junctures of the project to guide its development and to raise economic and operations considerations. Mr. Willard L. Baker and Mr. Christopher L.D. Hagger will serve as technical advisors for this Feasibility Study. Mr. John P. Boyden will represent UXB International Inc. on the technical advisory team. Mr. Boyden is Vice President of Operations for UXB and has 29 years of EOD experience, 25 with the U.S. Navy and 4 with UXB.

3.3 FIELD CONTROL METHODS

As the ordnance subcontractor for the Dolly Sods surface and subsurface clearance operations, UXB will take primary responsibility for the field control of these operations. UXB's project leader will have overall

responsibility for all UXB personnel on the site. Field control methods will differ depending on whether surface or subsurface clearing is being performed.

Visual inspection will be used for surface clearing operations. The visual inspections will be performed using sweep lines of three persons covering a path, 18 feet in width. The person on the far side of the line will lay down a hip chain which can then be followed on the next sweep across the five acre plot. In this way it is ensured that the entirety of the five-acre plots are covered. In conjunction with the visual search, a Schoenstadt GA-52B ferrous metal detector will be used. This metal detector will ensure that ordnance and fragments will not be concealed by ground cover. It is the responsibility of the UXB team leader to ensure that the sweep area is completely surveyed. In addition, the team leader is responsible for confirming that all ordnance is logged, identified and marked appropriately. The team leader will plot the locations of UXO measured to the site's boundary markers, and record all ordnance encountered on the UXB Ordnance Data Report.

Subsurface exploration will be accomplished through the use of a geophysical survey. Two pieces of equipment will be used in the geophysical survey; a Foerster Ferex Electromagnetic Detector and a White's Eagle II Metal Detector. In the subsurface geophysical survey, the two devices are used with the electromagnetic detector leading the metal detector in six foot wide paths. Previous to the field operation, the two devices will be calibrated by using a control grid "seeded" with metal items to ensure that the devices are working consistently. Finds will be hand excavated up to a depth of six feet and disposed of in the appropriate manner.

The survey area will be located using existing topographic maps. The corners will be staked and then marked with the GPS Pathfinder system. More information on UXB's field quality control methods is contained in Section 5.

During the field work performed at Dolly Sods Wilderness Area, each Metcalf & Eddy field engineer will keep a field notebook in order to record the days events. The engineer will record the following pieces of information into the field notebook:

- The date, starting time and finish time
- Weather and field conditions
- All personnel and visitors to the site. This would include Metcalf & Eddy, UXB, Army Corps of Engineers, and Forest Service representatives. In addition, any visitors to the Dolly Sods Wilderness area who happen to walk onto the location of work being performed would have to be recorded
- Location of work and amount of work accomplished
- Problems or difficulties encountered
- Ordnance or fragments located
- Non-ordnance related metal found
- Any other events which may be significant to the field operation

The daily information from the field notebooks will be summarized each week by the engineer onsite into a weekly report. This report will then be submitted to the Army Corps of Engineers along with the updated plot records and OEW accounting forms.

3.4 DATA COLLECTION PROCEDURES

Any ordnance and explosive wastes (OEW) located during the surface or subsurface clearance at the Dolly Sods Wilderness Area will be accounted for in detail. The accounting of the OEW will include amount and location. Location will be determined from GPS or by measurement from the GPS established boundaries of the five acre work areas. Ordnance will be identified and the condition of the ordnance will be determined and recorded. Finally, the disposition of the ordnance will be recorded. Accounting shall include the amount of non-OEW related debris which will interfere with subsurface clearance. The non-OEW material will be recorded in pounds-per-acre. Metallic OEW related materials will be identified and recorded in pounds-per-acre. This material will be transported by backpack from the wilderness and placed in the established holding area at the command post pending turn-in. The holding area will be secured from public access.

Following the completion of the clearance and search activities the recovered OEW related metal scrap will be turned in to the Defense Property Disposal Office (DPDO), located at DRMO-Chambersburg, Letterkenny Army Depot, PA.

Figure 3-2 shows a standard form which will be utilized for keeping track of ordnance found on each 5-acre plot. These forms will be used to record the location of the plots, the time that work is performed, what ordnance is found and where ordnance is found.

The upper portion of the form will contain general information about the plot. Also in the top section of the form will be GPS points to define the location of the plots, a general description of the terrain, and the start and finish dates. The OEW will be accounted for in detail in the middle portion of the form. The location, time of discovery, weight of the OEW, identification, conditions, and disposition will all be recorded here. The bottom section will show, graphically, the locations of ordnance and the corners of the plot.

These forms can be faxed to supervisory personnel so that they can immediately review the findings of the work being done in the field.

On a weekly basis, an overall map of the Dolly Sods Wilderness Area work locations and ordnance found will be plotted. This plan will be used to aid in determining areas where significant amounts of ordnance may exist and further investigations may be warranted.

SECTION 4.0
SITE EVALUATION

4.1 RECORDS RESEARCH

Government agencies, newspapers and private citizens were contacted by telephone for historical information concerning the military activities at the Dolly Sods Wilderness. Appendix B contains a list of the information sources that were contacted. Records were reviewed and/or obtained from the following sources of information during personal site visits: National Archives in Washington, D.C.; National Forest Service in Elkins, West Virginia; and National Forest Service in Petersburg, West Virginia.

Topographic maps were ordered from U.S. Geological Survey, Denver, Colorado. Aerial photos were ordered from U.S. Geological Survey, Sioux Falls, South Dakota and the National Archives Cartographic Branch in Alexandria, Virginia. The project site was visited and local populace and current and former forest service personnel were interviewed.

Reports were received from the Corps of Engineers, Huntsville, Alabama; and Corps of Engineers, Ohio River Division, Cincinnati, Ohio. Letter reports were received from former Forest Service employees. Copies of these reports are included in Appendix C.

An evaluation of the research information was made by Metcalf & Eddy and UXB International and general areas were selected for further investigation during the site visit. This information included the general locations of gun emplacements, sites where forest fire were started by ordnance, impact areas for artillery and mortar fire and UXO shells found by wilderness hikers.

4.2 SITE VISIT

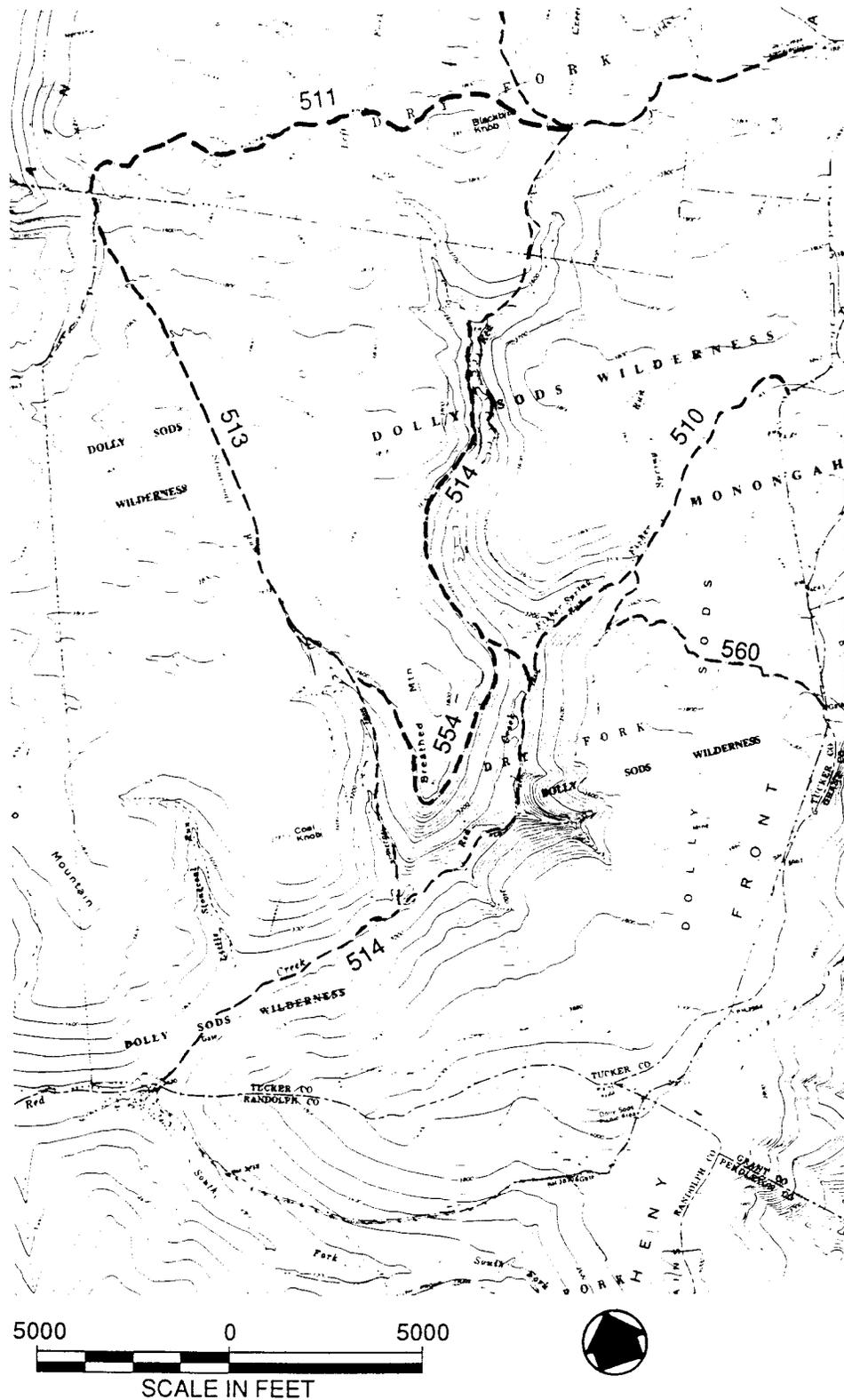
General

The statement of work for the Dolly Sods project called for a site visit in order to "assist in the development of the work plan." This site visit was performed from May 20, 1991, to May 31, 1991. The personnel conducting the site visit included representatives from Metcalf & Eddy and UXB, the ordnance specialist subcontractor. Based on the data obtained from the records search, areas of the site likely to contain UXO were searched. The results of the search were to be used to select the areas for surface and subsurface clearing operations.

Areas Searched During the Site Visit

During the first week of the site visit, areas to be searched included the locations of ordnance which had been uncovered in recent years and areas close to Blackbird Knob, a primary target for artillery during the maneuvers which took place in the Dolly Sods area. On Tuesday, May 21, the vicinity of the intersection of Fisher Spring Run and Red Creek was searched, and on Wednesday, May 22, the area around Breathed Mountain where additional rounds of ordnance had been found in the recent past was examined. Portions of trails 514, 513 and 554 were searched in addition to the rocky face of Breathed Mountain above trail 554. The location of these trails are shown in Figure 4-1. On Thursday, May 23, the area between the Red Creek and the Left Fork near the northern border of Dolly Sods Wilderness Area was investigated, and on Friday, May 24, the region west of the Left Fork was searched to about half mile west of the Left Fork. These areas which were searched are all shown in Figure 4-2.

During the second week of the site visit, the areas searched included high ground and open areas likely to have been targets for mortar fire. On Tuesday, May 28, the bogs at the head of Fisher Spring Run were searched as well as the high ground just north of Fisher Spring Run. The next day, the same bogs were searched again as well as the wooded areas around the bogs.



**FIGURE 4-1. SELECTED TRAILS
IN THE DOLLY SODS WILDERNESS AREA**

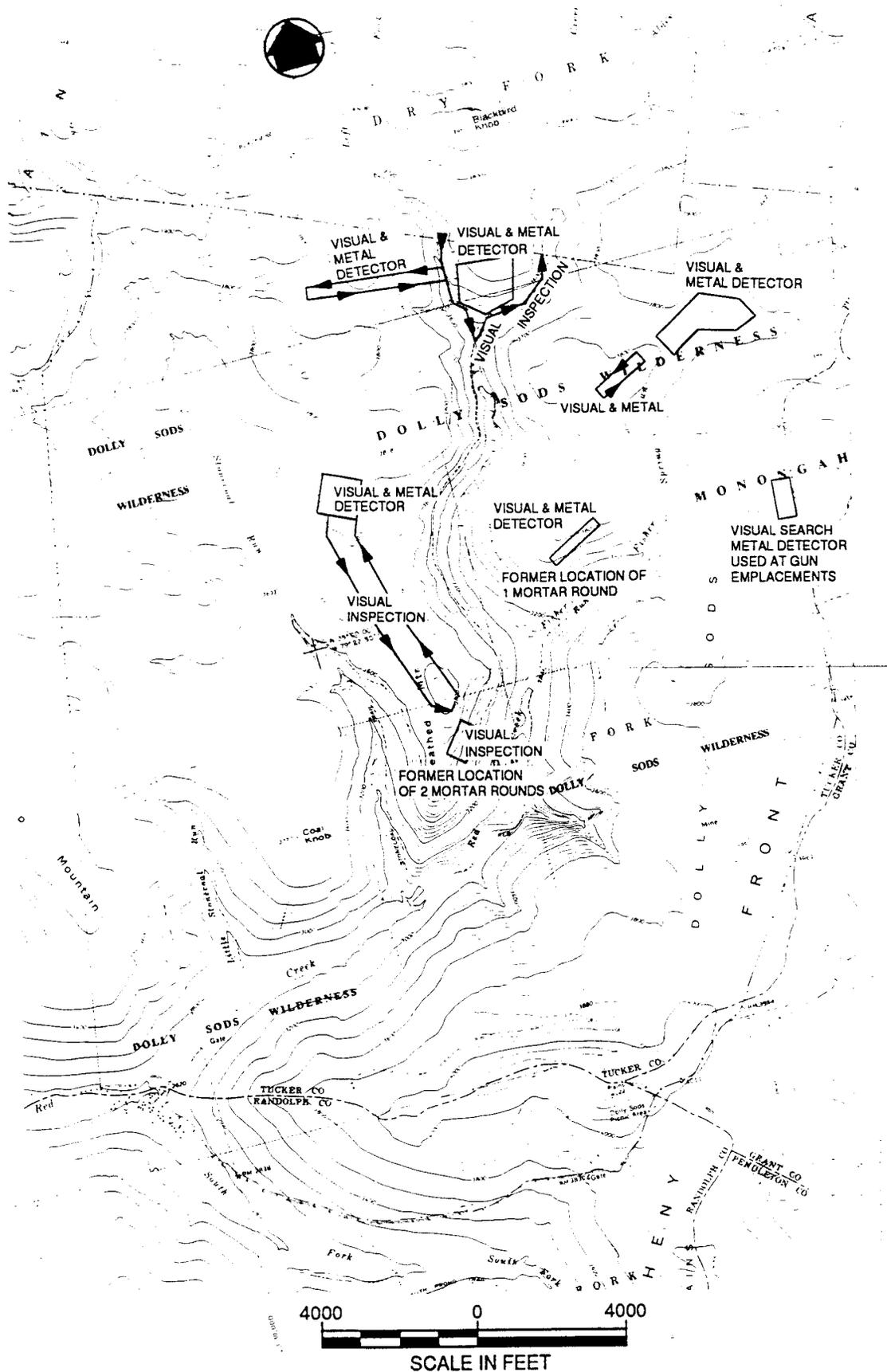


FIGURE 4-2. AREAS SEARCHED DURING DOLLY SODS SITE VISIT

Also on Wednesday, gun emplacements were discovered approximately 120 feet to the west of Forest Service Road 75 in the vicinity of Bell Knob Tower. The gun emplacements were distinguishable by the distinctive pattern of their eroded yet visible berms. On Thursday, the ridge north of Breathed Mountain and between the Red Creek and Stonecoal Run was searched. Finally, on Friday, May 31, further exploration was performed in the area where the Red Creek meets the Left Fork. These areas are also shown in Figure 4-2.

Results

No unexploded ordnance was discovered during the course of the site visit. At three locations, buried metal items were found but, because of their depth beneath the surface, couldn't be confirmed as ordnance related materials. Two of these locations were in the bog at the headwaters of Fisher Spring Run. The third was found among the gun emplacements west of Forest Service Road 75. In addition to the buried metal, ordnance fragments were found near where the Red Creek meets Fisher Spring Run. These fragments were found buried about one inch deep north of the Red Creek and west of Fisher Spring Run. GPS was used to determine the location of areas which were considered likely to contain OEW.

SECTION 5.0
UXB SURFACE AND SUBSURFACE INVESTIGATION PLAN

Visual search is appropriate for locating ordnance and ordnance related debris on the surface in areas where vegetation does not obscure a clear view of the ground surface or where light brush creates no significant obstruction. The Schonstedt GA-52B Magnetic Locator is used in conjunction with visual techniques to assist in search of those areas where vegetation reduces visibility. Geophysical investigation including magnetometry and metal detection is appropriate for locating ferrous and nonferrous metallic objects such as individual projectiles, rockets and bombs where these objects are buried and cannot be found using a visual search. In addition to the visual and geophysical investigation, UXB will hand excavate shallow contacts, six feet or less in depth. The location of the excavations will be based upon the results obtained from the surface and subsurface surveys.

5.1 PERSONNEL AND PERSONNEL ASSIGNMENTS

Resumes for UXB personnel who will work at the Dolly Sods Wilderness Area are given in Appendix D. UXB personnel have been trained at the Naval School of Explosive Ordnance Disposal, Indian Head, Maryland. No UXB International, Inc. personnel have been removed from Military EOD or Contractor EOD assignments for personnel reliability reasons. EOD training certificates for UXB personnel are presented in Appendix E.

Program Manager

Mr. Jim Pastorick will be the UXB Program Manager for the former WVMA Project and will have the ultimate responsibility for all UXB activities connected with the project. Mr. Pastorick is a graduate of the U.S. Naval School of Explosive Ordnance Disposal, Indian Head, Maryland, with four years of experience in an active duty military EOD assignment and 1 1/2 years of contractor UXO experience.

Project Manager

Mr. Robert T. Yancey will serve as the UXB Project Manager for the former WVMA project and will have direct responsibility for all UXB operations related to the project. Mr. Yancey is a graduate of the U.S. Naval School of Explosive Ordnance Disposal, Indian Head, Maryland, with over 11 years of experience in active duty military EOD assignments.

Project Leader

Mr. Thomas O'Neill will serve as the UXB Project Leader and Senior UXO Specialist. He will have overall responsibility for all UXB personnel and their performance under the direction of the M & E Site Manager. Mr. O'Neill is a graduate of the U.S. Naval School of Explosive Ordnance Disposal, Indian Head, Maryland, with 13 years of experience in an active duty military EOD assignment and 4 years experience in contractor UXO assignments. He will supervise all UXO field operations to include survey, excavation, backfilling, and cleanup. In addition, as the UXB project leader he will provide information for and guidance during the selection of excavation sites. The UXB Project Leader will also provide the M & E Site Manager with pertinent UXO information required to complete the RAC form.

UXB Team Leaders (3)

Mr. Larry Cook, Mr. Roger Topham, and Mr. Walter McCauley will serve as the UXB Team Leaders. The Team Leaders will be responsible for locating the survey sites and conducting surface and subsurface ordnance surveys as directed by the Project Leader. Each of the Team Leaders has over ten years of active duty military EOD experience.

UXO Technicians (6)

Mr. David Pollard, Mr. George Payne, Mr. Dan Isbell, Mr. Ward Stern, Mr. Joe Rodgers, and Mr. Ed Sueter will serve as the UXB UXO Technicians. Each of the UXO Technicians has over four years of active duty military EOD

and UXO contractor experience. In addition, Mr. Ed Sueter will serve as on-site Emergency Medical Technician.

5.2 EQUIPMENT

5.2.1 Global Positioning System (GPS)

General. One of the major logistical problems associated with the planned work at the Dolly Sods Wilderness Area is that of determining the exact location of the work areas and the position of work being done given the difficulty of using traditional surveying methods in the wilderness. Problems with traditional surveying methods include the large distance between existing benchmarks and the work areas, the difficulty of carrying surveying equipment over these large distances, and the problem of trying to establish a line-of-sight through the woods. Establishing a line-of-sight is virtually impossible because the disturbance of any vegetation is not allowed in the Dolly Sods Wilderness Area. The system which will be used to overcome this difficulty is called GPS or Global Positioning System. GPS is a system which allows for the rapid determination of one's position without the limitations of traditional surveying methods.

Description of GPS. GPS was developed by the Department of Defense (DOD) in order to simplify accurate navigation. GPS utilizes a "constellation" of 21 satellites, each sending out accurately timed signals, so that a person using GPS can determine his distance from several of the satellites and triangulate his position. These satellites are in orbit 11,000 miles above the Earth's surface so as to be free of the frictional effects of the atmosphere. Therefore, the positions of each of the satellites can be very accurately calculated at any given time. In addition, the satellites all utilize atomic clocks so that they know the precise time and broadcast signals which include the time at which they were sent. The GPS receiver unit, using its own clock, determines the amount of time it took for the signal from a given satellite to reach it, and, thus, its distance from each of the satellites. By receiving the signals from four of these satellites the receiver unit can triangulate its exact location in three dimensions. By discarding extremely unlikely

positions, it is possible to determine a location from three satellites, but a fourth is required in order to correct for inaccuracies of the GPS receiver's clock.

There are several complications which can introduce error into the determination of a position. The speed of light, and, therefore, the satellite signals, is only constant in a vacuum. The Earth's ionosphere and atmosphere can alter the timing of the signals enough to produce a significant error in the calculation of one's position. Other sources of error include satellite clock errors, satellite position errors, and receiver errors. In all, a typical receiver can expect an error of from 60 to 100 feet. In addition, only fifteen of the twenty-one satellites are currently in orbit so that the four required satellites are only available for limited periods of the day. If one assumes a fixed altitude, a position can be determined using the receivers distance from the center of the earth as the fourth distance. This is referred to as a two-dimensional measurement and is not as accurate as a three-dimensional measurement.

In order to increase surveying accuracy, a technique known as differential GPS will be used at Dolly Sods. With differential GPS an additional receiver is placed at a known location in order to calculate the errors from all of the different sources. It then sends the correction to all other receivers in the area which can apply the same correction to their calculations. This technique, of course, assumes that the error from all sources is the same between the two different receivers. Using differential GPS, one may be able to attain a surveying accuracy of about one meter.

GPS Use at Dolly Sods. For the Dolly Sods project, GPS will be used to solve the difficult problem of determining one's position in the densely wooded areas of the wilderness. GPS has already been used in the initial site visit to determine the areas searched and to size and locate areas which are likely to contain ordnance. GPS will be used in future operations in order to accurately locate boundary points of the fifty-five-acre plots and ten one-acre plots which are searched. In addition, GPS may be used to locate any ordnance which is found. The angle points of the five and one acre plots

which are searched and cleared will be identified by state plane grid coordinates and located on topographic maps prepared for the engineering report.

5.2.2 Field Equipment

The following major equipment items will be required to complete the investigation:

<u>Geophysical/Visual Survey Equipment</u>	<u>Number</u>	
General Support Tool Kit		1
Motorola HT-90 Portable Radios	5	
Schonstedt GA-52B		3
White's Eagle Metal Detector		3
Foerster Ferex Ordnance Locator	3	
Ryder Truck		1
Mini Van		1
Office Trailer		1
GPS Pathfinder		1
Electric Demolition Set		1
 <u>Trenching Equipment</u>	 <u>Number</u>	
Manual Excavation Tool Kit	3	

The following metal detectors will be used in searching for ordnance at the Dolly Sods site.

Schonstedt GA-52B Magnetic Locator. This is a man-carried, dual sensor magnetic locator. It responds to the difference in magnetic field strength between two sensors mounted approximately 20 inches apart in the probe. The response consists of a change in the frequency of a signal emitted from the integral loudspeaker. Operator controls consist of an on-off/volume control and a sensitivity control.

Foerster Ferex Electromagnetic Detector - The Foerster Ferex Ordnance Locator is the most recent military approved locator and is in use by the U.S. Military EOD forces, designated the MK 26 Ordnance Locator, for detecting subsurface ordnance items. The locator is a hand-held unit and uses 2

fluxgate magnetometers, aligned and mounted a fixed distance apart to detect changes in the earth's ambient magnetic field caused by ferrous metal or disturbances caused by soil conditions. Both an audio and a metered signal are provided to the operator. The detection capability of the Foerster Ferex is dependent on the size of the item versus its depth. The Foerster Ferex is capable of ordnance location to the following depths:

<u>ITEM</u>	<u>DEPTH</u>
Small Arms Round	1 ft
Hand Grenade	2 ft
Anti-Personnel Mine	3 ft
Anti-Tank Mine	4.5 ft
Medium Projectile	10 ft
Small Bomb	15 ft
Large Bomb	19 ft

Although the Foerster Ferex Ordnance Locator will detect disturbances caused by changes in soil conditions, its ability to detect metallic items is not affected by local soil conditions. Items of debris, such as crates and boxes, can interfere with the Ferex' ability to locate ordnance due to the metallic fasteners and hinges used in the construction of these items.

White's Eagle II Metal Detector. This is a man-carried, microprocessor controlled metal detector with a liquid crystal display and a keypad user interface. This metal detector operates on the induction principle whereby a transmitter coil induces eddy currents within buried metal and these induced eddy currents are received by a receiver unit. The advantage of this detector is that it can detect both ferrous and nonferrous metals.

5.3 TECHNICAL APPROACH

UXB has developed site specific, technical survey methods for use at the former West Virginia Maneuver Area. Three basic methods of sampling an area will be utilized to determine the amount of unexploded ordnance (UXO) or OEW contamination present. These methods are identified below.

Visual Survey

Entails visually scanning the area being searched to locate ordnance on the surface or surface indications of the presence of subsurface ordnance (e.g. craters or burial trenches).

Geophysical Survey

Using magnetometers and metal detectors to examine the surface and subsurface area in a non-intrusive manner.

Hand Excavation

Using hand excavation tools to excavate metallic contacts located with either the White's Eagle or Foerster Ferex Ordnance Locator.

All of the survey methods described above will be used alone or in combination to conduct the investigation depending on the specific characteristics of each site. A more detailed explanation of the sampling methods, outlining the benefits and drawbacks of each, follows.

5.4 SURFACE SURVEY (100%)

The Schonstedt GA-52B Magnetic Locator will be utilized during all visual survey operations to aid in the location of ordnance obscured by vegetation and other ground cover. All contacts located with the GA-52B will be uncovered down to ground level. If the item is visible at ground level it will be plotted, identified, and either moved to the ordnance holding area, or, if deemed too hazardous to move or it cannot be positively identified it will be prominently marked so that Disposal Team personnel can locate it. If the item is below ground level it will be marked and plotted on the site map with a notation indicating a subsurface contact.

5.4.1 Sweep Procedures

The sweep team will form a line along one side of the area spaced at approximately six foot intervals. This will result in each individual being responsible for a lane of approximately six feet in width. The sweep line will proceed across the area with the left end of the line following the boundary of the area and the individual on the right end of the line marking the edge of the swept area with a hip chain. When the line reaches the far edge of the area the sweep team will shift to the right and reverse direction. The individual on the right end of the sweep line will follow the hip chain line and the left end will again be marked with a hip chain. The sweep team will continue in this manner until the entire area has been surveyed.

5.4.2. ~~Communications~~ and Control

Sweep team will maintain communications via two-way radio with the Command Post (CP) at all times. If communications with the CP are lost the sweep team will suspend all activities until communications are restored.

The UXB Team Leader will be responsible for control of the sweep team. This responsibility will include but is not limited to the following: Ensure that all personnel on the sweep team are aware of the type of ordnance items which may possibly be found in the sweep area, and any specific safety considerations which apply to that ordnance. Ensure that sweep personnel maintain proper interval and stay on line during sweep operations. Ensure that the entire sweep area is surveyed. Ensure that sweep personnel comply with all safety rules applicable to surface survey operations. Ensure that all ordnance items discovered during surface surveys are properly logged, identified, and marked. The UXB Team Leader is also responsible for making all decisions pertaining to the safe handling of UXO.

5.4.3 Marking of Ordnance Locations

Prior to beginning surface survey of a site, an ordnance holding area in the immediate vicinity, will be selected and marked. All UXO discovered in the area which is deemed safe to move will be placed in the holding area for later disposal by Disposal Team personnel. Any ordnance residue which contains explosives, and is deemed safe to move will also be placed in the ordnance holding area. Prior to being placed in the holding area all UXO and ordnance residue will be positively identified and its location recorded on the site map and the UXB Ordnance Data Report. Items which are deemed to be too hazardous to move and any item which cannot be positively identified will be left in place. These items will be marked in such a manner that their location will be readily identified by disposal team personnel. The location of these items will also be recorded on the site map and the Ordnance Data Report.

If toxic chemical OEW is encountered, operations in that area shall cease and the CEHND Safety Officer shall be notified.

5.4.4 Data Collection

Accurate plotting of UXO locations is vital to the purpose of this survey. In order to ensure the accuracy of the data the following procedures will be used.

The UXB Team Leader will plot the location of all UXO and hazardous ordnance residue on the site map at the time of their discovery. The location will be measured, to the nearest foot, relative to the site boundary markers. The location of all UXO and OEW will also be recorded on the UXB Ordnance Data Report (see UXB Exhibit 5-1).

5.5 SUBSURFACE SURVEY

The Corps of Engineers requires that two distinct methods of subsurface survey be conducted. Both must be capable of detecting the existence and approximate

depth of ordnance items within the former WVMA. The general methods used for the magnetometer and metal detector surveys are summarized below. Areas to be investigated by a subsurface survey will be determined and approved by the Corps of Engineers as the surface survey is completed.

