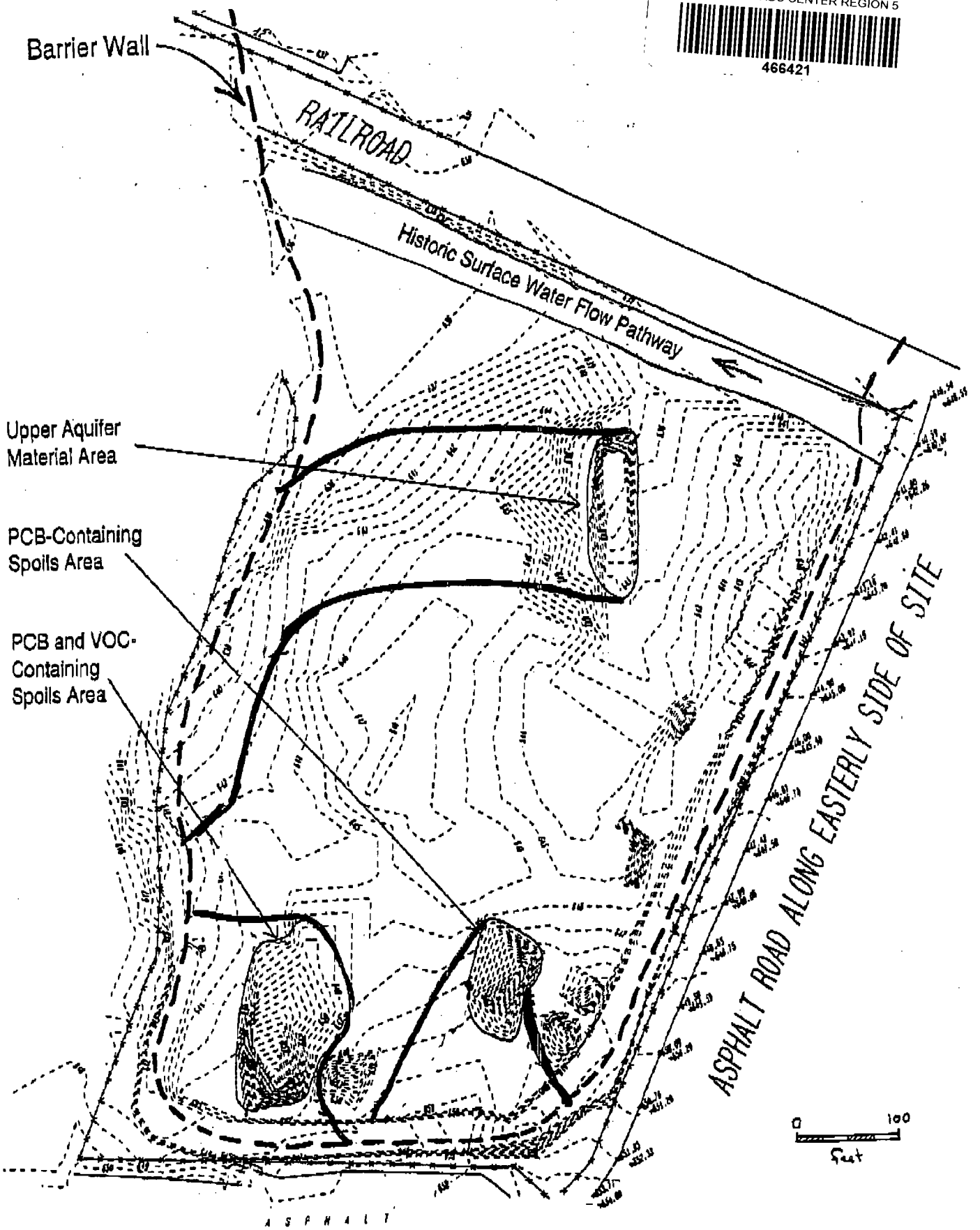
W. 3

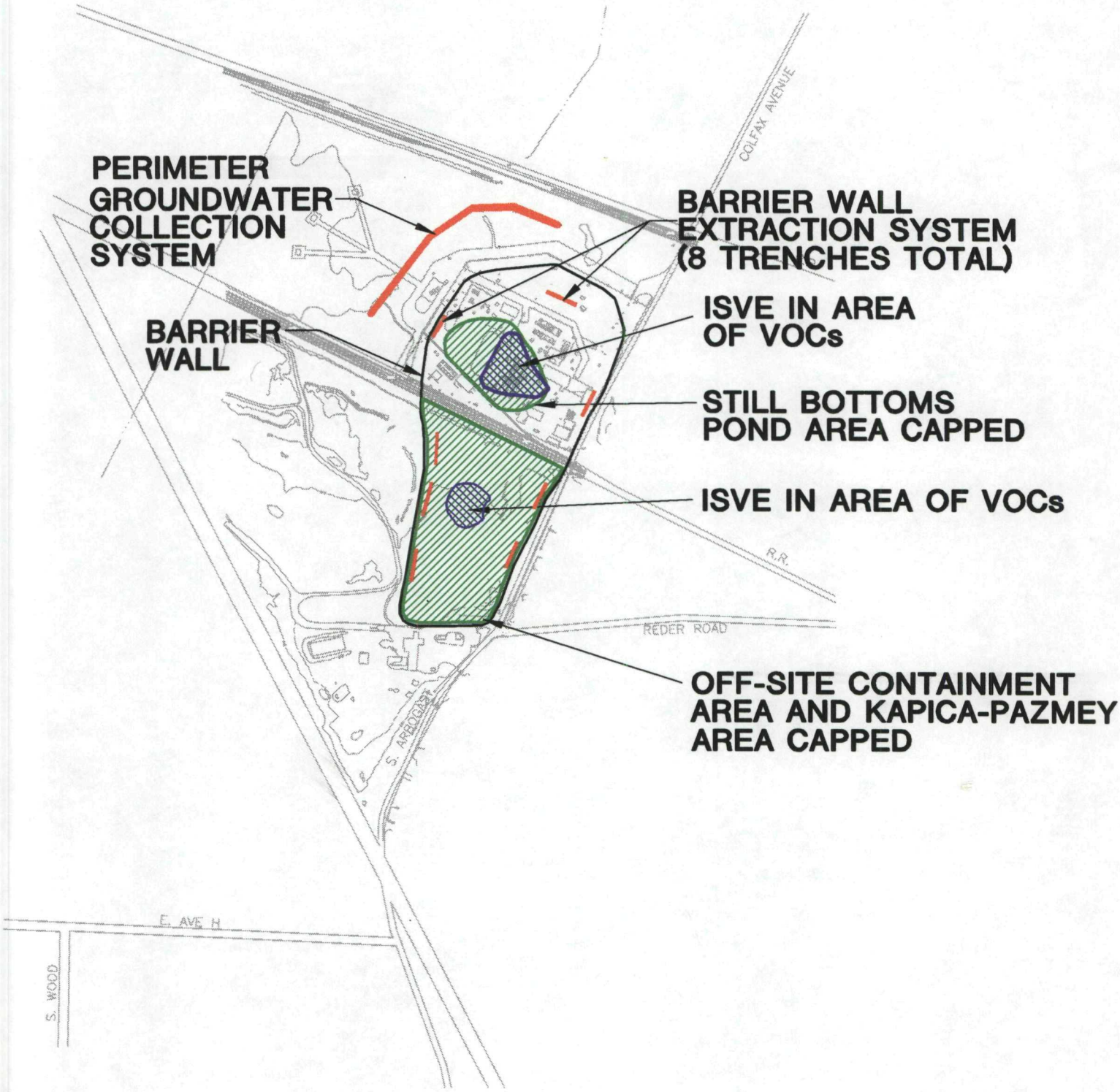
FIGURE 1. SURFACE ELEVATION CONTOUR MAP OF THE ACS OFF-SITE AREA

(Elevation Survey, June 26, 1997)

US EPA RECORDS CENTER REGION 5
466421



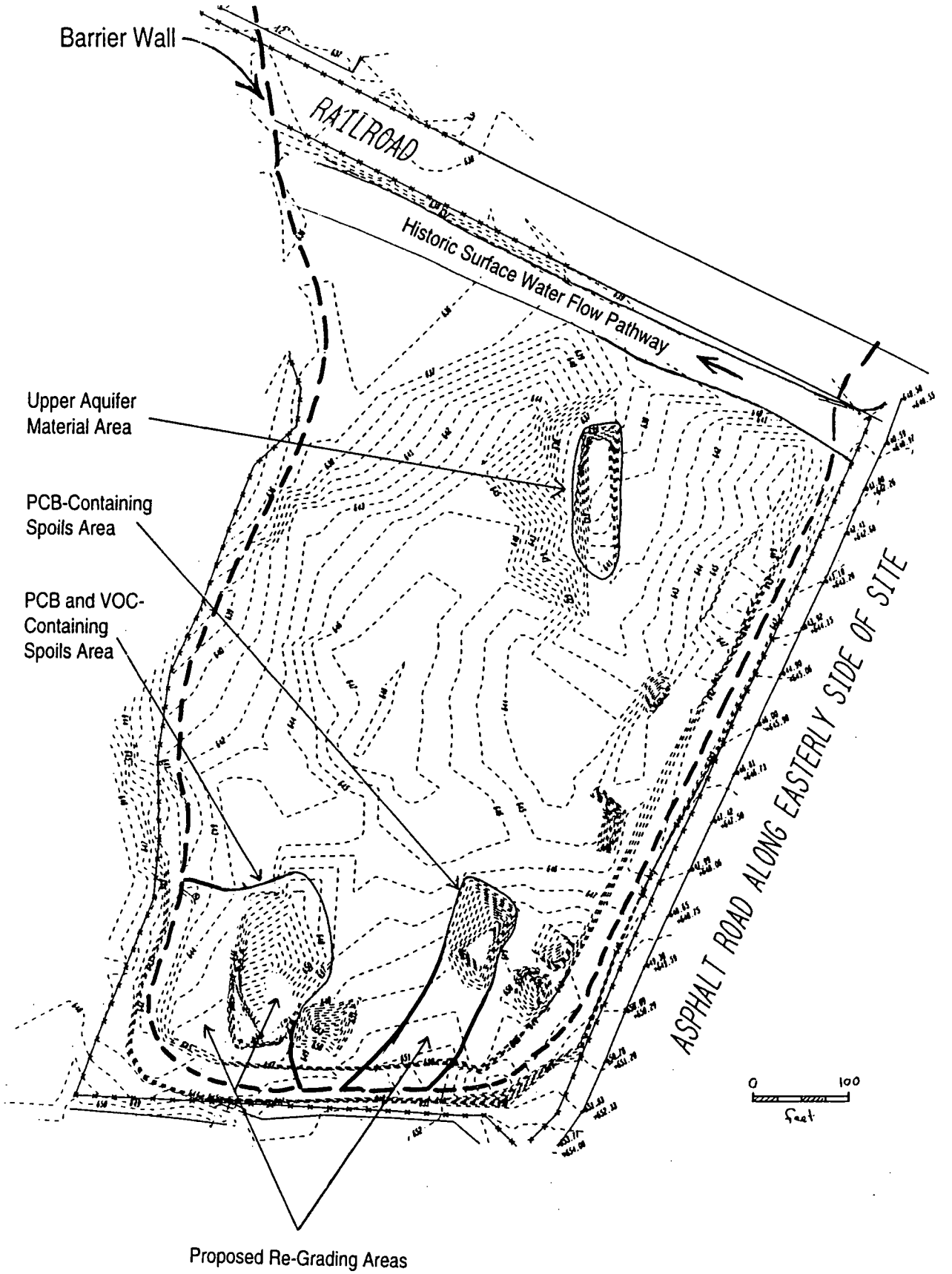
W 3
N6

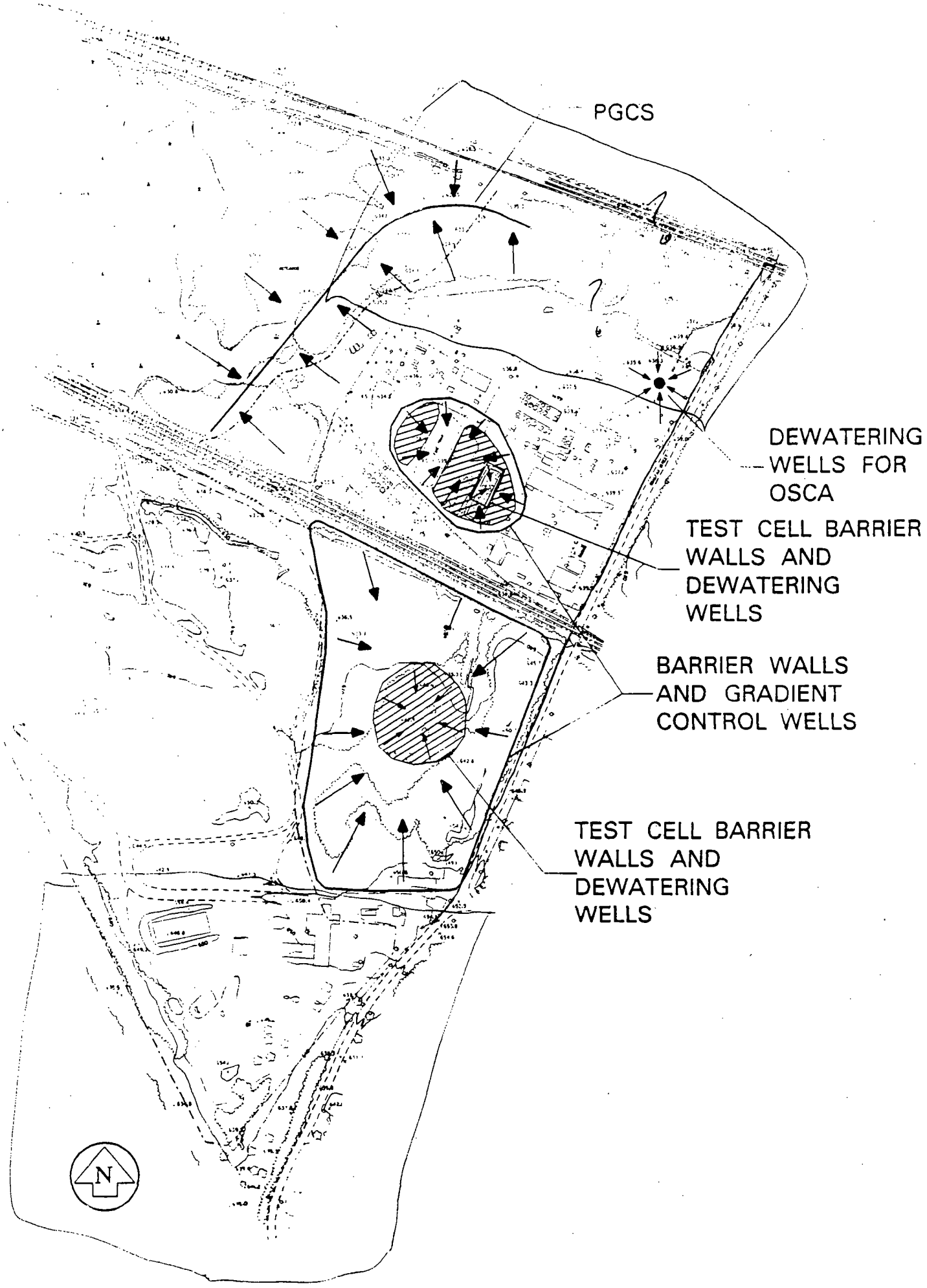

PERIMETER GROUNDWATER COLLECTION SYSTEM
BARRIER WALL
BARRIER WALL EXTRACTION SYSTEM (8 TRENCHES TOTAL)
ISVE IN AREA OF VOCs
STILL BOTTOMS POND AREA CAPPED
ISVE IN AREA OF VOCs
OFF-SITE CONTAINMENT AREA AND KAPICA-PAZMEY AREA CAPPED
COLFAX AVENUE
R.R.
REDER ROAD
S. ARBOGAST
E. AVE H
S. WOOD

