

**INSTALLATION RESTORATION PROGRAM
TWIN CITIES ARMY AMMUNITION PLANT**

1988
8851

ANNUAL MONITORING REPORT - VOLUME II

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SEPTEMBER 1989

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VOLUME II (continued)

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H-1 01U628A 01U617 01U627A 01U626A 01U625A
H-2 01L811 01U806 01U805 01U808 01U803
H-3 01L813
H-4 01L816 01L821 01L822 01L823 01U072
H-5 01U011 01U035 01U034 01U122 01U101 01U100
H-6 01U052 01U605 01U065 01U128 01U047 01U048
H-7 01U098 01U060
H-8 01U130 01U050 01U051 01U524 01U527 01U062
H-9 01U526 01U525 01U003 01U054 01U634
H-10 01U603 01U604 01U612 01U615 01U624B 01U616
H-11 01U607 01U611 01U601 01U609 01U613 01U033
H-12 01U621 01U620 01U618 01U623 01U619
H-13 01U652 01U631 01U632 01U642 01U064

I. UNIT 3 GROUNDWATER HYDROGRAPHS

I-1 03L002 03U021 03F305 03U700 03F304 03U671
I-2 03L010 03U011 03U082 03U022 03U023
I-3 03L012 03U025 03U083 03U088 03U089
I-4 03L014 03L081 03L086 03U099 03U006 03L005
I-5 03L028 03U647 03U659 03U658 03U004 03L832
I-6 03L029 03U301 03U674 03L003 03U672
I-7 03L078 03F303 03U703 03F302 03L079 03U710
I-8 03L806 03U711 03U804 03U801 03L802
I-9 03L811 03L809 03U803 03L673 03L841 03L848
I-10 03L813 03U856 03M843 03L859 03L854 03L860
I-11 03L853 03U821 03L822 03U824 03U831 03L861
I-12 03L858
I-13 03U009 03U008 03U129 03U707 03U111 03U097
I-14 03U015 03L091 03U090 03U112 03U121 03U019
I-15 03U024 03U706 03U704 03U705 03U016 03L007
I-16 03U031 03L017 03L020 03L027 03L080 03U030
I-17 03U087 03U521 03U032 03U124 03L113
I-18 03U096 03U093 03L018 03U026 03U092 03U094
I-19 03U702 03U701 03F307 03L077 03F306 03L832

VOLUME II (continued)

J. UNIT 4 GROUNDWATER HYDROGRAPHS

J-1 04U001 04U701 04U702 04U077 04U806 04U709
J-2 04U002 04U711 04U802 04U003 04U673
J-3 04U843 04U821 409595 04U861
J-4 04U847 04U841 04U848
J-5 04U850 04U877 04U851 04U852
J-6 04U859 04U845 04U854 04U860
J-7 04U875 04U880 04U881 04U882
J-8 04U879 04U871 04U872 04U883
J-9 409595 409598 117NB 409596 04U844 04U832
J-10 PJ#74 PJ#508 04U020 04U027
J-11 PJ#501 PJ#502 PJ#503 PJ#506 PJ#507

K. MONITOR WELL NEST GROUNDWATER HYDROGRAPHS

K-1 01L821 03U821 04U821
K-2 01L822 03L822 03U822
K-3 01U011 03U011
K-4 01U012 03L012 03M012 03U012 04U012
K-5 01U624B 01U624D 01U624C
K-6 01U625A 01U625B 01U625C 01U625D
K-7 01U626A 01U626B 01U626C 01U626D
K-8 01U627A 01U627B 01U627C 01U627D
K-9 01U628A 01U628B 01U628C 01U628D
K-10 01U803 03U803
K-11 03L001 03M001 03U001 04U001
K-12 03L002 03M002 03U002 04U002
K-13 03L003 03M003 03U003 04U003 PJ#003
K-14 03L004 03M004 03U004
K-15 03L005 03M005 03U005
K-16 03L007 03M007 03U007 04U007
K-17 03L010 03M010 03U010
K-18 03L013 03M013 03U013
K-19 03L014 03U014
K-20 03L017 03M017 03U017
K-21 03L018 03U018
K-22 03L020 03M020 03U020 04U020
K-23 03L021 03U021

VOLUME II (continued)

K-24 03L027 03U027 04U027 PJ#027
K-25 03L028 03U028
K-26 03L077 03U077 04U077
K-27 03L078 03U078
K-28 03L802 03M802 04U802 PJ#802
K-29 03L806 03M806 03U806 04U806 PJ#806
K-30 03L832 03U832 04U832
K-31 03L841 04U841
K-32 03L848 03M848 04U848
K-33 03L859 04U859
K-34 03L860 04U860
K-35 03L861 04U861

L. UNIT 1 GROUNDWATER QUALITY ISOCONCENTRATION MAPS - ORGANICS

L-1 Unit 1 Total VOCs Isoconcentrations (Q16)
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VOLUME II (continued)

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VOLUME III

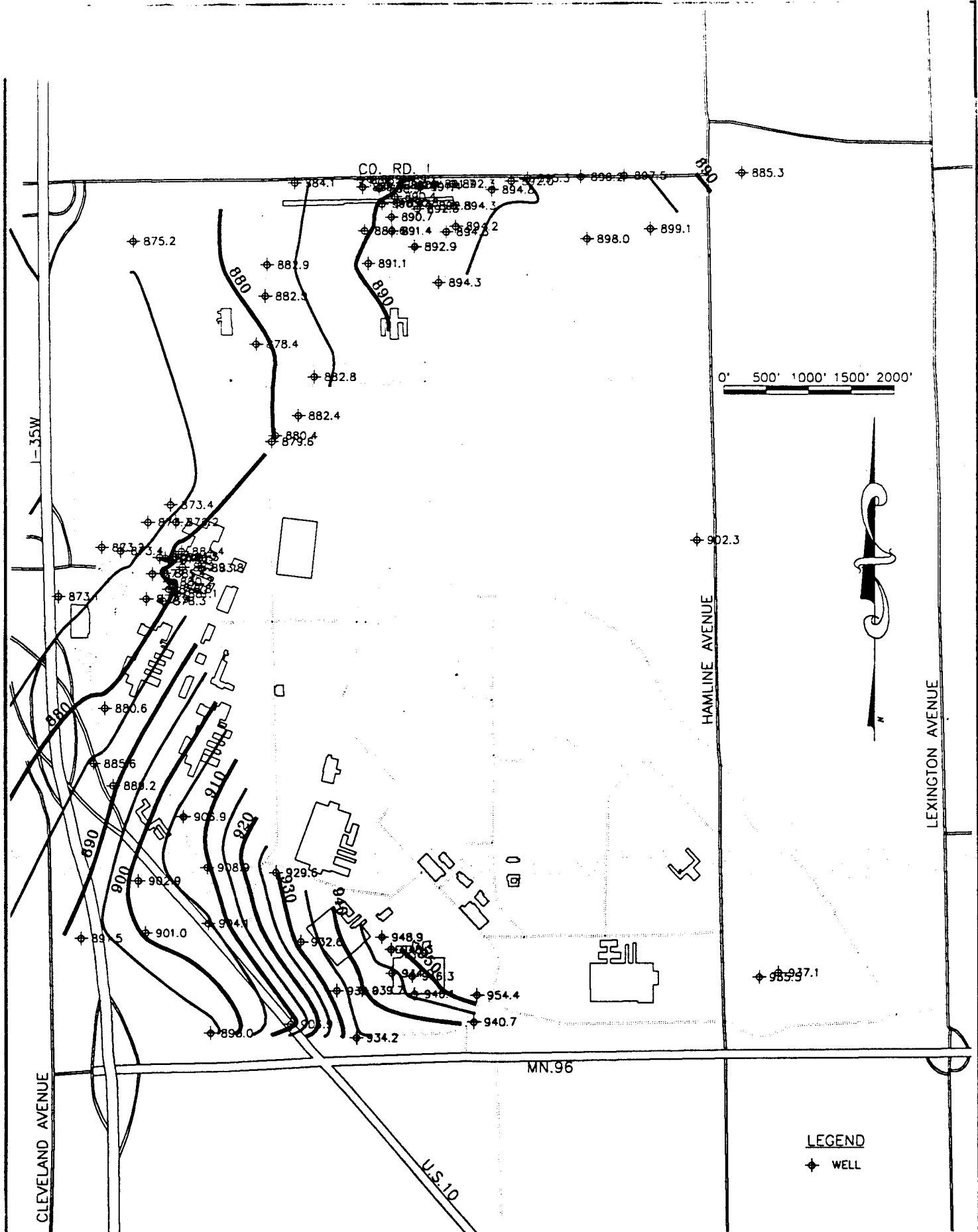
APPENDICES

- A 1987 GROUNDWATER MONITORING PLAN, SCOPE OF WORK
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- C 1989 QUARTER 22 MONITORING PLAN, SCOPE OF WORK
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- J. NPDES SURFACE WATER SAMPLING NUMBER/LETTER CROSS REFERENCE LIST

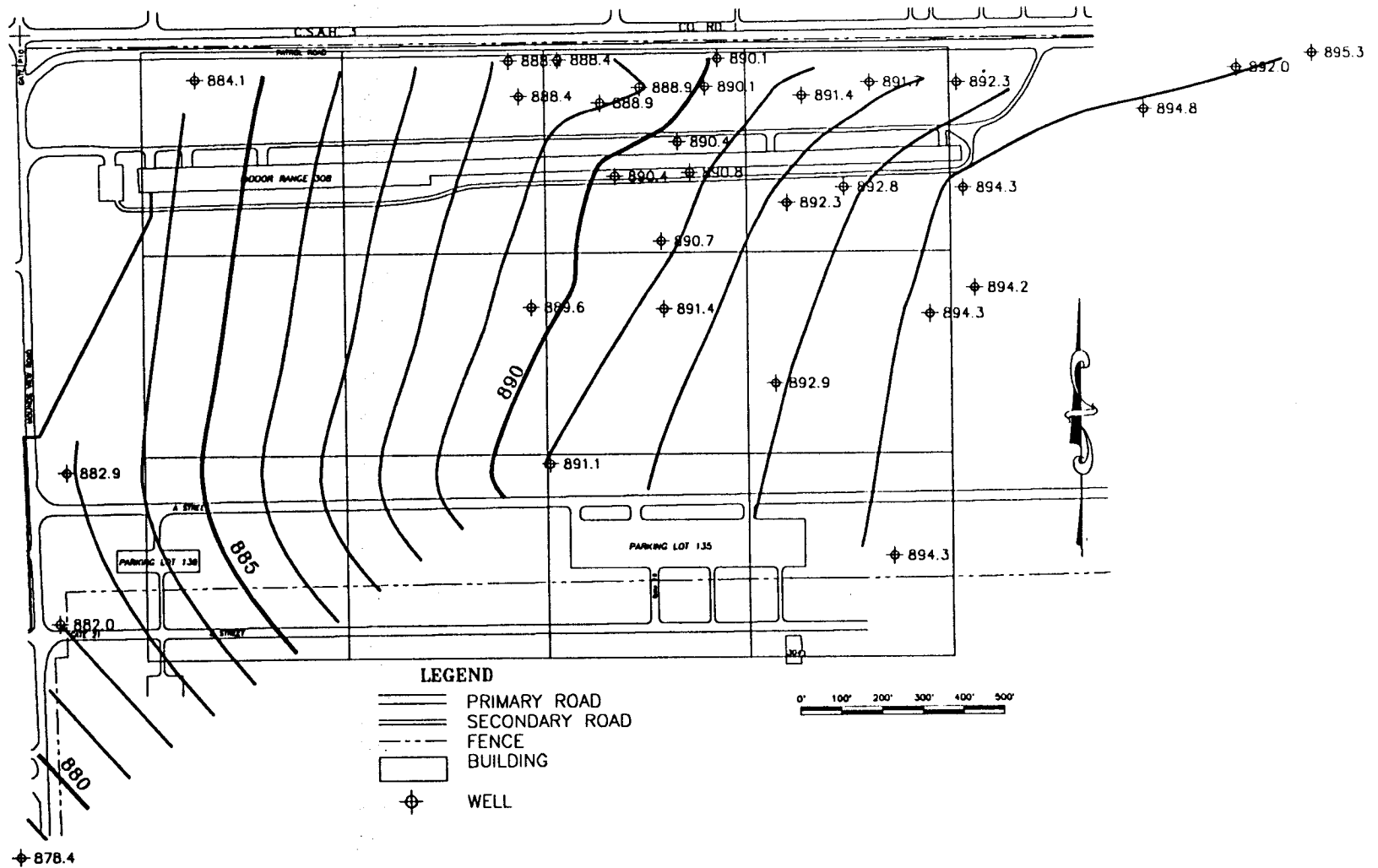
E. UNIT 1 GROUNDWATER LEVEL MAPS



TWIN CITIES ARMY AMMUNITION PLANT
 Groundwater Level Map Unit 1 Quarter 16

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 Fig. E-1



TWIN CITIES ARMY AMMUNITION PLANT

Groundwater Level Map Unit 1 (Site A Area) Quarter 16



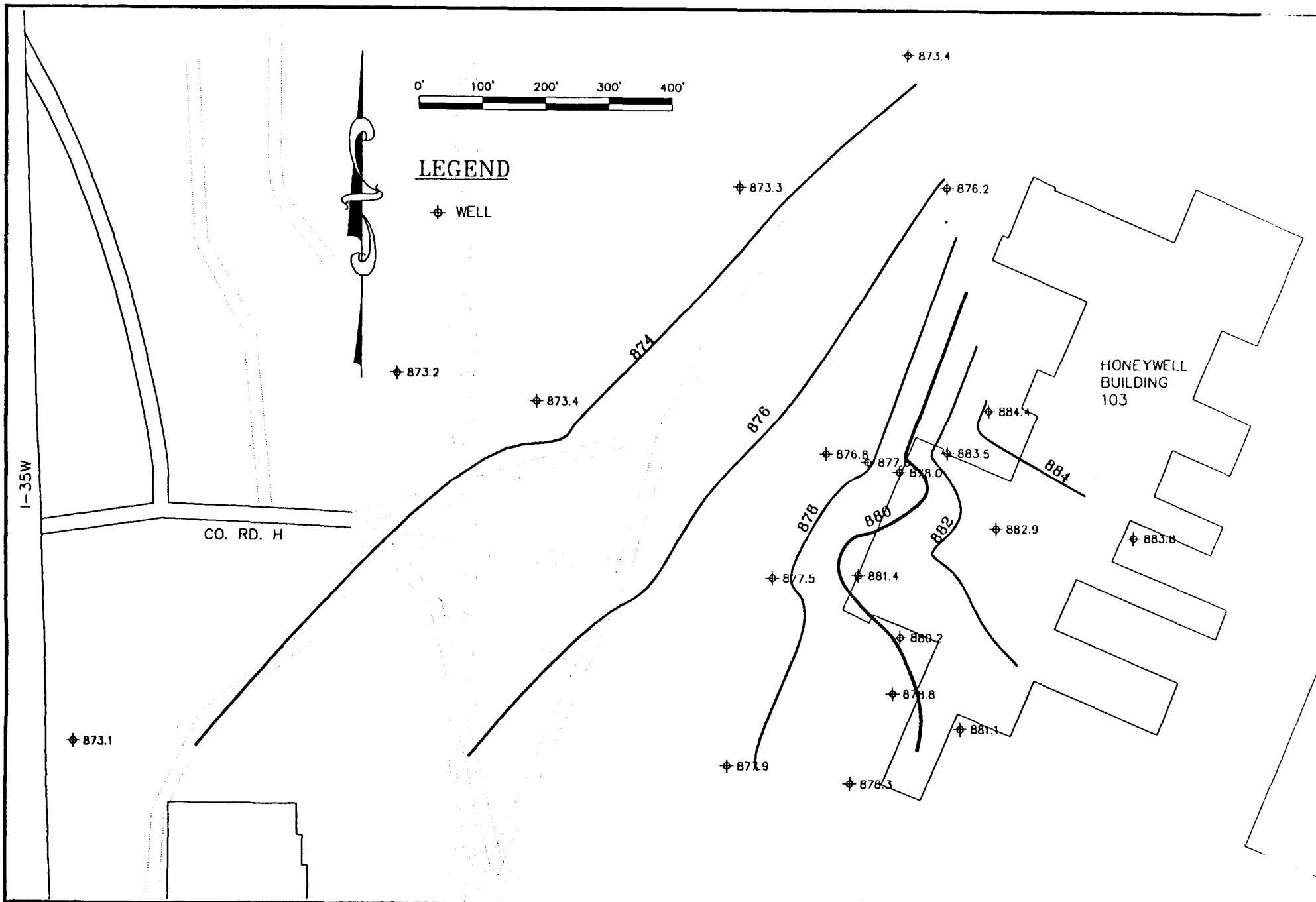
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Sheet 1 of 2

Fig. 1-2



TWIN CITIES ARMY AMMUNITION PLANT

Groundwater Level Map Unit 1 (Honeywell building 103 Area) Quarter 16

W

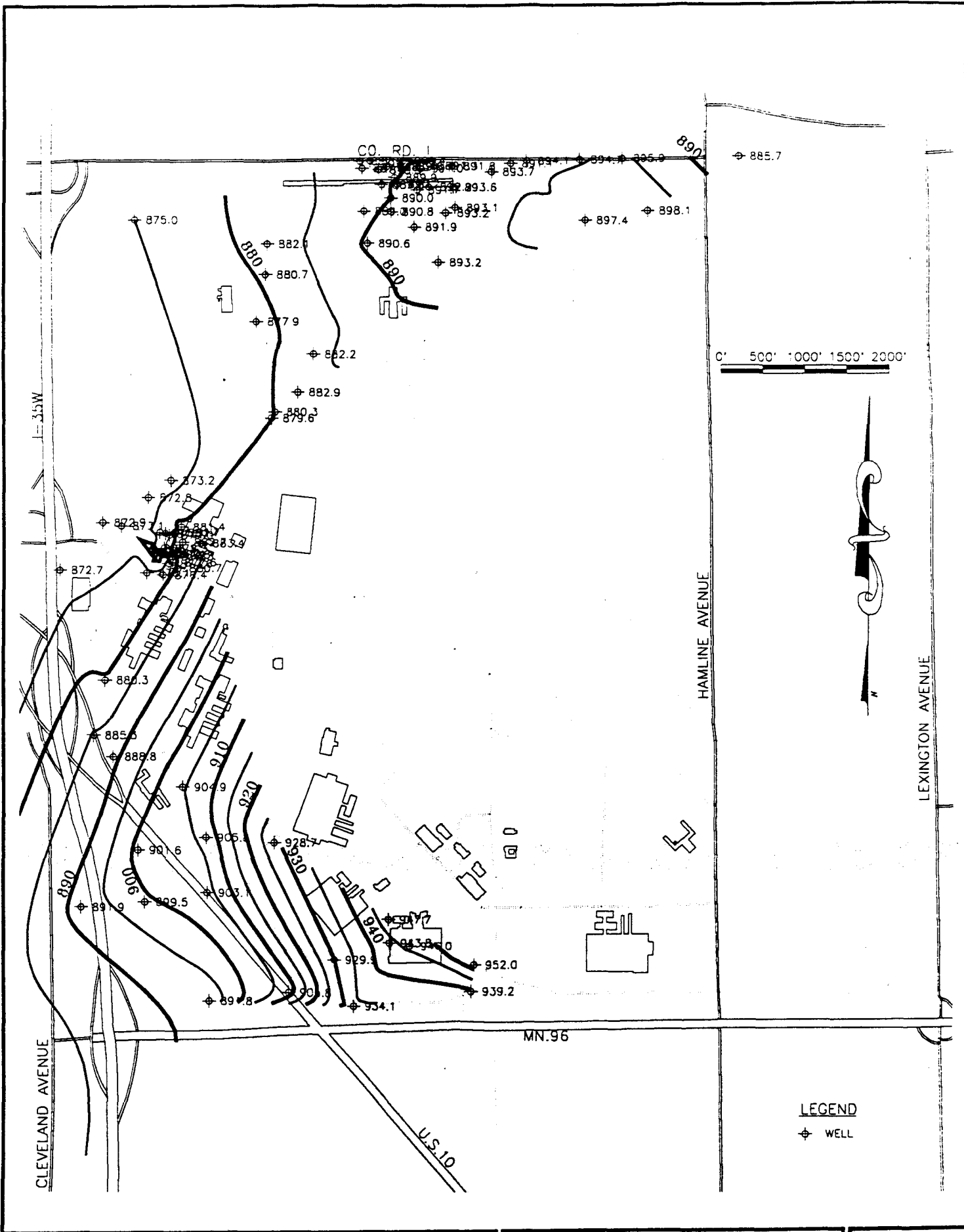
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Fig. E-3