5.5.1 Magnetometer and Metal Detector Survey

UXB International will use the Foerster Ferex Ordnance Locator in conjunction with the White's commercial metal detector, for all subsurface geophysical surveys. These metals detectors are described in Section 5.2.2, Field Equipment.

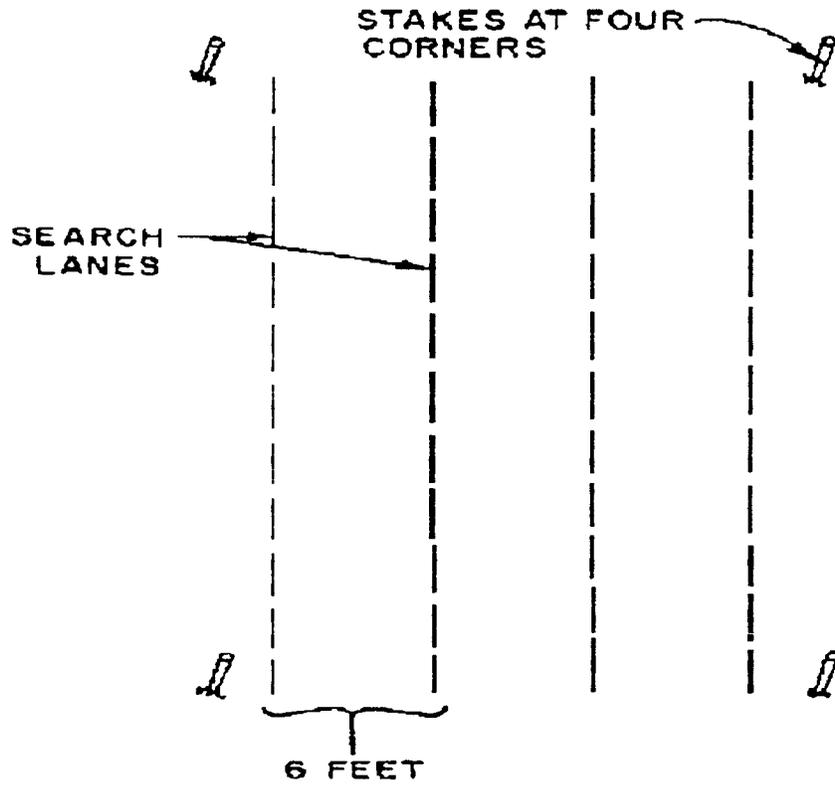
These instruments will be used, during the investigation, to locate subsurface metallic objects. They are very effective in areas where there is sparse metallic contamination and, conversely, of limited usefulness in areas that are heavily contaminated with miscellaneous metallic debris and slag.

Because the sampling sites at the West Virginia Maneuver Area are not heavily contaminated with metallic debris on the surface, normal geophysical survey methods can be used here.

UXB will employ the 100% survey method at the Former WVMA. This method is described as follows:

100% Survey. A 100% survey is illustrated in Figure 5-1. The area to be surveyed is identified and its perimeter is marked with wooden stakes. A magnetometer will be used to check stake locations prior to placement. After placement, the search area is divided into 6 foot search lanes using surveyor's line. The locator operator then walks the lane using the locator to survey the entire area within each lane and marks all positive metallic contacts with a spray paint for possible further inspection and identification by excavation. The metal detector operator follows the locator operator and marks all positive metallic contacts in a similar manner. The location of all contacts will be plotted on a site map with a notation indicating whether the contact was ferrous or nonferrous.

Example of 100% Survey Method



NOT TO SCALE

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FIGURE 5-1.
SUBSURFACE SURVEY METHOD

5.5.2 Magnetometer Procedures

Establish the Command Post. A command post (CP) will always be established at Bell Knob Tower (see Figure 5-2). The purpose of CP is to allow a responsible person, who is familiar with on-site operations, to be present and to take appropriate action in case of an emergency at the work site. Based on availability, one member of the M&E or UXB field team will man the CP and have communications with the surveying/excavation crews and outside assistance (fire dept., ambulance, etc.) at all times.

Instrument Calibration. Prior to investigation of suspect sites, the UXO team will establish a control grid in a non-contaminated area for instrument calibration and sensitivity verification. This area will be "seeded" with ferrous and nonferrous items. The source materials will present ferrous and nonferrous signatures similar to UXO contamination suspected in the historical review. Seeded items will be non-ordnance construction and carry no explosive fillers or mechanical actuators of any kind. Source materials that are buried are for operator checkout of instruments only and will be removed and accounted for prior to actual subsurface investigations of operational areas.

Establish the Survey Area. Prior to conducting the subsurface survey, the area to be surveyed must be accurately established. Field crew will use aerial photos, maps and existing landmarks to locate the desired survey area and will mark its boundaries with wooden stakes. The GPS Pathfinder will then be used to record these locations.

Conduct the Survey. The subsurface survey team will consist of one UXB/UXO Team Leader and two UXB/UXO Technicians. One technician will carry the Foerster Ferex Ordnance Locator and the other will carry a White's Eagle II Metal Detector. The team will search the predetermined lanes and the team leader will record all positive contacts on their field site map as well as on the Survey Contact Form (see UXB Exhibit 5-2). All contacts, visual observations, and notations will be made by the team leader and will include location, depth and type (i.e. F=ferrous, S=surface) of contact. All positive contacts will also be marked with a marking flag to facilitate relocating the contact for excavation and identification.

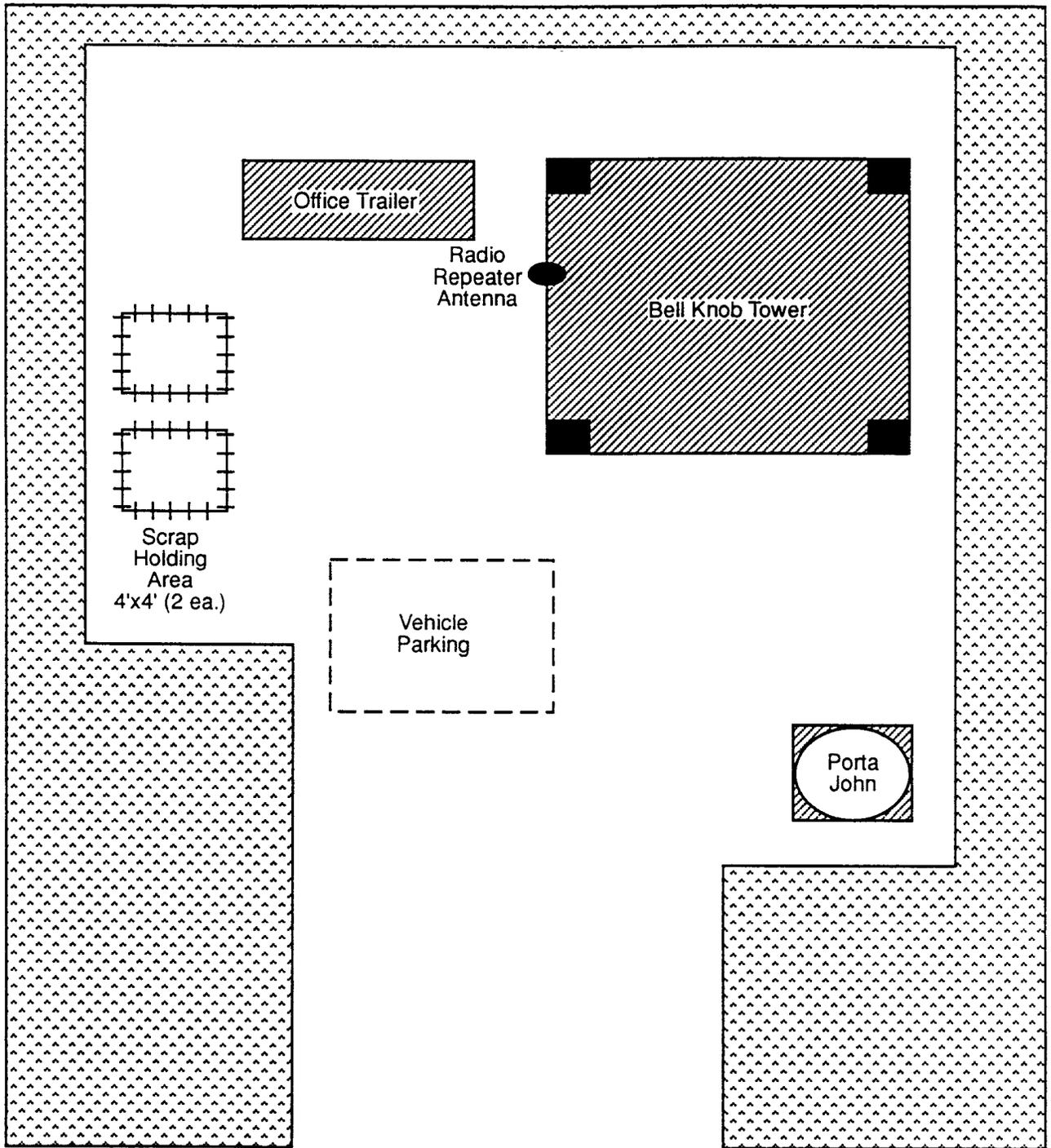


FIGURE 5-2. PROPOSED BELL KNOB TOWER BASE CAMP

Hand Excavation. All contacts located during the subsurface survey will be carefully excavated, using hand tools, i.e. shovels, trowels, etc., to determine identification and classification. The maximum depth for hand excavations shall not exceed six feet. If a contact has not been located after reaching a depth of six feet, it will be recorded as unknown.

Survey Evaluation. Upon completion of the survey, all positive contacts will be recorded on a master site map maintained in the CP. The results of the survey will be evaluated by UXB, M&E, and a representative of the U.S. Army Corps of Engineers. This evaluation will determine the boundaries and/or extent of contamination at each site and the usefulness of conducting additional surveys within the area.

5.6 HAND EXCAVATION PROCEDURES

A team of two UXB/UXO Technicians will approach the excavation site with suitable hand tools and the ordnance locator best able to detect the metallic contact to be excavated. Upon arrival at the excavation site, the contact will be reestablished using the ordnance locator and one technician will then carefully begin to excavate the contact. The other UXB/UXO Technician will man the ordnance locator and frequently resurvey the contact to estimate its depth below the excavation. When the object is located it will carefully be uncovered identified, plotted, and cataloged. If the object is ordnance, and the UXB team Leader determines that it is safe to move it will be placed in the OEW holding area. If the item is deemed unsafe to move it will be prominently marked for easy relocation by the disposal team. As part of the daily coordination with the Potomac District Forest Ranger Station, advance notice of all necessary excavations will be given. The excavated site locations will be a part of the daily field log and a copy of this log will be provided to the Potomac Ranger Station at the completion of the project. No excavation will take place in areas which are known to be inhabited by endangered species, in particular the Cheat Mountain Salamander, without the express approval of the Forest Service and the Army Corps of Engineers.

5.7 DISPOSAL PROCEDURES

UXB International is responsible for disposal of all hazardous UXO and for the explosive venting of all inert filled ordnance located during the survey at the former WVMA. UXB is also responsible for the collection of all OEW having a dimension greater than 4 square inches and for turning in of all non-hazardous OEW collected to the Defense Property Disposal Office (DPDO), DRMO-Chambersburg, Letterkenny Army Depot, PA.

5.7.1 Demolition Procedures. UXB and M&E realize the necessity and importance of keeping Dolly Sods Wilderness Area unmarred by human intervention. UXB will minimize the damage inherent with demolition operations as much as possible. This will be accomplished by tamping demolition shots with sand bags or relocating ordnance which is safe to transport to an area within DSWA and less susceptible to damage (clearings or open, grassy fields). Using sand bags will also serve to prevent the possibility of forest fires started by the explosive venting of ordnance. Special care is required at the Dolly Sods Wilderness Area when operations are taking place in areas inhabited by endangered species. In these areas, stable ordnance will be moved to areas which are not inhabited by endangered species before explosive venting. When working around endangered species, no ordnance will be detonated or excavation will take place without the approval of the Forest Service and the Army Corps of Engineers.

A demolition permit covering all phases of blasting operations in demolition projects has been applied for and granted by the State Fire Marshal of West Virginia. Explosives will be purchased from Piedmont Explosives of Romney, West Virginia. Piedmont is a state and federally licenses explosives dealer and will provide storage and transportation functions.

All UXO destruction and explosive venting will be performed using electric priming. Electric priming affords the demolition team the greatest degree of control of each detonation and provides the highest extent of safety.

The UXB Project Leader will coordinate with the Petersburg Ranger Station prior to all demolition operations for dispatching standby fire fighters prior to all demolition operations.

Prior to initiating any disposal or venting charge the UXB Disposal Team Leader will ensure that a careful check is made and that no personnel are located within the danger area. An audible warning device, air horn, siren, etc. capable of being heard throughout the danger area will be sounded for a minimum of 30 seconds prior to initiation of the charge.

All electric demolition procedures will be conducted in accordance with the UXB Technicians Handbook and the Demolition procedures SOP.

5.8 SITE-SPECIFIC SURVEY PLANS

The site visit and review of records identified several areas located within the Dolly Sods Wilderness Area which could contain OEW. These are displayed in Figure 5-3. The survey plan is summarized in Table 5-1 and preliminary locations of survey areas are shown in Figures 5-4 through 5-19.

Subsurface survey sites will be chosen on or before August 28, 1991 as results of the surface investigation are determined. If necessary a meeting will be held at this time between Metcalf & Eddy, UXB International Inc., and the U.S. Army Corps of Engineers to select sites for the subsurface investigation which will begin September 3, 1991.

The recommendations which follow are described on a site by site basis, according to the definitions of the sites found in Section 2.6 of this plan. These recommendations include work to be performed by UXB International at Areas 1 through 16.

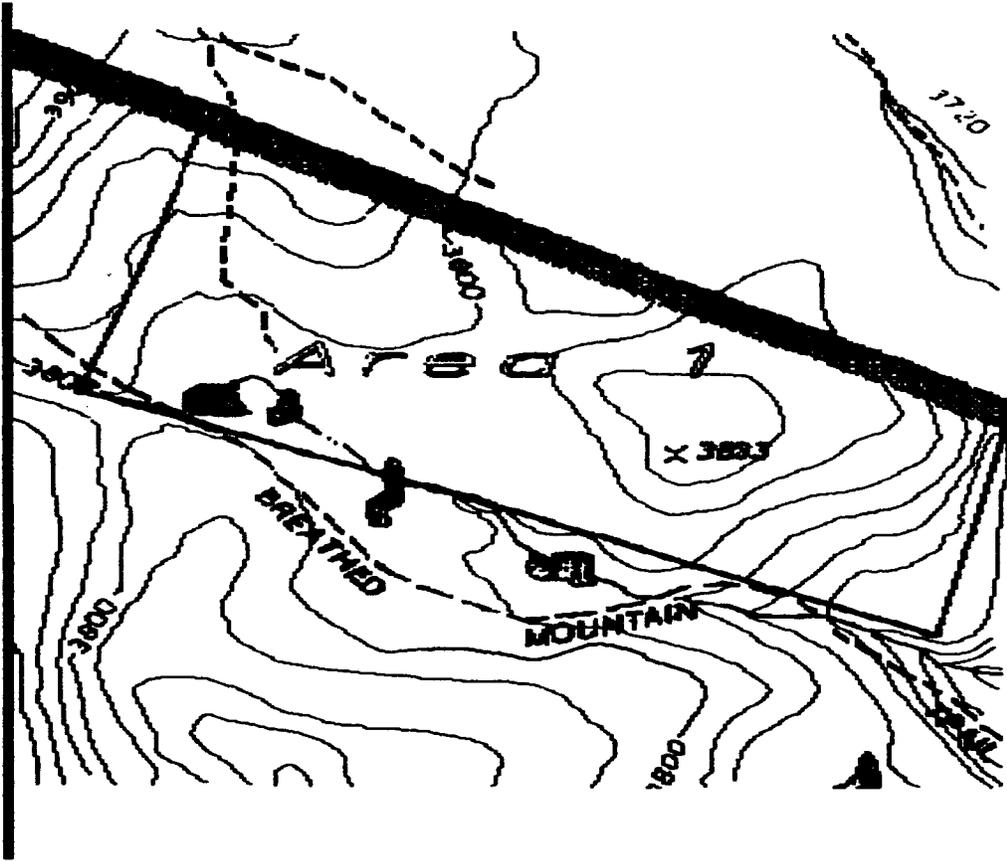
5.8.1 Area 1

Area 1 is located on the northern boundary of the wilderness area west Of Red Creek and consists of approximately 206.6 acres. (See Figure 5-4). The records review identified this area as laying within the range fans of several

TABLE 5-1. SUMMARY OF SURVEY PLAN

Site	Size	Surface
Area 1	206.6 Acres	55 Acres
Area 2	87.2 Acres	30 Acres
Area 3	110.2 Acres	40 Acres
Area 4	50.5 Acres	20 Acres
Area 5	33 Acres	15 Acres
Area 6	5 Acres	5 Acres
Area 7	38.3 Acres	10 Acres
Area 8	35.3 Acres	10 Acres
Area 9	41.4 Acres	10 Acres
Area 10	31.2 Acres	10 Acres
Area 11	38.2 Acres	10 Acres
Area 12	50.1 Acres	5 Acres
Area 13	43.4 Acres	10 Acres
Area 14	35.3 Acres	5 Acres
Area 15	36.7 Acres	5 Acres
Area 16	33.1 Acres	10 Acres

70° 22' 30" W



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FIGURE 5-4.
AREA 1

gun positions firing at both Blackbird Knob and Cabin Mountain. Interviews with retired U.S. Forest Service personnel established that multiple fires were started by exploding ordnance within the boundaries of Area 1. The terrain in this area varies from rocky to boggy and UXO can be expected both on the surface and subsurface.

Surface Survey: Eleven five acre (466.6' x 466.6') surface survey grids will be established and the corners recorded using the GPS Pathfinder. A 100% visual survey will then be conducted in each of these survey grids. UXB believes that this will be sufficient to determine the extent of surface OEW contamination of the area.

5.8.2 Area 2

Area 2 is located between the forks of Red Creek extending from the northern boundary to the junction of Red Creek and the Left Fork of Red Creek and contains approximately 87.2 acres (see Figure 5-5). Records review identified this area as being within the range safety fan of several gun positions which were firing at both Blackbird Knob and Cabin Mountain. Interviews with retired U.S. Forest Service personnel established that multiple forest fires were started by exploding ordnance within the boundaries of Area 2. The terrain in this area ranges from flat meadow to boulder strewn slopes making both surface and subsurface UXO a possibility.

Surface Survey: Six five acre (466.6' x 466.6') surface survey grids will be established and the corners recorded using the GPS Pathfinder. A 100% visual survey will then be conducted in each of these survey grids. UXB believes that this will be sufficient to determine the extent of surface OEW contamination of the area.

5.8.3 Area 3

Area three is located in the northeast corner of Dolly Sods Wilderness area and encompasses a total of approximately 110.2 acres (see Figure 5-6). Records review identified this area as being located within the range safety

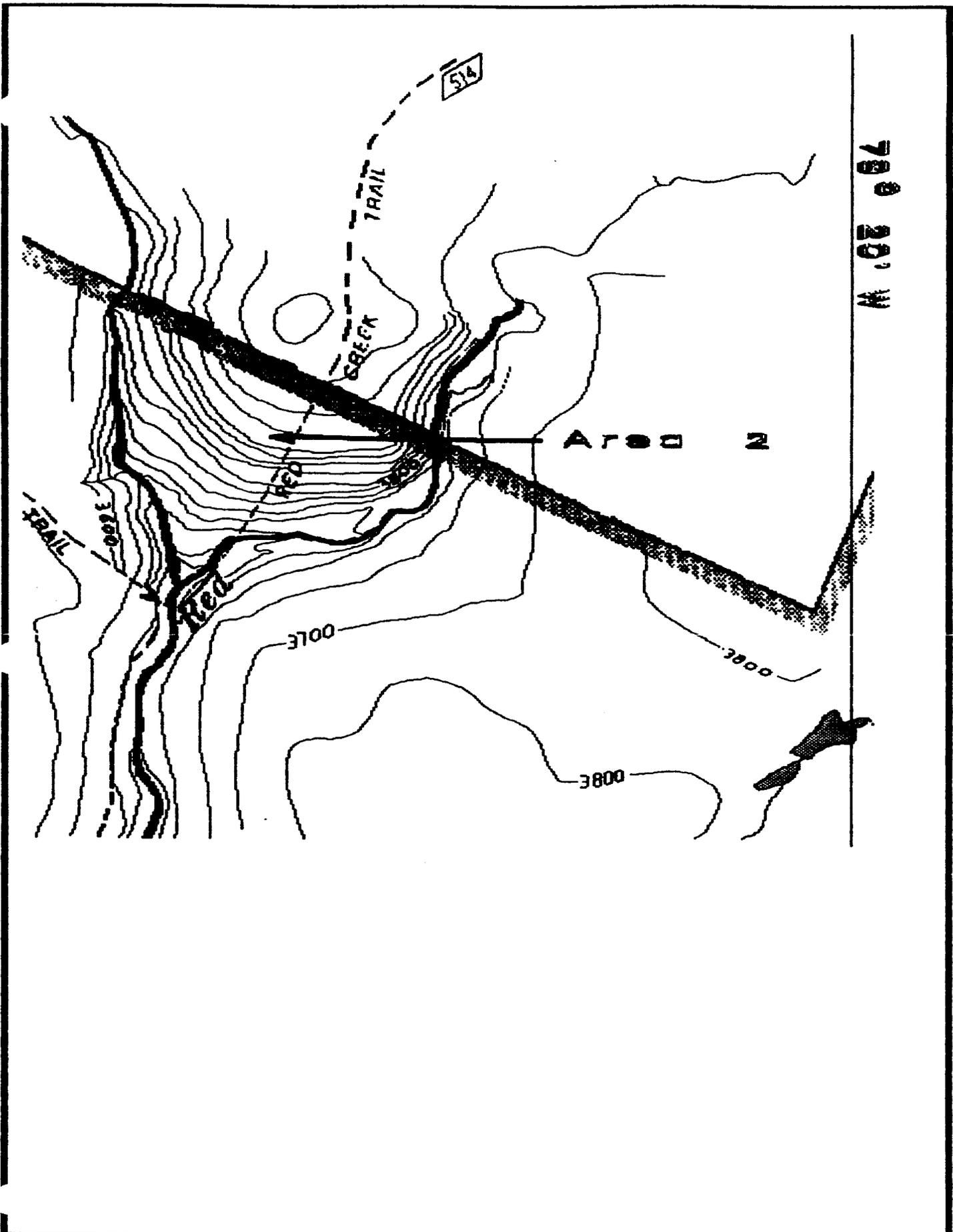
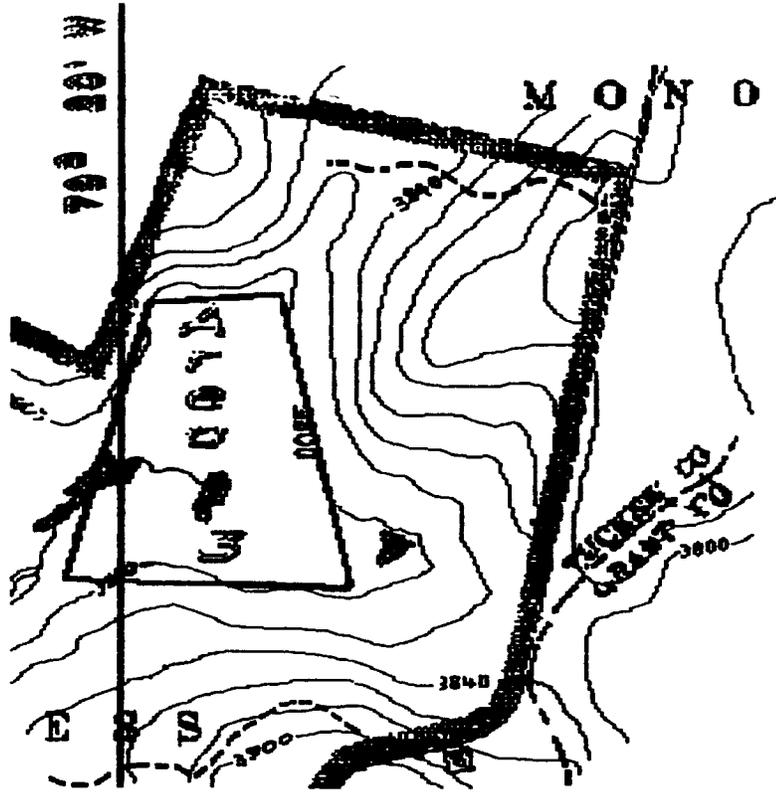


FIGURE 5-5.
AREA 2



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FIGURE 5-6.
AREA 3

fan of several gun positions firing at both Blackbird Knob and Cabin Mountain. This area consists primarily of bog area with some solid rock ground around the edges, therefore both surface and subsurface UXO may be located in the area.

Subsurface Survey: Eight five acre (466.6' x 466.6') surface survey grids will be established and the corners recorded using the GPS Pathfinder. A 100% visual survey will then be conducted in each of these survey grids. UXB believes that this will be sufficient to determine the extent of surface OEW contamination of the area.

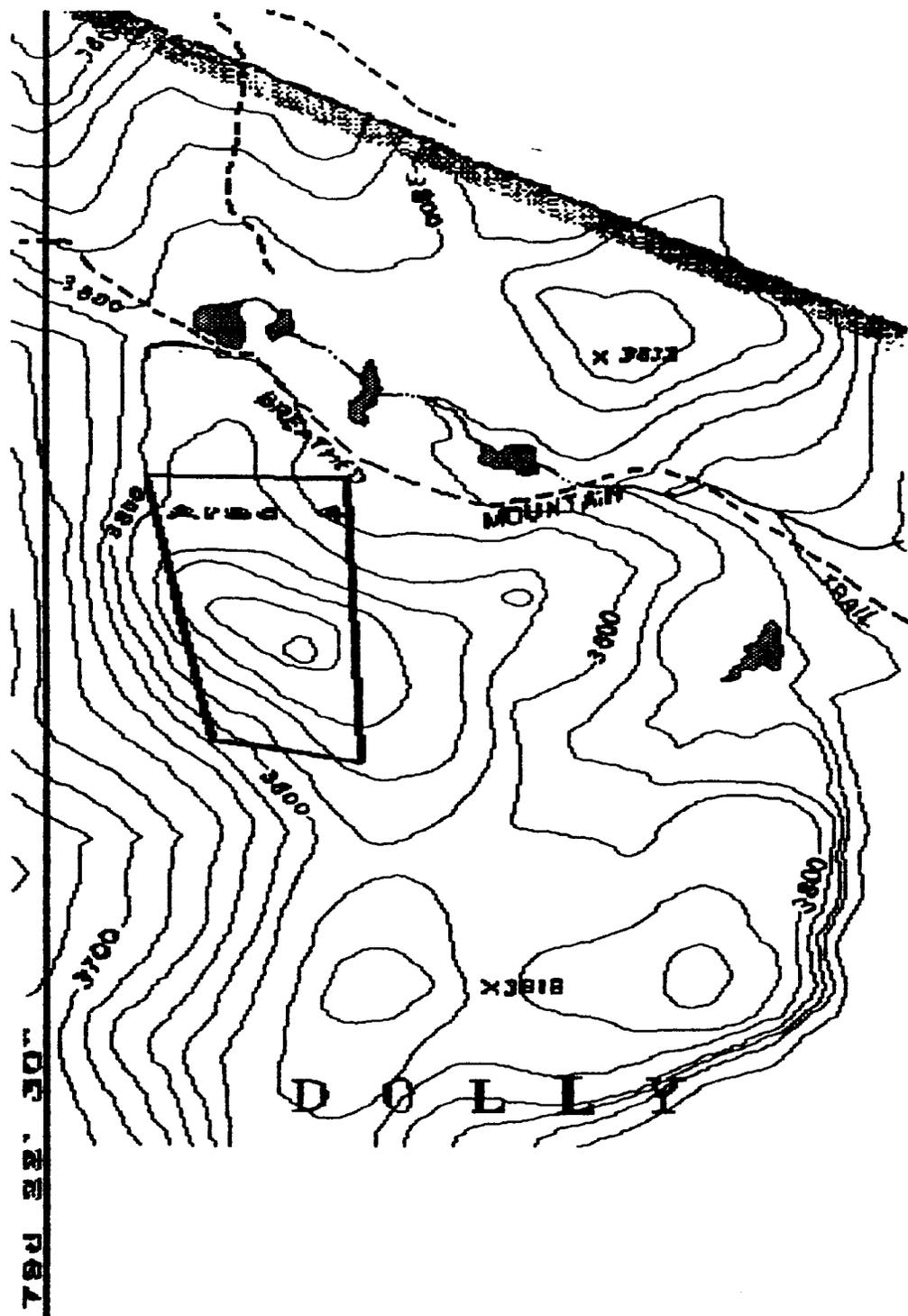
5.8.4 Area 4

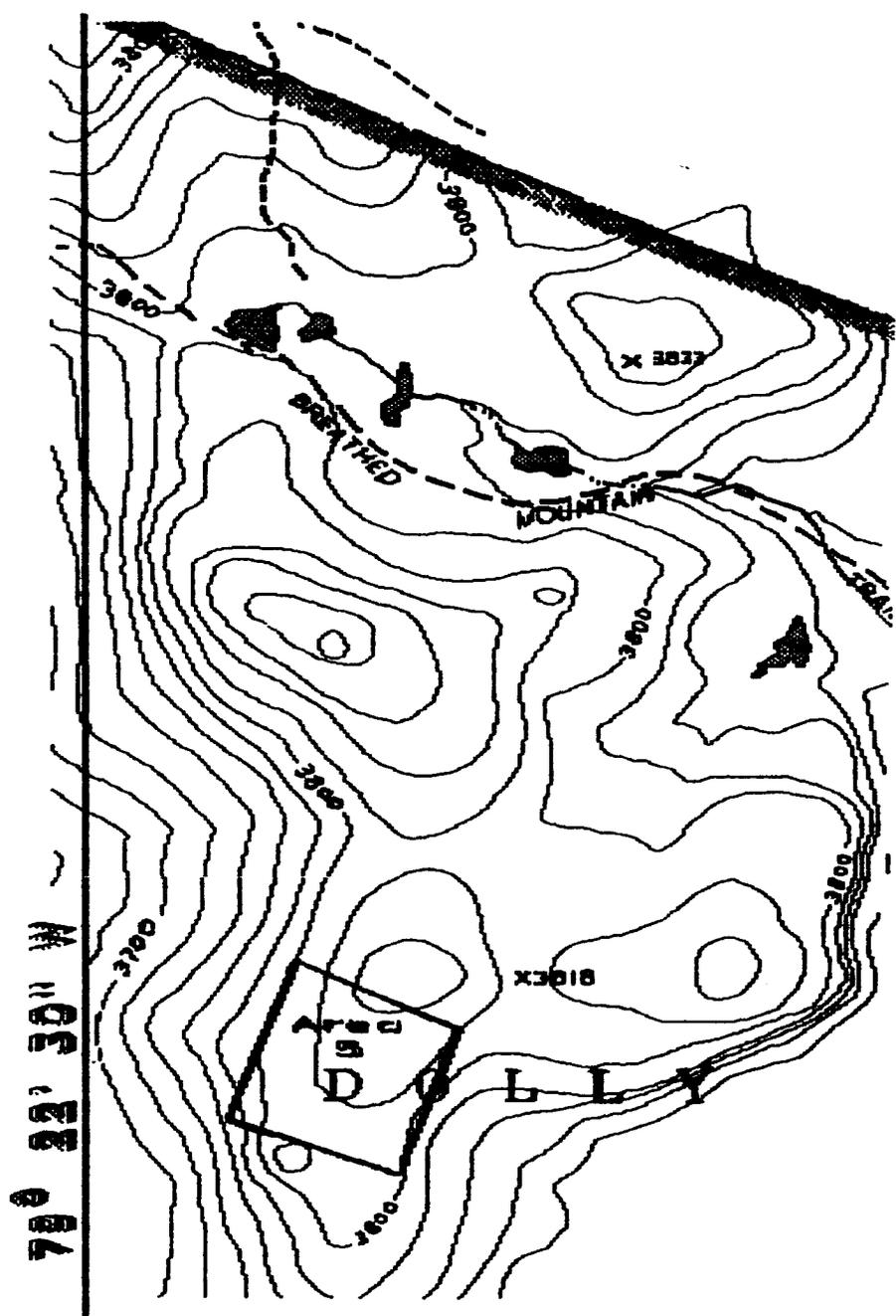
Area four is located at the northern end of Breathed Mountain and encompasses a total of approximately 50.5 acres (see Figure 5-7). Records review identified this area as being located within the range safety fan of several gun positions firing at both Blackbird Knob and Cabin Mountain. Evidence of infantry firing positions such as trenches and foxholes would indicate mortars may have been fired from these areas. This area consists primarily of open mountain meadow and wooded areas, therefore both surface and subsurface UXO may be located in the area.

