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SITE NAME	STURGIS MUNICIPAL WELLS
DOC ID #	150969
DOCUMENT VARIATION	____ COLOR **OR** _X_ RESOLUTION
PRP	
PHASE	REM - K8
OPERABLE UNITS	
PHASE (AR DOCUMENTS ONLY)	___ Remedial ___ Removal ___ Deletion Docket ___ ___ Original ___ Update # ___ Volume ___ of ___

COMMENT(S)

MULTIPLE SITE LOCATION MAPS

WARZYN

150969

Remedial Investigation Report 12686

Sturgis Well Field Remedial Investigation/ Feasibility Study Sturgis, Michigan Volume 2 of 5

Prepared for:

Michigan Department of Natural Resources
Lansing, Michigan

Prepared by:

Warzyn Inc.
Madison, Wisconsin

March 1991

Sturgis Well Field
Remedial Investigation/
Feasibility Study
Sturgis, Michigan
Volume 2 of 5

March 1991

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QUALITY CONTROL

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Lead Professional	TEM	2-27-91	Division	2-27-91	TPL	2-28-91
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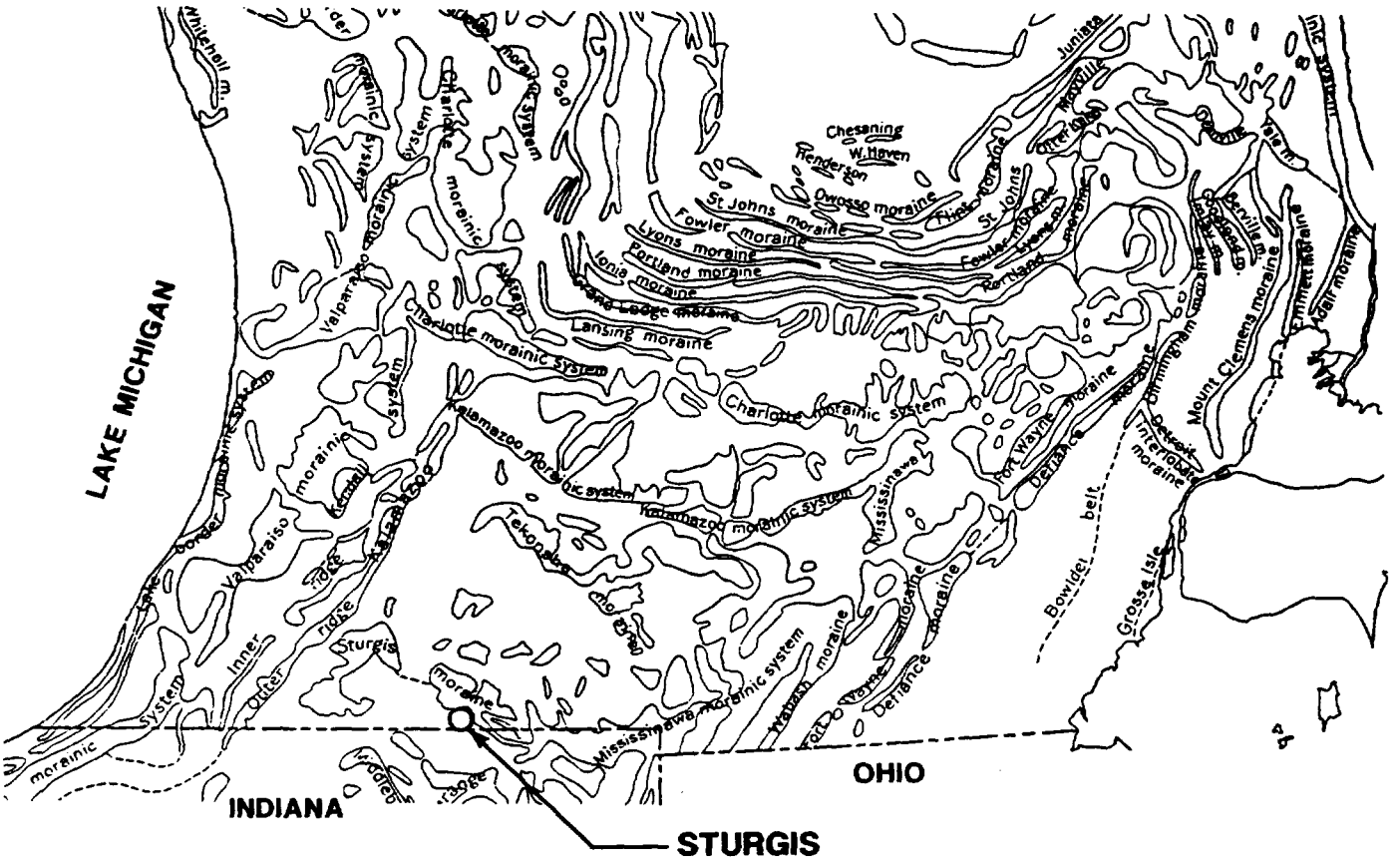

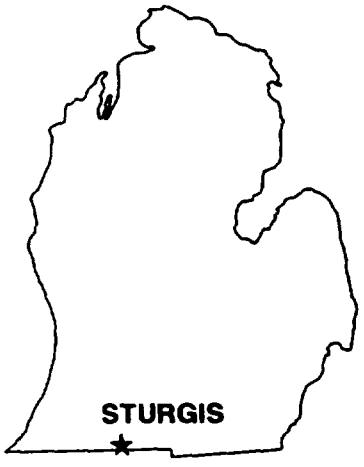

NOTES

1. BASE MAP DEVELOPED FROM HYDROGEOLOGIC ATLAS OF MICHIGAN, GLACIAL AND SURFICIAL GEOLOGY SOUTHERN PENINSULA, DATED 1981.
2. THE CITY OF STURGIS IS LOCATED APPROXIMATELY.

north

SCALE: 1" = 3.27 mi. (APPROX.)

WARZYN	RECESSIONAL MORAINES OF THE SOUTHERN HALF OF THE MICHIGAN LOWER PENINSULA	Drawn JC	Checked TEM	App'd T. Mattka
	REMEDIAL INVESTIGATION/ FEASIBILITY STUDY STURGIS WELL FIELD STURGIS, MICHIGAN	Revisions		Date 3-6-91
				12686 A8

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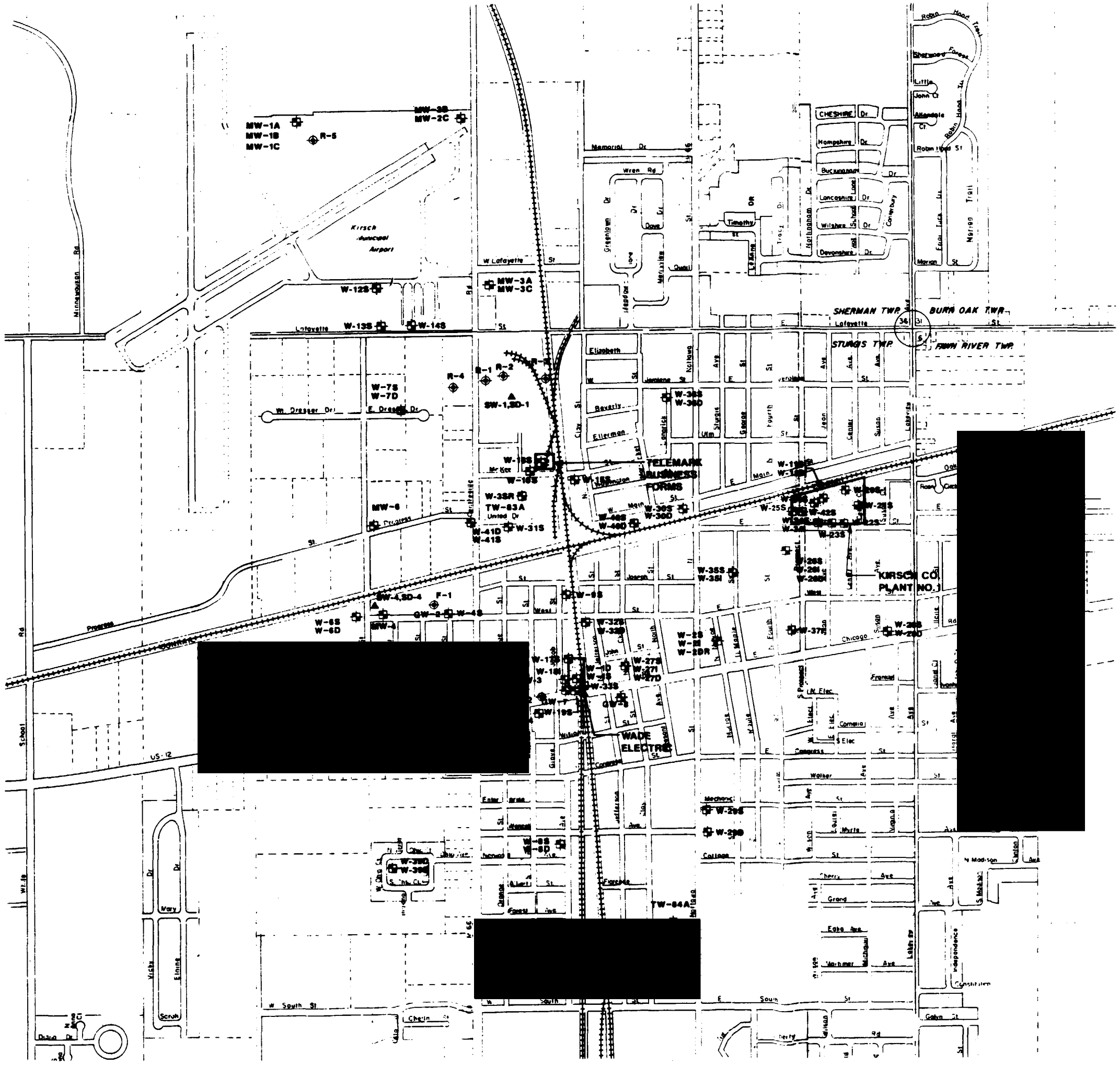
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MW-1B
MW-1C
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MW-2B
MW-2C
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W-12S
W-13S
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MW-3A
MW-3C
Lafayette
W. Lafayette
Memorial Dr
Wren Rd
Gregentown Dr
Dove Dr
Meadowlane Dr
Quail
Timothy
Tracy Dr
Nottingham Dr
Lexington
CHESHIRE Dr
Hampshire Dr
Buckingham Dr
Lancashire Lane
Wiltshire Dr
Devonshire Dr
Cornerbury
Robin Hood Trail
Sherwood Forest
Little John Ct
Allendale Ct
Robin Hood St
Friar Tuck Lane
Marion Trail
Marion St
SHERMAN TWP
BURN OAK TWP
STURGIS TWP
FAWN RIVER TWP
Elizabeth
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Nottawa
Avg
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Vicky Dr
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Dana Dr
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E. South St
Chelsea
Derby
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Prairie
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E. Dresser Dr
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Joseph St
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Grove
Hanover
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Ave
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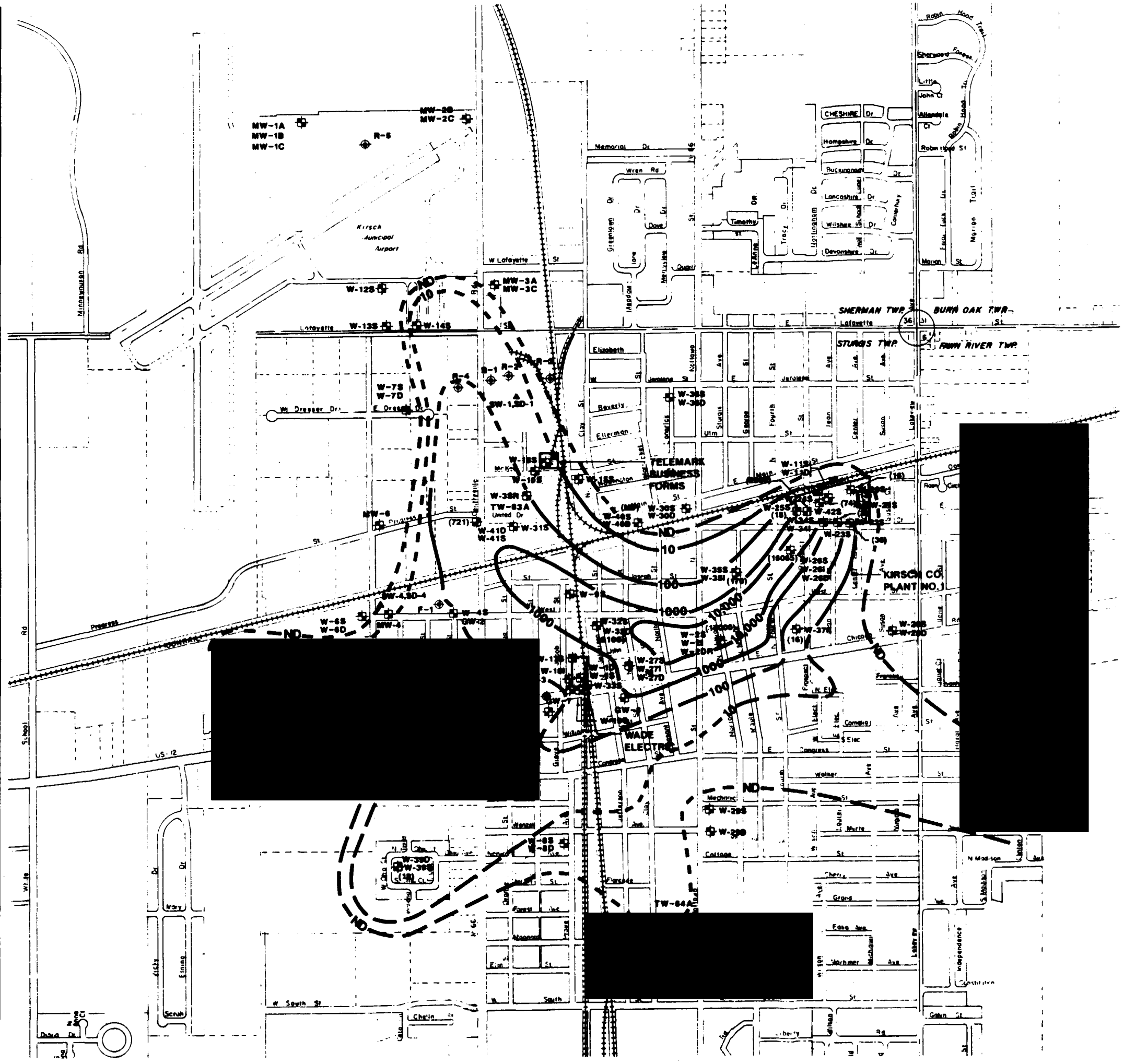
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MW-1C
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W-13S
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STURGIS TWP.
FAWN RIVER TWP.
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Marshall Ave
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Galvin St
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Minnemauken Rd
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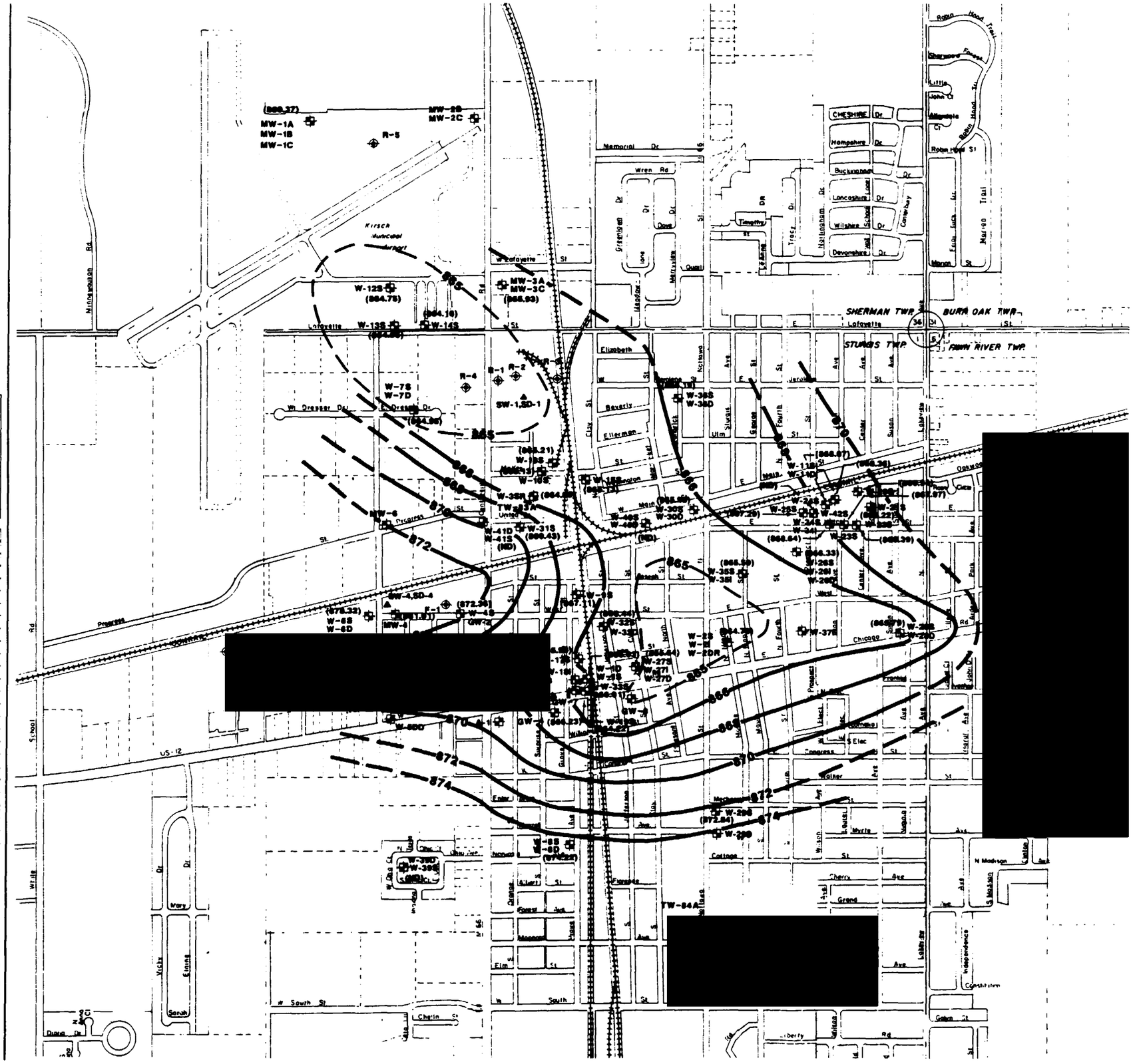
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MW-3C
(865.93)
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R-2
R-4
SW-1,SD-1
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W-38D
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Lancashire Dr
Wiltshire Dr
Devonshire Dr
Memorial Dr
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Congress
Walker Ave
Cottage
Cherry Ave
Grand
Myrtle
Elizabeth
Beverly
Ellerman
Ulm
Chicago
Prairie
CONRAIL
US-12
Mittengwalton Rd
School Rd
Wright Rd
Vicky Dr
Emma
Sarah
Diana Dr
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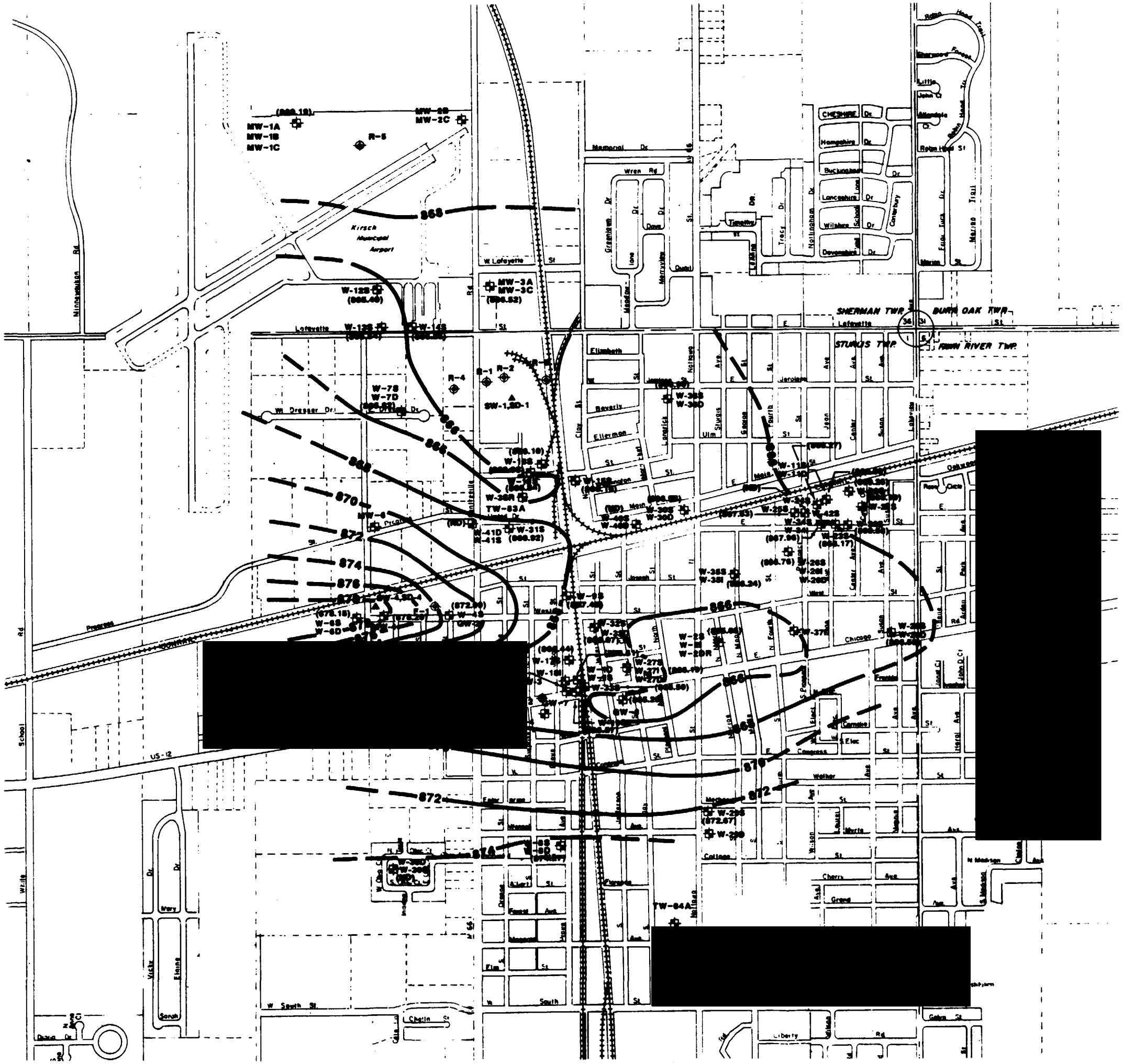

LEGEND

SW-1 SD-1 ▲	APPROXIMATE SURFACE WATER AND SEDIMENT SAMPLING LOCATION AND NUMBER
(866.86) W-2DR	EXISTING MONITORING WELL LOCATION, NUMBER AND GROUNDWATER ELEVATION
PW-4	PRODUCTION WELL LOCATION AND NUMBER
	RAILROAD TRACKS
	PAVED ROAD
874	WATER TABLE CONTOUR (CONTOUR INTERVAL: 2 FT, DASHED WHERE INFERRED)
(NID)	WELL NOT DRILLED BY THIS DATE

NOTES

1. SEE DRAWING 12686-5 FOR ADDITIONAL NOTES AND LEGEND.
2. WATER LEVELS MEASURED BY C.C. JOHNSON & MALHOTRA FOR WARZYN ENGINEERING INC. ON JANUARY 31, 1989.

north

0 600 1200

SCALE IN FEET

Date - By - Appd

Revisions

Designed By

Drawn By JC

Approved By

Checked By TKM

Date 2-26-91

Reference

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WARZYN

WARZYN ENGINEERING INC

WATER TABLE MAP (JANUARY 31, 1989)

