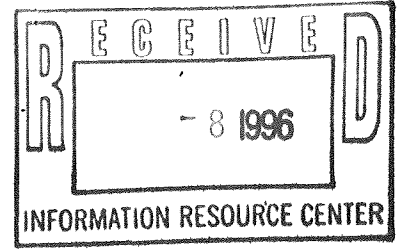


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REVIEW OF PARCEL ED-1
Under Section 120 (h) of the
Comprehensive Environmental Response, Compensation, and Liability Act
and Section XLIII of the Federal Facility Agreement
August 11, 1995

Executive Summary

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FROM ORIGINAL**

REVIEW OF PARCEL ED-1
Under Section 120 (h) of the
Comprehensive Environmental Response, Compensation, and Liability Act
and Section XLIII of the Federal Facility Agreement
August 11, 1995

Executive Summary

The U.S. Department of Energy (DOE) proposes to lease a parcel of land encompassing approximately 1,000 acres to the East Tennessee Economic Council (ETEC). The property is known as Parcel ED-1 and is north of the intersection of Highways 95 and 58 in Roane County, Tennessee. As required by Section 120(h) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), a review of property and government records and a visual inspection of Parcel ED-1 and adjacent property were performed. The purpose of the review was to identify any areas on the property on which hazardous substances or petroleum products were stored for 1 year or more, or known to have been disposed of or released. Section 120(h) also requires that DOE include a notice in any contract for the sale or other transfer of real property which is owned by the United States describing the time at which storage, release, or disposal of hazardous substances or petroleum products have taken place. The following is notice of such storage, release, or disposal and a summary of the evaluation performed.

- There is no evidence of any storage, release, or disposal of any hazardous materials or petroleum products on Parcel ED-1 in the areas outside of the East Fork Poplar Creek and Bear Creek floodplains. Visual inspection and a number of historical investigations of Parcel ED-1 and the property surrounding it did not reveal any obvious areas of contamination or recent land disturbances (with the exception of the pine trees that have been cut due to southern pine beetle infestation).
- A limited radiological survey of Parcel ED-1 (exclusive of East Fork Poplar Creek) and remote sensing surveys (flyovers) found radiation levels and radionuclide concentrations typical of natural background for this section of the Oak Ridge Reservation.
- Air deposition of particulates and aerosols onto Parcel ED-1 from the K-25 Site and the Toxic Substances Control Act (TSCA) Incinerator are not thought to be significant.
- Hazardous substances have been deposited within the floodplain and channel of East Fork Poplar Creek, which flows through Parcel ED-1 as well as property adjacent to Parcel ED-1. Hazardous substances may also have been deposited in the Bear Creek floodplain. Condition 28 of the lease between DOE and ETEC prohibits any activities within the 100-year floodplains except for routine maintenance actions. Additionally, it prohibits any critical actions [as defined in 10 Code of Federal Regulations (CFR) 1022.4(c)] within the 500-year floodplains. Exceptions can be made (for example for greenways or access roads and bridges) with appropriate characterization, remediation (if necessary), documentation, regulatory agency approval, and release by DOE. The hazardous substances, mainly mercury and uranium, have been deposited through natural riverine processes from primary and secondary sources upstream. The *East Fork Poplar Creek—Sewer Line Beltway Remedial Investigation Report* (SAIC 1994) reported a single observation of mercury contamination in the creek within the boundary of Parcel ED-1 above the 400 ppm

cleanup goal set by the *Record of Decision for Lower East Fork Poplar Creek* (Jacobs ER Team 1995).

Several areas of uncertainty that may be of concern include:

- Lambert's Quarry, located on adjacent DOE property northeast of Parcel ED-1, may be a contamination source. Although there is no documentation or physical evidence of contamination, metal drums have been reported to be beneath the quarry waters and petroleum products may have been stored there during past quarrying operations. Mercury concentrations found in largemouth bass taken from Lambert's Quarry were reported to be higher than mercury concentrations in largemouth bass in local reservoirs. The quarry is within the 100-year floodplain of East Fork Poplar Creek and mercury-contaminated sediments may have been deposited there during high flow events.
- It is possible, although not documented, that hazardous substances have been deposited via natural riverine processes associated with Bear Creek and the White Wing Scrapyard watershed. White Wing Scrapyard is on adjacent DOE property located about 4,000 ft southeast of Parcel ED-1.
- Although there is no documentation or evidence thereof, aboveground fuel tanks may have been located at farm houses that existed on Parcel ED-1 before the advent of the Manhattan Project. If such tanks existed and if there were spills associated with the tanks, it is unlikely that any residual contamination remains at unacceptable levels because of natural volatilization and biodegradation processes during the last 50 years of DOE ownership of the property.
- Groundwater has not been investigated in detail at the site. Although there is no evidence of groundwater contamination, there is a possibility that contamination from the White Wing Scrapyard, Lambert's Quarry, or other sources could migrate toward Parcel ED-1 through preferential pathways in the karst subsurface geologic features. Use of groundwater as a drinking water source or for industrial purposes should be prohibited until sufficient characterizations have been performed.

Investigation Results

Approximately 1,000 acres of land, known as Parcel ED-1, north of the intersection of Highways 58 and 95 in Roane County, Tennessee, and approximately 2 miles east of the K-25 Site and 6 miles west of the center of Oak Ridge, Tennessee, has been evaluated per the requirements of Section 120 (h)(4)(A) of CERCLA. DOE has proposed to lease this tract to ETEC for development purposes. Section 120(h)(4)(A) of CERCLA requires that the "head of the department, agency, or instrumentality of the United States with jurisdiction over the property shall identify the real property on which no hazardous substances and no petroleum products or their derivatives were stored for one year or more, known to have been released, or disposed of. Such identification shall be based on an investigation of the real property to determine or discover the obviousness of the presence or likely presence of a release or threatened release of any hazardous substance or any petroleum product or its derivatives, including aviation fuel and motor oil, on the real property." This evaluation must be performed before leasing the property and a notice of the time at which storage, releases, or disposal of hazardous substances or petroleum products occurred on the property must be included in the contract or lease agreement. In pursuing the identification of said property, Section 120(h)(4)(A) requires that the identification consist of a review of seven sources of information concerning the current and previous uses of the property. The seven sources of information were researched from July 24, 1995, to the date of this report and the results of the research are as follows:

1. *A detailed search of federal government records pertaining to the property*

Discussions were held with Lockheed Martin Energy Systems (Energy Systems) and DOE employees having access to records pertaining to Parcel ED-1 (Energy Systems 1995, DOE 1995). An employee having intimate knowledge of Energy Systems and DOE records indicated that there were no DOE records regarding the history of past or present land usage that would indicate that storage or releases of hazardous substances or petroleum products have occurred on Parcel ED-1 with the exception of the *East Fork Poplar Creek—Sewer Line Beltway Remedial Investigation Report* (SAIC 1994). This report documents the presence of contaminants (mercury and uranium) in East Fork Poplar Creek and its floodplain. Contamination of East Fork Poplar Creek is discussed further in Item 4 of this document.

In addition, the Tennessee Valley Authority (TVA) in Knoxville, Tennessee, and the U. S. Army Corps of Engineers (COE) District Office in Nashville, Tennessee, were contacted to determine if records of past or present land usage relative to Parcel ED-1 exist (TVA 1995, COE 1995). TVA has records pertaining to a transmission line easement that traverses the property along the southern boundary of the parcel. The TVA easement records contain no information regarding the history of past or present land usage that would indicate that there have been storage of or releases to Parcel ED-1 of hazardous substances or petroleum products. COE had no records of the real property in question.

The U.S. Environmental Protection Agency (EPA), Region IV, was contacted (EPA 1995) regarding information in their files concerning releases of hazardous substances or petroleum products on property adjacent to Parcel ED-1. No one was available that could provide any information on Parcel ED-1.

Several additional documents pertaining to inspections or studies performed on the property were reviewed and are discussed in Item 4.

2. *Recorded chain of title documents regarding the real property*

On July 25, 1995, the State of Tennessee Roane County Recorder's Office was visited and the recorded deeds that conveyed the land comprising Parcel ED-1 from the former property owners to the U. S. Government in the early 1940s were reviewed. Contents of the deeds reviewed contained no references to or other recorded evidence that the property was utilized for the storage of hazardous substances and/or petroleum products or their derivatives. No information was contained in the deeds that indicated that hazardous substances and/or petroleum products or their derivatives were released or disposed of on the properties now comprising Parcel ED-1.

3. *Aerial photographs that may reflect prior uses of the real property and that are reasonably obtainable through state or local governmental agencies*

The following aerial photographs were reviewed. A representative selection of photographs are included as Appendix A.

<u>Date</u>	<u>Flight By</u>	<u>Source</u>
1939	Unknown	ORNL ESD Library
Sept. 25, 1942	Aero Service Corp. for Stone and Webster	TVA/Energy Systems
1950	TVA	City of Oak Ridge, TN
Oct. 30, 1965	TVA	TVA
March 2, 1967	TVA	TVA
April 1972	NASA	City of Oak Ridge, TN
1981	TVA	ACHW
1984	TVA	ACHW
1987	TVA	ACHW
April 9—10, 1993	TVA	TVA/Energy Systems

ORNL ESD = Environmental Sciences Division at Oak Ridge National Laboratory.

NASA = National Aeronautics and Space Administration.

ACHW = Adams, Craft, Herz, Walker, Inc.

Photographs made in 1939 and 1942 show that the properties comprising Parcel ED-1 were predominantly used for agriculture. Approximately 80 percent of the properties were used in some type of agricultural pursuit and the remaining portions of the properties were wooded.

After 1942, the photographs indicate that Parcel ED-1 was re-forested under the guidance of the federal government. This observation has been confirmed by the Oak Ridge Reservation Forest Management Group (FMG). According to the FMG, timber management and reforestation have been the primary uses of Parcel ED-1 over the past fifty years. No industrial activities were observed on any of the aerial photographs of Parcel ED-1.

The land use of the properties adjacent to Parcel ED-1 was agricultural. Some wooded areas were observed on photographs of adjacent properties. No industrial activities were observed on any of the aerial photographs of the properties adjacent to Parcel ED-1 with the exception of evidence of a quarrying operation. Additional comments regarding the quarry are found in Item 4.

In addition to the photographs, topographic maps of the Oak Ridge Reservation were reviewed for the following time periods:

<u>Date</u>	<u>Compiled By</u>	<u>Source</u>
Sept. 25, 1942	Aero Services Corp. for Stone and Webster	Energy Systems
1953	TVA (7.5' Quad. Sheet)	Energy Systems
1954	TVA (7.5' Quad. Sheet)	Energy Systems
1959	TVA (S16A - Composite of 7.5' Quad. Sheets)	Energy Systems
1968	TVA (7.5' Quad. Sheet)	Energy Systems
1974	TVA (7.5' Quad. Sheet)	Energy Systems
1987	TVA (S16A - Composite of 7.5' Quad. Sheets)	Energy Systems
April 9—10, 1993	TVA	Energy Systems (OREIS)

OREIS = Oak Ridge Environmental Information System.

Appendix B, Figure B-1, is a map of Parcel ED-1, displaying site topography, floodplains, and other features.

Real estate maps prepared by the U.S. Department of the Army, dated February 19, 1945 (sheets 9 of 16—Segment "H", 10 of 16—Segment "I", 11 of 16—Segment "J") and dated May 1, 1950 (sheet 2 of 3—Segment "K") showing property parcels purchased by the federal government were reviewed. However, there was no information contained on these maps regarding the history of past or present land usage that would indicate that storage or releases of hazardous substances or petroleum products have occurred on Parcel ED-1. These maps were obtained from DOE/Energy Systems.

Other maps and documents covering the area that were reviewed include the following:

<u>Date</u>	<u>Compiled By</u>	<u>Source</u>
Jan. 17, 1935	TVA. Deed—Easement for 161 kV transmission line. Reg. of Deeds F-5-123 and Drawing by TVA.	Energy Systems
Apr. 13, 1963	USA. Easement document by DOE for right-of-way along Hwys. 95 and 58. Drawing by DOT.	Energy Systems

Again, there was no information contained in these maps regarding the history of past or present land usage that would indicate storage or releases of hazardous substances or petroleum products have occurred on Parcel ED-1. Review of the maps and documents mentioned previously revealed land uses compatible with those observed in the review of aerial photographs.

4. *A visual inspection of the real property and any buildings, structures, equipment, pipe, pipeline, or other improvements on the real property, and a visual inspection of properties immediately adjacent to the real property*

Numerous investigators researching wetlands, historic and archaeological sites of significance, geophysical anomalies, etc., have traversed the parcel and its environs. These investigations are documented in the East Fork Poplar Creek remedial investigation report (SAIC 1994). These investigators reported no obvious observations of storage and/or release of hazardous substances or petroleum products.

Several parties conducted a visual inspection of the property during the week of July 24, 1995. The visual inspection of Parcel ED-1 and adjacent property was performed via automobile, limiting the inspection to what was observable from the roads surrounding and through the parcel. East Fork Poplar Creek and Bear Creek flow through Parcel ED-1. The property comprising Parcel ED-1 is hilly to the north and flattens toward the south, toward the floodplain of East Fork Poplar Creek. The site is heavily forested in areas; however, many pine trees have been cut as a result of mitigation efforts to control the infestation of the southern pine beetle. The visual inspection of the property and the properties adjacent to Parcel ED-1 yielded no obvious observations of storage and/or release of hazardous substances or petroleum products.

A cemetery exists within the parcel. In addition, evidence of several farm sites, inhabited before the purchase of land by the federal government for the Manhattan Project, exists in several locations on the parcel. Figure B-2 in Appendix B shows the locations of the cemetery, pre-World War II structures, and archaeological sites. No tanks or remnants of tanks have been observed by those conducting research or normal work activities on the property. No record of leakage or spillage from any residential/farm tanks has been documented in the records reviewed during this investigation.

East Fork Poplar Creek dissects Parcel ED-1 on roughly an east to west flow path to its confluence with Poplar Creek near the west end of the parcel. The remedial investigation report for East Fork Poplar Creek (SAIC 1994) has identified sediments and soils associated with its floodplain that are contaminated with various chemicals of potential concern. The source of the

contamination is the Y-12 Plant located approximately 6 miles upstream of Parcel ED-1. Mercury and uranium are the principal contaminants of concern associated with East Fork Poplar Creek. The *Record of Decision for Lower East Fork Poplar Creek* (Jacobs ER Team 1995) has established a cleanup goal for mercury of 400 ppm. Mercury is an indicator element for other contaminants released due to DOE activities; that is, mercury is always found anywhere other contamination is found. Therefore, cleanup of mercury to this level would reduce risks from all hazardous constituents to acceptable levels for unrestricted release. The *East Fork Poplar Creek—Sewer Line Beltway Remedial Investigation Report* (SAIC 1994) sampled mercury concentrations on transects at 100-meter intervals along the creek. One sample within Parcel ED-1 indicated a mercury concentration exceeding the 400 ppm cleanup level.

Other features observed during the site investigation include two abandoned powerline right-of-ways and Lambert's Quarry. Lambert's Quarry is not part of Parcel ED-1; however, it is on DOE property adjacent to Parcel ED-1. The quarry is believed to have been used by the U.S. Government from 1942 to 1953 to provide stone for building purposes. Although no specific records were found during the investigation, it is postulated that petroleum products could have been stored at Lambert's Quarry during its operation.

The two abandoned powerline right-of-ways cross the eastern edge of the parcel. It appears that one of the powerlines supplied power to Lambert's Quarry. The other powerline appears to have supplied power to an old guard post on Oak Ridge Turnpike. It was reported (Energy Systems 1995, Bradburn) that glass insulators and portions of powerline poles were observed in the right-of-ways. No transformers or capacitors were observed in these areas during the investigation.

There is an area south of Lambert's Quarry and within Parcel ED-1 that appears to be littered with quarry spoils, old office equipment, and what is believed to be the remnants of an old supply storage facility.

A preliminary examination of existing high resolution aerial magnetic survey work (see Appendix C, Figure C-1) was performed. No unexplained major magnetic anomalies were found. Four of the anomalies are attributable to bridges over East Fork Poplar Creek and its tributaries. One anomaly is related to the existence of an iron drainage pipe located beneath the perimeter road. Two anomalies are located near Lambert's Quarry with one being attributable to a pile of concrete rubble containing iron rebar found near the location on the survey map. The other anomaly is located within Lambert's Quarry and may be the remnants of a tippie that may have been used at the quarry. It was reported that metal drums have been observed beneath the waters of the quarry (Energy Systems 1995, Finger), but no data was found during the investigation confirming this assertion. Likewise, there is little information regarding disposal activities associated with the quarry. Old tires were observed at shallow depths in the water in the quarry during the field investigation of the magnetic anomalies. Some small anomalies, not thoroughly investigated at this time, could be due to metallic debris, parked vehicles (during data collection), or geologic noise (such as magnetic soils).

The water contained in the quarry was observed to be clear (to an approximate depth of 6—10 ft below surface) during the site investigation. A 1991 study (Southworth et al. 1994) of largemouth bass taken from Lambert's Quarry for selenium and mercury content in bass tissue resulted in the finding that the selenium concentrations were at background levels for bass, but the mercury concentrations were higher than that found in bass from local reservoirs. Lambert's

Quarry is within the 100-year floodplain of East Fork Poplar Creek (see Appendix B, Figure B-1) and mercury-contaminated sediments may have been deposited during high flow events. There is a possibility that contamination (if any) in the quarry could migrate into groundwater on Parcel ED-1.

Apparent resistivity from aerial electromagnetic survey work can represent local geology, changes in soil and rock type, man-induced changes in the earth's surface (such as trenches or pits), nonmetallic waste areas, and metallic waste areas. The resistivity data confirm that this is a geologically complex area. The survey performed for the area (see Figure C-2) indicates one electrically conductive area in the carbonate rock formations that exist at the site. This anomaly has been interpreted as a sinkhole; there is one large sinkhole in the north-central portion of the parcel and two small sinkholes nearby. There is no evidence of significant buried metals apparent from the resistivity data.