Surface Survey: Four five acre (466.6' x 466.6') surface survey grids will be established and the corners recorded using the GPS Pathfinder. A 100% visual survey will then be conducted in each of these survey grids. UXB believes that this will be sufficient to determine the extent of surface OEW contamination of the area.

5.8.5 Area 5

Area five is located in the central section of Breathed Mountain and encompasses a total of approximately 33 acres (see Figure 5-8). Records review identified this area as being located within the range safety fan of several gun positions firing at both Blackbird Knob and Cabin Mountain. Evidence of infantry firing positions such as trenches and foxholes would





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FIGURE 5-8.
AREA 5

indicate mortars may have been fired from these areas. This area consists primarily of open mountain meadow and wooded areas, therefore both surface and subsurface UXO may be located in the area. -

Surface Survey: Three five acre (466.6' x 466.6') surface survey grids will be established and the corners recorded using the GPS Pathfinder. A 100% visual survey will then be conducted in each of these survey grids. UXB believes that this will be sufficient to determine the extent of surface OEW contamination of the area.

5.8.6 Area 6

Area six is located on the eastern edge of the wilderness area north of grid line 39° 00, N and encompasses a total of 5 acres (see Figure 5-9). Records review identified this area as containing several firing positions and the site visit revealed subsurface ferrous contamination. This area consists of second growth trees and light underbrush, surface survey of this area will serve primarily to identify the locations for subsurface survey.

Surface Survey: One five acre (200' x 1089') surface survey grid will be established and the corners recorded using the GPS Pathfinder. A 100% visual survey will then be conducted in each of these survey grids. UXB believes that this will be sufficient to determine the extent of surface OEW contamination of the area.

5.8.7 Area 7

Area seven is located along Red Creek extending from the south end of Breathed Mountain to the junction of Red Creek and Left Fork (see Figure 5-10). The area is 104' wide and encompasses a total of approximately 38.4 acres. Records review identified this area as laying within the range safety fans of several gun positions firing on both Blackbird Knob and Cabin Mountain. There were also UXO reported in the general area. This area consists of second growth trees and light underbrush and rocky slopes, therefore both surface and subsurface ordnance may be encountered.

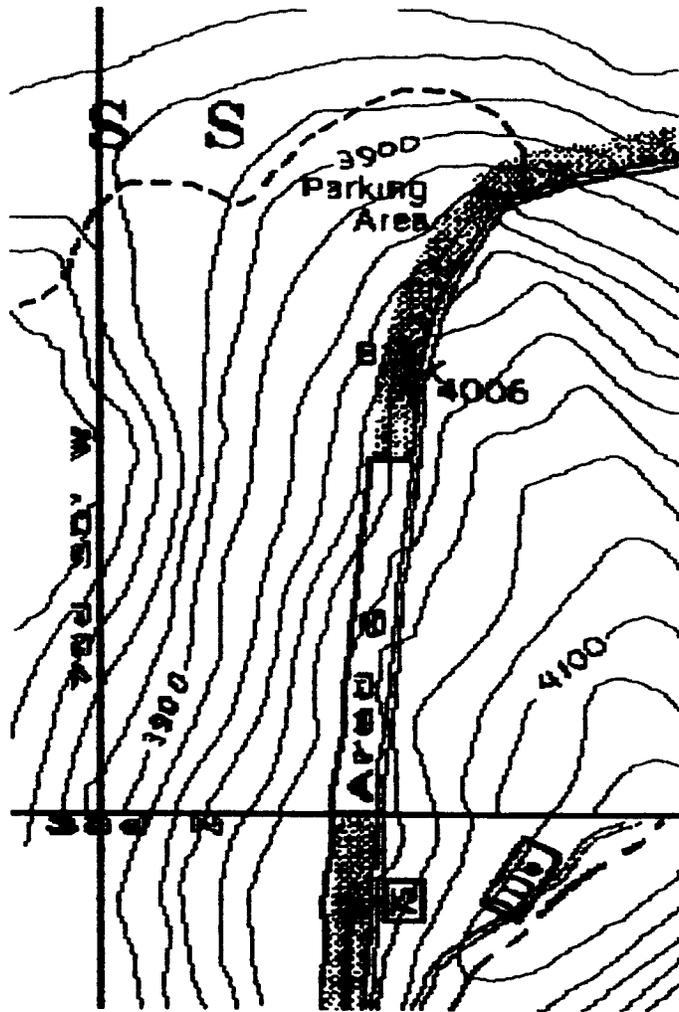
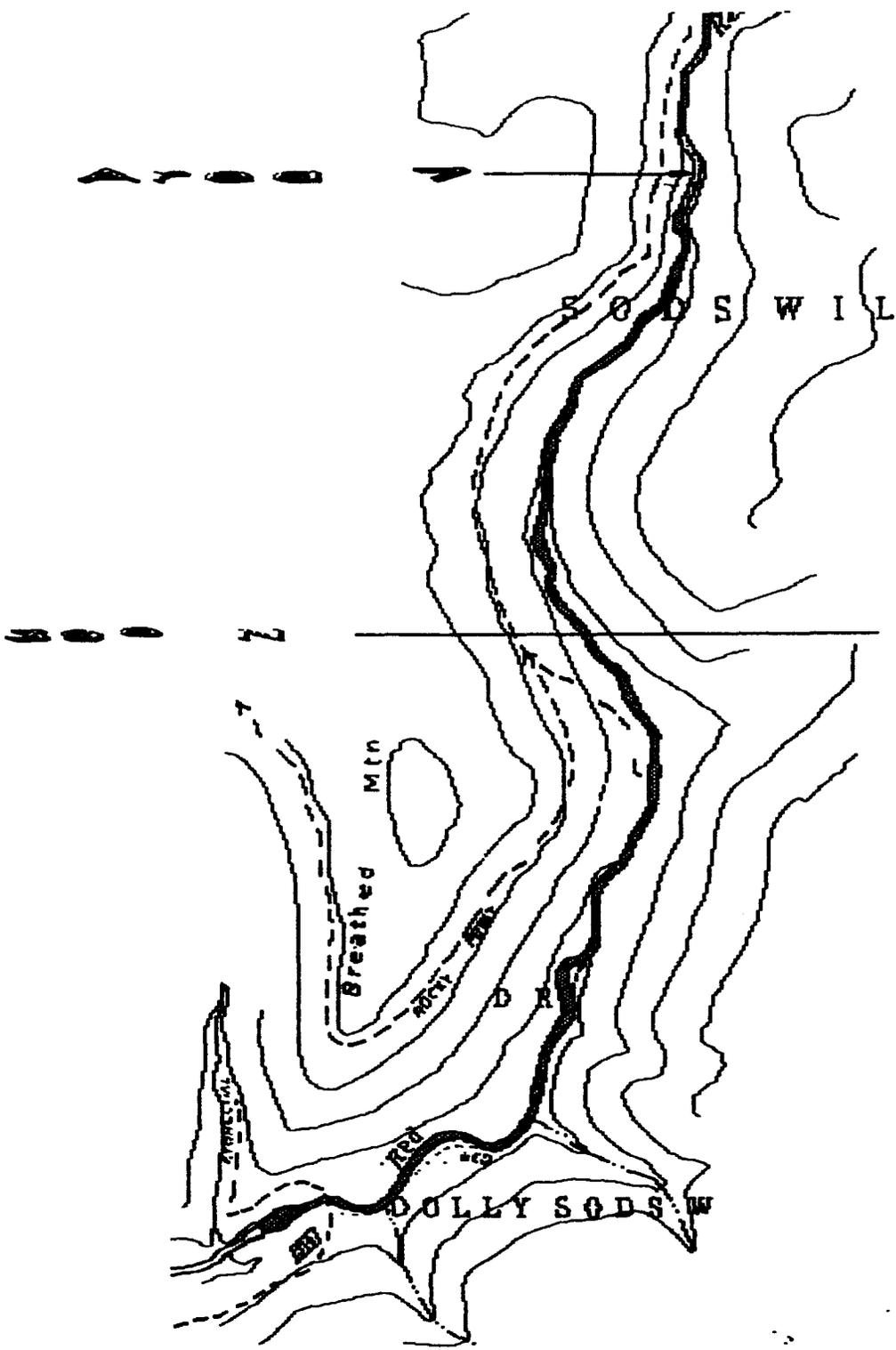


FIGURE 5-9.
AREA 6



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FIGURE 5-10.
AREA 7

Surface Survey: Two five acre (104' x 2094') surface survey grid will be established and the corners recorded using the GPS Pathfinder. A 100% visual survey will then be conducted in each of these survey grids. UXB believes that this will be sufficient to determine the extent of surface OEW contamination of the area.

5.8.8 Area 8

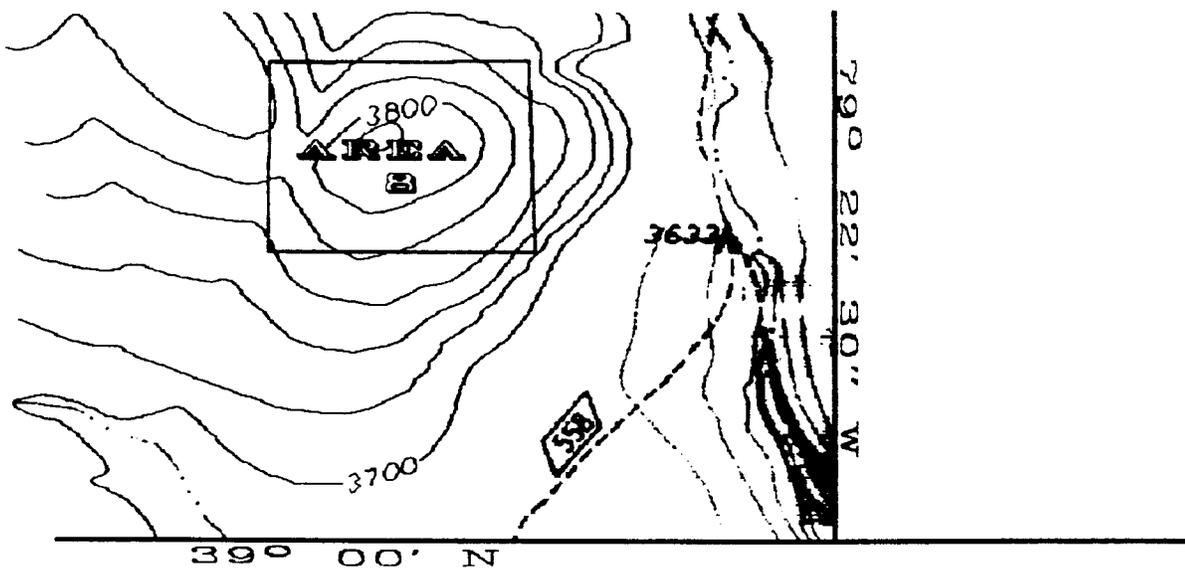
Area 8 is located in the northwest quadrant of the wilderness area on the hilltop labeled 3800 (see Figure 5-11) and is approximately 1400' x 1060'. The area encompasses approximately 35.3 acres. This high ground is likely to have been a target for mortar fire during military exercises.

Surface Survey: Two five acre (466.6' x 466.6') surface survey grid will be established and the corners recorded using the GPS Pathfinder. A 100% surface survey will then be conducted in each of these survey grids. UXB believes that this will be sufficient to determine the extent of the surface OEW contamination of the area.

5.8.9 Area 9

This area is located in the northeast quadrant of the wilderness area approximately 1600 feet north of Fisher Spring Run and 2800 feet east of Red Creek (see Figure 5-12). The area is approximately 1500' x 1260'. This area encompasses approximately 41.4 acres. This high ground is likely to have been a target during military exercises.

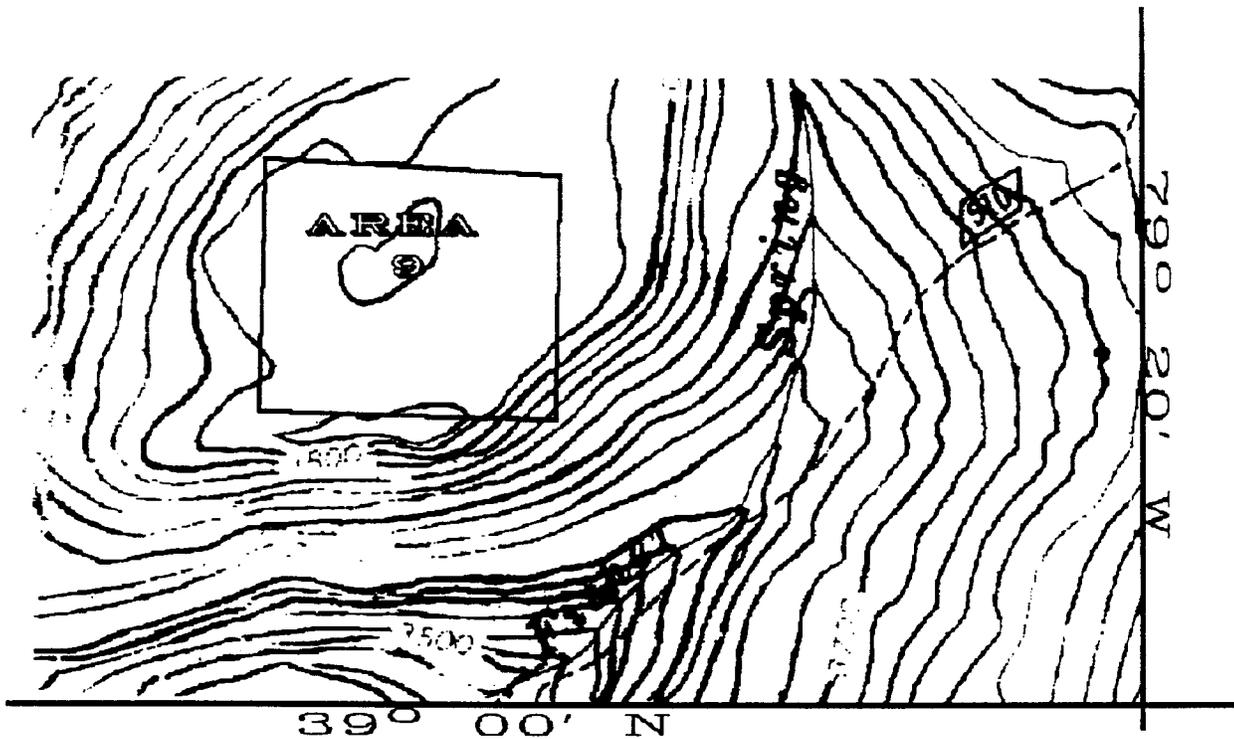
Surface Survey: Two five acre (466.6' x 466.6') surface survey grid will be established and the corners recorded using the GPS Pathfinder. A 100% surface survey will then be conducted in each of these survey grids. UXB believes that this will be sufficient to determine the extent of surface OEW contamination of the area.



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FIGURE 5-11.
AREA 8



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FIGURE 5-12.
AREA 9

5.8.10 Area 10

This area is located along the north bank of Fisher Spring Run approximately 100 feet east of Red Creek (see Figure 5-13). The area is approximately 2000' x 700'. This area encompasses approximately 31.2 acres. There are reports of UXO having been located in this area.

Surface Survey: Two five acre (466.6' x 466.6') surface survey grid will be established and the corners recorded using the GPS Pathfinder. A 100% surface survey will then be conducted in each of these survey grids. UXB believes that this will be sufficient to determine the extent of surface OEW contamination of the area.

5.8.11 Area 11

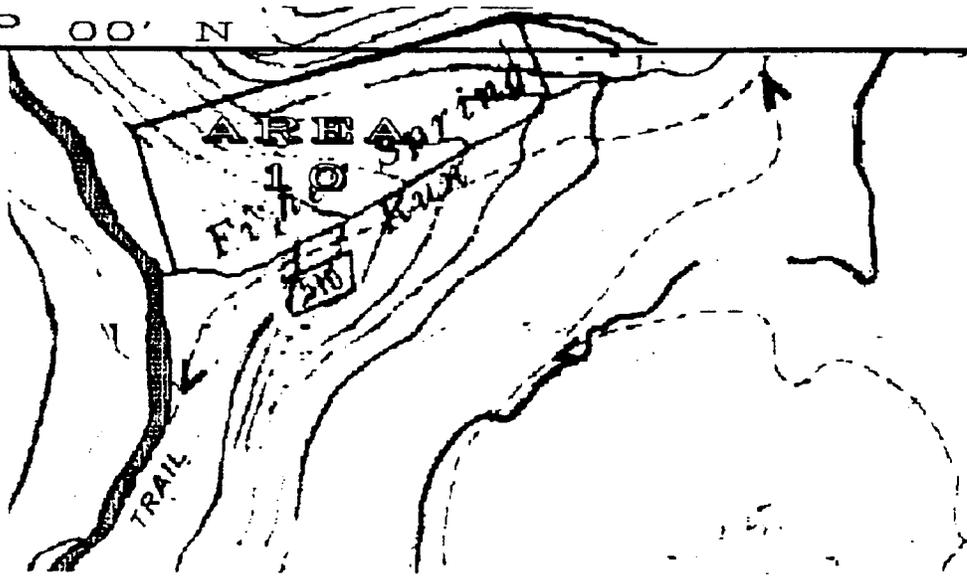
This area is located at the top of Breathed Mountain (see Figure 5-14). The area is approximately 1200' x 1400'. This area encompasses approximately 38.2 acres. There are reports of UXO having been located near this area.

Surface Survey: Two five acre (466.6' x 466.6') surface survey grid will be established and the corners recorded using the GPS Pathfinder. A 100% surface survey will then be conducted in each of these survey grids. UXB believes that this will be sufficient to determine the extent of surface OEW contamination of the area.

5.8.12 Area 12

This area is located along the western boundary of the wilderness area at the eastern end of the Stone Camp Mountain (see Figure 5-15). The area is approximately 1000' x 2100'. This area encompasses approximately 50.1 acres. This high ground is likely to have been a target for mortar fire during military exercises.

39° 00' N

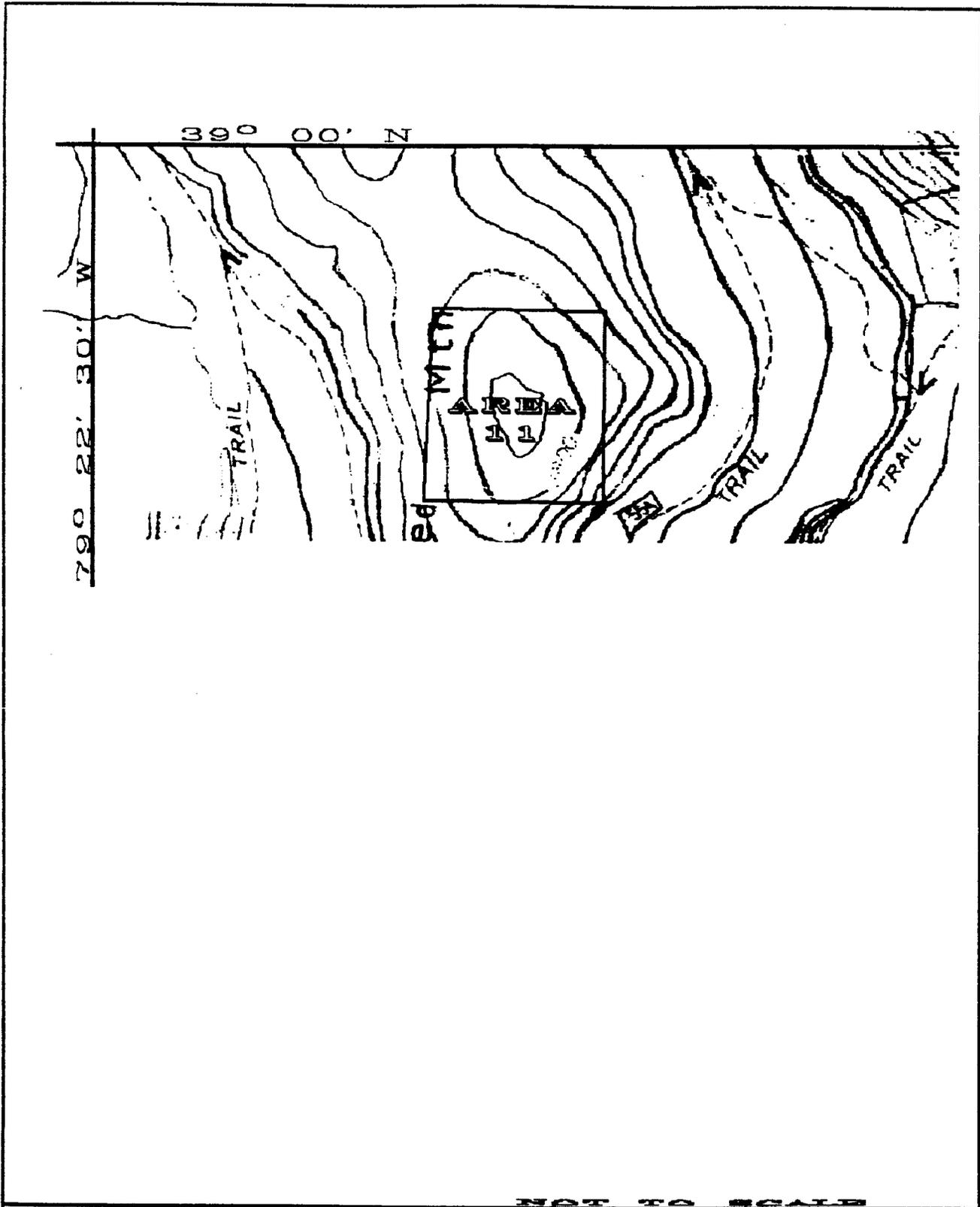


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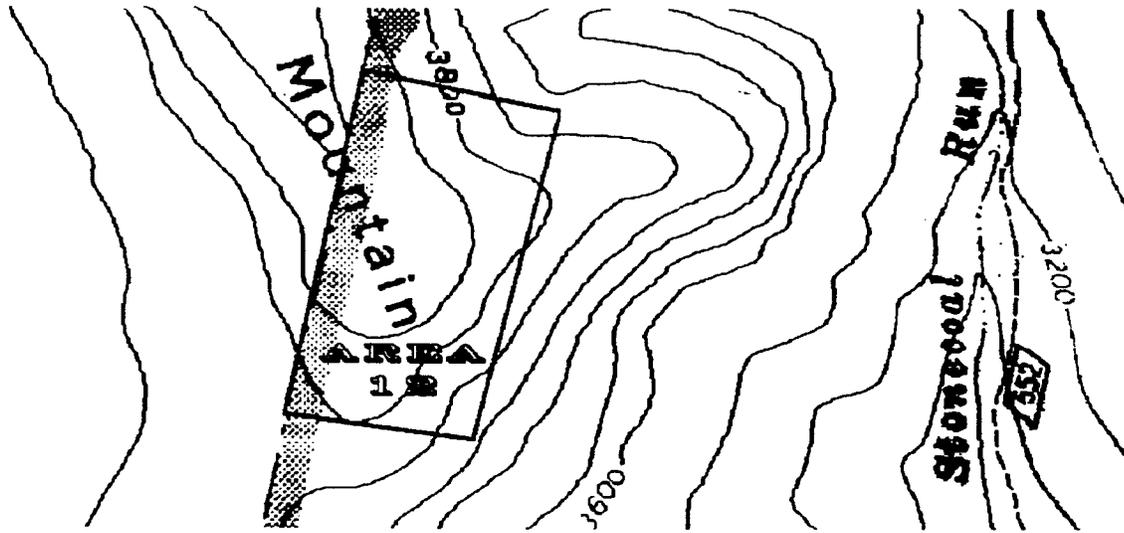
**FIGURE 5-13.
AREA 10**



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FIGURE 5-14.
AREA 11



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FIGURE 5-15.
AREA 12

Surface Survey: One five acre (466.6' x 466.6') surface survey grid will be established and the corners recorded using the GPS Pathfinder. A 100% surface survey will then be conducted in each of these survey grids. UXB believes that this will be sufficient to determine the extent of surface OEW contamination of the area.