W.3

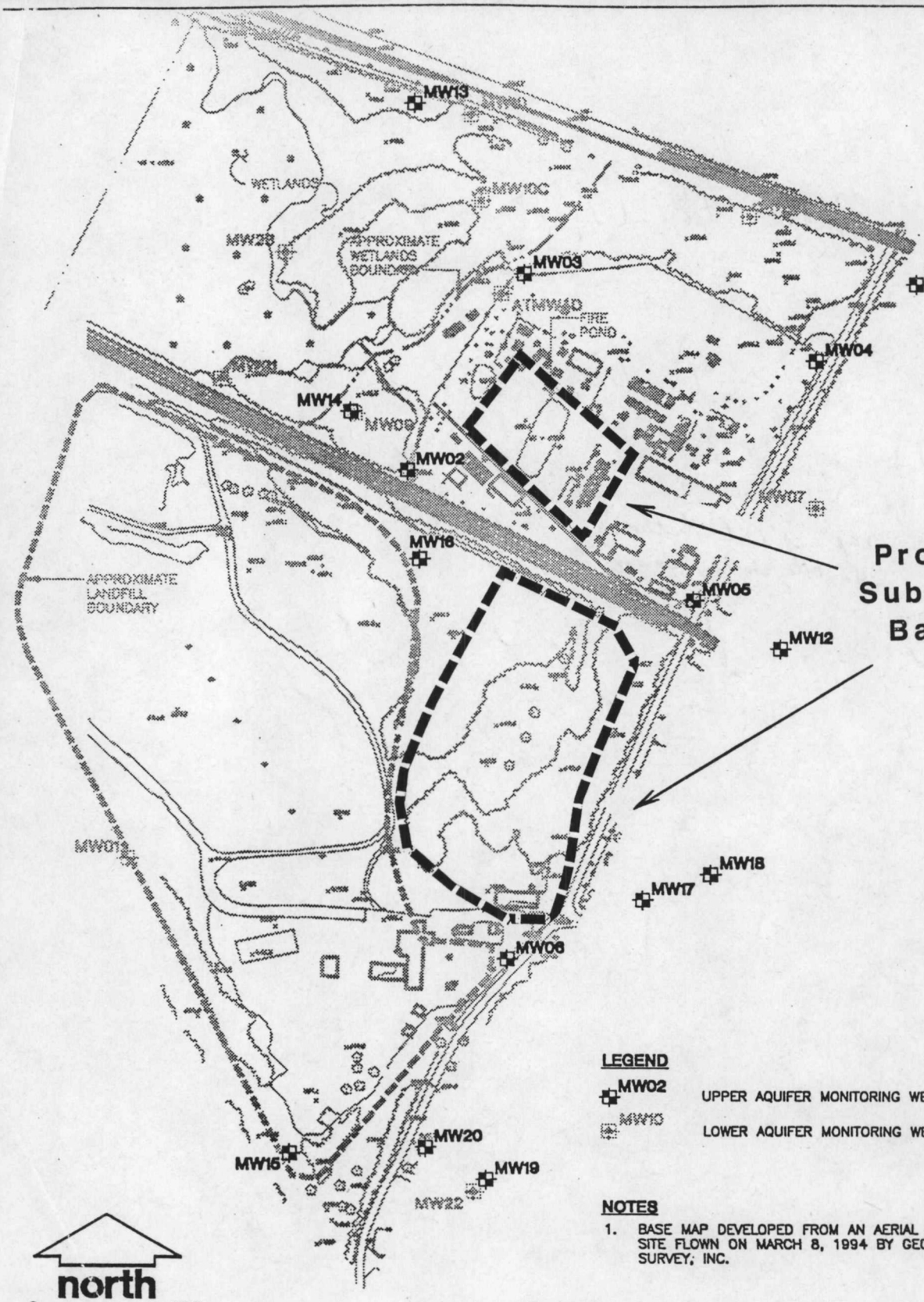
FIGURE 4. PROPOSED RE-GRADING TO MANAGE EROSION AND SURFACE WATER.

(Elevation Survey data derived June 26, 1997)




PGCS
DEWATERING WELLS FOR OSCA
TEST CELL BARRIER WALLS AND DEWATERING WELLS
BARRIER WALLS AND GRADIENT CONTROL WELLS
TEST CELL BARRIER WALLS AND DEWATERING WELLS
N

W3



LEGEND

MW02 — UPPER AQUIFER MONITORING WELL LOCATION AND NUMBER

MW10 — LOWER AQUIFER MONITORING WELL LOCATION AND NUMBER

NOTES

1. BASE MAP DEVELOPED FROM AN AERIAL SURVEY MAP OF THE SITE FLOWN ON MARCH 8, 1994 BY GEONEX CHICAGO AERIAL SURVEY, INC.

north

0 400

SCALE IN FEET

FIGURE 3

Developed By ACC	Drawn By JSL	Drawing Number 4077.0030 A31
Approved By	Date	
Reference		
Revisions		

AMERICAN CHEMICAL SERVICE, INC.
NPL SITE
GRIFFITH, INDIANA

MONTGOMERY WATSON

QUALITY CONTROL | Graphic Standards Lead Professional | Technical Review Project Manager | Management Review Other

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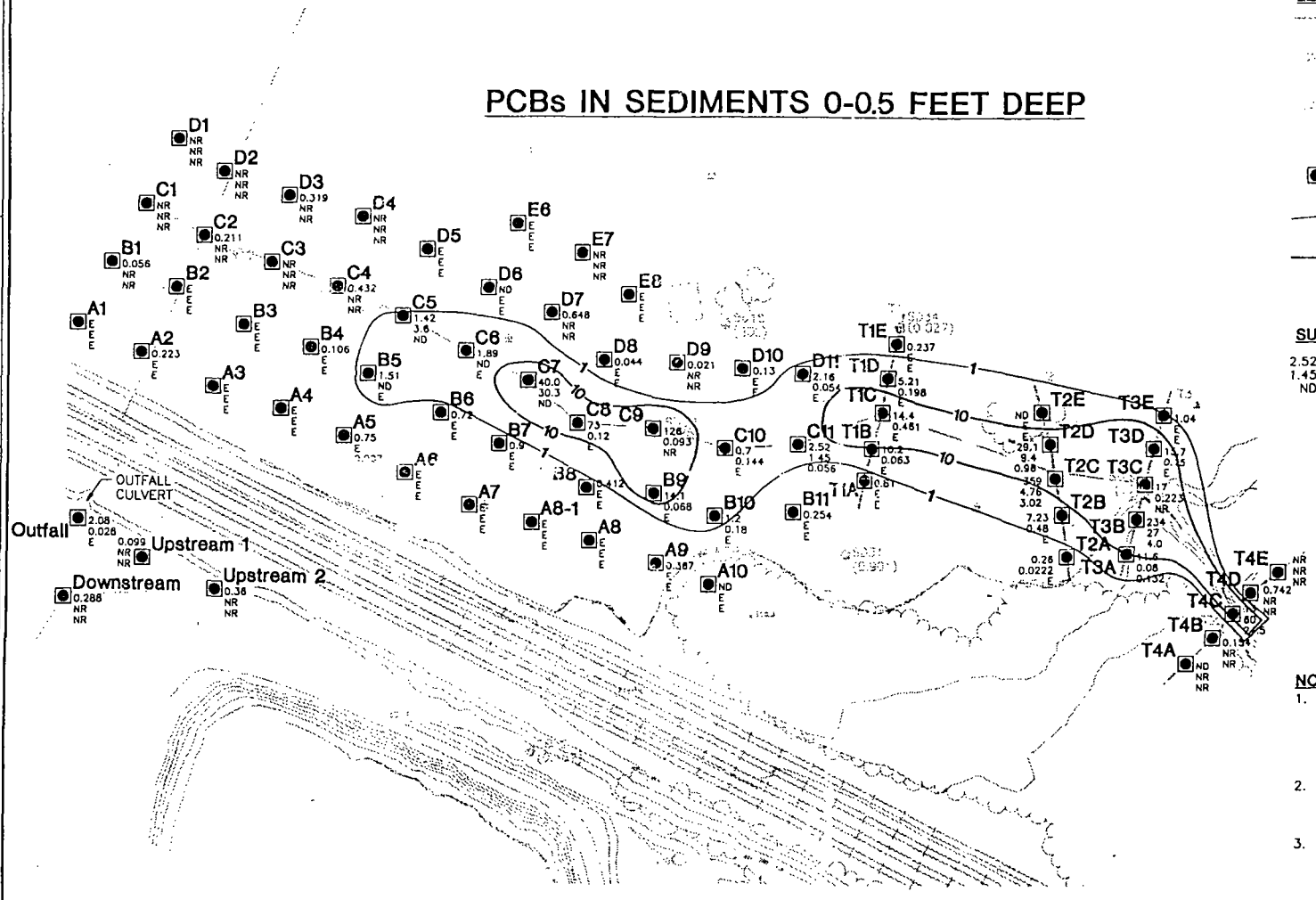
top clay flat
bottom clay flat >

H_2O treatment

(3) — Sampling in march

map of utilities
sanitary, storm, power

PCBs IN SEDIMENTS 0-0.5 FEET DEEP



LEGEND

- CHANNEL COURSE
- SEDIMENT/SOIL SAMPLE LOCATION AND NUMBER, FROM PHASE I WETLAND INVESTIGATION
- TOTAL PCB CONCENTRATION, in mg/kg FROM PHASE I WETLAND INVESTIGATION
- A1 — WETLAND SAMPLE LOCATION AND NUMBER
- —1— APPROXIMATE 1 mg/kg PCB ISOCONCENTRATION CONTOUR
- —10— APPROXIMATE 10 mg/kg PCB ISOCONCENTRATION CONTOUR

SUMMARY OF TOTAL PCB RESULTS

2.52 – 0.5 ft.
1.45 – 1.0 ft.
ND – 1.5 ft.
— ALL RESULTS IN mg/kg (ppm)

ND NOT DETECTED (DETECTION LIMIT APPROXIMATELY 0.05 mg/kg)
E EXTRACTED, NOT ANALYZED
NR ANALYSIS NOT REQUESTED

NOTES

1. BASE MAP DEVELOPED FROM AN AERIAL SURVEY MAP OF THE SITE FLOWN ON MARCH 8, 1994 BY GEONEX CHICAGO AERIAL SURVEY, INC. CONTOUR INTERVAL IS TWO FEET.
2. SEDIMENT SAMPLES COLLECTED BY MONTGOMERY WATSON FROM NOVEMBER 18 TO NOVEMBER 21, 1996.
3. THE ISOCONCENTRATION CONTOURS WERE ESTIMATED MANUALLY USING THE ANALYTICAL DATA.

north

0 80 160
SCALE IN FEET

FIGURE 2

WETLAND SEDIMENT PCB ISOCONCENTRATION MAP (0-0.5 FT INTERVAL)
AMERICAN CHEMICAL SERVICE, INC.
NPL SITE
GRIFFITH, INDIANA

Developed By MWK
Drawn By LCL
Approved By
Date
Reference 4077.0090-B01
Revisions

Drawing Number
1252042
0809.0076 B2

MONTGOMERY WATSON

QUALITY CONTROL
Graphic Standards
Lead Professional
Technical Review
Project Manager
Management Review
Other

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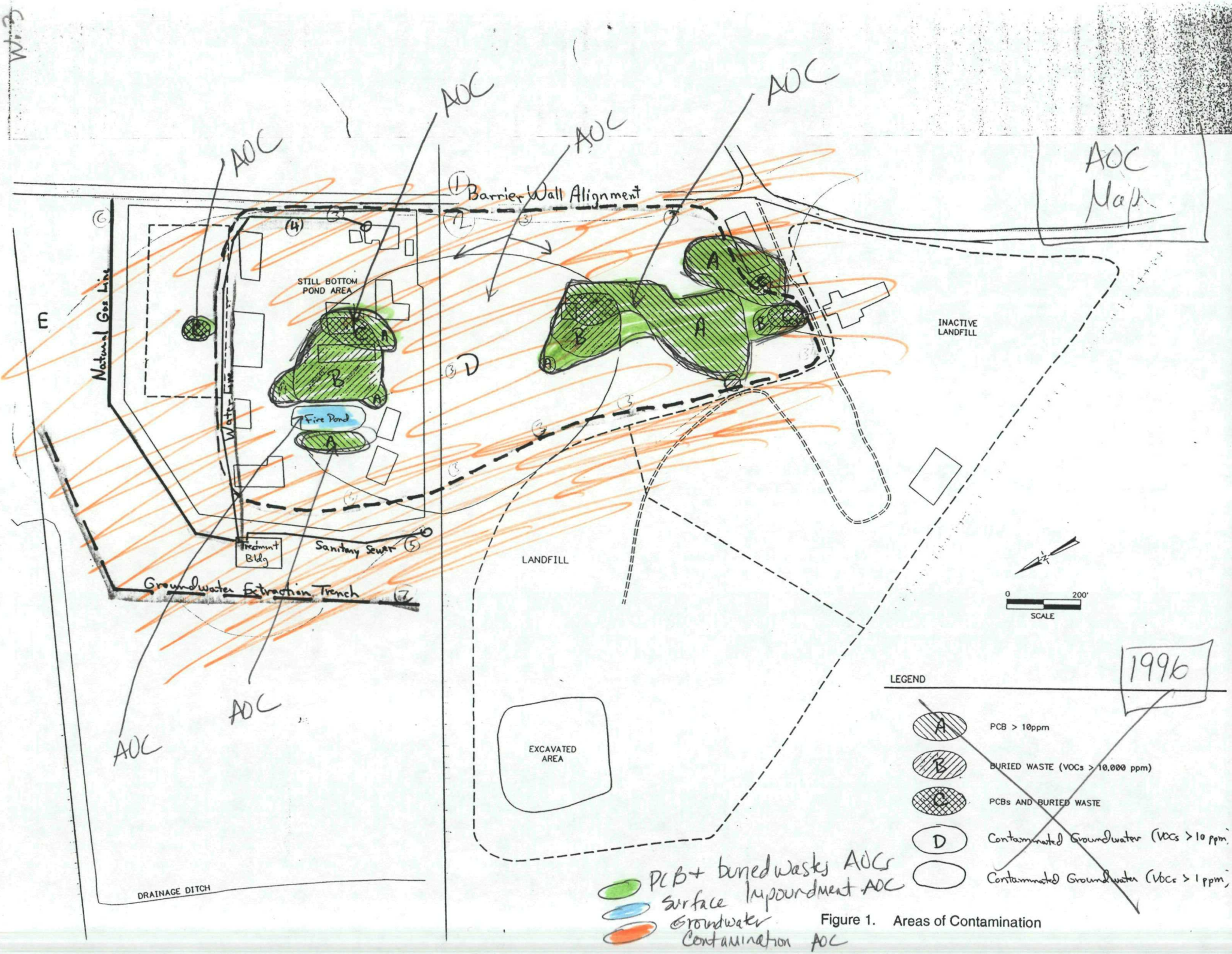


