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SUMMARY OF PRIOR SITE INVESTIGATIONS
AND IDENTIFICATION OF DATA GAPS REPORT
TEXTILE ROAD SITE
YPSILANTI TOWNSHIP
WASHTENAW COUNTY, MICHIGAN

(Filed as Report 4 - 4770 Folder)
(Copied from Report 3 - 4770)

Submitted by:	Tom Gutpell - July 8, 1992
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Revised by:	BLA - July 14, 1992
Revised by:	CM - August 21, 1992
Revised by:	JDH - August 24, 1992
Revised by:	JDH - August 31, 1992
Revised by:	SW - November 12, 1992
Revised by:	DM - November 13, 1992

SUMMARY OF PRIOR SITE INVESTIGATIONS AND IDENTIFICATION OF DATA GAPS REPORT EOC/EECA STUDY

Textile Road Site
Ypsilanti Township, Washtenaw County, Michigan

NOVEMBER 1992
REF. NO. 4770 (4)
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CONESTOGA-ROVERS & ASSOCIATES

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF FIGURES

LIST OF TABLES

LIST OF TABLES

LIST OF APPENDICES

1.0 INTRODUCTION

Conestoga-Rovers & Associates (CRA) has been hired by the Respondents for the Textile Road Site to prepare and implement a Work Plan (Work Plan) for an Extent of Contamination Study/Engineering Evaluation and Cost Analysis (EOC/EECA) for the Textile Road Site (Site) located in Ypsilanti Township, Washtenaw County, Michigan.

This document presents a report entitled "Summary of Prior Site Investigations and Identification of Data Gaps Report" (Report) which has been prepared to serve as the basis for the preparation of the EOC/EECA Work Plan.

The Textile Road Site (Site) is an inactive industrial property located to the southeast of the corner of Textile Road and Bunton Road in Ypsilanti Township, Washtenaw County, Michigan, approximately 1,000 feet south of Ford Lake. The location of the Site is presented on Figure 1.1. The Site is bounded to the north by Textile Road, to the west by Bunton Road, to the east by a Ford Motor Company facility and to the south by an agricultural property. A Site plan is presented on Figure 1.2.

Background information provided in this report was obtained from several field investigations conducted by, or under the direction of, the United States Environmental Protection Agency (U.S. EPA), Michigan Department of Natural Resources (MDNR) and Freedman, Levy, Kroll and Simonds. Data and other historical accounts presented in the available background information are used in this report to provide a summary overview of the Site history and environmental conditions.

The Textile Road Site is comprised of approximately 62 acres, two-thirds of which is currently covered by three ponds. The three ponds were created as a result of historical sand and gravel mining operations.

1.1 OBJECTIVES

The objectives of this Report are summarized as follows:

1. summarize and evaluate regional information with respect to geology, hydrogeology and hydrology,
2. summarize and evaluate all previous environmental investigations and related activities which have been completed at the Site,
3. identify possible contaminants of potential concern,
4. identify contaminant pathways of potential concern,
5. identify data gaps based on items 1 through 4 above, and
6. develop EOC/EECA Work Plan objectives.

1.2 REPORT ORGANIZATION

This report is organized as the following sections:

Section 2 - Site Background

- presents Site background history and geologic conditions;

Section 3 - Site Environmental Conditions

- presents the environmental conditions and investigations of the Site;

Section 4 - Environmental Fate and Transport of Site Chemicals of Potential Concern

- identifies contaminants and contaminant pathways of potential concern

Section 5 - Identification of Data Gaps

- identifies data gaps based upon an evaluation of existing information;

Section 6 - Summary

2.0 SITE BACKGROUND

The purpose of this section is to provide a summary of pertinent Site background information. This information is presented to support the rationale for the objectives and tasks identified for inclusion in the EOC/EECA Work Plan. Background information is presented in the following sections:

Section 2.1	Site History
Section 2.2	Physical Characteristics of the Site.

2.1 SITE HISTORY

The purpose of this section is to provide a summary of the Site history. The information presented was obtained from the following documents:

1) U.S. EPA Site Analysis Report TS-PIC-91114, (November 1991) (Aerial Photographs Review),
2) U.S. EPA Screening Site Inspection Report, (October 15, 1991), and
3) U.S. EPA TSCA Docket No. TSCA-V-C-222, (May 2, 1985).

Figures 2.1 through 2.7 provide schematic representations of the changes which have occurred at the Site since 1949. These figures were generated from the Aerial Photographs Review document identified above.

The Site has undergone several changes in property use. These include historical uses as an agricultural property and more recent industrial uses such as gravel mining. It is during the gravel mining of the Site that the majority of the contamination encountered at the Site is believed to have been placed.

A summary of historical information compiled from the documents identified above for specific time periods is presented in the following subsections.

2.1.1 Pre-1947

Prior to 1947 the Site was used for agricultural purposes. It was owned by Ford Motor Company (Ford) which permitted its use for the farming of wheat. It is not known when the property was acquired by Ford.

In 1947, Ford sold the property to Elma and Lenora Schultz. Three months later the property was sold to Lamar Thumm. The available information indicates that the Schultz's did not use the property during their ownership.

2.1.2 1947 - 1955

Gravel extraction operations were initiated at the Site in 1947 by Lamar Thumm. Figure 2.1 presents the conditions of the Site on

October 27, 1949. Mining activities had begun by this time. Figure 2.1 also identifies the drainage patterns around and within the Site. The drainage patterns indicate that the Site appears to act as a local low area (sink). This pattern was increased by the mining process which created large pits. U.S. EPA identified that there was no evidence of any filling activity in the 1949 aerial photograph.

Figure 2.2 presents the conditions of the Site on September 6, 1955. The mining of sand and gravel had increased the size of the pits and had created ponds on the east and west boundaries of the Site. Two small buildings were constructed at the Textile Road entrance between 1949 and 1955.

2.1.3 1956 - 1973

The aerial photograph of September 29, 1963 (Figure 2.3) indicates several excavations and ponds. Ford Motor Company constructed a large industrial plant on the east side of the Site. The U.S. EPA TSCA docket indicates that at some time during or close to 1957 H. Handley began dumping fly ash and cinders at the Site. Lamar Thumm also allowed others to dispose construction debris, such as bricks, concrete, etc., and earthen materials. The majority of the fill materials were placed at the Site without supervision.

Figure 2.4 shows the condition of the Site on November 21, 1966. The largest of the Site ponds, located across the southern third of the Site, was identified to be almost completely formed. The condition of the Site on June 8, 1970, along with notes from a 1969 aerial photograph, are presented on Figure 2.5. Figure 2.5 indicates that the rate of gravel extraction appeared to have been reduced. Further gravel extraction and filling activities continued at the Site until September 1973. Gravel extraction and filling activities ceased in September 1973.

2.1.4 1973 - Present

Figure 2.6 indicates the condition of the Site from 1973 to April 18, 1980. Figure 2.7 indicates the condition of the Site on April 8, 1990. The April 8, 1990 conditions are fairly representative of present conditions. Due to the cessation of the gravel operations, there has been substantial vegetation growth since 1980. Major Site features such as the pond locations have not changed since 1973.

From 1973 to 1976 the Site was leased for industrial or commercial purposes. These included the storage of earth moving equipment and between 1976 and 1977 it was leased to a welding operation. Between 1979 and 1981 the Site was used for the storage of construction trailers and equipment.

Attention was drawn to the Site in March 1983 when a local resident informed the MDNR of the presence of 55-gallon drums at the Site. The MDNR discovered forty 55-gallon drums containing an oily substance on the northern area of the property. Based on their appearance, it was postulated by the MDNR that the drums had been on Site for many years.

The drums were found to be corroded and perforated and many were missing lids. During a April 12, 1983 Site inspection, the MDNR collected samples from the drums, soils and surface water. Aroclor 1254 was detected in the oil samples from the 55-gallon drums and in soil samples. PCBs were not detected in the surface water samples collected from the ponds. The MDNR also identified oil-soaked rags, creosote treated wood blocks, fly ash and metal shavings. MDNR identified an area of oil-soaked soil in the northwest portion of the Site (just north of Pond 1).

2.2 PHYSICAL CHARACTERISTICS OF THE SITE

The purpose of this section is to present a summary of the physical characteristics of the Site.

2.2.1 Surface Features

The Textile Road Site is generally flat with occasional fill mounds (also referred to as hummocks) located across the Site. Three man-made ponds are located on the Site as shown on Figure 1.2. The ponds were formed after sand and gravel was removed from beneath the groundwater table.

The surface material at the Site consist of various amounts of earth fill, building rubble and household trash. The majority of the surface soils are covered with vegetation, including trees, shrubs and grass.

Several fill mounds were identified during an April 23, 1992 inspection by CRA. The materials identified in the mounds included; oily rags, concrete, stained soils, drum carcasses and general debris, trash and refuse.

A gravel road traverses the Site from the entrance point at Textile Road, southward to the area of the ponds. The gravel road forks at several locations to permit access to various parts of the Site.

All contours grade inward on Site towards the existing low areas and ponds. All precipitation either infiltrates or flows overland to the three ponds.

2.2.2 Hydrology

The Site is located in the Huron River Basin just south of Ford and Belleville Lakes, which are impoundments formed by damming the Huron River. The Huron River Basin is presented on Figure 2.8. The Huron River Basin drains an area of 908 square miles lying in Ingham, Oakland, Monroe, Washtenaw and Wayne Counties. The Huron River ultimately discharges to Lake Erie with an average discharge rate of 590 cubic feet per second (cfs).

Precipitation and runoff remains on Site, draining into the existing low areas (such as ditches or depressions) and ponds. As a result, surface drainage waters do not flow directly off Site but become part of the ponds or shallow groundwater flow regime.

In addition to on-Site surface water drainage, the ponds may receive off-Site drainage from adjacent properties. Based on predevelopment (1949) aerial photographs, all drainage which entered the Site remained on Site, as it does presently. However, at that time there were no ponds and the surface water collected at low points and subsequently infiltrated into the subsurface soils. Surface water drainage onto the Site from adjacent properties is noted on the summaries of historical aerial photos provided on Figures 2.1 to 2.7.

2.2.3 Geology

This section presents an overview of the overburden and bedrock geology present at and below the Site.

2.2.3.1 Overburden Geology

Pre-development topography and overburden soils are the result of glacial and post-glacial deposition and erosional processes. Continental glaciers advanced into this area of Michigan at least twice, once in each of the last two glacial stages of the Illinoian and Wisconsinan glaciers.

During the Wisconsinan stage, ice sheets of the Huron-Erie glacial lobe advanced across the area of the Site. During the advance and retreat of this ice sheet, a series of end moraines (Fort Wayne and Defiance) and a thick sequence of ground moraine (glacial till) comprised of clay, silt and rock was deposited in this area. As the ice sheet retreated, large volumes of meltwater formed the glacial Lake Maumee between the Fort Wayne Moraine and the retreating glacier. The ice again advanced, forming the Defiance Moraine and subsequently retreated, forming glacial Lake Arkona. The ancient Huron River then eroded through the Fort Wayne moraines to enter Lake Arkona. This resulted in the release of large amounts of sand and gravel over the thick deposits of glacial clay/till forming the surficial deltaic deposits which cover most of the area today. This sand and gravel is the source material for the sand and gravel extraction that occurs in the area.

The surficial overburden geology of the regional area is presented on Figure 2.9. Local surficial geology is presented on Figure 2.10. As indicated on Figures 2.9 and 2.10, the Site is located in an area of deltaic sands. Across the area surrounding the Site the deltaic sands range in thickness from 10 to 20 feet.

Regionally, the deltaic surficial sands are underlain by a series of glacial tills and clays. These in turn may overlie a lower sand unit which in some locations may overlie a series of lower clays. The lower clays rest directly on the bedrock of the area. The glacial drift thickness in the regional area surrounding the Site is expected to be on the order of 100 to 200 feet in thickness.

The local geologic conditions are described based on the review of eight stratigraphic logs of water wells drilled in the vicinity of the Site. These stratigraphic logs are provided in Appendix A. A geologic cross section of the area was produced from the stratigraphic information provided in Appendix A. The location of the cross section (and off-Site wells) is presented of Figure 2.11. The cross-section is presented on Figure 2.12.

Locally, the overburden soils can generally be subdivided into three characteristic units as indicated on Figure 2.12. The top unit consists of sand and gravel soils and extends 4 to 21 feet below ground surface (bgs). The second layer consists of clay (or till) and underlies the sand. The clay has been identified to extend to a depth ranging between 25 and 177 feet. The minimum thickness of the clay/till is about 20 feet. The clay/till unit may contain thin sand lenses. The extent of these sand lenses is unknown. Underlying the clay/till at most well locations is a second stratum of sand and gravel. In the area around the Site the lower sand and gravel unit may extend to the underlying shale bedrock.

2.2.3.2 Bedrock Geology

The Antrim Shale is the first bedrock formation encountered below the Site. This shale is dark brown to black, bituminous, fissile and finely laminated. Figure 2.13 presents the regional bedrock geology. The Antrim Shale is between 50 and 100 feet in thickness. Located below the Antrim Shale are carbonate (limestone) formations of the Traverse Group.

2.2.4 Hydrogeology

In the regional area surrounding the Site, groundwaters exist in the following aquifers (see Figures 2.12 and 2.14) (Hydrogeologic Atlas of Michigan, Western Michigan University, 1981):

1. upper sand unconfined water table aquifer;
2. lower sand confined aquifer; and
3. confined bedrock aquifer(s).

The upper sand of the area contains a shallow water table aquifer which is highly influenced by local drainage patterns and topography.

A lower sand aquifer generally exists below glacial tills and clays (i.e. aquiclude) immediately underlying the upper sands. In the vicinity of the Site, and in much of Washtenaw County, the lower sand confined aquifer is suitable for use as a potable water supply.

The Antrim shale is not considered water bearing and as a result constitutes a lower aquiclude located above lower bedrock aquifers. In the vicinity of the Site, the first usable bedrock aquifer exists in a Devonian carbonate formation of the Traverse Group. In Ypsilanti Township, this aquifer has been encountered in wells at depths of greater than 150 feet.

Figure 2.14 provides a schematic of the glacial drift aquifer characterization. Figure 2.14 indicates that the Site is located in an area where usable thin aquifers generally exist at depth in the glacial drift. Figure 2.15 presents the regional aquifer vulnerability to surface contamination.

The Site hydrogeology consists of an upper sand unconfined water table aquifer and potentially a lower sand confined aquifer. If present, the lower sand aquifer will be confined below the overlying glacial clay/till aquiclude.

Based on local ground contours it is expected that the shallow groundwater flow in the area of the Site is toward the on-Site ponds. Ultimately, the shallow groundwaters will flow and discharge to the Huron River which is located north of the Site.

The actual rate of groundwater flow and specific local flow directions, require further delineation during the EOC.

The upper sand aquifer is a shallow unconfined water table aquifer which exists in the upper 10 to 20 feet of the stratigraphic column. As a result of the shallow nature of the water table this aquifer is not used as a potable drinking water source. It is expected that the upper sand aquifer would discharge to the surface water drainage courses in the vicinity of the Site.

The lower sand confined aquifer supplies municipal wells located about a quarter mile northeast of the Site, as well as several farm houses located in the area. The closest residential wells within the lower sand aquifer are reported to be within about a half mile of the Site.

2.2.5 Land Use

The local land use consists of mixed residential, agricultural, gravel mining and industrial uses. The Site has been utilized for industrial purposes since 1949.

Present zoning for the Site is for "Light Industrial" use. The currently anticipated future Ypsilanti Township land use plans contemplate "Light Industrial" land uses for the property (Future Land Use Plan, Ypsilanti Township, Washtenaw County Planning Commission, July 1975).

To the north across Textile Road there are several houses and Ford Lake. Immediately east of the Site is a large manufacturing plant. Farther east the land is unused. South of the Site there is mixed urban and rural land use with some agriculture and residential development. A Trailer Park subdivision exists on land reclaimed from a separate gravel mining operation to the west of the Site.

2.2.6 Summary

Physical characteristics of the Site limit potential chemical migration routes to the surface soils, air and the groundwater within the upper sand aquifer. Deeper groundwater in the lower sand aquifer is believed to be protected by a glacial clay/till layer that is regionally extensive and prevents hydraulic communication between the upper and lower sand aquifers. However, this has not been demonstrated on Site.

As surface drainage is directed to the interior of the property there is minimal opportunity for surface water flow to serve as a contaminant pathway away from the Site.

3.0 SITE ENVIRONMENTAL CONDITIONS

The purpose of this section is to provide a summary of previous environmental investigations which have been completed at the Site. This information will be utilized in conjunction with the information presented in Section 2.0 to identify "data gaps" which will minimize the generation of additional redundant data.

3.1 SAMPLING AND ANALYSIS CONDUCTED TO DATE

Since 1983, when the Site was identified to the MDNR, the Site has been visited on several occasions for the purpose of obtaining samples for chemical analysis. The samples obtained for analysis included; oil from drums, refuse, stained soil, wood, groundwater, surface (lake) water, lake sediments and fish tissues.

Sampling and analysis has been conducted by/for the MDNR, U.S. EPA and Freedman, Levy, Kroll and Simonds.

3.1.1 Sampling and Analysis by/for MDNR

The MDNR visited the Site on three occasions in 1983 and once in 1986. Table 3.1 provides a summary of the analyses completed on samples collected during the four sampling events. Sample locations were not reported in the information presently available.

The Site was first visited by the MDNR on April 12, 1983, following a complaint by a local resident, of 55-gallon drums at the Site. Forty drums containing oily substances were discovered by the MDNR, some of which were reported to be leaking. Based on their condition, the drums were postulated by the MDNR to have been on Site for many years. Samples collected from the drums contained up to 210 ppm of PCB aroclor 1254. At the same time, two surface soil samples were obtained near the drums. The samples were oil stained and were found to contain 160 and 500 ppm of PCB aroclors 1242 and 1254. The MDNR also observed oil-soaked rags, creosote treated wood blocks, fly ash and metal shavings on the Site. Surface water samples obtained on April 12, 1983 were found to contain concentrations of copper (25 μg/L), phenol (14 μg/L) and zinc (350 μg/L).

The Site was visited for the second time by MDNR on June 10, 1983. During this visit, bottom sediments and fish tissue samples were obtained. PCBs were detected in the bottom sediment samples only, at concentrations ranging from 1.1 to 8.3 ppm.

On June 29, 1983, an inspection of the Site was conducted by the MDNR, the Washtenaw County Health Department, Washtenaw County Sheriff Department, representatives of Holtzman/Silverman, (a potential purchaser), and Lamar Thumm. During this visit 10 samples were obtained for chemical analysis. These included samples collected from the following media; soil, pond sediment and water, fill and wood blocks. All samples were collected at the north end of Pond 1 near the 55-gallon drums. The results of the sampling are summarized in Table 3.1. The concentrations of PCB in the soil samples ranged from 1.3 to 360 ppm. PCBs were not detected in the surface water. Pond sediments contained PCBs at a concentration of 100 ppm. The other samples collected contained PCBs at levels ranging between 4.5 and 28 ppm of PCB.

In response to an MDNR order, 55 drums were removed from the Site in February 1986. A March 20, 1986 inspection by the MDNR revealed an additional 24 rusty drums containing oily substances. Samples collected on March 20, 1986 from the drums revealed PCBs at concentrations of 17 to 43 ppm. A soil sample collected near the drums detected a PCB concentration of 230 ppm. These drums were removed from the Site in 1988 and 1991.

3.1.2 Sampling and Analysis by/for U.S. EPA

This section presents a summary of information and data developed by the U.S. EPA during a number of investigations completed at the Site.

3.1.2.1 E&E FIT Sampling and Analysis

A Site inspection, including sampling and analysis of environmental samples and a magnetometer survey were conducted by an Ecology and Environment Inc. (E&E) Field Investigation Team (FIT) for the U.S. EPA. E&E visited the Site on October 27, 1987, and reported 13 drums in the vicinity of the structure at the Site entrance. Oil and a tar like substance were found to be leaking from the drums which were reported to be in poor condition.

A magnetometer survey was subsequently conducted by the FIT Team on November 17, 1987. The survey reported high magnetometer readings along the north end of the Pond 1 (north-east corner) and near the north-west corner of the Site. Later investigations indicated that the anomalies were due to metal slag and debris.

Samples collected from the stained soil area north of Pond 1 were found to contain aroclor 1254 at a concentration of 116 ppm.

On December 11, 1990, E&E returned to the Site to conduct additional investigations. The results of the December 11, 1990 assessment are presented in the Screening Site Inspection Report dated October 15, 1991. During the 1990 assessment the following samples were obtained:

1) 16 soil samples,
2) 4 sediment samples,
3) 2 surface water samples,
4) 8 groundwater samples, and
5) 4 residential and municipal well samples.

The 1990 FIT sampling locations are presented on Figures 3.1 through 3.3. The results of the chemical analyses are provided in Tables 3.2 through 3.6. The sample locations in the FIT report are presented on a sketch map. The locations presented on Figures 3.1 through 3.3 are estimated from the sketch map and presented on a base map prepared from the 1990 aerial photography. A summary of analytical results is presented in the following paragraphs.

Soils

Sixteen soil samples were obtained from the surface soils at the Site from the locations approximated on Figure 3.1. The samples were submitted for chemical analysis including; volatile organic compounds (VOC), semivolatile organic compounds (SVOC), pesticides, PCBs and inorganics. The results of these analyses are summarized in Table 3.2.

Aroclor 1254 was detected in 9 of the 16 samples. The distribution of aroclor 1254 in the soil samples is plotted on Figure 3.1. The highest concentrations of PCBs were detected north of Pond 1. Lower concentrations were detected to the east of Pond 2.

The data summarized in Table 3.2 indicates that several VOCs were also reported at scattered locations across the Site. VOCs appear most frequently and at the highest concentration in samples S9, S14, S15 and S16. Samples S14 and S15 were collected north of Pond 1 in the area where most of the drums were found. Sample S16 was collected east of Pond 2.

The majority of the soil samples had at least one detected SVOC analyte. Eight samples had polycyclic aromatic hydrocarbons (PAHs) reported at estimated concentrations in excess of 0.1 mg/kg. Five of these samples had 3 or more individual PAH compounds. The distribution of the PAH data indicates that the areas most likely to contain PAHs are north of Pond 1, east of the main access road and southeast of Pond 2 (see Location S-8).

Several pesticides were reported in low concentrations at scattered locations across the Site. All but one of the reported values had a QA/QC qualifier.

Several metals including arsenic were detected at various locations across the Site. Elevated concentrations of inorganics including arsenic were identified in the visibly stained area to the north of Pond 1 (Location S-14 and 15) as well as east of Pond 2 (S-6 and 7).

Sediment

Figure 3.2 presents the location of four sediment samples collected from Ponds 1, 2 and 3. As with the soil samples, the sediment samples were analyzed for VOC, SVOC pesticide/PCBs and inorganic analytes. The results of these analyses are summarized in Table 3.3.

PCB aroclor 1254 was only detected in Sample S20 and at a concentration of 0.14 ppm. Sample 20 was obtained from Pond 2 sediments, near the location that PCBs were detected in soil samples.

Table 3.3 indicates that three VOC analytes were reported in sediment samples. Two of the analytes, acetone and methylene chloride are common field and laboratory contaminants that may have been introduced during the sample collection or analysis. Benzene, the third analyte, was reported at an estimated concentration of 2 μg/kg. The nature of the acetone and methylene chloride will be further evaluated during the EOC Studies.

Two of the four sediment samples, S19 and S20, had several PAH compounds reported. All of the PAH results were qualified. These results are from Ponds 2 and 3.

Several pesticides were reported at low concentrations (e.g. S-19). All values had QA/QC data qualifiers.

Several metals were detected at relatively low levels.

Surface Water

Figure 3.2 presents the location where four surface water samples were obtained during the FIT investigation. The results of the chemical analyses of these samples are presented in Table 3.4.

PCBs were not detected in any of the samples. A common laboratory contaminant, methylene chloride, was reported as estimated in samples SW3 and SW4. No SVOC or pesticides were reported above detection limits.

Several metals were detected at relatively low levels.

Groundwater

Eight groundwater samples were collected from the locations shown on Figure 3.3. These samples were collected using a driven steel probe and analyzed for VOC, SVOC, pesticides/PCBs and inorganics. In addition, the depth to groundwater was measured at each sampling location. A summary of the analytical results (i.e. detected analytes) is presented in Table 3.5.

PCBs were not detected in any of the groundwater samples. Three samples (GW3, GW3 Duplicate and GW4) had low estimated concentrations of two VOC analytes. A fourth sample, GW2, had low estimated concentrations reported for ethylbenzene and xylene and 120 μg/L reported for chloromethane. The chloromethane result is considered anomalous in comparison to the results from other groundwater samples or environmental media sampled at the Site.

Several pesticides and semi-volatile organic compounds were reported as estimated at very low concentrations. Several PAH compounds were detected at GW7 at relatively low levels. Metal results were found to vary widely. The nature of the arsenic and cyanide detections will be further evaluated during the EOC study.

The general trend of water depths indicates that groundwater is found at greater depth near the north boundary than at the south. However, without elevation data, it is not possible to precisely determine groundwater flow direction or velocity.

Residential and Municipal Wells

Four local residential and municipal wells were sampled near the Site. The locations of these wells are presented on Figure 3.4. The results of the chemical analyses are presented in Table 3.6. Well depths suggest that the wells are completed in the lower sand confined aquifer.

Wells RW1 and RW2 are municipal wells located about a quarter mile northeast of the Site. Well RW3 is a residential well located about a half mile southeast of the Site. Since the groundwater flow direction is considered to be in a northerly direction, RW3 is believed to be indicative of background conditions.

The common laboratory contaminant methylene chloride is the only VOC analyte reported in the results. No SVOC compounds, pesticides or PCBs were reported above detection limits in the results.

Wells RW1 and RW2 contain elevated levels of barium and magnesium in comparison to RW3. This result will be further evaluated during the EOC study.

3.1.2.2 Weston-MP TAT Sampling and Analysis

An extent of contamination study (EOC) was conducted by Maecorp for the U.S. EPA in March 1989. The investigation was monitored by Weston-MP Technical Assistance Team (TAT), who reported the findings in a Removal Action Plan (RAP, dated November 1989) prepared for the U.S. EPA.

The investigation consisted of sampling soil materials within 19 test pits and two test trenches excavated in the area north of Pond 1. The locations of the pits and trenches are presented on Figure 3.5.

The test pits were placed in the area where PCB contaminated oil stained soils had previously been identified by the U.S. EPA and MDNR. The pits were excavated using a trackhoe, and samples were collected at one, two, four and eight-foot depths from each pit. The exceptions were Pit 16 which was not sampled and Pit 15 where only the one and two-foot samples were obtained.

The trackhoe was also used to excavate the test trenches which extended north and northwest from test pits 1 and 2, respectively. The depths to which the trenches were excavated were not noted. However, it was identified that at one location the test trench was extended to a depth of ten feet. A composite sample was obtained from each of the test trenches.

A total of 76 soil samples were submitted for PCB analysis. The samples from test pits 2 and 5 and the two test trenches were also submitted for VOCs, SVOC and EP TOX metals analyses.

The results of the analyses are presented in Table 3.7 (reproduced from TAT Tables 1 and 2). PCBs were detected in 62 of the 76 samples. PCB concentrations in excess of 10 ppm were detected in 44 of the 76 samples (58 percent). The range and mean concentrations of PCBs at each of the sampling horizons are summarized as follows:

Interval (feet bgs)	*Minimum (ppm)*	*Maximum (ppm)*	*Mean (ppm)*
1	ND (<0.5)	154	56.6
2	ND (<0.5)	484	50.3
4	ND (<0.5)	530	78.0
8	ND (<0.5)	650	52.2

Levels of VOC were detected in six of the ten samples analyzed. VOC identified included benzene, ethylbenzene, toluene and trichloroethene. SVOC analytes were detected in eight of the ten samples.

Arsenic was the only metal which exceeded the EP Toxicity levels set by RCRA. The RCRA level is 5 ppm, and arsenic was detected in four samples at levels ranging from 5.7 to 6.3 ppm (see Table 3.7).

3.1.3 Sampling and Analysis by Others

A Site investigation was conducted by Versar (an Engineering Consulting Firm) on behalf of Freedman, Levy, Kroll and Simonds in March 1989.

The investigation included the collection and analysis of 14 samples of various materials, as summarized in Table 3.8. The samples included three drum samples, two cloth/filter cake samples, two wood samples, three filter cake samples, three soil/sediment samples and one buried (three foot depth) cinder sample. The locations of these samples are presented on Figure 3.6. The samples were analyzed for VOC, SVOC, PCBs and Inorganics. The results of the analyses are presented in Table 3.9.

PCBs were detected in each of the samples, except TR-2, 3, 11 and 12. The concentrations of PCBs ranged from 0.74 ppm to 210 ppm. The concentrations of PCBs in soil samples collected ranged from non-detect to 140 ppm.

Various concentrations of several VOCs were encountered in ten of the 14 samples. SVOCs were detected in two samples; an oil soaked soil sample and a soil/cinder sample.

Various inorganics were encountered at elevated concentrations, including arsenic and lead.

3.1.4 Data Validation

Proper laboratory QA/QC data validation requires the following information for each analysis:

1) A copy of original results (Forms) of the chemical analysis,
2) Chain-of-Custody forms for all samples,
3) The results of all duplicate, matrix spike and blank samples, and
4) Sample collection and field procedures utilized.

This information is necessary to assess the application of the data qualifiers assigned in the FIT report. In general, however, the results of the various studies are consistent with one another in terms of both the analyte types, concentrations and locations encountered.

3.1.5 Summary

A large number of environmental samples from various environmental media were analyzed during the MDNR and U.S. EPA investigations. Most of the samples were for soil and sediment. Other media sampled included pond water, fish tissue, groundwater, drums and fill materials. Approximately one half of the samples do not have locations specified and consequently the results cannot be used to assess a specific portion of the Site. Samples collected as part of the U.S. EPA FIT program have specified locations but lack a physical description of the sample which would be useful for establishing a correlation between analytical results and observable visual properties of the samples and the Site.

The data collectively indicates that the oil stained area at the north-east corner of the Site has been most affected by contamination. It is also the most intensively sampled area of the Site.

PCBs are the most frequently reported organic parameter at the Site followed by PAHs. It should be noted, however, that the PAH levels are significantly lower than the PCBs and generally qualified as estimated.

VOCs were identified sporadically at low concentrations and with very little repetition from location to location. Pesticides are present less frequently in the data at low concentrations. Inorganics are difficult to assess as they are naturally present and a good background definition is not available in the existing data.

4.0 ENVIRONMENTAL FATE AND TRANSPORT OF SITE CHEMICALS OF POTENTIAL CONCERN

This section evaluates the chemicals of concern encountered at the Textile Road Site and their ability to be transported in the natural environment. This section discusses the chemicals of potential concern with respect to:

1) physical and chemical properties,
2) potential routes of migration, and
3) migration and environmental fate.

The environments of concern, and the potential migration pathways, include:

1) groundwater,
   - upper sand aquifer
   - lower sand aquifer
2) surface water and sediments,
   - 3 on-Site ponds
3) soils, and
4) air.

4.1 CHEMICALS OF POTENTIAL CONCERN

The chemicals of potential concern which were identified through historical investigations completed at the Textile Road Site are listed in Table 4.1 This list is based on the results of the analyses conducted to date which were summarized in Section 3.1. The main chemicals of potential concern are PCBs, PAHs and inorganics:

The following sections discuss the physical and chemical properties of these contaminants and possible migration pathways. It should be noted, however, that based upon the concentrations present, toxicity and persistence, PCBs are considered to be the primary contaminant of concern at the Site.

4.2 PHYSICAL AND CHEMICAL PROPERTIES

The basic physical and chemical properties of the organic and inorganic chemicals of concern are presented respectively in Tables 4.2 and 4.3.

The probable behavior and environmental fate of all constituents can be assessed to some extent by evaluating the physical and chemical properties of the constituent. The mobility and persistence of these constituents are of primary importance in this evaluation. Mobility is the potential for a chemical to migrate away from the Site. Persistence is a measure of how long a chemical will remain in the environment. Factors that affect the mobility and persistence of Site-related constituents include, but are not limited to:

1) physical properties, such as density,

2) chemical properties, such as water chemistry, pH and REDOX potential
3) moisture levels, and
4) presence of microorganisms.

The water solubility is the maximum concentration of a compound that can dissolve in water at a specific temperature and pH. Compounds with high solubilities generally exhibit increased mobility.

Vapor pressure and Henry's Law Constants provide an indication of the volatility of a compound. High vapor pressures and Henry's constants indicate a general tendency for a compound to volatilize from water. Compounds with high Henry's constants generally do not persist in surface water environments.

The organic carbon partitioning coefficient (Koc) indicates the tendency of a compound to be adsorbed to organic materials in soils or sediments. High Kocs generally indicate lower mobility. PCBs have very high Kocs and are virtually immobile in organic rich soils.

The behavior of inorganic compounds is dependent upon numerous factors including water chemistry, pH and REDOX potential. Generally, inorganic compounds will precipitate as pH and alkalinity increase. Inorganic compounds may also become complexed depending upon the chemical environment.

Table 4.4 presents a descriptive summary of the chemical properties which help determine the environmental fate of Site-related constituents. A summary of the physical and chemical properties of other aroclor mixtures is presented on Table 4.5.

Appendix B provides additional descriptions of the three main chemical groups of potential concern identified at the Site; PCBs, PAHs and metals.

4.3 POTENTIAL MIGRATION PATHWAYS

Potential release and transport mechanisms are summarized as follows:

1) releases to air (volatilization),
2) erosion and atmospheric transport of fugitive dust,
3) leaching of contaminants into groundwater and transport in the upper sand aquifer,
4) surface water runoff, stormwater flow (sediment entrained transport), and
5) tracking by animals, equipment, visitors or trespassers.

Direct releases to the air occur from chemicals which have high vapor pressures such as VOC. Since no significant concentrations of VOC were reported from the sampling conducted at the Site by MDNR and U.S. EPA, it is considered that direct releases to the air by volatilization are minimal.

Compounds which are susceptible to transport as fugitive dust include those substances which have high Koc values and are generally found adsorbed to soil and particulate matter. These compounds include PCBs and PAHs. These substances were encountered at the Site during sampling by the U.S. EPA and MDNR. Erosion of soils by wind and/or rain will be minimized at the Site due to a heavy vegetative cover. However, there are some areas on Site which are bare of vegetation, and as a result, erosion can occur.

Compounds or elements which are susceptible to leaching into groundwater and transport through the upper sand aquifer include VOCs and some mobile metals. These substances generally have a high water solubility. Since no significant VOC concentrations were reported by U.S. EPA or MDNR, only the mobile metals reported, namely arsenic and barium are of concern. The rate of transport of these metals is dependent on the groundwater flow rate, pH of the groundwater and the pH of the infiltrating precipitation or surface water. Leaching of contaminated groundwater to the lower sand aquifer is precluded by a thick clay/till aquiclude. This clay/till stratum protects the lower sand aquifer by providing an effective low permeability barrier to groundwater flow and by adsorbing substances with high Koc values (i.e. PCBs, PAHs).

Substances which adhere to soil particles can be eroded and carried with surface water runoff. These substances include PCBs and PAHs, which have been reported in the pond sediments at comparably low levels by U.S. EPA. Since all on-Site stormwater enters the existing ponds on

Site, there is no concern that contaminants would migrate off Site by this mechanism.

Of the above identified transport mechanisms, groundwater migration, erosion and transport of fugitive dust and tracking by equipment, animals or Site visitors, trespassers may cause the chemicals of potential concern to migrate off Site. Also, due to the vegetative cover it is not considered that significant amounts of fugitive dust would be generated. Although general regional topography suggests that groundwater will flow to the north or northeast, there is presently insufficient data to provide accurate groundwater flow direction or velocities.

5.0 IDENTIFICATION OF DATA GAPS

Investigations completed to date were of a preliminary screening nature. They provide useful data to characterize the Site and define the nature of environmental conditions at the Site but require supplementary investigative activities to further assess the extent of different environmental conditions. Additional data is also required to permit an objective assessment of the need for and scope of response alternatives, if necessary.

Contaminated materials remaining on Site contain PCBs, PAHs and heavy metals as contaminants that may be mobile in the natural environment and available to human or environmental receptors. It should be noted, however, that PCBs are the main chemical of potential concern.

Objective definition and assessment of response alternatives will require additional environmental data. Specific "data gaps" that require the collection of additional Site specific analytical data are presented in the following sections. These data requirements were determined by evaluating the data which had been developed historically and evaluated in Section 3.1.

5.1 DATA GAPS

Data gaps relate to either the further definition of a chemical source or definition of chemical migration pathways. The chemical source definition is generally defined by the history of filling at the Site and the historical investigations conducted since sand and gravel mining ceased. Chemical source function data gaps are presented in Section 5.1.1.

As described in Section 4.0 natural migration opportunities are generally limited to the upper sand aquifer. Additional data is required to prove the effectiveness of natural controls and to quantify this potential groundwater migration pathway. Transport route data gaps are presented in Section 5.1.2.

5.1.1 Chemical Source Function Data Gaps

The following data gaps relate to the definition of a chemical source function at the Site.

1. Extent of soil/fill contamination. Contaminated soil represents a continuing source of contaminants that may be released to other parts of the Site. As a result, it is necessary to evaluate the nature and three-dimensional extent of contaminated soil.

2. Chemical parameters present. It is necessary to identify the number and concentrations of PCBs present in source material to evaluate the need and scope of potential response activities. Data available to date indicates that the only significant chemical present will be PCBs. Further definition is required to verify the nature and extent of the PCB contamination (including the lower sand aquifer).

5.1.2 Transport Mechanism Data Gaps

The following data gaps relate to the definition of physical constraints on contaminant migration pathways and the definition of transport routes and rates.

1. Topography and drainage. Aerial photographic data interpreted from small scale photos indicates that surface water drainage on the Site is contained internally. This significantly limits chemical migration opportunities and should be confirmed and documented.

2. Upper and lower sand aquifer. Characteristics of the upper and lower sand aquifer including thickness, depth to water, direction of flow, relationship to ponds, gradient and velocity should be evaluated to assess the contaminant migration potential.

3. Clay till layer. The clay till layer provides an effective bottom to the upper sand aquifer. The thickness, extent and hydraulic conductivity of the clay till layer are required to assess the adequacy of the clay till layer as an effective bottom to the upper sand aquifer.

5.2 FILLING DATA GAPS

Data gaps can often be filled by more than one method. Data collection activities are presented in Section 5.1.1 for Chemical Source Function Data Gaps and in Section 5.1.2 for Transport Mechanism Data Gaps.

5.2.1 Filling Chemical Source Function Data Gaps

The following data is required to fill the Chemical Source Function Data Gaps defined in Section 5.1.1.

1. Extent of Soil Contamination

   - collect soil samples from and adjacent to areas of visible or known soil contamination and at locations removed from such areas; and
   - analyze samples for chemicals of potential concern (i.e. TCL/TAL or PCBs).

5.2.2 Filling Transport Mechanism Data Gaps

The following data will adequately fill Transport Mechanism Data Gaps defined in Section 5.1.2.

1. Topography and Drainage

   - prepare topographic base plan of Site; and

- conduct detailed drainage inspection.

2. Upper and lower sand aquifer

- install boreholes through full thickness of upper and lower sand aquifer;
- install monitoring wells in upper and lower sand aquifer;
- conduct displacement hydraulic conductivity test (slug tests)
- measure water elevations (ground and surface) and calculate gradients; and
- collect groundwater quality samples.

3. Clay Till Layer

- install boreholes to a depth of ten feet below the clay surface;
- collect shelby tube samples of clay/till for hydraulic conductivity analysis;
- grout boreholes;
- determine location and completion depth of existing water wells within 500 feet of the Site; and
- survey location of boreholes.

4. Sediments

- collect sediment samples from Ponds 1, 2 and 3 to assess possible impacts related to waste deposition.

6.0 SUMMARY

The information presented and evaluated in this report may be summarized as follows:

- previous environmental investigations have been completed at the Site,
- the data collectively demonstrates that PCBs are the primary chemical of potential concern,
- however, further definition of the areal extent of the nature and extent contamination (including TCL, TAL and PCBs) is required, and
- further information on groundwater flow directions, velocities and contaminant distribution is required.