5.8.13 Area 13

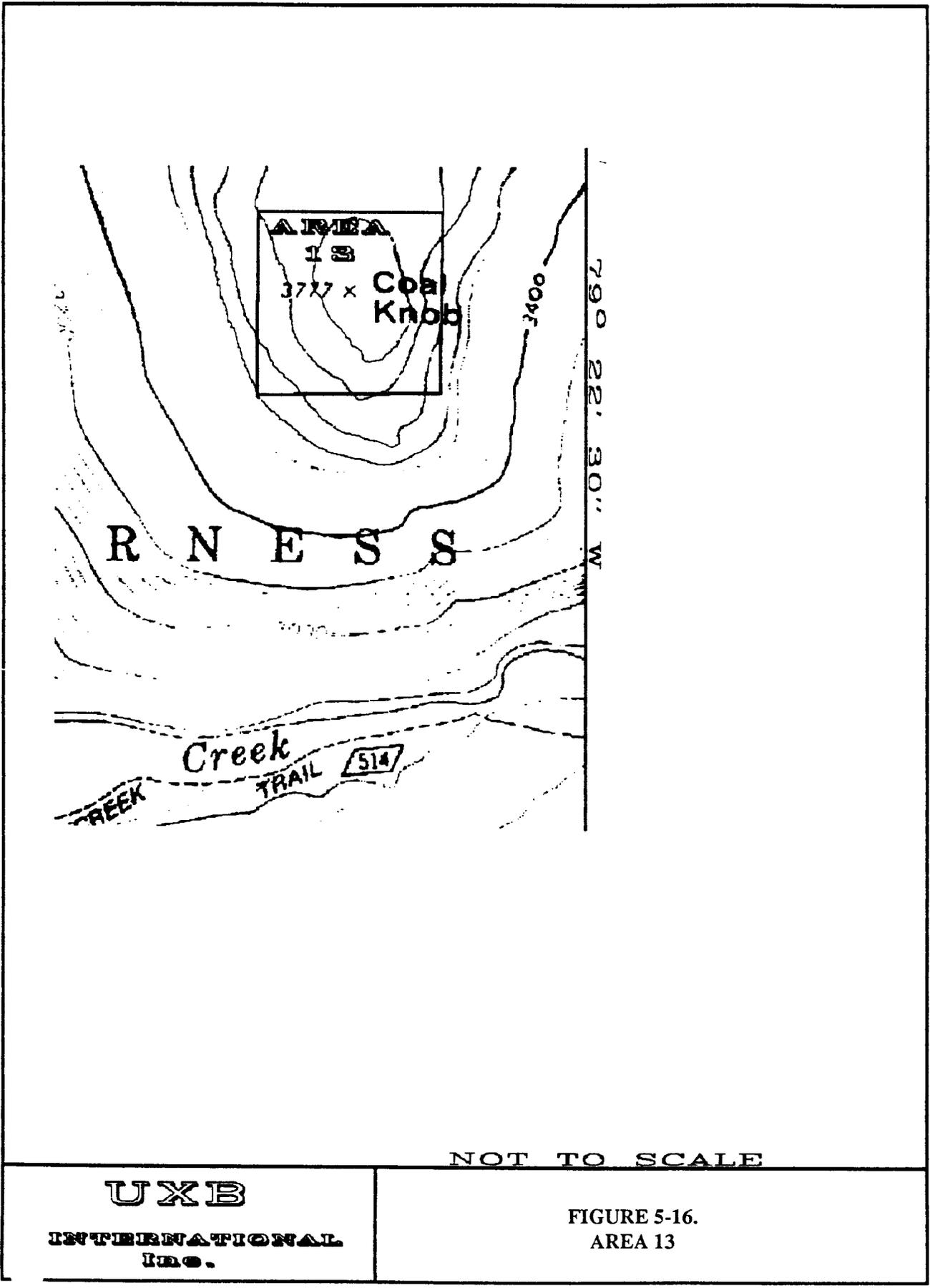
This area is located at the top of Coal Knob with BM 3777 being the approximate center (see Figure 5-16). The area is approximately 1350' x 1390'. This area encompasses approximately 43.4 acres. This high ground is likely to have been a target for mortar fire during military exercises and is similar to Breathed Mountain where ordnance was found.

Surface Survey: Two five acre (466.6' x 466.6') surface survey grid will be established and the corners recorded using the GPS Pathfinder. A 100% surface survey will then be conducted in each of these survey grids. UXB believes that this will be sufficient to determine the extent of surface OEW contamination of the area.

5.8.14 Area 14

This area is located at the southern end of Breathed Mountain in the loop formed at trail #554 (see Figure 5-17). The area is approximately 1200' x 1280'. This area encompasses approximately 35.5 acres. There are reports that UXO have been located in this area.

Surface Survey: One five acre (466.6' x 466.6') surface survey grid will be established and the corners recorded using the GPS Pathfinder. A 100% surface survey will then be conducted in each of these survey grids. UXB believes that this will be sufficient to determine the extent of surface OEW contamination of the area.

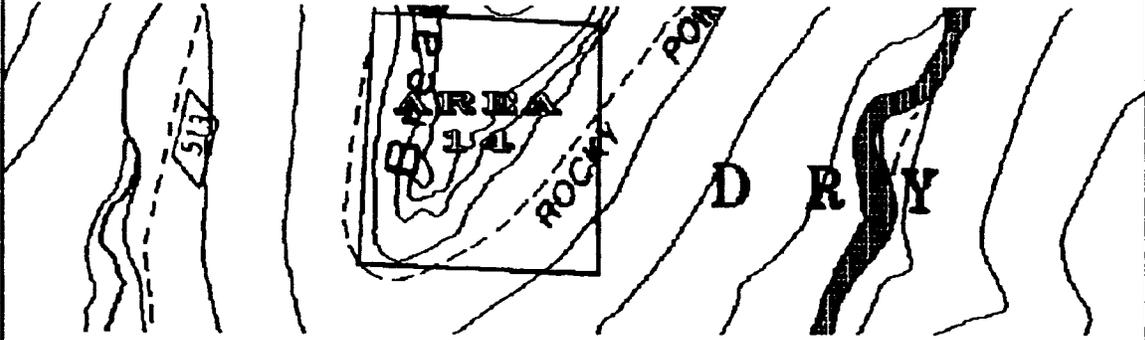


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FIGURE 5-16.
AREA 13

79° 22' 30" W



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FIGURE 5-17.
AREA 14

5.8.15 Area 15

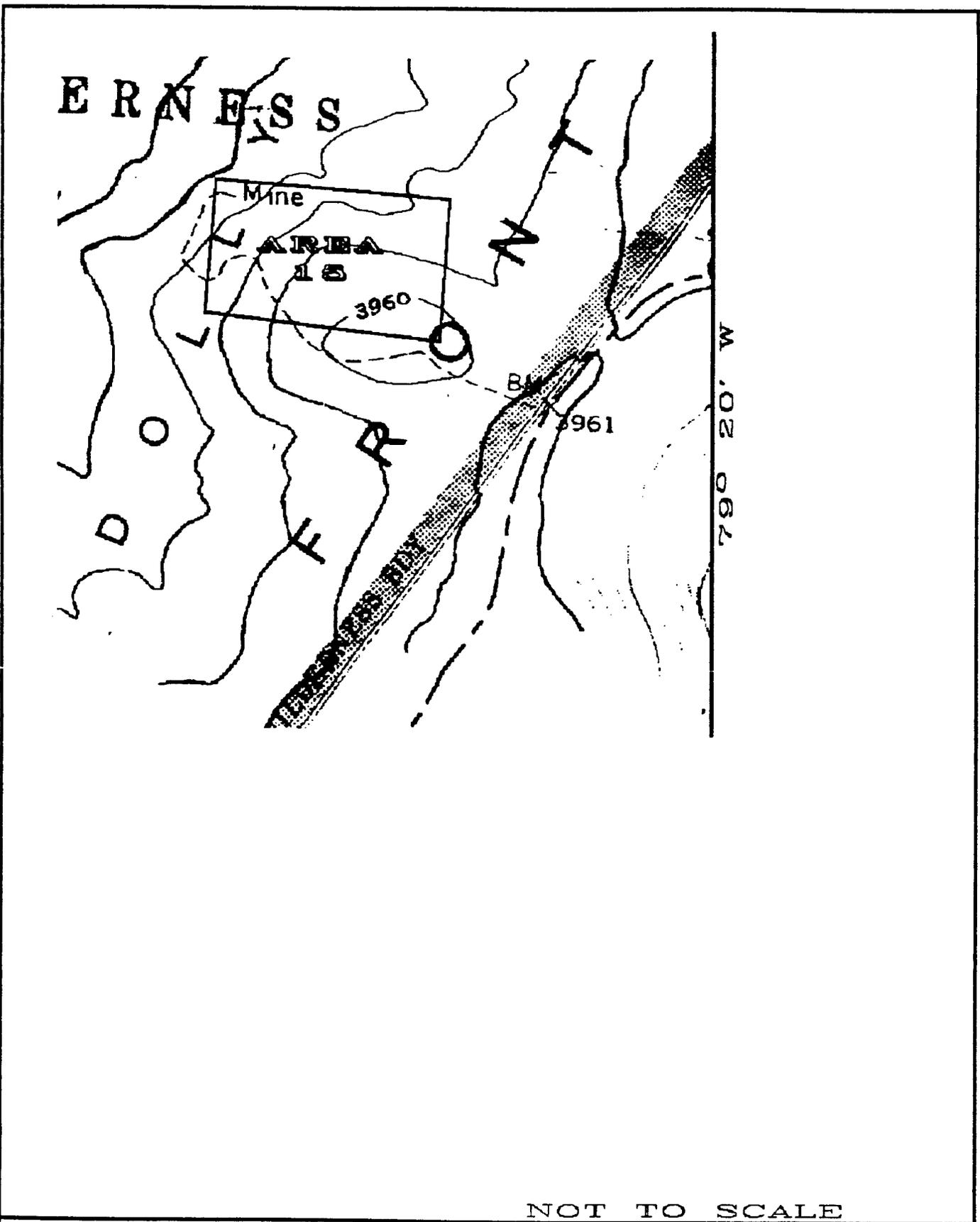
This area is located in the southeastern quadrant of the wilderness area approximately 800 feet west northwest of BM 3961 (see Figure 5-18). The area is approximately 1600' x 1000'. This area encompasses approximately 36.7 acres. This area will be representative of the southeastern portion of the Dolly Sods Wilderness Area.

Surface Survey: One five acre (466.6' x 466.6') surface survey grid will be established and the corners recorded using the GPS Pathfinder. A 100% surface survey will then be conducted in each of these survey grids. UXB believes that this will be sufficient to determine the extent of surface OEW contamination of the area.

5.8.16 Area 16

This area is located at the southeastern quadrant of the wilderness area approximately 2200 feet west northwest of Plains 4/22 (see Figure 5-19). The area is approximately 1780' x 820'. This area encompasses approximately 33.1 acres. This area will be indicative of the southern portion of the Dolly Sods Wilderness Area.

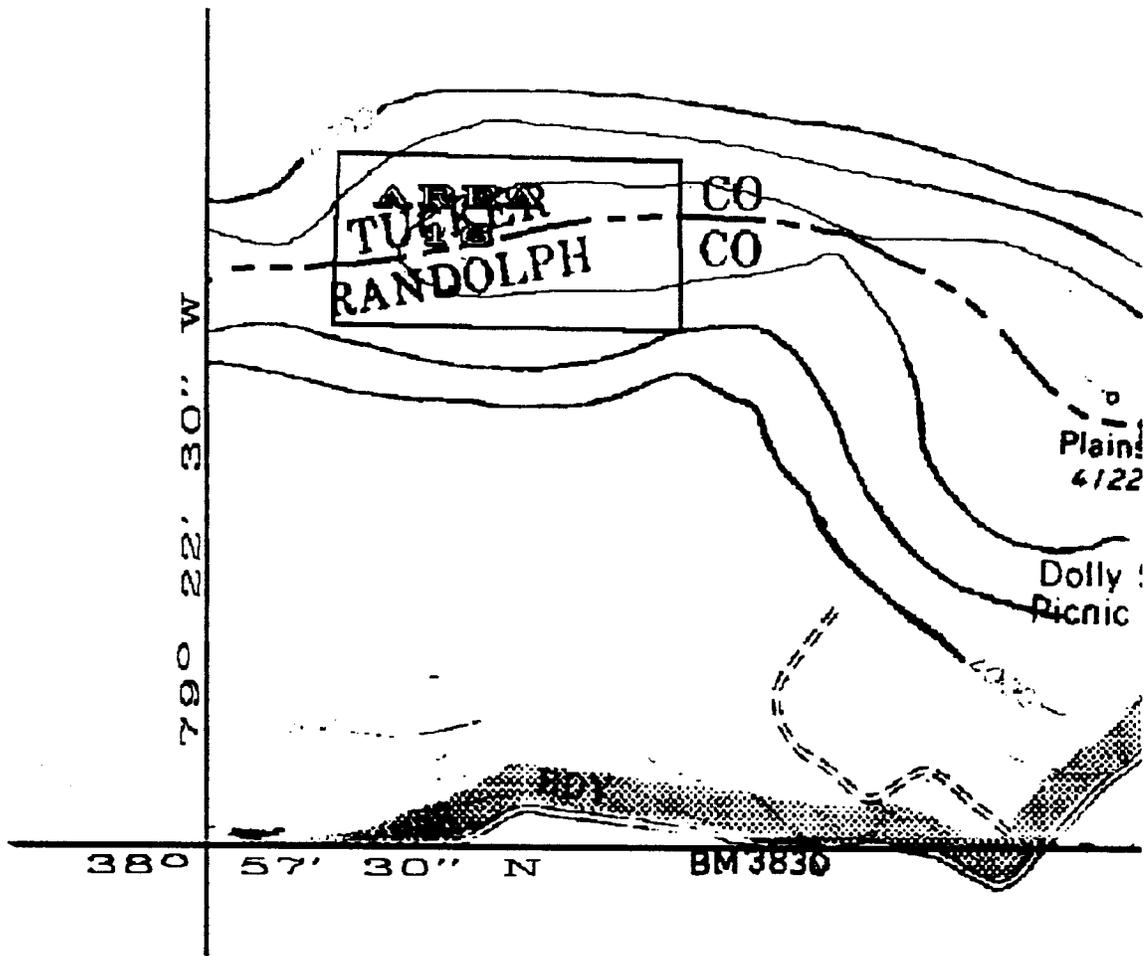
Surface Survey: Two five acre (466.6' x 466.6') surface survey grid will be established and the corners recorded using the GPS Pathfinder. A 100% surface survey will then be conducted in each of these survey grids. UXB believes that this will be sufficient to determine the extent of surface OEW contamination of the area.



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FIGURE 5-18.
 AREA 15



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FIGURE 5-19.
 AREA 16

SECTION 6.0
TURN-IN RECOVERED ORDNANCE ITEMS

All inert ordnance items and related metal scrap collected during the surface and subsurface investigation work will be temporarily stored in a secured holding area at the base camp. Upon completing the investigation work the recovered material will be turned into the Defense Property Disposal Office (DPDO), located at DRMO-Chambersburg, Letterkenny Army Depot PA. Prior to turn-in all inert fillers of ordnance items will be exposed. UXB International will segregate and weigh the items and transport the material to DPDO by truck.

During the May 29 visit to DPDO, the details for turn-in were discussed with DRMO Receiving Officer, Mr. Norman Smith. Mr. Smith provided UXB with DPDO's instruction guide for executing DO 1348-1 forms. All work related to this task will be performed in accordance with the requirements of DPDO.

SECTION 7.0
ENGINEERING REPORT

Upon conclusion of the field work, an engineering report will be submitted. This engineering report will consist of the following items:

- A map of the cleared and contaminated areas.
- A detailed accounting of all OEW and debris found during the course of the field activities, and an estimate of the extent of contamination in the wilderness area.
- A summary and discussion of remedial action alternatives. The section of remedial action alternatives will consider the various options for remedial action. These options include: 1) no action, 2) on-site disposal, and 3) off-site disposal or a combination of these alternatives. Each of these alternatives will be considered in terms of a brief evaluation of environmental consequences, an estimate of costs associated with each alternative, and safety issues involved with the different options. In addition, regulatory limitation which would affect any of these options will be considered.
- A summary of data collected during the field work.
- A summary of correspondence associated with the field effort.
- A description of lessons learned in the course of completing the project tasks.
- Color photographs depicting the clearing operation. At least 20 5" x 7" photographs will be included.

Based on the estimate of the extent/amount of contamination and analysis of the remedial action alternatives, recommendations will be made as to the most appropriate methods for remediating areas of the Dolly Sods site.

SECTION 8.0

SCHEDULE

Because the hunting season begins in October the field work must be completed by October 12. Delays to the planned events may make it necessary to continue the work into next year.

As shown on Figure 8-1, Project Schedule, the field work to be accomplished under Tasks A-3, A-4 and A-5 of the SOW is scheduled to begin on July 29, 1991 and end on October 11, 1991. Approximately five weeks have been allowed for searching and clearing fifty five-acre sites for surface contamination. Selection of sites for subsurface investigation will be done as the surface clearance comes to a conclusion. Subsurface will commence immediately upon completion of the surface survey. Approximately five weeks have been provided to complete the subsurface exploration and disposal work. This allows an additional week in order to complete work before the hunting season begins. Collected ordnance related metal scrap from surface and subsurface clearing will be turned into the Letterkenny Army Depot at Chambersburg, Pennsylvania. It is expected the process of transporting and turning in scrap will be accomplished in two days.

The results of the field work will be presented in the Engineering Report which will include an analysis of remedial action alternatives for OEW. Approximately three months have been allowed for preparing draft report, ACOE review and submitting the final report.

FEASIBILITY STUDY DOLLY SODS WILDERNESS AREA

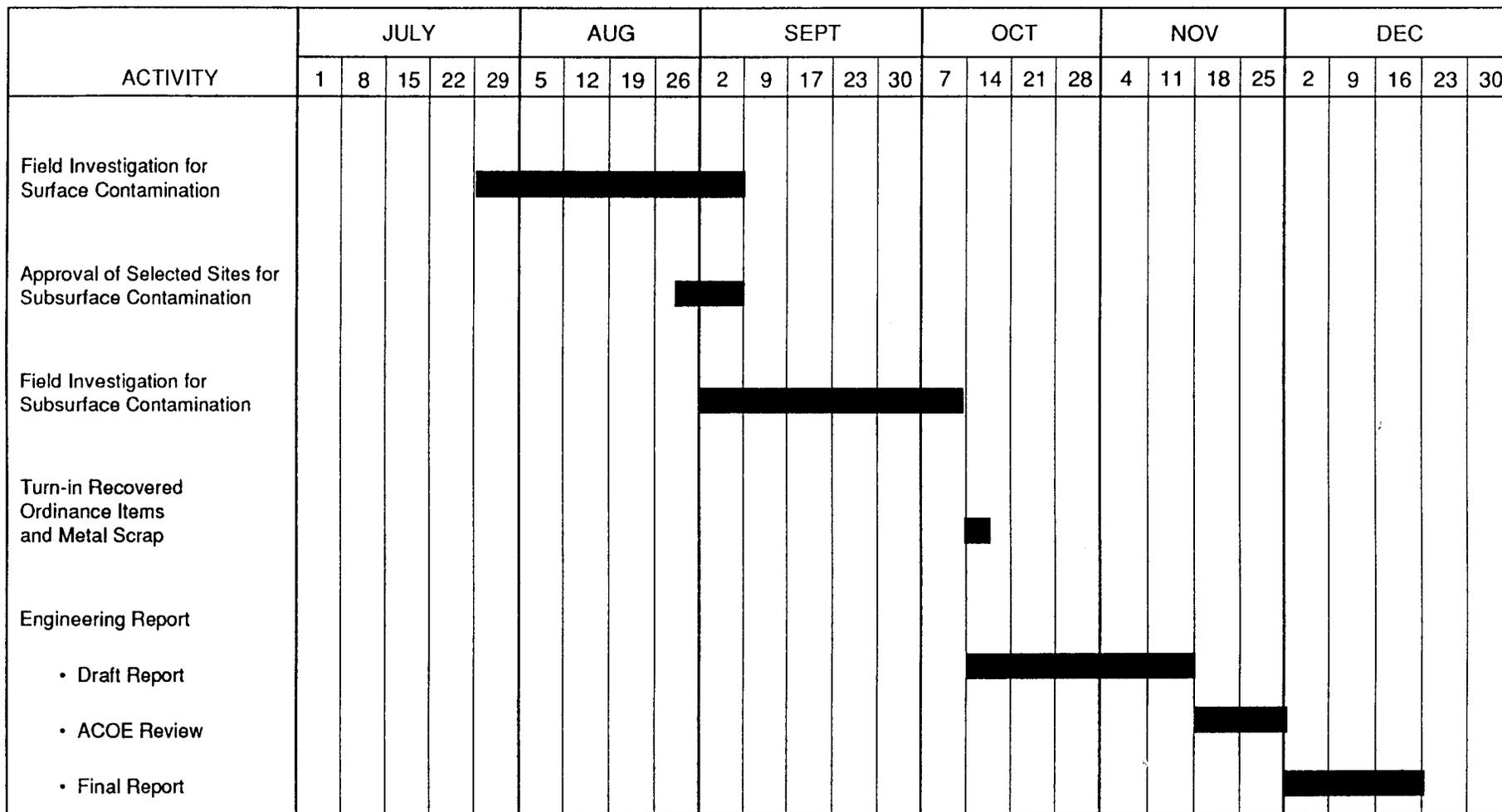


FIGURE 8-1. PROJECT SCHEDULE

APPENDIX A
SCOPE OF WORK

ANNEX A

**FEASIBILITY STUDY
DOLLY SODS WILDERNESS AREA
(FORMER WEST VIRGINIA MANEUVER AREA), DAVIS, WEST VA**

1.0 BACKGROUND AND GENERAL STATEMENT OF WORK

1.1 The work required under this Scope of Work (SOW) falls under the Defense Environmental Restoration Program (DERP). Ordnance and Explosive Wastes (OEW) exist on property that was formerly owned by Department of Defense (DOD). This SOW addresses the OEW that exists on the property listed below.

1.1.1 OEW is a safety hazard and constitutes an imminent and substantial endangerment to site personnel and the local populace. During this feasibility study, it is the government's intent that the contractor remove all OEW encountered.

1.2 Definitions: The definitions contained in Appendix A apply plus the following.

1.2.1 OEW: OEW is defined as explosive ordnance (see Appendix A) and soils with explosive constituents if the concentration in the soil is sufficient to present an imminent safety hazard. Soils contaminated with explosives which do not constitute an imminent safety hazard will be evaluated following Hazardous and Toxic Wastes (HTW) procedures. Surface and groundwater contaminated with explosives will be evaluated following HTW procedures.

1.2.2 Inert ordnance: An item which has functioned as designed, leaving an inert carrier; an item manufactured inert to serve a specific training purpose; and fragments from OEW.

1.2.3 EOD Specialist: An active duty military Explosive Ordnance Disposal (EOD) qualified person.

1.3 Description of project area.

1.3.1 The site is located in Grant, Tucker and Randolph Counties, W.VA.

1.3.2 The maneuver area consisted of approximately 2,181,000 acres and was used by the Army for military exercises, including mountain training and maneuvering during WWII. The exercises included firing of artillery into a designated area.

1.3.3 The site is owned by the Western Maryland Railroad and the U.S. Forest Service. The Forest Service operates a wilderness and scenic area for the general public, while the railroad restricts access to its property. The wilderness area is open to the public at all times and contains 10,215 acres. The public discovers abandoned ammunition on an annual basis and personal injuries have occurred.

2.0 OBJECTIVES

2.1 Identify the contaminated areas and determine the extent and magnitude of OEW contamination.

2.2 Determine remedial action alternatives which will alleviate OEW contamination.

3.0 DESCRIPTION OF SERVICES

3.1 (TASK A-1) RECORDS REVIEW, EVALUATION, AND SITE VISIT The contractor shall obtain, review, and evaluate existing records, studies, and data concerning the former Dolly Sods Wilderness Area. Data available within the Huntsville Division will be provided by the contracting officer (CO). Other data may exist in the files of Government agencies such as USACE, Huntington District, Federal Records Center, General Services Administration, and other appropriate agencies. Points of contact will be provided by the CO to the contractor as a starting point.

3.1.1. A site visit is authorized to complete the records review and assist in the development of the work plan. An UXO Specialist shall be included in the site visit team. An approved site safety plan is not necessary for the initial site visit. The site visit shall include a liaison visit to the DRMO-Chambersburg, Letterkenny Army Depot PA to arrange details for turn-in of inert ordnance and scrap metal located during *Tasks A-3 and A-4*.

3.2 (TASK A-2) WORK PLAN. The contractor shall prepare and submit a detailed Work Plan which describes the methods and procedures to accomplish the objectives and remaining tasks. As a part of this work plan, detailed information shall be submitted to describe the contractor's safety program, engineering controls, work practices, personal protective equipment, the technical approach to performing the tasks, and the management plan describing organizational functions, assignments, quality control system, individual qualifications, names of UXO personnel and their qualifications, functional relationships and responsibilities among the organizational elements that will participate in this SOW.

3.2.1 The Site Specific Safety Plan shall address responsibilities, hazard communication and training, medical surveillance and exposure monitoring, internal and external communications, and standard operating procedures (SOP), to include completion of ENG Form 3394 in the event of an accident.

3.2.2 The Work Plan shall include the necessary approved state permits to complete all tasks.

3.2.3 The contractor shall submit a draft Work Plan for review IAW paragraph 4.0, this SOW.

3.2.4 The contractor shall submit a final Work Plan for review and approval IAW paragraph 4.0, this SOW.

3.2.5 No access, recovery, or disposal of OEW shall be performed until the final Work Plan has been approved by the government.

3.3 (TASK A-3) DETERMINE EXTENT OF SURFACE CONTAMINATION.

3.3.1 The contractor shall furnish all personnel and equipment necessary to determine the extent of surface OEW contamination and dispose of any encountered non-chemical OEW. If toxic chemical OEW is encountered, operations in that area shall cease and the CO shall be notified, who will inturn notify military EOD for appropriate action.

3.3.2 Based on the data from Task A-1, the contractor shall select a total of 250 acres for surface sampling/clearing.

3.3.2.1 A planned, systematic approach shall be utilized to search and clear the sample area. This methodology shall be addressed in the work plan.

3.3.2.2 The surface clearance shall be accomplished in 5 acre plots scattered throughout the project site. Fifty 5-acre plots shall be delineated in the work plan with the rationale for selection and shall be approved by the CO before clearance operations begin.

3.3.3 The contractor shall identify the cleared/contaminated areas. The areas shall be clearly defined and drawn on a topographic or planimetric map at a scale no smaller than one inch equals two thousand feet (1 inch = 2000 feet), to show their location with respect to all surface features within the project area. Each corner of each five acre plot shall be identified by state plane grid coordinates to the closest one foot and shown on the maps. The maps shall be included in the engineering report.

3.3.4 The contractor shall maintain a detailed accounting of all materials encountered on the 250 acres. This accounting shall include the amounts of OEW, their identification/condition, and disposition. The accounting shall include all non-OEW related metallic debris that is present and which will interfere with a subsurface clearance. The non-OEW related metallic debris shall be detailed in pounds per acre. OEW-related metallic debris shall be identified and detailed in pounds per acre. This accounting shall be a part of the Engineering Report.

3.3.5 Inert OEW, to include fragments, shall be collected, the inert filler explosively vented, and then placed in a contractor established holding area pending turn-in by the contractor.

3.4 (TASK A-4) DETERMINE EXTENT OF SUBSURFACE CONTAMINATION.

3.4.1 The contractor shall furnish all personnel and equipment necessary to determine the extent of subsurface OEW contamination and dispose of encountered non-chemical OEW. If toxic chemical OEW is encountered operations in that area shall cease and the CO notified, who will inturn notify military EOD for appropriate action.

3.4.2 Based on the results of Task A-3, the contractor shall select 10 acres for subsurface examination and clearance.

3.4.2.1 The subsurface clearance shall be accomplished in 1 acre plots scattered throughout the project site. Ten 1-acre plots shall be recommended to the CO for approval.

3.4.2.2 A planned, systematic approach shall be utilized to search the sample areas. This methodology shall be addressed in the work plan.

3.4.3 A detailed accounting of the OEW, OEW-related debris and non-OEW related metallic debris encountered shall be maintained. This accounting shall include the identification of the OEW, its condition, depth encountered, and disposition. The OEW related debris and the non-OEW related metallic debris shall be accounted for in pounds per acre. This accounting shall be a part of the Engineering Report.

3.4.4 The contractor shall utilize geophysical techniques to detect subsurface UXO. Techniques, which may include seismic methods, metal detection, magnetometer, ground penetrating radar, resistivity, geophysical diffraction topography, and electromagnetic induction shall be considered and addressed in the work plan.

3.4.4.1 The two systems proposed shall be capable of detecting a 105mm projectile to a depth of six feet and shall be addressed in the work plan.

3.4.4.2 Access shall be gained to suspect subsurface UXO to perform diagnosis and appropriate disposal procedures. All access holes shall be refilled upon completion of the investigation.

3.4.4.3 Diagnosis and disposal procedures of UXO shall be accomplished by an UXO Supervisor.

3.4.5 Inert OEW, to include fragments, which interferes with the operation of the contractor shall be collected and placed in a contractor established safe holding area at the project site for turn-in. The contractor shall vent the inert filler prior to the OEW being placed in the holding area.

3.5 (TASK A-5) TURN-IN RECOVERED INERT ORDNANCE ITEMS AND METAL SCRAP

3.5.1 The contractor shall furnish all necessary personnel and equipment to turn-in all recovered inert ordnance items and metal scrap to the Defense Property Disposal Office (DPDO), located at DRMO-Chambersburg, Letterkenny Army Depot PA. The contractor shall coordinate with the DRMO-Chambersburg during the site visit in *Task A-1*.

3.5.2 The contractor shall segregate inert ordnance items from other types of metal scrap. The inert fillers of ordnance items shall be exposed. This shall be accomplished in any way necessary to preclude rupture due to confined pressure.

3.5.3 The contractor shall complete a DD Form 1348-1 as turn-in documentation. Instructions for completing this form are contained in DOD 4160.21-M.

3.5.3.1 The contractor shall prepare a Certificate signed by the Project Senior UXO Supervisor as follows:

"I certify that the property listed hereon has been inspected by me and, to the best of my knowledge and belief, contains no items of a dangerous nature."