Figure 1. Areas of Contamination

W.S

Legal Considerations AOC map

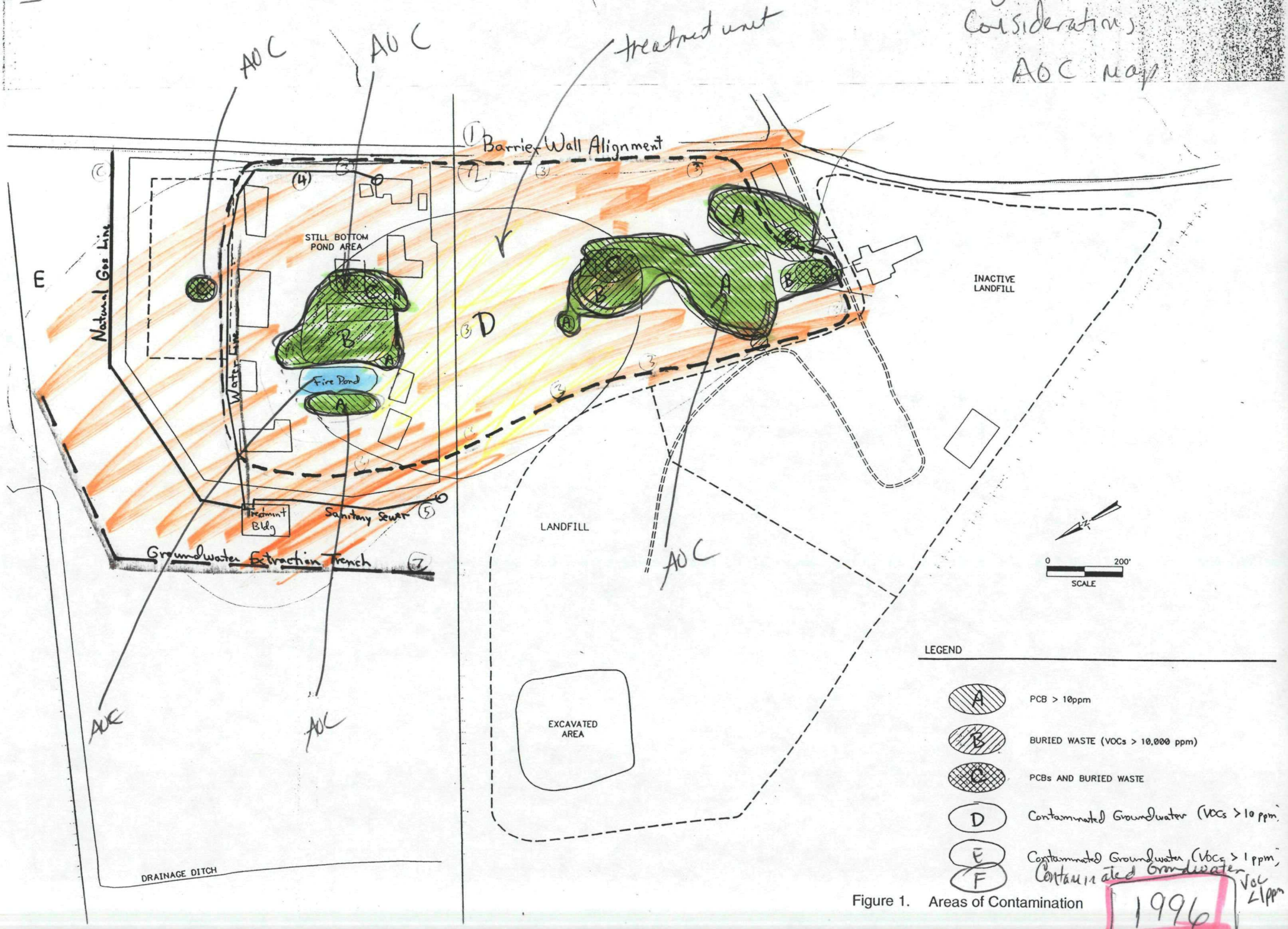


Figure 1. Areas of Contamination

1996

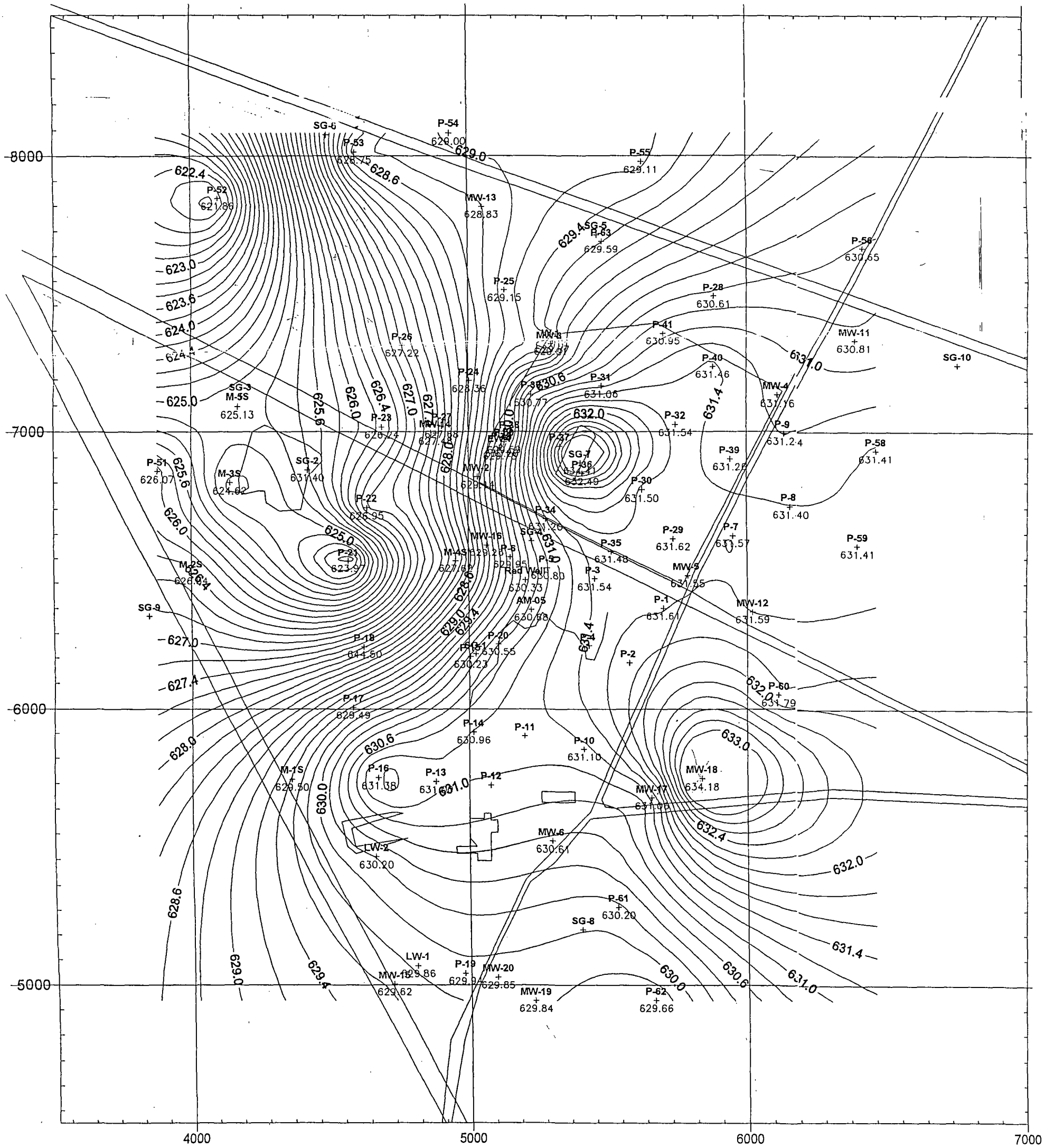
Figure 1. Areas of Contamination

Figure 1. Areas of Contamination

X 1" = 367 L = 10

Y 1" 367 L = 11

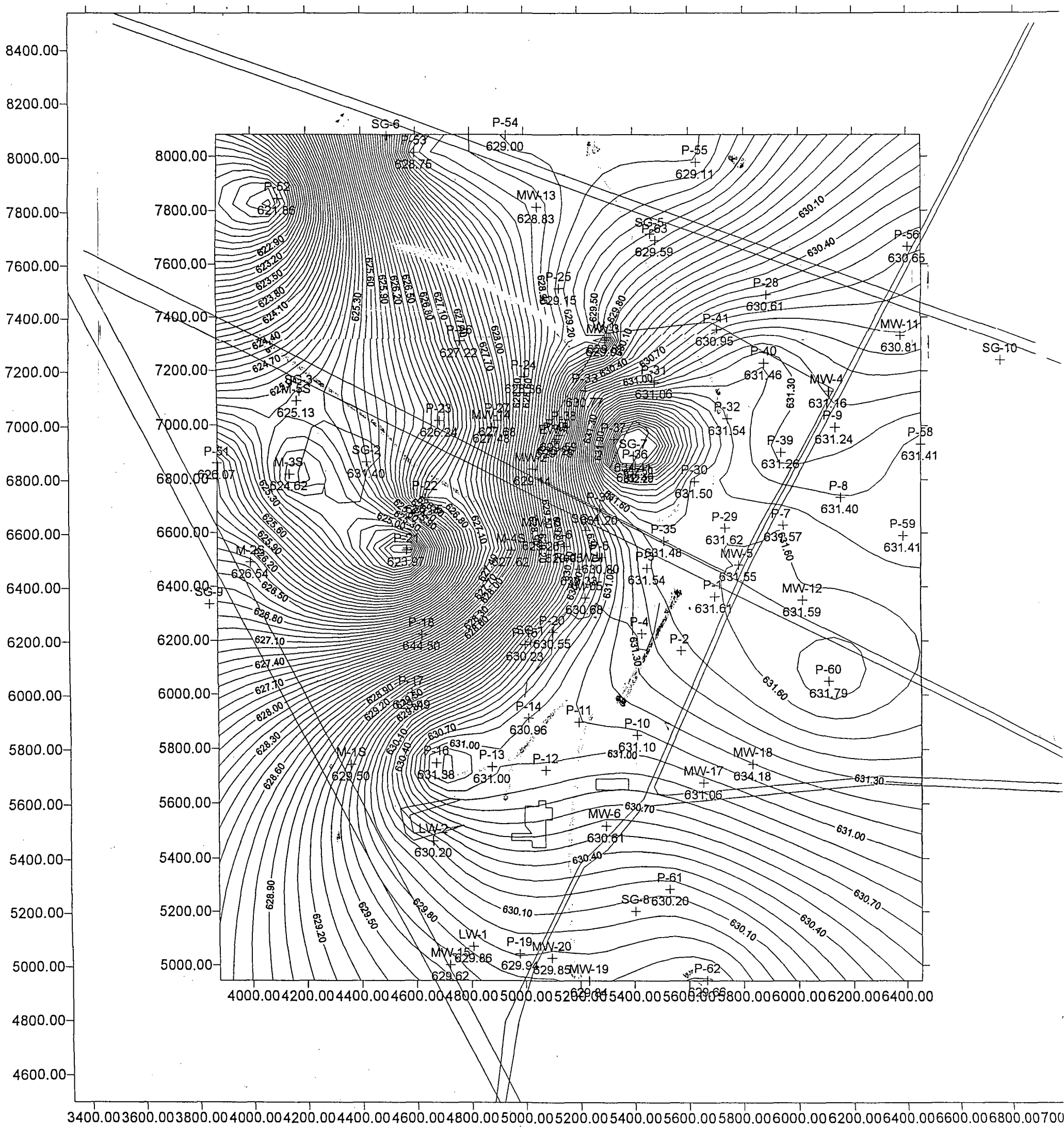
Figure 1. Upper Aquifer Watertable Elevation Contour Plot -- October 30, 1995
ACS NPL Site

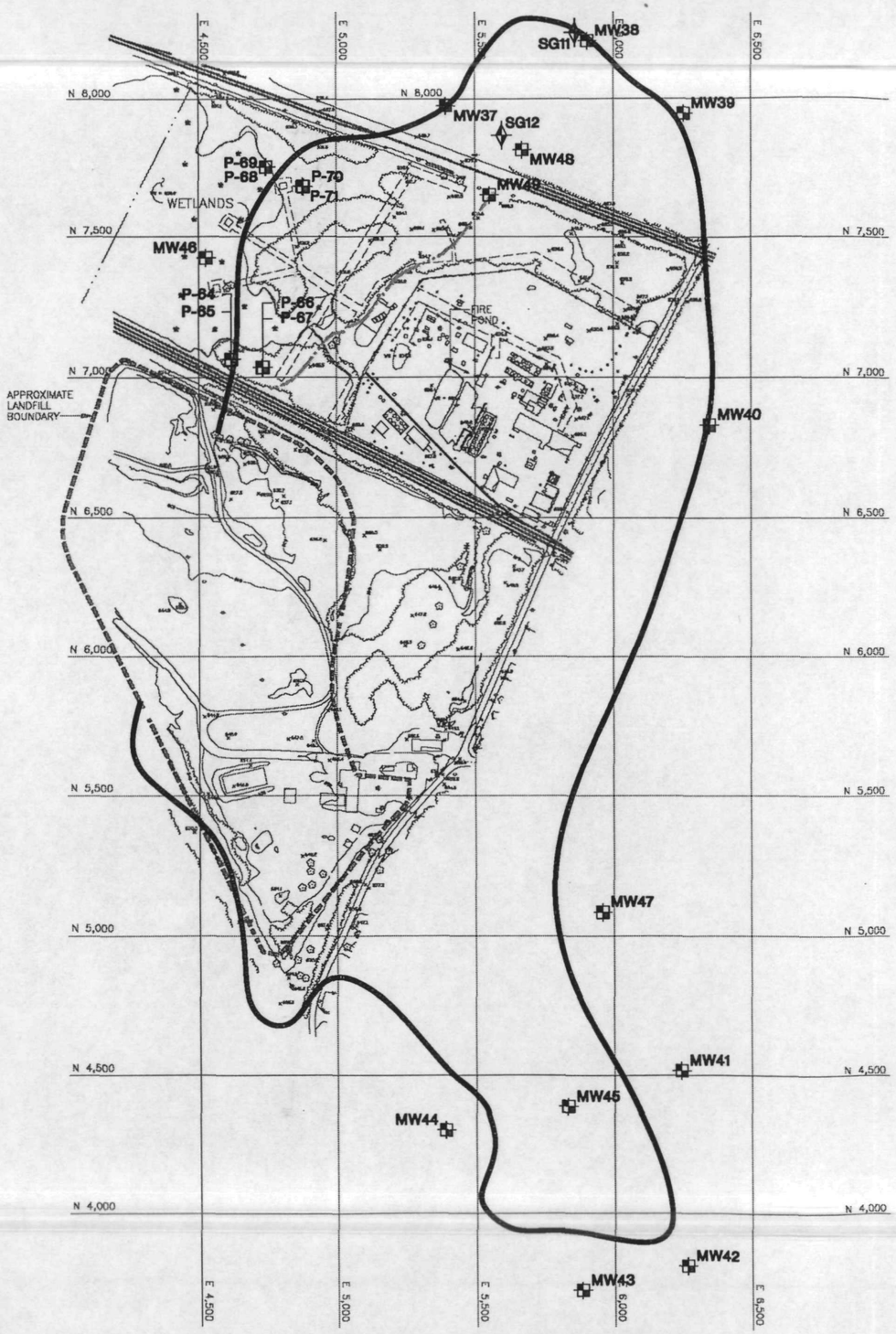


11/13/95

from Rob Lantz, Black + Veatch.

Figure A. Contour Map of Piezometric Surface (11-2-95) Minus the Influence of MW-18, P-18 and SG-2.