TWIN CITIES ARMY AMMUNITION PLANT

Groundwater Level Map Unit 1 Quarter 17



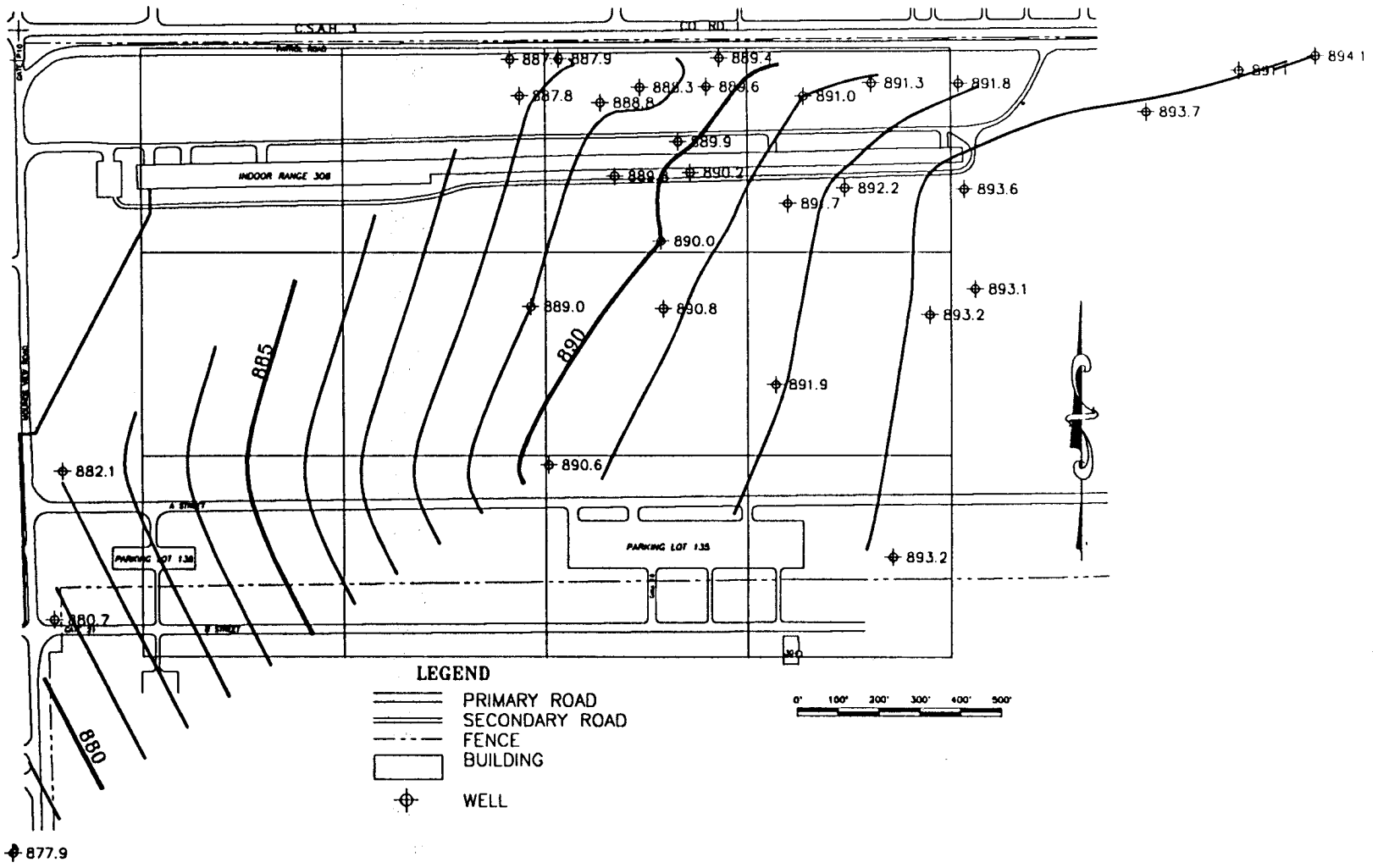
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




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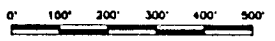
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Fig. E-4



LEGEND

-  PRIMARY ROAD
-  SECONDARY ROAD
-  FENCE
-  BUILDING
-  WELL



TWIN CITIES ARMY AMMUNITION PLANT

Groundwater Level Map Unit 1 (Site A Area) Quarter 17



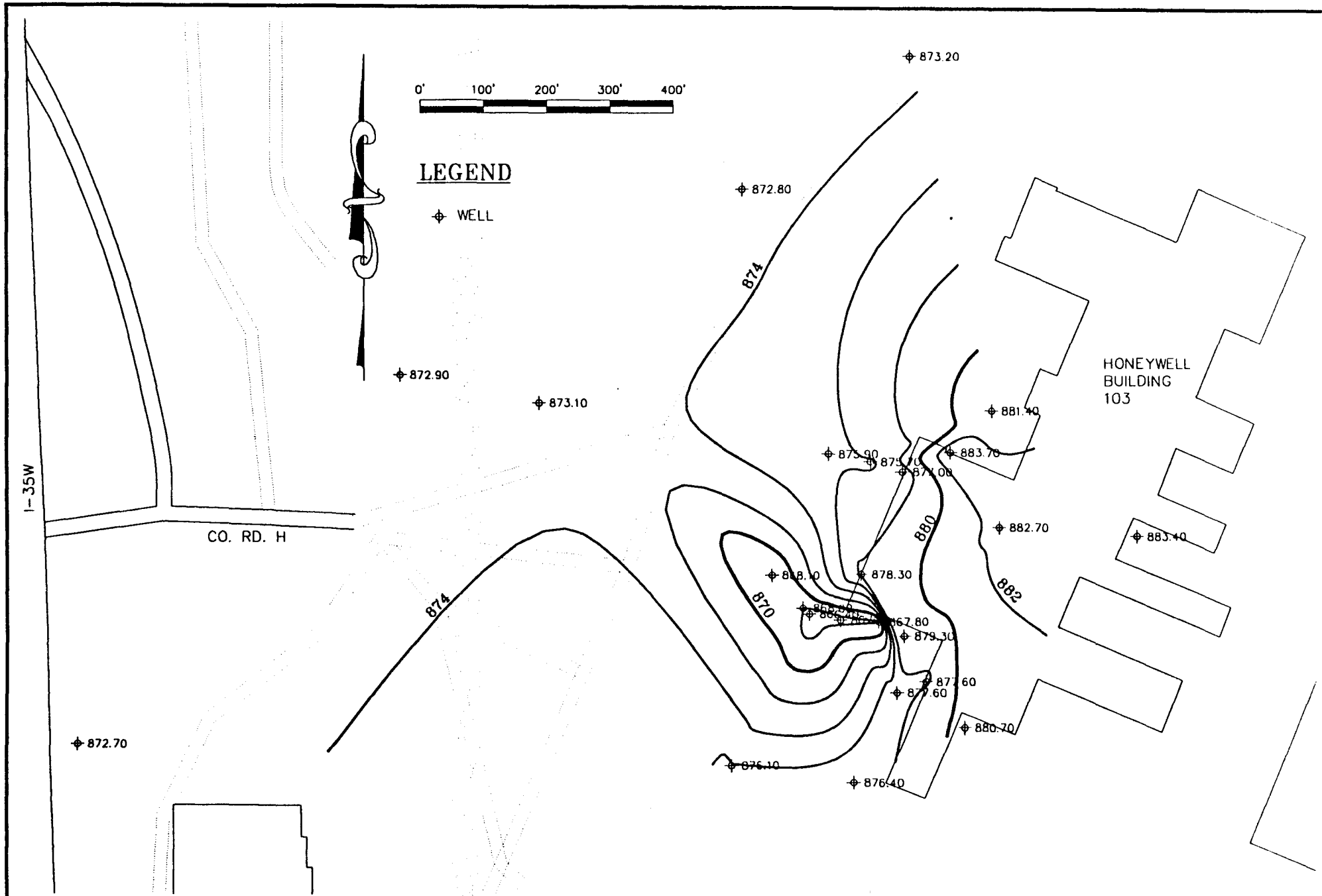
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Fig. E-5



TWIN CITIES ARMY AMMUNITION PLANT

Groundwater Level Map Unit 1 (Honeywell building 103 Area) Quarter 17



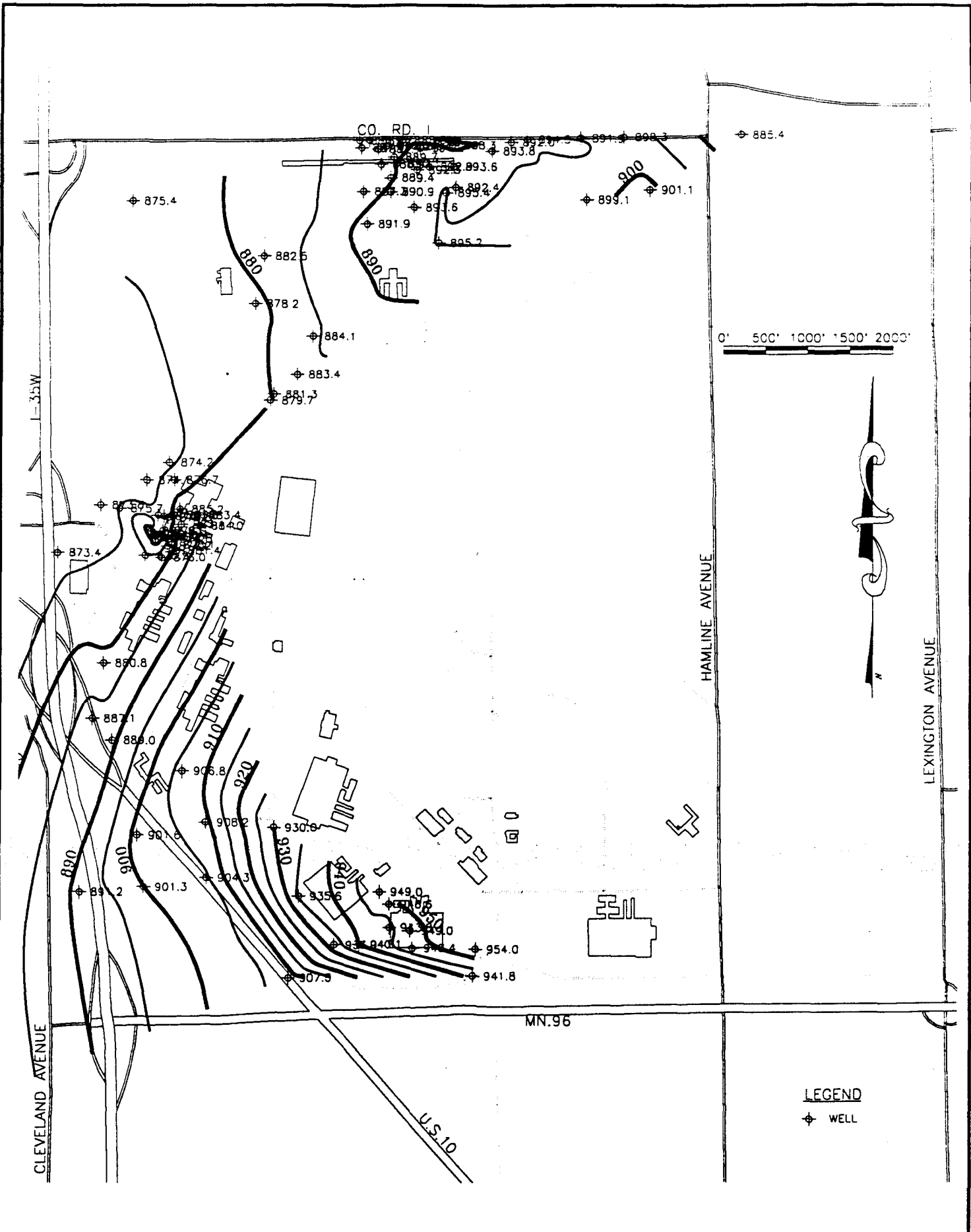
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Fig. E-6



TWIN CITIES ARMY AMMUNITION PLANT

Groundwater Level Map Unit 1 Quarter 18



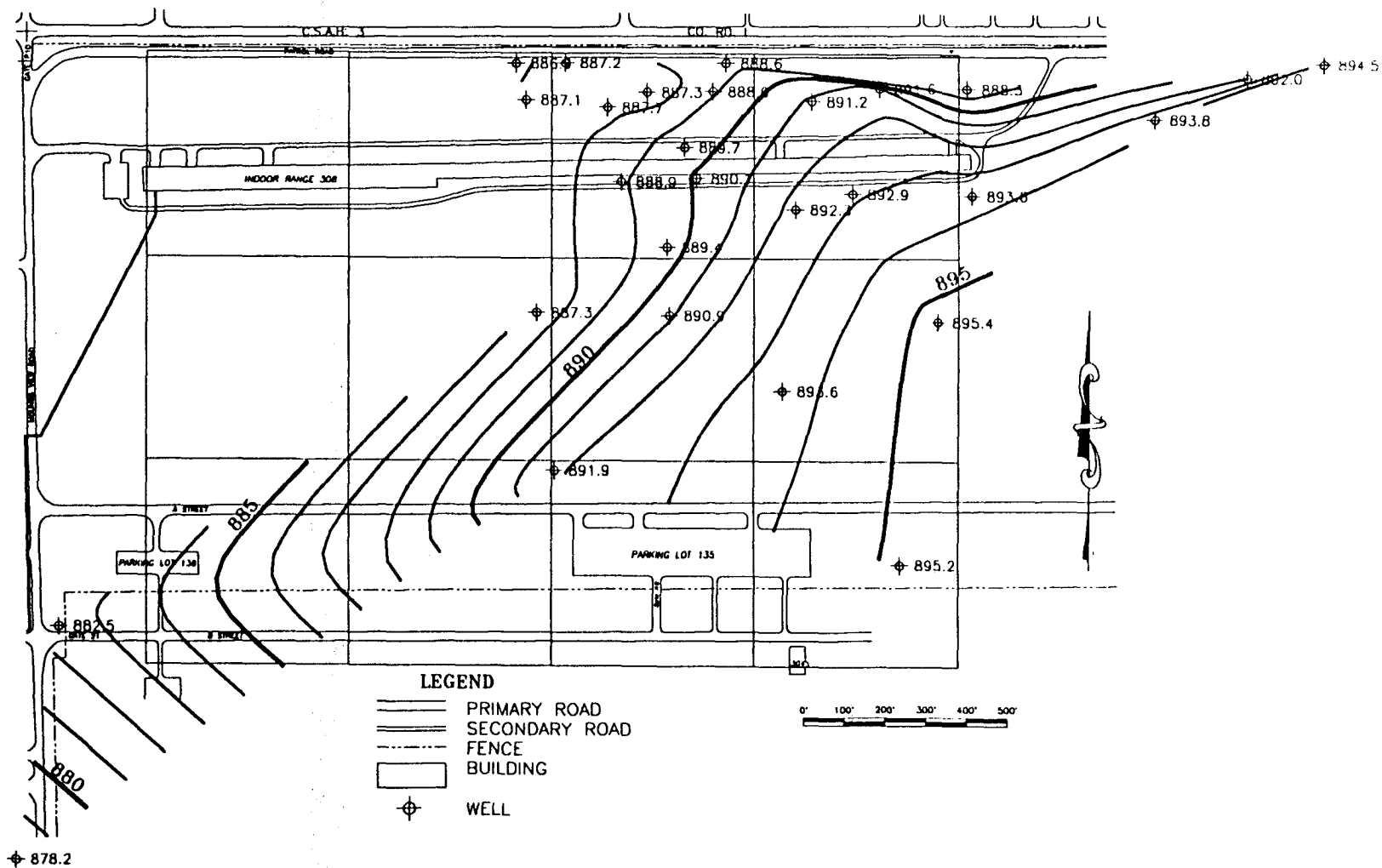
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Fig. E-7



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Groundwater Level Map Unit 1 (Site A Area) Quarter 18