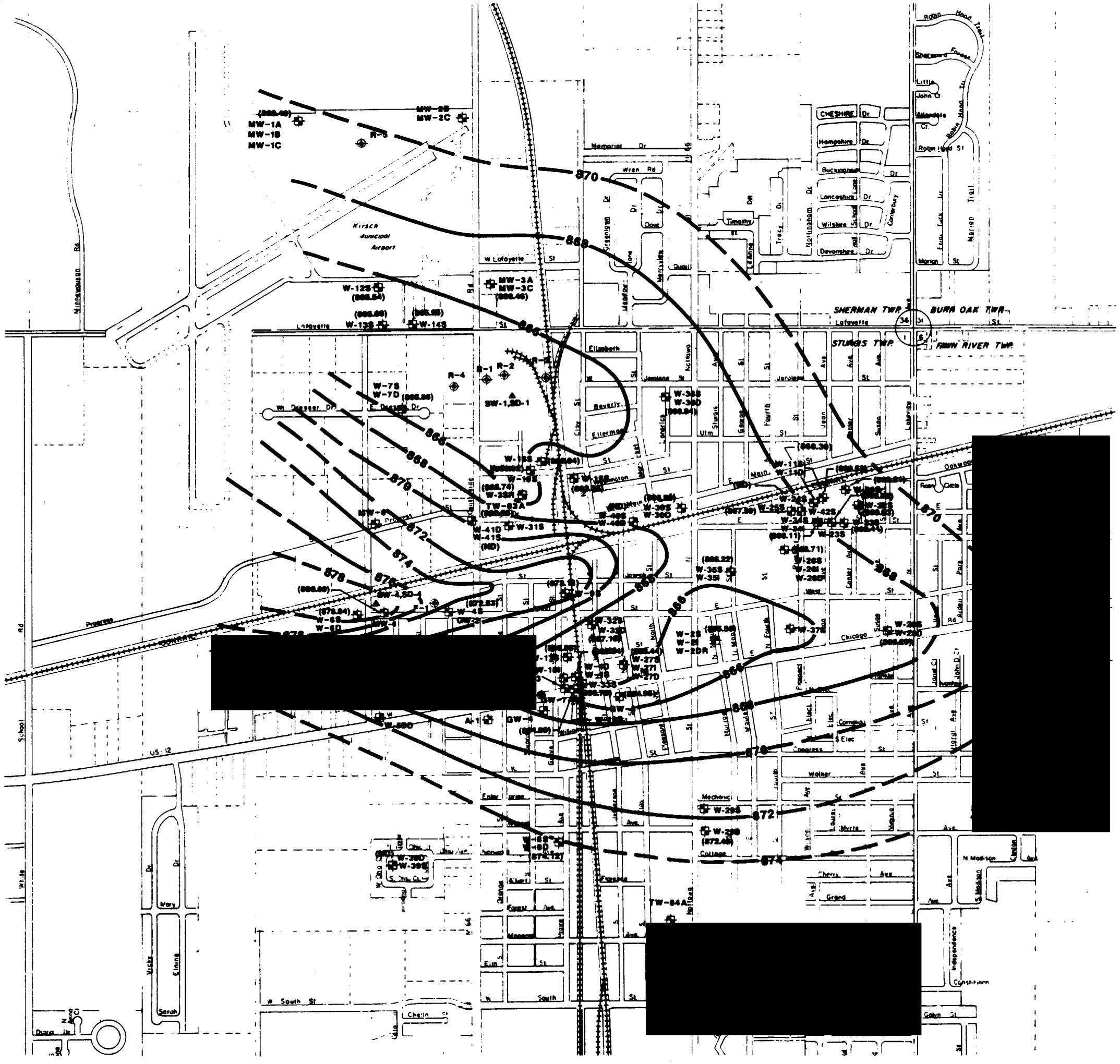
REMEDIAL INVESTIGATION / FEASIBILITY STUDY
STURGIS WELL FIELD
STURGIS, MICHIGAN

Printed

Sheet Number 4 OF 20

Project Number 12686 8

WARZYN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Lewis St
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Wiltshire Dr
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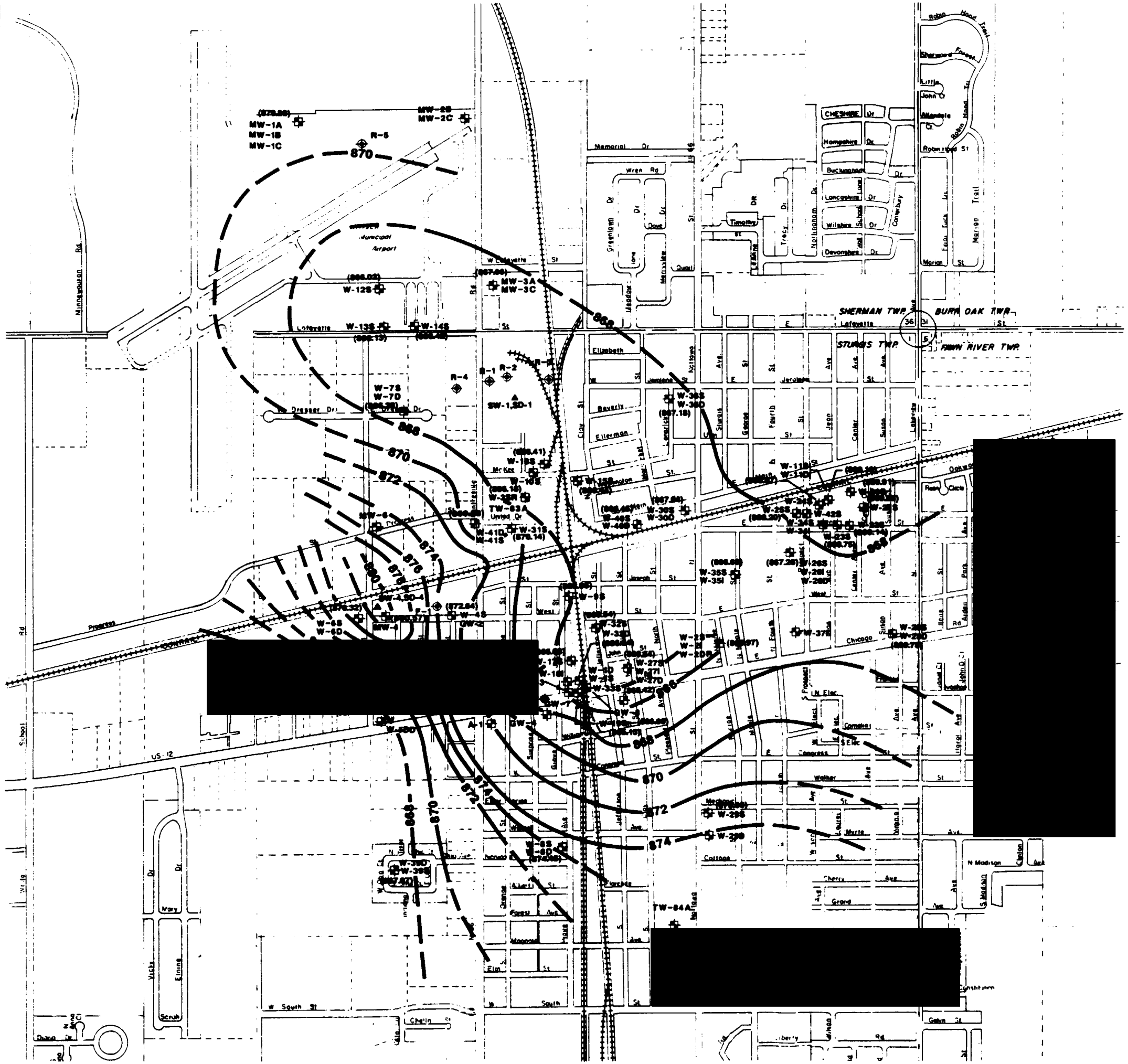
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Lancashire Lane
Wiltshire Dr
Devonshire Dr
Timothy St
Tracy Dr
Northington Dr
Canterbury
Frank Tuck Dr
Marigold Trail
Morgan St
Nottawaseppi Rd
Mary Dr
Vicky Dr
Elaine Dr
Scrub
Dave Dr
W South St
South St
Chelin St
Galvin St
Liberty
N Madison
S Madison
Clinton Ave
Park Ave
Sugar Ave
Lincoln Ave
Lincoln Rd
Lincoln Ct
John D Ct
Rose Circle
Oakwood
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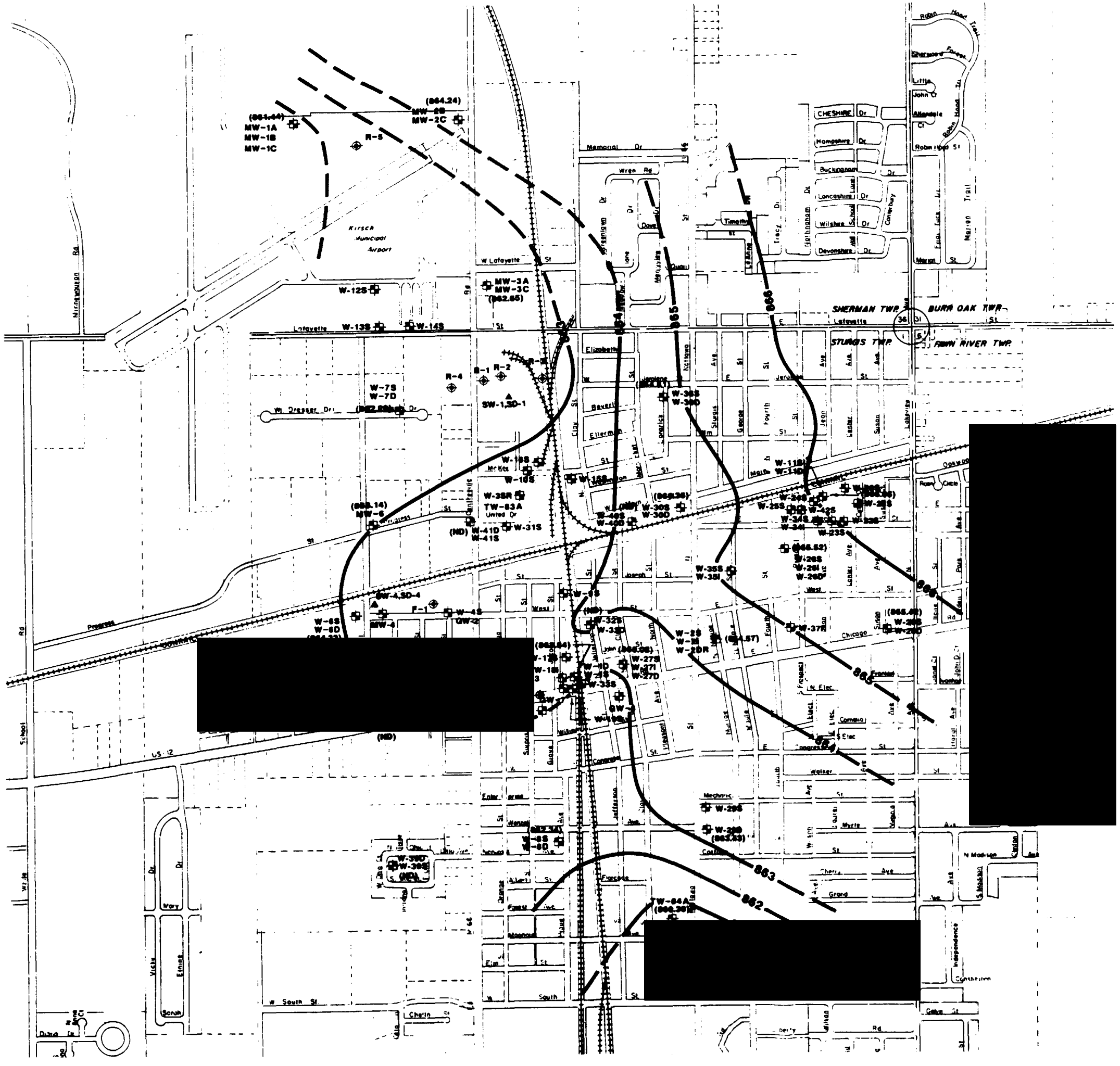
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MW-1C
(864.44)
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MW-2C
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Kirsch Municipal Airport
W-12S
MW-3A
MW-3C
(862.65)
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Buckingham Dr
Lancashire Dr
Wiltshire Dr
Devonshire Dr
Canterbury
Tracy Dr
Timothy St
Dover Dr
Marion Trail
Marion St
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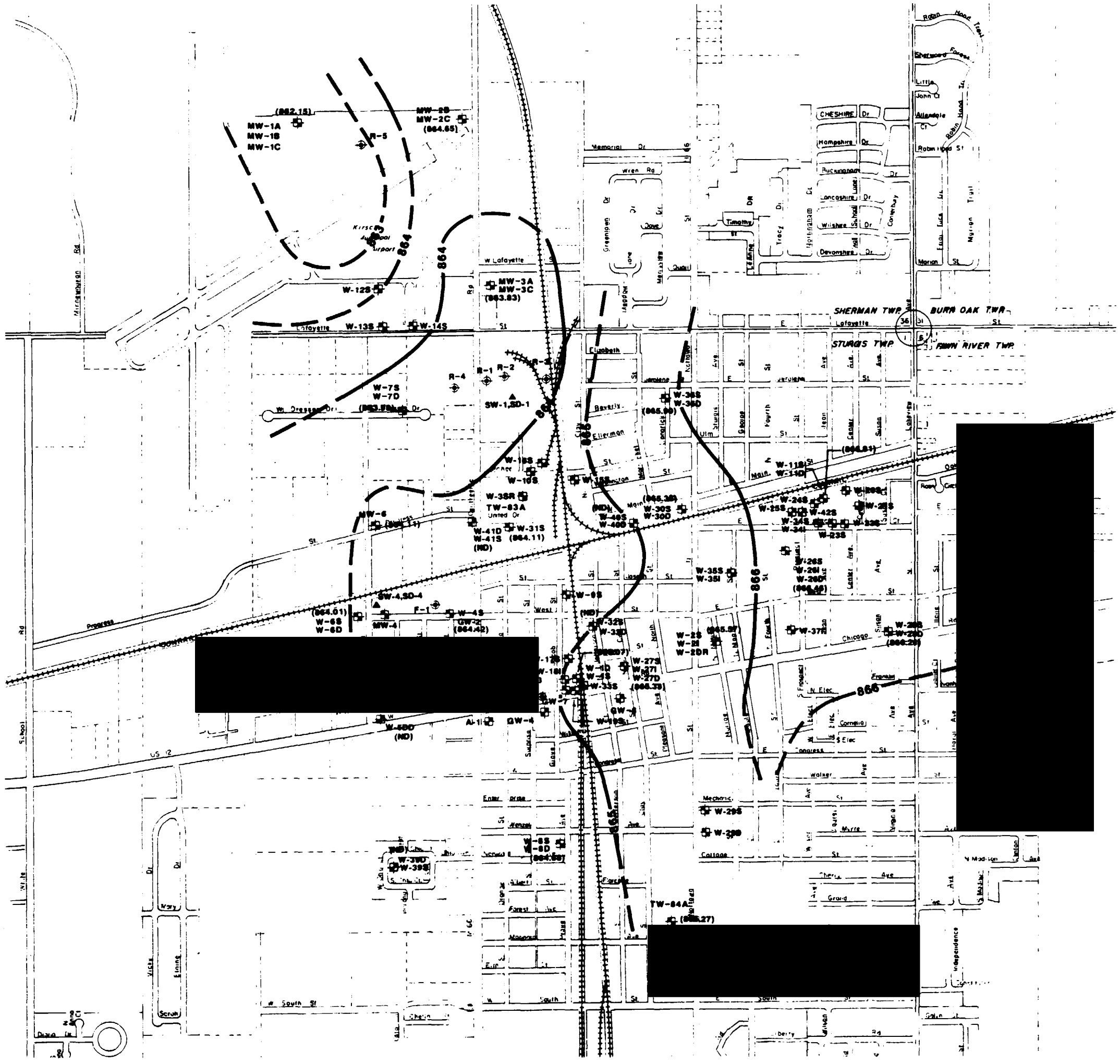

LEGEND

SW-1 SD-1 ▲	APPROXIMATE SURFACE WATER AND SEDIMENT SAMPLING LOCATION AND NUMBER
(865.57) W-2DR	EXISTING MONITORING WELL LOCATION, NUMBER AND POTENTIOMETRIC SURFACE ELEVATION
PW-4	PRODUCTION WELL LOCATION AND NUMBER
	RAILROAD TRACKS
	PAVED ROAD
866	POTENTIOMETRIC SURFACE CONTOUR (CONTOUR INTERVAL: 1 FT, DASHED WHERE INFERRED)
(ND)	WELL NOT DRILLED BY THIS DATE

NOTES

1. SEE DRAWING 12686-5 FOR ADDITIONAL NOTES AND LEGEND.
2. WATER LEVELS MEASURED BY C.C. JOHNSON & MALHOTRA FOR WARZYN ENGINEERING INC. ON JANUARY 31, 1989.

north

0 600 1200

SCALE IN FEET

POTENTIOMETRIC SURFACE MAP (JANUARY 31, 1989)

WARZYN

WARZYN ENGINEERING, INC.

Designed By

Drawn By JC

Checked By TEM

Approved By

Date 2-26-91

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REMEDIAL INVESTIGATION / FEASIBILITY STUDY
STURGIS WELL FIELD
STURGIS, MICHIGAN

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Sheet Number 8 OF 20

Project Number 12686

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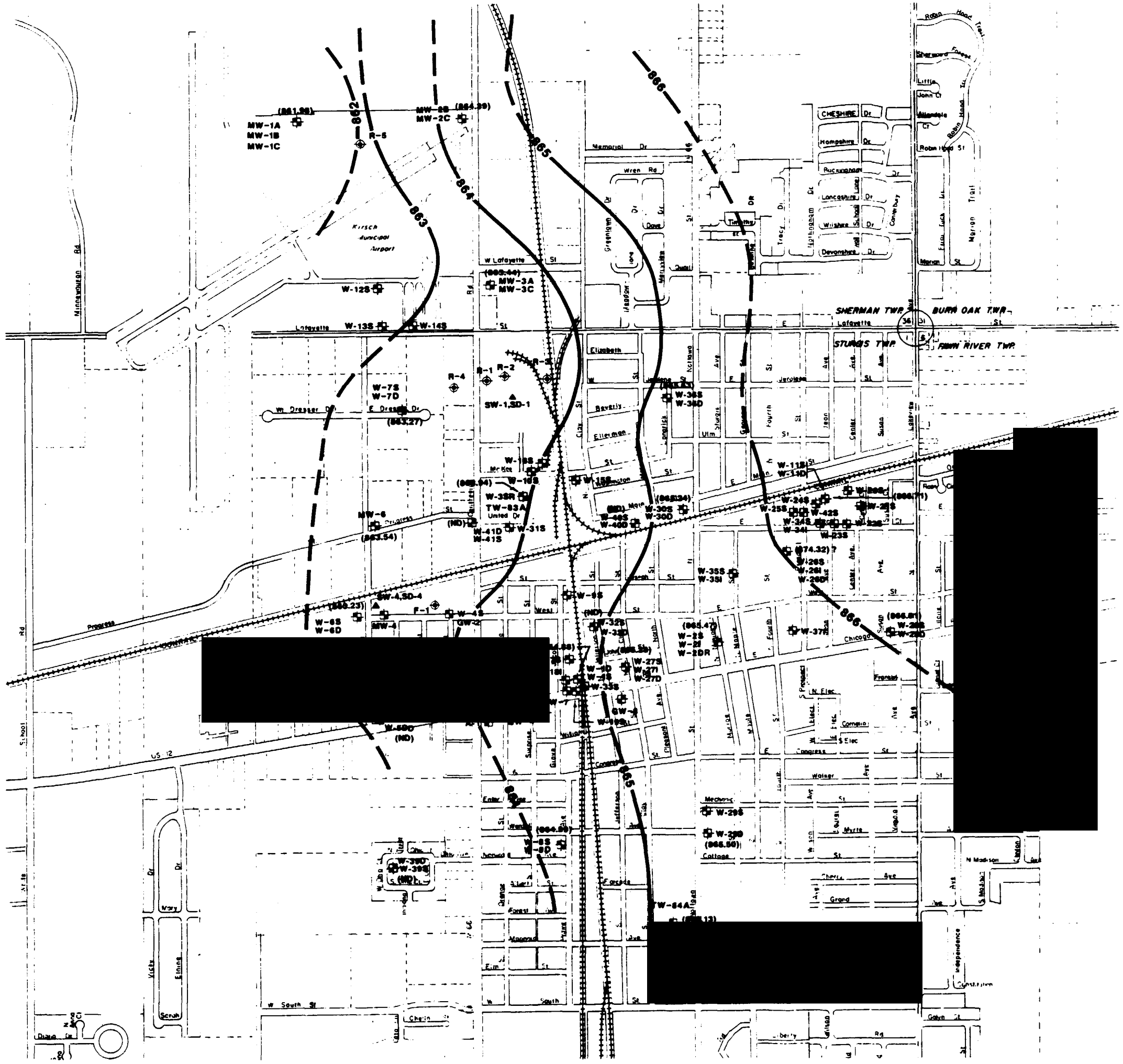
MW-1A
MW-1B
MW-1C
MW-2B
MW-2C
R-5
MW-3A
MW-3C
W-12S
W-13S
W-14S
W-7S
W-7D
R-4
R-1
R-2
SW-1,SD-1
W-38S
W-38D
W-11S
W-11D
W-10S
W-3SR
TW-83A
W-41D
W-41S
W-31S
MW-6
W-30S
W-30D
W-40S
W-40D
W-24S
W-25S
W-42S
W-34S
W-34I
W-23S
W-26S
W-26I
W-26D
W-29S
W-35S
W-35I
W-37S
W-6S
W-6D
SW-4,SD-4
MW-4
GW-2
F-1
W-4S
W-2S
W-2I
W-2DR
W-27S
W-27I
W-27D
W-35S
W-29S
W-39S
W-39I
W-39D
W-8S
W-8D
TW-84A
W-5S
W-5D
W-5DD
W-9S
W-32S
W-32I
W-32D
W-33S
W-33I
W-33D
W-10S
W-15S
W-16S
W-17S
W-18S
W-19S
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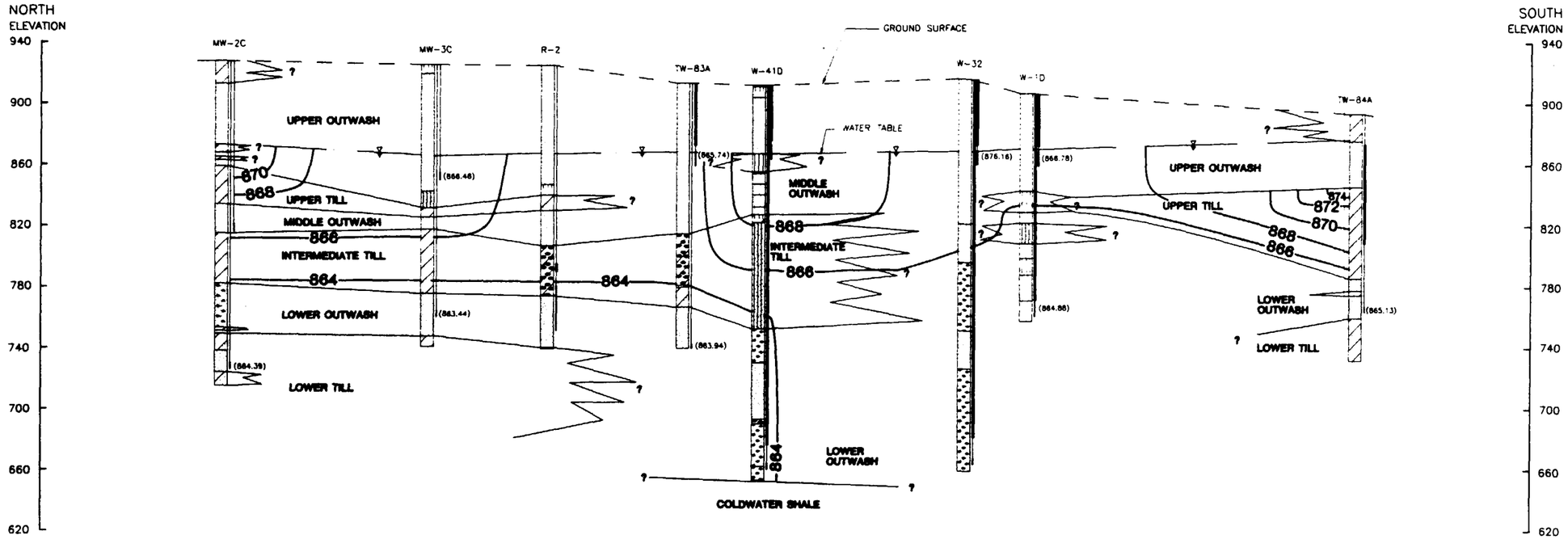
W-53S
W-54S



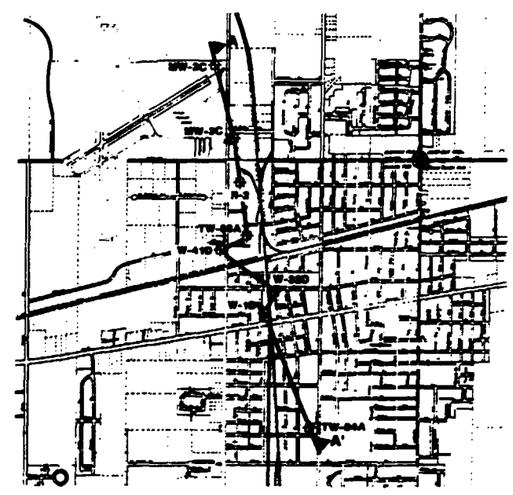
SECTION A-A'

LEGEND

- LEAN CLAY
- SILTY CLAY
- SANDY LEAN CLAY
- FILL
- CLEAN GRAVEL
- CLAYEY GRAVEL
- SANDY GRAVEL
- SILT
- SILTY SAND
- CLEAN SAND
- SANDSTONE
- CLAYEY SAND
- GRAVELLY SAND
- SHALE
- SANDY SILT
- TOPSOIL

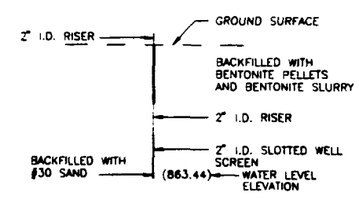
NOTES

1. THE CORRELATION LINES ARE BASED ON INTERPOLATION BETWEEN BORINGS AND MAY NOT REPRESENT ACTUAL SUBSURFACE CONDITIONS.
2. FOR THE PURPOSE OF ILLUSTRATING SUBSOIL CONDITIONS ON THE CROSS SECTIONS, SOME OF THE BORING LOGS HAVE BEEN SIMPLIFIED. FOR A DETAILED DESCRIPTION OF SUBSURFACE CONDITIONS AT INDIVIDUAL BORINGS, REFER TO SOIL BORING LOGS, APPENDIX _ OF TEXT.
4. FOR COMPLETE MONITORING WELL INSTALLATION DETAILS REFER TO APPENDIX _ OF TEXT.
5. CROSS SECTIONS HAVE BEEN EXAGGERATED FIFTEEN TIMES.
6. HORIZONTAL DISTANCES ARE MEASURED WITH RESPECT TO THE CENTER OF EACH SOIL BORING LOCATION.
7. GROUND SURFACE SHOWN IS FOR ILLUSTRATIVE PURPOSES ONLY.
8. ELEVATIONS ARE SHOWN IN REFERENCE TO U.S.G.S. DATUM.
9. QUESTION MARKS AT THE CONTACTS BETWEEN SUBSOIL TYPES INDICATES THE CONTACTS ARE INFERRED.
10. THE WATER TABLE ELEVATIONS ARE BASED ON MEASUREMENTS OBTAINED BY WARZYN ENGINEERING INC. ON APRIL 26, 1989. CONTOURS ARE EXTRAPOLATED FROM THE WATER TABLE MAP, DRAWING 12686-_.
11. PIEZOMETRIC GROUNDWATER CONTOURS HAVE BEEN DEVELOPED BASED ON GROUNDWATER ELEVATIONS OBTAINED ON APRIL 26, 1989, BY WARZYN ENGINEERING INC.