LEGEND

- P-70 — PIEZOMETER LOCATION AND NUMBER
- MW40 — MONITORING WELL LOCATION AND NUMBER
- SG12 — STAFF GAUGE LOCATION AND NUMBER
- TOTAL VOC CONCENTRATIONS GREATER THAN DETECTION LIMITS DELINEATED BY GEOPROBE INVESTIGATION

NOTES

1. BASE MAP DEVELOPED FROM AN AERIAL SURVEY MAP OF THE SITE FLOWN ON MARCH 8, 1994 BY GEONEX CHICAGO AERIAL SURVEY, INC. CONTOUR INTERVAL = 2 ft.

north

0 500 1000

SCALE IN FEET

FIGURE 1

Management Review
Other

Technical Review
Project Manager

9-18-96

Graphic Standards CCM
Lead Professional

QUALITY CONTROL

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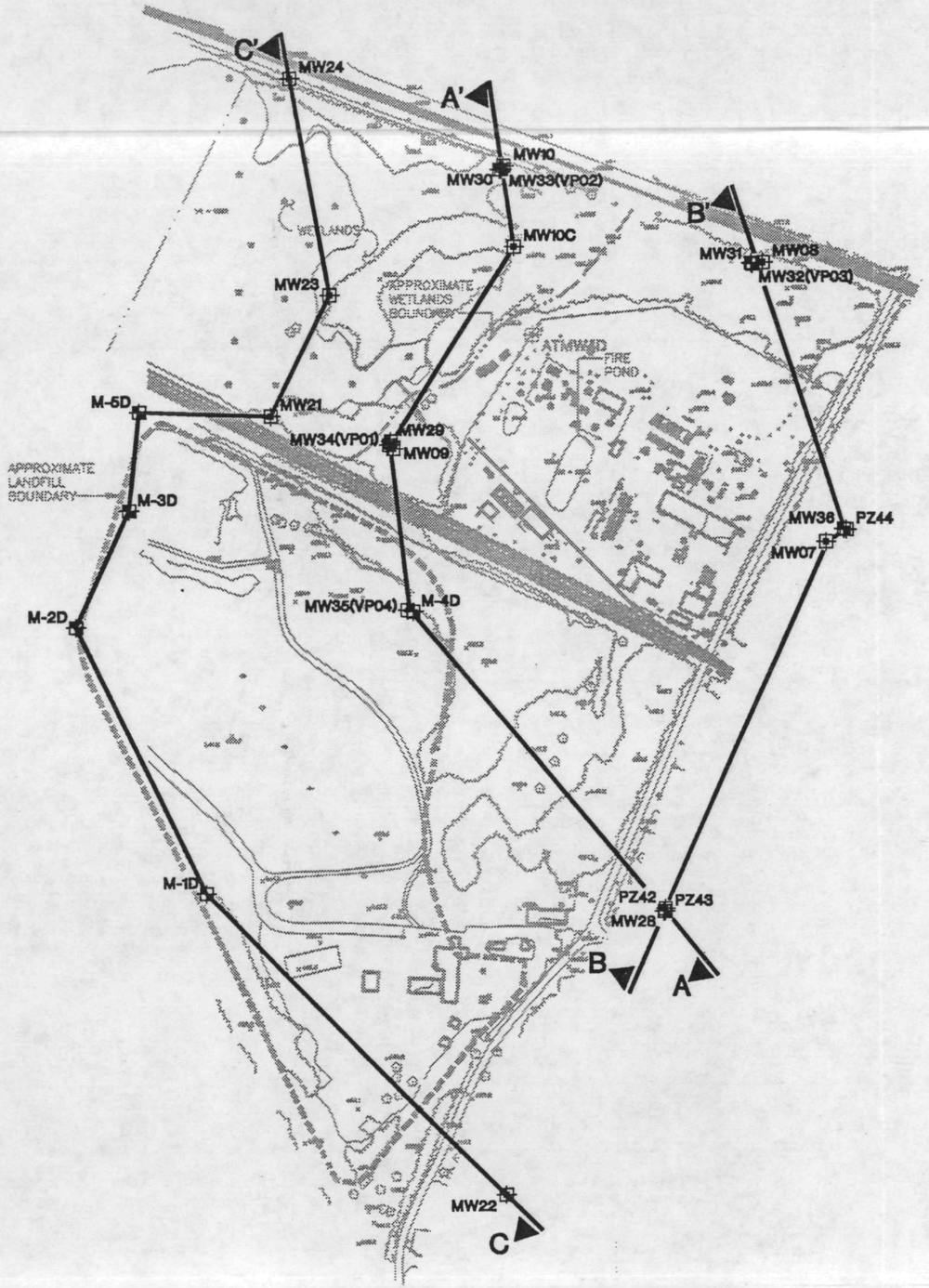
Developed By DAP
Drawn By CCM
Approved By
Date
Reference
Revisions

MONITORING WELL AND PIEZOMETER LOCATION MAP

UPPER AQUIFER TECH MEMO
AMERICAN CHEMICAL SERVICE, INC.
NPL SITE
GRIFFITH, INDIANA

Drawing Number
4077.0074 **B3**

MONTGOMERY WATSON



LEGEND

MW07	LOWER AQUIFER MONITORING WELL LOCATION AND NUMBER
MW28	NEW LOWER AQUIFER MONITORING WELL LOCATION AND NUMBER
PZ43	LOWER AQUIFER PIEZOMETER LOCATION AND NUMBER
M-3D	GRIFFITH LANDFILL LOWER AQUIFER MONITORING WELL LOCATION AND NUMBER
(VP01)	VERTICAL PROFILE BORING LOCATION AND NUMBER
A	CROSS SECTION LOCATION LINE

NOTES

1. BASE MAP DEVELOPED FROM AN AERIAL SURVEY MAP OF THE SITE FLOWN ON MARCH 8, 1994 BY GEONEX CHICAGO AERIAL SURVEY, INC. CONTOUR INTERVAL IS TWO FEET.
2. ELEVATIONS ARE BASED ON U.S.G.S. DATUM (MEAN SEA LEVEL).
3. GRID BASED ON INDIANA STATE PLANE COORDINATE SYSTEM.
4. MONITORING WELLS MW28 THROUGH MW36 AND PIEZOMETERS PZ42 THROUGH PZ44 INSTALLED DURING FEBRUARY, 1996 BY BOART LONGYEAR, INC. UNDER SUPERVISION OF MONTGOMERY WATSON. SEE RI REPORT FOR INSTALLATION INFORMATION FOR MONITORING WELLS MW07 THROUGH MW10 AND MW17. MONITORING WELL M-1D THROUGH M-5D OWNED BY GRIFFITH LANDFILL.
5. LOCATION OF MONITORING WELLS MW28 THROUGH MW36 AND PIEZOMETERS PZ42 THROUGH PZ44 BASED ON SURVEY CONDUCTED BY AREA SURVEY, CO., DURING MARCH, 1996.

north

0 400 800

SCALE IN FEET

FIGURE 2

Developed By RJR | Drawn By DLF,LCL
Approved By PJV | Date 8/15/96
Reference
Revisions

CROSS SECTION LOCATION MAP

LOWER AQUIFER INVESTIGATION
AMERICAN CHEMICAL SERVICE, INC.
NPL SITE
GRIFFITH, INDIANA

Drawing Number
4077.0076 B2

MONTGOMERY WATSON

QUALITY CONTROL | Graphic Standard | Lead Professional | 4-12-96 | Technical Review | Project Manager | Management Review | Other

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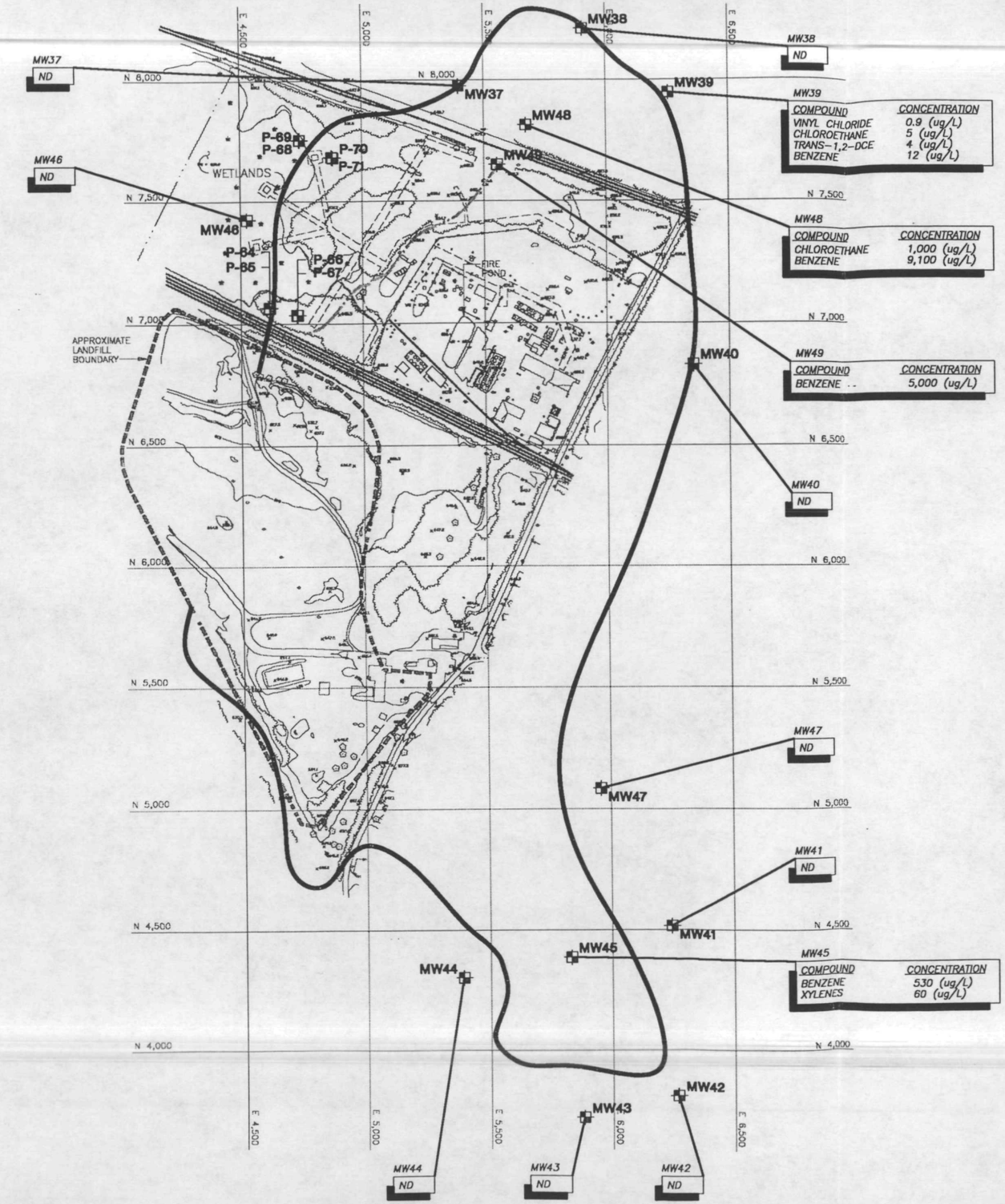

LEGEND

P-70 — PIEZOMETER LOCATION AND NUMBER

MW40 — MONITORING WELL LOCATION AND NUMBER

TOTAL VOC CONCENTRATIONS GREATER THAN DETECTION LIMITS DELINEATED BY GEOPROBE INVESTIGATION

ND — VOCs NOT DETECTED ABOVE LABORATORY DETECTION LIMITS

NOTES

1. BASE MAP DEVELOPED FROM AN AERIAL SURVEY MAP OF THE SITE FLOWN ON MARCH 8, 1994 BY GEONEX CHICAGO AERIAL SURVEY, INC. CONTOUR INTERVAL = 2 ft.

north

0 500 1000

SCALE IN FEET

FIGURE 3

Management Review
Other

Technical Review
Project Manager

9-25-96

Graphic Standards CCM
Lead Professional

QUALITY CONTROL

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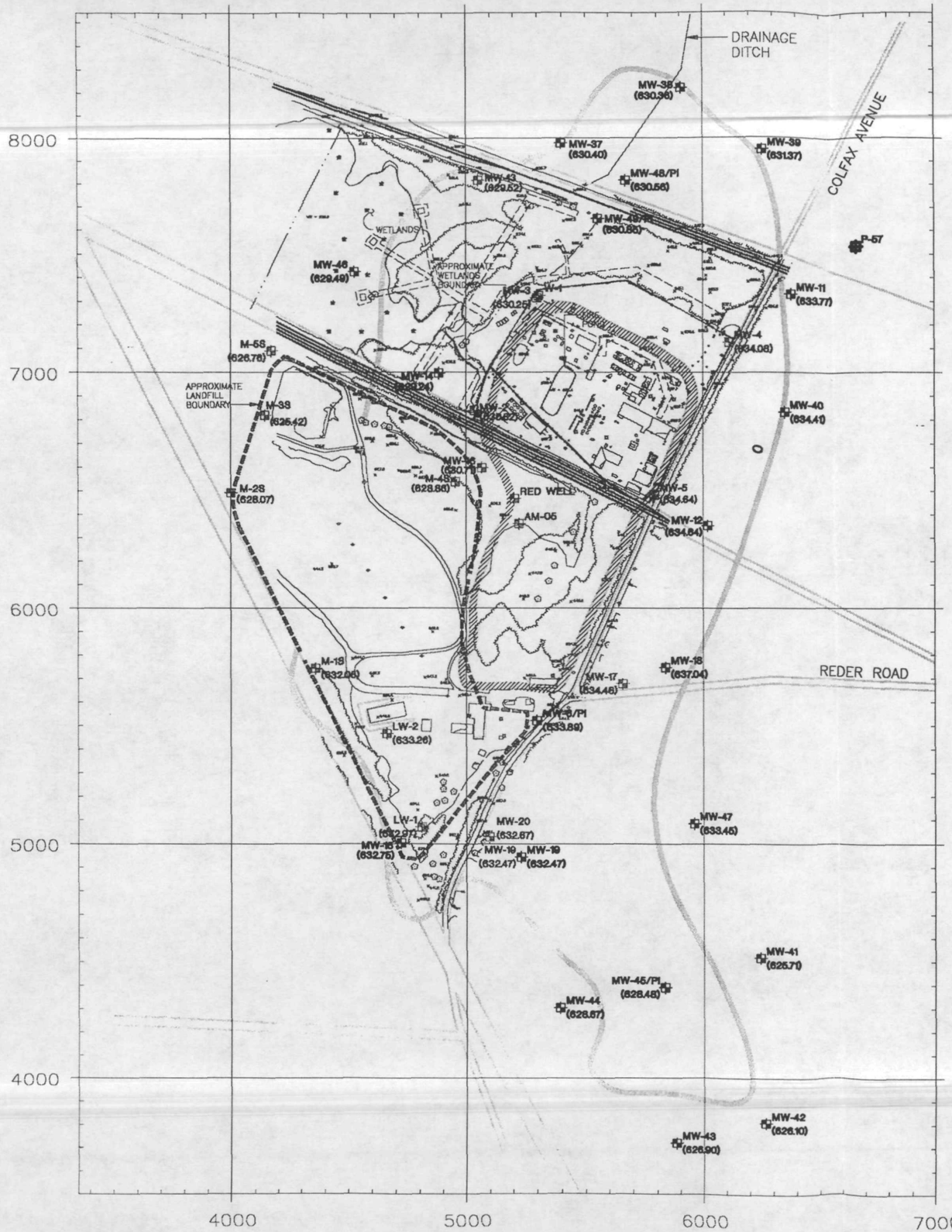
Developed By DAP
Drawn By CCM
Approved By
Date
Reference
Revisions

VOCs DETECTED IN MONITORING WELLS

UPPER AQUIFER TECH MEMO
AMERICAN CHEMICAL SERVICE, INC.
NPL SITE
GRIFFITH, INDIANA

Drawing Number
4077.0074 **B4**

MONTGOMERY WATSON



LEGEND

- MW-12 — UPPER AQUIFER WELL LOCATION AND NUMBER
- MW-48/PI — PLUME INTERIOR AQUIFER WELL LOCATION AND NUMBER
- M-1S — LEACHATE/UPPER AQUIFER WELL LOCATION AND NUMBER
- (632.47) — MEASURED WATER LEVEL ELEVATION, IN FT. AMSL
- TOTAL VOC CONCENTRATIONS GREATER THAN DETECTION LIMITS DELINEATED BY GEOPROBE INVESTIGATION
- APPROXIMATE LOCATION OF BARRIER WALL
- P-57 — PROPOSED PIEZOMETER LOCATION AND NUMBER

NOTES

1. GROUNDWATER LEVELS FOR WATER TABLE CONTOURS WERE MEASURED AT THE SITE ON AUGUST 27, 1996.

north

0 500 1000

SCALE IN FEET

FIGURE 4

Drawn By CCM
Developed By KS
Approved By
Date
Reference
Revisions

PROPOSED UPPER AQUIFER PIEZOMETER

UPPER AQUIFER TECH MEMO
AMERICAN CHEMICAL SERVICE, INC.
NPL SITE
GRIFFITH, INDIANA

Drawing Number
4077.0074 **B5**

MONTGOMERY WATSON

Management Review
Other
Technical Review
Project Manager
9-25-96
Graphic Standards C-1/8
Lead Professional
QUALITY CONTROL