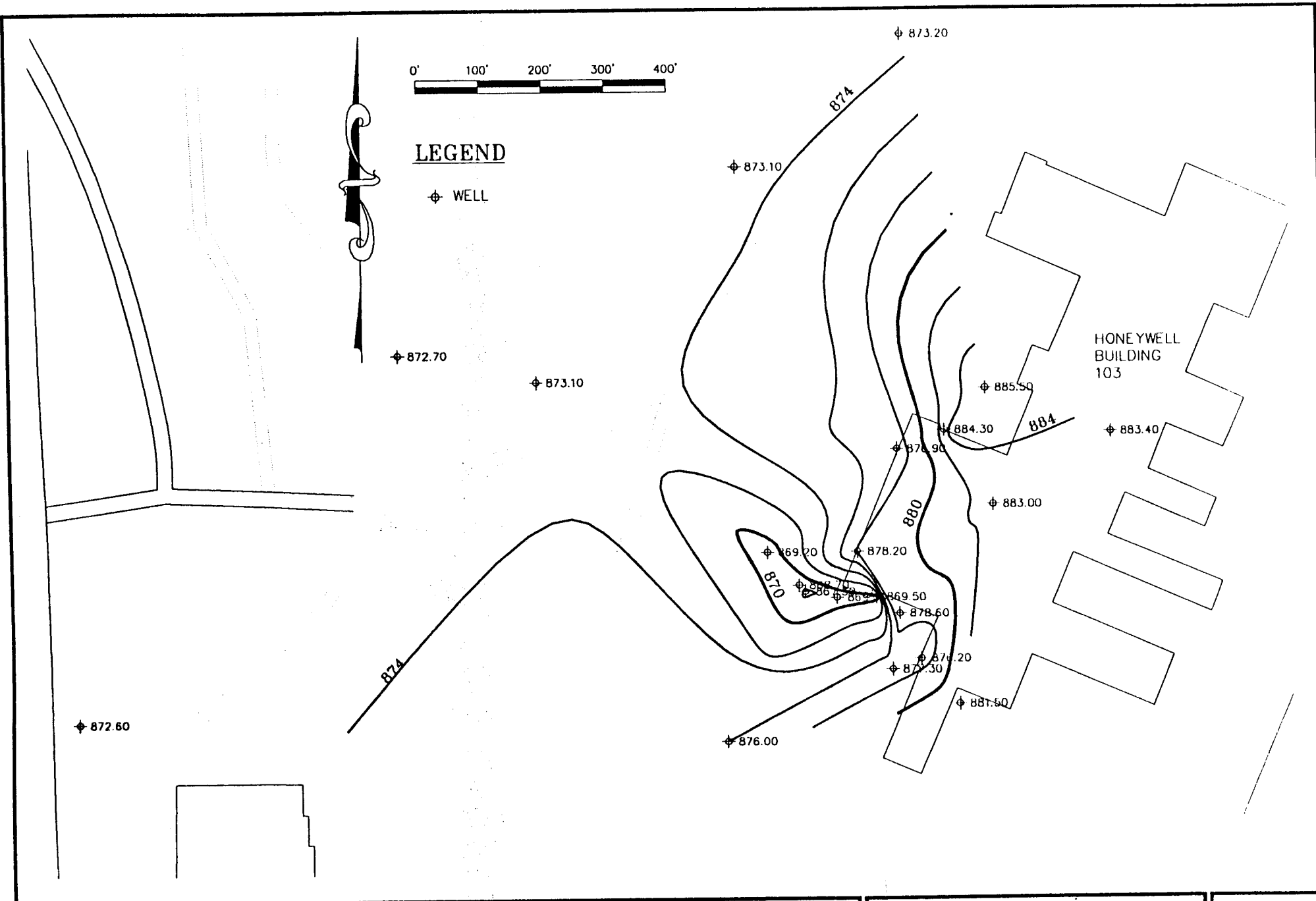
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Fig. E-8



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Groundwater Level Map Unit 1 (Honeywell building 103 Area) Quarter 18



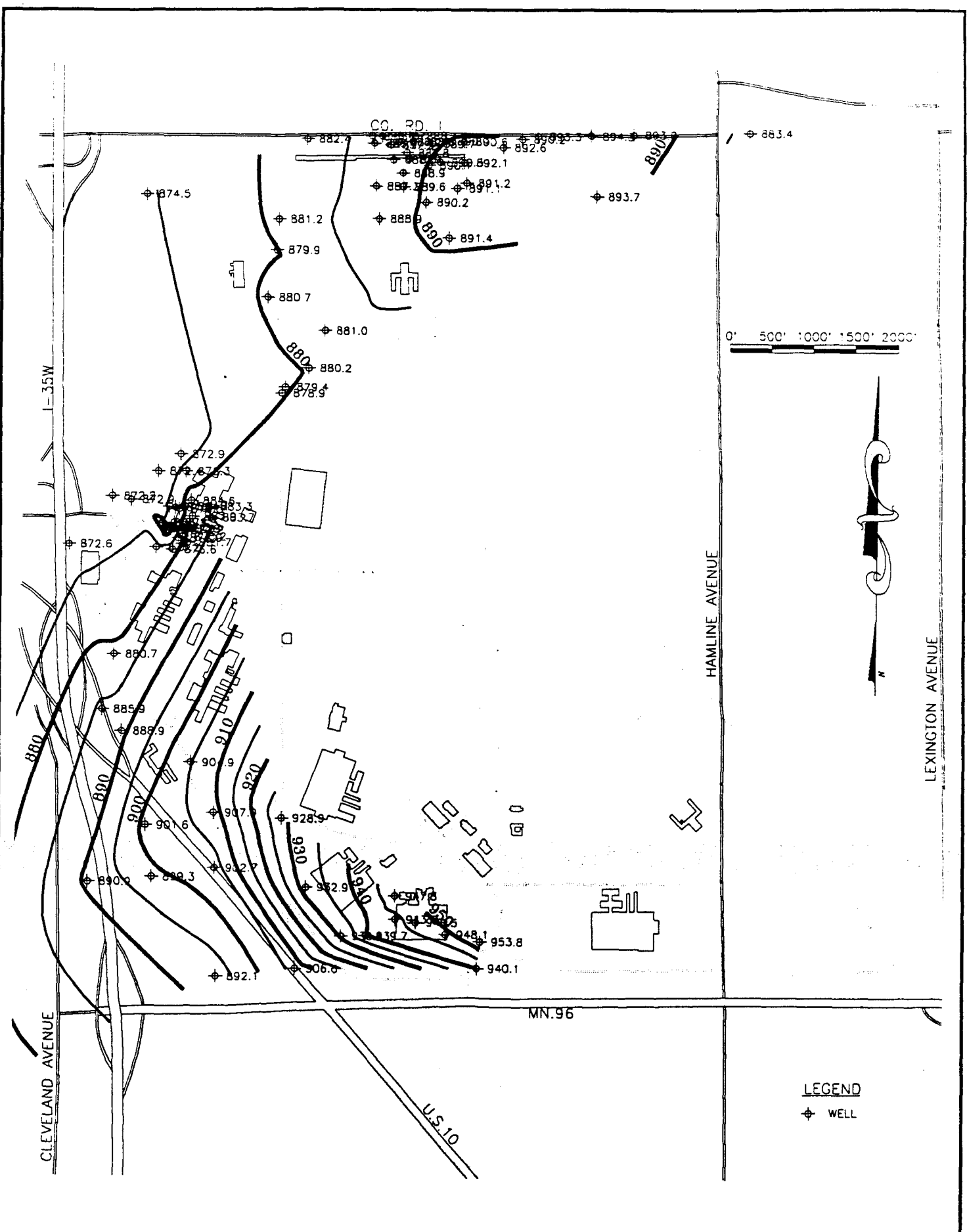
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Fig. E-9

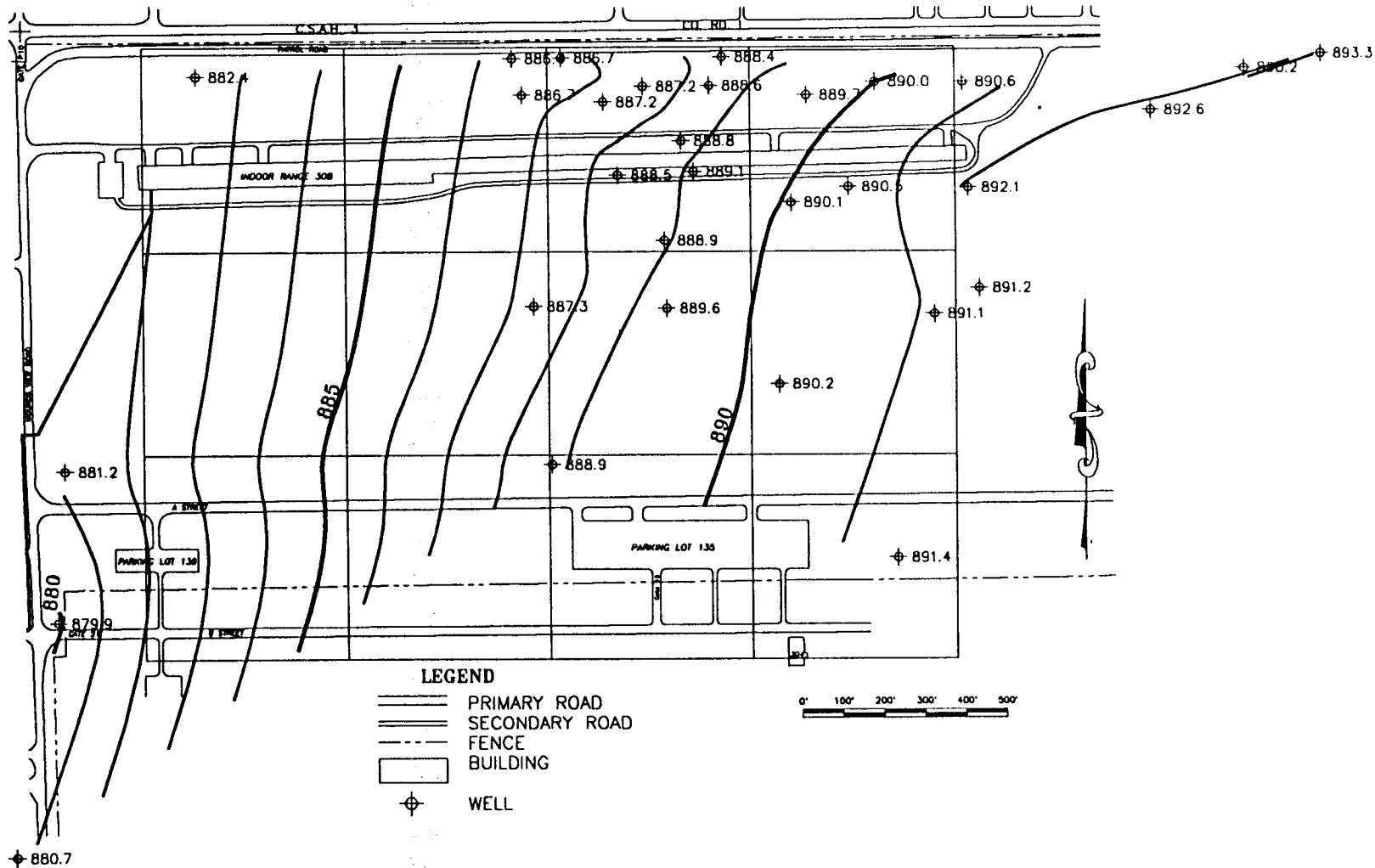


TWIN CITIES ARMY AMMUNITION PLANT
 Groundwater Level Map Unit 1 Quarter 19

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 Fig. E-10

LEGEND
 ◆ WELL



TWIN CITIES ARMY AMMUNITION PLANT

Groundwater Level Map Unit 1 (Site A Area) Quarter 19



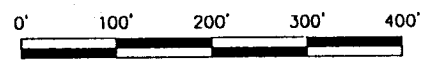
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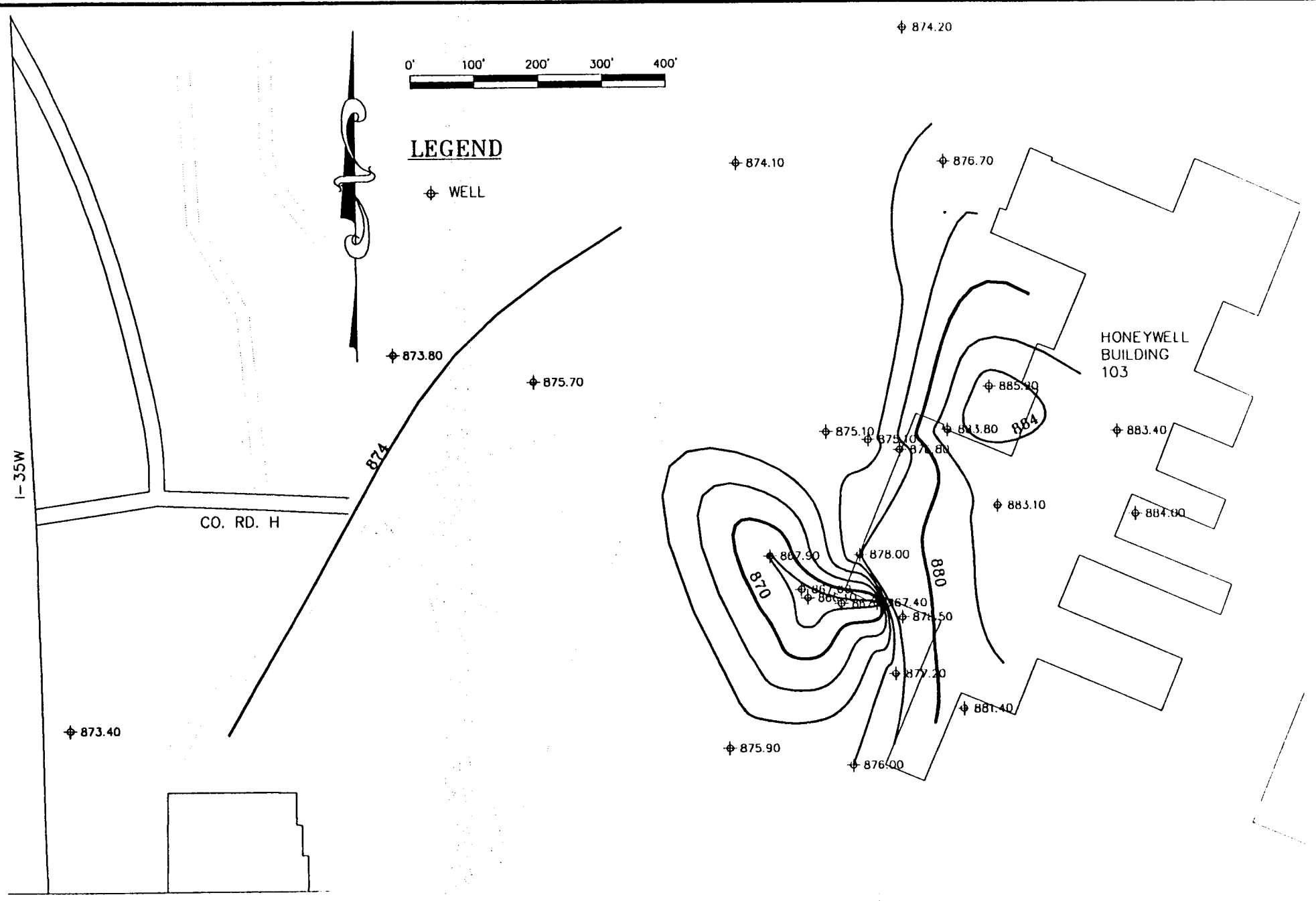
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Fig. E-11



LEGEND

⊕ WELL



TWIN CITIES ARMY AMMUNITION PLANT

Groundwater Level Map Unit 1 (Honeywell building 103 Area) Quarter 19

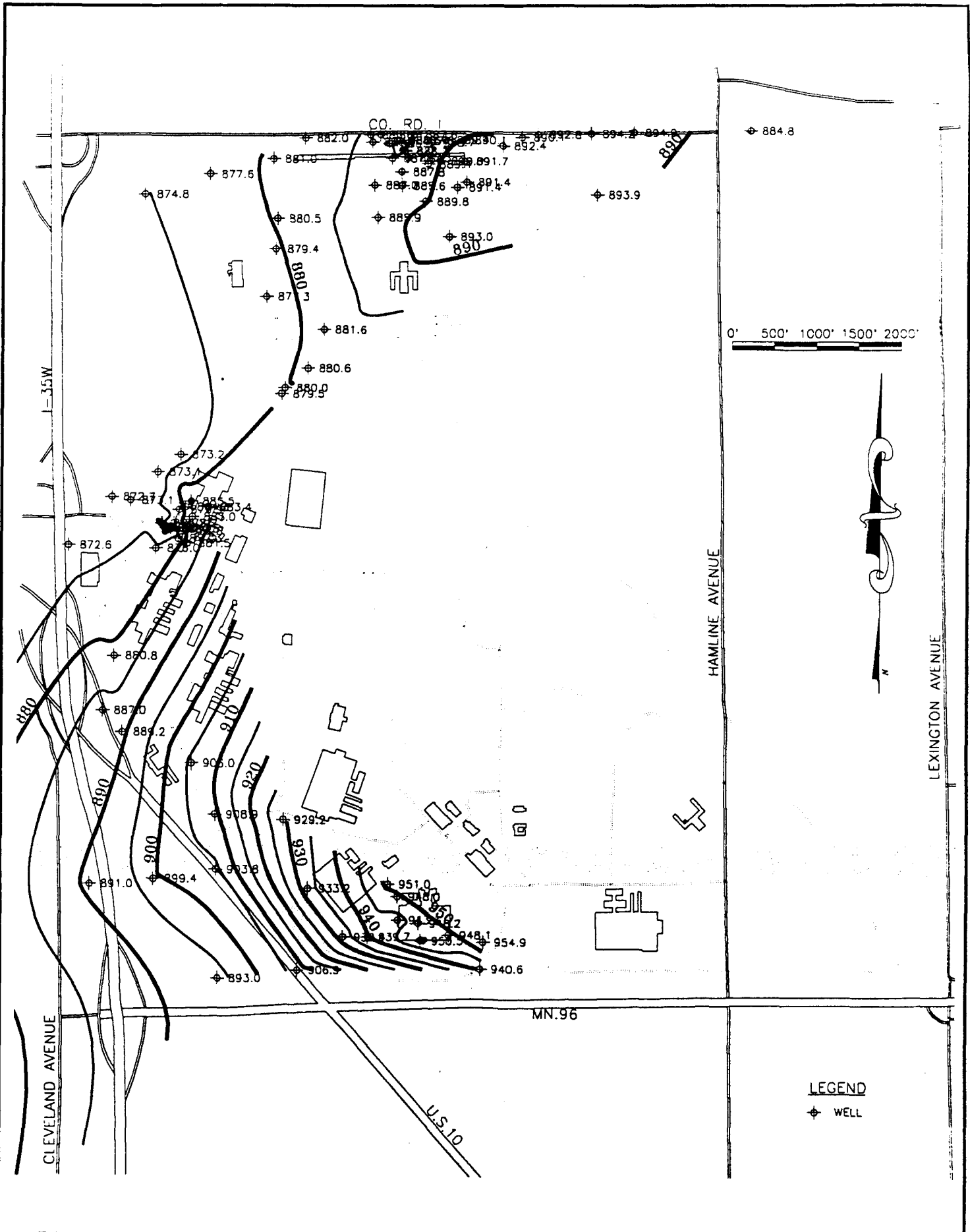


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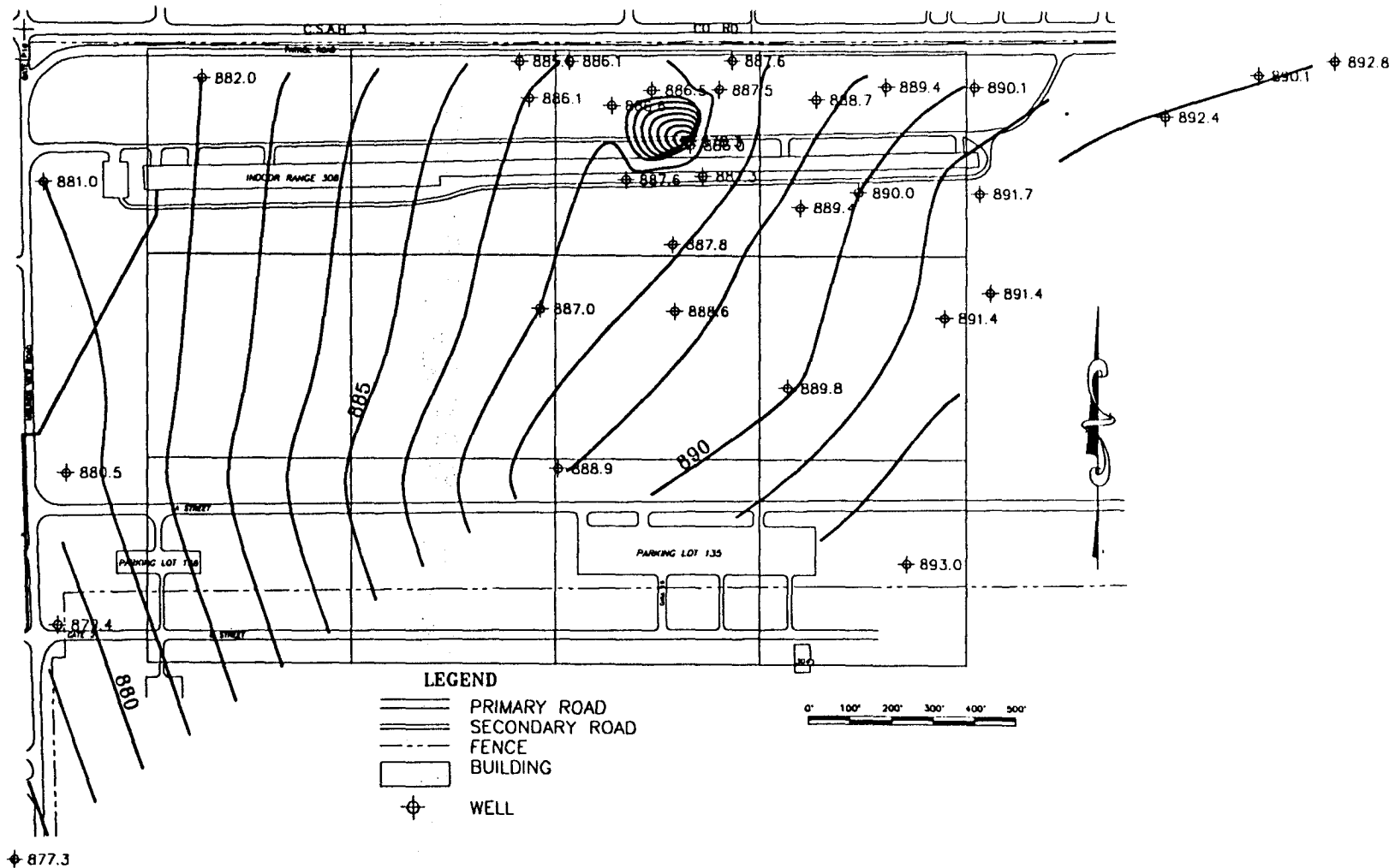
Fig. E-12