GEOLOGIC CROSS SECTION LOCATION MAP

0 2000 4000
SCALE IN FEET
north



TYPICAL WELL DETAIL

CROSS SECTION SCALE

40
0
0 600 1200
SCALE IN FEET
VERTICAL EXAGGERATION: FIFTEEN TIMES

Checked By: TBM
Date: 2-28-91
Drawn By: JC
Designed By:
Approved By:
Reference:
File Path: \12686\12686A A
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GEOLOGIC CROSS SECTION A-A'
REMEDIAL INVESTIGATION / FEASIBILITY STUDY
STURGIS WELL FIELD
STURGIS, MICHIGAN
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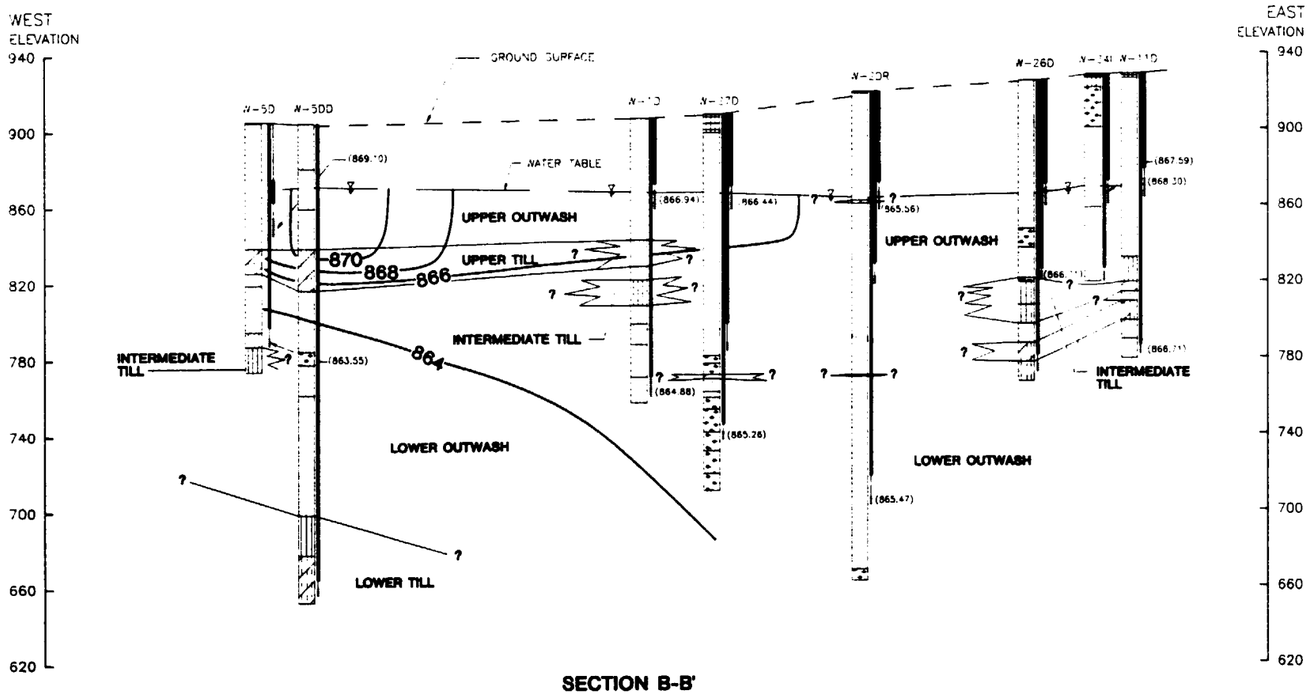
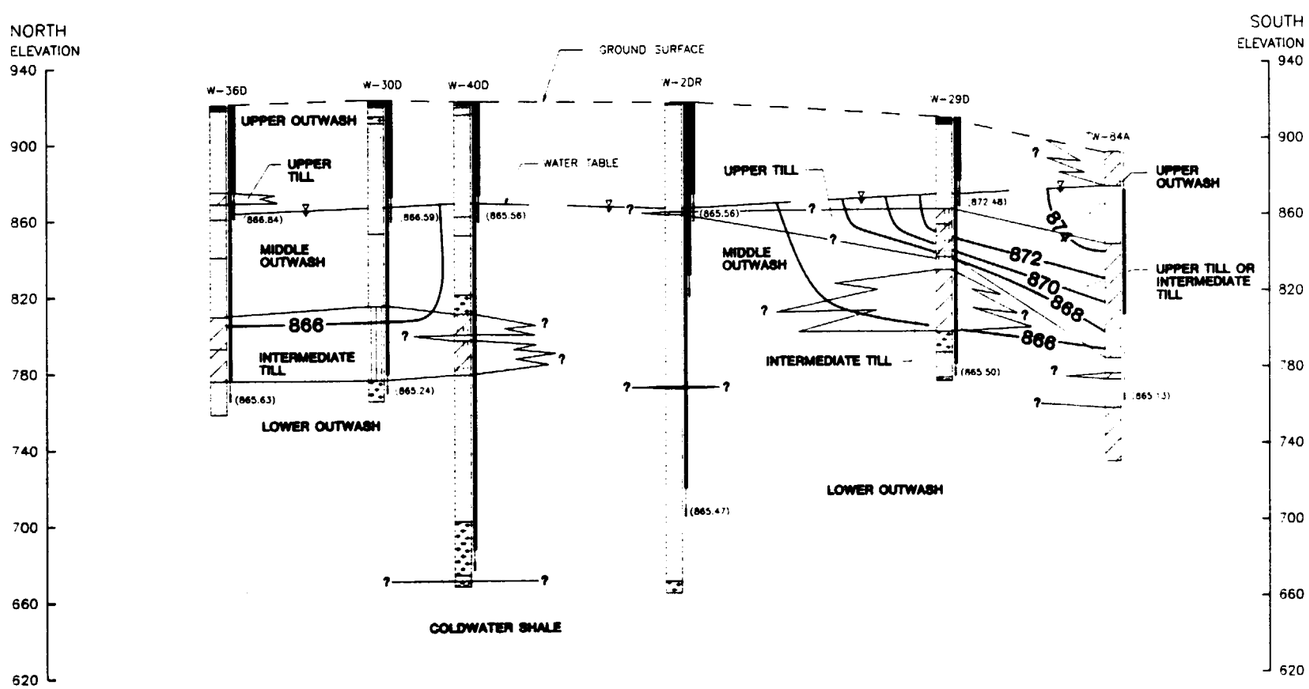


SECTION B-B'



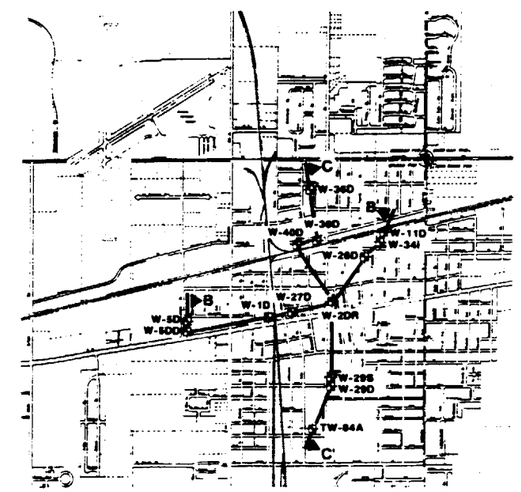
SECTION C-C'

LEGEND

LEAN CLAY	CLEAN SAND
SILTY CLAY	SANDSTONE
SANDY LEAN CLAY	CLAYEY SAND
FILL	GRAVELLY SAND
CLEAN GRAVEL	SHALE
CLAYEY GRAVEL	SANDY SILT
SANDY GRAVEL	TOPSOIL
SILT	
SILTY SAND	

NOTES

1. REFER TO DRAWING 12686-15 FOR ADDITIONAL NOTES.

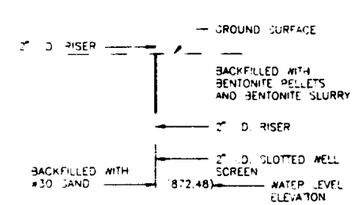


GEOLOGIC CROSS SECTION LOCATION MAP

0 2000 4000

SCALE IN FEET

north



TYPICAL WELL DETAIL

CROSS SECTION SCALE

40

0 600 1200

SCALE IN FEET

VERTICAL EXAGGERATION: FIFTEEN TIMES

Designed By:
Drawn By:
Checked By: KEM
Approved By:
Date: 2-26-91
Reference
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GEOLOGIC CROSS SECTIONS B-B' AND C-C'

REMEDIAL INVESTIGATION
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STORGE AREA FIELD
STORGE, MICHIGAN

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Sheet Number 11 OF 20

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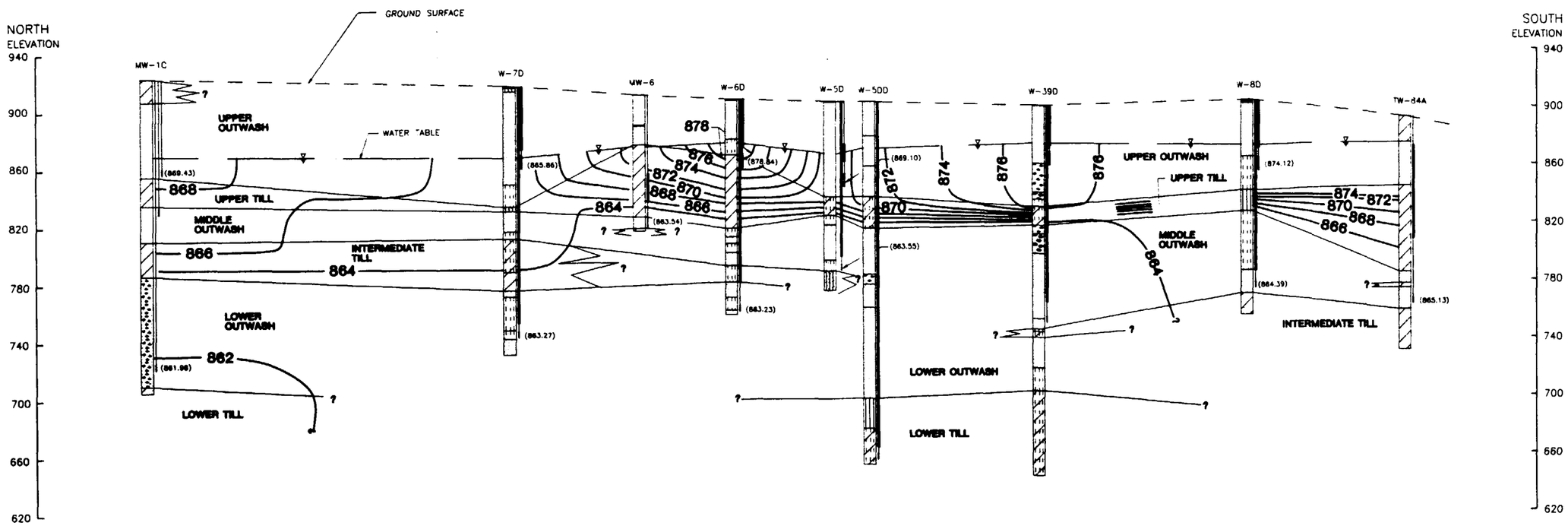


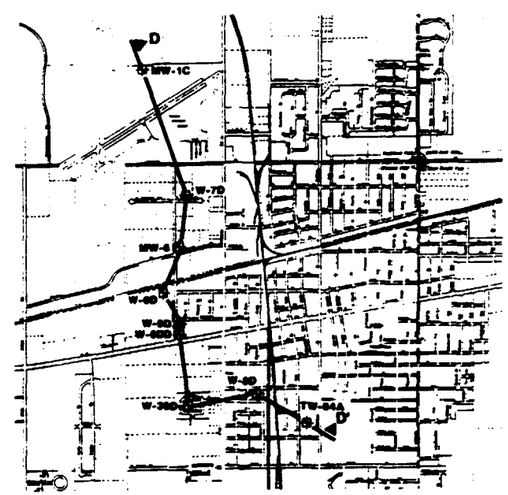
SECTION D-D'

LEGEND

- LEAN CLAY
- SILTY CLAY
- SANDY LEAN CLAY
- FILL
- CLEAN GRAVEL
- CLAYEY GRAVEL
- SANDY GRAVEL
- SILT
- SILTY SAND
- CLEAN SAND
- SANDSTONE
- CLAYEY SAND
- GRAVELLY SAND
- SHALE
- SANDY SILT
- TOPSOIL

NOTES

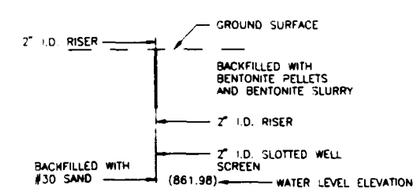
1. REFER TO DRAWING 12686-15 FOR ADDITIONAL NOTES.



GEOLOGIC CROSS SECTION LOCATION MAP

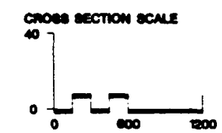
0 2000 4000
SCALE IN FEET

north



TYPICAL WELL DETAIL

CROSS SECTION SCALE



SCALE IN FEET
VERTICAL EXAGGERATION: FIFTEEN TIMES

Checked By: TRM
Date: 2-26-91
Drawn By: JC
Designed By:
Approved By: Timothy S. Marks
Reference:
File Path: \12686\12686D-D'
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REMEDIAL INVESTIGATION / FEASIBILITY STUDY
STURGIS WELL FIELD
STURGIS, MICHIGAN
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Drawing Number 12686 17
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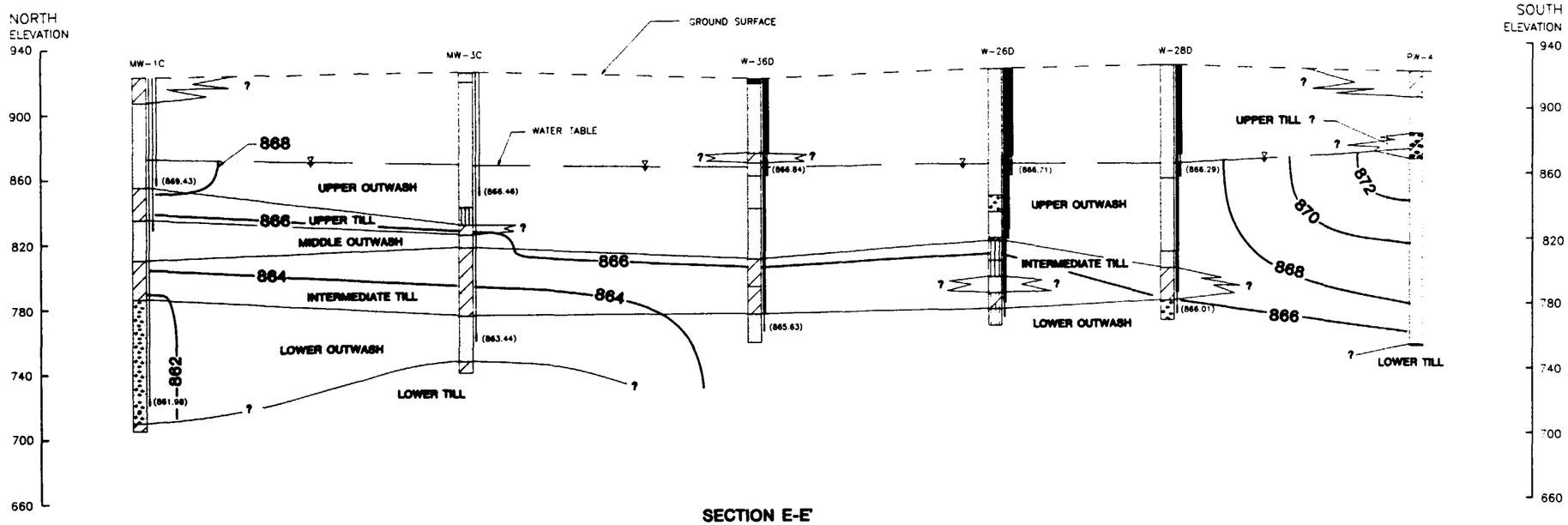


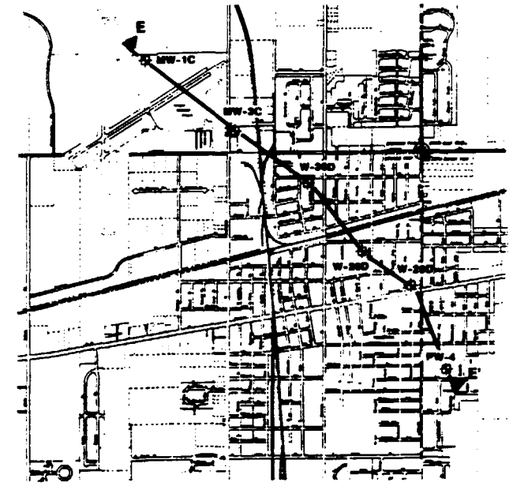
SECTION E-E'

LEGEND

- LEAN CLAY
- SILTY CLAY
- SANDY LEAN CLAY
- FILL
- CLEAN GRAVEL
- CLAYEY GRAVEL
- SANDY GRAVEL
- SILT
- SILTY SAND
- CLEAN SAND
- SANDSTONE
- CLAYEY SAND
- GRAVELLY SAND
- SHALE
- SANDY SILT
- TOPSOIL

NOTES

1. REFER TO DRAWING 12686-15 FOR ADDITIONAL NOTES.

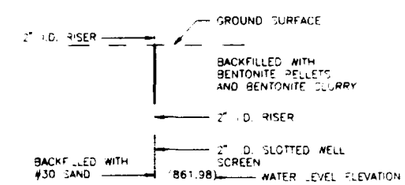


GEOLOGIC CROSS SECTION LOCATION MAP

0 2000 4000

SCALE IN FEET

north



TYPICAL WELL DETAIL

CROSS SECTION SCALE

40

0

0 600 1200

SCALE IN FEET

VERTICAL EXAGGERATION: FIFTEEN TIMES

Date, By, Appr'd

WARZYN

WARZYN ENGINEERING INC.

Designed By

Drawn By: JC

Checked By: TEM

Approved By: Timothy E. Hunter

Date: 2-26-91

Reference

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GEOLOGIC CROSS SECTION E-E'

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STURGIS WELL FIELD
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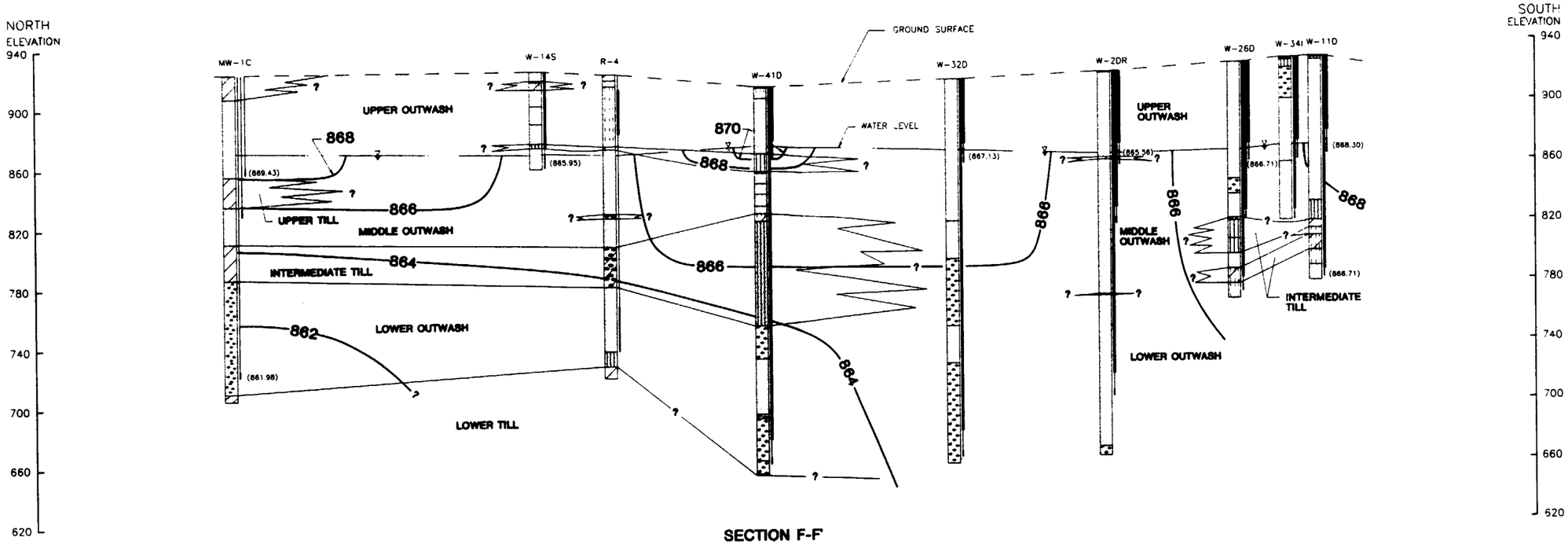


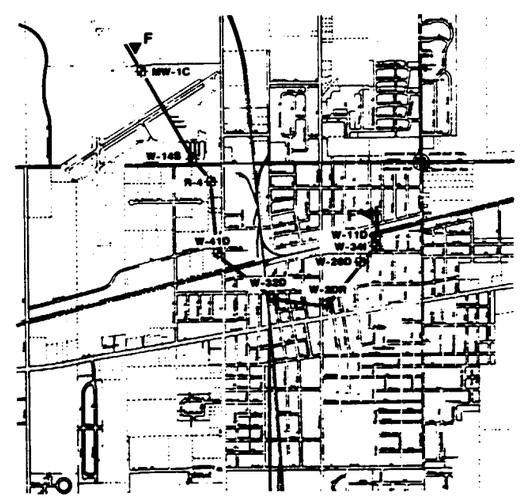
SECTION F-F'

LEGEND

- LEAN CLAY
- SILTY CLAY
- SANDY LEAN CLAY
- FILL
- CLEAN GRAVEL
- CLAYEY GRAVEL
- SANDY GRAVEL
- SILT
- SILTY SAND
- CLEAN SAND
- SANDSTONE
- CLAYEY SAND
- GRAVELLY SAND
- SHALE
- SANDY SILT
- TOPSOIL

NOTES

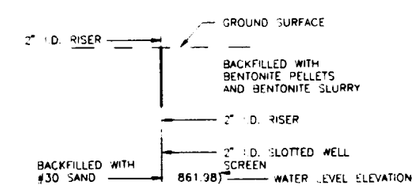
1. REFER TO DRAWING 12686-15 FOR ADDITIONAL NOTES.