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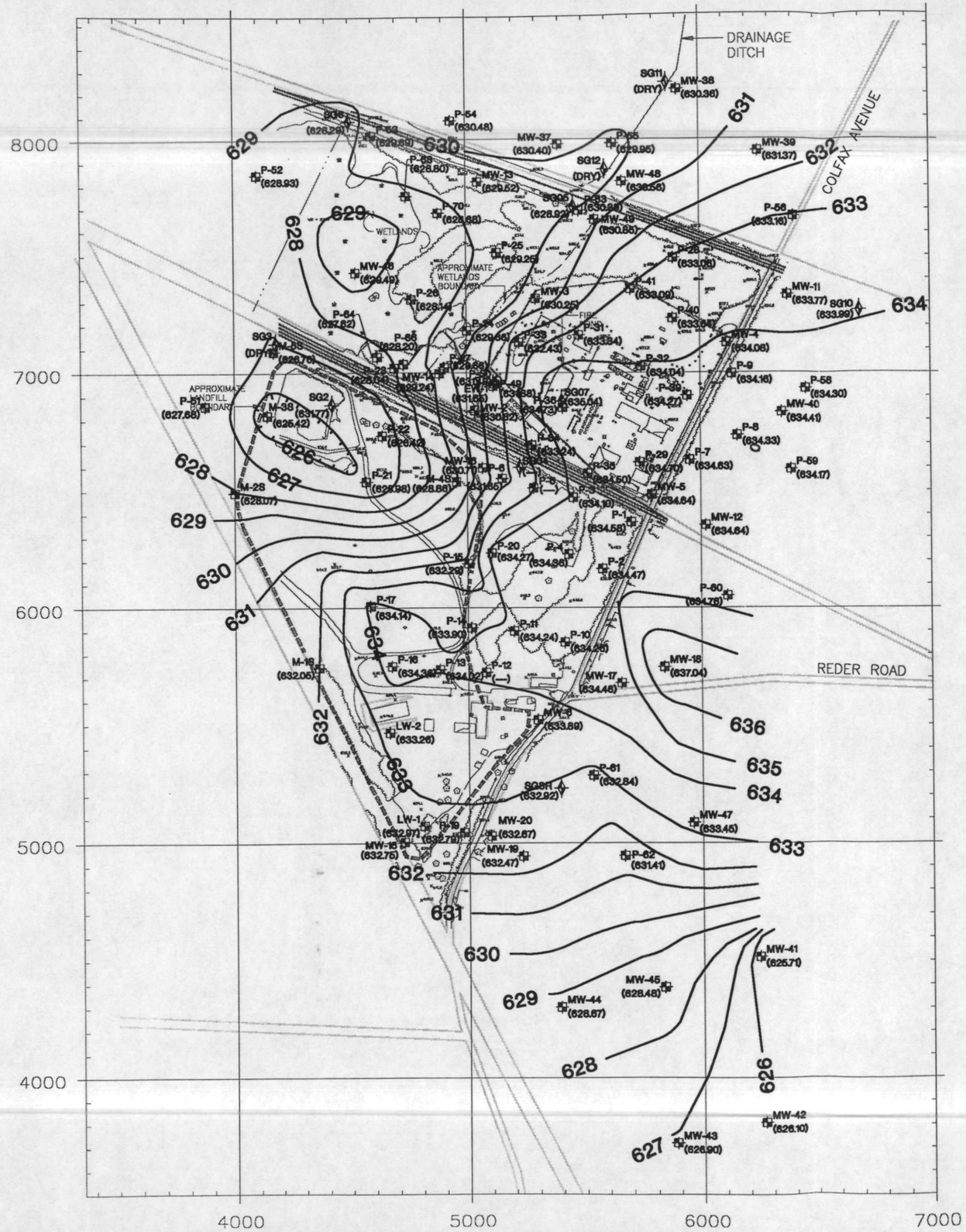

LEGEND

MW-12	UPPER AQUIFER WELL LOCATION AND NUMBER
M-18	LEACHATE/UPPER AQUIFER WELL LOCATION AND NUMBER
P-61	PIEZOMETER LOCATION AND NUMBER
SG10	STAFF GAUGE LOCATION AND NUMBER
(630.62)	MEASURED WATER TABLE ELEVATION, IN FT. AMSL
(—)	NOT MEASURED
635	GROUNDWATER ELEVATION CONTOUR

NOTES

1. GROUNDWATER LEVELS FOR WATER TABLE CONTOURS WERE MEASURED AT THE SITE ON AUGUST 27, 1996.

north

0 500 1000

SCALE IN FEET

FIGURE 2

Management Review
Other
Technical Review
Project Manager
9-10-96
Graphic Standards CCM
Lead Professional
QUALITY CONTROL

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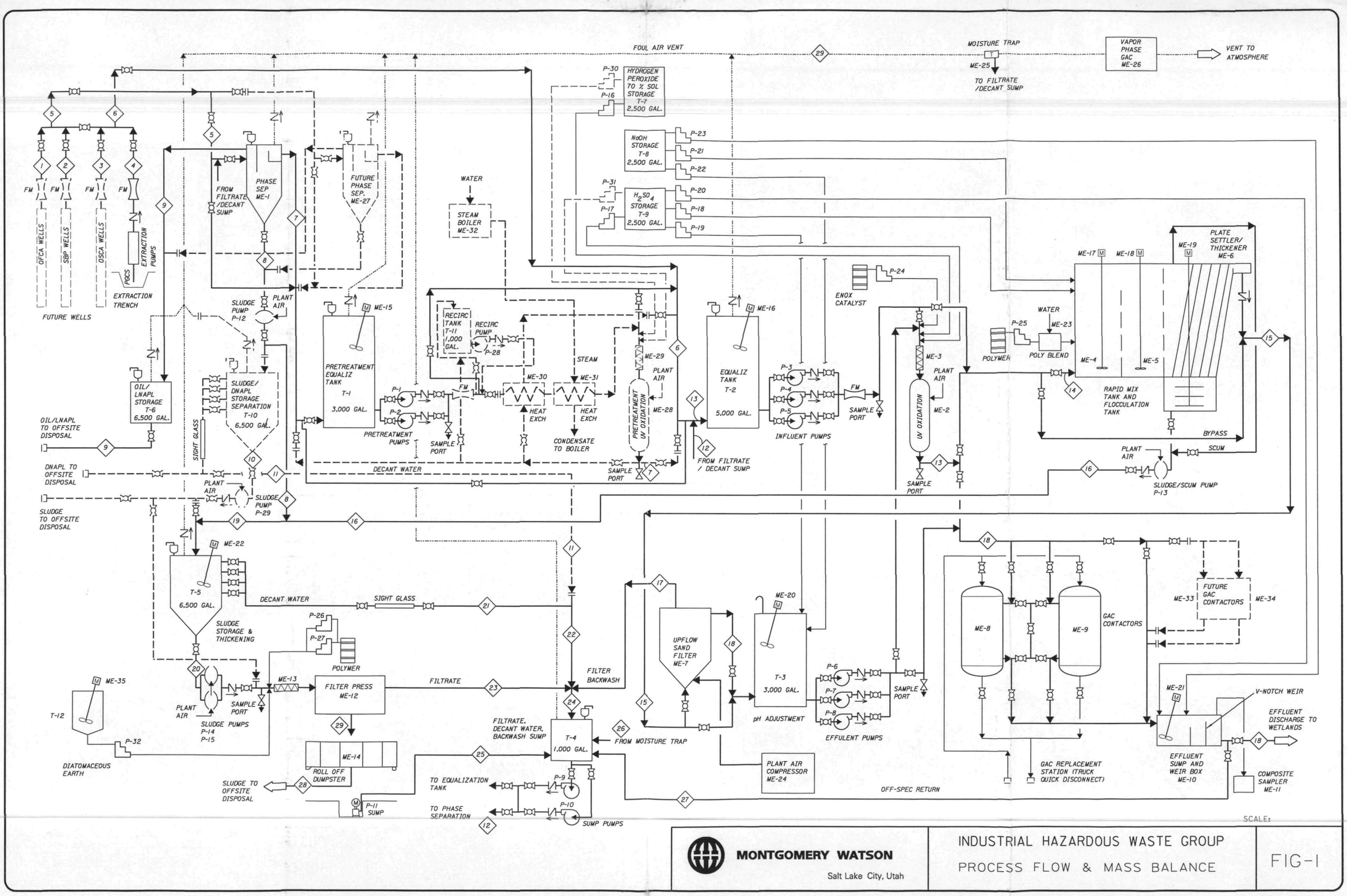
Developed By DAP
Drawn By CCM
Approved By
Date
Reference
Revisions

UPPER AQUIFER WATER TABLE ELEVATIONS AUGUST 27, 1996

UPPER AQUIFER TECH MEMO
AMERICAN CHEMICAL SERVICE, INC.
NPL SITE
GRIFFITH, INDIANA

Drawing Number
4077.0071 **B1**

MONTGOMERY WATSON

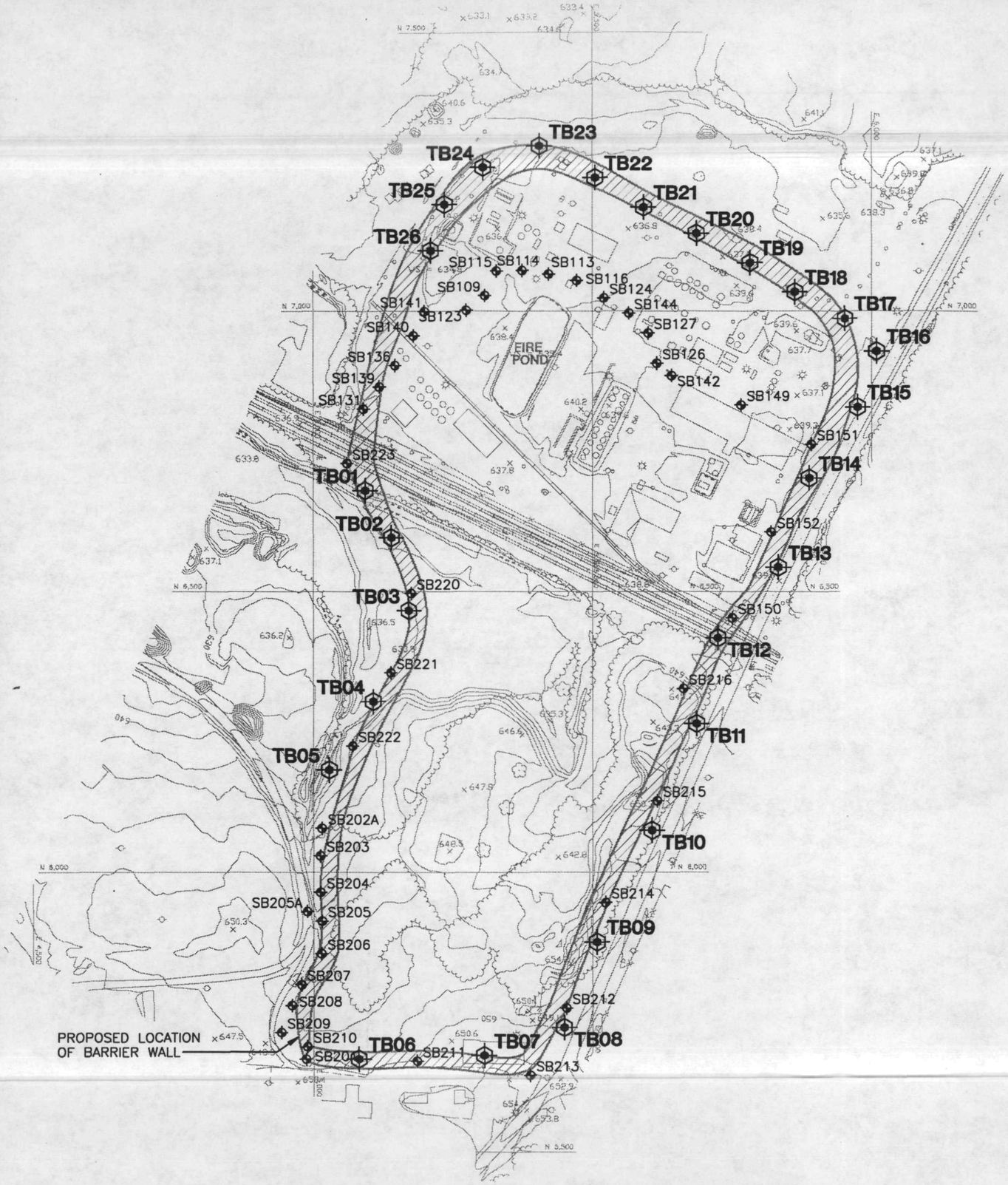


MONTGOMERY WATSON
Salt Lake City, Utah

INDUSTRIAL HAZARDOUS WASTE GROUP
PROCESS FLOW & MASS BALANCE

FIG-1

acs_fig01.dgn (09/05/95)



LEGEND

- TB20 — GEOTECHNICAL BORING BY HORIZONTAL TECHNOLOGY
- SB222 — BARRIER WALL SOIL BORING LOCATION AND NUMBER
- APPROXIMATE LOCATION OF BARRIER WALL
- RAILROAD TRACK
- TOPOGRAPHIC CONTOUR

NOTES

1. BASE MAP DEVELOPED FROM AN AERIAL SURVEY MAP OF THE SITE FLOWN ON MARCH 8, 1994 BY GEONEX CHICAGO AERIAL SURVEY, INC.
2. VERTICAL DATUM IS U.S.G.S. DATUM. CONTOUR INTERVAL IS 2 FEET.
3. FINAL BARRIER WALL LOCATION IS BASED ON RESULTS OF SOIL BORING PROGRAM.
4. SOIL BORINGS PERFORMED JANUARY 17, 1996 THROUGH FEBRUARY 12, 1996, BY ENVIRONMENTAL AND FOUNDATION DRILLING.
5. SOIL BORING ELEVATIONS AND LOCATIONS SURVEYED ON FEBRUARY 12 AND 16, 1996, BY AREA SURVEY.
6. TEST BORINGS PERFORMED JULY 1-3, 1996 BY BOART LONGYEAR, INC.

north

0 200 400

SCALE IN FEET

Management Review
Other

Technical Review
Project Manager

Graphic Standards CCM 7-25-96
Lead Professional

QUALITY CONTROL

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Developed By PJV
Drawn By DLF,LCL,CCM
Approved By
Date August 2, 1996
Reference
Revisions

