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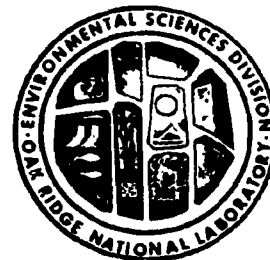
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**White Oak Creek Watershed
Topographic Map and
Related Materials**

N. D. Farrow

ENVIRONMENTAL SCIENCES DIVISION
Publication No. 1503

OPERATED BY
UNION CARBIDE CORPORATION
FOR THE UNITED STATES
DEPARTMENT OF ENERGY



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WHITE OAK CREEK WATERSHED TOPOGRAPHIC MAP AND RELATED MATERIALS

N. D. Farrow

ENVIRONMENTAL SCIENCES DIVISION
Publication No. 1503

NUCLEAR WASTE PROGRAMS
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ABSTRACT

FARROW, N. D. 1981. White Oak Creek Watershed topographic map and related materials. ORNL/TM-7289. Oak Ridge National Laboratory, Oak Ridge, Tennessee. 26 pp.

On March 22, 1978 a contract was let to Accu-Air Surveys, Inc., of Seymour, Indiana, to produce a topographic map of the White Oak Creek Watershed. Working from photography and ground control surveys, Accu-Air produced a map to our specifications.

The map is in four sections (N.W., N.E., S.W., S.E.) at a scale of 1:2400. Contour intervals are 5 ft (1.5 m) with accented delineations every 25 ft (7.6 m). The scribe method was used for the finished map. Planimetric features, roads, major fence lines, drainage features, and tree lines are included. The ORNL grid is the primary coordinate system which is superimposed on the state plain coordinates.

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INTRODUCTION

Toward the end of 1977, plans within the Waste Management Program of the Environmental Sciences Division revealed a need for an accurate topographic map of suitable scale of the White Oak Creek Watershed.

A scale of 1:2400 was chosen for the 6-sq mile (1554-ha) area. Contours were in 5-ft (1.5-m) intervals with every 25 ft (7.6 m) as an accented contour.

By the end of March 1978, an investigation of aerial survey companies resulted in a contract (purchase requisition no. N06650) let to Accu-Air Surveys, Inc., of Seymour, Indiana, to collect necessary data to produce the map. The contract called for a topographic map of scale and contour interval as above. The finished product was to meet or exceed National Map Accuracy Standards as follows:

1. Contours - 90% of the elevations determined from the solid line contours shall have an accuracy of one-half contour interval or better with respect to true elevation, and the remaining 10% may not be in error by more than one contour interval. In areas where vegetation obscures the ground and the contours are shown as dashed lines, they shall be plotted as accurately as possible from the stereoscopic model.

2. Spot Elevations - 90% of all spot elevations placed on the maps shall have an accuracy of at least one-fourth the contour interval, and the remaining 10% shall not be in error by more than one-half the contour interval.

3. Planimetric Features - 90% of all planimetric features which are well defined on the photographs shall be plotted within at least

one-fortieth of an inch of their true position at map scale, and none of the features shall be misplaced by more than one-twentieth of an inch.

Using a stereoscopic plotter with a "C" accuracy >2000 and working from black and white aerial photographs (negative scale 1 in. = 1000 ft; 2.54 cm = 305 m), Accur-Air Surveys, Inc. produced, by the scribe method, a topographic map to meet the above criteria.

The primary grid is the ORNL coordinate system superimposed on the state grid system. The map is in four sections of approximately 1000 acres (405 ha) per section. Sections 1 and 2 enclose the area north of Haw Ridge and are divided east and west at coordinate E32,000 (the approximate vicinity of 5th Street within the building complex of ORNL facilities) (Fig. 1). Sections 3 and 4 enclose the area south of Haw Ridge and are also divided east and west at coordinate E32,000 (the area west of HFIR, TRU, and TURF) (Fig. 1).

In conjunction with the production of the four-section topographic map, Accu-air produced, at our request, the following materials:

1. Two sets of 9 x 9 in. (23 x 23 cm) black and white contact prints suitable for stereoscopic viewing. Scale 1 in. = 1000 ft (2.54 cm = 305 m).
2. Selected prints of the above enlarged to a scale of 1 in. = 500 ft (2.54 cm = 152 m).
3. One set of 9 x 9 in. (23 x 23 cm) color contact prints suitable for stereoscopic viewing. Scale 1 in. = 660 ft (2.54 cm = 201 m).
4. The original negatives for the black and white and the color photographs described above.

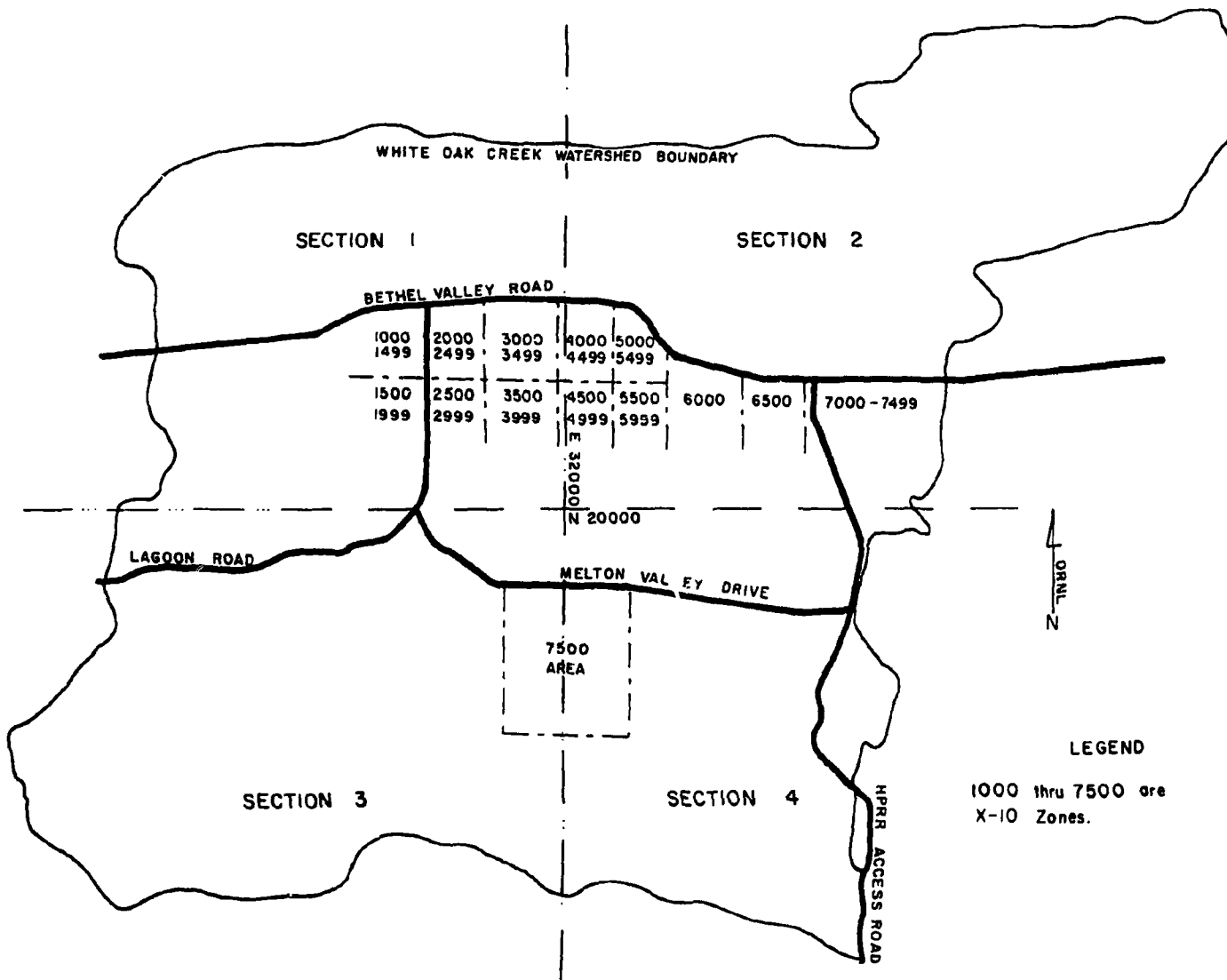


Fig. 1. Intersection of topographic map sections.

5. One mylar positive photomosaic of the photograph coverage. Scale 1 in. = 1000 ft (2.54 cm = 305 m).
 6. One black and white photographic print (and the negative) of the photomosaic of the photographic coverage. Scale 1 in. = 1000 ft (2.54 cm = 305 m).
 7. Mylar positive prints of the photographic coverage corresponding in area, dimension, and scale to each of the topographic map sections (four prints).
 8. Black and white photographic prints (and the negatives) of the photographic coverage corresponding in area, dimension, and scale to each of the topographic map sections (four each).
 9. One set of mylar positive prints of the topographic map.
- These items are available in Bldg. 3504 (see p. 13).

Black and White Aerial Photographs

Black and white photographs were taken using a Zena camera with 6" (15-cm) focal length. Kodak XX Aerographic film No. 2405 was used. The date of exposure was March 29, 1978. Exposure altitude was approximately 6000 ft (1830 m).

Three flight lines were necessary for proper coverage, i.e., 60% overlap and 30% sidelap (between flight lines). All flight lines were of east-west orientation relative to ORNL grid north (Fig. 2). Each photograph covers a 2.9-sq mile area (751 ha).

The first flight line (north) was flown east to west. The eight exposures generally covered Chestnut Ridge from Walker Branch west to the area between White Wing Road (Highway 95) and the Clinch River (see Table 1).

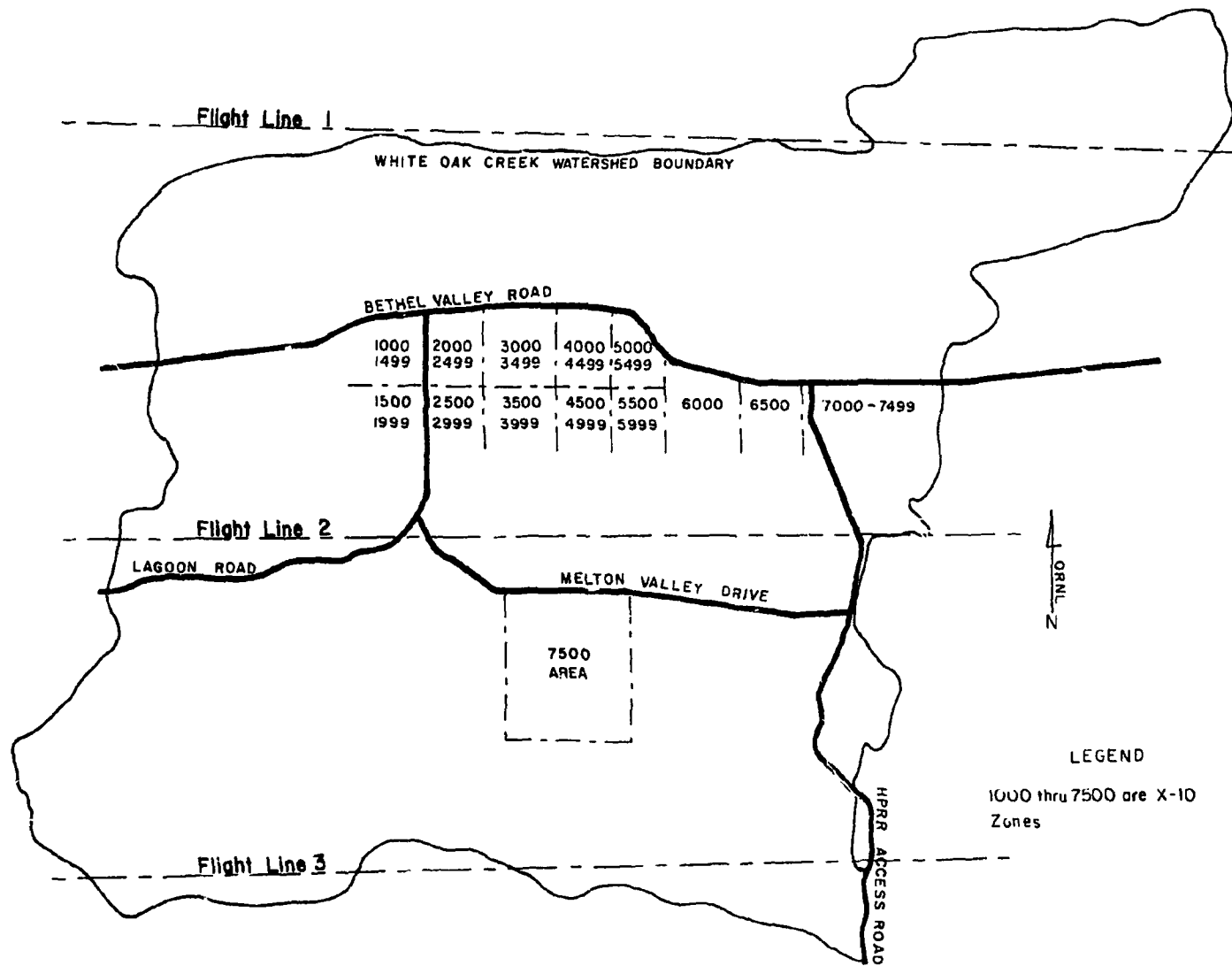


Fig. 2. Flight lines for black and white photography.

Table 1. Index of aerial black and white photographs (Flight line 1)

Photo No.	Central feature	Prominent feature ^{a,b}	ORNL grid coordinate			
			North	South	East	West
1 - 1 of 8	Chestnut Ridge east of White Oak Creek Watershed	Bear Creek Valley; Bethel Valley Road; Walker Branch; <u>Jim Diggs Road</u>	N30750	N22000	E49000	E40250
1 - 2 of 8	Chestnut Ridge at east end of White Oak Creek Watershed	Bear Creek Valley; Bethel Valley Road; <u>Chestnut Ridge Road</u> ; <u>Hawk's Nest Road</u>	N31000	N22250	E43250	E37500
1 - 3 of 8	Chestnut Ridge north of the east end of the 7000 area	Bear Creek Valley; Bethel Valley Road; <u>Chestnut Ridge Road</u> ; <u>Hawk's Nest Road</u> ; <u>Nursery Road</u>	N20750	N22000	E43250	E34500
1 - 4 of 8	Chestnut Ridge north of 7000 area	Bear Creek Valley; Bethel Valley Road; <u>Chestnut Ridge Road</u> ; <u>Nursery Road</u> ; <u>Gas Line Road</u> ; <u>Reservoir</u> ; <u>Reservoir Road</u>	N30500	N21750	E40250	E31500
1 - 5 of 8	Chestnut Ridge north of East Portal	Bear Creek Valley; Bethel Valley Road; <u>Nursery Road</u> ; <u>Gas Line Road</u> ; <u>Reservoir</u> ; <u>Reservoir Road</u> ; <u>Reeves Road</u> ; substation; X-10 target range	N30500	N21750	E37500	E28750
1 - 6 of 8	Chestnut Ridge north of West Portal	Bear Creek Valley; Bethel Valley Road; <u>Gas Line Road</u> ; <u>Reservoir</u> ; <u>Reservoir Road</u> ; <u>Reeves Road</u> ; substation; X-10 target range	N30500	N21750	E34500	E25750
1 - 7 of 8	Chestnut Ridge east of Highway 95	Bear Creek Valley; Bethel Valley Road; <u>Gas Line Road</u> ; X-10 target range; Highway 95	N30250	N21500	E31750	E23000
1 - 8 of 8	Chestnut Ridge east and west of Highway 95	Bear Creek Valley; Bethel Valley; Highway 95	N30250	N21500	E29250	E20500

^aRoad names and area designations are taken from:

Planning Map ORNL Building and Roads, General Engineering Division, revised 5/77; and Oak Ridge Area Map (S-16A), Oak Ridge, Tennessee. Prepared by Maps and Survey Branch, TVA, for Oak Ridge Office, AEC. Base Map was assembled from TVA-USGS 1:24,000 topographic maps. Revised in part in June 1974 from data furnished by AEC-ORO.

^bRoads underlined are not paved.

The second flight line was flown west to east. The seven exposures generally covered Haw Ridge from Jones Island to Gallaher Bend, each in the Clinch River (Table 2).

The third flight line (south) was also flown west to east. It covers Copper Ridge in seven exposures, from the area west of the Clinch River, east to Gallaher Bend (Table 3).

The prints which were enlarged to a scale of 1 in. = 500 ft (2.54 cm = 152 m) are as follows:

Flight line 1, print numbers 1, 3, 5, and 7.

Flight line 2, print numbers 2, 3, 4, and 6.

Flight line 3, print numbers 2, 3, 5, and 7.

Color Aerial Photographs

Color photographs were taken with the Zena camera using Kodak Aerocolor film No. 2445, also on March 29, 1978. Flight altitude for these exposures was slightly less than 4000 ft (1220 m), to accommodate the new scale of 1 in. = 660 ft (2.54 cm = 201 m).

The four flight lines necessary for proper coverage were also made in the east-west orientation relative to ORNL grid north, and were flown from the west to the east (Fig. 3).

The first flight line consisted of nine exposures covering the southern portion of the watershed. This southern portion included the northern slopes of Copper Ridge, from the Clinch River east to Bearden Creek (Table 4).

The second flight line of nine exposures covered the southern slopes of Haw Ridge from Jones Island east to Bearden Creek (Table 5).

Table 2. Index of aerial black and white photographs (Flight line 2)

Photo No.	Central feature	Prominent feature ^{a,b}	ORNL grid coordinate			
			North	South	East	West
2 - 1 of 7	Haw Ridge west of Highway 95	Jones Island; Highway 95; <u>New Zion Patrol Road</u>	N24250	N15500	E27500	E18750
2 - 2 of 7	Haw Ridge east and west of Highway 95	SWDA 3,4,5; Lagoon Road; 1500 Area	N24250	N15500	E30500	E21750
2 - 3 of 7	Haw Ridge east and west of White Oak Creek	SWDA 4 & 6; 1500 to 4500 Area; NSPP	N24000	N15250	E33250	E24500
2 - 4 of 7	Haw Ridge south of 4500 area	SWDA 6, 1500 to 6000 Area; NSPP; HFIR, TRU, TURF; Melton Valley Drive	N24000	N15250	E36500	E27750
2 - 5 of 7	Haw Ridge south of 6000 area	4500 to 7000 Area; HFIR, TRU, TURF; Melton Valley Drive; Melton Valley Access Road; Reservoir (6553 Area)	N24250	N15500	E39250	E30500
2 - 6 of 7	Haw Ridge south of 7000 area	7000 Area; Reservoir (6553 area) <u>Melton Valley Extension</u> ; HPRR Access Road; Bearden Creek	N24500	N15750	E42250	E33500
2 - 7 of 7	Haw Ridge east of 7000 area	<u>Melton Valley Extension</u> ; Bearden Creek; EGCR Access Road; EGCR (7600 area)	N24750	N16000	E45500	E36750

^aRoad names and area designations are taken from:

Planning Map ORNL Building and Roads, General Engineering Division, revised 5/77; and Oak Ridge Area Map (S-16A), Oak Ridge, Tennessee. Prepared by Maps and Survey Branch, TVA, for Oak Ridge Office, AEC. Base Map was assembled from TVA-USGS 1:24,000 topographic maps. Revised in part in June 1974 from data furnished by AEC-ORO.

^bRoads underlined are not paved.

Table 3. Index of aerial black and white photographs (Flight line 3)

Photo No.	Central feature	Prominent feature ^{a,b}	ORNL grid coordinate			
			North	South	East	West
3 - 1 of 7	Clinch River west of White Oak Lake	Farms along Clinch River; Highway 95; <u>TSF Access Road</u> ; <u>Jones Island Road</u>	N18750	N10000	E26000	E17250
3 - 2 of 7	White Oak Lake	Highway 95; <u>TSF Access Road</u> ; <u>Jones Island Road</u> ; <u>Holland Road</u> ; <u>North Reactor Road</u>	N19000	N10250	E29250	E20500
3 - 3 of 7	Copper Ridge west of Melton Hill	<u>TSF Access Road</u> ; <u>Holland Road</u> ; <u>North Reactor Road</u> ; <u>TSF</u> ; <u>Hydrofracture Area</u> ; <u>Melton Hill Road</u>	N19000	N10250	E32000	E23250
3 - 4 of 7	Melton Hill on Copper Ridge	<u>Holland Road</u> ; <u>North Reactor Road</u> ; <u>Hydrofracture Area</u> ; <u>Melton Hill Road</u> ; <u>TSF-HPRR Road</u>	N19000	N10250	E35250	E26500
3 - 5 of 7	Copper Ridge east of Melton Hill	<u>North Reactor Road</u> ; <u>TSF-HPRR Road</u> ; <u>HPRR Access Road</u> ; <u>HPRR</u>	N19250	N10500	E38000	E29250
3 - 6 of 7	HPRR access road	<u>North Reactor Road</u> ; <u>TSF-HPRR Road</u> ; <u>HPRR</u>	N19000	N10250	E41000	E32250
3 - 7 of 7	East of HPRR access road	<u>HPRR Access Road</u> ; <u>Bearden Creek</u> ; <u>Bearden Creek Road</u> ; <u>Park City Road</u>	N19000	N10250	E44250	E35500

^aRoad names and area designations are taken from:

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^bRoads underlined are not paved.

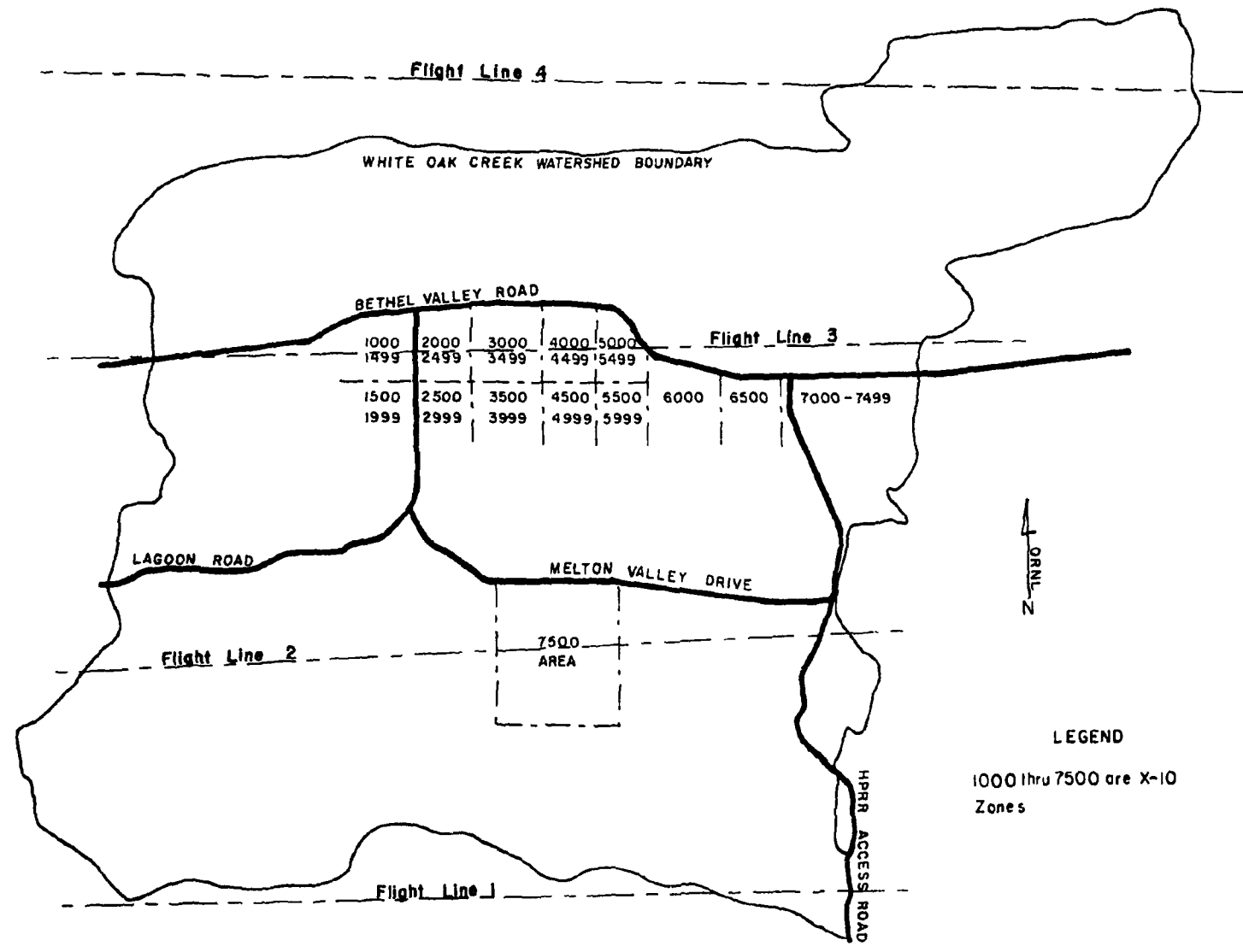


Fig. 3. Flight lines for color photography.

Table 4. Index of aerial color photographs (Flight line 1)

Photo No.	Central feature	Prominent feature ^{a,b}	ORNL grid coordinate			
			North	South	East	West
1 - 1 of 9	West of White Oak Lake	<u>Clinch River; Jones Island Road; Highway 95</u>	N17000	N11500	E24750	E19250
1 - 2 of 9	Copper Ridge south of White Oak Lake	<u>Highway 95; White Oak Lake; Holland Road</u>	N17000	N11500	E27000	E21500
1 - 3 of 9	Copper Ridge southeast of White Oak Lake	<u>White Oak Lake; Holland Road; New Hydrofracture</u>	N17250	N11750	E28750	E23250
1 - 4 of 9	Copper Ridge west of Melton Hill	<u>Holland Road; New Hydrofracture; North Reactor Road</u>	N17250	N11750	E31000	E25500
1 - 5 of 9	Melton Hill on Copper Ridge	<u>Holland Road; North Reactor Road; Melton Hill Road; TSF-HPRR Road</u>	N17250	N11750	E33000	E27500
1 - 6 of 9	Copper Ridge east of Melton Hill	<u>North Reactor Road; Melton Hill Road; TSF-HPRR Road</u>	N17250	N11750	E35250	E29750
1 - 7 of 9	North slope of Copper Ridge west of HPRR access	<u>North Reactor Road; TSF-HPRR Road; HPRR; HPRR Access Road</u>	N17250	N11750	E37000	E31500
1 - 8 of 9	HPRR access road	<u>North Reactor Road; HPRR Access Road; HPRR, Bearden Creek Road</u>	N17500	N12000	E39000	E33500
1 - 9 of 9	Area east of HPRR access road	<u>HPRR Access Road; Bearden Creek Road</u>	N17500	N12000	E41250	E35750

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^bRoads underlined are not paved.

Table 5. Index of aerial color photographs (Flight line 2)

Photo No.	Central feature	Prominent feature ^{a,b}	ORNL grid coordinate			
			North	South	East	West
2 - 1 of 9	Terrain between Jones Island and Highway 95	<u>Jones Island Road</u> ; SWDA 6; <u>White Oak Dam</u>	200000	N14500	E24500	E19000
2 - 2 of 9	Highway 95 north of White Oak Dam	<u>Jones Island Road</u> ; SWDA 6; <u>White Oak Lake</u> ; Lagoon Road	N20500	N15000	E26750	E21250
2 - 3 of 9	Lagoon Road between Highway 95 and SWDA 4	SWDA 6; White Oak Lake; ILLW Pits & Trenches; Hydrofracture Areas	N20750	N15250	E28750	E23250
2 - 4 of 9	SWDA 4 and 5	ILLW Pits & Trenches; Hydrofracture Areas; White Oak Creek at Melton Valley Drive	N21000	N15500	E31000	E25500
2 - 5 of 9	Melton Valley Drive south of 3500 area	Hydrofracture (7852 area); SWDA 4 & 5; NSPP; HFIR, TRU, TURF	N21250	N15750	E33250	E27750
2 - 6 of 9	Melton Valley Drive south of 4500 area	SWDA 5; NSPP; HFIR, TRU, TURF	N21250	N15750	E35250	E29750
2 - 7 of 9	Melton Valley Drive south of 6000 area	NSPP; HFIR, TRU, TURF; Reservoir (6553 area); Melton Valley Access Road; HPRR Access Road	N21250	N15750	E37000	E31500
2 - 8 of 9	Intersectin of Melton Valley Drive, Melton Valley access road, Melton Valley extension, HPRR access road	Reservoir (6553 area)	N21250	N15750	E39000	E33500
2 - 9 of 9	Melton Valley extension west of Bearden Creek	<u>Bearden Creek Road</u> ; Bearden Creek	N21250	N15750	E41250	E35750

^aRoad names and area designations are taken from:

Planning Map ORNL Building and Roads, General Engineering Division, revised 5/77; and Oak Ridge Area Map (S-16A), Oak Ridge, Tennessee. Prepared by Maps and Survey Branch, TVA, for Oak Ridge Office, AEC. Base Map was assembled from TVA-USGS 1:24,000 topographic maps. Revised in part in June 1974 from data furnished by AEC-ORO.

^bRoads underlined are not paved.

The third flight line consisted of 10 exposures and covered Bethel Valley from the area west of White Wing Road (Highway 95) to the areas east of Walker Branch (Table 6).

The fourth flight line consisted of 11 exposures and covered the northern portion of the watershed. Chestnut Ridge from the area west of White Wing Road (Highway 95) to the area west of Walker Branch was covered (Table 7).

AVAILABILITY OF MATERIALS

Items listed on pp. 2 and 4 are available for review in Rm 21, Bldg. 3504. Arrangements can be made by calling 574-7419 or 574-7429, FTS 624-7419 or FTS 624-7429.

Each map section at full size measures 59 in. x 42 in. (150 x 107 cm) (length x width) reproduceable prints of each section and a composite of all four sections are available at 50% reduction. Copies can be made as needed. Figure 4 is a copy of the composite map (scale 1:19700). The U.S. customary units of measurement used on the map can be converted to metric (SI) units as follows:

Multiply	By	To obtain
inches	2.54	centimeters
feet	0.3048	meters
miles (U.S. statute)	1609.344	meters
square feet	0.09290304	square meters
square miles	259	hectares
acres	0.40468	hectares

Table 6. Index of aerial color photographs (Flight line 3)

Photo No.	Central feature	Prominent feature ^{a,b}	ORNL grid coordinate			
			North	South	East	West
3 - 1 of 10	Bethel Valley Road at Highway 95	<u>New Zion Patrol Road</u> ; 1554 Area; SWDA 3	N25000	N19500	E27250	E21750
3 - 2 of 10	Bethel Valley east of Highway 95	1554 Area; SWDA 3; 1000-1999 area	N25000	N19500	E29500	E24000
3 - 3 of 10	Bethel Valley at 1000 area	SWDA 3; 1000-3999 Area; X-10 Target Range; White Oak Creek at Melton Valley Drive	N25000	N19500	E31500	E26000
3 - 4 of 10	Bethel Valley at 3000 area	1000-5999 Area; X-10 Target Range; Substation; Reservoir (902 Area)	N25250	N19750	E33500	E28000
3 - 5 of 10	Bethel Valley at 4000 area	3000-6000 Area; Substation; Reservoir (902 Area)	N25250	N19750	E35750	E30250
3 - 6 of 10	Bethel Valley at 6000 area	4000-7000 Area; Reservoir (902 Area); <u>Nursery Road</u>	N25250	N19750	E37750	E32250
3 - 7 of 10	Bethel Valley at 7000 area	<u>Nursery Road</u> ; <u>Chestnut Ridge Road</u>	N25500	N20000	E39750	E34250
3 - 8 of 10	Bethel Valley east of 7000 area	<u>Nursery Road</u> ; <u>Chestnut Ridge Road</u> ; <u>Hawk's Nest Road</u>	N25500	N20000	E42000	E36500
3 - 9 of 10	Bethel Valley west of EGCR access road	<u>Hawk's Nest Road</u> ; EGCR Access Road; <u>9214 Access Road</u>	N25500	N20000	E43750	E38250
3 - 10 of 10	Bethel Valley east and west of EGCR access road	<u>Hawk's Nest Road</u> ; <u>9214 Access Road</u>	N25250	N19750	E45550	E40000

^aRoad names and area designations are taken from:

Planning Map ORNL Building and Roads, General Engineering Division, revised 5/77; and Oak Ridge Area Map (S-16A), Oak Ridge, Tennessee. Prepared by Maps and Survey Branch, TVA, for Oak Ridge Office, AEC. Base Map was assembled from TVA-USGS 1:24,000 topographic maps. Revised in part in June 1974 from data furnished by AEC-ORO.

^bRoads underlined are not paved.

Table 7. Index of aerial color photographs (Flight line 4)

Photo No.	Central feature	Prominent feature ^{a,b}	ORNL grid coordinate			
			North	South	East	West
4 - 1 of 11	Chestnut Ridge west of Highway 95	Bear Creek Valley Road	N29250	N23750	E26000	E20500
4 - 2 of 11	Bethel Valley east and west of Highway 95	Bear Creek Valley Road	N29250	N23750	E28000	E22500
4 - 3 of 11	Chestnut Ridge east of Highway 95	Bear Creek Valley Road; <u>Gas Line Road</u>	N29500	N24000	E29750	E24250
4 - 4 of 11	Chestnut Ridge north of 1000 area	Bear Creek Valley Road; <u>Gas Line Road</u> ; X-10 Target Range	N29000	N23500	E31500	E26000
4 - 5 of 11	Chestnut Ridge north of 3000 area	Bear Creek Valley Road; <u>Gas Line Road</u> ; X-10 Target Range, Substation	N29250	N23750	E33750	E28250
4 - 6 of 11	Chestnut Ridge north of 4000 area	Bear Creek Valley Road; <u>Gas Line Road</u> ; <u>Reeves Road</u> ; Substation; Reservoir (902 Area)	N29500	N24000	E35750	E30250
4 - 7 of 11	Chestnut Ridge north of 6000 area	Bear Creek Valley Road; <u>Gas Line Road</u> ; <u>Reeves Road</u>	N29500	N24000	E37500	E32000
4 - 8 of 11	Chestnut Ridge north of 7000 area	Bear Creek Valley Road; <u>Nursery Road</u> ; <u>Chestnut Ridge Road</u>	N29250	N23750	E39500	E34000
4 - 9 of 11	Chestnut Ridge north and east of 7000 area	Bear Creek Valley Road; <u>Nursery Road</u> ; <u>Chestnut Ridge Road</u> ; <u>Hawk's Nest Road</u>	N29750	N24250	E41000	E35500
4 - 10 of 11	Chestnut Ridge at Chestnut Ridge Road	Bear Creek Valley Road; <u>Hawk's Nest Road</u>	N29750	N24250	E43250	E37750
4 - 11 of 11	Chestnut Ridge north of EGCR access road	Bear Creek Valley Road; <u>9214 Access Road</u>	N30000	N24500	E45000	E39500

^aRoad names and area designations are taken from:

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^bRoads underlined are not paved.



Fig. 4. Composite map of White Oak Creek Watershed (scale

ORNL-DWG 79-20262



Watershed (scale 1:19700).