GEOLOGIC CROSS SECTION LOCATION MAP

0 2000 4000
SCALE IN FEET

north



TYPICAL WELL DETAIL

CROSS SECTION SCALE

40
0
0 600 1200
SCALE IN FEET
VERTICAL EXAGGERATION: FIFTEEN TIMES

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Designed By:
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Reference:
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GEOLOGIC CROSS SECTION F-F'
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STURGIS WELL FIELD
STURGIS, MICHIGAN
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Drawing Number 12686 19
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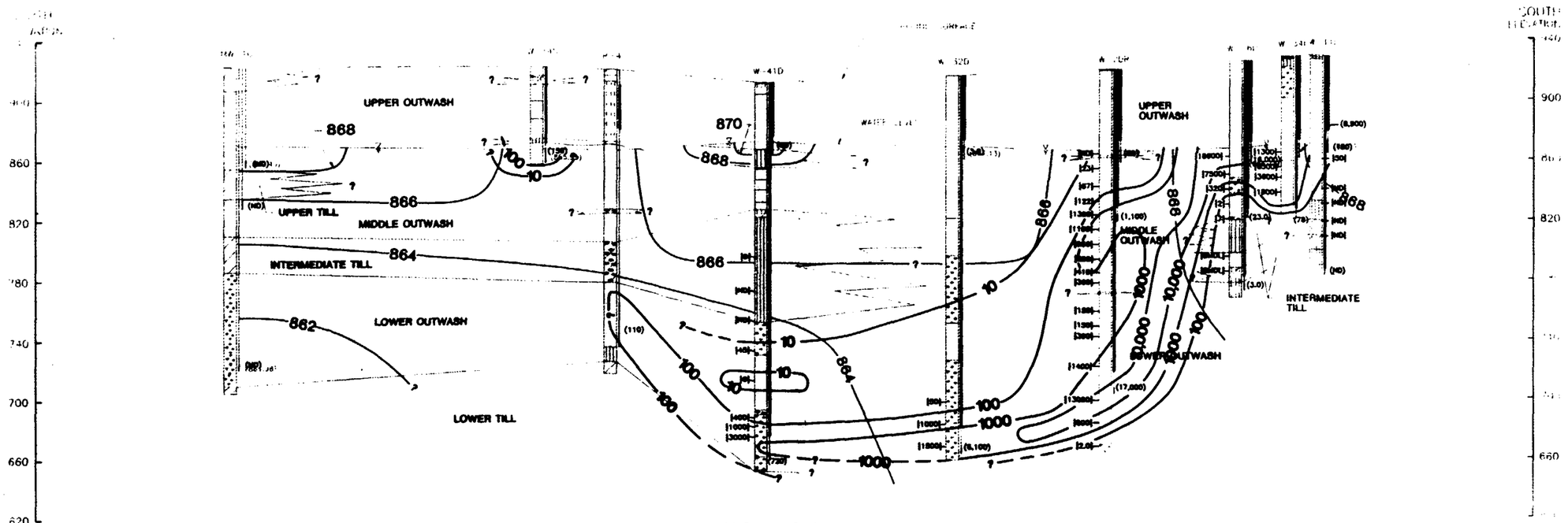
UPPER OUTWASH
UPPER TILL
MIDDLE OUTWASH
INTERMEDIATE TILL
LOWER OUTWASH
LOWER TILL
W-41D
W-32D
W-10P
W-34A
W-34B
868
866
864
862
870
10
100
1000
10,000
100,000
(110)
(1,100)
(17,000)
(6,100)
(8,900)
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(67)
(122)
(160)
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(320)
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(1800)
(1400)
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(600)
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(720)
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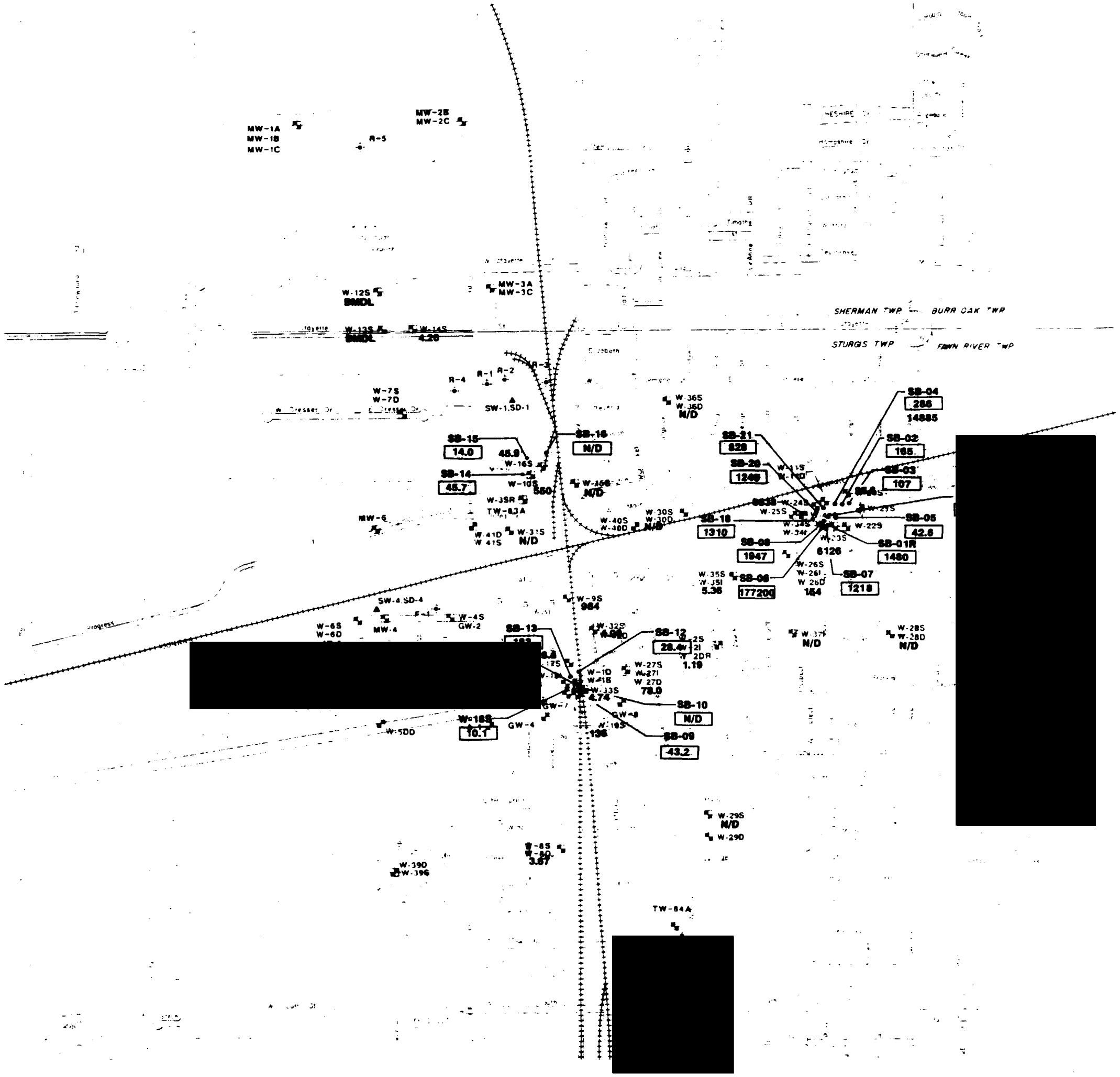

SW-1 SD-1 ▲	APPROXIMATE SURFACE WATER AND SEDIMENT SAMPLING LOCATION AND NUMBER
W-20S 25.6	EXISTING MONITORING WELL OR TEST WELL LOCATION AND NUMBER AND CONCENTRATION OF MAXIMUM TOTAL FIELD GC VOCs IN SOIL
PW-4	PRODUCTION WELL LOCATION AND NUMBER
	RAILROAD TRACKS
	PAVED ROAD
N/D	NO DETECTION OF FIELD GC VOCs
BMDL	VOCs PRESENT, BUT BELOW FIELD GC DETECTION LIMIT
4.06	MAXIMUM FIELD GC VOCs PRESENT IN MONITORING WELL SOIL SAMPLES
10.1	MAXIMUM FIELD GC VOCs PRESENT IN SOIL BORING SAMPLES

NOTES

1. REFER TO DRAWING 12686-5 FOR ADDITIONAL DETAILS.
2. CONCENTRATIONS SHOWN ARE ESTIMATED USING FIELD GAS CHROMATOGRAPHY METHODS, AND WERE DETERMINED DURING DRILLING ACITIVITIES IN PHASE I, PHASE II AND PHASE IIB INVESTIGATION. ONLY SOIL SAMPLES COLLECTED ABOVE THE WATER TABLE WERE ANALYZED. CONCENTRATIONS ARE IN ug/Kg (ppb).

north

0 600 1200

SCALE IN FEET

MAXIMUM TOTAL VOCs DETECTED IN SOIL - FIELD GC METHODS

Revisions

Date - By - App'd

WARZYN
WARZYN ENGINEERING INC

Designed By

Drawn By JC

Approved By

Checked By TEM

Date 2-26-91

Reference

REMEDIAL INVESTIGATION / FEASIBILITY STUDY
STURGIS WELL FIELD
STURGIS, MICHIGAN

Revised

Sheet Number 16 OF 20

Project Number 12686 21

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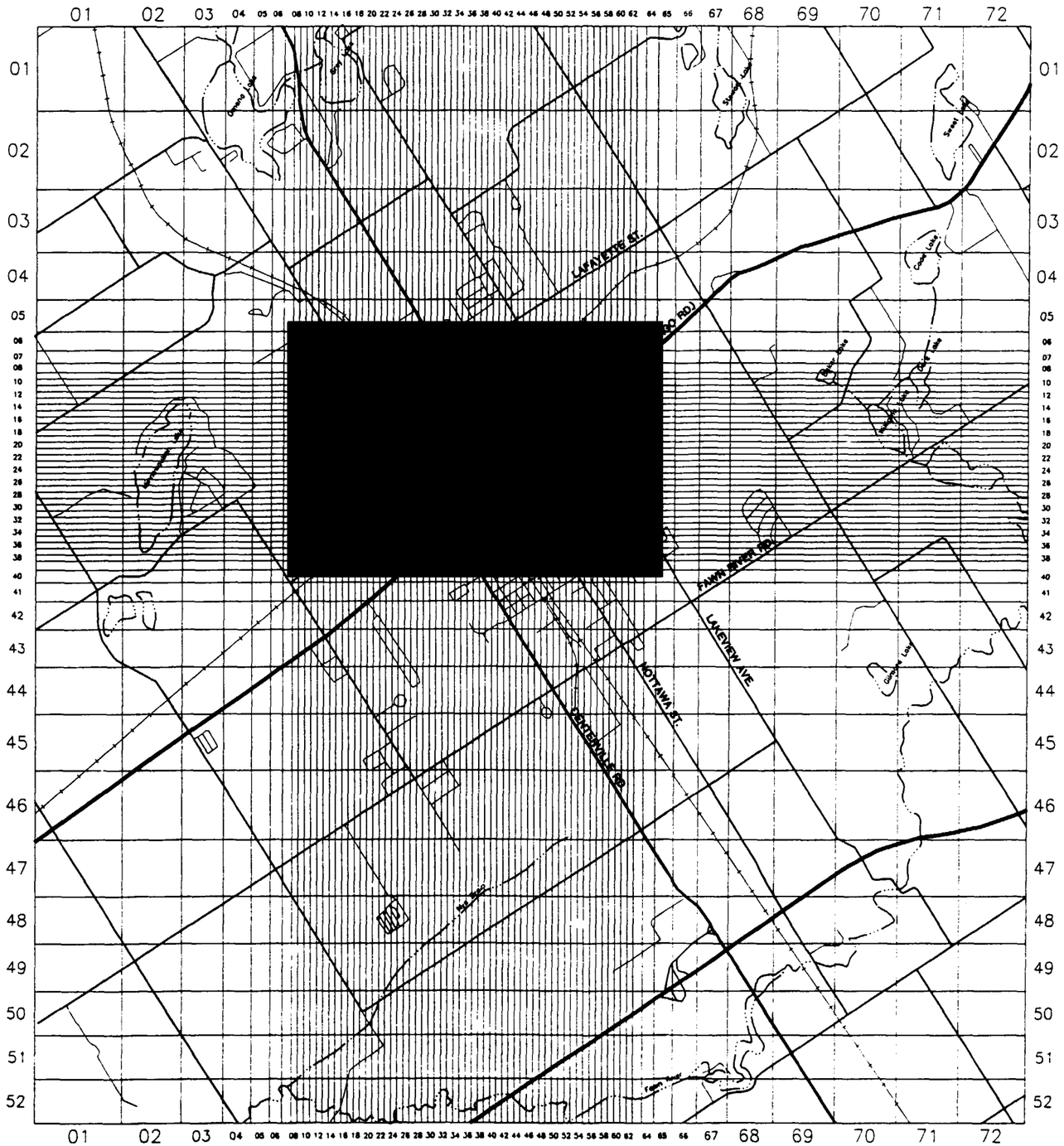

LEGEND

70 71 72 — MODEL COLUMNS AND NUMBERS

01, 02 — MODEL ROWS AND NUMBERS

◆PW-3 — PRODUCTION WELL LOCATION AND NUMBER
R SERIES – ROSS LABORATORIES
PW SERIES – CITY OF STURGIS
F-1 – STURGIS FOUNDRY

NOTES

1. BASE MAP IS A DIGITAL VERSION OF PORTION OF U.S.G.S. 7.5 MINUTE QUADRANGLES STURGIS, BURR OAK AND LA GRANGE OBTAINED FROM AMERICAN DIGITAL CARTOGRAPHY (FILES DATED 2/20/90).
2. MODEL NORTH AND TRUE NORTH ARE RELATED BY AN APPROXIMATE 32° ANGLE OF DECLINATION.
3. CITY WELL PW6 IS APPROXIMATELY LOCATED.

north

0 2000 4000
SCALE IN FEET

GROUNDWATER MODEL GRID

Designed By
Drawn By TPB
Checked By TEM
Approved By
Date 2-26-91
Reference
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REMEDIAL INVESTIGATION
FEASIBILITY STUDY
STURGIS WELL FIELD
STURGIS, MICHIGAN

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Sheet Number 17 OF 20
Drawing Number 12686 22
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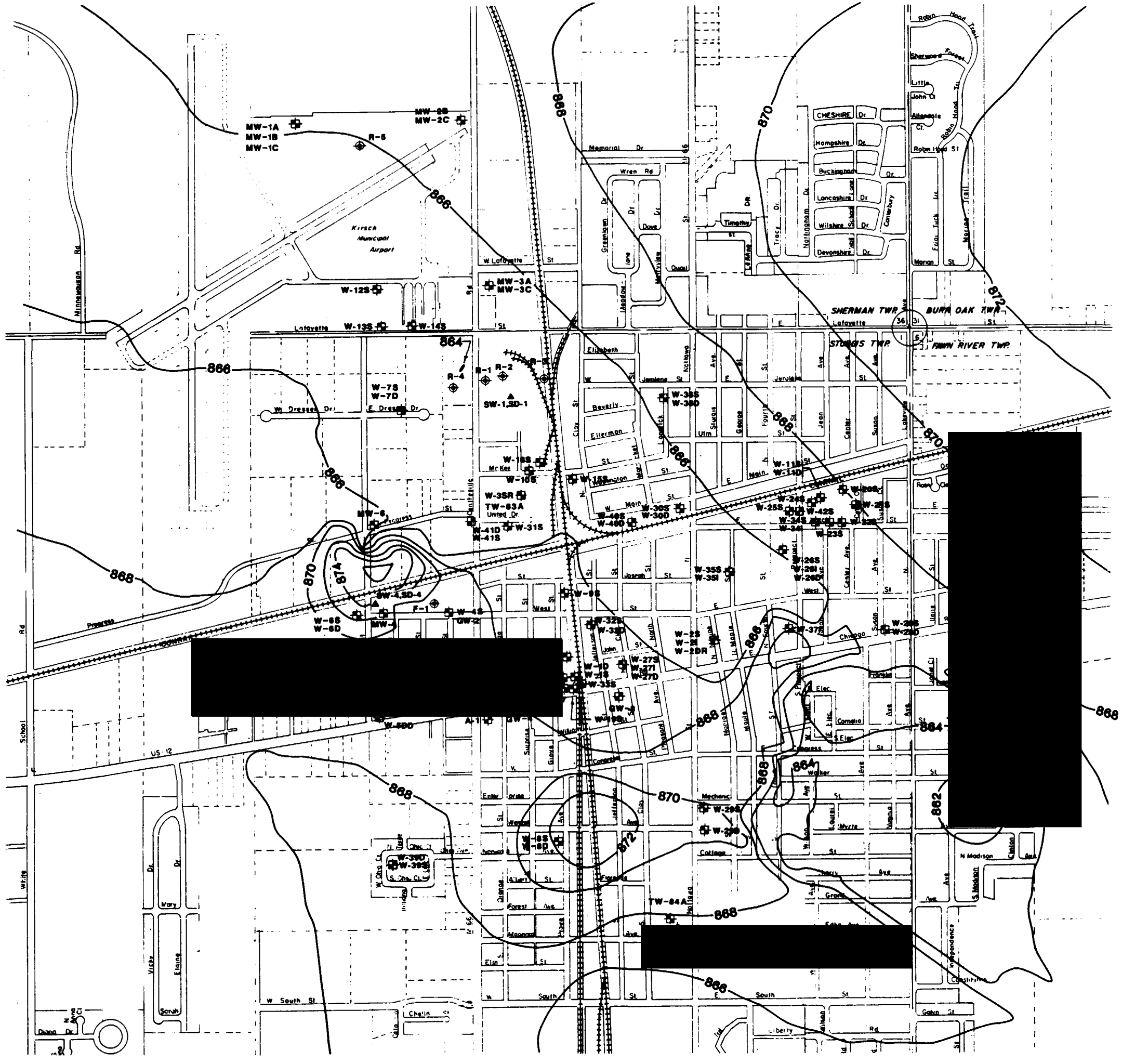

LEGEND

- SW-1 / SD-1 ▲ — APPROXIMATE SURFACE WATER AND SEDIMENT SAMPLING LOCATION AND NUMBER
- W-2DR — EXISTING MONITORING WELL LOCATION AND NUMBER
- PW-4 — PRODUCTION WELL LOCATION AND NUMBER
- RAILROAD TRACKS
- PAVED ROAD
- —870— SIMULATED WATER TABLE CONTOUR (CONTOUR INTERVAL: 2 FT)

NOTES

1. SEE DRAWING 12686-5 FOR ADDITIONAL NOTES AND LEGEND.
2. WATER TABLE MAP OF DECEMBER 1988, SIMULATED USING MODFLOW (McDONALD & HARBAUGH 1988).

north

0 600 1200

SCALE IN FEET

SIMULATED WATER TABLE MAP (DECEMBER 1988)

REMEDIAL INVESTIGATION / FEASIBILITY STUDY
STURGIS WELL FIELD
STURGIS, MICHIGAN

Designed By
Drawn By JC
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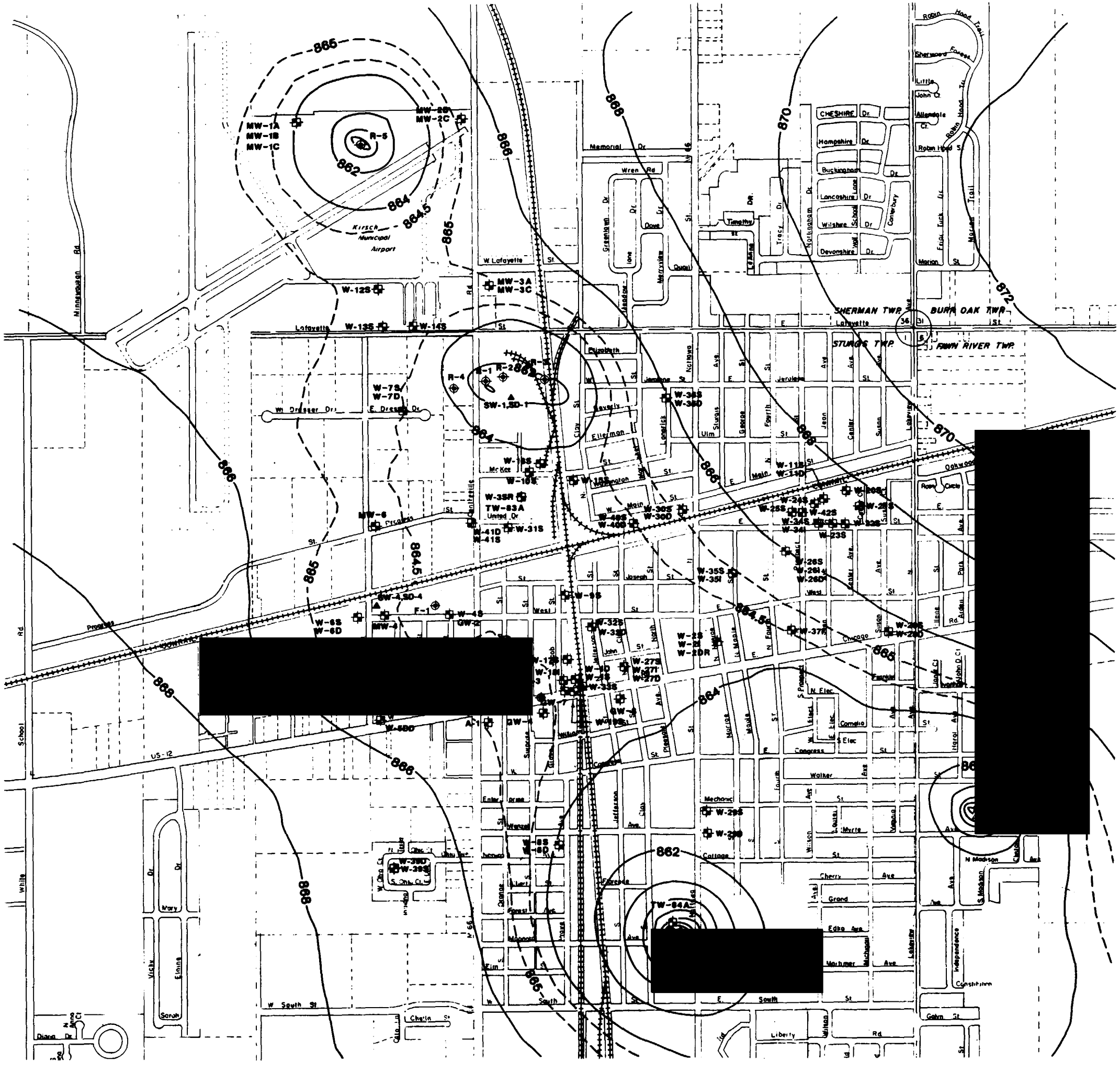

LEGEND

- SW-1 / SD-1 ▲ — APPROXIMATE SURFACE WATER AND SEDIMENT SAMPLING LOCATION AND NUMBER
- W-2DR — EXISTING MONITORING WELL LOCATION AND NUMBER
- PW-4 — PRODUCTION WELL LOCATION AND NUMBER
- RAILROAD TRACKS
- PAVED ROAD
- —870— SIMULATED POTENTIOMETRIC SURFACE CONTOUR (CONTOUR INTERVAL: 2 FT.)
- --865-- SIMULATED POTENTIOMETRIC SURFACE CONTOUR (CONTOUR INTERVAL: VARIES)

NOTES

1. SEE DRAWING 12686-5 FOR ADDITIONAL NOTES AND LEGEND.
2. POTENTIOMETRIC SURFACE OF DECEMBER 1988, SIMULATED USING MODFLOW (McDONALD & HARBAUGH 1988).

north

0 600 1200

SCALE IN FEET

Checked By TEM

Date 2-26-91

Reference

Drawn By JC

Designed By

Approved By

Date · By · App'd

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Revisions

SIMULATED POTENTIOMETRIC SURFACE MAP (DECEMBER 1988)

REMEDIAL INVESTIGATION / FEASIBILITY STUDY
STURGIS WELL FIELD
STURGIS, MICHIGAN

Printed

Sheet Number 19 OF 20

Project Number 12686

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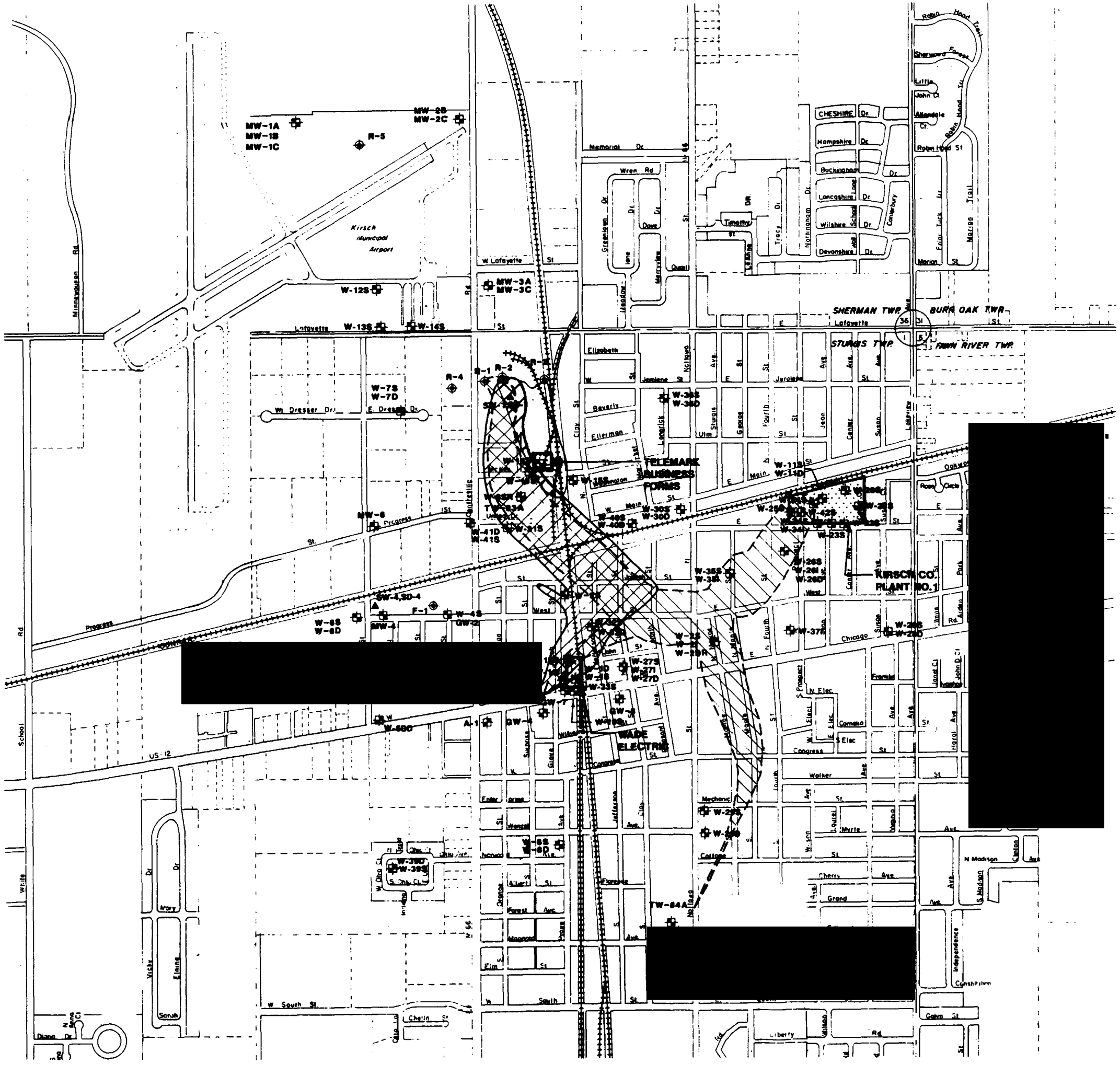