PROPOSED REVISED BARRIER WALL ALIGNMENT

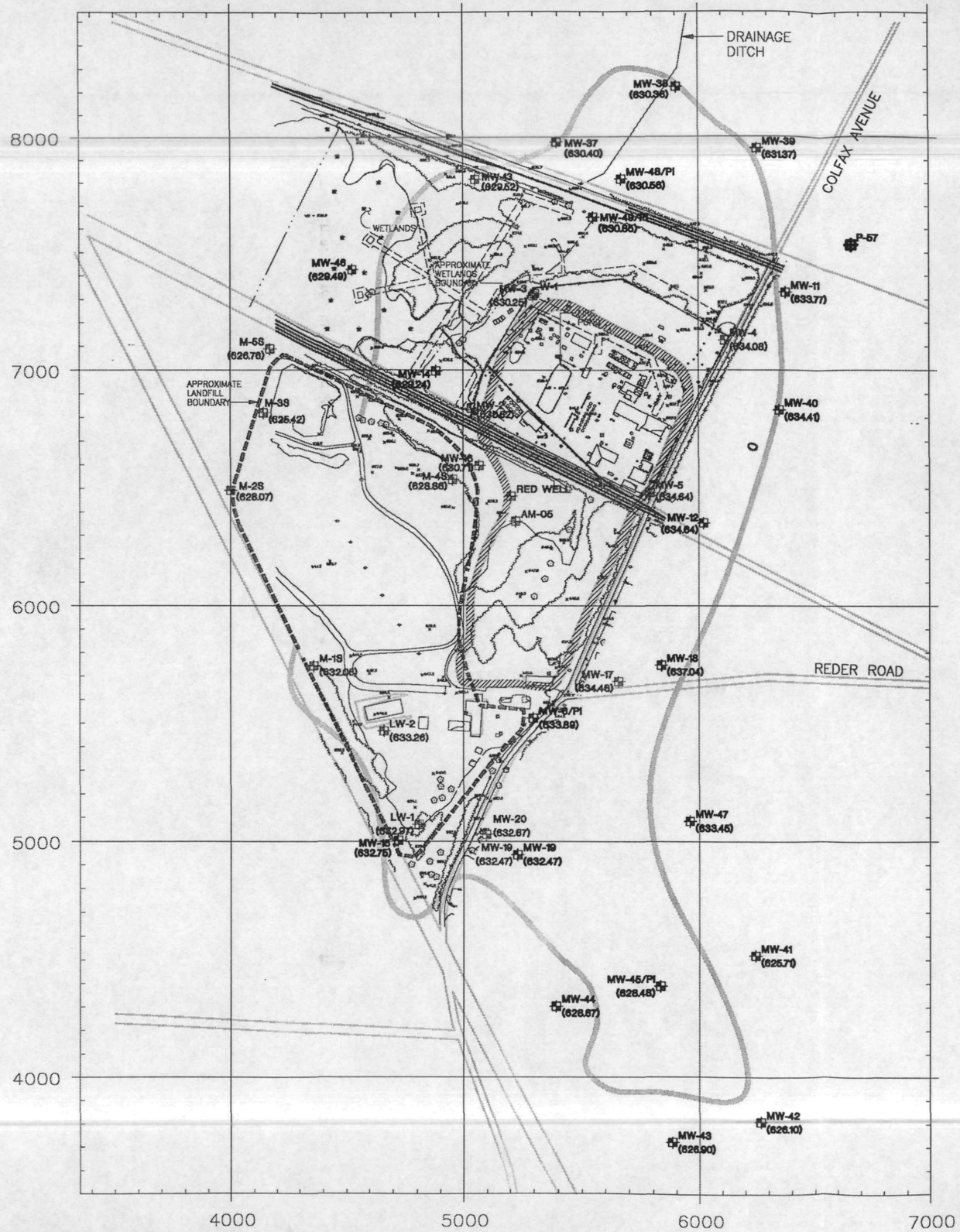
BARRIER WALL ALIGNMENT INVESTIGATION
AMERICAN CHEMICAL SERVICE, INC.
NPL SITE
GRIFFITH, INDIANA

Drawing Number
4077.0075 **B7**

MONTGOMERY WATSON

96/2/8
N.3

W3
ND



LEGEND

- MW-12 — UPPER AQUIFER WELL LOCATION AND NUMBER
- MW-48/PI — PLUME INTERIOR AQUIFER WELL LOCATION AND NUMBER
- M-1S — LEACHATE/UPPER AQUIFER WELL LOCATION AND NUMBER
- (632.47) — MEASURED WATER LEVEL ELEVATION, IN FT. AMSL
- TOTAL VOC CONCENTRATIONS GREATER THAN DETECTION LIMITS DELINEATED BY GEOPROBE INVESTIGATION
- APPROXIMATE LOCATION OF BARRIER WALL
- P-57 — PROPOSED PIEZOMETER LOCATION AND NUMBER

NOTES

1. GROUNDWATER LEVELS FOR WATER TABLE CONTOURS WERE MEASURED AT THE SITE ON AUGUST 27, 1996.

north

0 500 1000

SCALE IN FEET

FIGURE 4

Management Review
Other
Technical Review
Project Manager
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Lead Professional
Y
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Developed By KS
Drawn By CCM
Approved By
Date
Reference
Revisions

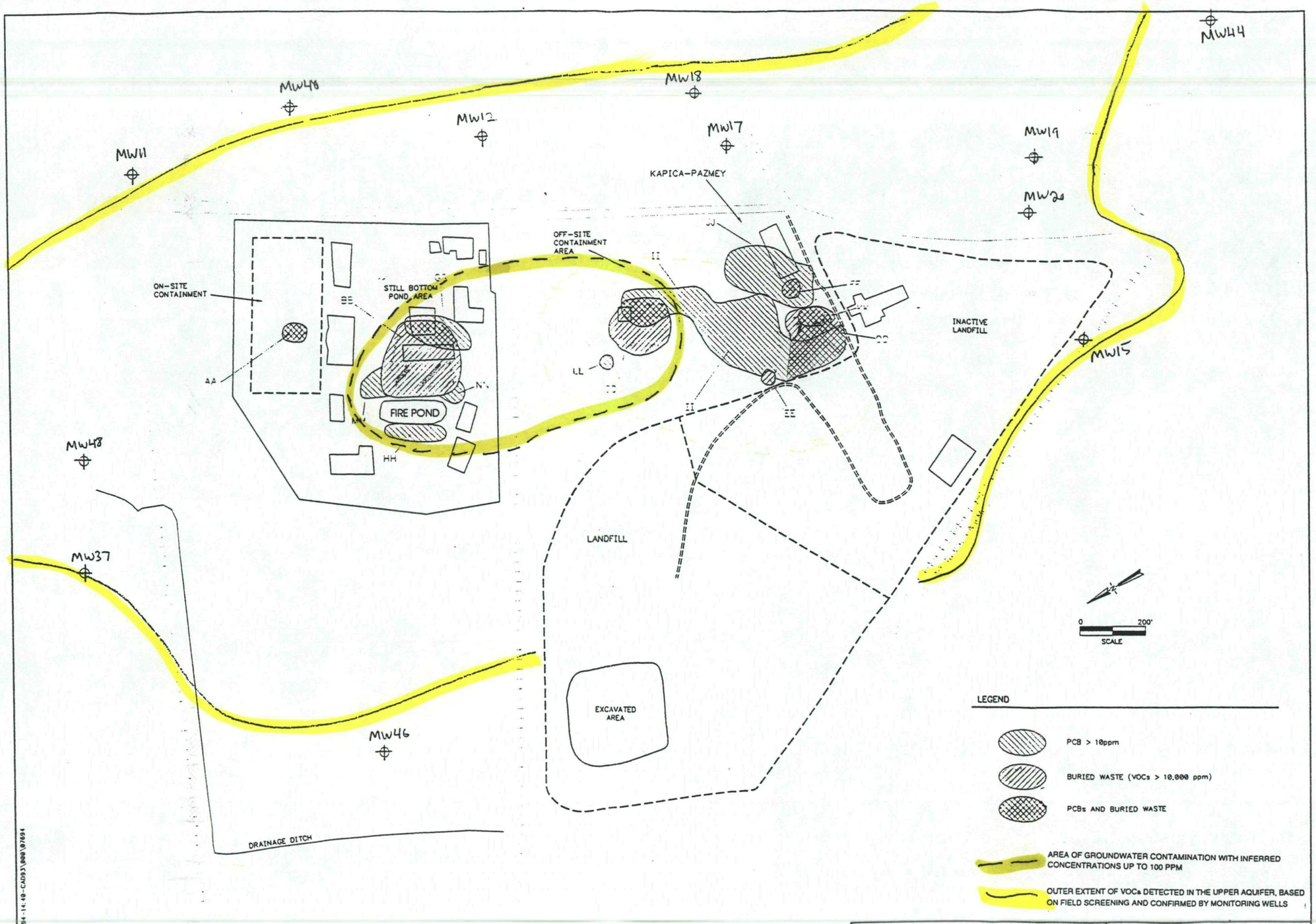
PROPOSED UPPER AQUIFER PIEZOMETER

UPPER AQUIFER TECH MEMO
AMERICAN CHEMICAL SERVICE, INC.
NPL SITE
GRIFFITH, INDIANA

Drawing Number
4077.0074 **B5**

MONTGOMERY WATSON

W13



Waste Delineation's defined in U.S. EPA Map, dated 02/23/94

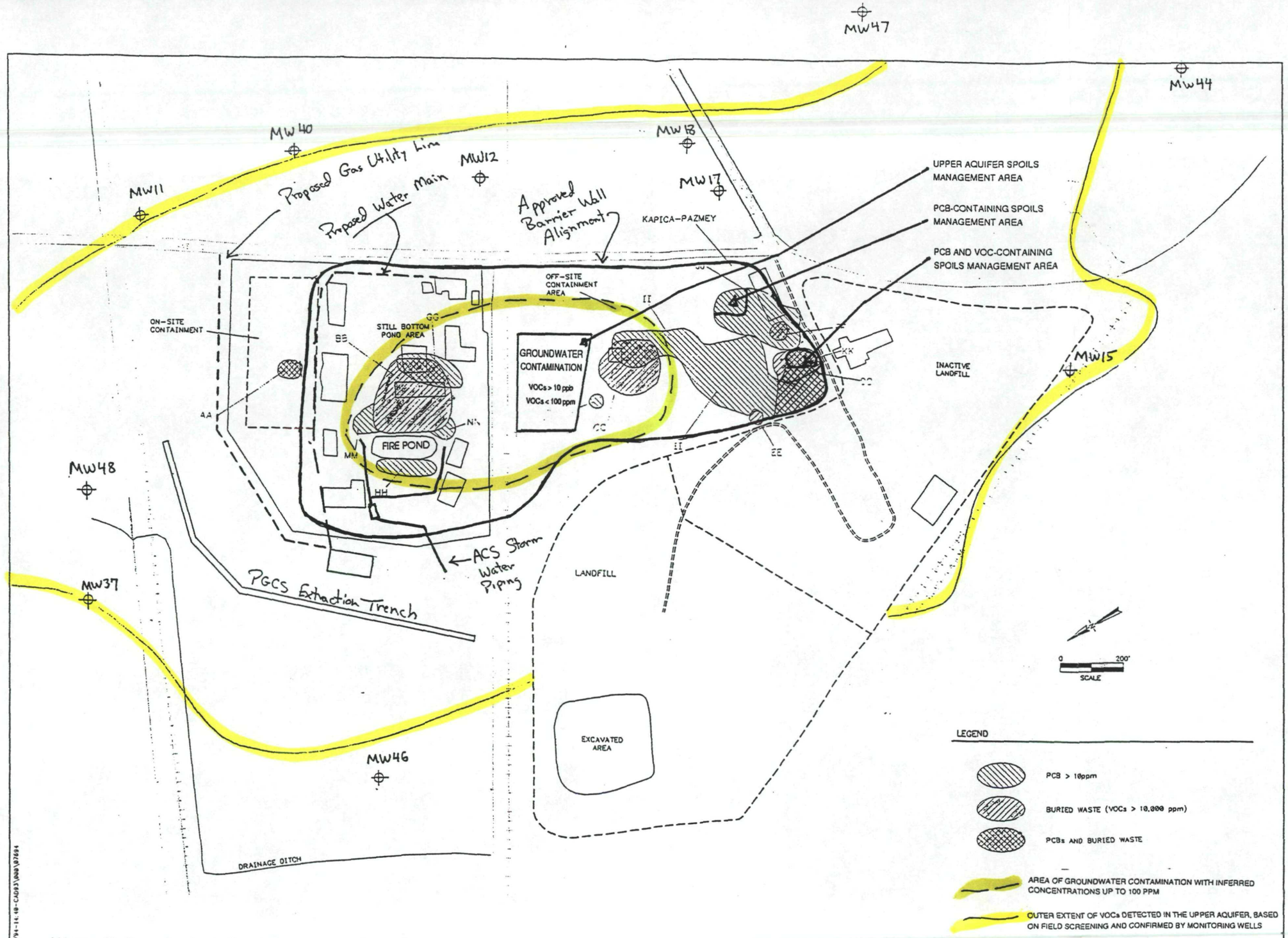
(PCB and buried waste delineation modified in southeast area on the basis of Pre-Design Investigations, 08/20/97)

ALTERNATIVE REMEDIAL CONTRACTING STRATEGY
U.S. EPA CONTRACT No. 68-W8-0089
WORK ASSIGNMENT No. 09-5PJ7
DOCUMENT CONTROL No. 4500-09-AIML

WASTE AND SOIL CONTAMINATION MAP
AMERICAN CHEMICAL SERVICES
Grifith, Indiana

RWS-07/23/94-14:40-CAD93\000\07694

FIGURE 1. U.S. EPA MAP OF AREAS OF CONTAMINATION (AOCs) AT ACS NPL SITE

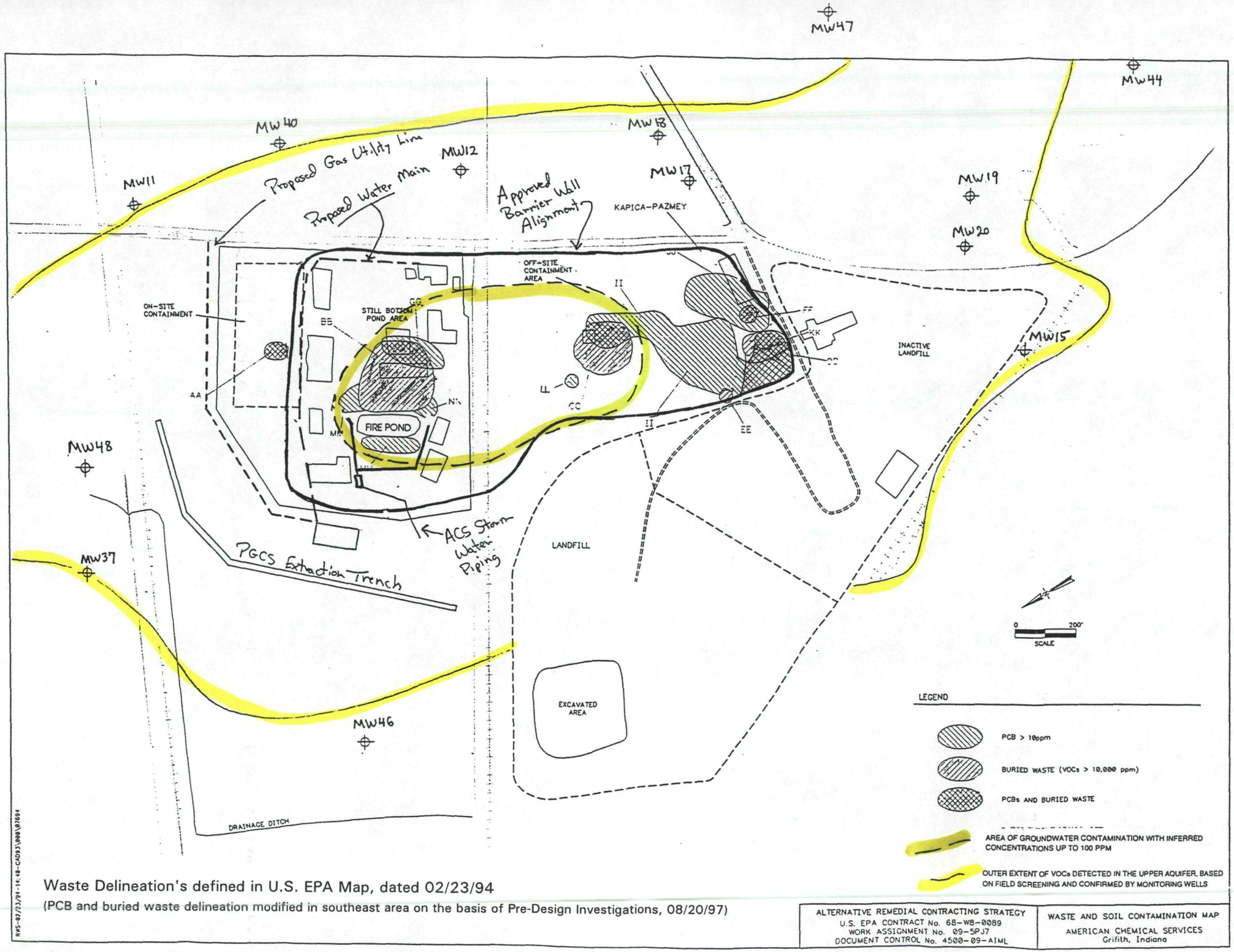


Waste Delineation's defined in U.S. EPA Map, dated 02/23/94

(PCB and buried waste delineation modified in southeast area on the basis of Pre-Design Investigations, 08/20/97)