Timber salvage has occurred in the area recently due to an infestation of southern pine beetles. A number of pine trees were observed to have been cut, leaving the parcel without forest cover where covered in the past. Secondary undergrowth (seedlings, small brushy weeds, and other vegetation) has replaced the trees and is so thick as to be impassible in many places.

A radiological characterization survey was conducted for this report by a team from the Measurement Applications and Development (MAD) Group at Oak Ridge National Laboratory (ORNL). The survey conducted by the MAD Group consisted of a radiation measurement survey of the ground surface in areas accessible to the survey team. The gamma radiation levels were determined using portable NaI gamma scintillation meters. Systematic surface (0–15 cm) soil samples were collected in selected locations without regard to radiation levels. Survey plans included analyzing all samples in the laboratory by gamma spectroscopy to determine concentrations of ^{238}U , and ^{226}Ra as well as any other gamma-emitting nuclide. The survey covered 13 discrete areas encompassing about 100 acres as shown in Figure B-3. The survey also included all roads shown on Figure B-4. Except for areas within the East Fork Poplar Creek floodplain, all gamma exposure rates were less than 10 uR/hr, typical of the natural background radiation in this area of the Oak Ridge Reservation. The results of radiological analysis of soil samples revealed concentrations of ^{238}U ranging up to 2.8 pCi/g. Concentrations of ^{226}Ra were found as high as 1.1 pCi/g. Figure B-4 shows soil sampling locations. All results are typical of radionuclide concentrations found in uncontaminated locations in the area. For many of the samples, the ^{238}U activity was twice the ^{226}Ra activity, suggesting some aerial deposition of uranium. A similar radiological characterization of the area conducted by ORNL's Radiological Survey Activities Group in 1985 revealed no radiation levels above typical background for the area.

These results are comparable to the results of the aerial survey conducted by EG&G (EG&G 1993). The EG&G survey showed no radiological anomalies in the parcel. Figures C-3 and C-4 show the results of aerial radiological surveys of total gamma emissions and man-made gamma emissions, respectively.

In addition to the radiation survey, the survey team was instructed to inspect the area for evidence of any remnants of hazardous substances. No evidence was found.

Airborne emissions records found in the *Oak Ridge Reservation Annual Site Environmental Report for 1993* (Annual Report) for the K-25 Site and the TSCA Incinerator were reviewed because the K-25 Site is located to the west of Parcel ED-1 and the prevailing winds are from the west and west-southwest. According to the Annual Report, there were no National Ambient Air Quality Standards (NAAQS) or Tennessee ambient air quality 24-hour period or annual primary or secondary standards exceeded by the K-25 Site during 1993. The Annual Report states that there are no national or state ambient air quality standards for As, Be, Cd, Cr, or U; however, emission data for these metals were compared to the National Institute of Occupational Safety and Health (NIOSH) and Occupational Safety and Health Administration (OSHA) standards. All emissions data were below standards set forth by NIOSH and OSHA.

The Annual Report presents 5-year summaries of the K-25 Site's ambient air monitoring data for each NAAQS parameter and uranium. Five-year emission trends for PM-10 (particulate matter less than 10 microns in diameter), total suspended particulates, and lead indicated insignificant variations during the time period of 1989 through 1993. The 5-year trend for uranium indicates that uranium was detected by the air monitoring network. This is indicative of the incineration of low levels of radioactive waste in the TSCA Incinerator, which started operations in spring 1991. The Annual Report states that no single recorded level exceeded 14 percent of the applicable standard for natural uranium.

5. *A physical inspection of property adjacent to the real property to the extent permitted by owners or operators of such property*

Please see the information regarding Lambert's Quarry and East Fork Poplar Creek in Item 4. In addition to DOE property that surrounds most of Parcel ED-1, the Oak Ridge Country Club and Southwood Subdivision (owned by J. W. Gibson) are adjacent to the site. Inspection of this property was performed from the Oak Ridge Turnpike and DOE property. Portions of these parcels of adjacent property are within the floodplain of East Fork Poplar Creek and its fringes. No features were observed that would indicate there has been past storage and/or release of hazardous substances or petroleum products on the property observed outside the East Fork Poplar Creek and its floodplain.

White Wing Scrapyard is approximately 4,000 ft southeast of the site (see Figure C-4). The White Wing Scrapyard watershed includes Bear Creek, which flows into East Fork Poplar Creek (the confluence of Bear Creek and East Fork Poplar Creek is within the boundary of Parcel ED-1). White Wing Scrapyard is contaminated with radiological constituents, polychlorinated biphenyls, mercury, and asbestos. An interim record of decision (Radian 1992) authorized cleanup of surface debris at the site. Subsurface contamination remains at the site, but it has not been fully characterized. It is possible that the streams making up the White Wing Scrapyard watershed may transport the mobile contaminants via Bear Creek to Parcel ED-1. It is also possible that groundwater contaminated from the scrapyard could be transported by conduit flow through fractured karst geologic features. There were no records identified during the investigation that support these suppositions.

6. *Reasonably obtainable federal, state, and local government records of each adjacent facility where there has been a release of any hazardous substance or any petroleum product or its derivatives, including aviation fuel and motor oil, and which is likely to cause or contribute to*

a release or threatened release of any hazardous substance or any petroleum product or its derivatives, including aviation fuel and motor oil, on the real property

The East Fork Poplar Creek remedial investigation (SAIC 1994) was reviewed to evaluate the distribution of hazardous substance contaminants found within the floodplain of East Fork Poplar Creek. The results of the review are reported in Item 4.

EPA was contacted (EPA 1995) regarding information in their files concerning releases of hazardous substances or petroleum products on property adjacent to Parcel ED-1. At the time of the call, no one was identified at EPA that could answer questions regarding releases to the site.

In addition, the Tennessee Department of Environment and Conservation (TDEC) was contacted (TDEC 1995) regarding any records in their files concerning releases of hazardous substances or petroleum products on property adjacent to Parcel ED-1. TDEC did not have any information regarding Parcel ED-1 or adjacent property beyond the remedial investigation report mentioned herein.

The City of Oak Ridge Engineering Department (City of Oak Ridge 1995) was contacted regarding storage and/or releases of hazardous substances or petroleum products on parcels adjacent to Parcel ED-1. The City representative had no knowledge of the occurrence of past releases of hazardous substances or petroleum products to Parcel ED-1 or adjacent property, with the exception of the general information contained in news articles, etc., regarding the results of the remedial investigation report.

7. *Interviews with current or former employees involved in operations on the real property*

A number of former and current DOE and Energy Systems employees were interviewed during the investigation (DOE 1995, Energy Systems 1995). Several of the former DOE and Energy Systems employees were employed in Oak Ridge from 1942 to the mid-1970's. As stated in Item 4, a number of investigators have conducted research projects on the parcel or on DOE property adjacent to Parcel ED-1. None have reported observations of storage and/or release of hazardous substances or petroleum products in the areas of the parcel of interest to their research. One current Energy Systems employee interviewed has intimate knowledge of DOE records concerning Parcel ED-1. The results of these interviews are interspersed throughout this report.

Summary

There is no evidence of any storage, release, or disposal of any hazardous materials or petroleum products on Parcel ED-1 outside of the floodplains of East Fork Poplar Creek and Bear Creek. Visual inspection and a number of historical investigations of Parcel ED-1 and the property surrounding it did not reveal any obvious areas of contamination or recent land disturbances (with the exception of the pine trees that have been cut due to southern pine beetle infestation).

There is evidence that hazardous substances, mainly mercury and uranium, have been deposited within the floodplain and channel of East Fork Poplar Creek, which flows through Parcel ED-1 and property adjacent to Parcel ED-1. These hazardous substances have been released over the years into East Fork

Poplar Creek environment from the Y-12 Plant site upstream of Parcel ED-1. Characterization of the East Fork Poplar Creek and its floodplain is documented in the *East Fork Poplar Creek—Sewer Line Beltway Remedial Investigation Report* (SAIC 1994). One sample on Parcel ED-1 indicates mercury concentrations in the floodplain above the 400 ppm cleanup goal set by the *Record of Decision for Lower East Fork Poplar Creek* (Jacobs 1995).

A visual inspection of Parcel ED-1 and the property surrounding it did not reveal any obvious areas of contamination or recent land disturbances (with the exception of the pine trees that have been cut). This observation was backed up by interviews with researchers who have studied the area in question.

A limited radiological survey of Parcel ED-1 (exclusive of East Fork Poplar Creek), historical surface investigations, and aerial radiological surveys found radiation levels and radionuclide concentrations typical of natural background of the Oak Ridge Reservation.

Air deposition of particulates and aerosols onto Parcel ED-1 from the K-25 Site and the TSCA Incinerator are not thought to be significant, based on air monitoring data found in the Annual Report.

Following are areas of uncertainty that may be of concern.

- It is possible that petroleum products were stored at Lambert's Quarry during its period of operation, although no records reviewed support this assertion.
- It was reported that metal drums have been observed beneath the waters of the quarry. Again, no records reviewed supported this assertion.
- Mercury concentrations found in largemouth bass taken from Lambert's Quarry were reported to be higher than mercury concentrations in largemouth bass in local reservoirs. The source of the mercury in the fish may be from deposits of sediment transported from East Fork Poplar Creek during high flow events.
- It is possible that hazardous substances have been deposited via natural riverine processes associated with Bear Creek and the White Wing Scrapyard watershed. It is also possible that groundwater contamination from the White Wing Scrapyard or from Lambert's Quarry may currently or in the future migrate to the site. No records were identified to support these suppositions.
- Aboveground fuel tanks may have been located at farm houses that existed on Parcel ED-1 before the advent of the Manhattan Project. No tanks have been found by investigators or workers and no evidence of leakage or spillage of petroleum products has been documented in records reviewed. If such tanks existed and if there were spills associated with the tanks, it is unlikely that any residual contamination remains at unacceptable levels because of natural volatilization and biodegradation processes during the last 50 years of DOE ownership of the property.

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D. Page, 576-1357
A. Conover (subcontractor), 576-1044
G. Bodenstein, 576-9429

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D. M. Bradburn, 574-7446
R. L. Hineman, 576-3461
M. E. Murray, 574-5838
W. J. Moore, 576-6621
D. S. Pesce (subcontractor), 574-8169
K. Craft (subcontractor), 576-8506
A. King, 576-1509
M. Wiest, 574-3390
J. M. Finger, 574-2919
D. Awl, 241-3950
G. Southworth, 574-7240
J. Miller, 574-3680 (contacted July 19, 1995)
J. R. Newman, 576-7226 (contacted several times during the week of July 24, 1995)

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TVA (Tennessee Valley Authority). 1995. Interview with and receipt of documents from John Michelson, (615) 673-2200.

COE (U.S. Army Corps of Engineers). 1995. Interview with Wendell Wilkinson, (615) 736-7181.

APPENDIX A
PHOTOGRAPHS

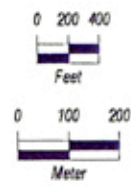
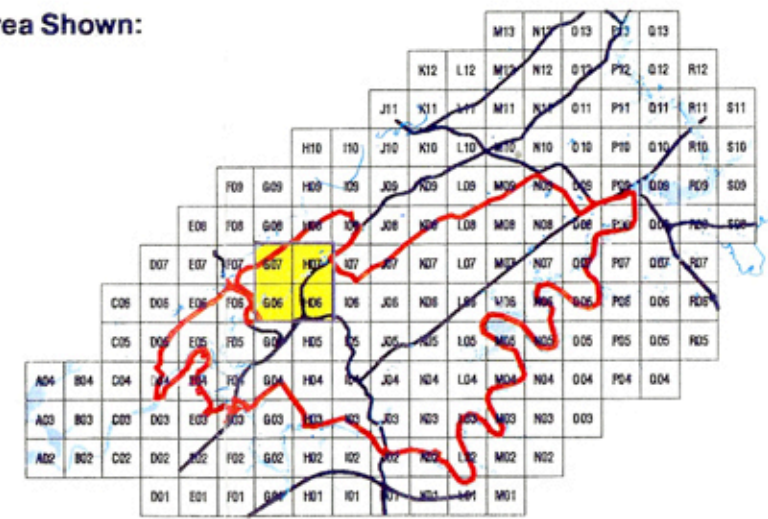


Ortho Image of Parcel ED-1

 Parcel Boundary


- Aerial Photography Taken April 9 & 10, 1993.
- Aerial Photography Scale 1:14,400.
- 500 m. NAD 83 Tennessee State Plane Grid Shown.
- Map created: August 10, 1995.

Area Shown:

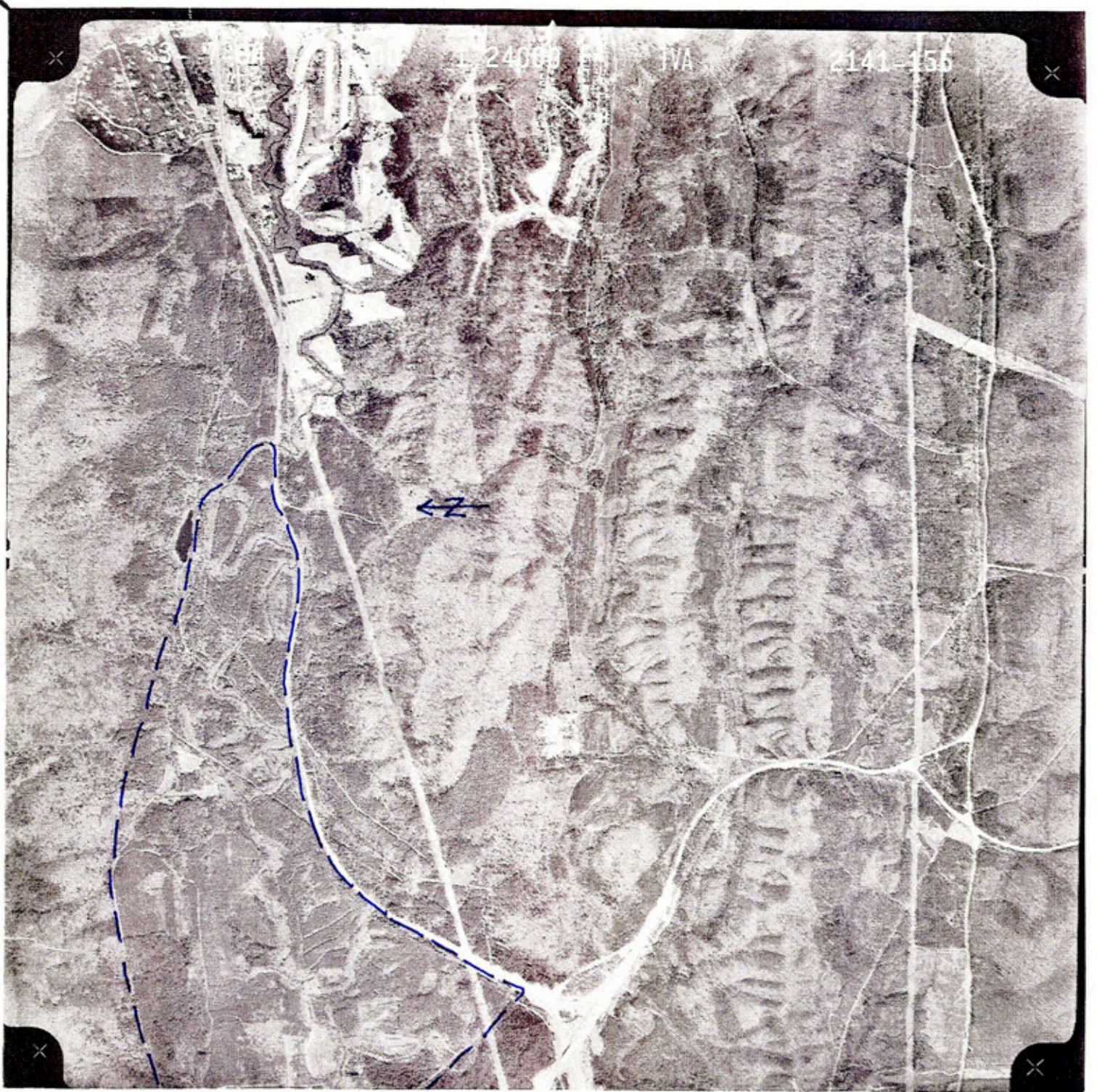


Provided By:
 ER Base Mapping and Imagery Project
 GIS and Spatial Technologies Program
 Environmental Restoration Program
 Source: Ortho Image Data Base Version 2.0

Map Produced by:



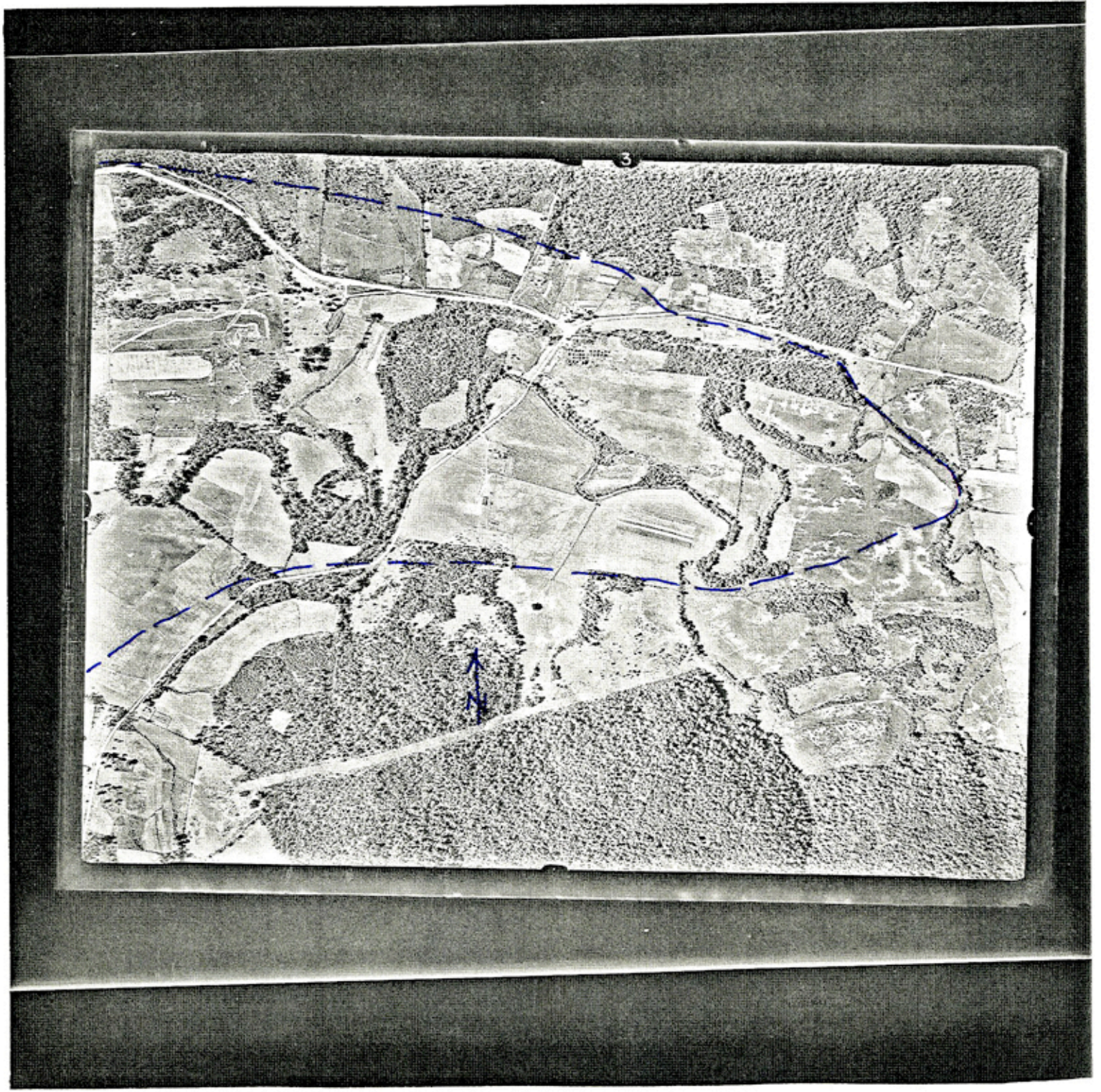
Geographic Information Systems & Computer Modeling
 Oak Ridge National Laboratory



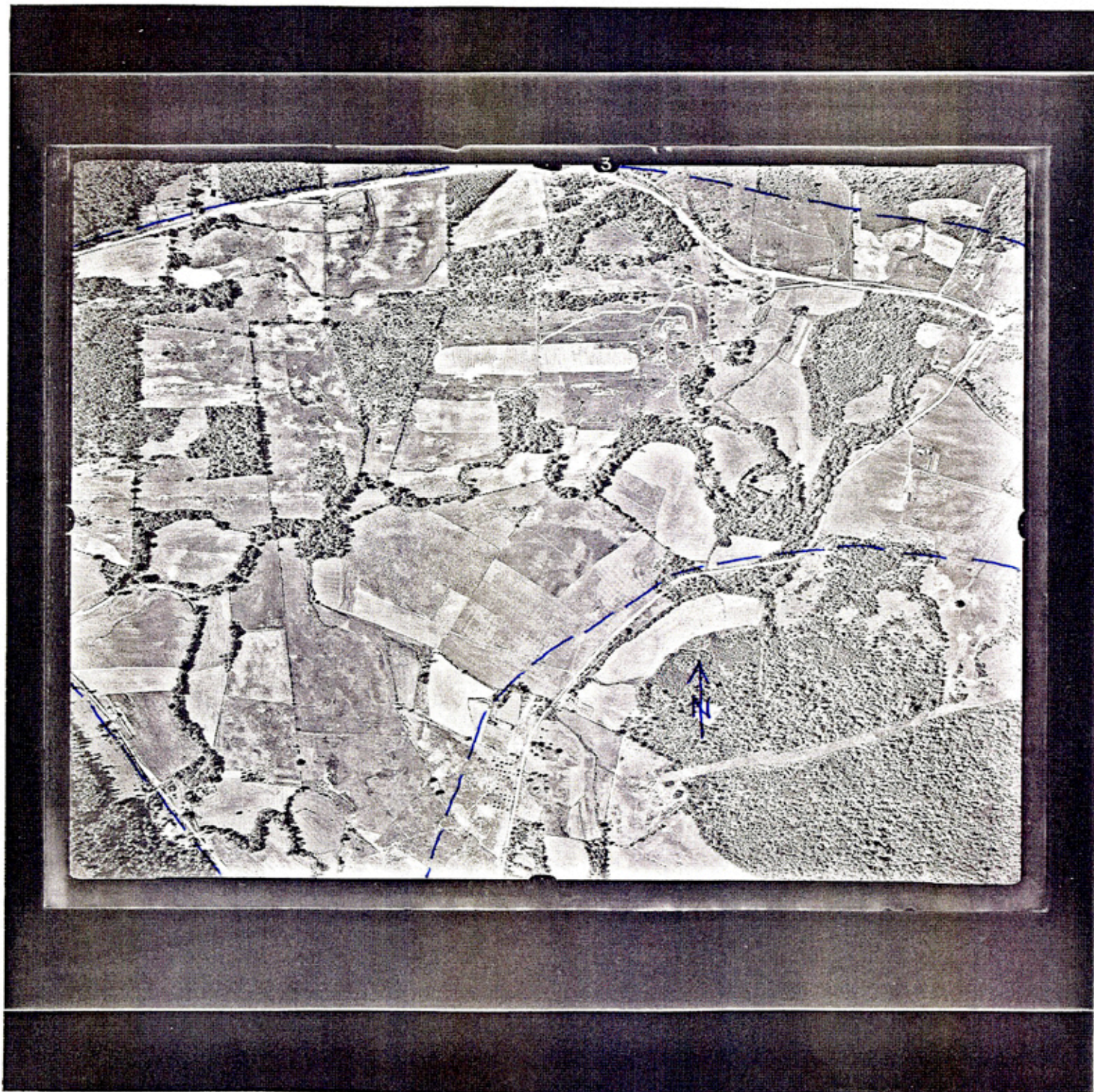
Tennessee Valley Authority, 1984



Tennessee Valley Authority, 1984



Aero Service Corp, September 25, 1942



Aero Service Corp, September 25, 1942

APPENDIX B

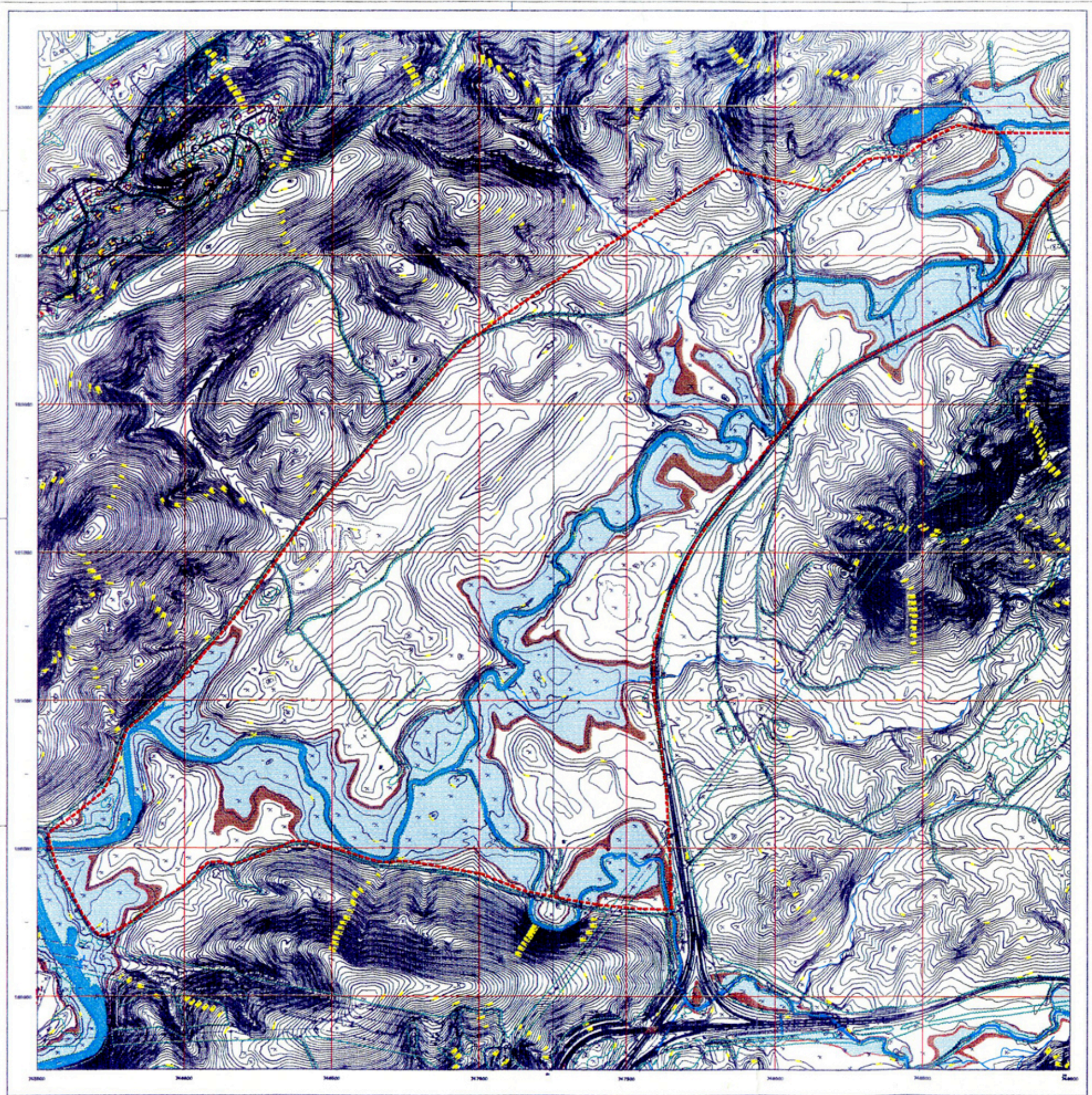
MAPS

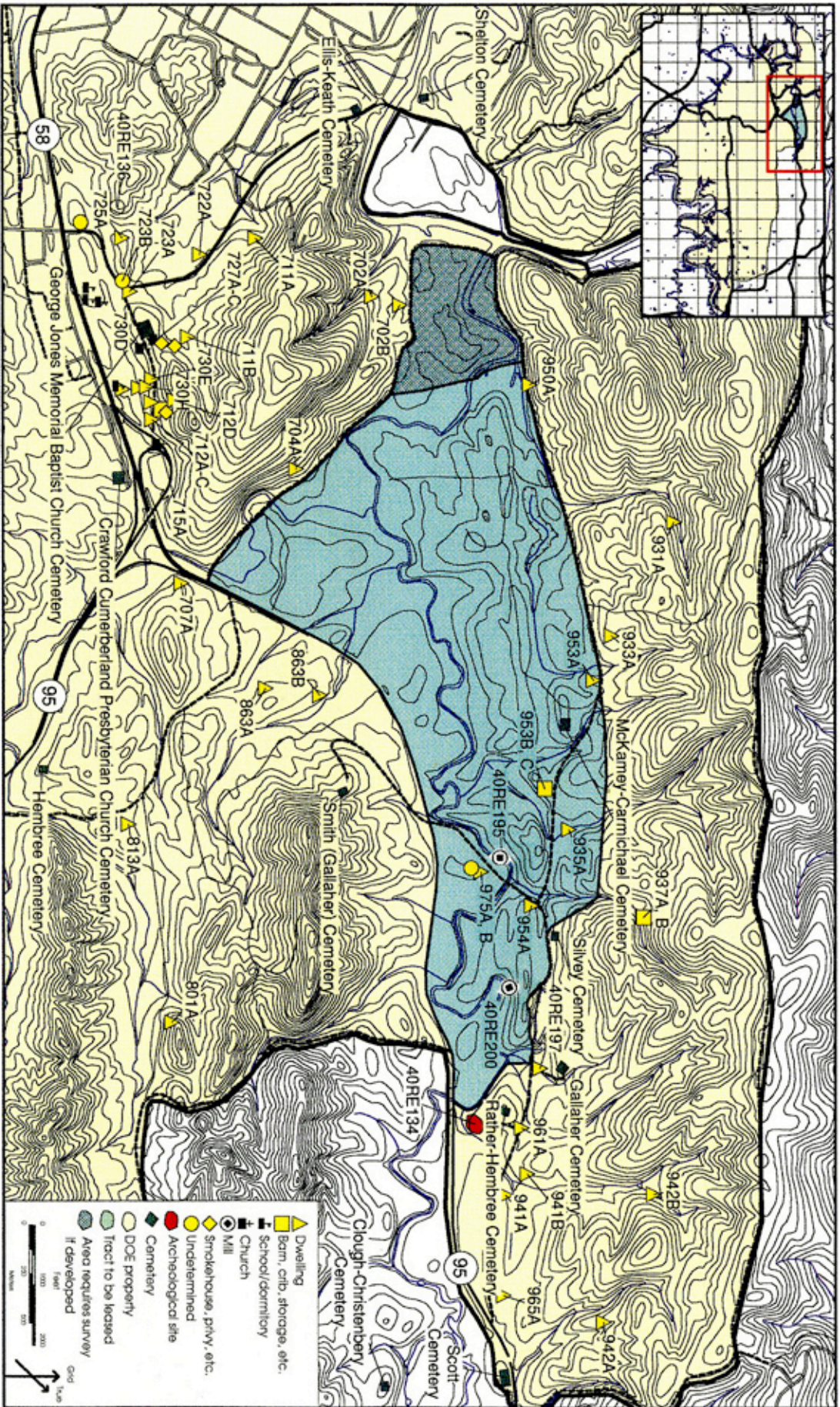
Figure B-1. Floodplains

Figure B-2. Locations of pre-World War II structures, archaeological sites, and cemeteries

Figure B-3. Radiological characterization survey: areas surveyed

Figure B-4. Radiological characterization survey: locations of samples collected





Note: Coordinate system is Oak Ridge administrative grid (S16A).

Figure B-2. Location of pre-World War II structures, archaeological sites, and cemeteries within and adjacent to the tract.

Figure B-3. Radiological characterization survey: areas surveyed

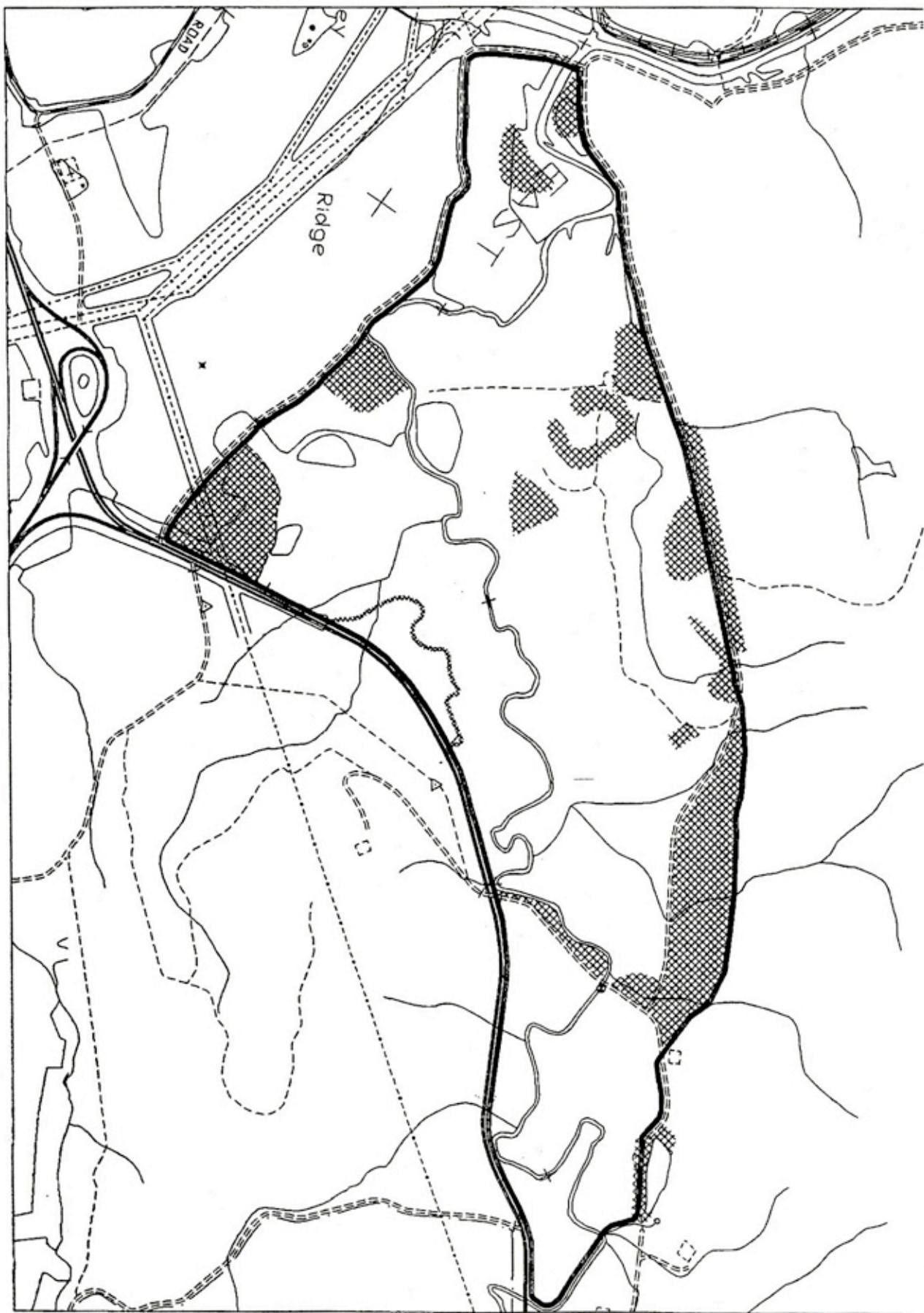
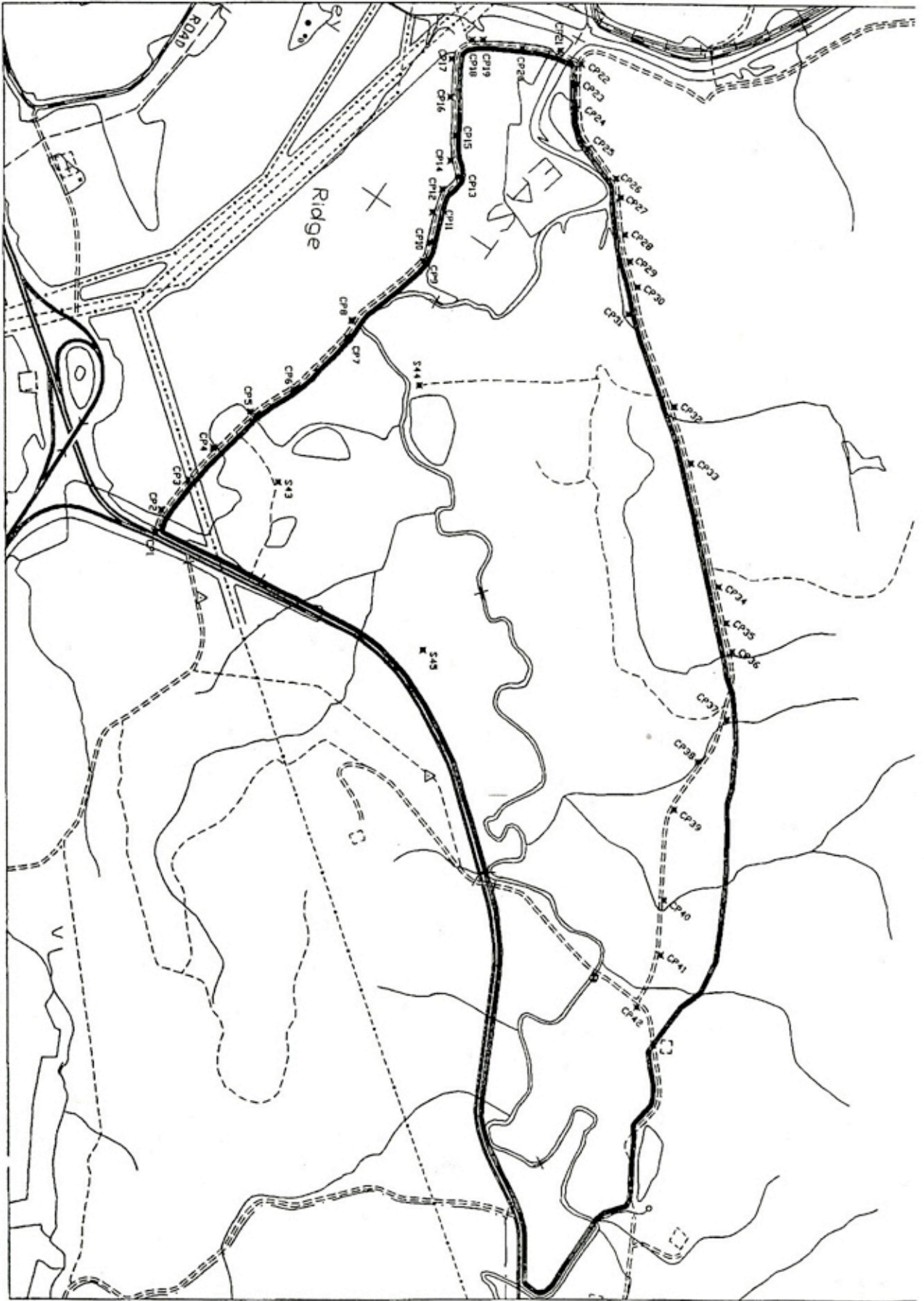


Figure B-4. Radiological characterization survey: locations of samples collected



APPENDIX C

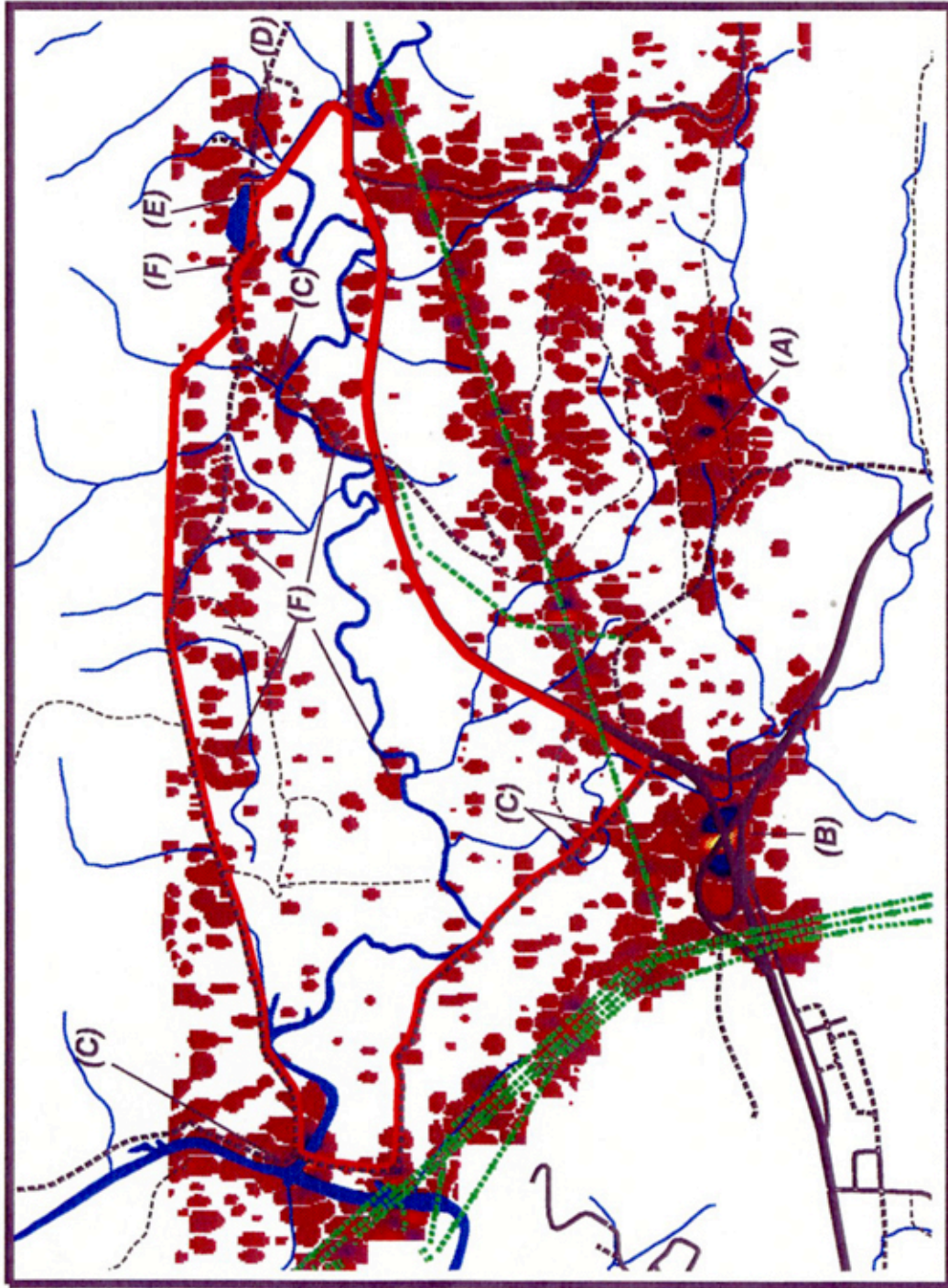
REMOTE SENSING

Figure C-1. Residual vertical magnetic gradient

Figure C-2. Apparent resistivity map

Figure C-3. Aerial radiological survey: total gamma emissions

Figure C-4. Aerial radiological survey: man-made gamma emissions



Vertical Mag.
Grad. (nT/m)



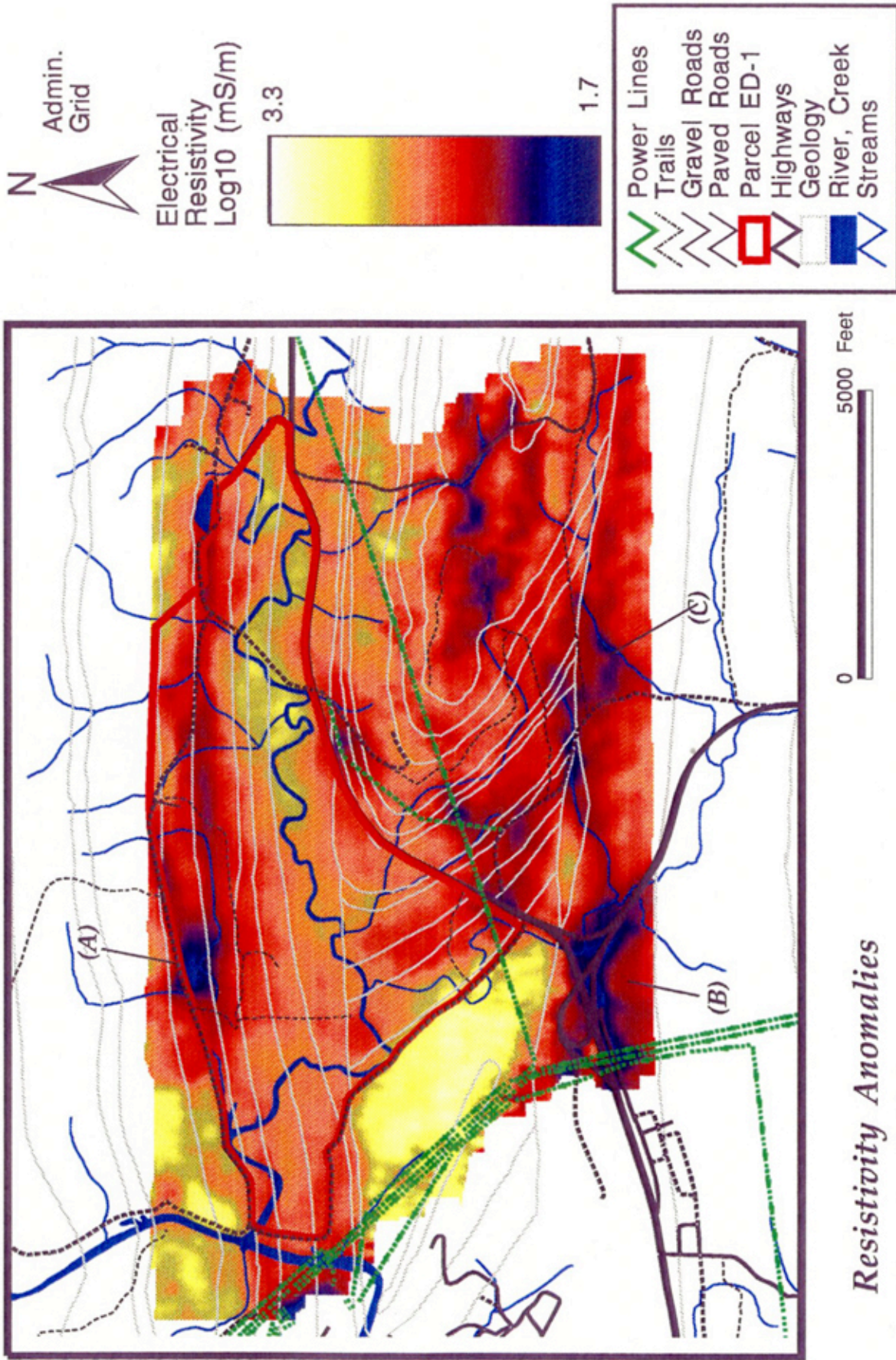
- Power Lines
- Trails
- Gravel Roads
- Paved Roads
- Parcel ED-1
- Highways
- River, Creek
- Streams



Magnetic Anomalies

- (A) White Wing Scrapyard
- (B) Highway Overpass
- (C) Bridge
- (D) Pipe
- (E) Concrete Rubble
- (F) Unidentified

Data provided by the ER Remote Sensing Program
Analysis by the Environmental Sciences Division







Resistivity Anomalies
 (A) Major Sinkhole
 (B) Highway Overpass
 (C) White Wing Scrapyard

Data provided by the ER Remote Sensing Program
 Analysis by the Environmental Sciences Division

Parcel ED-1

LEGEND

	Parcel ED-1 Boundary
Total Gamma Emissions	
	3861 Counts Per Second
	5695 Counts Per Second
	8446 Counts Per Second




Data provided by the ER Remote Sensing Program
Radiological data collected by EG&G Energy Measurements, Inc.



Figure C-3 Aerial Radiological Survey: Total Gamma Emissions (Naturally occurring and man-made sources)

Parcel ED-1

LEGEND

	Parcel ED-1 Boundary
Man-Made Gamma Emissions	
	1000 Counts Per Second
	3200 Counts Per Second

Data provided by the ER Remote Sensing Program
Radiological data collected by EG&G Energy Measurements, Inc.

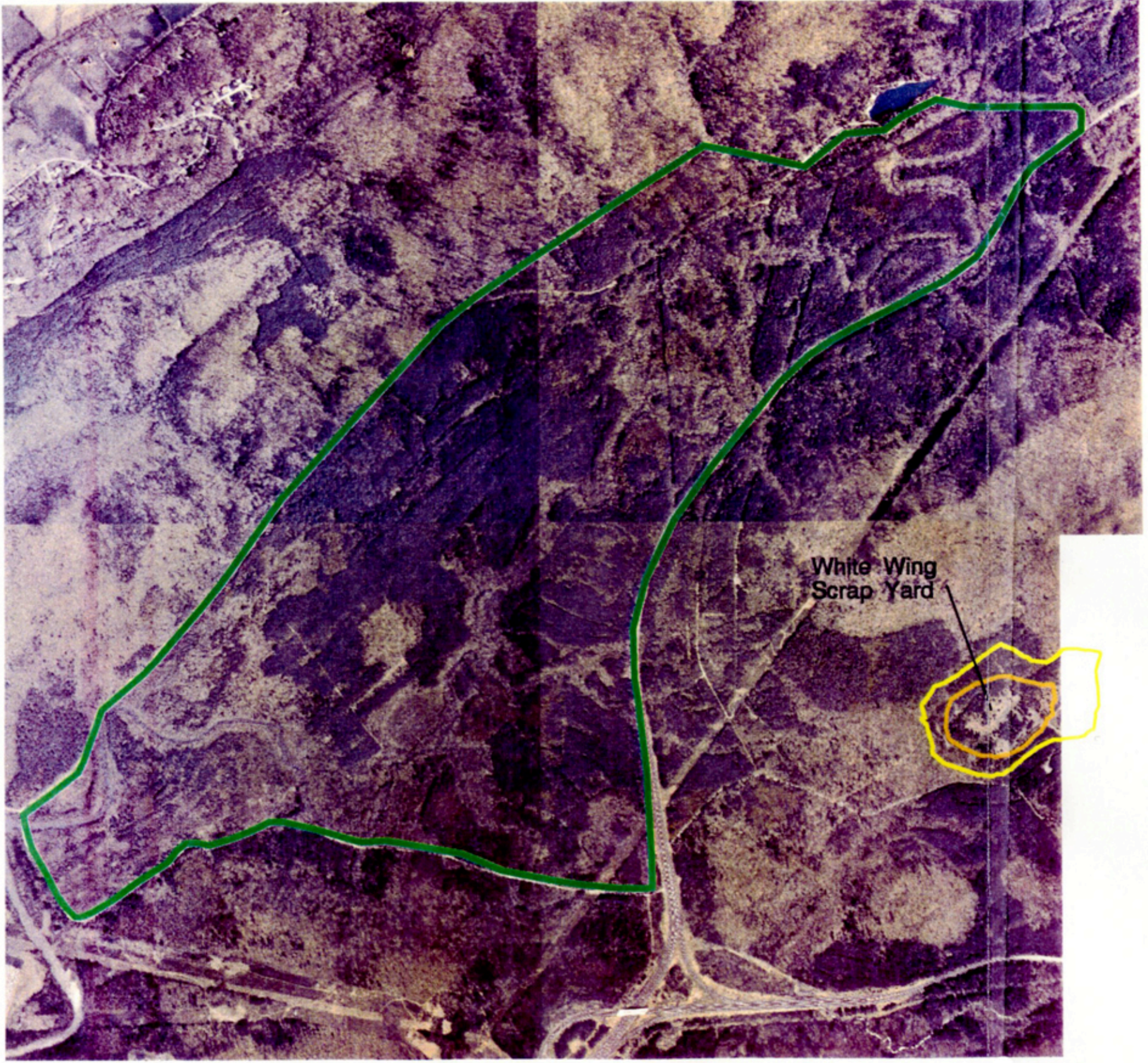


Figure C-4 Aerial Radiological Survey: Man-made Gamma Emissions