LEGEND

SW-1 SD-1 ▲	APPROXIMATE SURFACE WATER AND SEDIMENT SAMPLING LOCATION AND NUMBER
W-2DR	EXISTING MONITORING WELL LOCATION AND NUMBER
PW-4	PRODUCTION WELL LOCATION AND NUMBER
	RAILROAD TRACKS
	PAVED ROAD
	EXTENT OF SIMULATED CONTAMINANT MIGRATION ROUTES TRACKED FROM KIRSCH CO. PLANT NO. 1
	EXTENT OF SIMULATED CONTAMINANT MIGRATION ROUTES TRACKED FROM WADE ELECTRIC
	EXTENT OF SIMULATED CONTAMINANT MIGRATION ROUTES TRACKED FROM TELEMARK BUSINESS FORMS

NOTES

1. SEE DRAWING 12686-5 FOR ADDITIONAL NOTES AND LEGEND.
2. AREAS DELINEATED DESCRIBE THE CONTAMINANT MIGRATION ROUTES FROM THREE DISTINCT LOCATIONS, FOR THE PERIOD JANUARY 1950 THROUGH DECEMBER 1988, INCLUSIVE. CONTAMINANT MIGRATION SIMULATION CONSIDERING ONLY ADVECTIVE PROCESSES WITH NO DISPERSION OR DIFFUSION.
3. AQUIFER PARAMETERS SIMULATED IN MODFLOW (McDONALD & HARBAUGH 1988), CONTAMINANT MIGRATION ROUTES SIMULATED USING PATH3D (ZHENG 1988).

north

0 600 1200

SCALE IN FEET

Checked By TCM

Date 2-26-91

Reference

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SIMULATED CONTAMINANT MIGRATION ROUTES

Revisions

REMEDIAL INVESTIGATION / FEASIBILITY STUDY
STURGIS WELL FIELD
STURGIS, MICHIGAN

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Sheet Number 20 OF 20

Project Number 12686

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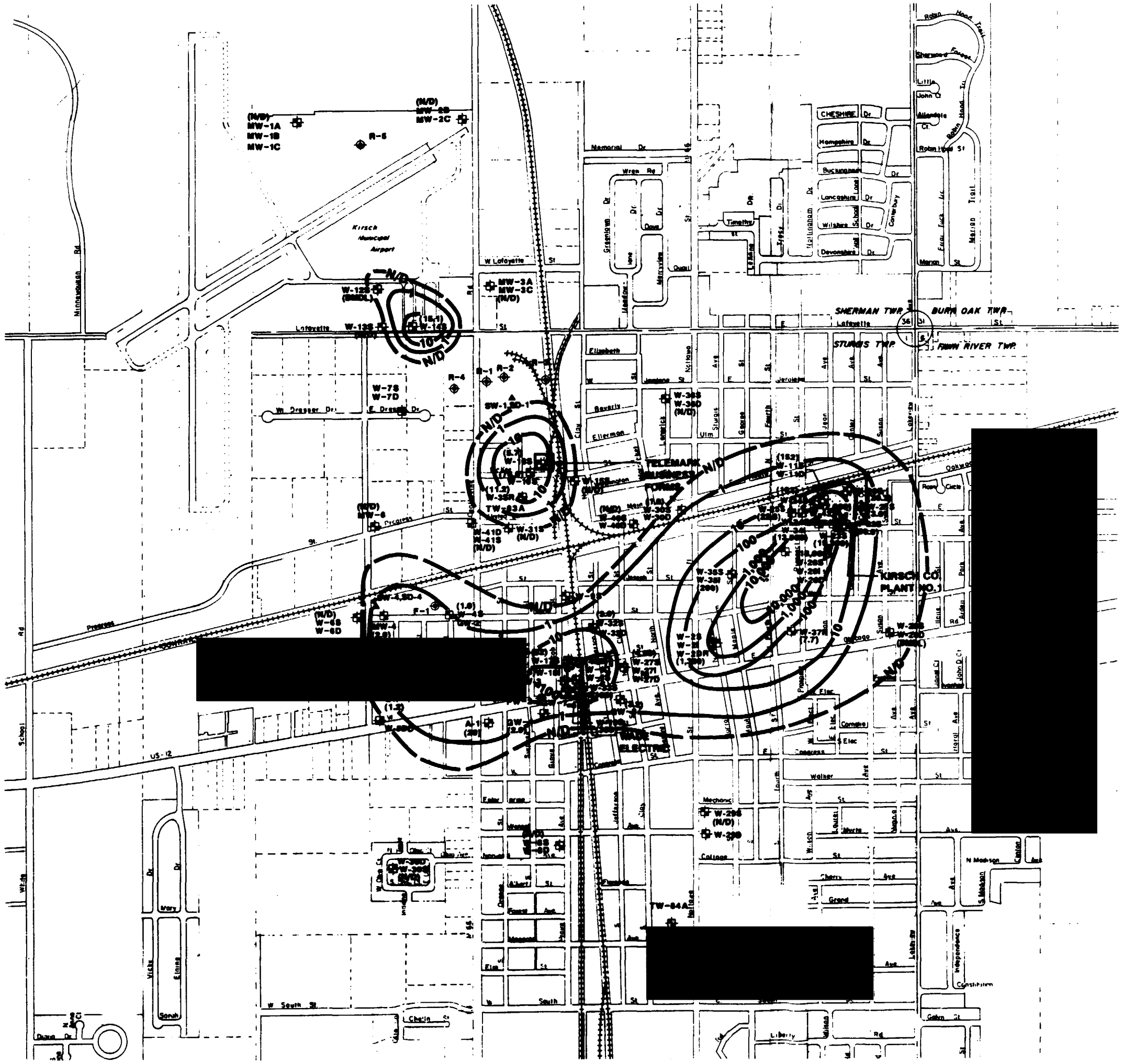
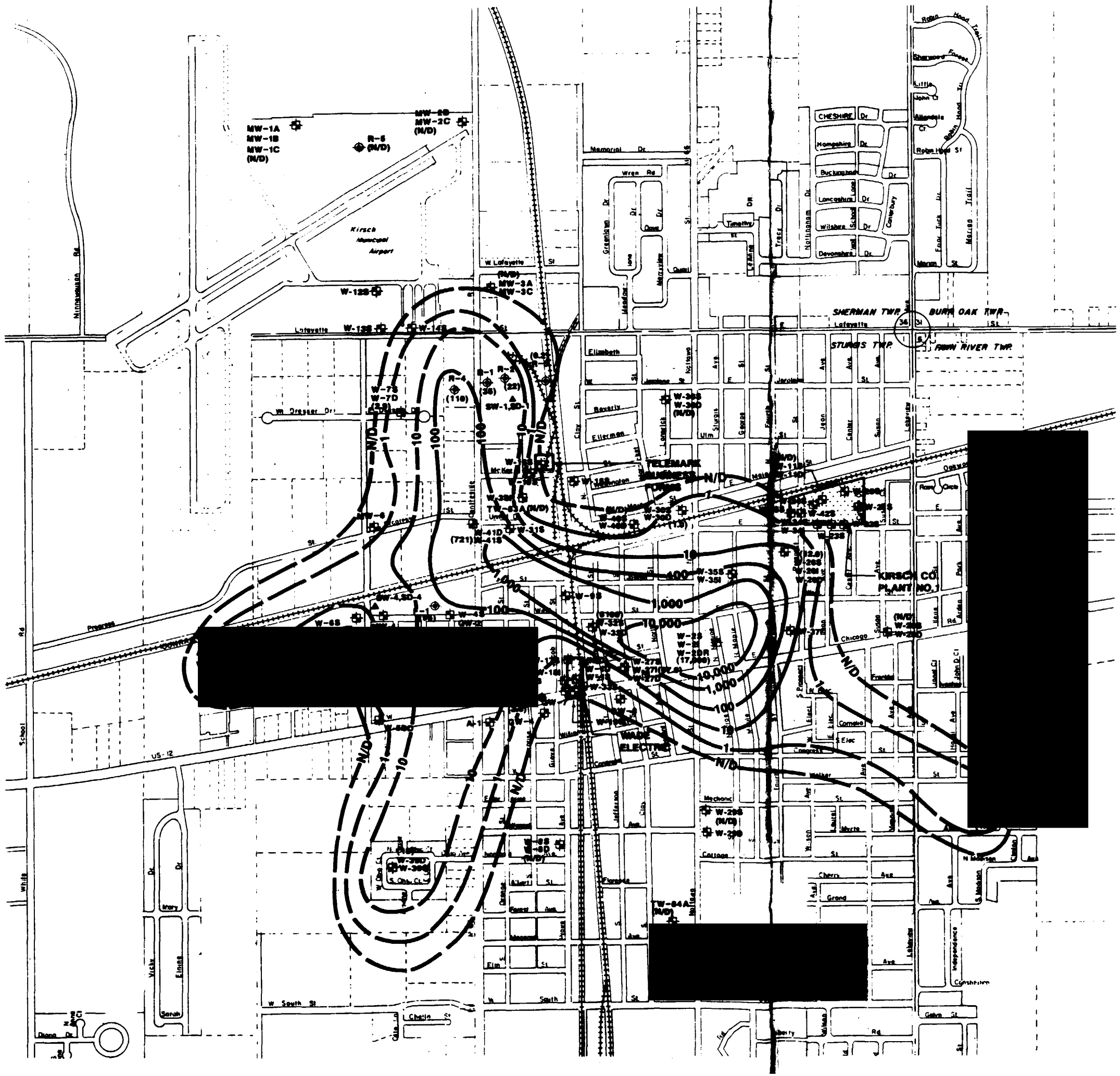

(N/D) MW-1A MW-1B MW-1C
(N/D) MW-2B MW-2C
R-5
Kirsch Municipal Airport
Minnewaska Rd
Memorial Dr
W Lafayette St
MW-3A MW-3C (N/D)
W-12S (8600L)
W-13S
(15.1) W-14S
SHERMAN TWP
BURN OAK TWP
STURGIS TWP
FAWN RIVER TWP
W-7S W-7D
R-4
B-1 R-2
SW-1.5D-1
W-35S W-35D (N/D)
TELEMARK BUSINESS PARK
(11.2) W-36R
TW-83A
W-31S (N/D)
W-41D W-41S (N/D)
(N/D) MW-6
W-4S W-4D
W-2.5D-4
F-1
W-43
W-32
W-33S
W-33I (200)
W-27S
W-27I
W-27D
W-28S
W-28D (N/D)
W-29S (N/D)
W-29D
KIRSCH CO. PLANT NO. 1
ELECTRIC
TW-84A
W-35S W-35I (200)
W-23 W-25 W-29W (1,300)
W-37S (7.7)
W-26S (N/D)
W-26D (N/D)
A-1 (20)
2W (2.0)
US-12
Prairie
CONRAIL
School Rd
Wirth Rd
W South St
Chestnut St
Diane Dr
Vicki Dr
Elmer Dr
Mary Dr
Sonia Dr
CHESHIRE Dr
Hampshire Dr
Buckingham Dr
Lancashire Dr
Wiltshire Dr
Devonshire Dr
Robin Hood Trail
Sherwood Forest
Little John Ct
Allendale Ct
Robin Hood St
Marion Trail
Fawn Lake Dr
Timothy St
Highlandom Dr
Greenlawn Dr
Meadowview Dr
Elizabeth St
Beverly St
Ellermon St
Jackson St
Jerome St
Nelson Ave
Lewick St
Ulm St
Gaines St
Fourth St
Jason St
Susan St
Lafayette St
Oakwood
Park Ave
Walker Ave
Mechanic St
Cottage St
Cherry Ave
Grand St
N Madison St
S Madison St
Independence St
Constitution
Liberty Rd
Gaskin St
Mill St
Elm St
Water St
Wood St
Pleasant Ave
Clay St
Lincoln Ave
Jefferson Ave
Washington Ave
Elec St
Comstock St
Prospect St
Pleasant St
Fourth Ave
Lincoln Ave
Liberty Ave
Lakeview Ave
Susan St
Park Ave
Ruby Circle
Oakwood
Fawn Lake Dr
Marion St
Marion Trail
Robin Hood St
Robin Hood Trail
Memorial Dr
Wren Rd
Greenlawn Dr
Meadowview Dr
Timothy St
Highlandom Dr
Comerbury Dr
Lancashire Dr
Wiltshire Dr
Devonshire Dr
Buckingham Dr
Hampshire Dr
Cheshire Dr
Sherwood Forest
Little John Ct
Allendale Ct
Robin Hood St
Robin Hood Trail
Marion Trail
Fawn Lake Dr
Lafayette St
Elizabeth St
Beverly St
Ellermon St
Jackson St
Jerome St
Nelson Ave
Lewick St
Ulm St
Gaines St
Fourth St
Jason St
Susan St
Lafayette St
Oakwood
Ruby Circle
Park Ave
Walker Ave
Mechanic St
Cottage St
Cherry Ave
Grand St
N Madison St
S Madison St
Independence St
Constitution
Liberty Rd
Gaskin St
Mill St
Elm St
Water St
Wood St
Pleasant Ave
Clay St
Lincoln Ave
Jefferson Ave
Washington Ave
Elec St
Comstock St
Prospect St
Pleasant St
Fourth Ave
Liberty Ave
Lakeview Ave
Susan St
Park Ave
W Dixie Cir
Chestnut St
Diane Dr
Vicki Dr
Elmer Dr
Mary Dr
Sonia Dr
W South St



LEGEND

W-2DR (17,000)	EXISTING MONITORING WELL LOCATION, NUMBER AND CONCENTRATION OF TOTAL CHLORINATED ETHENES
PW-4 (1.0)	PRODUCTION WELL LOCATION, NUMBER AND CONCENTRATION OF TOTAL CHLORINATED ETHENES
	RAILROAD TRACKS
	PAVED ROAD
100	ISOCONCENTRATION CONTOUR (DASHED WHERE INFERRED)
(N/D)	COMPOUNDS NOT DETECTED
	APPROXIMATE FACILITY AREA BOUNDARY

NOTES

1. SEE DRAWINGS 12686-5 AND 12686-26 FOR ADDITIONAL NOTES AND LEGEND.
2. SEE DRAWING 12686-26 FOR PLUME DISTRIBUTION IN THE SHALLOW AQUIFER.
3. TOTAL CHLORINATED ETHENE COMPOUNDS INCLUDED IN THIS DRAWING ARE 1,1-DICHLOROETHENE, TOTAL-1,2-DICHLOROETHENE, TRICHLOROETHENE AND TETRACHLOROETHENE.
4. CONCENTRATIONS ARE IN ug/L.
5. RESULTS SHOWN ARE MAXIMUM CONCENTRATIONS DETECTED IN GROUNDWATER SAMPLES COLLECTED BY WARZYN ENGINEERING INC. DURING FOUR ROUNDS OF SAMPLING (SEPTEMBER 1987 THROUGH AUGUST 1989).
6. THE DEEP AQUIFER IS DEFINED AS THE LOWER SAND AND GRAVEL AQUIFER FROM WHICH THE MAJORITY OF THE PUBLIC AND INDUSTRIAL WATER SUPPLY WELLS DRAW THIER PRODUCTION.

Date · By · App'd

Revisions

Designed By

Drawn By JC, DLF

Checked By TGM

Approved By

Date 2-26-91

Reference

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CONTAMINANT PLUME - DEEP AQUIFER

REMEDIAL INVESTIGATION / FEASIBILITY STUDY
STURGIS WELL FIELD
STURGIS, MICHIGAN

Printed

Sheet Number OF

Project Number 12686

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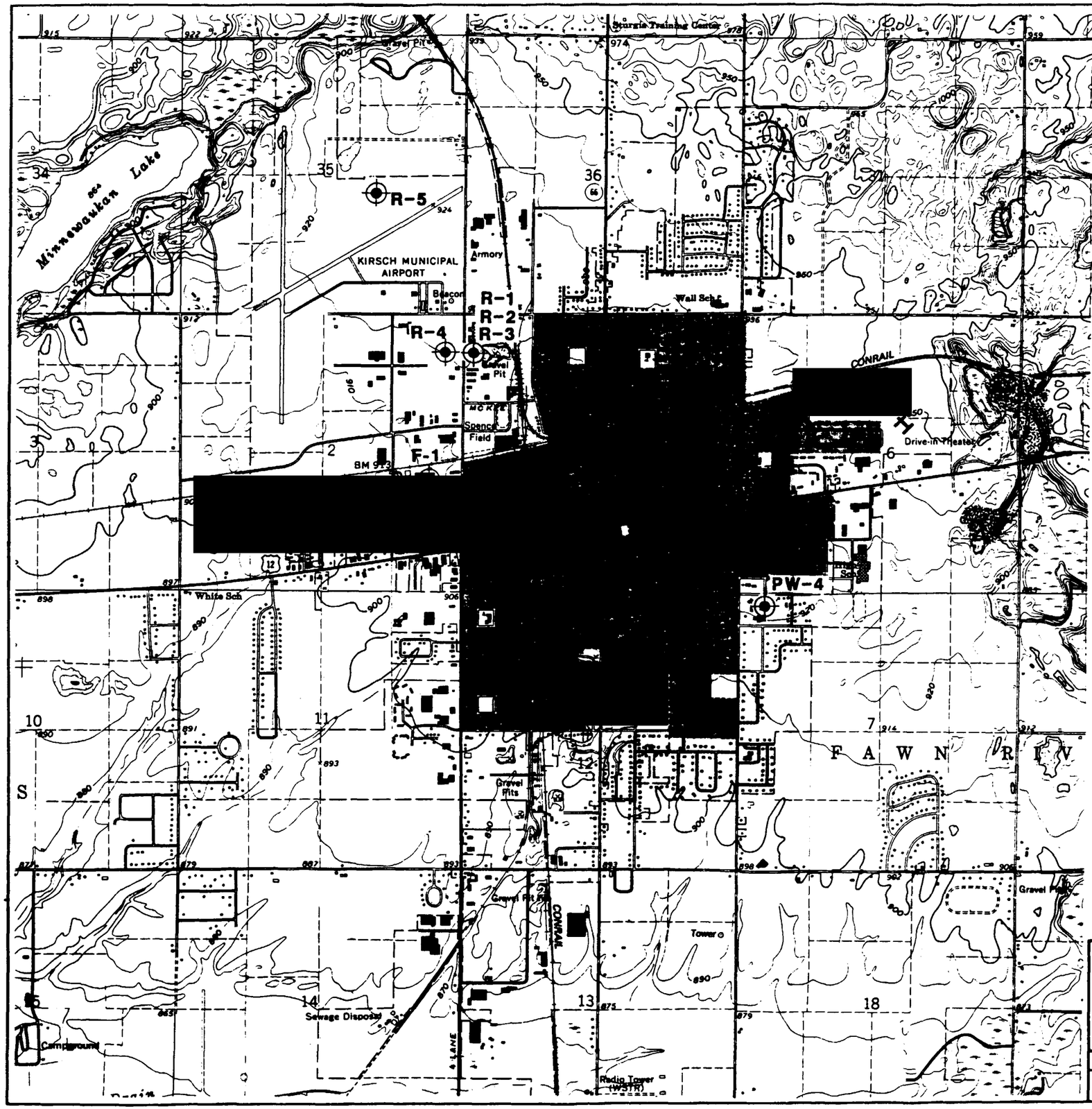

NOTES:

1. SITE LOCATION MAP OBTAINED FROM U.S.G.S. 7 1/2 MINUTE QUADRANGLE MAP STURGIS, MICHIGAN - INDIANA DATED 1961 PHOTOREVISED 1982.
2. CONTOUR INTERVAL IS 10 FEET.
3. REFER TO STANDARD U.S.G.S. MAP SYMBOLS.
4. R SERIES WELLS - INDUSTRIAL WATER SUPPLY WELLS. PW-1 - JACKSON WELL. PW-2 - LAYNE WELL. PW-3 BROADUS ST. WELL. PW-4 - LAKEVIEW WELL. PW-5 - OAKLAWN WELL. PW-6 - THURSTON WOODS WELL.

LEGEND:

PW-1 ⊕ PRODUCTION WELL LOCATION AND NUMBER

north

FIG. 1

WARZYN

SITE LOCATION MAP

REMEDIAL INVESTIGATION/FEASIBILITY STUDY
STURGIS WELL FIELD
STURGIS, MICHIGAN

DRAWN	CHECKED	APPROVED	DATE	SCALE	DRAWING NO.
ALH	TEM	Ken Lunn	7/22/87	1"=2000'	12686-B1

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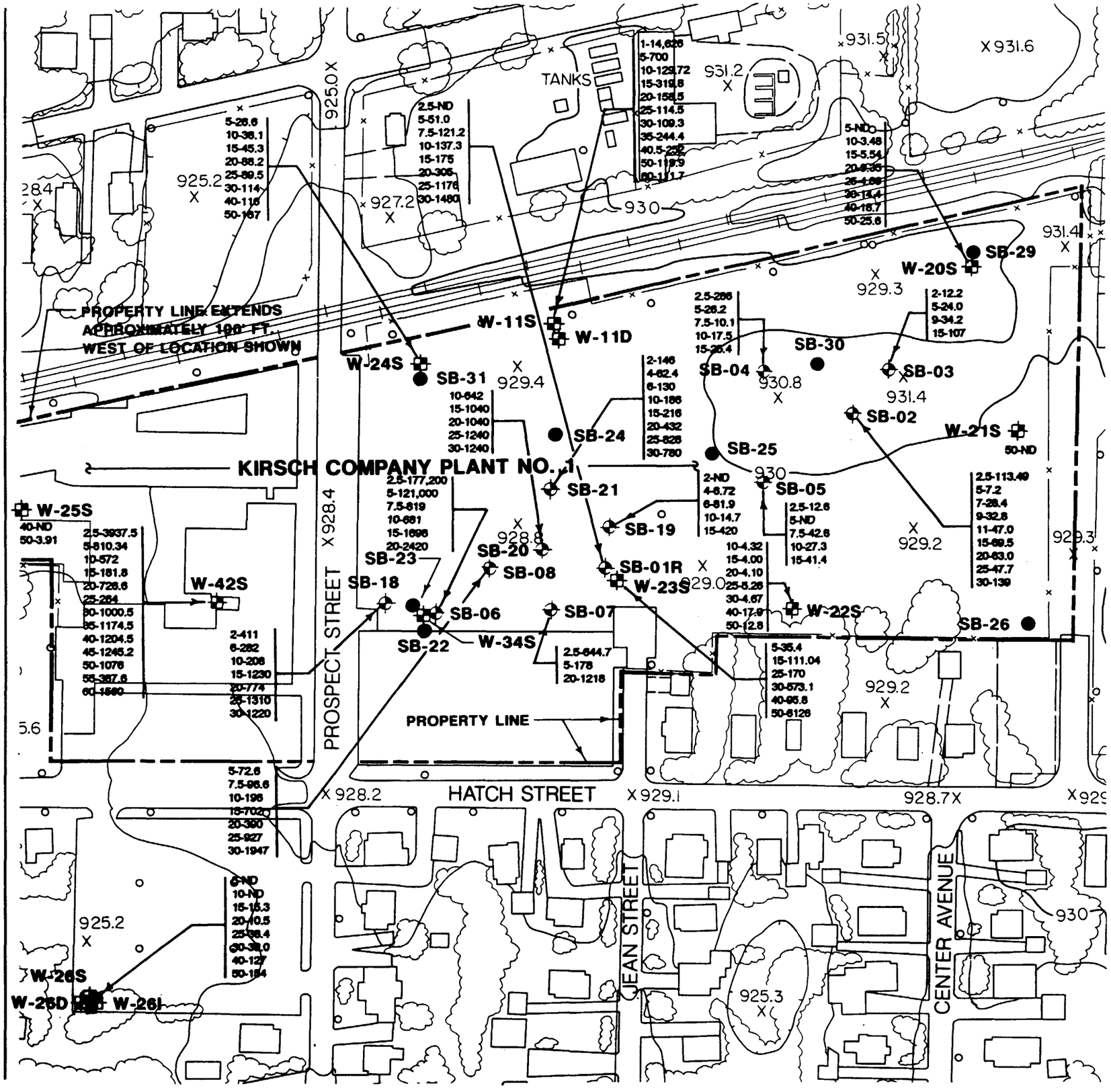

LEGEND

SB-04	APPROXIMATE SOIL BORING LOCATION AND NUMBER
SB-25	APPROXIMATE SURFACE SOIL SAMPLE LOCATION AND NUMBER
W-20S	MONITORING WELL LOCATION AND NUMBER
930	CONTOUR
x923.9	SPOT ELEVATION
	POWER POLE
	BUILDINGS
	BRUSH OR TREES
	RAILROAD TRACKS
	FENCE LINE
	PAVED ROAD
	KIRSCH COMPANY PLANT NO. 1 PROPERTY BOUNDARY
ND	NO DETECTION OF ETHENES
10-38.1	DEPTH OF SAMPLING IN FEET TOTAL FIELD GC ETHENES PRESENT IN SOIL SAMPLES IN ug/Kg (ppb).

NOTES

1. REFER TO DRAWING 70084-B2 FOR ADDITIONAL NOTES.
2. CONCENTRATIONS SHOWN ARE ESTIMATED USING FIELD GAS CHROMATOGRAPHY METHODS, AND WERE DETERMINED DURING DRILLING ACTIVITIES IN PHASE I, PHASE II AND PHASE IIB INVESTIGATION. ONLY SOIL SAMPLES COLLECTED ABOVE THE WATER TABLE WERE ANALYZED. CONCENTRATIONS ARE IN ug/Kg (ppb).

north

0 100 200

SCALE IN FEET

Checked By
Date 3/6/91
Reference
Drawn By JC
Designed By
Approved By

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WARZYN ENGINEERING INC

KIRSCH COMPANY PLANT NO. 1-TOTAL ETHENES DETECTED IN SOIL-FIELD GC METHODS

REMEDIAL INVESTIGATION/
FEASIBILITY STUDY
STURGIS WELL FIELD
STURGIS, MICHIGAN

Project Number 70084 B8

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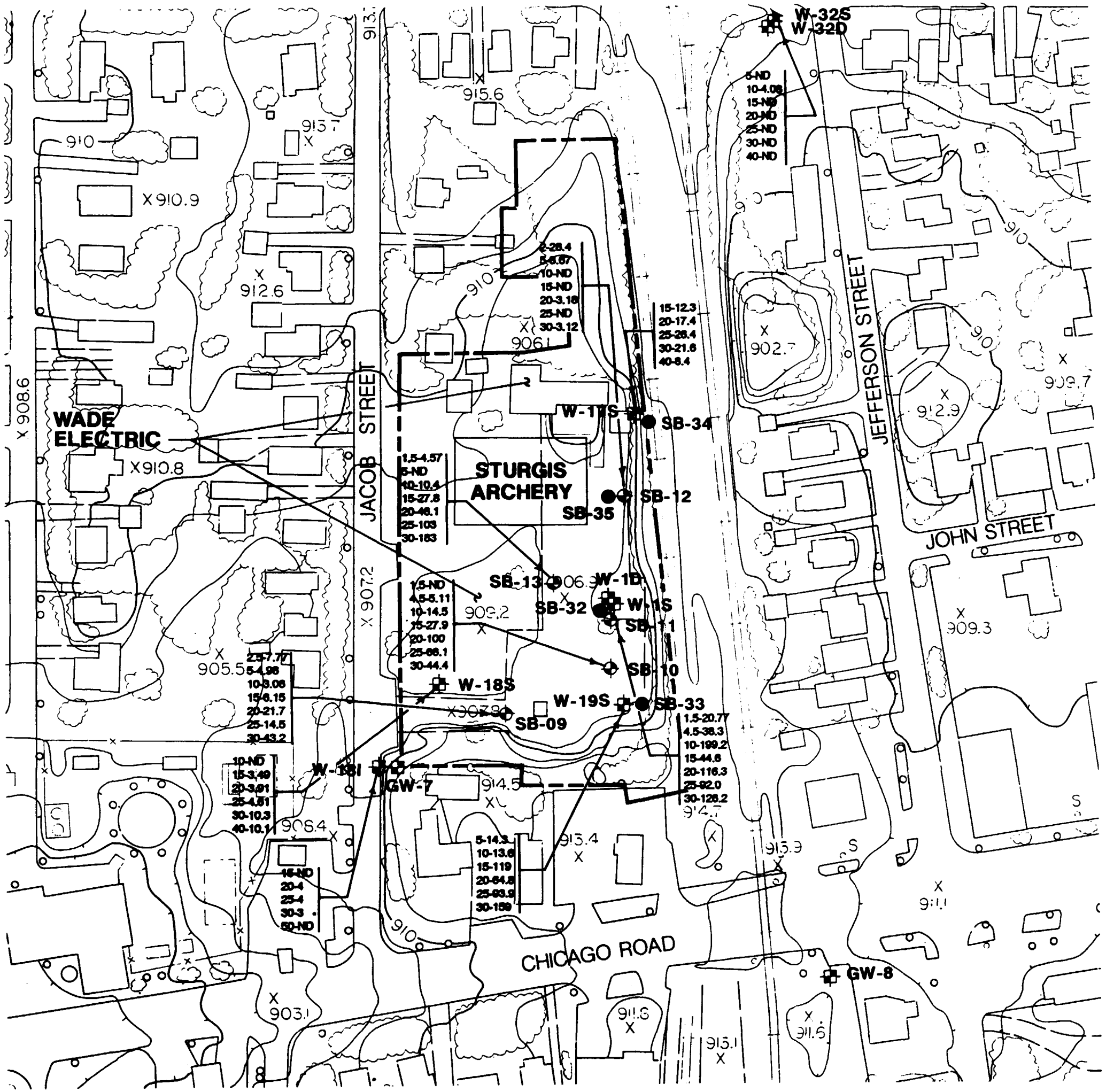

NOTES

1. REFER TO DRAWING 70084-B4 FOR ADDITIONAL NOTES.
2. CONCENTRATIONS SHOWN ARE ESTIMATED USING FIELD GAS CHROMATOGRAPHY METHODS, AND WERE DETERMINED DURING DRILLING ACTIVITIES IN PHASE I, PHASE II AND PHASE IIB INVESTIGATION. ONLY SOIL SAMPLES COLLECTED ABOVE THE WATER TABLE WERE ANALYZED. CONCENTRATIONS ARE IN ug/Kg (ppb).

Checked By
Date 3/6/91
Reference
Drawn By
Designed By
Approved By

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FORMER WADE ELECTRIC PROPERTY - TOTAL ETHENES DETECTED IN SOIL-FIELD GC METHODS

REMEDIAL INVESTIGATION/
FEASIBILITY STUDY
STURGIS WELL FIELD
STURGIS, MICHIGAN

Project Number 70084 **B9**

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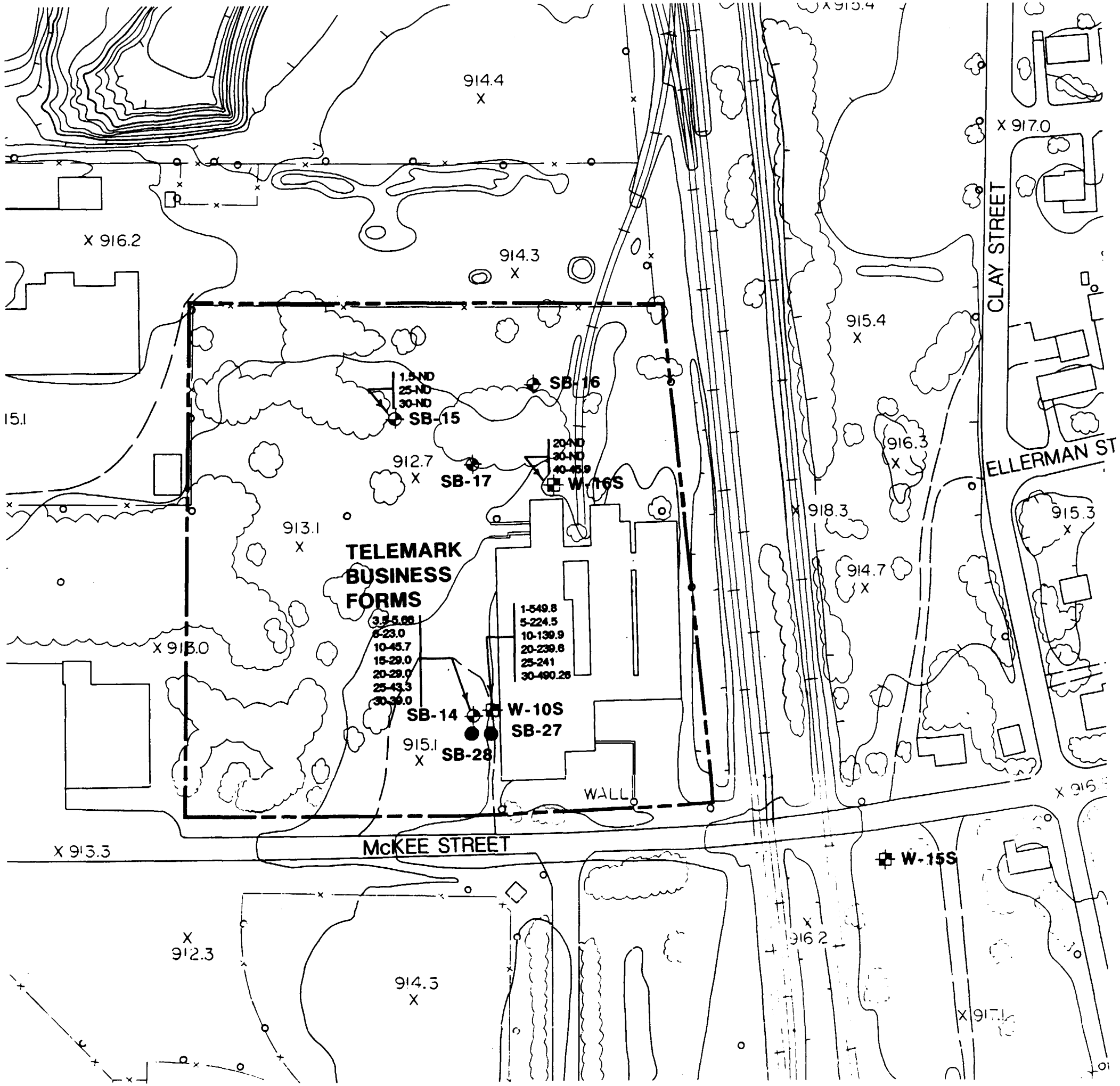

LEGEND

SB-15	APPROXIMATE SOIL BORING LOCATION AND NUMBER
SB-28	APPROXIMATE SURFACE SOIL SAMPLE LOCATION AND NUMBER
W-10S	MONITORING WELL LOCATION AND NUMBER
930	CONTOUR
x923.9	SPOT ELEVATION
	POWER POLE
	BUILDINGS
	BRUSH OR TREES
	RAILROAD TRACKS
	FENCE LINE
	PAVED ROAD
	PROPERTY BOUNDARY
ND	NO DETECTION OF ETHENES
1-549.8	DEPTH OF SAMPLING IN FEET
	TOTAL FIELD GC ETHENES PRESENT IN SOIL SAMPLES IN ug/Kg (ppb).

NOTES

1. REFER TO DRAWING 70084-86 FOR ADDITIONAL NOTES.
2. CONCENTRATIONS SHOWN ARE ESTIMATED USING FIELD GAS CHROMATOGRAPHY METHODS, AND WERE DETERMINED DURING DRILLING ACTIVITIES IN PHASE I, PHASE II AND PHASE IIB INVESTIGATION. ONLY SOIL SAMPLES COLLECTED ABOVE THE WATER TABLE WERE ANALYZED. CONCENTRATIONS ARE IN ug/Kg (ppb).

north

0 100 200

SCALE IN FEET

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WARZYN ENGINEERING, INC.

Designed By
Drawn By
Approved By
Checked By MT
Date 3/6/91
Reference

TELEMARK BUSINESS FORMS-TOTAL ETHENES DETECTED IN SOIL-FIELD GC METHODS

REMEDIAL INVESTIGATION/
FEASIBILITY STUDY
STURGIS WELL FIELD
STURGIS, MICHIGAN

Project Number
70084 B10

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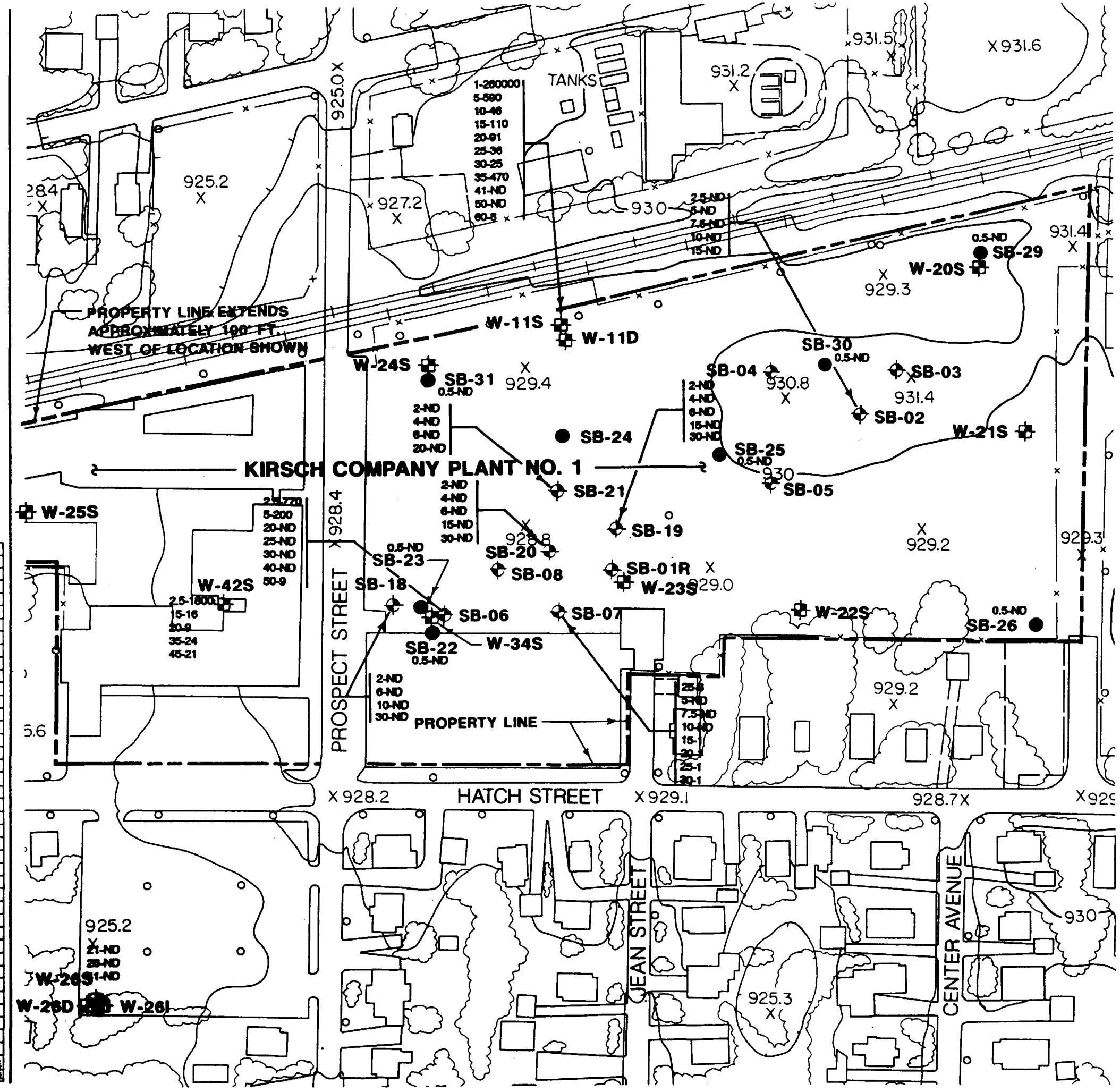

LEGEND

SB-09	APPROXIMATE SOIL BORING LOCATION AND NUMBER
SB-34	APPROXIMATE SURFACE SOIL SAMPLE LOCATION AND NUMBER
W-19S	MONITORING WELL LOCATION AND NUMBER
930	CONTOUR
x923.9	SPOT ELEVATION
	POWER POLE
	BUILDINGS
	BRUSH OR TREES
	RAILROAD TRACKS
	FENCE LINE
	PAVED ROAD
	KIRSCH COMPANY PLANT NO. 1 PROPERTY BOUNDARY
ND	COMPOUNDS NOT DETECTED
2.5	DEPTH OF SAMPLING IN FEET
770	SOIL PCE CONCENTRATION (ug/kg) (CLP ANALYSIS)

NOTES

1. REFER TO DRAWING 70084-82 FOR ADDITIONAL NOTES.
2. CONCENTRATIONS SHOWN ARE ESTIMATED USING FIELD GAS CHROMATOGRAPHY METHODS, WERE DETERMINED DURING DRILLING ACTIVITIES IN PHASE I, PHASE II AND PHASE IIB INVESTIGATION. ONLY SOIL SAMPLES COLLECTED ABOVE THE WATER TABLE WERE ANALYZED. CONCENTRATIONS ARE IN ug/Kg (ppb).

north

0 100 200

SCALE IN FEET

Designed By
Drawn By JC
Checked By MT
Approved By
Date 3/6/91
Reference

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KIRSCH COMPANY PLANT NO. 1
PCE CONCENTRATION IN SOIL (CLP ANALYSIS)

REMEDIAL INVESTIGATION/
FEASIBILITY STUDY
STURGIS WELL FIELD
STURGIS, MICHIGAN

Project Number 70084 B11

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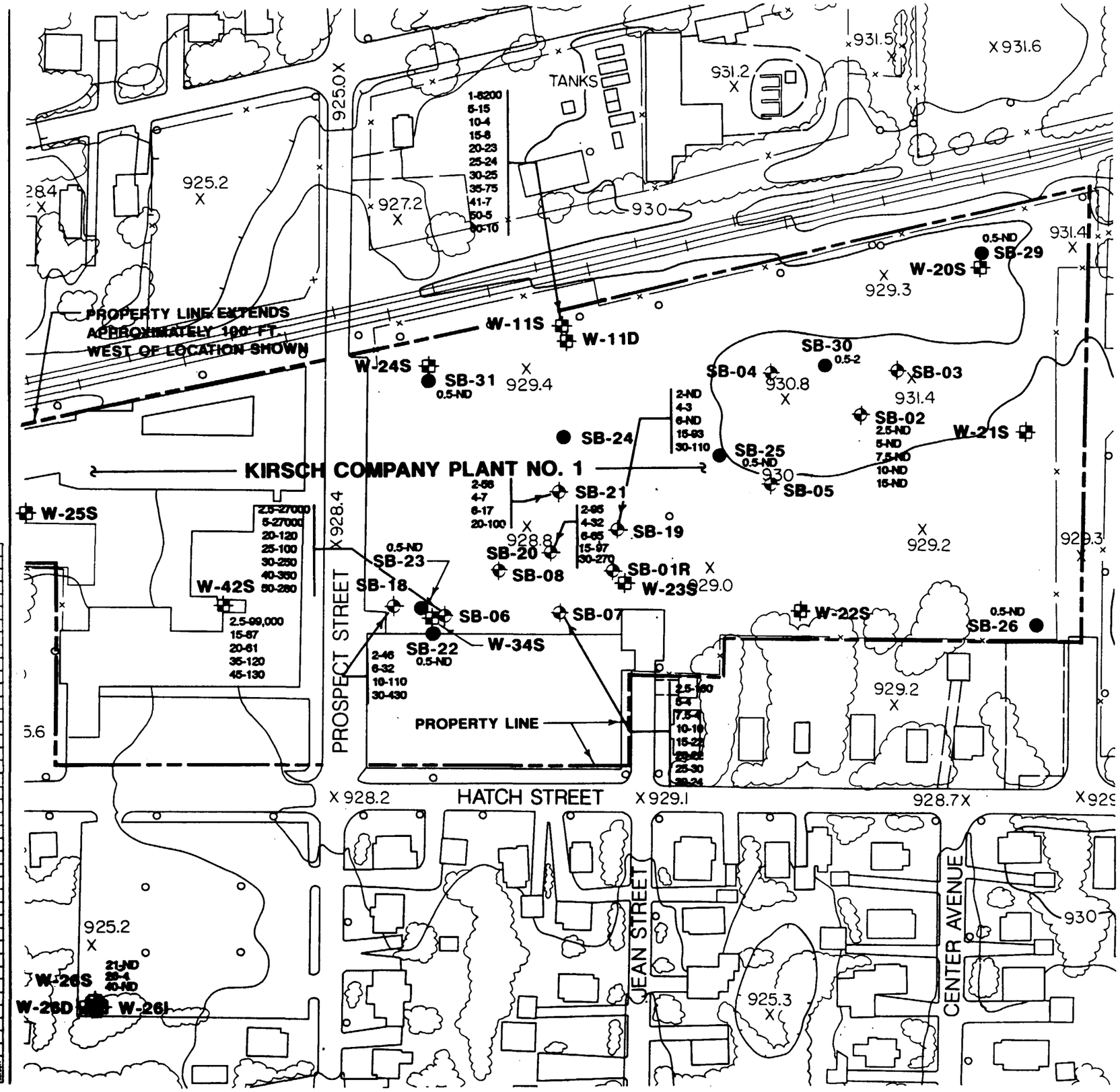

LEGEND

SB-09	APPROXIMATE SOIL BORING LOCATION AND NUMBER
SB-34	APPROXIMATE SURFACE SOIL SAMPLE LOCATION AND NUMBER
W-19S	MONITORING WELL LOCATION AND NUMBER
930	CONTOUR
x923.9	SPOT ELEVATION
	POWER POLE
	BUILDINGS
	BRUSH OR TREES
	RAILROAD TRACKS
	FENCE LINE
	PAVED ROAD
	KIRSCH COMPANY PLANT NO. 1 PROPERTY BOUNDARY
ND	COMPOUNDS NOT DETECTED
2.5-160	DEPTH OF SAMPLING IN FEET SOIL TCE CONCENTRATION (ug/kg) (CLP ANALYSIS)

NOTES

1. REFER TO DRAWING 70084-82 FOR ADDITIONAL NOTES.
2. CONCENTRATIONS SHOWN ARE ESTIMATED USING FIELD GAS CHROMATOGRAPHY METHODS, WERE DETERMINED DURING DRILLING ACTIVITIES IN PHASE I, PHASE II AND PHASE IIB INVESTIGATION. ONLY SOIL SAMPLES COLLECTED ABOVE THE WATER TABLE WERE ANALYZED. CONCENTRATIONS ARE IN ug/Kg (ppb).

north

0 100 200

SCALE IN FEET

WARZYN
WARZYN ENGINEERING INC

Designed By
Approved By
Drawn By JC
Checked By
Date 3/6/91
Reference

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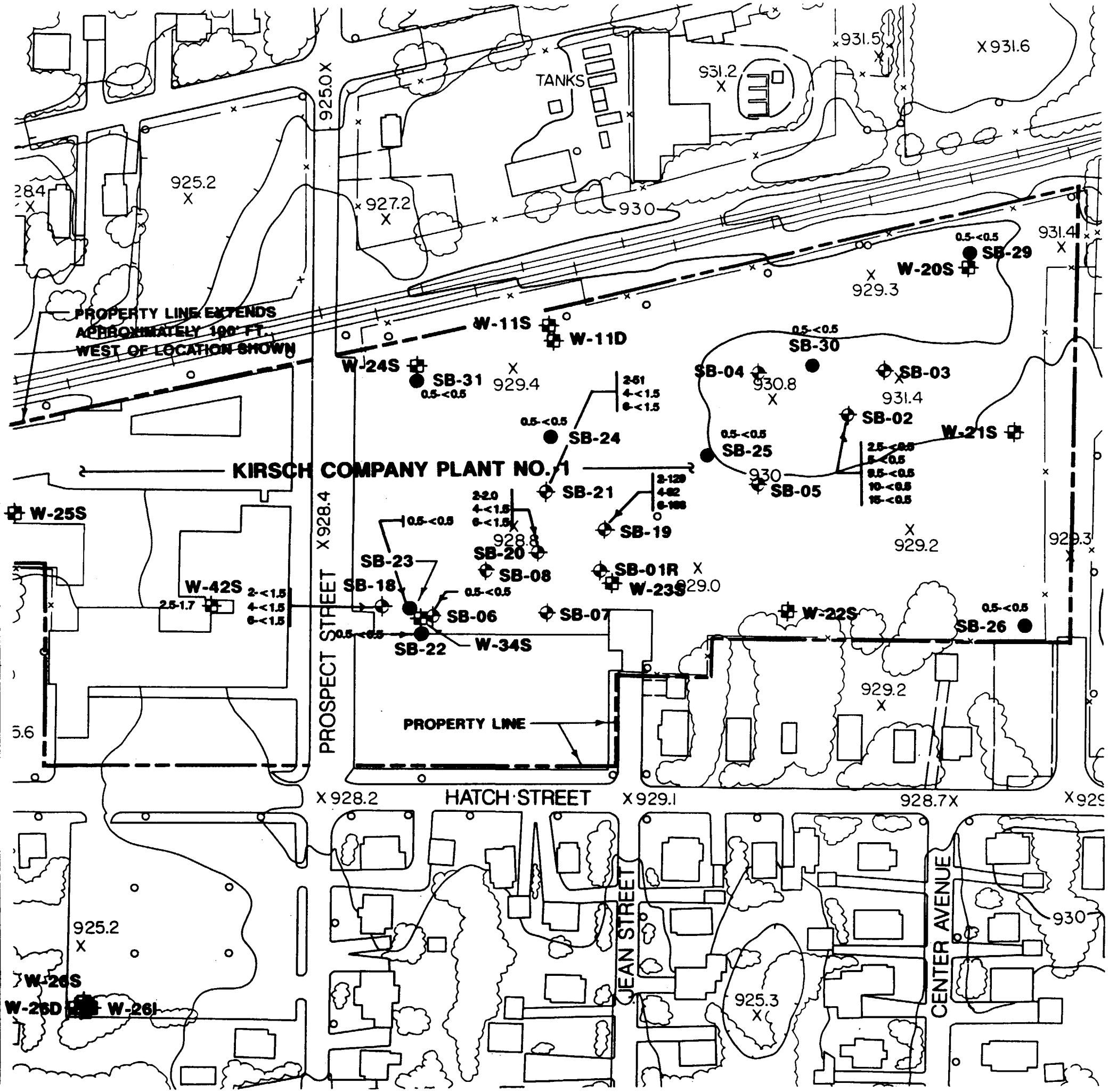
KIRSCH COMPANY PLANT NO. 1
TCE CONCENTRATION IN SOIL (CLP ANALYSIS)

REMEDIAL INVESTIGATION/
FEASIBILITY STUDY
STURGIS WELL FIELD
STURGIS, MICHIGAN

Project Number
70084 B12



LEGEND

SB-09	APPROXIMATE SOIL BORING LOCATION AND NUMBER
SB-34	APPROXIMATE SURFACE SOIL SAMPLE LOCATION AND NUMBER
W-19S	MONITORING WELL LOCATION AND NUMBER
930	CONTOUR
x923.9	SPOT ELEVATION
	POWER POLE
	BUILDINGS
	BRUSH OR TREES
	RAILROAD TRACKS
	FENCE LINE
	PAVED ROAD
	KIRSCH COMPANY PLANT NO. 1 PROPERTY BOUNDARY
ND	COMPOUND NOT DETECTED.
2.5	DEPTH OF SAMPLING IN FEET
<0.5	SOIL CYANIDE CONCENTRATION (ug/kg) (CLP ANALYSIS)

NOTES

1. REFER TO DRAWING 70084-82 FOR ADDITIONAL NOTES.

north

0 100 200

SCALE IN FEET

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Approved by
Date 8/6/91
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KIRSCH COMPANY PLANT NO. 1
CYANIDE CONCENTRATION IN SOIL (CLP ANALYSIS)

REMEDIAL INVESTIGATION/
FEASIBILITY STUDY
STURGIS WELL FIELD
STURGIS, MICHIGAN

Project Number
70084 B13
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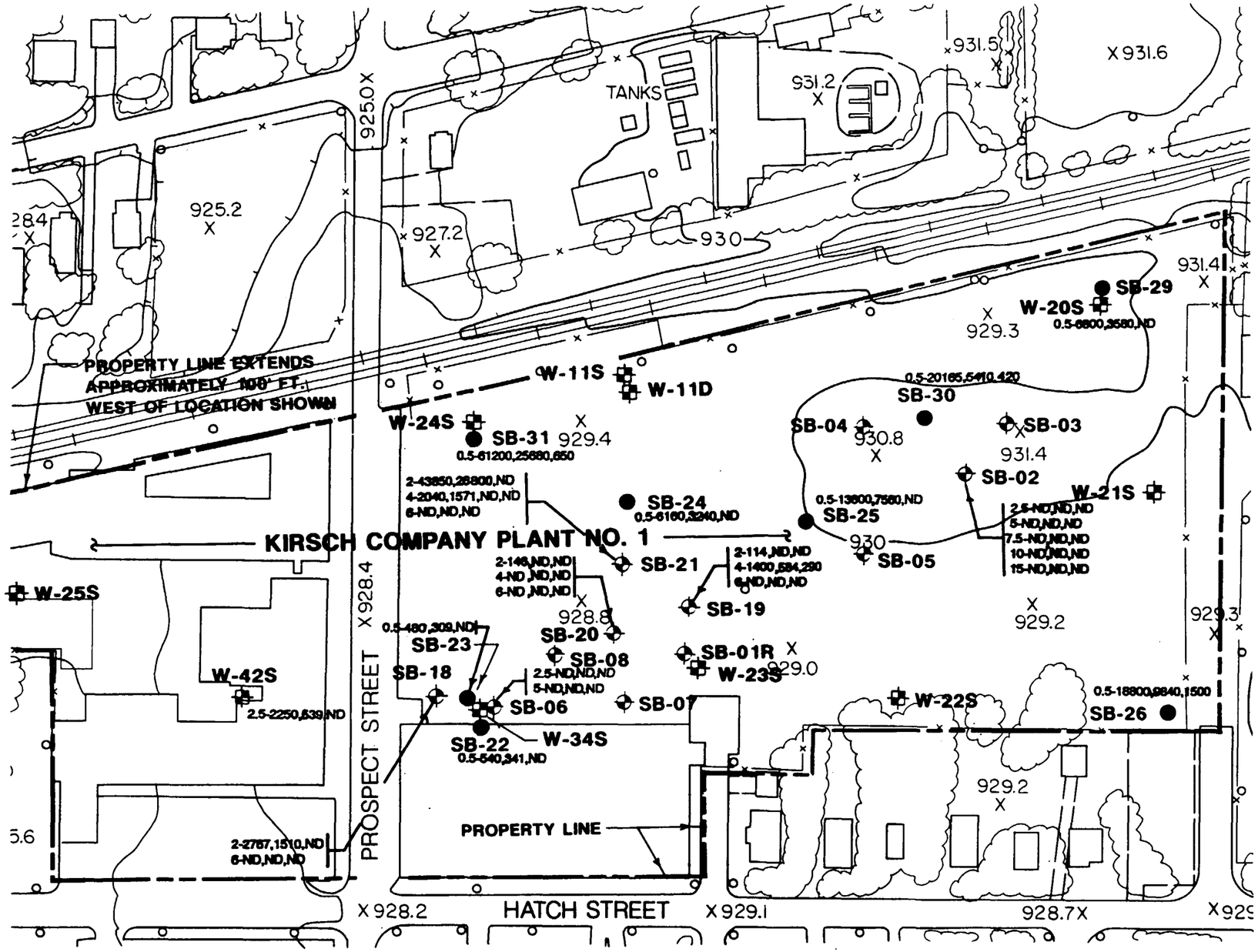


LEGEND

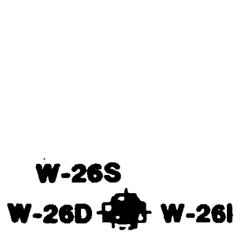
SB-09	APPROXIMATE SOIL BORING LOCATION AND NUMBER
SB-34	APPROXIMATE SURFACE SOIL SAMPLE LOCATION AND NUMBER
W-19S	MONITORING WELL LOCATION AND NUMBER
930	CONTOUR
x923.9	SPOT ELEVATION
	POWER POLE
	BUILDINGS
	BRUSH OR TREES
	RAILROAD TRACKS
	FENCE LINE
	PAVED ROAD
	KIRSCH COMPANY PLANT NO. 1 PROPERTY BOUNDARY
ND	COMPOUNDS NOT DETECTED
2-114,ND,ND	DEPTH OF SAMPLING IN FEET PCB CONCENTRATION (ug/kg) CARCINOGENIC PAH CONCENTRATION (ug/kg) SOIL PAH CONCENTRATION (ug/kg) (CLP ANALYSIS)

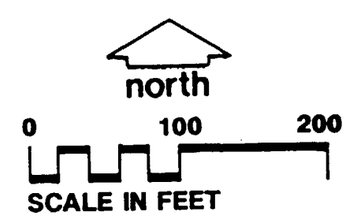
NOTES

1. REFER TO DRAWING 70084-B2 FOR ADDITIONAL NOTES.
2. THE CARCINOGENIC PAH CONCENTRATION IS THE SUM OF BENZO(a)ANTHRACENE, CHRYSENE, BENZO(b)FLUORANTHENE, BENZO(k)FLUORANTHENE, BENZO(a)PYRENE AND, INDENO(1,2,3-cd) PYRENES.
3. MDNR PAH CLEAN-UP CRITERIA ARE SHOWN IN THE TABLE. MDNR PCB CLEAN-UP CRITERION IS 1000 ug/kg.

KIRSCH CO. PLANT NO. 1 SOIL BORING WITH QUANTIFIABLE PAH CONCENTRATION

	MDNR Act 307 Criteria		Soil Boring Concentations (ug/kg)													
	Type B	Type A	SB-18(2')	SB-19(4')	SB-20(2')	SB-21(2')	SB-21(4')	SB-22(0.5')	SB-23(0.5')	SB-24(0.5')	SB-25(0.5')	SB-26(0.5')	SB-29(0.5')	(SB-30(0.5')	SB-31(0.5')
Acenaphthene	8000	330									98	180	51	430	1500
Acenaphthylene	330	330				360					35			44	
Anthracene	40000	330	67	52		760	140			92	230	390	110	640	2800
Benzo(a)anthracene	330	330	190	110		5000	310	42	44	520	1400	1400	550	1400	4500
Benzo(b)fluoranthene	330	330	260	110		5100	300	76	87	780	1500	2100	830	1200	5900
Benzo(k)fluoranthene	330	330	190	73		3500	300	76	87	780	1500	2100	830	650	5900
Benzo(a)pyrene	330	330	290	98		5100	330	37	41	450	1000	1500	420	1100	3600
Benzo(g,h,i)perylene	330	330	240	84		1600	210			210	610	740	240	590	1200
Chrysene	330	330	210	120		4000	310	91	50	480	1400	1700	500	1300	4100
Dibenz(a,h)anthracene	330	330	150			1100	81				150	340	130	190	380
Fluoranthene	6000	330	270	230	68	5200	590	87	92	940	1800	2900	910	2800	9100
Fluorene	6000	320				220					67	160	49	380	1300
Indeno(1,2,3-cd)pyrene	330	330	220	73		3000	240			230	610	700	320	570	1300
Naphthalene	800	330				170					92	200	95	210	1400
Phenanthrene	330	330	220	160		3600	570			660	1100	1700	670	3500	8700
Pyrene	4000	330	310	240	78	8100	580	90	77	910	1800	2300	780	2800	8400
Soils with Concentrations						*	*			X	X	X	X	X	X





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Designed By
Approved By
Drawn By JC
Checked By
Date 3/6/91
Reference

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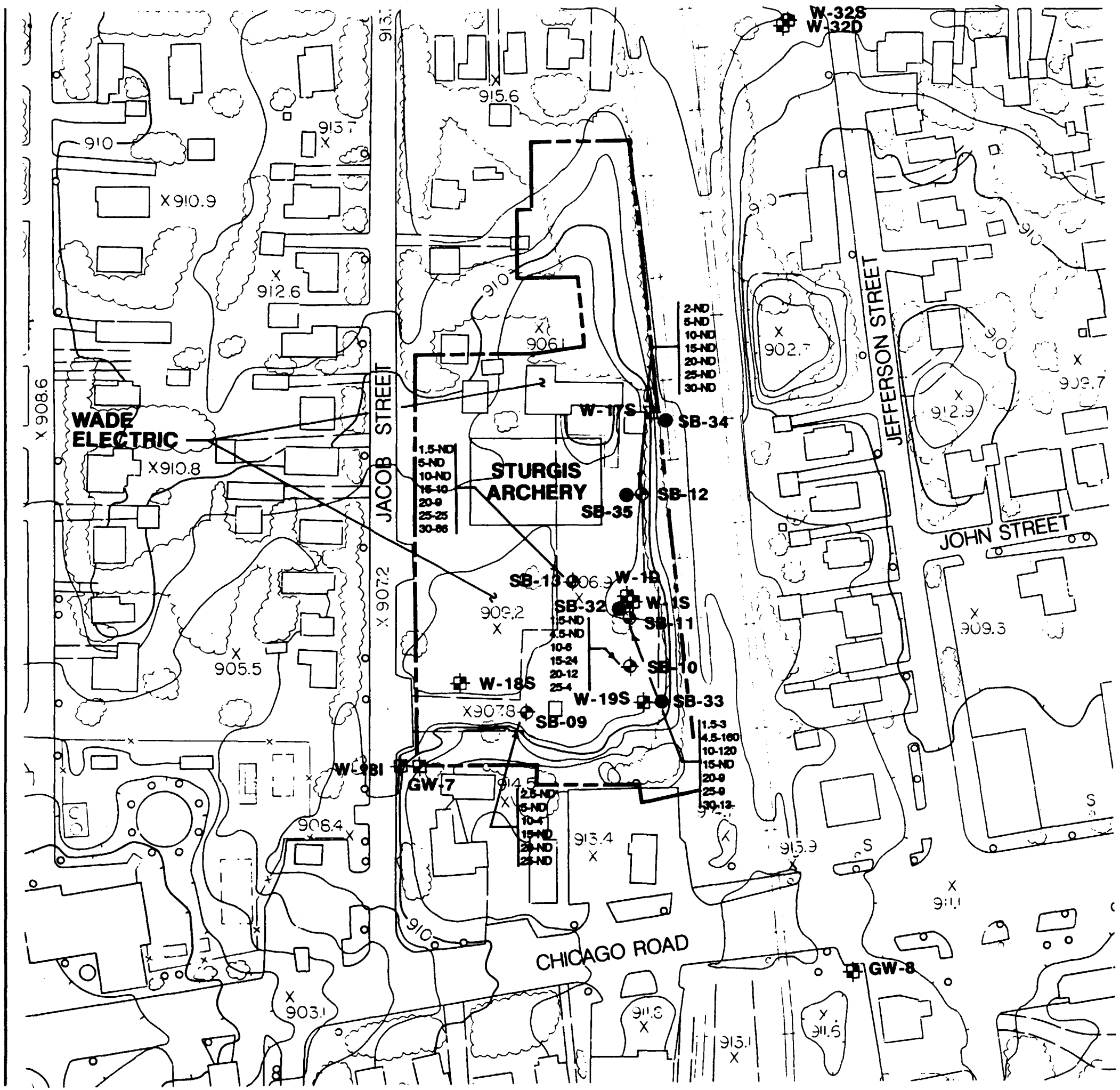
KIRSCH COMPANY PLANT NO. 1
PAH AND PCB CONCENTRATION IN SOIL (CLP ANALYSIS)

REMEDIAL INVESTIGATION/
FEASIBILITY STUDY
STURGIS WELL FIELD
STURGIS, MICHIGAN

Project Number
70084 B14
WARZYN



LEGEND

SB-09	APPROXIMATE SOIL BORING LOCATION AND NUMBER
SB-34	APPROXIMATE SURFACE SOIL SAMPLE LOCATION AND NUMBER
W-19S	MONITORING WELL LOCATION AND NUMBER
930	CONTOUR
x923.9	SPOT ELEVATION
	POWER POLE
	BUILDINGS
	BRUSH OR TREES
	RAILROAD TRACKS
	FENCE LINE
	PAVED ROAD
	PROPERTY BOUNDARY
ND	NO CONCENTRATIONS DETECTED
1.5-3	DEPTH OF SAMPLING IN FEET
	SOIL TCE CONCENTRATION (ug/kg) (CLP ANALYSIS)

NOTES

1. REFER TO DRAWING 70084-B4 FOR ADDITIONAL NOTES.

north

0 100 200

SCALE IN FEET

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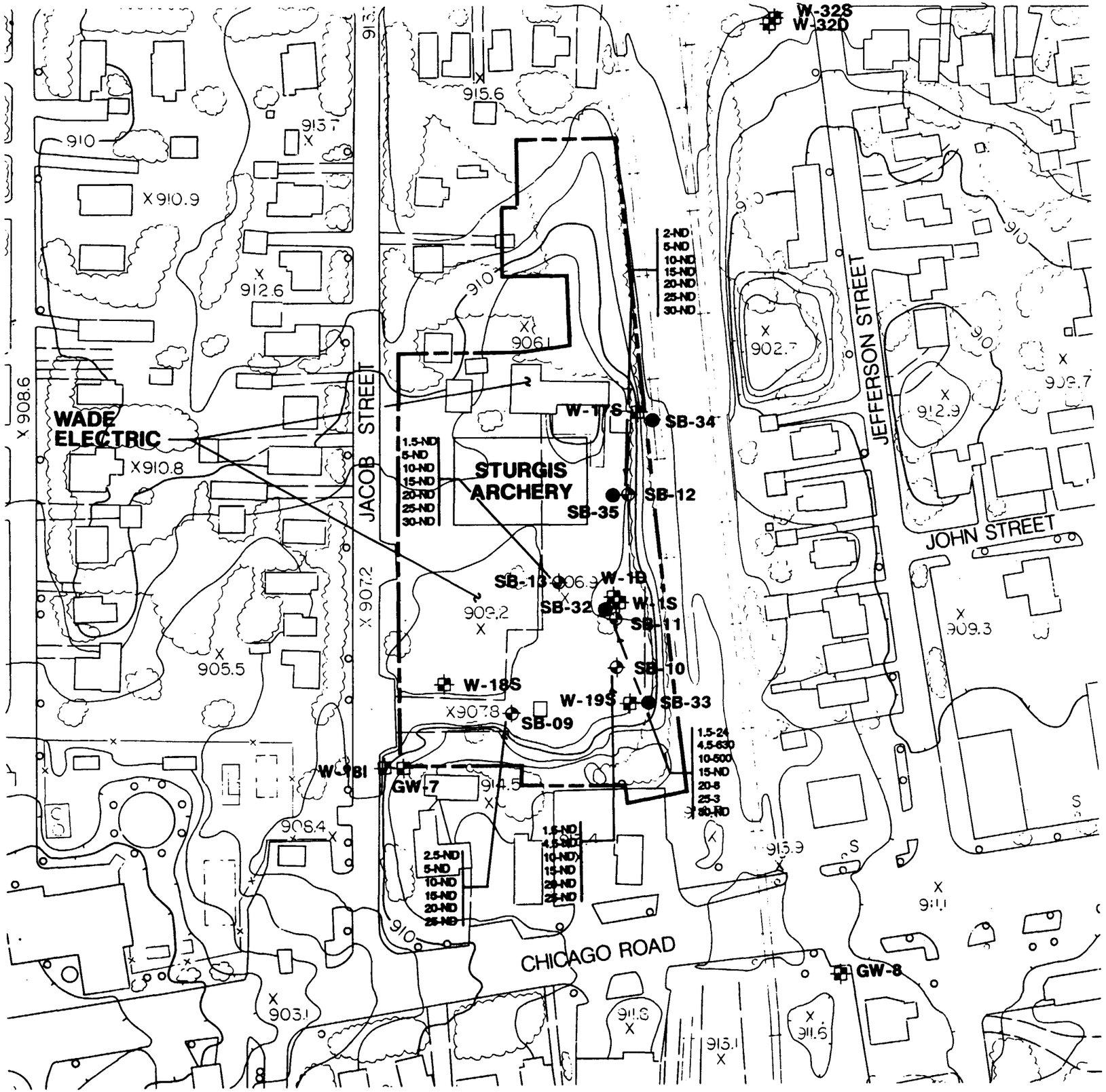
FORMER WADE ELECTRIC PROPERTY
TCE CONCENTRATION IN SOIL (CLP ANALYSIS)

REMEDIAL INVESTIGATION/
FEASIBILITY STUDY
STURGIS WELL FIELD
STURGIS, MICHIGAN

Project Number
70084 B15

WARZYN



LEGEND

SB-09	APPROXIMATE SOIL BORING LOCATION AND NUMBER
SB-34	APPROXIMATE SURFACE SOIL SAMPLE LOCATION AND NUMBER
W-19S	MONITORING WELL LOCATION AND NUMBER
930	CONTOUR
x923.9	SPOT ELEVATION
	POWER POLE
	BUILDINGS
	BRUSH OR TREES
	RAILROAD TRACKS
	FENCE LINE
	PAVED ROAD
	PROPERTY BOUNDARY
ND	NO CONCENTRATIONS DETECTED
1.5-24	DEPTH OF SAMPLING IN FEET
	SOIL PCE CONCENTRATION (ug/kg) (CLP ANALYSIS)

NOTES

1. REFER TO DRAWING 70084-84 FOR ADDITIONAL NOTES.

north

0 100 200

SCALE IN FEET

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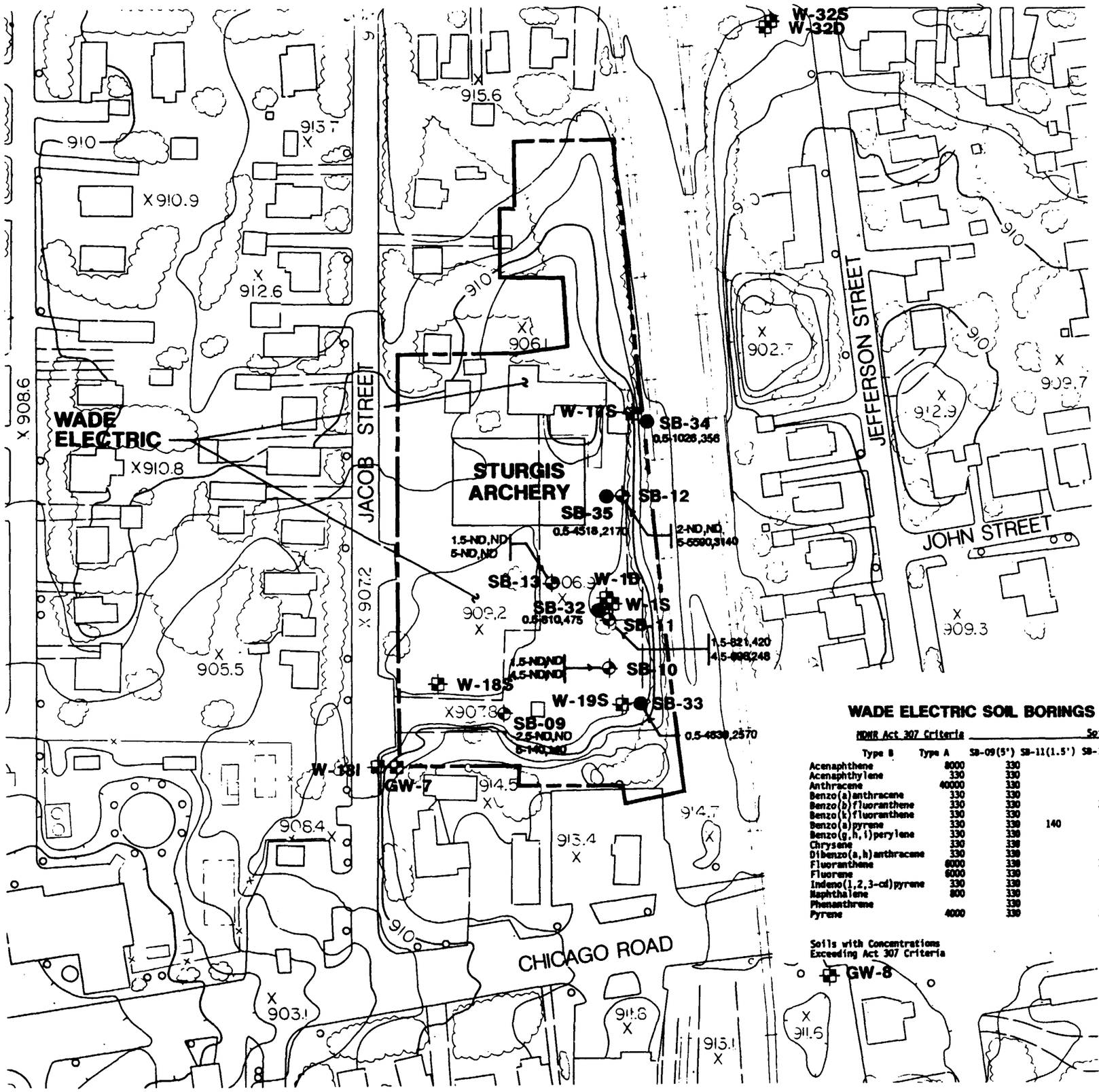
FORMER WADE ELECTRIC PROPERTY
PCE CONCENTRATION IN SOIL (CLP ANALYSIS)

REMEDIAL INVESTIGATION/
FEASIBILITY STUDY
STURGIS WELL FIELD
STURGIS, MICHIGAN

Project Number
70084 B16

WARZYN

MARTIN BLUE PRINT INC. 614-885



LEGEND

SB-09	APPROXIMATE SOIL BORING LOCATION AND NUMBER
SB-34	APPROXIMATE SURFACE SOIL SAMPLE LOCATION AND NUMBER
W-19S	MONITORING WELL LOCATION AND NUMBER
930	CONTOUR
x923.9	SPOT ELEVATION
	POWER POLE
	BUILDINGS
	BRUSH OR TREES
	RAILROAD TRACKS
	FENCE LINE
	PAVED ROAD
	PROPERTY BOUNDARY
ND	COMPOUNDS NOT DETECTED
1.5-821,420	DEPTH OF SAMPLING IN FEET; CARCINOGENIC PAH CONCENTRATION (ug/kg); SOIL PAH CONCENTRATION (ug/kg) (CLP ANALYSIS)

NOTES

1. REFER TO DRAWING 70084-B4 FOR ADDITIONAL NOTES AND LEGEND.
2. THE CARCINOGENIC PAH CONCENTRATION IS THE SUM OF BENZO(a)ANTHRACENE, CHRYSENE, BENZO(b)FLUORANTHENE, BENZO(k)FLUORANTHENE, BENZO(a)PYRENE AND, INDENO(1,2,3-cd) PYRENES.
3. PCB CONCENTRATIONS FOR ALL SOIL SAMPLES WERE ND.

WADE ELECTRIC SOIL BORINGS WITH QUANTIFIABLE PAH CONCENTRATIONS

	MDNR Act 307 Criteria		Soil Boring Concentrations (ug/kg)										
	Type B	Type A	SB-09(5')	SB-11(1.5')	SB-11(4.5')	SB-12(5')	SB-32 (0.5')	SB-33(0.5')	SB-34(0.5')	SB-35(0.5')			
Acenaphthene		8000	330								44		
Acenaphthylene		330	330								42		
Anthracene		40000	330						70	44	310		
Benzo(a)anthracene		330	330		50		650	58	380	73	540		
Benzo(b)fluoranthene		330	330		140	89	1000	120	630	89	540		
Benzo(k)fluoranthene		330	330					120	630	48	250		
Benzo(a)pyrene		330	330	140	78	61	620	63	360	74	130		
Benzo(g,h,i)perylene		330	330		89	56			300		410		
Chrysene		330	330		77	49	870	69	410	72			
Dibenzo(a,h)anthracene		330	330										
Fluoranthene		6000	330		110	88	850	95	570	89	370		
Fluorene		6000	330										
Indeno(1,2,3-cd)pyrene		330	330		75	49		45	160		120		
Naphthalene		800	330			63					260		
Phenanthrene			330		52	94	620	63	410	44	340		
Pyrene		4000	330		150	81	980	83	660	100	390		
Soils with Concentrations Exceeding Act 307 Criteria							X		X		X		

north

0 100 200

SCALE IN FEET

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Approved
Date
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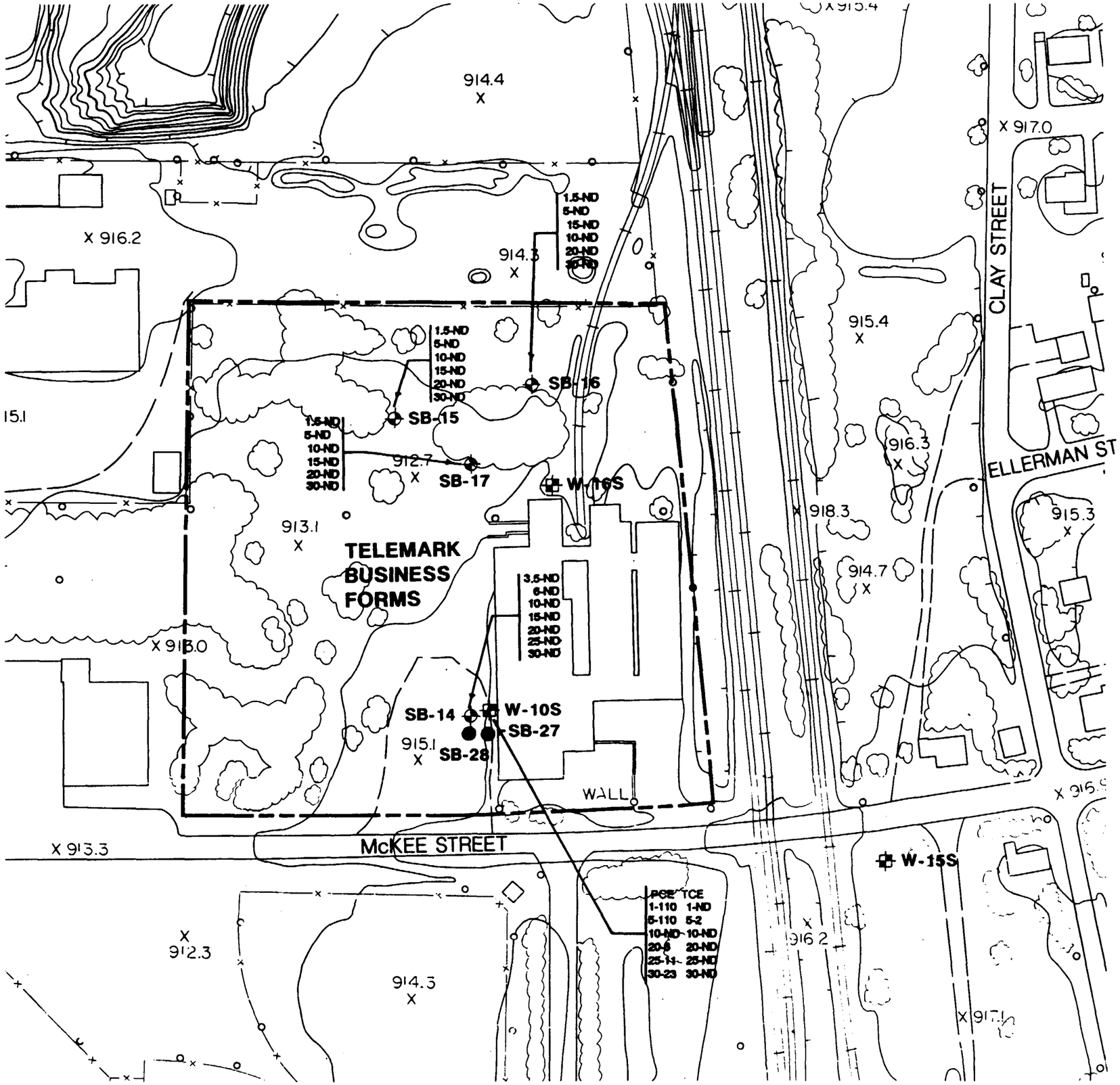
FORMER WADE ELECTRIC PROPERTY
PAH CONCENTRATION IN SOIL (CLP ANALYSIS)
REMEDIAL INVESTIGATION/
FEASIBILITY STUDY
STURGIS WELL FIELD
STURGIS, MICHIGAN

Project Number 70084 B17

WARZYN

MASTER BLUE PRINT INC. 814488



LEGEND

SB-15	APPROXIMATE SOIL BORING LOCATION AND NUMBER
SB-28	APPROXIMATE SURFACE SOIL SAMPLE LOCATION AND NUMBER
W-10S	MONITORING WELL LOCATION AND NUMBER
930	CONTOUR
x923.9	SPOT ELEVATION
	POWER POLE
	BUILDINGS
	BRUSH OR TREES
	RAILROAD TRACKS
	FENCE LINE
	PAVED ROAD
	PROPERTY BOUNDARY
ND	COMPOUND NOT DETECTED
1-110	DEPTH OF SAMPLING IN FEET
	SOIL CONCENTRATION OF PCE OR TCE (ug/kg) (CLP ANALYSIS)

NOTES

1. REFER TO DRAWING 70084-86 FOR ADDITIONAL NOTES.
2. ALL SOIL BORING SAMPLES DID NOT HAVE DETECTABLE LEVELS OF PCE OR TCE EXCEPT FOR SAMPLES FROM W-10S.

north

0 100 200

SCALE IN FEET

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Drawn By
Checked By MWT
Date 8/6/91
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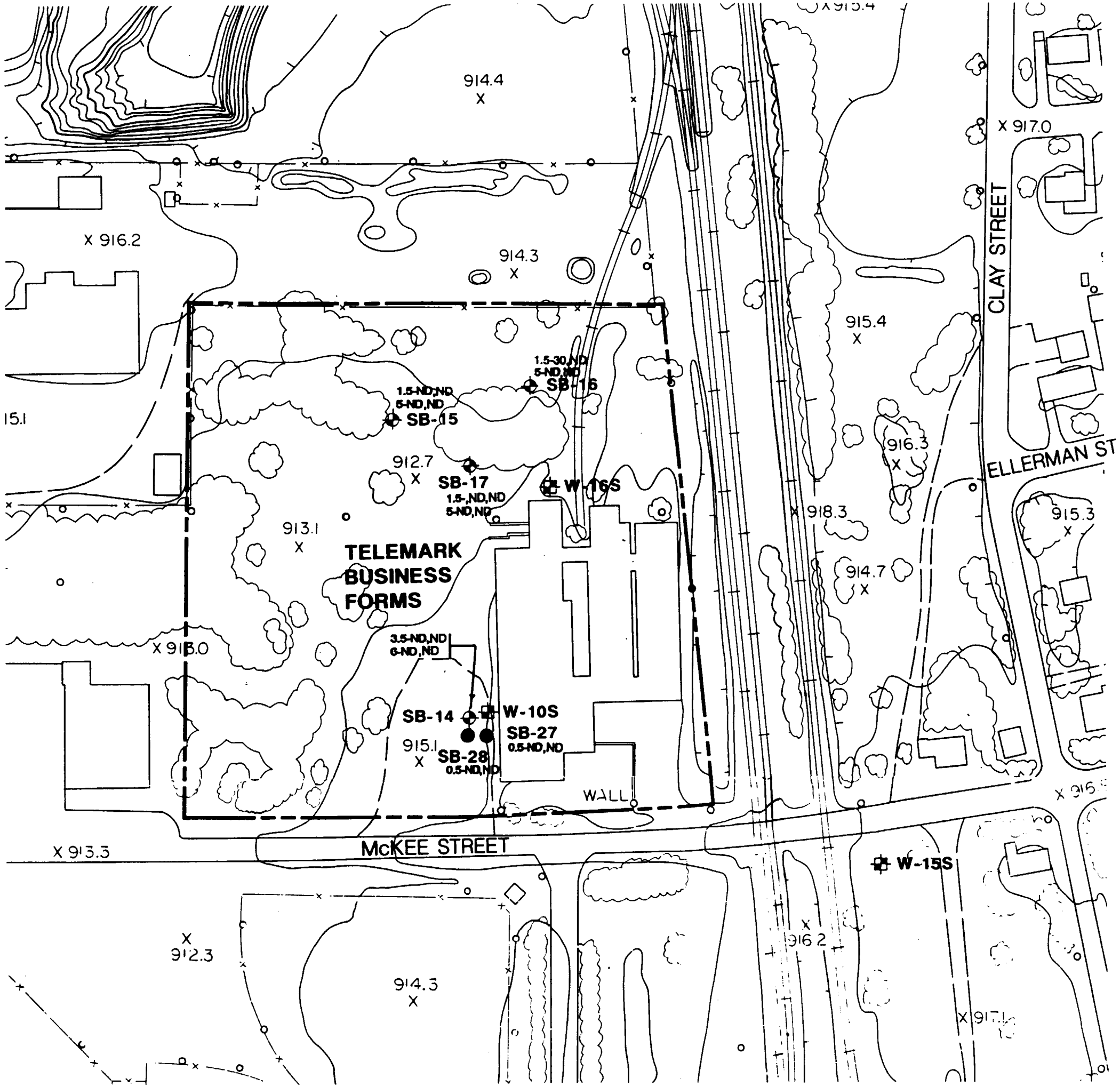
TELEMARK BUSINESS FORMS
PCE AND TCE CONCENTRATION IN SOIL (CLP ANALYSIS)

REMEDIAL INVESTIGATION/
FEASIBILITY STUDY
STURGIS WELL FIELD
STURGIS, MICHIGAN

Project Number
70084 B18



LEGEND

SB-09	APPROXIMATE SOIL BORING LOCATION AND NUMBER
SB-34	APPROXIMATE SURFACE SOIL SAMPLE LOCATION AND NUMBER
W-19S	MONITORING WELL LOCATION AND NUMBER
930	CONTOUR
x923.9	SPOT ELEVATION
	POWER POLE
	BUILDINGS
	BRUSH OR TREES
	RAILROAD TRACKS
	FENCE LINE
	PAVED ROAD
	PROPERTY BOUNDARY
ND	COMPOUNDS NOT DETECTED

1-5-30,ND,ND

- DEPTH OF SAMPLING IN FEET
- PCB CONCENTRATION (ug/kg)
- CARCINOGENIC PAH CONCENTRATION (ug/kg)
- SOIL PAH CONCENTRATION (ug/kg) (CLP ANALYSIS)

NOTES

1. REFER TO DRAWING 70084-B6 FOR ADDITIONAL NOTES.
2. THE CARCINOGENIC PAH CONCENTRATION IS THE SUM OF BENZO(a)ANTHRACENE, CHRYSENE, BENZO(b)FLUORANTHENE, BENZO(k)FLUORANTHENE, BENZO(a) PYRENE AND, INDENO(1,2,3-cd) PYRENES.

north

0 100 200

SCALE IN FEET

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TELEMARK BUSINESS FORMS
PAH CONCENTRATION IN SOIL (CLP ANALYSIS)

REMEDIAL INVESTIGATION/
FEASIBILITY STUDY
STURGIS WELL FIELD
STURGIS, MICHIGAN

Project Number
70084 B19

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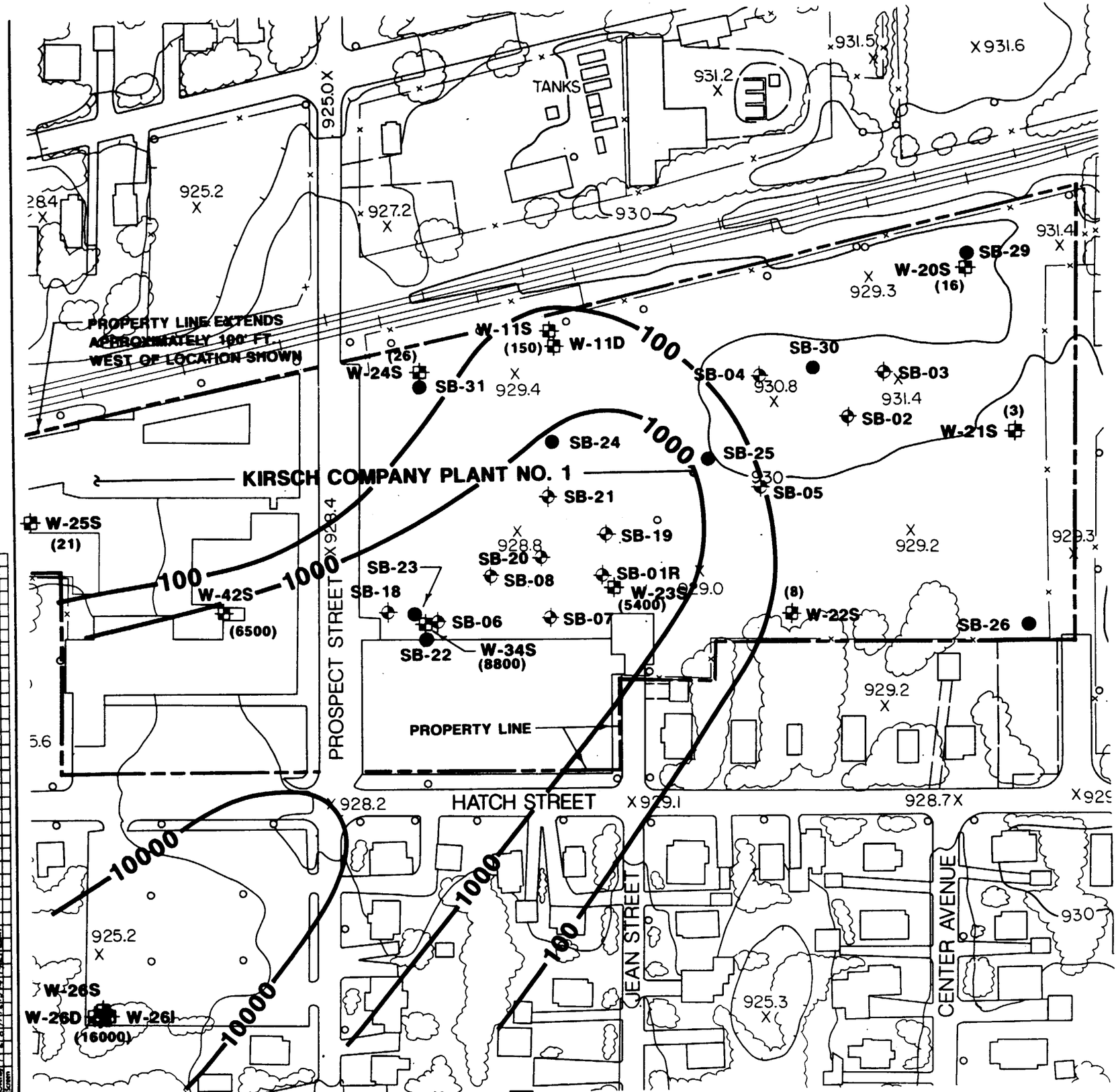

LEGEND

SB-04	APPROXIMATE SOIL BORING LOCATION AND NUMBER
SB-25	APPROXIMATE SURFACE SOIL SAMPLE LOCATION AND NUMBER
W-20S	MONITORING WELL LOCATION AND NUMBER
930	CONTOUR
x923.9	SPOT ELEVATION
	POWER POLE
	BUILDINGS
	BRUSH OR TREES
	RAILROAD TRACKS
	FENCE LINE
	PAVED ROAD
	PROPERTY BOUNDARY
(8)	SHALLOW GROUNDWATER CONCENTRATION OF TOTAL ETHENES (ug/l)
100	ISOCONCENTRATION CONTOUR

NOTES

1. REFER TO DRAWING 70084-B2 FOR ADDITIONAL NOTES.
2. CONCENTRATION BASED ON THE GROUNDWATER SAMPLE WITH THE HIGHEST TOTAL ETHENE CONCENTRATION (CLP ANALYSIS).

north

0 100 200

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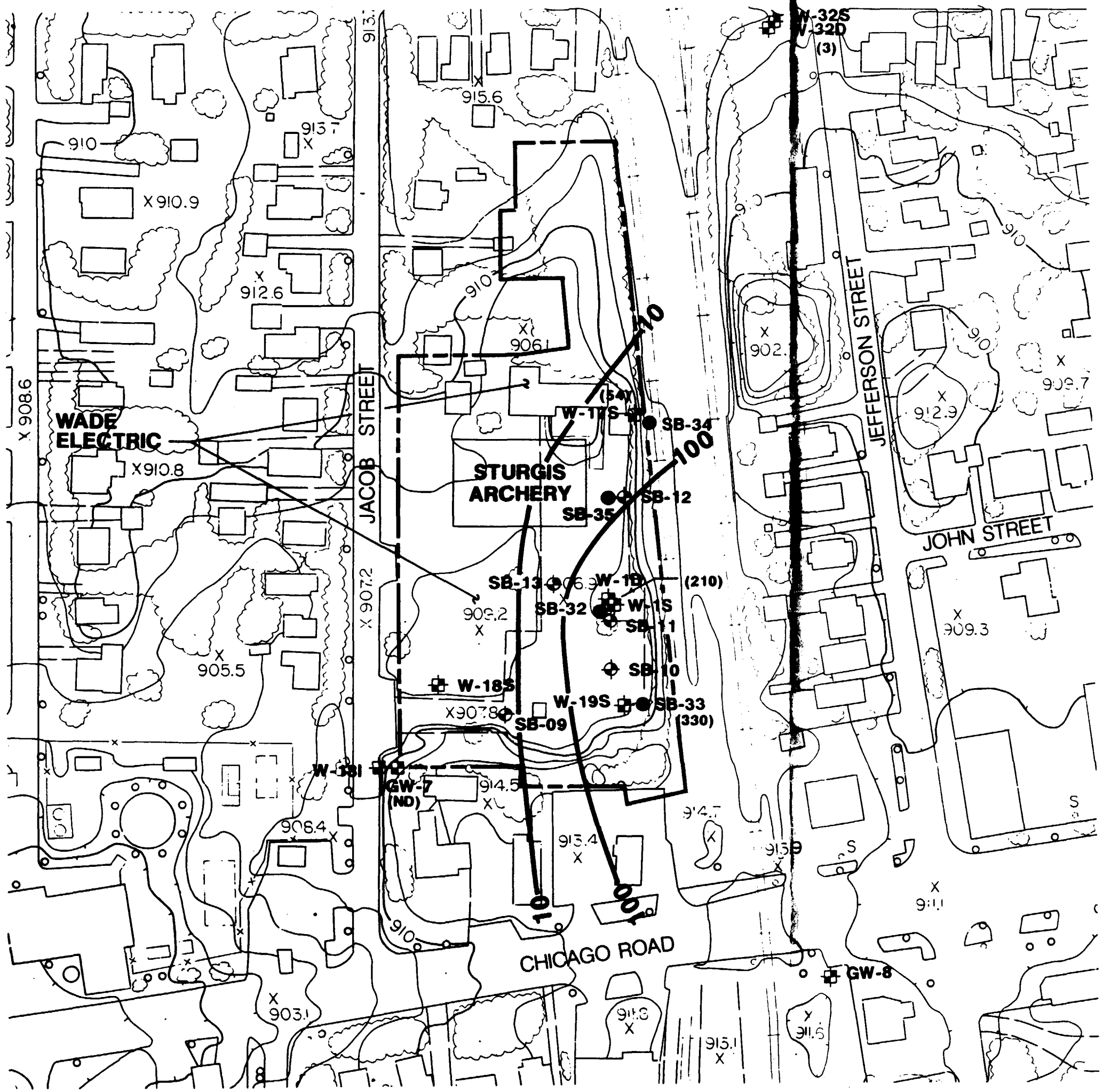
KIRSCH COMPANY PLANT NO. 1
GROUNDWATER ETHENE CONCENTRATIONS

REMEDIAL INVESTIGATION/
FEASIBILITY STUDY
STURGIS WELL FIELD
STURGIS, MICHIGAN

Project Number
70084 B26
WARZYN

MASTER BLUE PRINT INC. 614828



LEGEND

SB-09	APPROXIMATE SOIL BORING LOCATION AND NUMBER
SB-34	APPROXIMATE SURFACE SOIL SAMPLE LOCATION AND NUMBER
W-19S	MONITORING WELL LOCATION AND NUMBER
930	CONTOUR
x923.9	SPOT ELEVATION
	POWER POLE
	BUILDINGS
	BRUSH OR TREES
	RAILROAD TRACKS
	NEW FENCE
	PAVED ROAD
	PROPERTY BOUNDARY
(ND)	ETHENES NOT DETECTED
(54)	SHALLOW GROUNDWATER CONCENTRATION OF TOTAL ETHENES (ug/l)
—100—	ISOCONCENTRATION CONTOUR

NOTES

1. REFER TO DRAWING 70084-84 FOR ADDITIONAL NOTES.
2. CONCENTRATION BASED ON THE GROUNDWATER SAMPLE WITH THE HIGHEST TOTAL ETHENE CONCENTRATION (CLP ANALYSIS).

north

0 100 200

SCALE IN FEET

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Date 3/16/91
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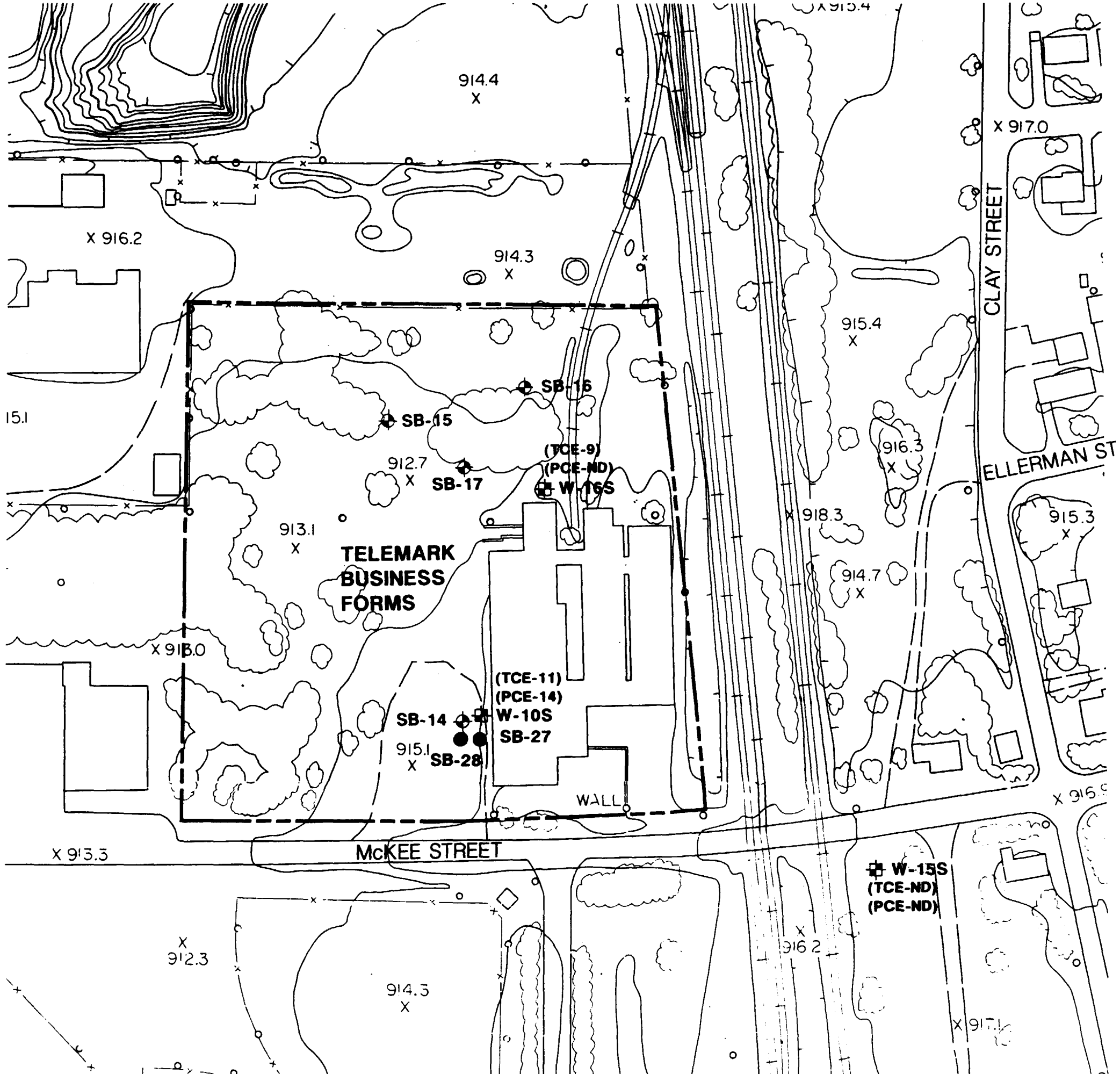
FORMER WADE ELECTRIC PROPERTY
GROUNDWATER ETHENE CONCENTRATIONS

REMEDIAL INVESTIGATION/
FEASIBILITY STUDY
STURGIS WELL FIELD
STURGIS, MICHIGAN

Project Number
70084 B27



LEGEND

SB-15	APPROXIMATE SOIL BORING LOCATION AND NUMBER
SB-28	APPROXIMATE SURFACE SOIL SAMPLE LOCATION AND NUMBER
W-10S	MONITORING WELL LOCATION AND NUMBER
930	CONTOUR
x923.9	SPOT ELEVATION
	POWER POLE
	BUILDINGS
	BRUSH OR TREES
	RAILROAD TRACKS
	FENCE LINE
	PAVED ROAD
	PROPERTY BOUNDARY
(ND)	ETHENES NOT DETECTED
(TCE-9) (PCE-ND)	TRICHLOROETHYLENE (TCE) AND TETRACHLOROETHENE (PCE) (ug/l)

NOTES

1. REFER TO DRAWING 70084-86 FOR ADDITIONAL NOTES.
2. CONCENTRATION BASED ON THE GROUNDWATER SAMPLE WITH HIGHEST TOTAL ETHENE CONCENTRATION (CLP ANALYSIS).

north

0 100 200

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TELEMARK BUSINESS FORMS GROUNDWATER CONCENTRATION OF TRICHLOROETHYLENE AND TETRACHLOROETHENE

REMEDIAL INVESTIGATION/
FEASIBILITY STUDY
STURGIS WELL FIELD
STURGIS, MICHIGAN

Project Number
70084B28

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