ALTERNATIVE REMEDIAL CONTRACTING STRATEGY U.S. EPA CONTRACT No. 68-W8-0089 WORK ASSIGNMENT No. 09-5PJ7 DOCUMENT CONTROL No. 4500-09-AIML	WASTE AND SOIL CONTAMINATION MAP AMERICAN CHEMICAL SERVICES Grifith, Indiana

FIGURE 3. SPOILS MANAGEMENT AREAS AT ACS NPL SITE



Waste Delineation's defined in U.S. EPA Map, dated 02/23/94

(PCB and buried waste delineation modified in southeast area on the basis of Pre-Design Investigations, 08/20/97)

ALTERNATIVE REMEDIAL CONTRACTING STRATEGY
U.S. EPA CONTRACT No. 68-W8-0089
WORK ASSIGNMENT No. 09-SPJ7
DOCUMENT CONTROL No. 4500-09-AIML

WASTE AND SOIL CONTAMINATION MAP
AMERICAN CHEMICAL SERVICES
Grifith, Indiana

RWS-02/23/94-14:49-CAD93\000\07694

FIGURE 2. CONSTRUCTION AREAS AT THE ACS NPL SITE

W.3

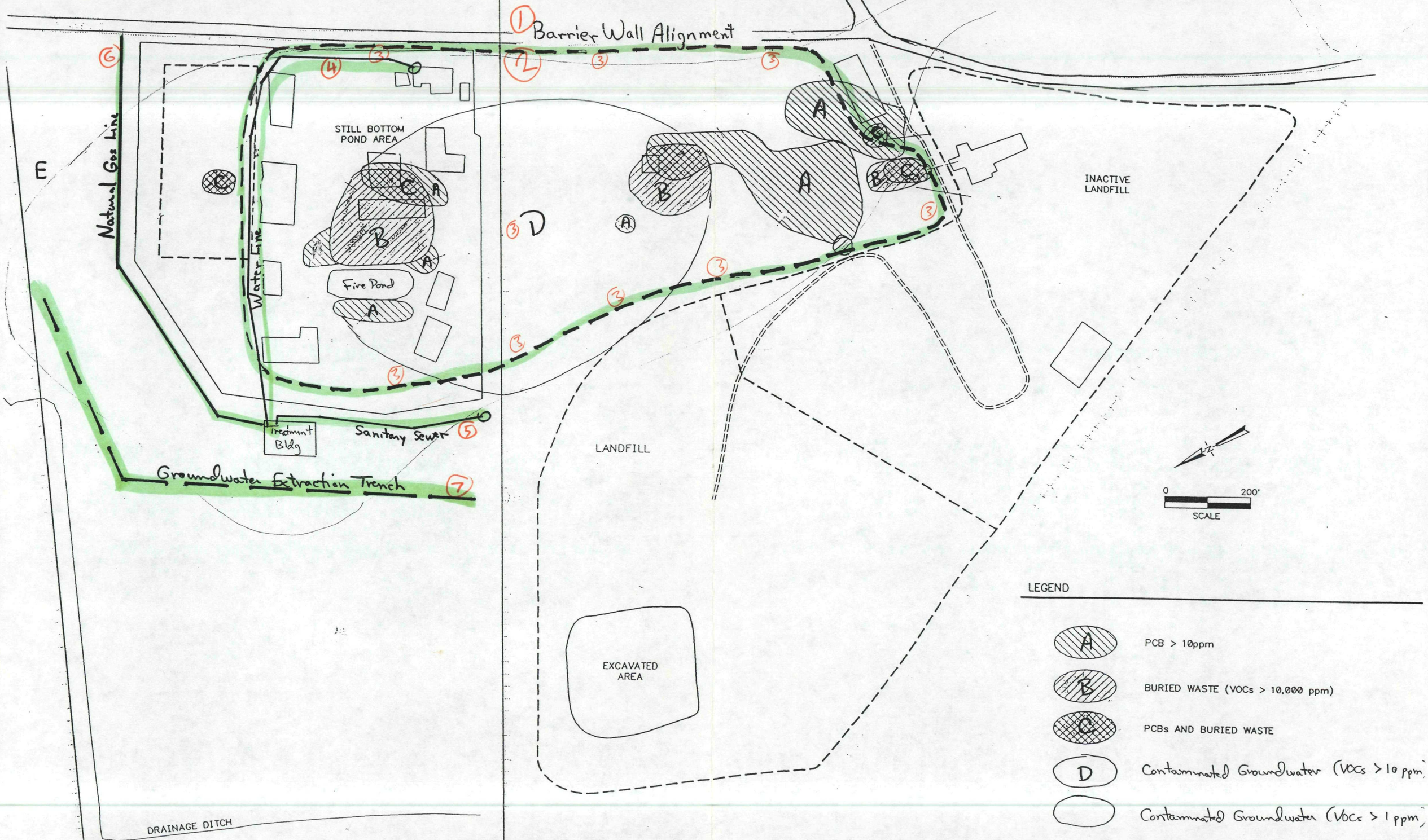
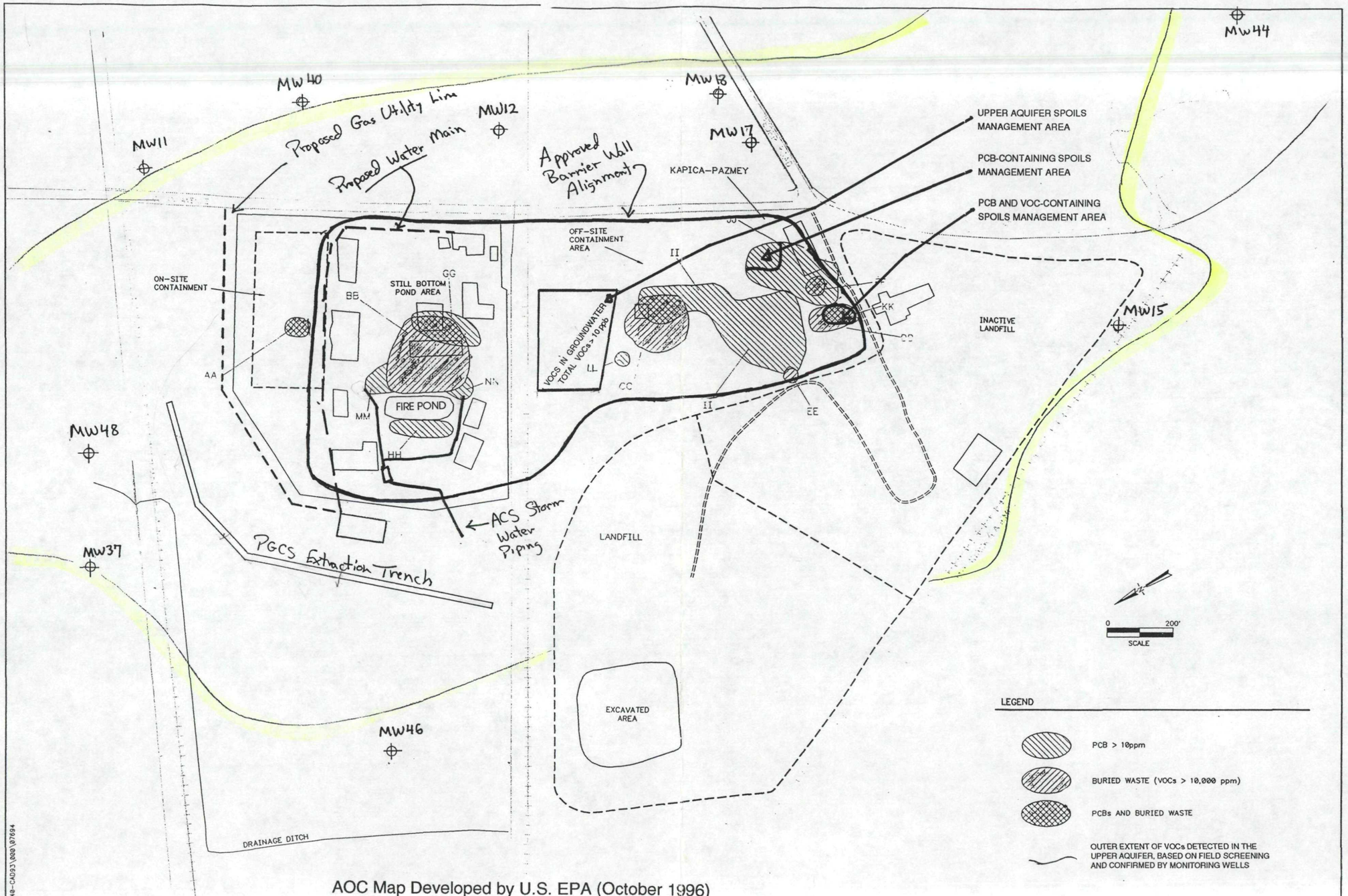


Figure 1. Areas of Contamination

W. 3



AOC Map Developed by U.S. EPA (October 1996)

Overlay Developed by Montgomery Watson to show
- Areas to be excavated during construction of the BWES and PGCS
- Management and storage areas for construction-derived spoils

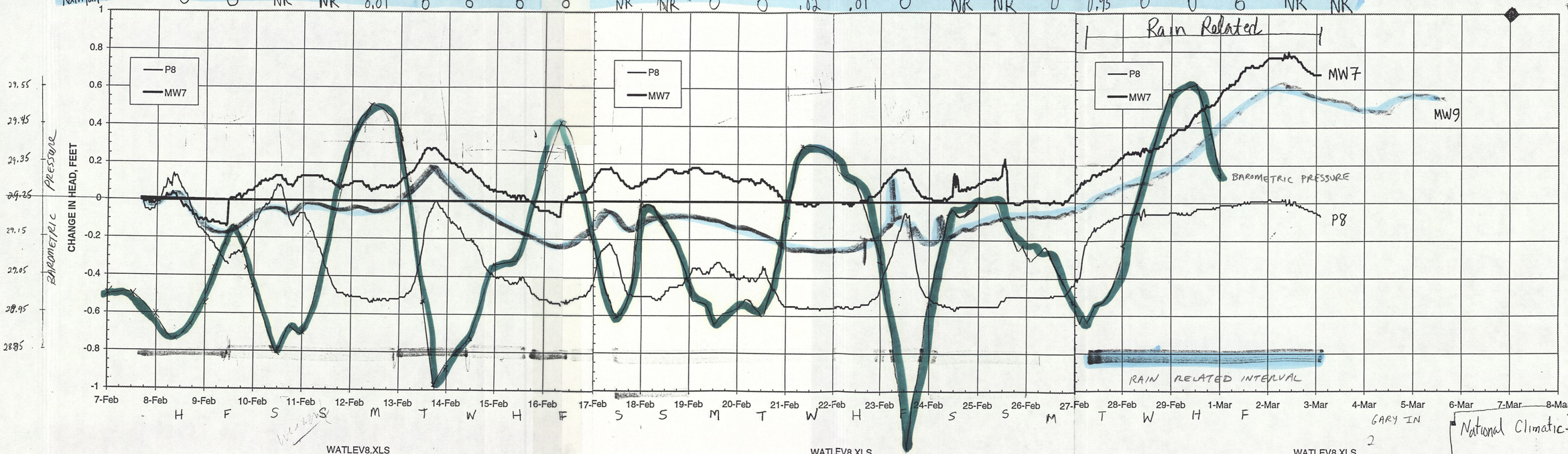
RWS-02/23/94-14:48-CAD93\000\07694

ALTERNATIVE REMEDIAL CONTRACTING STRATEGY U.S. EPA CONTRACT No. 68-W8-0089 WORK ASSIGNMENT No. 09-5PJ7 DOCUMENT CONTROL No. 4500-09-AIML	FIGURE 1 WASTE AND SOIL CONTAMINATION MAP AMERICAN CHEMICAL SERVICES Grifith, Indiana

Montgomery Watson

Barometric Pressure (in. Hg)

Rainfall (inches) 0 0 NR NR 0.01 0 0 0 0 NR NR 0 0 .02 .01 0 NR NR 0 0.95 0 0 0 NR NR



WATLEV8.XLS

WATLEV8.XLS

WATLEV8.XLS

GARY IN

2

4/12/96

Channel 2 News 914 6000 Weather - Radio

826-3535

Channel 5 News 836-5555 Weather Dept Radio Research Dept

Channel 7 News 750-7070

Feb 8 - March 3

#20

National Climatic Data Center

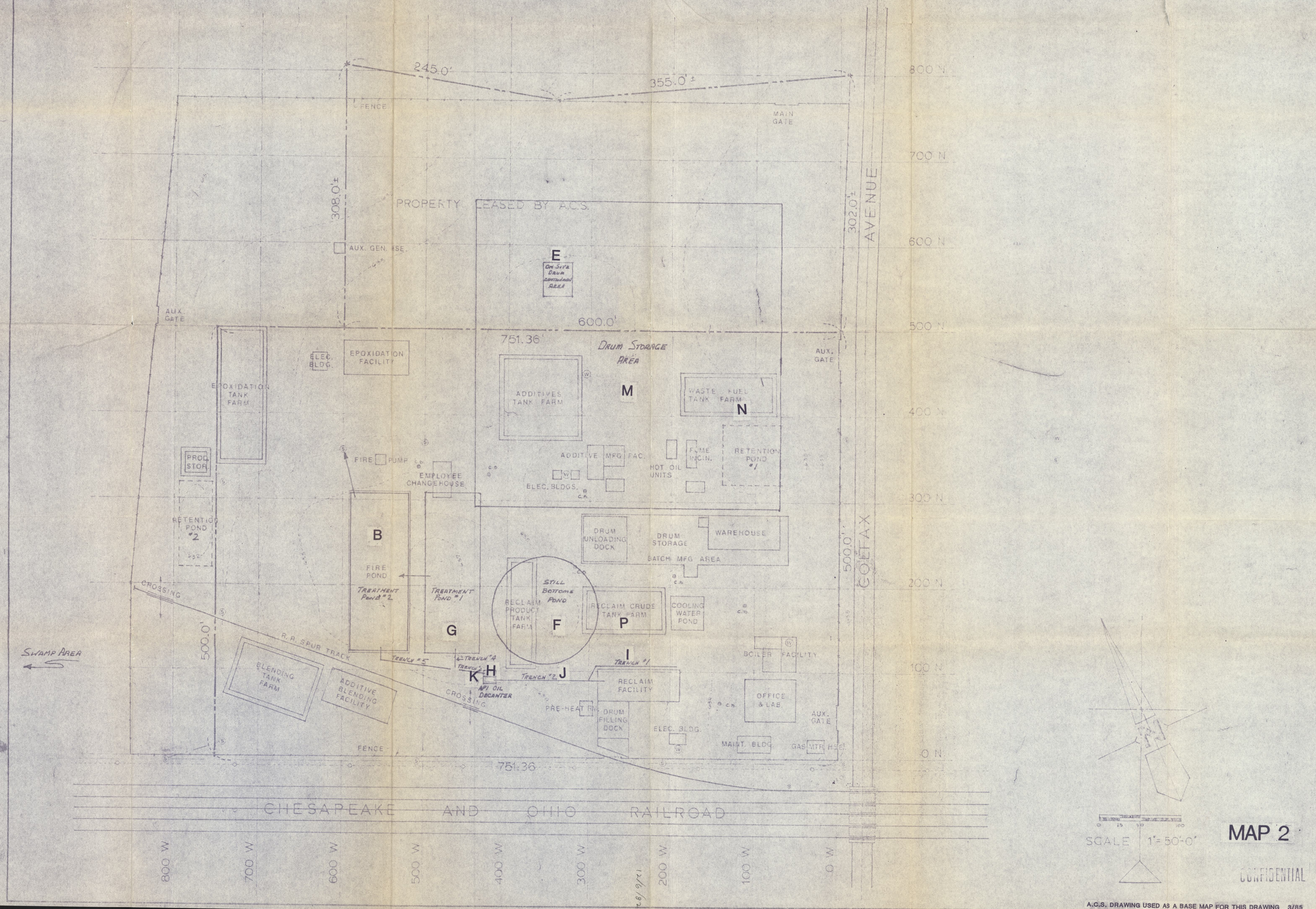
704 271 4800

2-15-96

Upper Aquifer Tracer Study

Water Level
10/30/95

CONFIDENTIAL



MAP 2

CONFIDENTIAL

A.C.S. DRAWING USED AS A BASE MAP FOR THIS DRAWING 3/85

American Chemical Service, Inc.
P.O. BOX 190 - GRIFFITH, INDIANA

G. DALE LOLLIS, ARCHITECT
12480 96th AVENUE ST. JOHN, INDIANA

no.	revision	date
1	[illegible]	[illegible]

AMERICAN CHEMICAL

2 of 2

CONFIDENTIAL

KEEN FOUNDRY, INC.