The following presents the objectives for the EOC/EECA study:

Extent of Contamination (EOC) Study Objectives

1. investigate the nature and extent of contamination (including TCL/TAL chemical analysis) across the entire area of the Site including the sediments of Ponds 1, 2 and 3;

2. investigate and further delineate the nature and extent of PCB contamination at the Site[1] . Based upon previous investigations the

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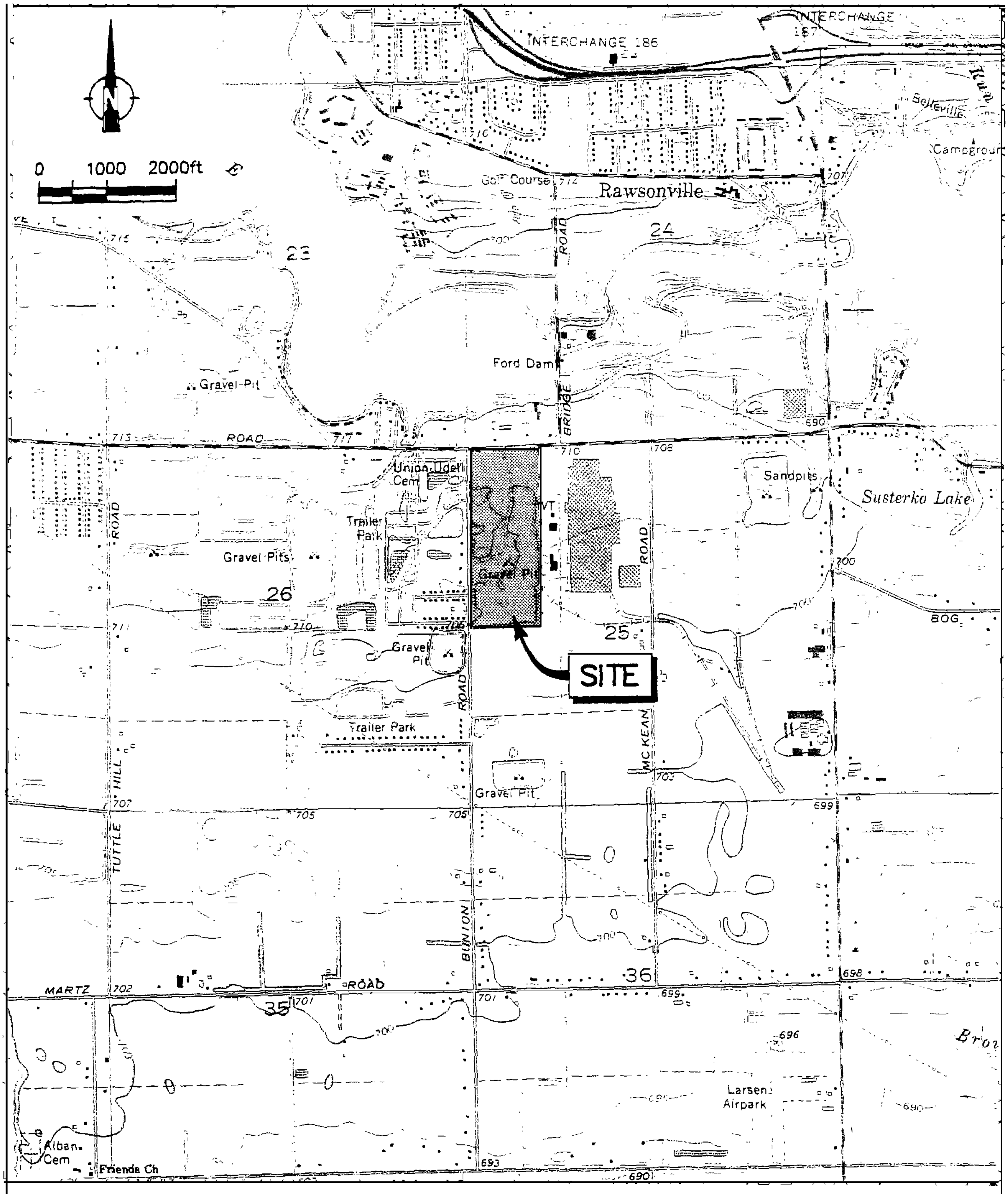
1 Though no decision has been made as to the cleanup standards for the Site, recommended PCB action levels for industrial Sites are generally established in the 10 to 25 ppm range. "Guidance on Remedial Actions for Superfund Sites with PCB Contamination" (OSWER Directive No. 9355.4-01, August 1990).

focus of this portion of the investigation will be in the areas north of Pond 1 and east of Pond 2;

3. investigate the hydrogeologic conditions at the Site in the upper sand aquifer;
4. investigate the upper and lower sand aquifer groundwater quality at the Site; and
5. investigate the nature of the underlying clay/till aquiclude separating the upper and lower sand aquifer.

Engineering Evaluation and Cost Analysis (EECA) Objectives

The objectives of the EECA are to assess the Site conditions, defined during the EOC, and to complete an evaluation of response alternatives. Treatability studies will be conducted, if required.



SOURCE: USGS QUADRANGLE MAP,
YPSILANTI EAST, MICHIGAN

RAWSONVILLE
MICHIGAN

CRA

figure 1.1

SITE LOCATION
TEXTILE ROAD SITE
Ypsilanti Twp., Washtenaw Cty., Michigan

4770(4)-JUL.8/92-REV.0

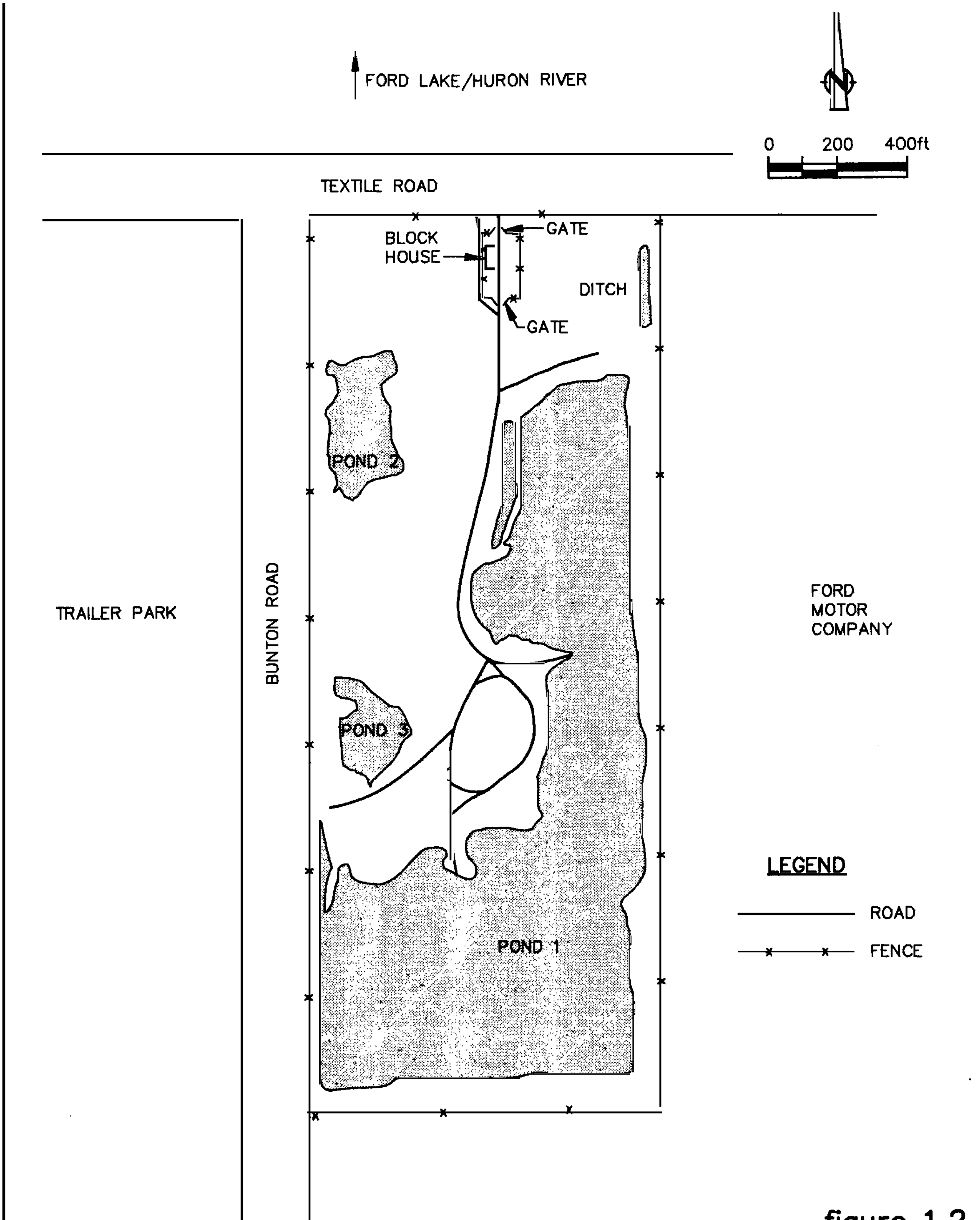
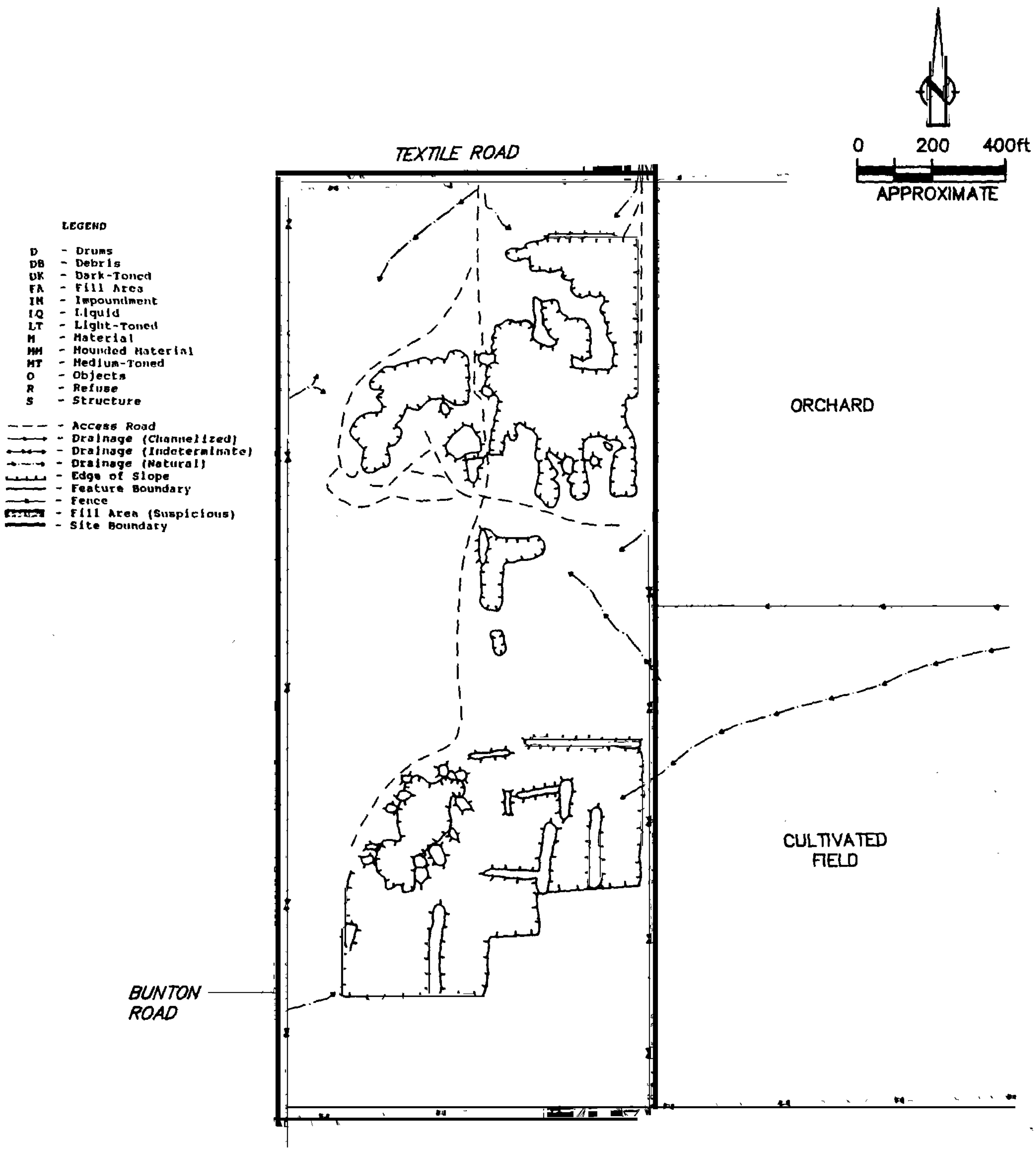


figure 1.2

SITE PLAN
TEXTILE ROAD SITE
Ypsilanti Twp., Washtenaw Cty., Michigan

CRA

4770(4)-JUL.8/92-REV.0 (P-27)



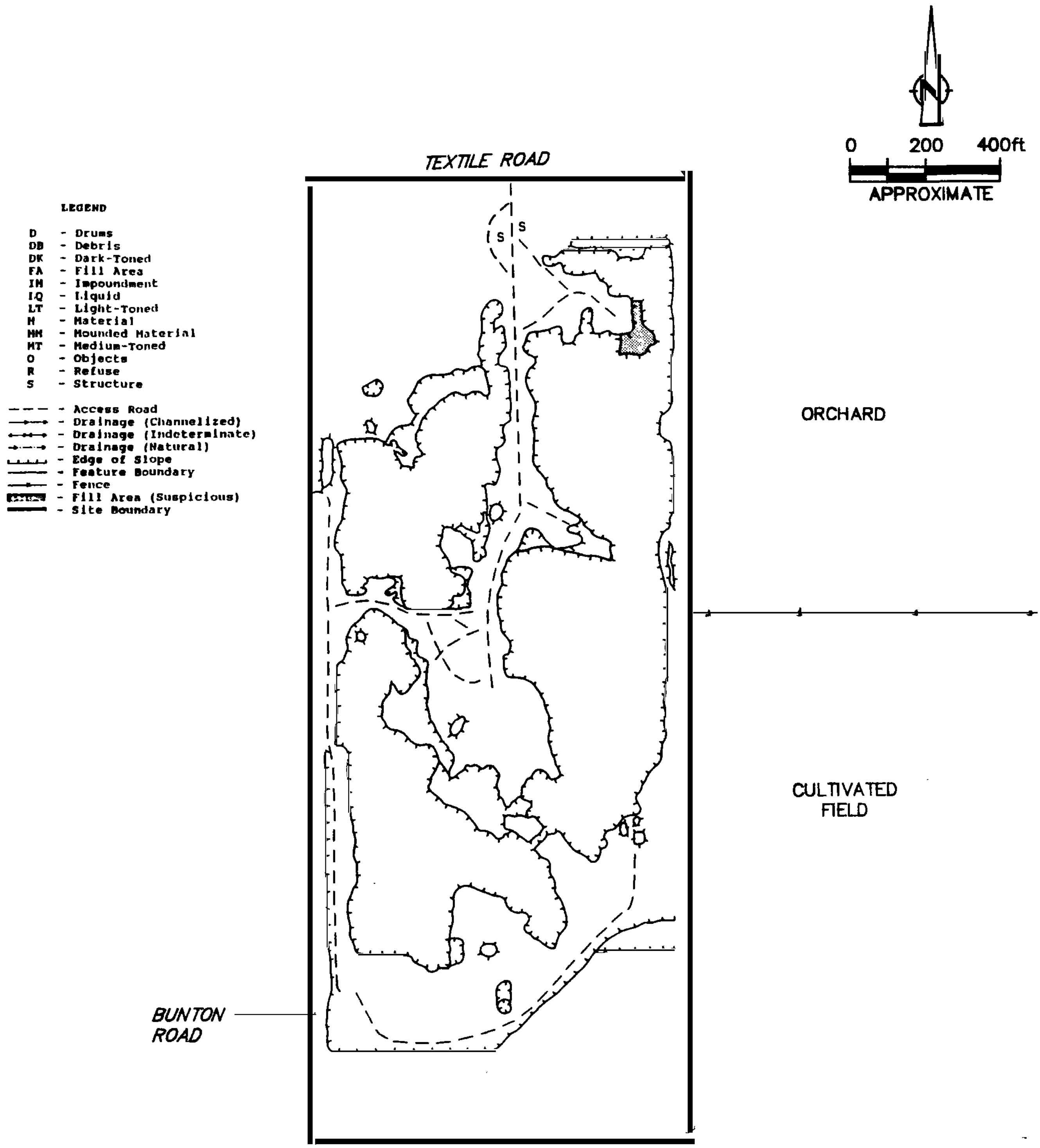
SOURCE: USEPA REPORT TS-PIC-91114
NOVEMBER 1991

figure 2.1

SITE CONDITIONS
OCTOBER 27, 1949
TEXTILE ROAD SITE
Ypsilanti Twp., Washtenaw Cty., Michigan

CRA

4770(4)-JUL.8/92-REV.0



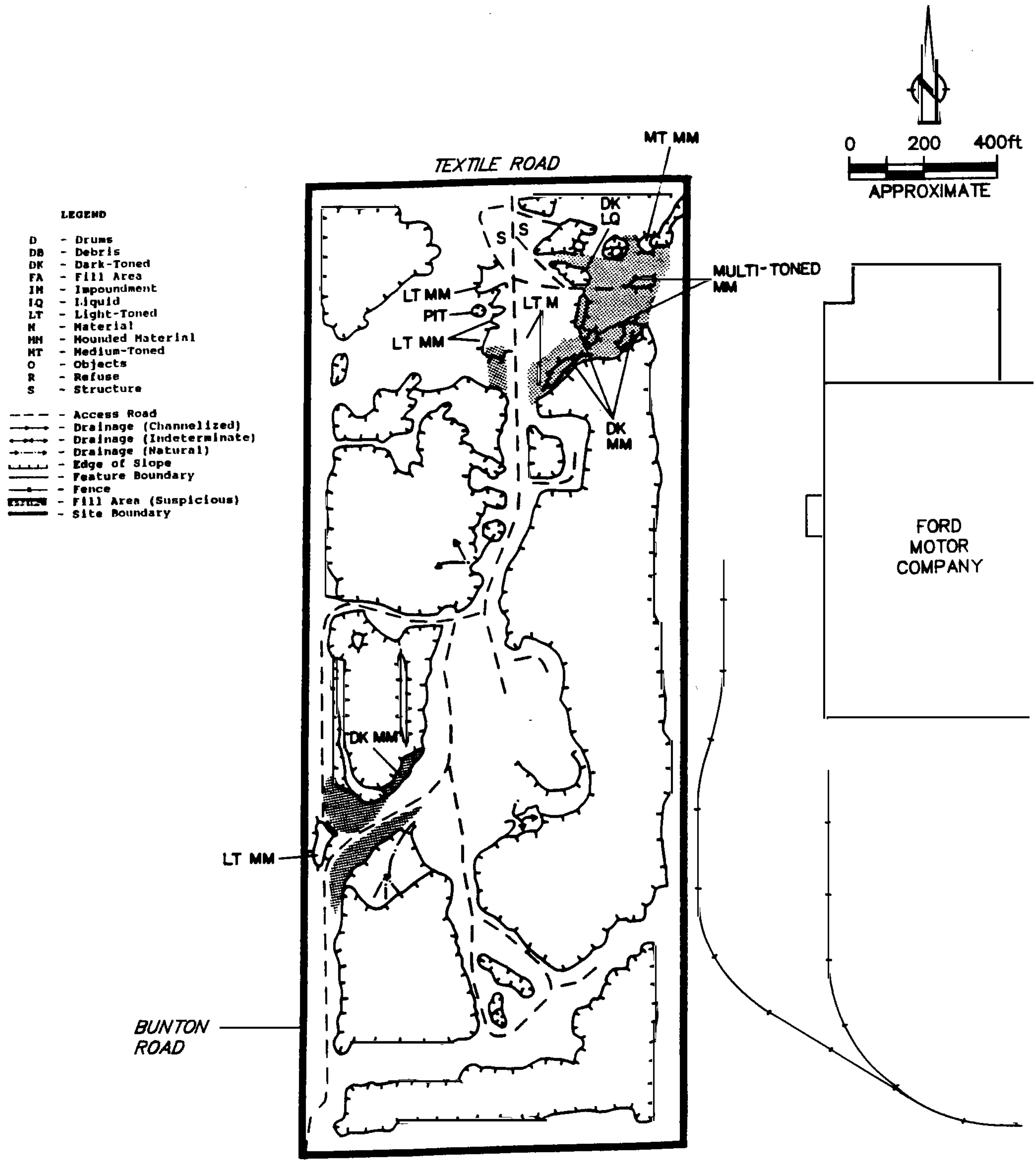
SOURCE: USEPA REPORT TS-PIC-91114
NOVEMBER 1991

figure 2.2

SITE CONDITIONS
SEPTEMBER 6, 1955
TEXTILE ROAD SITE
Ypsilanti Twp., Washtenaw Cty., Michigan

CRA

4770(4)-JUL.8/92-REV.0



SOURCE: USEPA REPORT TS-PIC-91114
NOVEMBER 1991

figure 2.3

SITE CONDITIONS
SEPTEMBER 29, 1963
TEXTILE ROAD SITE
Ypsilanti Twp., Washtenaw Cty., Michigan

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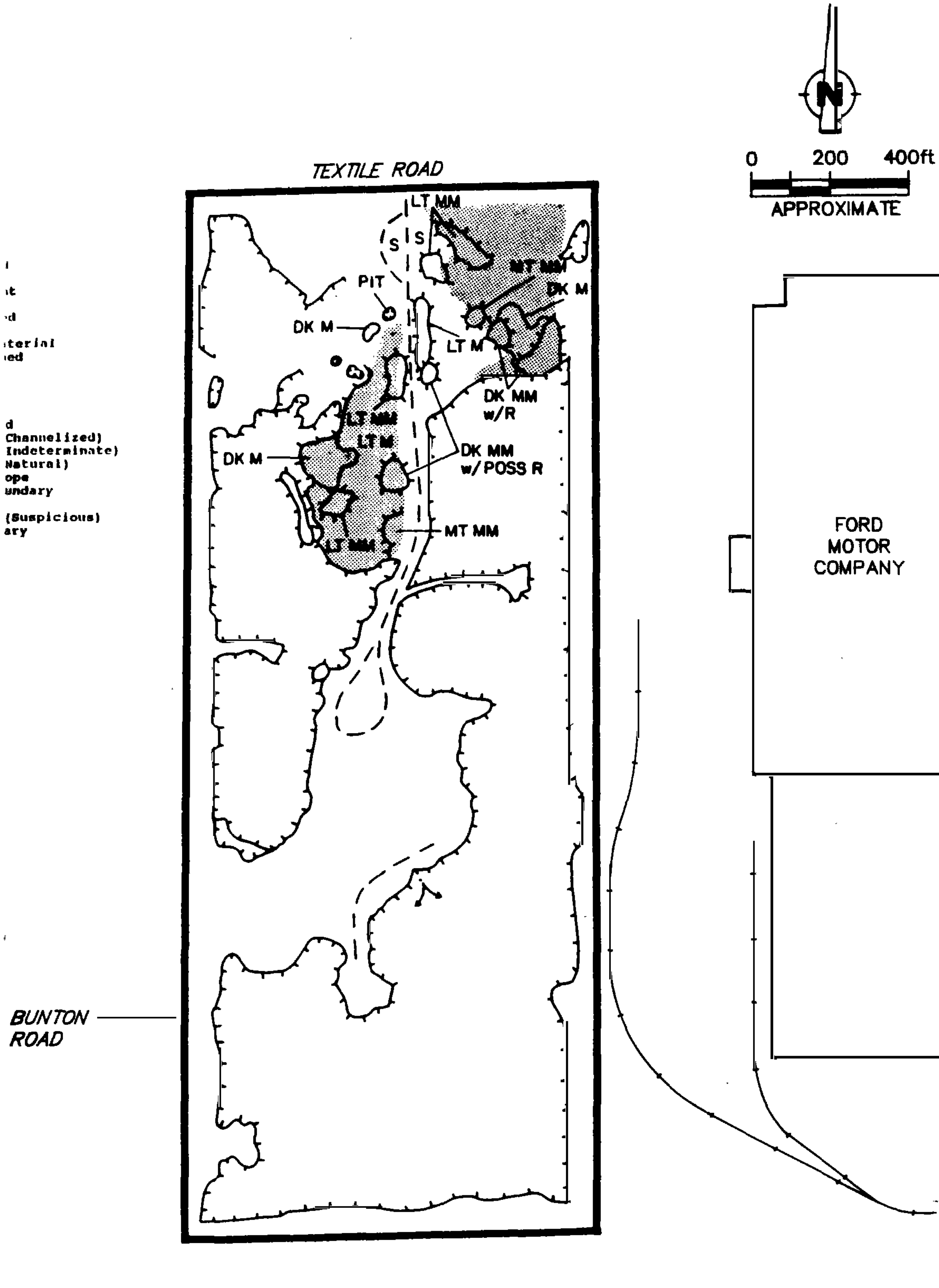
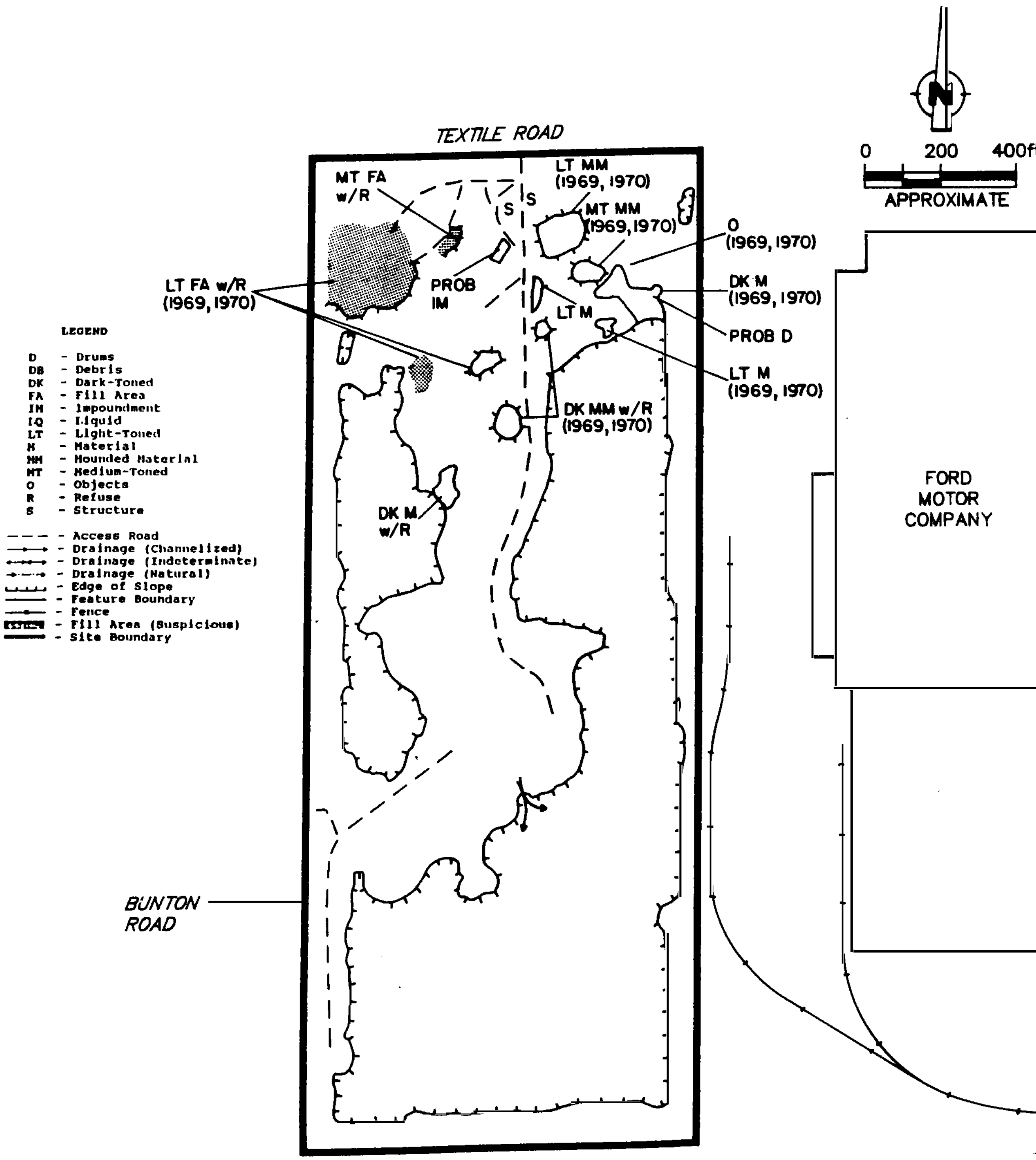
4770(4)-JUL.8/92-REV.0



USEPA REPORT TS-PIC-91114
NOVEMBER 1991

figure 2.4

SITE CONDITIONS
NOVEMBER 21, 1966
TEXTILE ROAD SITE
Ypsilanti Twp., Washtenaw Cty., Michigan



SOURCE: USEPA REPORT TS-PIC-91114
NOVEMBER 1991

figure 2.5

SITE CONDITIONS
JUNE 8, 1970
TEXTILE ROAD SITE
Ypsilanti Twp., Washtenaw Cty., Michigan

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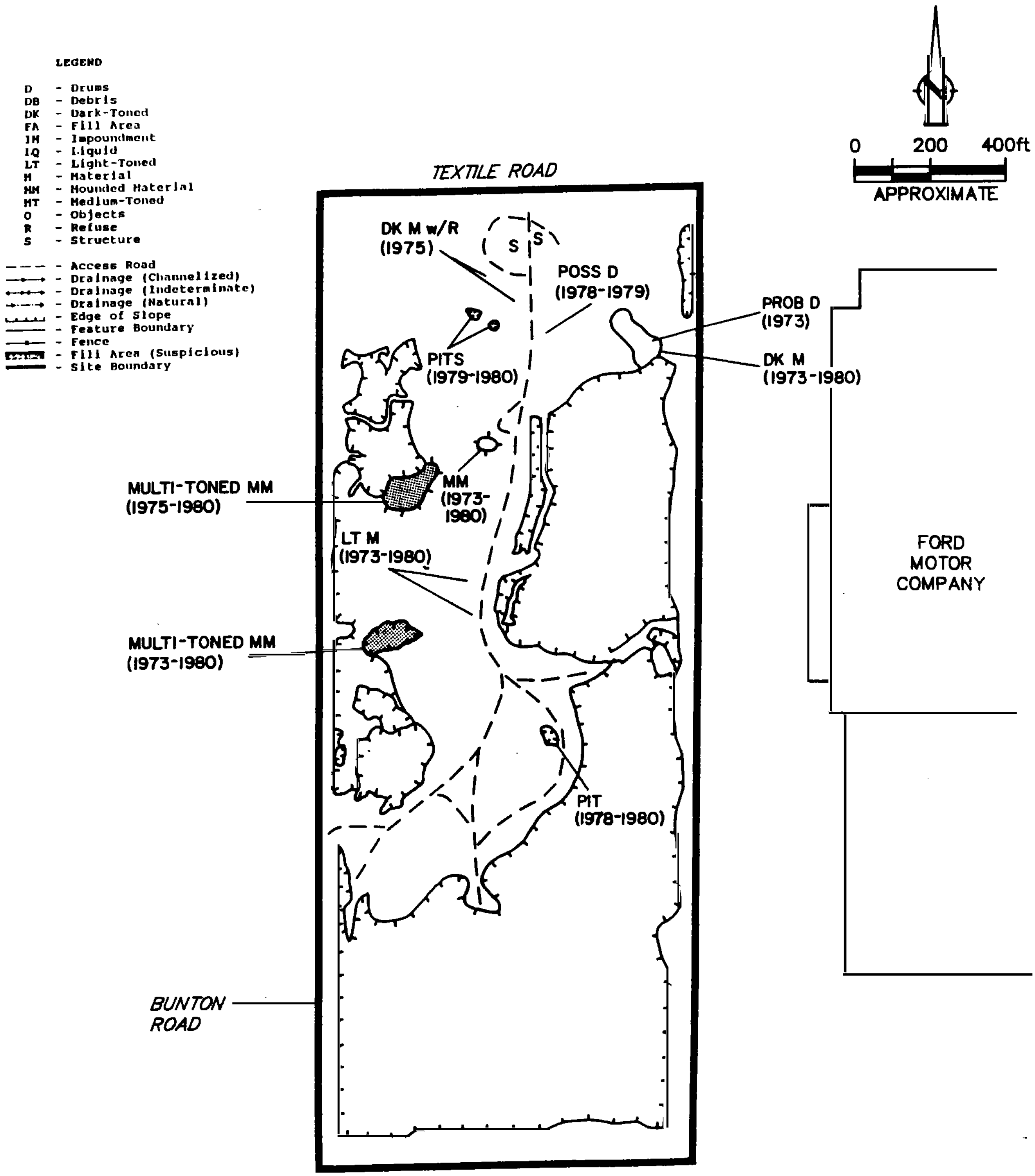
4770(4)-JUL.8/92-REV.0



SOURCE: USEPA REPORT TS-PIC-91114
NOVEMBER 1991

figure 2.6

SITE CONDITIONS
APRIL 18, 1980
TEXTILE ROAD SITE
Ypsilanti Twp., Washtenaw Cty., Michigan

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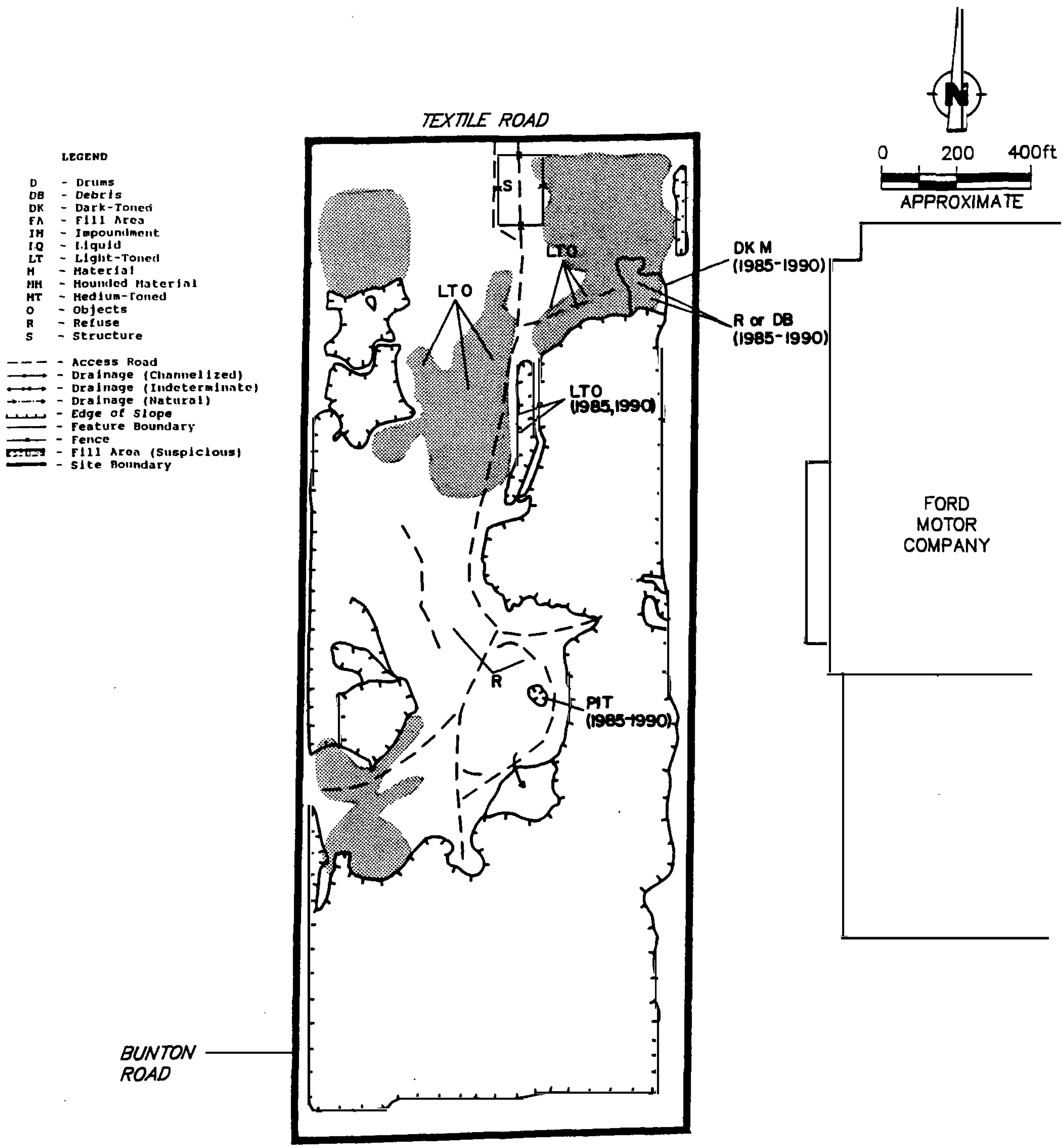
4770(4)–JUL.8/92–REV.0



SOURCE: USEPA REPORT TS-PIC-91114
NOVEMBER 1991

figure 2.7

SITE CONDITIONS
APRIL 8, 1990
TEXTILE ROAD SITE
Ypsilanti Twp., Washtenaw Cty., Michigan