3.5.4 The contractor shall propose the methodology to accomplish this task in the Work Plan.

3.6 (TASK A-6) SUBMIT ENGINEERING REPORT

3.6.1 At the conclusion of the field work, the contractor shall submit an Engineering Report which consists of the following:

3.6.1.1 Map of Cleared/Contaminated Areas

3.6.1.2 Detailed accounting of found OEW/debris and estimate of extent/amount of contamination.

3.6.1.3 Remedial Action Alternatives

3.6.1.3.1 Environmental Consequences of each alternative.

3.6.1.3.2 Economic analysis of the alternatives.

3.6.1.4 Data Summary

3.6.1.5 Correspondence Summary

3.6.1.6 Lessons Learned

3.6.1.7 Color 5"x7" photographs depicting field effort and any found OEW/debris.

3.6.2 The Engineering Report presenting all data, analyses, and recommendations shall be prepared in a standard format for A-E reports and include all the items above. All site drawings shall be of engineering quality with sufficient detail to show interrelations of major features on the site map. The report shall consist of 8 1/2 by 11 inch pages with drawings folded, if necessary, to this size. The report covers shall be durable binders which hold pages firmly while allowing easy removal and/or addition of pages. A report title page shall identify the A-E, the Corps of Engineers Huntsville Division and the date. This SOW shall be incorporated in the draft report. At least 20 original 5"x7" color photographs shall be included in each copy of the draft and final Engineering Report. Photocopies of photographs are unacceptable.

3.6.3 Identify Remedial Action Alternatives. Based on the results of the investigation and contamination encountered, the A-E shall identify remedial actions for OEW at this site and include in the Engineering Report. The A-E shall select from, but not be limited to, the following alternatives:

3.6.3.1 No Action

3.6.3.2 On-site disposal

3.6.3.3 Off-site disposal

3.6.3.4 Any combination of the above.

3.6.4 Based on the analyses of alternatives, the A-E shall recommend by separate letter, recommendations and justifications for the optimum corrective measure. If separate corrective measures are recommended by the A-E for different areas within the project site, the A-E shall so specify and justify.

3.6.5 The Engineering Report shall include a recapitulation of exposure data. This shall include total number of man-hours worked on-site, total motor vehicle mileage, total number of flying hours, and number of flights.

3.7 CONTRACTOR QUALIFICATIONS: The contractor shall furnish a staff that is qualified through education, training, and experience that will accomplish the objectives and tasks of this SOW.

3.7.1 The contractor shall have experience in architect-engineering and managing multi-facet operations involving Formerly Used Defense Sites-OEW projects.

3.7.2 Minimum qualifications for the UXO Team Members:

3.7.2.1 The senior UXO Specialist on-site shall be detailed as the Senior UXO Supervisor. In addition to being a graduate of the USN EOD School, Indian Head MD, the Senior UXO Supervisor shall have served at least 15 years in active duty military EOD assignments, of which at least six years shall have been in supervisory positions. This individual shall have supervised multiple UXO Teams involved in UXO land clearance operations. Up to 3 years of active duty military experience may be substituted by contractor UXO experience on a one-day to one-day basis for the Senior UXO Supervisor. This substituted experience may be approved on a case-by-case basis by the Safety Specialists, CEHND-ED-SY.

3.7.2.2 UXO personnel designated as Team Leaders, shall be detailed as UXO Supervisors. In addition to being a graduate of the USN EOD School, Indian Head MD, the UXO Supervisor shall have served at least 10 years in active duty military EOD assignments, of which 3 years shall have been in supervisory positions.

3.7.2.3 UXO Specialists, in addition to being a graduate of the USN EOD School, Indian Head MD, shall have at least 2 years experience in active duty military EOD assignments.

3.7.2.4 Detailed resumes for all UXO personnel, to include EODS certificates, all EOD assignments, and in the case of the Senior UXO Supervisor, a detailed listing of contractor UXO experience, shall be included as part of the work plan.

3.7.3 Minimum qualifications for Non-UXO Specialist, Non-management Project personnel:

3.7.3.1 Shall have the necessary education, training and experience to accomplish assigned tasks, as certified by the contractor.

3.7.4 Certification IAW 29 CFR 1910.120(e) is not required for this site.

4.3 Due Dates, Submittals, and Action Items.

<u>Submittals</u>	<u>calendar days after award</u>
1. Draft Work Plan	30
2. Draft Work Plan reviewed by CEHND	45
3. Final Work Plan	60
4. Final Work Plan reviewed/approved by CEHND	75
5. Draft Engineering Report	150
6. Final Engineering Report	180

5.0 PUBLIC AFFAIRS

5.1 The contractor shall not make available or publicly disclose any data generated or reviewed under this contract or any subcontract unless specifically authorized by the CO. When approached by any person or entity requesting information about the subject of this contract, the contractor shall refer to the CO for response. Reports and data generated under this contract shall become the property of the government and distribution to any other source by the contractor is prohibited unless authorized by the CO.

5.2 The contractor shall incorporate a similar condition in all subcontracts, which states as follows:

The subcontractor shall not make available or publicly disclose any data generated or reviewed under this subcontract unless specifically authorized by the prime contractor. When approached by any person or entity requesting information about the subject of this subcontract, the subcontractor shall refer to the prime contractor for response. Reports and data generated under this contract shall become the property of the prime contractor and distribution to any other source by the sub-contractor is prohibited unless authorized by the prime contractor.

6.0 REFERENCES

6.1 AR 75-14, Interservice Responsibilities or Explosive Ordnance Disposal.

6.2 EM 385-1-1, CE Safety and Health Requirements Manual

6.3 AR 358-40, Accident Reporting and Records dtd Apr 87 with USACE Supplement dtd Mar 90.

6.4 TM 9-1300-206, Ammunition and Explosive Standards

6.5 DOD 4160.21-M, Defense Utilization and Disposal Manual

4.0 SUBMITTALS

4.1 Submittals. The contractor shall furnish copies of the plans and reports as identified in paragraph 4.3 to each addressee listed below in the quantities indicated. The contractor shall utilize express mail services for delivering these plans and reports. Following each submission, comments generated as a result of their review shall be incorporated. A reproducible copy shall be furnished with the final Engineering Report submittal only to CEHND-ED-PM. At the discretion of the Contracting Officer (CO), the contractor shall turn over to the CO all working papers, maps, and documents relating to this project at the end of the contract. Throughout the contract, the contractor shall make available all working papers, maps, and documents relating to this project to the CO.

ADDRESSEE	COPIES OF EACH SUBMITTAL
U.S.Army Engineer Division, Huntsville ATTN: CEHND-ED-PM (Walt Perro) 106 Wynn Drive Huntsville AL 35805-1957	6
HQ, USACE Department of the Army ATTN: CEMP-EB 20 Massachusetts Ave Washington, DC 20314-1000	3
US Army Engineer District, Huntington ATTN: CEORH-ED 502 8th St. Huntington WV 25701-2070	3
Commander 549th Ordnance Detachment (EODCC) Fort Meade MD 20755-5320	2

4.2 Correspondence. The contractor shall make a record of each phone conversation and written correspondence regarding information related to the performance of this contract. A summary of the phone conversations and written correspondence shall be submitted to the CO with the Engineering Report.

6.6 TM 9-1300-214, Military Explosives (Paragraph 13-2)

6.7 CEHND UXO Safety Concepts and Basic Considerations

7.0 SPECIAL INSTRUCTIONS

7.1 If an unmovable UXO is encountered that cannot be detonated on site because of the closeness of inhabited areas, structures, or facilities, the CO shall be notified, who will inturn contact military EOD for applicable procedures.

7.2 The safety concepts and basic considerations outlined in reference 6.7 shall be complied with, unless exceptions are granted by the CO.

7.3 If suspected pieces of explosive are encountered, color tests shall be conducted in accordance with reference 6.6 above to provide an immediate clue to the possible identification of an energetic material.

7.4 The government shall arrange right-of-entry permits.

7.5 29 CFR 1926.100(a) requires employees to wear protective helmets in areas where there is a possible danger of head injury from impact, or from falling or flying objects, or from electrical shock or burns. During the accomplishment of this SOW, hardhats need be worn only when the above possibilities are present.

APPENDIX B
INFORMATION SOURCES

**DOLLY SODS
Information Sources**

CORPS OF ENGINEERS/HUNTSVILLE
Department of the Army
Huntsville Division Corps of Engineers
P. O. Box 1600
Huntsville, Alabama 35807-4301

Lt. Col. Barry W. Peterman, U.S. Army
Contracting Officer

Mr. Walter Perro
Project Manager
205-955-5142

Mr. Stan Lee
Lead Project Manager
205-955-5533

Mr. Robert Britton
Site Development Section
205-955-5170

Mr. William Newburn
Site Development Section
205-955-5170

Mr. James Ferris
Safety Officer
205-955-5785

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Huntington, West Virginia 25701-2070
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Ohio River Division
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Ms. Billy Wheeler
Law Enforcement Officer
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Harry Mahoney
Historian
304-636-1800

Benjamin Backus
Law Enforcement Officer
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Jane Darnell
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Petersburg, West Virginia 26847

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Staff Officer for Recreation and
Wilderness
304-257-4488

Randall C. Kipley
304-257-4488

Dave McMorin
304-257-4488

Richard Vandernoot
304-257-4488

AERIAL PHOTOGRAPH SOURCES

U.S. Department of Agriculture
Agricultural Stabilization Conservation
Service
222 West 2300 South
P. O. Box 30010
Salt Lake City, Utah 84119-2020
801-524-5865

National Archives
Cartographic Branch
Washington, DC 20408

Bob Richardson
703-756-6700

U.S. Geological Survey
Aerial Photographs

Bob Miracle
303-236-5829

Defense Mapping Agencies
Combat Support Center
Customer Assistance
301-227-2495

Information Services
1-800-359-3997

NATIONAL ARCHIVES
Suitland Reference Branch (NNRR)
Washington, DC 20409

Rich Boylan
301-763-7410

US ARMY GOVERNMENT RECORDS
CENTER
St. Louis, Missouri

Bill Seibert
314-538-4261

GENERAL SERVICES ADMINISTRATION
Washington, DC
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Local Newspaper
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Elkins, WV 26241

Eldora Nuzum, Editor
304-636-2121

GLOBAL POSITIONING SYSTEM
Information Contact
Eric Jespersen
Plan Dynamics
174 South Main Street
Hackensack, NJ
914-783-8033

APPENDIX C

REFERENCE DOCUMENTS

- 1 Inventory Project Report
- 2 Background Information
Ohio River Division
- 3 Information
B. William Vanorsdale
U.S.F.S. Retired
- 4 Records Research;
May 6 and 7 Interviews
U.S.F.S.

DEFENSE ENVIRONMENTAL RESTORATION PROGRAM
FOR FORMERLY USED DEFENSE SITES
INVENTORY PROJECT REPORT
DOLLY SODS WILDERNESS AREA
(WEST VIRGINIA MANEUVER AREA)
DAVIS, WEST VIRGINIA
PROJECT NO. G03WV006500

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PART I - PROJECT DESCRIPTION

PROJECT DESCRIPTION
DOLLY SODS WILDERNESS AREA
(WEST VIRGINIA MANEUVER AREA)
DAVIS, WEST VIRGINIA
PROJECT NO. G03WV006500

1. INTRODUCTION

At the request of the Huntsville Division, the Huntington District performed a site inspection of the former West Virginia Maneuver Area on 3 December 1984. The purpose of the site inspection was to determine the presence of unsafe debris, hazardous or toxic waste, and unexploded ordnance at the site.

2. DESCRIPTION OF PROJECT

A Remedial Investigation and Feasibility Study (RI/FS) is proposed to determine the types and extent of ordnance contamination at the site and develop alternatives to safeguard the public. The public discovers ordnance at the site on an annual basis, and personal injuries have occurred.

3. DESCRIPTION OF SITE

a. The site is located in Grant, Tucker and Randolph Counties, West Virginia.

b. The former maneuver area is owned by the U.S. Forest Service and Western Maryland Railroad. The Forest Service operates a wilderness and scenic area for the general public. Access is uncontrolled. Overnight camping permits are required and warning signs are posted. The railroad restricts access to its property. Personal injuries related to ordnance have occurred in the wilderness area.

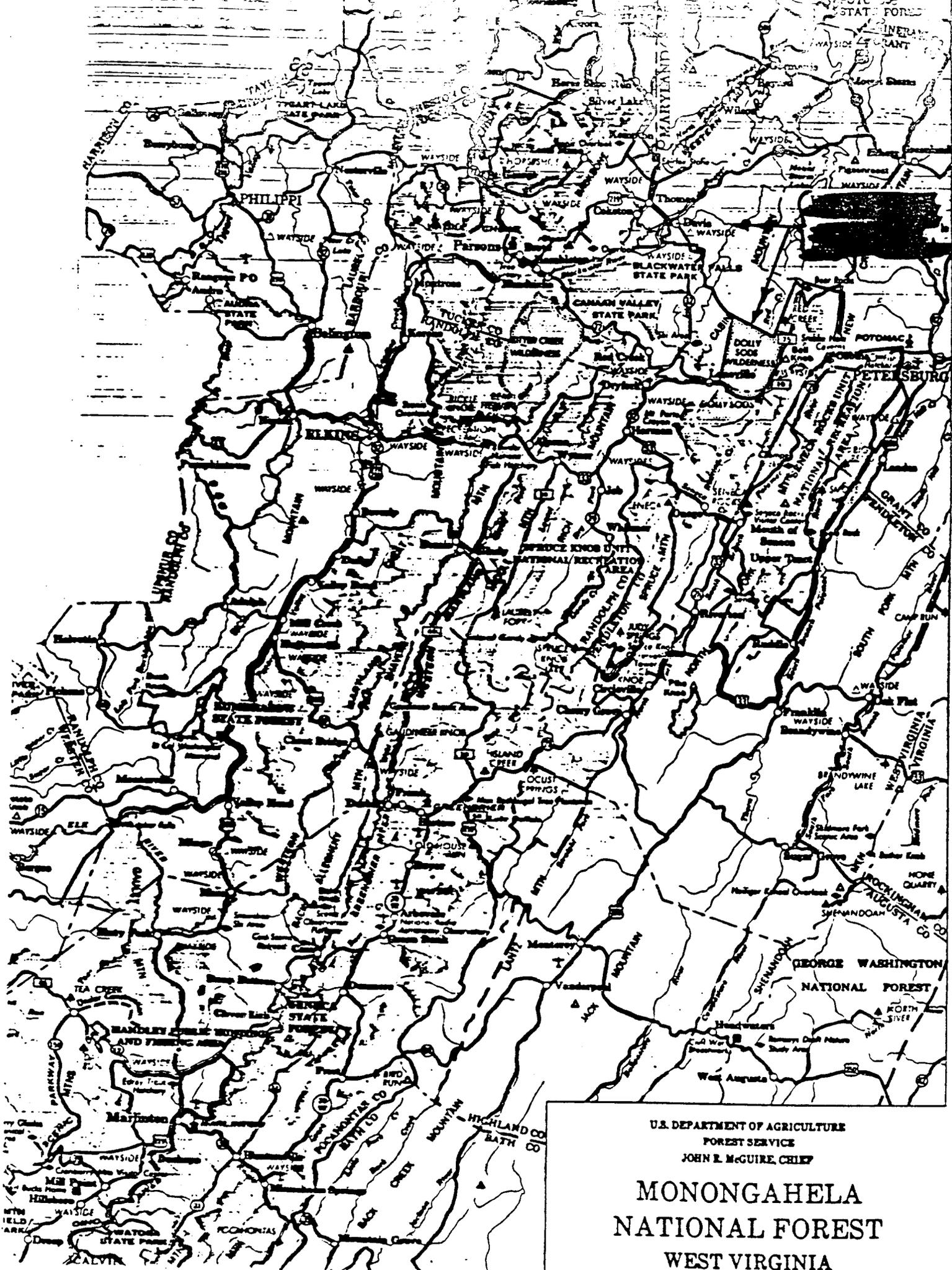
ATTACHMENT 1 - SITE SURVEY SUMMARY SHEET

SITE SURVEY SUMMARY SHEET
FOR
PROJECT NO. G03WV006500

1. SITE NAME: Dolly Sods Wilderness Area (West Virginia Maneuver Area)
2. LOCATION: Davis, West Virginia - Tucker, Grant and Randolph Counties
3. DESCRIPTION OF SITE: Former maneuver area and artillery range
4. SITE HISTORY: The site was acquired by the Army in the early 1940s for military exercises. The site was returned to the Department of Agriculture in 1950.
5. AVAILABLE STUDIES AND REPORTS: None
6. CATEGORY OF HAZARD: Unexploded ordnance
7. BASIS FOR DETERMINATION OF DOD RESPONSIBILITY: The Department of Defense leased the area for a maneuver and artillery range.
8. POC/DISTRICT: Frank Albert, (304) 529-5194, Huntington District
9. DESCRIPTION OF PROPOSED REMEDIAL ACTION: A Remedial Investigation and Feasibility Study are proposed to determine the types and extent of contamination and develop alternatives to safeguard the public.
10. STATUS: The site is operated as a wilderness area by the U.S. Forest Service.
11. ESTIMATED COST: Safety to provide

ATTACHMENT 2 - COST ESTIMATE

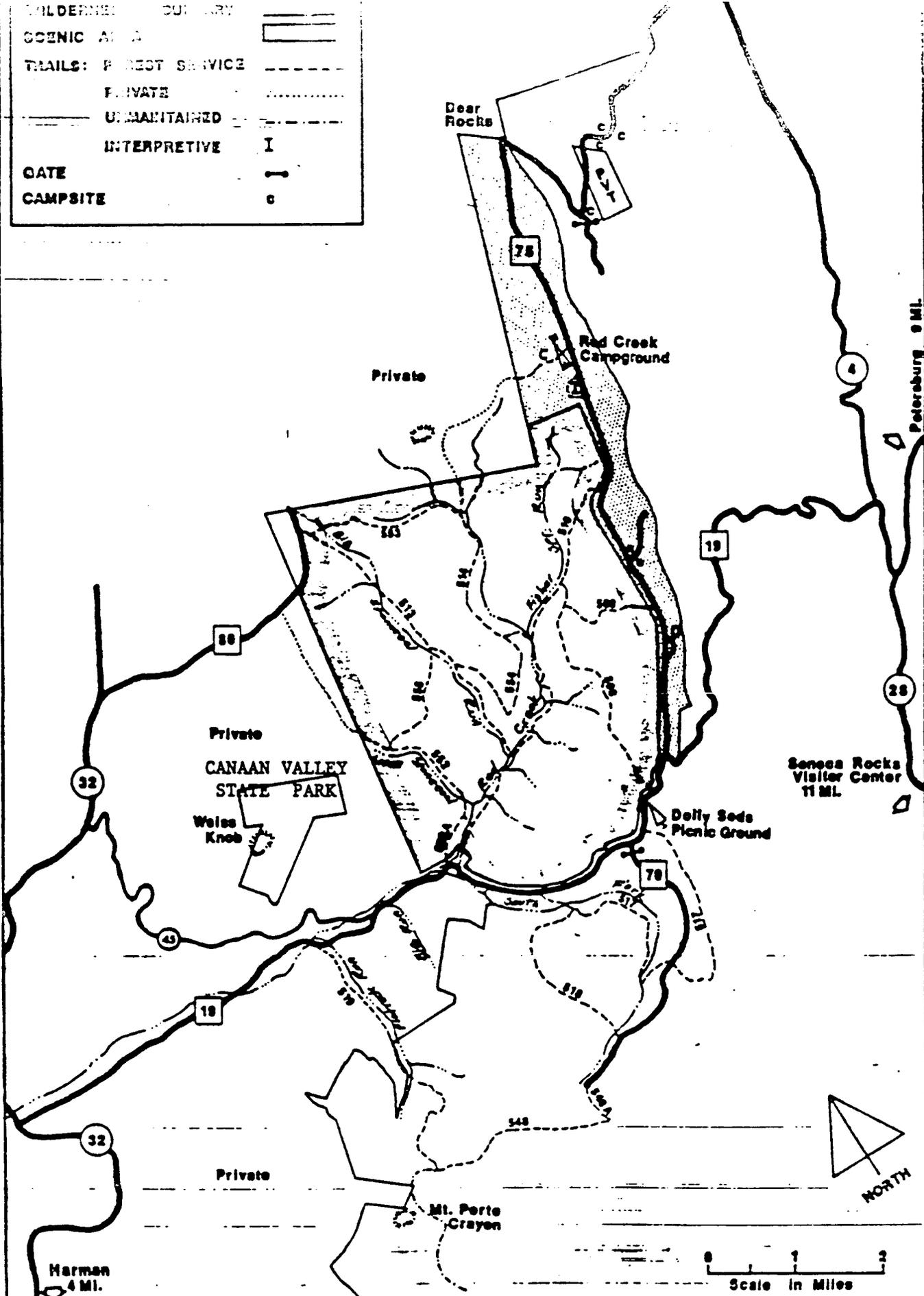
ATTACHMENT 3 - SITE MAPS AND PHOTOGRAPHS



U.S. DEPARTMENT OF AGRICULTURE
 FOREST SERVICE
 JOHN E. MCGUIRE, CHIEF

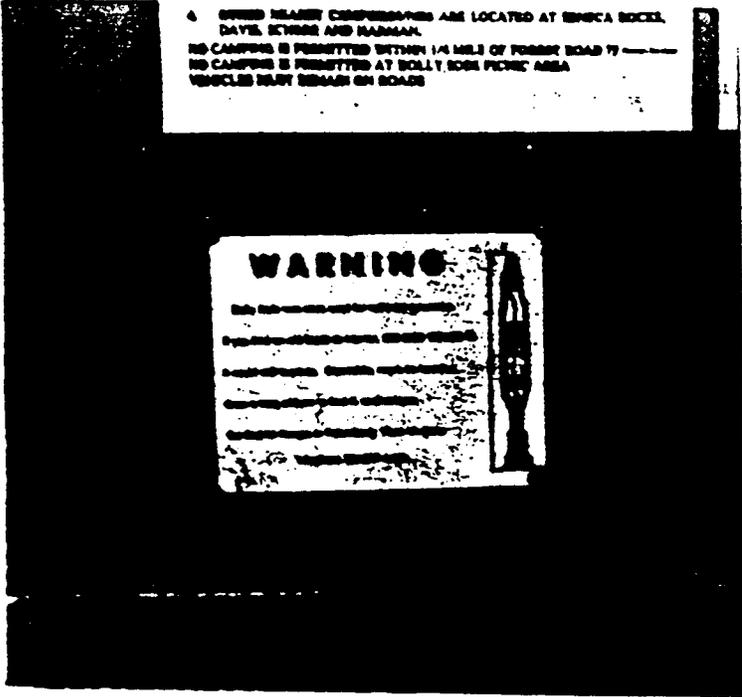
**MONONGAHELA
 NATIONAL FOREST
 WEST VIRGINIA**

WILDERNESS BOUNDARY	
SCENIC AREA	
TRAILS: FOREST SERVICE	
PRIVATE	
UNMAINTAINED	
INTERPRETIVE	
GATE	
CAMPSITE	

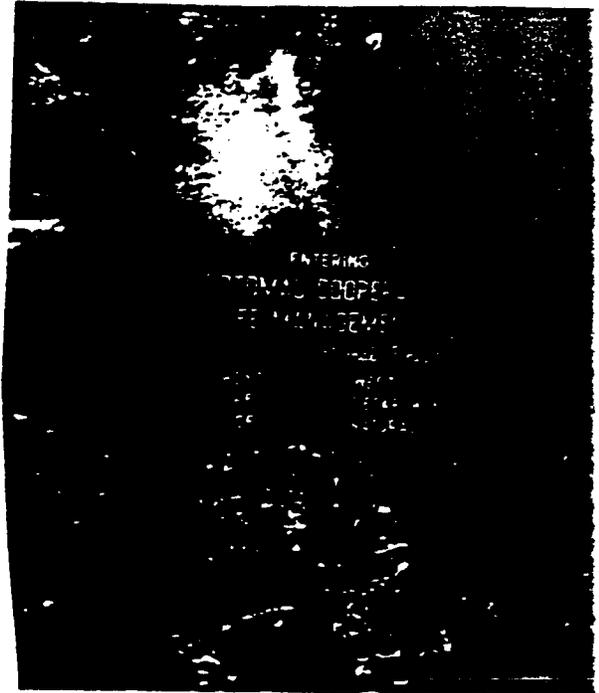


DOLLY SODS WILDERNESS AND SCENIC AREA

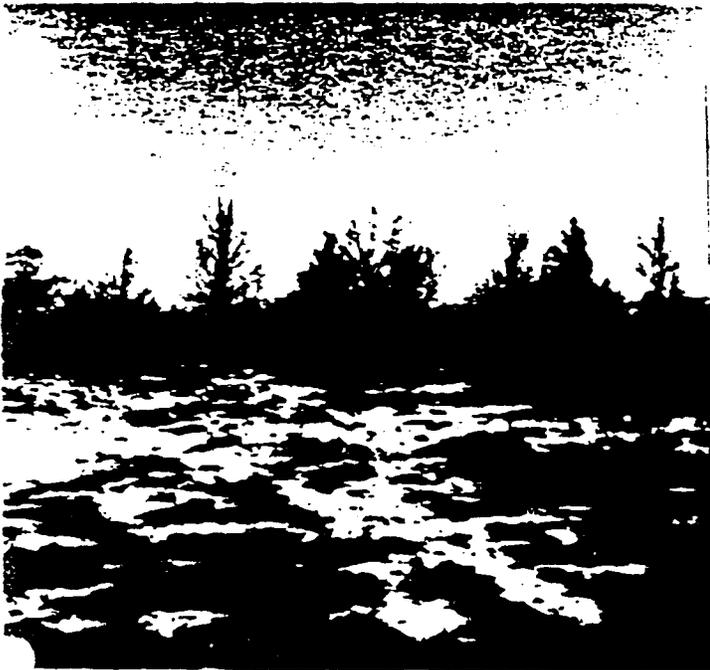
National Forest WEST VIRGINIA



ENTRANCE SIGN



ENTRANCE SIGN



IMPACT AREA



IMPACT AREA

PART II - FINDINGS AND DETERMINATION OF ELIGIBILITY

DEFENSE ENVIRONMENTAL RESTORATION PROGRAM
FOR FORMERLY USED DEFENSE SITES
FINDINGS AND DETERMINATION OF ELIGIBILITY
DOLLY SODS WILDERNESS AREA
(WEST VIRGINIA MANEUVER AREA)
DAVIS, WEST VIRGINIA
PROJECT NO. G03WV006500

FINDINGS OF FACT

1. A Remedial Investigation and Feasibility Study (RI/FS) is proposed to determine the types and extent of ordnance contamination and develop alternatives to safeguard the public at this former munitions range. The general public has discovered unexploded ordnance at this site on an annual basis, and personal injuries have occurred.

2. The maneuver area consisted of a total of 2,180,742.37 acres of land. Of this, 350,416.37 acres were public lands; 48,557.00 acres were leased; and 1,781,769 acres were so-called lesser interests. According to a warning order notice dated 26 March 1945, these lesser interests were covered by "trespass agreements." Apparently, the land owners had given use of these lands to the Army verbally. There are no records surviving that describe the trespass agreements or the area they covered.

The public lands were all permitted to the Secretary of War by the Department of Agriculture, all being a part of the Monongahela National Forest. By letter dated 4 August 1943, 341,266 acres were permitted to the Army. By letter dated 10 November 1943, an additional 9,150.37 acres were permitted to the Army. Leases over 48,557 acres and one license from Western Maryland Railroad Company for a stream line were acquired by purchase and condemnation. All lands where work is recommended are those covered by the permits from the Department of Agriculture.

3. The West Virginia Maneuver Area was used by the Army for military exercises, including mountain training and maneuvering, during World War II. The exercises included firing of artillery into a designated area. No permanent facilities were constructed in the former maneuver area. There is no evidence that the area was under other than DOD control during the period of DOD interest.

4. A warning order issued for the entire facility, dated 26 March 1945, stated that on 19 March 1945 the entire 2,180,742.37 acre facility was declared surplus. A subsequent warning order dated 10 August 1945 withdrew the entire facility from surplus. A 21 April 1945 letter from the Office for Emergency Management, Office of Scientific Research and Development, Washington, DC (OEM-SRD) requested OCE issue a permit for OEM-SRD or its agencies or contractors to test fire rockets and projectiles.

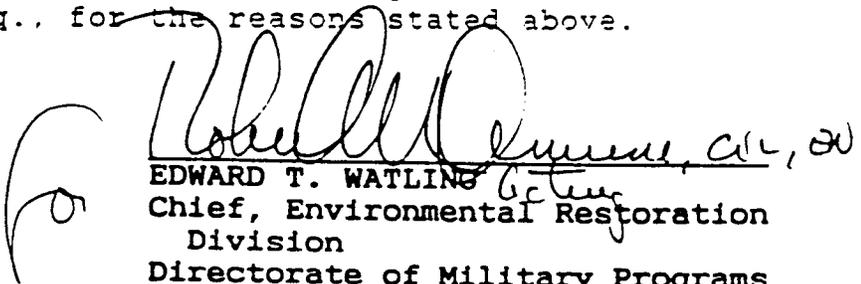
The permit was issued and would expire upon the Army's relinquishing the lands back to the Department of Agriculture. On 10 August 1950, OCE relinquished the land by letter back to the Department of Agriculture. A 27 June 1945 letter from OCE to ORD advised that these lands must be decontaminated before disposal and that such must be done even if decontamination costs exceeded costs of acquiring the land in fee. All work proposed to be done is located on the lands formerly permitted to the Secretary of War by the Department of Agriculture. These lands remain under the ownership of the Department of Agriculture. There were no intervening owners who could have contributed to the ordnance contamination at the site.