I-2 GENERAL INDUSTRIAL

NORTH LINE SE 1/4 NE 1/4 SEC 2-35-9 1336.17'

NORTH 1316.75'

G. T. R. R.

GRAND TRUNK WESTERN RAILROAD

I-1 LIGHT INDUSTRIAL

S 0°-03'-55" W 1315.0'

G. T. R. R.

NOTE: TOPO TAKEN FROM USGS MAP

C. & O. R. R.

SITE BOUNDARY PLUS 1000.0'

I-2 GENERAL INDUSTRIAL

WEST LINE SE 1/4 NE 1/4 SEC 2-35-9

G. T. R. R.

A

AREA 3

AREA 1A

AMERICAN CHEMICAL SERVICE, INC.

(FOR DETAILED SITE, SEE DWG. S2 of 2)

AVENUE

G. T. R. R.

CHESAPEAKE AND OHIO RAILROAD

AREA 1

EAST-WEST ℄ SEC 2-35-9 1335.0'

I-2 GENERAL INDUSTRIAL

SOUTH LINE SE 1/4 NE 1/4 SEC 2-35-9

NORTH LINE NE 1/4 SE 1/4 SEC 2-35-9

EAST LINE SE 1/4 NE 1/4 SEC 2-35-9

C. & O. R. R.

C. & O. R. R.

MW-3

AREA 2B1

AREA 2B2

TOWN OF GRIFFITH SANITARY LANDFILL

I-2 GENERAL INDUSTRIAL

MW-1

OFF SITE DRUM CONTAINMENT AREA

AREA 2

AREA 2C

C

NOTE: TOPO TAKEN FROM TOWN OF GRIFFITH - DWG. 99-D TORRENCA ENGINEERING 8-6-75

MW-2

COLFAX

AUSTGEN

I-1 LIGHT INDUSTRIAL

SINGLE FAMILY RESIDENCES

CHICAGO AND ERIE RAILROAD

D

KAPICA DUMP SITE

L

J & H KAPICA

AREA 2A

O

REDER ROAD

TOWN OF GRIFFITH

AUSTGEN'S INDUSTRIAL PARK

SITE BOUNDARY PLUS 1000.0'

N

SCALE 1" = 100'-0"

MAP 1

LEGEND

- Boundary of AREA 1
- AREA 1A
- Boundary of AREA 2
- Boundary of AREA 2A
- Boundary of AREA 2B1
- AREA 2B2
- Boundary of AREA 2C
- Boundary of AREA 3

A.C.S. DRAWING USED AS A BASE MAP FOR THIS DRAWING 3/85

CONFIDENTIAL

american chemical Service, Inc.
P.O. BOX 190 - GRIFFITH, INDIANA

G. DALE LOLLIS, ARCHITECT
12480 - 96th AVENUE, ST. JOHN, INDIANA

G. DALE LOLLIS REGISTERED NO. 2859 STATE OF INDIANA ARCHITECT

no	revision	date	no	revision	date

L-234 8-9-82

AMERICAN CHEMICAL

S1 of 2

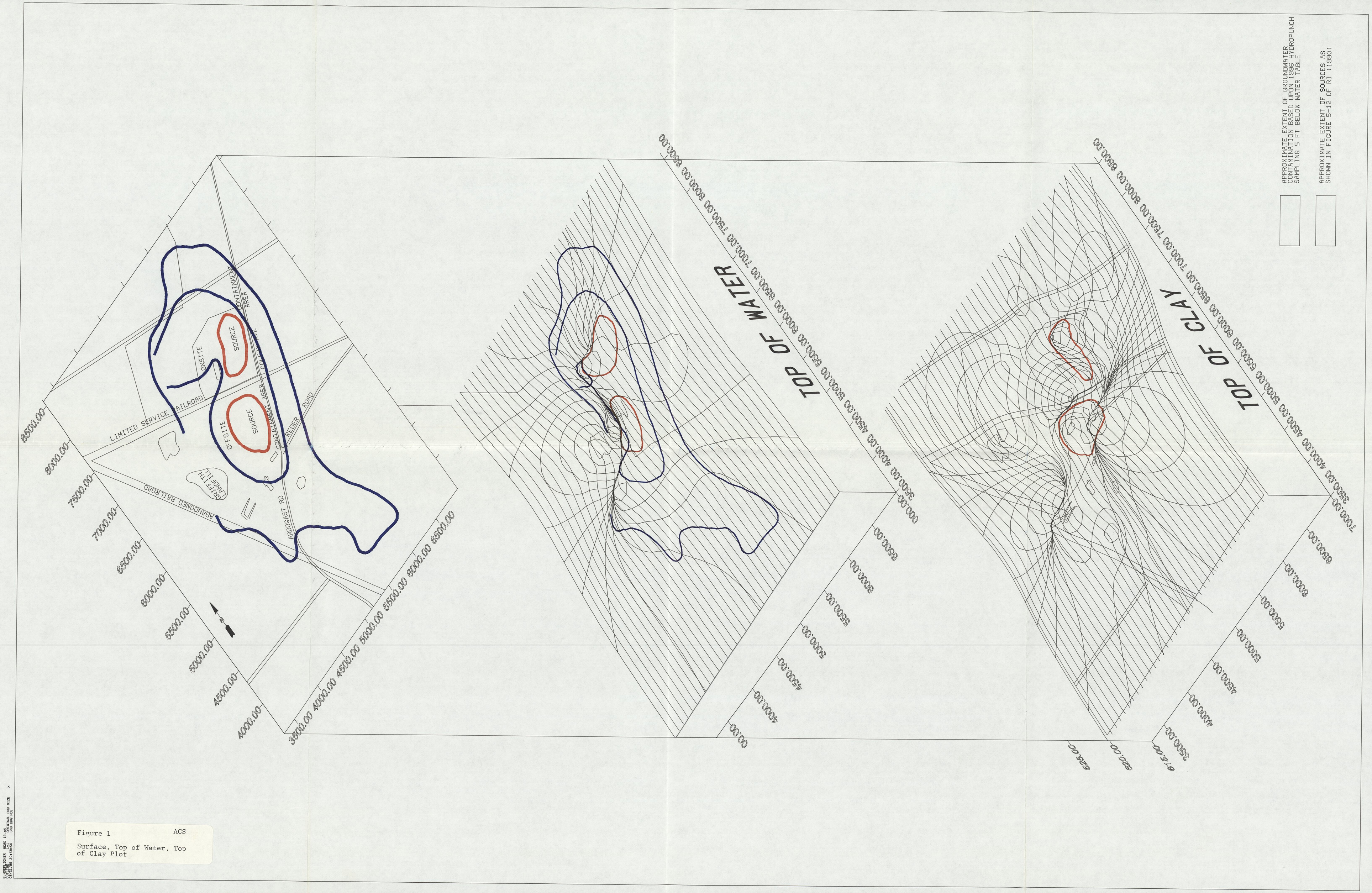


Figure 1 ACS

Surface, Top of Water, Top of Clay Plot

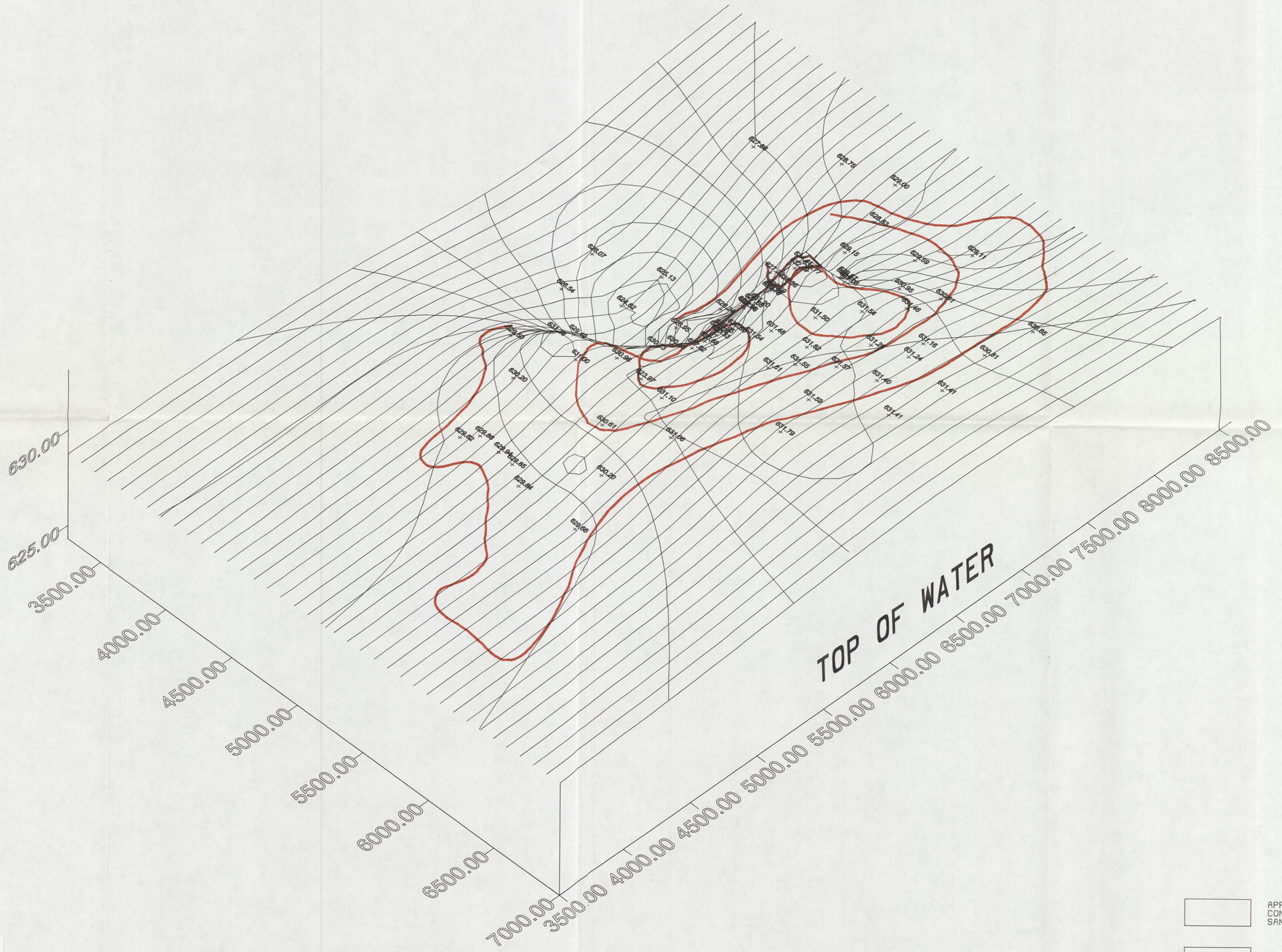


Figure 2 ACS

Top of Water Detail

APPROXIMATE EXTENT OF GROUNDWATER CONTAMINATION BASED UPON 1996 HYDROPUNCH SAMPLING 5 FT BELOW WATER TABLE

APPROXIMATE EXTENT OF SOURCES AS SHOWN IN FIGURE 5-12 OF RI (1990)

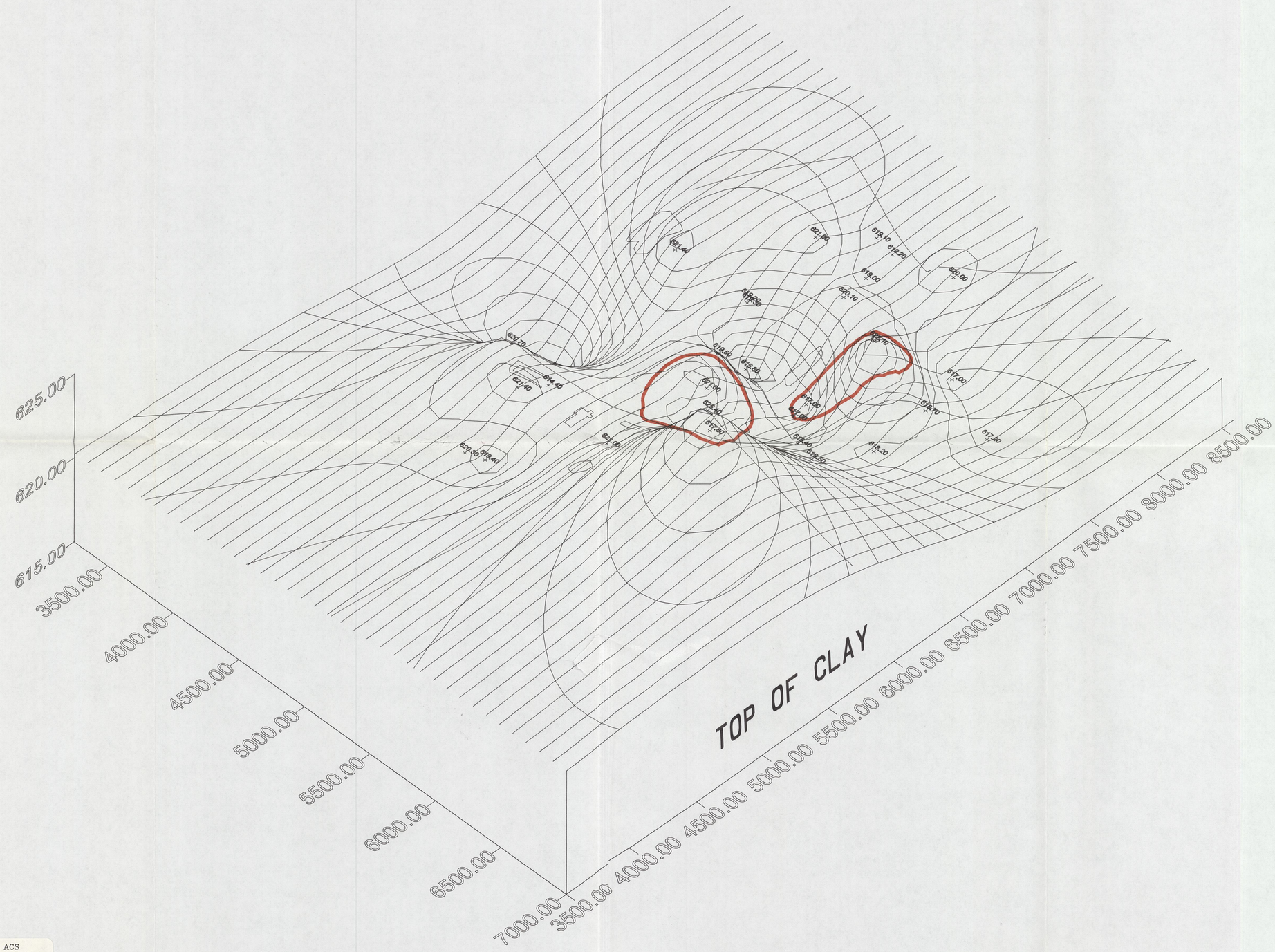


Figure 3

Top of Clay Detail

ACS

71870-001
ACRO 10-07
1:1
DATE: TIME: