US Army Corps of Engineers
Rock Island District

Defense Environmental Restoration Program
For
Formerly Used Defense Sites
Ordnance and Explosives

U.S. Army Defense Ammunition Center and School
Savanna, Illinois

Archives Search Report

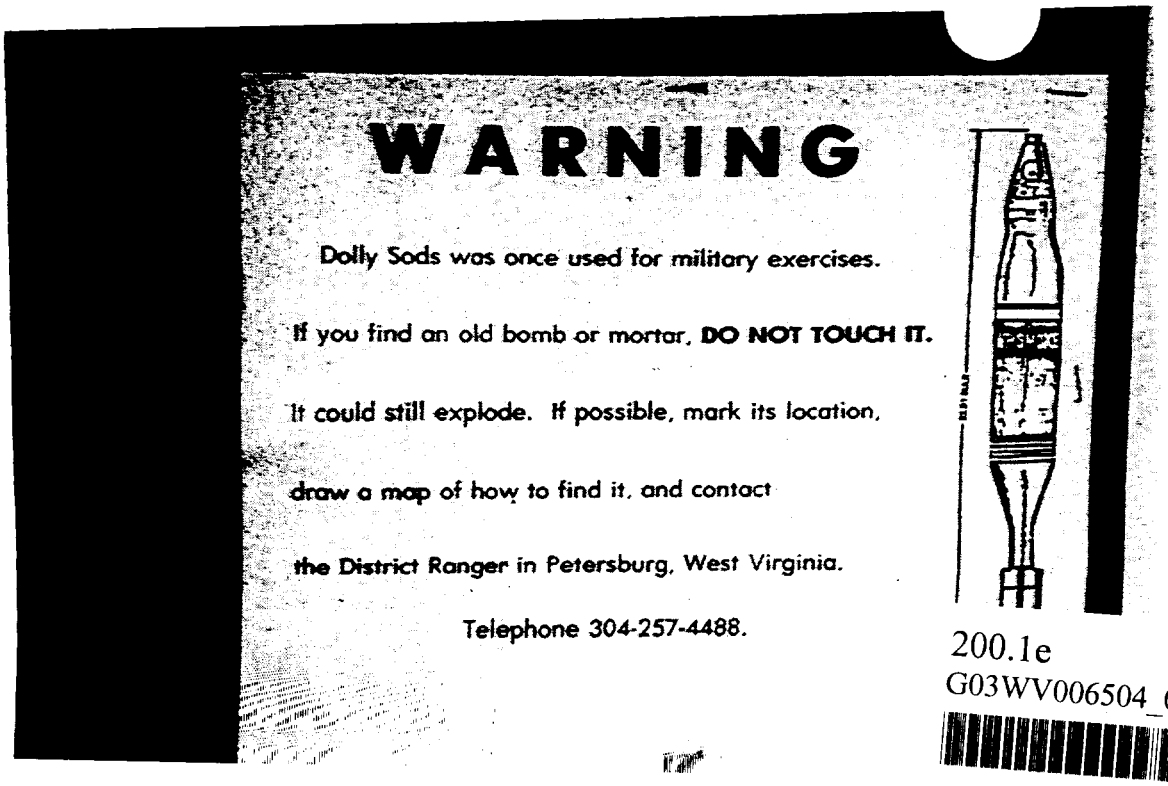
FINDINGS

for the former

DOLLY SODS NORTH

Tucker County, West Virginia
Project Number G03WV006504

September 1995



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DEFENSE ENVIRONMENTAL RESTORATION PROGRAM

for
FORMERLY USED DEFENSE SITES

FINDINGS

ORDNANCE AND EXPLOSIVES ARCHIVES SEARCH REPORT for the former DOLLY SODS NORTH TUCKER COUNTY, WEST VIRGINIA PROJECT NUMBER G03WV006504

September 1995

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ORDNANCE AND EXPLOSIVES
ARCHIVES SEARCH REPORT
for the former
DOLLY SODS NORTH
TUCKER COUNTY, WEST VIRGINIA
PROJECT NUMBER G03WV006504

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ORDNANCE AND EXPLOSIVES
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ORDNANCE AND EXPLOSIVES
ARCHIVES SEARCH REPORT
For the former
DOLLY SODS NORTH
TUCKER COUNTY, WEST VIRGINIA
PROJECT NUMBER G03WV006504

1. INTRODUCTION

a. Subject and Purpose

(1) This report presents the findings of an historical records search and site inspection for ordnance and explosives (OE) presence located at the former Dolly Sods North. Dolly Sods North is part of a much larger site, The West Virginia Maneuver Area, but, since Dolly Sods North has recently been acquired by the Department of Agriculture for use by hikers and campers it was looked at as a separate unit (see document E-2 with supporting memorandums, and plates 1 and 2). The investigation was performed under the authority of the Defense Environmental Restoration Program for Formerly Used Defense Sites (DERP/FUDS).

(2) The investigation focused on 6,168 acres of land that was used by the Army as an artillery range beginning 15 October 1943, and ending 1 July 1944.

(3) The purpose of this investigation was to characterize the site for potential OE contamination, to include conventional and chemical warfare material (CWM). This was achieved through evaluation of all historical records available, interviews, and the on-site visual inspection results.

b. Scope

(1) This report presents the site history, site description, real estate ownership information, and confirmed ordnance presence based on available records, interviews, and the site inspection. It further provides a complete evaluation of all information to assess actual and potential current day ordnance contamination.

(2) For the purpose of this report, OE contamination consists of live ammunition, live ammunition components, CWM or explosives which have been lost, abandoned, discarded, buried, fired, or thrown from demolition pits or burning pads. These items were either manufactured, purchased, stored, used, and/or disposed of by the War Department/Department of Defense. Such ammunition/components are no longer under accountable record control of any DOD organization or activity.

(3) **Expended** small arms ammunition (.50 cal or smaller) is **not** considered OE contamination. OE further includes "explosive soil" which refers to any mixture in soil, sands, clays, etc., such that the mixture itself is explosive. Generally, 10 percent or more by weight of secondary explosives in a soil mixture is considered explosive soil.

2. PREVIOUS INVESTIGATIONS/PROJECTS

a. 1992 Preliminary Assessment

(1) A Preliminary Assessment of Dolly Sods North was conducted under the Defense Environmental Restoration Program, Formerly Used Defense Sites (DERP/FUDS) by the Corps of Engineers, Huntington District (reference B-4). At that time, The Findings and Determination of Eligibility (FDE), dated 2 January 1992, concluded that the West Virginia Maneuver Area had been formerly owned or used by the Army. Dolly Sods North, a 6,168 acre tract is one portion of the maneuver area, and is the subject of this report. (see documents E-3).

(2) The FDE concluded that there were eligible categories under the DERP/FUDS program. Since the site was found to have been used as an artillery target range by the Army, an Ordnance and Explosives Waste (OE) project was recommended, DERP FUDS Project Number G03WV006504, which is the principal subject of this report (see document E-2).

TABLE 2-1
DERP-FUDS PRELIMINARY ASSESSMENT PROJECTS

Project Number	DERP Category	Present Phase	Comments	Location
G03WV006500	OE	SI	Private Contractor	Dolly Sods Wilderness
G03WV006504	OE	SI	Ordnance and Explosives	Dolly Sods North
	BD/DR	-	Undetermined	
	HTRW	-	Undetermined	

b. Other Investigations

No other investigations of Dolly Sods North have been done, but an Engineering Report was prepared using the West Virginia Maneuver Area site number, G03WV006500, as a project number for the Dolly Sods Wilderness, which is just to the south of Dolly Sods North, by Metcalf & Eddy, Inc. in January of 1992 (see appendix B-22)

3. SITE DESCRIPTION

a. Existing Land Usage

(1) The majority of Dolly Sods North is located in Tucker County, West Virginia, with a very small portion, the northeast corner, being found in Grant County. Dolly Sods North consists of 6,168 acres of mountainous, rocky terrain including Blackbird Knob which was used as an artillery target.

(3) Table 3-1 shows current land usage.

TABLE 3-1
CURRENT LAND USAGE

AREA	FORMER USAGE	PRESENT OWNER	PRESENT USAGE	SIZE/ ACRES	COMMENTS
A	Artillery target	U. S. Forest Service	Hiking/ camping	670	see plate 3
B	All other lands	U. S. Forest Service	Hiking/ camping	5,498	see plate 3
Total Acres				6,168	

*Approximate acreage

(4) The entire Dolly Sods North area is owned by the Department of Agriculture, having been purchased from the West Virginia Nature Conservancy in 1992 and 1993. The land had been owned by logging companies and a railroad from the time the land was originally leased for use during WW II until purchase by the Nature Conservancy.

b. Climatic Data

(1) Material in paragraphs 3b.(2) through (5) was extracted from the Soil Survey for Tucker County, West Virginia (reference B-5).

(2) Tucker County is in the northeastern part of West Virginia. It covers 269,869 acres. More than 3/4 of the acreage is forested. Little of it is suited to intensive farming because the terrain is steep, the surface stony, and the growing season short.

(3) The annual precipitation averages 53 inches a year.

(4) The normal growing season is short. At the lower elevations, the average length of the freeze free period is 150 days, while on the upper plateau it is 90 days. The average temperature ranges from about 21 degrees F. in January and February to 84 degrees F. in July and August. The lowest temperature observed was -28 degrees, and the highest temperature was 102 degrees.

(5) In an average year, there will be 70 days with snow cover, with an average depth of 6 inches.

c. Topography

The terrain is steep, rocky, and forested. The area contains Blackbird Knob, which is covered on the upper slopes with brush and trees and is extremely steep. The lower slopes are marshy and covered with ferns and brush.

d. Geology and Soils

(1) Regional Geology/Soils

Tucker County contains 9 different soil associations broken into 30 different soil series. A complete description of these associations can be found in the Soil Survey of Tucker County (reference B-5).

(2) Material in paragraphs d.(3)(a) through d.(3)(g) was extracted from the Soil Survey of Tucker County, West Virginia, dated March 1967 (reference B-5).

(3) Site Specific Geology/Soils

Dolly Sods North lies within 8 soil series. These series are further broken down based upon the degree of land slope and amount of stone in the ground. The basic series descriptions follow:

(a) Brinkerton Series

[1] In the Brinkerton series are deep, nearly level to moderately sloping, somewhat poorly drained or poorly drained, grayish-brown soils that occur extensively on plateaus in the survey area. Intermittent drainageways are common. They ordinarily occur near the well drained Dekalb soils, the moderately well drained Ernest soils, and the very poorly drained Lickdale soils.

[2] The Brinkerton soils are saturated with water in spring and in fall because the firm layer in the subsoil is very slowly permeable.

(b) Cookport Series

[1] The Cookport series consists of moderately deep to deep, moderately well drained soils that developed on uplands in acid, gray material weathered from sandstone and shale. A firm, mottled fragipan is generally at a depth of about 20 inches.

[2] The Cookport soils occur with the Dekalb soils. They also occur with the somewhat poorly drained or poorly drained Nolo soils and the very poorly drained Lickdale soils.

[3] Permeability is moderate in the surface layer, but it is slow in the subsoil, which contains a fragipan. Because of slow internal drainage, deep rooted plants may not grow well.

(c) Dekalb Series

[1] In the Dekalb series are moderately deep to deep, well drained soils that developed on uplands. These soils range from gently sloping to very steep: they are moderately steep to very steep in most areas. In most places these soils are covered with a considerable amount of stones and boulders.

[2] Narrow strips of the Dekalb soil are adjacent to the Calvin soils in the western and southern parts of the survey area. On mountain slopes in the eastern half of the area, they are above the Calvin soils that have a neutral substratum.

[3] Dekalb soils are moderately permeable.

(d) Ernest Series

[1] The Ernest series consists of deep, moderately well drained soils along drainageways and at the heads of streams. These soils have a moderately firm fragipan below a depth of 18 to 24 inches. They developed in areas that generally are covered with a considerable amount of stones and boulders.

[2] Near the Ernest soils are areas of well drained Dekalb soils and somewhat poorly drained or poorly drained Brinkerton soils.

[3] Permeability of the Ernest soils is moderate above the fragipan, but it is slow in the fragipan layer. These soils normally furnish enough moisture for plants during the growing season. The hazard of erosion is moderate.

(e) Leetonia Series

[1] In the Leetonia series are excessively drained, moderately deep to deep soils of the uplands. The Leetonia soils occur with the well drained Dekalb soils, the somewhat poorly or poorly drained Brinkerton soils, and Wet terrace land.

[2] The Leetonia soils are moderately to rapidly permeable. Natural fertility is moderately low.

(f) Lickdale Series

[1] In the Lickdale series are deep, very poorly drained soils that are in upland depressions and at the heads of streams.

[2] Near the Lickdale soils are the well drained Dekalb soils, poorly drained Brinkerton soils, which are in gently sloping areas near streams.

[3] The Lickdale soils are very slowly permeable, and they are saturated with water for long periods in spring and in fall.

(g) Nolo Series

[1] In the Nolo series are moderately deep, somewhat poorly drained or poorly drained soils that developed on uplands. These soils are on mountain plateaus in the eastern half of the survey area.

[2] Near the Nolo soils are areas of the well drained Dekalb soils and of the moderately well drained Cookport soils. Also near these soils are areas of the very poorly drained Lickdale soils. The Nolo soils occur with the somewhat poorly drained or poorly drained Brinkerton soils.

[3] The Nolo soils are slowly permeable and are saturated with water for extended periods in spring and in fall because of the firm, medium textured layer in the subsoil.

(h) Sandstone Rubble

[1] Sandstone rubble land is made of areas where more than 90 percent of the surface is covered with stones and boulders 2 to 6 feet in diameter, and there is commonly little or no soil material between them.

[2] On plateaus in some areas, this land supports a cover of red spruce, growing mostly in its own needle litter.

e. Hydrology

Dolly Sods is drained by Red Creek, a tributary of the Dry Fork, Cheat River, and Ohio River system. Red Creek has two major tributaries, the north (or main) fork and the south fork.

f. Natural Resources

(1) As the Department of Agriculture has only recently acquired the Dolly Sods North area, there has been no survey for threatened or endangered species, but the Forest Service botanist for the area indicated that there were a number of species present in the adjacent Dolly Sods Wilderness and that similar habitats were present in Dolly Sods North and those species could be expected to be found in those habitats. Table 3-3 presents a listing of endangered/threatened animal/plant species in the Dolly Sods Wilderness (see interview I-4).

(2) There are no species of plants listed as endangered or threatened in the area, but there are some wetlands that are considered to be sensitive areas.

TABLE 3-2 NATURAL RESOURCES		
Resource Classification	Type	Comment
Wildlife	Virginia Northern Squirrel	Endangered
	Cheat Mountain Salamander	Threatened
	Appalachian Cottontail Rabbit	Sensitive
	Allegheny Woodrat	Sensitive
Plantlife	Wetlands	Sensitive
Historical	None identified	

g. Historical/Cultural Resources

There are no known archeological or paleontological sites located within the boundaries of the Dolly Sods North area. Information on any sites found would have to come from the forest service as the property is owned by the Government (reference State Historic Preservation Officer, document F-16).

4. HISTORICAL ORDNANCE PRESENCE

a. Chronological Site Summary

(1) On 15 July 1943, the War Department determined that there was a military necessity for land in West Virginia to be used for Army maneuvers and artillery training and the War Department acquired portions of private, state and federal lands in Preston, Grant, Randolph, Tucker, and Pendleton Counties. This need for land resulted in the leasing of 48,557 acres which included tract A-76A. Tract A-76A encompasses the 6,168 acres that make up Dolly Sods North (see documents F-1, F-2, F-3, F-4, F-5, F-6, G-1, G-2, G-3, and plates 1 and 2).

(2) Tract A-76A was a 17,515.54 tract of land leased from the West Virginia Central and Pittsburgh Railroad Company and the Davis Coal and Coke Company through lease number W33-017 Eng 1403, dated 6 August 1943.

(3) The land was used for mountain training and artillery practice for a number of different units. (See table 4-1 and documents E-4, H-2, H-3, H-4, and H-5).

UNITS TRAINED AT THE WEST VIRGINIA MANEUVER AREA	
UNIT TRAINED	TRAINING DATE
28 Infantry Division	08-02-43 to 09-30-43
31 Infantry Division	09-09-43 to 11-17-43
77 Infantry Division	10-15-43 to 01-02-44
35 Infantry Division	02-04-44 to 03-28-44
95 Infantry Division	05-01-44 to 07-01-44

(4) On 19 March 1945, 48,557 acres of land which included tract A-76A were declared surplus to the needs of the military (see document G-4).

(5) On 8 September 1945, the Office of Scientific Research and Development was granted a permit to use the land controlled by lease numbers W33-017-Eng-345 and W33-017-Eng-1403 as a test range for rockets and projectiles. There is no documentation or evidence that the test range was ever used. The test range impact area included a portion of Dolly Sods North and the West Virginia Wilderness Area to the south (see document G-3).

(6) Lease numbers W33-017-Eng-345 and W33-017-Eng-1403 were canceled between 28 February and 30 June 1946 and the use of the land reverted to the railroad (see document G-2).

(7) In two separate transactions, the Nature Conservancy of West Virginia purchased 3,701.1 acres and 2,467.4 acres from the Western Pocahontas Properties Limited who were successors to the West Central and Pittsburg Railroad Company. The acreage purchased was that portion of land making up Dolly Sods North. The Nature Conservancy subsequently sold the land to the United States of America in December 1992 and September 1993 for inclusion in the Dolly Sods Wilderness Area (see documents G-5, G-6 and G-7 and maps L-2 and L-3).

(8) Dolly Sods North is now a wilderness area, used for hiking and camping and administered by the US Forest Service.

b. Ordnance Related Records Review.

(1) Research efforts began with a thorough review of all reports, historical documents, and reference material gathered during the archival records search. During the review, an effort was made to focus on the area of potential OE contamination as described in the Inventory Project Report (INPR) (document E-1).

(2) Numerous pieces of correspondence were found relating to the use of the West Virginia Maneuver Area.

(a) Letter to the Honorable Secretary of Agriculture, from Henry L. Stimson, Secretary of War, dated 15 July 1943. The letter states there is a military necessity for portions of the Monongahela National Forest, West Virginia, for Army maneuvers (document F-1).

(b) Letter with 2 endorsements to The Commanding General, Army Service Forces, from the Chief of Engineers, U.S. Army, dated 23 July 1943. The letter states there is a military necessity for the acquisition of 52,820 acres of land for use as artillery training grounds (document F-2).

(c) Letter to the Condemnation Section and Leasing Section, Corps of Engineers, from COL T. F. Farrell, Planning and Appraisal Section, Corps of Engineers, dated 28 July 1943. The letter states there is a need for an additional 4,849 acres of land for use as artillery training grounds (document F-3).

(d) Letter to Henry L. Stimson, the Secretary of War, from Claude R. Wickard, the Secretary of Agriculture, dated 4 August 1943 (document F-4). The letter grants permission for the Army to use 341,266 acres of land more or less in the Monongahela National Forest (document F-4).

(e) Letter to the Condemnation Section and Leasing Section, Corps of Engineers, from COL T. F. Farrell, Planning and Appraisal Section, Corps of Engineers, dated 28 July 1943. The letter revises acreage to be leased as 48,067 acres (document F-5).

(f) Letter to the Acquisition Branch, Purchase Section, from the Chief, Real Estate Division, dated 8 December 1943. The letter recaps land acquisition and describes additional land required (document F-6).

(g) Letter to The Ohio River Division Engineer, from the Office of the Chief of Engineers, dated 28 June 1945. The letter discusses disposal of the maneuver area and the need to decontaminate all land regardless of value (document F-7).

(h) Letter to the Chief of Engineers, from Mr. C. B. Raymer, Real Estate Officer, Ohio River Division, dated 18 July 1950. The letter discusses the termination of two use permits issued by the Department of Agriculture (document F-8).

(i) Letter to the Chief, Forest Service, Department of Agriculture, from COL W. H. Hastings, Corps of Engineers, Assistant Chief of Engineers for Real Estate, dated 10 August 1950. The letter discusses release of 350,531 acres of land by the Army and states that the land has been thoroughly searched for explosive material and that all such material reasonably possible to detect has been removed or neutralized (document F-9).

(j) Report written by B. W. Vanorsdale, dated, 31 August 1978, titled World War II Army Maneuvers - Monongahela National Forest. The report discusses types of munitions used, types of operations, time frame of operations, and problems caused by the operations (document F-10).

(k) Report written by U. S. National Forest Service employee using information relayed by Bill Vanorsdale, undated, circa 1992. The report expands information relayed by Mr. Vanorsdale in other documents, and discusses incidents of unexploded ordnance being found in the area (document F-11).

(l) Statement written by a Forest Service employee dated 30 May 1991. Statement discusses use of Dolly Sods North by the military, units trained in the area, munitions used, and decontamination efforts (document F-12).

(m) Inventory Project Report for The West Virginia Maneuver Area. INPR is for the whole maneuver area, but by direction, Dolly Sods North was looked at as a stand alone project (see documents E-1, E-2, and E-3).

(n) Letter to the Director, WO Lands, Attn: Ralph Bauman, from Mr. Paul M. Stockinger, Natural Resources Team, U.S. Forest Service, Eastern Region, dated 17 January 1995. The letter discusses the history of Dolly Sods North and Dolly Sods Wilderness area as well as measures taken by the Army and Forest Service to insure these areas are safe for public use (document F-13).

(o) Letter to Corps of Engineers, Huntsville Division, Attn: Mr. Roland Belew, from Nancy Feakes, District Ranger, Potomac Ranger District, Petersburg, WV, dated 3 November 1993. The letter expresses concerns about Dolly Sods North, and mentions ordnance found on the site (document F-14).

(p) Monthly report from Metcalf & Eddy to CEHND, dated 5 June 1991. The report lists units who trained at the West Virginia Maneuver Area, and indicates that Blackbird Knob, in the Dolly Sods North Area, was a target site (document E-4).

(q) EOD reports dated 21 September 1993, and 9 December 1993. The reports relate the destruction in place of two 4.2 inch mortar rounds found in Dolly Sods North (document E-5).

(r) Listing of ordnance found, reported, and destroyed in the Dolly Sods North area, undated. Listing supplied by Nancy Feakes, District Ranger, Potomac Ranger District, Petersburg, WV (document E-6).

(s) Letter to Richard Dikeman, SIOAC-ESL, Savanna Army Depot, Savanna, IL, from Douglas N. Toothman, Manager, Land Resources, Western Pocahontas Properties, dated 5 July 1995. The letter discusses land in the Dolly Sods area and discusses trees containing shrapnel (document F-15).

(t) Excerpt from the pamphlet *Dolly Sods Wilderness* put out by the Forest Service, Monongahela National Forest. The pamphlet discusses the possibility of munitions being present in the area (document H-1).

(u) Excerpt from the *History of the 31st Infantry Division, In Training and Combat, 1940-1945*, undated. The excerpt indicates training in West Virginia (document H-2).

(v) Excerpt from *Presenting the 35th Infantry Division in WW II, 1941-1945*, undated. The excerpt indicates training in West Virginia (document H-3).

(w) Excerpt from the *Historical and Pictorial Review of the 28th Infantry Division in WW II*, undated. The excerpt indicates training in West Virginia (document H-4).

(x) Excerpt from the *95th Division (Tng) History and Mission*, undated. The excerpt indicates training in West Virginia (document H-5).

(y) Military Acquisition Project Report dated 25 July 1950. The report shows 65 tracts of land totaling 48,557 acres of land being leased as part of the West Virginia Maneuver Area (document G-1).

(z) Tract Register for 65 tracts of land dated 26 July 1950. The register includes tract number A-76A which included the area which is now Dolly Sods North. The tract register shows lease number W33-017 Eng 1403 as the lease for tract number A-76A, and shows the lease being terminated on 28 February 1946 (document G-2).

(aa) Permit granted to The Office of Scientific Research and Development, with tract map including tract A-76A, dated 8 September 1945. The permit grants the Office of Scientific Research and Development the use of area marked on the tract map for testing of rockets and other projectiles (document G-3).

(bb) Real Property Management and Disposal Report dated 15 April 1951. The report shows 48,557 acres of leased land as being surplus (document G-4).

(cc) Description of 6168 acres of land conveyed to the Western Pocahontas Properties Limited Partnership on 31 December 1986 (reference G-5).

(dd) Warranty Deed dated 3 December 1992. Deed conveys 3,701.1 acres of land from the Nature Conservancy to the United States. The deed indicates that the land was conveyed to the Nature Conservancy by Western Pocahontas Partnership by deed dated 25 July 1991 (reference G-6).

(ee) Warranty Deed dated 1 September 1993. Deed conveys 2467.4 acres of land from the Nature Conservancy to the United States. The deed indicates that the land was conveyed to the Nature Conservancy by Western Pocahontas Partnership by deed dated 22 July 1993 (reference G-7).

(ff) Engineering Report for Extent of OEW Contamination and Evaluation of Remedial Action Alternatives. Feasibility Study, Dolly Sods Wilderness Area, Davis, West Virginia. Contract DACA 87-90-D0018, dated 21 January 1992 by Metcalf & Eddy, Inc., Wakefield, Massachusetts, for the Huntsville Division, Corps of Engineers. The report indicated the possible presence of OE in Dolly Sods North and on land that was part of the West Virginia Maneuver Area further to the north (reference B-22, map L-4, and plate 4).

(3) Sources that were checked in the search for any OE contamination included:

(a) National Archives
(b) Regional Archives
(c) The Military History Institute
(d) US Army Center for Military History
(e) Emergency Ordnance Disposal Units (EOD)
(f) Local Police Department
(g) Local Sheriff's Department
(h) County Court House
(I) Local Residents

(j) An intense investigation was made to determine exact location of gun emplacements, but nothing could be found other than the general recollections of William Vanorsdale. Map L-4 shows possible locations, but the guns were mobile and could be set up anywhere that was convienent for the unit using the area at the time. There were no permanent gun emplacements (see interview I-3).

(k) For a complete list of sources checked, see Appendix A, Reference Sources.

c. Interviews with Site Related Personnel.

(1) In an attempt to verify the Army did in fact use Dolly Sods North as a maneuver area and artillery target, and to attempt to verify the presence or absence of OE on site, interviews were conducted with individuals who were previously employed by the Army, or had knowledge of the area.

(2) Interview with: Ms. Nancy Feakes, U.S. Forest Service. Ms. Feakes is the District Ranger in charge of the Dolly Sods North area. Ms. Feakes stated that since the Park Service had taken over the area, several items of OE had been found. She supplied the SI with a list of four different items found, which had been disposed of by the 56th Ord Det. She said that she had never seen any ordnance in the area but had seen material that had been brought out. She said at the time the Park Service was not promoting the area due to the OE potential, but the area was open to the public. Ms. Feakes was asked about accessibility to the area. She said the area was open only to pedestrian traffic, that there were no bridges over the creeks, and to reach the target area, Blackbird Knob, Red Creek would have to be forded twice by the site inspectors. Ms. Feakes said that any roads in the area would be slower that walking (see interview I-1).

(3) Interview with: Deputy Lawrence Cornell, with the Grant County Sheriff's Department. Deputy Cornell served with the Petersburg, WV Police Department for 10 years and with the Grant County Sheriff's Department for over 5 years. Deputy Cornell also spent 20 years in the military and has had training in chemical weapons. Deputy Cornell assisted in the recovery and disposal of four OE items recovered from the Dolly Sods North area within the last 2 years. The items Deputy Cornell assisted with were a 105mm projectile and an 81mm mortar round, which had been found by a Boy Scout Troop. The 105mm (EOD records indicate this was a 4.2" mortar round) was blown in place, but the 81mm round was carried out by the scouts in the rear of a pickup truck and was destroyed at another location by the EOD.

Deputy Cornell also assisted with a 105mm projectile carried out of the area and left along a road, and a 4.2 inch mortar round that was carried out of the area and left in a yard. The 105mm projectile was blown in place along the road, and the 4.2 inch mortar round, which was later found to be a white phosphorous round, was taken away by the EOD and destroyed at another location. Deputy Cornell was asked if he had any written reports of these incidents and he said no, but that the EOD unit should have records of them. Approximate locations of these ordnance items are shown on plate 3 (see interview I-2).

(4) Interview with: Mr. William Vanorsdale, retired, US Forest Service. Mr. Vanorsdale worked with the Forest Service in the Dolly Sods area from 1941 to 1979 with a two year break from September 1944 to March 1946 for a term in the Navy. Mr. Vanorsdale was not taken into the service earlier because he was considered essential personnel for his work with the units training in the Dolly Sods area. Mr. Vanorsdale said that the military used the area around Blackbird Knob and Cabin Mountain for artillery practice. He said mortars, 105mm, and possibly 155mm rounds were used. He said while occasionally rounds would start fires, most fires were caused by the soldiers carelessness in the woods with their cooking fires. He said, that contrary to some other reports, he knew of no instances where a fire set off any unexploded ordnance. Mr. Vanorsdale said that when the artillery was training the mountain was pretty much clear of vegetation due to grazing and a fire. Mr. Vanorsdale pointed out the areas where he thought the 105mm and 155mm guns were emplaced. According to Mr. Vanorsdale the guns where all located in what is now the Dolly Sods Wilderness. He said that there were no permanent locations for the guns. The guns were on wheeled carriages and each unit set up where ever they wanted (see interview I-3).

(5) Interview with: Mr. Harry Pawelczyk, biologist with the US Forest Service. Mr. Pawelczyk was interviewed about the possibility of any endangered species of plants or animals being present in the project area. Mr. Pawelczyk stated since the land had until recently been privately owned, the forest service had not done any type of survey for endangered species. He said there were several endangered species in the Dolly Sods Wilderness just to the south and the same type habitat for those species was present in the Dolly Sods North area. Mr. Pawelczyk indicated that the Virginia Northern Flying Squirrel and the Cheat Mountain Salamander could both be expected to be found in the project area. The squirrel is endangered and the salamander is threatened. He also stated there were wetlands areas in the project area that would be considered sensitive. Mr. Pawelczyk said there could be up to 60 species in the area that are candidates for listing including the Appalachian Cottontail Rabbit and the Allegheny Woodrat (see interview I-4).

(6) Interview with Mr. Frank Albert of the Huntington, WV Corps of Engineers by Mr. Michael Patterson: Frank, I have a question about the West Virginia Maneuver Area. I did a site investigation of Dolly Sods North, which was part of the West Virginia Maneuver Area. The site No. G03WV006500 is for the West Virginia Maneuver Area. My project, No. G03WV006504, was for the Dolly Sods North area. It appears that my project is one of several within the West Virginia Maneuver Area site. Is that correct? Mr. Albert responded that was correct. Mr. Albert was asked if that meant that any possible contamination north or west of the Dolly Sods North project on land that was part of the West Virginia Maneuver Area would be looked at in other projects associated with the overall site? Mr. Albert said, yes. There was a push to look at areas taken over by the Department of Agriculture due to the use of the areas by hikers and campers. That included the Dolly Sods Wilderness Area which was looked at by Metcalf and Eddy and the Dolly Sods North project. The rest of the site will be evaluated. Mr. Patterson said, that's good, because the Metcalf and Eddy report indicated that OE had been found north of the Dolly Sods North project and evidence also indicates that Cabin Mountain was a target. Cabin Mountain is located to the west of the Dolly Sods North project and was also part of the West Virginia Maneuver Area. My problem was, whether these areas should be classified as potential FUDS, or if they were already part of a defined site. Mr. Albert said, he understood the problem. He said the West Virginia Maneuver Area is a site that will be looked at excluding those areas already assigned projects, that is, Dolly Sods North, and the Dolly Sods Wilderness Area (see interview I-5).

5. SITE ELIGIBILITY

a. Confirmed Formerly Used Defense Site

(1) Former land usage by the Army was previously confirmed for the entire 6,168.5 acre site as summarized in section 4 of this report. The site remained an active training area until 28 February 1946, when the lease for the site was canceled (reference G-2).

(2) Although the site was in private ownership at time of use by the Army, it is now owned by the Department of Agriculture and is part of the Monongahelia National Forest.

b. Potential Formerly Used Defense Site

No potential formerly used defense sites were discovered. Although a Metcalf and Eddy report indicates unconfirmed OE contamination just north of the Dolly Sods North project area, and evidence indicates that Cabin Mountain to the west was an artillery target, these areas are part of the West Virginia Maneuver Area, Site No. G03WV006500, and will be addressed in separate projects (see map L-4, interview I-5, and plates 2 and 4).

6. VISUAL SITE INSPECTION

a. General Procedures and Safety.

(1) During the period 12 through 19 July 1995, members of the Site Inspection (SI) team traveled to the former Dolly Sods North, Tucker County, West Virginia. The primary task of the SI team was to assess OE presence and potential due to the activities of the Army while using the site as an artillery target and maneuver area.

(2) Access to all areas assessed was granted to the inspectors by Nancy Feakes, District Ranger, Potomac Ranger District, Monongahela National Forest.

(3) A site safety plan was developed and used by the SI team to assure an injury-free site inspection of the Dolly Sods North. A briefing was conducted prior to the SI which stressed that OE should only be handled by military EOD personnel. Site safety was maintained by the inspection team at all times during the on-site inspection (reference B-3)).

(4) Prior to the site visit, a thorough review was made of available reports, historical documents, texts, and technical ordnance reference materials gathered during the ASR historical records search. This review was made to ensure team awareness of potential ordnance types and hazards.

(5) The actual inspection of Dolly Sods North began on 18 July 1995, when the SI team inspected several potentially contaminated areas of Dolly Sods North.

(6) The site is accessed by exiting from state route 28 onto Jordan Run Road then following the signs up the mountain to the Dolly Sods area. When entering the Monongahela National Forest, there are informational signs that warn visitors about unexploded ordnance (see photographs J-1 and J-2 and plate 5).

Upon reaching Dolly Sods, go north on forest road 75 to the Red Creek Campgrounds. From the campground, trail 511 can be found which goes to Blackbird Knob (see photograph J-9 and plate 5). The trail is unmarked until reaching the junction with trail 514 on the southeastern slope of the knob (see photograph J-3 and plate 5).

(7) Dolly Sods North is a 6168.5 acre tract of land which was a part of the much larger West Virginia Maneuver Area. The prominent landmark, Blackbird Knob, is located in the south central part of the tract, and was used as a target by artillery crews training in the area (see plates 1 and 2).

b. Area A: Blackbird Knob

(1) Blackbird Knob is located about two miles west of Red Creek Campground. The knob itself is 3,950 feet above sea level at its' highest point. The lower slopes are large meadows made of a marshy, sponge like material that at the time of site inspection was saturated with water (see photograph J-4 and plate 5). Going up the slope of the knob, the ground becomes very rocky and is covered with waist high shrubbery (see photograph J-5 and J-6 and plate 5). On the upper reaches, the knob is covered with trees and scrub brush (see photographs J-7 and J-8, and plate 5). Ground cover is such that if any OE were present, it could not be seen. Due to the dense ground cover, a magnetometer was used as a safety precaution. No metallic hits were recorded.

c. Area B: All Remaining Land

(1) The remaining land surrounding the knob is similar to the lower slopes of Blackbird knob. Open marshy areas interspersed with heavily wooded areas (see photographs J-10, J-11, and J-12 and plate 5). Two forks of Red Creek run through the site. Even on the trails, there are no bridges, so getting across the creek is dependent upon the water level at the time. The entire site is in the mountains, the terrain is very rocky, often quite steep, and sometimes swampy. Again, ground cover was such that in most areas if any OE were present, it could not be seen. Due to the dense ground cover, a magnetometer was used as a safety precaution. No metallic hits were recorded. In those areas where there was limited ground cover, no OE was observed.

7. EVALUATION OF ORDNANCE HAZARDS

a. General Procedures

(1) The site was evaluated to determine confirmed, potential, or uncontaminated ordnance presence. Confirmed ordnance contamination is based on verifiable historical evidence or direct witness of ordnance items. Verifiable historical records evidence consists of ordnance items located on site and documented by the local bomb squad, Army Explosive Ordnance Demolition team, newspaper articles, correspondence, current findings, etc. Direct witness of ordnance items consists of the inspection team directly locating ordnance items by visual inspection. Additional field data is not needed to identify a confirmed subsite.

(2) Potential ordnance contamination is based on a lack of confirmed ordnance. Potential ordnance contamination is inferred from records or indirect witness. Inference from historical records would include common practice in production, storage, usage, or disposal, at that time, which could have allowed present day ordnance contamination. Potential ordnance contamination could also be based on indirect witness or from present day site features. Additional field data is needed to confirm potential ordnance subsites.

(3) Uncontaminated ordnance subsites are based on a lack of confirmed or potential ordnance evidence. Historical records evidence and present day site inspections do not indicate confirmed or potential ordnance contamination. There is no reasonable evidence, either direct or inferred, to suggest present day ordnance contamination. Additional field data is not needed to assess uncontaminated ordnance subsites.

b. Area A: Blackbird Knob

(1) While there was no direct observation of OE on Blackbird Knob, there are numerous documented reports of OE being found on, or near the knob. Reports are as follows:

(a) An EOD report dated 21 September 1993 shows a 4.2" empty mortar round being blown in place at Dolly Sods, West Virginia (see document E-5).

(b) An EOD report dated 9 December 1993 shows a 4.2" mortar, smoke, being blown in place at Dolly Sods State Park, West Virginia (see document E-5).

(c) An ordnance disposal record supplied by District Ranger, Nancy Feakes, of the Potomac Ranger District lists four OE finds (see document E-6). Although records were not available, the report indicates EOD responded to all four finds:

[1] A suspected "chemical" ordnance round (most likely a smoke or WP round) was removed from the Bear Rocks parking lot in September 1993. The round was found somewhere in the area and transported to the parking lot by a visitor (see document E-6 and plate 4).

[2] A mortar round detonated in Dolly Sods North in October 1993 (probably the same round referred to in 7 (b)(1)(a) above)(see document E-5 and plate 4).

[3] A mortar round detonated in Dolly Sods North in December 1993 (probably the same round referred to in 7 (b)(1)(b) above)(see document E-5 and plate 4).

[4] A smoke round detonated along Red Creek between Big Stonecoal Run and Fisher Spring Run in the Dolly Sods Wilderness in September 1994.

(d) Deputy Lawrence Cornell with the Grant County Sheriff's Department was interviewed and supplied information about ordnance finds. Deputy Cornell assisted EOD in the disposal of several rounds during the 1992 to 1994 time frame. Although his recollection of the exact size of the rounds differs with EOD, the time frame of the incidents correspond with the above EOD reports (see interview I-2 and plate 4).

(2) Several documents were found relating to the decontamination of Dolly Sods, but, as the above reports of ordnance show, the decontamination efforts were not adequate (see documents F-7, F-8, F-9, F-10, F-11, F-12, and F-13).

(3) Area A is considered to have **confirmed contamination.**

c. Area B: All Other Land

(1) The remaining acreage that surrounds Blackbird Knob, and is part of Dolly Sods North, was the area traversed by artillery rounds being fired at Blackbird Knob and Cabin Mountain during training exercises in 1943 and 1944. Reports have indicated that guns firing 105mm rounds were arranged in a semi-circle from the southwest to the southeast around the northern part of the West Virginia Maneuver Area.

A map extracted from an assessment of the Dolly Sods Wilderness Area indicates one individuals recollection (William Vanorsdale) of the general area where these guns were set up. These guns were on wheeled carriages, so there was no permanent emplacement of the guns. While the map also indicates locations of ordnance finds in Dolly Sods North, no records were found to substantiate those locations (see documents F-10, F-11, F-12, F-13,F-14, Map L-4, and plates 2 and 4).

(2) It must be assumed that some rounds that were fired either fell short or flew over their intended target and, if they did not function as intended, are somewhere in this land surrounding the target. No firing fans are identified because of the mobile nature of the gun emplacements and mortars.

(3) Based on the relationship to the target area, and unconfirmed OE as noted above, the remaining acreage comprising Dolly Sods North is considered to be **potentially contaminated**.

8. SITE ORDNANCE TECHNICAL DATA

a. End Item Technical Data

(1) Evidence indicates the use of mortars from 60mm to 4.2" in smoke and possibly high explosive. Evidence also indicates the use of 105mm artillery rounds.

(2) Table 8-1, a listing of items possibly used at Dolly Sods North along with explosive fillers has been developed. An * next to an item indicates items actually found on site. Other items have been found in the Dolly Sods Wilderness to the south, or historical evidence indicates their use.

(3) Technical data for items in table 8-1 can be found in reference D.

TABLE 8-1
Ammunition used and Explosives/Chemical Filler

Item	Type/Model	Filler Weight
Mortar, 60mm, HE	M49A2	TNT, .34#
PD Fuze	M52	Tetryl
Ignition cartridge	M5	Double base powder, 40 grains
Percussion primer	M32	
Propellant	M2	140 grains
Mortar, 81mm HE	M43	TNT, 1.22#
PD Fuze	M45	Tetryl and Lead azide
PD Fuze	M52	Tetryl
Ignition cartridge	M3	Double base powder, 120 grains
Propellant	M1	400 grains
Mortar, 81mm, HE	M45	TNT, 4.48#
PD Fuze	M45	Tetryl and Lead azide
PD Fuze	M53	Black powder, Lead azide and Tetryl
Ignition cartridge	M3	Double base powder, 120 grains
Propellant	M1	400 grains
Mortar, 81mm, HE	M56	TNT, 4.31#
PD Fuze	M53	Black powder, Lead azide and tetryl
Percussion primer	M34	
Ignition cartridge	M6	Double base powder, 120 grains
Propellant	M2	820 grains
Mortar, 81mm, WP	M57	WP, 4.04#
PD Fuze w/burster	M52/M1	Tetryl, .08#
Percussion primer	M34	
Ignition cartridge	M6	Double base powder, 120 grains
Propellant	M2	820 grains
Shell, 105mm, HE	M1	TNT, 4.8#
PD Fuze	M48	
TSQ Fuze	M54	
Booster	M20	
Cartridge case	M14	
Percussion primer	M1B1A2	
Propelling charge		FNH Smokeless powder, 3#

TABLE 8-1 cont. Ammunition Used and Explosives/Chemical Filler		
Item	Type/Model	Filler Weight
Shell, 105mm, WP	M60	WP, 34.7#
PD Fuze	M57	
Booster	M22	
Burster charge	M5	Tetryl, 1,331 grains
Cartridge case	M14	
Percussion primer	M1B1A2	
Propelling charge		FNH Smokeless powder, 3#
*Mortar, 4.2", WP	M2	WP, 7.5#
PD Fuze with burster	M2	Tetryl
Propellant	M6	
Mortar, 4.2", TNT	M3	TNT, 8.2#
PD Fuze	M3	Tetryl
Propellant	M6	
* indicates item found on site		

b. Chemical Data of Ordnance Fillers

Table 8-2 has been developed to provide information on the explosive/chemical compounds used in the ordnance cited in table 8-1.

TABLE 8-2 Chemical Data of Ordnance Fillers		
Explosive Materiel	Synonym(s)	Chemical Formula
Black Powder		
74.0% potassium nitrate	Saltpeter, niter	KNO_3
10.4% sulphur		S
15.6% charcoal		C
Double-base Powder	Ballistite	
60% Nitrocellulose	Guncotton: Pyroxylin	$[C_6H_8O_5(NO_2)_3]n$
39% Nitroglycerin		$CH_2NO_3CHNO_3CH_2NO_3$
0.75% Diphenylamine	Stabilizer DPA	$(C_6H_5)_2NH$
Lead Azide		$PB(N_3)_2$
Propellant, M1		
85.00% Nitrocellulose	Guncotton: Pyroxylin	$[C_6H_8O_5(NO_2)_3]n$
1.00% Diphenylamine	Stabilizer DPA	$(C_6H_5)_2NH$
10.00% Dinitrotoluene		
Propellant, M2		
77.45% Nitrocellulose	Guncotton: Pyroxylin	$[C_6H_8O_5(NO_2)_3]n$
19.50% Nitroglycerin	Glyceryl Trinitrate	$C_3H_5N_3O_9$
1.40% Barium Nitrate		
.75% Potasium Nitrate		
Propellant, M6		
87.00% Nitrocellulose	Guncotton: Pyroxylin	$[C_6H_8O_5(NO_2)_3]n$
10.00% Dinitrotoluene	DNT	$C_6H_2CH_3(NO_2)_2$
1.00% Diphenylamine	Stabilizer DPA	$C_6H_5)_2NH$
Smokeless Powder	FNH Powder	
Nitrocellulose	Guncotton: Pyroxylin	$[C_6H_8O_5(NO_2)_3]n$
Dinitrotoluene	DNT	$C_6H_2CH_3(NO_2)_2$
Dibutylphthalate	Gelling Agent	$C_6H_4(CO_2C_4H_9)_2$
Diphenylamine	Stabilizer DPA	$C_6H_5)_2NH$
Tetryl	Tetralite; Pyronite	$C_7H_5N_5O_8$
TNT	2,4,6, Trinitrotoluene	$C_6H_2CH_3(NO_2)_3$
White Phosphorus	WP	P

9. OTHER ENVIRONMENTAL HAZARDS

There were no other hazards associated with this site.

ORDNANCE AND EXPLOSIVES
ARCHIVES SEARCH REPORTS
for the former
DOLLY SODS NORTH
TUCKER COUNTY
WEST VIRGINIA
PROJECT NUMBER G03WV006504

APPENDIX A

REFERENCE SOURCES

REFERENCE SOURCES

The following organizations/personnel are acknowledged for their support.

Organizations	Name	Telephone	Support
GOVERNMENT SOURCES			
FEDERAL AGENCIES			
DEPARTMENT OF DEFENSE			
Defense Library on Disk Pentagon Room 1A518 Washington, DC 20319-6000	(DLOD)	(703) 697-4658	No information on site.
Defense Logis Studies Information Exchange Fort Lee, VA 23801-6043	(DLSIE)	(804) 734-4007	No information on site.
Defense Technical Information Center Cameron Station Alexandria, VA 22304-6145	(DTIC)	(202) 274-7633	No information on site.
ARMY			
Center of Military History Attn: DAMH-RAS 1099 14th. N.W. Washington, DC 20536	Hannah Zedlak	(202) 504-5416	No information on site.
U.S. Military History Institute Carlisle Barracks Building 22 Carlisle, PA 17013-5008	Dennis Vetock	(717) 245-3611	Real estate information
Corps of Engineers Office of History 7701 Telegraph Road Alexandria, VA 22310-3865	Martin K. Gordon PH.D	(703) 355-3558	No information on site.

REFERENCE SOURCES

The following organizations/personnel are acknowledged for their support.

Organizations	Name	Telephone	Support
ARMY cont.			
Corps of Engineers Huntsville Division PO Box 1600 Huntsville, AL 35807-4301	Bob Britton Lynn Frow	(205) 895-1545	Background information.
Corps of Engineers Huntsville District 4800 University Square Huntsville, AL 35816-1822	Tom Hunt	(205) 895-1615	Maps and background information.
Corps of Engineers PO Box 59 Louisville, KY 40201	Mark Robinson Mike Fawler Pat Wright	(502) 582-6379 (502) 582-5748 (502) 582-6197	No information on site. Referrals No information on site.
Corps of Engineers 502 8th Street Huntington, WV 25701-2070	Chris Cordes Frank Albert Paul Dean	(304) 529-5267 (304) 529-5760 (304) 529-5698	Maps See interview I-5. Referrals
Corps of Engineers Ohio River District PO Box 1159 Cincinnati, OH 45202	Wayne Mello	(513) 684-6248	Background information.
Corps of Engineers Omaha District 215 North 17th Street Omaha, NE 68102	Gary Blair	(402) 221-4321	No information on site.
Office of History Rock Island Arsenal Rock Island, IL	Dr. Herb LaPore	(309) 794-1276	No information on site.

REFERENCE SOURCES

The following organizations/personnel are acknowledged for their support.

Organizations	Name	Telephone	Support
ARMY cont.			
Rock Island Arsenal Museum Rock Island Arsenal Rock Island, IL	Kris Leinicke	(309) 794-5021	No Information on site.
Army Safety Management Information System Fort Rucker, AL	(ASMIS)	(205) 255-6485	No information on site.
Historical Accident Database Attn: SMCAC-ESM Savanna, IL 61074-9639	(DDESB)	(703) 325-8624	No information on site.
Army Chemical and Biological Defense Command Aberdeen Proving Ground, MD 21010-5423	Kathleen Ciolfi	(410) 679-4430	Real estate information No evidence of chemical contamination at this site.
U.S. Army Construction Engineering Research Lab Champaign, IL	Pat Lacey (CERCL)	(217) 373-7127	No information on site.
U.S. Army Chemical School Fischer Library, Bldg. 1081 Aberdeen Proving Ground Maryland, 21010-5423	Dick Pastorett	(205) 848-4414	No information on site.
542 Ord EOD Fort Dix NJ	Capt. Quick	(609) 562-5940	HQ for 71st Ord Det. Contact 71st Ord.

REFERENCE SOURCES

The following organizations/personnel are acknowledged for their support.

Organizations	Name	Telephone	Support
ARMY cont.			
71st Ord Det 2031 Schuster Road Wright Patterson AFB OH 45433-5521	SSG Pace	(513) 257-4536	Don't work this area. Contact 56th Ord Det.
56th Ord Det Fort Indiantown Gap, PA	SSG McRae	(717) 861-2811	Been to the area two times. Will send copies of reports.
Army/Air Force Reservation File Director of Real Estate Washington, DC	Fred Lombardo	(202) 794-1275	No information on site.
AIR FORCE			
AFHRA/ISR 600 Chennault Drive Maxwell AFB, AL 36112-6424	Lynn Gamma	(205) 953-4096	No information on site.
NATIONAL ARCHIVES RECORDS ADMINISTRATION			
National Archives II Civil Reference Branch 8601 Adelphi Road College Park, MD 20704	HRS Team	(301) 713-7250	See Appendix B, Sec II.

REFERENCE SOURCES

The following organizations/personnel are acknowledged for their support.

Organizations	Name	Telephone	Support
NATIONAL ARCHIVES RECORDS ADMINISTRATION cont.			
National Archives II (Cartographic and Architectural Branch) 8601 Adelphi Rd. College Park, MD 20740	HRS Team	(301) 713-7040	See Appendix B, Sec II.
National Archives II (Still Photo Branch) 8601 Adelphi Rd. College Park, MD 20740	CEHO-SR NCR Contractor	(301) 713-6660	See Appendix B, Sec II.
National Archives II (Textual Branch) 8601 Adelphi Rd. College Park, MD 20740	HRS Team	(202) 501-5385	See Appendix B, Sec II.
National Archives II (Motion Picture Branch) 8601 Adelphi Rd. College Park, MD 20740	HRS Team	(202) 713-7060	See Appendix B, Sec II.
National Archives I (Old Military) Penn. Ave. & 7th Washington, DC 20408	HRS Team	(202) 501-5390	See Appendix B, Sec II.
National Archives I (Modern Military) Penn. Ave. & 7th Washington, DC 20536	Contractor Resource	(202) 501-5385	See Appendix B, Sec II.

REFERENCE SOURCES

The following organizations/personnel are acknowledged for their support.

Organizations	Name	Telephone	Support
NATIONAL ARCHIVES RECORDS ADMINISTRATION cont.			
National Archives Suitland Branch (Civil and Military) 4205 Suitland Rd. Suitland, MD 20409	HRS Team	(301) 763-7410	See Appendix B, Sec II.
National Archives Southeast Region 1557 St. Joseph Ave. East Point, GA 30344	HRS Team	(404) 763-7477	RGs 18, 30, 77, 270, 342, & 406 - no info.
National Archives Mid Atlantic Region Room 1350 9th and Market Street Philadelphia, PA 19107	Kellee Blake	(215) 597-3000	Real estate information.
National Personnel Records Center 9700 Page Ave. St. Louis, MO 63132	Wilson Sullivan	(314) 538-4085	Real estate information.
DEPARTMENT OF INTERIOR			
U.S. Geological Survey Reston VA, 22092	Dave Keys	(703) 648-5956	Aerial photographs available.
USGS Branch of Distribution Box 25286, Bldg. 810 Denver, CO 80225	Staff	(303) 236-7646	Topographical maps.

REFERENCE SOURCES

The following organizations/personnel are acknowledged for their support.

Organizations	Name	Telephone	Support
DEPARTMENT OF INTERIOR cont.			
Fish and Wildlife Service PO Box 1278 Elkins, WV 26241	Bill Tolin	(304) 636-6586	Endangered Species information.
NOAA/National Climate Cntr Federal Bldg. Ashville, NC 28801	Yolanda Goosch	(704) 271-4272	Local Climatological data
DEPARTMENT OF AGRICULTURE			
Office of General Council 310 W. Wisconsin Ave. Suite 200 Milwaukee, WI 53202	John Vandlik	(414) 297-3774	Referrals.
Aerial Photography Field Office PO Box 30010 Salt Lake City, UT	Sherrie Holyoak	(801) 975-3503	Aerial photographs available if needed.
Consolidated Farm Service Agency 6 Park Street Petersburg, WV 26847	Mike Taylor	(304) 257-4068	Provided soil survey.
Natural Resource Conservation Service 6 Park Street Petersburg, WV 26847	Richard Gray	(304) 257-4068	No information on site.

REFERENCE SOURCES

The following organizations/personnel are acknowledged for their support.

Organizations	Name	Telephone	Support
DEPARTMENT OF AGRICULTURE cont.			
US Forest Service Monongahela National Forest HC 59, Box 240 Petersburg, WV 26847	Nancy Feakes District Ranger	(304) 257-4488	Background information, See interview I-1.
US Forest Service Monongahela National Forest HC 59, Box 240 Petersburg, WV 26847	Richard Vandernoot Reality Specialist	(304) 257-4488	Supplied maps.
Natural Soil Resource Service 200 Sycamore St. Elkins, WV 26241	Mike Mullennex	(304) 636-6808	Soil survey.
Consolidated Farm Service Agency 200 Sycamore St. Elkins, WV 26241	Denise Thompson	(304) 636-6703	Aerial photographs available.
US Forest Service Monongahela National Forest 200 Sycamore St. Elkins, WV 26241	A. L. Richards Lands Manager	(304) 636-1800 ext 277	Background information.

REFERENCE SOURCES

The following organizations/personnel are acknowledged for their support.

Organizations	Name	Telephone	Support
DEPARTMENT OF AGRICULTURE cont.			
US Forest Service Monongahela National Forest 200 Sycamore St. Elkins, WV 26241	Ruth Breckner Forest Archaeologist	(304) 636-1800	Recommends study of site before any type of remediation.
US Forest Service Monongahela National Forest 200 Sycamore St. Elkins, WV 26241	Harry Pawelczyk Biologist	(304) 636-1800	Endangered species information. See interview I-4.
SMITHSONIAN INSTITUTE			
Historical Research Div. Washington, DC 20560	HRS Team	(202) 357-3133	No information on site.
LIBRARY OF CONGRESS			
Geography and Map Division Washington, DC	Thomas DeClair	(202) 707-5522	No information on site.
JUSTICE DEPARTMENT			
FBI 10th & Penn. Ave. Washington, DC 20535	Mike Flanning	(202) 324-2696	No information on site.
STATE AGENCIES			
West Virginia National Guard 1707 Coonskin Dr. Charleston, WV 25311-1099	Col. Norman Southern Facility Manager	(304) 341-6450	No information on past use.

REFERENCE SOURCES

The following organizations/personnel are acknowledged for their support.

Organizations	Name	Telephone	Support
STATE AGENCIES cont.			
West Virginia State Police 1300 Harrison Ave. Elkins, WV 26241	SGT Kershner	(304) 637-0200	Referral
West Virginia State Police 341 2nd Street Parsons, WV 26287	Michelle Herb		No reports of any OEW.
West Virginia State Police 525 Depot Street Romney, WV 26757	SGT Ben Flanagan	(304) 822-3562	No reports of any OEW.
West Virginia State Police HC85 Box 104, US 220 Moorefield, WV 23836	SGT Roger Hefner	(304) 257-1411	Do not keep reports, but one OEW incident last year. Called 56th Ord Det.
West Virginia Division of Forestry Moorefield Industrial Park RR HC 85, Box 302 Moorefield, WV	John Anderson	(304) 538-2397	Knows of OEW being found but knows no details.
COUNTY AGENCIES			
Grant County Clerks Office 5 Highland Ave. Petersburg, WV 26487	Loretha Allen	(304) 257-4550	No information on site.

REFERENCE SOURCES

The following organizations/personnel are acknowledged for their support.

Organizations	Name	Telephone	Support
COUNTY AGENCIES cont.			
Grant County Extension Service 115 1/2 Virginia Ave. Petersburg, WV 26847	Rebecca Ketterman	(304) 257-4688	No information on site.
Grant County Library 18 Mt. View Street Petersburg, WV 26847	Staff	(304) 257-4122	Referrals
Grant County Sheriff's Department 5 Highland Ave. Petersburg, WV 26847	Lawrence Cornell Deputy	(304) 257-4122	See interview I-2.
Randolph County Assessors Office 4 Randolph Ave. Elkins, WV 26241	Chuck Keller	(304) 636-2114	Tax maps available.
Randolph County Clerk's Office 2 Randolph Ave. Elkins, WV 26241	Rose	(304) 636-5885	No information on site.
Randolph County Sheriff's 4 Randolph Ave. Elkins, WV 26241	Willard Herron Sheriff	(304) 636-2100	No information on site.

REFERENCE SOURCES

The following organizations/personnel are acknowledged for their support.

Organizations	Name	Telephone	Support
COUNTY AGENCIES cont.			
Tucker County Clerk's Office Tucker County Court House Parsons, WV 26287	Allen Loughry	(304) 478-2414	No information on site.
Tucker County Extension Service 215 1st Street Parsons, WV 26287	Larry Campbell	(304) 478-2949	Aerial photographs.
Tucker County Sheriff's Department 318 2nd Street Parsons, WV 26287	Marshall Davisson	(304) 478-2321	Do not keep records of OEW finds.
Tucker County Tax Assessors Office 215 1st Street Parsons, WV 26287	Nelson Wade	(304) 478-3727	Plat maps available.
Tucker County Tax Office 318 2nd Street Parsons, WV 26287	Carol Irons	(304) 478-2321	Referrals
Five Counties Library 301 Walnut Street Parsons, WV 26287	Kathy	(304) 478-3880	No information on site.

REFERENCE SOURCES

The following organizations/personnel are acknowledged for their support.

Organizations	Name	Telephone	Support
NON-GOVERNMENT SOURCES			
NATIONAL			
DIALOG Information Services, Inc. 75 East Wacher Dr. 5th Floor Chicago, IL 60601	(DIALOG)	(312) 726-9206	No information on site.
Northern Illinois Library System 4034 East State Street Rockford, IL 61108	(NILS)	(815) 229-0330	Background information.
Online Computer Library Center Northern Il. Library System 4034 East State Street Rockford, IL 61108	(OCLC)	(800) 848-5878	No information on site.
Scientific & Technical Information Library Auto System 689 Discovery Dr. Huntsville, AL 35806	(STILAS)	(205) 922-9820	No information on site.
Council On America's Past 518 Why Worry Lane Phoenix, AZ 85021	Heliogram Publication	(800) 396-4693	No information on site.

REFERENCE SOURCES

The following organizations/personnel are acknowledged for their support.

Organizations	Name	Telephone	Support
LOCAL			
Huffman Logging, Inc. HC33, Box 620 Petersburg, WV 26847	Gerald Huffman	(304) 257-4105	Logged in area for 30 and never saw any OEW.
Western Pocahontas Properties PO Box 2827 Huntington, WV 25702-2827	Ralph Dodrill	(304) 259-5683	Once owned land sold to Forest Service. Provided map.
LOCAL INDIVIDUALS			
1003 S. Henry Ave. Elkins, WV 26241	William Vanorsdale	(304) 636-4997	Background information. See interview I-3.

ORDNANCE AND EXPLOSIVES
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APPENDIX B

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PART B: NEGATIVE FINDINGS

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SECTION I: BIBLIOGRAPHY

APPENDIX B

REFERENCES AND ABSTRACTS

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B-1 Mandatory Plan for Ordnance and Explosive Waste (OEW) Mandatory Center of Expertise (MCX) and Design Center, CEHND 1105-3-9, U.S. Army Corps of Engineers, Huntsville Division, 10 August 1992.

B-2 Defense Environmental Restoration Program for Formerly Used Defense Sites, Ordnance and Explosive Waste, Archives Search Report Instructions, Version 1.0 with changes, U.S. Army Corps of Engineers, Rock Island District, 21 December 1992.

B-3 Site Safety Plan for OEW Investigations w/Appendix A-17, dated 25 June 1992, U.S. Army Corps of Engineers, Rock Island District.

B-4 Inventory Project Report: Includes the Site Survey Summary Sheet for DERP-FUDS Site No. G03WV006500, undated, (document E-1), the Project Summary Sheet for OEW Project No. G03WV006504 dated, 25 June 1991, with two memorandums clarifying the scope of the project dated 19 April and 25 April 1995 (document E-2), and the Findings and Determination of Eligibility, (FDE), dated 2 January 1992, (document E-3).

B-5 Soil Survey of Tucker County, West Virginia, dated March 1967.

B-6 Report written by B. W. Vanorsdale, dated, 31 August 1978, titled World War II Army Maneuvers - Monongahela National Forest. The report discusses types of munitions used, types of operations, time frame of operations, and problems caused by the operations (document F-10).

B-7 Report written by U. S. National Forest Service employee using information relayed by Bill Vanorsdale, undated, circa 1992. The report expands information relayed by Mr. Vanorsdale in other documents, and discusses incidents of unexploded ordnance being found in the area (document F-11).

B-8 Monthly report from Metcalf & Eddy to CEHND, dated 5 June 1991. The report lists units who trained at the West Virginia Maneuver Area, and indicates that Blackbird Knob in the Dolly Sods North Area was a target site (document E-4).

B-9 EOD reports dated 21 September 1993, and 9 December 1993. The reports relate the destruction in place of two 4.2 inch mortar rounds found in Dolly Sods North (document E-5).

B-10 Listing of ordnance found, reported, and destroyed in the Dolly Sods North area, undated. Listing supplied by Nancy Feakes, District Ranger, Potomac Ranger District, Petersburg, WV 26847 (document E-6).

B-11 Letter to the Honorable Secretary of Agriculture, from Henry L. Stimson, Secretary of War, dated 15 July 1943. The letter states there is a military necessity for portions of the Monongahela National Forest, West Virginia, for Army maneuvers (document F-1).

B-12 Letter with 2 endorsements to The Commanding General, Army Service Forces, from the Chief of Engineers, U.S. Army, dated 23 July 1943. The letter states there is a military necessity for the acquisition of 52,820 acres of land for use as artillery training grounds (document F-2).

B-13 Letter to the Condemnation Section and Leasing Section, Corps of Engineers, from COL T. F. Farrell, Planning and Appraisal Section, Corps of Engineers, dated 28 July 1943. The letter states there is a need for an additional 4,849 acres of land for use as artillery training grounds (document F-3).

B-14 Letter to Henry L. Stimson, the Secretary of War, from Claude R. Wickard, the Secretary of Agriculture, dated 4 August 1943 (document F-4). The letter grants permission for the Army to use 341,266 acres of land more or less in the Monongahela National Forest (document F-4).

B-15 Letter to the Condemnation Section and Leasing Section, Corps of Engineers, from COL T. F. Farrell, Planning and Appraisal Section, Corps of Engineers, dated 28 July 1943. The letter revises acreage to be leased as 48,067 acres (document F-5).

B-16 Letter to the Acquisition Branch, Purchase Section, from the Chief, Real Estate Division, dated 8 December 1943. The letter recaps land acquisition and describes additional land required (document F-6).

B-17 Letter to The Ohio River Division Engineer, from the Office of the Chief of Engineers, dated 28 June 1945. The letter discusses disposal of the maneuver area and the need to decontaminate all land regardless of value (document F-7).

B-18 Letter to the Chief of Engineers, from Mr. C. B. Raymer, Real Estate Officer, Ohio River Division, dated 18 July 1950. The letter discusses the termination of two use permits issued by the Department of Agriculture (document F-8).

B-19 Letter to the Chief, Forest Service, Department of Agriculture, from COL W. H. Hastings, Corps of Engineers, Assistant Chief of Engineers for Real Estate, dated 10 August 1950. The letter discusses release of 350,531 acres of land by the Army and states that the land has been thoroughly searched for explosive material and that all such material reasonably possible to detect has been removed or neutralized (document F-9).

B-20 Statement written by a Forest Service employee dated 30 May 1991. Statement discusses use of Dolly Sods North by the military, units trained in the area, munitions used, and decontamination efforts (document F-12).

B-21 Letter to the Director, WO Lands, Attn: Ralph Bauman, from Mr. Paul M. Stockinger, Natural Resources Team, U.S. Forest Service, Eastern Region, dated 17 January 1995. The letter discusses the history of Dolly Sods North and Dolly Sods Wilderness area as well as measures taken by the Army and Forest Service to insure these areas are safe for the public (document F-13).

B-22 Engineering Report for Extent of OEW Contamination and Evaluation of Remedial Action Alternatives. Feasibility Study, Dolly Sods Wilderness Area, Davis, West Virginia. Contract DACA 87-90-D0018, dated 21 January 1992 by Metcalf & Eddy, Inc., Wakefield, Massachusetts, for the Huntsville Division, Corps of Engineers.

B-23 Letter to Corps of Engineers, Huntsville Division, Attn: Mr. Roland Belew, from Nancy Feakes, District Ranger, Potomac Ranger District, Petersburg, WV, dated 3 November 1993. The letter expresses concerns about Dolly Sods North, and mentions ordnance found on the site (document F-14).

B-24 Letter to Richard Dikeman, SIOAC-ESL, Savanna Army Depot, Savanna, IL, from Douglas N. Toothman, Manager, Land Resources, Western Pocahontas Properties, dated 5 July 1995. The letter discusses land in the Dolly Sods area and discusses trees containing shrapnel (document F-15).

B-25 Letter to Richard Dikeman, SIOAC-ESL, Savanna Army Depot, Savanna, IL, from William G. Farrar, Deputy State Historic Preservation Officer, West Virginia Division of Culture and History, dated 5 July 1995. Letter states that since Dolly Sods North is Government property, and, any information must come from the Forest Service (document F-16).

B-26 Excerpt from the pamphlet *Dolly Sods Wilderness* put out by the Forest Service, Monongahela National Forest. The pamphlet discusses the possibility of munitions being present in the area (document H-1).

B-27 Excerpt from the *History of the 31st Infantry Division, In Training and Combat, 1940-1945*, undated. The excerpt indicates training in West Virginia (document H-2).

B-28 Excerpt from *Presenting the 35th Infantry Division in WW II, 1941-1945*, undated. The excerpt indicates training in West Virginia (document H-3).

B-29 Excerpt from the *Historical and Pictorial Review of the 28th Infantry Division in WW II*, undated. The excerpt indicates training in West Virginia (document H-4).

B-30 Excerpt from the *95th Division (Tng) History and Mission*, undated. The excerpt indicates training in West Virginia (document H-5).

B-31 Military Acquisition Project Report dated 25 July 1950. The report 65 tracts of land totaling 48,557 acres of land being leased as part of the West Virginia Maneuver Area (document G-1).

B-32 Tract Register for 65 tracts of land dated 26 July 1950. The register includes tract number A-76A which included the area which is now Dolly Sods North. The tract register shows lease number W33-017 Eng 1403 as the lease for tract number A-76A, and shows the lease being terminated on 28 February 1946 (document G-2).

B-33 Permit granted to The Office of Scientific Research and Development, with tract map including tract A-76A, dated 8 September 1945. The permit grants the Office of Scientific Research and Development the use of area marked on the tract map for testing of rockets and other projectiles (document G-3).

B-34 Real Property Management and Disposal Report dated 15 April 1951. The report shows 48,557 acres of leased land as being surplus (document G-4).

B-35 Description of 6168 acres of land conveyed to the Western Pocahontas Properties Limited Partnership on 31 December 1986 (reference G-5).

B-36 Warranty Deed dated 3 December 1992. Deed conveys 3,701.1 acres of land from the Nature Conservancy to the United States. The deed indicates that the land was conveyed to the Nature Conservancy by Western Pocahontas Partnership by deed dated 25 July 1991 (reference G-6).

B-37 Warranty Deed dated 1 September 1993. Deed conveys 2467.4 acres of land from the Nature Conservancy to the United States. The deed indicates that the land was conveyed to the Nature Conservancy by Western Pocahontas Partnership by deed dated 22 July 1993 (reference G-7).

B-38 TM 9-1904, Ammunition Inspection Guide, by the War Department, dated 2 March 1944 (reference D-1, D-2, and D-3).

B-39 TM 3-320, Mortar, Chemical, 4.2", by the War Department, dated 1945 (reference D-4).

B-40 TM 43-0001-28, Army Ammunition Data Sheets, Artillery Ammunition, Guns, Howitzers, Mortars, Recoilless Rifles, Grenade Launchers, and Artillery Fuzes, by Headquarters, Department of the Army, dated April 1994 (reference D-2 and D-3)

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SECTION II
NATIONAL CAPITOL REGION RECORDS FINDINGS
PART A
POSITIVE FINDINGS

DOLLY SODS NORTH
AKA
WEST VIRGINIA MANEUVER AREA
BLACKBIRD KNOB

See Negative Findings

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NATIONAL CAPITOL REGION ARCHIVES FINDINGS
PART B
NEGATIVE FINDINGS

DOLLY SODS NORTH
AKA
WEST VIRGINIA MANEUVER AREA
BLACKBIRD KNOB

NARA, SUITLAND
SUITLAND REFERENCE BRANCH
SUITLAND, MD

RG 77, Records of the Office of the Chief of Engineers
All Entries
Nothing Found

RG 92, Records of the Office of the Quartermaster General
All Entries
Nothing Found

RG 111, Records of the Office of the Chief Signal Officer
All Entries
Nothing Found

RG 156, Records of the Chief of Ordnance
All Entries
Nothing Found

RG 338, Records of U.S Army Commands
All Entries
Nothing Found

RG 394, Records of the U.S. Army Continental Commands, 1920-1942
All Entries
Nothing Found

NARA, ARCHIVES I
MILITARY REFERENCE BRANCH
WASHINGTON, DC

RG 18, Records of the Army Air Forces
All Entries
Nothing Found

RG 407, Records of the Adjutant General's Office, 1917-
All Entries
Nothing Found

NARA, ARCHIVES II
CARTOGRAPHIC AND ARCHITECTURAL BRANCH
COLLEGE PARK, MD

RG 30, Records of the Bureau of Public Roads
All Entries
Nothing Found

RG 77, Records of the Office of the Chief of Engineers
All Entries
Nothing Found

RG 92, Records of the Office of the Quartermaster General
All Entries
Nothing Found

NARA, ARCHIVES II
TEXTUAL REFERENCE BRANCH
COLLEGE PARK, MD

RG 77, Records of the Office of the Chief of Engineers
Entry 1011, Security Classified 1940-1945
Nothing Found

RG 92, Records of the Office of the Quartermaster General
General Correspondence, Geographic file 1936-1945
Nothing Found

RG 107, Records of the Office of the Secretary of War
Entry 211
Nothing Found

RG 234, Records of the Reconstruction Finance Corporation
All Entries
Nothing Found

RG 269, Records of the General Services Administration
Real Property Disposal Files 1945-1953
Nothing Found

RG 270, Records of the War Assets Administration
All Entries
Nothing Found

RG 291, Records of the Federal Property Resources Service
Records Relating to Surplus Real Property
Nothing Found

NARA, ARCHIVES II
STILL PICTURE BRANCH
COLLEGE PARK, MD

RG 80, General Records of the Department of the Navy, 1798-1947
All Entries
Nothing Found

RG 111, Records of the Office of the Chief Signal Officer
All Entries
Nothing Found

NAVAL HISTORICAL CENTER
WASHINGTON NAVY YARD
WASHINGTON, DC

All Records
Nothing Found

ORDNANCE AND EXPLOSIVES
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APPENDIX C

GLOSSARY

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GLOSSARY

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BD/DR	Building Demolition/Debris Removal
BLM	Bureau of Land Management
CEHND	U.S. Army Engineer, Huntsville Division
CENCR	U.S. Army Engineer, Rock Island District
CEMRD	Corps of Engineers, Missouri River Division
COE	Corps of Engineers
CON/HTRW	Containerized/Hazardous Toxic Radioactive Waste
CWM	Chemical Warfare Material
DA	Department of Army
DERP	Defense Environmental Restoration Program
DOD	Department of Defense
EOD	Explosive Ordnance Disposal
EE/CA	Engineering Evaluation/Cost Analysis
EPA	Environmental Protection Agency
EXO	Explosive Ordnance
FDE	Findings and Determination of Eligibility
FUDS	Formerly Used Defense Site(s)
HE	High Explosive
HTRW	Hazardous, Toxic, and Radiological Waste
HTW	Hazardous and Toxic Waste

INPR	Inventory Project Report
M	Model Number
OEW	Ordnance and Explosive Waste
PA	Preliminary Assessment
PBR	Precision Bombing Range
PN	Project Number
QASAS	Quality Assurance Specialist (Ammunition Surveillance)
RD/RA	Remedial Design/Removal Action
SI	Site Investigation or Site Inspection
USA	U.S. Army
USACE	U.S. Army Corps of Engineers
USADACS	U.S. Army Defense Ammunition Center and School
USAEDH	U.S. Army Engineer Division, Huntsville
USATCES	U.S. Army Technical Center for Explosives Safety
UXO	Unexploded Ordnance
WD	War Department
WP	White Phosphorous
WW	World War
#	Pounds (lbs.)

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APPENDIX D

TEXTS/MANUALS

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TEXTS/MANUALS

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D-1 60mm Mortar, HE (reference B-38).

D-2 81mm Mortar, HE and WP (reference B-38 and B-40)

D-3 Projectile, 105mm, WP, and 105mm HE (reference B-38 and B-40).

D-4 4.2" Mortar, HE and WP (reference B-39)

COMPLETE ROUND CHART FOR 60-MM TRENCH MORTAR WEAPONS

Complete Round Designation	Filler	Fuze	Propellent Increment	Percussion Primer	Ignition Cartridge	Packing	Status
SHELL, H.E., M49A2	TNT	P.D. M52	140 grains (4 incr—M3)	M32	M5A1	Fuzed	S & M
SHELL, practice, M50A2	Inert Mat'l B.P. Pellet	P.D. M52	140 grains (4 incr—M3)	M32	M5A1	Fuzed	S & M
SHELL, training, M69	.....	.....	.....	.....	M4	.....	S & M
SHELL, illuminating, M83	Flare Composition	Time M65	112 grains (4 incr—M4)	M32	M5A1	Fuzed	S & M

is utilized, preventing the set-back pin from moving rearward against its spring during handling.

Function. This fuze is armed in the same manner as the M45 and M52 P.D. Fuzes previously described. The cotter pin or safety wire is removed, freeing the set-back pin. The shell is dropped down the bore of the weapon. The force of set-back resulting from ignition of the propelling charge causes the set-back pin to move rearward against its spring, freeing the safety pin. The safety pin, due to the action of its spring, is forced out of the fuze until its head comes in contact with the bore of the mortar. After emerging from the mortar, the safety pin is completely ejected by its spring from the fuze. The slider is now free, and due to the action of the slider spring is forced into the armed position, thereby bringing the detonator in direct alinement with the explosive train. The slider also serves to close the hole left by the safety pin so as to prevent the entrance of mud or dirt into the slider cavity which might interfere with the fuze function. The slider is locked in the armed position by a slider lock which is forced up into a recess in the slider by a spring.

Upon impact with the target, the striker is forced inward against its shear wire, breaking it and bringing the firing pin of the striker into a primer. The flame from the primer ignites a black powder delay pellet which burns for 0.1 second. The pellet in turn ignites a relay of lead azide which detonates and in so doing sends a wave to the detonator of lead azide and tetryl. The detonator in turn functions the lead charge of tetryl which detonates the booster of tetryl. The booster charge amplifies the wave and sends it to the shell filler of TNT.

General Information. 81-mm ammunition can be used in 3-inch trench mortar weapons by making the following modifications:

1. The firing pin in the 3-inch trench mortar weapon must be lengthened. This modification will be found in the 3-inch Trench Mortar Mk. IA2. Therefore, the 81-mm mortar ammunition may be used only in the 3-inch Mk. IA2, and never in the 3-inch Trench Mortar Mk. I or Mk. IA1.

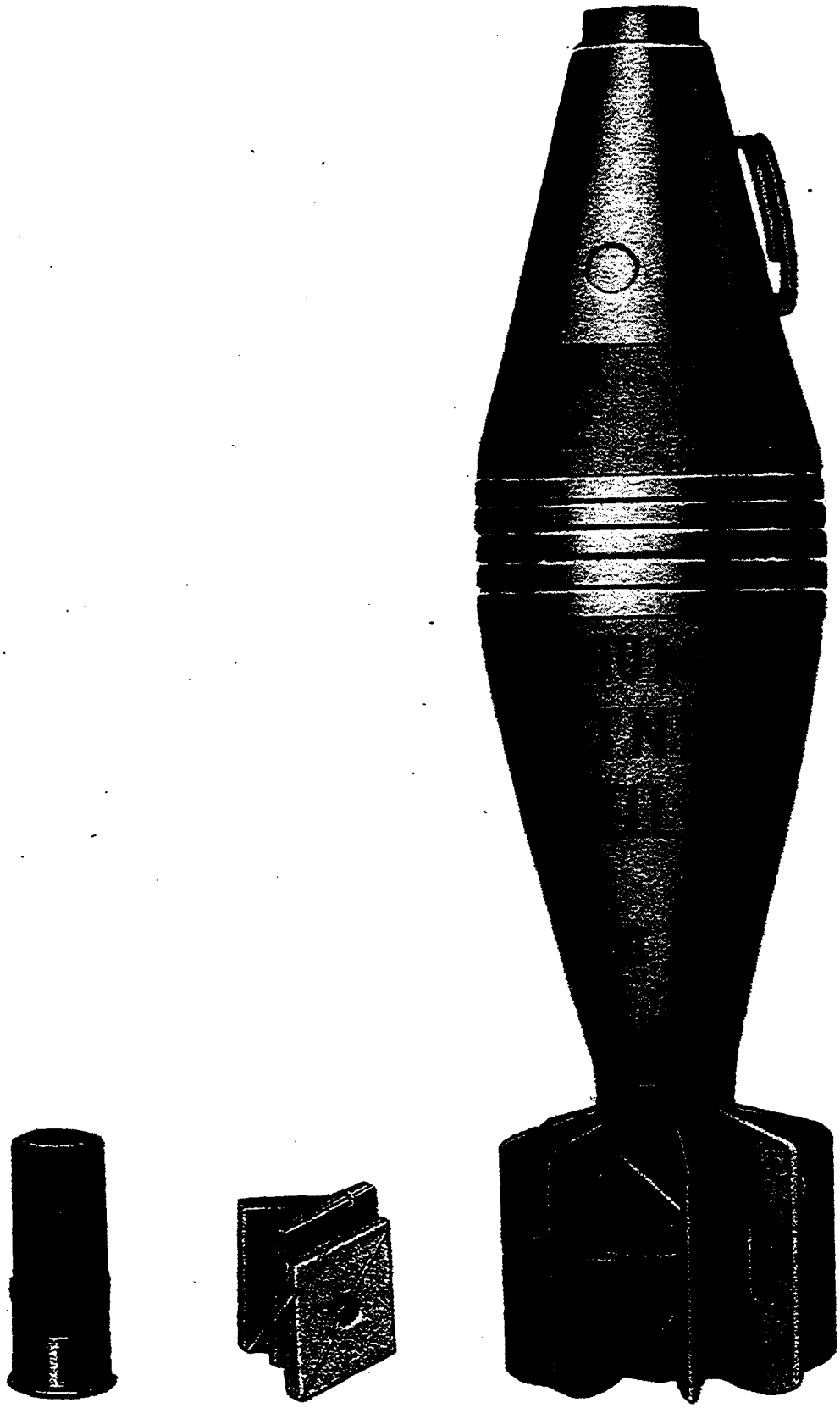
2. Maximum number of increments must be changed in the following manner:

Outer zone propelling charge must be reduced from six to four increments, for the M43A1 and M44 Shells.

Outer zone propelling charge must be reduced from four to three increments, for the M56 and M57 Shells.

The full charge of four increments may be used with the M45 shell.

The 3-inch trench mortar shell can be fired in an 81-mm weapon without any modifications being made.



RA PD 22908

Figure 120 — SHELL, H.E., M49A2

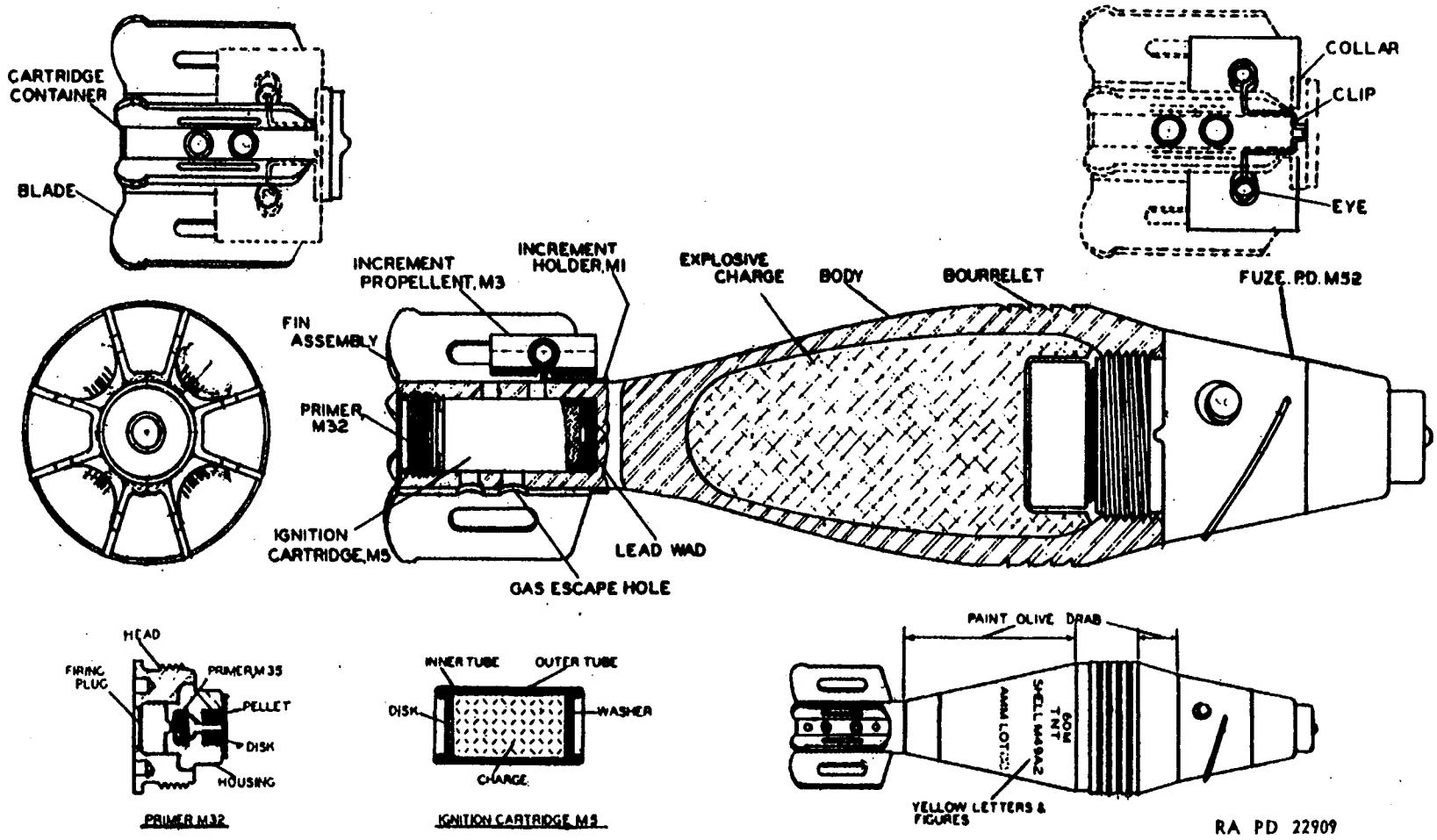


Figure 121 — SHELL, H.E., M49A2

AMMUNITION INSPECTION GUIDE

60-MM TRENCH MORTAR.

General. For missions between ranges of usefulness of hand grenade and 81-mm trench mortar, the Ordnance Department initiated the development of a light 42-mm trench mortar.

Before a 42-mm trench mortar could be made, the Brandt Company furnished a 47-mm trench mortar which was suitable for infantry. The cavalry wanted something that had a greater maximum range than the 47-mm weapon. Consequently, a 60-mm trench mortar and ammunition for it was developed by the Brandt Company.

In 1938, the 60-mm trench mortar was adopted and the 47-mm trench mortar was rejected. The mobility of the weapon, due to its light weight, and the quantities of ammunition that can be carried, increased the fire power of the using arms in movement.

The general design of the 60-mm trench mortar shell is similar to the light shell for the 81-mm trench mortar. The method of firing is exactly the same. The color, marking, and stenciling are the same as for the 81-mm mortar ammunition of the same types. The class of ammunition used for the 60-mm mortar is once again semifixed. Four types of ammunition are at present provided for use in the 60-mm mortar: high-explosive shell, practice shell, training shell, and illuminating shell.

SHELL, H.E., M49A2. This is the present standard high-explosive shell for use in 60-mm trench mortar. It is used against light targets and personnel in the open.

Shell body. In shape, the body of this shell closely resembles the light shell for the 81-mm trench mortar; however, it is much smaller in size. Several methods of manufacturing the shell body are in practice at the present time, depending on the method best adapted to the individual manufacturer. The body may be of forged steel, cupped-rolled, plate-welded longitudinally, or a machined casting.

It is tear-dropped in shape, having a blunt nose and tapered tail. Near the nose end of the shell is a machined bourrelet which acts as a forward bearing surface and as a gas check. The nose is threaded to receive the fuze directly. The fuze used is the P.D. Fuze M52 which has a superquick action. Due to the light weight and blunt nose, very little penetration can be obtained. The shell is designed to produce fragments as the other light shells previously described. The tail end is closed and internally threaded to receive the stabilizer assembly. Earlier models of this shell had the stabilizer and body made from one piece with the fins attached. The shell filler is 0.34 pound of flake TNT. The weight of the round completely assembled is 2.94 pounds; the entire length of the shell with fuze attached is 9½ inches.

Zones of fire and range. The shell has five zones of fire. The first zone of fire consists of the ignition cartridge and percussion primer. Zone five consists of the ignition cartridge, percussion primer, and four propellent increments.

Zone one has a range of approximately 100 yards.

Zone five has a range of approximately 1,935 yards.

Marking and packing. The shell body is painted olive drab with yellow stencil. The shell is shipped as a complete assembled round. One round is packed per individual fiber container, six individual fiber containers per large outer fiber container, three large outer containers (18 rounds) per bundle. One bundle per chocolate-stained wooden crate for overseas shipment.

SHELL, Practice, M50A2. SHELL, practice, M50A2, is similar to SHELL, H.E., M49A2. The shell body, components used, and packing are identical to the shell previously described. It differs in that its filler consists of 0.29 pound of inert material and 0.05 pound of a smoke producing pellet of black powder to act as a spotting charge. The body is painted blue with white stencil to indicate a practice shell.

SHELL, Training, M69. This shell is designed to give the mortar crew training in loading the weapon, and practice in firing under conditions which will not permit firing in more than the first zone.

Shell body. The body of the shell is cast iron. It is similar in shape to the 60-mm trench mortar shell and the M68 Training Shell for 81-mm mortar previously described. It is tear-dropped with a blunt nose and tapered tail. It has a bourrelet on the body near the nose to act as a forward bearing surface and gas check. At the tail end is a recess which is threaded to receive a stabilizer assembly. The nose end is closed and rounded with no provisions made to receive a fuze. Its weight varies depending on its weight zone. Seven weight zones are possible with a minimum of 3.83 pounds for weight zone one and a maximum of 4.07 pounds for weight zone seven without fin assembly and ignition cartridge.

The fin assembly and propelling charge. The fin assembly is of the same construction and shape as previously described. It receives the Ignition Cartridge M4. Several ignition cartridges are provided with each round so that the shell can be fired more than one time. There are no propellent increments used, for the shell is designed to be fired in the first zone only.

Marking and packing. The shell is painted black with white stencil. On the shell body will be found a number of white squares (one to seven) with a prick punch mark in the center of each to indicate the zone weight.

The fin assembly. The fin assembly consists of a machined cartridge container closed at one end with a threaded protrusion to screw into the shell body. It is hollow, with the other end threaded to receive an ignition cartridge and a percussion primer. A series of holes in the cartridge container serves to allow for the escape of gas, and to conduct the flame from the ignition cartridge to the propellent increments. Attached to the cartridge container are eight stationary fins in which may be seated the increments, or as recently changed, the increments are placed between the fins and held there by an increment holder.

The ignition cartridge. The ignition cartridge is the M5A1. It consists of a cardboard container having approximately 40 grains of double base powder. It supersedes the M5, and differs from it in that the number of grains of powder has been reduced from 47 to 40 grains. A hollow celluloid tube three-fourths inch long was also introduced at ignition end of cartridge. The M5 Ignition Cartridge produced erratic flight. Short ranges made it necessary for all members of the crew to be protected. With the M5A1, muzzle velocities have been reduced, but the maximum range obtained with all propellent increments and cartridges have not been reduced.

Previous to the M5 Ignition Cartridge, the M4 had been used. The M4 was a cardboard container having 47 grains of double base powder with a primer located in a brass base. It fitted snugly into the cartridge container and was disadvantageous in that set-back would cause residue of the M4 Ignition Cartridge to remain in the weapon.

The percussion primer. The Percussion Primer M32 is of the same construction and shape as the M33 previously described. It differs in that it has a narrow body diameter.

The propellent increments. The Propellent Increments M3 are made up of thin square sheets of double base powder sewn together. Each increment weighs approximately 35 grains. In the center of each increment is a hole which serves to increase the burning surface, and allows the increment to be held by the Propellent Increment Holder M1, by fitting into the wire loop of the increment holder. The corners, the sides, or edges may be notched to adjust the increment to the desired weight. The increments are held in place by seating in the fins diagonally, or recently by use of the Propellent Increment Holder M1. The Propellent Increment Holder M1 consists of a wire band seated around the stabilizer assembly near the body of the shell. Two thin wires bent in a V-shape, their ends in a circular loop, extend from the band down between the fins. On these loops are placed the increments by means of the holes in their center.

The percussion primer, ignition cartridge, and four increments comprise the full propelling charge; a total of 180 grains of powder.

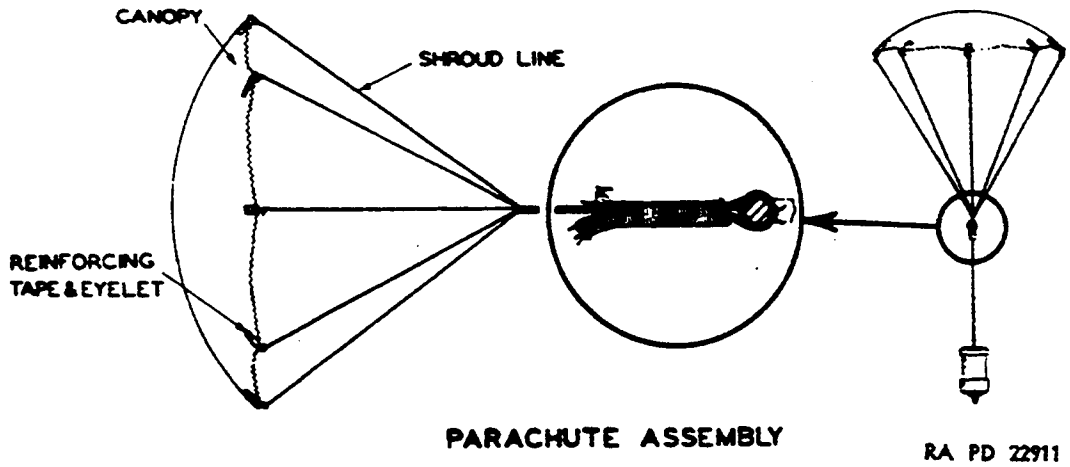


Figure 122a — SHELL, Illuminating, M83 — Parachute Assembly

Information as to the exact packing of the shell is not available at the present time. However, the complete round comes in separate units consisting of the shell body, ignition cartridge, and fin assembly.

SHELL, Illuminating, 60-mm, M83. The SHELL, illuminating, M83, was designed to provide a night light of relatively high candle power that could be fired from a standard infantry weapon. The SHELL, illuminating, M83, adequately fills the need, having 110,000 candle power, minimum, and burning for 25 seconds while drifting earthward on its parachute. The shell consists of the following components: fuze, body assembly, parachute assembly, illuminant assembly, fin assembly, propellant, and ignition cartridge.

Shell body. The body is constructed of a machined steel tube. It is cylindrical in shape with a tapered tail assembly and a nose assembly having its taper produced by the contour of the fuze. At the nose is a steel adapter spot welded and internally threaded so as to receive the Time Fuze M65. At the base of the cylindrical body is a coupling which serves to join the body to the tail assembly. The body is held to the coupling by means of four shear pins and Pettman cement. The tail assembly is held to the coupling by means of spot welding and Pettman cement,

The tail assembly consists of a cone to which is attached a fin adapter. The fin adapter is internally threaded to receive the fin assembly. The total weight of the shell completely assembled is approximately 3.8 pounds. Entire length of the fuzed shell is approximately 14.2 inches.

Parachute assembly. The parachute assembled in the illuminating shell is of sufficient size to permit the illuminant to burn 25 seconds while falling to the ground from a height of approximately 400 feet. The parachute assembly consists of a parachute canopy, tying cord, eight eyelets, eight shroud lines, reinforcing tape, and tying thread.

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The parachute canopy is cut from Fortisian cloth, in the form of an octagon, having a width of 36 inches and pinked on the periphery. The canopy has a porosity of 225 cubic feet air per minute per square foot.

At each corner of the octagonal canopy, an eyelet is crimped into the cloth, the latter being first reinforced by sewing on a strip of cotton tape with nylon thread.

One end of each of the shroud lines is tied to an eyelet. The cords in each assembly are the same length, usually 31 inches. The lines are tied together with tying cord, at a point 27 inches distant from the eyelets.

The shrouds are run through the flare assembly loop and tied firmly back upon themselves with tying thread. The canopy is then folded according to specified directions and inserted in the parachute case.

After the illuminant assembly is inserted in the body tube, the suspension wire (to which the shroud lines are attached) is coiled in the bottom of the parachute case. The two hemicylindrical steel parachute spacers are fitted into the rear end of the body tube. They fit snugly against the inner wall of the tube and rest on the steel disc of the flare assembly. The two spacers form the cylindrical parachute case into which the chute is placed. The chute and the suspension wire are separated in the case by an onionskin paper separator.

Two chipboard parachute discs are forced into place against the walls of the spacers. A coupling disc is placed on the runs of the parachute spacers and the tail assembly is pressed into position, and the shear pins are inserted.

Illuminant assembly. The illuminant assembly is the functional part, the "heart" of the shell, and is carefully designed to insure its effectiveness. The assembly fits into the shell body, and its front face is in contact with the fuze. Its rear face is attached to the parachute assembly by means of a suspension wire. The illuminant assembly consists of a case, first fire charge, illuminant charge, priming charge, suspension wire, steel disc, quick match disc, top disc, plywood plug, quick match, top seal, spacer, quick match spacer, tying string, reinforcing band, and binding tape.

The quick match is in contact with the expelling charge of the fuze. The quick match leads through four alined holes in the steel quick match disc, hair felt quick match spacer, and top disc. The ends of the quick match, which is in two lengths, are exposed to the fuze; the middles, after passing through the four holes pass thru the priming charge.

The priming charge consists of a 0.055-ounce pellet of Army black powder that is located just above and in contact with the first fire charge. The first fire charge is 0.74-ounce pellet consisting of a mixture of 25 percent black powder and 75 percent illuminant com-

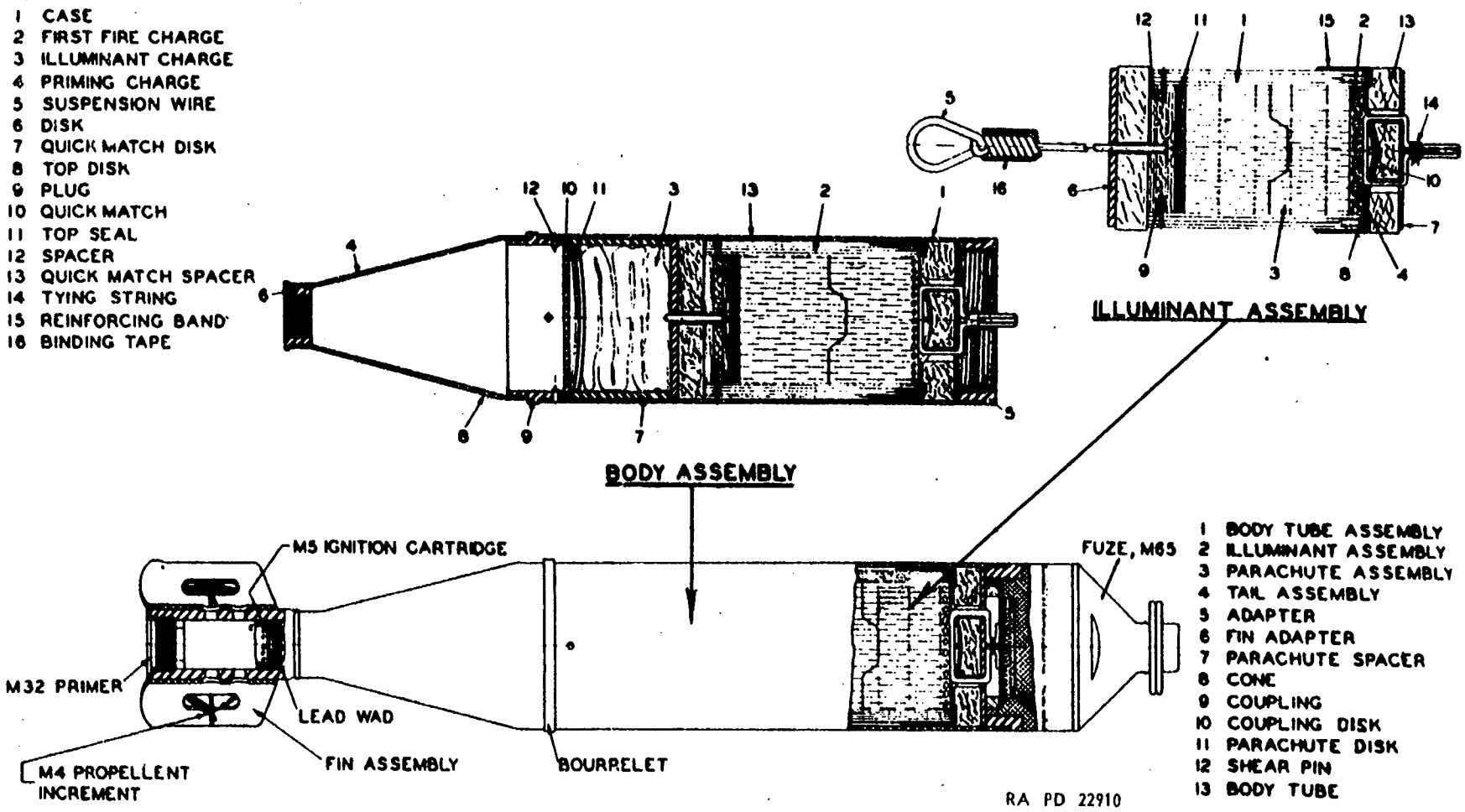

Figure 122b — SHELL, Illuminating, M83 — Body and Illuminant Assemblies

position. Since the illuminant is difficult to ignite, the straight black powder priming charge and the partially black powder first fire charge are set up in series to insure ignition of the illuminant. The illuminant charge is just below the first fire charge and in contact with it.

The illuminant charge, which is pressed in two equal increments, weighs approximately 8.8 ounces, and has the following compositions:

	Percent
Barium nitrate	52.1
Sodium nitrate	10.4
Aluminum	26.0
Sodium oxalate	5.2
Sulfur	4.1
Castor oil	1.1
Linseed oil	1.1

The illuminant is ignited by the first fire composition and burns with a clear white light of 110,000 candle power, minimum, for 25 seconds minimum time. The illuminant (when the shell is in firing position) rests on a ⅛-inch thick top seal of fire clay. Just below the fire clay is a ⅜-inch thick plug of plywood, with a hole through its center.

All the components of the illuminant assembly mentioned previously with the exception of the quick match disc and a quick match spacer are within the illuminant case. The case is constructed of sheet box board ⅜ inch thick in the shape of a tube which will fit freely into the shell body. The quick match passes through four holes in the top disc. The disc serves as a cover for the case, after being glued and nailed into place. The fire clay top seal, illuminant, priming charge, and first fire charge are all shaped into discs to fit into the case. The quick match in passing through holes in the top disc and the quick match disc and spacer, anchors the latter two parts in place.

The suspension wire passes through the hole in the plywood plug, with the knotted end fitting flush in the pocket. The wire passes through alined holes in the hair felt spacer and steel disc. The steel disc forms the rest for the parachute spacer in the parachute case. The suspension wire from the surface of this disc to the end of the loop is approximately 11½ inches long. The loop is formed by wrapping the wire about itself and then binding with tape. The complete illuminant assembly slips freely into the shell case coming to rest against the fuze.

The top disc closing one end of the case is further sealed by the addition of a strip of crinoline that is pasted over the sides of the case and top disc.

The hair felt spacers serve to protect the illuminant charge against the sudden shocks of set-back and expulsion from the body tube. They

also assist in preventing the escape of expelling charge gases around the illuminant case.

Fin assembly. The fin assembly is the same as that assembled with the SHELL, H.E., M49A2.

Ignition cartridge. The ignition cartridge is the M5A1 previously described.

Primer. The primer is the M32 Percussion Primer previously described.

Propellent increments. The Propellent Increment M4 assembled with the illuminating shell are essentially the same as the Propellent Increment M3. The M4 Increments are composed of flake propellent powder, and each increment weighs 28 grains, which is less than the weight of the M3. Four increments are assembled with the illuminating shell, corners of the increments being wedged into the fin blade slots to hold them in place. An increment holder may be used with the illuminating shell to hold the propellent increments in place.

The percussion primer, ignition cartridge, and four increments comprise the full propelling charge; a total of 152 grains of powder.

Zone of fire and range. The shell is normally fired with the full complement of propellent increments. This fact and the fixed burning time of the fuze cause the shell to shear and the flare to commence to burn at a point at 800 yards range and 400 feet elevation. The parachute canopy controls the speed of descent so that the flare burns completely during its descent and no effect is lost by the flare burning on the ground.

Action. The cotter pin is removed from the fuze and the round is dropped down the bore of the mortar. The round is propelled from the mortar in the same manner as the H.E. shell, the propellent gases being confined by the bourrelet. Set-back causes the fuze to function in the manner described in pages 314 to 318. Ignition of the expelling charge in the fuze has two functions. First, to ignite the quick match; and second, to expel the flare assembly. The latter is accomplished by the expelling charge gases acting forcibly against the steel quick match disc. The shock caused by these gases is transmitted to the shear pins that hold the body tube to the tail assembling coupling. These pins are sheared and the flare assembly is expelled from the body tube. The tail assembly, the fuze, and the body tube fall free.

As the flare assembly (designation of the parachute assembly and the illuminant assembly together) is forced out of the case, the two parachute spacers fall free as do the coupling and parachute discs. The parachute spacers guide the ejection of the chute from the core, and when they fall free the parachute unfolds and checks the descent of the illuminant case. The flame from the expelling charge ignites the quick match, which in turn ignites the primer charge. As the quick

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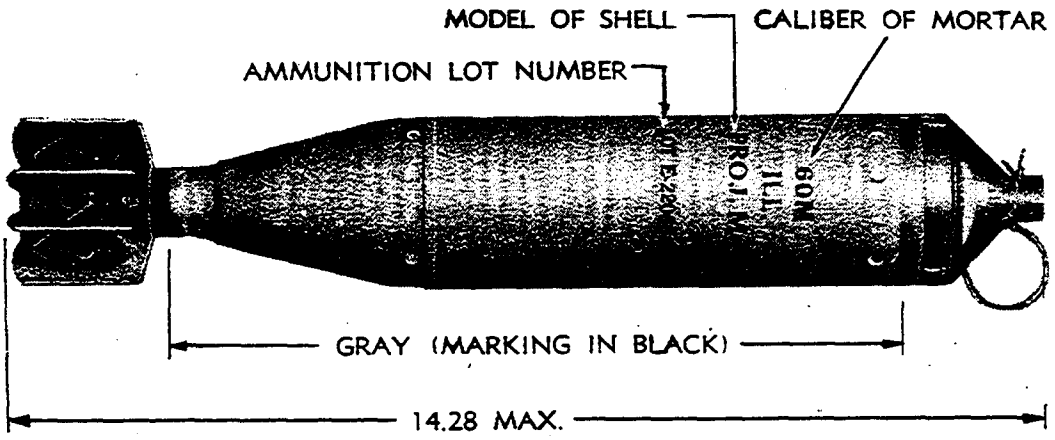

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Figure 122c — SHELL, Illuminating, M83 — Marking Diagram

match burns through the holes in the quick match disc, and the quick match spacer disintegrates, the two components fall free.

The primer charge ignites the first fire charge, and the latter ignites the illuminant charge. The burning of the illuminant ignites the illuminant case, but the case being in several thicknesses, burns at the same rate as the illuminant and is able to support the charge for its period of burning. The fire clay prevents the flame of the burning illuminant from igniting the shroud lines, during the period of descent.

Marking and packing. The shell body is painted gray with black stencil. The shell is shipped as a complete assembled round. One round is packed per individual fiber container, six individual fiber containers per large outer fiber container, three large outer containers (18 rounds) per bundle. One bundle per chocolate-stained wooden crate for overseas shipment.

FUZE, Time, (Fixed) M65. The Time Fuze (Fixed) M65 is assembled to the SHELL, illuminating, M83. It is a simple powder time-train fuze whose burning time is fixed. The fuze consists of a body assembly, a time train ring assembly, a head assembly, and a primer assembly.

Body assembly. The body is alumimum alloy die cast to the shape illustrated in figure 123. The upper projection is threaded to receive the head, and a recess is drilled to seat the primer. This recess narrows, and is met at right angles by a hole drilled through the walls of the time-train recess. The continuation of the primer recess and the hole which meets it, form the flash vent for the primer flame. The surface of the base on which the time-train may rest is cut with eight annular grooves. Glued to this grooved surface is a cloth washer. In the rear face of the body, a recess is formed for the expelling charge. The lower edge of this recess is threaded to receive the steel ex-

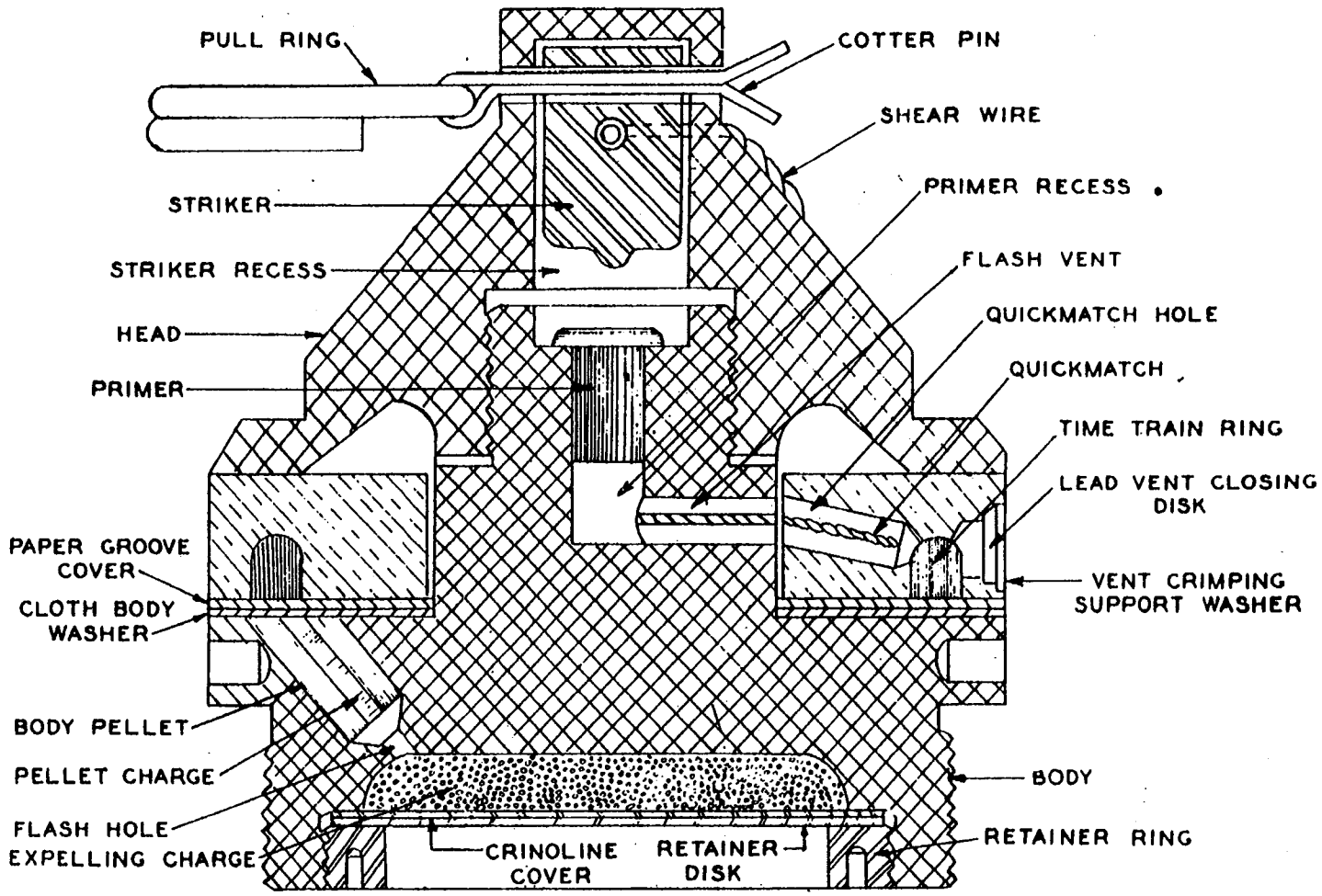

Figure 123 — FUZE, Time (Fixed), M65

pelling charge retainer-ring that holds the steel expelling charge retainer-disc and crinoline against the expelling charge. Leading from the surface of the time-train ring recess base to the expelling charge recess is a hole. It is drilled at a 45-degree angle to the surface of the time-train ring recess base. The upper or larger section houses the body pellet; the lower section is empty, and is the flash hole proper. A final hole is drilled normal to the surface of the time-train ring base. In this hole is seated a brass locating pin that fits into a hole in the time-train ring, thus properly locating the ring in the final assembly.

Time-train ring assembly. The time-train is essentially a large thick washer that fits over the upper projection of the body and rests on the fuze cloth-covered surface of the time-train ring recess base. The time ring is made of brass. In the lower surface of the ring is an annular groove interrupted by a brass plug. The black powder time-train ring (groove charge) is housed in this groove. Leading into the groove from the inner wall of the ring is a hole. This hole is a continuation of the primer flash vent in the head and houses a length of quick match. Drilled from the outer wall of the ring and meeting the annular groove at the ignition of the quick match hole and similar groove hole is another hole. This hole is closed by a lead vent closing disc and vent crimping support washer. The disc melts on ignition of time-train charge and permits the combustion gases to escape. An onionskin paper groove cover is shellacked to the lower surface of the ring.

Head assembly. The head made of aluminum alloy has two functions: first, to house the striker; second, to hold the time-train ring securely in place. The striker is housed in a recess in the top of the head. Passing through the head and striker, is a removable cotter pin and pull ring. Also passing through the striker and head is a shear wire. The inner recess of the head is threaded to receive the projection on the body. An outer flange rests on top of the time-train ring, and, when the head is tightened, holds the ring firmly in place.

Explosive components. A primer which is the standard Mk. V Primer is used in this fuze. In the flash vent of the time-train ring is housed a ¼-inch length of quick match that transmits the primer flame to the groove charge. The groove charge is approximately 60 grains of fuze powder, black powder of a very fine texture. It provides a time delay of approximately 14 seconds. The body pellet which leads from the ring to the expelling charge consists of approximately 5.2 grains of black pellet powder. The body pellet has a core, the pellet charge, which consists of approximately 0.02 grains of nitrocellulose. The expelling charge consists of 40 grains of black powder.

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Function. The cotter pin is removed prior to dropping the round down the bore of the mortar. The shear wire retains the striker in its normal position. The sudden forward motion of the round being fired causes the striker, through set-back, to shear the wire and move to the rear. The firing pin of the striker functions the primer. The flame from the primer ignites the quick match in the time-train ring flash hole. The quick match in turn ignites the time-train ring groove charge. The groove charge has a burning time of about 14 seconds. When the flame from the groove charge has completed its circle about the time-train ring, it ignites the body pellet of black powder and the pellet charge of nitrocellulose. This, in turn, ignites the expelling charge. The flame from the expelling charge passes to the rear through apertures in the expelling charge retainer disc. The fixed burning time of the fuze permits the round, fired with full increment charge, to be nearly at its optimum range and height when the fuze has completed its function.

Marking. On the circumferential flange just above the body threads of the fuze is stamped in small characters: "Time fuze, M65."

Packing. The fuze is packed assembled to the round.

Safety precautions. The cotter pin must only be removed immediately before the round is placed in the mortar.

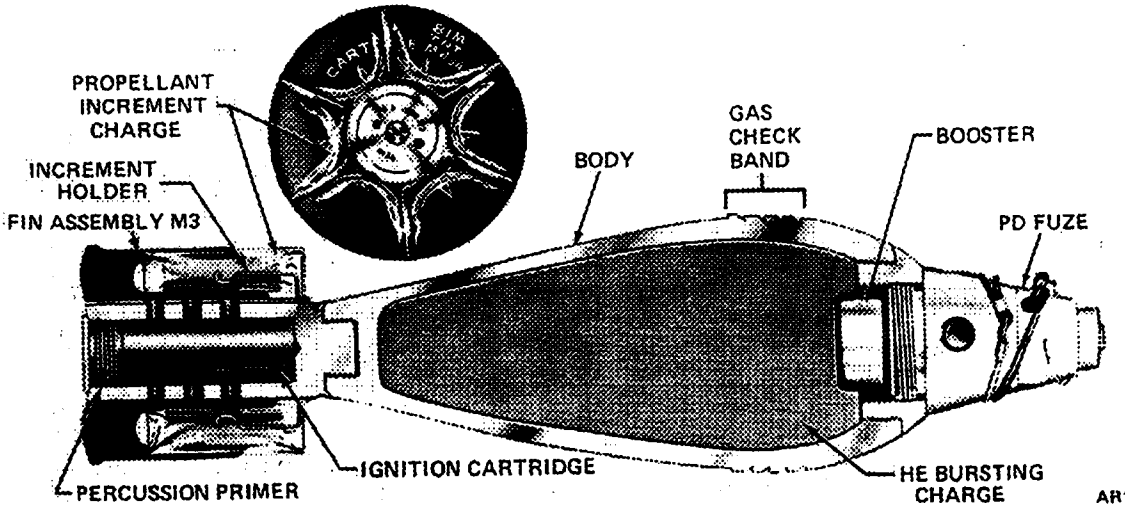
FURTHER REFERENCES: TM 9-1900, Ammunition in General; OS 9-18, Ammunition in General; The Ordnance Sergeant; TR 1350-3A, 3-inch Trench Mortar Ammunition; FM 23-90 Basic Field Manual, 81-mm Mortar M1; SNL R-4 Parts 1 and 2; Complete Round Chart No. 5981; O.O. 7224, Ordnance Safety Manual Elements of Ordnance, Hayes; Ordnance Drawings; Picatinny Text, Vol. III; Ammunition for 60-mm and 81-mm Mortars, Savanna Section, Ordnance School.

COMPLETE ROUND CHART FOR 81-MM TRENCH MORTAR WEAPONS

Complete Round Designation	Filler	Fuze	Propellent Increment	Percussion Primer	Ignition Cartridge	Packing	Status
SHELL, H.E., M43	TNT	P.D. M45 or M52	400 grains (4 incr)	.....	M3	Fuzed	S
SHELL, H.E., M43A1	TNT	P.D. M52	700 grains (6 incr—M1)	M33	M6	Fuzed	S & M
SHELL, practice, M43A1	Inert Mat'l B.P. Pellet	P.D. M52	700 grains (6 incr—M1)	M33	M6	Fuzed	S & M
SHELL, practice, M44	Inert Mat'l B.P. Pellet	P.D. M52	700 grains (6 incr—M1)	M33	M6	Fuzed	S & M
SHELL, H.E., M45	TNT	P.D. M45 or M53	400 grains (4 incr)	.....	M3	Fuzed	S
SHELL, H.E., M56	TNT	P.D. M53	820 grains (4 incr—M2)	M34	M6	Fuzed	S & M
SHELL, chemical, M57	WP, FS, H	P.D. M52	820 grains (4 incr—M2)	M34	M6	Fuzed	S & M
SHELL, training, M68	.....	.....	.....	.....	M3	.....	S & M

CARTRIDGE, 81 MILLIMETER: HE, M43A1 AND M43A1B1

AR199500



AR199499

Type Classification:

OBS 11756003.

Use:

This cartridge is used against personnel and light materiel, providing both fragmentation and blast effect.

Description:

The complete round consists of a projectile body, a point-detonating fuze, a fin assembly, a propellant charge, and an ignition charge with a percussion primer. The projectile body is of forged steel, and is threaded internally at the nose to accept the fuze and at the base to accept the fin assembly. The projectile body is filled with Composition B high explosive.

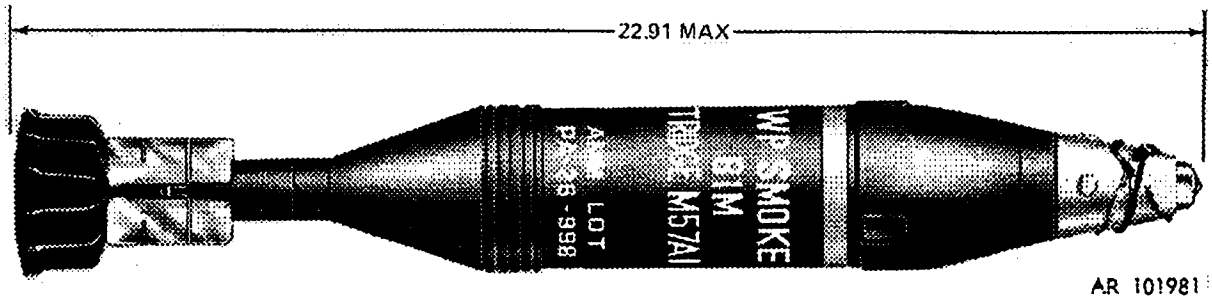
Functioning:

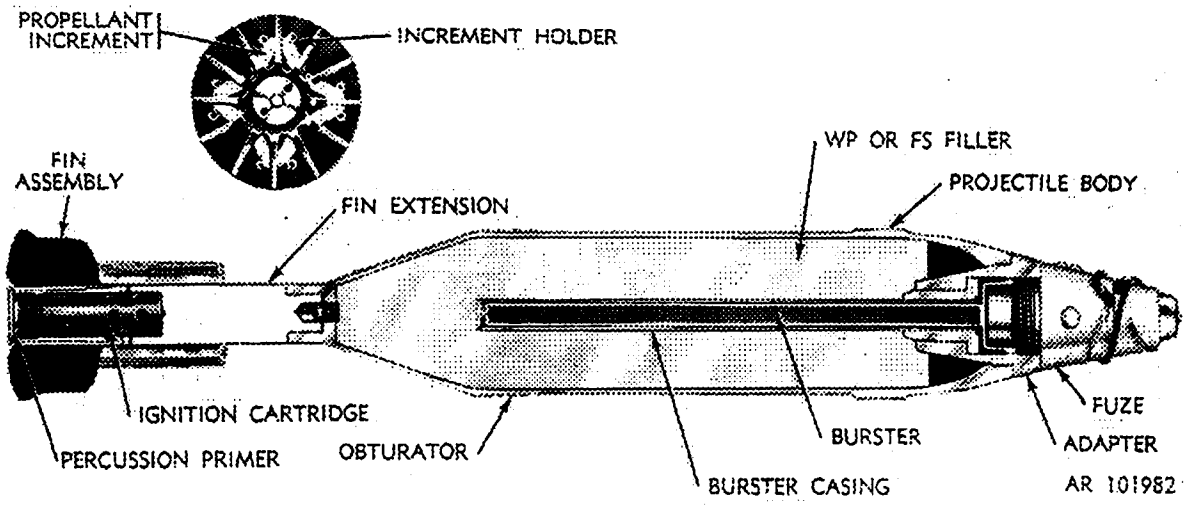
When the cartridge is loaded, it slides down the mortar tube until the percussion primer in the ignition cartridge strikes the firing pin in the base cap of the mortar. The primer ignites the ignition cartridge, and the cartridge ignites the propellant charge. Rapidly expanding gases from the burning propellant expel the projectile from the tube and propel it to the target. The projectile is fin-stabilized in flight. The PD fuze functions on impact detonating the fuze booster charge and, in turn, the high explosive charge. The bursting charge shatters the projectile body, producing near optimum fragmentation and blast effect at the target.

Difference Between Models:

The two cartridges differ only in some minor metal parts.

CARTRIDGE, 81 MILLIMETER: SMOKE, WP, M57A1 AND M57





Type Classification:

With WP Filler: CON 11756003.
With FS Filler: OBS OTCM 37196 dtd 1961.

Use:

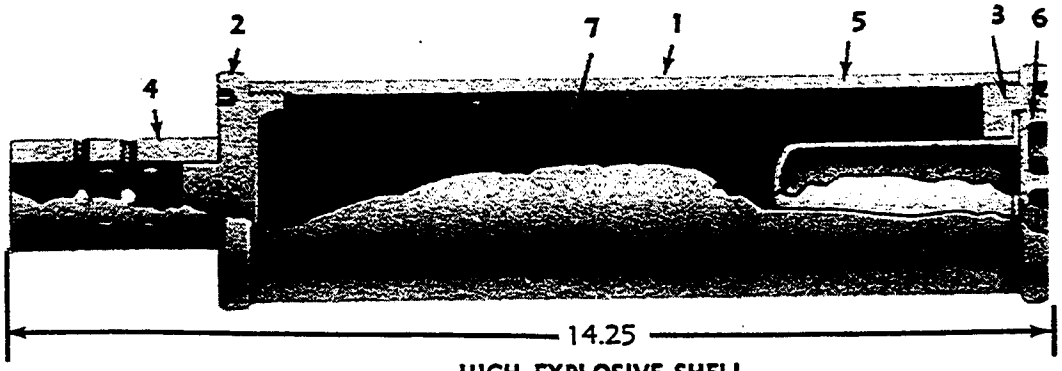
This cartridge is used against personnel and materiel as an incendiary device and also to produce screening smoke.

Description:

The complete round consists of a projectile body with a burster assembly, a point-detonating fuze, a fin assembly, a propellant charge, and an ignition cartridge with a percussion primer. The projectile body is of relatively thin-walled steel, and is filled with white phosphorous (WP) or a liquid smoke filler (FS). The base of the projectile is internally threaded to accept the fin assembly, and the nose is fitted with a steel adapter. The adapter is internally threaded to accept the fuze, and is designed to hold the burster assembly. The burster assembly is a thin-walled steel tube filled with tetryl and extends into the smoke charge.

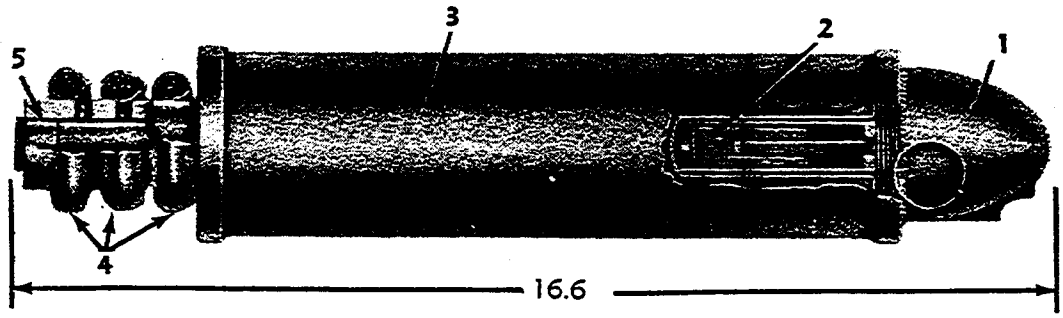
Functioning:

When the cartridge is loaded, it slides down the mortar tube until the percussion primer in the ignition cartridge strikes the firing pin in the base cap of the mortar. The primer ignites the ignition cartridge, and the cartridge ignites the propellant charge. Rapidly expanding gases from the burning propellant expel the projectile from the tube with the velocity required to reach the target. The fuze functions on impact, detonating the burster charge which ruptures the projectile and disperses the chemical filler. Both WP and FS react spontaneously on contact with the air; WP ignites producing a dense white smoke and some incendiary effect, while FS, combining with the moisture in the air, creates a cloud-like smoke screen without burning.



HIGH EXPLOSIVE SHELL

1 — CASING
2 — BASE
3 — HEAD
4 — CARTRIDGE CONTAINER
5 — BOOSTER JACKET
6 — FUZE HOLE PLUG
7 — EXPLOSIVE FILLER (TNT)



COMPLETE ROUND

1 — FUZE
2 — BOOSTER
3 — SHELL
4 — POWDER RINGS
5 — CARTRIDGE

RA PD 15199

D-2

Figure 109 — 3-inch and 81-mm Trench Mortar Ammunition Mk. I

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81-MM TRENCH MORTAR.

General. The first attempt to obtain more efficient trench mortar ammunition was with the development of the 75-mm smooth bore mortar in which the old 75-mm French type shell was modified by tapering the shell from the bourrelet back to the base, and fitting an aluminum fin in the base of the shell. The round was propelled by means of an ignition cartridge inserted in a short cartridge case, and with propelling increments inserted between the blades of the fin. The stability of the round was not satisfactory, and the development was abandoned. A streamlined projectile with fin assembly was then designed for the 3-inch trench mortar with poor results. Several attempts were made with shell of different contours, but proved unsatisfactory because proper stability was not obtained.

After World War I, there was an early trend away from the low powered, muzzle-loading Stokes mortar to breech and rifled mortars which were mounted on wheels. The muzzle velocity, the range, and the weight increased, but in so doing, the effectiveness of the trench mortar was decreased in that it lost its simplicity. The weapon became too cumbersome and unwieldly.

Meanwhile the Edgar Brandt Company worked on the 81-mm trench mortar which turned out to be simple in design, utilizing ammunition which was stable in flight and had a long range. In 1931 and 1932, tests conducted by the War Department proved that this mortar and ammunition were highly satisfactory. In 1932, manufacturing rights were purchased from Brandt Company. The weapon itself was a refinement of the 3-inch trench mortar, consisting mainly of a cross leveling mechanism, a better sight, and a heavier baseplate. For simplicity and effectiveness, this mortar proved a remarkable weapon.

Advantages of 81-mm over 3-inch Trench Mortar Ammunition.

1. The 81-mm ammunition is more stable in flight.

2. The 81-mm ammunition has a longer range.

3. The 81-mm ammunition comes to the firing line assembled, ready for use.

4. The 81-mm ammunition utilizes a point detonating fuze.

Types of 81-mm Ammunition: High-explosive shell, chemical shell, practice shell, and training shell.

Class of Ammunition. 81-mm ammunition is classified as semi-fixed; although the ammunition is designed to be loaded into the weapon in one operation, provisions are made for adjusting the propelling charge at the point of fire.

Description. The ammunition itself is streamline in design. It has a stabilizer assembly in the rear of the shell to produce stability in flight and to seat the propelling charge. The stability adds to the

range, velocity, and accuracy of the projectile, and causes the projectile to strike point first, allowing the use of a point detonating fuze. It comes assembled with fuze, propelling charge, and ignition cartridge in place. The only operation necessary before loading the shell into the weapon is to remove the round from its fiber container and then pull the cotter pin or safety wire from the fuze and drop shell into the weapon.

SHELL, H.E., M43. The shell was originally adapted as the light shell for the 81-mm mortar. It is designed for use against light targets such as machine gun nests, barbed wire entanglements and personnel in the open.

Shell body. The body of this shell is constructed of forged steel. It is tear-dropped in shape; that is, blunt nose and tapered tail. It has a bourrelet machined near the nose of the shell consisting of several annular grooves which serves to act as a forward bearing surface and a gas check. The action of the propelling charge gases expanding in the grooves and contracting to pass the raised portions tends to slow the gases and prevent their passing the bourrelet. The nose is machined and threaded to receive an adapter. The adapter is threaded and acts as a bushing for a bakelite fuze well cup and the fuze. The bakelite fuze well cup is fitted to the adapter before it is assembled to the shell body and prevents the entrance of foreign material into the fuze cavity prior to the assembly of the fuze to the round. The fuze used is the Point-detonating Fuze M45. This fuze has a selective element and can be set for either superquick or delay action. (For details, see pages 295 to 298.) To the rear of the bourrelet is a curved taper reducing the base of the shell to approximately 1½ inches. The base is closed and machined so as to receive a stabilizer assembly. The shell filler is 1.22 pounds of TNT. The total weight of completely assembled round is 7.05 pounds. Entire length of the fuzed shell is 13¼ inches.

Fin assembly. The fin assembly consists of a machined cartridge container to which are attached six stationary fins. One end is closed and threaded so as to be screwed on to the body of the shell. The other end is machined and hollow inside so as to receive the ignition cartridge. Several holes leading from the interior to the exterior periphery of the cartridge container serve to conduct the flames from the ignition cartridge to the propellent increments which are seated in the fins.

The ignition cartridge. The Ignition Cartridge M3, red, is similar in appearance to a shotgun shell; the head is of brass and contains the percussion primer; the body is of cardboard, red in color, and contains 120 grains of finely granulate double base powder. It is designed to fit into the hollow portion of the stabilizer assembly.

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The propellent increments. The propellent increments are in the form of small half-round celluloid increments. These increments are often referred to as "chocolate drops" due to their similar shape. Each of these increments contains 100 grains of finely granulated double base powder.

A total of one ignition cartridge and a set of increments comprise the full propelling charge (720 grains of ballistite). The increments are held in the stabilizer assembly by small flanges on the fins and may be removed to adjust the propelling charge.

Zones of fire and range. This shell has seven zones of fire. The first zone of fire consists of the ignition cartridge. Zone seven consists of the ignition cartridge and six increments.

Zone one has a range of approximately 100 yards.

Zone seven has a range of approximately 3,300 yards.

Marking and packing. The shell body is painted olive drab lustreless with yellow stencil to indicate H.E. filler. The stenciling includes the following information: caliber of weapon, kind of filler, model number of shell, and ammunition lot number.

For storage, shipment, and issue this shell is packed as a complete assembled round with the fuze and propelling charge in place.

It is packed one round per individual fiber container, six containers per bundle. Weight of a full bundle is 59 pounds. It may also be packed one per individual fiber container, eight containers per wooden box. Weight of a full box is 91 pounds.

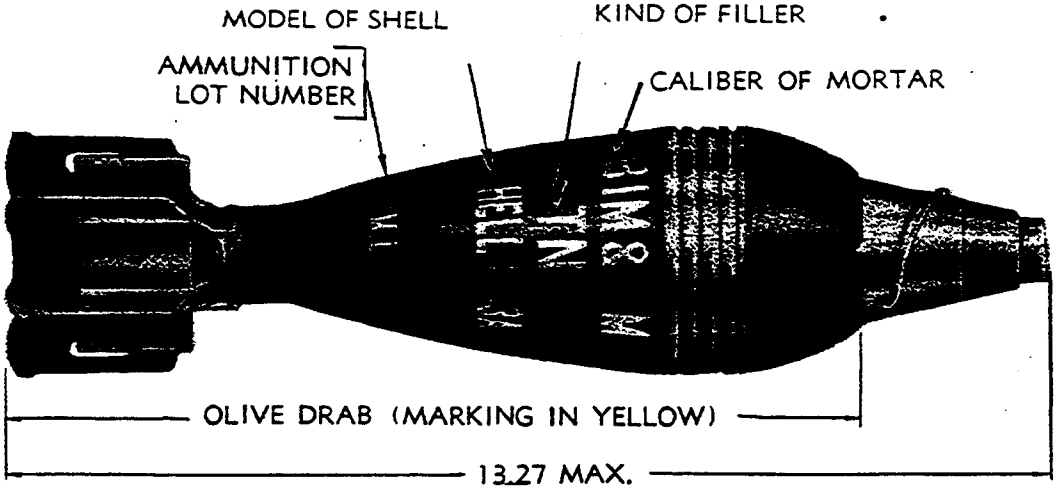
Individual fiber containers are sealed with adhesive tape. The color of the tape and stenciling indicate the type of the shell inside.

Metal plates are placed on the ends of each packing bundle. One plate gives the number of rounds contained in the bundle, the nomenclature of the rounds, the lot number, and initials of the loading plant. The plate at the opposite end gives the proper shipping name as listed in SNL R-4, the total weight of the loaded bundle, and cubic displacement.

Packing bundles are held together by a rod passing through the center of the bundle with a wing nut at the end. After assembling, each bundle is sealed with a wire and lead seal. If this seal has not been broken, the bundle may be considered as the original package, positively identified by the metal plates at the ends of the bundle and by the marking of the fiber container.

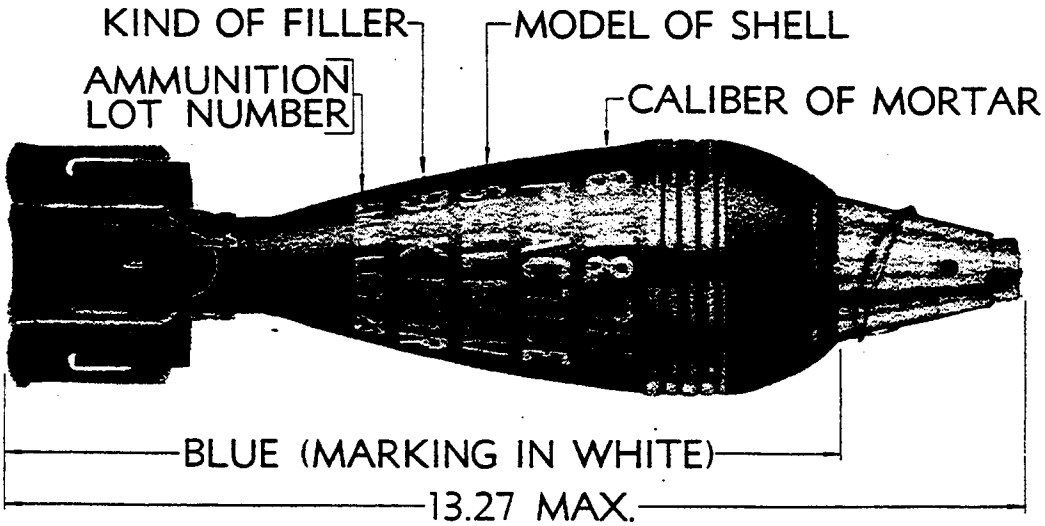
SHELL, H.E., M43A1. This shell was designed to replace SHELL, H.E., M43. It is standard for issue and manufacture (S & M), whereas the SHELL, H.E., M43, is standard for issue (S).

Shell body. The body, filler, adapter, and bakelite fuze well cup are exactly the same as in the M43. The fuze used is the Point-detonating Fuze M52, which has a superquick action. Due to the light



RA PD 7232B

Figure 110a — SHELL, H.E., M43A1, 81-mm Mortar



RA PD 7235A

Figure 110b — SHELL, Practice, M43A1, 81-mm Mortar

weight and blunt nose of this shell, very little penetration can be obtained. This shell, as the M43, is designed, therefore, to produce fragments as its primary function against personnel in the open and against barbed wire entanglements. Fragments to be effective must be above ground. The use of a superquick fuze to burst the shell above ground is therefore mandatory. For details in the functioning of the M52 P.D. Fuze, see page 298 to 300.

Fin assembly. The fin assembly is similar to that previously described. It differs in that the flanges on the fins for holding the propellent increments are omitted, as they are not necessary with the newer type increments. Later models, without any change in designation, have the hollow end threaded in the inside so as to receive the new percussion primer.

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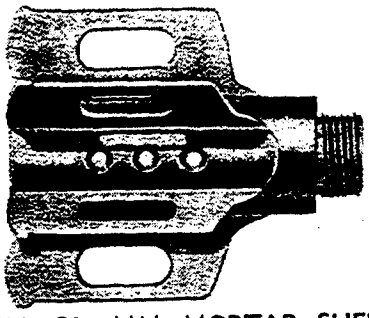
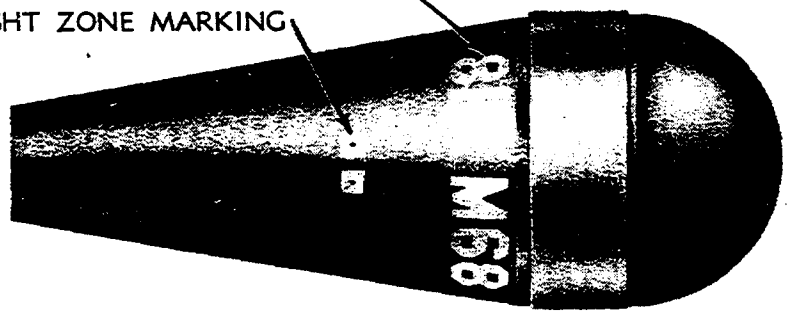
PRIMER, PERCUSSION, M33
AND
CARTRIDGE, IGNITION, M6

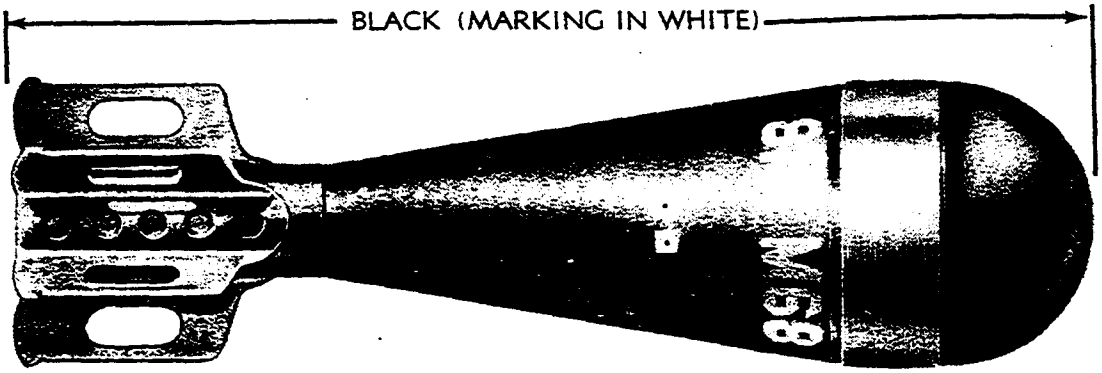


FIN, 81 - MM MORTAR SHELLS,
M43A1 AND M68



SHELL, TRAINING, M68, 81-MM MORTAR,
W/O FIN, IGNITION CARTRIDGE, AND PRIMER

A — COMPONENTS



B — ASSEMBLED

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Figure 110c — SHELL, Training, M68, 81-mm Mortar

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Ignition cartridge. The Ignition Cartridge M6, red, consists of a cardboard container having approximately 120 grains of double base powder. It supersedes the M3 red and differs from it in that the percussion primer is no longer part of the ignition cartridge but a separate component.

The percussion primer. The Percussion Primer M33 is a relatively new component. The percussion primer is contained in an aluminum head and is threaded so as to screw into the end of the cartridge container after the ignition cartridge has been inserted. The advantage of this type of percussion primer and ignition cartridge is that the whole assembly will leave the mortar with the shell whereas the older type ignition cartridge would, due to the force of setback, at times leave its brass head in the trench mortar weapon, fouling the firing pin and possibly causing a misfire in subsequent rounds.

Propellent increments. The Propellent Increment M1 consists of square strips of double base powder sewn together to form increments. Passing thru these increments will be found holes to increase the burning surface. These sheets are thin and flexible and will not crumple or break as did the old celluloid containers of double base powder used with the M43 Shell. Each increment has 117 grains of double base powder. Occasionally one corner edge of an increment will be cut away (notched) so as to bring the charge to the desired weight and specification. The increments are held in the stabilizer assembly by being placed diagonally in the holes of the fins.

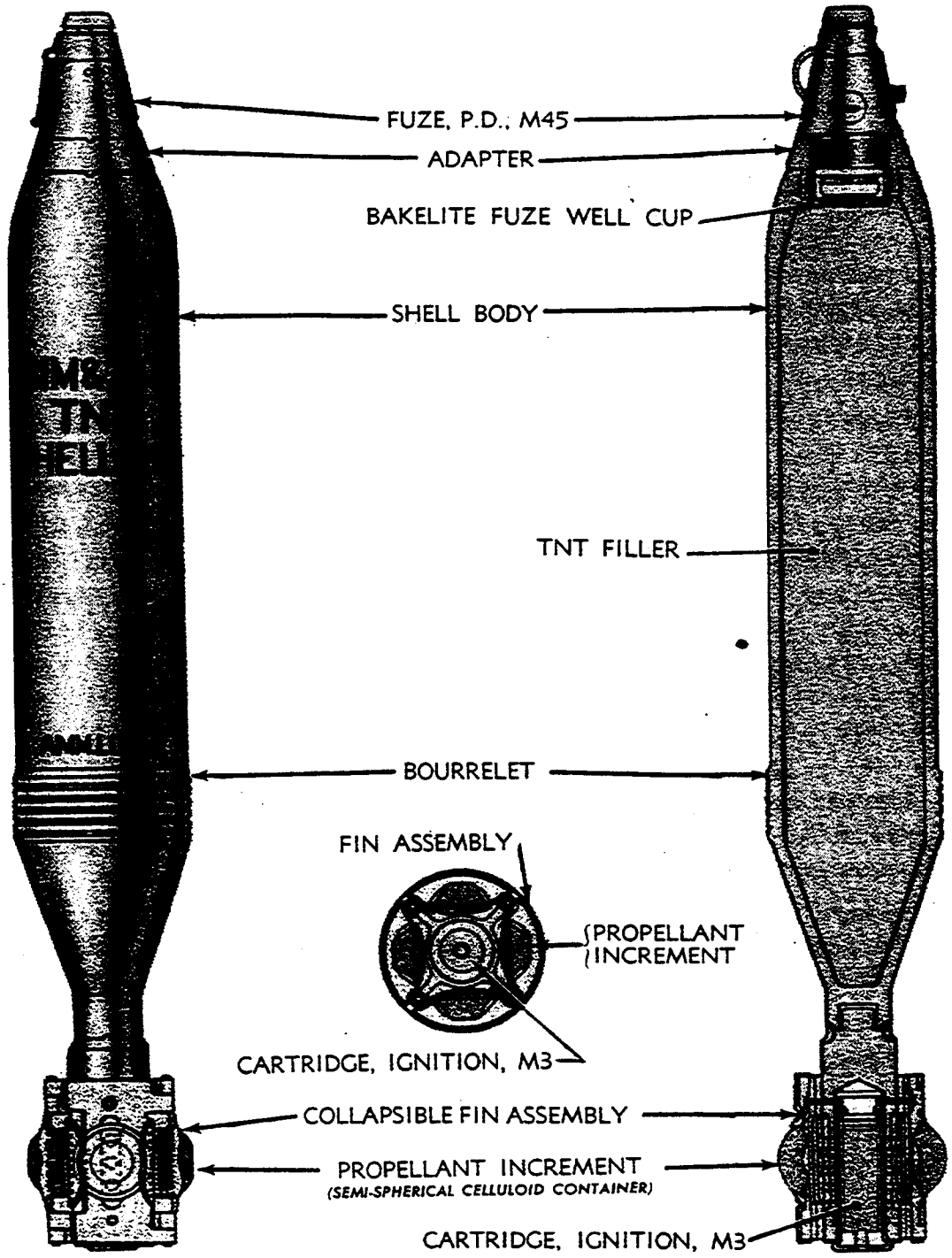
The percussion primer, ignition cartridge and six increments make up the full propelling charge of a total of 822 grains of powder. The increments may be removed to adjust the propelling charge.

Zone of fire and range. This shell has the same number of zones of fire and approximately the same range as described for SHELL, H.E., M43.

Marking and packing. The shell body is painted olive drab with yellow stencil. It is packed one per individual fiber container, six fiber containers per bundle, one bundle per wooden chocolate-stained crate for overseas shipment. The rounds are completely assembled, ready to fire.

SHELL, Practice, M43A1. SHELL, practice, M43A1, is similar to SHELL, H.E., M43A1. The shell body, components used, and packing are identical to the shell previously described. It differs in that the filler consists of 0.16 pound of black powder to act as a spotting charge, and 1.06 pounds of inert filler such as wax, talcum, or rosin which will not crack up in handling. The body is painted blue with white stencil to indicate a practice shell.

AMMUNITION INSPECTION GUIDE



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D–2

Figure 111 — SHELL, H.E., M45, 81-mm Mortar

SHELL, Practice, M44. This shell is used for practice firing in the 81-mm trench mortar weapon.

The body of the shell is made of cast iron and contains an inert filler. A small amount of black powder (0.20 pound) is placed below the fuze to give a spotting effect when the fuze functions. The body shape, size, and weight are identical to the M43 Shell. It has no adapter, however. The fuze screws directly into the nose of the shell.

The shell body is painted blue with white stencil and is packed in the same manner as SHELL, H.E. M43.

SHELL, H.E., M45. This shell is one of the early types adopted for use in the 81-mm mortar. At the present time, this shell is standard for issue but not standard for manufacture. The principal use of this shell is against dugouts, heavy barricades, and underground structures where a mining action is most effective.

Shell body. The body of this shell is constructed of forged steel. It is cylindrical in shape, having a tapered nose and tail. It has a bourrelet machined on the body near the tail which serves as a rear bearing surface and a gas check. There is no bourrelet at the front of the shell. The nose is threaded to receive an adapter.

The adapter is threaded to receive the fuze well cup and fuze. The use of an adapter bushing allows the shell to be loaded with less difficulty and also permits the use of the same fuze for the 81-mm and 60-mm shells. The fuze used is the P.D. M45 having a selective setting for either superquick or delay action. For details as to functioning of the M45 Fuze see pages 295 to 298. The base of the shell is closed and threaded so as to receive a stabilizer assembly. The shell filler is 4.48 pounds of TNT. The total weight of the completely assembled round is 15.10 pounds. The entire length of the shell is 23½ inches.

Fin assembly. The fin assembly consists of a machined cartridge container to which are attached collapsible fins. One end of the cartridge container is closed and threaded to be screwed on the body of the shell. The other end is machined and hollow inside to receive the ignition cartridge. Holes in the cartridge container act to lead the flame from the ignition cartridge to the propellent increments.

The propellent increments are held in place by the collapsible fins. The fins are always being forced into their open position by compressed springs. The fins are kept in position before firing by a small copper wire tied around them. The blast of the propelling charge shears the copper wire and permits the fins to open to a greater diameter than the shell body after it has cleared the muzzle of the weapon. This was designed to increase the stability of the shell by increasing the fin surface.

This type of fin assembly has not proved successful for several reasons:

During storage the springs which are always compressed will lose their tension or become set.

The fins, due to their size, are delicate and the blast of the propelling charge explosion will in many cases cause distortion.

Both of the above reasons tend to result in unstable flight and the purpose for which this stabilizer assembly was designed is defeated.

The ignition cartridge. The ignition cartridge is the M3 red previiously described.

The propellent increments. The propellant is in the form of half-round celluloid increments previously described.

A total of one ignition cartridge and four increments comprise the full propelling charge of 520 grains of double base powder.

The propelling charge may be adjusted to vary the range.

Zones of fire and range. This shell has five zones of fire. The first zone of fire consists of the ignition cartridge itself. Zone five consists of ignition cartridge and four increments.

Zone one has a range of approximately 100 yards.

Zone five has a range of approximately 1,275 yards.

Marking and packing. The shell body is painted olive drab lustreless with yellow stencil to indicate H.E. filler.

The shell is packed as complete and assembled rounds for storage, shipment, and issue in the following manner:

One per individual fiber container, three rounds per bundle, or one per individual fiber container, four rounds per wooden box.

SHELL, H.E., M56. This shell was developed to replace the H.E. Shell M45 and is standard for issue and manufacture (S & M). It is used against dugouts, barricades, and underground structures where a mining action is desired. This shell is a much more effective one than the M45 due to the fact that it contains approximately 40 percent explosive filler as compared to 30 percent explosive filler of the M45. The greater the percentage of explosive filler, without sacrificing the penetrating ability of the shell body, the more effective is the shell when used for mining effect.

The shell body. The shell body is constructed of forged steel. It is long and cylindrical in shape with a tapered nose and tail. It has a bourrelet machined on the body near the base of the shell which acts as a rear bearing surface and a gas check. There are three raised portions around the shell near the nose to act as a forward bearing surface. The nose is machined and threaded to receive an adapter. The adapter is threaded to receive a fuze well cup and fuze. The fuze used is the M53 P.D. which has a delay in action on impact. For mining effect, penetration of the target produces the most effective

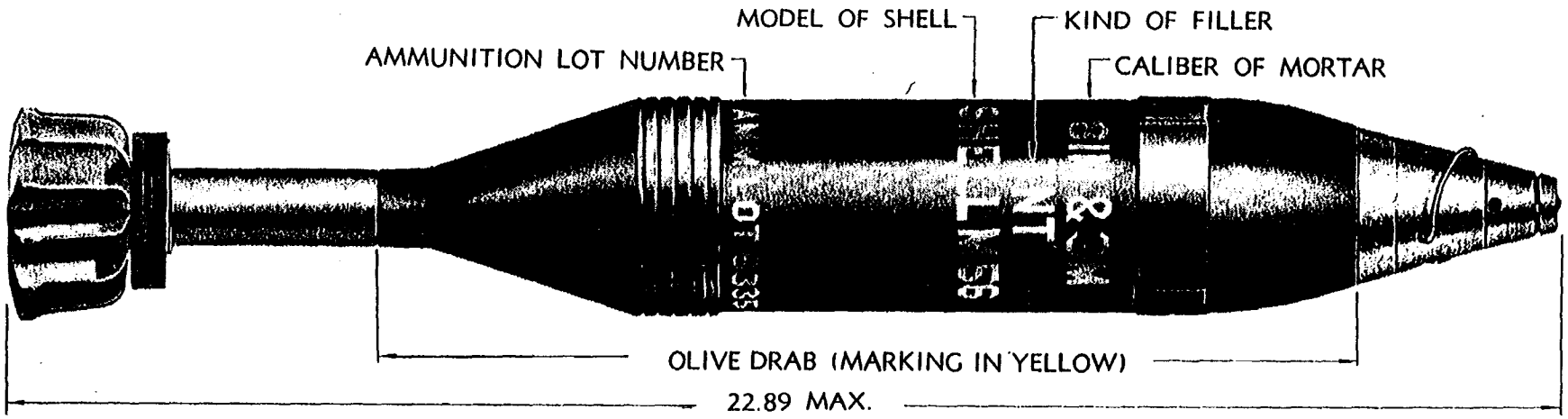

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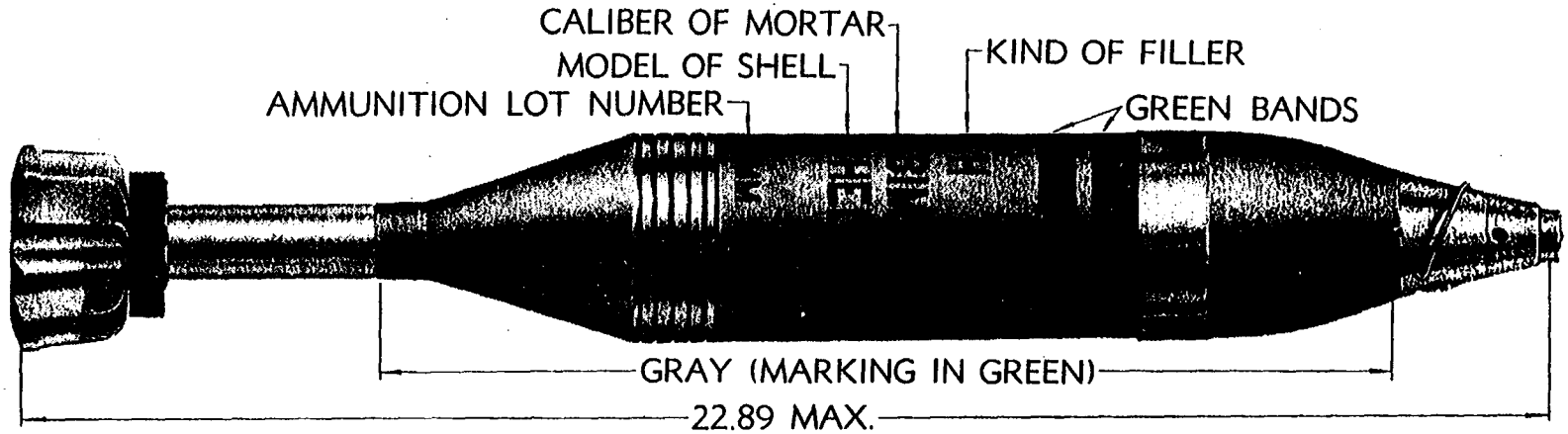
Figure 112 — SHELL, H.E., M56, 81-mm Mortar



RA PD 7231A

Figure 113 — SHELL, Gas, Persistent, H, M57, 81-mm Mortar

results. The use of a delay action fuze, therefore, to allow penetration is mandatory. For details of functioning of the M53 P.D. Fuze, see page 300 to 303. The base of the shell is closed, machined, and threaded to receive the stabilizer assembly. The shell filler consists of 4.31 pounds TNT. The weight of the completely assembled round is 10.77 pounds. The entire length of the shell with fuze assembled is 22.89 inches.

The fin assembly. The fin assembly consists of a long stem and cartridge container made of aluminum alloy. Having stationary fins formed at the open end of the cartridge container, the stem is closed and threaded so as to be screwed to the shell body. The cartridge container which is part of the same unit is hollow, machined, and threaded at the open end to receive the percussion primer. There are holes in the cartridge container near the fins so as to conduct the flames from the ignition cartridge to the propellent increments which fit around the cartridge container.

The ignition cartridge. The earlier shell of this model used the M3 Ignition Cartridge red. The later shell of the same model had the fin assembly threaded so as to receive the M6 Ignition Cartridge and percussion primer.

The percussion primer. The Percussion Primer M34 is of the same construction and shape as the M33 previously described except that it has a greater diameter.

The propellent increments. The Propellent Increment M2 is made up of thin square sheets of double base powder sewn together. A hole of the same diameter as the stem of the fin assembly is cut in the center of the increment and a slit runs to the outer edge so that the increments can be easily attached to the stem or removed to adjust the propelling charge. In the latest manufacture, however, the increments are held in place by a star shaped spring wire clip known as a propellent holder. Each increment has 205 grains of double base powder.

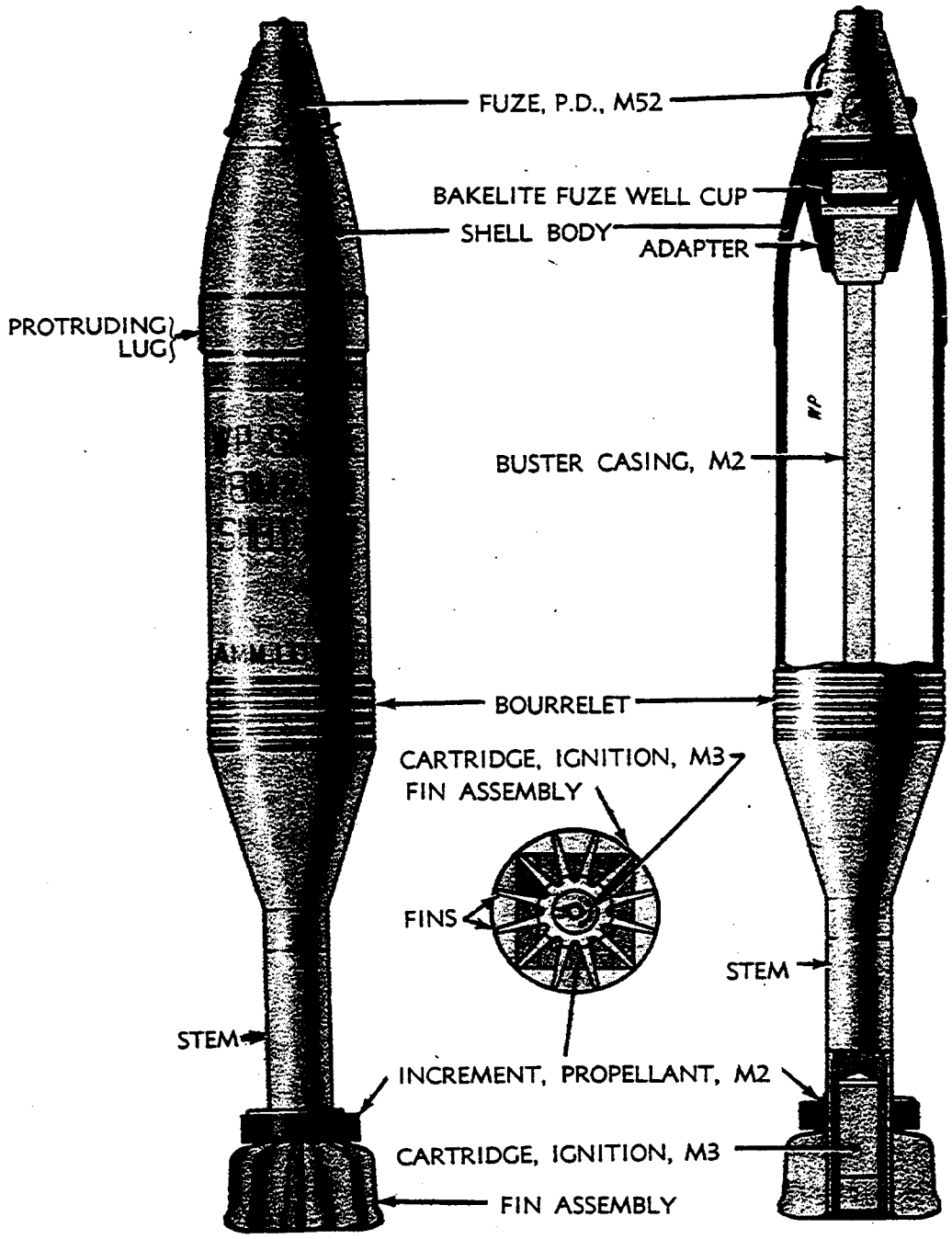
The percussion primer, ignition cartridge, and four increments comprise the field propelling charge; a total of 940 grains of powder.

Zone of fire and range. The shell has five zones of fire. The first zone of fire consists of the ignition cartridge and percussion primer; zone five consists of the ignition cartridge, percussion primer, and four propellent increments.

Zone one has a range of approximately 300 yards.

Zone five has a range of approximately 2,655 yards.

Marking and packing. The shell body is painted olive drab with yellow stencil. It is packed one per fiber container, three fiber containers per bundle, and one bundle per wooden crate for overseas shipment. The rounds are completely assembled ready for fire.



D–2

Figure 114 — SHELL, Chemical, M57, 81-mm Mortar

AMMUNITION INSPECTION GUIDE

SHELL, Chemical, M57. This shell is used for the placing of smoke screens and gas clouds with a secondary incendiary effect when WP is used as its chemical filler.

Shell body. In general construction, this shell body has the same outer characteristics as the High-explosive Shell M56. The nose of the shell is threaded to receive the type of adapter peculiar to chemical shell. The adapter is threaded internally to receive the Point-detonating Fuze M52 which has a superquick action. All chemical shell to produce efficient dispersion of filler must burst above ground. A superquick action fuze is therefore used to produce such action. For details, in function of the M52 P.D., see pages 298 to 300.

The chemical filler is loaded into the shell body, and then the burster casing is pressed in place. The head of the Burster Casing M2 is wider than the body of the burster casing and has a slight taper; when pressed into place in the adapter sleeve it forms a gas-tight seal and acts as a seat for the burster charge. A recess is machined in the base of the shell body internally so as to receive the end of the casing, preventing it from becoming loose due to the shock and jars incident to shipment. During the loading of the chemical filler and the pressing of the burster casing in place, there is no explosive charge present in the casing.

The Burster Charge M1 consists of tetryl pellets or tetrytol in a thin aluminum or cardboard cylinder. It is placed in the burster casing prior to the assembly of the fuze to the shell. This construction burster as compared to the old booster found in the 3-inch smoke shell is much more efficient. The explosive charge runs through the entire length of the shell and splits the shell from nose to tail upon function of the fuze, allowing for the dispersion of all the chemical filler in the shell. The old booster charge found in 3-inch smoke shell split the shell near the nose where the booster charge was located, and allowed a good deal of the chemical filler to remain in the base of the shell.

The fin assembly, ignition cartridge, propellent increments, and percussion primer are identical to those used with the High-explosive Shell M56.

Three chemical fillers are loaded at the present time; WP smoke, FS smoke, and H gas. The weight of the completely assembled round varies with the filler used. The weights of the various rounds are:

Filler	Weight of Filler (lb)	Weight of Completely Assembled Round (lb)
WP	4.04	11.50
FS	4.59	12.00
H	3.15	10.45

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The total length of the shell with the fuze assembled is 22.89 inches.

Marking and packing. Shell loaded with WP and FS are painted a blue-gray base color with yellow stencil and one yellow band to indicate a nonpersistant screening smoke filler. Shell loaded with H are painted a blue-gray base color with green stencil and two green bands indicate a persistant toxic filler.

Packing is the same as for M56 High-explosive Shell.

SHELL, Training, M68. The shell is designed to give the mortar crew training in loading the weapons and practice in firing under conditions which will not permit firing in more than the first zone.

Shell body. The body of the shell is cast iron. It is similar in shape to the light H.E. 81-mm shell which is tear-drop with a blunt nose and tapered tail. It has a bourrelet on the body near the nose to act as a forward bearing surface and gas check. At the tail end is a recess which is threaded to receive a stabilizer assembly. The nose end is closed and rounded with no provisions made to receive a fuze. Its weight varies depending on its weight zone. Nine weight zones are used with a minimum of 9.50 pounds for weight zone one, and a maximum of 10.10 pounds for weight zone nine, weighed without fin assembly and ignition cartridge.

The fin assembly and propelling charge. The fin assembly is of the same construction and shape as previously described. It receives the Ignition Cartridge M3. Several ignition cartridges are provided with each round so that the shell can be fired more than one time. There are no propellent increments used because the shell is designed to be fired in the first zone only. The maximum range is 350 yards.

Marking and packing. The shell is painted black with white stencil. On the shell body may be found a number of white squares (one to nine) with a prick punch mark in the center of each to indicate the zone weight.

Information as to the packing of the shell is not available at the present time. However the complete round comes in separate units consisting of shell body, ignition cartridge, and fin assembly.

TRENCH MORTAR FUZES.

General. The fuzes used with the 81-mm and the 60-mm mortar ammunition are, except for the 60-mm illuminating shell, of the point-detonating type. The stability of the shell in flight allows the use of this type of fuze. The M45 Fuze, first used on the M43, M44 and M45 Shells, is a point-detonating fuze having a selective feature which allows the fuze to be set for either superquick or delay action as desired. The superquick action is used for effect against light

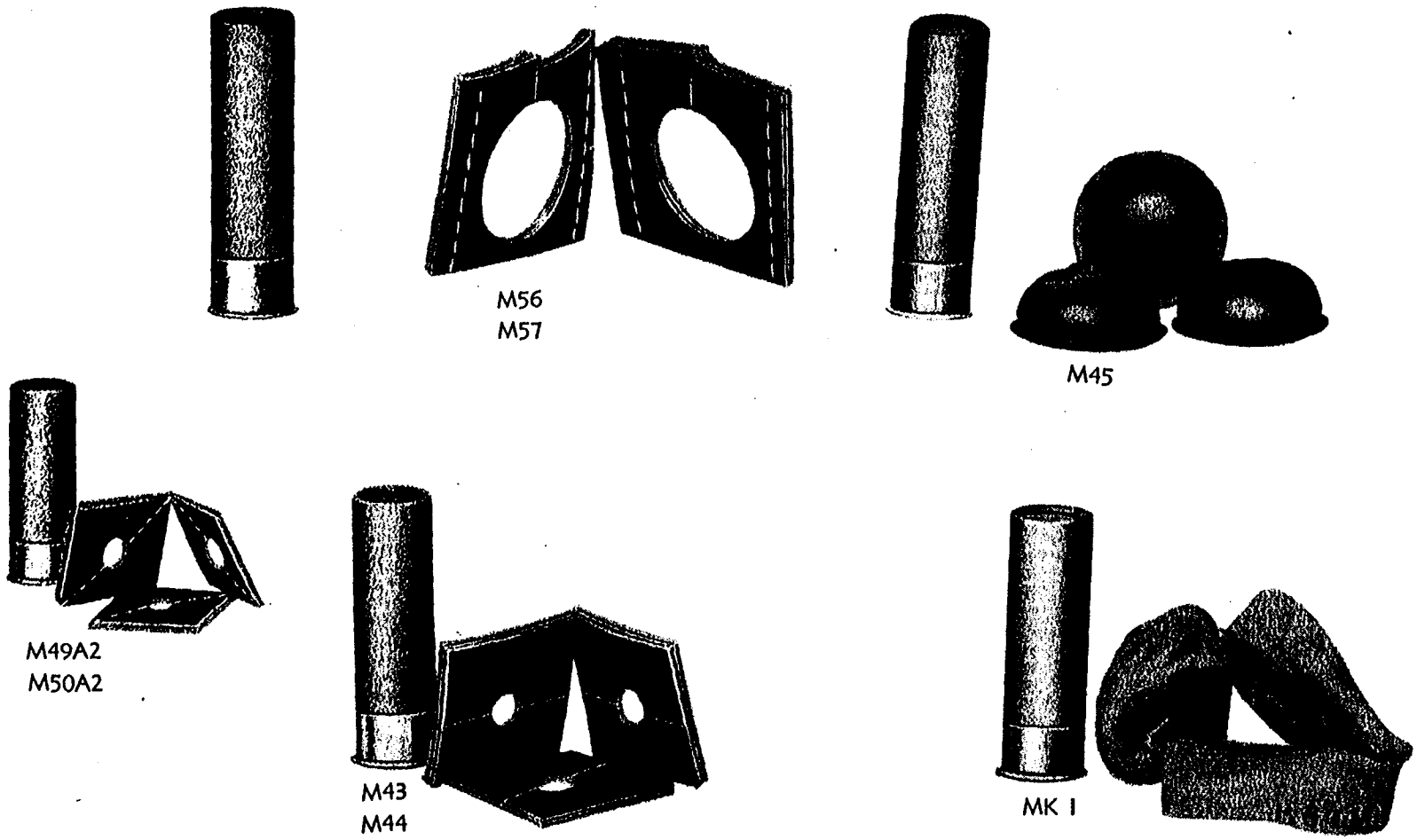

Figure 115 — Trench Mortar Propellants

RA PD 22903

targets above the ground where no penetration is necessary, and a fragmentation effect is desired such as against personnel and barbed wire entanglements. The delay action is used against heavy targets and underground structures where penetration is desired to produce the most effective mining and concussion results.

Recently it was decided that each shell could be classified as for use against light targets or as for use against heavy targets. Thus, a single action fuze could be definitely assigned to each shell according to its tactical use. All of the light shell (7 pounds or less) were classified for use against light targets, as very little penetration could be obtained due to their light weight and blunt construction. It is also to be noted that the percentage of explosive filler as compared to the percentage of metal components (approx. 17 percent) was designed to destroy the light shell so as to produce efficient fragments which can be effective only if distributed above ground. The M52 P.D. Superquick Fuze was also assigned to the Chemical Shell M57, as it is necessary to function the chemical shell above the ground to obtain the proper effects and dispersion to its chemical filler. All the heavy shell of the H.E. type were classified for use against heavy targets and for use where a mining effect was necessary. It is also to be noted here that the percentage of explosive filler as compared to the percentage of metal components (approx. 40 percent) was designed to produce an efficient mining or concussion result with heavy shell which would be most effective if allowed to penetrate its target and then explode. The M53 P.D. Delay Action Fuze was assigned to these shell.

The M45 P.D. Selective Fuze was declared limited standard (S). It was a waste of one element to use a selective fuze on trench mortar shell, because it was known before the shell ever reached the firing point what action fuze was desired. The M52 P.D. superquick and the M53 P.D. delay are standard for issue and manufacture (S & M). It is interesting to note that the subdivision of a selective fuze into two separate fuzes is in definite opposition to the trend in artillery fuze design where the tendency is to combine two fuzes into one selective or combination fuze. This is true because in artillery fuzes the action desired varies with the condition at the field of battle.

Rounds used with these fuzes may be considered boresafe. The detonating elements are positively separated from the booster until the projectile has left the bore of the mortar. The fuzes are assembled to their respective shell and stacked in place. They are, therefore, being stored, shipped, and issued as a permanent part of the complete round. Each fuze is stamped with its model number, manufacturer's initials, and lot number for positive identification. The M45 can be obtained in a practice type. It has a black powder charge in place of a tetryl booster charge, and is designated as a point practice

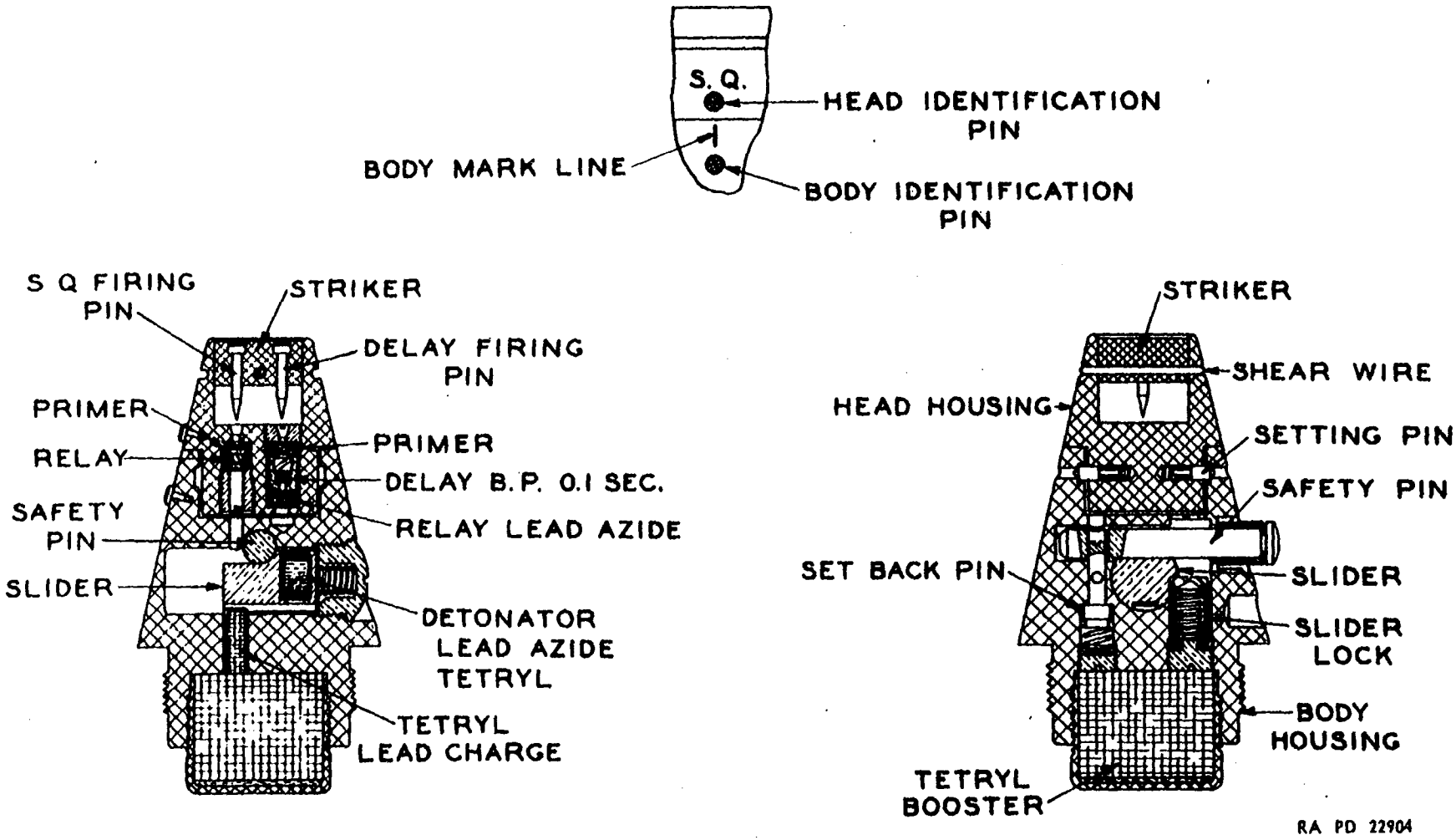

Figure 116 — FUZE, P.D., M45

fuze. The head is painted blue, and "Fuze, Point, M45, Practice" is stamped on the body.

Point-detonating Fuze M45.

Description. The M45 Point-detonating Fuze is a selective, superquick, and delay action fuze, used to effect functioning of SHELL, H.E. M45, fired from the 81-mm trench mortar. This shell and fuze are now limited standard. The superquick setting is used when it is desired to obtain fragmentation of the shell above the ground, whereas the delay setting is used for underground action. The fuze weighs approximately 0.52 pounds.

The fuze housing is made of aluminum. The head of the fuze fits into the body so as to be able to turn on the body housing. The head houses a comparatively short, but wide, striker which is flush with the nose. The striker has two firing pins and is held in place by a shear wire. Underneath the firing pins is a superquick element and a delay element. One element is directly in line with a flash hole to the body explosive charges, and the other element is in line with a dead flash hole depending on the setting. Located in the head are setting pins and setting pin springs which when in proper position for either delay or superquick setting will engage recesses in the body. On the external surface of the head are stamped "S.Q.," or "D," to indicate the setting. The body houses the slider, slider lock, safety pin, and set-back pin, with their respective springs. In the center and at the base of the body is an inverted brass cup known as a lead cup. It is held in place by crimping, and contains a tetryl lead pellet. The base of the body is internally threaded to receive a booster cup, which in turn houses a tetryl booster pellet. On the external surface of the body is a marked line and an identification pin which indicates the setting.

Setting. When set for superquick action the head is set so that the "S.Q." stamped thereon is in line with the line on the body. Identification pins are provided for setting at night. These pins are so located that for superquick setting the heads of the pins are directly in line and for delay setting, they are 180 degrees removed. Pressure applied on the setting pin by the setting pin springs forces them to engage in recesses in the body at the exact position of "S.Q.," and "D" so as to restrain the head in proper position.

Safety features. The M45 Fuze is boresafe. This is accomplished by assembling the detonator into a slider which in the armed position holds the detonator out of alinement with the explosive train. Arming of the slider in the bore of the mortar is prevented by a safety pin, the head of which bears against the bore, thereby retaining the slider in the safe position. To prevent arming of the set-back pin, which holds the safety pin in position, a cotter pin is utilized, preventing

the set-back pin from moving rearward against its spring during handling.

Function when set for superquick action. The cotter pin is removed, freeing the set-back pin. The shell is dropped down the bore of the weapon. The force of set-back resulting from ignition of the propelling charge causes the set-back pin to move down against the set-back pin spring, freeing the safety pin. The safety pin, due to the action of the safety pin spring, is forced out of the fuze until its head comes in contact with the bore of the mortar. After emerging from the mortar the safety pin is completely ejected by its spring from the fuze. The slider is now free, and due to the action of the slider spring is forced into the armed position, thereby bringing its detonator in direct alinement with the explosive train. The slider also serves to close the hole left by the safety pin, so as to prevent the entrance of mud or dirt into the slider cavity which might interfere with the fuze functioning. The slider is locked in the armed position by a slider lock which is forced up into a recess in the slider by a slider lock spring.

Upon impact with the target the striker is forced inward, breaking the shear wire and carrying both firing pins into their respective elements. The superquick firing pin ignites a primer which in turn ignites a lead azide relay charge. The lead azide relay detonates, and sends a wave to the detonator charge of lead azide and tetryl in the slider. The wave from the detonator functions the lead charge of tetryl. The wave from the lead charge of tetryl detonates the booster of tetryl which amplifies the wave and sends it to the shell filler. Simultaneously with the above action, the delay firing pin functions its primer. If the superquick action functions properly, the delay action will proceed no farther. If the superquick fails to function, the primer will ignite a black powder pellet which will burn for 0.1 second. The flame from the black powder delay pellet in turn will set off a relay of lead azide which will detonate and carry a wave into a blank flash hole where it will be stopped and will proceed no farther.

Function on delay. The head must be turned so that the "D" stamped thereon is in line with the mark line on the body. By means of setting the head as described, the delay element is brought into alinement with the flash hole and the superquick primer is 180 degrees removed. The fuze function is exactly the same until action on impact.

Upon impact the striker is forced inward, breaking the shear wire, carrying both firing pins into their respective elements. The superquick firing pin ignites its primer which in turn sets off a relay of lead azide. The wave produced passes into a blank flash hole and proceeds no farther. Simultaneously with the above action, the delay firing pin functions its primer. The flash from the primer ignites a

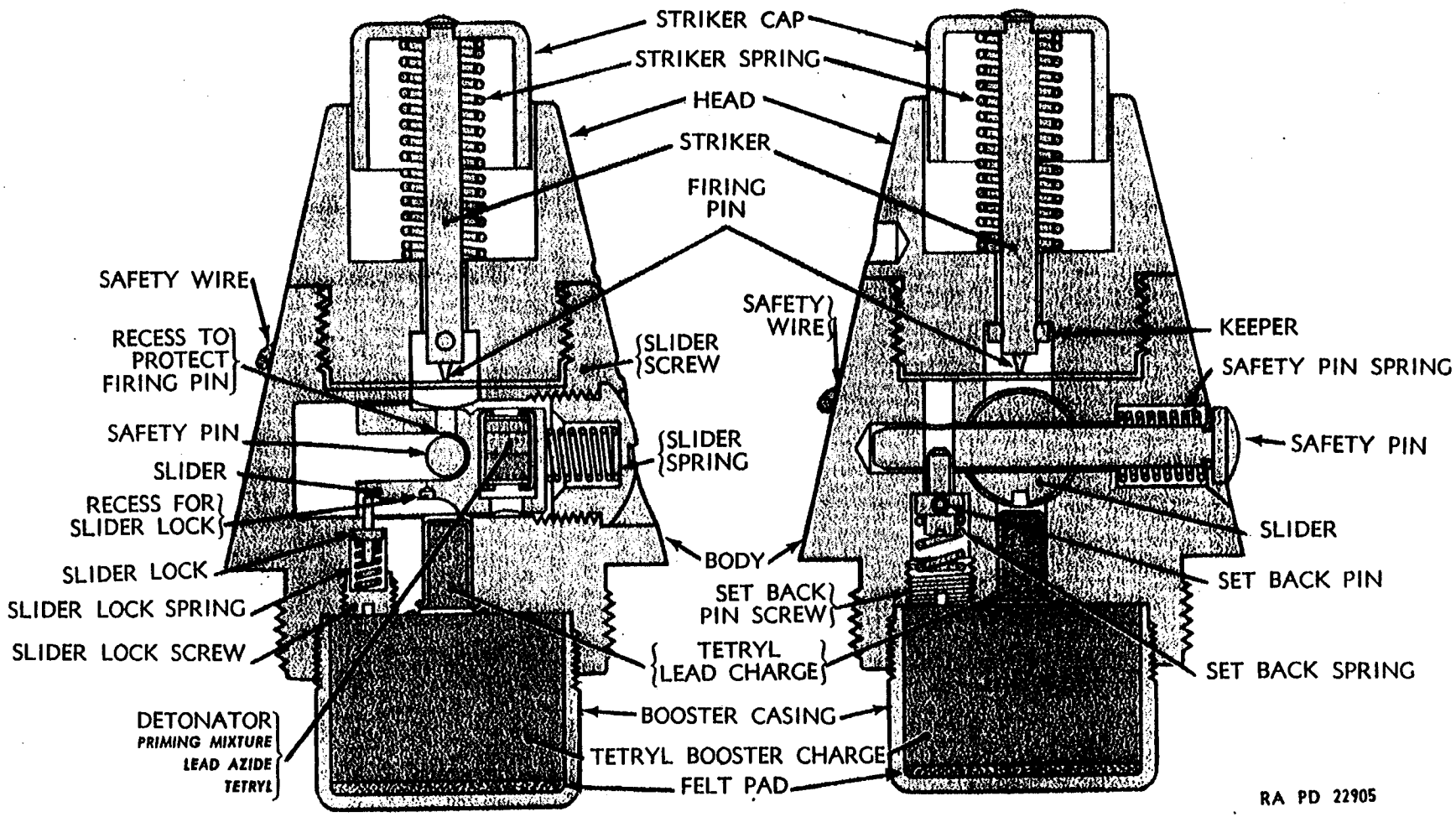

Figure 117 — FUZE, P.D., M52

black powder delay pellet which burns for 0.1 second. The delay pellet ignites a relay of lead azide which detonates, and in turn sets off the detonator charge of lead azide and tetryl located in the slider. The wave from the detonator functions the lead charge of tetryl which detonates, and functions the booster of tetryl. The booster charge amplifies the wave and sends it to the shell filler.

Point-detonating Fuze M52.

Description. The M52 Fuze is a superquick fuze used to effect the functioning of rounds fired from the 81-mm and 60-mm mortars. It is normally used with light shell when fragmentation above the ground is desired. This fuze will fit any of the present "M" series of shell; however, it is only assembled in the following shell at present:

M43A1 H.E. for 81-mm T.M.	M57 Chemical for 81-mm T.M.
M43A1 Practice for 81-mm T.M.	M49A2 H.E. for 60-mm T.M.
M44 Practice for 81-mm T.M.	M50A2 Practice for 60-mm T.M.

The weight of the fuze is 0.45 pound.

The fuze housing is made of aluminum. The head of the fuze screws into the body. The head houses a long protruding striker and a compressed restraining spring. The striker and restraining spring are held in place by a keeper. The body houses the slider, slider lock, safety pin, and set-back pin, with their respective springs. In the center and at the base of the body is an inverted cup known as a lead cup. It is held in place by crimping and contains a tetryl lead pellet. The base of the body is internally threaded to receive a booster cup which in turn houses a tetryl booster pellet. The slider carries a detonator and a blank flash hole to receive and protect the firing pin from shocks due to handling and set-back action.

Safety features. The safety features correspond to the M45. The M52 Fuze is boresafe. This is accomplished by the assembling of the detonator into a slider which in the unarmed position holds the detonator out of alinement with the firing pin and the tetryl lead charge. Arming of the slider within the bore of the weapon is prevented by the safety pin, the head of which bears against the bore and retains the slider in the unarmed position. To prevent arming of the set-back pin, which holds the safety pin in position, a cotter pin (safety wire in later manufacture) is utilized.

Function. This fuze is armed in the same manner as the M45. The cotter pin or safety wire is removed to free the set-back pin. The shell is dropped down the bore of the weapon. The force of set-back resulting from ignition of the propelling charge causes the set-back pin to move rearward against its spring. This frees the safety pin.

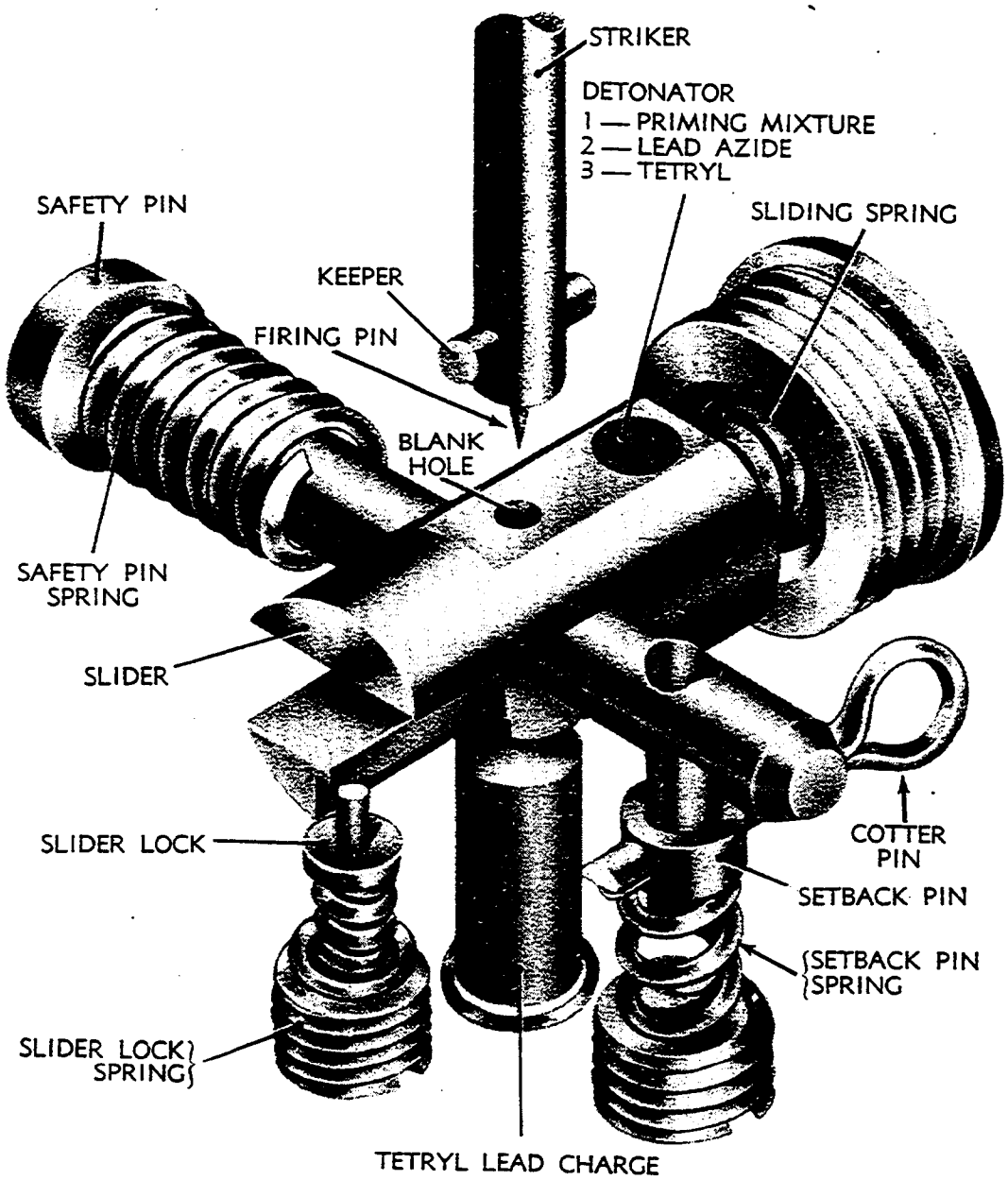

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Figure 118 — Working Parts for FUZE, P.D., M52

The safety pin, due to the action of its spring, is forced out of the fuze until its head comes in contact with the bore of the mortar. After emerging from the mortar, the safety pin is completely ejected by its spring from the fuze. The slider is now free, and due to the action of the slider spring, is forced into the armed position, thereby bringing the detonator in direct alinement with the explosive train. The slider also serves to close the hole left by the safety pin, so as to prevent the entrance of mud or dirt into the slider cavity which might interfere with the fuze functioning. The slider is locked in the

D–2

armed position by a slider lock which is forced into a recess in the slider by a slider lock spring.

Upon impact with the target, the striker is forced inward against its spring bringing the firing pin into the detonator charge of priming mixture, lead azide, and tetryl. The wave produced functions the lead charge of tetryl which in turn detonates the booster of tetryl. The booster charge amplifies the wave and sends it to the shell filler.

Point-detonating Fuze M52B1. This fuze differs from the M52 in that the body and head housing are made of bakelite instead of aluminum as the M52. In all other respects, it is identical to the M52 Fuze.

Point-detonating Fuze M52B2. This fuze differs from the M52 in that the body housing is made of bakelite, but the head housing is made of aluminum alloy. In all other respects, it is identical to the M52 Fuze.

Point-detonating Fuze M53.

Description. The M53 Fuze is a delay fuze used to effect the functioning of rounds fired from the 81-mm trench mortar. It is normally used with heavy shell where penetration is desired. This fuze will fit any of the "M" series of shell; however, it is only authorized to be assembled in the H.E. Shell M56 for 81-mm mortars. The weight of the fuze is 0.45 pound.

The fuze housing is made of aluminum. The head of the fuze screws into the fuze body. The head houses a comparatively short striker which is flush with the nose of the fuze. The striker is held in place by a shear wire. The head is internally threaded at the base to receive a delay assembly. The delay assembly houses a primer, delay pellet of black powder and a relay of lead azide. The body houses the slider, slider lock, safety pin, and set-back pin, with their respective springs. In the center and at the base of the body is an inverted brass cup known as a lead cup. It is held in place by crimping and contains a tetryl lead pellet. The base of the body is internally threaded to receive a booster cup which in turn houses a tetryl booster pellet.

Safety features. The safety features correspond to the M45 and M52 P.D. Fuzes previously described. The M53 is boresafe. This is accomplished by the assembling of the detonator into a slider which in the unarmed position holds the detonator out of alinement with the relay charge of lead azide and the lead charge of tetryl. Arming of the slider within the bore of the weapon is prevented by the safety pin, the head of which bears against the bore, thereby retaining the slider in the unarmed position. A set-back pin is used to hold the safety pin in position until set-back action occurs. To prevent arming of the set-back pin, a cotter pin (safety wire in later manufacture)

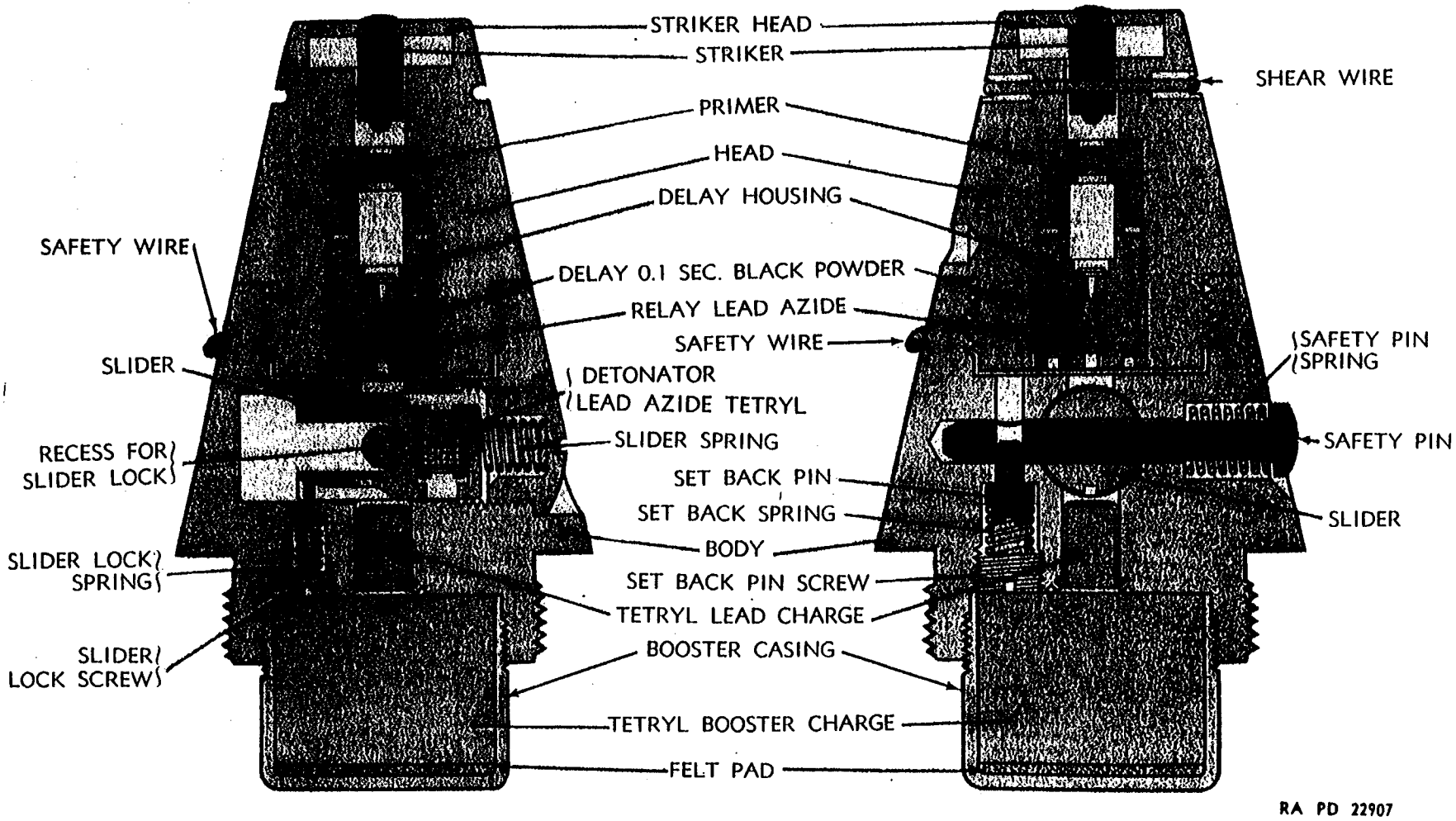

Figure 119 — FUZE, P.D., M53

105-MM AA GUN AND HOWITZER COMPLETE ROUNDS

Complete Round	Status	Projectile	Filler	Fuze	Booster	Cartridge Case	Primer	Weapon	Class
Shell, H.E., M38	S	M38	TNT	M.T. M2	.....	M6	M1B1A2	Gun	Fixed
Shell, H.E., M38A1	S&M	M38A1	TNT	M43 (all mod.)	M20	M6	M1B1A2	Gun	Fixed
Shell, Prac., M38	S	M38	Inert	M2	.....	M6	M1B1A2	Gun	Fixed
Shell, Prac., M38A1	S&M	M38A1	Inert	M43 (all mod.)	M20	M6	M1B1A2	Gun	Fixed
Cart., Drill, M8	S	Cast Bronze	.....	M44A2	.....	Cast Bronze	Inert	Gun	.....
Cart., Drill, M11	S&M	Cast Bronze	.....	T23	.....	Cast Bronze	Inert	Gun	.....
Shell, H.E., M1	.....	M1	TNT	M48 M54	M20	M14	M1B1A2	How.	Semifixed
Shell, Chem. B.E., M84	S&M	M84	H.C. Mixture	M54	.....	M14	M1B1A2	How.	Semifixed
Shell, Chem., M60	S S S&M	M60	F.S. W.P. H.S.	M57	M22	M14	M1B1A2	How.	Semifixed
Shell, H.E., AT, M67	S&M	M67	50/50 Pentolite	M62	.....	M14	M1B1A2	How.	Semifixed
Cart., Drill, M14	S&M	Cast Bronze	.....	M59 Dummy M54 Inert	.....	M14	Dummy M1B1A1	How.	Semifixed
Blank Ammunition	S&M	.....	Black Powder	.....	.....	M15	Mk. II	How.	.....

Round. The components are the same as those in the high-explosive rounds.

CARTRIDGE, Drill, M8 (S) and M11 (S&M).

General. These drill rounds are similar in make-up to other drill rounds previously discussed, and they serve the same purpose. The T23 Dummy Fuze is used on the M11 Round while the M44A2 is used on the M8.

Packing. 105-mm AA gun ammunition is packed 1 round per fiber container, 2 rounds per box.

AMMUNITION FOR 105-MM HOWITZERS.

General. Three different types of howitzers are provided in the 105-mm caliber. Their difference lies in the function they are designed to perform, and in the carriage mount which equips them to fulfill that function. The light field howitzer, mounted on a split-trail type of carriage and towed behind a prime mover, is designed to meet the traditional demand of the artillery. It is designed to provide the infantry with necessary cover and support. The same weapon mounted on a full track chassis similar to that of the medium tank, will perform essentially the same job as the tank itself and, because of its lighter weight, it will have important advantages over the tank. These 105-mm howitzers are provided in two models: the "Limited Standard," M2, and the "Standard," M2A1, which are interchangeable and differ only slightly.

The third type is the recently developed, M3 Airborne Howitzer. It is naturally lighter, and complete rounds are not interchangeable between the M3 and the other howitzers.

All ammunition provided for the 105-mm howitzer is of the semi-fixed class.

Types of ammunition provided for the 105-mm howitzer are:
High-explosive
High-explosive, antitank (H.E., A.T.)
Chemical
Drill
Blank

Fuzes. Fuzes used may be listed as follows:
M48, P.D., selective, S.Q. and short delay
M54, combination, time and superquick
M57, P.D., superquick
M62, base-detonating
All of the above fuzes have been completely discussed with 75-mm gun ammunition components.

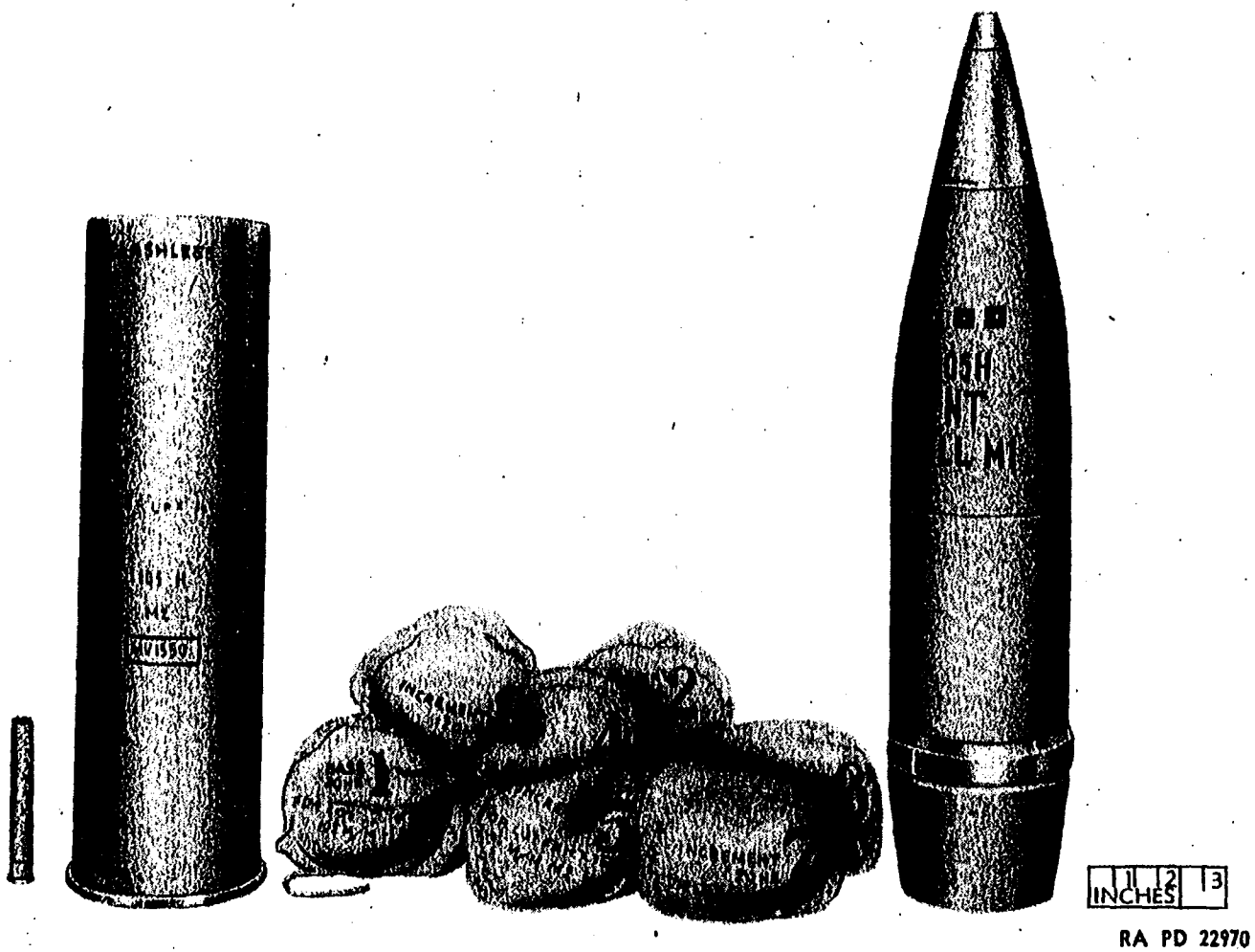

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Figure 187 — Components of a Complete Round of Semifixed Ammunition (7 Zone Charges)

ARTILLERY AMMUNITION

Boosters. The M20 (or M20A1) Booster is used in the H.E. rounds with the M48 or M54 Fuzes. The M22 is used in conjunction with the M5 Burster for the 105-mm Chemical Shell M60. The M22 is similar in size and outward shape. It differs in that a detonator of lead azide and tetryl is located in the body of the booster in line with the central flash channel of the fuze. As rounds assembled with this booster are not boresafe, the use of this booster will be restricted to chemical shell. The Burster M5 is similar to that in 75-mm chemical ammunition, except, naturally, for the fact that it is much larger. The burster charge is 1,331 grains of tetryl or tetrytol.

Cartridge Case. The standard case used with 105-mm howitzer ammunition is the M14, type I. This case is 14.64 inches long and weighs 5.9 pounds. It is made of brass. The type II case has a slightly smaller mouth, and was used in the ROUND H.E., AT, M67. M14 Cartridge Cases are designed to seat the M1B1A2 100-grain, Percussion Primer, and are found with and without screw eyes in the head to fasten the propelling charge. A retainer disc is used on cases that do not have screw eyes.

Propelling Charge. The smokeless powder used is FNH. It is inserted in seven increments, each in a cloth bag. Seven zones of fire result from the base and increment type of charge. The increments are of unequal weight and are, therefore, not interchangeable.

The propelling charge for rounds to be fired from the M3 Airborne Howitzer consists of a reduced charge which includes only a base and four increments, allowing five zones of fire. This difference makes the complete rounds for this weapon not interchangeable with those provided for other 105-mm howitzers.

The base charge (No. 1) and increment(No. 2)have a doughnut shape which enables the primer to fit up into the charge. When the retainer disc is used, it is sewn to the base charge and is then forced over the primer, holding the propelling charge firmly in the case.

Primer. 105-mm howitzer ammunition is provided with the M1B1A2 100-grain Percussion Primer exclusively. This primer is discussed in detail with 75-mm ammunition.

SHELL, Semifixed, H.E., M1.

General. The H.E. Shell M1 is issued to the using arms as a fuzed complete round, weighing 42.07 pounds.

Projectile. The M1 Projectile is of forged steel construction, streamlined in shape with a boat-tail base, and is adapted for a fuze that continues the contour. It has a steel base plate and a 0.81-inch rotating band of gilding metal. Provision is made for a 4.8-pound H.E. filler.

Components. A complete round of M1 H.E. Ammunition consists of a loaded and fuzed (M48 or M54 Fuze) projectile loosely attached

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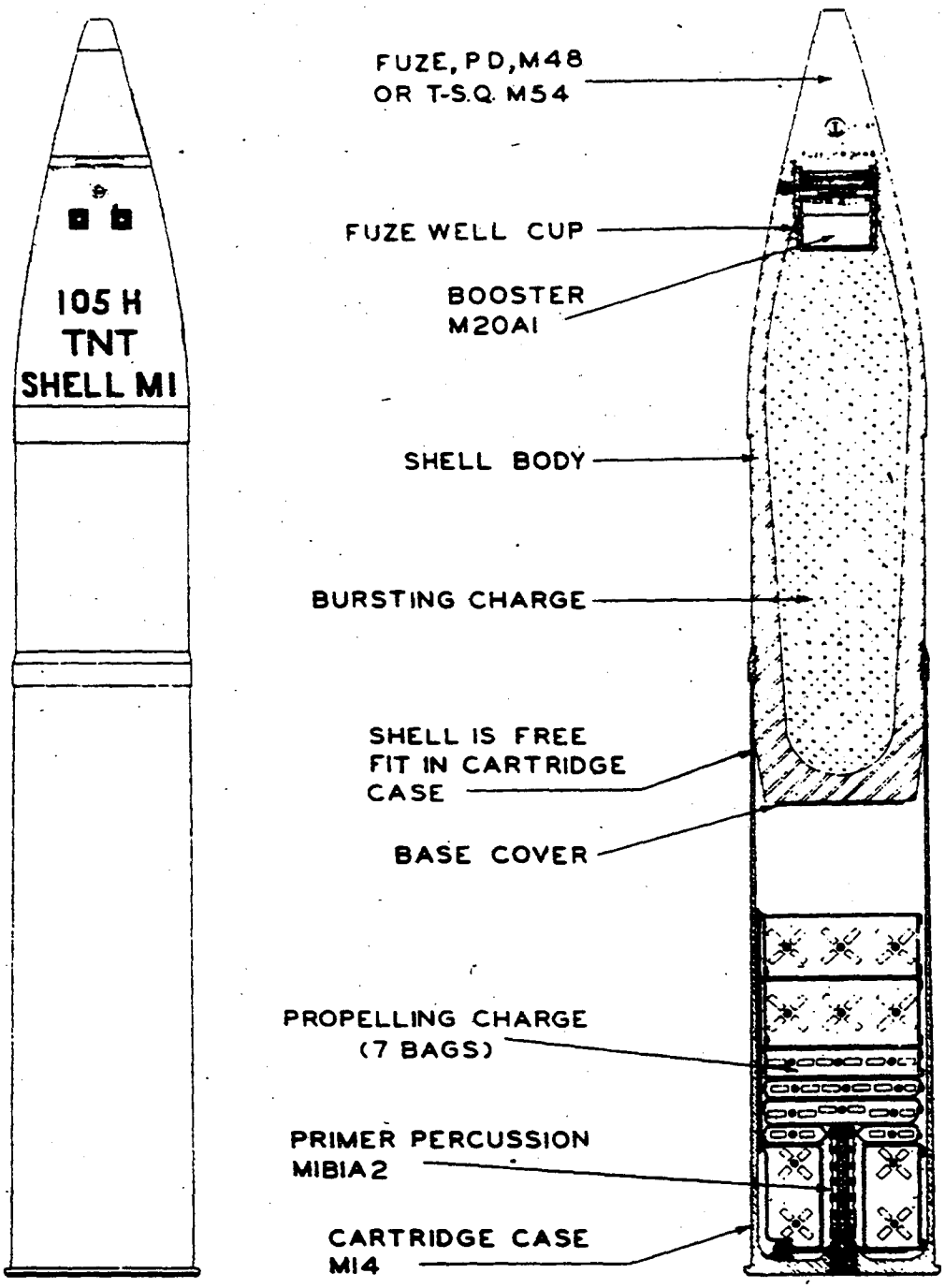

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Figure 188 — SHELL, H.E., 105-mm, M1

to the M14 Cartridge Case with its 3-pound bag of propelling charge (7 zones) of FNH powder and an M1B1A2 Primer. If fired in the M3 Airborne Weapon, the reduced propelling charge will consist of a base and four increments.

SHELL, Semifixed, Chemical, M60.

General. There are three types of fillers for the Chemical Shell M60. These fillers are H (mustard), FS (smoke), and WP (smoke). Of the three fillers, only shell filled with H are classed as "Standard," the FS and WP filled shell being made "Substitute Standard" because of the standardization of the base-ejection type Smoke Shell M84.

Projectile. The M60 Projectile is of forged steel construction with the same general shape and size as the M1 H.E. Projectile. The body is actually 1 inch shorter, but the adapter that is necessary to hold the burster brings the length up to 19.33 inches, the same length as the M1. This projectile has no base plate. The rotating band, radius of ogive, and boat-tail base are the same in both rounds. The loaded weight of rounds varies with the filler: 37.77 pounds with H, 34.7 with WP, and 35.21 pounds with FS. The projectile has provisions for the M5 Burster which consists of the Burster Casing M5, and the Burster Charge M5.

Components. A complete round of M60 Chemical Ammunition consists of a loaded and fuzed (P.D. M57 Fuze with M22 Booster) projectile loosely attached to an M14 Cartridge Case with its propelling charge of seven increments of FNH powder and an M1B1A2 Primer. The Burster M5 consists of 1,331 grains of tetryl pressed in pellets. The fillers are found in the following quantities: H—3.17 pounds; WP—4.06 pounds; FS—4.61 pounds.

SHELL, Semifixed, Smoke, B.E., M84.

General. Two factors contributed to the adoption of the M84 base-ejection type of smoke shell in place of the M60 Smoke Shell. The first was the failure of the M60 to satisfy the requirements of the using arms for a screening smoke producer, and the second was the successful development and use of the base-ejection type by the British in their 25-pounder gun.

The general effect of the M60 Smoke Shell, with its superquick type of impact fuze and a burster charge of high explosive to disperse the chemical agent, is to create a large cloud of dense white smoke, most of which, due to the heat evolved, rises rapidly so that only a small percentage of the total remains to produce screening effect. This tendency to form a mushroom-shaped pillar of smoke is obviously unsatisfactory.

The British developed a base-ejection type of smoke shell similar to the ordinary star shell (illuminating projectile). It is fitted with

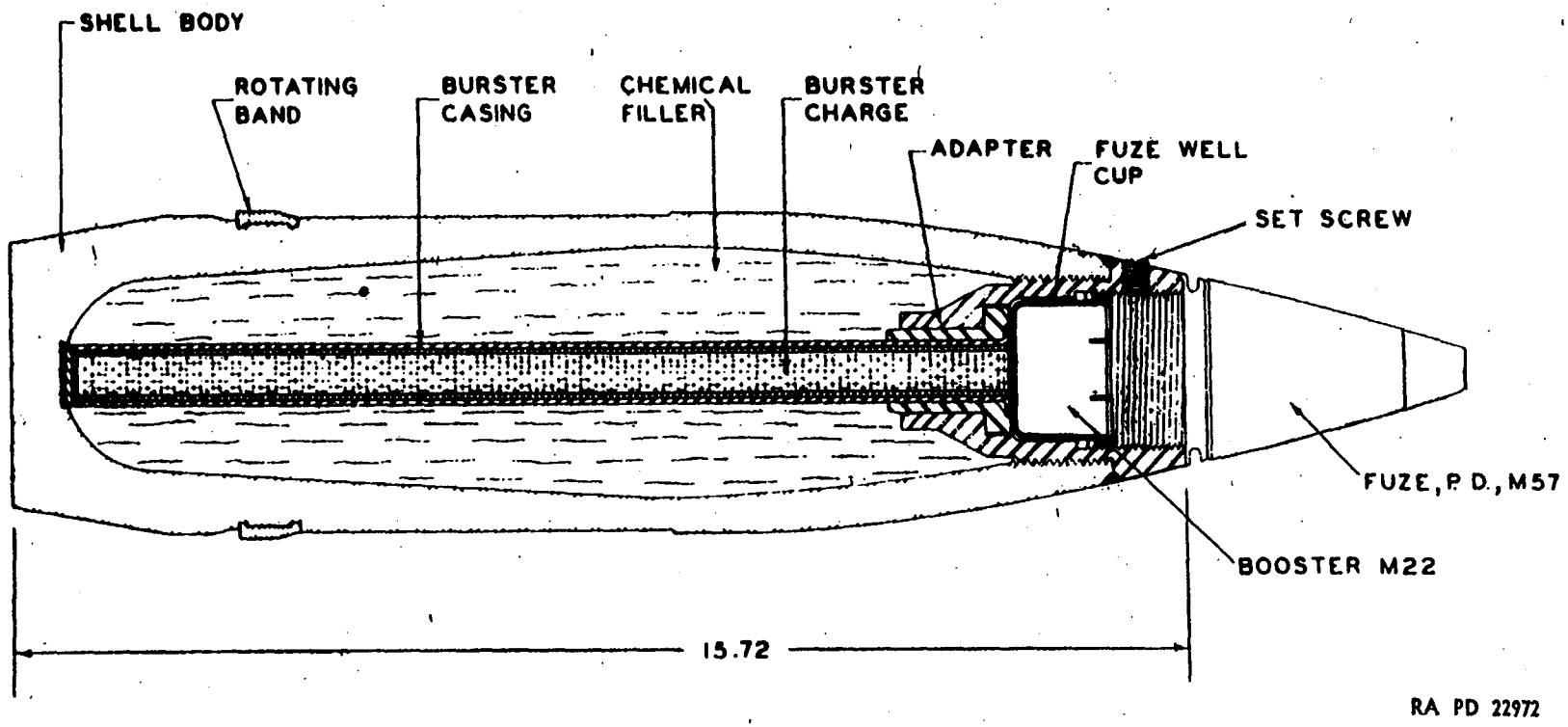
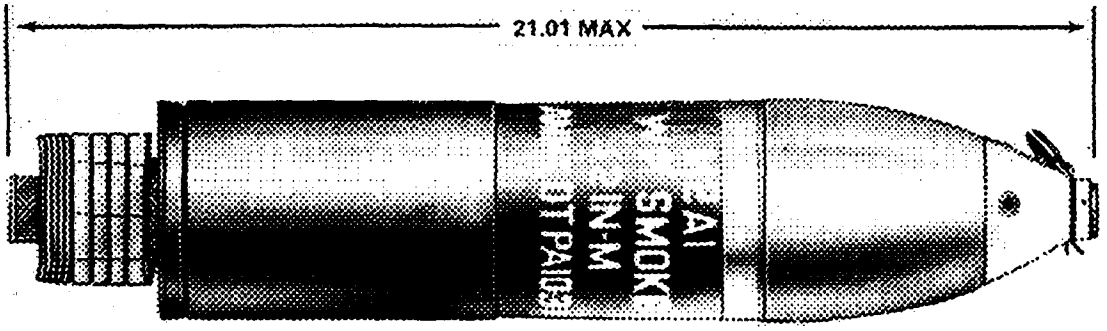


Figure 189 — SHELL, Chemical, 105-mm, M60

CARTRIDGE, 4.2-INCH: SMOKE, PWP OR WP, M2A1 & M2



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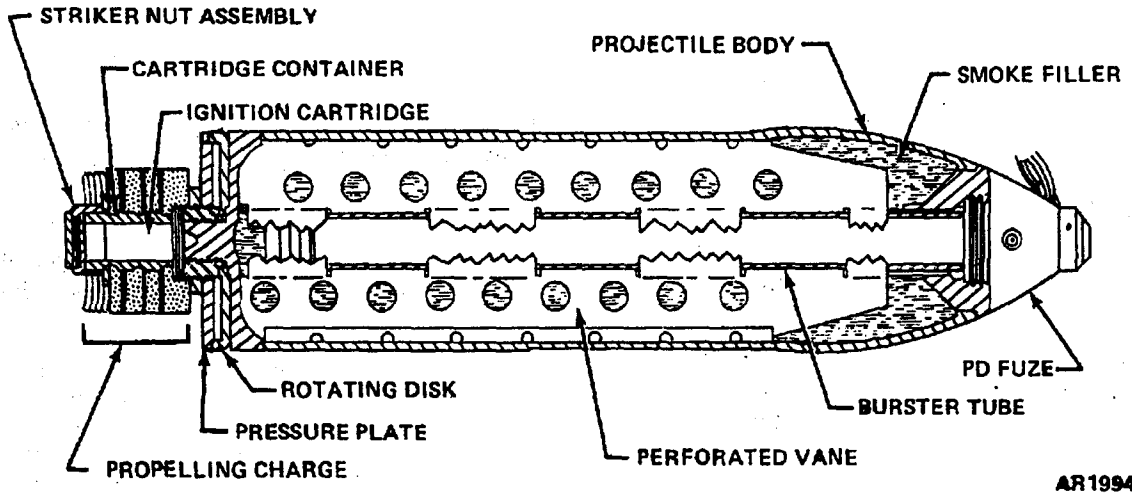

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Type Classification:

OBS 11756003.

Use:

This cartridge is used against personnel and materiel as an incendiary device, and to produce a screening smoke.

Description:

The complete round consists of a projectile body, a PD fuze with an integral burster, and a tail assembly. The body contains a perforated vane assembly welded to the inside of the body and designed to accommodate the burster tube that extends from the fuze. The tail assembly consists of a pressure plate and rotating disc, a propelling charge, a cartridge container and ignition cartridge, and a striker nut assembly.

Functioning:

When the cartridge is released, it slides down the mortar tube until the percussion primer strikes the firing pin. The flash from the primer ignites the ignition cartridge which, in turn, ignites the propelling charge. The gases from the propelling charge exert pressure on the pressure plate at the base of the projectile which expands the rotating disc, engaging it in the rifling of the tube. The spin imparted to the projectile as it leaves the weapon stabilizes it in flight. On impact, the functioning of the fuze detonates the burster charge which shatters the projectile casing, dispersing the filler. On contact with the air, the WP (or PWP) filler ignites creating a dense white smoke with some incendiary effect.

Difference Between Models:

Cartridge M2 differs slightly from cartridge M2A1 in the design of the obturating mechanism.

	Complete Round Nomenclature	PROJECTILE															
		BODY						FILLING			Fuze (Including Burster or Booster) (3)			PROPELLING CHARGE			
		Type and Kind	Designation	Av. Wt. Shell Casing (lbs.)	Wt. Base Components	Diameter (approx.)	Length (less fuze) (approx.)	Type	Wt. Filling (lbs.)	Minimum Void (0/0)	Designation	Type	Weight (lbs.)	Designation	Cartridge (5)	Total Charge Wt. (lbs.)	Complete Assembly Wt. (lbs.)
ol. o.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1	Shell, Smoke, WP, 4.2-inch Chemical Mortar, M2	Shell Smoke	M2 M2-ALT	13.86 13.86	1.84 1.84	4.19"	20.4"	WP	7.5	14.7	M2	Impact	1.5	M6(4)	M2	.51	25.5
2	Shell, Smoke, FS, 4.2-inch Chemical Mortar, M2	Shell Smoke	M2 M2-ALT	13.86 13.86	1.84 1.84	4.19"	20.4"	FS	7.5	23.0	M2	Impact	1.5	M6(4)	M2	.51	25.5
3	Shell, Gas, Nonpersistent, CG, 4.2-inch Chemical Mortar, M2	Shell Gas	M2 M2-ALT	13.86 13.86	1.84 1.84	4.19"	20.4"	CG	6.25	14.3	M2	Impact	1.5	M6(4)	M2	.51	24.25
4	Shell, Gas, Persistent, HD, 4.2-inch Chemical Mortar, M2	Shell Gas	M2 M2-ALT	13.86 13.86	1.84 1.84	4.19"	20.4"	HD	5.8	10.0	M2	Impact	1.5	M6(4)	M2	.51	24.2
5	Shell, Gas, Irritant, CNB, 4.2-inch Chemical Mortar, M2	Shell Gas	M2 M2-ALT	13.86 13.86	1.84 1.84	4.19"	20.4"	CNB	5.45	5.7	M2	Impact	1.5	M6(4)	M2	.51	23.5
6	Shell, Gas, Irritant, CNS, 4.2-inch Chemical Mortar, M2	Shell Gas	M2 M2-ALT	13.86 13.86	1.84 1.84	4.19"	20.4"	CNS	7.0	4.5	M2	Impact	1.5	M6(4)	M2	.51	25.0
7	Shell, 4.2-inch Chemical Mortar, (HE), M3 (W/M3 Fuze)	Shell HE	M3 M3-ALT	12.72 12.72	1.84 1.84	4.19"	20.4"	HE	8.5	None	M3	Impact	1	M6(4)	M2	.51	24.5
8	Shell, 4.2-inch Chemical Mortar, (HE), M3 (W/M4 Fuze)	Shell HE	M3 M3-ALT	12.72 12.72	1.84 1.84	4.19"	21.0"	HE	8.5	None	M4(1)	Delay	1	M6(4)	M2	.51	24.5
9	Shell, 4.2-inch Chemical Mortar, (HE), M3 (W/M5 Fuze)	Shell HE	M3 M3-ALT	12.72 12.72	1.84 1.84	4.19"	22.0"	HE	8.5	None	M5(1)	T & S	2.0	M6(4)	M2	.51	25.5
0	Shell, Sub-caliber, 3-inch, M5 (For 4.2-inch Chemical Mortar)	Shell Dummy	M5	6.0	--	3.0"	12.5"	--	--	--	M1(2)	Impact (FM-Nose)	Approx. 1/4	M8	M5A2	.14	6.0

) Fu[illegible] l and shipped separately. To be added to shell at point of use.
) Sn[illegible]ge, shipped separately.
) Sta[illegible] nomenclature for fuzes.
a. Fuze, shell, 4.2-inch chemical mortar, M2
b. Fuze, shell, 4.2-inch chemical mortar, (HE), M3
c. Fuze, delay, shell, 4.2-inch chemical mortar, M4
d. Fuze, time and superquick, shell, 4.2-inch chemical mortar, M5
e. Charge, smoke, 3-inch, sub-caliber shell, M1

(4) Standard nomenclature for propelling charges:
a. Charge, propelling, 4.2-inch chemical mortar, M6
b. Charge, propelling, 3-inch sub-caliber shell, M8

(5) Standard nomenclature for cartridge: Cartridge, ignition, 4.2-inch chemical mortar, M2

FIGURE 64. *Authorized rounds for 4.2-inch chemical mortar.*

d. Keep cartridge and propelling charges dry. Moisture reduces range; therefore, moist propelling charge increments should be separated from dry ones so as to eliminate the possibility of short rounds when firing over friendly troops.

e. When it is necessary to leave ammunition in the open, place it on dunnage at least 6 inches from the ground and cover with a double thickness of paulin. Suitable trenches should be dug to prevent water from flowing under the pile. For further precautions in storage, see TM 9–1900.

f. Complete round should be free of foreign matter—sand, mud, grease, etc.—before loading into the mortar.

g. Propelling charges of rounds prepared for firing should be protected by slipping one end of laminated shell container over base of round.

h. Rounds prepared for firing but not fired will be returned to their original condition by reinserting safety pins, replacing packings, and appropriately marking. Fuzes will be inspected prior to repacking. Such components will be used first in subsequent firing, in order that stocks of opened packings may be kept at a minimum.

i. Do not handle duds. Because their fuzes may be armed, duds are extremely dangerous. Do not move or turn them, but destroy them in place, in accordance with directions contained in TM 9–1900.

62. Authorized Rounds

The standard ammunition authorized for use in the 4.2-inch chemical mortar is described in figure 64. Note that the nomenclature completely identifies the ammunition.

63. Shell

a. General. Four shell, similar except for minor construction differences, are issued for the 4.2-inch chemical mortar. These shell are known as the M2, M2 alternate, M3, and M3 alternate.

b. Filling. The M3 and M3 alternate are high explosive shell with TNT filling. They differ from the M2 and M2 alternate (chemical-filled) in that they contain solid filling with no steel vane inside the body and a booster which is one-third the length of the burster in the M2 shell.

c. Construction. (1). The M2 and M3 shell (fig. 65) have a body made from a steel forging with base and walls integral, the casing being swaged to form the ogive.

(2) The M2 alternate and M3 alternate shell, designed to simplify manufacturing operations, are made of seamless steel tubing. The base is slip-fitted and silver-soldered to the end of the tubing.

(3) In the M2 and M2 alternate shell, a perforated sheet steel vane is welded inside the body. This aids in stabilizing flight of the shell by forcing the liquid filling to rotate with it. Holes in the vanes are designed to facilitate distribution of liquid in the shell.

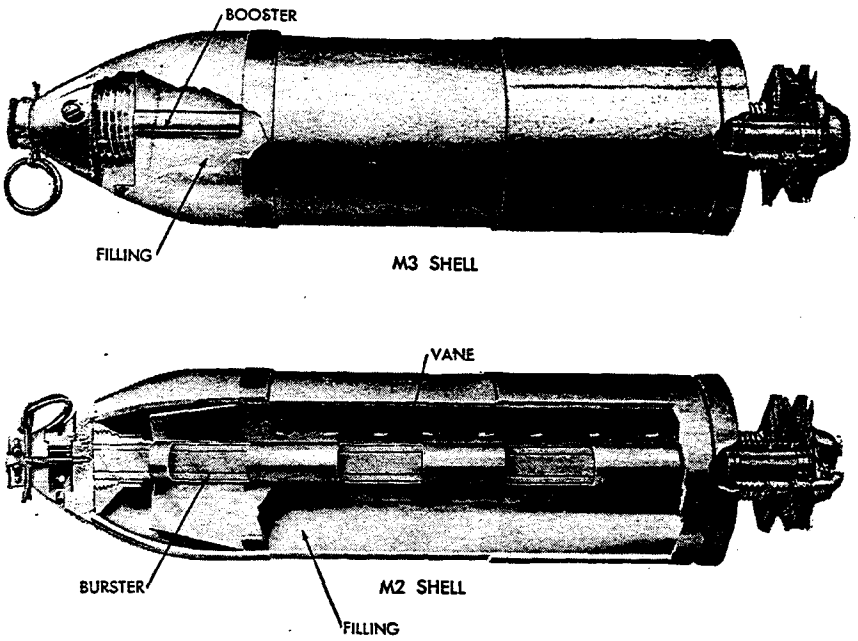


Fig. 65. Comparison between M2 and M3 chemical mortar shell

(4) A steel adapter is welded in the nose of the M2 and M3 shell. In the M2 alternate and M3 alternate shell, the adapter is silver-soldered. The M2 shell has a smooth finished central opening into which the burster tube well is pressed after the shell has been filled, thus forming a gastight seal. The M3 shell has a ringlike adapter to receive fuze.

(5) On the base of all the shell is a threaded stud to which the cartridge container is secured. The cartridge container is a tube of machine steel, threaded on the inside to screw onto the stud on the base of the shell. It is also threaded externally and has a wire propellant holder and a striker nut to hold the propellant over the ventholes. After removing the undesired rings, the propellant holder is pushed down against the remaining rings in order to hold them tightly between the holder and the striker nut. The ventholes are drilled radially through the walls of the cartridge container and serve to transmit the flash of the ignition cartridge to the rings of powder, thus igniting them. The striker nut, in addition to holding the propelling charge and ignition cartridge in place, also carries a striker plate and striker point to fire the primer of the ignition cartridge. It prevents the base of the ignition cartridge from being blown out into the base of the barrel when the mortar is fired, and causes the flash of the ignition cartridge to spread through the radial holes in the

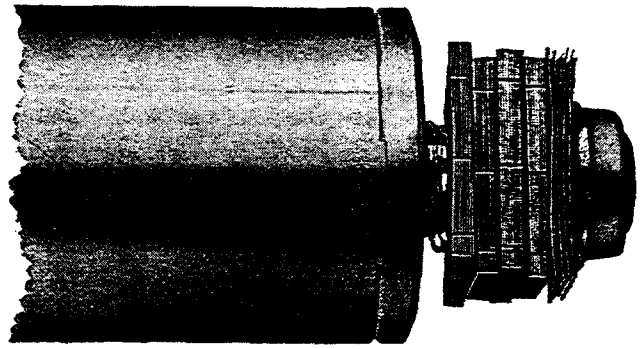
cartridge container and into the powder rather than being blown out the rear end of the cartridge container.

(6) The rotation unit of all the shell consists of a brass rotating disk and a steel pressure plate. In the surfacing of the rotating disk is a groove 1.5 inches wide and 0.062 inch deep, fitting over a key on the base of the shell and transmitting rotation to the shell. Diameter of rotating disk is approximately equal to that of the shell, while the pressure plate is slightly smaller and fits into rotating disk. When assembled, disk and plate form a hollow ring. Under the pressure of the propellent gases, the plate is pressed into the disk, expanding the disk in such manner that the rim of the disk engages the rifling of the barrel.

64. Propelling Charge

a. CHARGE, PROPELLING, 4.2-INCH CHEMICAL MORTAR, M6. The M6 propelling charge consists of an ignition cartridge and 25½ rings of non-hygroscopic disk powder. The full propelling charge comes affixed to the shell (fig. 66). Ranges varying from 4,397 yards down to 565 yards may be obtained by removing rings as required to conform with appropriate firing tables. The basic unit of propelling powder is a ring which consists of two sheets sewn together. The M6 propelling charge includes one half-ring, five one-ring bundles, and four five-ring bundles (fig. 67).

b. IGNITION CARTRIDGE (fig. 68). The ignition cartridge used with the M6 propelling charge is designated as follows: *cartridge, ignition, 4.2-inch chemical mortar, M2.* It is similar in exterior appearance to a commercial 12-gauge shotgun shell.



c. Propellent powder. (1) The propellent powder is practically nonhygroscopic and smokeless, but not flashless. It is in the form of thin, square sheets, 2¾ inches square and about 0.026 inch thick. A circular hole 1.35 inches in diameter is cut in the center of each square.

(2) The sheets of powder weigh approximately 60 grains each. Each square is slit radially from the circular hole to one of the edges. The size of units may be identified by their thickness.

65. Preparation for Firing

When shell are delivered to mortar position packed in waterproof containers, prepare ammunition in an orderly sequence for purposes of safety and economy of effort as follows:

a. Remove shell from its waterproof container.

b. Clean by removing all rust-preventive compound and remove any dirt from guides, body, cartridge container, and flash outlet holes. Use emery cloth to remove rust from guides.

c. Pull safety pin and examine fuze. See that shear wire is in place and bent over at both ends, and that two steel balls are present. Replace safety pin.

d. Examine guides for burrs which might cause shell to stick in the barrel. Burrs must be filed down.

e. Remove rings of propellant as required for range.

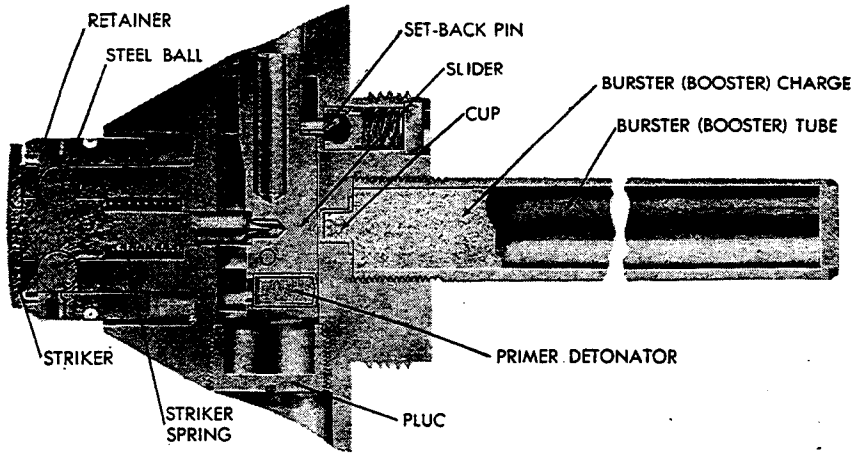
f. Propellant must be fastened firmly between striker nut and propellant holder. This is accomplished by first tightening the striker nut against the propellant and then the propellant holder against the powder.

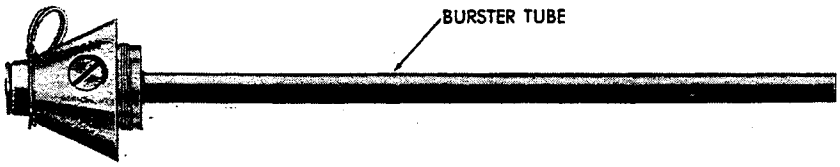
g. When necessary, ends of safety pin in fuze may be straightened with a pair of pliers to facilitate rapid removal by mortar squad.

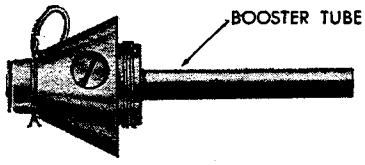
66. M2 and M3 Fuzes

a. General (fig. 69). The fuze, shell, 4.2-inch chemical mortar, M2 is an impact fuze of the point detonating type, weighing about 1½ pounds. The complete assembly consists of the fuze proper with an aluminum body, its various components, and a seamless steel burster tube. The bursting charge consists of about 65 grams of tetryl pellets in the burster tube and the cup. After the burster tube has been screwed into the base of the fuze body, the entire outside surface of the tube is given a coating of rust-preventive compound. This fuze is furnished with the M2 shell. The fuze, shell, 4.2-inch chemical mortar, (HE), M3 is furnished with the M3 shell. *The M2 and the M3 fuze heads are identical, but the M2 fuze has a burster tube, while the M3 fuze has a booster.* The burster tube of the M2 fuze (fig. 70) is about three times the length of the seamless steel booster tube of the M3 fuze (fig. 71). This difference is necessary because the M2 burster must contain a sufficient amount of tetryl

COMPARTMENT SHELL FUZES







to rupture the shell body, while in the M3 the booster merely conducts the shock action to the high explosive (TNT) filling which, in turn, bursts the shell. The M3 fuze has the same safety features as the M2 and functions in exactly the same manner.

b. SAFETY FEATURES. The M2 and M3 fuzes have four safety features:

(1) The *safety pin* is a cotter pin passing through (off center) the body of the fuze and the retainer. The pin secures the retainer firmly to the body of the fuze and prevents its movement. Its function is to act as a reinforcement for the shear wire. Just before firing, the safety pin is pulled from the fuze by means of the ring attached to the pin.

(2) The *shear wire* passes through the retainer and the fuze body. This prevents any movement of the retainer, even after the safety pin has been withdrawn, as long as the shear wire itself remains unbroken. The ends of the shear wire are bent into the annular groove around the outer surface of the retainer. This prevents accidental damage to the shear wire from external sources and enables the fuze to arm itself by cutting the shear wire inside the retainer only.

(3) The *retainer* is a brass ring which holds two steel balls in cylindrical holes 180° apart in the upper part of the fuze body. When the striker is in the unarmed position, two hemispherical recesses, 180° apart in the stem, are located opposite the two holes in the fuze body. The diameter of the holes is slightly larger than the diameter of the balls but their depth is less. When the retainer is held in the unarmed position by the shear wire, its inner surface covers the outer openings of the holes so that approximately one-third of each ball fits into the corresponding hemispherical recess in the striker stem. The other two-thirds remains in the cylindrical hole in the body of the fuze. The balls prevent movement of the striker. Immediately below the retainer is a well in the fuze body into which the retainer drops when the shear wire is cut. The retainer has either two slots or two holes through which the two steel balls can be seen. For safety, every fuze must contain the two steel balls.

(4) The *slider is* a cylindrical brass piece. Holes are cut in the slider to take the primer detonator, the striker point, and the lock pin, and there is a groove for the guide screw. In the unarmed position, the primer detonator is out of line with the bursting charge and the striker. The point on the end of the striker fits into a hole in the slider, locking it in place as long as the retainer is held in position by the shear wire.

(5) The *set-back pin assembly* consists of set-back pin, socket, and spring. In the unarmed position, the slider is held safe by the set-back pin which is held in place by force of the spring. This serves as an additional safety feature in preventing alignment of the primer detonator with bursting charge before firing.

c. FUNCTIONING. (1) The safety pin is pulled out of the fuze just before the shell is inserted in the barrel. After striking the striker pin at

D-4

foreign material when assembling fuzes to shell. Assemble with proper seating.

(3) Do not attempt to alter or disassemble fuzes in the field.

(4) Do not remove plugs or fuzes from shell except when a new fuze is to be inserted immediately.

(5) Protect fuzes against shock, heat, and fire. Take special care to avoid blows to nose and base of fuze.

(6) Leave safety pin in fuze until ready to fire. Replace immediately if round is not fired.

67. Delay Fuze M4

a. General. The fuze, delay, shell, 4.2-inch chemical mortar, M4 (figs. 72 and 73) consists of three subassemblies: head assembly, body assembly, and booster assembly. The head assembly consists of head and firing pin assembly, a delay element assembly which contains a percussion primer, a 0.15-second delay charge, and a relay charge assembly. The body assembly consists of a body, a booster lead charge and safety pin assembly, a detonator slider containing a detonator and a slider lock, a slider spring, a closing cup, a guide screw, and a set-back element and spring. The booster assembly consists of a tube and a 22-gram tetryl booster charge. Total weight of a fuze, loaded and completely assembled, is 1 pound.

b. Functioning. (1) The fuze is a point detonating, delayed action fuze, designed to produce demolition effect by initiating detonation of the HE in the shell 0.15 second after impact.

(2) The fuze is detonator safe in that the tetryl booster charge does not explode from the force of the detonator if it functions in the offset, unarmed position. The fuze is not armed until detonator is aligned with explosive train by centrifugal force and/or spring action.

(3) After fuze is assembled to shell, the first step in arming, preparatory to firing, is to remove the safety pin. If the round is not fired, the safety pin should be replaced. When shell is fired, the force delivered to base of shell by the burning propelling charge causes the set-back element in the fuze, which holds the slider in the unarmed position, to move to the rear; this frees slider so that it moves to armed position under centrifugal force and/or spring action. The slider is locked in armed position by slider lock.

(4) Upon impact, the striker in the head of the fuze is driven in, cutting the shear wire and allowing point of firing pin to strike the percussion primer, causing it to ignite delay charge. The delay charge burns for 0.15 second after which it ignites the relay charge which initiates functioning of the detonator. The detonator sets off the booster charge which in turn explodes HE in the shell.

c. Use. This fuze may be used in any existing type of 4.2-inch chemical mortar HE-loaded shell. In the event that shell are already equipped with

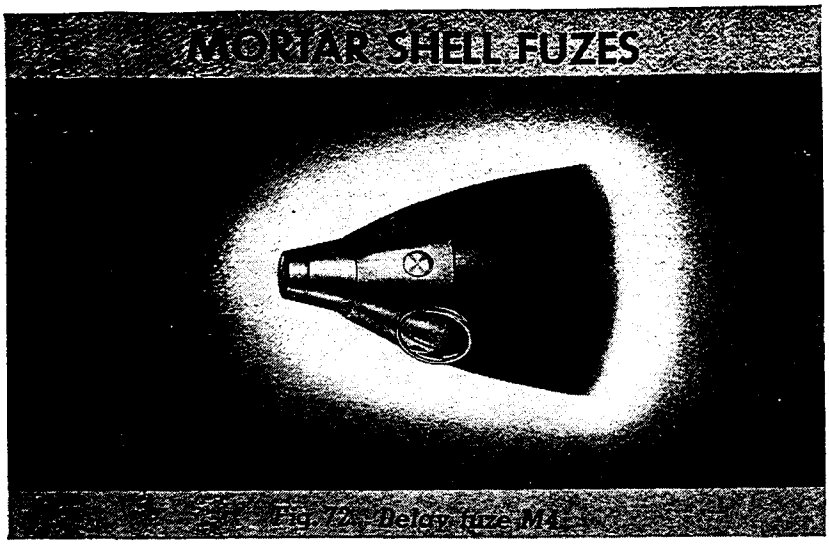


Fig. 72. Delay fuze M4.

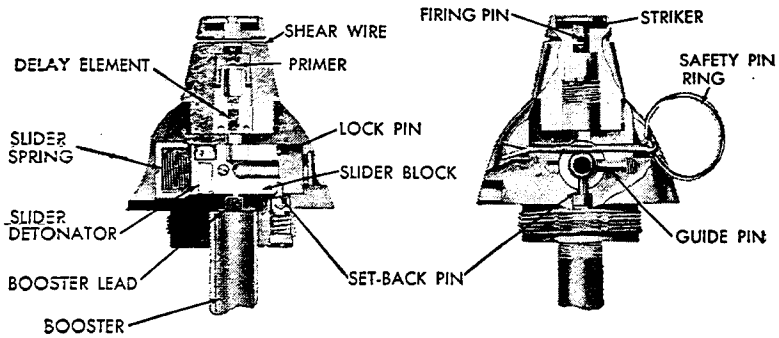
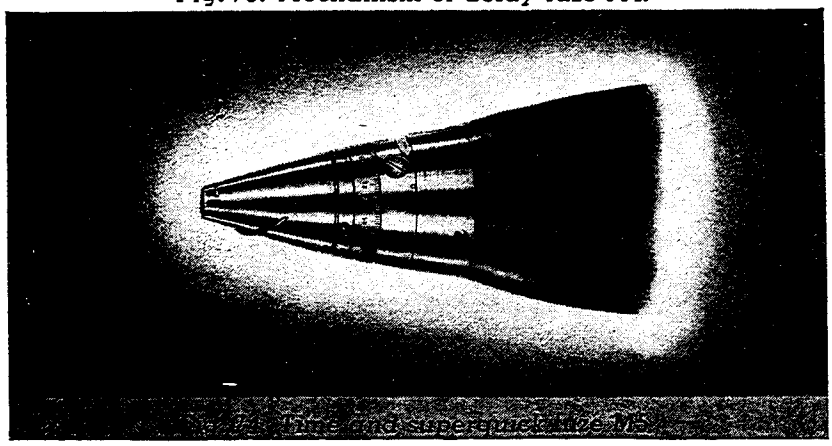


Fig. 73. Mechanism of delay fuze M4.



Inert and Supercharge Fuze M5

the point detonating fuze M3 (instantaneous action), the M3 fuze may be safely removed from the shell and the M4 fuze substituted by means of a fuze wrench.

d. SAFETY PRECAUTIONS. See paragraph 66*d*.

68. Time and Superquick Fuze M5

a. GENERAL. The fuze, time and superquick, shell, 4.2-inch chemical mortar, M5 (fig. 74) is a modified ordnance M54 powder train type. It is provided with an adapter-booster or an adapter-burster assembly to fit the 4.2-inch chemical mortar shell. The M54 fuze portion consists of a body assembly, time train ring assembly (two rings), and a closing cap assembly with a lead annulus. The adapter-booster (burster) has internal threads to receive the M54 fuze and external threads for assembly into the shell. The adapter-booster (burster) contains a detonator which is initiated by the flash produced by functioning of the fuze, and a booster or burster charge detonated by functioning of the detonator.

b. FUNCTIONING. The fuze is a combination time and superquick type containing two separate mechanisms for producing these actions.

(1) The *superquick mechanism* is contained in the closing cap assembly. When nose of fuze is crushed, a firing pin is driven into a detonator, causing it to function. The flash from this upper detonator passes through an axial hole through closing cap and body assemblies and functions the detonator in the adapter-booster (burster).

(2) The *time mechanism* is initiated by plunger contained in the closing cap assembly. An internal safety feature prevents instantaneous action. The plunger is supported by two small shear wires until fired; to insure safety in handling, the plunger is locked in place by a spiral safety wire. The safety wire is removed immediately before firing. When shell is fired, inertia of plunger causes it to cut shear wires and move downward against a primer striker in the fuze body. The primer striker bends until it fires a primer in the fuze body. This primer ignites one end of a pressed black powder time train contained in upper (fixed) time train ring. The upper time train burns completely and, if fuze is not set safe, ignites lower time train after approximately one-half of set time. A magazine charge of black powder is ignited after lower time train has burned the remainder of the set time, and flame from the magazine charge causes lower detonator in adapter-booster (burster) to detonate.

(3) Whether initiated by superquick element or time element, the lower detonator in the adapter-booster (burster) detonates and causes booster (burster) charge to detonate. Detonation of booster charge in HE shell causes detonation of HE filling; detonation of the burster charge in chemical shell ruptures the shell case. The superquick action is always operative after arming and functions on impact unless prior functioning has been caused by time action.

ORDNANCE AND EXPLOSIVES
ARCHIVES SEARCH REPORT
for the former
DOLLY SODS NORTH
TUCKER COUNTY
WEST VIRGINIA
PROJECT NUMBER G03WV006504

APPENDIX E

REPORTS/STUDIES

APPENDIX E

REPORTS/STUDIES

Table of Contents

E-1 Site Survey Summary Sheet for DERP-FUDS Site No. G03WV006500 (reference B-4).

E-2 Project Summary Sheet for OEW Project No. G03WV006504 with two clarifying memorandums (reference B-4).

E-3 Findings and Determination of Eligibility For Site No. G03WV006500 (reference B-4).

E-4 Monthly report from Metcalf & Eddy to CEHND, dated 5 June 1991 (reference B-8).

E-5 EOD reports dated 21 September 1993, and 9 December 1993. (reference B-9).

E-6 Listing of ordnance found, reported, and destroyed in the Dolly Sods North area, undated. Listing supplied by Nancy Feakes, District Ranger, Potomac Ranger District, Petersburg, WV 26847 (reference B-10)

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

PROJECT SUMMARY SHEET
FOR
DERP-FUDS PROJECT NO. G03WV006504
WEST VIRGINIA MANEUVER AREA
SITE NO. G03WV006500
25 June 1991

PROJECT DESCRIPTION: 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. Unexploded ordnance has been found and personal injuries have occurred. Ordnance is located on public lands operated by the U.S. Forest Service and on private property.

PROJECT ELIGIBILITY: Records indicate that the area was used by the Army for military maneuvers and as an artillery range, and was returned to the Department of Agriculture for use as a wilderness area.

POLICY CONSIDERATIONS: There is no policy which prohibits the proposal of this project.

PROPOSED ACTIVITIES: The INPR should be referred to CEHND for determination of further action.

RAC: Attached.

POC: Frank Albert, (304) 529-5194.

CEHND-PM-OT (210-20b) 25 April 1995

MEMORANDUM FOR RECORD

SUBJECT: Defense Environmental Restoration Program for Formerly Used Defense Sites (DERP-FUDS) Project Number G03WV001304, Dolly Sods West Virginia, request for Archive Search Report (ASR)

1. Reference our letter CEHND-PM-OT, dated 19 April 1995, SAB.

2. The enclosed materials should help as a starting point for the ASR for Blackbird Knob Area, or Dolly Sods - North. I do have a lot of correspondence between the former PM and Metcalf & Eddy, (AE who completed the RI/FS) but it concerns daily logs, contract reviews and general items concerning their work in 1991 at Dolly Sods Wilderness. If there is anything else I can help with please let me know.

3. Mary Jo if you have any questions please contact me at 205 895-1546.

Encl

Lynn Frow
PM-OT

1564
1540

Thanks Mary Jo for fitting this project in your schedule! I do appreciate the very timely response.
L

E-2

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

REPLY TO
ATTENTION OF

CEHND-PM-OT (210-20b) 19 April 1995

MEMORANDUM FOR Commander, U.S. Army Engineer District,
Rock Island, ATTN: CENCR-ED-DN
(Ms. Mary Jo Civis) Clock Tower Building,
P.O. Box 2004, Rock Island, IL 61204-2004

SUBJECT: Defense Environmental Restoration Program for Formerly Used Defense Sites (DERP-FUDS) Project Number G03WV001304, Dolly Sods, West Virginia, Request for Archive Search Report (ASR)

1. Reference telephone conversation between Ms. Mary Jo Civis, Rock Island, and Ms. Lynn Frow, Huntsville, 14 April 1995, SAB.

2. Request an ASR be completed on Dolly Sods-North (also called Blackbird Knob) as soon as possible per reference. Project Number G03WV001304.

3. Work at Dolly Sods has been ongoing intermittently since 1988. Available records and data will be forwarded to assist in the ASR. Most records encompass the entire area (Blackbird Knob and Dolly Sods Wilderness) as an entity and is called Dolly Sods or the former West Virginia Maneuver Area. The Black Bird Knob Area was purchased from the Nature Conservancy several years ago and includes 5,000 plus acres. It is adjacent to, but not included in, the Dolly Sods Wilderness which was created by Congress in 1975. The Inventory Project Report (InPR) is enclosed. A Removal Action (RA) is scheduled for the Wilderness in late August FY95.

DEFENSE ENVIRONMENTAL RESTORATION PROGRAM
FOR
FORMERLY USED DEFENSE SITES
FINDINGS AND DETERMINATION OF ELIGIBILITY

West Virginia Maneuver Area

North Central West Virginia

Site No. G03WV006500

FINDINGS OF FACT

1. 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. There is work recommended for this project, and hazardous conditions are present. We shall endeavor to do the best we can with what we have, but it must be understood from the outset that little documentation for this project remains. 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 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 steam line were acquired by purchase and condemnation during World War II. Most of the lands where work is recommended are those covered by the permits from Department of Agriculture. The

remainder is an area called Blackbird Knob. Blackbird Knob is included in the leased lands then designated as Tracts Nos. A-76A: 17,515.54 acres; A-76B: 2107.74 acres; and A-76C: 3512 acres, all of which were leased 6 August 1943 from The West Virginia Central and Pittsburg [sic] Railroad Company and The Davis Coal & Coke Company. The Lease No. was W33-017, ENG 1403. Blackbird Knob, a target area, was included in these lands, and work is recommended for that area.

2. 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 done even if decontamination costs exceed costs of acquiring the land in fee. Most of the 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. The leases from the railroad, Tracts Nos. A-76A, A-76B, and A-76C were terminated on 28 February 1946. The Blackbird Knob area is now owned by The Nature Conservancy, which acquired it, less certain mineral interests not here pertinent, as a 3701.1 acre tract on 25 July 1991 for $3,000,000. Western Pocahontas Properties Limited Partnership, successor to West Central and Pittsburg [sic] Railroad Company, still owns some of the surrounding lands, but The Nature Conservancy is in the process of acquiring those interests, for eventual consolidation into the Monongahela National Forest. An exact plat of The Nature Conservancy's current holdings is found on Plat Cabinet 1, Slide 189, Tucker County, West Virginia, Clerk of the County Commission's records.

DETERMINATION

Based on the foregoing findings of fact, the site has been determined to be formerly used by DOD. It is, therefore, eligible for the Defense Environmental Restoration Program - Formerly Used Defense Sites established under 10 USC 2701 et seq.

8 January 1992
Date

ALBERT J. GENETTI, Jr.
Brigadier General, U.S. Army
Commanding

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.

9-614

Metcalf & Eddy

006856-0001

June 5, 1991

Mr. Walt Perro, Project Manager
Department of the Army
Huntsville Division Corps of Engineers
P.O. Box 1600
Huntsville, AL 35807-4301

Dear Mr. Perro:

We are pleased to submit our May report for the Dolly Sods project. The report describes the research and site visit activities during May.

As you know our field efforts did not locate any OEW in the sample sites. However, we intend to develop the work plan for Tasks A-3, A-4, and A-5 based on our evaluation of information we have gained from our research work.

We are planning to submit a draft of the work plan to you on June 21, 1991.

Please contact me if you have any questions or require any additional information.

Very truly yours,

METCALF & EDDY, INC.

William F. Mooney

William F. Mooney, P.E.
Project Manager

WFM/jc
Attachment

cc: B. Baker
C. Hagger
P. Wolf

E-4

30 Harvard Mill Square, Wakefield, MA 01880
Mailing Address: P.O. Box 4043, Woburn, MA 01888-4043
617-246-5200 — FAX 617-245-6293

MONTHLY REPORT

Feasibility Study for
Dolly Sods Wilderness Area, Davis, WV

Contract DACA 87-90-D-0018
Delivery Order 0001
Monthly Report - May 1991

TASK A-1 - RECORDS RESEARCH AND SITE VISIT

On May 6 and 7 M&E and its subcontractor UXB conducted a research visit to Elkins and Petersburg, West Virginia. Forest Service personnel were interviewed for historical information pertaining to the Dolly Sods Wilderness. A retired Forest Service employee who had worked at DSWA during WWII was helpful in locating gun emplacements and sites of forest fires started by ordnance during the maneuvers and live firing exercises. The Army fired at the rock faces of Blackbird Knob and Cabin Mountain to minimize the risk of forest fires. The Rangers identified two shells that had been located north of the DSWA and three that were located in the central areas of DSWA.

The National Archives in Washington, D.C. was visited on May 8 - May 10. Although a great deal of historical information was made available of Army maneuver sites during WWII, none of it specifically pertained to DSWA. We were able to determine that infantry divisions of the XIII Corp out of Fort DuPont, Delaware trained in DSWA during the following time periods.

77 Inf Division	10/15/43 - 1/2/44
28 Inf Division	8/2/43 - 9/30/43
31 Inf Division	9/9/43 - 11/17/43
35 Inf Division	2/4/44 - 3/28/44
95 Inf Division	5/1/44 - 7/1/44

The two week site visit began on May 20 and ended on May 31. The project team did not work on the weekend or Memorial Day. The field work consisted of hiking to selected sample sites in DSWA performing random ordnance sweeps, and mapping site perimeters with GPS as satellite availability and terrain allowed.

On May 29 UXB drove to Letterkenny Army Depot at Chambersburg, PA and met with the DRMO Receiving Officer, Mr. Norman Smith. He outlined his requirements for turning in ordnance related scrap metal and provided sample DD 1348-1 forms and an instruction guide on their proper execution.

A meeting was held at the Forest Service Office in Petersburg, West Virginia on May 20 to explain SOW for the DSWA project. Those in attendance were:

Nancy Feakes, District Forest Ranger
Richard Trochill, Forest Service
Dave McMorin, Forest Service
Walt Perro, ACOE, Huntsville
Bill Mooney, Metcalf & Eddy

The Forest Service had previously raised the issue that an environmental permit would be required for on-site ordnance disposal. From the results of the meeting discussions, the Forest Service appeared satisfied that the DOD is exempt from obtaining permits for a munitions response action under existing regulations.

EXPLOSIVE ORDNANCE INCIDENT REPORT
For use of this form, see FM 9-15; the proponent agency is US Army Training and Doctrine Command.

1. UNIT NUMBER: 56-218-93
2. CONTROL NUMBER:
3. UNUSUAL: ☐
4. ROUTINE: ☒

SECTION A: INITIAL INFORMATION

5. DATE/TIME REPORTED: 21 1555 Sep 93
6. REPORTED BY: Mernie Kimsh
7. PHONE NUMBER: (304)-257-4488
8. ADDRESS: HC 59, Box 240 Petersburg, WV 26847
9. INCIDENT LOCATION: Dolly Sotes, WV
10. POINT OF CONTACT: WV State PD
11. ITEM(S) REPORTED: 4.2" Chemical

SECTION B: ACTION BY EOD

12. PERSONNEL DISPATCHED: SFC Barklow, SGT Stines
13. DATE/TIME: A. DPRT 22 0600 Sep 93; B. ARR 22 1130 Sep 93; C. COMPL 22 1945 Sep 93
14. TRAVEL DATA: A. AIR: FLYING TIME; B. VEH MILEAGE 300
15. WORK HOURS: A. TRAVEL 24; B. INCIDENT 4
16. CONFIRMED IDENTIFICATION: 1ea. M2 Mortar Empty
17. DISPOSITION: BIP

18. INCIDENT NARRATIVE (INCLUDE ALL SIGNIFICANT DETAILS AND PROBLEMS)

1. EODCT Notified of Delay: SSG Hurb DTG 21 1600 Sep 93
2. EODCT Notified of Departure SFC Coates DTG 22 0550 Sep 93
3. On-Post POC Notified: Mrs Sheetz DTG 22 0552 Sep 93
4. EODCT Notified of Return: SFC Rodriguez DTG 22 1945 Sep 93
5. The items listed below were consumed during the completion of the above listed incident.

ITEM#	DODIC & NOMENCLATURE	LOT#	QUANTITY USED
1.	M023 Charge Demo	LOP89H016004	2
2.	M130 Cap Blast. Elec.	DUP88L001-014A	2
3.			
4.			
5.			

TEAM LEADER [signature] TEAM MEMBER [signature]

SECTION C: AUTHENTICATION

19. NAME AND GRADE AND SIGNATURE OF UNIT COMMANDER: BRENNAN S. PHILLIPS, 1LT, OD, Commanding
20. TELEPHONE NO.: AV 277-2011/2617
21. DATE: 18 Nov 93

DA FORM 3265-R, FEB 80 EDITION OF 1 AUG 70 IS OBSOLETE.

E-5

EXPLOSIVE ORDNANCE INCIDENT REPORT
For use of this form, see FM 9-15; the proponent agency is US Army Training and Doctrine Command.

1. UNIT NUMBER: 56-035-934
2. CONTROL NUMBER:
3. UNUSUAL: ☐
4. ROUTINE: ☒

SECTION A: INITIAL INFORMATION

5. DATE/TIME REPORTED: 09 1500 Dec 93
6. REPORTED BY: Jill Shoemaker
7. PHONE NUMBER: (304)-257-4488
8. ADDRESS: HC 59 Box 240 Petersburg, WV
9. INCIDENT LOCATION: Dolly Sods State Park, WV
10. POINT OF CONTACT: Jill Shoemaker
11. ITEM(S) REPORTED: 1ea. Projo 4"

SECTION B: ACTION BY EOD

12. PERSONNEL DISPATCHED: 1LT Phillips, SGT McRae
13. DATE/TIME: A. DPRT 09 1500 Dec 93; B. ARR 10 0800 Dec 93; C. COMPL 10 1630 Dec 93
14. TRAVEL DATA: A. AIR FLYING TIME; B. VEH MILEAGE 750
15. WORK HOURS: A. TRAVEL 46; B. INCIDENT 4
16. CONFIRMED IDENTIFICATION: 1ea. 4.2" Mortar Smoke
17. DISPOSITION: BIP

18. INCIDENT NARRATIVE (INCLUDE ALL SIGNIFICANT DETAILS AND PROBLEMS)

1. EODCT Notified of Delay: _____ DTG _____
2. EODCT Notified of Departure SGT Gradl DTG 09 1515 Dec 93
3. On-Post POC Notified: Mrs Sheetz DTG 09 1520 Dec 93
4. EODCT Notified of Return: ~~SFC~~ SGT Kissinger DTG 10 1630 Dec 93
5. The items listed below were consumed during the completion of the above listed incident.

ITEM#	DODIC & NOMENCLATURE	LOT#	QUANTITY USED
1.	M023 Chg Demo M112	~~[illegible]~~ LOT 89H016004	2ea.
2.	M130 Cap Blasting Elec	DUP881001-004A	2ea.
3.			
4.			
5.			

TEAM LEADER [signature] TEAM MEMBER [signature]

SECTION C: AUTHENTICATION

19. NAME AND GRADE AND SIGNATURE OF UNIT COMMANDER: BRENNAN S. PHILLIPS, 1LT, OD, Commanding
20. TELEPHONE NO.: AV 277-2811/2617
21. DATE:

DA FORM 3265-R, FEB 89 EDITION OF 1 AUG 70 IS OBSOLETE

Ordnance Disposal/Removal Record

9/7/93 - Suspected chemical ordnance* removed from Bear Rocks Parking Lot (found + transported there by visitor)

10/93 - Mortar Round detonated (dead)
DS North

12/10/93 - Mortar Round detonated (dead)
DS North

9/2/94 - Smoke Round detonated (live)
Along Red Creek between Big Stonecoal Run + Fisher Spring Rd

type of ordnance
date EOD unit came
location of ordnance
removed or detonated on site
initials of person who assisted army.

* SI NOTE: PROBABLY SMOKE OR WP ROUND.

ORDNANCE AND EXPLOSIVES
ARCHIVES SEARCH REPORTS
for the former
DOLLY SODS NORTH
TUCKER COUNTY
WEST VIRGINIA
PROJECT NUMBER G03WV006504

APPENDIX F

LETTERS/MEMORANDUMS/MISCELLANEOUS ITEMS

APPENDIX F

LETTERS/MEMORANDUMS/MISCELLANEOUS ITEMS

TABLE OF CONTENTS

F-1 Letter to the Honorable Secretary of Agriculture, from Henry L. Stimson, Secretary of War, dated 15 July 1943. (reference B-11).

F-2 Letter with 2 endorsements to The Commanding General, Army Service Forces, from the Chief of Engineers, U.S. Army, dated 23 July 1943 (reference B-12).

F-3 Letter to the Condemnation Section and Leasing Section, Corps of Engineers, from COL T. F. Farrell, Planning and Appraisal Section, Corps of Engineers, dated 28 July 1943. (reference B-13).

F-4 Letter to Henry L. Stimson, the Secretary of War, from Claude R. Wickard, the Secretary of Agriculture, dated 4 August 1943 (reference B-14).

F-5 Letter to the Condemnation Section and Leasing Section, Corps of Engineers, from COL T. F. Farrell, Planning and Appraisal Section, Corps of Engineers, dated 28 July 1943. (reference B-15).

F-6 Letter to the Acquisition Branch, Purchase Section, from the Chief, Real Estate Division, dated 8 December 1943. (reference B-16).

F-7 Letter to The Ohio River Division Engineer, from the Office of the Chief of Engineers, dated 28 June 1945. (reference B-17).

F-8 Letter to the Chief of Engineers, from Mr. C. B. Raymer, Real Estate Officer, Ohio River Division, dated 18 July 1950 (reference B-18).

F-9 Letter to the Chief, Forest Service, Department of Agriculture, from COL W. H. Hastings, Corps of Engineers, Assistant Chief of Engineers for Real Estate, dated 10 August 1950. (reference B-19)).

F-10 Report written by B. W. Vanorsdale, dated, 31 August 1978, titled World War II Army Maneuvers - Monongahela National Forest. (reference B-6).

F-11 Report written by U. S. National Forest Service employee using information relayed by Bill Vanorsdale, undated, circa 1992 (reference B-7).

F-12 Statement written by a Forest Service employee dated 30 May 1991 (reference B-20).

F-13 Letter to the Director, WO Lands, Attn: Ralph Bauman, from Mr. Paul M. Stockinger, Natural Resources Team, U.S. Forest Service, Eastern Region, dated 17 January 1995 (reference B-21).

F-14 Letter to Corps of Engineers, Huntsville Division, Attn: Mr. Roland Belew, from Nancy Feakes, District Ranger, Potomac Ranger District, Petersburg, WV, dated 3 November 1993 (reference B-23).

F-15 Letter to Richard Dikeman, SIOAC-ESL, Savanna Army Depot, Savanna, IL, from Douglas N. Toothman, Manager, Land Resources, Western Pocahontas Properties, dated 5 July 1995. (reference B-24).

F-16 Letter to Richard Dikeman, SIOAC-ESL, Savanna Army Depot, Savanna, IL, from William G. Farrar, Deputy State Historic Preservation Officer, West Virginia Division of Culture and History, dated 5 July 1995. (reference B-25).

COPY

CE 671.3 MONONGAHELA NATIONAL FOREST - SPELD

July 15, 1943

The Honorable,

The Secretary of Agriculture.

Dear Mr. Secretary:

There is a military necessity for the use of portions of the Monongahela National Forest, West Virginia, for Army Maneuver purposes.

This Department is acquiring maneuver rights over all private and state owned lands in the counties of Preston, Grant, Randolph, Tucker and Pendleton, West Virginia, and it is desired that a permit be issued to this Department to use the National Forest lands situate in those counties and under the jurisdiction of the Department of Agriculture.

It has been indicated that the use of the forest by the Army will greatly increase the fire hazard and representatives of the two Departments are preparing an agreement setting forth a plan for fire prevention and fire fighting. It is considered advisable to have the fire prevention measures and actual fire fighting administered by the Forest Service. It is understood that funds available in your Department are not sufficient for this purpose. It has been administratively determined that the performance of this work by your Department is in the interest of the Government and that the contemplated services cannot be as conveniently or more cheaply performed by private agencies. Upon receipt of Standard Form 1080, the War Department will advance the sum necessary to cover the cost of this work by your Department.

It is requested that permission be granted to use the forest lands pending final agreement on the details of a fire control plan, your cooperation in making these lands available and rendering the necessary fire fighting services is greatly appreciated.

Sincerely yours,

JJO'B

re

JRM

MEADOWS
77714

Secretary of War.

F-1

ADDRESS REPLY TO
CHIEF OF ENGINEERS, U. S. ARMY
WASHINGTON, D. C.

WAR DEPARTMENT

OFFICE OF THE CHIEF OF ENGINEERS

WASHINGTON

REFER TO FILE No. CE 601.53(Elkins,W.Va.)SPELR

23 July 1943

SUBJECT: Acquisition of Land for the West Virginia Training Grounds, Army Ground Forces, Tucker & Grant Counties, near Elkins, W.Va.

To: The Commanding General, Army Service Forces.

1. There is a military necessity for the acquisition of land indicated under subject above and described more in detail in paragraph 2 below.

2. Description of the land and other pertinent data are as follows:

a. BRIEF DESCRIPTION OF THE LAND: The subject land is located in the State of West Virginia, in portions of the Counties of Tucker and Grant, more particularly described on the attached map and perimeter description.

b. PROPOSED USE: Artillery training grounds for the Army Ground Forces.

c. ACREAGE INVOLVED: 52,820 acres.

d. IMPROVEMENTS: None.

e. ESTIMATED RENTAL: $23,200 per annum.

f. ESTATE TO BE ACQUIRED: Leasehold interest.

g. METHOD OF ACQUISITION: Negotiation or condemnation.

h. REMARKS: The abovementioned lands include only Area A and Tracts 12, 13, and 14 of Area B, as shown on the inclosed map. The balance of the area is to be obtained for maneuver rights.

3. The determination of military necessity for the acquisition of the subject land is based upon the request of the Division Engineer, set forth in letter of 2 June 1943; and the approval of the Commanding General, Army Ground Forces, as indicated in the 2nd Indorsement of 23 June 1943; both of which are inclosed.

4. Attention is invited to memorandum dated 9 July 1943 from Military Construction Branch, wherein the proposed site for the subject project was approved at Meeting No. 306 of the Interdepartmental Air Traffic Control Board on 7 July 1943, subject to the provision that firing activities in that portion of the area which extends into Red Airway No. 18 shall be controlled as to safeguard navigable air space.

5. Funds for this acquisition are available from Public 108, 78th Congress, approved 1 July 1943.

FOR VICTORY BUY UNITED STATES WAR BONDS AND STAMPS

RE-D 2418

F-2

6. Pursuant to general directive dated 10 April 1942, issued by the Under Secretary of War, you are authorized to proceed with the acquisition of the subject land as described hereinabove.

O'Brien

O'BRIEN

ami

Attached:
Ltr 7-24-43 w/3 Indls.

HNB
MJG
MTD
RES

SUBJECT: Acquisition of Land for the West Virginia Training Grounds, Army Ground Forces, Tucker & Grant Counties, near Elkins, W.Va.

1st Ind.

War Department, Headquarters, Army Service Forces. 23 July 1943

To: The Under Secretary of War.

The Secretary of War directs that you be informed that a military necessity exists for the acquisition of the land described in the preceding basic communication.

For the Commanding General:

F. W. Smith
Col. G.S.C.
For W. D. STYER,
Major General, G. S. C.,
Chief of Staff.

Incls. n/c

2nd Ind.

Office of the Under Secretary of War, 23 July 1943

To: The Chief of Engineers.

For acquisition of land in accordance with Section VII, Circular No. 47, W.D. 1942.

By direction of the Under Secretary of War:

Marion Rushton
MARION RUSHTON
Colonel, J.A.G.D.
Administrative Officer

Incls. n/c

F-2

WAR DEPARTMENT

OFFICE OF THE CHIEF OF ENGINEERS

File No. CE 601.53 (Elkins, W.Va.) SPELR Date 28 JUL 1943

Subject Acquisition of Additional Land for the West Virginia Training Grounds, Army Ground Forces, Tucker and Grant Counties, Elkins, West Virginia.

From PLANNING & APPRAISAL SECTION To CONDEMNATION SECTION
LEASING SECTION

1. Directive dated 23 July 1943 authorized the acquisition of 52,820 acres of land by lease for the proposed artillery ranges, Army Ground Forces. The estimated annual rental is $23,200.

2. It has now been determined that a military necessity exists for the acquisition by lease of a portion of the lands referred to in paragraph 2-h of the abovementioned directive as the balance of the area to be obtained by maneuver rights and designated as Area "C" on the inclosed map.

3. Description of the land and other pertinent data are as follows:

a. BRIEF DESCRIPTION OF THE LAND: The subject land is located adjacent to the eastern boundary of Areas "A" and "B" as referred to in original directive dated 23 July 1943, and more particularly shown in red on the inclosed map.

b. PROPOSED USE: Artillery training grounds for the Army Ground Forces.

c. ACREAGE INVOLVED: 4,849 acres.

d. IMPROVEMENTS: None.

e. ESTIMATED ANNUAL RENTAL: Not to exceed $3,000.

f. ESTATE TO BE ACQUIRED: Leasehold interest.

g. METHOD OF ACQUISITION: Negotiation or condemnation.

h. REMARKS: The abovementioned lands are to be acquired on the same basis and in the same court proceedings as Area "A", and the using service intends to utilize this additional area in the same manner as they propose to use Area "A", i.e., for artillery firing ranges. This action will therefore authorize the acquisition by lease of a total of 57,669 acres of land, more or less, for the use of the using service as artillery ranges. Immediate possession of the abovementioned additional land is requested under War Powers Act and it is recommended that this area be included with the proceedings to obtain possession of Area "A" as requested in memorandum of transmittal dated 23 July 1943, under subject above.

4. The determination of military necessity for the acquisition of the additional land is based upon the request of the Division Engineer, as set forth in letter dated 24 July 1943; and the recommendations of the Commanding Officer, West Virginia Maneuver Area, as indicated in letter of 17 July 1943; both of which are inclosed.

5. Funds for this acquisition are available from Public 108, 78th Congress, approved 1 July 1943.

F-3

RE-D 2 Forwarded to Condemnation Section 28 July 1943.

DAVENPORT

6. It is recommended that the Under Secretary of War be informed that a military necessity exists for the acquisition of the abovementioned land and that he be requested to authorize this office to acquire the necessary leasehold interest in same.

For the Chief of Engineers:

T. F. Farrell
T. F. FARRELL,
Colonel, Corps of Engineers,
Executive Assistant.

Incls.
1 - Memo 7-9-43
2 - Ltr 6-2-43 w/2 Inds.
3 - Directive Map.

DEPARTMENT OF AGRICULTURE
Washington

August 4, 1943

The Honorable
The Secretary of War

Dear Mr. Secretary:

I have Acting Secretary of War Patterson's letter of July 15, 1943, in which he requests that your Department be granted formal permission to use national forest land in the Monongahela National Forest in the counties of Preston, Grant, Randolph, Tucker and Pendleton, West Virginia, for Army maneuver purposes, and that this Department, with funds to be advanced by the War Department, administer the fire prevention measures and actual forest fire fighting on all of the lands that are used by your Department in the above mentioned counties.

The Forest Service has issued a special use permit to the Town of Parsons covering the Elklick Run Watershed for municipal water supply purposes. This same watershed also includes the Fernow Experimental Forest, which is administered for research purposes. In order to prevent the pollution of this municipal water supply, and so that the long-time experiments being conducted on the experimental forest may not be interfered with, it will be appreciated if your Department refrains from use of this watershed.

Although we do not have in Washington any specific records of rights of use and occupancy which hitherto may have been granted under the authority of the Secretary of Agriculture, it is known that some such rights do exist. A specific list of all the permits, agreements and rights issued and outstanding on the national forest land concerned will be made available to your representatives located at Elkins, West Virginia.

The Forest Service will assume the responsibility for protecting the maneuver area from forest fires in accordance with Memorandum of Understanding dated July 8, 1943, which was prepared and signed by Colonel A. W. Gower, C.A.C., Director: Major Holland V. Shields, C.E., Fifth Service Command, Rents and Claims Board; and Forest Supervisor Arthur A. Wood, Monongahela National Forest. Standard Form 1080 is being prepared in the sum of $43,083 as specified in the above mentioned agreement, for the fiscal year 1944, in order to effectuate the transfer of funds between Departments.

F-4

2 - Secretary of War -

Subject to the conditions above set forth, the use by your Department of the 341,266 acres, more or less, of national forest land in the Monongahela National Forest, in the counties of Preston, Grant, Randolph, Tucker and Pendleton, West Virginia, is hereby authorized for such period as may be necessary.

Sincerely,

Signed: Claude R. Wickard,
Secretary

F-4

WAR DEPARTMENT

OFFICE OF THE CHIEF OF ENGINEERS

File No. CE 601.53 (Elkins, W. Va.)SPELR Date 29 October 1943

Subject Revised Description of Area for the West Virginia Training Grounds, Tucker and Grant Counties, Elkins, West Virginia.

From PLANNING & APPRAISAL SECTION To CONDEMNATION SECTION
LEASING SECTION

1. By 2nd Indorsement dated 23 July 1943, the Under Secretary of War authorized the acquisition by lease of 52,820 acres of land at an estimated annual rental of $23,200.

2. Pursuant to general directive issued by the Under Secretary of War 10 April 1942, the acquisition of an additional 4,849 acres of land by lease was authorized 28 July 1943, at an estimated annual rental of $3,000.

3. Based upon the recommendation of the Division Engineer by letter dated 21 October 1943 and the concurrence of the Commanding General, Army Ground Forces by letter dated 8 October 1943, a military necessity exists for the revision in the boundary description and total acreage authorized in the directives referred to in paragraphs 1 and 2 above.

4. The total acreage is hereby amended to the leasing of a total of 48,067 acres, more or less, and the boundary of the area amended to agree with the revised boundary description attached. However, the revised area is generally the same lands authorized in the abovementioned directives, except for the elimination of certain areas whereby unrestricted firing would endanger farming activities and rural dwellings. The revised boundary of the subject area to be acquired by lease is shown by a dash-line on the inclosed "Directive Map".

5. It is requested that the present condemnation action for possession under War Powers be amended to agree with the abovementioned revision.

O'Brien

O'BRIEN

ami

Attached:
Ltr 10-8-43
Ltr 10-21-43 w/incls.

RE-D 2418 A

Forwarded to Condemnation Section 29 October 1943.

F-5

RE-D 2418 A CLARK

WAR DEPARTMENT

File No. CE 601.53 (Elkins, W. Va.)SPELR Date 8 DECEMBER 1943

Subject Acquisition of additional land for West Virginia Training Grounds, Elkins, West Virginia.

From CHIEF, REAL ESTATE DIVISION To ACQUISITION BRANCH
PURCHASE SECTION
Attn: Mr. Frazier

1. Directive dated 23 July 1943 authorized the acquisition by lease of 52,820 acres of land at an estimated rental of $23,200 per annum.

2. General directive dated 28 July authorized the acquisition by lease of an additional 4,849 acres of land at an estimated annual rental of $3,000.

3. General directive dated 29 October 1943 amended the abovementioned directives to reduce the total acreage to be acquired to 48,067 acres.

4. Based upon the approval of the Commanding General, Army Ground Forces by 1st Indorsement dated 23 October 1943, a military necessity exists for the acquisition of additional land described in detail below:

a. BRIEF DESCRIPTION OF THE LAND: The subject area is bounded: (1) on the west by a line extending northerly from the Town of Laneville to the south line of the area referred to in the abovementioned directives, said line having a bearing of N 11° 26' W -- approximately 255 chains in length; (2) on the north by the south line of the abovementioned project; (3) on the east the boundary generally follows the Tucker and Grant County line to the intersection with the Tucker and Randolph County line; and (4) on the south by an irregular east-west line connecting the Town of Laneville with the intersection of the Grant-Tucker and Tucker-Randolph County lines, being a part of Tucker and Randolph Counties, State of West Virginia, as indicated on the attached directive map dated 2 December 1943 and entitled "Monongahela Area".

b. PROPOSED USE: Impact area.

c. AREA INVOLVED: 9,470 acres.

d. OWNERSHIP: U. S. Government.

e. ESTATE TO BE ACQUIRED: Use permit.

f. METHOD OF ACQUISITION: Formal request from the Government Agency having jurisdiction over said land.

5. It is requested that necessary action be taken promptly to acquire the abovementioned use permit.

RE-D 2418 B

O'BRIEN

lac
Attachments:
1 - Ltr to C.O., AGF 10-20-43
w/3 Inds & incls.
2 - Directive Map 12-2-43

Forwarded to Purchase Section 8 December 1943.

MEG
JMC
RES

RE-D 2418 B

CLARK

F-6

OSL/1j

CE 602 Elkins West Virginia Maneuver Area. SPELT 1st Ind.
(Ban. ltr. 12 June 45)
SUBJECT: Real Estate Disposal Plan West Virginia
Maneuver Area and Base Installations, Elkins, West Va.

OCE, Washington 25, D. C., 28 June 1945.

TO: The Ohio River Division Engineer, COLUMBUS 16, OHIO.

1. The real estate disposal plan for the West Virginia maneuver area and base installations is approved as recommended with certain exceptions as hereinafter set forth.

2. The disposal plan recommends (page 27, paragraph 3B), that the War Department acquire 12,760 acres in fee in order to save the expense of decontaminating land of low value, such acquired land to be later transferred to the Monongahela National Forest Reserve. It is the policy of the War Department as promulgated in Circular Letter No. 3680 (Real Estate No. 69), dated 13 April 1945, to decontaminate all contaminated areas regardless of cost, even though it would be cheaper to acquire the land in fee. Therefore, the recommendation that the War Department acquire this land is not favorably considered. This office advised your office by letter dated 28 March 1945, that a trained decontamination squad would be available for performance of neutralization work in the West Virginia maneuver area when requested. No contaminated land should be returned to the owner until such decontamination work has been performed.

3. All maneuver rights given to the Government should be relinquished if not needed in the performance of decontamination work.

4. This office has previously authorized the transfer of the two demountable CCC buildings at the Elkins Equipment Depot to the Allegheny Ballistics Laboratory. The remaining CCC buildings may be salvaged in accordance with existing regulations.

5. The buildings added to the Elkins Equipment Depot by the War Department during its occupancy thereof may be disposed of to the Monongahela National Forest Reserve on a reimbursable basis, pursuant to RE Manual 1205.10 or sold in accordance with RE Manual 1205.06.

6. The recommendation made on page 9, paragraph 2(e), of the disposal plan, regarding dismissal of tract A-36 from condemnation, will be made the subject of a separate communication.

7. Approval of the disposal plan is subject to adjustments in boundary descriptions of the area requested by the Office of Scientific Research and Development, and subsequent reactivation of such area by the War Department.

8. The transfer of Government improvements in connection with the termination of leases should be supported in each case by proper restoration cost estimates and valuations of improvements in accordance with existing procedure and regulations.

BY ORDER OF THE CHIEF OF ENGINEERS:

ROBERT H. FABIAN
Major, Corps of Engineers
Chief, Management and Disposal Division
Real Estate

1 Incl. N/c
(except 2 cys w/d)

F-7

SUBJECT: Termination of Permits from Department of Agriculture covering West Virginia Maneuver Area, Elkins, West Virginia (Ltr fm OCE dtd 6 July 1950 ENGLT)

OVLMS 601.52 (Elkins, W.Va., West Virginia Maneuver Area)1 2nd Ind

O Dist Engr, P. O. Box 59, Louisville 1, Ky. 18 July 1950

THRU: The Div Engr, OHDiv, Cincinnati 1, Ohio OVDVR

TO: The Chief of Engineers, Washington 25, D.C.

Attention: ENGLT

1. In compliance with paragraph 2 of basic communication, and to the extent information is available in this office, requirements as provided for in paragraph 5111.08 c(2) of Orders and Regulations are as follows:

a. Mountainous, uninhabited land, a great portion being high plateaus covered with rock, scrub growths and timber, located in Grant, Pendleton, Preston, Randolph and Tucker Counties, West Virginia.

b. August 4, 1943 and November 10, 1943.

c. Department of Agriculture (Forest Service).

d. Two Use Permits.

e. ENG Form 1440 included as Inclosure No. 1.

f.g.h. No restoration work was performed by Department of the Army. In accordance with Memorandum of Understanding dated July 8, 1943, and two amendments thereto, between local representatives of Forest Service and Department of the Army, the Forest Service assumed responsibility for protecting the maneuver area from forest fires. The Forest Service constructed the necessary facilities, the cost of construction and maintenance being borne by the Department of the Army on a reimbursable basis under existing regulations. It is indicated from the records that the funds were made available directly by OCE to Forest Service, and, provided for the construction of lookout towers and road building and repairs due to the additional fire hazards caused by Department of the Army maneuvers within the area under use permit.

i. Three Reports of Decontamination Work are included as Inclosure No. 2.

j. WAA Form 1005 is not necessary as land was not improved by Department of the Army.