5. This site is owned by the Western Maryland Railroad and the U.S. Forest Service. The Forest Service operates a wilderness and scenic area for the general public, while the railroad restricts access to its property. The wilderness area is open to the public at all times. There are signs at access points leading into the area indicating that it was used for military exercises during World War II and that old ordnance still remain in the area, and should not be handled. The public discovers abandoned shells on an annual basis and personal injuries have occurred. There is no other evidence of unsafe debris, hazardous or toxic waste, or unexploded ordnance resulting from DOD use of the site.

DETERMINATION

Based on the foregoing findings of fact, the site has been determined to have been formerly used by DOD. Moreover, it is determined that an environmental restoration project, to the extent set out herein, is an appropriate undertaking within the purview of the Defense Environmental Restoration Program, established under 10 U.S.C. 2701 et seq., for the reasons stated above.

21 May 50
Date


EDWARD T. WATLING
Chief, Environmental Restoration
Division
Directorate of Military Programs

PART III - POLICY CONSIDERATIONS

POLICY CONSIDERATIONS
DOLLY SODS WILDERNESS AREA
(WEST VIRGINIA MANEUVER AREA)
DAVIS, WEST VIRGINIA
PROJECT NO. G03WV006500

1. Current DOD policy permits remediation of DOD-generated ordnance contamination provided both the policy criteria and technical criteria are met. With regard to the policy criteria; the title transfer documents do not absolve the Government from site restoration responsibility. DOD correspondence indicates responsibility to decontaminate the site before disposal, even if the cost exceeds the cost of acquiring lands in fee. The owner did not receive compensation in lieu of restoration; the property has not been altered or beneficially used for ordnance related purposes by subsequent owners; and there were no deed restrictions violated.
2. With regard to the technical criteria, the site has been evaluated as having a Risk assessment Code (RAC) of 2. A RAC score of 2 indicates a need for action to mitigate hazards or protect personnel. A Remedial Investigation and Feasibility Study are appropriate.

PART IV - PROJECT RECOMMENDATIONS

PROJECT RECOMMENDATIONS
DOLLY SODS WILDERNESS AREA
(WEST VIRGINIA MANEUVER AREA)
DAVIS, WEST VIRGINIA
PROJECT NO. G03WV006500

1. It is recommended that the Remedial Investigation and Feasibility Study be approved as proposed.

DEFENSE ENVIRONMENTAL RESTORATION PROGRAM
PROJECT DESCRIPTION
FOR
WEST VIRGINIA MANEUVER AREA
DAVIS, WEST VIRGINIA

PROJECT NO. G03WV006500

1. Introduction. As tasked by the Ohio River Division, the Huntington District has been tasked to make a site visit of the former West Virginia Maneuver Area. The purpose of the site visit was to assess the possible hazard condition of the former Maneuver Area.

2. Project Description. A decontamination survey and remedial action of a previously used munition range with unknown amount and type of hazardous unexploded ordnance is proposed. The project consists of making a survey report, locating unexploded ordnances, determining site clearance procedures and proper disposal methods for the environmental restoration of the site.

3. Description of Site: The project site is in Grant and Tucker Counties and owned by The Western Maryland Railroad and the U.S. Forest Service. The Forest Service operates a wilderness and scenic area for the general public while the railroad restricts access to the area. There are signs leading into the wilderness area that the area was used for military exercises during World War II and that some old ordnances still remain in the area. The area is at a very high elevation and temperatures are comparable to those several hundred miles to the north. The area is strictly controlled by the Forest Service and motorized equipment is prohibited in the wilderness area. The existance of unexploded ordnance is a prime concern of the Forest Service, as identification of unexploded ordnance by the general public is made on an annual basis.

SITE SURVEY SUMMARY
FOR
PROJECT NO. G03WV006500

SITE NAME: West Virginia Maneuver Area

LOCATION: Davis, West Virginia - Tucker and Grant Counties

DESCRIPTION OF PROJECT: Former maneuver area and artillery range.

SITE HISTORY: The site was acquired by the Army in the early 1940's for military exercises. The site was turned over to the Department of Agriculture in 1950.

AVAILABLE STUDIES AND REPORTS: None

CATEGORY OF HAZARDS: Ordnance and explosive waste project.

BASIS OF DOD RESPONSIBILITY: The Department of Defense leased the area for a maneuver and artillery range. The site was later abandoned by DOD and obtained by the Western Maryland Railroad and the U.S. Forest Service.

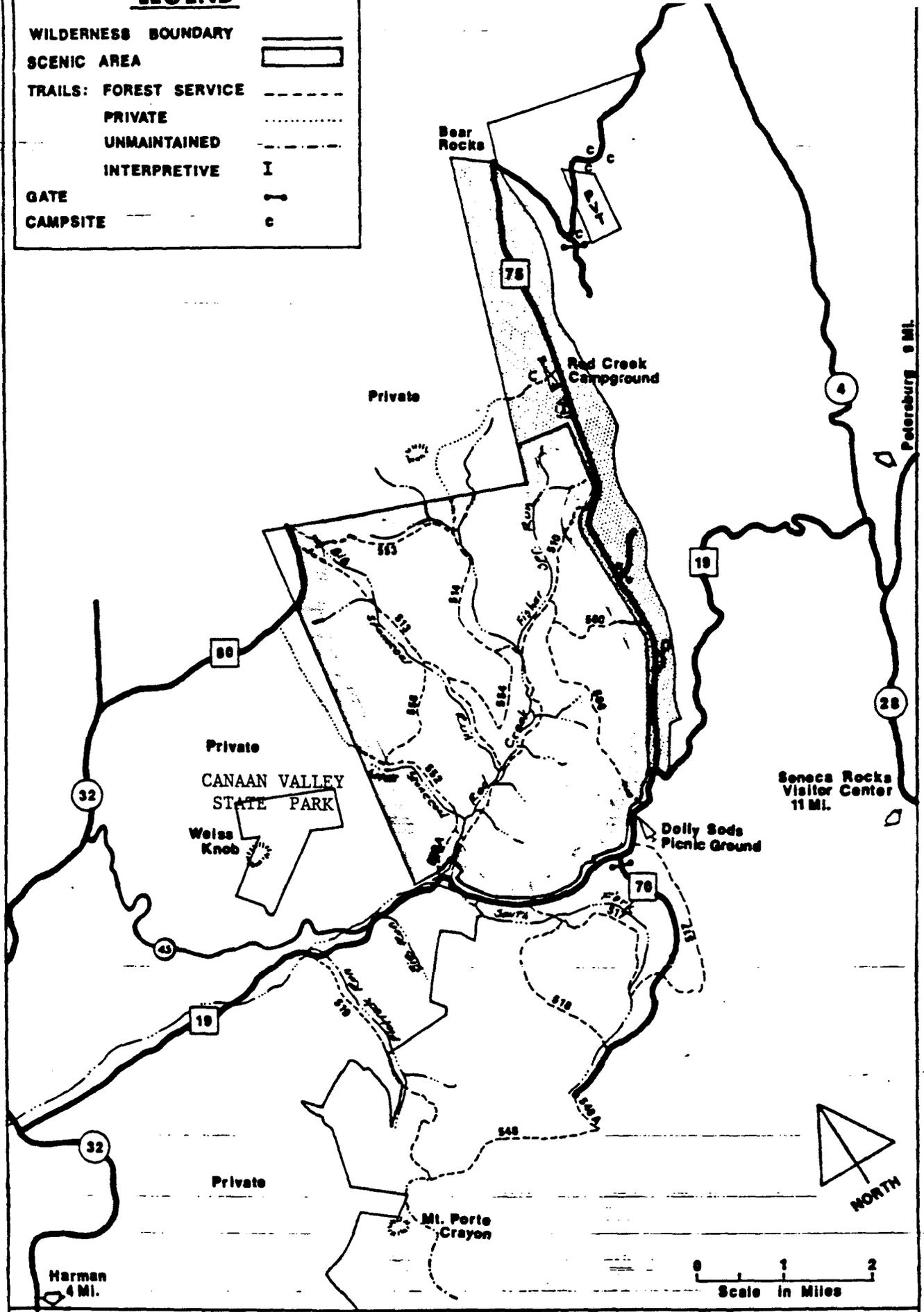
POS/DISTRICT: Frank R. Albert, Jr., 304-529-5194

STATUS: The U.S. Forest Service currently operates a wilderness and scenic area while remaining portions, which are privately owned, are restricted from the public.

DESCRIPTION OF PROPOSED REMEDIAL ACTION: A decontamination survey and remedial action of a previously used munition range with unknown amount and type of hazardous unexploded ordnance is proposed.

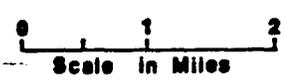
ESTIMATED COSTS: \$500,000

WILDERNESS BOUNDARY	
SCENIC AREA	
TRAILS: FOREST SERVICE	
PRIVATE	
UNMAINTAINED	
INTERPRETIVE	
GATE	
CAMPSITE	



DOLLY SODS WILDERNESS AND SCENIC AREA

MONONGAHELA National Forest WEST VIRGINIA



DEFENSE ENVIRONMENTAL RESTORATION PROGRAM
FOR FORMERLY USED SITES
FINDINGS AND DETERMINATION OF ELIGIBILITY
WEST VIRGINIA MANEUVER AREA
DAVIS, WEST VIRGINIA
PROJECT NO. G03WV006500

FINDINGS OF FACT

1. A decontamination survey and ordnance removal project at a previously used munition range with unknown amount and type of hazardous unexploded ordnance is proposed. The project consists of making a survey report, locating unexploded ordnance, and determining site clearance procedures and proper disposal methods. The general public has uncovered abandoned unexploded ordnance on an annual basis.

2. The West Virginia Maneuver Area was an extremely large area in North Central West Virginia used by the Department of the Army for mountain training and maneuvering. The remaining records are skimpy, at best. It is not at all certain that good documentation ever existed for the land acquisitions that took place during the heat of the national emergency, World War II. The maneuver area consisted of a total of 2,180,367 acres of land. Of this, 350,531 acres were public lands of which more will be said later; 48,067 acres were leased, and 1,781,769 acres were so-called lesser interests. According to a warning order notice dated 26 March 1945, these lesser interests were covered by "trespass agreements." Apparently, the owners and Army agreed, given the contemporaneous emergency, that Army would shoot first and pay later. There are no records surviving that describe the trespass agreements or the area they covered. From the writer's extensive knowledge of World War II land acquisition procedures, it can be safely surmised that there is no information of record in any of the local courthouses as to this project.

Fortunately, better documentation remains for the public lands and leased lands. The public lands were all permitted to the Secretary of War by Department of Agriculture, all being a part (and virtually all of) the Monongahela National Forest. By letter dated 4 August 1943, 341,266 acres of Monongahela National Forest in Preston, Grant, Randolph, Tucker, and Pendleton counties, West Virginia, is so permitted. By letter dated November 10, 1943, an additional 9,265 acres is said to be permitted, but from that should be subtracted 114.63 acres which was excepted by attached map (which did not survive the audit pruning of the files), leaving a true acreage of 9,150.37, or a total of 350,416.37 acres of land under permit from the Department of Agriculture. Additionally, 65 tracts totalling 48,557 acres and one license from Western Maryland Railroad

Company for a stream line were acquired by purchase and condemnation during World War II. All lands where work is recommended are those covered by the permits from Department of Agriculture.

3. The U.S. Army used the area for military exercises during World War II. The exercises included the use of artillery into a designated area. No permanent facilities were constructed associated with the former maneuver area.

4. Just as the acquisition of these lands was rapid, and no actual legal description of the lands acquired survives (perhaps because there never was one due to unavailability of manpower or time), so was the disposal process unusual. Apparently, a warning order issued for the entire facility, dated 26 March 1945, stating that on 19 March 1945 the entire 2,180,367 acre facility was declared surplus (350,531 acres public lands), 1,781,769 acres "lesser interests," and 48,067 acres leased). However, a subsequent warning order dated 10 August 1945 withdrew the entire facility from surplus. As a Second Endorsement from the Louisville District Engineer to OCE through ORD dated 18 July 1950 notes, a 21 April 1945 letter from Office for Emergency Management, Office of Scientific Research and Development, Washington DC (hereinafter OEM-SRD) requested OCE issue a permit for OEM-SRD or its agencies or contractors to test fire rockets and projectiles. The Louisville endorsement indicates no further information was available as to whether such a permit was issued. Thereupon, in the normal process, on 10 August 1950, OCE relinquished the land by letter back to Department of Agriculture. What OCE, and apparently Louisville District, were not aware of was that such a permit had been issued and a copy is hereto attached. Apparently the permit expired by its own items either prior to or simultaneously with Army's relinquishment of the land back to Department of Agriculture. Also of interest, and perhaps importance, attached is a copy of a 27 June 1945 letter from OCE to ORD advising that these lands must be decontaminated before disposal and that must be done even if decontamination costs exceed costs of acquiring the land in fee. All work to be done is located on the lands permitted to Secretary of War by the Department of Agriculture and remain under the ownership of the Department of Agriculture.

5. The project site is owned by private industry and the U.S. Forest Service. The Forest Service operates a wilderness and scenic area for the general public while private industry restricts the area. The wilderness area is open to the public at all times. There are signs leading into the area indicating that the area was used for military exercises during World War II and that old ordnance still remain in the area, creating a severe hazard to the public. The public discovers these abandoned shells on an annual basis and in some cases, personnel injury has occurred.

REAL ESTATE DIVISION
SURVEY REPORT - (DERP)
DEFENSE ENVIRONMENTAL RESTORATION PROJECT

Site: Dolly Sods National Forest
Monongahela, West Virginia

Project No. G03WV001300

This site has been used as an artillery impact area. While the Baltimore District is responsible for this area, they have no historical records concerning any agreements with the Forest Service prior to 1980. A copy of a Memorandum of Understanding between Department of the Army and U. S. Department of Agriculture-Forest Service, dated 5 September 1980, is attached.

The Forest Service has been contacted and while they have identified the impact area, they have no record of any previous transactions or memorandum's with the Department of the Army.

Some private land owned by Western Maryland Railroad (now controlled by CSX Resources Group, Inc.) was also affected. They have agreed to examine their records to see if they have any agreement with the Government. A copy of letter to CSX dated 13 December 1984 is attached.

MEMORANDUM OF UNDERSTANDING
between
DEPARTMENT OF THE ARMY
and
U.S. DEPARTMENT OF AGRICULTURE - FOREST SERVICE

WHEREAS, the Secretary of the Army and the Secretary of Agriculture on 3 July, 1951, entered into an agreement titled "A Joint Policy Between the Department of the Army and the Department of Agriculture Relating to the Use of National Forest lands for Defense Purposes", and,

WHEREAS, the Department of the Army in the interest of national defense desires to use lands in the Monongahela National Forest, West Virginia, for training and maneuver purposes, and,

WHEREAS, the Forest Service, U.S. Department of Agriculture, desires to make available to the Department of the Army such National Forest lands as are needed for these purposes;

NOW, THEREFORE, the Forest Service, acting by and through the Forest Supervisor, Monongahela National Forest, Elkins, West Virginia, and the Department of the Army, herein referred to as the Army, acting by and through the District Engineer, U.S. Army District, Corps of Engineers, Baltimore, Maryland, agree as follows:

A. THE FOREST SERVICE WILL:

1. Cooperate fully with the Army in all matters relating to the use and occupancy of National Forest lands for defense purposes.
2. Grant permission, subject to all valid existing claims and to limitations included herein, to the Army for use of National Forest lands in the Monongahela National Forest in West Virginia for training and maneuver purposes.
3. Retain administrative control of the land and its products.
4. Request assistance from the Army in forest fire suppression only when emergencies arise.
5. Allow and hereby grant permission to make cooking or warming campfires when necessary and in accordance with accepted safe practices except that this permission to have campfires may be cancelled at the discretion of the Forest Service during periods of high fire danger.

B. THE ARMY WILL:

1. Comply with the regulations of the Department of Agriculture covering the use of National Forests; observe all sanitary laws and regulations applicable to the premises; take all reasonable precautions to prevent damage to the land, its products, and improvements thereon; and maintain and restore sites, roads, and all maneuver portions of the Forest to a neat, safe, and orderly condition. Repair of damage shall be done to the extent possible within the resources of the field commander and in a manner as mutually agreed upon and [to the satisfaction of the Forest Service.]

2. Establish liaison with the Forest Service, at least 20 days prior to exercising the rights granted herein, so that specific areas to support the training and maneuver activities may be agreed to and all other matters relating to use of National Forest lands may be resolved. The Army understands (a) that Natural Areas shall not be used for occupancy nor shall developed recreation areas be used for occupancy from June 1 through September 30, or during the designated State hunting seasons for deer; and (b) that there may be areas including developed recreation areas on which the Forest Service will prohibit or limit use. The Army will be advised by the Forest Service of the areas in (b) at the time liaison is established.
3. Prior to undertaking actual maneuver and training activities, obtain review and approval by the Forest Service of any change in plans in the interest of affording adequate protection to National Forest resources.
4. Recognize that private ownerships are intermingled with National Forest ownership in this National Forest and that it is not the intent of this agreement to modify or interfere with the use of such lands nor to authorize in any way the use of such private land except as the U.S., through the Forest Service, may have ingress and egress rights over such lands.
5. Comply with all state laws particularly those dealing with hunting and fishing.
6. Save and hold the Forest Service, its officers, employees, and agents free from any and all liability for damages and claims by third parties for damages to life or property arising from the operations or on the occupancy and/or use of National Forest lands under this agreement.
7. Secure prior approval, in writing by the Forest Service, for any improvements which may need to be constructed for maneuver purposes. However, temporary shelters, lean-tos, etc., for overnight or emergency protection and other purposes are authorized without advance approval. When no longer needed, all such improvements shall be removed or disposed of and the area cleaned up to the satisfaction of the Forest Service.
8. Make its own arrangements for use of public utilities now located on National Forest lands and shall in all ways hold the Forest Service harmless for any cost or damage claims for such use.
9. In the interest of public safety, restrict and hold vehicle speeds to safe limits as the Forest Service shall agree are consistent with the condition, standard, and other use of Forest Service roads.
10. Use only dead and/or down timber when necessary in connection with maneuvers or for camp use, except that live trees, shrubbery, etc., from preselected areas may be used with the consent of the Forest Service. Boughs from live trees may be utilized for camp use, but no more than 1/3 of those from any one tree shall be removed. Boughs taken must be from the lower part of the tree and cut flush with the trunk. However, under no circumstances will pine plantations or regeneration plots be disturbed or exploited nor will any cutting of or on any trees within sight of any public road or developed recreation area be allowed.

11. In accordance with the recommendations of the Deputy Secretary of Defense in his 2 February 1957 "Memorandum for the Secretary of the Army", cooperate with the Forest Service in the prevention, detection, and suppression of forest fires on or threatening National Forest lands. The Army agrees to make its personnel aware of the seriousness of forest fires and to do everything reasonably within its power, including taking immediate independent or cooperative action, to control wild fire on or threatening National Forest lands.

Such actions will be with all available manpower and equipment at its immediate disposal. The Army will notify the Forest Service at once of any wild fire which originates in the operation area. The Army furthermore agrees that upon request, unless prevented by circumstances over which it has no control, to place its personnel and equipment (engaged in the training and maneuver activities) at the disposal of the Forest Service for the purpose of fighting forest fires and to bear all costs for such cooperative fire control work.

12. Evacuate the base camp of any other area which it may be using within 30 days of written request to do so by the Forest Service. Such request will normally be made if the Forest Service development plans require the use to be discontinued.
13. Protect the scenic and aesthetic values on the National Forest as far as possible, consistent with the authorized use, and to give particular attention to clean-up operations.
14. Take such measures as it deems necessary to insure that its officers are cognizant of all matters included in this Agreement in the interest of affording adequate protection to National Forest lands, resources, and improvements.

C. THE ARMY AND THE FOREST SERVICE MUTUALLY AGREE THAT:

1. Details of use not covered by this Agreement shall be worked out between representatives specified in Part D of this Agreement.
2. (a) No charge will be made for this use under authority of the Secretary of Agriculture's Regulation, 36 CFR 251.2.

(b) All or portions of work for which the Army is responsible under the terms of this agreement may, upon written request by the Army and approval of the Forest Service, be performed by the Forest Service on the basis of cooperation under authority of the Economy Act (31 U.S.C. 686).
3. This Memorandum of Understanding may be modified by amendment by mutual consent.
4. This Memorandum of Understanding shall not obligate the Forest Service to perform any service in the absence of any appropriations therefor by Congress.
5. The title to any of said National Forest lands covered by this agreement is not warranted. The rights and privileges herein granted shall be subject to any mineral reservations or rights now outstanding in third persons including authorized uses of National Forest lands and resources.

6. This Memorandum of Understanding shall be effective from the date of execution by the Forest Service Representative and shall continue in effect until (a) terminated by mutual consent, (b) revoked at discretion of the Regional Forester.

D. DESIGNATION OF FIELD REPRESENTATIVES:

1. ARMY

The Army shall appoint and maintain, at all times when the Army proposes to use National Forest lands and during such use and occupancy, an officer or local representative who will represent the Army in all matters as they relate to this Memorandum of Understanding and, further, to inform the Forest Service, in writing, the name and address of such representative, and if a substitute representative is appointed, to immediately so inform the Forest Service.

2. FOREST SERVICE

The Forest Supervisor, Monogahela National Forest, Elkins, West Virginia, shall represent the Forest Supervisor in all matters pertaining to the use, occupancy, and administration of the National Forest as covered by this Memorandum of Understanding.

The Forest Supervisor is authorized to designate and assign representatives to act as field liaison officers to work in close cooperation with the Army during a field exercise and to carry out the additional land protection and management functions for which the Army does not directly provide the necessary services.

IN WITNESS WHEREOF, the parties hereto have caused this Memorandum of Understanding to be properly executed by their duly authorized representatives as of the last date written below.

U.S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE

September 27, 1980
DATE

BY: R. F. Mumme
RALPH F. MUMME
Forest Supervisor
Monongahela National Forest

DEPARTMENT OF THE ARMY
U. S. ARMY CORPS OF ENGINEERS

5 Sep 1980
DATE

BY: James W. Peck
JAMES W. PECK
DISTRICT ENGINEER
U.S. ARMY ENGINEER DISTRICT, BALTIMORE

December 13, 1984

Real Estate Division
Acquisition Branch

D. L. Lancaster, Director
CSX Resources Group, Inc.
350 8th and Main Building
707 East Main Street
Richmond, Virginia 23219-2814

Dear Mr. Lancaster:

During the 1940's the Government utilized a portion of the Monongahela National Forest, in West Virginia, as an artillery range. This area is now known as the Dolly Sods Wilderness area. The artillery range extended on to private land owned by the Western Maryland Railroad in the vicinity of Blackbird Knob.

We are planning a debris clean-up project in this area, to include the removal of unexploded ordnance and are in need of a copy of the agreement the railroad had with the Government for use of railroad property. Our records do not indicate what type of agreement this was, although it was most likely a lease.

We have contacted Mr. Gordon Kelly of the Chessie System in Baltimore with a reference to Tract C-1 in Tucker and Grant Counties covering 18,557 acres, part or all of which may have been owned by Western Maryland Railroad. Mr. Kelly has supplied maps of the area which we have enclosed. He has indicated you may be able to assist us in locating this agreement and establishing the chain of ownership of the property. The specific area in question is in Tucker County and is highlighted in yellow on the enclosed map. This was the impact area for the artillery. We understand that CSX Resources Group now has control over the property formerly owned by Western Maryland Railroad.

Once we have established that railroad property was actually utilized and who the present owner is, we will need to obtain a right of entry for access to the property to complete the project.

We appreciate any assistance you can provide us in this matter. Please Feel free to contact Keith Kolozie or myself at Area Code (304) 529-5268 with any questions you may have.

Sincerely,

William G. Graham
Chief, Acquisition Branch
Real Estate Division

KOLOZIE RE AJ
GRAHAM RE A

Enclosures

DEFENSE ENVIRONMENTAL RESTORATION PROGRAM (DERP)

PRELIMINARY ASSESSMENT REPORT

DOLLY SODS NATIONAL FOREST

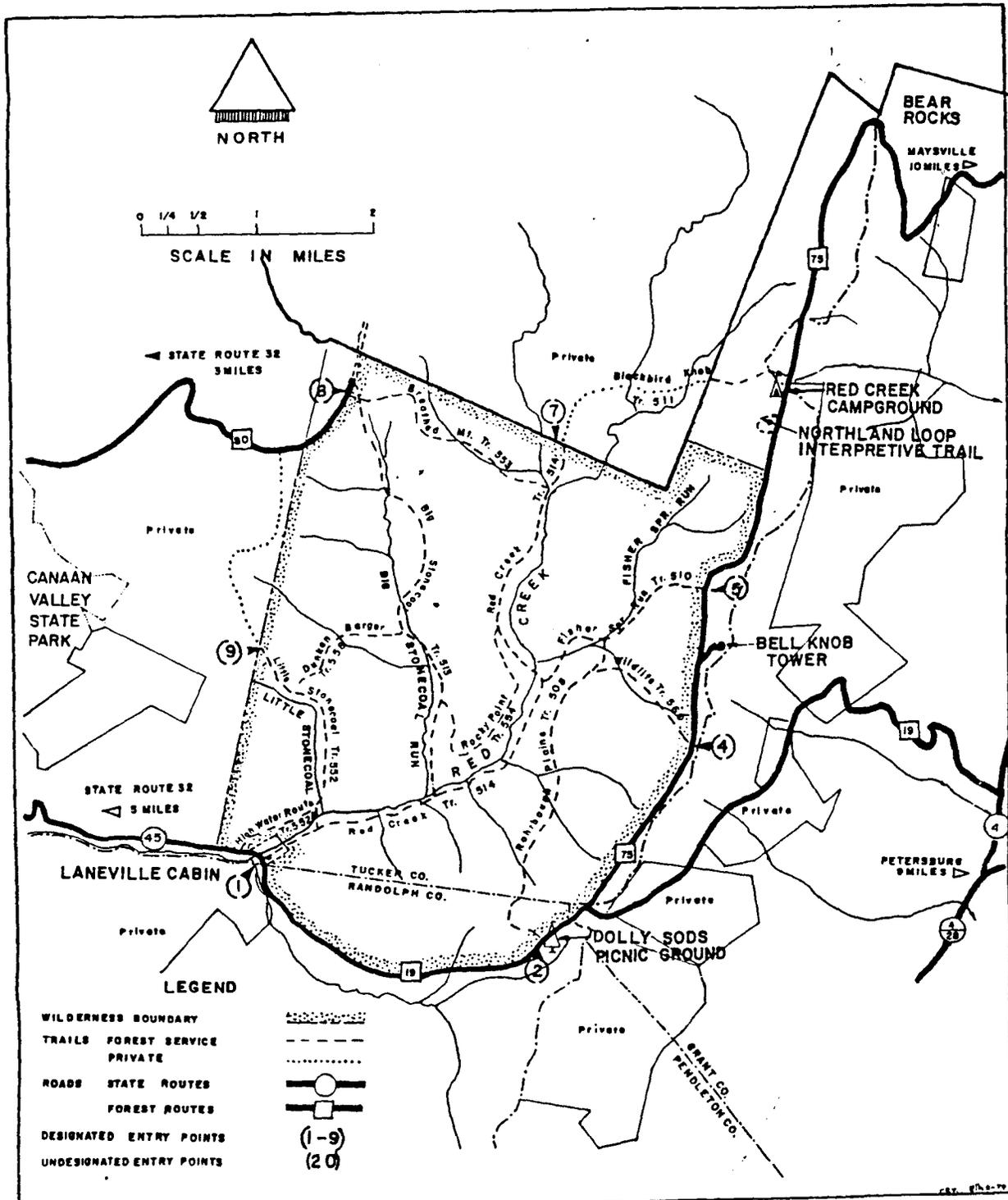
PROJECT NO. G03WV00130

MONONGAHELA NATIONAL FOREST
PETERSBURG, WEST VIRGINIA

1. Introduction. This installation is located in Randolph and Tucker Counties, 15 miles west of Petersburg, West Virginia. The installation was an area where DoD conducted various military exercises and mainly used as an artillery range. Old ordnance is found yearly by the general public as numerous trails are throughout the National Forest. The impact area is on private and Department of Agriculture lands operated by the Forest Service. The portion of the impact area in National Forest has been designated by Congress in 1975 to the Dolly Sods Wilderness Area. Strict rules are enforced to preserve the natural condition of the area. One typical rule is that motorized equipment is prohibited at all times in the wilderness area.
2. Scope of Work. The following item is recommended for inclusion in the DERP program.
 - a. Cleanup of former artillery range.
3. Photograph - Typical pictures of area is attached.
4. Real Estate Data - See enclosed information.
5. District POC - David J. Lambert 304-529-5246.
6. Recommendation. A review of all data to date indicates that the area was used for various military exercises during World War II and mainly as an artillery range. Since old ordnance is found on a yearly basis, it is recommended that this preliminary assessment report be forwarded to Huntsville Division for further investigation and evaluation. The Huntsville Division should prepare the complete survey report including the determination and findings sheet and complete the Real Estate search.