CRA

4770(4)-JUL.8/92-REV.0

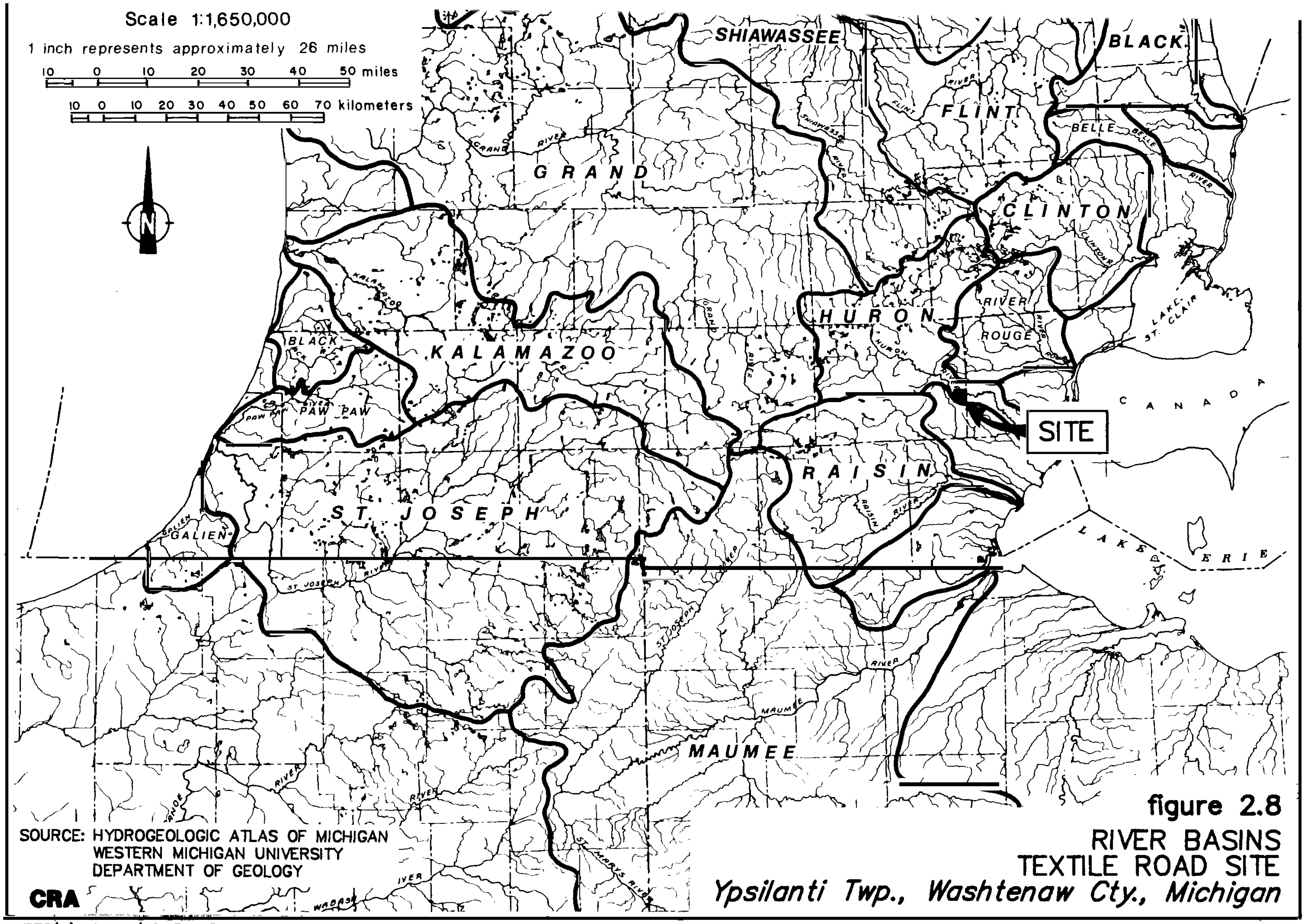
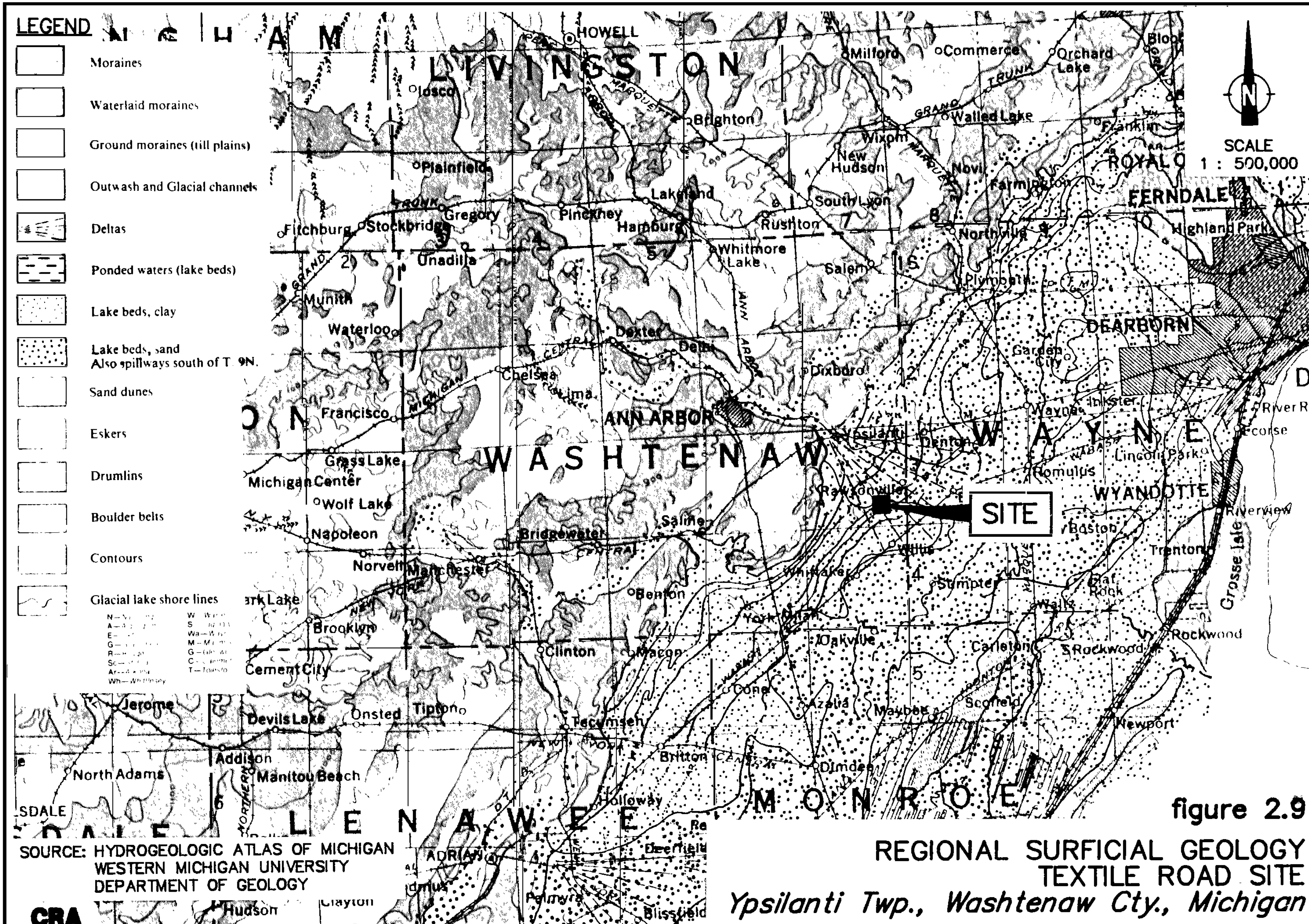


figure 2.8
RIVER BASINS
TEXTILE ROAD SITE
Ypsilanti Twp., Washtenaw Cty., Michigan

SOURCE: HYDROGEOLOGIC ATLAS OF MICHIGAN
WESTERN MICHIGAN UNIVERSITY
DEPARTMENT OF GEOLOGY

CRA

4770(4)-JUL.8/92-REV.0



SOURCE: HYDROGEOLOGIC ATLAS OF MICHIGAN
WESTERN MICHIGAN UNIVERSITY
DEPARTMENT OF GEOLOGY

CRA

figure 2.9

REGIONAL SURFICIAL GEOLOGY
TEXTILE ROAD SITE
Ypsilanti Twp., Washtenaw Cty., Michigan

4770(4)–JUL.8/92–REV.0

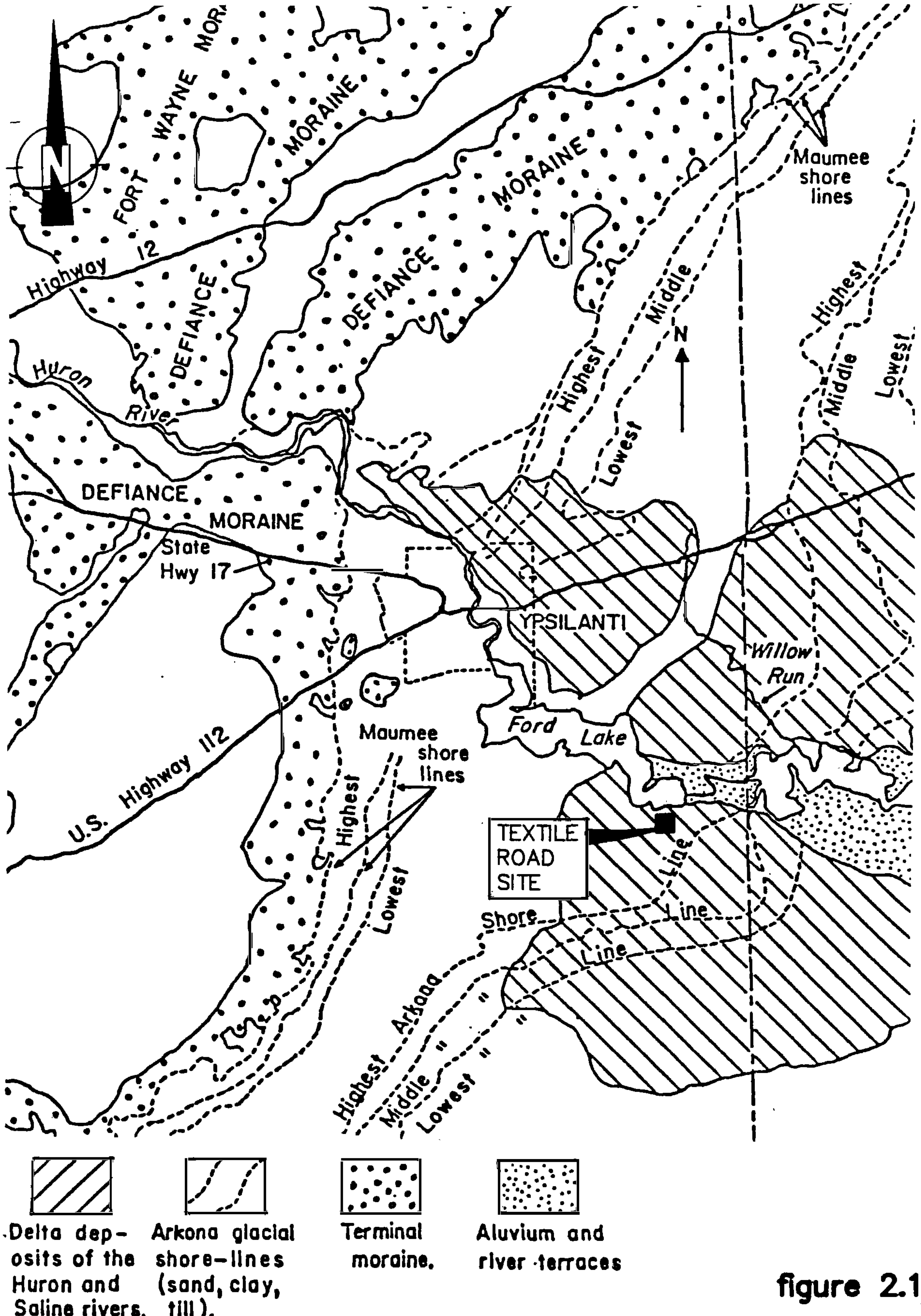


figure 2.10

LOCAL SURFICIAL GEOLOGY
TEXTILE ROAD SITE
Ypsilanti Twp., Washtenaw Cty., Michigan

Source for map: McGuiness, 1949

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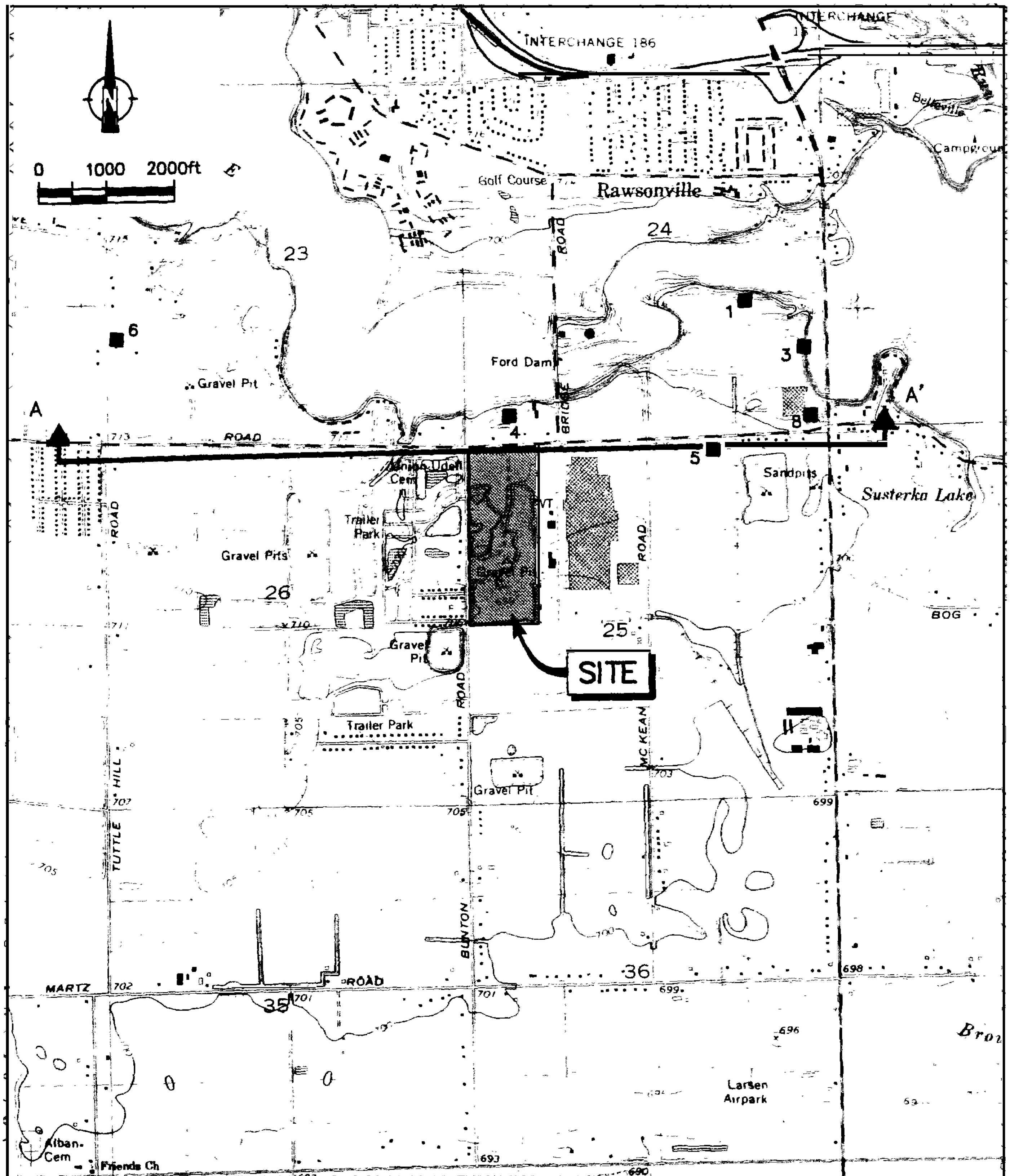
4770(4)–JUL.8/92–REV.0



SOURCE: USGS QUADRANGLE MAP,
YPSILANTI EAST, MICHIGAN

LEGEND

1 ■ WELL LOCATION

A ▲ CROSS-SECTION LOCATION

figure 2.11

WELL LOCATION PLAN
TEXTILE ROAD SITE
Ypsilanti Twp., Washtenaw Cty., Michigan

4770(4)-JUL.8/92-REV.0

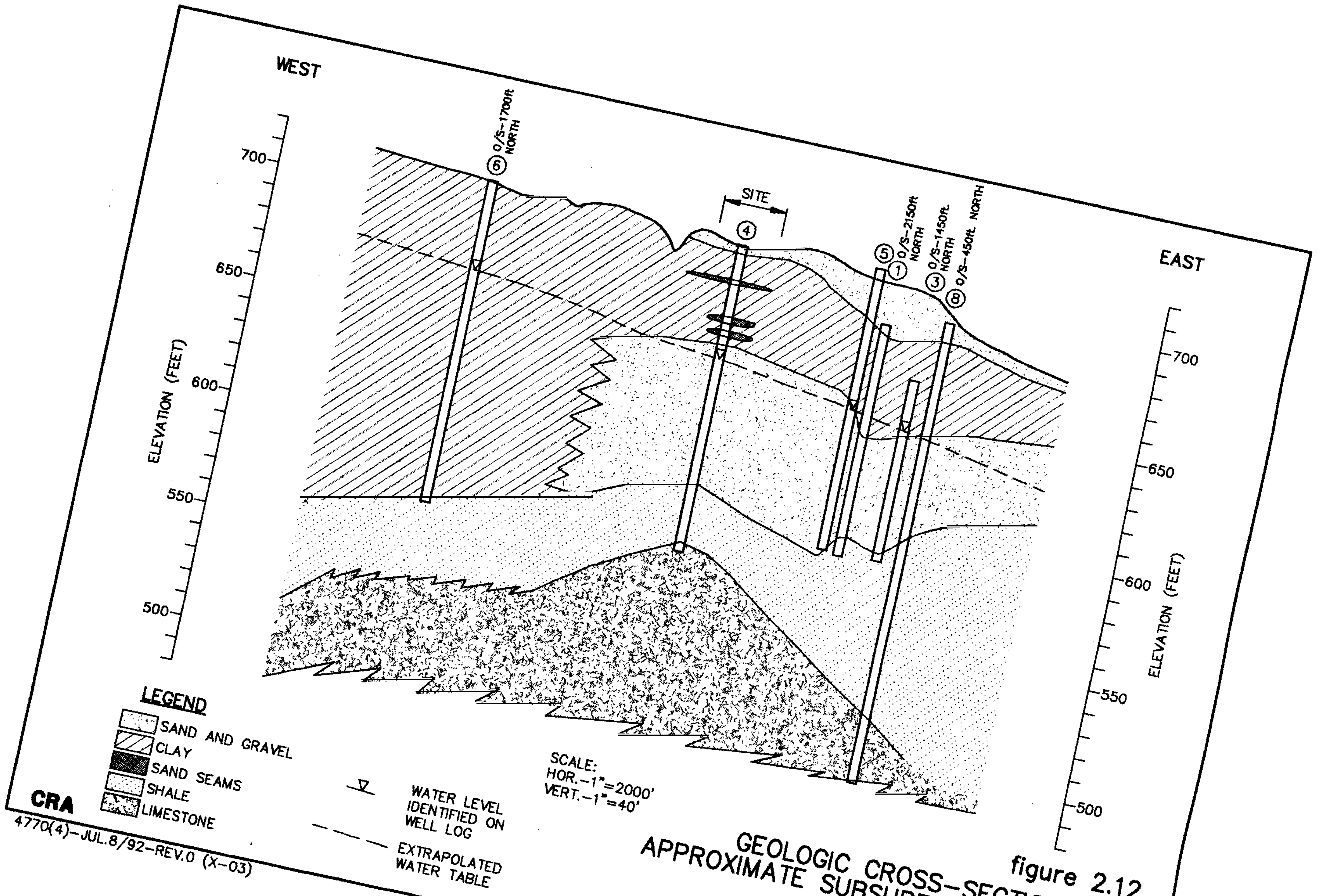
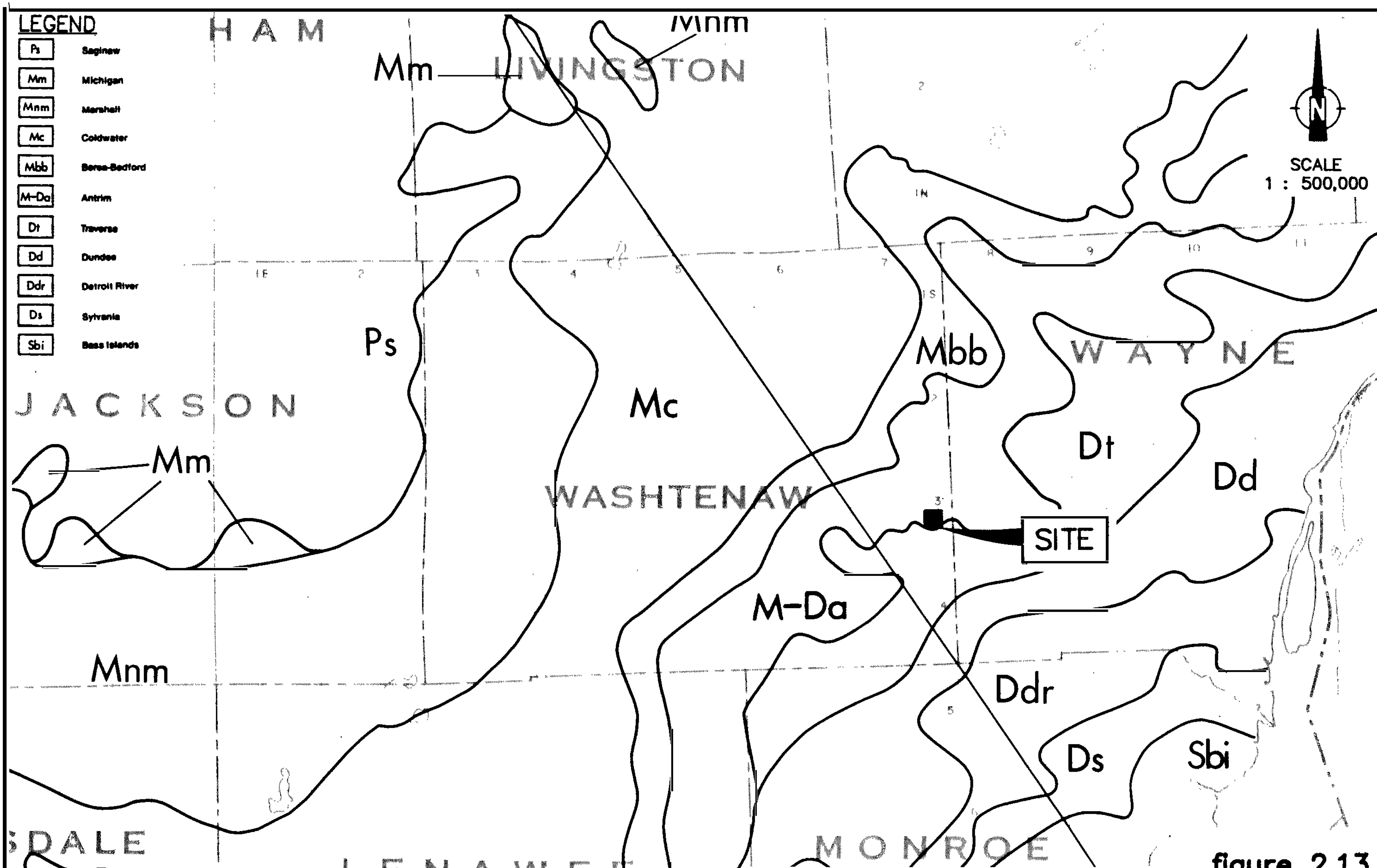


figure 2.12
GEOLOGIC CROSS-SECTION A-A'
APPROXIMATE SUBSURFACE CONDITIONS
BASED ON WELL LOGS
TEXTILE ROAD SITE
Ypsilanti Twp., Washtenaw Cty., Michigan



SOURCE: HYDROGEOLOGIC ATLAS OF MICHIGAN
WESTERN MICHIGAN UNIVERSITY
DEPARTMENT OF GEOLOGY

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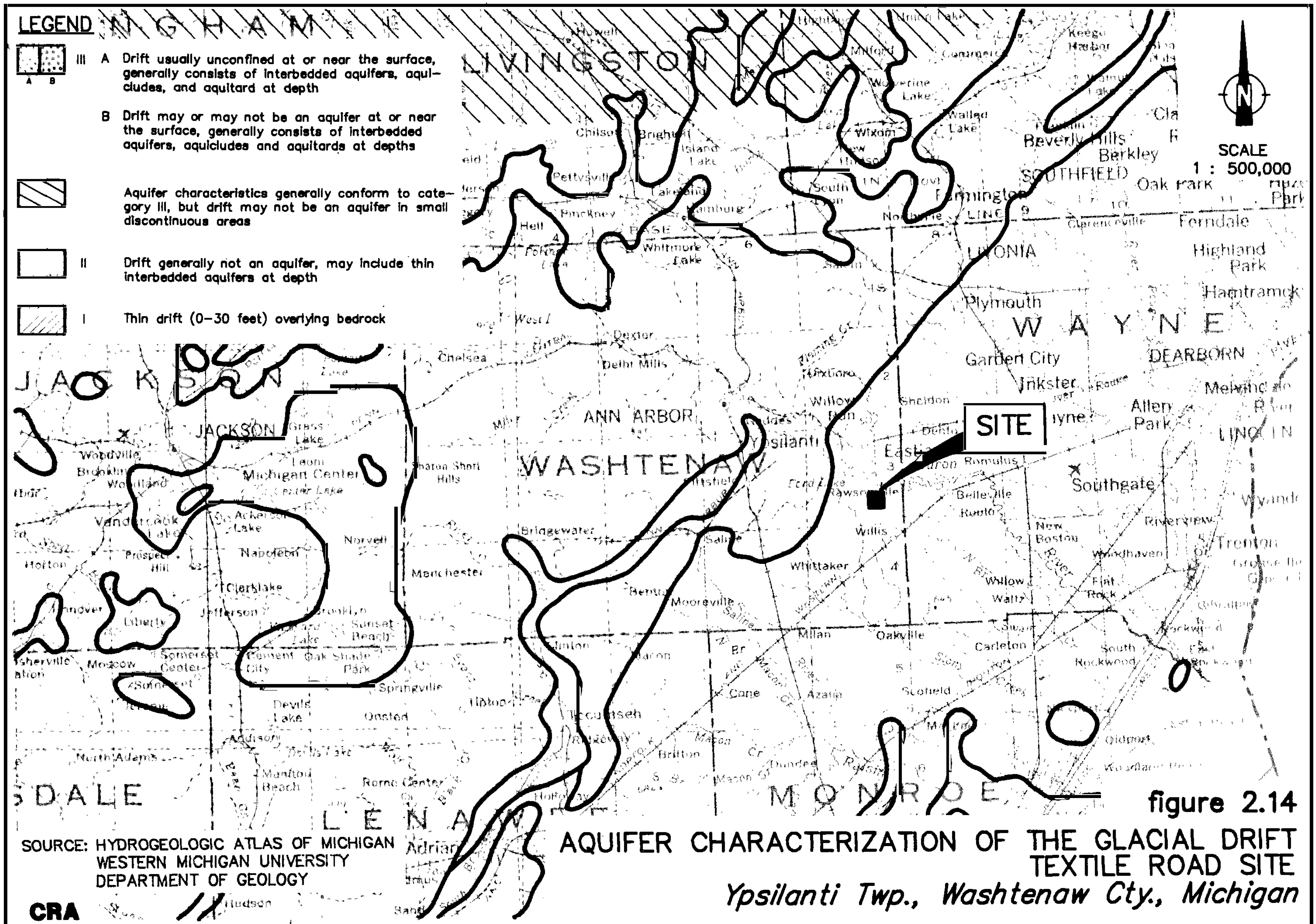
figure 2.13
REGIONAL BEDROCK GEOLOGY
TEXTILE ROAD SITE
Ypsilanti Twp., Washtenaw Cty., Michigan

4770(4)-JUL.8/92-REV.0



SOURCE: HYDROGEOLOGIC ATLAS OF MICHIGAN
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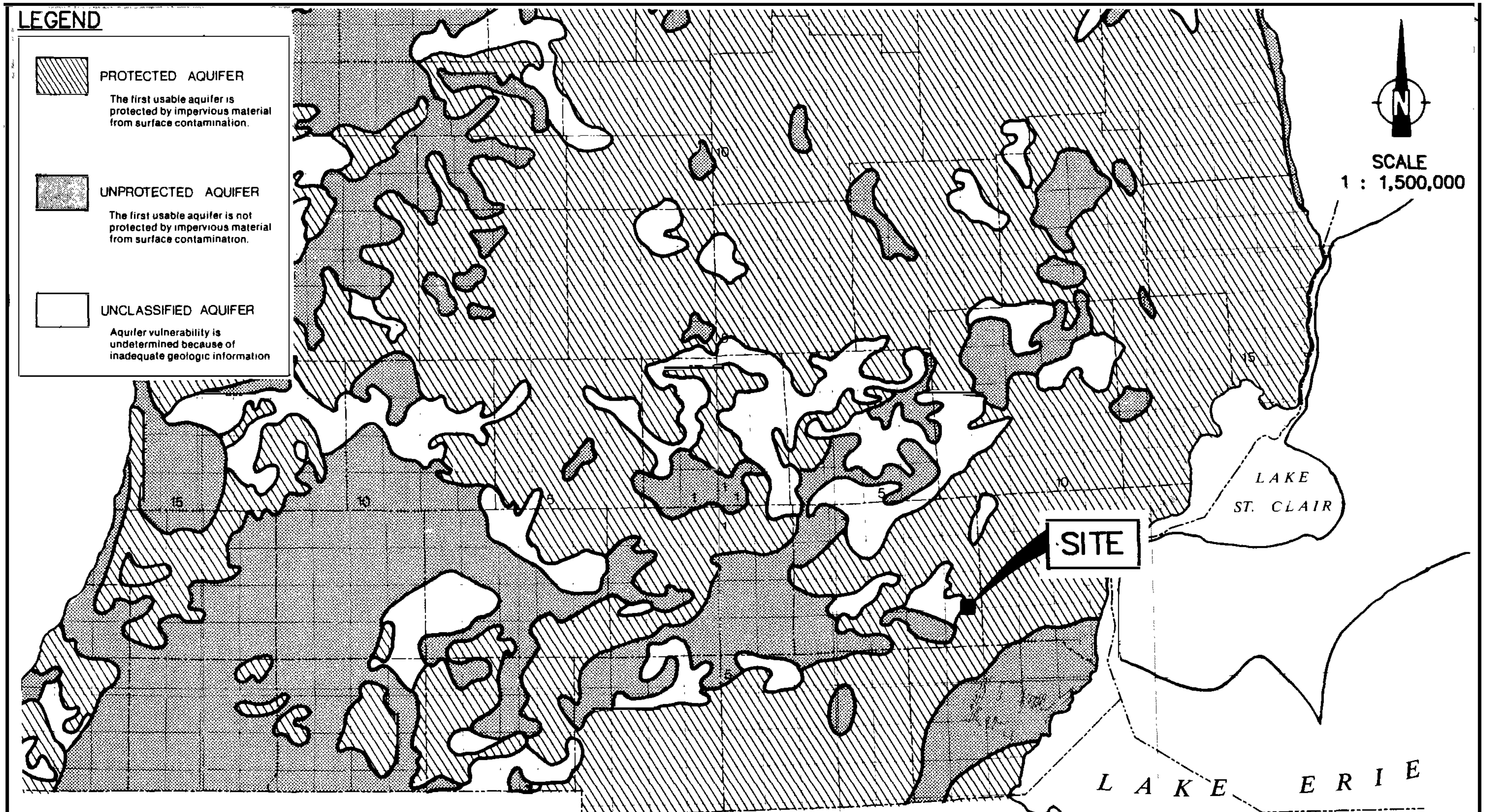
figure 2.14

AQUIFER CHARACTERIZATION OF THE GLACIAL DRIFT
TEXTILE ROAD SITE
Ypsilanti Twp., Washtenaw Cty., Michigan

4770(4)–JUL.8/92–REV.0



Scale 1:1,500,000

1 inch represents approximately 24 miles

25 0 25 50 miles

10 0 10 20 30 40 50 kilometers

SOURCE: HYDROGEOLOGIC ATLAS OF MICHIGAN
WESTERN MICHIGAN UNIVERSITY
DEPARTMENT OF GEOLOGY

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figure 2.15

AQUIFER VULNERABILITY TO SURFACE CONTAMINATION
TEXTILE ROAD SITE
Ypsilanti Twp., Washtenaw Cty., Michigan

4770(4)–JUL.8/92–REV.0

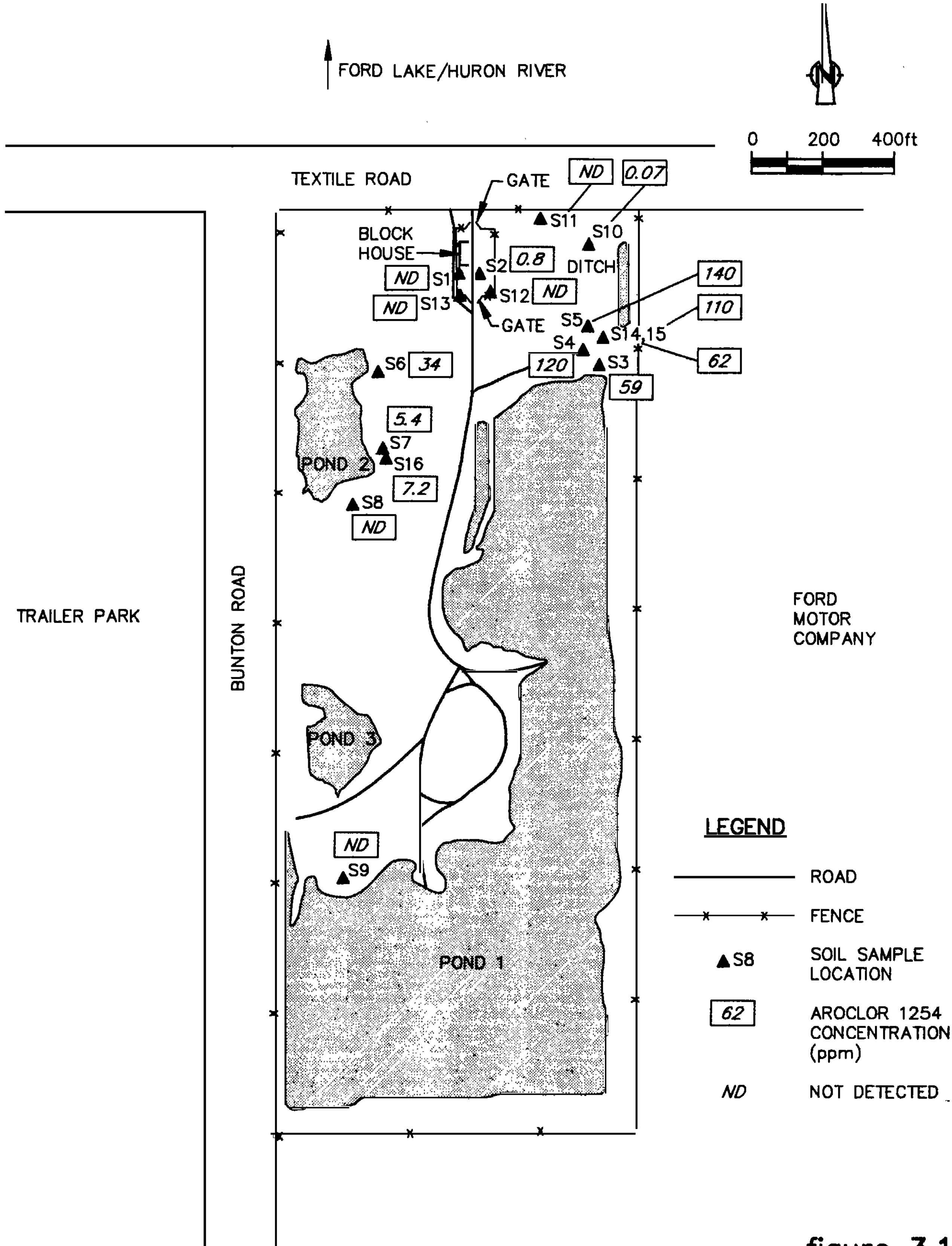


figure 3.1

1990 FIT SOIL SAMPLING LOCATIONS
TEXTILE ROAD SITE
Ypsilanti Twp., Washtenaw Cty., Michigan

CRA

4770(4)–JUL.8/92–REV.0 (P–28)

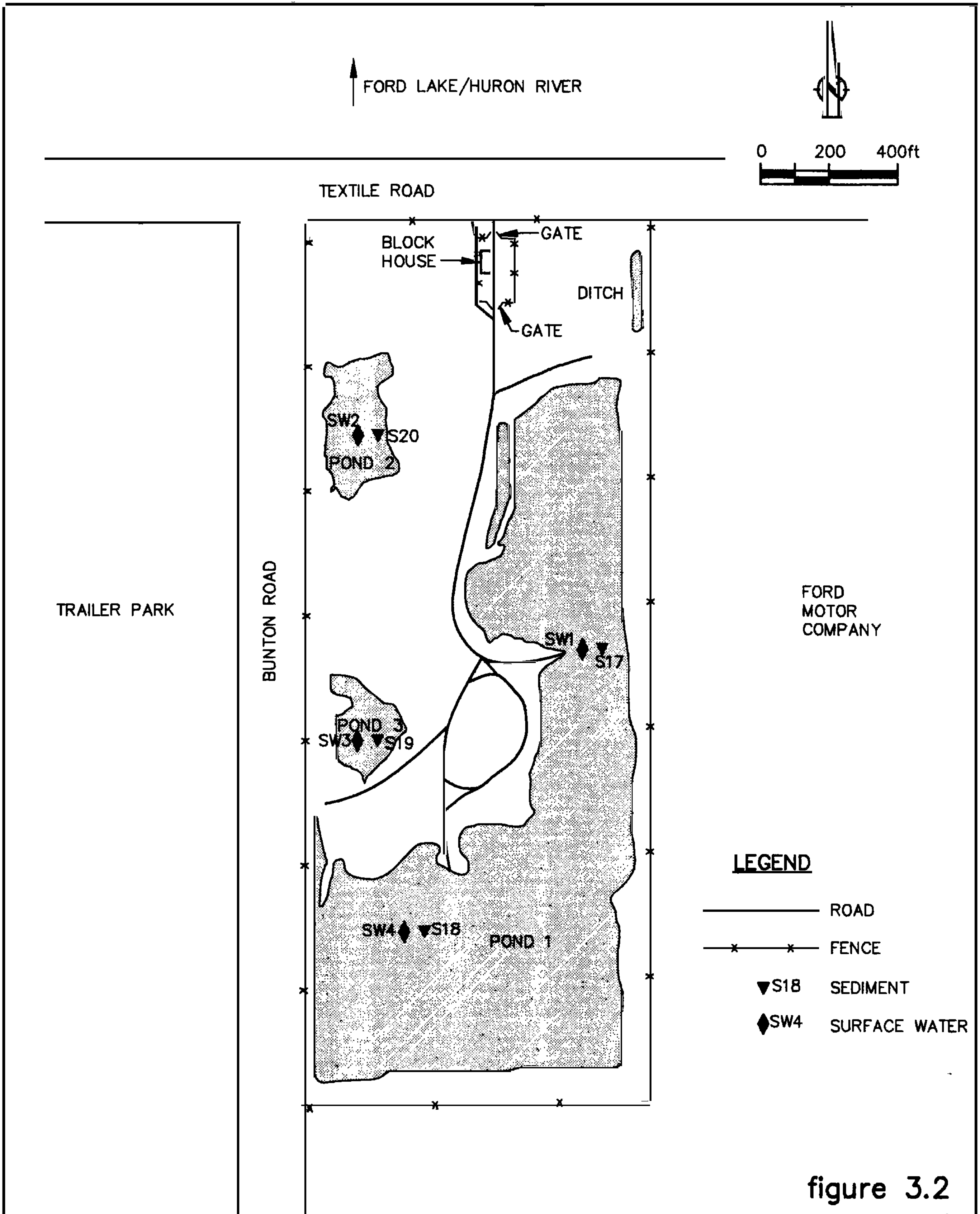


figure 3.2

1990 FIT SURFACE WATER/
SEDIMENT SAMPLING LOCATIONS
TEXTILE ROAD SITE
Ypsilanti Twp., Washtenaw Cty., Michigan

CRA

4770(4)-JUL.8/92-REV.0 (P-29)

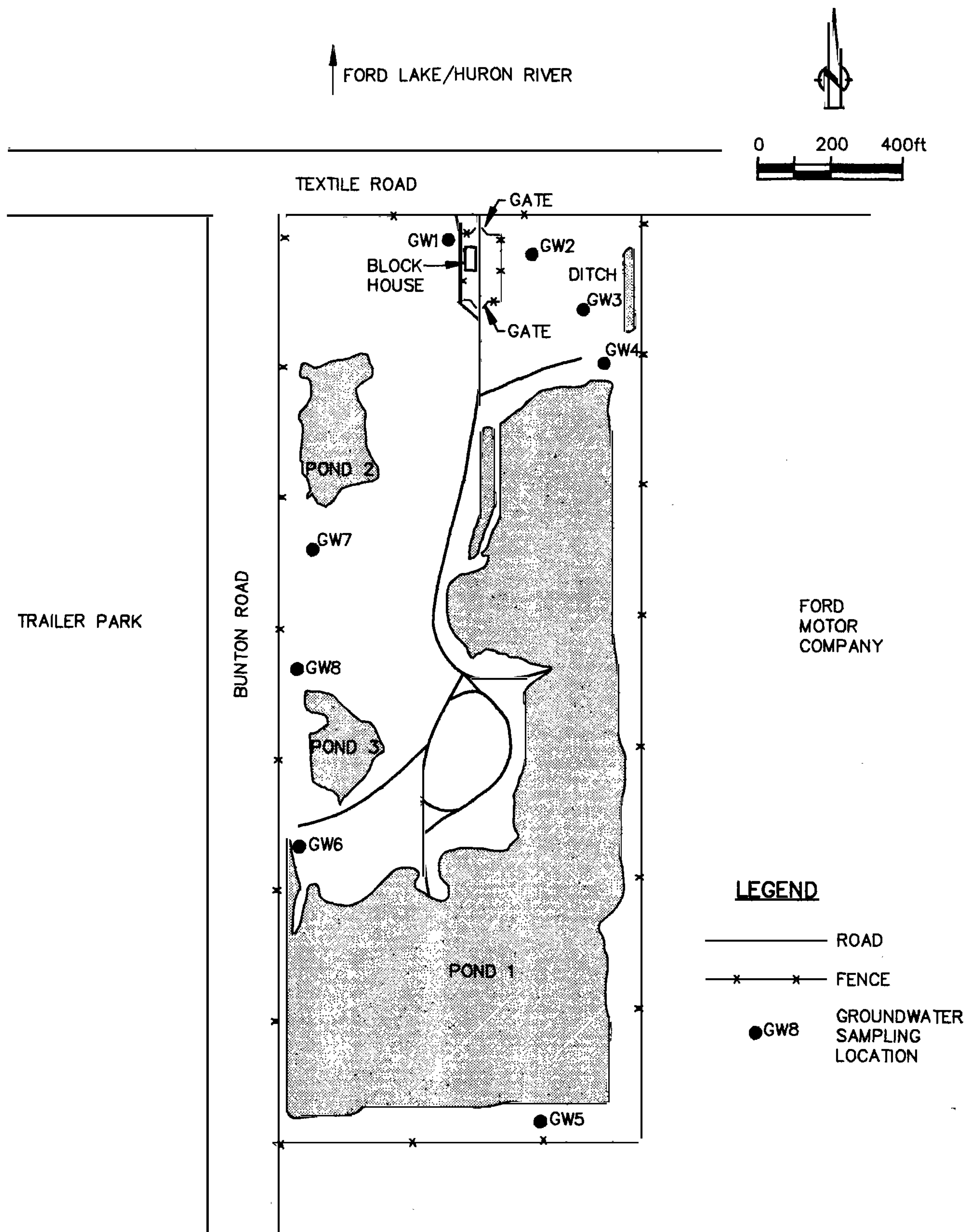
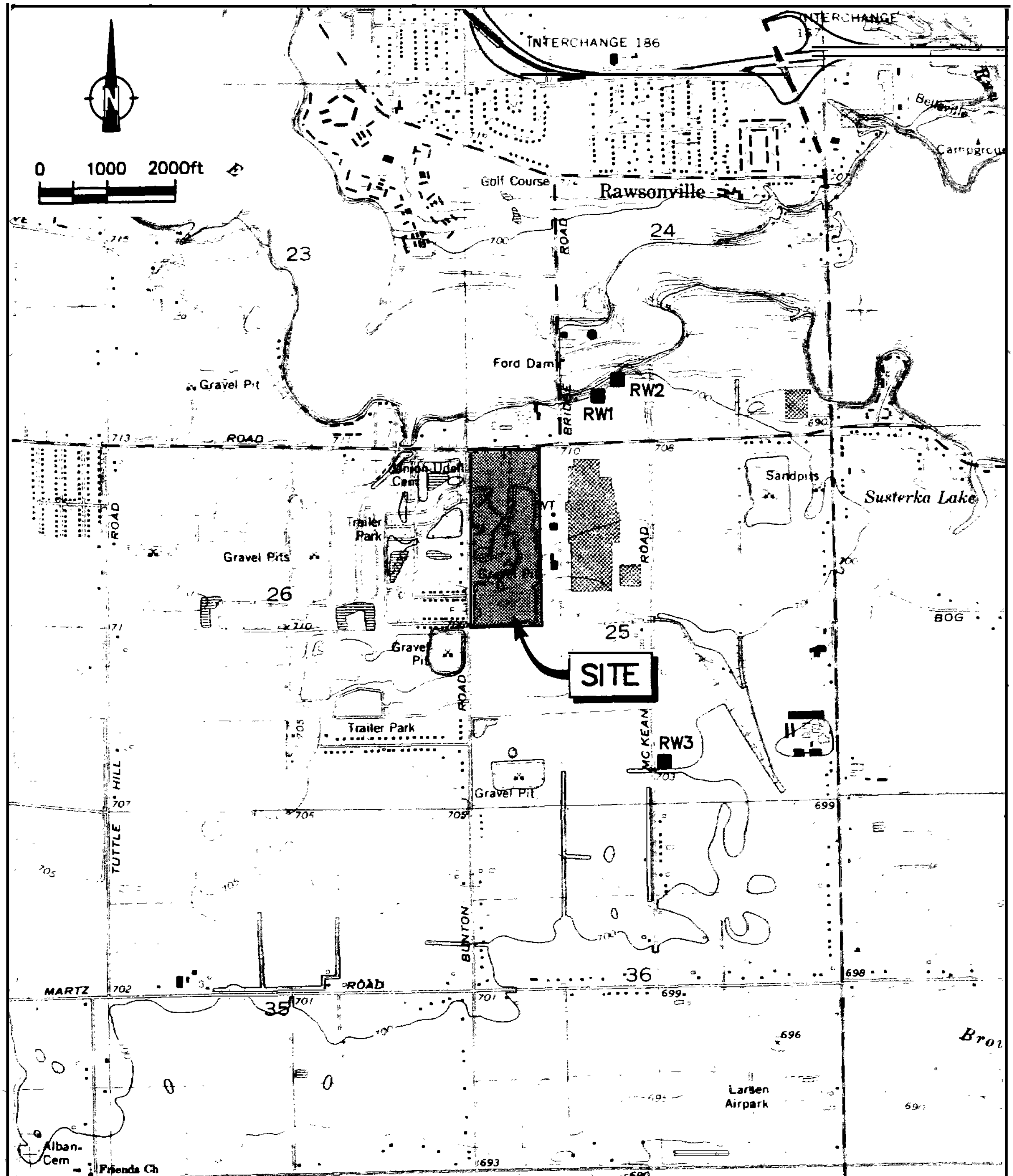


figure 3.3

1990 FIT GROUNDWATER SAMPLING LOCATIONS
TEXTILE ROAD SITE
Ypsilanti Twp., Washtenaw Cty., Michigan

CRA

4770(4)-JUL.8/92-REV.0 (P-30)



SOURCE: USGS QUADRANGLE MAP,
YPSILANTI EAST, MICHIGAN

figure 3.4

LEGEND

RW1 ■ RESIDENTIAL AND MUNICIPAL WELL SAMPLING LOCATION

1990 FIT RESIDENTIAL AND MUNICIPAL WELL SAMPLING LOCATIONS
TEXTILE ROAD SITE
Ypsilanti Twp., Washtenaw Cty., Michigan

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4770(4)-JUL.8/92-REV.0

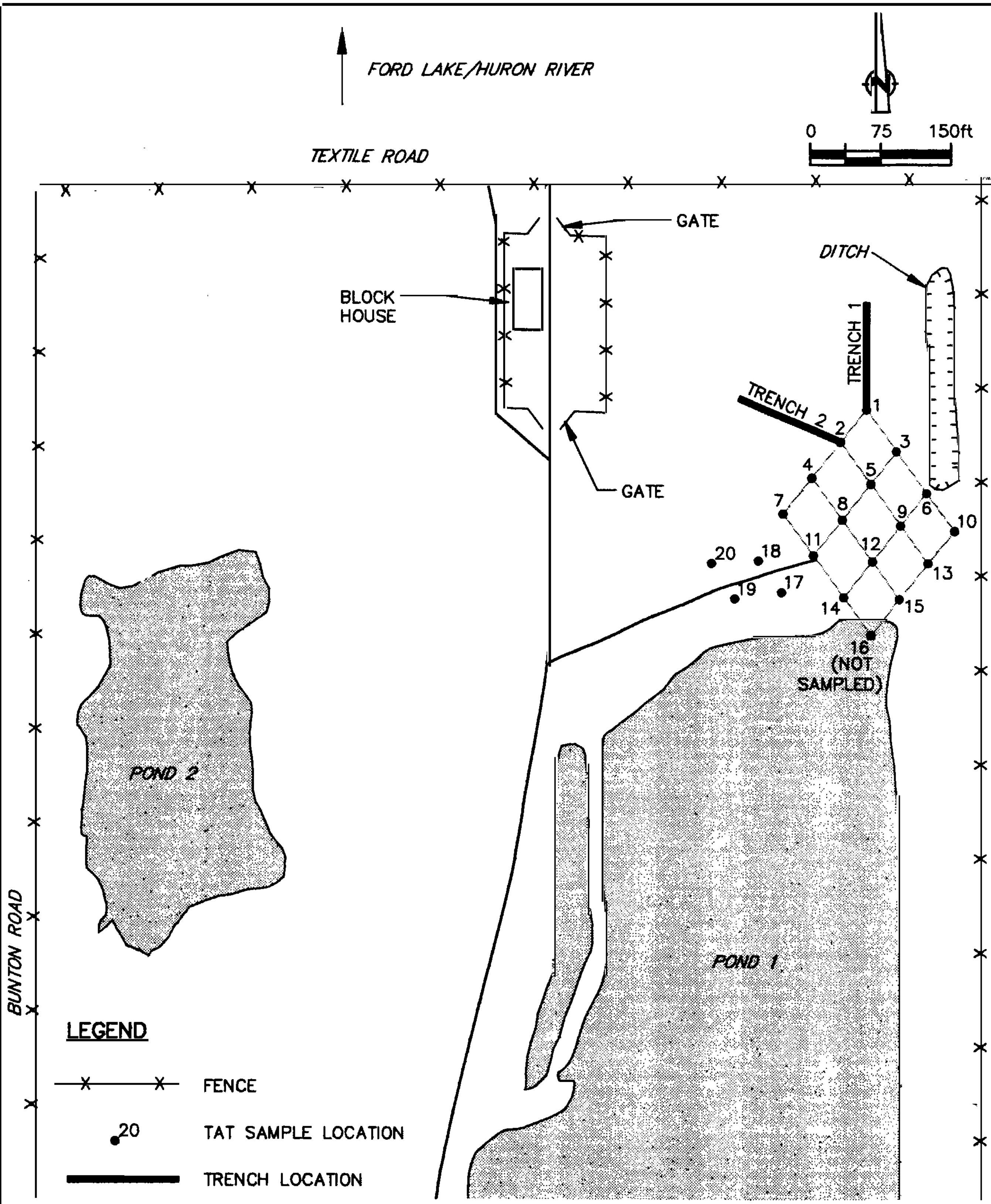
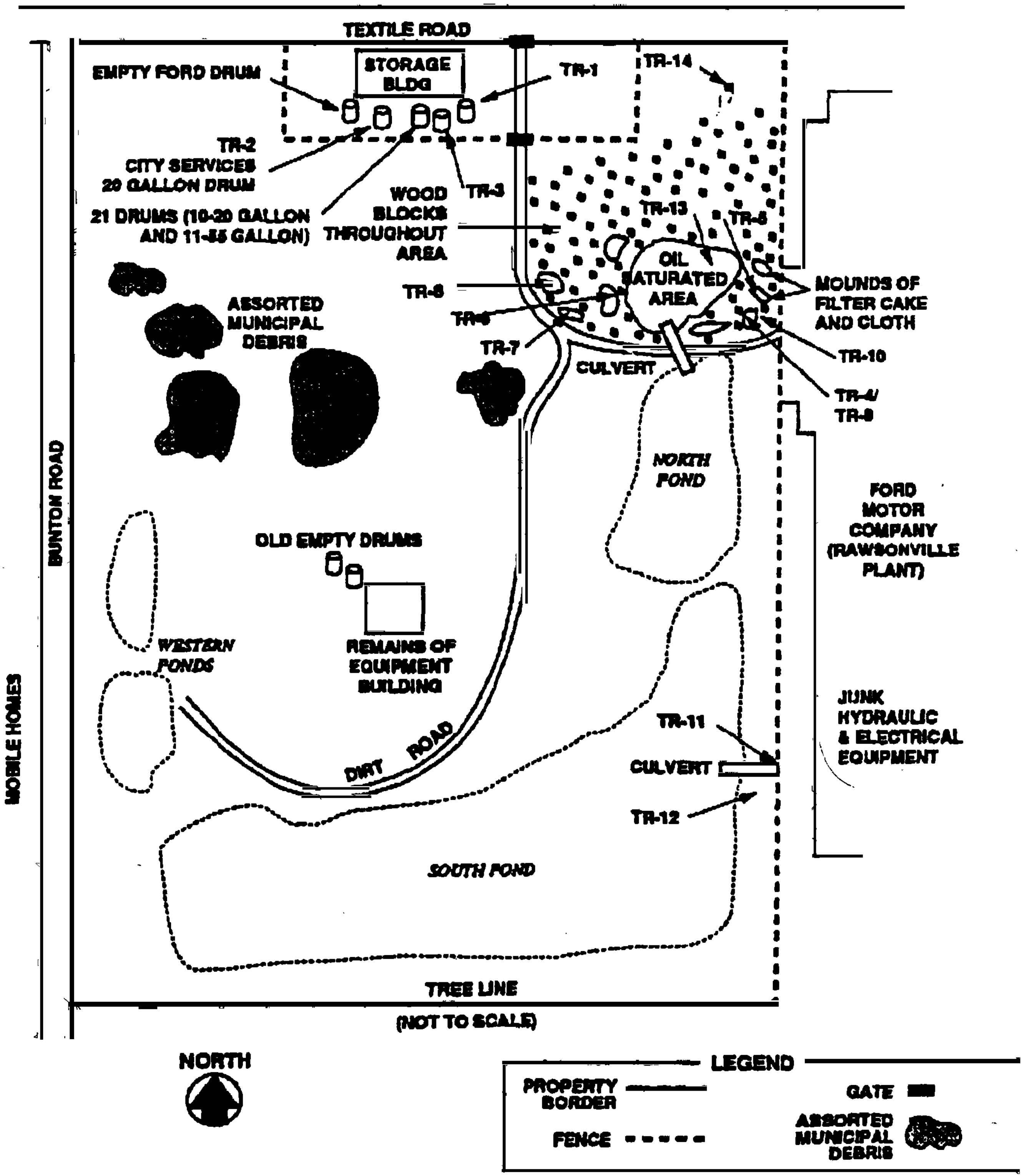


figure 3.5

1989 TAT SAMPLE LOCATION/GRID MAP
TEXTILE ROAD SITE
Ypsilanti Twp., Washtenaw Cty., Michigan

CRA

4770(4)–JUL.8/92–REV.0 (P–31)



SOURCE: REPRODUCED FROM VERSAR REPORT

figure 3.6
1989 VERSAR SAMPLE LOCATIONS
TEXTILE ROAD SITE
Ypsilanti Twp., Washtenaw Cty., Michigan

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4770(4)–JUL.8/92–REV.0

TABLE 3.1

SUMMARY OF ANALYTICAL RESULTS
MDNR SAMPLING
TEXTILE ROAD SITE
YPSILANTI, MICHIGAN

Date	*Medium*	*Parameter*	*Concentration (ppm)*
April 12, 1983	Drum	PCB	8.1
	Drum	PCB	61.0
	Drum	PCB	210
	Soil (surface)	PCB	500
	Soil (surface)	PCB	160
June 8, 1983	Fish Tissue (5 samples)	PCB	ND (0.1)
	Fish Tissue (5 samples)	Pesticides	ND (0.01)
	Pond Sediment	PCB	1.1
	Pond Sediment	PCB	8.3
	Pond Sediment	DDD	0.048
	Pond Sediment	DDD	0.110
	Pond Sediment	DDE	0.070
	Pond Sediment	DDE	0.051
June 29, 1983	Soil (surface)	PCB	14.0
	Soil (surface)	PCB	360.0
	Soil (surface)	PCB	1.3
	Soil (2.5 ft)	PCB	6.1
	Soil (8 ft) @ water table	PCB	22.0
	Pond Sediment	PCB	100.0
	Pond Water	PCB	ND (0.0002)
	Black Material	PCB	4.5
	Black Waste	PCB	28.0
	Wood Block	PCB	11.0
March 20, 1986	Drum	PCB	32
	Drum	PCB	43
	Drum	PCB	17
	Soil	PCB	230

TABLE 3.2

RESULTS OF CHEMICAL ANALYSIS OF
FIT-COLLECTED SOIL (FILL) SAMPLES
TEXTILE ROAD SITE
YPSILANTI, MICHIGAN

Sample Number	*S1*	*S2*	*S3*	*S4*	*S5*	*S6*	*S7*	*S8*
Date	*12/11/90*	*12/11/90*	*12/11/90*	*12/11/90*	*12/11/90*	*12/11/90*	*12/11/90*	*12/11/90*
Time	*935*	*930*	*1005*	*1005*	*1005*	*1100*	*1105*	*1110*
CLP Organic Traffic Report Number	*EMK74*	*EMK75*	*EMK76*	*EMK77*	*EMK78*	*EMK79*	*EMK80*	*EMK81*
CLP Inorganic Traffic Report Number	*MEMQ54*	*MEMQ55*	*MEMQ56*	*MEMQ57*	*MEMQ58*	*MEMQ59*	*MEMQ60*	*MEMQ61*
Parameter								
Volatile Organics (ug/kg)								
methylene chloride	--	--	2J	--	4J	--	2J	--
acetone	--	--	--	--	--	--	--	--
carbon disulfide	--	--	--	--	--	--	--	--
2-butanone	--	--	--	--	--	--	--	--
benzene	--	--	--	--	--	1J	--	--
toluene	1J	4J	3J	3J	12J	8J	--	--
ethylbenzene	--	--	--	--	--	--	--	--
styrene	--	--	--	--	--	--	--	--
xylenes (total)	--	2J	2J	--	--	4J	--	--
Semi-volatile Organics (ug/kg)								
phenol	--	71J	--	--	--	--	--	--
2-methylnaphthalene	--	--	1,500J	--	--	--	--	--
pentachlorophenol	16,000J	--	--	--	--	--	--	--
phenanthrene	--	240J	--	--	--	--	--	2,100J
anthracene	--	--	--	--	1,500J	--	--	--
fluoranthene	--	230J	--	--	--	--	--	2,800J
pyrene	--	470	--	--	--	--	--	2,700J
butylbenzylphthalate	--	--	--	--	--	--	--	--
benzo(a)anthracene	--	180J	--	--	--	--	--	1,400J
chrysene	--	240J	--	--	--	--	--	1,900J
bis(2-ethylhexyl)phthalate	--	--	3,600J	--	--	--	--	--
benzo(b)fluoranthene	--	210J	--	--	--	--	--	7,100J
benzo(k)fluoranthene	--	190J	--	--	--	--	--	3,100J
benzo(a)pyrene	--	360J	--	--	--	--	--	8,300J
indeno(1,2,3-cd)pyrene	--	210J	--	--	--	--	--	7,800J
dibenzo(a,h)anthracene	--	81J	--	--	--	--	--	2,000J
benzo(g,h,i)perylene	--	190J	--	--	--	--	--	5,600J

TABLE 3.2

RESULTS OF CHEMICAL ANALYSIS OF
FIT-COLLECTED SOIL (FILL) SAMPLES
TEXTILE ROAD SITE
YPSILANTI, MICHIGAN

Sample Number	*S1*	*S2*	*S3*	*S4*	*S5*	*S6*	*S7*	*S8*
Date	*12/11/90*	*12/11/90*	*12/11/90*	*12/11/90*	*12/11/90*	*12/11/90*	*12/11/90*	*12/11/90*
Time	*935*	*930*	*1005*	*1005*	*1005*	*1100*	*1105*	*1110*
CLP Organic Traffic Report Number	*EMK74*	*EMK75*	*EMK76*	*EMK77*	*EMK78*	*EMK79*	*EMK80*	*EMK81*
CLP Inorganic Traffic Report Number	*MEMQ54*	*MEMQ55*	*MEMQ56*	*MEMQ57*	*MEMQ58*	*MEMQ59*	*MEMQ60*	*MEMQ61*
Pesticides/PCBs (ug/kg)								
beta BHC	--	--	--	--	--	--	--	13P
gamma BHC (Lindane)	--	--	--	--	--	--	--	--
Heptachlor epoxide	--	--	--	--	--	--	--	--
Endosulfan I	--	--	--	--	--	--	--	--
Dieldrin	--	--	--	--	--	--	--	--
4,4'-DDE	4.5JP	--	--	--	--	--	--	--
Endrin	24J	--	--	--	--	--	--	--
Endosulfan sulfate	--	--	--	--	--	--	--	--
4,4'-DDT	--	--	--	--	--	--	--	--
Methoxychlor (Mariate)	--	--	--	--	--	--	--	NL
Endrin ketone	9.0JP	--	--	--	--	--	--	NL
Aroclor 1254	--	800	59,000	120,000	140,000	34,000	5,400	--
Endrin aldehyde	54	--	--	--	--	--	--	160P

TABLE 3.2

RESULTS OF CHEMICAL ANALYSIS OF FIT-COLLECTED SOIL (FILL) SAMPLES TEXTILE ROAD SITE YPSILANTI, MICHIGAN

Sample Number	*S1*	*S2*	*S3*	*S4*	*S5*	*S6*	*S7*	*S8*
Date	*12/11/90*	*12/11/90*	*12/11/90*	*12/11/90*	*12/11/90*	*12/11/90*	*12/11/90*	*12/11/90*
Time	*935*	*930*	*1005*	*1005*	*1005*	*1100*	*1105*	*1110*
CLP Organic Traffic Report Number	*EMK74*	*EMK75*	*EMK76*	*EMK77*	*EMK78*	*EMK79*	*EMK80*	*EMK81*
CLP Inorganic Traffic Report Number	*MEMQ54*	*MEMQ55*	*MEMQ56*	*MEMQ57*	*MEMQ58*	*MEMQ59*	*MEMQ60*	*MEMQ61*
Inorganics (mg/kg)								
aluminum	2,110AEJ	3,110AEJ	11,100AEJ	10,500AEJ	18,400AEJ	123,000AEJ	28,600AEJ	6,180AEJ
antimony	--	--	--	19.7N	--	10.88N	10BN	--
arsenic	4.6	5.6	25	37.7J	32.8	21.6	31.3	8.7
barium	267NAJ	350NAJ	201NAJ	1,130NAJ	319NAJ	23.7BNAJ	24.9BNAJ	10,100NAJ
beryllium	--	--	1.3B	--	0.59B	--	--	--
cadmium	--	--	--	--	--	--	--	5.5
calcium	88,500AJ	28,100AJ	3,940AJ	2,440AJ	2,260AJ	800BAJ	6,350AJ	24,200AJ
chromium	8.5AJ	43.3AJ	314AJ	1,030AJ	531AJ	478AJ	289AJ	298AJ
cobalt	2.2B	3.4B	12.4B	89.9	23.3	31.1	26.1	14.3
copper	17.7	29.5	946	2950	829	13400	699	22.3
iron	6,280AEJ	14,200AEJ	81,800AEJ	388,000AEJ	158,000AEJ	300,000AEJ	247,000AEJ	14,300AEJ
lead	59.2	40.8	148	644	400	2,990	80.6	120
magnesium	46,700AJ	7,940AJ	1,610AJ	608BAJ	831BAJ	132BAJ	2,760AJ	9,880AJ
manganese	193NEJ	241NEJ	504NEJ	2,830NEJ	1,310NEJ	2,460NEJ	3,110NEJ	296NEJ
nickel	4.6B	14.3	76.4	282	120	362	177	15.2
potassium	389B	456B	399B	136B	284B	53.9B	324B	959B
selenium	--	--	--	--	--	--	--	0.79BEJ
sodium	72.8BJ	99.1B	142B	84.9BJ	134B	73.2BJ	80.5BJ	76.4BJ
thallium	8	--	--	--	--	--	--	--
vanadium	6B	6.2B	2B	--	2.9B	--	--	13.2
zinc	105NAEJ	47.3NAEJ	88.2NAEJ	141NAEJ	132NAEJ	1,540NAEJ	101NAEJ	450NAEJ
cyanide	--	--	--	--	--	--	--	2.6

Notes:

--	not detected
J	indicates an estimated value
E	indicates non-detection or semiquantitative
NL	indicates not legible on document provided
A	duplicate value outside QC protocols which indicates a possible matrix problem
N	indicates value may be quantitative or semi-quantitative
B	indicates value may be quantitative or semi-quantitative
W	indicates value is semiquantitative

TABLE 3.2

RESULTS OF CHEMICAL ANALYSIS OF
FIT-COLLECTED SOIL (FILL) SAMPLES
TEXTILE ROAD SITE
YPSILANTI, MICHIGAN

Sample Number	*S9*	*S10*	*S11*	*S12*	*S13*	*S14*	*S15*	*S16*
Date	*12/11/90*	*12/11/90*	*12/11/90*	*12/11/90*	*12/11/90*	*12/11/90*	*12/11/90*	*12/11/90*
Time	*1150*	*1405*	*1450*	*1440*	*1445*	*1540*	*1600*	*1630*
CLP Organic Traffic Report Number	*EMK82*	*EMK83*	*EMK84*	*EMK85*	*EMK86*	*EMK87*	*EMK88*	*EMK89*
CLP Inorganic Traffic Report Number	*MEMQ62*	*MEMQ63*	*MEMQ64*	*MEMQ65*	*MEMQ66*	*MEMQ67*	*MEMQ68*	*MEMQ69*
Parameter								
Volatile Organics (ug/kg)								
methylene chloride	--	--	3J	--	--	--	--	44
acetone	--	--	--	--	--	1,700B	1,600	970E
carbon disulfide	--	--	--	--	--	--	14	24
2-butanone	--	--	--	--	--	580BJ	170	210
benzene	--	--	--	--	--	--	28	75
toluene	7J	--	2J	--	--	--	63	29
ethylbenzene	2J	--	--	--	--	--	11J	7J
styrene	130	--	--	--	--	--	7J	--
xylenes (total)	2J	--	--	--	--	--	26	19
Semi-volatile Organics (ug/kg)								
phenol	--	--	--	--	--	--	--	--
2-methylnaphthalene	--	--	--	--	--	3,000J	--	1,700J
pentachlorophenol	--	--	--	--	--	--	--	--
phenanthrene	--	42J	--	--	--	--	2,300J	--
anthracene	--	--	--	--	--	--	2,500J	--
fluoranthene	--	93J	--	--	--	--	--	--
pyrene	--	71J	--	--	--	--	--	--
butylbenzylphthalate	--	71J	--	--	--	--	--	--
benzo(a)anthracene	--	--	--	--	--	--	--	--
chrysene	--	58J	--	--	--	--	--	--
bis(2-ethylhexyl)phthalate	--	89J	120J	--	38J	--	3,500J	--
benzo(b)fluoranthene	--	87J	--	--	--	--	--	--
benzo(k)fluoranthene	--	44J	--	--	--	--	--	--
benzo(a)pyrene	--	45J	--	--	--	--	--	--
indeno(1,2,3-cd)pyrene	--	44J	--	--	--	--	--	--
dibenzo(a,h)anthracene	--	--	--	--	--	--	--	--
benzo(g,h,i)perylene	--	51J	--	--	--	--	--	--

TABLE 3.2

RESULTS OF CHEMICAL ANALYSIS OF
FIT-COLLECTED SOIL (FILL) SAMPLES
TEXTILE ROAD SITE
YPSILANTI, MICHIGAN

Sample Number	*S9*	*S10*	*S11*	*S12*	*S13*	*S14*	*S15*	*S16*
Date	*12/11/90*	*12/11/90*	*12/11/90*	*12/11/90*	*12/11/90*	*12/11/90*	*12/11/90*	*12/11/90*
Time	*1150*	*1405*	*1450*	*1440*	*1445*	*1540*	*1600*	*1630*
CLP Organic Traffic Report Number	*EMK82*	*EMK83*	*EMK84*	*EMK85*	*EMK86*	*EMK87*	*EMK88*	*EMK89*
CLP Inorganic Traffic Report Number	*MEMQ62*	*MEMQ63*	*MEMQ64*	*MEMQ65*	*MEMQ66*	*MEMQ67*	*MEMQ68*	*MEMQ69*
Pesticides/PCBs (ug/kg)								
beta BHC	--	--	--	--	--	--	--	--
gamma BHC (Lindane)	--	--	--	1.7JP	--	--	--	--
Heptachlor epoxide	--	--	--	0.9J	--	--	--	--
Endosulfan I	0.7JP	--	--	0.3JP	--	--	--	--
Dieldrin	--	--	--	0.6JP	--	--	--	--
4,4'-DDE	1.6JP	--	--	0.3JP	--	--	--	--
Endrin	--	--	--	--	--	--	--	--
Endosulfan sulfate	--	--	0.4JP	--	--	--	--	--
4,4'-DDT	10P	--	0.8JP	0.9JP	--	--	--	--
Methoxychlor (Mariate)	--	--	--	--	--	--	--	--
Endrin ketone	--	--	--	--	--	--	--	--
Aroclor 1254	--	74P	--	--	--	62,000	110,000	7,200
Endrin aldehyde	--	--	--	--	--	--	--	--

TABLE 3.2

RESULTS OF CHEMICAL ANALYSIS OF FIT-COLLECTED SOIL (FILL) SAMPLES TEXTILE ROAD SITE YPSILANTI, MICHIGAN

Sample Number	*S9*	*S10*	*S11*	*S12*	*S13*	*S14*	*S15*	*S16*
Date	*12/11/90*	*12/11/90*	*12/11/90*	*12/11/90*	*12/11/90*	*12/11/90*	*12/11/90*	*12/11/90*
Time	*1150*	*1405*	*1450*	*1440*	*1445*	*1540*	*1600*	*1630*
CLP Organic Traffic Report Number	*EMK82*	*EMK83*	*EMK84*	*EMK85*	*EMK86*	*EMK87*	*EMK88*	*EMK89*
CLP Inorganic Traffic Report Number	*MEMQ62*	*MEMQ63*	*MEMQ64*	*MEMQ65*	*MEMQ66*	*MEMQ67*	*MEMQ68*	*MEMQ69*
Inorganics (mg/kg)								
aluminum	3,480AEJ	4,870AEJ	3,890AEJ	4,900AEJ	3,400AEJ	14,800AEJ	8,760AEJ	1,070AEJ
antimony	--	--	--	--	--	15.5N	--	26.8N
arsenic	6.1	3.9	5.9	4.6	5	45.4	51	71.6J
barium	49.4NAJ	26.1BNA	67.3NAJ	25.2BNAJ	11.6BNAJ	663NAJ	714NAJ	12.7BNAJ
beryllium	--	--	0.47B	--	--	0.56B	2.2	--
cadmium	11.2	--	--	--	--	--	--	--
calcium	21,400AJ	3,580AJ	8,160AJ	10,100AJ	76,700AJ	1,130AJ	1,910AJ	432BAJ
chromium	7.3AJ	12.6AJ	6.9AJ	8.2AJ	5.9AJ	771AJ	398AJ	664AJ
cobalt	2.5B	4.4B	3.3B	3.9B	3.4B	37.1	18.6	44.8
copper	42.7	20.9	20.6	13.8	16.7	1,970	341	773
iron	7,110AEJ	10,500AEJ	5,050AEJ	10,700AEJ	8,900AEJ	340,000AEJ	99,000AEJ	452,000AE
lead	32.6	18.5	7.3	11.1	8.3	472	58.2	5.3
magnesium	4,670AJ	2,040AJ	1,750AJ	4,840AJ	15,600AJ	224BAJ	440BAJ	40.5BAJ
manganese	189NEJ	96.6NEJ	57.1NEJ	194NEJ	349NEJ	2,280NEJ	717NEJ	8,030NEJ
nickel	7.1B	11.1	7.6B	7.9B	7.3B	250	87.8	281
potassium	455B	652B	261B	243B	302B	153B	583B	55.5B
selenium	--	--	--	--	--	--	2.9	--
sodium	76.7BJ	48.4BJ	54.4BJ	37BJ	65.9BJ	154B	383B	58.4B
thallium	--	--	--	--	--	--	1.1B	--
vanadium	7.7B	13.7	10B	10.7B	8.5B	--	11.7B	--
zinc	75.1NAEJ	46.5NAE	19.9NAEJ	26.5NAEJ	25.5NAEJ	157NAEJ	52.7NAEJ	--
cyanide	--	--	--	--	--	--	--	--

Notes:

- -- not detected
- J indicates an estimated value
- E indicates non-detection or semiquantitative
- NL indicates not legible on document provided
- A duplicate value outside QC protocols which indicates a possible matrix problem
- N indicates value may be quantitative or s indicates value is semiquantitative
- B indicates value may be quantitative or semi-quantitative
- W indicates value is semiquantitative

TABLE 3.3

RESULTS OF CHEMICAL ANALYSIS OF FIT-COLLECTED SEDIMENT SAMPLES TEXTILE ROAD SITE YPSILANTI, MICHIGAN

Sample Number	***S17***	***S18***	***S19***	***S20***
Date	***12/12/90***	***12/12/90***	***12/12/90***	***12/12/90***
Time	***1200***	***1250***	***1340***	***1410***
CLP Organic Traffic Report Number	***EMK90***	***EMK91***	***EMK92***	***EMK93***
CLP Inorganic Traffic Report Number	***MEMQO70***	***MEMQ71***	***MEMQ72***	***MEMQ73***
Parameter				
Volatile Organics (ug/kg)				
methylene chloride	--	--	2J	2J
acetone	--	32	72	16J
benzene	--	2J	--	--
Semi-volatile Organics (ug/kg)				
naphthalene	--	--	--	93J
phenanthrene	--	--	250J	140J
fluoranthene	69J	--	510J	280J
pyrene	82J	--	500J	230J
butylbenzylphthalate	--	--	--	78J
benzo(a)anthracene	--	--	230J	83J
chrysene	--	--	300J	110J
bis(2-ethylhexyl)phthalate	150J	--	--	--
benzo(b)fluoranthene	--	--	370J	140J
benzo(k)fluoranthene	--	--	280J	91J
benzo(a)pyrene	--	--	290J	180J
benzo(g,h,i)perylene	--	--	--	200J
Pesticides/PCBs (ug/kg)				
alpha BHC	--	1.2JP	--	--
Endosulfan I	--	--	2.4JP	--
4,4'-DDE	--	1.1JP	4.5JP	--
Endosulfan sulfate	--	--	1.5JP	--
4,4' DDT	--	1.2JP	5.35P	--
Endrin ketone	2.1JP	--	--	--
Aroclor 1254	--	--	--	140

TABLE 3.3

RESULTS OF CHEMICAL ANALYSIS OF FIT-COLLECTED SEDIMENT SAMPLES TEXTILE ROAD SITE YPSILANTI, MICHIGAN

Sample Number	*S17*	*S18*	*S19*	*S20*
Date	*12/12/90*	*12/12/90*	*12/12/90*	*12/12/90*
Time	*1200*	*1250*	*1340*	*1410*
CLP Organic Traffic Report Number	*EMK90*	*EMK91*	*EMK92*	*EMK93*
CLP Inorganic Traffic Report Number	*MEMQO70*	*MEMQ71*	*MEMQ72*	*MEMQ73*
Inorganics (mg/kg)				
aluminum	3,060*EJ	2,090*EJ	5,840*EJ	6,210*EJ
arsenic	5.3	5.7	16.3	15
barium	25BN*J	18.6BN*J	86.4BN*J	86.8BN*J
beryllium	--	--	--	0.53B
calcium	65,500*J	52,400*J	99,400*J	43,100*J
chromium	8.8*J	3.6B*J	11.8*J	12.1*J
cobalt	4.6B	2.6B	7.3B	7.2B
copper	16	8.5B	28.4	25.3
iron	10,000*EJ	7,200*EJ	15,100*EJ	13,400*EJ
lead	14.8	8.3	64	32.2
magnesium	17,200*J	9,110*J	14,800*J	10,700*J
manganese	317NEJ	293NEJ	434NEJ	318NEJ
nickel	8.9B	5.6B	17.1B	15.8
potassium	477B	364B	970B	1,320B
selenium	--	--	--	2.4+J
sodium	161B	109B	211B	181B
vanadium	9B	5.6B	17.8B	17.3B
zinc	50.5N*EJ	28.1N*EJ	76.9N*EJ	55.8N*EJ

Notes:

-- not detected
+ indicates data value may be biased
J indicates an estimated value
P duplicate value outside QC protocols for two GC columns
N indicates value may be quantitative or semi-quantitative
*,B indicates value is semiquantitative
E indicates a non detect or value may be semiquantiative

TABLE 3.4

RESULTS OF CHEMICAL ANALYSIS OF
FIT-COLLECTED SURFACE WATER SAMPLES
TEXTILE ROAD SITE
YPSILANTI, MICHIGAN

Sample Number	*SW1*	*SW2*	*SW3*	*SW4*	*Duplicate*	*Blank*
Date	12/12/90	12/12/90	12/12/90	12/12/90	12/12/90	12/12/90
Time	*1200*	*1410*	*1340*	*1250*	*1250*	*1000*
CLP Organic Traffic Report Number	*EMK69*	*EMK70*	*EMK71*	*EMK72*	*ENA11*	*EMK99*
CLP Inorganic Traffic Report Number	*MEMQ79*	*MEMQ80*	*MEMQ81*	*MEMQ82*	*MEMQ88*	*MEMQ90*
Temperature (deg. C)	*10.4*	*11.5*	*9.9*	*9.4*	*9.4*	*6.7*
Specific Conductivity (µmhos/cm)	*732*	*1180*	*680*	*721*	*721*	*4.4*
pH	*8.25*	*7.66*	*7.80*	*8.50*	*8.50*	*6.30*
Parameter						
Volatile Organics (ug/L)						
methylene chloride	--	--	3J	2J	--	--
chloroform	--	--	--	--	--	2J
Inorganics (mg/L)						
aluminum	--	65.60BJ	--	--	--	--
arsenic	4.10B	--	--	9.50B	--	--
barium	37.10B	107B	40.90B	147B	34.80B	--
calcium	44,600	45,600	38,500	45,600	46,900	29.5BJ
copper	4.20BJ	3.20BJ	--	5.40BJ	--	19.60B
iron	89.40BJ	162	69.60BJ	49.50BJ	211.86BJ	--
lead	--	--	--	8.50J	5.00J	--
magnesium	16,900	18,300	13,500	17,100	17,400	--
manganese	9.40B	15.5	17.6	10.20B	9.30B	--
mercury	0.43NJ	--	--	--	--	--
potassium	5,170	64,400	11,300	4,650B	4,590B	--
selenium	4.40B	--	--	--	--	--
sodium	23,700	39,700	21,100	24,000	24,100	66.50BJ
thallium	--	--	--	2.00NW	--	--
zinc	15.00BJ	7.20BJ	10.00BJ	8.9BJ	--	9.50BJ
cyanide	--	19.2	--	--	--	--

Notes:

--	not detected
J	indicates an estimated value
N,B	indicates value may be quantitative or semi-quantitative
W	indicates value is semiquantitative

TABLE 3.5

RESULTS OF CHEMICAL ANALYSIS OF
FIT-COLLECTED GROUNDWATER SAMPLES
TEXTILE ROAD SITE
YPSILANTI, MICHIGAN

Sample Number	*GW1*	*GW2*	*GW3*	*Duplicate*	*GW4*	*GW5*	*GW6*	*GW7*	*GW8*	*Blank*
Date	*12/11/90*	*12/11/90*	*12/11/90*	*12/12/90*	*12/12/90*	*12/11/90*	*12/11/90*	*12/12/90*	*12/12/90*	*12/11/90*
Time	*1310*	*1415*	*1615*	*1615*	*900*	*1100*	*1145*	*1005*	*1055*	*1100*
CLP Organic Traffic Report Number	*ENA01*	*ENA02*	*ENA03*	*ENA09*	*ENA04*	*ENA05*	*ENA06*	*ENA07*	*ENA08*	*ENA10*
CLP Inorganic Traffic Report Number	*MEMQ91*	*MEMQ92*	*MEMQ93*	*MEMQ86*	*MEMQ94*	*MEMQ95*	*MEMQ96*	*MEMQ84*	*MEMQ85*	*MEMQ87*
Temperature (deg. C)	*8.4*	*9.1*	*3.9*	*5.8*	*7.6*	*8.5*	*7.9*	*8.9*	*9.4*	*5.8*
Specific Conductivity (umhos/cm)	*1810*	*1620*	*9040*	*9040*	*920*	*1630*	*1760*	*1375*	*1030*	*4.69*
pH	*7.18*	*7.14*	*7.16*	*6.97*	*6.4*	*7.16*	*7.17*	*7.25*	*12.5*	*6.97*
depth to groundwater (ft)	*9.5*	*9.9*	*10.1*		*8.9*	*5.5*	*5.1*	*6.0*	*3.7*	
Parameter										
Volatile Organics (µg/L)										
chloromethane	--	120	--	--	--	--	--	--	--	--
acetone	--	--	--	--	--	--	--	--	--	12
chlorobenzene	--	--	--	--	1J	--	--	--	--	--
ethylbenzene	--	8J	--	--	--	--	--	--	--	--
xylene's(total)	--	9J	1J	4J	--	--	--	--	--	--
Semi-volatile Organics (ug/L)										
naphthalene	--	--	--	--	--	--	--	2J	--	--
phenanthrene	--	--	--	--	--	--	--	4J	--	--
anthracene	--	--	--	--	--	--	--	0.9	--	--
fluoranthene	--	--	--	--	--	--	--	3J	--	--
pyrene	--	--	--	--	--	--	--	3J	--	--
Pesticides/PCBs (ug/L)										
beta BHC	--	0.030JP	--	--	--	--	--	--	--	--
delta BHC	--	0.024J	--	--	--	--	--	0.015JP	--	--
Heptachlor epoxide	--	0.019JP	--	--	--	--	--	0.012JP	--	--
Dieldrin	--	--	--	--	0.031JP	--	--	0.012JP	--	--
4,4' DDE	--	0.022JP	--	--	--	--	--	--	--	--
Endrin	--	--	--	--	0.006JP	--	--	--	--	--
Endosulfan II	--	--	--	--	0.027JP	--	--	0.014JP	--	--
Endrin ketone	--	--	--	--	0.013JP	--	--	--	--	--
gamma chlordane	--	--	--	--	--	--	--	0.0083JP	--	--

TABLE 3.5

RESULTS OF CHEMICAL ANALYSIS OF
FIT-COLLECTED GROUNDWATER SAMPLES
TEXTILE ROAD SITE
YPSILANTI, MICHIGAN

Sample Number	*GW1*	*GW2*	*GW3*	*Duplicate*	*GW4*	*GW5*	*GW6*	*GW7*	*GW8*	*Blank*
Date	*12/11/90*	*12/11/90*	*12/11/90*	*12/12/90*	*12/12/90*	*12/11/90*	*12/11/90*	*12/12/90*	*12/12/90*	*12/11/90*
Time	*1310*	*1415*	*1615*	*1615*	*900*	*1100*	*1145*	*1005*	*1055*	*1100*
CLP Organic Traffic Report Number	*ENA01*	*ENA02*	*ENA03*	*ENA09*	*ENA04*	*ENA05*	*ENA06*	*ENA07*	*ENA08*	*ENA10*
CLP Inorganic Traffic Report Number	*MEMQ91*	*MEMQ92*	*MEMQ93*	*MEMQ86*	*MEMQ94*	*MEMQ95*	*MEMQ96*	*MEMQ84*	*MEMQ85*	*MEMQ87*
Temperature (deg. C)	*8.4*	*9.1*	*3.9*	*5.8*	*7.6*	*8.5*	*7.9*	*8.9*	*9.4*	*5.8*
Specific Conductivity (umhos/cm)	*1810*	*1620*	*9040*	*9040*	*920*	*1630*	*1760*	*1375*	*1030*	*4.69*
pH	*7.18*	*7.14*	*7.16*	*6.97*	*6.4*	*7.16*	*7.17*	*7.25*	*12.5*	*6.97*
depth to groundwater (ft)	*9.5*	*9.9*	*10.1*		*8.9*	*5.5*	*5.1*	*6.0*	*3.7*	
Inorganics (mg/L)										
aluminum	--	--	--	--	131B	--	--	--	1,480	--
arsenic	--	18.1	--	4.00B	3.00B	--	--	9.50B	61.6	--
barium	83.70B	80.10B	61.70B	64.90B	139.00B	82.80B	65.20B	147.00B	8.50B	--
calcium	109,000	153,000	74,200	77,000	94,600	116,000	87,800	81,300	30,000	34.60BJ
copper	--	--	--	--	--	--	--	4.40BJ	--	41.4
iron	1,020	20,800	4,620	5,010	3,960	104J	3,460	62.60BJ	64.60BJ	--
lead	--	--	--	--	4.60J	5.30J	--	4.10J	--	--
magnesium	26,900	24,100	17,600	18,300	17,000	25,200	20,100	48,500	257B	--
manganese	170	71.80	530	549	449	285	183	112	--	--
mercury	--	--	--	--	--	--	--	--	1.70NJ	--
potassium	20,600	4900B	9,080	9,510	9,020	2,560B	1,830B	2,500	25,900	--
sodium	12,700	14,300	29,200	30,500	24,200	9,730	25,100	43,500	36,600	--
zinc	22.20J	31.60J	16.80BJ	24.50J	--	35.20J	23.00J	46.9	16.20BJ	6.00BJ
cyanide	--	--	--	--	--	--	--	26.7	--	--

Notes:

-- not detected
J indicates an estimated value
B,P indicates value may be quantitative or semi-quantitative

TABLE 3.6

RESULTS OF CHEMICAL ANALYSIS OF
FIT-COLLECTED RESIDENTIAL AND MUNICIPAL WELL SAMPLES
TEXTILE ROAD SITE
YPSILANTI, MICHIGAN

Sample Number	*RW1*	*Duplicate*	*RW2*	*RW3*	*Blank*
Date	*12/12/90*	*12/12/90*	*12/12/90*	*12/12/90*	*12/12/90*
Time	*905*	*905*	*915*	*1105*	*930*
CLP Organic Traffic Report Number	*EMK94*	*EMK97*	*EMK95*	*EMK96*	*EMK98*
CLP Inorganic Traffic Report Number	*MEMQ74*	*MEMQ77*	*MEMQ75*	*MEMQ76*	*MEMQ78*
Temperature (deg. C)	*8.3*	*8.3*	*9.7*	*9.4*	*6.7*
Specific Conductivity (umhos/cm)	*965*	*985*	*1044*	*452*	*0.02*
pH	*6.56*	*6.6*	*6.8*	*5.6*	*7.01*
depth to groundwater (ft)					
Parameter					
Volatile Organics (µg/L)					
methylene chloride	2B	2B	2B	1BJ	2B
chloroform	--	--	--	--	2
dibromochloromethane	--	--	--	--	0.7J
Inorganics (mg/L)					
aluminum	--	82.3B	116	90B	--
barium	196	193	131	9.9B	--
cadmium	--	--	0.12BJ	--	--
calcium	90,700	87,500	90,800	3,280	--
copper	--	--	--	--	23.8
iron	1,680	1,600	801	129	--
lead	--	--	--	2.5	--
magnesium	23,100	22,100	21,900	1,240	--
manganese	223	221	150	--	--
potassium	2,920	3,110	1,930B	1,670B	--
sodium	30,300	29,600	35,300	90,400	343BJ
thallium	--	1.8BJ	1.3BJ	--	--
zinc	--	--	--	19.1B	--

Notes:

-- not detected
J indicates an estimated value
B indicates value may be quantitative or semi-quantitative

TABLE 3.7

ANALYTICAL RESULTS OF EOC SAMPLES*
(MARCH 1989)
TEXTILE ROAD SITE
YPSILANTI, MICHIGAN

Sample Number	*P1*	*P2*	*P3*	*P4*	*P5*	*P6*	*P7*	*P8*	*P9*	*P10*
Parameter: Total PCBs										
Depth										
1 foot	1.3	12.9	4.6	.96	19	0.55	154	2.8	ND	38
2 feet	29	24	5.1	19	2.4	13	ND	484	33	83
4 feet	1.4	10	ND	0.95	530	82	ND	120	220	31
8 feet	1.2	1.5	1.8	ND	180	ND	ND	ND	ND	6.4

Sample Number	*P11*	*P12*	*P13*	*P14*	*P15*	*P17*	*P18*	*P19*	*P20*	*Composite Trench #1*	*Composite Trench #2*
Parameter: Total PCBs											
Depth											
1 foot	130	1.7	110	145	86	93	100	138	37	--	--
2 feet	130	0.7	27	33	ND	17	34	20	ND	ND	12
4 feet	79	45	ND	50	--	210	2.2	11	11	--	--
8 feet	650	17	38	1.6	--	1.8	ND	ND	39	--	--

Notes:

* Analysis performed by Canton Analytical Laboritories, Ypsilanti, Michigan

ND Not detected at method detection limits (0.5 ppm) except Composite Trench #1: ND(1.0)

All results in ppm

TABLE 3.7

ANALYTICAL RESULTS OF EOC SAMPLES*
(MARCH 1989)
TEXTILE ROAD SITE
YPSILANTI, MICHIGAN

Sample Number	*P2-1'*	*P2-2'*	*P2-4'*	*P2-6'*	*P2-8'*	*P5-1'*	*P5-2'*	*P5-4'*	*P5-8'*	*Composite Trench #1*	*Composite Trench #2*
Parameter: Total PCBs											
Volatile Organics											
Benzene	ND	ND	0.13	ND	0.04	ND	ND	ND	ND	ND	ND
Toluene	ND	ND	1.9	ND	0.86	ND	ND	ND	0.09	ND	ND
Ethylbenzene	ND	ND	0.21	ND	0.77	ND	ND	ND	0.05	ND	ND
cis-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	ND	0.35	1.89	ND	ND	ND	ND	2.1	1.9	ND	ND
Trichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	124
Semi-Volatile Organics											
Napthalene	ND	0.89	2.6	ND	1.7	ND	ND	1.89	2.29	ND	ND
Fluorene	ND	2.44	4.97	ND	0.55	ND	ND	5.11	ND	ND	ND
Phenanthrene	ND	1.73	20.8	ND	4.87	ND	ND	20.08	ND	ND	ND
Pyrene	ND	1.25	ND	0.69	0.60	ND	ND	ND	ND	ND	ND
Fluoranthene	ND	1.73	ND	ND	0.48	ND	ND	ND	ND	ND	ND
Anthracene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
bis (2-Ethylhexyl)phthalate	ND	ND	ND	5.17	1.61	ND	0.08	ND	ND	1.84	ND
Chrysene	ND	ND	ND	0.51	ND	ND	ND	ND	ND	ND	ND
Di-n-butylphthalate	ND	ND	ND	ND	0.60	ND	ND	3.38	ND	ND	ND
Benzo (b&k) Fluoranthene	ND	ND	ND	ND	ND	ND	ND	0.38	0.03	ND	ND
Benzo (a)Pyrene	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.43	ND
EP TOX Metals											
Arsenic	ND	5.9	6.0	ND	ND	ND	ND	6.3	5.7	ND	ND

Notes:

* Analysis performed by Canton Analytical Laboritories, Ypsilanti, Michigan
ND Not detected at method detection limits.
All results in ppm

TABLE 3.8

VERSAR REPORT
SAMPLE MATRICES AND DESCRIPTIONS
TEXTILE ROAD SITE
YPSILANTI, MICHIGAN

Sample Number	*Matrix*	*Description*
TR-1*	Drum	Waste oil. Black grease and metal fibers.
TR-2*	Drum	Waste oil. Black grease on top. Tan/orange oil 4 in. below surface.
TR-3*	Drum	Waste oil. Dark brown grease on top. Tan/orange 3 in. below surface.
TR-4	Cloth	Long sheet of white cloth discolored by filter cake.
TR-5	Cloth	Long sheet of white cloth discolored by filter cake.
TR-6	Wood	Approximately 2" x 3" x 6" block, discolored by black oil, taken from center of small pile away from oil-saturated area.
TR-7	Wood	Approximately 2" x 3" x 6" block, discolored by black oil, taken from center of small pile away from oil-saturated area.
TR-8	Filter cake	Fine grained, silvery, metallic.
TR-9	Filter cake	Dark brown, granular.
TR-10*	Filter cake	Black pasty sludge.
TR-11	Soil/Sediment	Tan/orange sandy soil. Adjacent to Ford fence where oil spill occurred, at 3 foot depth.
TR-12	Soil/Sediment	Gravel from lake shore where Ford spill flowed into lake, at 3 foot depth.
TR-13*	Soil	Black oily soil from center of oil-saturated area at 3 foot depth.
TR-14*	Buried Cinder	Black oily cinders and gravel taken from 50 yards south of Textile Road and 75 yards west of Ford fence, at 3 foot depth.

Note:

* Samples also underwent fingerprint analysis.

TABLE 3.9

1989 VERSAR SAMPLING
SAMPLE RESULTS (MARCH 1989)
TEXTILE ROAD SITE
YPSILANTI, MICHIGAN

Sample Number	*TR-1*	*TR-2*	*TR-3*	*TR-4*	*TR-4 MS*	*TR-4 MSD*	*TR-5*	*TR-6*	*TR-6 MS*	*TR-6-MSD*
Sample Description	*Drum #10*	*Drum #17 City Services*	*Drum #19*	*Cloth*	*Cloth*	*Cloth*	*Cloth*	*Wood*	*Wood*	*Wood*
Parameter										
Volatile Organics (ug/kg)										
Methylene Chloride			250 *							
Acetone				1,500	1,500	870		3,000		
Carbon Disulfide										
1,1-Dichloroethane										
1,2-Dichloroethene (total)										
1,2-Dichloroethane										
2-Butanone										
Carbon Tetrachloride										
Benzene										
4-Methyl-2-Pentanone										
Tetrachloroethene										
1,1,2,2-Tetrachloroethane				1,300						
Toluene										
Chlorobenzene										
Ethylbenzene										
Styrene										
Xylenes (total)										
Tentatively Identified Compounds (ug/kg)										
Alpha-Pinene (ACN)										
Beta-Pinene								37,000 *		
Methyl-Cyclopentane										
3-Methyl-Pentane										
Trichlorofluoromethane										
2-Propanol (ACN)										
Pentane (ACN) (DOT)										
Hexane (DOT)										
2,4-Dimethyl Pentane										
5,5-Dimethyl-2-Hexane										
Hexamethyl Cyclotrisiloxane										

TABLE 3.9

1989 VERSAR SAMPLING
SAMPLE RESULTS (MARCH 1989)
TEXTILE ROAD SITE
YPSILANTI, MICHIGAN

Sample Number	*TR-1*	*TR-2*	*TR-3*	*TR-4*	*TR-4 MS*	*TR-4 MSD*	*TR-5*	*TR-6*	*TR-6 MS*	*TR-6-MSD*
Sample Description	*Drum #10*	*Drum #17 City Services*	*Drum #19*	*Cloth*	*Cloth*	*Cloth*	*Cloth*	*Wood*	*Wood*	*Wood*
Parameter										
PCBs (μg/kg)										
Ar-1248										
Ar-1254	13,000			49,000	51,000	44,000	2,900	740	1,400	1,600
Inorganics (mg/kg)										
Aluminum	3,680	[6.2]	[5.5]	2,130			2,010	97		
Antimony	[7.8]			107			92			
Arsenic	25			10			6.8			
Barium	415			[13]			[6.1]	[8.7]		
Beryllium	[0.70]									
Cadmium	19	1.4		1.8				1.3		
Calcium	16,900	1,560	1,100	[143]			[87]	1,670		
Chromium	70	[1.8]	[1.7]	129			1,050	19		
Cobalt	[8.5]			12			16			
Copper	1,070	[1.4]		180			8,450	8.3		
Iron	29,400	41	32	20,400			162,000	300		
Lead	1,580	38	4.6	7.7			10,000	84		
Magnesium	4,060	[11]	[14]	[40]			[37]	[291]		
Manganese	347	[1.2]	[0.49]	753			1,700	36		
Mercury	0.17		0.1				0.14			
Nickel	48	[2.5]		55			281			
Potassium	1,930	[148]	[189]	[244]						
Selenium	3.8									
Silver	[1.7]		[0.62]				[1.5]			
Sodium	1,160	[661]	4,410	[145]			[45]	[22]		
Thallium										
Vanadium	20	[0.93]	[0.85]	20			[4.3]			
Zinc	1,260	[2.6]	[1.4]	7.1			230	40		

TABLE 3.9

1989 VERSAR SAMPLING
SAMPLE RESULTS (MARCH 1989)
TEXTILE ROAD SITE
YPSILANTI, MICHIGAN

Sample Number	*TR-1*	*TR-2*	*TR-3*	*TR-4*	*TR-4 MS*	*TR-4 MSD*	*TR-5*	*TR-6*	*TR-6 MS*	*TR-6-MSD*
Sample Description	*Drum #10*	*Drum #17 City Services*	*Drum #19*	*Cloth*	*Cloth*	*Cloth*	*Cloth*	*Wood*	*Wood*	*Wood*
Parameter										
Cyanide (µg/kg)	1.22						1.04			

Notes:

MS	Matrix Spike
MSD	Matrix Spike Duplicate
*	compound present below detection limit
+	presence strongly suspected, not confirmed
no entry	non-detect
NL ( )	indicates not legible on document provided. ( ) indicates estimated value.

TABLE 3.9

1989 VERSAR SAMPLING
SAMPLE RESULTS (MARCH 1989)
TEXTILE ROAD SITE
YPSILANTI, MICHIGAN

Sample Number	*TR-7*	*TR-7 MS*	*TR-8*	*TR-8 MS*	*TR-8 Rt*	*TR-9*	*TR-9 Rt*	*TR-10*	*TR-10 MS*	*TR-10 MSD*
Sample Description	*Wood*	*Wood*	*Filter Cake*	*Filter Cake*	*Filter Cake*	*Filter Cake*	*Filter Cake*	*Filter Cake Sludge*	*Filter Cake Sludge*	*Filter Cake Sludge*
Parameter										
Volatile Organics (ug/kg)										
Methylene Chloride			22							32
Acetone	240,000 *+	150,000 *+				100	14	320	300	260
Carbon Disulfide										31
1,1-Dichloroethane			4*							
1,2-Dichloroethene (total)								15*+		
1,2-Dichloroethane										
2-Butanone								130	120	100
Carbon Tetrachloride			7		11	5*	2*			
Benzene						3*	2*			
4-Methyl-2-Pentanone										
Tetrachloroethene										
1,1,2,2-Tetrachloroethane										
Toluene			6		12	4*+	2*+	29		
Chlorobenzene										
Ethylbenzene					9*					
Styrene										
Xylenes (total)			9		34*			46*	50	40
Tentatively Identified Compounds (ug/kg)										
Alpha-Pinene (ACN)	1,000,000 *									
Beta-Pinene	130,000 *									
Methyl-Cyclopentane			22*			39*				
3-Methyl-Pentane			130*			260*	160*			
Trichlorofluoromethane						17*	10*			
2-Propanol (ACN)										
Pentane (ACN) (DOT)										
Hexane (DOT)										
2,4-Dimethyl Pentane										
5,5-Dimethyl-2-Hexane										
Hexamethyl Cyclotrisiloxane										

TABLE 3.9

1989 VERSAR SAMPLING
SAMPLE RESULTS (MARCH 1989)
TEXTILE ROAD SITE
YPSILANTI, MICHIGAN

Sample Number	***TR-7***	***TR-7 MS***	***TR-8***	***TR-8 MS***	***TR-8 Rt***	***TR-9***	***TR-9 Rt***	***TR-10***	***TR-10 MS***	***TR-10 MSD***
Sample Description	***Wood***	***Wood***	***Filter Cake***	***Filter Cake***	***Filter Cake***	***Filter Cake***	***Filter Cake***	***Filter Cake Sludge***	***Filter Cake Sludge***	***Filter Cake Sludge***
Parameter										
PCBs (µg/kg)										
Ar-1248	6,900									
Ar-1254			14,000	16,000		210,000		2,500		
Inorganics (mg/kg)										
Aluminum	125		322,000			8,590		3,610		
Antimony			NL (33)			277		103		
Arsenic			NL (36)			39		47		
Barium	[21]		NL (85)			105		8,320		
Beryllium										
Cadmium	1.3		9.8			2.6		21		
Calcium	1,300		[232]			[329]		[658]		
Chromium	[1.5]		518			860		136		
Cobalt			NL (62)			38		77		
Copper	7.1		NL (3570)			339		3,620		
Iron	431		198,000			4,880		93,000		
Lead	5.6		168			15		4,890		
Magnesium	[242]		[296]			[85]		[78]		
Manganese	62		NL (2,330)			3,200		578		
Mercury								1.1		
Nickel			332			244		136		
Potassium	[189]							[330]		
Selenium										
Silver			3.1			[1.5]		49		
Sodium	[51]		[97]			[419]		[108]		
Thallium			[1.1]							
Vanadium			43			50		56		
Zinc	20		1,620			45		246		

TABLE 3.9

1989 VERSAR SAMPLING
SAMPLE RESULTS (MARCH 1989)
TEXTILE ROAD SITE
YPSILANTI, MICHIGAN

Sample Number	***TR-7***	***TR-7 MS***	***TR-8***	***TR-8 MS***	***TR-8 Rt***	***TR-9***	***TR-9 Rt***	***TR-10***	***TR-10 MS***	***TR-10 MSD***
Sample Description	***Wood***	***Wood***	***Filter Cake***	***Filter Cake***	***Filter Cake***	***Filter Cake***	***Filter Cake***	***Filter Cake Sludge***	***Filter Cake Sludge***	***Filter Cake Sludge***
Parameter										
Cyanide (µg/kg)								1.1		

Notes:

MS	Matrix Spike
MSD	Matrix Spike Duplicate
*	compound present below detection limit
+	presence strongly suspected, not confirmed
no entry	non-detect
NL ( )	indicates not legible on document provided. ( ) indicates estimated value.

TABLE 3.9

1989 VERSAR SAMPLING
SAMPLE RESULTS (MARCH 1989)
TEXTILE ROAD SITE
YPSILANTI, MICHIGAN

Sample Number	*TR-11*	*TR-12*	*TR-12Rt*	*TR-13*	*TR-13Rt*	*TR-14*	*TR-14 MS*	*TR-14 MSD*
Sample Description	*Soil/Sed*	*Soil/Sed*	*Soil/Sed*	*Soil*	*Soil*	*Soil*	*Soil*	*Soil*
	Ford Fence	*Lake Shore*	*Lake Shore*	*Oil Soaked*	*Oil Soaked*	*Cinders*	*Cinders*	*Cinders*
Parameter								
Volatile Organics (ug/kg)								
Methylene Chloride					4 *+			
Acetone		38 B		190	600 E			
Carbon Disulfide								
1,1-Dichloroethane								
1,2-Dichloroethene (total)								
1,2-Dichloroethane								
2-Butanone				49				
Carbon Tetrachloride								
Benzene								
4-Methyl-2-Pentanone				12*	20			
Tetrachloroethene								
1,1,2,2-Tetrachloroethane								
Toluene				17 +	15 +	320 *+		
Chlorobenzene					9 +			
Ethylbenzene					6*+			
Styrene								
Xylenes (total)				7 +	14 +	320 *		
Tentatively Identified Compounds (ug/kg)								
Alpha-Pinene (ACN)								
Beta-Pinene								
Methyl-Cyclopentane								
3-Methyl-Pentane								
Trichlorofluoromethane								
2-Propanol (ACN)				11 *				
Pentane (ACN) (DOT)				11 *				
Hexane (DOT)				11 *				
2,4-Dimethyl Pentane				12 *				
5,5-Dimethyl-2-Hexane				25 *		1100 *		
Hexamethyl Cyclotrisiloxane				24 *B				

TABLE 3.9

1989 VERSAR SAMPLING
SAMPLE RESULTS (MARCH 1989)
TEXTILE ROAD SITE
YPSILANTI, MICHIGAN

Sample Number	***TR-11***	***TR-12***	***TR-12Rt***	***TR-13***	***TR-13Rt***	***TR-14***	***TR-14 MS***	***TR-14 MSD***
Sample Description	***Soil/Sed Ford Fence***	***Soil/Sed Lake Shore***	***Soil/Sed Lake Shore***	***Soil Oil Soaked***	***Soil Oil Soaked***	***Soil Cinders***	***Soil Cinders***	***Soil Cinders***
Parameter								
PCBs (µg/kg)								
Ar-1248								
Ar-1254				140,000		36,000	25,000	34,000
Inorganics (mg/kg)								
Aluminum	4,540	2,230		18,000		4,210		
Antimony	14			98		218		
Arsenic	6.2	4.9		11		24		
Barium	[13]	[5.5]		73		126		
Beryllium	[0.26]					[0.32]		
Cadmium				1.6		8.3		
Calcium	44,500	101,000		17,000		18,700		
Chromium	13	4.9		776		710		
Cobalt	[4.3]	[0.97]		19		33		
Copper	NL (12)	6.8		1,760		686		
Iron	32,000	5,890		200,000		40,400		
Lead	4.9	3.4		339		141		
Magnesium	17,600	22,600		3,830		NL (3.96)		
Manganese	NL (653)	326		2,090		2,710		
Mercury								
Nickel	13	[4.8]		174		NL (887)		
Potassium	[606]	[348]		[373]				
Selenium								
Silver				[1.3]				
Sodium	[344]	[203]		[192]		[522]		
Thallium								
Vanadium	22	[8.2]		24		42		
Zinc	85	26		243		20		

TABLE 3.9

1989 VERSAR SAMPLING
SAMPLE RESULTS (MARCH 1989)
TEXTILE ROAD SITE
YPSILANTI, MICHIGAN

Sample Number	*TR-11*	*TR-12*	*TR-12Rt*	*TR-13*	*TR-13Rt*	*TR-14*	*TR-14 MS*	*TR-14 MSD*
Sample Description	*Soil/Sed*	*Soil/Sed*	*Soil/Sed*	*Soil*	*Soil*	*Soil*	*Soil*	*Soil*
	Ford Fence	*Lake Shore*	*Lake Shore*	*Oil Soaked*	*Oil Soaked*	*Cinders*	*Cinders*	*Cinders*
Parameter								
Cyanide (µg/kg)								

Notes:

MS	Matrix Spike
MSD	Matrix Spike Duplicate
*	compound present below detection limit
+	presence strongly suspected, not confirmed
no entry	non-detect
NL ( )	indicates not legible on document provided. ( ) indicates estimated value.

TABLE 4.1

CHEMICALS OF POTENTIAL CONCERN
TEXTILE ROAD SITE
YPSILANTI, MICHIGAN

Semi-volatile Organics (PAHs)

anthracene
2-methylnaphthalene
pentachlorophenol
benzo(a)anthracene
chrysene
benzo(b)fluoranthene
benzo(k)fluoranthene
benzo(a)pyrene
indeno(1,2,3-cd)pyrene
benzo(g,h,i)perylene
dibenzo(a,h)anthracene

Inorganics

aluminum
arsenic
barium
lead
manganese
cyanide

Pesticides/PCBs

aroclor 1254

TABLE 4.2

SEMI-VOLATILE ORGANIC COMPOUNDS
PHYSICAL AND CHEMICAL PROPERTIES
TEXTILE ROAD SITE
YPSILANTI, MICHIGAN

Parameter	*CAS RN*	*Molecular Weight* (*g/mole*)	*Water Solubility* (*mg/L*)	*Vapor Pressure* (*mm Hg*)	*Henry's Law Constant* (*atm-m^3/mole*)	*KOC* (*mL/g*)	*LOG KOW*
anthracene	120-12-7	178	4.50×10^{-2}	1.95×10^{-4}	1.02×10^{-3}	14,000	4.45
benzo(a)anthracene	56-55-3	228	5.70×10^{-3}	2.20×10^{-8}	1.16×10^{-6}	1,380,000	5.6
benzo(b)fluoranthene	205-99-2	276	7.00×10^{-4}	5.10×10^{-7}	5.34×10^{-8}	1,600,000	6.51
benzo(k)fluoranthene	207-08-09	252	4.30×10^{-3}	1.03×10^{-10}	3.94×10^{-5}	550,000	6.06
benzo(g,h,i)perylene	191-24-2	252	1.40×10^{-2}	5.00×10^{-7}	1.19×10^{-5}	550,000	6.06
benzo(a)pyrene	50-32-8	252	1.20×10^{-3}	5.60×10^{-9}	1.55×10^{-6}	5,500,000	6.06
chrysene	218-01-9	228	1.80×10^{-3}	6.30×10^{-9}	1.50×10^{-6}	200,000	5.61
indeno(1,2,3-cd)pyrene	193-39-5	276	5.30×10^{-4}	1.00×10^{-10}	6.86×10^{-8}	1,600,000	6.5
2-methynapthalene	91-57-6	142	6.74	1.70×10^{-2}	5.40×10^{-4}	NA	NA
dibenzo(a,h)anthracene	NA	278	5.00×10^{-4}	NA	7.30×10^{-8}	NA	NA

Note:

NA - Not Available

References:

Superfund Public Health Evaluation Manual, October 1986.
(1) Sax and Lewis 1989, Verschueren 1983, The Merck Index 1983, SPHEM 1986, EPA 1986.

TABLE 4.2

PCB COMPOUNDS
PHYSICAL AND CHEMICAL PROPERTIES
TEXTILE ROAD SITE
YPSILANTI, MICHIGAN

Parameter	*CAS RN*	*Molecular Weight (g/mole)*	*Water Solubility (mg/L)*	*Vapor Pressure (mm Hg)*	*Henry's Law Constant (atm-m³/mole)*	*KOC (mL/g)*		*LOG KOW*	
aroclor-1254	11097-69-1	328.4	1.20×10^{-2}	7.71×10^{-5}	8.37×10^{-3}	530,000	1	6.04	1

Note:

NA - Not Available

References:

All references to Guidance on Remedial Actions for Superfund Sites with PCB contamination, August 1990, except where noted.
(1) SPHEM 1986.

TABLE 4.3

INORGANIC COMPOUNDS
PHYSICAL AND CHEMICAL PROPERTIES
TEXTILE ROAD SITE
YPSILANTI, MICHIGAN

Parameter	*CAS RN*	*Atomic Weight (g/mole)*	*Vapor Pressure (mm Hg)*	*Henry's Law Constant (atm-m³/mole)*	*Water Solubility*
aluminum	7429-90-5	26.98	0	0	varies with salt and pH
arsenic	7440-38-2	74.92	0	NA	insoluble; some salts are soluble
barium	7440-39-3	137.33	NA	NA	decomposes, $BaSO_4$ has a solubility of 1.6 mg/L at 20°C
lead	7439-92-1	207.2	1.77 mm @ 1,000°C	NA	insoluble; some organic compounds are soluble
manganese	7439-96-5	54.94	1 mm @ 1,292°C	NA	decomposes in water
cyanide(1)		27	657.8 mm @ 21.9°C	NA	soluble (HCN)

Note:

NA - Not Available
(1) - Hydrogen cyanide

References:

All references to Sax and Lewis 1989, Verschueren 1983, The Merck Index 1983, SPHEM 1986, EPA 1986.

TABLE 4.4

DEFINITION OF
PHYSICAL AND CHEMICAL PROPERTIES
TEXTILE ROAD SITE
YPSILANTI, MICHIGAN

Property	*Description*	*Units*	*Descriptive Ranges*
Liquid density	The density of a chemical in its pure liquid form, relative to water.	D (g/cm^3)	<1 -- less dense than water >1 -- more dense than water
Aqueous solubility	The amount of a chemical at equilibrium that will be dissolved in pure water	mg/L	high -- soluble in watere low -- insoluble in water
Vapor Pressure	The partial pressure of a vapor at equilibrium with the chemical in its pure state; describes the tendency of a chemical to evaporate	VP (mm Hg)	high -- volatile low -- nonvolatile
Partitioning between air and water	The proportion of a chemical at equilibrium in the vapor phase in the space above an aqueous solution of the chemical; describes the tendency of a chemical to transfer between air and volatility water	Henry's law constant, H (atm m^3/mol)	<3 x 10^{-7} -- nonvolatilene 3 x 10^{-7} to 10^{-5} -- low volatility 10^{-5} to 10^{-3} -- moderate >10^{-3} -- high volatility
Partitioning between organic matter and water	The proportion of a chemical at equilibrium sorbed to organic material in a water-soil or water-sediment system; more strongly sorbed chemicals tend to be less mobile.	K_{oc} (mL/g)	0 to 50 -- very high mobilitye 50 to 100 -- high mobility 100 to 500 -- moderate mobility 500 to 2,000 -- low mobility 2,000 to 20,000 -- slight mobility >20,000 -- immobile

TABLE 4.5

PHYSICAL AND CHEMICAL PROPERTIES OF AROCLORS
TEXTILE ROAD SITE
YPSILANTI, MICHIGAN

Aroclor	*Density (at 20°C) (g/cm^3)*	*Viscosity (Saybolt Univ. sec) at 89.9°C*	*Percent Chlorine (%)*	*Flash Point (°C)*	*Fire Point (°C)*	*Pour Point (°C)*	*Distillation Range (°C)*	*Vaporization Rate ($g/cm^2/h$) x 106 at 250°C*	*Dielectric Const. at 20°C*	*at 100°C*	*Solubility in Water at 25°C (µg/L)*	*CAS Registry No*[b]
1016	1.37		41	170	ntb		323-356				15,000[c]	12674-11-2
1221	1.18	30-31	21	141-150	176	1	275-320	1,740			1,450[c]	11104-28-2
1232	1.26	31-32	32	152-154	238	-35	270-325	874	5.7	4.6	420[c]	11141-16-5
1242	1.38	34-35	42	176-180	ntb	-19	325-366	338	5.8	4.9	240	53469-21-9
1248	1.44	36-36	48	193-196	ntb	-7	340-375	152	5.6	4.6	52	12672-29-6
1254	1.54	44-58	54	ntb[a]	ntb	10	365-390	53	5.0	4.3	12	11097-69-1
1260	1.62	72-78	60	ntb	ntb	31	385-420	13	4.3	3.7	3	11096-82-5
1262	1.64	86-100	62	ntb	ntb	35-38	390-425	9				37324-23-5
1268	1.81		68	ntb	ntb		435-450		2.5			11100-14-4
1270	1.95		70	ntb	ntb		450-460					

Notes:

a - ntb - none to boiling
b - The registry number for "Aroclor" (number unspecified) is 12767-79-2.
c - U.S. EPA/600/G-85/002a - A Screening Procedure for Toxic and Conventional Pollutants and Groundwater - Part 1.
Source Brinkman and Dekok, 1980. Elsevier Biomedical Press BV.

APPENDIX A

WELL LOGS

Page ___ of ___

Sample No.

GEOLOGICAL SURVEY DIVISION ✓

SNNESE

WATER WELL RECORD 6-31340 1 -6

WELL LOG 1

County: Washtenaw | Twp.: Ypsilanti | ~~SENE SWSE~~ Sec. 24 | Town 3 S. | Range 7 E.

Distance from Roads, Section Lines, etc.: Approx. 875' w. of Rawsonville rd
1850' N of Textile rd } (on intersection is SE corner sec 24)

Formation	Thickness of Stratum	Depth to Bottom of Stratum
Gravel	5	5
clay	7	12
clay & rock	10	22
clay	10	32
clay and rocks	10	42
clay and sandy gravel	10	52
clay	8	60
sand & gravel	2	62
gravel	30	92
clay & shale	10	102
Sly-6-55'		

Owner: Ypsilanti township

Address:

Driller and Address: Layne Northern - J. Turner

Well Depth: 102 ft. Date of Completion: 10-22-65

☐ Cable tool ☐ Rotary ☐ Dug ☒ R.C.
☐ Driven ☐ Jetted ☐ Bored

Use: ☐ Domestic ☒ Public Supply ☐ Industry
☐ Irrigation ☐ Air Conditioning ☐ Dewatering
☐ Test Well ☐ ______

Casing: Diam. 38 in. to 61 ft. Depth
___ in. to ___ ft. Depth

Height: Above/Below surface ___ ft.

Type-Weight

Screen:
Type: ______ Dia: ______
Slot/Gauze ______ Length ______
Set between ______ ft. and ______ ft.
Accessories:

Water level:
______ ft. above/below ______

Drawdown: 95'6" P.L.
___ ft. after ___ hrs. pumping 1400 g.p.m.
___ ft. after ___ hrs. pumping ___ g.p.m.
Meas. by Date

Flow:
g.p.m./g.p.h. Temp: °F

Water Quality in Parts Per Million:
Iron (Fe) ______ Chlorides (Cl) ______
Hardness ______

Elevation:
±685' topo ft. above

Source of data:

Record by: Date:

Remarks:

H015623

WELL LOG 2

Layne NORTHERN COMP...
INCORPORATED
INDIANAPOLIS • MISHAWAKA • LANSING

☐ TEST
☐ PERMANENT

Job No. L-31409

WELL LOG No. 7 CITY Ypsilanti County Washtenaw

Owner Ypsilanti Twp. Township Ypsilanti

Section 24

Location State Michigan

From Land Description

From Street or Road

FORMATION FOUND – DESCRIBE FULLY	Depth to Top of Formation	Depth to Bottom of Formation	Thickness of Formation	Static Water Level
Top Soil	0	6	6	
Sand & Gravel	6	4	3'6"	
Clay - hard - gravely	4	18	14	
Clay - Blue - gravely	18	27	9	
Sand & Gravel & Rocks	27	54	27	46
Sand & Gravel	54	59	5	46
Sand & Gravel & Rocks	59	80	21	
Sand & Gravel	80	91	11	

Hole 12 " Dia Drilled by: Cable Tool ___ Rotary R.C. Jetting ___ Reverse Circ. ___ Bucket ___ Auger ___

Rotary Hole Grouted: Neat Cement ___ Drilling Mud ___ Other ___

Casing ___ " OD From ___ " above ground to ___ feet below ground. Weight ___ Pounds per foot

Screen ___ " Set from ___ to ___ feet Make ___ Type ___ Slot ___

Pumping test ___ GPM drawdown to ___ feet after ___ hours pumping

H015624

Layne NORTHERN COMP WELL LOG 3

INCORPORATED

INDIANAPOLIS • MISHAWAKA • LANSING

☐ TEST
☒ PERMANENT

Job No L-32082

WELL LOG No. 9 CITY YPSILANTI County WASHTENAW

Owner YPSILANTI TOWNSHIP Township YPSILANTI

Section 24

State MICHIGAN

Location

From Land Description 170' West of guardrail of Rawsonville Road

From Street or Road 610' South of Huron river (South bank)

FORMATION FOUND – DESCRIBE FULLY	Depth to top of Stratum	Depth to Bottom of Stratum	Thickness of Stratum	Static Water Level
Fill - clay	0	2	2	
Top fill & rocks	2	4	2	
Clay - brown	4	9	5	
Clay - sand & gravel	9	18	9	
Sand & gravel - some clay	18	25	7	
Coarse sand & fine gravel	25	49	24	
Sand & gravel - rocks & shale	49	78	29	22'3" G
Shale	78	80	2	

Hole 36" Dia Drilled by: Cable Tool ___ Rotary ___ Jetting ___ Reverse Circ. X Bucket ___ Auger ___

H015625

Rotary Hole Grouted: Neat Cement X Drilling Mud ___ Other ___

Casing 36 " OD From 1'6" above ground to 35 feet below ground. Weight ___ Pounds per foot 15" 13

Screen 16 " Set from 79 to 59 feet Make LAYNE Type S.S. Slot 4' 44

XXXXXXXXXXXXXXXXX X (SEE WELL PRINT) XXXXXXXXXXXXXXXXXXXXXXXXXXXX

Date Completed 9/9/68 Driller L. D. COOMBOD

Layne Northern

WELL LOG 4

(Layne) NORTHERN COMPANY
INCORPORATED
INDIANAPOLIS • MISHAWAKA • LANSING

249

☒ TEST Observation Well for pumping test of pumping Well No. 5
☐ PERMANENT

Job No. L-32338

WELL LOG No. 69-E CITY YPSILANTI TOWNSHIP County Washtenaw
Owner YPSILANTI TOWNSHIP Township Ypsilanti
NE SW SW W½, SW¼ Section 24, T. 3 S., R. 7 E.
Location El. ≈ 687' topo State Michigan
From Land Description 25' West of Well No. 5 ; just W of Water Treatment Plant
From Street or Road and W of Bridge St.

FORMATION FOUND — DESCRIBE FULLY	FROM NATURAL GROUND LEVEL			
	Depth to top of Stratum	Depth to Bottom of Stratum	Thickness of Stratum	Static Water Level
Brown clay	0	16	16	
Brown sand	16	17	1	
Blue grey clay with stones	17	33	16	
Sand & gravel, fine sand, brown	33	[illegible]	1	
Brown clay	34	38	4	
Sand & gravel, coarse	38	41	3	
Grey clay	41	42	1	
Sand & gravel - coarse	42	45	3	
Sand & gravel - medium	45	50	5	
Sand & gravel - medium with fines	50	60	10	
Sand & gravel - medium with fines & coarse	60	75	15	
Sand & gravel	75	80	5	
Sand & gravel - medium	80	85	5	
Sand & gravel - fine material black	85	90	5	[illegible]
Sand & gravel	90	106	[illegible]	± 50'
Hard shale - black, slabby	106	117	17	
Soft shale - clay like - grey	117	125	8	
Black shale, slabby	125	131	6	
Limestone	131	135	4	

Hole 5 5/8 "Dia Drilled by: Cable Tool ______ Rotary X Jetting ______
Reverse Circ. ______ Bucket ______ Auger ______

Rotary Hole Grouted: Neat Cement ______ Drilling Mud ______ Other ______

Casing 2 "OD From 24 "above ground to 99 feet below ground. Weight ______ Pounds per foot

Screen 1¼ " Set from 99 to 103 feet Make Johnson Type 1¼" Point Slot .025

JUN 30

Pumping test ______ GPM drawdown to ______ feet after ______ hours pumping

Date Completed 10/8/69 Driller Burrows - McCracken

H015626

MICHIGAN DEPARTMENT OF CONSERVAT
GEOLOGICAL SURVEY DIVISION

WELL LOG 5

Page ___ of ___

Sample no.

WATER WELL RECORD

TW 653

County	Twp.		Sec.	Town	Range
Washtenaw	Ypsilanti	NE ¼ NE ¼ NE ¼ (NW)	25	3S N/S	7E E/W

Distance from Roads, Section Lines, etc.
100 feet south centerline of Textile. 980 feet east centerline of McKeon Road.
200 feet west of East property line.

Formation	Thickness of stratum	Depth to bottom of stratum
Coarse gravel	10	10
Sand and gravel	11	21
Grey clay	39	60
Gravelly clay	23	83
Sand and gravel--some shale	42	125

Owner: City of Ypsilanti
Address:
Driller and address: Layne Northern Co., Lansing
Well depth: 125 ft. Date of Completion: 11/1/65
☒ Cable tool ☐ Rotary ☐ Dug ☐ R.C.
☐ Driven ☐ Jetted ☐ Bored
Use: ☐ Domestic ☐ Public Supply ☐ Industry
☐ Irrigation ☐ Air Conditioning ☐ Dewatering
☒ Test Well ☐
Casing: Diam. ___ in. to ___ ft. Depth; Height: Above/Below surface ___ ft.; Type-Weight
___ in. to ___ ft. Depth
Screen:
Type: ___ Dia: ___
Slot/Gauze ___ Length ___
Set between ___ ft. and ___ ft.
Accessories:
Water level: (4648)
63 ft. above/below land
___ ft. above/below ___
Meas. by: Driller Date: 11/65
Drawdown:
___ ft. after ___ hrs. pumping ___ g.p.m.
___ ft. after ___ hrs. pumping ___ g.p.m.
Meas. by ___ Date
Flow:
___ g.p.m./g.p.h. Temp: ___ °F
Water Quality in Parts Per Million:
Iron (Fe) ___ Chlorides (Cl) ___
Hardness ___
Elevation: 24 700 ft. above
Source of data: Layne record
Record by: R. P. [illegible]ll Date: 7/31/68

Remarks:
* 100 feet of 1¼ inch pipe and point left in hole.

H015627

GEOLOGICAL SURVEY SAMPLE NO. 5

JUL 19 1976

WELL LOG 6

WATER WELL RECORD
ACT 294 PA 1965

DEPARTMENT OF PUBLIC HEALTH

1 LOCATION OF WELL

County	Township Name	Fraction	Section Number	Town number	Range Number
WASHTENAW	YPSILANTI	SW¼ NW¼ SW¼	23	3 N	7 E

Distance And Direction from Road Intersections: 5720 TUTTLE HILL

Street address & City of Well Location

Locate with "X" in section below — Sketch Map

3 OWNER OF WELL: STEVE MOSS
Address 5720 TUTTLE HILL RD. YPSILANTI

4 WELL DEPTH (completed) 177 ft. Date of Completion 5-12-76

5 ☐ Cable tool ☑ Rotary ☐ Driven ☐ Dug ☐ Hollow rod ☐ Jetted ☐ Bored ☐ ____

6 USE: ☑ Domestic ☐ Public Supply ☐ Industry ☐ Irrigation ☐ Air Conditioning ☐ Commercial ☐ Test Well ☐

7 CASING: Threaded ☑ Welded ☐ Height: Above/Below Surface ____ ft.
Diam. 4 in. to 142 ft. Depth Weight 11 lbs./ft.
in. to ____ ft. Depth Drive Shoe? Yes ☐ No ☑

2 FORMATION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
YELLOW CLAY	5	5
YELLOW CLAY & GRAVEL	3	8
HARD BLUE CLAY	128	136
BROKEN SHALE & CLAY	5	141
BLACK SHALE	36	177

USE A 2ND SHEET IF NEEDED

8 SCREEN:
Type: NONE Dia.: ____
Slot/Gauze ____ Length ____
Set between ____ ft. and ____ ft.
Fittings:

9 STATIC WATER LEVEL
40 ft. below land surface

10 PUMPING LEVEL below land surface
140 ft. after 4 hrs. pumping 5 g.p.m.
____ ft. after ____ hrs. pumping ____ g.p.m.

11 WATER QUALITY in Parts Per Million:
Iron (Fe) ____ Chlorides (Cl) ____
Hardness ____ Other ____

12 WELL HEAD COMPLETION: ☐ In Approved Pit ☑ Pitless Adapter ☐ 12" Above Grade

13 Well Grouted? ☑ Yes ☐ No
☐ Neat Cement ☑ Bentonite ☐ ____
Depth: From ____ ft. to ____ ft.

14 Nearest Source of possible contamination
170 feet S Direction DRAINFIELD Type
Well disinfected upon completion ☑ Yes ☐ No

15 PUMP: ☐ Not installed
Manufacturer's Name AERMOTOR
Model Number SA-8 HP 1/2 Volts 230
Length of Drop Pipe 126 ft. capacity 6.5 G.P.M.
Type: ☑ Submersible ☐ Jet ☐ Reciprocating

16 Remarks, elevation, source of data, etc.

replacement well

ENTERED BY ____ WELLER ITEM NO.
CORRECTED BY 3
LOCATION BY
ELEVATION
TO ROCK

17 WATER WELL CONTRACTOR'S CERTIFICATION:
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.
Dunn Drilling Company, Inc. 0385
REGISTERED BUSINESS NAME — REGISTRATION NO.
Address 1701 E Michigan Ypsilanti
Signed Richard A. Dunn Date 5-18-76
AUTHORIZED REPRESENTATIVE

1002a (Rev. 12-65)

H015628

GEOLOGICAL SURVEY SAMPLE No.

WELL LOG 7

WATER WELL RECORD
ACT 294 PA 1965

OF PUBLIC HEALTH 23-1

1 LOCATION OF WELL

County	Twp.	Fraction	Section No.	Town	Range
WASHTENAW	Ypsilanti	SW¼ NW¼ SW¼	23	3 S.	7 E

Distance And Direction from Road Intersections: SAME

Street address & City of Well Location

OWNER No.

3 OWNER OF WELL: Mr Taylor (Replacement)
Address: 5531 Tuttle Hills, Ypsilanti

4 WELL DEPTH: (completed) 100 ft. Date of Completion: Nov 12, 68

2 FORMATION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
Gravel Sand	11	11
Blue clay	40	51
Blue clay - Gravel	19	70
Gray sand	20	90
Fine water Gravel	10	100

5 ☐ Cable tool ☒ Rotary ☐ Driven ☐ Dug ☐ Hollow rod ☐ Jetted ☐ Bored ☐

6 USE ☒ Domestic ☐ Public Supply ☐ Industry ☐ Irrigation ☐ Air Conditioning ☐ Commercial ☐ Test Well ☐

7 CASING Diam. Threaded ☐ Welded ☐ 4 in. to 96 ft. Depth ___ in. to ___ ft. Depth
Height: Above/Below surface ___ ft. Weight 11 lbs./ft. Drive Shoe? Yes ☒ No ☐

8 SCREEN: Type: Red brass Dia.: 4" Slot/Gauze: 18 Length: 4' Set between 96 ft. and 100 ft.
Fittings: Hemp packer - Plug

9 STATIC WATER LEVEL ___ ft. below land surface

10 PUMPING LEVEL below land surface
70 ft. after 2 hrs. pumping 10 g.p.m.
___ ft. after ___ hrs. pumping ___ g.p.m.

11 WATER QUALITY in Parts Per Million: Iron (Fe) ___ Chlorides (Cl) ___ Hardness ___

12 WELL HEAD COMPLETION: ☐ In Approved Pit ☒ Pitless Adapter ☐ 12" Above Grade

13 GROUTING: Well Grouted? ☒ Yes ☐ No — Too Much in the cutting
Material: ☐ Neat Cement ☐
Depth: From ___ ft. to ___ ft.

14 SANITARY: Nearest Source of possible contamination 100 feet E Direction Drain Field type
Well disinfected upon completion ☐ Yes ☐ No

15 PUMP: Manufacturer's Name Gould
Model Number 11EA HP ___
Length of Drop Pipe 54 ft. capacity 10 G.P.M.
Type: ☒ Submersible ☐ ___ ☐ Jet ☐ Reciprocating

LOGGED BY ... DRILLER ...
CORRECTED BY: Z

16 Remarks, elevation, source of data, etc.
Replacement Well

17 WATER WELL CONTRACTOR'S CERTIFICATION:
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

P.E. Whitewell Drilling — 0388
REGISTERED BUSINESS NAME — REGISTRATION NO.

Address: 715 Cambridge

Signed: [signature] Nov 12, 68
AUTHORIZED REPRESENTATIVE

H015629

0670 10M 6-66

WELL LOG 8

24-3S-7E
Ypsilanti Twp. (Washtenaw Co.)

Adolph E. Povsek

Wabash Railroad Co. No. 1 Permit No. 25482

Drilling Contractor: Muskegon Development Company (Cable)

Location: SE SE NE Section 24, T. 3S, R. 7E
350' from South and 330' from East line of quarter section

Elevation: 693.5 feet above sea level ([illegible] fl.)

Record by: William Mantek from incomplete samples; some formation tops from Schlumberger Gamma Ray-Neutron Log (Schj)

	Thickness (feet)	Depth (feet)
PLEISTOCENE:		
Drift:		
"Drift"	97	97 Schj
MISSISSIPPIAN - DEVONIAN:		
Antrim:		
Shale, brown	38	135 Schj
DEVONIAN:		
Traverse Formation:		
Shale, gray	42	177 Schj
Traverse Limestone:		
Lime, gray (water @ 195')	50	227
Shale, gray	23	250
Lime, gray	13	263
[illegible]	[illegible]	[illegible] Schj
Lime, gray	-	[illegible]
From Samples:		
Limestone, buff, fragmental and fine grained, very fossiliferous	10	375
Limestone, buff, white to buff, fragmental, very fossiliferous, sparry and chalky in part	8	383
Limestone, buff to brown, fragmental, very fossiliferous, dolomitic in part	6	389
Limestone, buff, fragmental, very fossiliferous, [illegible] sparry in part; trace porosity (Pre-report Hole full water @ 393)	21	410
Limestone, buff white to buff, fragmental, very fossiliferous, sparry in part (412 CTM = 418 SLM)	8	418
Limestone, buff, fragmental, very fossiliferous, dolomitic, porous; trace dead black oil	21	439
Limestone, buff and buff white, fragmental and finely crystalline, fossiliferous, dolomitic, porous; trace dead black oil	7	446
Limestone, buff, as above; some Chert, white, granular and chalky, dolomitic	10	456
Dolomite, buff, finely crystalline, fossiliferous and calcareous in part, porous (7 bailers water per hour @ 456')	9	465
Dolomite, buff, medium crystalline, very porous, sandy with clear quartz grains, fine to medium, rounded and frosted	24	489 Schj
	(132)	

H015630

APPENDIX B

ENVIRONMENTAL FATE OF REPORTED SITE CONTAMINANTS

TABLE OF CONTENTS

Page

B.0 ENVIRONMENTAL FATE OF REPORTED SITE CONTAMINANTS

This section provides information on the environmental fate of substances which have been reported to be on Site. These include PCBs, PAHs and inorganics. The information on environmental fate presented is summarized from U.S. EPA Toxicological Profile reports for each substance.

B.1 PCBS

Polychlorinated biphenyls (PCBs) are a group of 209 stable, fat-soluble chemicals. Historically, PCBs have been used in the manufacturing of capacitors, transformers, carbonless copying paper, paints and hydraulic fluid. Presently, the use of PCBs is restricted to closed electrical systems and is being phased out as new dielectric fluids are developed and become widely available.

The PCBs identified at the Textile Road Site include:

1. Aroclor 1242, and
2. Aroclor 1254.

Aroclor is the commercial name for American PCB product mixtures. Different product mixtures are further identified by codes, such as 1242 and 1254. These codes designate the percent of chlorination of the product mixture. Because the time necessary for different components of

PCB mixtures to break down in the environment varies, PCB mixtures found in soils, sediments and biota have different compositions in comparison to the commercial formulations.

Chemical Identity

Aroclor 1242 and 1254 have similar physical and chemical properties. Table 4.5 presents a summary of the physical and chemical properties of all PCB aroclors.

Environmental Fate

Environmental fate is of great importance in determining the environmental impact of PCBs. Sorption, volatilization and bioaccumulation are important fate processes. PCBs strongly adsorb to organic rich sediment and soil. Volatilization and biodegradation are also important fate processes but may occur only at relatively slow rates. However, in the context of considering extended periods of time (such as the 20-year period which has elapsed since the majority of filling ceased) these processes may play an important role in determining the ultimate environmental fate of PCBs.

B.2 PAHS

Polycyclic aromatic hydrocarbons (PAHs) are a group of chemicals formed during the incomplete combustion of coal, oil, gas, garbage, or other organic substances. Some PAHs are used in medicines and others are used to make dyes, plastics and pesticides. PAHs are found throughout the environment in the air, water and soil. As pure chemicals, PAHs generally exist as colorless, white or pale yellow-green solids. Most PAHs do not occur alone in the environment, rather they are found as mixtures of two or more PAHs. PAHs can occur either in the air attached to dust particles, or in soil or sediment as solids. PAHs can also be found in substances such as crude oil, coal tar pitch, creosote and road and roofing tar. PAHs generally exhibit low solubility in water, but some may readily volatilize in air.

Chemical Identity

The following 11 PAHs are considered as a group in this review of the chemical and physical properties of PAHs.

- anthracene
- benzo(a)anthracene
- benzo(a)pyrene
- benzo(b)fluoranthene
- benzo(g,h,i)perylene
- benzo(k)fluoranthene
- chrysene
- dibenzo(a,h)anthracene
- indeno(1,2,3-cd)pyrene
- 2-methylnaphthalene

Environmental Fate

PAHs released to the environment are subject to a number of environmental fate processes including volatilization, sorption, biodegradation and bioaccumulation. PAH compounds tend to be removed from the water column by volatilization to the atmosphere, adsorption to particulates or sediments, or by being accumulated by or sorbed into aquatic organisms. Adsorption of PAHs to soil and sediments increases with increasing organic carbon content, and is also directly dependent on particle size.

Environmental Evaluation of PAHs

The environmental fate of PAHs is described by U.S. EPA in the document "Ambient Water Quality Criteria for Polynuclear Aromatic Hydrocarbons" which states:

> ***"PAH will adsorb strongly onto suspended particulates and biota and their (PAH) transport will be determined largely by the hydrogeologic condition of the aquatic system. PAH dissolved in the water column will probably undergo direct photolysis at a rapid rate. The ultimate fate of those which accumulate in the sediment is believed to be biodegration and biotransformation by benthic organisms (U.S. EPA, 1979)".***

This is restated in the U.S. EPA document "Health Effects Assessment for Polycyclic Aromatic Hydrocarbons (PAHs)" which states:

> ***"The predominant mechanism that is likely to dictate the fate of most PAHs in aquatic media is sorption to particulate matter and subsequent sedimentation and microbial degradation."***

Since PAHs are most likely to stay in the sediment or soil, microbial degradation is the most likely ultimate environmental fate in contrast to photolysis and volatilization. Compounds with four cyclic rings or less are most amenable to microbial degradation. Benzo(a)pyrene (five cyclic rings) has a half life in soil inoculated with bacteria of less than eight days. The half-life reported for benzo(a)pyrene in soil reported in Superfund Public Health Evaluation Manual (SPHEM, 1986) is 420 to 480 days but there is no reference to the microbial content in the soil.

The above comments indicate that terrestrial animals are unlikely to be exposed to PAH levels of concern in either the plants or the water consumed. Contact with contaminated soil is a potential exposure to Site-related PAHs, but the low solubility and large molecular size of PAHs of concern make dermal absorption or incidental ingestion an unlikely route of exposure for terrestrial animals.

B.3 INORGANICS

The Site-related contaminants of concern include a variety of inorganics:

- aluminum
- arsenic
- barium
- manganese
- lead
- cyanide

The following sections present a literature review of the properties of these organics. The goals of this review will be to determine and evaluate the properties of these inorganics in the environment that are important in determining the environmental fate.

B.3.1 Aluminum

Aluminum is a naturally occurring abundant metal, comprising about 8 percent of the earth's crust. It is mined from bauxite ore, but also occurs in micas, feldspars and cryolite. Aluminum does not occur as a free metal in nature.

Aluminum is used in the re-smelting of various metals, and on its own for packaging material, several types of containers, kitchen utensils, auto components, airplanes and building panels. Certain aluminum compounds are used in paint pigments, insulating materials, abrasives, cosmetics, food additives and drinking water and sewage water treatments.

Chemical Identity

Pure aluminum is a light ductile metal. Pertinent physical and chemical properties of aluminum are presented in Table 4.3. Additional properties of aluminum include:

Symbol	-	Al
Atomic Weight	-	26.98
Atomic Number	-	13
Density	-	2.7 g/cm^3
Melting Point	-	660.4°C
Boiling Point	-	2400°C

Aluminum is a good conductor of heat and electricity. When exposed to air a thin film of oxide is produced, creating a protective coating which is resistant to further corrosion.

Environmental Fate

Aluminum enters the environment from the natural weathering of minerals, and from pollutant sources such as discarded metal products, paints, etc.

Aluminum is the third most common element in the earth's crust, comprising about 8 percent. Generally, natural soils contain about 3 to 10 percent aluminum.

Aluminum compounds have very low solubility when pH is greater than about 5.5. The concentration of aluminum in lakes and rivers where pH >5.5 is generally very low, at less than about 100 µg/L. The solubility of most aluminum compounds increases rapidly as pH levels drop below 5.5. Where surface water or groundwater has a concentration below 5.5, it can be expected that aluminum concentrations will be found in the range of 0.1 to 0.7 mg/L.

In the surface water and groundwater environment, several processes inhibit the concentration and mobility of aluminum. These include:

- sorption to mineral matter,
- sorption to clay,
- sorption to suspended solids, and
- precipitation with hydroxyl ions.

Water samples at the Site generally had pH levels greater than 7. As such, it is expected that any aqueous phase aluminum would not have significant mobility.

Speciation

The only oxidation state of aluminum is (+3). It partitions between solid and liquid phases by reacting and complexing with water molecules and electron rich molecules such as chloride, fluoride, sulfate, nitrate, phosphate, and negatively charged functional groups on humic materials and clay.

B.3.2 Arsenic

Arsenic occurs in nature in sulfide ores, such as Arsenopyrite. Arsenic trioxide is obtained as a by-product from the smelting of copper, lead or gold ores.

Arsenic was used as a therapeutic agent as early as 400 BC.

The major current use of arsenic is for pesticides, herbicides, cotton desiccants, wood preservatives, bronzing, glass production, metal alloy production, and manufacture of integrated circuits.

Chemical Identity

Pertinent physical and chemical properties of arsenic are presented in Table 4.3. The following provides additional description:

Symbol	-	As
Atomic Weight	-	74.92
Atomic Number	-	33
Density	-	5.727
Valence States	-	-3, 0, +3, +5

Arsenic compounds may be classified into three major groups:

(1) inorganic arsenic compounds,

(2) organic arsenic compounds, and

(3) arsine gas.

The most common inorganic arsenic compounds include arsenic trioxide, sodium arsenite, arsenic trichloride, arsenic pentoxide, arsenic acid and arsenate (i.e. lead arsenate and calcium arsenate). Common organic arsenic compounds are arsanilic acid, methylarsonic acid, dimethylarsinite acid and arsenobetaine.

Environmental Fate

Arsenic generally enters the environment as a byproduct of industrial processes. It may enter the environment as particulate fall-out from smoke stacks during smelting process, discarded as residual of casting processes or wood preserving operations, etc.

Arsenic trioxide is only slightly soluble in water. Sodium arsenite and sodium arsenate are highly soluble. Depending on the pH of water, interchanges of valence may occur in water solution. Arsenic may be transformed by oxidation-reduction reactions. The most common form of arsenic in water is arsenate, which can be reduced to arsenite by microorganisms.

Arsenic is released into the atmosphere primarily as arsenic trioxide. Trivalent arsenic in the atmosphere undergo oxidation to the pentavalent state.

Arsenic levels in uncontaminated surface water and groundwater range from about 1 to 10 ppb. Much higher levels, up to 3400 ppb, have been detected in volcanic rock. Arsenic is relatively mobile.

Speciation

Arsenic exists in the oxidation states -3, 0, +3, +5. It undergoes transformation to the various states by oxidation-reduction reactions, ligand exchange and biotransformations.

B.3.3 Lead

Lead is a naturally occurring bluish-gray metal found in only limited quantities in the Earth's crust. Lead and its compounds can be detected in all parts of the environment. Lead has a wide variety of uses including:

- batteries,
- ammunition,
- metal products, and
- chemical manufacture.

Chemical Identity

The physical properties of lead are presented in Table 4.3. Additional information includes:

Symbol	-	Pb
Atomic Weight	-	207.2
Atomic Number	-	82

Metallic lead is stable in dry air. In moist air, however, it quickly forms lead monoxide, which in turn produces lead carbonate with carbon dioxide in air. In general, the properties of inorganic lead compounds are similar to those of the alkaline earth metals. The nitrate, chlorate and acetate salts are water soluble, chloride salt is slightly soluble and the sulfate, carbonate, chromate, phosphate and sulfide salts are insoluble. Lead forms stable compounds with organic compounds, especially under anaerobic conditions, which are generally insoluble in water.

Environmental Fate

It is believed that combustion of leaded gasoline is responsible for over 90 percent of the lead in the environment. Lead particles are removed from the atmosphere by wet or dry deposition. Lead is extremely persistent in both water and soil. The speciation of lead depends upon pH, temperature and the presence of humic materials. Lead is largely associated with the suspended solids and sediments (immobile forms) in aquatic systems.

Lead has the tendency to form compounds of low solubility. Hydroxide, carbonate, sulfide and sulfate may act as solubility controls in precipitating lead from water.

The amount of lead that remains in solution depends largely upon the pH and the water dissolved salt content. Equilibrium calculations show that at pH>5.4 the solubility of lead is 30 µg/L (hard water) or 500 μg/L (soft water). The presence of sulfate and carbonates will limit these levels. In the groundwaters of the upper sand aquifer the majority of any aqueous phase lead, which may leave the sludge lagoon, would be readily precipitated as $PbCO_3$ (solid).

Speciation

Lead exists in three oxidation states ($0, 2^+$ and 4^+). Lead can precipitate as a number of compounds including, $PbS0_4$, $PbC0_3$, $Pb(OH)_2$, PbS and $Pb_3(PO4)_2$.

Lead readily forms complexes with organic ligands, which tend to increase the amount of lead which can be dissolved in water. Lead is readily adsorbed to numerous solid surfaces including organic matter, clay, silica, iron and manganese oxides.

B.3.4 Barium

Barium occurs in nature usually as the mineral barite ($BaSO_4$), and occasionally as witherite ($BaCO_3$).

The major commercial use of barite is in the manufacture of well drilling mud. Barite is also used in the manufacture of glass, ceramics, television picture tubes, brick, tile, vinyl, railroad flares, fireworks, fine chemicals, lubricating oil additives, magnets, sugar refining, steel hardening and paint pigments. A minor amount are used in the manufacture of rodenticides, insecticides and depilatories.

Chemical Identity

The free element of barium is a sliver-grey soft metal. Pertinent physical and chemical properties of barium are presented in Table 4.3. The following provides some additional information:

Symbol	-	Ba
Atomic Weight	-	137.33
Atomic Number	-	56

Barium is a colorless divalent positive ion in compounds. The chloride and nitrate compounds are highly soluble in water, and the carbonate and sulfite compounds are much less soluble.

Environmental Fate

Barium enters the environment through the disposal of contaminated liquids or muds.

Barium in surface water or groundwater precipitates out of solution as an insoluble salt or it may adsorb to suspended solids. Barium in sediments is found largely in the form of barium sulfate.

Barium added to soils can be taken up by vegetation, or percolate to the groundwater with precipitation. Barium has been found to bioconcentrate in fish and marine plants.

Barium has low mobility in soil systems, being dependent on the characterization of the materials. Soils with a high cation exchange capacity cause barium to be adsorbed. Soils with high $CaCO_3$ cause barium to precipitate as $BaCO_3$ and thus limit its mobility. Barium is more mobile in the presence of chloride ions.

Elemental barium is oxidized readily in moist air. Barium may remain in moist air. Barium may remain in the air for several days depending on particulate size, chemical nature and amount of rainfall.

Speciation

Barium will generally form compounds in the +2 oxidation state. Barium will precipitate to form $BaSO_4$ and $BaCO_3$. Barium will adsorb to suspended particulate matter.

B.3.5 Manganese

Manganese is a whitish-grey metal which is harder than iron and very brittle. Uses for manganese include:

- steel manufacturing,

- manufacture of dry cell batteries,
- chemical production and process,
- manufacture of glass,
- textile bleaching,
- welding,
- dyeing,
- tanning leather, and
- fertilizers.

Manganese does not occur naturally in its native state. It is found in many minerals, including pyrolusite (MnO_2) which contains 60 to 63 percent manganese.

Chemical Identity

Pertinent physical and chemical properties are presented in Table 4.3. Additional information is provided below:

Symbol	-	Mn
Atomic Weight	-	54.94
Atomic Number	-	25
Density	-	7.21 to 7.44

Manganese is found in the oxidation states 0, +1, +2, +3, +4, +5, +6 and +7. The most stable oxidation state is +2. Important compounds of manganese include MnO_2 and permanganates. It may also form various organometallic compounds.

Environmental Fate

Land disposal of wastes which contain manganese are the principal source of manganese releases to soil.

The vapor pressure of elemental manganese and inorganic compounds is negligible. It may exist in the air as suspended particulate matter. Particulates are removed from the air by gravitational settling. The half-life of airborne particles is on the order of several days.

The transport and partitioning of manganese is controlled by the solubility of the specific chemical form present. The chemical form is controlled by the pH, oxidation-reduction potential and available anions.

Manganese may exist in water in four oxidation states (+2, +3, +4 or +7). Divalent manganese is most common at pH of 4 to 7, but may become oxidized at higher pH. The concentration of manganese is limited in the presence of carbonates.

Manganese is often transported in surface water by suspended sediments.

Manganese is generally found to be bioconcentrated in water plant life and fish.

Soil adsorption constants for manganese span five orders of magnitude (0.2 to 10,000 mL/g) and is a function of the organic content and the ion exchange capacity of the soil. Therefore, adsorption to soil or sediments may be highly variable. At low concentrations, manganese may be "fixed" by clays, and not released into solution.

Speciation

The oxidation states of manganese are 0, +1, +2, +3, +4, +5, +6 and +7. In solution, the states are only +2, +3, +4 and +7. The oxidation state of manganese in soil, sediment or water is subject to microbial activity, pH and Eh.

B.3.6 Cyanide

Cyanides are naturally occurring substances found in a number of foods and plants and produced by certain bacteria, fungi and algae. Most of the cyanide found in the environment comes from industrial sources and especially vehicle exhaust.

Cyanide is one of the more potent poisons. It can adversely affect the central nervous system, respiratory system and cardiovascular system. The effects of short term exposure to cyanide may include coma and/or death.

Cyanide is used mainly as hydrogen cyanide and as cyanide salts. Hydrogen cyanide is used primarily in the production of organic chemicals. Cyanide salts are used primarily in electroplating and metal treatment.

Chemical Identity

Pertinent physical and chemical properties of hydrogen cyanide are presented in Table 4.3. Additional properties of hydrogen cyanide include:

Chemical Formula	-	HCN
Melting Point	-	-13.24 °C
Boiling Point	-	25.70 °C
Autoignition Temperature	-	538 °C
Density	-	0.6884 g/cm^3 (liquid @ 20 °C)

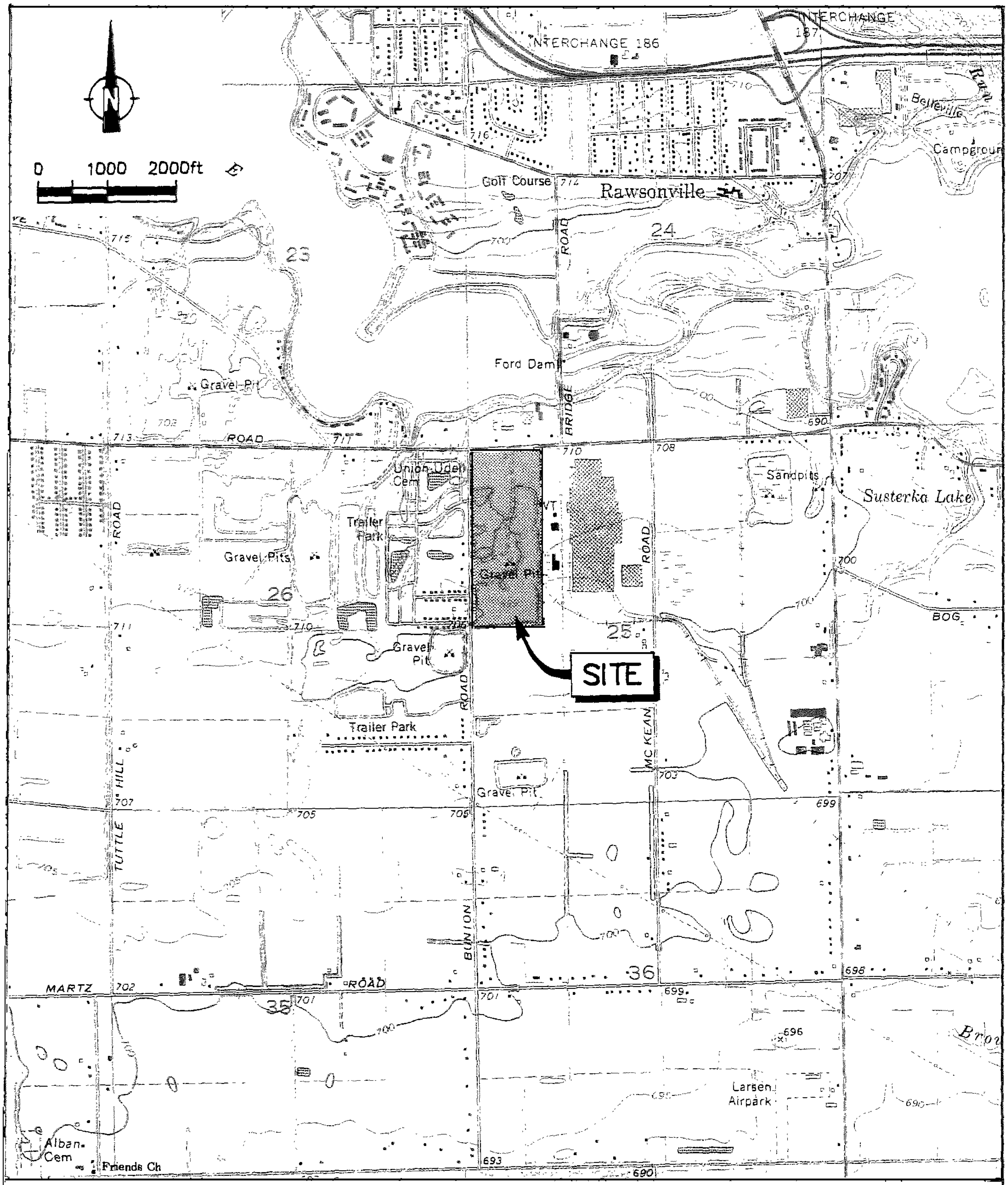
Cyanide compounds which are most likely to be present in the biosphere are hydrogen cyanide, sodium cyanide and potassium cyanide. Hydrogen cyanide is a colorless gas or liquid with a faint bitter almond odor. Sodium cyanide and potassium cyanide are both white solids that possess a slight odor of bitter almonds in damp air.

Environmental Fate

Discharges from metal finishing industries, iron and steel mills and organic chemical industries are the principal sources of cyanide releases to water. The cyanide compound most common in water, hydrogen cyanide, is expected to be removed from water primarily by volatization or, at low concentrations, by aerobic or anaerobic biodegradation.

Vehicle exhaust is the principal source of cyanide releases to air. These cyanide releases consist mainly of hydrogen cyanide gas which may travel long distances before reacting with photochemically generated hydroxyl radicals or being removed by wet deposition.

Disposal of cyanide wastes in landfills and the use of cyanide-containing road salts are the principal sources of cyanide releases, usually of hydrogen cyanide, to soil. Volatization is the primary loss mechanism for hydrogen cyanide in surface soil with pH less than 9.2. In subsurface soil, hydrogen cyanide should biodegrade when existing in low concentrations. If present in high concentrations, hydrogen cyanide may leach into groundwater.



SOURCE: USGS QUADRANGLE MAP, YPSILANTI EAST, MICHIGAN

CRA

figure 1.1

SITE LOCATION
TEXTILE ROAD SITE
Ypsilanti Twp., Washtenaw Cty., Michigan

4770(4)-JUL.8/92-REV.0

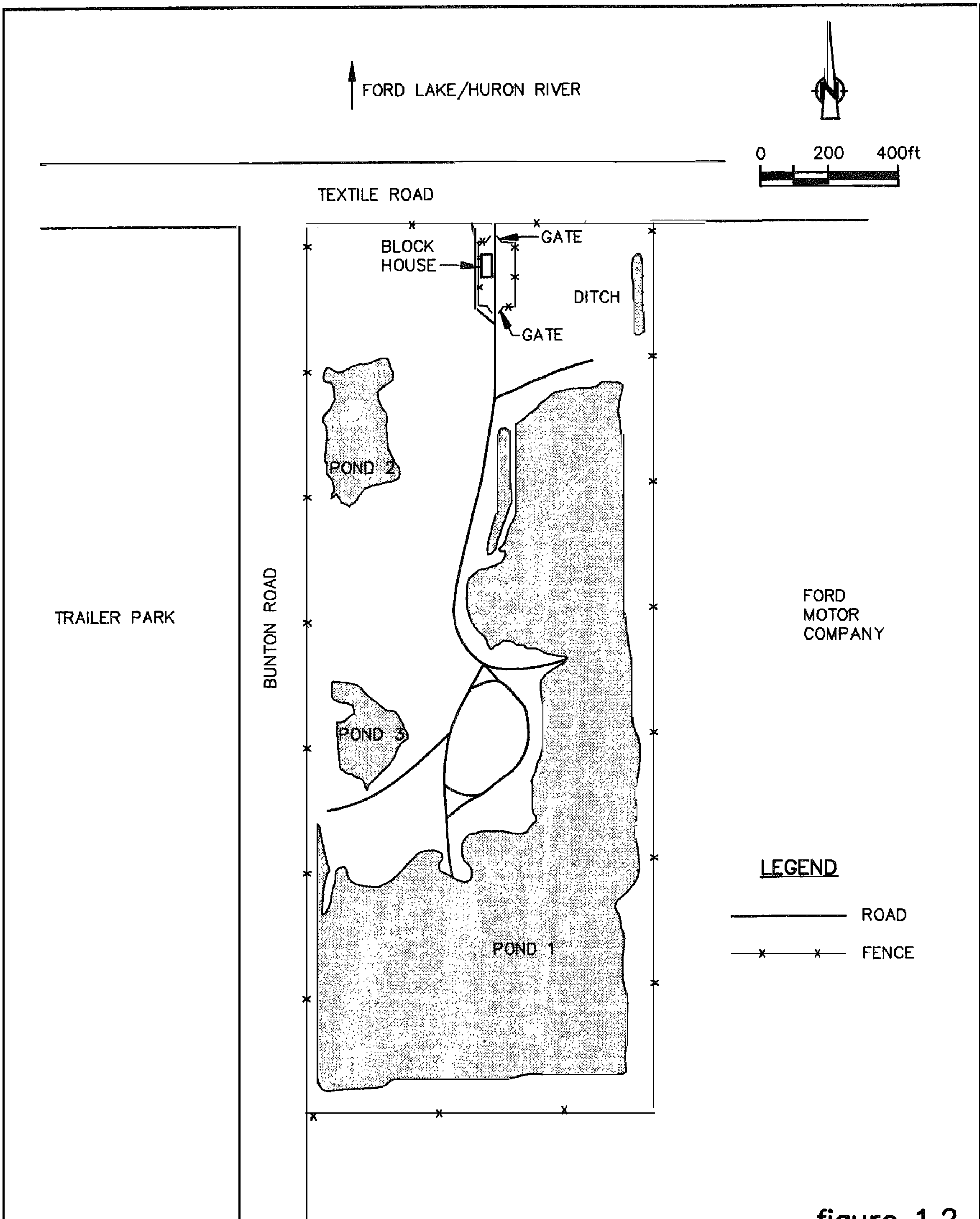


figure 1.2

SITE PLAN
TEXTILE ROAD SITE
Ypsilanti Twp., Washtenaw Cty., Michigan

CRA

4770(4)–JUL.8/92–REV.0 (P–27)

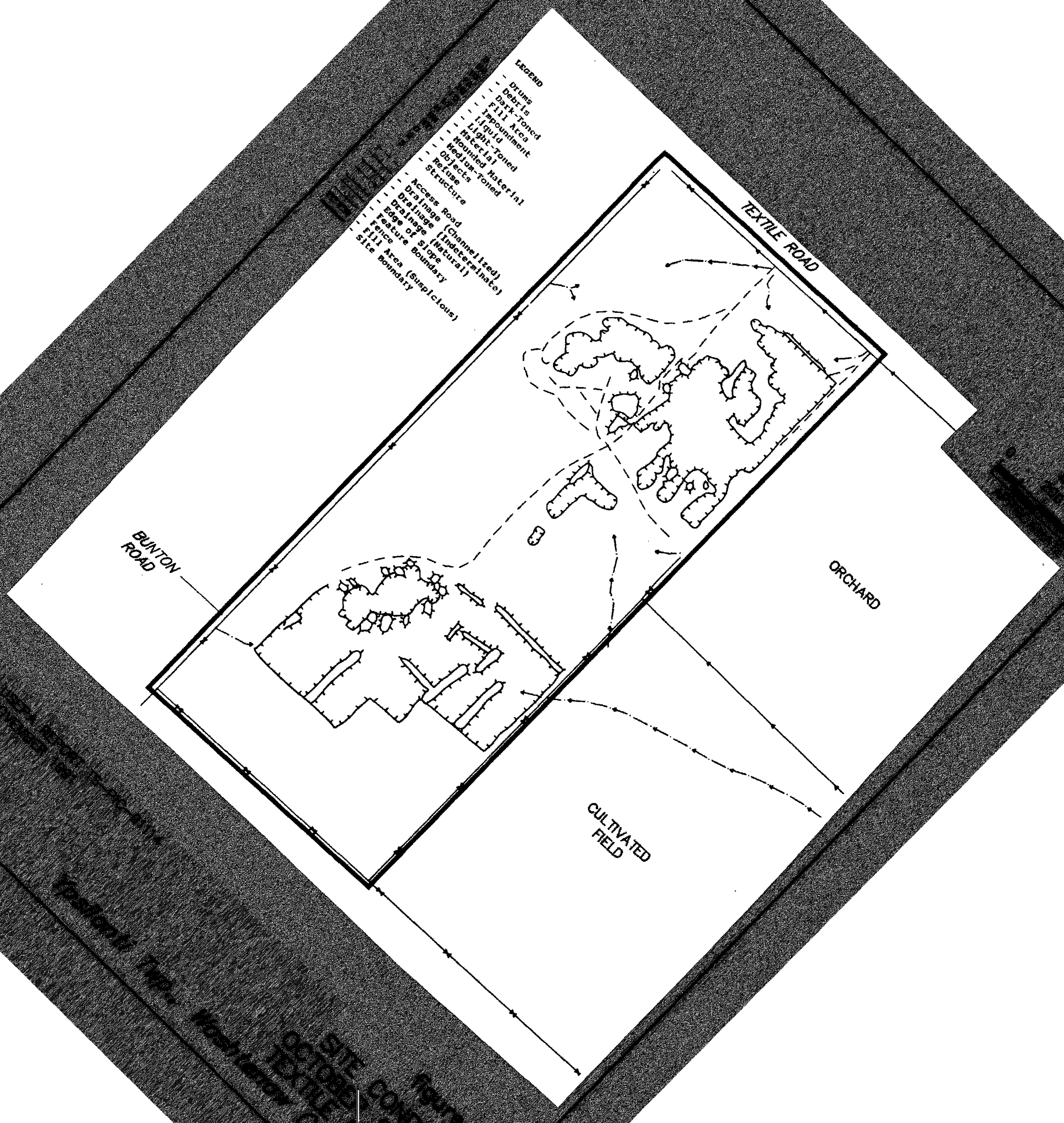


Figure 2.1
SITE CONDITIONS
OCTOBER 27, 1949
TEXTILE ROAD SITE
Ypsilanti Twp., Washtenaw Co., Michigan

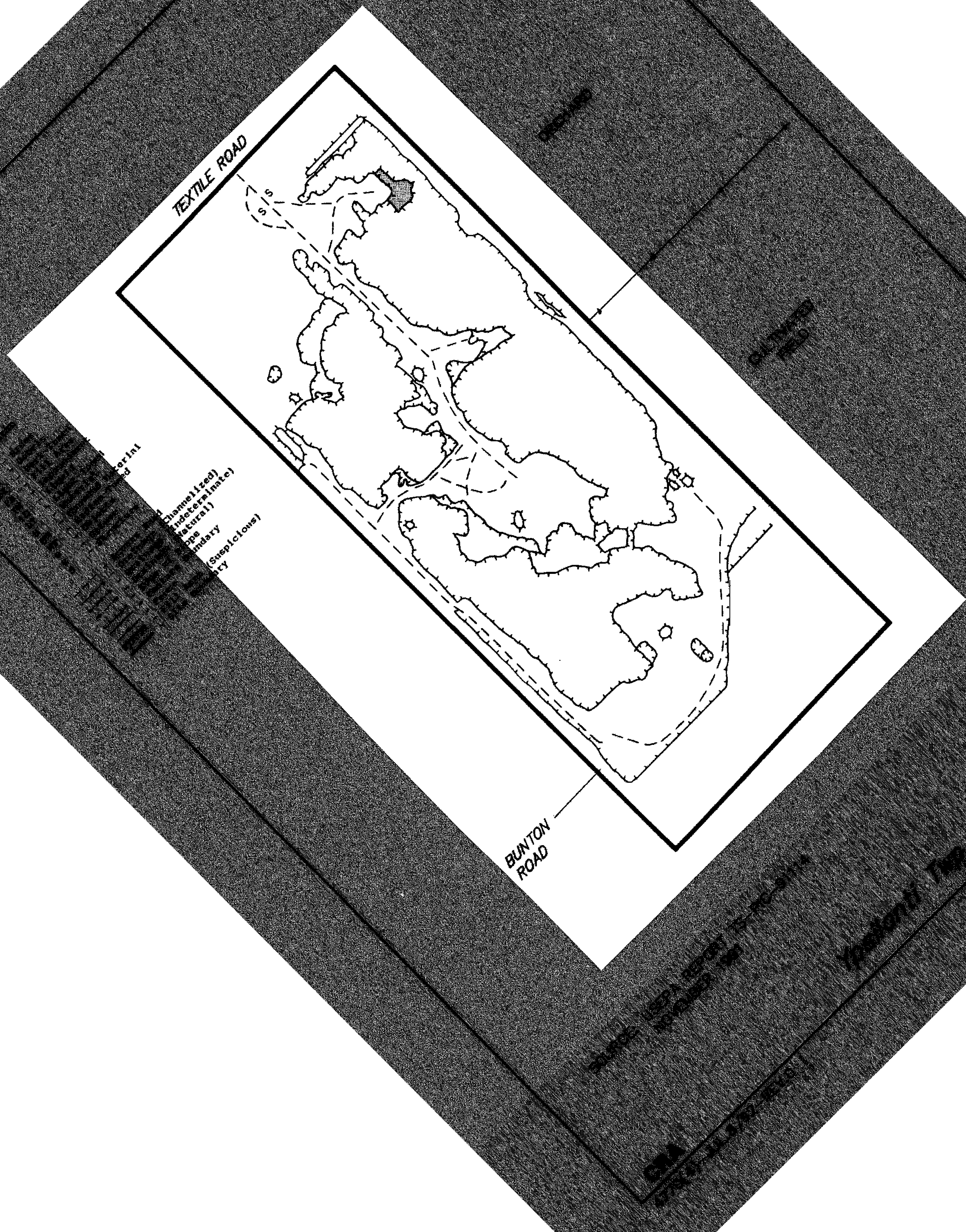


figure 2.2
SITE CONDITIONS
SEPTEMBER 6, 1980
TEXTILE ROAD SITE
Ypsilanti Twp., Washtenaw Cty., Michigan

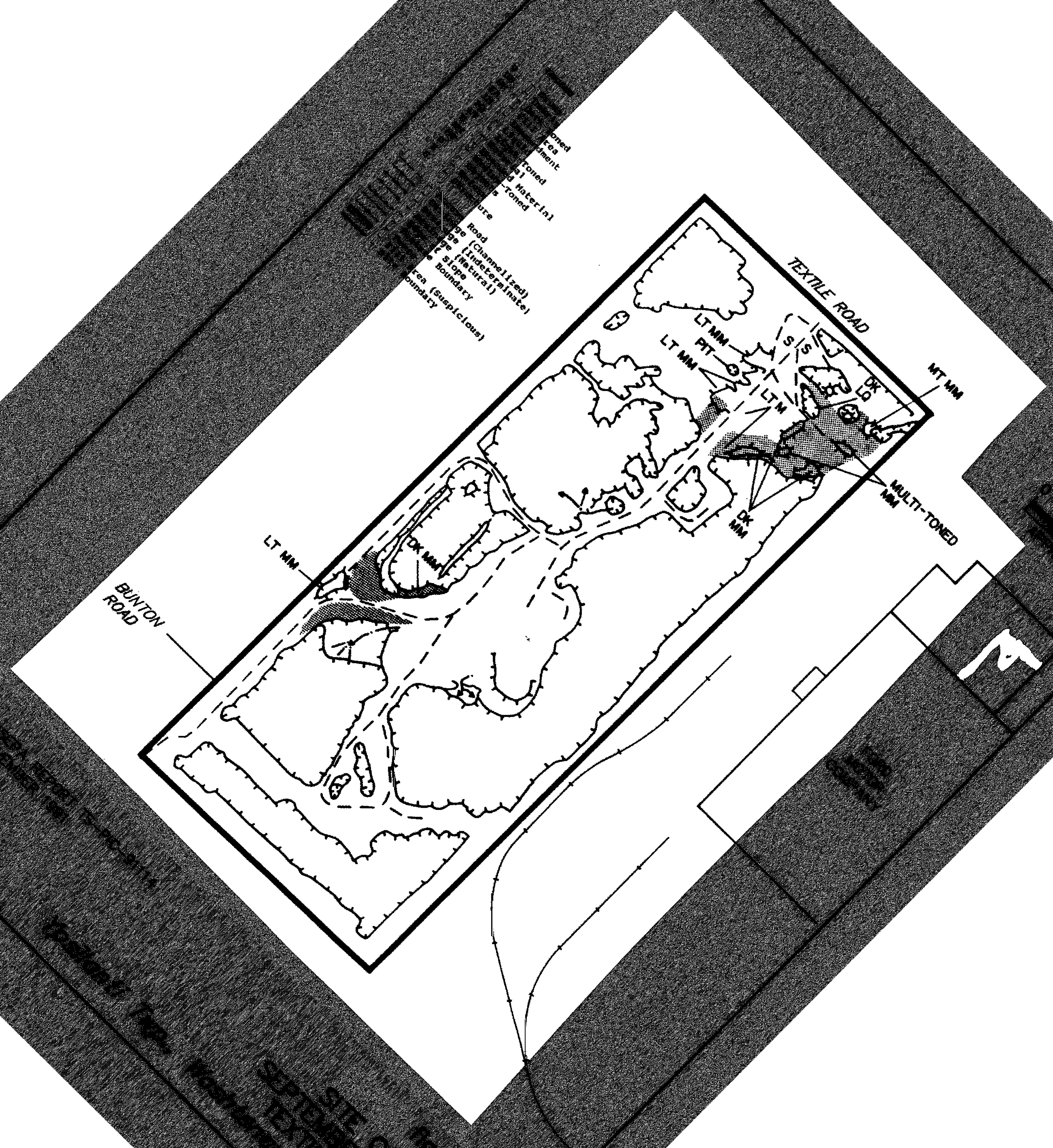
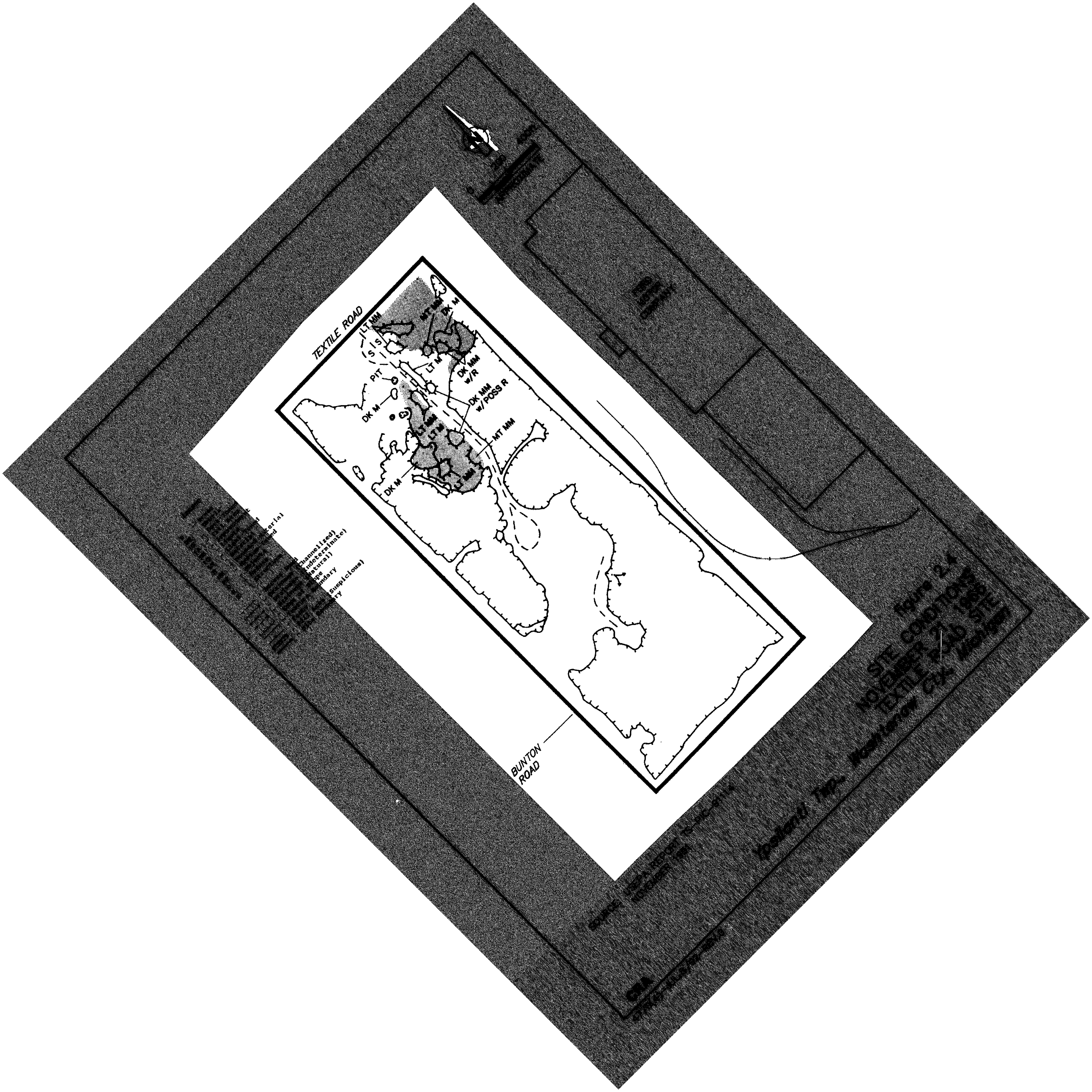
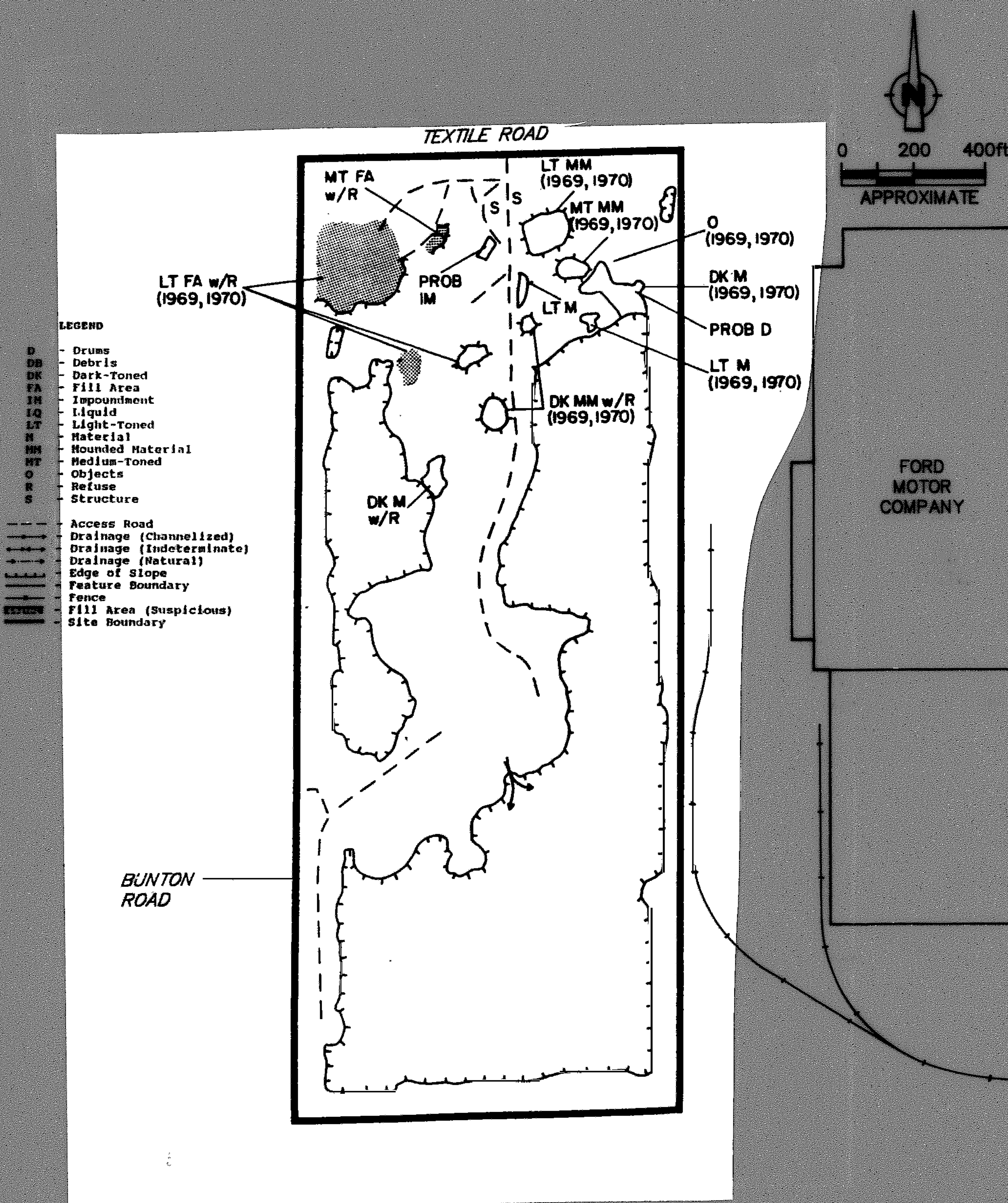


Figure 2.3
SITE CONDITIONS
SEPTEMBER 28, 1983
TEXTILE ROAD SITE
Washtenaw Co., Michigan


TEXTILE ROAD
BUNTON ROAD
LT MM
MT MM
DK M
S
PIT
LT M
DK MM w/R
DK MM w/POSS R
figure 2.4
SITE CONDITIONS
NOVEMBER
TEXTILE ROAD SITE
Ypsilanti Twp., Washtenaw Cty., Michigan



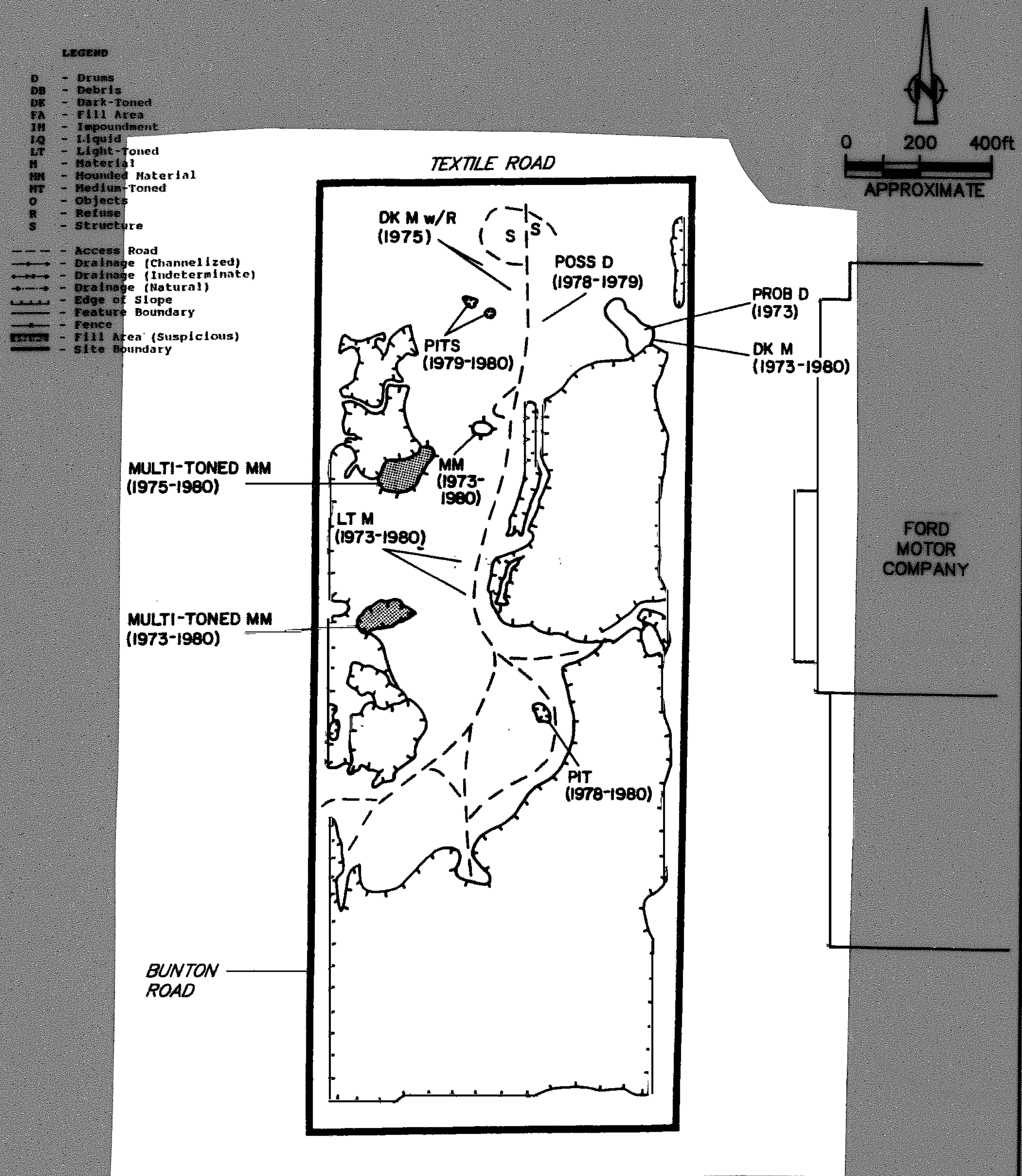
SOURCE: USEPA REPORT TS-PIC-91114
NOVEMBER 1991

figure 2.5

SITE CONDITIONS
JUNE 8, 1970
TEXTILE ROAD SITE
Ypsilanti Twp., Washtenaw Cty., Michigan

CRA

4770(4)-JUL.8/92-REV.0



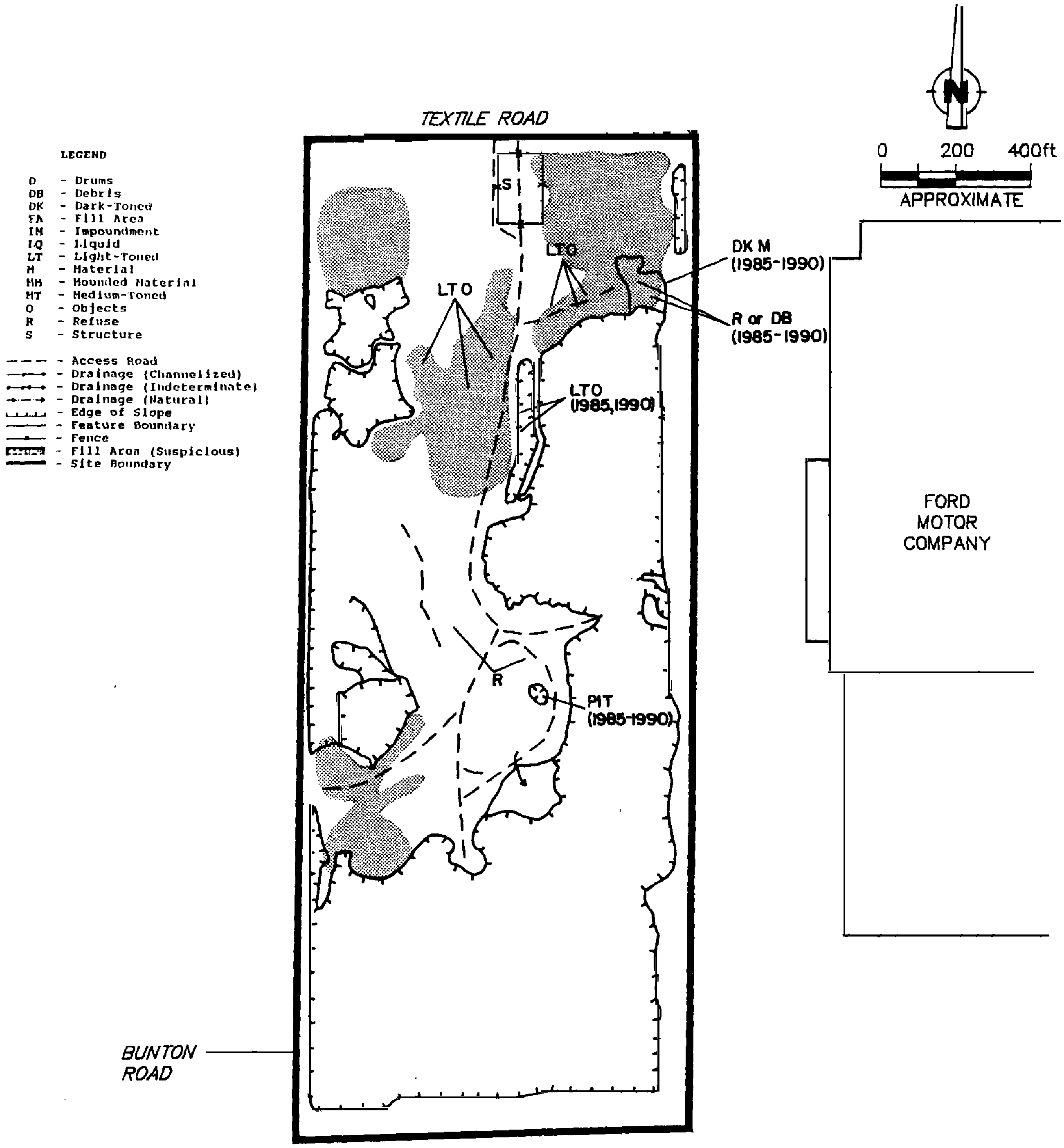
SOURCE: USEPA REPORT TS-PIC-91114
NOVEMBER 1991

figure 2.6

SITE CONDITIONS
APRIL 18, 1980
TEXTILE ROAD SITE
Ypsilanti Twp., Washtenaw Cty., Michigan

CRA

4770(4)-JUL.8/92-REV.0



SOURCE: USEPA REPORT TS-PIC-91114
NOVEMBER 1991

figure 2.7

SITE CONDITIONS
APRIL 8, 1990
TEXTILE ROAD SITE
Ypsilanti Twp., Washtenaw Cty., Michigan

CRA

4770(4)-JUL.8/92-REV.0

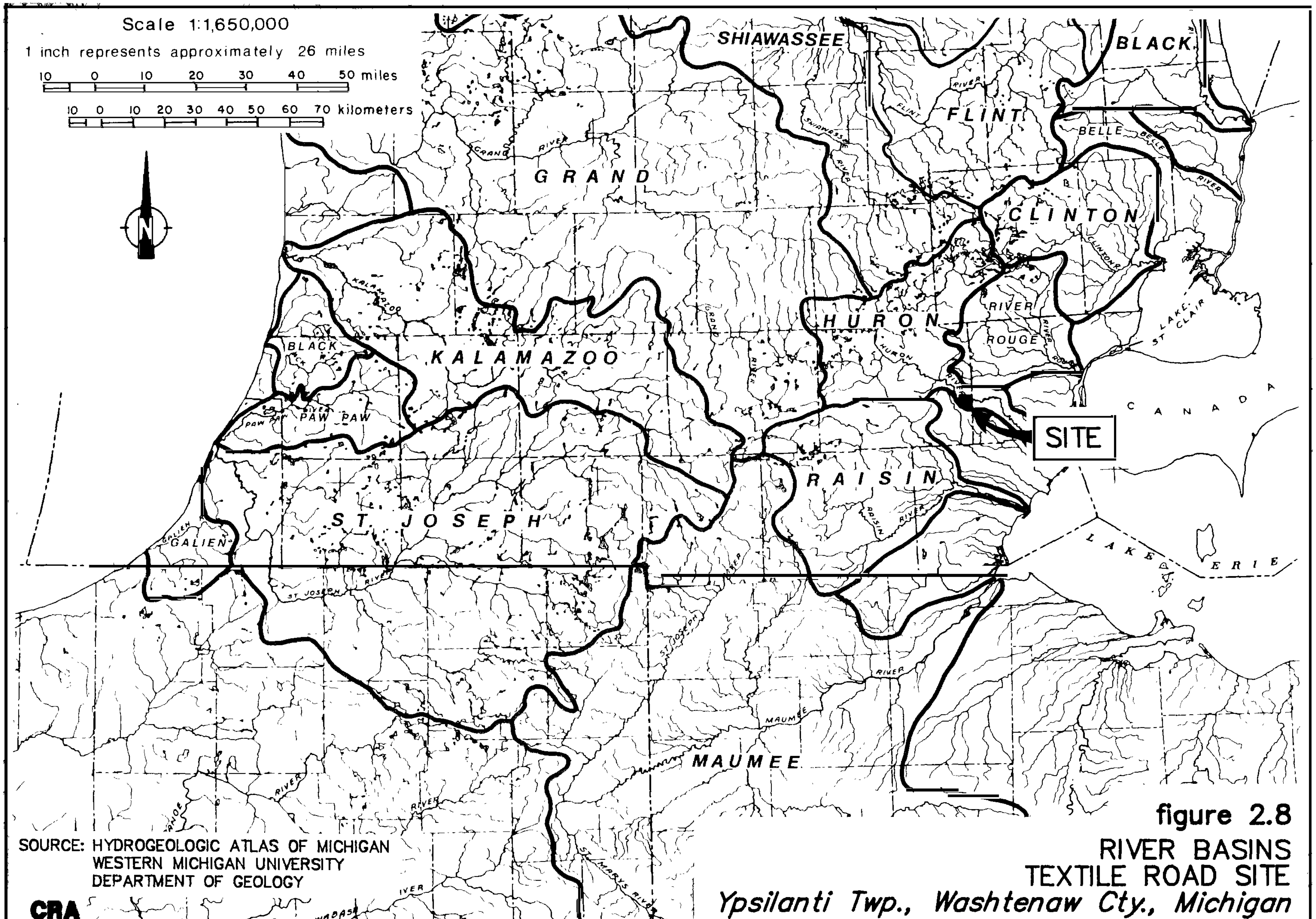
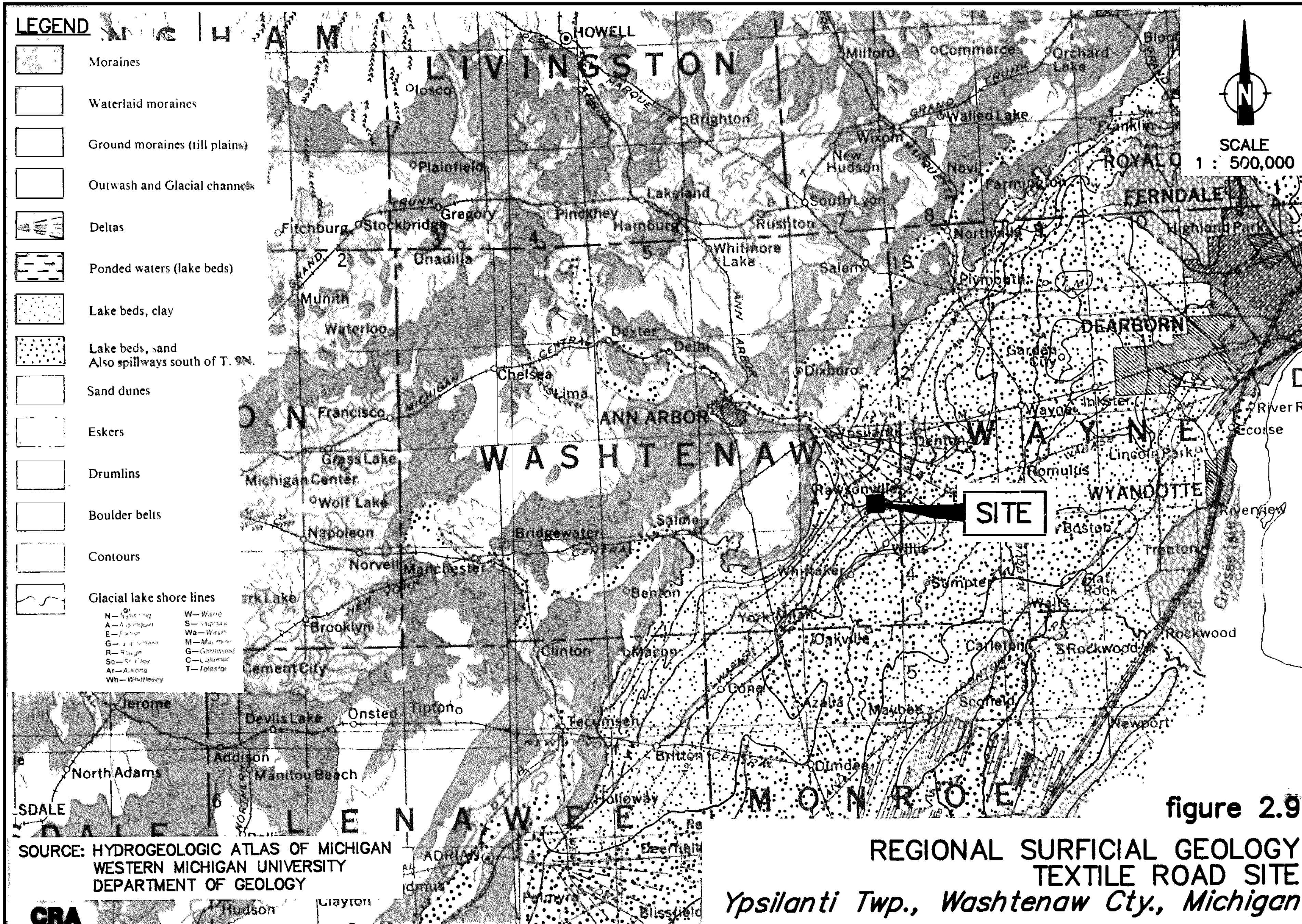


figure 2.8
RIVER BASINS
TEXTILE ROAD SITE
Ypsilanti Twp., Washtenaw Cty., Michigan

SOURCE: HYDROGEOLOGIC ATLAS OF MICHIGAN
WESTERN MICHIGAN UNIVERSITY
DEPARTMENT OF GEOLOGY

CRA

4770(4)-JUL.8/92-REV.0



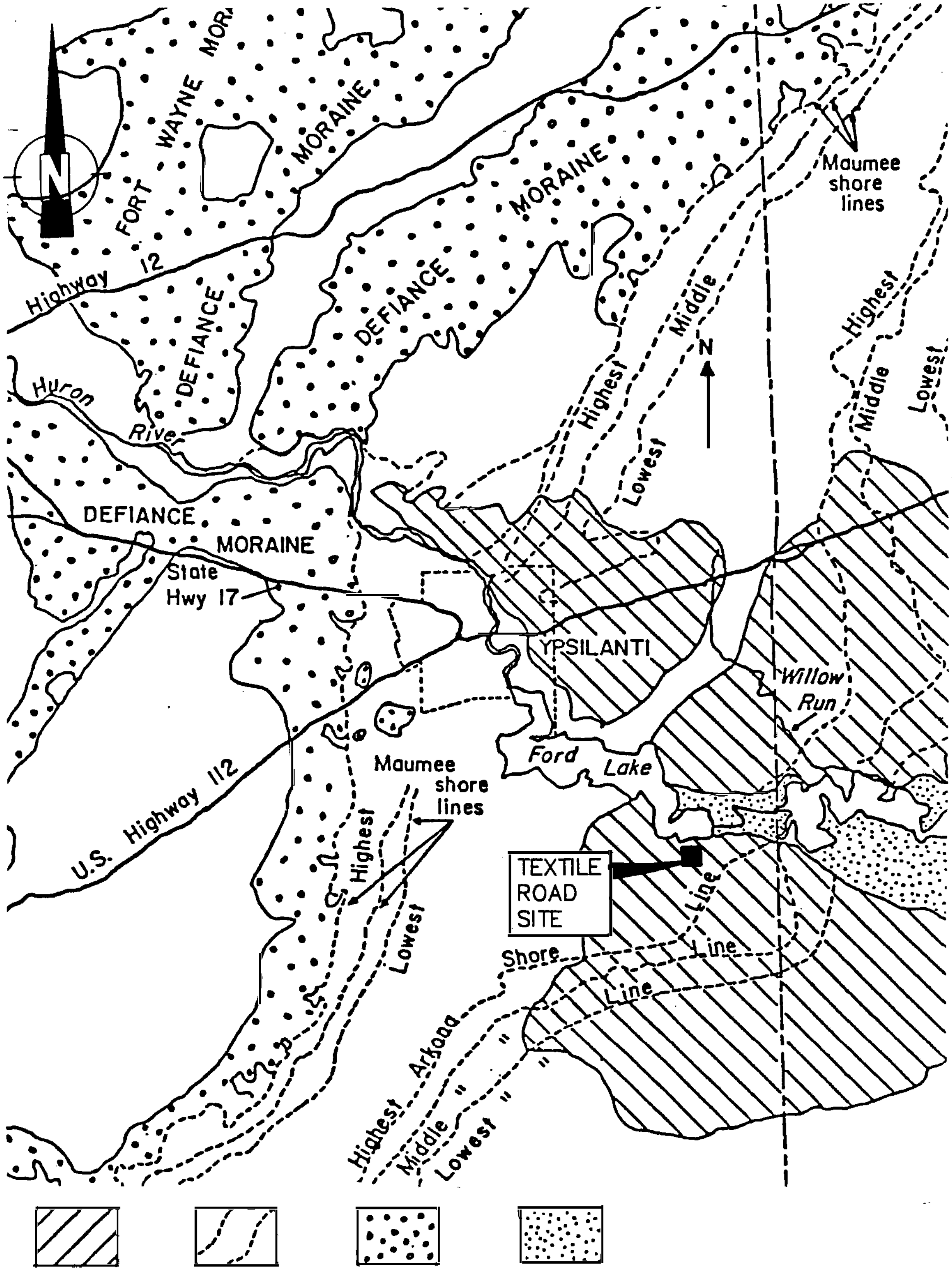
SOURCE: HYDROGEOLOGIC ATLAS OF MICHIGAN
WESTERN MICHIGAN UNIVERSITY
DEPARTMENT OF GEOLOGY

CRA

figure 2.9

REGIONAL SURFICIAL GEOLOGY
TEXTILE ROAD SITE
Ypsilanti Twp., Washtenaw Cty., Michigan

4770(4)–JUL.8/92–REV.0



·Delta deposits of the Huron and Saline rivers.

Arkona glacial shore-lines (sand, clay, till).

Terminal moraine.

Aluvium and river terraces

Source for map: McGuiness, 1949

figure 2.10

LOCAL SURFICIAL GEOLOGY
TEXTILE ROAD SITE
Ypsilanti Twp., Washtenaw Cty., Michigan

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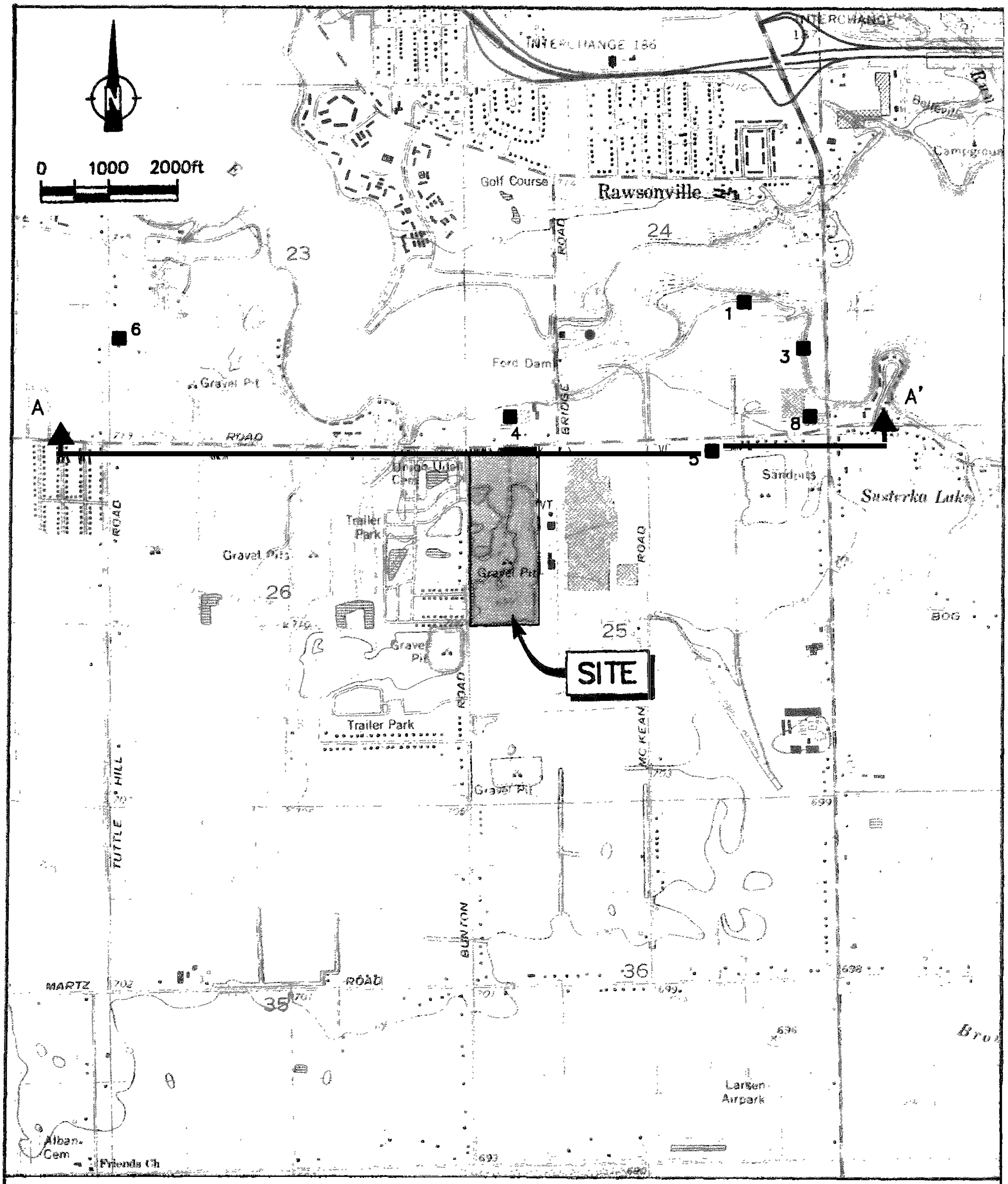
4770(4)–JUL.8/92–REV.0



SOURCE: USGS QUADRANGLE MAP, YPSILANTI EAST, MICHIGAN

LEGEND

1 ■ WELL LOCATION

A ▲ CROSS-SECTION LOCATION

figure 2.11

WELL LOCATION PLAN
TEXTILE ROAD SITE
Ypsilanti Twp., Washtenaw Cty., Michigan

4770(4)–JUL.8/92–REV.0

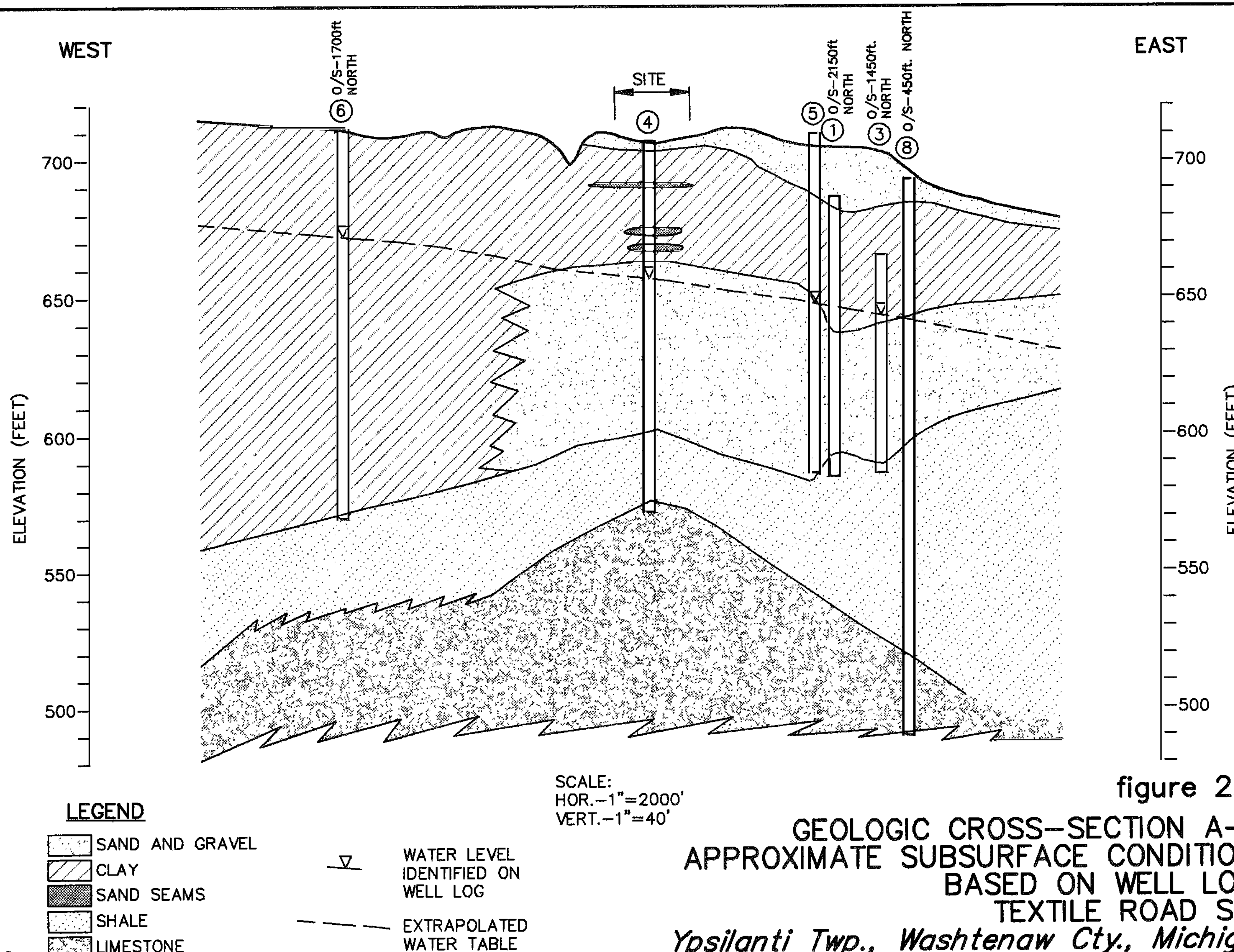


figure 2.12

GEOLOGIC CROSS-SECTION A-A'
APPROXIMATE SUBSURFACE CONDITIONS
BASED ON WELL LOGS
TEXTILE ROAD SITE
Ypsilanti Twp., Washtenaw Cty., Michigan

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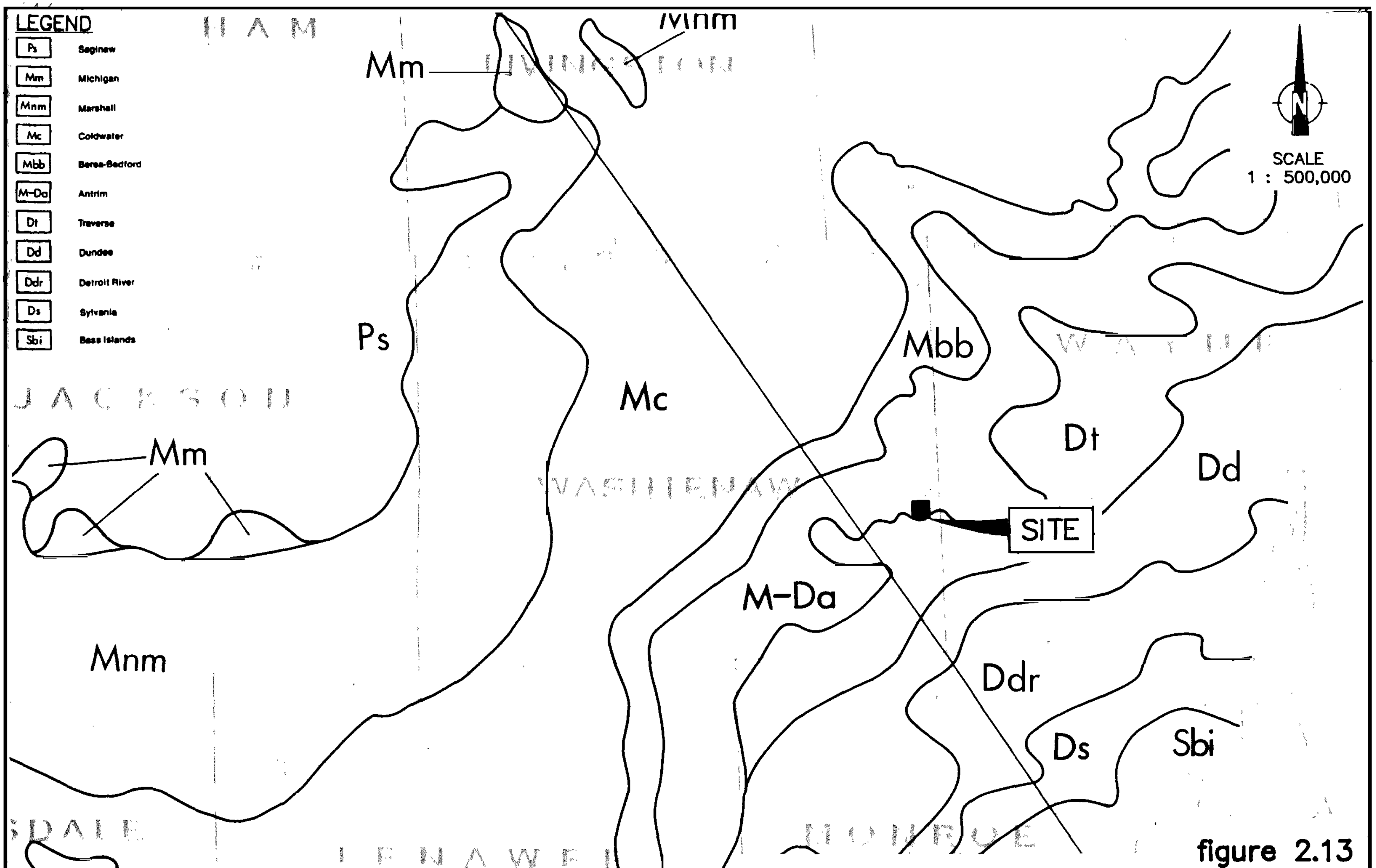
4770(4)-JUL.8/92-REV.0 (X-03)



SOURCE: HYDROGEOLOGIC ATLAS OF MICHIGAN
WESTERN MICHIGAN UNIVERSITY
DEPARTMENT OF GEOLOGY

CRA

figure 2.13

REGIONAL BEDROCK GEOLOGY
TEXTILE ROAD SITE
Ypsilanti Twp., Washtenaw Cty., Michigan

4770(4)–JUL.8/92–REV.0

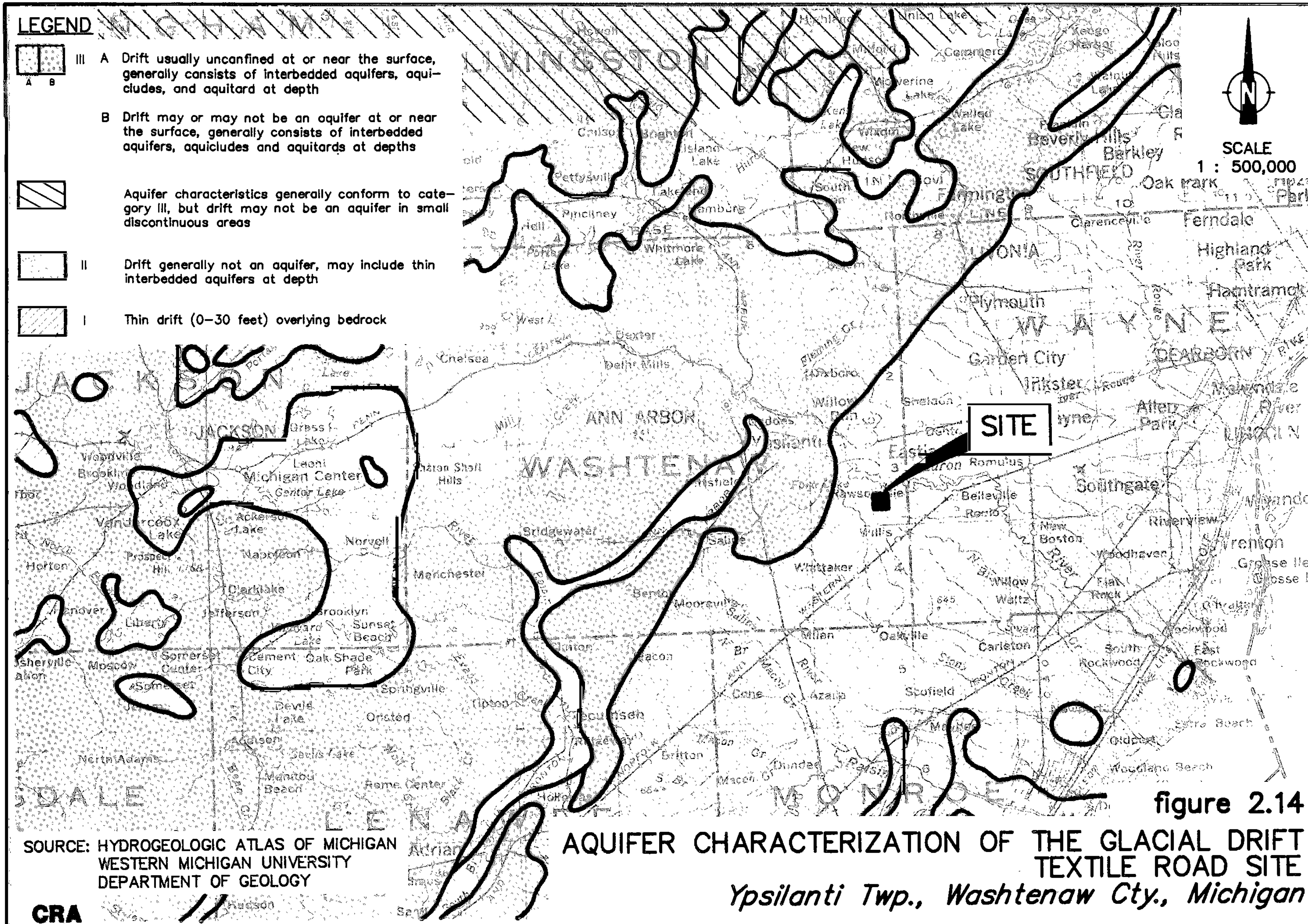


figure 2.14

AQUIFER CHARACTERIZATION OF THE GLACIAL DRIFT
TEXTILE ROAD SITE
Ypsilanti Twp., Washtenaw Cty., Michigan

4770(4)–JUL.8/92–REV.0

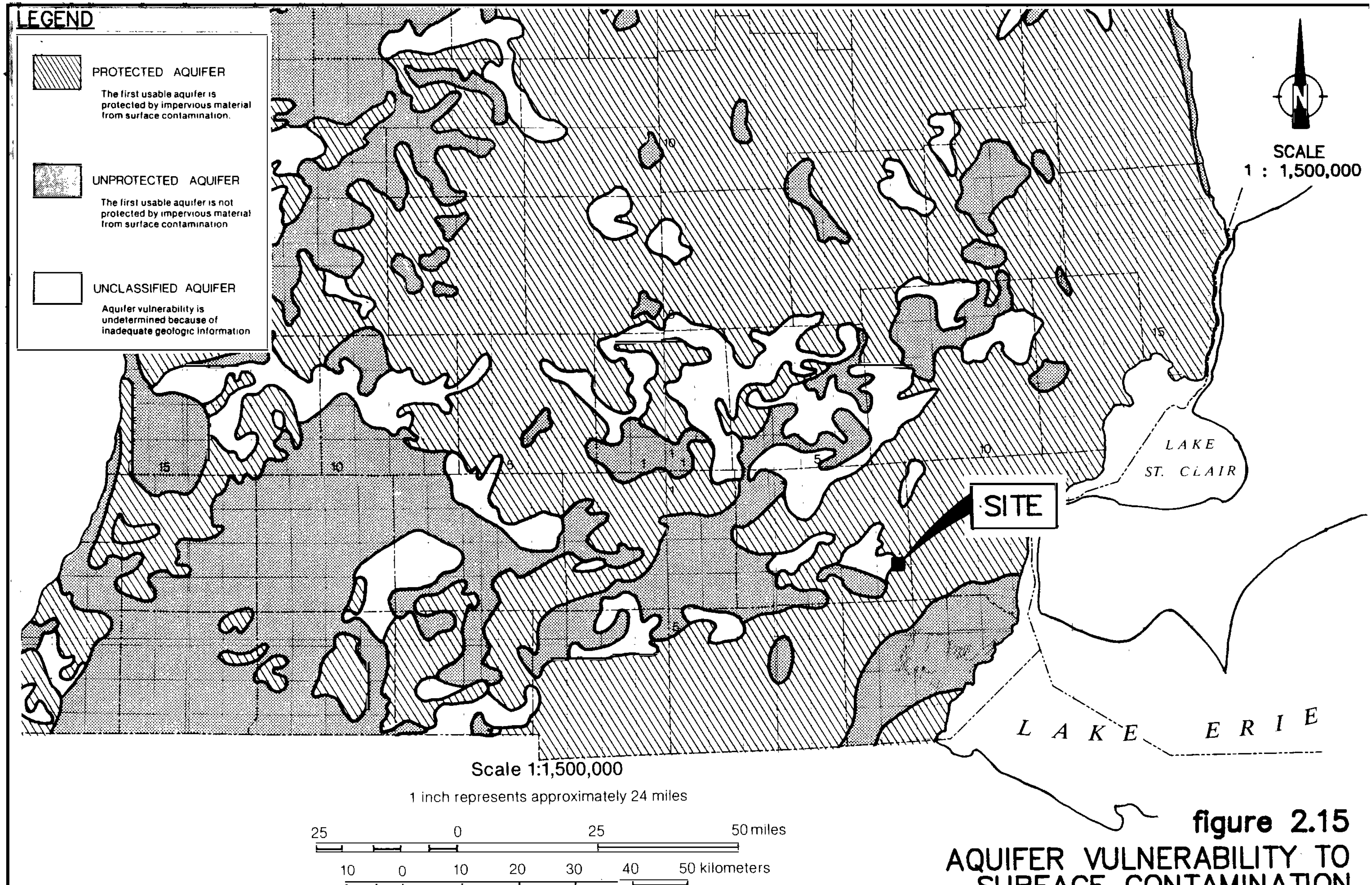


figure 2.15
AQUIFER VULNERABILITY TO
SURFACE CONTAMINATION
TEXTILE ROAD SITE
Ypsilanti Twp., Washtenaw Cty., Michigan

SOURCE: HYDROGEOLOGIC ATLAS OF MICHIGAN
WESTERN MICHIGAN UNIVERSITY
DEPARTMENT OF GEOLOGY

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4770(4)–JUL.8/92–REV.0

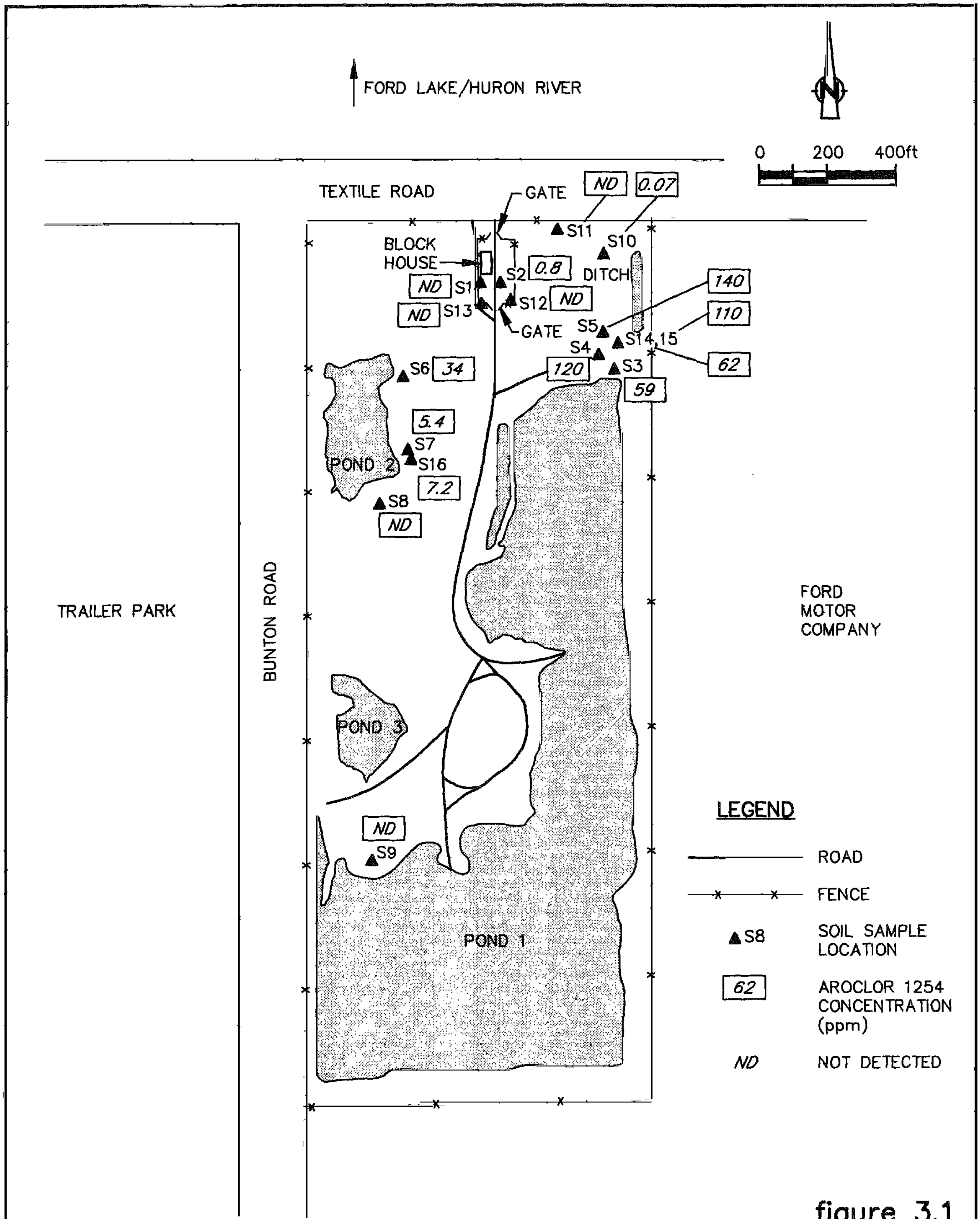

figure 3.1

1990 FIT SOIL SAMPLING LOCATIONS
TEXTILE ROAD SITE
Ypsilanti Twp., Washtenaw Cty., Michigan

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4770(4)-JUL.8/92-REV.0 (P-28)

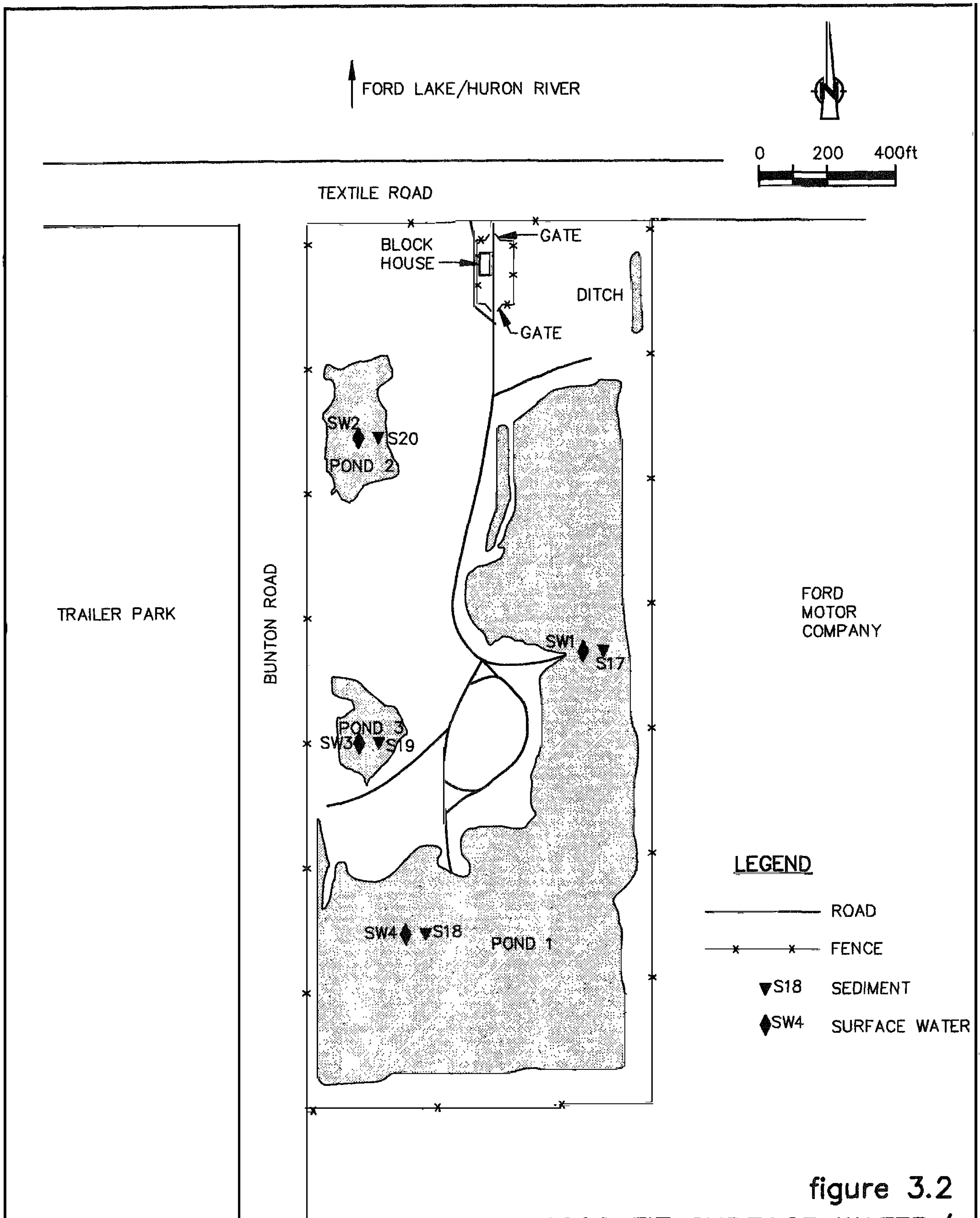


figure 3.2

1990 FIT SURFACE WATER/
SEDIMENT SAMPLING LOCATIONS
TEXTILE ROAD SITE
Ypsilanti Twp., Washtenaw Cty., Michigan

CRA

4770(4)–JUL.8/92–REV.0 (P–29)

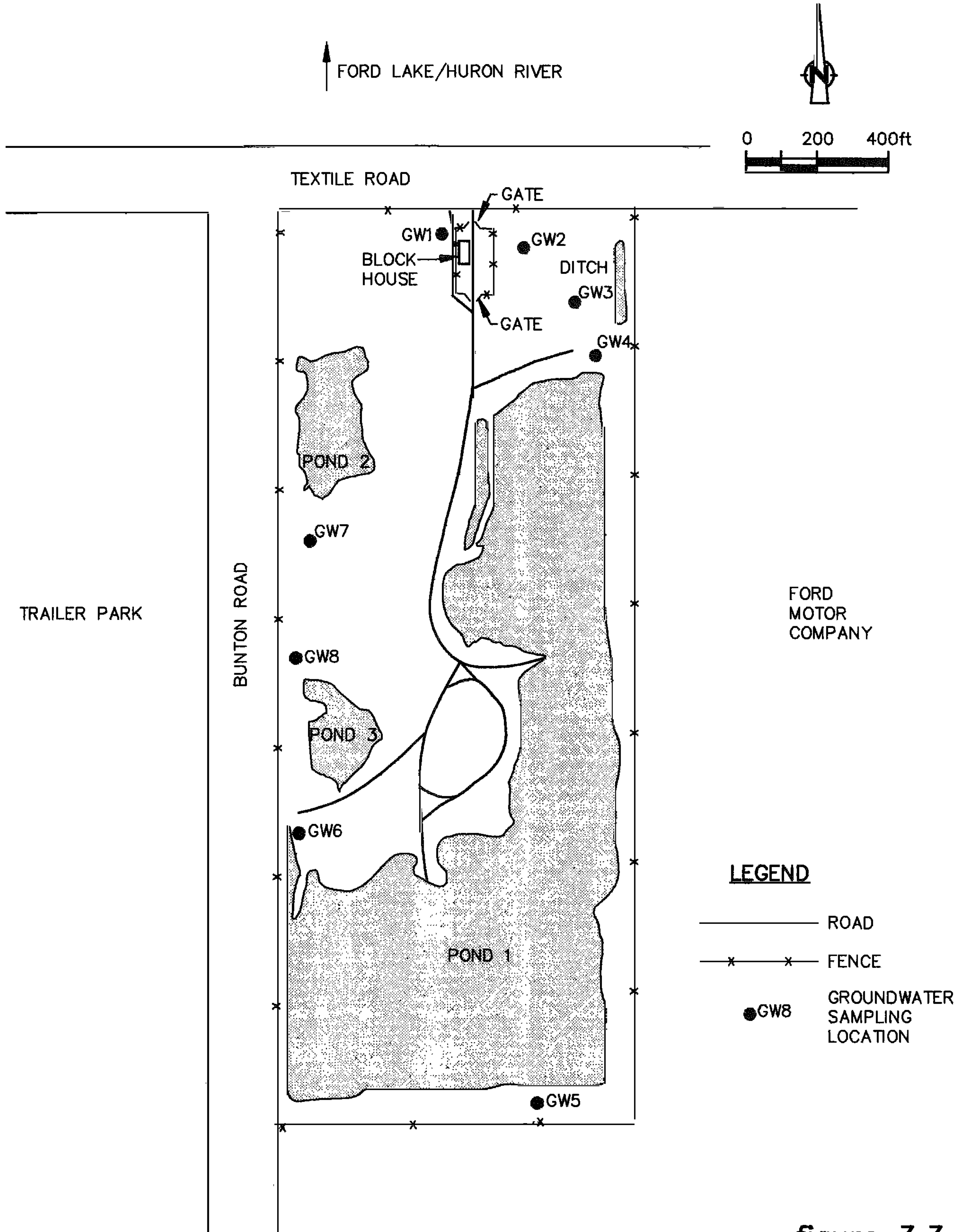
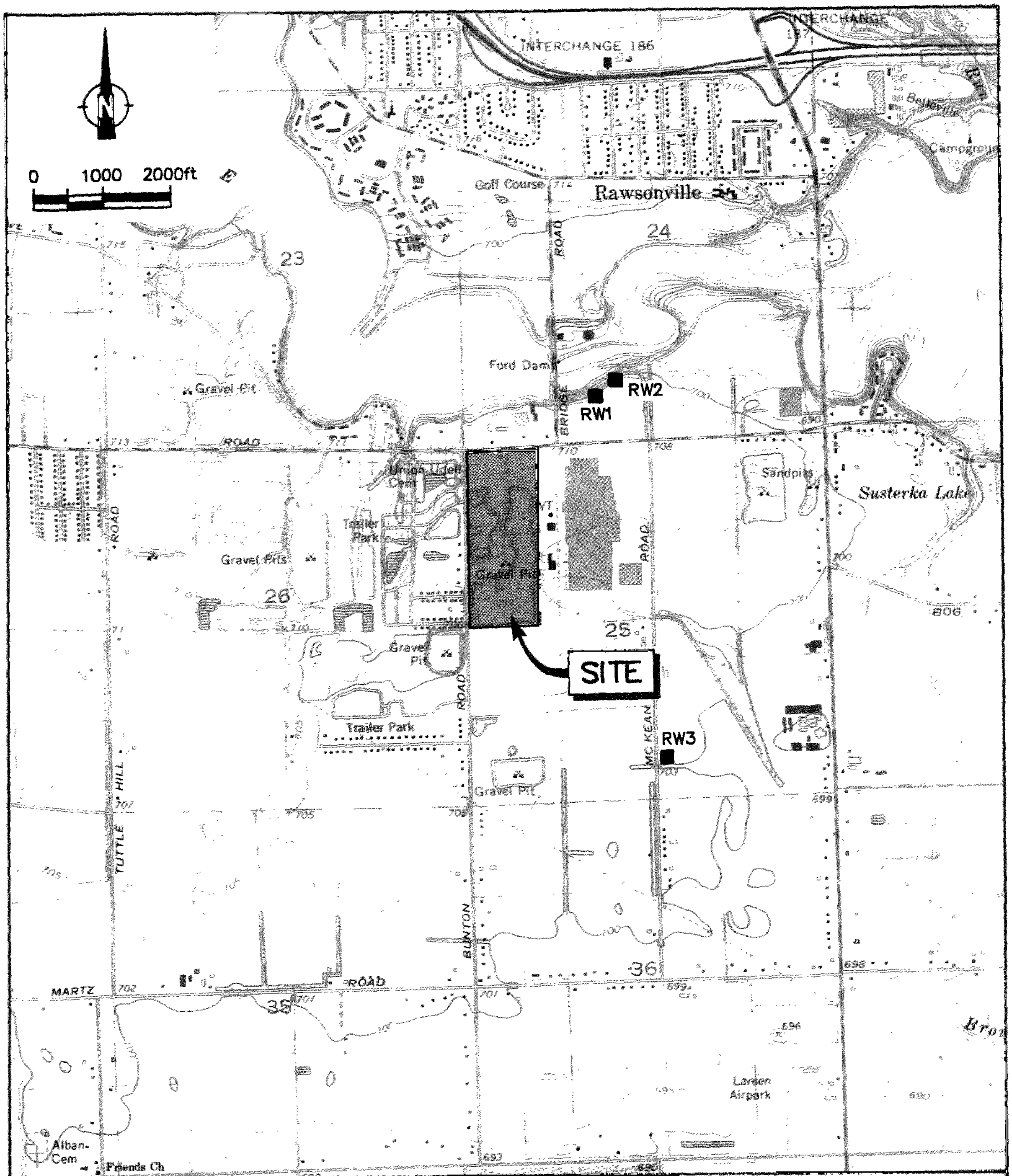


figure 3.3

1990 FIT GROUNDWATER SAMPLING LOCATIONS
TEXTILE ROAD SITE
Ypsilanti Twp., Washtenaw Cty., Michigan

CRA

4770(4)–JUL.8/92–REV.0 (P–30)



SOURCE: USGS QUADRANGLE MAP, YPSILANTI EAST, MICHIGAN

LEGEND

RW1 ■ RESIDENTIAL AND MUNICIPAL WELL SAMPLING LOCATION

CRA

figure 3.4

1990 FIT RESIDENTIAL AND MUNICIPAL WELL SAMPLING LOCATIONS
TEXTILE ROAD SITE
Ypsilanti Twp., Washtenaw Cty., Michigan

4770(4)-JUL8/92-REV.0

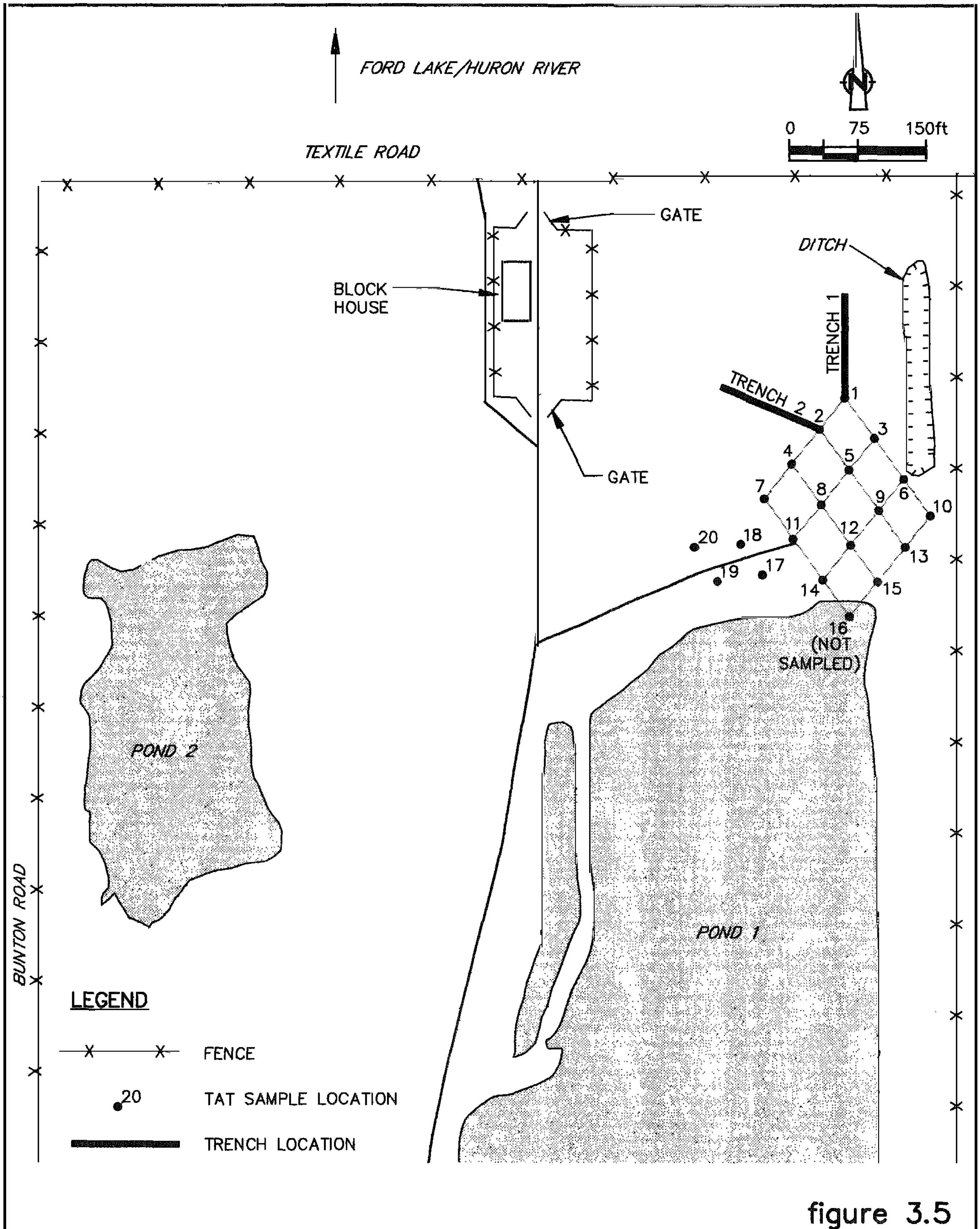
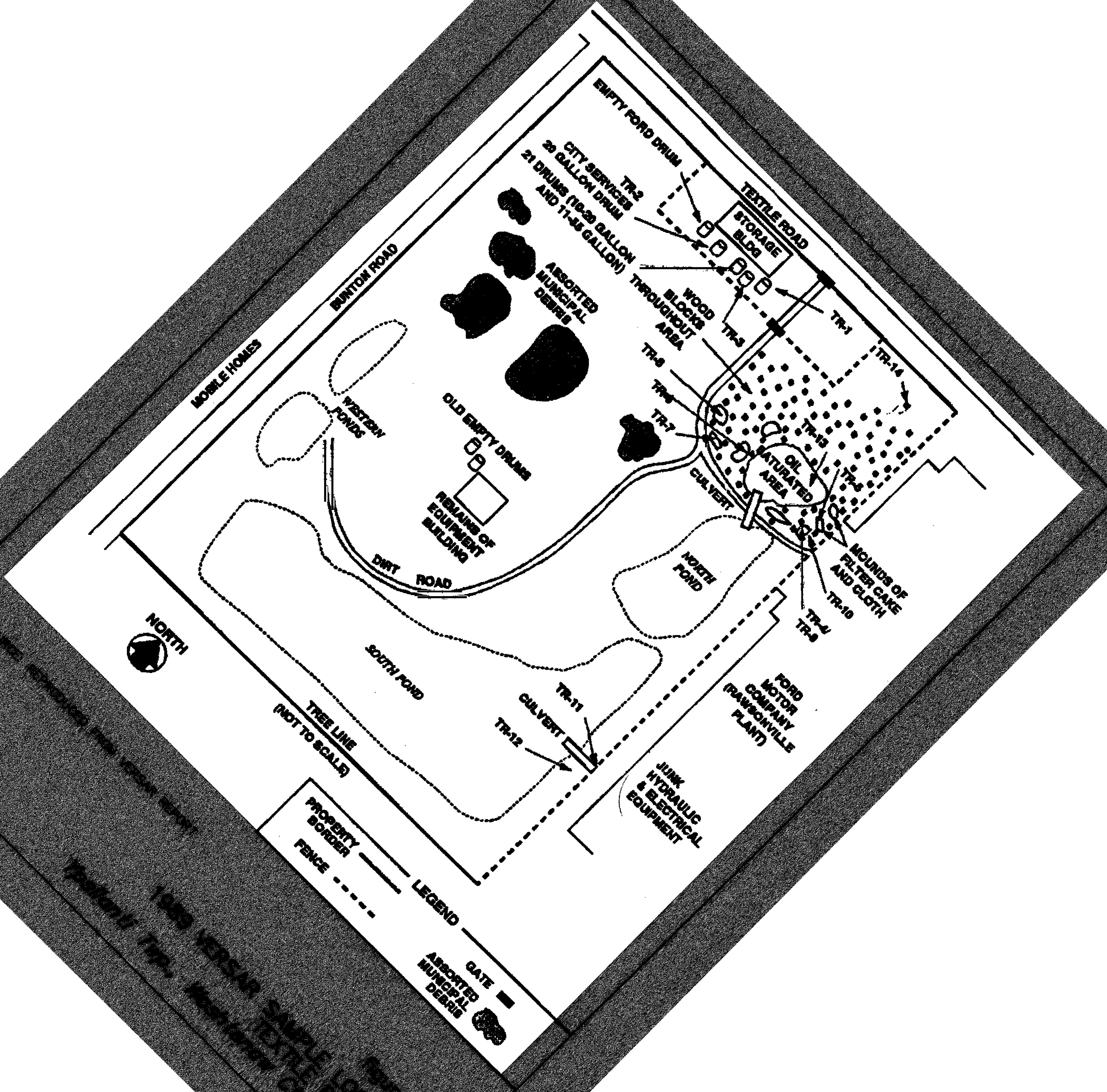


figure 3.5
1989 TAT SAMPLE LOCATION/GRID MAP
TEXTILE ROAD SITE
Ypsilanti Twp., Washtenaw Cty., Michigan

CRA

4770(4)-JUL.8/92-REV.0 (P-31)



SOURCE: REPRODUCED FROM VERSAR REPORT

Figure 3.6
1989 VERSAR SAMPLE LOCATIONS
TEXTILE ROAD SITE
Ypsilanti Twp., Washtenaw Co., Michigan