601.32 (Elkins, W.Va., West Virginia Maneuver Area) 1 OVLRM (7-18-50) 2nd Ind
SUBJECT: Termination of Permits from Dept. of Agriculture covering W.Va. Maneuver area, Elkins, W.Va.

2. This installation was placed in surplus status as of 19 March 1945, and subsequently withdrawn for the purpose of issuing a permit for use thereof by the Office of Scientific Research and Development. Warning Notice No. 825 dated 10 August 1945, withdrew this entire area from surplus, however, correspondence in this office indicates that by letter dated 21 April 1945, from Office for Emergency Management, Office of Scientific Research and Development, Washington, D.C., to OCE, it was requested that OCE issue to OSRD a permit to use itself or through its agencies or contractors, a portion of the maneuver area. No information is available as to the actual issuance of the permit by OCE, or the terms or conditions under which the permit was granted.

FOR THE DISTRICT ENGINEER:

2 Incls
1 - ENG Form 1440 (trip)
2 - Decontamination Reports

C. B. RAYMER
Real Estate Officer

OVDVR ~~3rd~~ IND.
OHIO RIVER DIVISION
21 July 1950
TO CHIEF OF ENGINEERS ENGLT
2 INCLS. n/c

F-8

FMJ/pm

602 West Virginia Maneuver Area,
West Virginia - ENGLT

10 August 1950

TJC

HO'N

Chief, Forest Service
Department of Agriculture
Washington 25, D. C.

EJF

Dear Sir:

GFM

Reference is made to letters dated 4 August 1943 and 10 November 1943 from the Secretary of Agriculture to the Secretary of War, granting the War Department the right to use approximately 350,531 acres of land in the Monongahela National Forest, West Virginia, for Army maneuvers.

The use of this land is no longer required by the Department of the Army and, accordingly, the rights granted in the above referenced letters are hereby relinquished.

The land has been thoroughly searched for explosive material on the land as a result of military operations and all such material reasonably possible to detect has been removed or neutralized as indicated in the inclosed Report of Decontamination.

The cooperation of the Forest Service in making this land available for use by the Army is appreciated.

Sincerely yours,

2 Incls:
1. Ltr 24 May 46 (cy) w/Report of Decontamination (cy)
2. Cy of Map

W. H. HASTINGS
Colonel, Corps of Engineers
Assistant Chief of Engineers for
Real Estate

cc: ORD, Cincinnati, Ohio

JAG, Attn: Lands Division

F-9

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 laison 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 artillary 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 Roost (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 Kisamore). 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 ~~gridded~~ grid, 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. VANORSDALE
August 31, 1978

Original to Ballantyne
9/1/78
BWV

F-10

MILITARY USE-DOLLY SODS NORTH

The following information is primarily from Bill VanOrsdale, retired Forest Service employee. He was employed on the Potomac District from 1942-44, 1946-58. He was directly involved with the military activities on the District, being deferred from the Selective Service for that purpose. The military project ran from early 1943 to late summer 1944. At it's end, he was drafted in Sept. 1944. He worked out of the Ranger Office as fire dispatcher.

The three FS employees that worked directly with the military in the field are deceased.

Dolly Sods North lies just adjacent to northern border of Dolly Sods Wilderness and the western border of Dolly Sods Scenic Area. Dolly Sods North has been owned by Western Maryland RR and it's successor, Western Pocahontas, since the turn of the century.

During WW II, a portion of US land now known as Dolly Sods Scenic area and Dolly Sods Wilderness, and a portion of Dolly Sods North then owned by Western Maryland RR, was used as an artillery training area. We assume the Army used a "Declaration of Taking" to allow occupancy of the private land. However, all court records up to 1967 were destroyed, and the successor to Western Maryland claims no documents in their files.

Artillery used was 60mm, 81mm, 4.2 mortars, and 105mm and 155mm howitzers. VanOrsdale personally saw all these types, and there may have been additional types such as the 75 mm and 57 mm anti-tank gun. He is not sure if the 155 mm were ever fired, but had been told that they were emplaced.

The aiming point was Blackbird Knob, which lies just north of the Wilderness boundary on Dolly Sods North. The point was fired on from several directions, SW, SE, E,and NE. The vast majority of shells currently being found seem to be the 4.2 mortar variety. Shells used seem to have been "high explosive" and "white phosphorus" and possibly some sort of smoke shells, which also may have a white phosphorus compnent. It should be noted that the "target" must have been on the forward slope of the Knob. Any shell that went over the Knob stood a good chance of landing in unsuitable terrain, like somebody's backyard, if it went far enough.

VanOrsdale never saw any "targets" on the Knob. In normal military practice, an object (burnt out tank, wrecked vehicle etc) is sited on the range for the forward observers to range in on. There was no such target here and there were no sites for forward observers, as far as VanOrsdale can remember. It would appear that the training was for familiarization only. VanOrsdale remembers that there were constant new gun crews being trained.

The use of artillery during the dry season (particularly white phosphorous) often started brush fires. Fighting such fires was considered hazardous because it was thought that the heat would detonate unexploded rounds, particularly if it was a "hot" fire. VanOrsdale said that the crews were "very careful about that", but he does not remember a single incident where a shell blew up from a fire. What did happen, apparently more than once, was that FS firefighters would be entering the area to fight a fire, only to have the artillery open up and drop shells in the vicinity. It seems that it was very

difficult to get the word to everybody that FS firefighters were out on the range. This appears be the source of the story that "shells were exploding in the fire".

Things got so bad, firewise, weatherwise and coordinationwise, that they closed down the range, and set up a fire camp on it to try to control all of the fires. The army was called into help. Unfortunately, during the noon hour, the troops lit fires to heat their combat rations, one thing led to another, and soon there was a lot more fire than there had been earlier. Anyway, the camp got burnt out and the army was sent home.

After termination of the manuevers, the area was "swept" by the US Army to pick up unexploded ordinance. This was done more than once, the last serious effort taking place betweee 1951-53.

The Blackbird Knob area was grass, a lot more open than the area that is now the Wilderness. VanOrsdale is of the opinion that the Army sweeps of the area would have been much more effective on the Knob than in the area of what is now the Wilderness.

The Blackbird Knob area and its adjacent areas now Wilderness and Scenic Area were heavily grazed until the early 1970's. Grazing was heavy enough to keep back forest and brush encroachment, which indicates that cattle traversed the entire area. VanOrsdale has no recollection of cattle being injured by explosives.

The slope of Blackbird Knob is a major access point to the north end of Dolly Sods Wilderness. For years, we have been attempting to get an easement across the area, but to no avail, although hikers use it all the time. In fact, at least two shells were discovered there some years ago by hikers. With purchase of the area, that access problem will be solved.

Incidents involving unexploded ordinance.

> About 1948, someone from the Dept of Nat Res was in the area, picked up a shell, tossed it away, only to have it explode. He got away with some injuries to his leg. (We do not know the source of this information. VanOrsdale had no recollection of this. If it took place at all, possibly it was in 1945-46 when VanOrsdale was absent from the District.)
>
> During the first 15 years or so after the war, hikers and others found shells in large numbers, maybe 6-10 a summer. Although the area was heavily signed as to what to do, hikers would often carry the shells out to the road to make it convenient for the FS to dispose of them. VanOrsdale remembers "several at a time" being detonated by the Explosive Ordinance Demolition crews. As far as he knows, nobody got hurt moving the shells.
>
> In the last 15 years, there have been 6-7 occasions when hikers have found unexploded ordinace, including two shells on the slope of Blackbird Knob. (We have shell ID signs at the trailheads) The explosive ordinance demolition team from Ft Belvoir comes out usually to explode the shells for us. The last incident was this summer. The last incident previous to this one involving hikers was some years ago.

As far as we know the grazers reported no cows having an unfortunate encounter with unexploded ordinance.

ATV users are all over the area that we are purchasing and have been for years. No incidents reported.

Some years ago, this office received a call from the Corps of Eng about that artillery range. They wanted to know what the land use was now. They were told that it was a scenic area and a Wilderness, with heavy recreational use.

In 1990, TNC started negotiating purchase and resale to the US. The tract was divided up into two parts, coal being the main divisor, with the proviso that Blackbird Knob be in the first purchase, that area needed for proper use mangement of Dolly Sods Wilderness. Because of the coal location and values, it would be very difficult to re-divide the area to exclude the Knob.

In 1991, contractors for the Corps appeared to make a "recon survey" of the area to determine whether there was enough of a problem to warrant further action. We have not seen a report, but it is our understanding that they divided the Wilderness into equal sized tracts, randomly selected a total of 250 acres. (VanOrsdale was told that this was 2.5% of the total area the Army thought was affected.) The cost of this was rumoured to be over $600,000. The cost of sweeping the entire affected area could run up to $24,000,000, it seems.

VanOsrdale had a list of some of the items found by the survey.

The unexploded ordinance was equally distributed six on the surface and six subsurface.

5 81mm smoke rounds
3 4.2" mortar practice rounds
1 4.2" smoke round
1 81mm high explosive
1 4.2" high explosive
1 57mm solid shot (armor piercing anti-tank)
10 incomplete rounds of various types
fragments from a 60mm mortar round

They also found an incredible amount of other iron including 109 tent stakes, 115 railroad spikes, 3 horseshoes, chains, tin cans etc.

General comment: (NOT VanOrsdale)

What's out there? Mostly high explosive and white phosphorous shells. (During WWII, the terms smoke and white phosphorous were interchangeable.) As time goes on, the HE shells should get less and less sensitive. (That is not true for those of you with WW II Japanese shells. They get more sensitive through the years). White Phosphorous is another matter. The shell contents are in a semi-liquid state, with a central blasting or scattering charge. As the shells corrode, and water or air gets into them, they can ignite. So far, we know of no such incidents. However, the last shell discovered out there (this summer) was WP and it was "live". If the corrosion goes very slowly so that the shell does not heat up, it is possible for such shells to eventually become inert. But one should not count on that as a management alternative.

How much danger? Well the public has been all over the place picking blueberries (best blueberry habitat in these parts) since the War. And since the Wilderness was proclaimed 17 years ago, there has been heavy hiking use, including portions of Blackbird Knob. And the Blackbird Knob portion was heavily grazed until 20 years ago, and right now there is heavy ATV use on Dolly Sods North and there has been only one incident, which took place over 40 years ago.

Management activities.

1. All trailheads are signed showing the fact that the area was an artillery range, giving a description and illustration of shells that might be found, and providing information as to what to do if one is found.

2. A wilderness Ranger is assigned full time, there are two seasonals on the area, plus two other people on a coop program. As part of their duties, they make public contacts. One of the contact subjects is unexploded ordinance potential on the area.

3.

ANSWERS TO DOLLY SODS MILITARY USE QUESTIONS

Blackbird Knob and Cabin Mountain are on private land and always have been. The Knob is inside Dolly Sods North, about a mile north of Dolly Sods Wilderness, Cabin Mountain (the highest point) is right on the west boundary of Dolly Sods North. If we buy, I think we will own it.

If the military did it like they did everywhere else, they had the local court issue a "Declaration of Taking" to allow instant use of the private lands and then settled later. The land was owned by a railroad company, I think. If so, they were paid handsomely, you can be sure.

The Corps of Engineers has some statutory directive to seek out all military artillery impact sites, determine the extent of the hazard and if there is one, to clean it up. They claimed to me that all lands outside military reservations are covered. 10,000 sites were mentioned, going back to the Civil War. (Archeologists are not happy about that).

MILITARY USE-DOLLY SODS

During the period 1943-44, at least six infantry divisions trained in "mountainous" warfare on the mountain. NF. The 28th, 31st, 35th, 77th and 95th Infantry were trained in preparation for the invasion of Italy, the 10th "mountain division" as a light division for mountain warfare.

The Dolly Sods area was used as an artillery range. Weapons used were the 60mm, 81mm and 4.2" mortars. There may have been some 105mm artillery used also, but probably nothing bigger, and the area is pretty cramped for 105mm.

The artillery positions were arranged in a 3/4 circle running around the compass from SW in Canaan Valley North to the SE along what is now the eastern boundary of Dolly Sods Wilderness. Blackbird Knob which lies just north of Dolly Sods Wilderness in Dolly Sods North, and Cabin Mountain, 2 miles west of Blackbird on the western boundary of Dolly Sods North, were the aiming points. I am told that they used to fire over Blackbird to hit Cabin and vice versa depending on the location of the cannon. I find this hard to believe, because an "over" on Cabin Mt would land the shell somewhere out in Canaan Valley. Anyway, the two mountains were used as aiming points.

I had been originally led to believe that the only artillery positions were SE of Blackbird Knob, and that Blackbird was the aiming point. Standard artillery practice when you can't see the other side of the target is to "walk" the shell bursts onto the target. Consequently, most of the shells would have fallen short, into what is now Dolly Sods Wilderness. And what little information we have on shell discoveries tends to suggest just that. However, it is also possible that few shells have been discovered elsewhere because no one has looked elsewhere.

To my knowledge, the only shells discovered have been the 4.2" mortar size. Before the area was turned back to the Forest Service, we were told that it had been thoroughly "swept" for unexploded ordinance.

Although they seem not to have don it lately, the 345th Ordinance Co. of Washington DC. used to periodically come up to Dolly Sods to look for unexploded ordinance as a training exercise. They used to find one or two in a weeks searching. They have not come in recent years, either because they were no longer finding enough to make it worth the trouble, or maybe they found something better to do. The DOE contractor contacted them only to find that they keep records only a couple of years. And there was no one there that knew what had taken place on Dolly Sods previously.

The area is thoroughly signed warning visitors about unexploded ordinance. Included are drawings illustrating what these might look like.

Written by Forest Service Employee
Richard Trochlil
30 April 1991

United States Department of Agriculture | Forest Service | Eastern Region | 310 W. Wisconsin Ave. Milwaukee, WI 53203

File Code: 5400
Route To:

Date: January 17, 1995

1995 JAN 9 AM 9:05

Subject: Dolly Sods Tract Liability, Monongahela NF
Response to Office of Inspector General Concerns

To: Director, WO Lands
Attn: Ralph Bauman

We have reviewed the Management Alert from James R. Ebbitt of the Office of Inspector General (OIG) to Jack Ward Thomas, Chief of the Forest Service, relative to the purchase and management of the Dolly Sods Wilderness and "Dolly Sods North".

We are very aware of the potential risk to the public from unexploded munitions in the Dolly Sods area. We are actively involved with the Army Corps of Engineers in remedial action for the area. Currently, the Corps of Engineers is planning for remedial action in the Dolly Sods Wilderness this year and a thorough investigation and remedial action in the remaining area. In addition to the current remedial actions, the area has been searched and remedial action taken in the 1940's, 50's and as recent as the mid-1980's by the Army. We feel that our management of the area reduces the potential risk to the public to an appropriate level. These activities are illuminated below.

The land area known as "Dolly Sods North" consists of two parcels that were purchased from The Nature Conservancy in 1992 and 1993, and total 6168 acres. This land, as well as the 10,215 acre Dolly Sods Wilderness immediately to its south, was a part of the 2,181,000 acre West Virginia Maneuver Area that was used by the Thirteenth Army Corps of the Third Army for mountain training and maneuvers from October 15, 1943 to July 1, 1944. This training included artillery and mortar fire. While the exact targets and gun emplacements are unknown, it is known that the targets of the artillery fire included the southern face of Blackbird Knob, which is within the Dolly Sods North purchases. The artillery range was grid-searched and decontaminated of unexploded ordnance following the end of operations in the area.

In the mid-1980s, the Forest worked with the 354th Ordnance Company at Morgantown on a project of cleaning up ordnance in the Dolly Sods area. They held a summer camp at Dolly Sods and completed the removal of ordnance. Even following this effort, the Forest and District continued to work with various entities in the Department of Defense (DOD) to dispose of other, infrequently reported ordnance and to effect a more thorough clean-up.

Because the Huntington District Corps of Engineers believed that unexploded ordnance might still remain in the area and that the ordnance could create a hazard to the public, the Dolly Sods Wilderness area was selected for a Feasibility Study authorized under the Department of Defense Environmental Restoration Program for Formerly Used Defense Sites in 1991. At that time, the DOD acknowledged a significant level of uncertainty as to the location of unexploded explosive waste in the Wilderness, and this study was needed to determine the extent and potential hazard of that waste and to determine

feasibility and need for further clean-up action. This is the study referred to in the second paragraph of the Management Alert. The study was completed entirely within the lands owned and managed by the USDA-Forest Service at that time, and did not include any of the land that was to be purchased in the Dolly Sods North area. The Dolly Sods North area is scheduled for evaluation this year and, if necessary, additional remedial action will be taken. The notation on page 2 of the Management Alert that "the Corps determined that the area should be decontaminated" refers to the Dolly Sods Wilderness, not the Dolly Sods North tract. Some people believe that because the Blackbird Knob area in Dolly Sods North was much more open and grassy than the Wilderness area, that the previous decontamination efforts there were probably much more effective than the efforts in the Wilderness area.

The Monongahela National Forest and the Potomac Ranger District are currently working with the Army Corps of Engineers on two separate, but related projects, dealing with unexploded explosive ordnance in the Dolly Sods area. Within the Wilderness area, we are working with them on a work plan and an Environmental Assessment that will result in a contract for decontamination of the area. In the Dolly Sods North area, we are working with them to prepare for a feasibility study that will assess the extent of the ordnance still existing in Dolly Sods North, the hazards that the ordnance presents, and the need for additional decontamination. Both of these studies include a risk analysis prepared by a subcontractor who specializes in such matters.

Though the Corps of Engineers has given the Dolly Sods Wilderness area a rating of "2" in their risk scale, their involved personnel have indicated that it is in the lower ranges of that rating. They have accelerated their schedule for the remediation of the contamination to include the Dolly Sods Wilderness remediation and the Dolly Sods North feasibility work for this year as a result of the continued interest and involvement of the Forest Service.

On December 6 & 7, 1994 Forest Service employees met with representatives of the Huntington and Huntsville Divisions of the US Army Corps of Engineers, as well as their contractors that will be doing the work in the two areas. This meeting included several hours of hiking within the affected area on December 6, as well as discussions of the uses of the area, risks to recreationists and management personnel, and various other concerns. We have discussed the possibility of ordnance showing up after the remediation work and have been told that, because of our request, a "maintenance clause" will be included in the remediation contract. We have been working with personnel from these offices to move forward on this project since that time. Both projects are funded in the Corps' FY95 budget, and contracts are expected to be signed this year to start the actual work on-the-ground. We and the Corps are quickly moving forward on these projects.

In the meantime, as noted in the Management Alert, we are continuing to sign all the trailheads and access points with warning signs and to include the unexploded ordnance information in all of our brochures and other handout information on the areas. We include these warnings in our personal and telephone contacts with potential visitors and ask that our partners do the same.

With respect to the content of the third to last paragraph on page 2 of the OIG Management Alert, OGC, Milwaukee informed us that while closing the area to entry would be the most the Forest Service could do to reduce potential liability, it has no opinion as to whether access to the area should or should not be restricted.

We firmly believe that the measures we have taken are sufficient, reasonable and informed to ensure public safety. We are continuing to work with the Corps of Engineers and should new information emerge, we will address the issues forthrightly to continue ensuring public safety. We don't believe that denying access to the National Forest in the form of a closure order is the appropriate resolution for this situation.

Please use this letter as material for your response to OIG. Contact us if there is a need for additional discussion. We believe this issue is properly within the delegated authority of the Region and the National Forest. We urge that you involve us as you prepare your final response to OIG.

/s/Paul M. Stockinger

PAUL M. STOCKINGER
Natural Resources Team

cc: Monongahela NF
OGC-Milwaukee

PStockinger:ps/lbb 1/13/95

United States Department of Agriculture | **Forest Service** | **Monongahela National Forest** | **Potomac Ranger District**
HC 59, Box 240
Petersburg, WV 26847
304-257-4488

"CARING FOR THE LAND AND SERVING PEOPLE"

Reply to: 2320

Date: November 3, 1993

Technical Center
Huntsville Division, DOD Corps of Engineers
P.O. Box 1600
Huntsville, AL 35807-4301
Attn: C.E.H.&D.-PM-OT (Belew)

Mr. Roland Belew, Project Manager
Dolly Sods OEW Removal

Recently, I discussed with you some of our concerns relative to the Dolly Sods OEW removal. At that time, I also informed you of additional UXO which has been found on our property in the Dolly Sods North property that we have recently acquired. This included a chemical bomb that was removed earlier this fall, as well as a chemical bomb that reportedly was removed a couple of years ago. As I mentioned, Dolly Sods North contains Blackbird Knob, the point that was determined to be the target area for much of the UXO that has been found in the Dolly Sods Wilderness. (See Figure 1-3 in the 1/21/92 Engineering Report that you provided us). The Engineering Report also advised us (on page 3-10) that "it is believed that no large sized artillery ordnance exists in the Dolly Sods Wilderness. This may not be the case for land to the north of Dolly Sods owned by the Western Maryland Railroad where Blackbird Knob was known to be a target for artillery fire during training activities."

Because of our concerns for public safety and government liability should an accident occur as a result of the UXO, as well as our responsibility to manage that land for the American public, we are requesting that you evaluate the need for removal of the UXO on this land.

I am enclosing a sketch map of the Dolly Sods North property. If you need further information or further action from us in order to initiate this evaluation, please do not hesitate to contact me or my staff at this office. We look forward to working with you to resolve this situation.

Sincerely,

Nancy R. F. Feakes

NANCY R.F. FEAKES
District Ranger

Enclosure

cc:SO

RECEIVED

Western Pocahontas Properties
Limited Partnership
1035 - 3rd Avenue • P. O. Box 2827
Huntington, WV 25727-2827
(304) 522-5757 • Fax (304) 522-5401

July 5, 1995
Files Nos.: 26-18; 32-18

USADACS
Attn.: SMCAC-ESL
Richard Dikeman, Director
Savanna, IL 61074-9639

Dear Mr. Dikeman:

Reference is made to our telephone conversation of Friday, June 16, concerning the Army's search for unexploded shells in Grant and Tucker Counties, WV. Attached is a map, scale 1"=4,000±, showing Western Pocahontas Properties' ownership in the area.

I have been working as a forester on the land now owned by Western Pocahontas Properties since 1978 and there have never been any reports of unexploded shells being found outside the Dolly Sods Watershed (i.e., Red Creek). There have been reports of trees in the northern end of Canaan Valley containing fragments of shrapnel, but I am unaware of any unexploded shells being found in the area.

If you need additional information, please feel free to give me a call.

Sincerely,

Douglas N. Toothman

Douglas N. Toothman
Manager, Land Resources

DNT/g

Attachment

WEST VIRGINIA DIVISION OF
CULTURE AND HISTORY

July 5, 1995

Richard Dikeman
SNCAC-ESL
USADACS
Director
Savanna, Illinois 61074-9639

Re: (1) Proposed Ordnance Demolition/Removal Project, WV Ordnance Plant, Point Pleasant;
(2) Proposed Ordnance Demolition/Removal Project, Dolly Sods Wilderness Area, West Virginia

Dear Mr. Dikeman:

I am writing in reference to the cultural resources file searches for the two proposed projects identified above. You talked with Dr. Frederick McEvoy of the SHPO staff by phone about these two projects on Monday, June 26.

(1) Of the two projects, the Point Pleasant Ordnance plant is somewhat easier to deal with. Enclosed are photocopies of relevant parts of the Addison and Gallipolis quadrangles (USGS 7.5' Topographic Series), showing previously recorded prehistoric archaeological sites in and around the city of Point Pleasant. One site, 46Ms53, appears to abut upon the northern boundary of the U.S. Reservation (presumed to be the ordnance plant). It is not known what the current condition of 46Ms53 might be. This site was recorded many years ago, and so far as I am aware, has not been excavated by professional archaeologists; the likelihood that it has been excavated in by artifact collectors is quite high.

The attached table showing the approximate UTMs for other recorded sites in the Point Pleasant area also indicates very briefly the kinds of sites in the nearby region. Given the occurrence of these river bottom sites, it is probably safe to say that evidence of prehistoric occupation of the lands within the U.S. Reservation and the nearby Ordnance School grounds could be expected with fairly high probability.

On the copied portion of the Gallipolis quad, you will note an area of Point Pleasant that has been highlighted yellow: this signifies the Point Pleasant (National Register) Historic District. At the south end of the historic district is another National Register site, this one commemorating the Battle of Point Pleasant (1780s).

THE CULTURAL CENTER • 1900 KANAWHA BOULEVARD, EAST • CHARLESTON, WEST VIRGINIA 25305-0300
TELEPHONE 304-558-0220 • FAX 304-558-2779 • TDD 304-558-0220

With regard to the Ordnance Plant itself, it is likely that the buildings and the property as a whole are now sufficiently old to warrant evaluation for eligibility and nomination to the National Register of Historic Places. The "Ordnance School," located east of the U.S. Reservation and adjacent to Jackson Avenue, if dating from the same period as and associated with the U.S. Reservation, should also be evaluated for register eligibility.

(2) The project for clearing the Dolly Sods Wilderness area (and the expanded territory that you talked about the other day) is much more complicated. Information about locations and contents of archaeological sites within the boundaries of the National Forest (including the designated Wilderness Area) will have to be released to you by the Forest Service. The WVSHPO is not authorized to release information about archaeological resources on Forest Service lands.

The expanded area of the project to include private or state lands outside the boundaries of the Monongahela National Forest would appear to include lands within some nine topographic quadrangles. Because of small staff size, the WVSHPO does not carry out file searches for proposed projects that may impact known or "not known" (previously unrecorded) cultural resources (historic structures as well as historic and prehistoric archaeological sites). Such searches are the responsibility of project sponsors (or cultural resource consultants hired by the sponsor), who normally do the necessary background research in our office and in the State Archives. To do such a file search in nine quadrangles would require more time from our small staff than we have available for other projects with which we are directly concerned, and would set a probably undesirable precedent.

It will be necessary, therefore, for someone from your own staff to come to Charleston to carry out the cultural resources file and inventory search for the Dolly Sods project. Lists of qualified archaeologists and historical consultants who might be persuaded to do this research in your agency's behalf are being sent to you with this letter.

Sincerely,

William G. Farrar

William G. Farrar, IV, Deputy
State Historic Preservation Officer

Enclosures

WGF:fm

ORDNANCE AND EXPLOSIVES
ARCHIVES SEARCH REPORTS
for the former
DOLLY SODS NORTH
TUCKER COUNTY
WEST VIRGINIA
PROJECT NUMBER G03EV006504

APPENDIX G

REAL ESTATE DOCUMENTS

APPENDIX G

REAL ESTATE DOCUMENTS

TABLE OF CONTENTS

G-1 Military Acquisition Project Report dated 25 July 1950 (reference B-31).

G-2 Tract Register for 65 tracts of land dated 26 July 1950 (reference B-32).

G-3 Permit granted to The Office of Scientific Research and Development, with tract map including tract A-76A, dated 8 September 1945 (reference B-33).

G-4 Real Property Management and Disposal Report dated 15 April 1951 (reference B-34).

G-5 Description of 6168 acres of land conveyed to the Western Pocahontas Properties Limited Partnership on 31 December 1986 (reference B-35).

G-6 Warranty Deed dated 3 December 1992 (reference B-36).

G-7 Warranty Deed dated 1 September 1993 (reference B-37)

MILITARY A[illegible]ION PROJECT REPORT

REPORTS CONTROL SYMBOL
ENGLC - 2 (R2)

TO: Chief of Engineers Washington 25, D. C. ATTN: ENGLH	FROM (Division) Ohio River	DISTRICT Louisville, Ky.	STATE (S) West Virginia
PROJECT NAME West Virginia Maneuver Area		DIRECTIVE DATE 4-10-42, 7-23-43, 7-28-43, 10-29-43	DIRECTIVE NUMBER RE-D 773 RE-D 2418, Gen. RE-D 2418A Gen. RE-D 2418A
PURPOSE Mountain Training		DATE OF REPORT 7-26-50	
		CHECK ONE [XX] ARMY [ ] AIR FORCE [ ] ATOMIC ENERGY COMM.	

3029 GENERAL	CURRENT PERIOD TRACTS	CURRENT PERIOD ACRES	CURRENT PERIOD DOLLARS	PROGRESS TO DATE TRACTS	PROGRESS TO DATE ACRES	PROGRESS TO DATE DOLLARS
1. TOTAL AUTHORIZED FOR ACQUISITION				65	48,557	26,200
a. FEE				-	-	-
b. EASEMENTS & LESSER INTERESTS				* 1	-	-
c. PUBLIC LANDS				-	-	
d. LEASED TO U.S.				** 64	48,557	
ACQUISITION OF FEE, EASEMENTS AND LESSER INT.						
2. TOTAL *(Items 1a & 1b)*				1	-	-
3. TRACT OWNERSHIP DATA COMPLETED				1		
4. TRACT MAPS COMPLETED				1		
5. APPRAISALS APPROVED				-	-	-
6. TITLE EVIDENCE ORDERED				1		
7. TITLE EVIDENCE RECEIVED				1		
PURCHASE *(Including Donations)*						
8. OPTIONS OBTAINED				* 1		
9. OPTIONS ACCEPTED				1	-	-
10. TITLE EVIDENCE SUBMITTED				1		
11. PRELIMINARY TITLE APPROVED				1		
12. PAYMENTS AND CLOSINGS COMPLETED				1	-	-
13. FINAL TITLE PAPERS SUBMITTED				1	-	-
CONDEMNATION *(Including Declarations of Taking)*						
14. ASSEMBLIES SUBMITTED						
15. CONDEMNATION PETITION FILED						
16. ORDER OF POSSESSION ENTERED						
17. TITLE EVIDENCE TO U.S. ATTORNEY						
18. DECLARATION OF TAKING FILED						
19. STIPULATIONS AND AWARDS APPROVED						
20. AWARDS AND DEFICIENCIES DEPOSITED						
21. PARTIAL DISBURSEMENTS						
22. FINAL JUDGEMENT ENTERED						
23. FINAL DISBURSEMENTS						

PROJECT MANAGER *(Name)* C.B. Raymer C.B. RAYMER, ~~Chief~~, Real Estate Division	OFFICE ADDRESS P.O. Box 59 Louisville, Ky.

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(SEE INSTRUCTIONS ON REVERSE SIDE)

ENG FORM 1 JUN 50 1010 PREVIOUS EDITIONS OF THIS FORM ARE OBSOLETE.

INSTRUCTIONS

a. ORTS WILL BE PREPARED QUARTERLY AS OF 15 MARCH, 15 JUNE, 15 SEPTEMBER, AND 15 DECEMBER.
b. ORTS WILL BE PREPARED IN QUINTUPLICATE FOR THE FOLLOWING DISTRIBUTION: Forward original and one copy in sufficient time to reach the Office, Chief of Engineers on or before the 22nd of the month in which the report is prepared. One copy forwarded to the Division Office, one to the District Office and one copy retained in the project office.
c. SUBMISSION OF REPORTS WILL BEGIN AS SOON AS NOTICE OF ISSUANCE OF A DIRECTIVE IS RECEIVED AND CONTINUED UNTIL ALL ACTION HAS BEEN COMPLETED, INCLUDING DISTRIBUTION OF FUNDS DEPOSITED ON EXCESS AWARDS.
d. RECORDS WILL BE MAINTAINED ON A FRACTIONAL ACREAGE AND DOLLAR BASIS: Totals thereof however will be rounded to the nearest acre or dollar in preparing this report (.50 acre will be reported as an additional acre; 50 cents will be reported as an additional dollar).
e. THE NUMBER OF TRACTS, ACRES, AND AMOUNT OF MONEY SHOWN IN ITEM 1 OF THE INITIAL REPORT WILL BE AS RECITED IN THE DIRECTIVE. The number of tracts and acres will be revised as the preparation of tract ownership data and tract maps progresses. The amount of money will remain constant under item 1 unless changed by a subsequent Directive.
f. THIS REPORT WILL COVER ALL TYPES OF ACQUISITION OF REAL ESTATE OR INTERESTS THEREIN:
   1. Tracts involving Public Domain, State owned land not being acquired, or land to be leased will NOT be reported in six columns of report but will be reported under remarks below. Tracts under lease will be identified by contract number, tract number and acreage.
   2. Completed transactions not involving condemnation which do not follow regular acquisition procedure steps (such as easements, licenses, and donations) will for report purposes be reflected in all purchase steps (items 8-13) and will be identified by appropriate footnote showing interest acquired and number of tracts. Where no actual acreage is involved as in the case of informal agreements to top trees, only "tract" and "dollar" data will be reported.
g. ALL TRACTS TRANSFERRED FROM "PURCHASE" TO "DECLARATION OF TAKING" SHOULD BE DEDUCTED FROM ALL "PURCHASE" STEPS AFFECTED AND REPORTED UNDER "DECLARATION OF TAKING".
h. ALL TRACTS TRANSFERRED FROM "CONDEMNATION" TO "PURCHASE" SHOULD BE DEDUCTED FROM ALL "CONDEMNATION" STEPS AFFECTED AND REPORTED UNDER THE "PURCHASE" STEPS.
i. WHERE TWO OR MORE "REAL ESTATE DIRECTIVES" HAVE BEEN ISSUED IN CONNECTION WITH THE SAME PROJECT, A SEPARATE REPORT WILL BE SUBMITTED FOR EACH DIRECTIVE. "GENERAL DIRECTIVES" WILL BE REPORTED WITH THE "REAL ESTATE DIRECTIVE" TO WHICH EACH RELATES.

ADDITIONAL TRACTS: DURING THE CURRENT PERIOD,_____TRACTS, IDENTIFIED AS TRACTS NUMBERS_____

_____WERE ADDED UNDER THE FOLLOWING AUTHORITY

AND FOR THE FOLLOWING REASONS:

TRACT REDUCTIONS: DURING THE CURRENT PERIOD,_____TRACTS, IDENTIFIED AS TRACTS NUMBERS_____

_____WERE DROPPED UNDER THE FOLLOWING AUTHORITY

AND FOR THE FOLLOWING REASONS:

REMARKS

3052

* 1 license, no area and nominal cost.
** For lease number, tract numbers and acreage of tracts taken by leasehold, see tract register, same directive.

61 1471

OFFICE OF THE CHIEF OF ENGINEERS
REAL ESTATE DIVISION

TRACT REGISTER

☐ PRELIMINARY
☒ FINAL 3029
(Separate Register to be prepared for each Real Estate Directive)

PROJECT (Official Name): West Virginia Maneuver Area
PURPOSE (As Set Forth in Directive): Mountain Training
DATE OF DIRECTIVE: 4-10-42, 7-23-43, 7-28-43, 10-29-43
DIRECTIVE NUMBER: ~~ED-D 2418~~ Gen. ~~ED-D~~ 2418A, Gen. ~~ED-D~~ 2418 A

TRACT NUMBER	LANDOWNER'S NAME	ACREAGE	PRICE	ESTATE 1/	METHOD 2/	LAST ACTION STEP TAKEN	REMARKS (Including Contract No. of Leases)
2-L	The Western Maryland RR Co.	No area	Nominal	LI	P	License dated 12-17-43	For steam line
A-67	Virgil F. Stonestreet	158.80	180.00	LE	L	Lease No. W33-017 Eng 351 dated 10-1-43	Cancelled 6-30-46 $332.58 for period from 8-6-43 to 8-31-43, $180.00 per annum thereafter.
A-75	Harry B. Herr, et al	3,830.00	223.80	LE	L	Lease No. W-33-017 Eng 1322 dated 11-1-43	Cancelled 6-30-46 $223.80 per annum.
A-76A	The W. Va. Central & Pittsburgh R.R. Co. and The Davis Coal & Coke Co.	17,515.54	None	LE	L	Lease No. W33-017 Eng 1403 dated 8-6-43	Cancelled 2-28-46 $1.00 per annum, receipt acknowledged.
A-76B	The W. Va. Central & Pittsburgh R.R. Co. and The Davis Coal & Coke Co.	2,107.74	None	LE	L	Lease No. W-33-017 Eng 1403 dated 8-6-43	Cancelled 2-28-46.
A-76C	The W. Va. Central & Pittsburgh R.R. Co. and The Davis Coal & Coke Co.	3,512.00	None	LE	L	Lease No. W33-017 Eng-1403 dated 8-6-43	Cancelled 2-28-46.
A-77	W. Va. Power & Transmission Co.	9,523.37	1,300.00	LE	L	Lease No. W33-017 Eng 439 dated 11-1-43	Cancelled 9-30-46 $3,033.88 for period from 8-6-43 to 8-31-43, $1300.00 per annum thereafter. Includes Tracts A-91, A-92 and A-93.
A-78	Tacy A. Carwell	1,082.00	499.92	LE	L	Lease No. W33-017 Eng 347 dated 10-1-43	Cancelled 2-28-46 $106.60 for period from 8-6-43 to 9-30-43 $499.92 per annum thereafter.
A-79	Willie J. Trout & John R. Harper	875.50	300.00	LE	L	Lease Contract No. W33-017 Eng 457 dated 11-15-43	Cancelled 2-15-46 $320.95 for period from 8-6-43 to 8-31-43 and $300.00 per annum thereafter.
A-80	Alice Coffman	553.60	100.00	LE	L	Lease Contract No. W33-017 Eng 364 dated 10-1-43	Cancelled 2-5-46 $100.00 per annum
A-81	Roscoe C. Beall, et ux	368.00	100.00	LE	L	Lease Contract No. W33-017 Eng 352 dated 10-1-43	Cancelled 2-28-46 $167.00 for period from 8-6-43 to 8-31-43 and $100.00 per annum thereafter.
A-82	Jason Harmon Estate	939.20	600.00	LE	L	Lease Contract No. W33-017 Eng 918 dated 10-1-43	Cancelled 2-28-46 $311.90 for period from 8-6-43 to 8-31-43 and $600.00 per annum thereafter.
A-86	West Virginia Pulp & Paper Co.	474.71	None	LE	L	Lease Contract No. W33-017 Eng 2257 dated 11-1-43	Cancelled 4-30-45 $1.00 for term of lease-receipt acknowledged.
A-87A	The W.Va. Central & Pittsburgh R.R. Co. and The Davis Coal & Coke Co.	290.00	None	LE	L	Lease Contract No. W33-017 Eng 1403 dated 8-6-43	Cancelled 6-30-46
	TOTAL						

1/ "F" Fee; "LE" Leasehold; "LI" License; "PE" Permit; "E" Easement.
2/ "P" Purchase; "D/T" Declaration of Taking; "WPA" War Powers Act Condemn; "N" Nonnegotiated; "T" Transfer; "D" Donation; "DC" Straight Condemn.; "L" Lease; "NWPA" Natural War Powers Action; "AG" Informal agreement; "LS" Lease - Suspension Agreement; "A" Assignment.

DIVISION: Ohio River
DATE PREPARED: 7-26-50

ENG FORM 1 NOV 48 1019

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OFFICE OF THE CHIEF OF ENGINEERS
REAL ESTATE DIVISION

TRACT REGISTER (Cont'd)

☐ PRELIMINARY
☒ FINAL 3029
(Separate Register to be prepared for each Real Estate Directive)

PROJECT (Official Name): West Virginia Maneuver Area
PURPOSE (As Set Forth in Directive): Mountain Training
DATE OF DIRECTIVE: 4-10-42, 7-23-43, 7-28-43, 10-29-43
DIRECTIVE NUMBER: RE-D 773, RE-D 2418, Gen.RE-D 2418A, Gen. RE-D 2418B

TRACT NUMBER	LANDOWNER'S NAME	ACREAGE	PRICE	ESTATE 1/	METHOD 2/	LAST ACTION STEP TAKEN	REMARKS (Including Contract No. of Leases)
A-87B	The W. Va. Central & Pittsburgh R.R. Co. and The Davis Coal & Coke Co.	134.00	None	LE	L	Lease Contract No. W33-017 Eng 1403 dated 8-6-43	Cancelled 6-30-46
A-89	George Ervin Rohrbaugh	291.20	80.00	LE	L	Lease Contract No. W33-017 Eng 350 dated 10-1-43	Cancelled 6-30-46 $285.59 for period from 8-6-43 to 8-31-43 and $80.00 per annum thereafter.
A-90	John H. Rohrbaugh & Claudia A. Rohrbaugh	140.00	150.00	LE	L	Lease Contract No. W33-017 Eng 349 dated 10-1-43	Cancelled 6-30-46 $220.48 for period from 8-6-43 to 8-31-43 and $150.00 thereafter
A-91	W. Va. Power & Transmission Co.	412.27	See A-77	LE	L	Lease Contract No. W33-017 Eng 439 dated 11-1-43	Cancelled 9-30-46 Per Annum Cost included in Tract A-77.
A-92	W. Va. Power & Transmission Co.	6.64	See A-77	LE	L	Lease Contract No. W33-017 Eng 439 dated 11-1-43	Cancelled 9-30-46 Per Annum Cost included in Tract A-77.
A-93	W. Va. Power & Transmission Co.	35.27	See A-77	LE	L	Lease Contract No. W33-017 Eng 439 dated 11-1-43	Cancelled 9-30-46 Per Annum Cost included in Tract A-77.
A-94A	Parsons Realty & Machinery Co.	309.00	None	LE	L	Lease Contract No. W33-017 Eng 409 dated 11-15-43	Cancelled 6-30-46 $1.00 per annum receipt acknowledged.
A-94B	Parsons Realty & Machinery Co.	258.50	None	LE	L	Lease Contract No. W33-017 Eng 409 dated 11-15-43	Cancelled 6-30-46.
C-8	T. G. Smith	505.00	20.00	LE	L	Lease Contract No. W33-017 Eng 348 dated 10-1-43	Cancelled 6-30-46 $20.00 per annum.
C-25	N.C. Halterman Estate	103.00	30.00	LE	L	Lease Contract No. W33-017 Eng 365 dated 10-1-43	Cancelled 6-30-46 $30.00 per annum.
C-26	Margaret Hall & Jeff Hall	101.00	90.00	LE	L	Lease Contract No. W33-017 Eng 346 dated 10-1-43	Cancelled 6-30-46 $149.29 for period from 8-6-43 to 8-31-43 and $90.00 per annum thereafter.
C-29	Unknown Owner	128.00	*	LE	D/T	Civil Action 1919 for period from 8-6-43 to 6-30-46	No D/T was filed and no money deposited in Court Petition filed 8-6-43. See note at bottom of last page of this tract register.
C-30	Carroll B. Tyson	240.00	77.00	LE	L	Lease Contract No. W33-017 Eng 455 dated 11-1-43	Cancelled 6-30-46 $77.00 annual rental.
C-31	Unknown Owner	62.00	*	LE	D/T	Civil Action 1919 for period from 8-6-43 to 6-30-46	No D/T filed and no money deposited in Court. Petition filed 8-6-43. See note at bottom of last page of this tract register.
C-32	C. J. Burgess	112.00	45.00	LE	L	Lease Contract No. W33-017 Eng 366 dated 10-1-43	Cancelled 6-30-46 $263.14 for period from 8-6-43 to 8-31-43 and $45.00 per annum thereafter.
	TOTAL						

1/ "F" Fee; "LE" Leasehold; "LI" License; "PE" Permit; "E" Easement.
2/ "P" Purchase; "D/T" Declaration of Taking; "NPA" War Powers Act Condemn; "U" Unnegotiated; "T" Transfer; "D" Donation; "SC" Straight Condemn.; "L" Lease; "WPA" Waived War Powers Action; "AG" Informal agreement; "LS" Lease - Supposing Agreement; "R" Reassignment.

DIVISION: Ohio River
DATE PREPARED: 7-26-50

ENG FORM 1019
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OFFICE OF THE CHIEF OF ENGINEERS
REAL ESTATE DIVISION

TRACT REGISTER

☐ PRELIMINARY
☒ FINAL 3029
(Separate Register to be prepared for each Real Estate Directive)

PROJECT (Official Name): West Virginia Maneuver Area
PURPOSE (As Set Forth in Directive): Mounting Training
DATE OF DIRECTIVE: 4-10-42, 7-23-43, 7-28-43, 10-29-43
DIRECTIVE NUMBER: RE-D 773, RE-D 2418, Gen. RE-D 2418A, Gen. RE-D 2418A

TRACT NUMBER	LANDOWNER'S NAME	ACREAGE	PRICE	ESTATE 1/	METHOD 2/	LAST ACTION STEP TAKEN	REMARKS (Including Contract No. of Lease)
C-34	Unknown Owner	96.00	*	LE	D/T	Civil Action 1919 for period from 8-6-43 to 6-30-46	No D/T was filed and no money deposited in Court. Petition filed 8-6-43. See note at bottom of last page of this tract register.
C-35	Lillian Stockton Klein	464.00	145.00	LE	L	Lease Contract No. W33-017 Eng 463 dated 11-1-43	Cancelled 6-30-46 $145.00 per annum.
C-37	O. J. Weimer Estate	230.00	80.00	LE	L	Lease Contract No. W33-017 Eng 373 dated 10-1-43	Cancelled 6-30-46 $165.59 for period from 8-6-43 to 8-31-43 and $80.00 per annum thereafter.
C-37A	Unknown Owner	298.00	*	LE	D/T	Civil Action 1919	No D/T was filed and no money deposited in Court. Petition filed 8-6-43. See note at bottom of last page of this tract register.
C-38	Bessie Weimer Berg	198.00	100.00	LE	L	Lease Contract No. W33-017 Eng 368 dated 10-1-43	Cancelled 6-30-46 $70.00 for period from 8-6-43 to 8-31-43 and $100.00 per annum thereafter.
C-39	Carl E. Weimer & John B. Weimer	208.00	100.00	LE	L	Lease Contract No. W33-017 Eng 370 dated 10-1-43	Cancelled 6-30-46 $186.99 for period from 8-6-43 to 8-30-43 and $100.00 per annum thereafter.
C-40	Unknown Owner	96.00	*	LE	D/T	Civil Action 1919 for period from 8-6-43 to 6-30-46	*No D/T was filed and no money deposited in court. Petition filed 8-6-43. See note on last page.
C-41	A. J. Welton Estate	118.00	25.00	LE	L	Lease Contract No. W33-017 Eng 344 dated 10-1-43	Cancelled 6-30-46 $25.00 per annum.
C-42	J. Swere Evans, et ux	128.00	110.00	LE	L	Lease Contract No. W33-017 Eng 369 dated 10-1-43	Cancelled 6-30-46 $407.68 for period from 8-6-43 to 8-31-43 and $110.00 per annum thereafter.
C-54	Willie Burgess & Arthur Barger	78.75	110.00	LE	L	Lease Contract No. W33-017 Eng 363 dated 10-1-43	Cancelled 6-30-46 $112.69 for period from 8-6-43 to 8-31-43 and $110.00 per annum thereafter.
C-56	Harrison Evans	150.00	200.00	LE	L	Lease Contract No. W33-017 Eng 361 dated 10-1-43	Cancelled 6-30-46 $463.99 for period from 8-6-43 to 8-31-43 and $200.00 per annum thereafter.
C-59	Aaron C. Goldisen	200.00	150.00	LE	L	Lease Contract No. W33-017 Eng 354 dated 10-1-43	Cancelled 6-30-46 $391.48 for period from 8-6-43 to 8-31-43 and $150.00 per annum thereafter.
	TOTAL						

1/ "F" Fee; "LE" Leasehold; "LI" License; "PE" Permit; "E" Easement.
2/ "P" Purchase; "D/T" Declaration of Taking; "WPA" War Powers Act Condem.; "N" Unnegotiated; "T" Transfer; "D" Donation; "SC" Straight Condem.; "L" Lease; "NWPA" Entered War Powers Action; "AG" Informal agreement; "LS" Lease - Suspension Agreement; "R" Reassignment.

DIVISION: Ohio River
DATE PREPARED: 7-26-50

ENG FORM 1019
1 NOV 48

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OFFICE OF THE CHIEF OF ENGINEERS
REAL ESTATE DIVISION

TRACT REGISTER

☐ PRELIMINARY
☒ FINAL 3029
(Separate Register to be prepared for each Real Estate Directive)

PROJECT (Official Name): West Virginia Maneuver Area
PURPOSE (As Set Forth in Directive): Mountain Training
DATE OF DIRECTIVE: 4-10-42, 7-23,43,7-28-43,10-29-43
DIRECTIVE NUMBER: ~~RE-D~~ 773, RE-D 2418,Gen.RE-D 2418A, Gen.RE-D 2418A

TRACT NUMBER	LANDOWNER'S NAME	ACREAGE	PRICE	ESTATE 1/	METHOD 2/	LAST ACTION STEP TAKEN	REMARKS (Including Contract No. of Lease)
C-60	Arlie Goldizen	101.00	50.00	LE	L	Lease Contract No. W33-017 Eng 362 dated 10-1-43	Cancelled 6-30-46 $50.00 per annum.
C-61	Delphia Berg & Ben Berg	47.50	82.00	LE	L	Lease Contract No. W33-017 Eng 367 dated 10-1-43	Cancelled 6-30-46 $125.73 for period from 8-6-43 to 8-31-43 and $82.00 per annum thereafter.
C-65	Adam H. Evans	40.00	50.00	LE	L	Lease Contract No. W33-017 Eng 360 dated 10-1-43	Cancelled 6-30-46 $163.49 for period from 8-6-43 to 8-31-43 and $50.00 per annum thereafter.
C-66	Earl H. Rohrbaugh, et ux	88.00	66.00	LE	L	Lease Contract No. W33-017 Eng 371 dated 10-1-43	Cancelled 6-30-46 $234.61 for period from 8-6-43 to 8-31-43 and $66.00 per annum thereafter.
C-68	M. E. Goldizen	104.00	50.00	LE	L	Lease Contract No. W33-017 Eng 358 dated 10-1-43	Cancelled 6-30-46 $193.49 for period from 8-6-43 to 8-31-43 and $50.00 per annum thereafter.
C-69	M. K. Barger	16.00	60.00	LE	L	Lease Contract No. W33-017 Eng 359 dated 10-1-43	Cancelled 6-30-46 $134.19 for period from 8-6-43 to 8-31-43 and $60.00 per annum thereafter.
C-71	Central Tie and Lumber Co.	592.00	30.00	LE	L	Lease Contract No. W33-017 Eng 345 dated 10-1-43	Cancelled 6-30-46 $30.00 per annum.
C-72	Abijah Rohrbaugh	323.00	180.00	LE	L	Lease Contract No. W33-017 Eng 353 dated 10-1-43	Cancelled 6-30-46 $232.58 for period from 8-6-43 to 8-31-43 and $180.00 per annum thereafter.
C-73	T.J. & J.B. Grove Estate	784.00	88.00	LE	L	Lease Contract No. W33-017 Eng 372 dated 10-1-43	Cancelled 6-30-46 $88.00 per annum.
1	Western Maryland R.R. Co.	4.26	None	LE	L	Lease Contract No. W33-017 Eng 437 dated 10-5-43	Transferred to FPHA 7-1-46. $1.00 per annum receipt acknowledged.
3	J.V. Lough & Citizens National Bank	22.70	113.50	LE	L	Lease Contract No. W33-017 Eng 197 dated 8-1-43	Cancelled 8-7-44 $113.50 per annum.
4	City of Elkins	1.05	100.00	LE	L	Lease Contract No. W33-017 Eng 1170 dated 1-1-44	Cancelled 2-2-46 $100.00 per annum.
5	J.H. Fitzwater	1.00	None	LE	L	Lease Contract No. W33-017 Eng 248 dated 7-1-43	Cancelled 6-5-44 $1.00 per annum receipt acknowledged.
6	Earl Scott	7.00	35.00	LE	L	Lease Contract No. W33-017 Eng 137 dated 8-1-43	Cancelled 4-10-44 $25.00 per annum $525.00 in lieu of restoration.
	TOTAL						

1/ "F" Fee; "LE" Leasehold; "Li" License; "PE" Permit; "E" Easement.
2/ "P" Purchase; "D/T" Declaration of Taking; "WPA" War Powers Act Condem; "N" Nonnegotiated; "T" Transfer; "D" Donation; "DC" Straight Condem.; "L" Lease; "WPA" Entered War Powers Action; "AG" Informal agreement; "LS" Lease - Suspension Agreement; "R" Reassignment.

DIVISION: Ohio River
DATE PREPARED: 7-26-50

ENG FORM 1 NOV 48 1019

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OFFICE OF THE CHIEF OF ENGINEERS
REAL ESTATE DIVISION

TRACT REGISTER

☐ PRELIMINARY
☒ FINAL
(Separate Registers prepared for each Real Estate Directive) 3029

PROJECT (Official Name): West Virginia Maneuver Area
PURPOSE (As Set Forth in Directive): Mountain Training
DATE OF DIRECTIVE: 4-10-42, 7-23-43, 7-28-43, 10-29-43
DIRECTIVE NUMBER: RE-D 773, RE-D 2418, Gen. RE-D 2418A, Gen. RE-D 2418B

TRACT NUMBER	LANDOWNER'S NAME	ACREAGE	PRICE	ESTATE 1/	METHOD 2/	LAST ACTION STEP TAKEN	REMARKS (Including Contract No. of Lease)
7	Trs. of the Valley Improvement Co.	14.00	None	LE	L	Lease Contract No. W33-017 Eng 158 dated 8-1-43	Cancelled 9-15-44 $1.00 per annum receipt acknowledged.
8	Randolph Co. Board of Education	1.17	None	LE	L	Lease Contract No. W33-017 Eng 161 dated 8-2-43	Cancelled 9-15-44 $1.00 per annum receipt acknowledged.
9	Carl Degler & Richard Degler	0.60	50.00	LE	L	Lease Contract No. W33-017 Eng 909 dated 4-1-44	Cancelled 5-27-44 $50.00 per annum.
10	Victor Del Sordo	4.00	20.00	LE	L	Lease Contract No. W33-017 Eng 330 dated 9-14-43	Cancelled 4-10-44 $20.00 per annum.
11	Edna F. Hartman	17.00	170.00	LE	L	Lease Contract No. W33-017 Eng 326 dated 10-5-43	Cancelled 6-5-44 $170.00 per annum.
12	I. N. Vanscoy	10.00	100.00	LE	L	Lease Contract No. W33-017 Eng 450 dated 10-16-43	Cancelled 4-10-44 $100.00 per annum.
13	Wilbert Kissmore	14.80	201.00	LE	L	Lease Contract No. W33-017 Eng 160 dated 7-26-43	Cancelled 8-7-44 $201.00 per annum.
14	Mrs. Monna Bond	5.30	25.00	LE	L	Lease Contract No. W33-017 Eng 212 dated 7-26-43	Cancelled 8-7-44 $25.00 per annum.
15	J. R. Teter	6.50	60.00	LE	L	Lease Contract No. W33-017 Eng 321 dated 10-13-43	Cancelled 4-10-44 $60.00 per annum.
16	D. D. Caufield	18.72	150.00	LE	L	Lease Contract No. W33-017 Eng 355 dated 10-10-43	Cancelled 6-5-44 $150.00 per annum.

NOTE:

No Declarations of Takings were filed on Tracts C-29, C-31, C-34, C-37A and C-40. Petition filed 8-6-43 for a term of years ending 6-30-44 with subsequent extensions to 6-30-46. These tracts were not extended beyond 6-30-46, however, final judgments have not been entered and ownerships thereof have never been determined. The fair rental values have not been determined and no deposits have been made in court. When deposits are made, and remain unclaimed for a period of 5 years, the money will be returned to the U. S. Treasurer.

AUDITED

26 July 1950

Frances C. Edelen

1	TOTAL	No Area	--

1/ "F" Fee; "LE" Leasehold; "LI" License; "PE" Permit; "E" Easement.
2/ "P" Purchase; "D/T" Declaration of Taking; "WPA" War Powers Act Condemn.; "N" Unnegotiated; "T" Transfer; "D" Donation; "DC" Straight Condemn.; "L" Lease; "NWPA" Natural War Powers Action; "AG" Informal agreement; "LS" Lease - Dispossess Agreement; "R" Reassignment.

DIVISION: Ohio River
DATE PREPARED: 7-26-50

ENG Form 1019 1 NOV 48

48 11810

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THE OFFICE OF SCIENTIFIC RESEARCH AND DEVELOPMENT in the Office for Emergency Management, Executive Office of the President, is hereby granted a permit commencing May 1, 1945, but revocable at will be the Secretary of War, to use as a range for test firing of rockets and other projectiles a portion of the WEST VIRGINIA MANEUVER AREA MILITARY RESERVATION, West Virginia, located substantially as shown in red on Exhibit "A" attached hereto and made a part hereof.

THIS PERMIT is granted subject to the following provisions and conditions:

1. That the premises covered by this permit are embraced in leases from the Central Tie and Lumber Company, whose address is Petersburg, West Virginia, to the United States of America under Lease No. W 33-017-Eng-345 for the period beginning August 6, 1943, through June 30, 1944, and the West Virginia Central and Pittsburgh Railway Company and the Davis Coal and Coke Company, whose address is in care of H. A. Bruck, Real Estate and Tax Agency, Western Maryland Railway Company, Hillin Station, Baltimore 2, Maryland, to the United States of American under Lease No. W 33-017-Eng-1403, for the period beginning August 6, 1943, through June 30, 1944, both leases provided that, unless and until the Government shall give notice of termination in accordance with Provision 6 thereof, the lease shall remain in force thereafter from year to year without further notice; provided further that the lease shall in no event extend the period of occupancy of the premises beyond six (6) months after the date of termination of the unlimited National Emergency as declared by the President of the United States in Proclamation No. 2487, dated May 27, 1941, and a permit from the Department of Agriculture dated August 4, 1943, for such period as may be necessary, and this permit, subject to all the provisions and conditions of said leases and permit, shall be extended automatically until the termination or expiration of said leases and permit. It is understood that this permit shall be subject to all the provisions and conditions contained in said leases and permit.

2. That the permittee will make arrangements with the Forest Service, Department of Agriculture, for responsibility for forest fire protection on the national forest land in the Monongahela National Forest which is included in the area described herein.

3. That the permittee shall have the right to attach fixtures, and erect structures or signs, in or upon the premises, which fixtures and structures, or signs, so placed in, upon, or attached to the said premises shall be and remain the property of permittee and may be removed or otherwise disposed of by permittee.

4. That the permittee will give immediate notice to the Office, Chief of Engineers, at such time as it is determined the area is no longer to be used.

5. The privileges herein granted may be exercised by the permittee through its agencies or contractors, subject to the terms and conditions herein contained; provided, however, that the permittee is not relieved of its responsibilities and obligations under this

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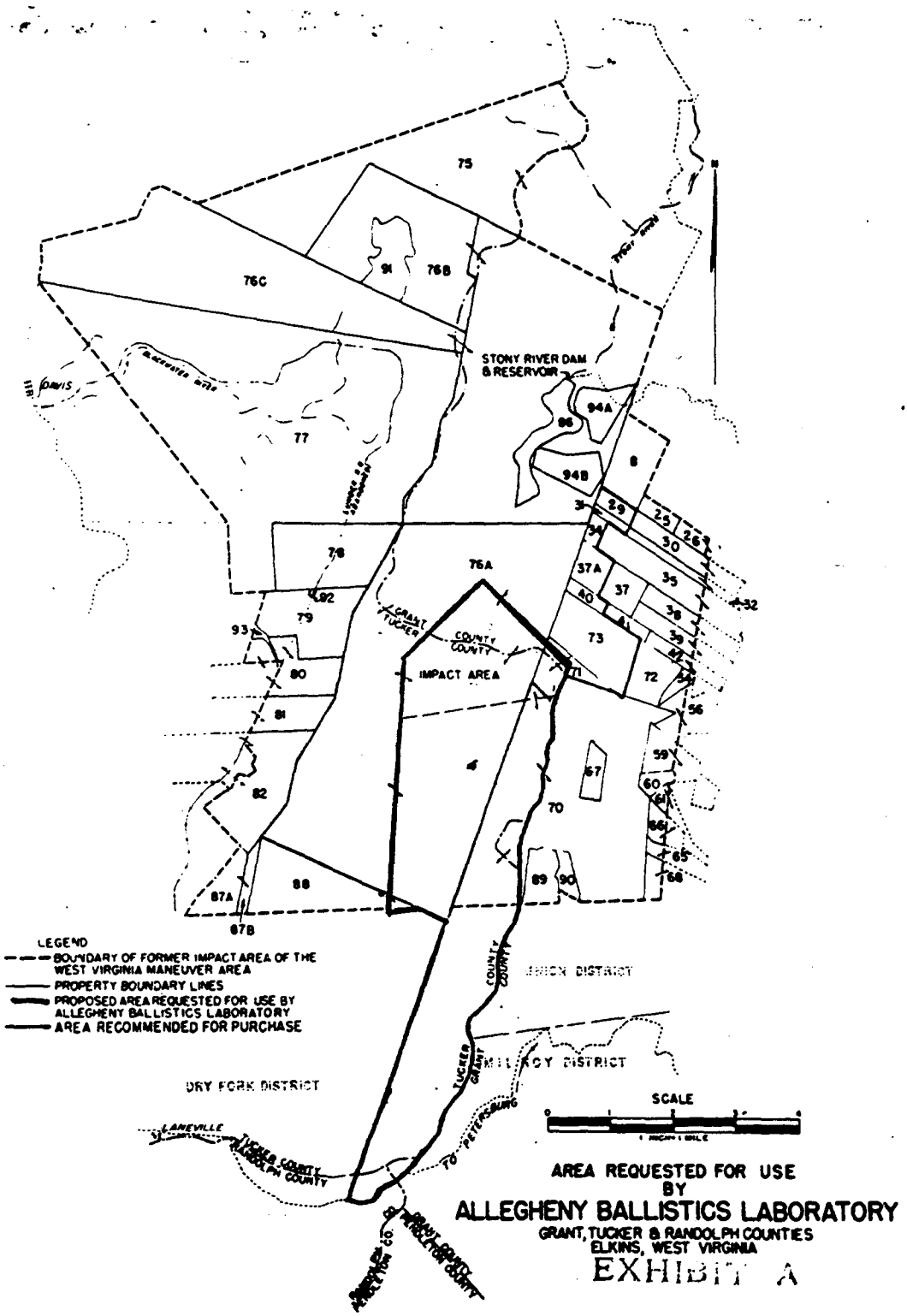
permit. Such agencies and contractors shall be required to warrant that as long as the premises are used and occupied by them, they will not include in any price charged the Government or any supplier of the Government for the work performed therein, any charges (including amortization and depreciation) for the premises herein granted, exclusive of coats of alterations, improvements, maintenance or other charges for which they may be obligated.

IN WITNESS WHEREOF I have hereunto set my hand by authority of the Secretary of War and under the direction of the Chief of Engineers this 8th day of September 1945.

/s/ ROBERT H. FABIAN
ROBERT H. FABIAN
Major, Corps of Engineers
Chief, Management and
Disposal Division
Real Estate


STONY RIVER DAM & RESERVOIR
IMPACT AREA
GRANT
TUCKER
COUNTY
COUNTY
LEGEND
BOUNDARY OF FORMER IMPACT AREA OF THE WEST VIRGINIA MANEUVER AREA
PROPERTY BOUNDARY LINES
PROPOSED AREA REQUESTED FOR USE BY ALLEGHENY BALLISTICS LABORATORY
AREA RECOMMENDED FOR PURCHASE
DRY FORK DISTRICT
UNION DISTRICT
MILLCRY DISTRICT
LANEVILLE
TUCKER COUNTY
RANDOLPH COUNTY
TO PETERSBURG
SCALE
AREA REQUESTED FOR USE
BY
ALLEGHENY BALLISTICS LABORATORY
GRANT, TUCKER & RANDOLPH COUNTIES
ELKINS, WEST VIRGINIA
EXHIBIT A

these Stat.

REAL PROPERTY MANAGEMENT AND DISPOSAL REPORT

REPORTS CONTROL SYMBOL
ENGKL - 12 (R3)

TO: Chief of Engineers ATTENTION: ENGLH Washington 25, D. C.	DIVISION	DISTRICT	DATE OF REPORT
	Ohio River	Louisville	4-15-51

PART I

INSTALLATION	LOCATION
West Virginia Maneuver Area No. 3029	Elkins

[XX] ARMY [ ] AIR FORCE [ ] ATOMIC ENERGY COMMISSION

MILITARY [XX] COMMAND [ ] INDUSTRIAL

CIVIL [ ] FLOOD CONTROL [ ] RIVER & HARBORS

ACREAGE ENTIRE INSTALLATION	FEE OWNED	PUBLIC LAND	LEASED	LESSER INT.	COUNTY	STATE
		350,416	48,557	*	Randolph,etc.	W. Va.

PART II

DATE	STATUS	E OR P	FEE OWNED (Acres) (1)	PUBLIC LANDS (Acres) (2)	LEASED (Acres) (3)	LESSER INT. (Acres) (4)	NATURE OF FACILITIES	COST TO GOVT. (Dollars)	CUSTODY BY C.E. (Date)
A 3/19/45	Surplus	E	—	350,416	48,553	*	Land		
B 3/19/45	"				4		"		
C									
D									
E									
F									
G									
H									
I									

PART III

TEMPORARY USE GRANTS

REF.	IN PROCESS NO.	IN PROCESS ACRES	IN PROCESS CONSIDERATION ($)	GRANTED NO.	GRANTED ACRES	GRANTED CONSIDERATION ($)	PURPOSE

REPORTED TO WAA OR GSA

REF.	REPORTED TO WAA OR GSA	DESIGNATED DISPOSAL AGENCY	DATE DESIGNATED	DISPOSITION

TRANSFER OR RETRANSFER TO OTHER GOVERNMENT AGENCIES

REF.	DATE AUTHORIZED	RECEIVING AGENCY	DATE OF LTR FROM ARMY	RESTORATION OR BLDG.	DATE

INSTRUCTIONS

ALL NUMBERS WILL BE ROUNDED TO THE NEAREST DOLLAR OR ACRE IN PREPARING THIS REPORT

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a. REPORTS WILL BE PREPARED MONTHLY AS OF THE 15TH DAY OF EACH MONTH.

b. REPORTS WILL BE PREPARED IN QUADRUPLICATE FOR THE FOLLOWING DISTRIBUTION: Original and one copy will be forwarded so as to reach the Chief of Engineers, ATTENTION ENGLH, not later than the 23rd day of the month in which the report is prepared. One copy forwarded to the Division office and one copy retained in the preparing office.

c. WHEN REQUIRED: Reports will be required commencing with the month in which the installation or any portion thereof is placed in Standby, Inactive, Excess, or Surplus status and continued until excess or surplus property is disposed of by transfer, sale, termination of leases, or otherwise, but if another portion of the installation is placed in a management or disposal status at a later date and the report resumed, all previous actions subsequent to 1 July 1940, will be reflected; where the installation or portion thereof is inactive or Standby, the report may be suspended when the granting of temporary use of facilities made available for such purposes shall have been completed or definite information shall have been received that temporary use of facilities at installations or portions thereof in standby or inactive status cannot be granted. Only military installations are definitively placed in a Standby or Inactive status; therefore, reports covering Civil Works or Atomic Energy Commission Projects are required only in connection with excess or surplus statuses. Where no progress has been made during a reporting

period, a "Negative ENG Form 836" may be submitted id[illegible]ying the installation, the state, the Division, the District, [illegible]he reporting period with the words, "No Progress since report dated . . . .", posted in Part II of the report.

d. PART I will identify the installation as to name, location, department and type and set forth the entire acreage either acquired or being acquired. The acreage will be divided to show Fee owned, Public Lands (Public Domain and Lands transferred from other Government Agencies), Leased, and Lesser interests. If an installation is part industrial and part Command, the acreages of these parts similarly broken down will be reflected in "Remarks". State, County or municipally owned lands will not be shown as Public Lands.

Part II will reflect information as to areas which have been placed in a "Standby", "Inactive", "Excess", or "Surplus" status. A separate line will be used for [illegible]ch report of status, but subsequent withdrawals or adjustments affecting an area will be reflected by net figures with an explanation under "Remarks". The date [illegible]ll be that on which the Appropriate Authority approved the status. A symbol P or E will be used to denote whether the area is a Portion of or the Entire [illegible]nstallation. The acreage will be divided as explained in PART I above, but will cover only the actual area or areas involved, the nature or use of the area will be reflected under "Nature of facilities", i.e. Housing Area, Warehouse Area, Modification Center #2, POW Camp, etc. and if the installation is comprised of both command and industrial portions the Symbol I (Industrial) or C (Command) will be used to indicate to which portion the area belongs. The cost of both land and construction will be shown under "Cost to Government". If the Corps of Engineers assumed custody the date will be shown, otherwise "NO" will be entered in the last column.

f. PART III will reflect management of disposal actions taken in connection with areas listed under PART II. The reference column will indicate the area by referring to the line on which it is listed under PART II (A, B, C, etc.) and the appropriate column (1), (2), (3), or (4). No areas or portions of areas which were listed separately in Part II will be combined in a single line under PART III, however, it may be necessary to use several lines under PART III to reflect separate actions taken in connection with an area listed on a single line under PART II. The latter occurence will be explained under "Remarks" and if necessary a further division of acreage recited.

1. TEMPORARY USE GRANTS will be reported by cumulative figures showing the number of instruments, acres involved and annual consideration. When right of entry has been given but a formal instrument not executed and delivered it will be reported "In process" with appropriate footnote under "Remarks" including date right of entry granted. After delivery of the instrument it will be reported "granted", "Purpose" will reflect type of interest Le for Lease, Li for License and the proposed use of the area, such as agriculture, industrial, etc. Elaboration where necessary will be made under "Remarks".
2. REPORTED TO WAA OR GSA will include only property formally reported by Forms SPB-5, SPA-5, WAA 1005, or GSA Form 30 for disposal but will not include leases reported for clearance purposes only. The following will be recorded: date of report, name of disposal agency designated, and the date disposal agency designated. (In case of Declaration of Surplus to WAA and its predecessor agencies, the date of designation of disposal agencies need not be recorded unless readily available). Disposition column will be utilized (a) to reflect assumption of custody by the disposal agency by recording the symbol "CT" followed by the date of assumption, or (b) to refer to further disposal actions recorded in subsequent portions of the report where the CE is designated disposal agency or is acting under specific direction of GSA. The symbol "TR" will refer to "Transfer to other Government Agencies". The Symbol "LC" will refer to "Lease Cancellations". The symbol "OD" will refer to "Other Disposals".
3. TRANSFERS TO OTHER GOVERNMENT AGENCIES will include transfer, retransfer, or relinquishment of all types of interests or estates to another Gov't. Agency not acting as a disposal agency. If property has been reported to GSA and so recorded under "Reported to WAA or GSA" the entry in the reference column will be preceded by the symbol "R". Entries in the second, third, and fourth columns will be made from information or informational copies of documents received from OCE, except when leases are transferred at the direction of GSA Field offices. The date restoration or building disposal (if required) is completed will be shown, otherwise the entry "none" will be made. The last column will reflect the date of written acceptance either from a field or departmental level with appropriate notation in "Remarks".
4. LEASE CANCELLATIONS will include all excess or surplus leases which have been cancelled or are proposed for cancellation. If leases have been formally reported for disposal to GSA (GSA Form 30), entry in the "Reference" column will be preceded by the symbol "R" and no entry will be made in "Reported to GSA" column. If leases have been reported to GSA (GSA Form 30) for clearance purposes only, the symbol "R" will not be placed in the "Reference" column and the date they were "Reported to GSA" for clearance will be recorded. An explanatory entry, reflecting disposal status, reasons for delay and expected termination date, will be made in "Remarks" for any lease that has been in an excess status for a period of ninety days or longer.
5. OTHER DISPOSALS will include sales, termination of special contracts involving interests in realty, disposal of easements, etc. Entries most nearly applicable to the circumstances will be recorded with an explanation in "Remarks" to explain unusual actions. If the property has been formally reported to GSA (by GSA Form 30) the symbol "R" will precede the entry in the "Reference" column.

KS

* 1 license (no area) terminated 11-27-50

** Report revised to agree with final audit.

Leases cancelled as follows;

No. of Leases	Acres	Annual Rental	Date Cancelled
4	27.50	$215.00	4-10-44
1	.60	50.00	5-27-44
3	36.72	320.00	6-5-44
3	42.80	339.50	8-7-44
2	15.17		9-15-44
1	474.71		4-30-45
1	1.05	100.00	2-2-46
1	553.60	100.00	2-5-46
1	875.50	300.00	2-15-46
6	25,524.48	1,199.92	2-28-46
36	11,022.75	2,571.80	6-30-46
4	9,977.55	1,300.00	9-30-46

B 9614

2-1713-ARMY-FORT BELVOIR, VA.-11-13-50-20,000

DOLLY SODS NORTH PURCHASE UNIT

A tract of land situated in Dry Fork District, Tucker County, West Virginia, about 12 miles northwest of the town of Petersburg, north of and adjoining the Dolly Sods Wilderness Area of the Monongahela National Forest, on the waters of Red Creek, a tributary of the Dry Fork of the Cheat River, being a portion of a tract of 18,557 acres conveyed to Western Pocahontas Properties Limited Partnership by deed dated December 31, 1986 and recorded in the Office of the County Clerk, Tucker County, West Virginia, in Deed Book 118 at page 634, more particularly bounded and described as follows:

BEGINNING at Corner 1 of U. S. Tract 38 (Parsons Pulp and Lumber Co.), being a point on line between Corner 75A and Corner 1 of U. S. Tract 21 (Bridges Estate).

THENCE one line with U. S. Tract 21:

N 58° 07' 25" W 17,113.28 feet to Corner 1 of U. S. Tract 21.

THENCE five lines with Allegheny Properties Inc. (DB 83/54, DB 102/353, DB 93/52):

N 49° 58' 49" E 3208.84 feet;

N 24° 06' 30" E 1654.64 feet;

N 28° 26' 31" E 1532.91 feet to a point on the west side of Cabin Mountain;

N 36° 59' 21" E 2618.02 feet to a point on the west side of Cabin Mountain;

N 40° 06' 22" E 3789.30 feet to a point on top of Cabin Mountain;

THENCE one line, in part with Allegheny Properties, Inc. (DB 93/52) and in part with Monongahela Power Co. (DB 79/406):

N 20° 31' 37" E 1740.17 feet to a point 200 feet west of the top of Cabin Mountain, being a point on line of Monongahela Power Co.

THENCE seven lines with Western Pocahontas Properties Limited Partnership (DB 118/634) as reserved:

S 75° 33' 38" E 1820.56 feet;

S 66° 46' 37" E 1741.38 feet;

S 52° 44' 12" E 2093.78 feet;

N 86° 11' 24" E 7562.40 feet;

S 62° 01' 23" E 1737.54 feet to a point on the brow of a ridge near the County Line;

N 51° 07' 08" E 3459.43 feet to a point on the high part of a ridge;

S 60° 47' 40" E 382.67 feet to a point on line between Western Pocahontas Properties Limited Partnership and Virginia Electric & Power Company (DB 72/338).

THENCE one line, in part with Virginia Electric & Power Co. and in part with U. S. Tract 38:

S 29° 12' 40" W 22,732.82 feet to the point of beginning, containing 6168 acres more or less.

G-5

74780

WARRANTY DEED

THIS DEED, made this 31 day of December, 1992, by and between THE NATURE CONSERVANCY, a nonprofit corporation organized and existing under and by virtue of the laws of the District of Columbia and having an office and principal place of business at 1815 North Lynn Street, Arlington, Virginia 22209, Grantor, and the UNITED STATES OF AMERICA, Grantee;

WFink
WFink

WITNESSETH: That for and in consideration of the sum of THREE MILLION FIVE HUNDRED THOUSAND AND NO/100 DOLLARS ($3,500,000.00), to it in hand paid, the receipt whereof is hereby acknowledged, the said Grantor does hereby grant, bargain, sell, and convey, with covenants of GENERAL WARRANTY, unto the UNITED STATES OF AMERICA and its assigns, forever, all that certain tract or parcel of land designated as Tract No. 911n by the United States Forest Service, situated on the headwaters of Red Creek in Dolly Sods area, in Dry Fork District, Tucker County, West Virginia, being the same land conveyed by Western Pocahontas Properties Limited Partnership to The Nature Conservancy by deed dated July 25, 1991, recorded in the Office of the Clerk of the County Commission of Tucker County, West Virginia, in Deed Book 136, Page 179; Tract No. 911n containing 3,701.1 acres, more or less, is more particularly described in EXHIBIT A attached hereto and made a part hereof.

Said Tract No. 911n contains 3,701.1 acres of land, more or less.

SUBJECT TO easements and rights-of-way for established or existing roads, highways, railroads, and utilities, including the easements recorded in Right-of-Way Book 5, Page 197, and in Deed Book 127, Page 604.

SUBJECT ALSO TO oil and gas rights excepted and reserved in Deed Book 118, Page 634.

SUBJECT ALSO TO oil and gas leases outstanding of record in third parties.

The acquiring agency is the Forest Service, United States Department of Agriculture.

TO HAVE AND TO HOLD FOREVER.

TOGETHER WITH ALL and singular the tenements, hereditaments and appurtenances thereunto belonging or in anywise appertaining.

The said Grantor covenants that it has the right to convey said land to the Grantee; that it has done no act to encumber said land; that the Grantee shall have quiet possession thereof, free from all encumbrances; that it will execute such further assurances of the said land as may be requisite; and that it is seized in fee simple thereof.

IN WITNESS WHEREOF, The said THE NATURE CONSERVANCY, has caused these presents to be executed in its corporate name this 3rd day of December, 1992, by Michael Dennis, its Vice-president, under its corporate seal, and duly attested by Paul Flint, its assistant secretary, both hereunto duly authorized by the Bylaws of the said THE NATURE CONSERVANCY, as amended to date, said Bylaws being in full force and effect as of the date of execution of this instrument.

THE NATURE CONSERVANCY

By _____

Its Vice-president

(CORPORATE SEAL)

ATTEST:

_____

Its Assistant Secretary

G-6

STATE OF Virginia)
) ss
COUNTY OF Arlington)

I, Glenna C. Aylor a Notary Public for the County and State aforesaid do hereby certify that Michael Dennis, the Vice President, for THE NATURE CONSERVANCY, the corporation named in the foregoing instrument, acknowledged the execution of the deed on behalf of said corporation.

Given under my hand this 3rd ~~4th~~ day of December, 1992.

My Commission Expires March 31, 1995

Glenna C. Aylor
Notary Public

(NOTARIAL SEAL)

My commission expires:

DECLARATION OF TRANSFER

Under the penalties of fine and imprisonment as provided by law, the undersigned does hereby declare that the transfer involved in the document to which this declaration is appended is not subject to the State excise tax upon the privilege of transferring real estate because the transfer is to the United States of America.

Given under my hand this 10th day of December, 1992.

Jacqueline M. Potts
(Signature of party presenting document for recordation)

Elkins, WV
(Address)

This instrument was drafted by Conrado M. Almario, Attorney, Office of the General Counsel, U.S. Department of Agriculture, Milwaukee, Wisconsin.

G-6

77640

WARRANTY DEED

THIS DEED, made this 1st day of September, 1993, by and between THE NATURE CONSERVANCY, a nonprofit corporation organized and existing under and by virtue of the laws of the District of Columbia and having an office and principal place of business at 1815 North Lynn Street, Arlington, Virginia 22209, Grantor, and the UNITED STATES OF AMERICA, Grantee;

WFink
WFink

WITNESSETH: That for and in consideration of the sum of TWO MILLION AND NO/100 DOLLARS ($2,000,000.00), to it in hand paid, the receipt whereof is hereby acknowledged, the said Grantor does hereby grant, bargain, sell, and convey, with covenants of GENERAL WARRANTY, unto the UNITED STATES OF AMERICA and its assigns, forever, all that certain tract or parcel of land designated as Tract No. 911nn by the United States Forest Service, and a roadway easement, situated on the headwaters of Red Creek in Cabin Mountain and Dolly Sods area, in Dry Fork District, Tucker County, West Virginia, being the same land conveyed by Western Pocahontas Properties Limited Partnership to The Nature Conservancy by deed dated July 22, 1993, recorded July 30, 1993, in the Office of the Clerk of the County Commission of Tucker County, West Virginia, in Deed Book 142, Page 454; Tract No. 911nn containing 2,467.4 acres, more or less, and roadway easement, are more particularly described in EXHIBIT A attached hereto and made a part hereof.

Said Tract No. 911nn contains 2,467.4 acres of land, more or less.

SUBJECT TO easements and rights-of-way for established or existing roads, highways, railroads, and utilities, including the easements recorded in Right-of-Way Book 5, Page 197, and in Deed Book 127, Page 604.

SUBJECT ALSO TO oil and gas rights excepted and reserved in Deed Book 118, Page 634.

SUBJECT ALSO TO oil and gas leases outstanding of record in third parties.

The acquiring agency is the Forest Service, United States Department of Agriculture.

TO HAVE AND TO HOLD FOREVER.

TOGETHER WITH ALL and singular the tenements, hereditaments and appurtenances thereunto belonging or in anywise appertaining.

The said Grantor covenants that it has the right to convey said land to the Grantee; that it has done no act to encumber said land; that the Grantee shall have quiet possession thereof, free from all encumbrances; that it will execute such further assurances of the said land as may be requisite; and that it is seized in fee simple thereof.

IN WITNESS WHEREOF, The said THE NATURE CONSERVANCY, has caused these presents to be executed in its corporate name this 1st day of September, 1993, by Michael Dennis, its Vice-president, under its corporate seal, and duly attested by Paul H. Flint, its Assistant Secretary, both hereunto duly authorized by the Bylaws of the said THE NATURE CONSERVANCY, as amended to date, said Bylaws being in full force and effect as of the date of execution of this instrument.

THE NATURE CONSERVANCY

By Michael Dennis

Its Vice-President

(CORPORATE SEAL)

ATTEST:

Paul H Flint Jr

Its ASSISTANT SECRETARY

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STATE OF Virginia)
) ss
COUNTY OF Arlington)

I, Claire S. De Cou a Notary Public for the County and State aforesaid, do hereby certify that Michael Dennis, the Vice President, for THE NATURE CONSERVANCY, the corporation named in the foregoing instrument, acknowledged the execution of the deed on behalf of said corporation.

Given under my hand this 1 day of September, 1993.

Claire S. De Cou
(Claire S. De Cou)
Notary Public

(NOTARIAL SEAL)

My commission expires: My Commission Expires August 31, 1993

DECLARATION OF TRANSFER

Under the penalties of fine and imprisonment as provided by law, the undersigned does hereby declare that the transfer involved in the document to which this declaration is appended is not subject to the State excise tax upon the privilege of transferring real estate because the transfer is to the United States of America.

Given under my hand this 10th day of September, 1993.

(Signature of party presenting document for recordation)

P.O. Box 1819
Elkins, W. Va. 26241
(Address)

This instrument was drafted by Conrado M. Almario, Attorney, Office of the General Counsel, U.S. Department of Agriculture, Milwaukee, Wisconsin.

G-7

ORDNANCE AND EXPLOSIVES
ARCHIVES SEARCH REPORTS
for the former
DOLLY SODS NORTH
TUCKER COUNTY
WEST VIRGINIA
PROJECT NUMBER G03WV006504

APPENDIX H

NEWSPAPERS/JOURNALS

APPENDIX H

NEWSPAPERS/JOURNALS

TABLE OF CONTENTS

H-1 Excerpt from the pamphlet *Dolly Sods Wilderness* put out by the Forest Service, Monongahela National Forest (reference B-26).

H-2 Excerpt from the *History of the 31st Infantry Division, In Training and Combat, 1940-1945*, undated (reference B-27).

H-3 Excerpt from *Presenting the 35th Infantry Division in WW II, 1941-1945*, undated (reference B-28).

H-4 Excerpt from the *Historical and Pictorial Review of the 28th Infantry Division in WW II*, undated (reference B-29).

H-5 Excerpt from the *95th Division (Tng) History and Mission*, undated (reference B-30).

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, Barlow, 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.

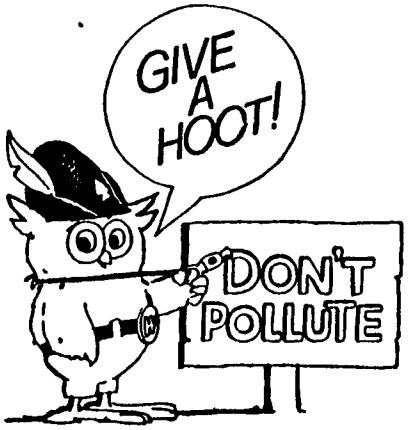
Maximum number of people per party is 10.

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.

☆U. S. Government Printing Office: 1979—652-096
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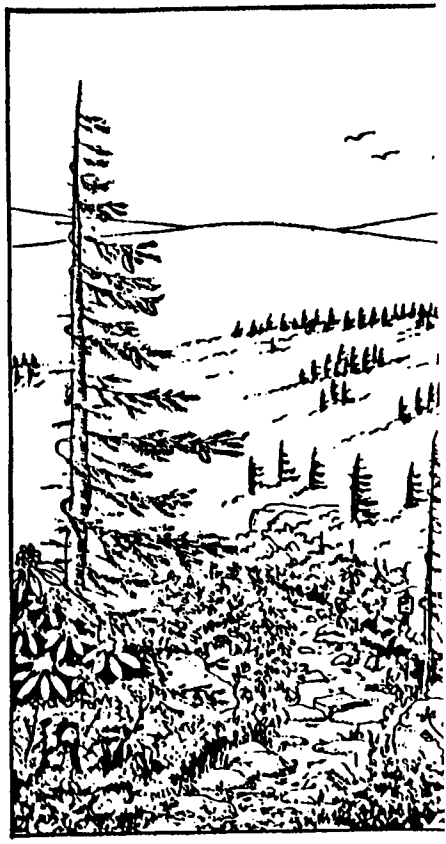
DOLLY SODS WILDERNESS



MONONGAHE

National F

HISTORY

OF THE

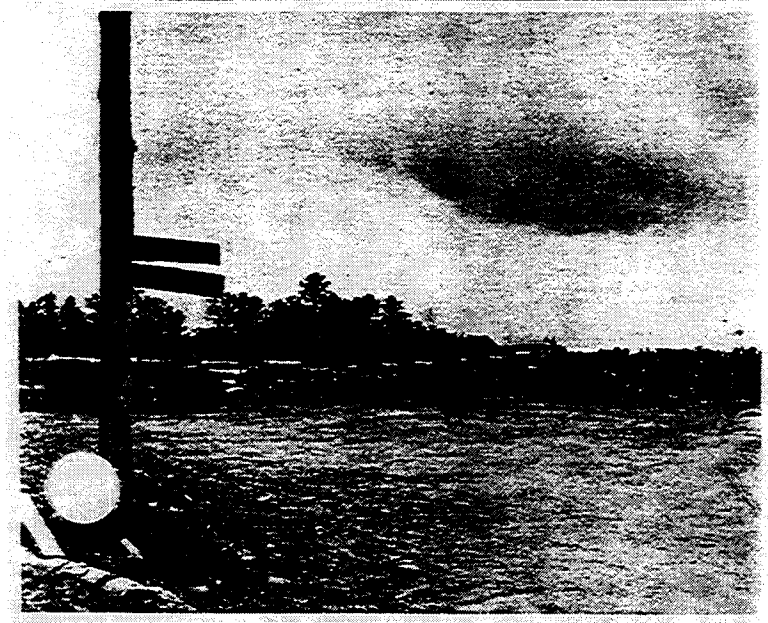
31ST INFANTRY DIVISION

IN TRAINING AND COMBAT

1940—1945

H-2

The Battery Press, Inc.
Nashville



s during the Carolina maneuvers. Top: Artillery in ..ion; Center: P.W. exchange; Bottom: Bridge guard.

H–2

honey) and realize the life we're living here is all luxury compared to the men in the very advanced posts."

Then, after three summers of fighting back and forth across the Sabine river, three years of being trained and, in turn, training, the Division was ordered to Camp Pickett, Va., an order which all knew was the vanguard of overseas shipment. Meanwhile, as units underwent mountain-training in the hills of West Virginia, practiced amphibious landings on the beaches of Virginia and Maryland and received once more a smattering of garrison-life at Camp Pickett, the 31st (Dixie) Division could look back on four years of distinguished service—officers and men from its components were performing well in every active War Theatre in the world. Its training contribution was truly immense; soon it was to demonstrate its own absorption of discipline, technical skill, and general "know how" passed on, for such a long time, to others.

In a summary of the Division's activities since induction in November of 1940, General Persons listed for General McNair, chief of Army Ground Forces, the training and accomplishments of the interim: juxtaposed against the required strength for an infantry division in enlisted men of 13,469 was the actual number trained by the Division—35,980. And so it went. 1608 soldiers had left its ranks to become officers via Officer Candidate Schools. Seven of its officers (four no longer with it) were Generals—three were required by an Infantry Division. The Division had been tested, more than once in most cases, by the Third Army, IV Corps, XV Corps, VIII Corps, and XIII Corps—no major unit of the Division had failed to pass any test. Nine and one half months had been spent in the field with many additional months transpiring in division, regimental and battalion problems. On two previous occasions the Division had reached full strength and completed prescribed training for combat, only to have the experience of being stripped of officers and men for other units. However, each obstacle had been accepted as a challenge and overcome—now it was pronounced ready.

General McNair commented that if the "31st Division does not perform outstandingly in battle, I shall be forced to believe that there is no merit in training, or that the training of the Army Ground Forces has been all wrong. . . I remember clearly the last time I saw it in the Louisiana maneuvers, in pouring rain, but with every man stepping along as though it were a summer day. It all is one more example of how a body of troops reflects the character and spirit of its commander. The 31st Division has a great commander, and I doubt not for a moment that no one realizes it better than the soldiers themselves."

With this stirring accolade, addressed to the Division and its commander, from one of the Army's finest Generals, the 31st was ready for combat. As a supply sergeant remarked at the time, "At last we're on the receiving end of things." Trucks which had been strained and mud-caked in Louisiana bogs, and battered and worn by West Virginia mountain-climbing were replaced by new—if "unshiny"—GI vehicles. Rifles, pistols, mortars, artillery

pieces, knives, forks, tent staves—all were exchanged for new if the owners considered it necessary. Searching medical examinations eliminated those men considered unfit for combat service. An atmosphere of "going places" permeated every barracks in the Division area—this was . The 31st was alerted in December of 1943 with first units sailing from Hampton Roads in January. By March the entire Division was on its way.

With the Division Commander spearheading the movement by air, the Division sailed due South; then, to the surprise of many a soldier who thought himself destined for European campaigns, the eleven jampacked transports performed an arc which carried up and through the Panama Canal—the 31st was directed toward Pacific waters. Meanwhile, in the snail-pace required for the weighted vessel to cross the man-hewn canal between Atlantic and Pacific, a last, long look at civilization, albeit tropical, was being had by the men of the DD. Convoys ended with exit from Atlantic waters and the long voyage was begun in earnest when "converted freighters" nudged into the great expanse of water that was the Pacific Ocean. The shortest time aboard ship for any unit was 35 days with some of the "plodders" combating seasickness and inertia for as long as 63 days.

The Division Commander arrived in Australia in a matter of days, weeks ahead of even the advance echelon, although he had not left the United States until half the Division had embarked. He proceded at once to General Douglas MacArthur's Brisbane headquarters from which was detailed to the Sixth Army, commanded by Lt. Gen. Kreuger, former commanding general of the Third Army during two of the 31st Division's Louisiana maneuvers. The advance party moved to Oro Bay, New Guinea, followed by the diverted echelons who continued to come in, piecemeal, by battalion and detachment, throughout March until about mid-April when all units had arrived. All were glad to set foot on land again—even if that land was New Guinea.

Assigned initially to the I Corps, the Division was later reassigned to the XI Corps. Almost immediately units filed out of a divisional area which had become a showplace in thirty days after arrival for training in jungles captured months before at the cost of much American and Allied blood. Jungle undergrowth, it was found, was more close-knit than any ever encountered in the States, and the constant, though varying, screams of the wildlife lent even Pacific "mock" warfare a certain distinction. "Tested", upon conclusion of a three-weeks period, the Division was pronounced fit. Grading inspectors, in fact, gave the 31st the highest rating ever attained by a divisional unit of the XI Corps.

In addition to jungle training and day and night practice of amphibious landings, the 31st during its war-eatre indoctrination was given many assignments of an administrative nature. The Division unloaded all supplies designated for Oro's air base. On one occasion it was ordered, 48-hours in advance, to prepare a camp for 6,000 recruits. Later the mass billet was increased to 17,000 but the assignment was accomplished on time by engineers, and quartermaster troops, assisted by willing artillerymen and infantrymen.

On June 25, 1944, while the Division was busily engaged in night amphibious training operations, an order was received directing one combat team to proceed to Aitape; and the 124th Infantry Combat Team, which included the 124th Infantry, the 149th Field Artillery, a detachment of 106th Engineers, 106th Medical Battalion and Quartermaster troops with other attachments of special troops, was selected for this mission and alerted under the command of Brigadier General Joseph C. Hutchison. The movement to Aitape was by a combination of Liberty ships and LCI's.

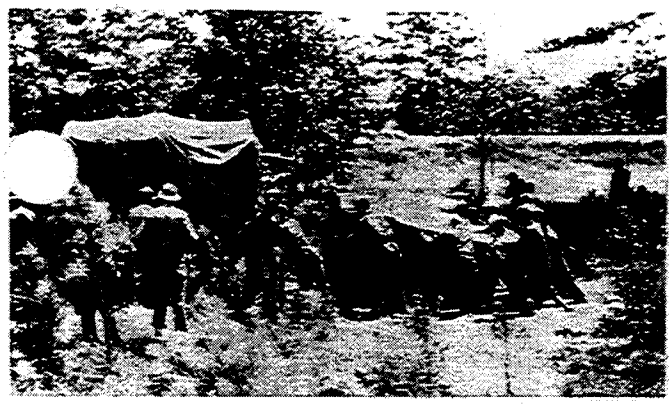
The information of the enemy indicated that the 20th, 41st and 51st Japanese Divisions were planning a desperate effort to regain control of the Aitape area, and American troops there needed reinforcements, for which mission the 124th Infantry Combat Team was selected. After loading on board the ships provided, which were as usual tremendously overcrowded, this force landed at Aitape without any major difficulties.

After landing, the combat team had sufficient time to make a reconnaissance of the area, and when the Japanese finally attacked, made a great contribution toward the defeat of the enemy. The fighting here was fierce and the troops of the 31st Division proved their mettle to the satisfaction of everyone. It was here that the GHQ observer reported that "the exploit of the 124th Infantry was possibly unparalleled in the history of military maneuver over this type of terrain." Major General Hall stated the action of the 3rd Battalion, 124th Infantry, was the best he had seen during the war, and commendations were received from Major General Gill of the 32nd Division, as well as from the Artillery Commander.

The remainder of the Division was alerted for movement to Hollandia and ships of all types were provided for loading; between June 26 and July 15 the Division was busily engaged in loading its personnel and equipment, all ships being terribly crowded, requiring many men to sleep on deck and all of them to eat in shifts. On July 14 the Commanding General was ordered to report to Sixth Army at Hollandia by air with certain members of the general staff. Arriving at Hollandia, General Krueger directed the Commanding General to divert the Division to the Toem-Sarmi-Wakde Island area and there to relieve the Sixth Infantry Division, assume command of the area with the mission of protecting the airport on Wakde Island, and the port and supply base at Maffin Bay. The Division Commander and staff proceeded by air to Wakde Island, and after reconnoitering the area, assumed command on July 18. Between the period of July 18 and September 11 the Division, less the 124th Infantry Combat Team, remained in this area.

The situation consisted of a perimeter about ten miles long, extending from a few hundred feet to about a mile from the Beach into the jungle. Vast quantities of sup-

H-2



Top: Louisiana maneuvers, 1943
Bottom: On the road, Camp Shelby, Miss.

Mountain training in West Virginia

LOUISIANA MANEUVERS 1942

The Regiment, on July 26, again moved to Louisiana for maneuvers and this time under considerable handicap. At about the same time that the Third Battalion was leaving the Regiment the 156th Infantry was withdrawn from the Division for duty elsewhere. Thus the Division h five, rather than the normal nine infantry battalions s faced with the problem of maintaining its good reputation Higher headquarters directing the maneuvers pitted Divis Division without regard to strength inequal under such conditions the Regiment was able its excellent record.

H-2

At the close of the maneuver the Regiment was required to send most of its personnel as replacements to units going overseas and retained only a skeleton organization. At the same time it was ordered to a new station at Camp Shelby, Mississippi and headquarters opened there September 20, 1942.

CAMP SHELBY, MISSISSIPPI

On September 23, the 154th Infantry was organized to replace the 156th Infantry and the Regiment sent one-third of its remaining officer and enlisted personnel to the new organization

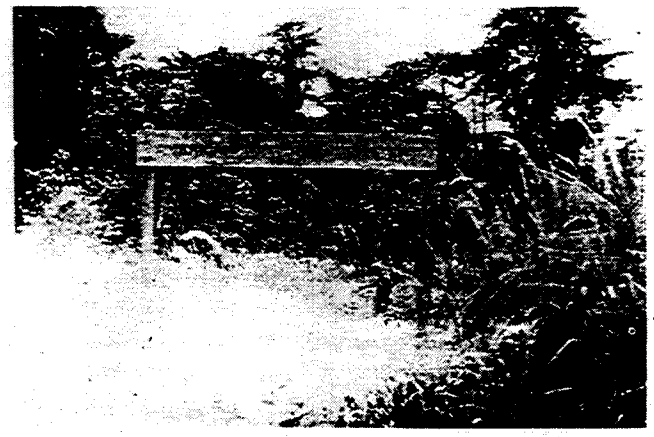
Thus the Regiment, with one battalion remaining at Fort Sill, was forced to reorganize and begin almost anew, this time to train the people who were finally to go with it into combat.

Never was the shortage of arms and equipment a more serious problem than at this time. Two skeleton battalions the First and Second, were engaged in advanced training and new recruits as they arrived were placed in a provisional battalion for basic training. The number of M-1 rifles within the regiment was sufficient for only one battalion, Lee-Enfield rifles were available to arm another battalion. Bayonets could not be used on Lee-Enfield weapons and all troops undergoing bayonet training must be armed with the M-1 for that purpose. In other classes of weapons and equipment the situation was the same. Because of this situation it was necessary to exchange weapons and equipment between companies and battalions each night to meet the training requirements of the following day.

Despite shortages in trained personnel and in equipment the training program was soon operating smoothly and the development of the regiment as a combat unit continued satisfactorily.

Battalion combat tests, both offensive and defensive, were conducted by higher headquarters during the month of April and these were followed by Infantry-Artillery firing tests. All battalions made excellent records. The Third Battalion had returned to the Regiment and the new recruits, now finished with basic training, had been absorbed into the companies.

In May the Division began the "D" series maneuvers in south Mississippi and the 167th Infantry's performance was up to the usual standard. The men had been well fitted into a smooth working organization.



U.S. ARMY MILITARY HISTORY INSTITUTE

Presenting . . . .

THE 35TH INFANTRY DIVISION IN WORLD WAR II 1941-1945

H-3

PROPERTY OF US ARMY

The men who trained with the Santa Fe at Camp Rucker will long remember those days. The combat ranges and battle courses gave the men rigorous and thorough training. The division was taking shape as a top-notch fighting team.

By November 1943, the Santa Fe was considered sufficiently trained to participate in the Tennessee maneuvers. It was cold and wet and under the most unfavorable weather conditions the Division engaged in two months of realistic battle problems, two months of conditioning for combat that earned the 35th the commendation of the Second Army directors of the exercises.

Following the completion of the eight phases of the Tennessee maneuvers, the Division moved to Camp Butner, North Carolina, on 18 January 1944 for its final polishing. Combat Teams 134th and 137th went to West Virginia to attend cliff-scaling schools and take mountain training, in the West Virginia Maneuver Area. After four months of putting the finishing touches to its leashed potentialities, the units of the Santa Fe, during the first week of May, 1944, moved into the staging area at Camp Kilmer, New Jersey. A final, thorough inspection of the men and equipment by Port of Embarkation officials and the 35th was ready to sail, ready to assemble with the gathering Allied forces to uncork its power when the word was given to attack.

An Advance Detachment, under the command of Brigadier General Edmund B. Sebree, Assistant Division Commander, sailed from Fort Hamilton on 20 April aboard the SS Queen Elizabeth. The party consisted of 54 officers, one warrant officer and 69 enlisted men. The ship docked at Greennock, Scotland, on 27 April 1944.

Debarking the next day, the detachment entrained for a 21 hour ride to Okehampton where they remained from 30 April to 20 May making arrangements for the reception of the division.

Historical and Pictorial Review of the 28th Infantry Division in World War II

This is the combat story of the 28th Infantry Division in its untiring efforts to defeat the enemy which confronted it. It is the story of a typical American outfit—one of the great family of divisions which the American people sent forth against the foe in their pledge to uphold and defend the finer things of life without exception or compromise.

PUBLISHED 1946

NORMANDY ☆ NORTHERN FRANCE ☆

RHINELAND ☆ ARDENNES ☆

CENTRAL EUROPE ☆

[illegible] January of 1942 the division proceeded by train and motor to Camps Livingston and Beauregard, Louisiana. The area which had just been vacated by the 32nd Infantry Division was used by the 28th as the latter intensified its training. Upon triangularization of the division, the 229th Field Artillery Battalion was formed—a product of the old 7th Field Artillery Regiment.

From September to November 1942 the 28th participated in large-scale maneuvers in Louisiana and Texas held by the Third Army, then commanded by Lieutenant General Walter Krueger. Other units which engaged in these IV Corps maneuvers were the 38th Infantry Division, 7th Armored Division, 106th Cavalry Regiment, and 73rd Field Artillery Brigade.

* * *

In January 1943 the Keystone outfit moved to Camp Gordon Johnston, Florida. Major stress was placed upon shore-to-shore amphibious exercises. Training was conducted with the 3rd Engineer Amphibious Brigade under the control of Amphibious Training Command.

A tragedy struck the division as it trained along the Florida coast. Fourteen men of the Second Battalion 112th Infantry were drowned when a landing craft grounded on a sand bar at night during a severe March storm. The coxswain announced that the vessel had landed on the designated beach and the men rushed off the boat into the deep water.

Major General (later General) Omar N. Bradley, who had commanded the 28th since June of 1942, left in February of 1943 to take over II Corps, then in Tunisia. Major General Lloyd D. Brown assumed command of the division.

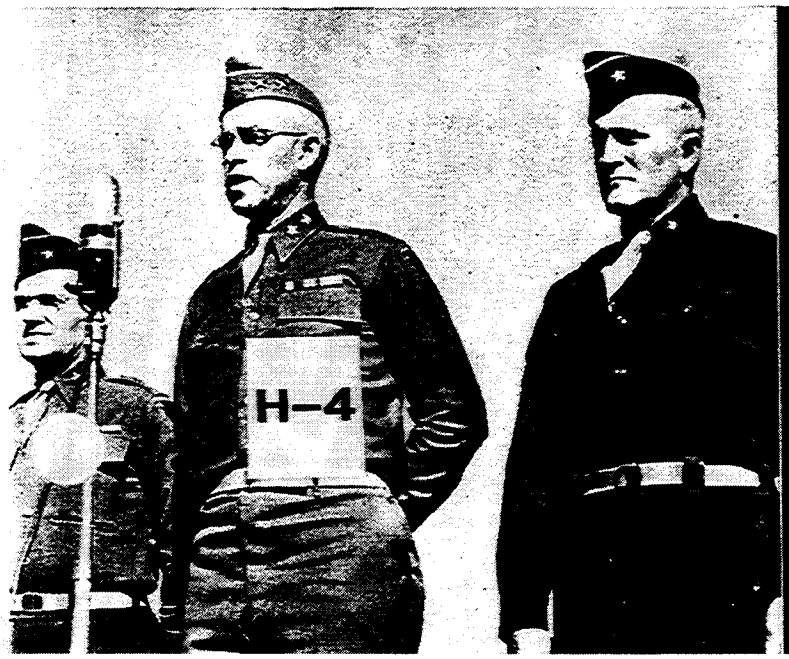
In June 1943 the division moved to Camp Pickett, Virginia. At Norfolk two weeks of ship-to-shore amphibious training was conducted with the Navy in joint exercises in Chesapeake Bay under control of Amphibious Force Atlantic Fleet. In the hills of West Virginia the division later engaged in mountain operations.

Training in the proper use of camouflage proved useful in the hedgerows of France.

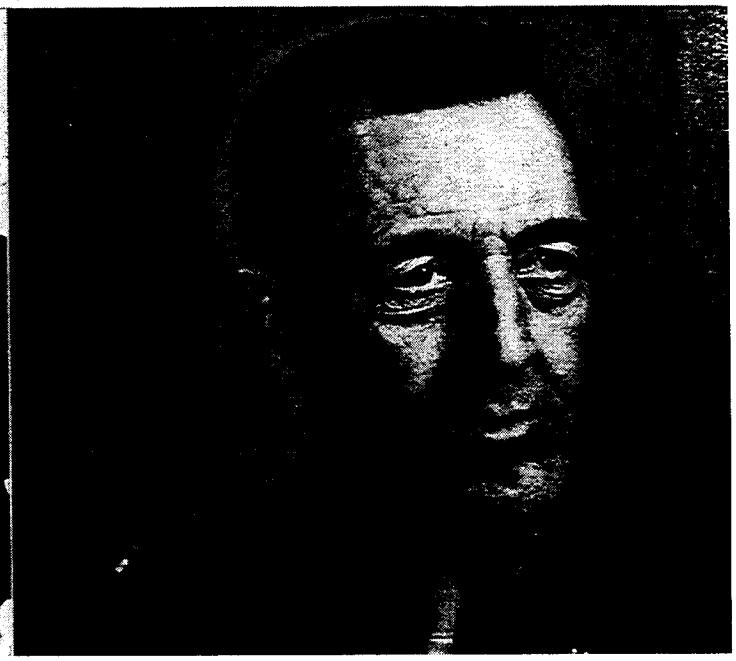
A series of rigid inspections followed for Keystone troops as they returned to Camp Pickett to prepare for overseas shipment. The advance detachment, numbering 30 officers and 30 enlisted men, staged at Fort Hamilton, New York. On September 18-19, they boarded the "Queen Mary" and headed for the British Isles.

The main body of the division began leaving Camp Pickett ten days later. Staging was accomplished at Camp Miles Standish, outside Boston. Transports were boarded on October 8, on which date the convoy sailed.

Major General Omar N. Bradley, as Commanding General of the 28th Division (later commander of Twelfth Army Group) speaks to his officers and men. With him are Brigadier General Basil H. Perry, Division Artillery Commander (left) and Brigadier General Kenneth E. Buchanan, Assistant Division Commander.



Brigadier General (then Colonel) Truman C. Thorson, Commanding Officer 112th Infantry until July, 1943.



DISTINCTIVE UNIT INSIGNIA

95th Division (NCBU)

95th Regt.

291st Regt.

377 Regt.

378th Regt.

379th Regt.

U.S. Army Training Activities
Leadership Academy

BRAVEST OF
THE BRAVE

IRONMEN OF
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95th DIVISION (Tng)
HISTORY AND MISSION

Thirteen weeks of training were scheduled, beginning November 1. The scope of the desert area was such as to afford the Division its best training ground up to that time. For the first time, the Division could use live ammunition most of its training problems. Bangalore torpedoes boomed through the night as troops learned to blast gaps in field obstructions, while many other phases of field work were covered in the "swing shift" training periods. Close battle conditions were simulated with considerable realism during artillery rolling barrage demonstration, when infantry troops were progressively deployed 150 yards behind the artillery barrage and light aerial bombardment.

While the Division trained in the California desert, The Journal was increased in size to a six-page semi-monthly, an eight-page edition being published February 3, 1944; Miss Virginia Ference of Maple Heights, Ohio, was named "Miss Victory Division" in a Journal-sponsored contest; T/Sgt. M. George Vanicek wrote the winning entry in a Journal-conducted Division song-writing contest. Vanicek's song, "The 95th Marches On", was later published and copyrighted. "Prelude", a forty-page pictorial training history of the Division, was distributed to troops early in February. Late in December, 1943, General Dunkelberg left the Division for a new assignment in the Aleutians, being replaced as assistant Division commander by Brig. Gen. Don C. Faith, former commander of the Women's Army Corps. The Division was then directed to move to the Indiantown Gap Military Reservation, Pennsylvania.

Th nced party arrived at Indiantown Gap, February 12, with the entire Div sing into the new station February 25. having boarded trains in Cal temperate winter climate, Division troops were not altogether prepared for the sub-zero weather that met then when they detrained in Pennsylvania. The weather couldn't chill the troops' enthusiasm for their new station, however, with the easy accessibility to several metropolitan areas (New York, Philadelphia, Washington, Baltimore) probably Indiantown Gap's leading virtue in their eyes.

Outstanding in the Division's latest training program was the series of exercises conducted in the West Virginia Maneuver Area. Besides combat teams, parts of all special troops units went through the mountain climbing exercises, while selected personnel attended the pack and assault schools. The pack schools afforded the Division's mule-skinners a chance at their trade. Seneca Rock offered a 928-foot climb or descent to the cliff scalers who hung Tarzan-like by their nylon ropes. "Rappels", "traverses" and "chimneys", among other terms, were added to the GI vernacular. The West Virginia training was generally regarded by veteran officers and enlisted men as the most rigorous single phase of training undertaken by the 95th Division.

The influx of new men was heavy at Indiantown Gap. The Division received 4000 troops from the drastically curtailed Army Specialized Training Program, half of this number being sent later to other units. Besides this total, 2,190 other enlisted men were added to the Division's rolls at its Pennsylvania station.

Late in March the 95th Division Artillery received a commendation for having attained the highest division artillery score in Army Ground Force battalion firing tests since the inauguration of a new form of tests in

November, 1943. Also in March, the Division newspaper made another advance, The Journal becoming a six-page weekly. A few weeks earlier, The Journal became a four-page weekly, marking an advance over the newspaper's previous hsitory when it had been an every-other-week publication.

April 1, Undersecretary of War Robert P. Patterson (later Secretary) visited the Divison on an inspection tour which lasted most of the day. After witnessing a cross-section of troops in their various training exercises, Mr. Patterson and his party reviewed the entire Division in a steady rain. To newspaper reporters present at the time, Mr. Patterson said, in part, "I am sure that dispatches from the battlefront will recall the 95th Division to my mind with the greatest pride." That rainy-day statement was to be fullfilled eight months later.

Late in April the Division's first boxing tournament on a team basis saw the 378th Infantry Regiment win the Class I (experienced) title and the 377th Infantry Regiment win the Class II (novice) trophy. Also late in April, The Journal jumped to an eight-page weekly, thus ranking among the largest divisional newspapers.

In early May, 1944, another change in the Division's command replaced General Maris, who moved up to the command of a corp artillery, as Division Artillery commander with Colonel Mark McClure. Colonel McClure had been Division G-3 at the time of the Division's activation. Three occasions in May and June put the 95th Division on display for the nearby and visiting public. A Mothers Day observance honored the mothers of seven Division men, drawn by lot from the seven major units. The mothers were guests of the Division for a three-day program which was featured by a radio broadcast and a review of the 379th Infantry Regiment. Sunday, May 28, the Division and the post were host to the governors of 37 states and the Virgin Islands, plus other nationally prominent politicos, who were attending the thirty-sixth annual Governors Conference held in nearby Hersey. Combat Team Seven was reviewed by the governors, who also witnessed a display of military equipment. June 15 was marked by the most spectacular demonstration of the fundamentals of foot-soldiering every staged by the Division. More than six thousand visitors beheld a four-hour exhibition as the Division's part in the first national observance of Infantry Day.

June and most of July found the 95th Division treading unmistakably toward an overseas movement. Personnel and equipment received equal attention. Speculation ended a few days before June 25, when an advance party left Indiantown Gap and sailed for the European Theater of Operations. June 29, the Division was on its way to battle, and most troops enjoyed their remaining respites in Pennsylvania and surrounding states. Units began moving to the staging area at Camp Miles Standish, Massachusetts, July 18 two trains daily, and all units had closed in by July 27.

Loud speakers warned troops as soon as they detrained that they were "now in a secret area." In the two weeks that followed, processing of clothing and equipment followed. A full round of lectures occupied all hands as they were advised about ship security, abandoning ship, censorship, finance, sanitation, conduct overseas and other pertinent subjects (including "gangplank fever"). Physical fitness was maintained through road marches, obstacle course-

ORDNANCE AND EXPLOSIVES
ARCHIVES SEARCH REPORTS
for the former
DOLLY SODS NORTH
TUCKER COUNTY
WEST VIRGINIA
PROJECT NUMBER G03WV006504

APPENDIX I

INTERVIEWS

ORDNANCE AND EXPLOSIVES WASTE

APPENDIX I

INTERVIEWS

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I-4 Interview with Mr. Harry Pawelczyk, U.S. Forest Service Biologist, Elkins, WV.

I-5 Interview with Mr. Frank Albert, Huntington, WV Corps of Engineers.

CONVERSATION RECORD-PERSONAL INTERVIEW

WITH: Ms. Nancy Feakes

ORGANIZATION: U.S. Forest Service

LOCATION: U.S. Forest Ranger Station
Petersburg, WV 26847

TELEPHONE: (304) 257-4488

DATE: 13 July 1995

I-1 Interview with: Ms. Nancy Feakes, U.S. Forest Service. Ms Feakes is the District Ranger in charge of the Dolly Sods North area. Ms. Feakes stated that since the Park Service had taken over the area, several items of OEW had been found in the area. She supplied the SI with a list of four different items found, which had been disposed of by the 56th Ord Det. She said that she had never seen any ordnance in the area but had seen material that had been brought out. She said at the time the Park Service was not promoting the area due to the OEW potential, but that the area was open to the public. Ms. Feakes was asked about accessibility to the area. She said the area was open only to pedestrian traffic, that there were no bridges over the creeks, and to reach the target area, Blackbird Knob, Red Creek would have to be forded twice by the site inspectors. Ms. Feakes said that any roads in the area would be slower that walking.

MICHAEL D. PATTERSON

CONVERSATION RECORD-PERSONAL INTERVIEW

WITH: Deputy Lawrence Cornell

ORGANIZATION: Grant County Sheriff's Department

LOCATION: Grant County Courthouse
5 Highland Ave.
Petersburg, WV 26847

TELEPHONE: (304) 257-1818

DATE: 13 July 1995

I-2 Interview with: Deputy Lawrence Cornell, with the Grant County Sheriff's Department. Deputy Cornell served with the Petersburg, WV Police Department for 10 years and with the Grant County Sheriff's Department for over 5 years. Deputy Cornell also spent 20 years in the military and has had training in chemical weapons. Deputy Cornell assisted in the recovery and disposal of four OEW items recovered from the Dolly Sods North area within the last 2 years. The items Deputy Cornell assisted with were a 105mm projectile found on the south slope of Blackbird Knob in the fall of 1993 which was blown in place and an 81mm mortar round, also found on the south slope in the fall of 1993 by a Boy Scout Troop. The 81mm round was carried out by the scouts in the rear of a pickup truck and was destroyed at another location by the EOD. Deputy Cornell also assisted with a 105mm projectile carried out of the area and left along a road, where it was blown in place by the EOD, and a 4.2 inch mortar round that was carried out of the area and left in a yard somewhere down the mountain. The 4.2 inch mortar round which was later found to be a white phosphorous round and was taken away by the EOD and destroyed at another location. Deputy Cornell was asked if he had any written reports of these incidents and he said no, but that the EOD unit should have records of them. Approximate locations of these ordnance items are shown on plate 3).

MICHAEL D. PATTERSON

CONVERSATION RECORD-PERSONAL INTERVIEW

WITH: Mr. William Vanorsdale

ORGANIZATION: Retired U. S. Forest Service

LOCATION: 1003 S. Henry Ave.
Elkins, WV

TELEPHONE: (304) 636-4997

DATE: 17 July 1995

I-3 Interview with: Mr. William Vanorsdale, retired, U. S. Forest Service. Mr. Vanorsdale worked with the Forest Service in the Dolly Sods area from 1941 to 1979 with a two year break from September 1944 to March 1946 for a term in the Navy.
Mr. Vanorsdale was not taken into the service earlier because he was considered essential personnel for his work with the units training in the Dolly Sods area. Mr. Vanorsdale said that the military used the area around Blackbird Knob and Cabin Mountain for artillery practice. He said that mortars, 105mm, and possibly 155mm rounds were used. He said that while occasionally rounds would start fires, most fires were caused by the soldiers carelessness in the woods with their cooking fires. He said that he knew of no instances where a fire set off any unexploded ordnance. Mr. Vanorsdale said that when the artillery was training the mountain was pretty much clear of vegetation due to grazing and a fire. Mr. Vanorsdale pointed out the areas where he thought the 105mm and 155mm guns were fired. The guns were located within what is now the Dolly Sods Wilderness area. He said the guns were mounted on wheeled carriages and being mobile, were set up where ever the unit using the area at the time wanted to put them. There were no permanent gun emplacements.

Michael D. Patterson

MICHAEL D. PATTERSON

CONVERSATION RECORD-PERSONAL INTERVIEW

WITH: Mr. Harry Pawelczyk

ORGANIZATION: U.S. Forest Service

LOCATION: 200 Sycamore St.
Elkins, WV

TELEPHONE: (304) 636-1800

DATE: 17 July 1995

I-4 Interview with: Mr. Harry Pawelczyk, biologist with the U.S. Forest Service. Mr. Pawelczyk was interviewed about the possibility of any endangered species of plants or animals being present in the project area. Mr. Pawelczyk stated since the land had until recently been privately owned, the forest service had not done any type of survey for endangered species. He said there were several endangered species in the Dolly Sods Wilderness just to the south and the same type habitat for those species was present in the Dolly Sods North area. Mr. Pawelczyk indicated that the Virginia Northern Flying Squirrel and the Cheat Mountain Salamander could both be expected to be found in the project area. The squirrel is endangered and the salamander is threatened. He also stated there were wetlands areas in the project area that would be considered sensitive. Mr. Pawelczyk said there could be up to 60 species in the area that are candidates for listing including the Appalachian Cottontail Rabbit and the Allegheny Woodrat.

Michael D. Patterson

MICHAEL D. PATTERSON

CONVERSATION RECORD-TELEPHONE INTERVIEW

WITH: Mr. Frank Albert

ORGANIZATION: US Army Corps of Engineers

LOCATION: 502 8th Street
Huntington, WV 25701-2070

TELEPHONE: (304) 529-5760

DATE: 11 October 1995

Patterson: Frank, I have a question about the West Virginia Maneuver Area. I did a site investigation of Dolly Sods North, which was part of the West Virginia Maneuver Area. The site No. G03WV006500 is for the West Virginia Maneuver Area. My project, No. G03WV006504, was for the Dolly Sods North area. It appears that my project is one of several within the West Virginia Maneuver Area site. Is that correct?

Albert: Yes.

Patterson: O.K. That means that any possible contamination north or west of the Dolly Sods North project on land that was part of the West Virginia Maneuver Area will be looked at in other projects associated with the overall site. Is that correct?

Albert: Yes. There was a push to look at areas taken over by the Department of Agriculture due to the use of the areas by hikers and campers. That included the Dolly Sods Wilderness Area that was looked at by Metcalf and Eddy and the Dolly Sods North project. The rest of the site will be evaluated.

Patterson: That's good, because the Metcalf and Eddy report indicated that OE had been found north of the Dolly Sods North project and evidence also indicates that Cabin Mountain was a target. Cabin Mountain is located to the west of the Dolly Sods North project and was also part of the West Virginia Maneuver Area. My problem was whether these areas should be classified as potential FUDS or if they were already part of a defined site.

Albert: I understand your problem. The West Virginia Maneuver Area is a site that will be looked at excluding those areas already assigned projects, that is, Dolly Sods North, and the Dolly Sods Wilderness Area.

ORDNANCE AND EXPLOSIVES
ARCHIVES SEARCH REPORTS
for the former
DOLLY SODS NORTH
TUCKER COUNTY
WEST VIRGINIA
PROJECT NUMBER G03WV006504

APPENDIX J

PRESENT SITE PHOTOGRAPHS

APPENDIX J

PRESENT SITE PHOTOGRAPHS

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J-1 Sign at the entrance to the Monongahela National Forest.

J-2 Close of of warning on sign.

J-3 Trail marker at trail intersection.

J-4 Lower south slope of Blackbird Knob.

J-5 Ferns on south slope of Blackbird Knob.

J-6 Ferns on south slope of Blackbird Knob.

J-7 Upper south slope of Blackbird Knob.

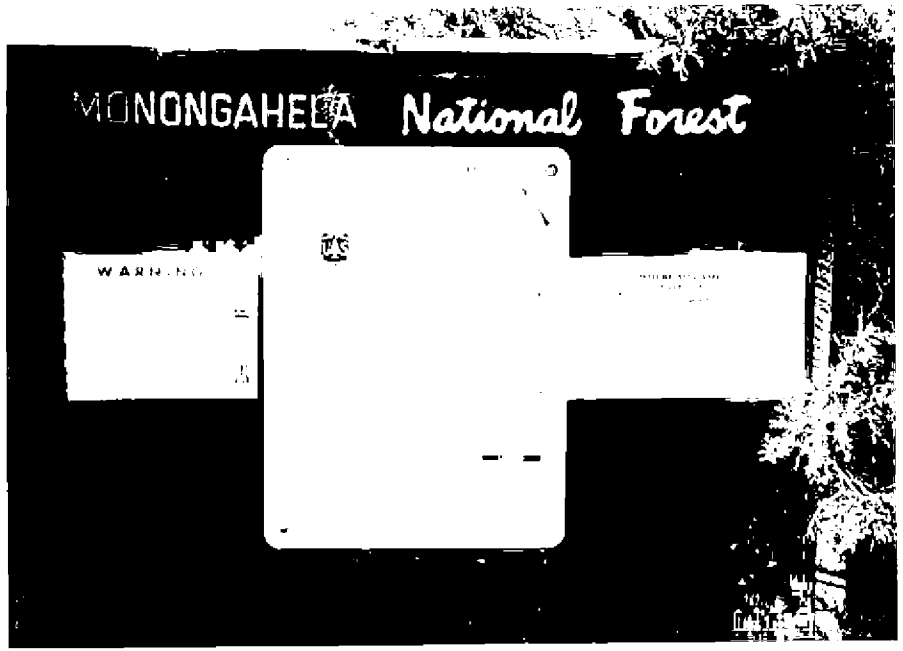
J-8 Upper north slope of Blackbird Knob.

J-9 Trail leading to Blackbird Knob.

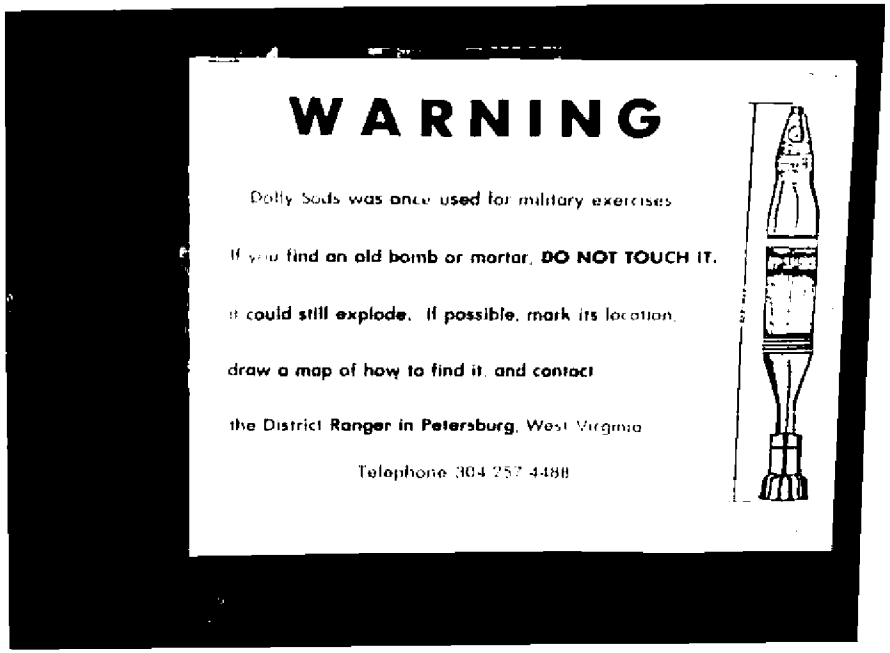
J-10 Area to the east of Blackbird Knob.

J-11 East side of Blackbird Knob.

J-12 Area to the north of Blackbird Knob.



J-1 Sign at the entrance of Monongahela National Forest.



J-2 Closeup of of warning on sign.

J-3 Trail marker at intersection of 511 & 514.

J-4 Lower south slope of Blackbird Knob.

J-5 Ferns on south slope of Blackbird Knob.

J-6 Ferns on south slope of Blackbird Knob.

J-7 Upper south slope of Blackbird Knob.

J-8 Upper north slope of Blackbird Knob.

J-9 Trail leading
to Blackbird Knob.

J-10 Area to the west
of Blackbird Knob.

J-11 East side of Blackbird Knob.

J-12 Area to the north
of Blackbird Knob.

ORDNANCE AND EXPLOSIVES
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DOLLY SODS NORTH
TUCKER COUNTY
WEST VIRGINIA
PROJECT NUMBER G03WV006504

APPENDIX K

HISTORICAL PHOTOGRAPHS

(NOT USED)

ORDNANCE AND EXPLOSIVES
ARCHIVES SEARCH REPORTS
for the former
DOLLY SODS NORTH
TUCKER COUNTY
WEST VIRGINIA
PROJECT NUMBER G03WV006504

APPENDIX L

REFERENCE MAPS/DRAWINGS

APPENDIX L

REFERENCE MAPS/DRAWINGS

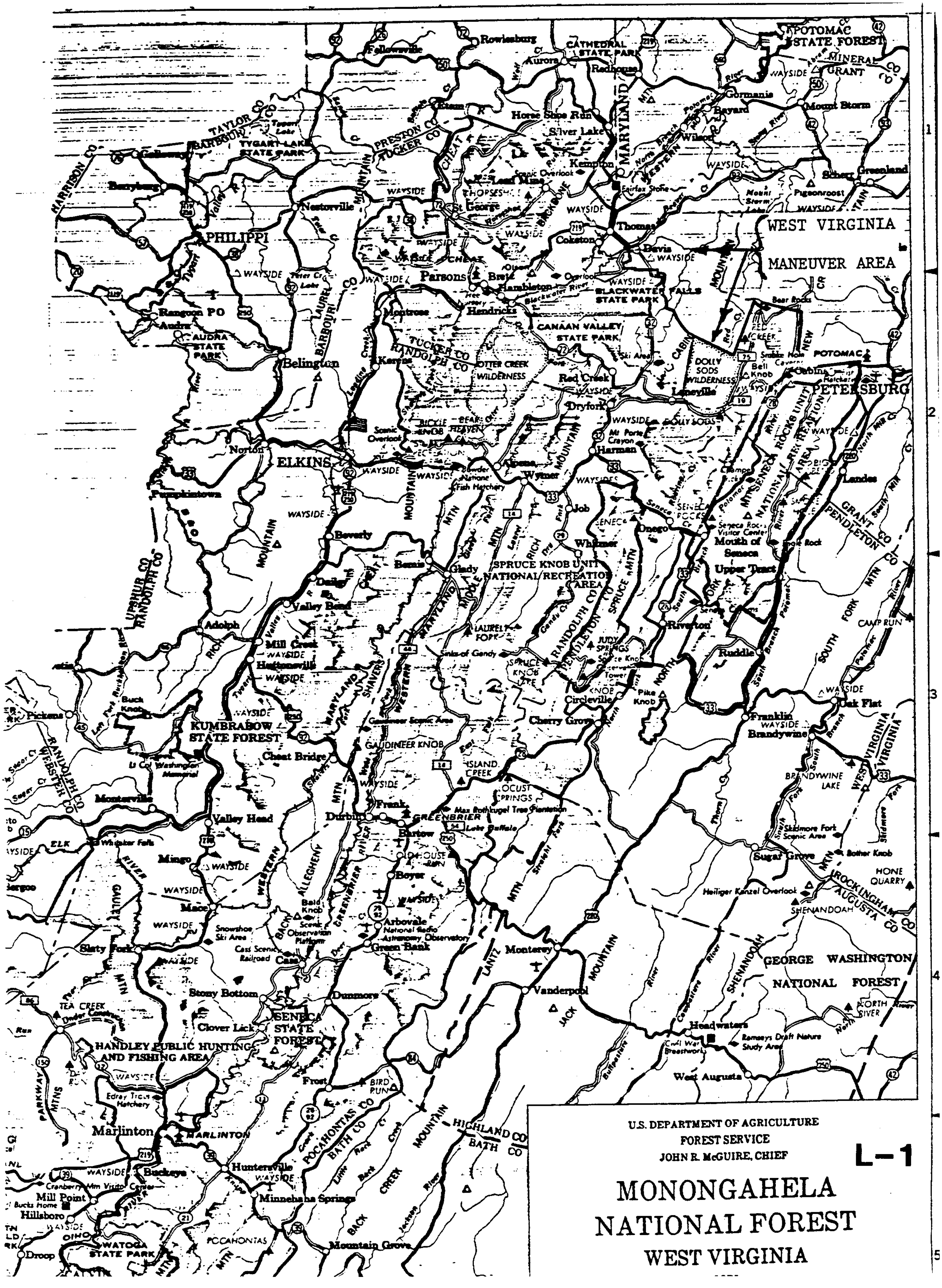
TABLE OF CONTENTS

L-1 Map of the West Virginia Maneuver Area, dated 1975.

L-2 Map of the Dolly Sods Wilderness with Dolly Sods North outlined showing 6,168 acres.

L-3 Map of Dolly Sods North showing two parcels. 1 parcel of 3,701.1 acres and 1 parcel of 2466.9 for a total of 6,168 acres.

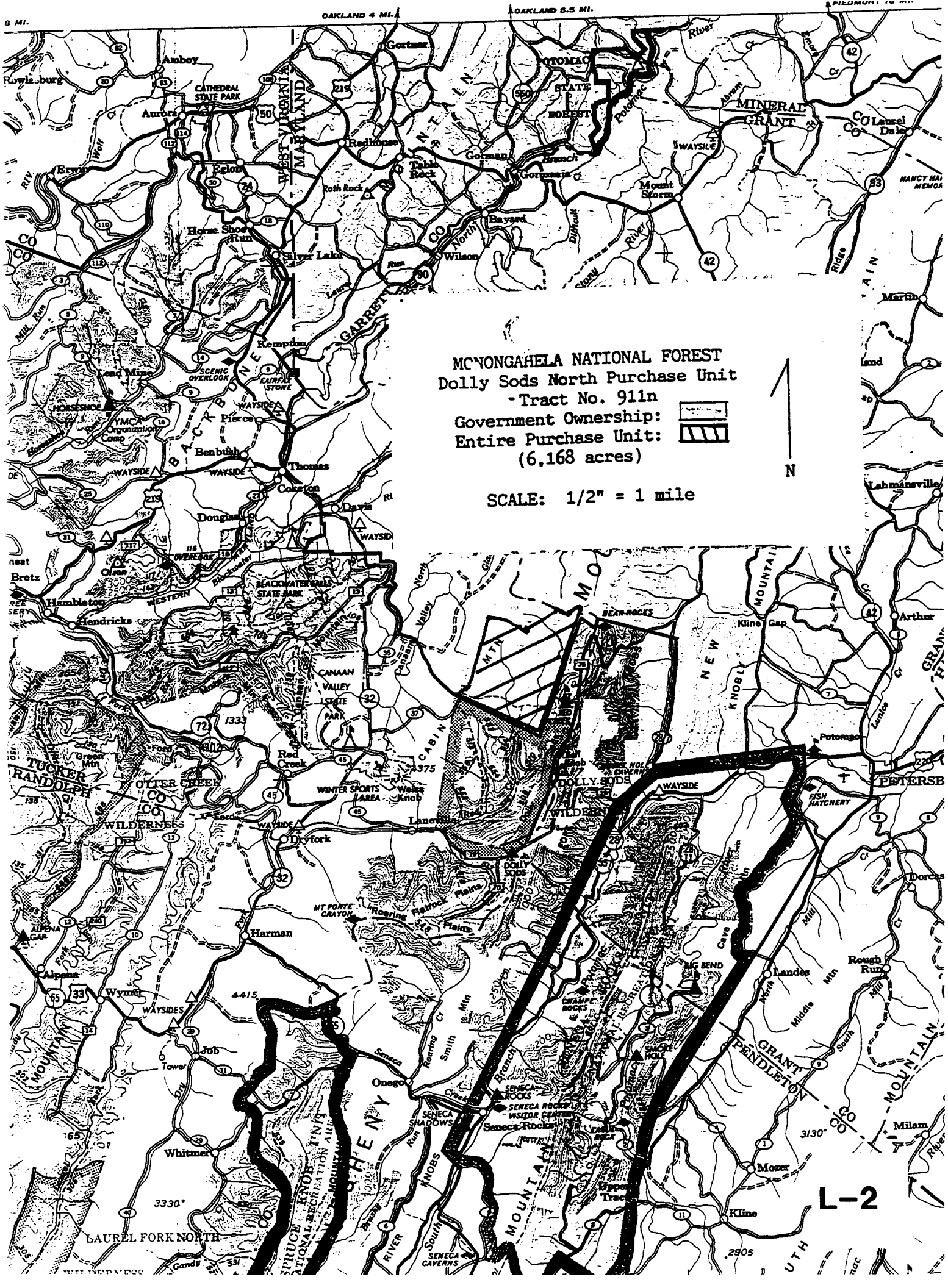
L-4 Map showing possible locations of ordnance finds and gun emplacements.

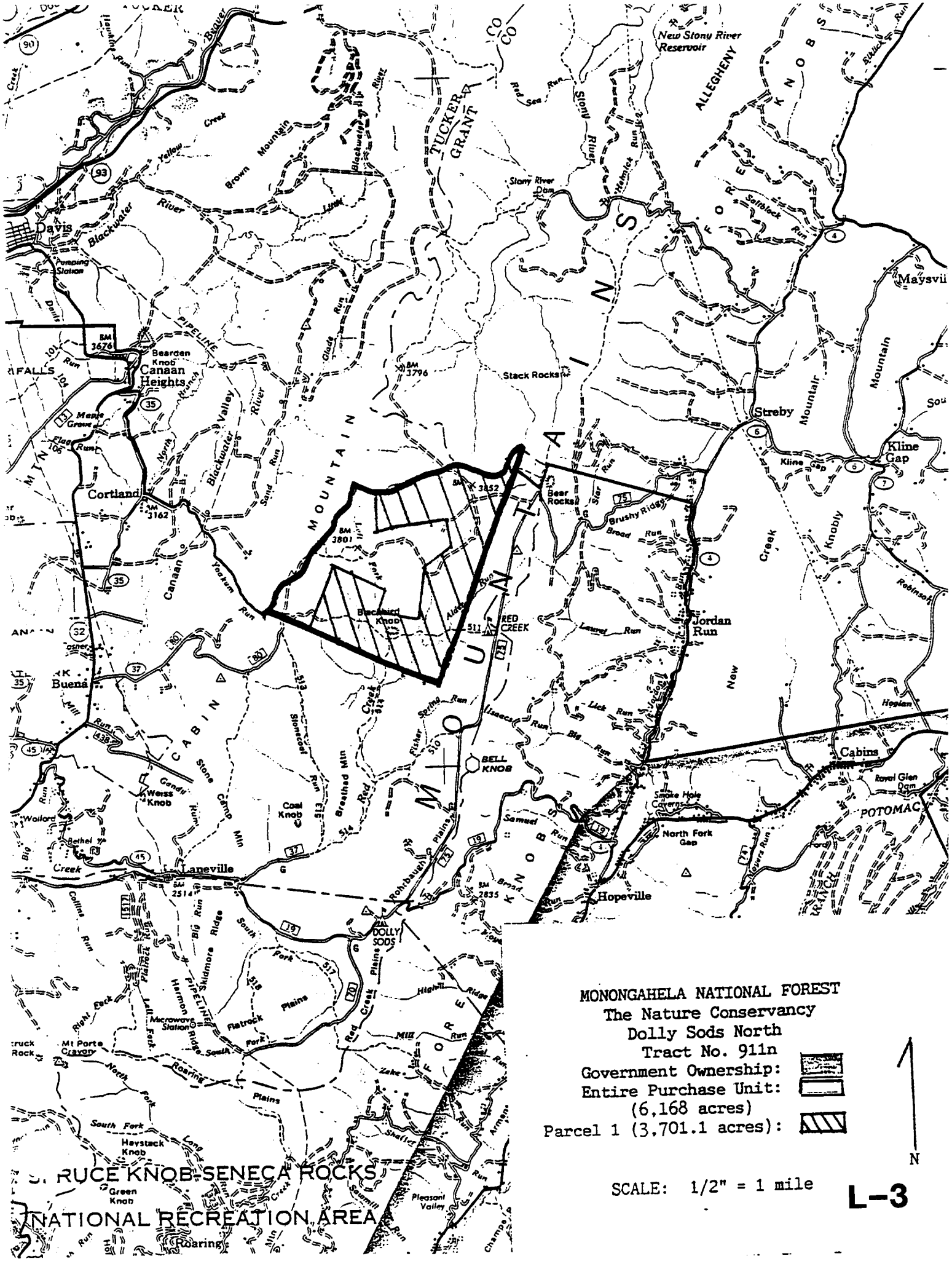


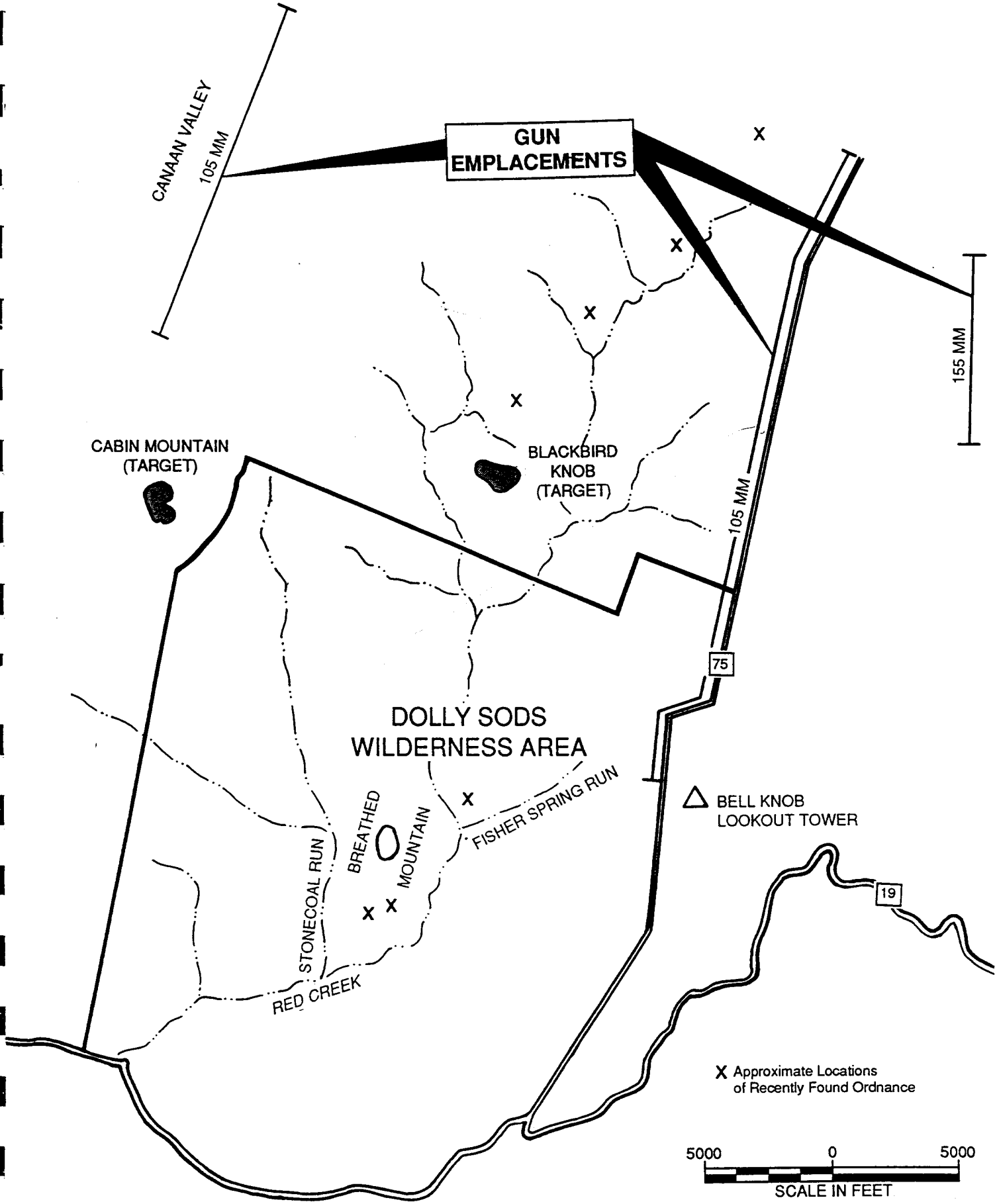
U.S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE
JOHN R. McGUIRE, CHIEF

L-1

MONONGAHELA NATIONAL FOREST
WEST VIRGINIA


MONONGAHELA NATIONAL FOREST
Dolly Sods North Purchase Unit
-Tract No. 911n
Government Ownership:
Entire Purchase Unit:
(6,168 acres)
SCALE: 1/2" = 1 mile
N
L-2
OAKLAND 4 MI.
OAKLAND 8.5 MI.
Amboy
Rowlesburg
Aurora
CATHEDRAL STATE PARK
Gortner
Redhouse
Table Rock
Gorman
Gormania
Mount Storm
Bayard
Wilson
Silver Lake
Horse Shoe Run
Erwin
Eglon
Roth Rock
Kempton
Lead Mine
SCENIC OVERLOOK
FAIRFAX STONE
HORSESHOE
YMCA Organization Camp
Pierce
Benbush
Thomas
Coketon
Davis
Douglas
Bretz
Hambleton
Hendricks
BLACKWATER FALLS STATE PARK
CANAAN VALLEY STATE PARK
Red Creek
WINTER SPORTS AREA
Weiss Knob
Green Mtn
OTTER CREEK WILDERNESS
Dryfork
Harman
Alpena
Wymer
Job
Tower
Onego
Whitmer
Laneville
DOLLY SODS WILDERNESS
DOLLY SODS
BEAR ROCKS
Kline Gap
Arthur
Potomac
PETERSBURG
FISH HATCHERY
Dorcas
Rough Run
Landes
Milam
Mozer
Kline
SENECA ROCKS
SENECA ROCKS VISITOR CENTER
SENECA SHADOWS
SENECA CAVERNS
MT PORTE CRAYON
Roaring Plains
Flatrock Plains
BIG BEND
CHAMPE ROCKS
SHADY HOLE
EAGLE ROCK
Upper Tract
LAUREL FORK NORTH
WEST VIRGINIA
MARYLAND
POTOMAC STATE FOREST
MINERAL CO
GRANT CO
GARRETT CO
TUCKER CO
RANDOLPH CO
PENDLETON CO
POCAHONTAS CO
BACKBONE MOUNTAIN
NEW MOUNTAIN
KNOBLY MOUNTAIN
SPRUCE KNOB-SENECA ROCKS NATIONAL RECREATION AREA
SENECA ROCKS NATIONAL RECREATION AREA
WAYSIDE
3330'
3130'
4415
4375
2905


MONONGAHELA NATIONAL FOREST
The Nature Conservancy
Dolly Sods North
Tract No. 911n
Government Ownership:
Entire Purchase Unit:
(6,168 acres)
Parcel 1 (3,701.1 acres):
N
SCALE: 1/2" = 1 mile
L-3
BRUCE KNOB-SENECA ROCKS
NATIONAL RECREATION AREA
Davis
Canaan Heights
Cortland
Buena
Laneville
Hopeville
Cabins
Streby
Kline Gap
Maysville
Jordan Run
Stack Rocks
Bear Rocks
Brushy Ridge
Blackbird Knob
RED CREEK
BELL KNOB
DOLLY SODS
Coal Knob
Weiss Knob
Haystack Knob
Green Knob
Mt Porte Crayon
Microwave Station
Smoke Hole Caverns
North Fork Gap
Stony River Dam
New Stony River Reservoir
Royal Glen Dam
POTOMAC
TUCKER GRANT
ALLEGHENY
MOUNTAINS
CABIN MOUNTAIN
Brown Mountain
Blackwater River
Canaan Valley
Pipeline
Roaring Plains
Pleasant Valley



L-4

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

ORDNANCE AND EXPLOSIVES
ARCHIVES SEARCH REPORTS
for the former
DOLLY SODS NORTH
TUCKER COUNTY
WEST VIRGINIA
PROJECT NUMBER G03WV006504

APPENDIX M

ARCHIVES SEARCH REPORT CORRESPONDENCE

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ORDNANCE AND EXPLOSIVES
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ED-D	-	-	1
ED-DN	3	-	-
ED-G	-	-	1
ED-H	-	-	1
SO	-	-	1
RE	-	-	1
PD	-	-	1

ORDNANCE AND EXPLOSIVE WASTE
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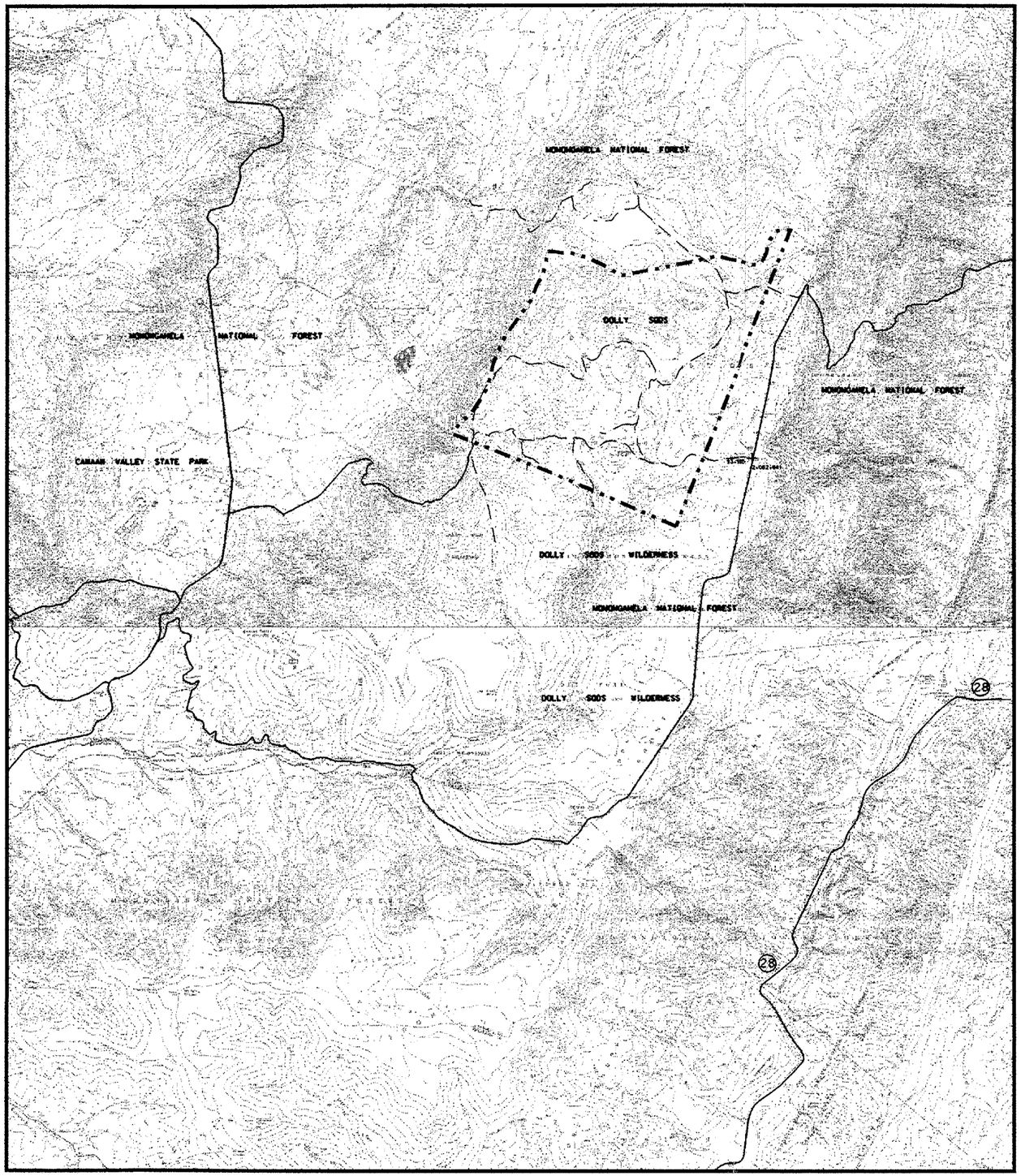
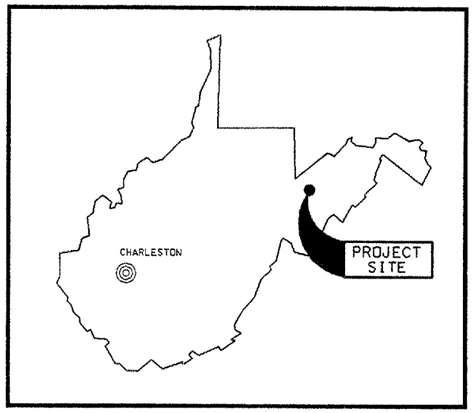
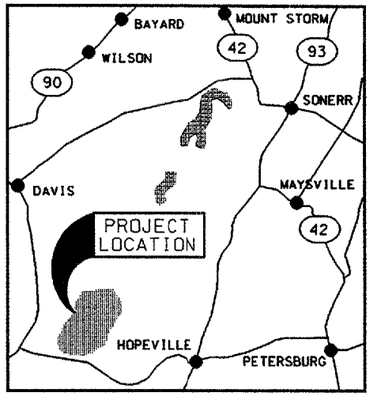
for the former
DOLLY SODS NORTH
TUCKER COUNTY, WEST VIRGINIA
PROJECT NUMBER G03WV006504

REPORT PLATES





STATE MAP



VICINITY MAP

LEGEND

- SITE BOUNDARY
- ROADS
- TRAILS
- STATE PLANE COORDINATES

4000 2000 0 4000 8000

Revisions			
Symbol	Description	Date	Approved

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US Army Corps of Engineers Rock Island District

DOLLY SODS-NORTH
Tucker County, WV

SITE MAP

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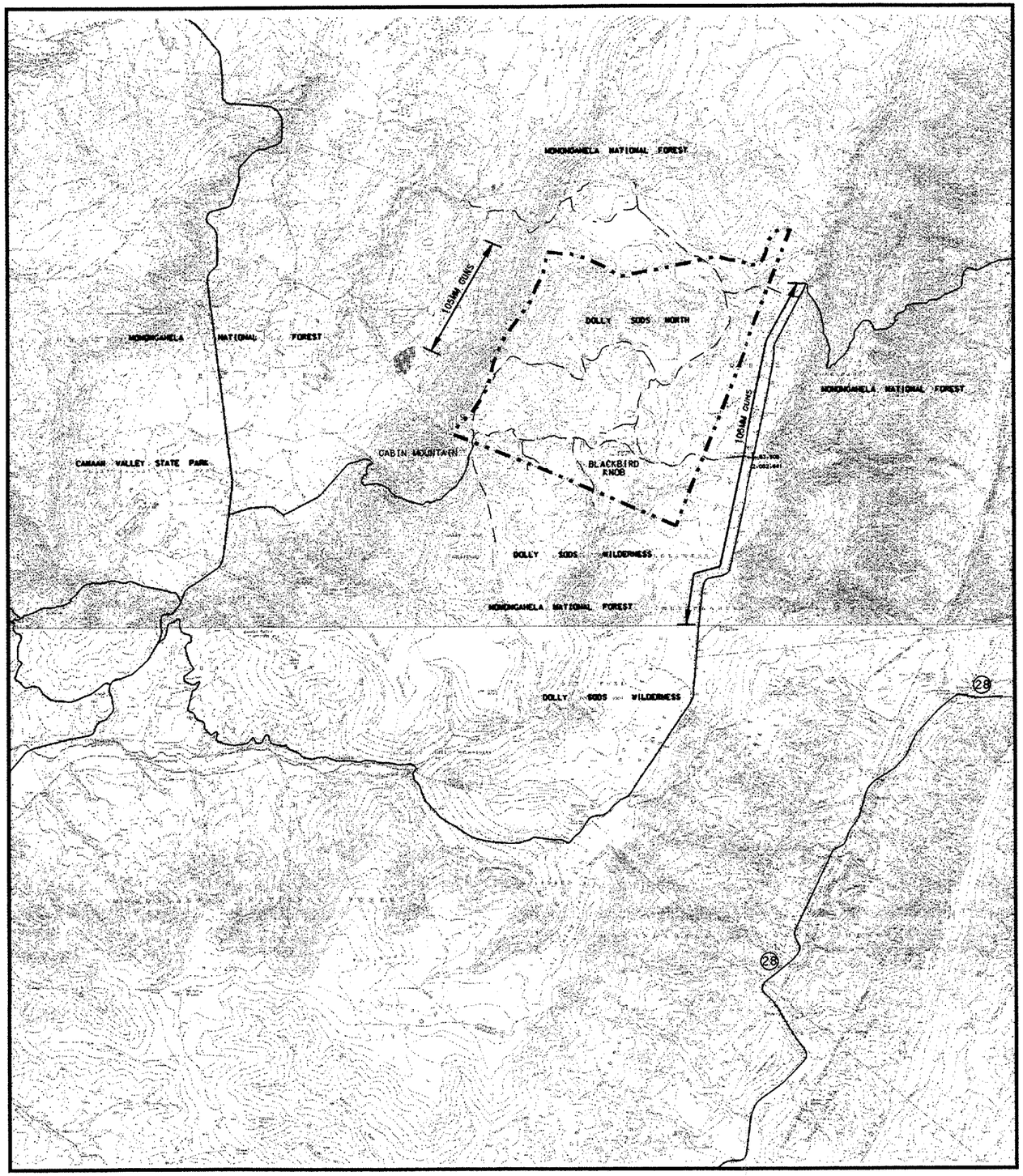

N

NOTE: ENTIRE PLATE AREA WAS PART OF THE WEST VIRGINIA MANEUVER AREA. THE BOUNDARIES OF THE MANEUVER AREA ARE UNDEFINED.

LEGEND

- SITE BOUNDARY
- ROADS
- TRAILS
- STATE PLANE COORDINATES

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DOLLY SODDS-NORTH
Tucker County, WV

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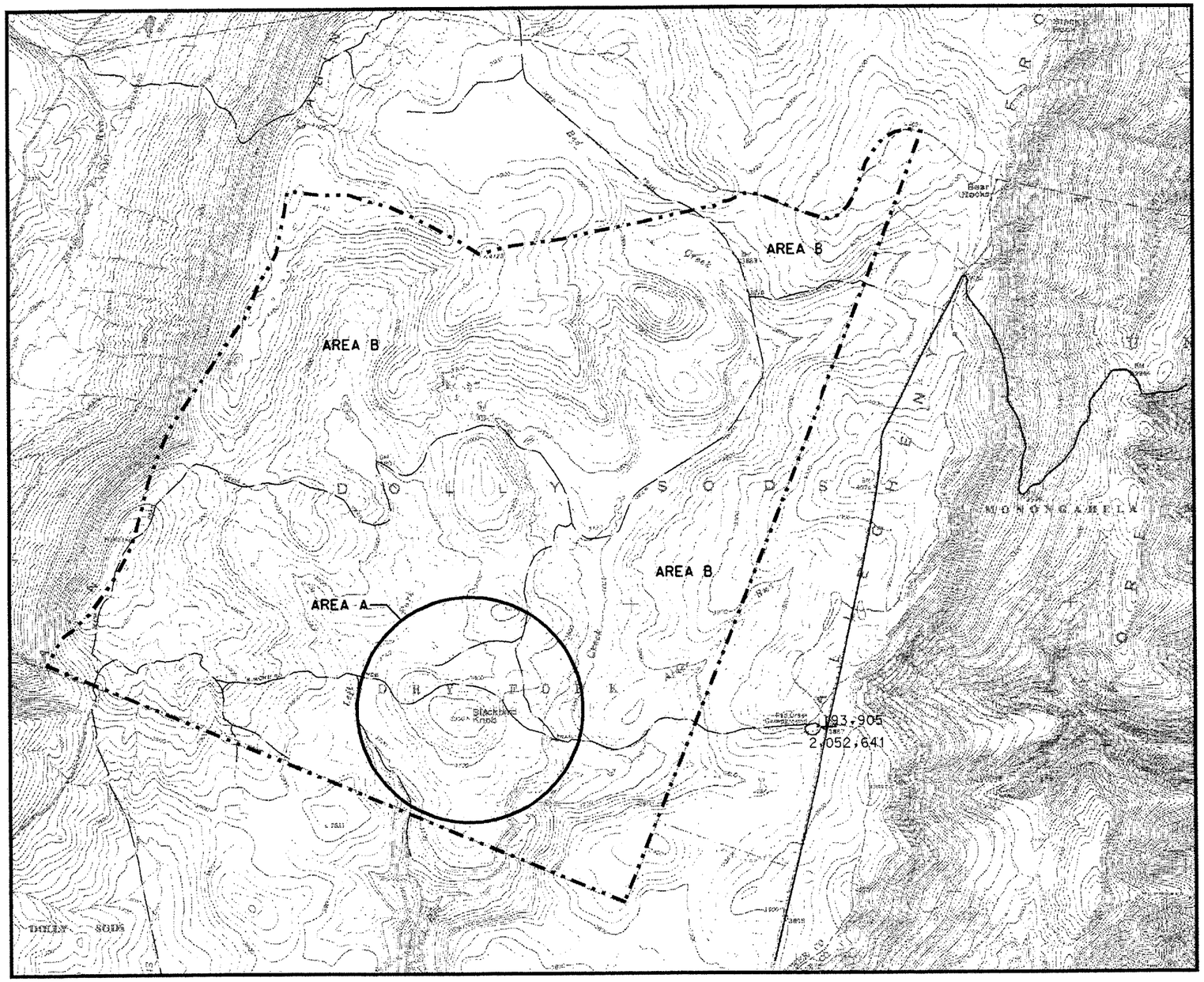
PLATE 2



N

SUMMARY OF AREAS			
AREA	FORMER USAGE	OEW PRESENCE	ACRES
A	TARGET AREA	CONFIRMED	670.0
B	ALL OTHER LANDS	POTENTIAL	5,498.0
		TOTAL ACRES	6,168.0

LEGEND

- SITE BOUNDARY
- ROADS
- TRAILS
- STATE PLANE COORDINATES

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DOLLY SODDS-NORTH
Tucker County, WV

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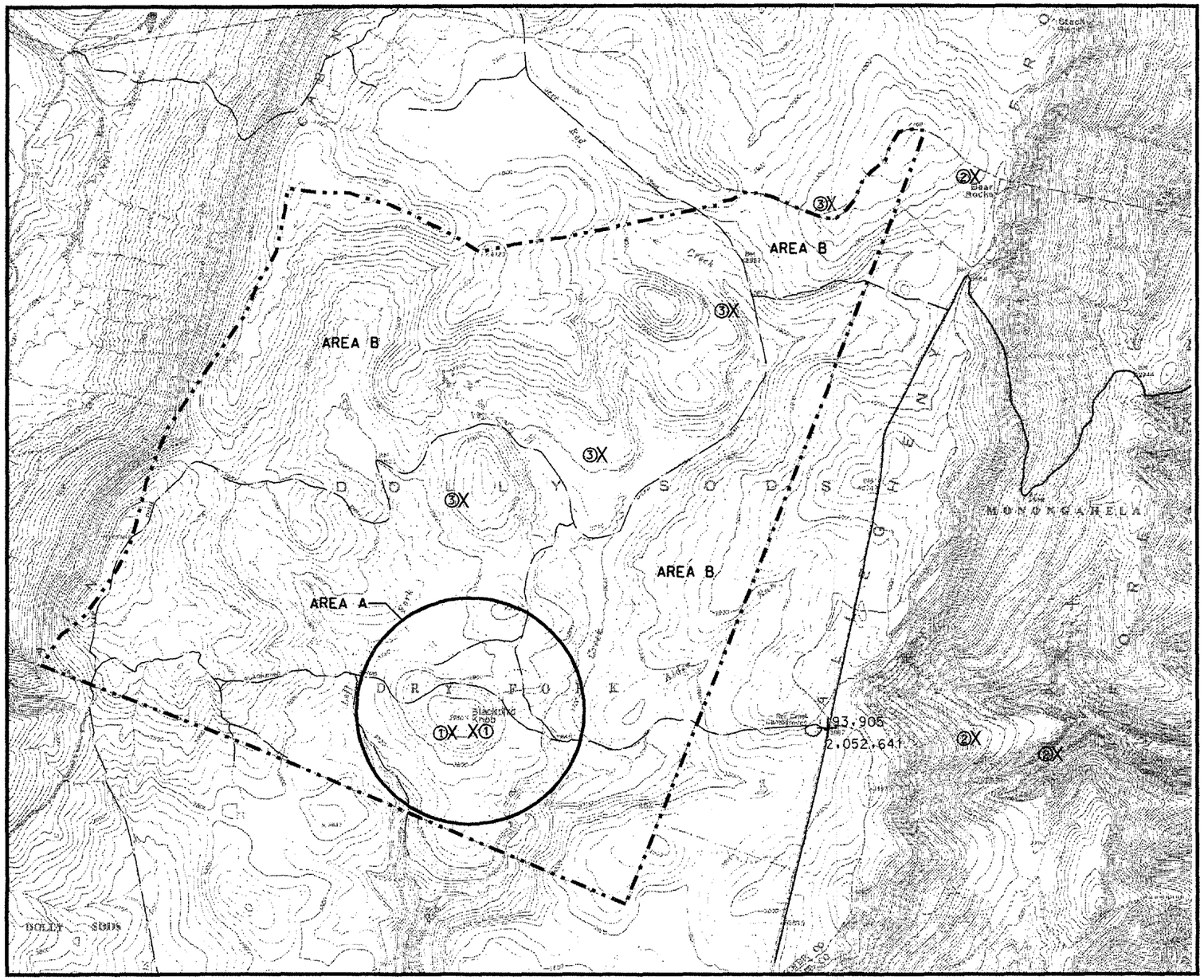

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X LOCATION OF CONFIRMED, OR UNCONFIRMED (UNSUBSTANTIATED REPORT), ORDNANCE

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② ORDNANCE FOUND BY VISITORS IN DOLLY SODS NORTH, REMOVED FROM AREA AND TURNED OVER TO FOREST OFFICIALS OR SHERIFFS DEPARTMENT AT LOCATIONS MARKED

③ UNCONFIRMED (UNSUBSTANTIATED REPORT) ORDNANCE

NOTE: UNCONFIRMED ORDNANCE ③ FOUND NORTH OF THE PROJECT AREA LIES WITHIN THE WEST VIRGINIA MANEUVER AREA ADDRESSED UNDER SITE #G03WV06500

LEGEND

SITE BOUNDARY

ROADS

TRAILS

STATE PLANE COORDINATES

1500 750 0 1500 3000

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US Army Corps of Engineers

DOLLY SODDS-NORTH
Tucker County, WV

OE CONTAMINATION

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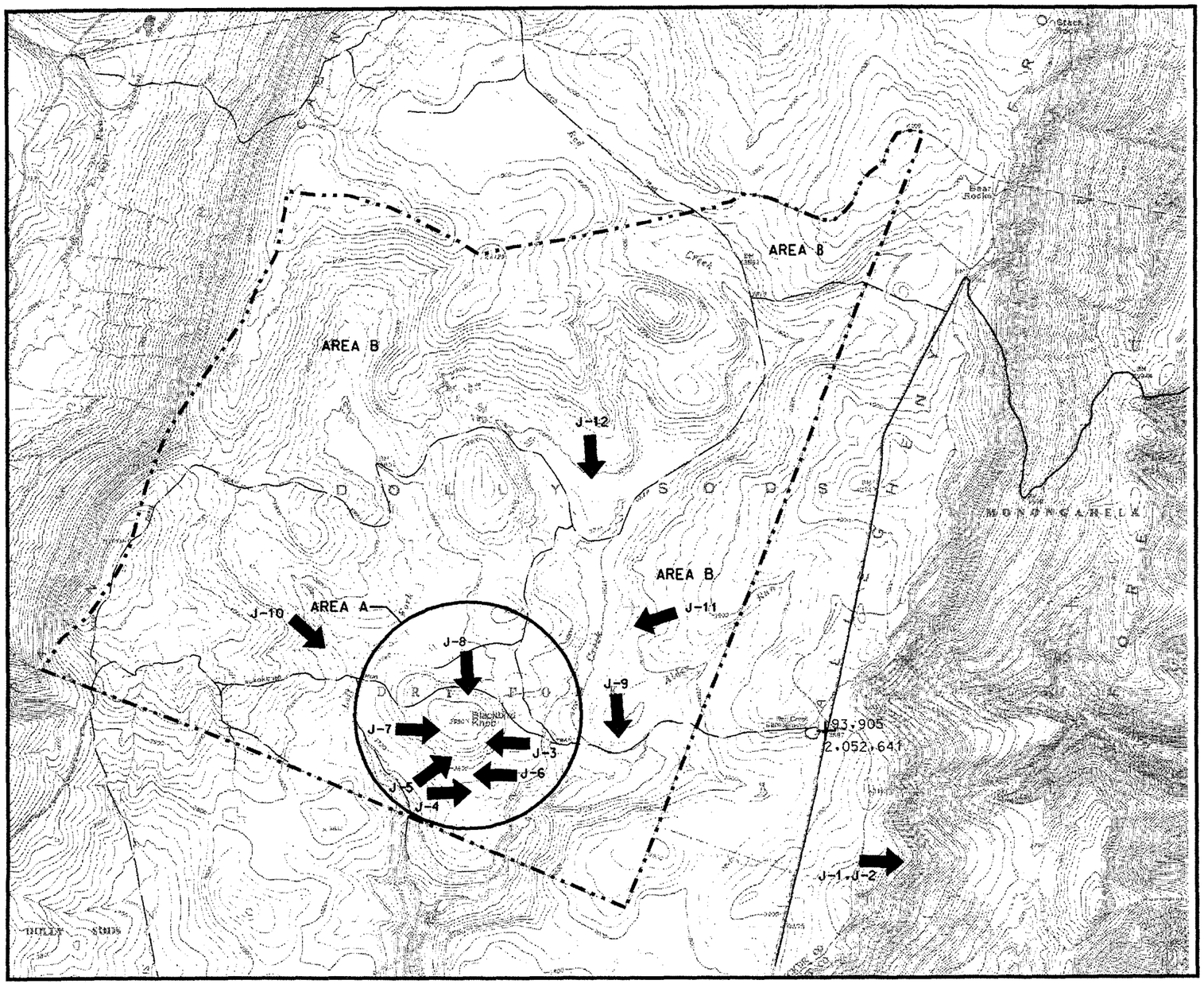

N

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LEGEND

SITE BOUNDARY

ROADS

TRAILS

STATE PLANE COORDINATES

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ROCK ISLAND DISTRICT

DOLLY SODDS-NORTH
Tucker County, WV

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Checked by: M.L.P.
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Approved by:

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PLATE5