5 Encls

1. Photographs
2. Real Estate Data
3. Dolly Sods Brochure
4. Monongahela National Forest Plan Sheet
5. Impact Area - Quad Sheets



DOLLY SODS WILDERNESS

MONONGAHELA *National Forest* WEST VIRGINIA

Dolly Sods Wilderness

The 10,215-acre Dolly Sods Wilderness is located in Tucker and Randolph Counties, West Virginia within the Monongahela National Forest. This rugged mountainous area is set atop the Allegheny Mountains at the 4000 foot level, at the headwaters of Red Creek which runs into the Dry Fork River. It is a land of harsh climate, with dense rhododendron, thick, second-growth hardwood and spruce stands, bogs, streams, beaver ponds, and some open "sod" areas (sod is a local name for pastureland). The area is named for the pioneer Dahle (Dolly) family, which formerly owned and cleared some of the area for grazing.

Permits: One signed permit is required for each entry of individuals or a group into the wilderness. Day users as well as overnight campers must have permits. Maintained roads are outside the wilderness and permits are not needed to travel on them. Permits may be obtained free by writing, calling, or stopping at Forest Service Ranger offices at Parsons, Richwood, Bartow, Marlinton, Petersburg, White Sulphur Springs, or the Forest Supervisor's Office at Elkins. During the summer months permits are available at the Seneca Rocks Visitor Center and Bell Knob Tower. Check the nearest ranger station for the Visitor Center and tower schedules. It is recommended that Dolly Sods permits be obtained from Petersburg, Bell Knob Tower, or Seneca Rocks Visitor Center. Information needed is: Applicant's name and address; expected date and duration of visit; location of entry and exit; and number of people in party.

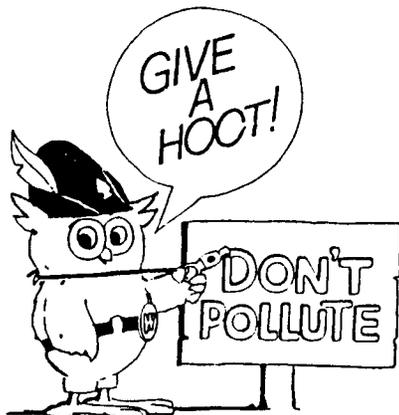
Maximum number of people per party is 10.

Use of Motorized Equipment is prohibited in all wildernesses.

Camping is Permitted in this Wilderness, but not within 100 feet of live streams, trails, or roads, except at designated campsites. Leave one fire ring at designated campsites. At all other campsites, remove the fire ring and all other traces of human presence. The use of small cooking and heating stoves, rather than campfires, is recommended.

Garbage and Human Waste: No garbage or toilet facilities are provided in the Wilderness. Pack out any garbage or other trash that cannot be burned. All human wastes should be buried at least 200 feet from trails, campsites, or streams. Leave a clean and sanitary camp for those who follow you.

More than 25 miles of Hiking Trails are maintained in and near the Wilderness. Most are marked with blue



paint on trees. The trails are not suitable for horses. Extreme care should be exercised in crossing streams during periods of high water and in cooler months.

Weather: You should plan for rain (or snow in winter, spring, and fall). The area receives more than 55 inches of precipitation annually, usually quite evenly distributed through the year. The weather frequently changes suddenly, and 2 to 3 inches of rain or 12 to 18 inches of snow in a single storm is not uncommon. Temperatures at high elevations are comparable to those several hundred miles to the north. Frost may occur during any month of the year. It is very important to have proper equipment and clothing for protection against insects, snakes, rain, and cold. Know the symptoms of hypothermia and how to treat it.

Water should be considered unsafe for drinking. To be on the safe side, treat it chemically or boil it before using.

Hunting and Fishing are Permitted subject to West Virginia State hunting and fishing regulations.

U.S. Geological Survey Topographic Maps: 7.5 minute topographic maps may be purchased from the U.S. Geological Survey, 12201 Sunrise Valley Drive, Reston, Virginia 22092. Four maps are needed to give complete coverage of the Wilderness. The quadrangles are Blackbird Knob, Blackwater Falls, Laneville, and Hopeville. These maps are excellent for topography, but not all trail locations shown are correct.

Safety: Always travel with a companion. If traveling in a group, make sure no one leaves the group without leaving word. Carry map and compass. If you do get lost, be deliberate in planning your moves. Don't get excited. Don't run.

The Dolly Sods area was used for military exercises during World War II. Some old ordnance remains. If you find an old mortar or shell, **DO NOT TOUCH IT.** It could still explode. Mark its location, draw a map of how to find it and contact the district ranger at the address below.

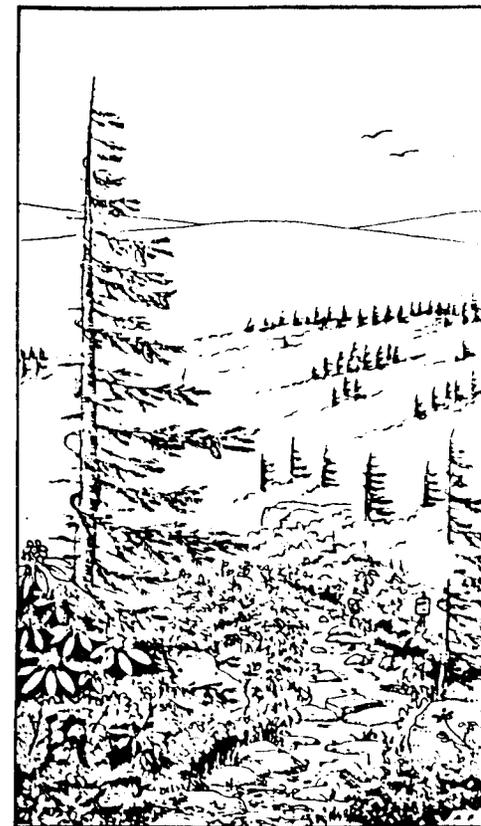
Wilderness Management: National Forest Wilderness is managed primarily to perpetuate natural conditions for future generations. Public use for primitive recreation is permitted only to the extent consistent with maintaining high-quality Wilderness. You will find few, if any, facilities for comfort or convenience. Please help maintain the wilderness character of this area.

Information: For additional information concerning Dolly Sods Wilderness, write District Ranger, Monongahela National Forest, Petersburg, West Virginia 26847. Telephone 304/257-4488.

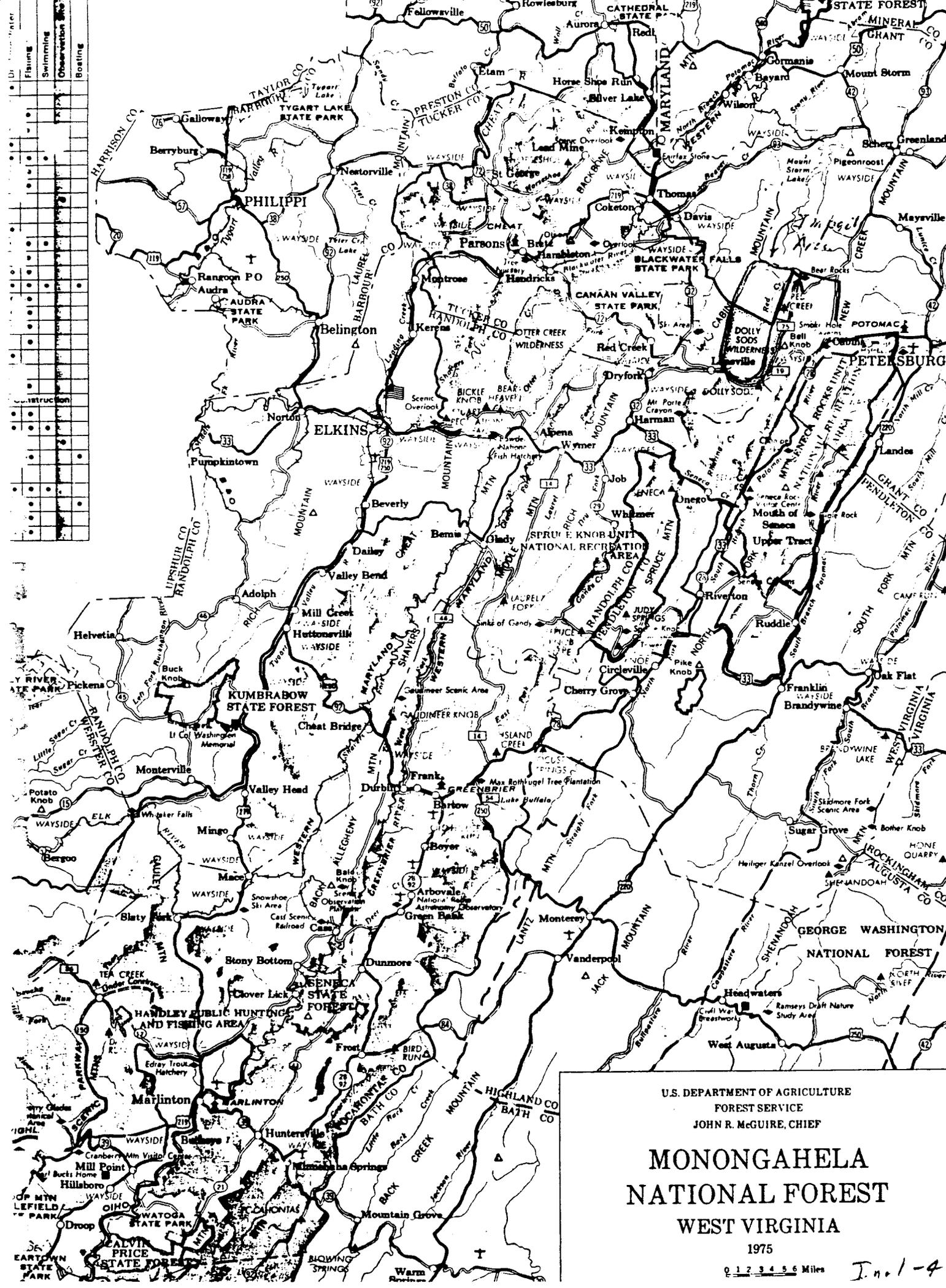
National Forests provide a variety of uses, products, and pleasures for people. They were originally established to protect watersheds and supply timber, and they still do. But in addition, these forest lands are now rich in wildlife, forage, and recreation opportunities. These and other uses are managed by the Forest Service, U.S. Department of Agriculture. Specialists in many fields coordinate and balance uses so that all Americans will receive maximum benefits throughout the years.



DOLLY SODS WILDERNESS



MONONGAHELA National Forest



U.S. DEPARTMENT OF AGRICULTURE
 FOREST SERVICE
 JOHN R. McGUIRE, CHIEF

MONONGAHELA NATIONAL FOREST WEST VIRGINIA

1975

0 1 2 3 4 5 6 Miles

J. n. 1-4

METCALF & EDDY

P. O. Box 2445
1003 South Henry Avenue
Elkins, WV 26241
April 16, 1991

APR 22 1991

RECEIVED

Metcalf & Eddy
P. O. Box 4043
Woburn, MA 01888-4043

Dear folks, (Attention: Michael A. Lamphier or Bill Mooney)

Reference your letter dated April 11, 1991 and our telephone conversation of April 12th.

Referring to the map you provided of the Dolly Sods Wilderness Area, it appears there was relatively little intentional artillery firing across the area; although mortars could have been used anywhere in the area.

Cabin Mountain, at the northwest corner of the DSWA was a primary impact area from the east and I'm quite sure from the west - Canaan Valley - as well. The Blackbird Knob area was also an impact area from the east.

Gun emplacements were located along the Forest Service Road on the crest of the Allegheny Mountain from a point near the Bell Knob Tower, north to the end of the road.

Some of these artillery pieces would have fired across the northern extremity of the DSWA.

Emplacements on the east side of the mountain on the Allegheny Front (off your map) would have been north of the DSWA.

Unfortunately, I know of no one who could confirm the location of gun emplacements in Canaan Valley but the target area would have been Cabin Mountain north of the access road from the Valley - Yokum Run Road. On your map this would be the head of Big Stonecoal Run and the northwest corner of the DSWA.

I am enclosing a copy of a resume prepared August 31, 1978 which you may find helpful. Also, the following excerpts were taken from a memorandum dated July 19, 1978 by the then District Ranger at Petersburg:

"Last week an explosive ordinance team from Fort Lee, Virginia disposed of the second projectile reported this year by hikers". (Underlining mine).

Metcalf & Eddy, 4/16/91

"The last one (explosive) disposed of by the explosive ordinance team was a live white phosphorus round, 4.2 inches in diameter, about 18 inches long. The firing pin was in the firing position *****". This would confirm my recollection that the artillery pieces were 105mm in size.

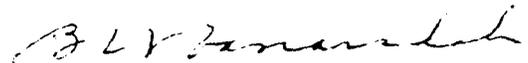
I have been told it was the Third Army that used the maneuver area in 1943, not the Eighth Army as I had said. There were, of course, various other units including the Army's 94th. Signal Battalion (Ramberg); and reportedly, the 84th Engineers, 485th., 486th. and 487th. Medical Collecting Company with 30 ambulances (Spanitz).

I trust this will be of some help in your planning and in the decontamination process.

Kindly let me know if I can be of further help.

Enclosures

Sincerely,



B. WILLIAM VANORSDALE
U.S.F.S. Retired

WORLD WAR II ARMY MANEUVERS - MONONGAHELA NATIONAL FOREST

Re/ postscript on Potomac's memorandum of July 19th.

To the best of my recollection, here are some data regarding Army Maneuvers on the Monongahela during WWII days. Even though I was up to my neck in the activity I must admit that some things are hazy and some I have forgotten altogether. Ms. Alice Welton, Editor of the Grant County Press could "dig" up some more facts, if needed; also retirees such as Jeff Goldizen, Charles Kelsey and Olliver L. "Lake" Mullenax could help. They were our field liaison people and travelled with the Army units. C. R. McKim, Elkins could also help, I believe.

Size of maneuvers:

I would not know the number of men who maneuvered here. One outfit was trained and shipped out, only to be followed by another.

The area used was most of the Potomac and Cheat Districts; probably a small part of the Greenbrier and a lot of private land.

Type of Operation:

Full field maneuvers - night and day; heavy artillery and mortar firing; Rock climbing - day and night; night convoy movements; small arms use, etc.

Types of Projectiles:

105 MM Howitzers; 20 and 40-MM; mortars and small arms.

Years & Seasons:

Began in the spring or summer of 1943; ended 1944.

Remarks:

The Forest Service was given full responsibility for fire control in the maneuver area. The area of responsibility was extended beyond the forest Proclamation Boundary. Route 42 was the eastern boundary; US 50 was the northern boundary.

On the Potomac District additional lookout towers were built at Niges Cliff (south of Rt. 33) on North Mtn.; Pigeon Rocst (now State-owned) near Bismark; Dolly Sods Tower was moved from original location to present location at Bell Knob. I believe only one tower was built on the Cheat - Bearden Knob near Davis.

Gun emplacements along Allegheny Front (Potomac) fired across Allegheny to Blackbird Knob Area near the head of Red Creek; emplacements along Dolly Sods Road fired across to Cabin Mtn.; it is possible that emplacements in Canaan Valley fired against Cabin Mtn. also.

Rock Climbing was done on Seneca Rocks, Champ Rocks, Blue Rocks and many other places. Fox Holes, of course, were everywhere.

Headquarters was set up in Elkins; a Division 7 Hdqrs. occupied the large field along the North Fork River north of the pumping station just north of Seneca Rocks - farm now owned by Mr. Harley Bennett (owned then by Wilbert Kismore). I believe there was a Division Hdqrs. in Canaan Valley too, near Davis.

Telephone systems, composed of many circuits, stretched from Elkins to Seneca Hdqrs. and from Elkins to Davis.

The Army furnished the Potomac with two jeeps; the other districts had one or two. These were the first conventional jeeps ever to be used in the area.

We had numerous fires caused by artillery shells, tracer bullets, flares, cooking and warming fires, smoking and just about everything else. Several hundred acres burned in the Red Creek-Cabin Mtn. area.

K. P. Butterfield was Ranger on the Potomac; I was the District Dispatcher; R. L. Rowland was Ranger on the Cheat; Ernest B. "Pete" Olson was the District Dispatcher. I don't recall who was Ranger on the Greenbrier, perhaps "Bill" Maule.

We used our first radio communication in fire control on the Red Creek fires. We had a SX radio with SXA loudspeaker attachment at Bell Knob and perhaps two SX field units.

When the Army moved out they restored the area as near as possible to its original condition. (This is evident at the Bennett farm north of Seneca Rocks). The artillery range was ~~searched~~^{gridded}, searched and decontaminated of "duds". At a later time - several years - as berry-pickers and hunters discovered isolated projectiles the Army sent decontamination teams into the area again. For many years the Red Creek-Cabin Mtn. area was signed at all points of entry warning about the "duds", cautioning people to report but not to touch any projectile found.

B. W. VANCROSDALE
August 31, 1978

Original to Ballantyne
9/1/78
BWV

RECORDS SEARCH

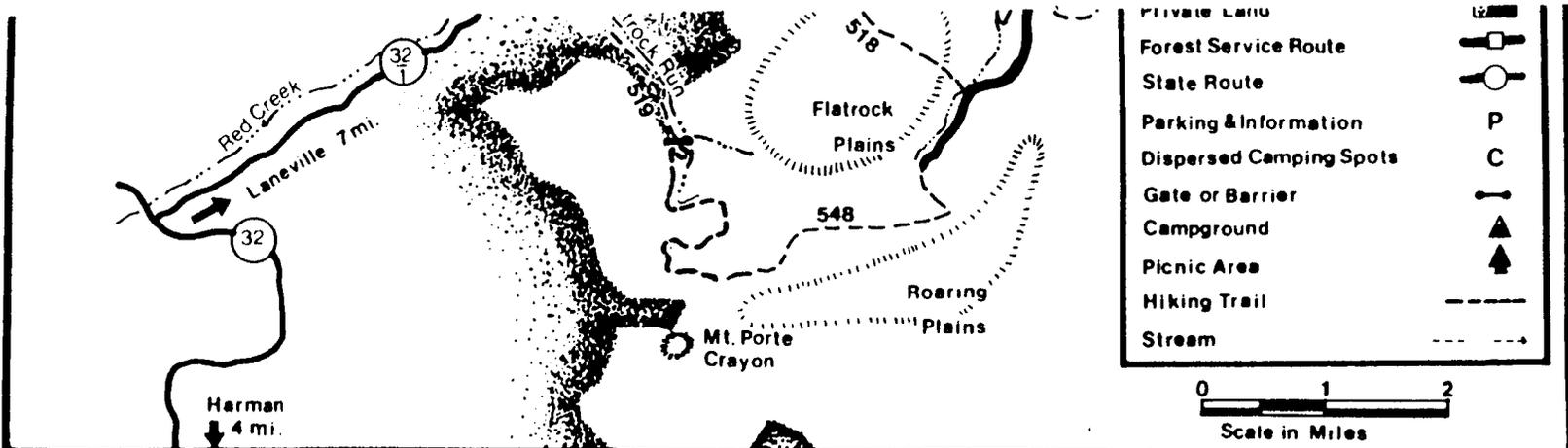
MAY 6 & 7

On Monday, May 6, 1991, Ron O'Brien OF Metcalf & Eddy visited the U.S. Forest Service office in Elkins, WV. Ron interviewed William VanOrsdale, Richard Trochill, and Linda Tracy.

William VanOrsdale, a retired Forest Service Ranger, showed Ron locations of artillery ranges (105 & 155 mm) and impact areas on a USGS quad sheet. He stated that the army was firing at the south face of Blackbird Knob and the East face of Cabin Mountain. The army fired at these rocky areas to minimize the risk of forest fires.

Richard Trochill indicated that, to his knowledge, only 81 mm mortar shells had been found in the Dolly Sods area. A geologist at the Elkins office, Linda Tracy marked the locations of mortar shells she had discovered on a USGS sheet. The two mortar shells were north of the Dolly Sods Wilderness Area.

On May 7, 1991, Ron visited the ranger station in Petersburg. Mernie Kimball (Forest Service, Petersburg) marked the locations of five mortar shells on a USGS sheet. Two of the shells were north of the Dolly Sods Wilderness while three were in the center parts of the wilderness area.



DOLLY SODS WILDERNESS AND SCENIC AREA

MONONGAHELA

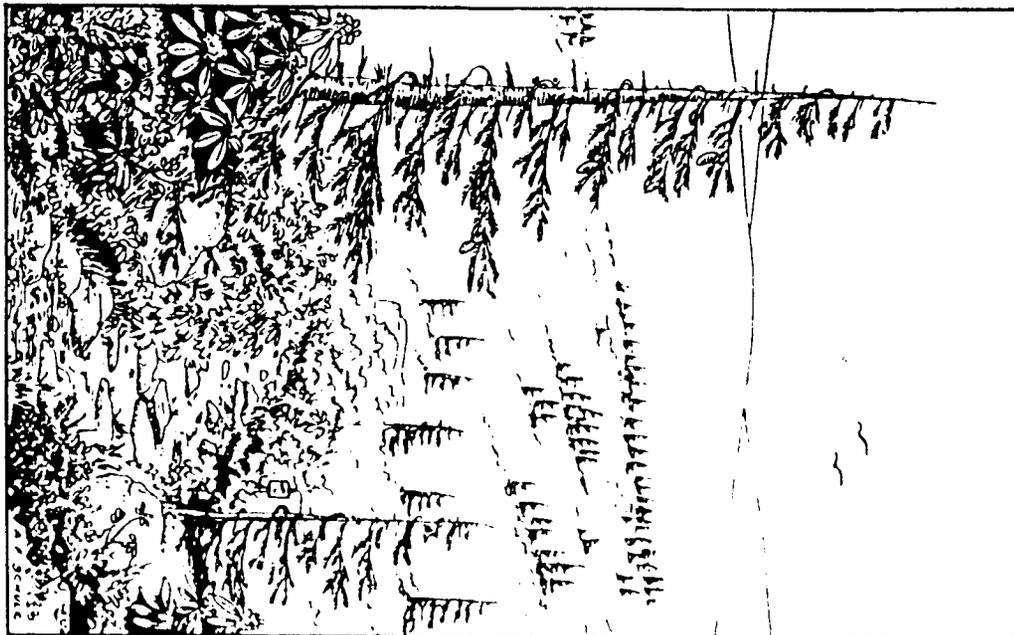
National Forest

WEST VIRGINIA

United States
Department of
Agriculture

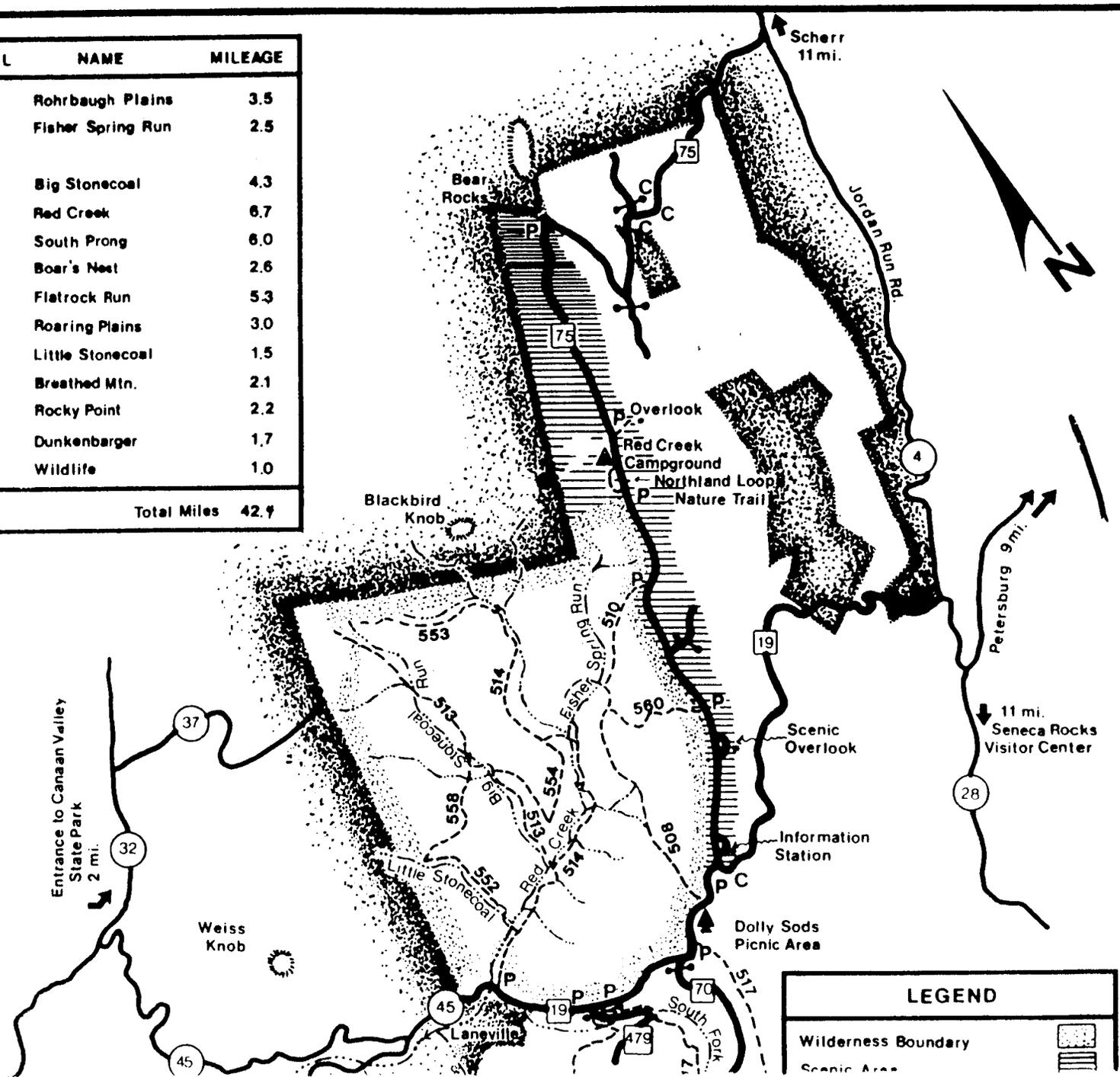
Forest
Service

Monongahela
National
Forest

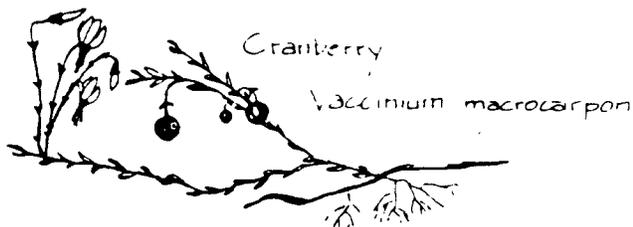


**DOLLY SODS
WILDERNESS &
SURROUNDING AREA**

TRAIL	NAME	MILEAGE
508	Rohrbaugh Plains	3.5
510	Fisher Spring Run	2.5
513	Big Stonecoal	4.3
514	Red Creek	6.7
517	South Prong	6.0
518	Boar's Nest	2.6
519	Flatrock Run	5.3
548	Roaring Plains	3.0
552	Little Stonecoal	1.5
553	Breathed Mtn.	2.1
554	Rocky Point	2.2
558	Dunkenbarger	1.7
560	Wildlife	1.0
Total Miles		42.9



LEGEND	
Wilderness Boundary	
Scenic Area	



WELCOME TO DOLLY SODS, an area of high elevation wind-swept plains on the Allegheny Plateau. At elevations of 2,600 to over 4,000 feet the area has extensive flat rocky plains, upland bogs, and sweeping vistas. The plant life and climate on this high plateau resembles northern Canada, and many species found here are near their southernmost range. The Wilderness and surrounding areas have an extensive system of hiking trails.

DOLLY SODS WILDERNESS. This 10,215 acre wilderness was designated by Congress in 1975 and is located in West Virginia's Tucker and Randolph counties. Its ecosystems are unaffected by human manipulation and influences so that plants and animals are able to respond to natural forces. Special rules apply to Wilderness visitors.

DOLLY SODS SCENIC AREA is located to the east and north of the Wilderness and sits directly atop the Allegheny plateau. A one and a half lane gravel road with turnouts (Forest Road 75) traverses this high plateau and offers a scenic motor trip. Red Creek Campground, Northland Loop Interpretive Trail, and a scenic overlook are found in Dolly Sods Scenic Area. Some special rules also apply in the Scenic Area.

FLATROCK PLAINS/ROARING PLAINS, a high elevation plateau similar to Dolly Sods, is located south of the Wilderness. This area has high elevation bogs, rocky plains, one-sided red spruce, heath barrens, and 20 miles of hiking trails.

VEGETATION. Plant communities on the high plateaus of Dolly Sods and Roaring/Flatrock Plains include sphagnum bogs, patches of one-sided red spruce and stunted yellow birch, open areas of heath barrens, and aspen patches. Most of the high plateau is heath barrens, where the azaleas, mountain laurel, rhododendron, and blueberries seldom grow taller than chest-high. Cranberries and the insect-eating sundew plant can be found in the bogs growing on floating mats of sphagnum moss. Boulder-strewn areas are common on the flat plains. Northern hardwoods are found in the coves and drainages, and red pine plantations exist in several areas of Dolly Sods Wilderness and Scenic Area.

HISTORY The boulders which are strewn about on these plains were once covered with 7-9 feet of humus. This humus layer was formed under a red spruce-hemlock forest—a forest where the average tree was four feet in diameter. After these huge trees were logged in the late 1800's, hot fires burning in the logging slash destroyed the fertile humus layer. In the inhospitable climate and present rocky soil of Dolly Sods red spruce now struggle to attain 12" of diameter. About the same time the slash fires raged, local farmers burned the plains to create grazing land or "sods". The pioneer Dahle family used the sods for grazing about the turn of the century. Their German name became the present "Dolly" of "Dolly Sods". The Civilian Conservation Corps of the 1930's planted red pine and other conifers in the area and assisted with construction of Forest Road 75.

THINGS TO DO AND SEE



HIKING TRAILS are maintained in the Wilderness and Scenic Area. Most are marked with unpainted 2" X 6" axe blazes on trees and rock cairns (mounds). Trail signing in Dolly Sods Wilderness consists only of directional markers and trail numbers at trail junctions. Distances are not indicated. The trail blazes in Flatrock/Roaring Plains are painted blue. The trail map on the back of this brochure shows approximate trail locations but USGS topographic maps are recommended as well. The 7.5 minute (1"=2000') Blackbird Knob, Blackwater Falls, Laneville and Hopeville quads are required to cover the entire area. They may be purchased at some sporting goods stores, USDA Forest Service, and from the U.S. Geological Survey, Federal Center, PO Box 25286, Denver, CO 80225. Permits are required to cross private land near the Blackbird Knob Trail on the north side of the Wilderness. Contact Davis Volunteer Fire Department, Davis, WV for permits.



RED CREEK CAMPGROUND provides 12 campsites (2 walk-in and 10 suitable for trailers) and offers the only opportunity for camping with vehicles in the Dolly Sods area. Vault toilets and a water well with a handpump are provided. There are no electrical hookups or dump stations. A fee is charged.



DOLLY SODS PICNIC AREA is located on Forest Road 19 south of the Scenic Area. This shady area has picnic tables, grills and vault toilets. Water from a spring in the picnic area is not tested and must be treated before drinking.

APPENDIX D
PERSONNEL RESUMES

**JAMES P. PASTORICK
SENIOR PROJECT MANAGER
SENIOR EOD TECHNICIAN**

EDUCATION: Graduate, U.S. Naval School of Explosive Ordnance Disposal, 1986
Graduate, OSHA 40 hour Health and Safety Training (29 CFR 1910.120), 1989
Graduate, OSHA 8 hour Site Supervisor Training, 1989
BA Degree, Journalism, The University of South Carolina, 1980
Certified Surface Blaster, Virginia State Department of Mines, Minerals, and Energy, 1989

TRAINING: Construction Mechanic and Heavy Equipment Operator, U.S. Navy SEABEES

EMPLOYMENT HISTORY:

September 1989 - Present, UXB International
November 1982 - September 1989, U.S. Navy
August 1972 - June 1976, U.S. Navy

PROFESSIONAL EXPERIENCE:

September 1989 - Present
UXB International, Inc.
14800 Conference Center Dr., Suite 100
Chantilly, VA 22021

As Corporate Programs Manager is directly responsible for coordination and site supervision of assigned field operations including:

Live firing range underwater clearance at Tuno Knob, Denmark. Supervised eight UXO technician/divers in the location, identification, and disposal of this underwater target range. Also cleared two target ships of UXO and salvaged the remains of the ships.

Geophysical survey for UXO at Picatinny Arsenal, NJ. Supervised four UXO technicians during the geophysical investigation for UXO and the excavation of possible buried UXO.

Investigations to determine the amount and type of UXO contamination at the former Kingsbury Ordnance Plant, LaPorte, IN, the former Pantex Ammunition Plant, Amarillo, TX, and the former Sioux Ammunition Depot, Sidney, NE.

Site clearance and safety escort during soil sampling and well drilling operations at Umatilla Depot Activity, OR, Fort Sheridan, IL, Savanna Army Depot Activity, IL, Milan Army Ammunition Plant, TN, and Cornhusker Army Ammunition Plant, NE.

November 1982 - September 1989

U.S. Navy
EOD Mobile Unit TWO
Little Creek, VA

EOD Officer and EOD Detachment Officer-In Charge. Supervised EOD Teams during the following operations:

Underwater UXO location, identification, and removal at the Intracoastal Waterway, Camp Lejeune, NC. Supervised a team of seven EOD technician/divers during this two-month long task.

Underwater mine retrieval at the Viequez Bombing Range, Puerto Rico. Supervised an eight person EOD Team in the location and removal of over 80 underwater practice mines.

As Officer-In-Charge of an EOD Detachment supervised a five person EOD Team during a six month Mediterranean deployment while providing emergency EOD response to the Sixth Fleet and supporting aircraft carrier flight deck operations.

August 1972 - June 1976

U.S. Navy
Various Commands

Served as Construction Mechanic and Heavy Equipment Operator in various locations with the U.S. Navy SEABEES.

ADDITIONAL INFORMATION:

Mr. Pastorick is currently a full-time employee of UXB International, Inc. He is a Senior EOD Technician with over five years of active EOD experience and is currently a Lieutenant in the U.S. Naval Reserve maintaining a SECRET security clearance.

**ROBERT T. YANCEY
GENERAL SAFETY OFFICER
MASTER EOD TECHNICIAN**

EDUCATION: Graduate, U.S. Navy Explosive Ordnance Disposal School, 1984
Graduate, U.S. Navy Diving and Salvage School, 1983
Graduate, U.S. Navy Parachutist and Life Support Systems School, 1985
Graduate, BS Aviation Management, Embry-Riddle Aeronautical University, 1974
Graduate, OSHA, 40 Hour Health and Safety Course (29 CFR 1910.120)

EMPLOYMENT HISTORY:

February 1991 - Present - UXB International, Inc.
1967 - 1990 - U.S. Navy

PROFESSIONAL EXPERIENCE

February 1991 - Present
UXB International, Inc.
14800 Conference Center Dr., Suite 100
Chantilly, VA 22021

Project Manager and Site Supervisor directly responsible for coordination and performance of assigned field operations including surface and subsurface ordnance sweeps at the Cenak Reservoir, Aurora, Colorado and the Former West Virginia Maneuver Area.

July 1988 - December 1990
Naval Ocean Systems Center
Hawaii Laboratory
Kaneohe Marine Corp Air Station

EOD Projects Officer for mine countermeasure research and development; test director for mine neutralization charges performing extensive underwater explosive testing and effectiveness evaluations; developed preliminary render safe procedures for two neutralization charges.

June 1986 - June 1988
Explosive Ordnance Disposal Training and Evaluation Unit ONE
Barbers Point, Hawaii

Training Officer for all West CONUS and Pacific EOD units; developed advanced EOD training courses, scheduled and managed training; evaluated new EOD procedures and equipment.

April 1984 - May 1986
Explosive Ordnance Disposal Mobile Unit ONE,
Barbers Point, Hawaii

EOD Officer in Charge on West Pacific Battle Group Deployments, Intelligence Collection Cruises, and Mine Exercises; EOD Shore Detachment OIC providing EOD, diving, range clearance, and parachute insertion services to Hawaiian Island chain.

October 1967 - March 1984
U. S. Navy
Various Units

Aircraft Mechanic; Aviation Maintenance Officer supervising aircraft maintenance department and divisions.

ADDITIONAL INFORMATION:

Mr. Yancey is currently an employee of UXB International, Inc. He is a Master EOD Technician with over twenty years of professional experience in explosive ordnance disposal, SCUBA/Surface Supplied/Mixed gas diving, parachuting, and aircraft maintenance. Eleven years of commissioned Naval service encompassing hands-on EOD operations, mine countermeasure R & D, foreign ordnance exploitation, and EOD curriculum development. Active Naval Reservist at Naval EOD Technical Center.

LARRY J. COOK
UXO SUPERVISOR

EDUCATION: Graduate, U.S. Naval School of Explosive Ordnance Disposal, 1957
Graduate, 40 Hour OSHA Health and Safety Training (29 CFR 1910.120)

EMPLOYMENT HISTORY:

December 1988 - Present, UXB International, Inc.
May 1964 - December 1988, Self Employed
May 1957 - May 1964, U.S. Army

PROFESSIONAL EXPERIENCE:

December 1988 - Present
UXB International, Inc.
14800 Conference Center Dr., Suite 100
Chantilly, Va. 22021

EXPLOSIVE ORDNANCE DISPOSAL TECHNICIAN conducting ordnance location, identification and disposal operations at NAS Brunswick, Me., Milan Army Ammunition Plant, Tn., Cornhusker Army Ammunition Plant, Ne., and Tooele and Dugway Proving Grounds, Ut.

May 1957 - May 1964
U.S. Army
Various Commands

Explosive Ordnance Disposal Technician conducted UXO location, identification, and disposal operations during major clearance operations for World War II ordnance on Wotje, Majuro, and Malolap Atolls and on the Yakima Firing Center, Wa.

ADDITIONAL INFORMATION:

Mr. Cook is currently an employee of UXB International, Inc. He is a Master Rated EOD Technician with valuable experience in World War II vintage UXO clearance.

THOMAS P. O'NEILL
SENIOR UXO SPECIALIST

EDUCATION: Graduate, U.S. Naval School of Explosive Ordnance Disposal, 1974
Completed, U.S. Naval School of EOD Refresher, 1979
Associate of Arts Degree, Central Texas College, 1979

TRAINING: Qualified U.S. Army Heavy Equipment Operator

EMPLOYMENT HISTORY:

July 1987 - Present, UXB International, Inc.
July 1966 - August 1987, U.S. Army

PROFESSIONAL EXPERIENCE:

July 1987 - Present
UXB International, Inc.
14800 Conference Center Dr., Suite 100
Chantilly, Va. 22021

Range Supervisor and Safety Engineer during the Phase 1 construction of aerial gunnery range at Fort Rucker, Al. Supervised EOD Technicians and Ordnance Workers in the location, identification, removal and disposal by detonation of over 2,700 UXOs without accident or injury to personnel. Additionally served as Site Supervisor during UXO location, identification, and removal operations at the former Pantex Ammunition Plant, Amarillo, Tx., the former Sioux Ammunition Depot, Sidney, Ne., the former Kingsbury Ordnance Plant, LaPorte, In., the former Naval Ammunition Depot, Hastings, Ne., the former Nebraska Ammunition Depot, Mead, Ne., and Tooele Army Depot and Dugway Proving Grounds, Utah.

October 1983 - August 1987
U.S. Army
123rd Ordnance Detachment
Fort Rucker, Al.

EOD Detachment Commander and Senior EOD Supervisor during planning and initial implementation of the Phase 1 range clearance for the Fort Rucker Range Upgrade Program. Trained and Supervised ten EOD Technicians in the location, identification, and disposal by detonation of artillery range UXOs.

August 1980 - September 1983
U.S. Army, 3rd Ordnance Detachment
Augsburg, Federal Republic of Germany

Senior EOD Supervisor during continuous UXO location, identification, and disposal operations at the Hohenfelds Live Fire Training Area. Responsible for coordination of EOD efforts with range operations directors, training, and supervision of EOD range clearance teams tasked with UXO location, removal, and disposal by detonation. Also assisted in planning of the Grafenwoehr Training Area Live Fire Range Upgrade Program.

September 1974 - July 1980
U.S. Army, 63rd Ordnance Detachment
Fort Leonard Wood, Mo.

EOD Team Supervisor responsible for training, supervision, and administration of assigned EOD personnel tasked with emergency response to explosive accidents in the surrounding area and live fire range UXO location, identification, removal, and disposal by detonation.

ADDITIONAL INFORMATION:

Mr. O'Neill, a Master Rated EOD Technician with over 16 years of operational EOD Experience, is a current full-time employee of UXB International, Inc. He has previously held a TOP SECRET/CNWDI security clearance.

WALTER J. McCAULEY
SENIOR UXO TECHNICIAN

EDUCATION: Graduate, U. S. Naval School of Explosive Ordnance Disposal, 1981
Graduate, Great Britain and Northern Ireland Defense Explosive Ordnance Disposal School NATO Officers & SNCO IED Disposal Course, 1982

EMPLOYMENT HISTORY:

1991 - Present, UXB International, Inc.
1987 - 1990, International Paper Company
1966 - 1986, U. S. Navy

PROFESSIONAL EXPERIENCE:

July 1991 - Present
UXB International, Inc.
14800 Conference Center Drive, Suite 100
Chantilly, VA 22021

Senior EOD Supervisor responsible directly to the Project Manager for the planning, coordination, and supervision of daily operations on UXO clearance and disposal projects. Duties include the assignment of personnel to sweep teams, tasking and supervision of sweep team leaders in performing UXO location, hazard assessment, and removal.

1987 - 1991
International Paper Company
Ticonderoga, New York

1966 - 1986
U. S. Navy, Various units and locations

Officer In Charge of four shipboard and two shore EOD detachments performing fleet diving services, range clearances, nuclear site clean-up, ordnance location, identification, removal, and disposal.

ADDITIONAL INFORMATION:

Mr. McCauley is a Master Rated EOD Technician with twenty years of operational military EOD experience. He has extensive diving experience including three years as an exchange Diving Officer in Canada. Mr. McCauley also spent four months in Lebanon on a Mobile Training Team in 1982, and previously held a Top Secret/CNWDI security clearance.

ROGER K. TOPHAM

UXB INTERNATIONAL, INC.

EDUCATION: Graduate, U.S. Naval School of Explosive Ordnance Disposal, 1979
Naval School of Diving and Salvage
U.S. Navy Gunners Mate "A" School
Photographers Mate "A,B,C" Schools
Graduate, AS, Mohegan Community College

EMPLOYMENT HISTORY:

June 1991 - Present, UXB International, Inc.
June 1968 - August 1990, U. S. Navy

PROFESSIONAL EXPERIENCE:

June 1991 - Present
UXB International Inc.
14800 Conference Center Dr., Suite 100
Chantilly, Va 22021

Senior UXO Specialist and UXO Technician supervising ordnance location, identification, and disposal operations.

1968 - 1990
U. S. Navy
Various Commands

Served in a wide variety of supervisory EOD positions including EOD Equipment Fabrication Shop Supervisor, Command Diving Officer at Explosive Ordnance Disposal Training and Evaluation Unit TWO at Fort Story, VA., and EOD Instructor Supervisor. Very proficient in repair of all EOD equipment; heavy equipment operator and repairman.

ADDITIONAL INFORMATION:

Mr. Topham is currently an employee of UXB International, Inc. He is a Master Rated EOD Technician with over eleven years of operational EOD experience.

**DANIEL R. ISBELL
SENIOR UXO SPECIALIST**

EDUCATION: Graduate, U.S. Naval School of Explosive Ordnance
Disposal, April 1968
Graduate, 40 Hour OSHA Health and Safety Training
(29CFR 1910.120)

EMPLOYMENT HISTORY:

April 1991 - Present, UXB International, Inc.
December 1966 - December 1991, U.S. Army

PROFESSIONAL EXPERIENCE:

December 1966 - December 1991
U.S. Army, various locations

EOD Technician in a variety of field-level, supervisory, and management positions. Served as Assistant Officer-In-Charge of Army EOD units responsible for access, identification, recovery, render safe and disposal of ordnance and UXO. In recent assignments was also responsible for compliance with RCRA standards.

ADDITIONAL INFORMATION:

Mr. Isbell is a Master EOD Technician with over twenty four years of active EOD field experience.

**GEORGE R. PAYNE
SENIOR UXO TECHNICIAN**

EDUCATION: Graduate, U. S. Naval School of Explosive Ordnance Disposal, 1975
Graduate, University of Maryland, 1988
Graduate, U. S. Army Technical Escort Mission Training, 1975
Graduate, U. S. Army Engineer School, 1971

EMPLOYMENT HISTORY:

1991 - Present, UXB International, Inc.
1989 - 1991, U. S. Army Technical Escort Unit
1974 - 1989, U. S. Army

PROFESSIONAL EXPERIENCE:

July 1991 - Present
UXB International Inc.
14800 Conference Center Drive, Suite 100
Chantilly, VA 22021

Senior EOD Supervisor responsible directly to the Project Manager for the planning, coordination, and supervision of daily operations on UXO clearance and disposal projects. Duties include the assignment of personnel to sweep teams, tasking and supervision of sweep team leaders in performing UXO location, hazard assessment, removal and disposal.

1989 - 1991
U. S. Army Technical Escort Center
Edgewood Arsenal, Maryland

Responsible for movement, storage, decontamination, and disposal of chemical, biological, etiological, and nuclear waste. Served as civilian volunteer in support of Desert Shield and Desert Storm in Saudi Arabia. Participated in the safe movement of over 100,000 tons of VX and GB filled projectiles.

DAVID L. POLLARD
SENIOR UXO TECHNICIAN

EDUCATION: Graduate, U. S. Naval School of Explosive Ordnance Disposal, 1976
Graduate, U. S. Army Technical Escort Mission Training, 1977
Graduate, OSHA, 40 Hour Health and Safety Course (29 CFR 1910.120), 1991

EMPLOYMENT HISTORY:

1991 - Present, UXB International, Inc.
1973 - 1990, U. S. Marine Corps
1967 - 1971, U. S. Navy

PROFESSIONAL EXPERIENCE:

July 1991 - Present
UXB International Inc.
14800 Conference Center Drive, Suite 100
Chantilly, VA 22021

Senior EOD Supervisor responsible directly to the Project Manager for the planning, coordination, and supervision of daily operations on UXO clearance and disposal projects. Duties include the assignment of personnel to sweep teams, tasking and supervision of sweep team leaders in performing UXO location, hazard assessment, removal and disposal.

1967 - 1990
U. S. Marine Corps and U. S. Navy
Various units and locations

Supervised and coordinated daily operations of several EOD units conducting range clearances, emergency ordnance responses. Responsible for location, identification, removal and disposal of domestic and foreign ordnance.

ADDITIONAL INFORMATION:

Mr. Pollard is Master Rated EOD Technician with over 15 years experience in active duty military EOD assignments and authored many technical documents that were subsequently adopted for joint service and USMC use. Previously held a Final Secret security clearance.

JOSEPH T. ROGERS
UXO TECNICIAN

EDUCATION: Graduate, U. S. Naval School of Explosive Ordnance Disposal, 1981

EMPLOYMENT HISTORY:

1991 - Present, UXB International, Inc.
1983 - 1991, U. S. Postal Service
1977 - 1983, U. S. Army

PROFESSIONAL EXPERIENCE:

July 1991 - Present
UXB International, Inc.
14800 Conference Center Drive, Suite 100
Chantilly, VA 22021

UXO Technician assisting UXO Specialists conducting ordnance location identification, removal, and disposal at field project sites.

1983 - 1991
U. S. Postal Service

1977 - 1991
U. S. Army, Various units and locations

Explosive Ordnance Disposal Technician tasked with conducting ordnance detection, identification, render safe, and disposal of U.S. and foriegn ordnance. Served as EOD Team Member at Edgewood Arsenal conducting range clearances and demilling of leaking chemical ammunition.

ADDITIONAL INFORMATION:

Mr. Rogers is a Senior EOD Technician with over four years experience of active military EOD experience.

EDWARD J. SEUTER
EOD ASSISTANT

EDUCATION: Graduate, U.S. Navy Diving and Salvage School,
May 1984
Graduate, 180 Emergency Medical Technician-
Ambulance Course, May 1988
Graduate, OSHA 40 Hour Health and Safety Course
(29 CFR 1910.120)

EMPLOYMENT HISTORY:

August 1989 - Present, UXB International, Inc.
November 1982 - July 1989, U.S. Navy

PROFESSIONAL EXPERIENCE:

August 1989 - Present
UXB International, Inc.
14800 Conference Center Dr., Suite 100
Chantilly, VA 22021

Assists UXO Specialists conducting ordnance location,
identification, removal and disposal at field project sites.

November 1982 - July 1989
U.S. Navy, Various Locations

Assisted Explosive Ordnance Disposal Technicians with conducting
ordnance detection, identification, render safe, and disposal of
chemical munitions and improvised explosive devices.

ADDITIONAL INFORMATION:

Mr. Seuter is an EOD Assistant with over six years of active
military EOD experience.

WARD R. STERN
UXO TECHNICIAN

EDUCATION: Graduate, U. S. Naval School of Explosive
Ordnance Disposal, 1981

EMPLOYMENT HISTORY

1991 - Present, UXB International, Inc.
1981 - 1985, U. S. Army

PROFESSIONAL EXPERIENCE:

July 1991 - Present
UXB International, Inc.
14800 Conference Center Drive, Suite 100
Chantilly, VA 22021

UXO Technician assisting UXO Specialists conducting ordnance
location identification, removal, and disposal at field
project sites.

1985 - 1991
U. S. Army Ammunition Plant Inspector, ensuring proper
storage and transporting of ammunition at depot level.

1981 - 1985
U. S. Army, Various units and locations

Explosive Ordnance Disposal Technician tasked with conducting
ordnance detection, identification, render safe, and disposal
of U.S. and foreign ordnance. Served as EOD Team Member at
Ft Indiantown Gap and Ft Eustis.

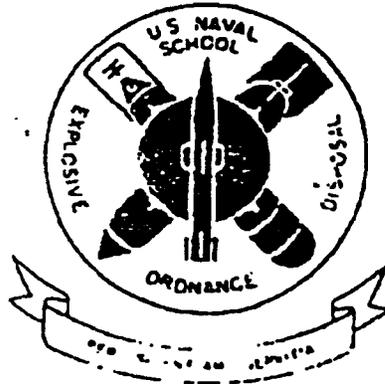
ADDITIONAL INFORMATION:

Mr. Stern is a Senior EOD Technician with over four years
experience of active military EOD experience, and holds a
Pennsylvania blasting license.

APPENDIX E

**EXPLOSIVE ORDNANCE DISPOSAL
CERTIFICATES**

U.S. Naval School Explosive Ordnance Disposal



This certifies that

GUNNERS MATE FIRST CLASS John P. Boyden, USN , 519-11-58

having successfully completed the prescribed course of study

for **Explosive Ordnance Disposal**

is awarded this

Certificate

this 27th day of May A.D. 1966

A. Sokolowski
A. SOKOLOWSKI, LT. USN

Acting **COMMANDING OFFICER**



Naval School Explosive Ordnance Disposal



This certifies that

Lieutenant
James P. Pastorick, USN

having successfully completed
the prescribed course of study for

NAVY BASIC EXPLOSIVE ORDNANCE DISPOSAL

is awarded this

Certificate

this 27th day of October A.D. 1986

M. A. Murray
M. A. MURRAY, CDR, USN

COMMANDING OFFICER

Naval School Explosive Ordnance Disposal



This certifies that

Lieutenant
Robert T. Vancey, 260-76-8787, USN

having successfully completed
the prescribed course of study for

NAVY BASIC EXPLOSIVE ORDNANCE DISPOSAL

is awarded this
Certificate

this 5th day of April A.D. 1984

J. Sedlak, Jr.
J. SEDLAK, JR., CDK, USN
COMMANDING OFFICER

Naval School

Explosive Ordnance Disposal



This certifies that

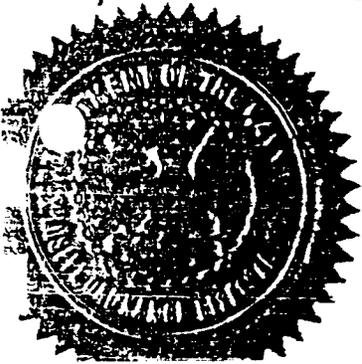
STAFF SERGEANT THOMAS P. O'NEILL, 497-50-7430, USA

having successfully completed
the prescribed course of study for

BASIC EXPLOSIVE ORDNANCE DISPOSAL 431-55D20 - 55D30

is awarded this
Certificate

this 13TH day of AUGUST A.D. 1974



D. L. Schaible

D. L. SCHAIBLE, CDR, USN

COMMANDING OFFICER

Naval School Explosive Ordnance Disposal



This certifies that

Sergeant
Larry J. Cook, USA

having successfully completed
the prescribed course of study for

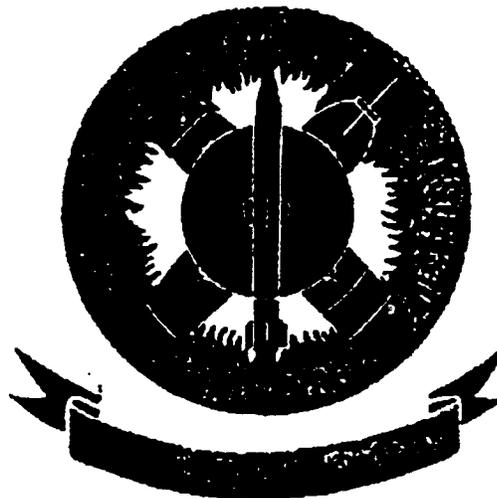
BASIC EXPLOSIVE ORDNANCE DISPOSAL - SURFACE/NUCLEAR PHASES

is awarded this
Certificate

this 8th day of December A.D. 1957

M. G. Mathews
 M. G. MATHES, CDR.
 COMMANDING OFFICER

Naval School Explosive Ordnance Disposal



This certifies that

MACHINIST'S MATE (DV) FIRST CLASS WALTER J. MCCADLEY, 121-38-6265, USN

**having successfully completed
the prescribed course of study for**

NAVY BASIC EXPLOSIVE ORDNANCE DISPOSAL

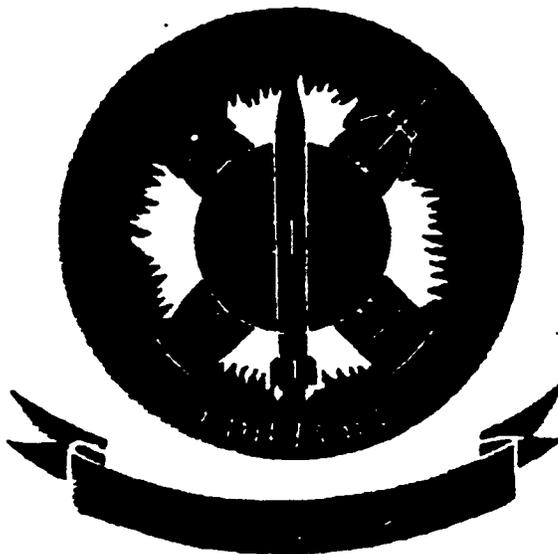
**is awarded this
Certificate**

this TH **day of** **A.D.** **1977**

[Signature]
P. B. SCHAFFER, CDR, USN
COMMANDING OFFICER

NAVSCHOOL FORM 1650/2

Naval School Explosive Ordnance Disposal



This certifies that

PHOTOGRAPHER'S MATE SECOND CLASS ROGER K. TOPHAM, 510-56-6114, USN

**having successfully completed
the prescribed course of study for**

NAVY BASIC EXPLOSIVE ORDNANCE DISPOSAL

**is awarded this
Certificate**

this 19TH **day of** NOVEMBER **A.D.** 1976

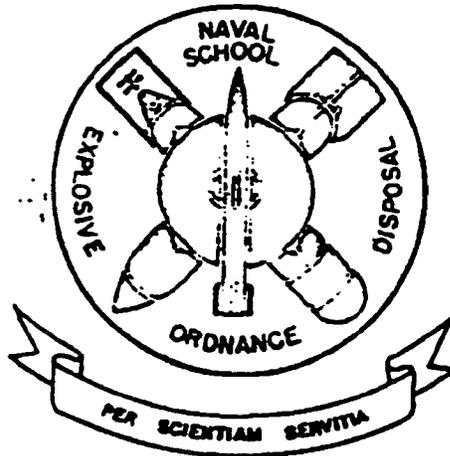
D. L. Schaible

D. L. SCHAIBLE, CDR, USN

COMMANDING OFFICER

NAVSCOLEOD FORM 1650/2

Naval School Explosive Ordnance Disposal



This certifies that

SPECIALIST FOURTH CLASS DANIEL R. ISBELL, RA15769089, USA

having successfully completed the prescribed course of study

in BASIC Explosive Ordnance Disposal 431-55D20-55D30

is awarded this

Certificate

on 25TH day of APRIL A.D. 1968

K. PLOOF, CDR, USN

COMMANDING OFFICER



Naval School Explosive Ordnance Disposal



This certifies that

SPECIALIST FIFTH CLASS CHRISTOPHER D. BROWN, USN, 030470107, USA

having successfully completed
the prescribed course of study for

BASIC EXPLOSIVE ORDNANCE DISPOSAL COURSE, 03030

is awarded this
Certificate

this _____ day of _____ A.D. 1977

[Signature]

COMMANDING OFFICER

Naval School Explosive Ordnance Disposal



This certifies that

SERGEANT DAVID L. POLLARD, 241-78-9546, USMC

**having successfully completed
the prescribed course of study for**

BASIC EXPLOSIVE ORDNANCE DISPOSAL

**is awarded this
Certificate**

this 10TH day of NOVEMBER A.D. 1976

D. L. SCRATCHEL, CDR, USN

COMMANDING OFFICER

*7TH
Tom Yancey*

Naval School Explosive Ordnance Disposal



This certifies that

Sergeant Joseph T. Rogers, 217-70-9826, USA

having successfully completed
the prescribed course of study for

BASIC EXPLOSIVE ORDNANCE DISPOSAL SURFACE - PHASE II

is awarded this
Certificate

this 25th day of November A.D. 1981

James C. Blanton
JAMES C. BLANTON, CDK, USN
COMMANDING OFFICER

Naval School Explosive Ordnance Disposal



This certifies that

Specialist Fourth Class
Ward R. Stern, 068-56-2172, USA

having successfully completed
the prescribed course of study for
BASIC EXPLOSIVE ORDNANCE DISPOSAL
SURFACE PHASE

is awarded this

Certificate

this 25th day of August 1981

JAMES C. BLANTON, CDR, USN
COMMANDING OFFICER