TWIN CITIES ARMY AMMUNITION PLANT
Groundwater Level Map Unit 1 Quarter 20

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Fig. E-13



TWIN CITIES ARMY AMMUNITION PLANT

Groundwater Level Map Unit 1 (Site A Area) Quarter 20



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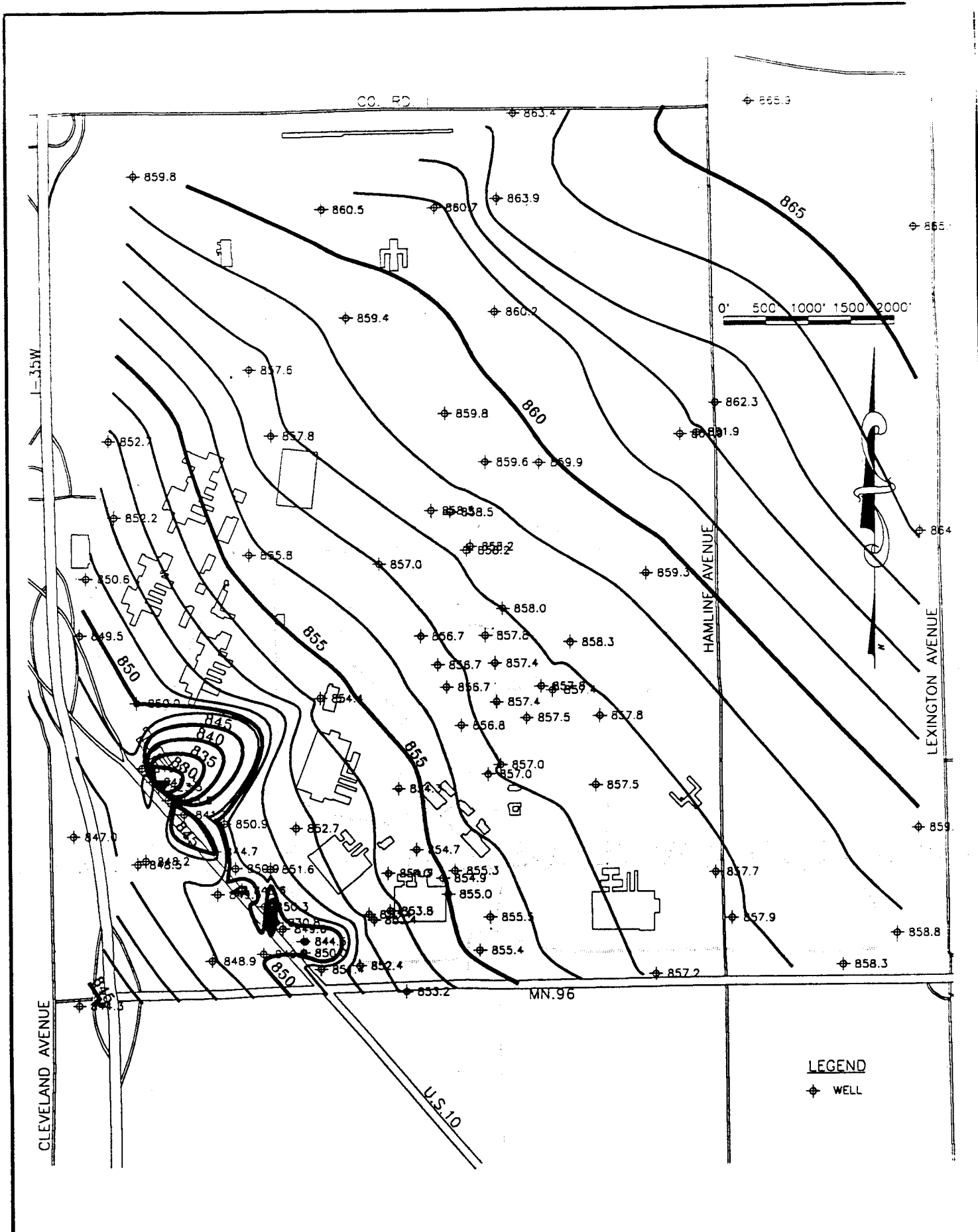
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Fig. E-14

F. UNIT 3 GROUNDWATER LEVEL MAPS



TWIN CITIES ARMY AMMUNITION PLANT

Groundwater Level Map Unit 3 Quarter 16



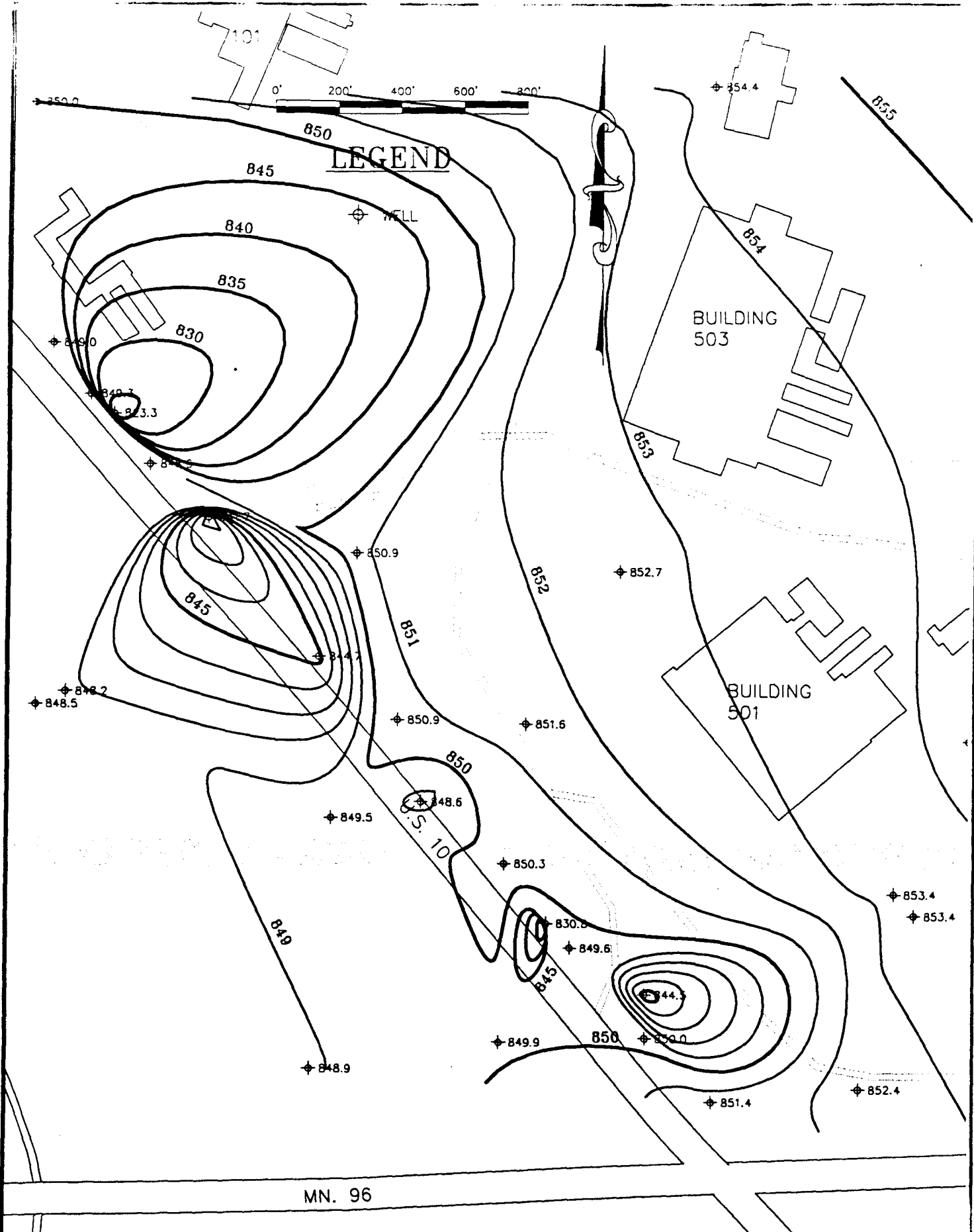
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Fig. F-1



TWIN CITIES ARMY AMMUNITION PLANT

Groundwater Level Map Unit 3 (BGRS Area) Quarter 16

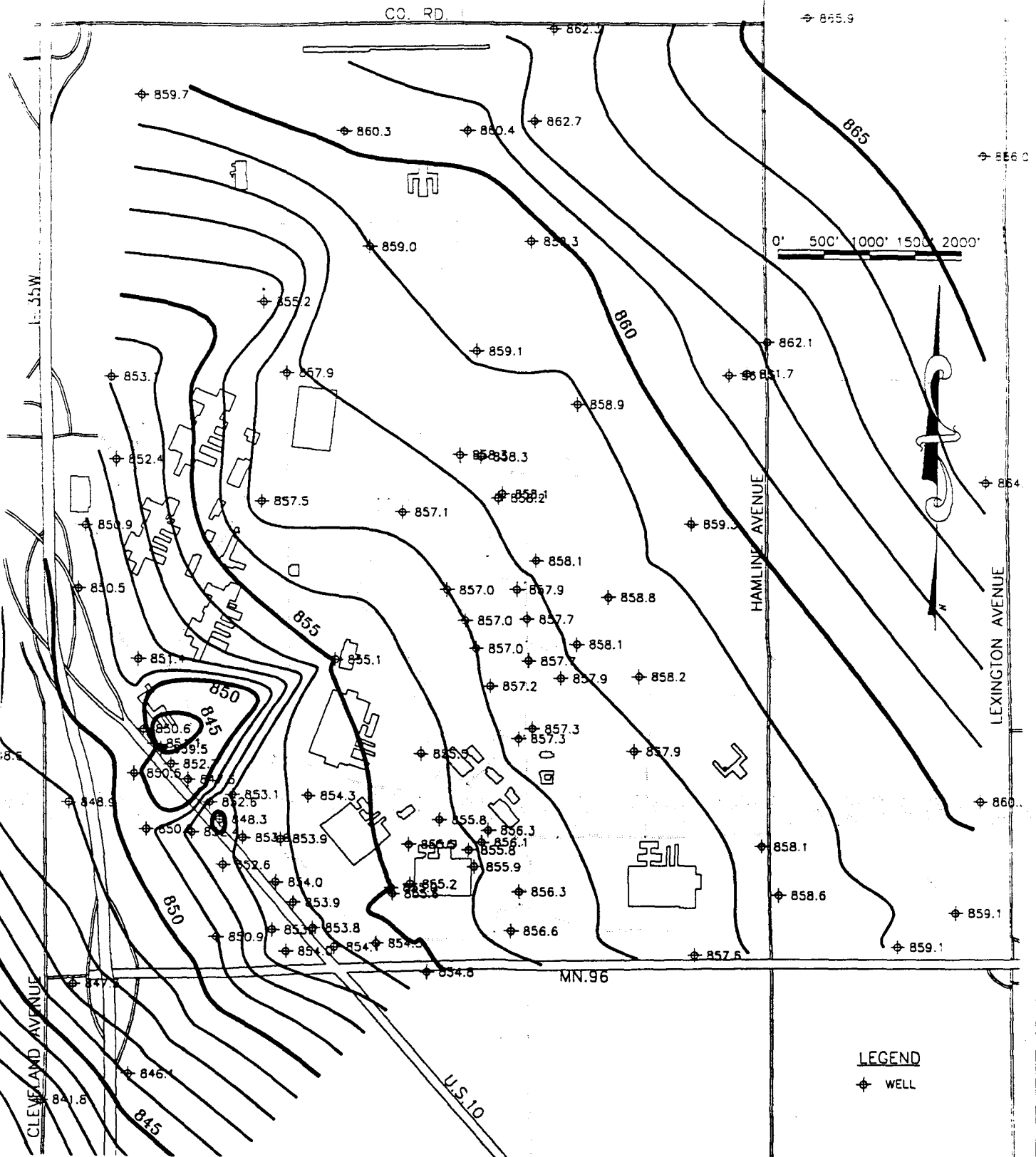
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Fig. F-2



TWIN CITIES ARMY AMMUNITION PLANT

Groundwater Level Map Unit 3 Quarter 18



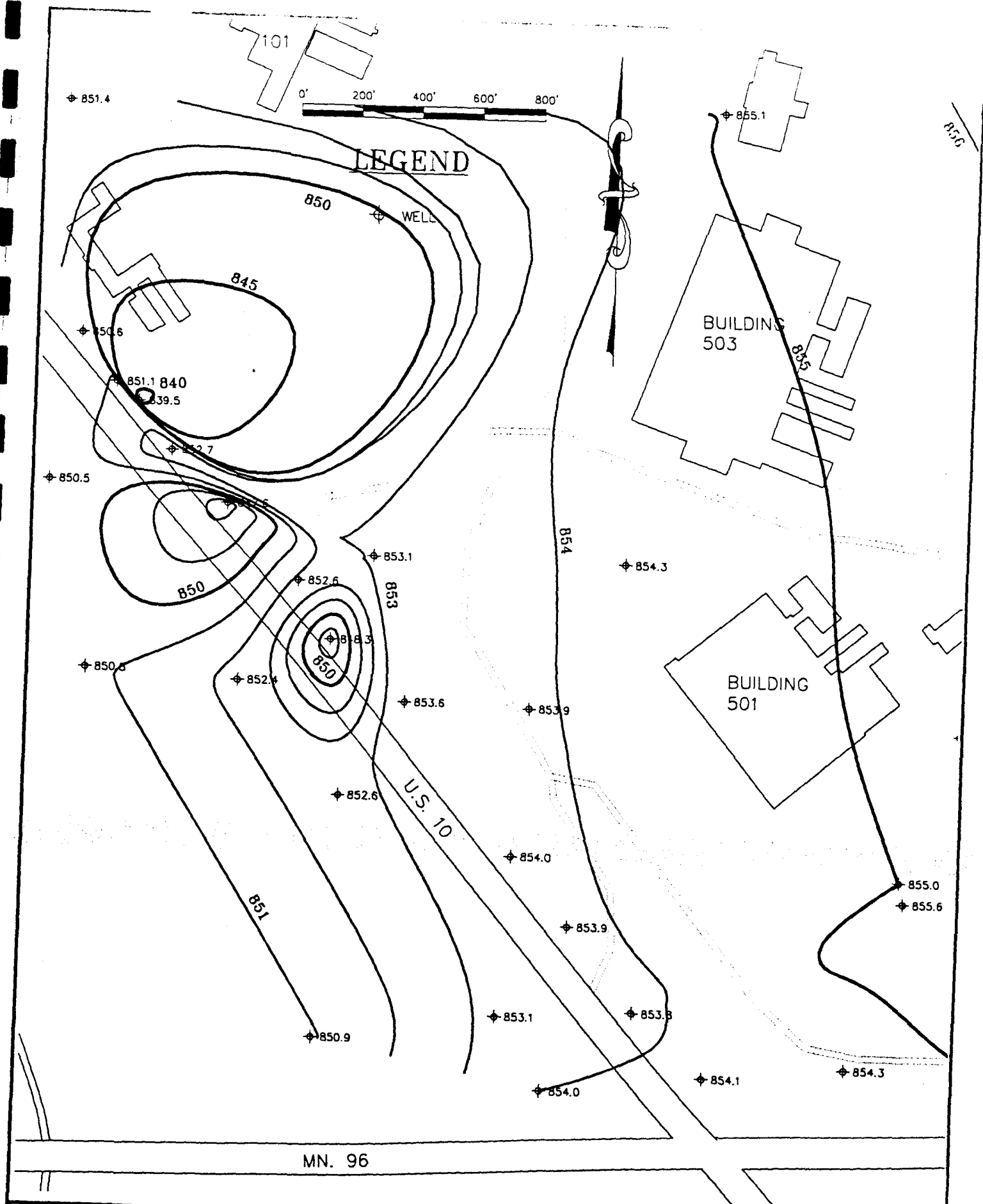
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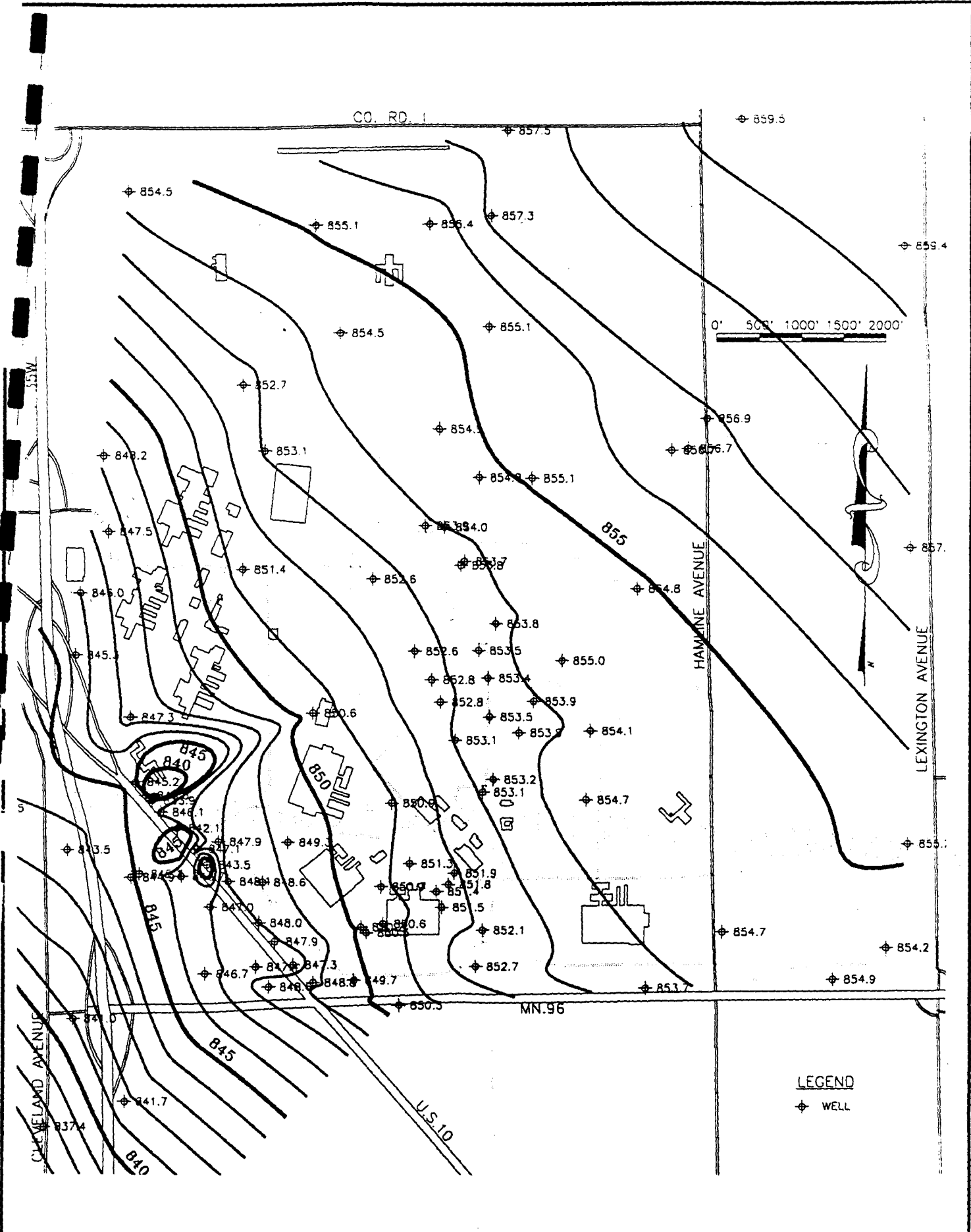
Fig. F-5



TWIN CITIES ARMY AMMUNITION PLANT
 Groundwater Level Map Unit 3 (BGRS Area) Quarter 18

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 Fig. F-6



TWIN CITIES ARMY AMMUNITION PLANT

Groundwater Level Map Unit 3 Quarter 19



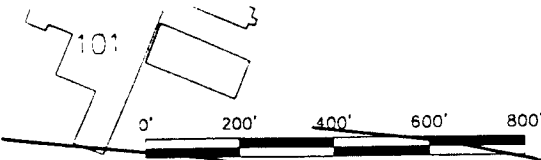
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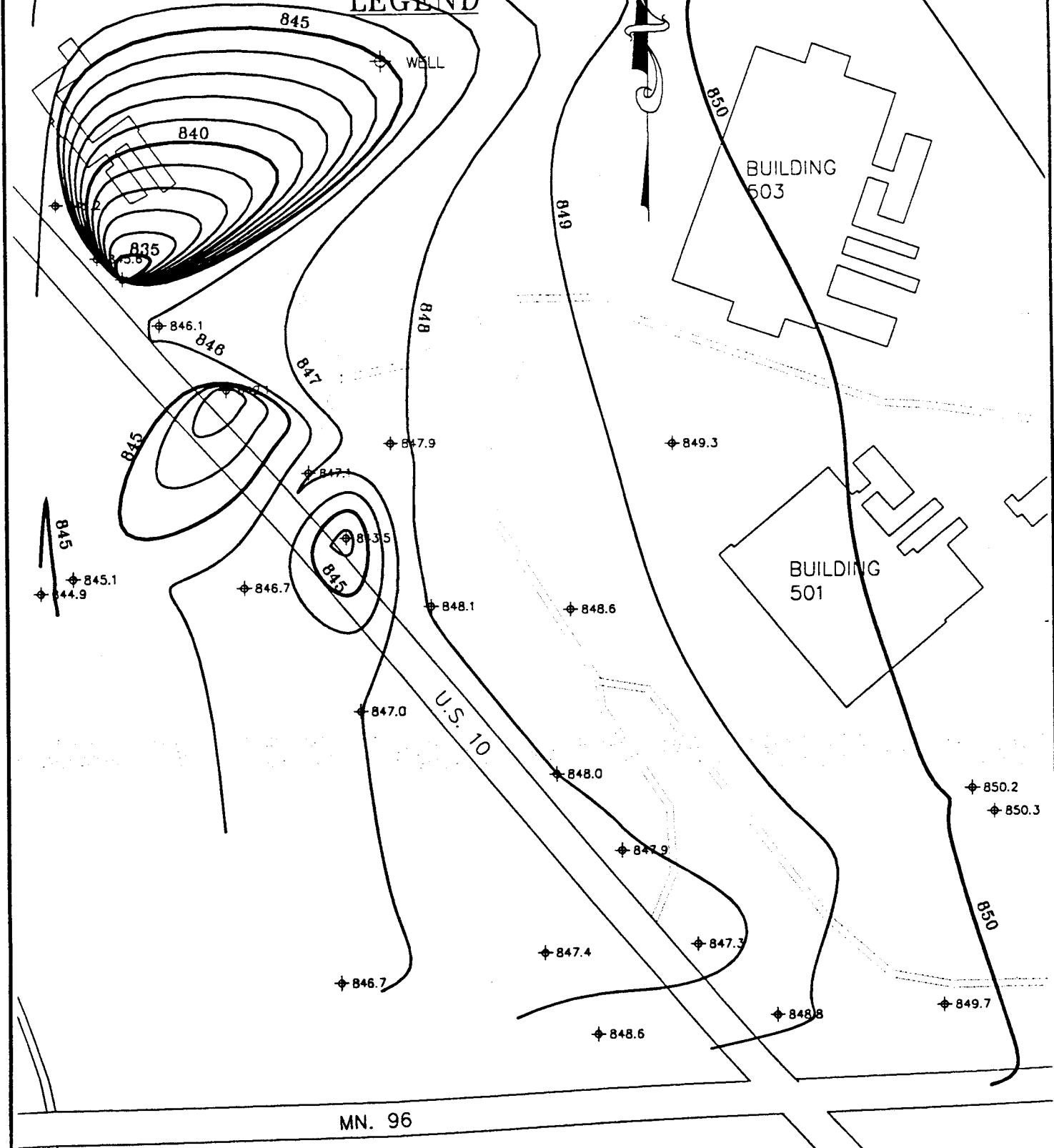
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Fig. F-7



LEGEND



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Groundwater Level Map Unit 3 (BGRS Area) Quarter 19



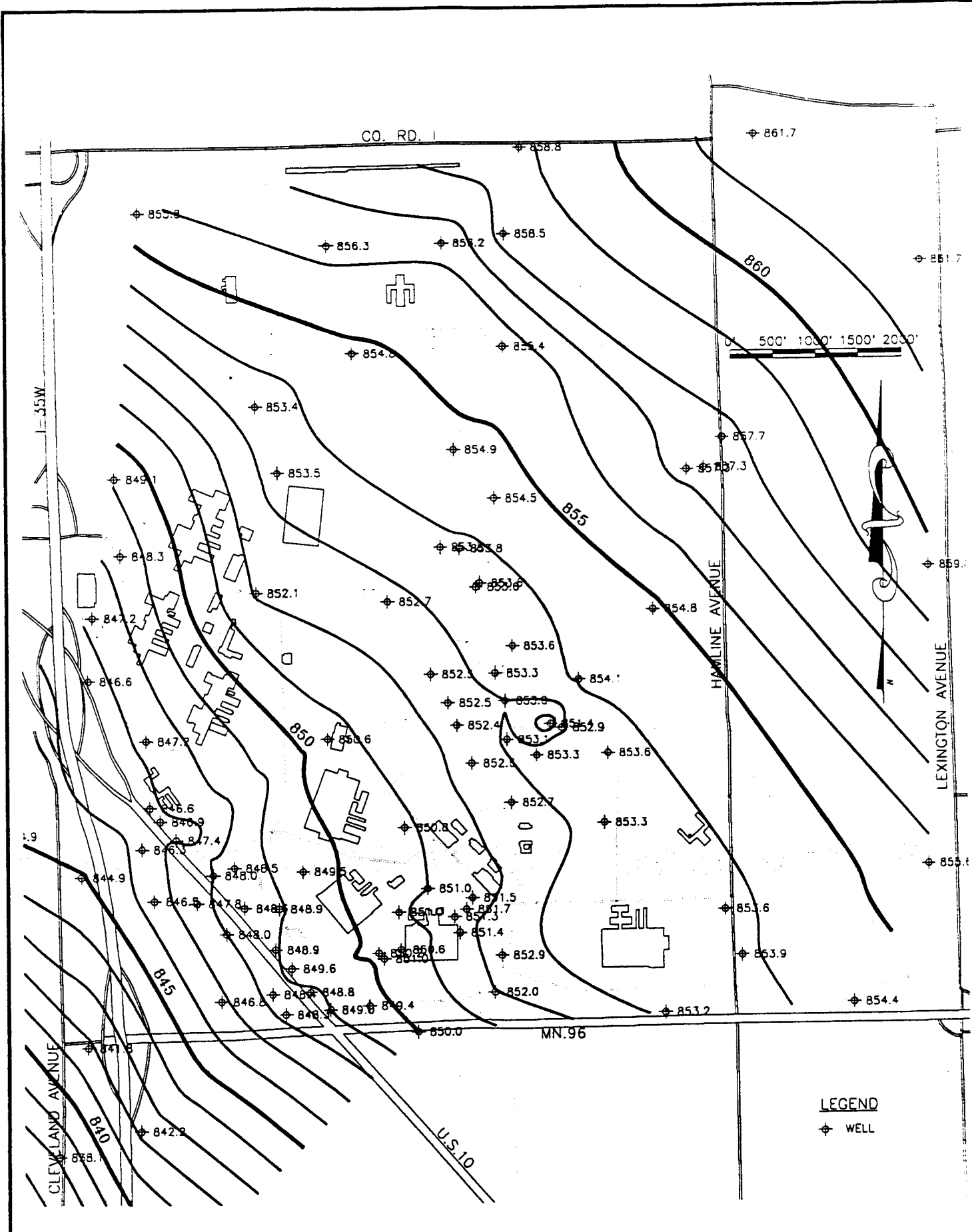
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Fig. F-8



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Groundwater Level Map Unit 3 Quarter 20



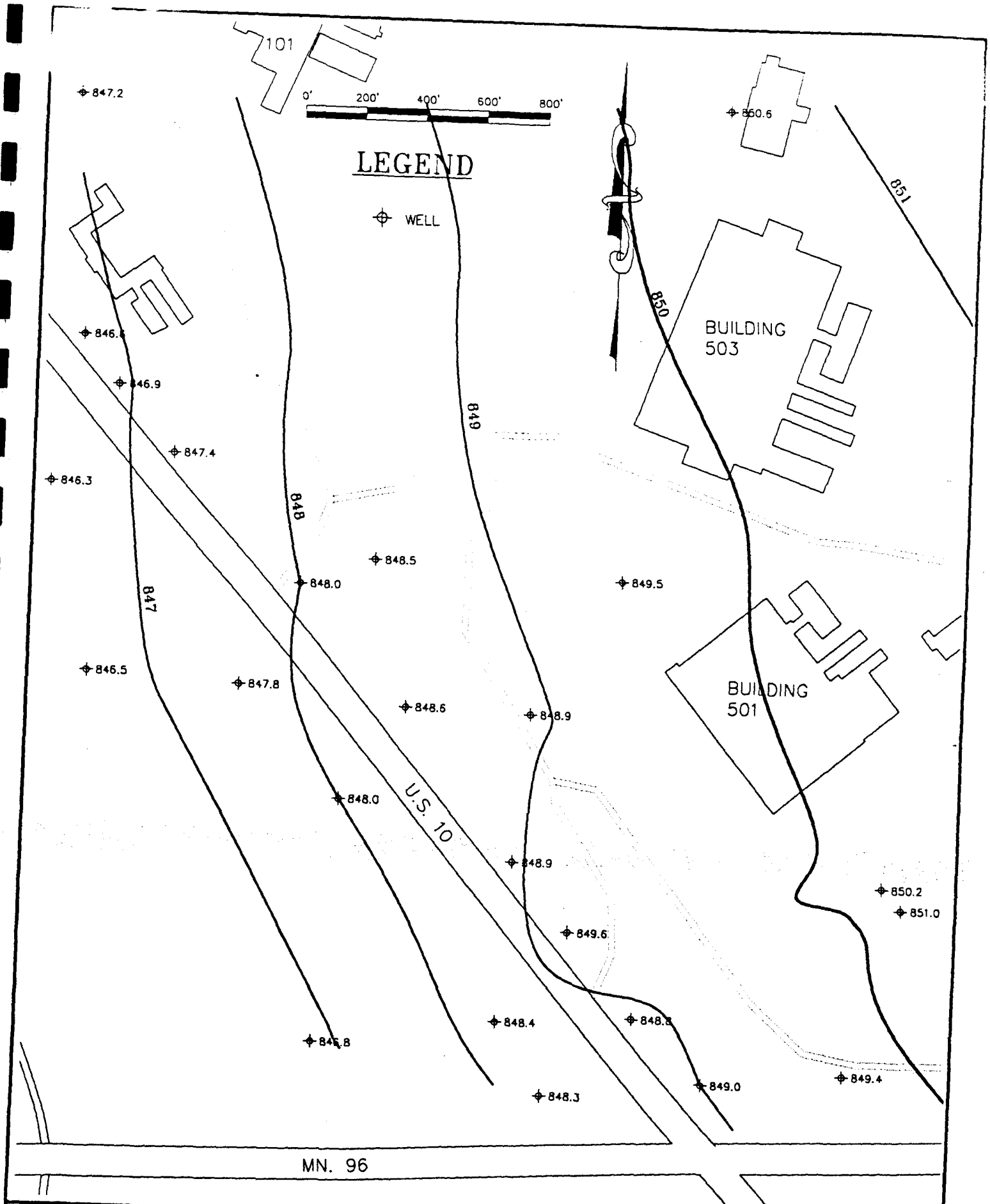
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Fig. F-9



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Groundwater Level Map Unit 3 (BGRS Area) Quarter 20

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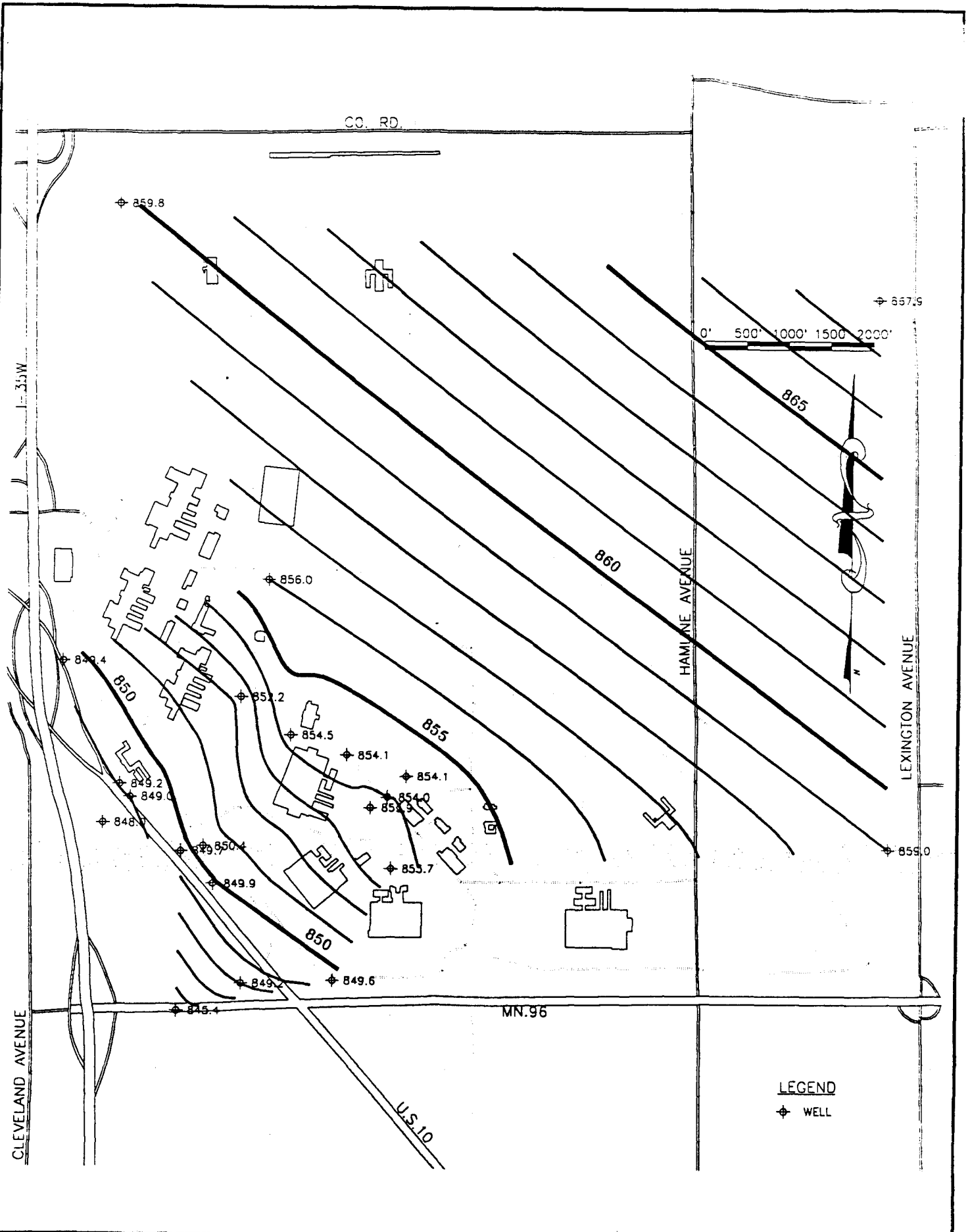
Consulting Engineers

Twelve Oaks Center
15500 Wayzata Blvd.
Wayzata, MN 55391

SEP 1989

Fig. F-10

G. UNIT 4 GROUNDWATER LEVEL MAPS



TWIN CITIES ARMY AMMUNITION PLANT

Groundwater Level Map Unit 4 Quarter 16



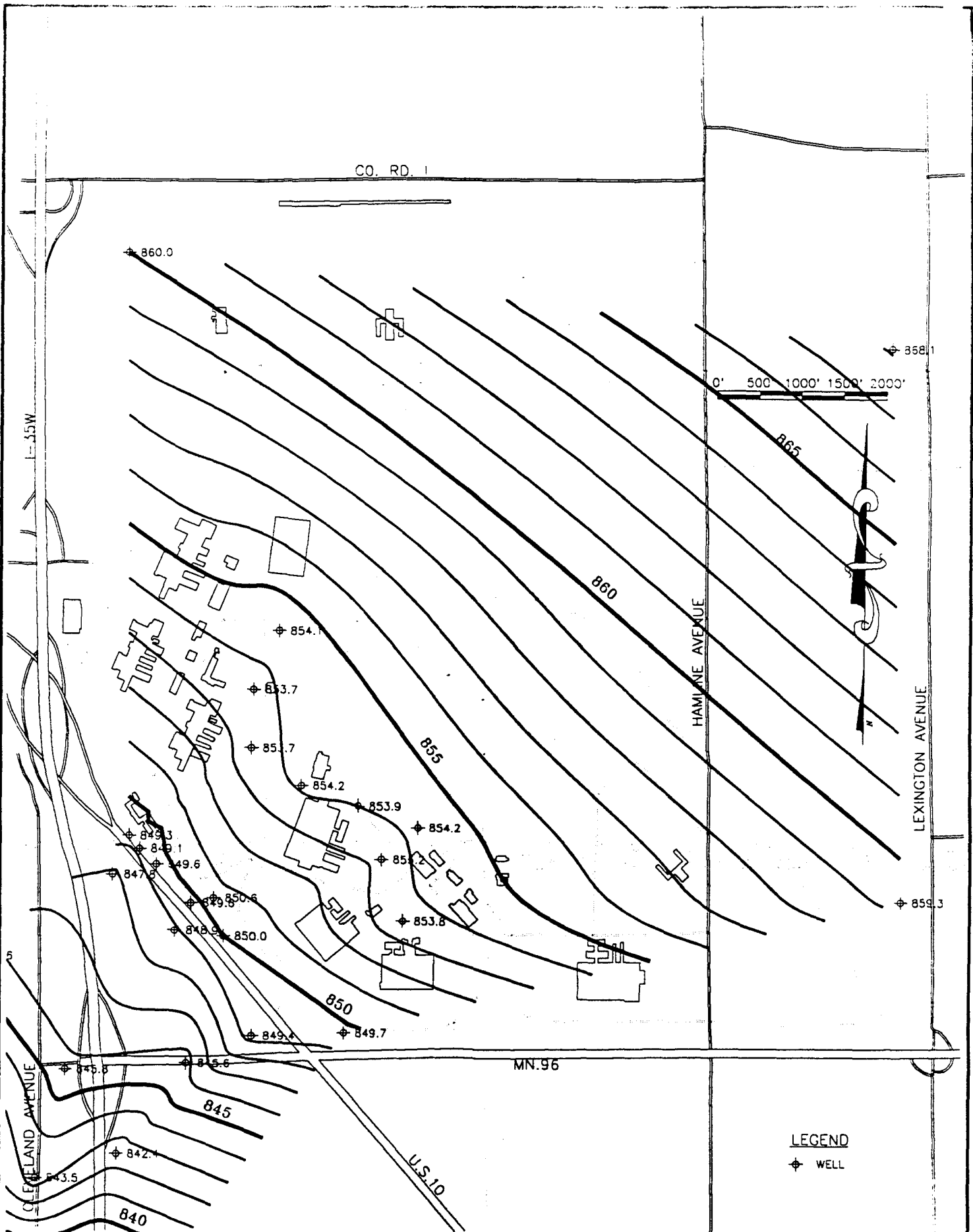
Wenck Associates, Inc.

Consulting Engineers

Twelve Oaks Center
15500 Wayzata Blvd.
Wayzata, MN 55391

SEP 1989

Fig. G-1



TWIN CITIES ARMY AMMUNITION PLANT

Groundwater Level Map Unit 4 Quarter 17



Wenck Associates, Inc.

Consulting Engineers

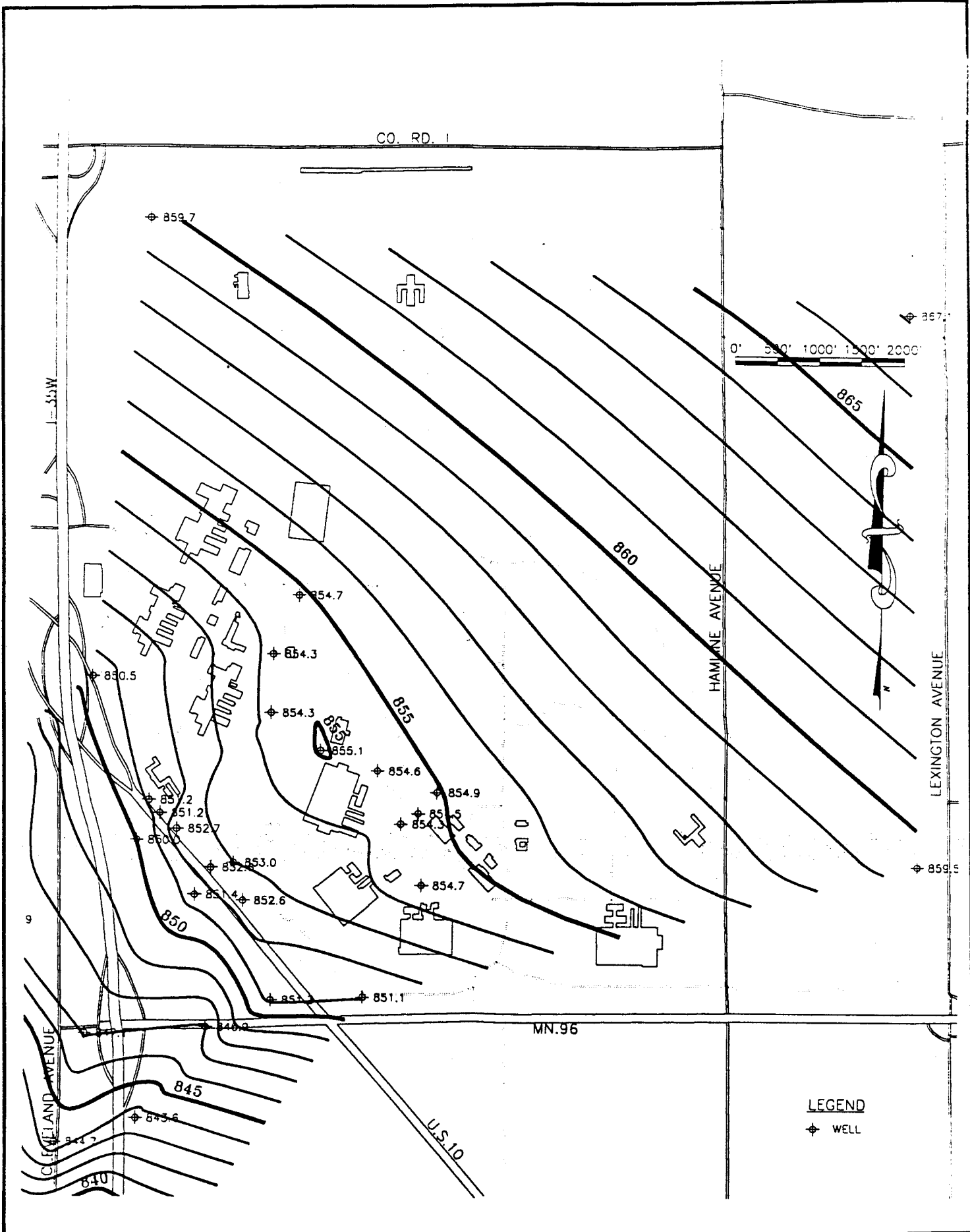
Twelve Oaks Center
15500 Wayzata Blvd.
Wayzata, MN 55391

LEGEND

♦ WELL

SEP 1989

Fig. G-2



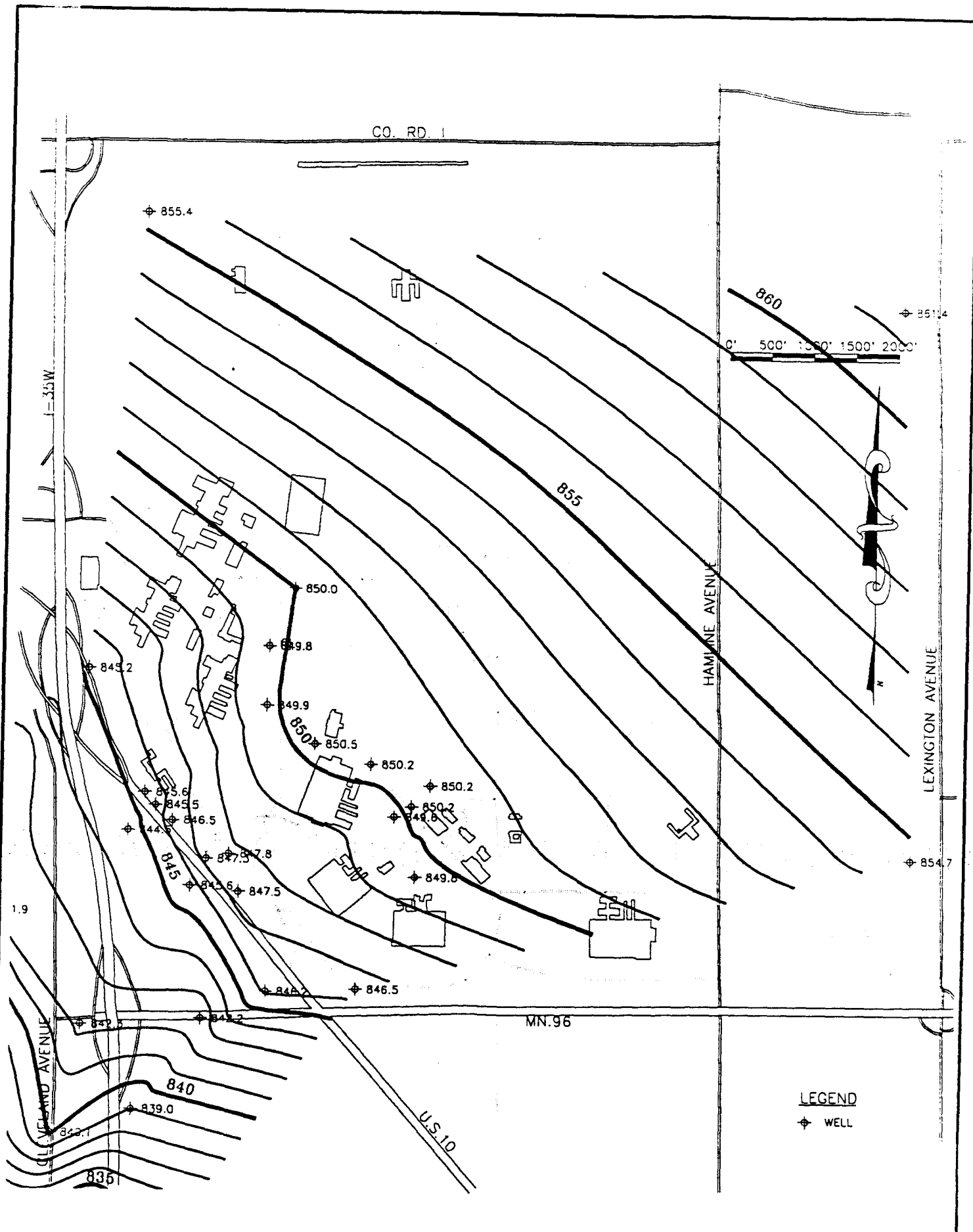
LEGEND
 ◆ WELL

TWIN CITIES ARMY AMMUNITION PLANT
 Groundwater Level Map Unit 4 Quarter 18

W
W
W
 Wenck Associates, Inc.

Consulting Engineers
 Twelve Oaks Center
 15500 Wayzata Blvd.
 Wayzata, MN 55391

SEP 1989
 Fig. G-3



TWIN CITIES ARMY AMMUNITION PLANT

Groundwater Level Map Unit 4 Quarter 19



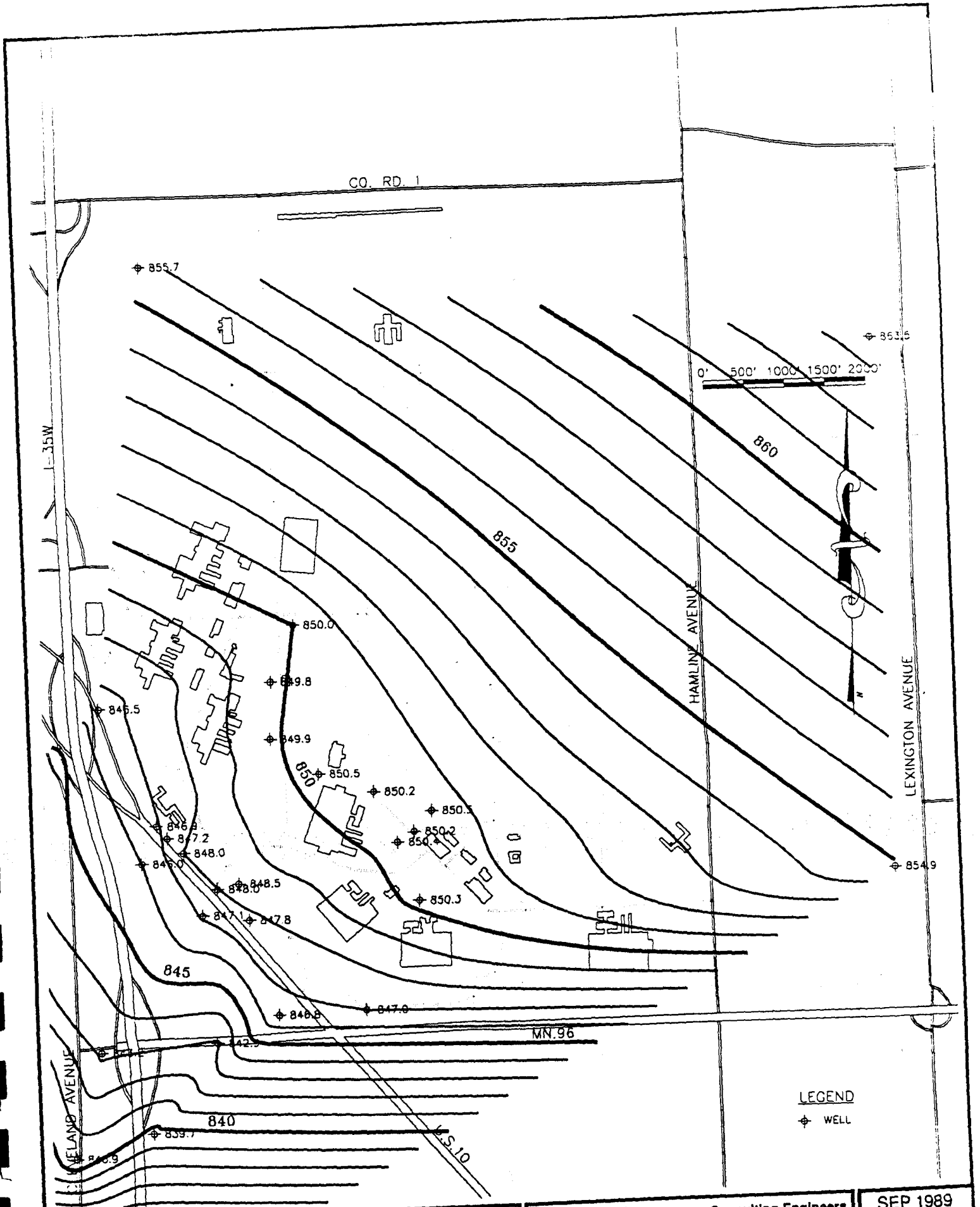
Wenck Associates, Inc.

Consulting Engineers

Twelve Oaks Center
15500 Wayzata Blvd.
Wayzata, MN 55391

SEP 1989

Fig. G-4



TWIN CITIES ARMY AMMUNITION PLANT
 Groundwater Level Map Unit 4 Quarter 20

Wenck Associates, Inc.

Consulting Engineers
 Twelve Oaks Center
 15500 Wayzata Blvd.
 Wayzata, MN 55391

SEP 1989
 Fig. G-5

H. UNIT 1 GROUNDWATER HYDROGRAPHS

GROUNDWATER HYDROGRAPHS

TWIN CITIES ARMY AMMUNITION PLANT

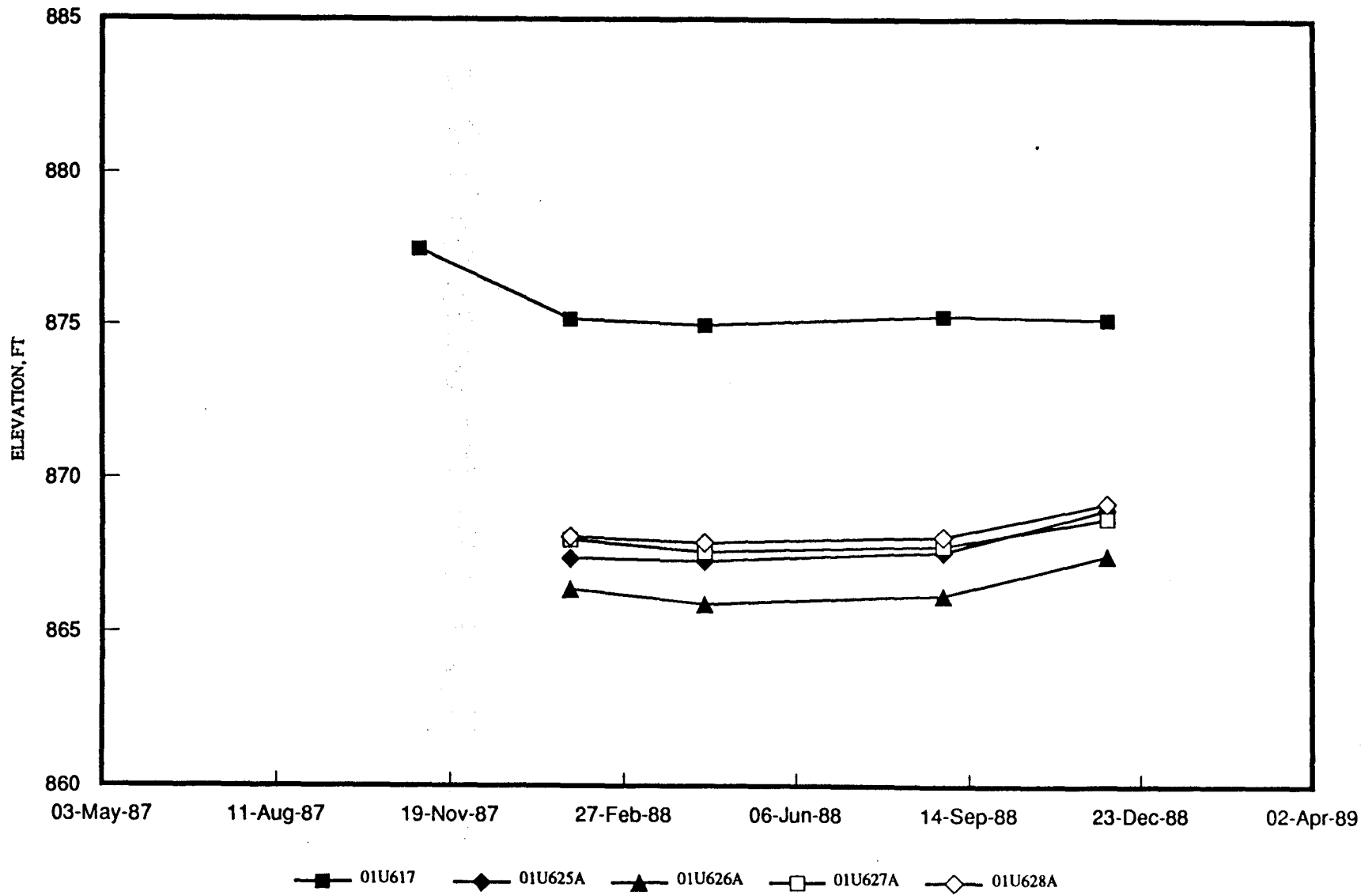


FIG. H-1, October, 1989
WENCK ASSOCIATES, INC.

GROUNDWATER HYDROGRAPHS

TWIN CITIES ARMY AMMUNITION PLANT

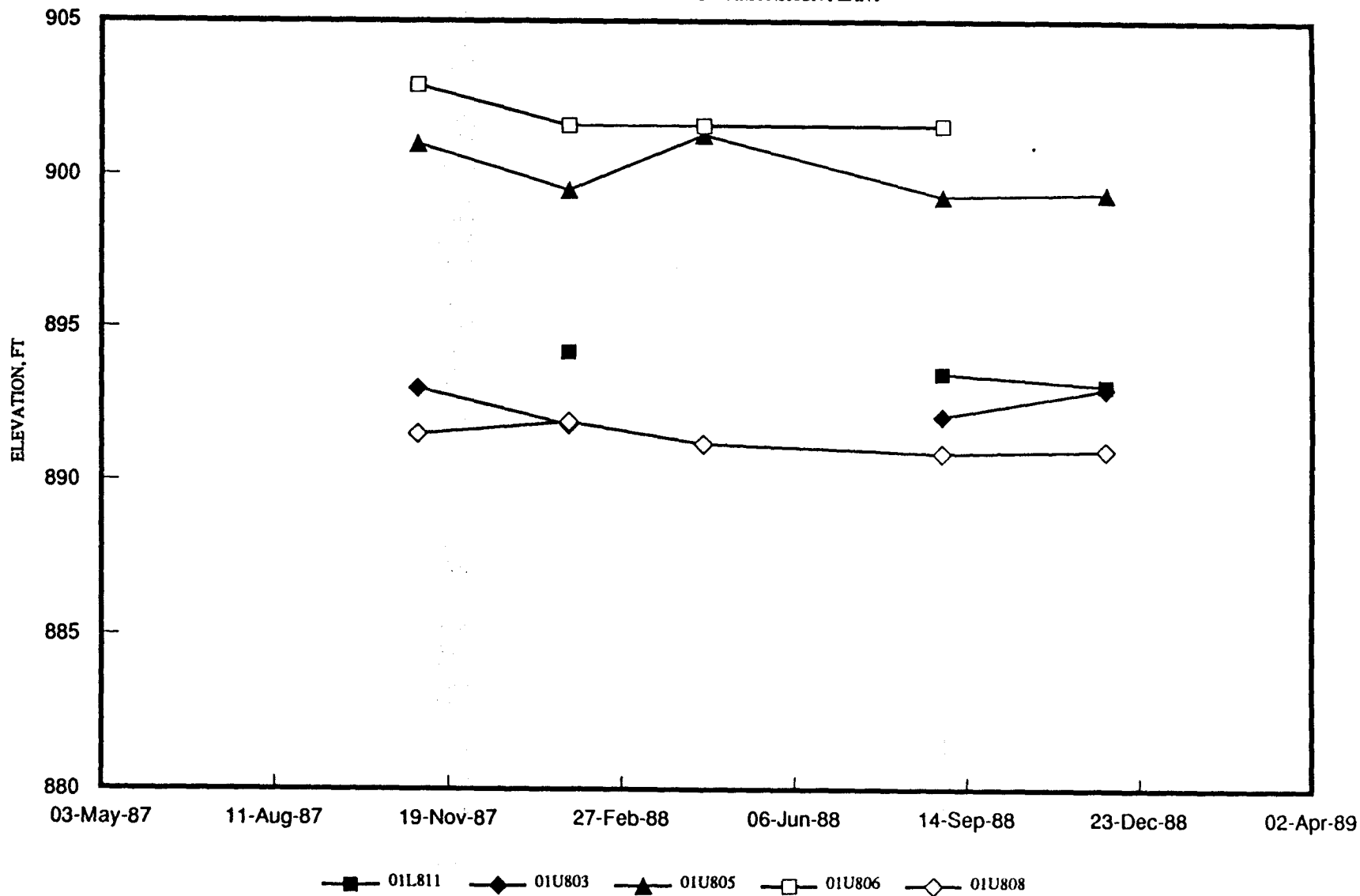


FIG. H-2, October, 1989
WENCK ASSOCIATES, INC.

GROUNDWATER HYDROGRAPHS

TWIN CITIES ARMY AMMUNITION PLANT

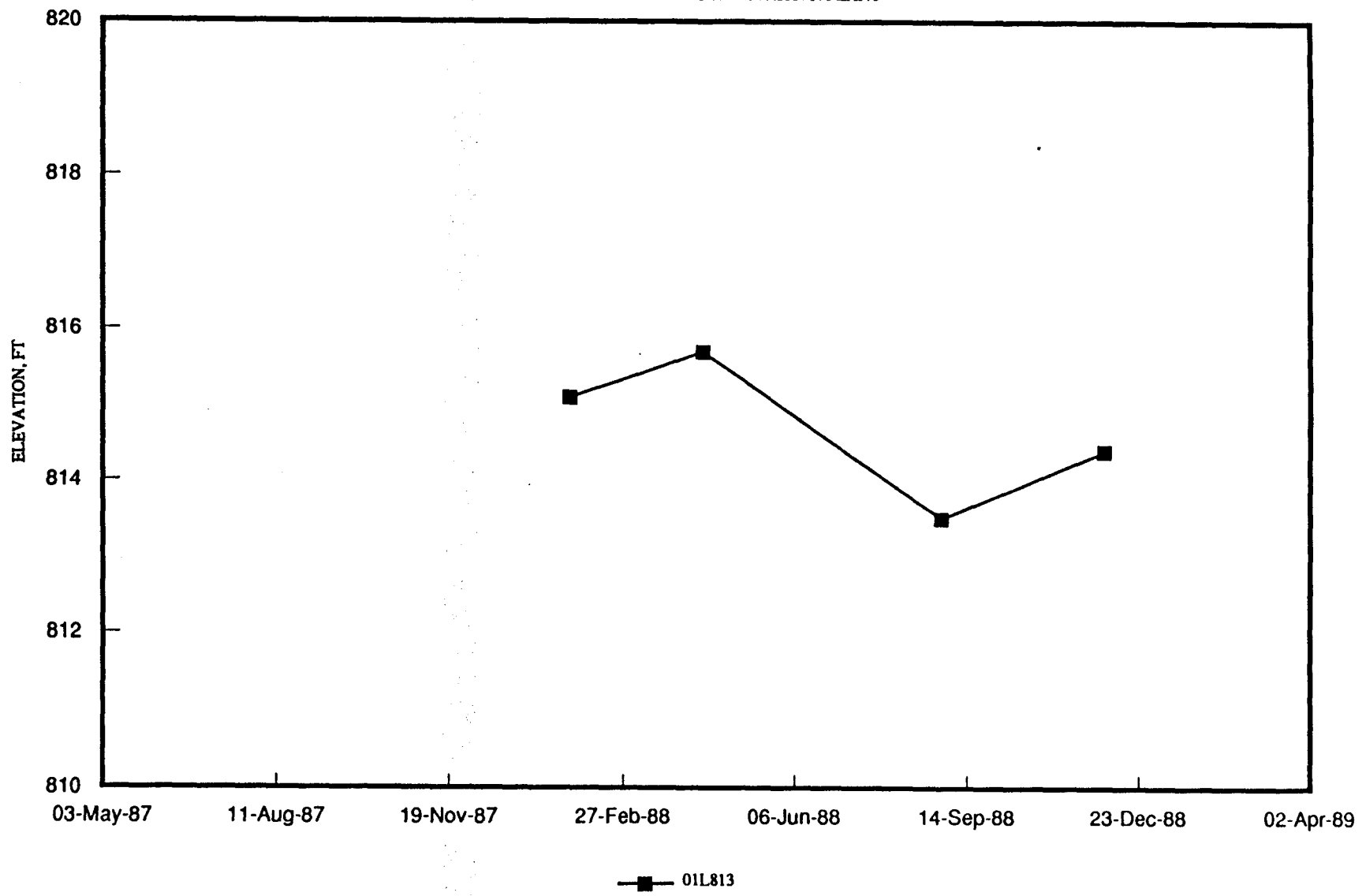


FIG. H-3, October, 1989
WENCK ASSOCIATES, INC.

GROUNDWATER HYDROGRAPHS

TWIN CITIES ARMY AMMUNITION PLANT

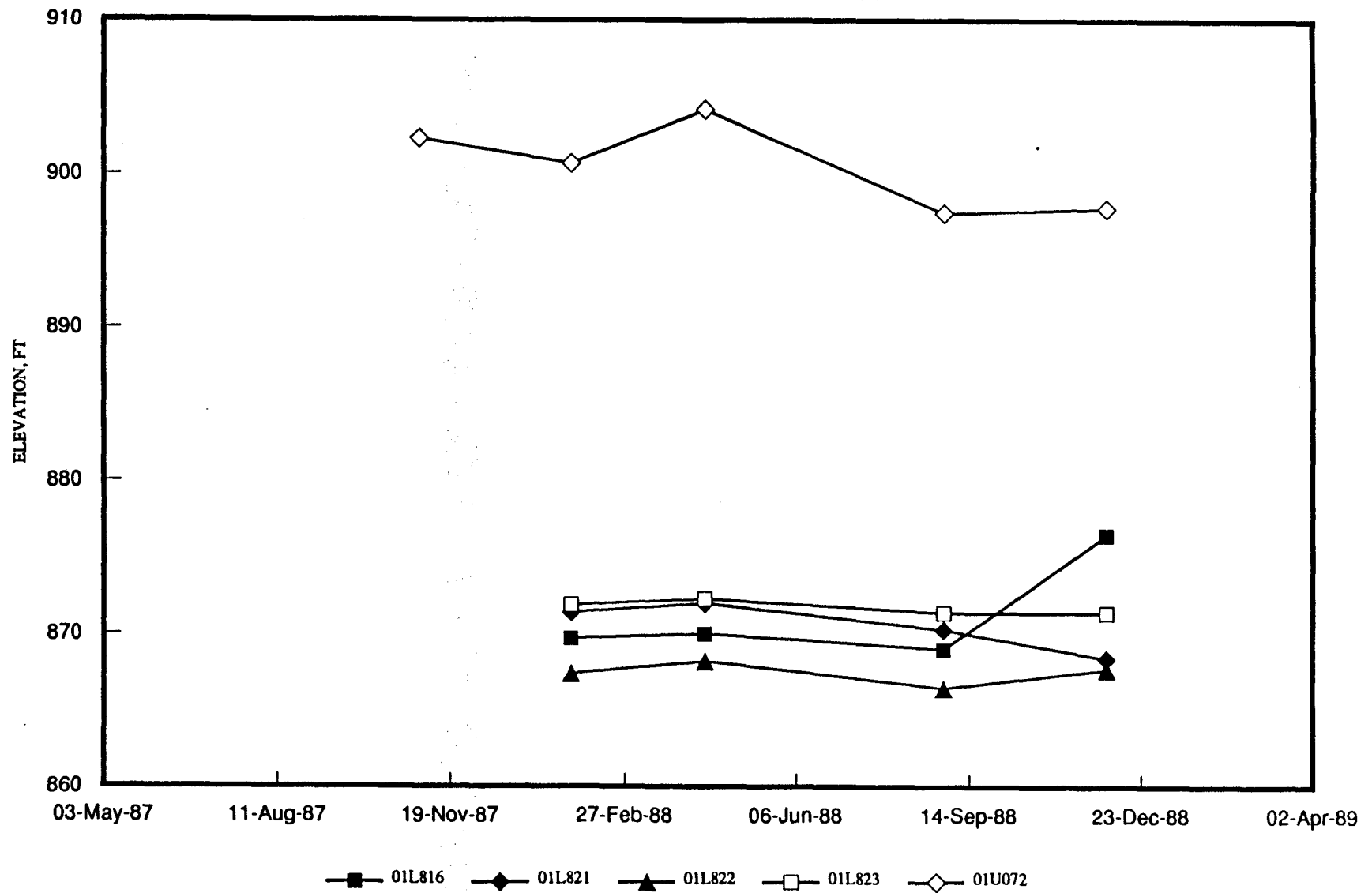


FIG. H-4, October, 1989
WENCK ASSOCIATES, INC.

GROUNDWATER HYDROGRAPHS

TWIN CITIES ARMY AMMUNITION PLANT

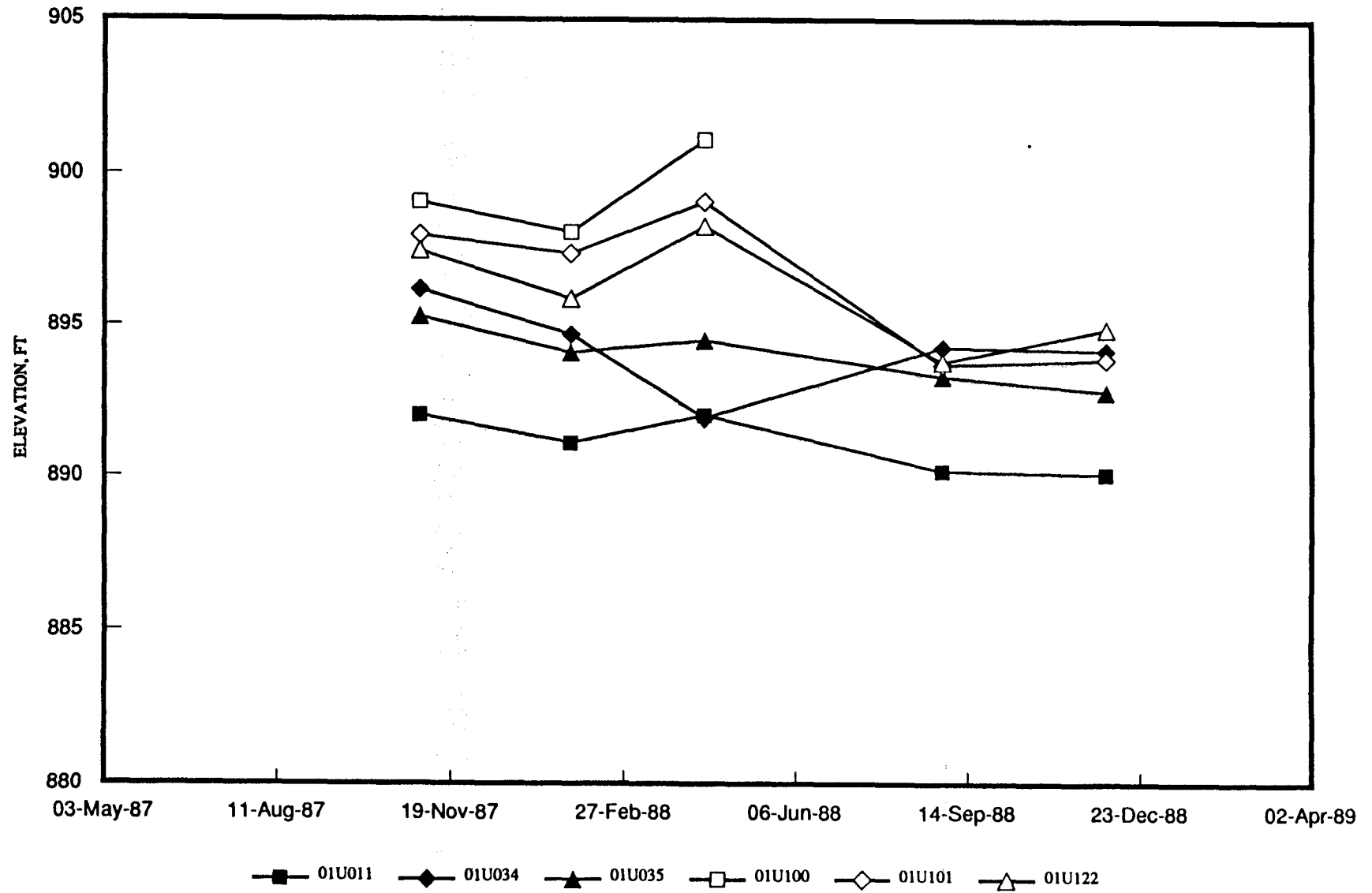


FIG. H-5, October, 1989
WENCK ASSOCIATES, INC.

GROUNDWATER HYDROGRAPHS

TWIN CITIES ARMY AMMUNITION PLANT

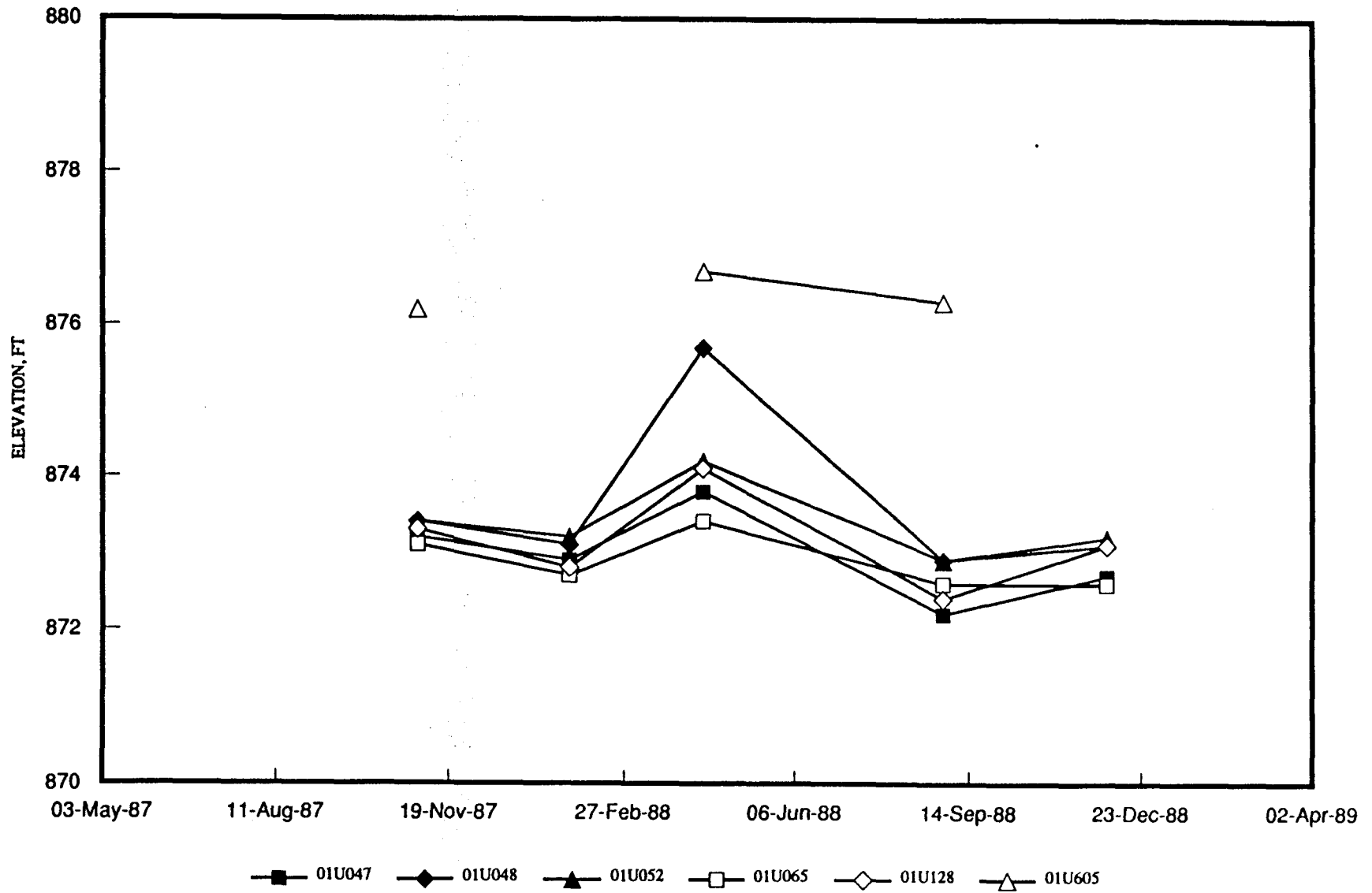


FIG. H-6, October, 1989
WENCK ASSOCIATES, INC.

GROUNDWATER HYDROGRAPHS

TWIN CITIES ARMY AMMUNITION PLANT

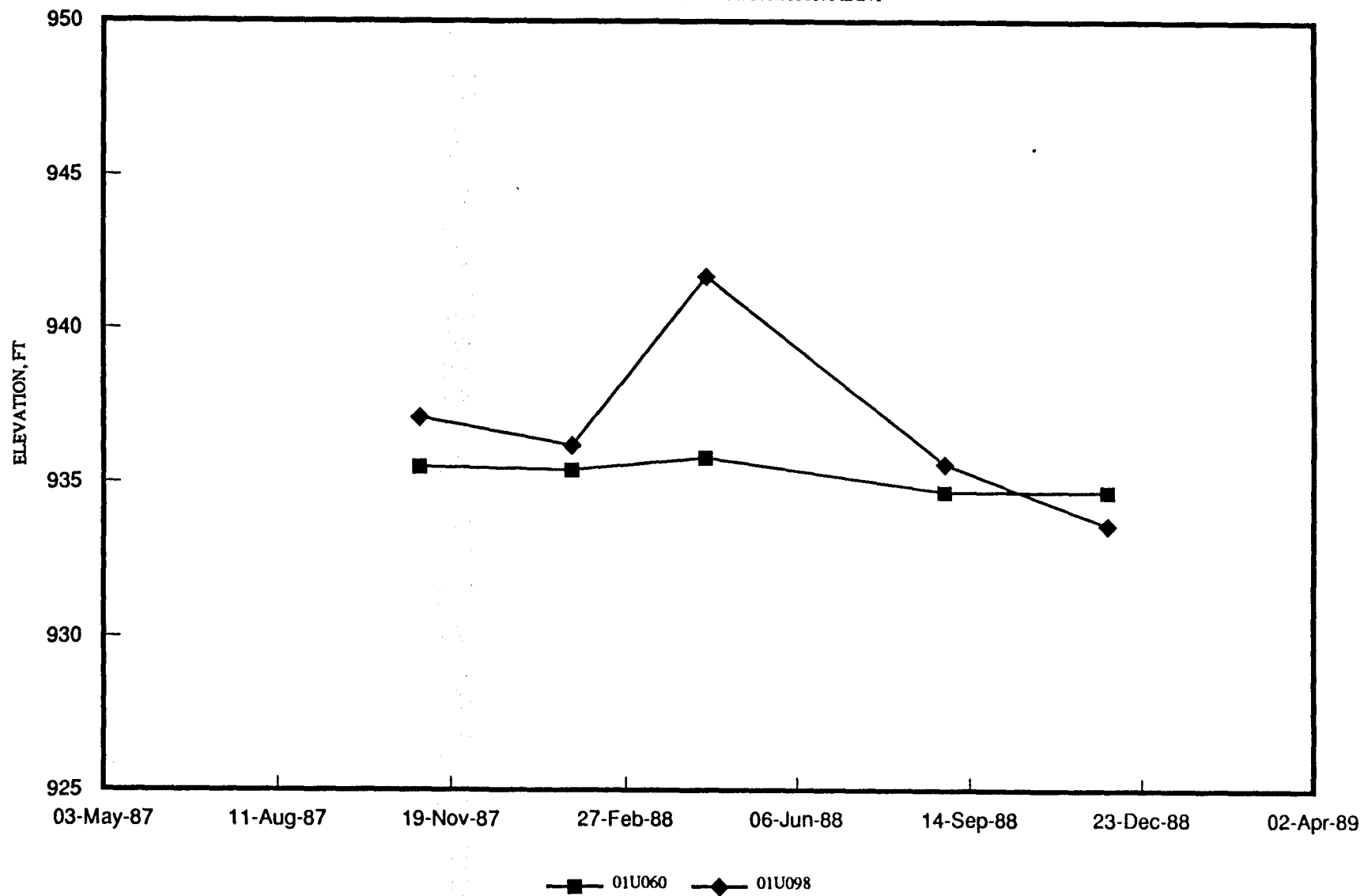


FIG. H-7, October, 1989
WENCK ASSOCIATES, INC.

GROUNDWATER HYDROGRAPHS

TWIN CITIES ARMY AMMUNITION PLANT

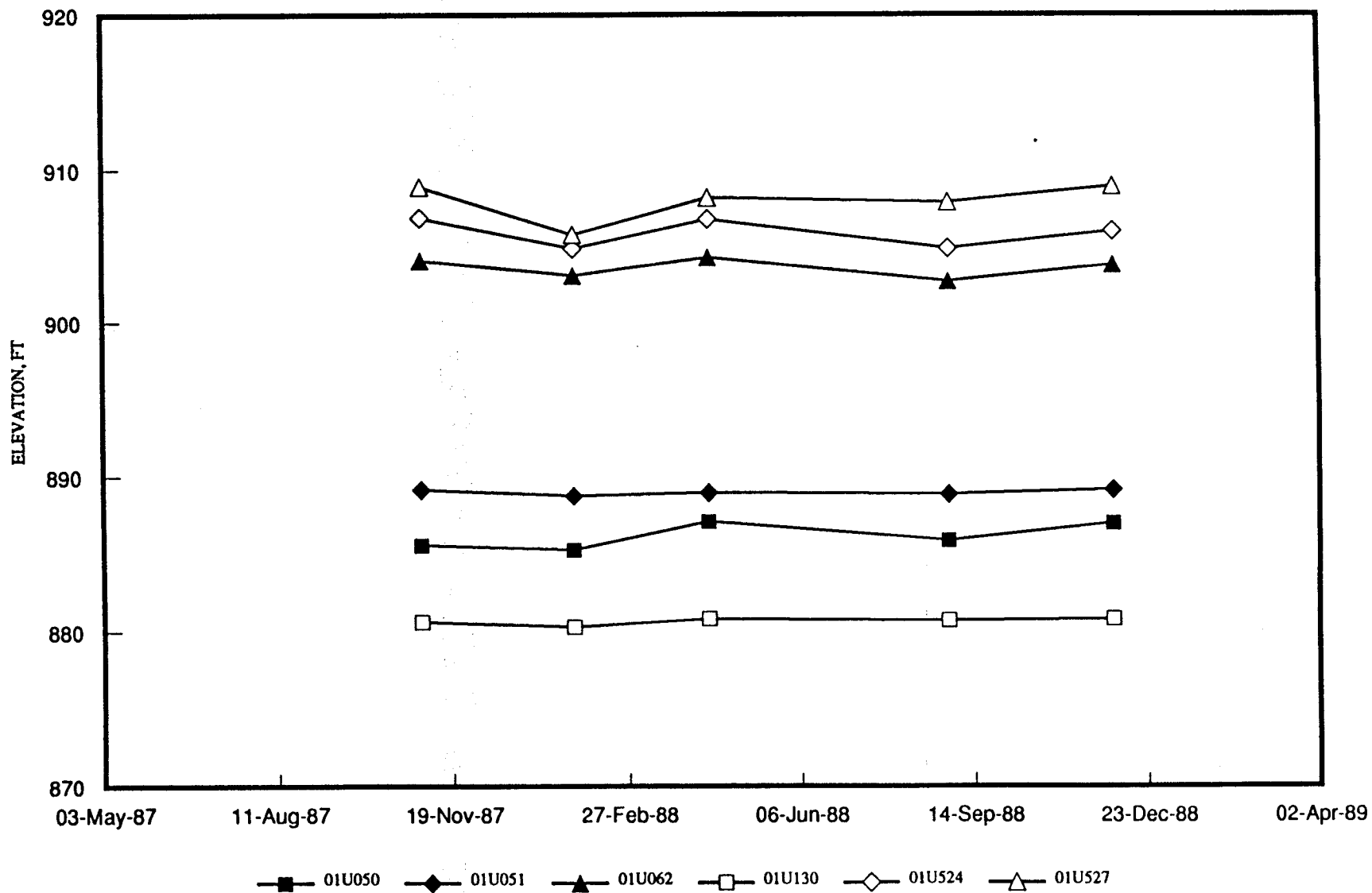


FIG. H-8, October, 1989
WENCK ASSOCIATES, INC.

GROUNDWATER HYDROGRAPHS

TWIN CITIES ARMY AMMUNITION PLANT

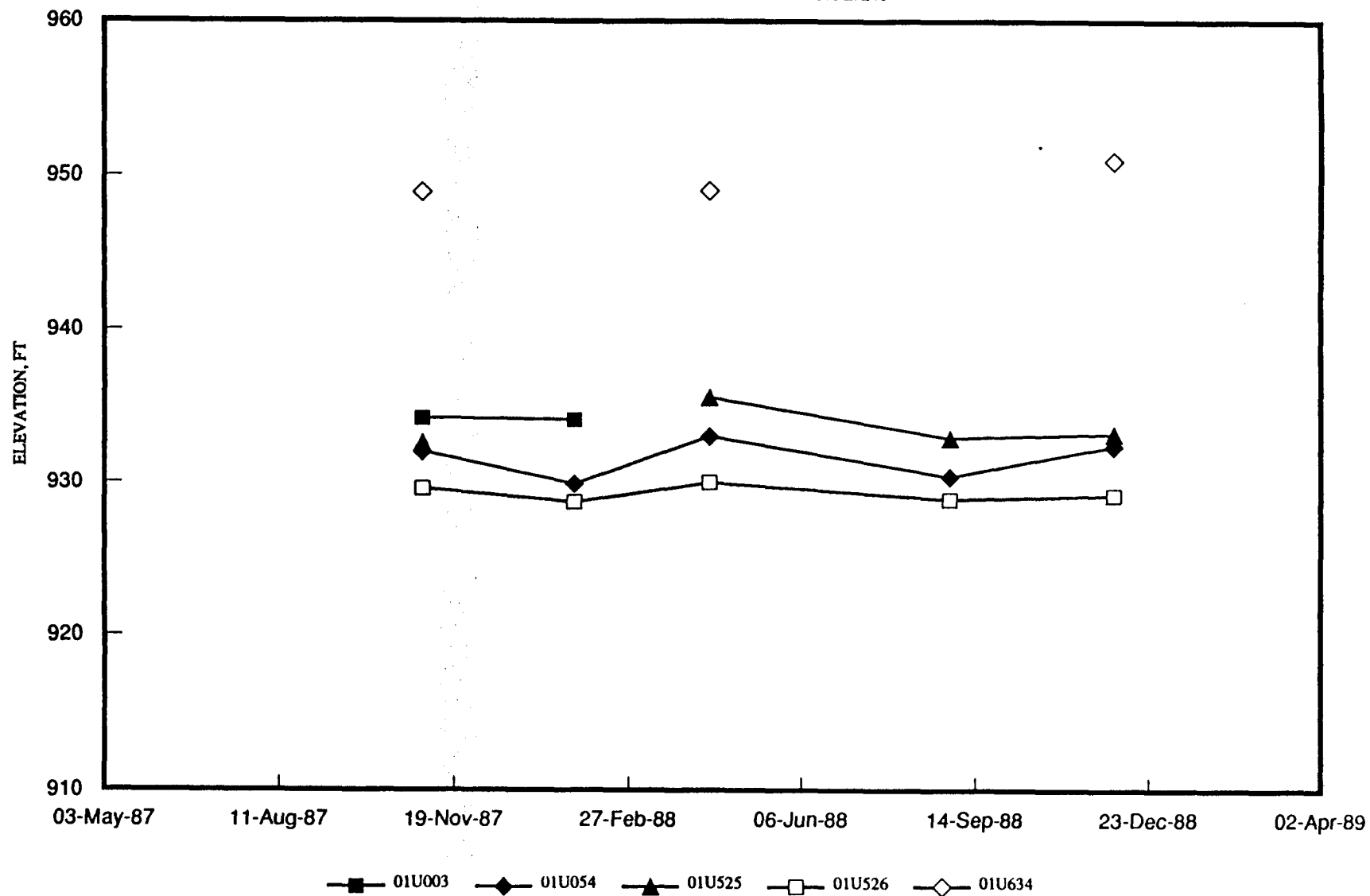


FIG. H-9, October, 1989
WENCK ASSOCIATES, INC.

GROUNDWATER HYDROGRAPHS

TWIN CITIES ARMY AMMUNITION PLANT

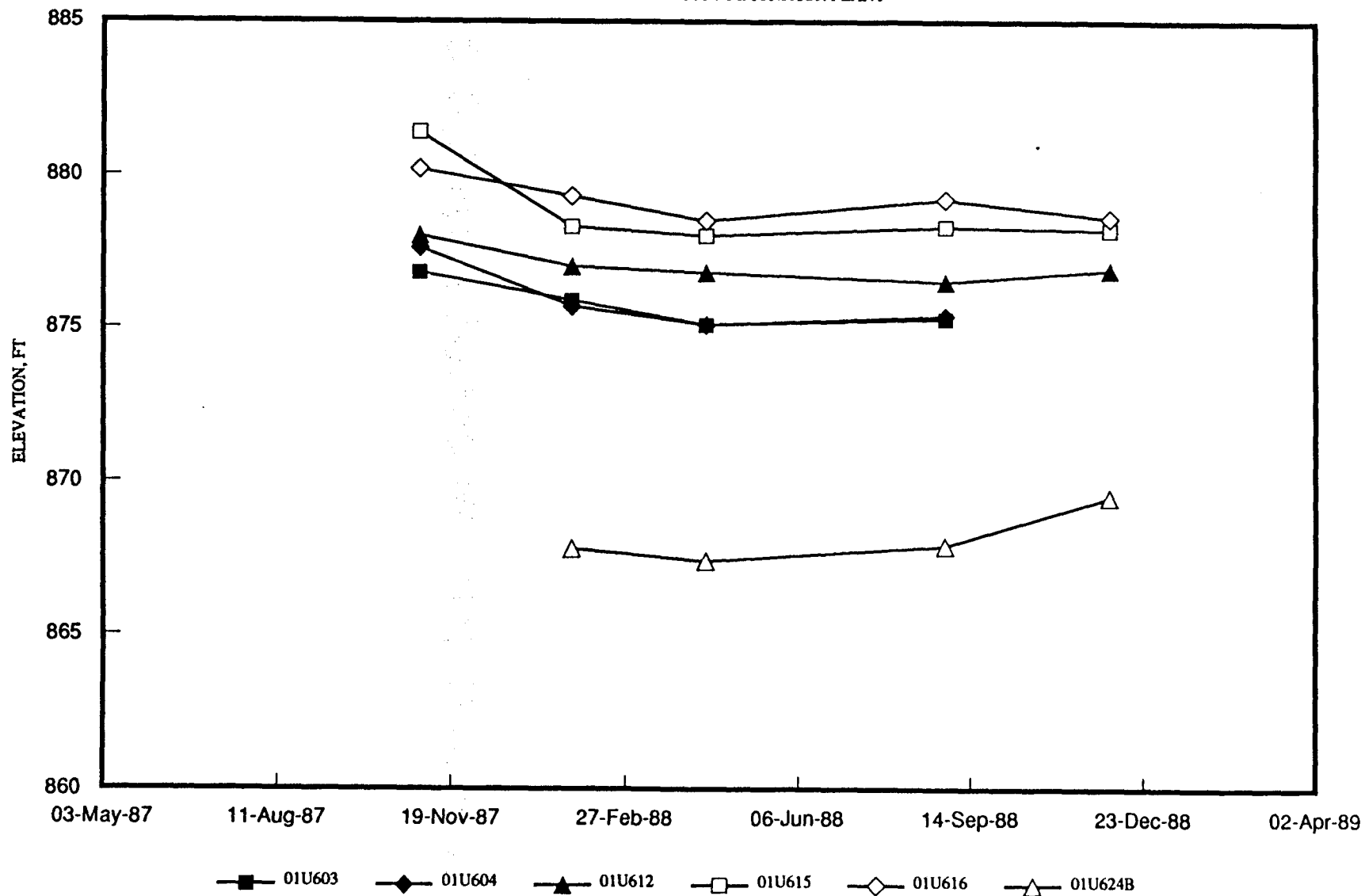


FIG. H-10, October, 1989
WENCK ASSOCIATES, INC.

GROUNDWATER HYDROGRAPHS

TWIN CITIES ARMY AMMUNITION PLANT

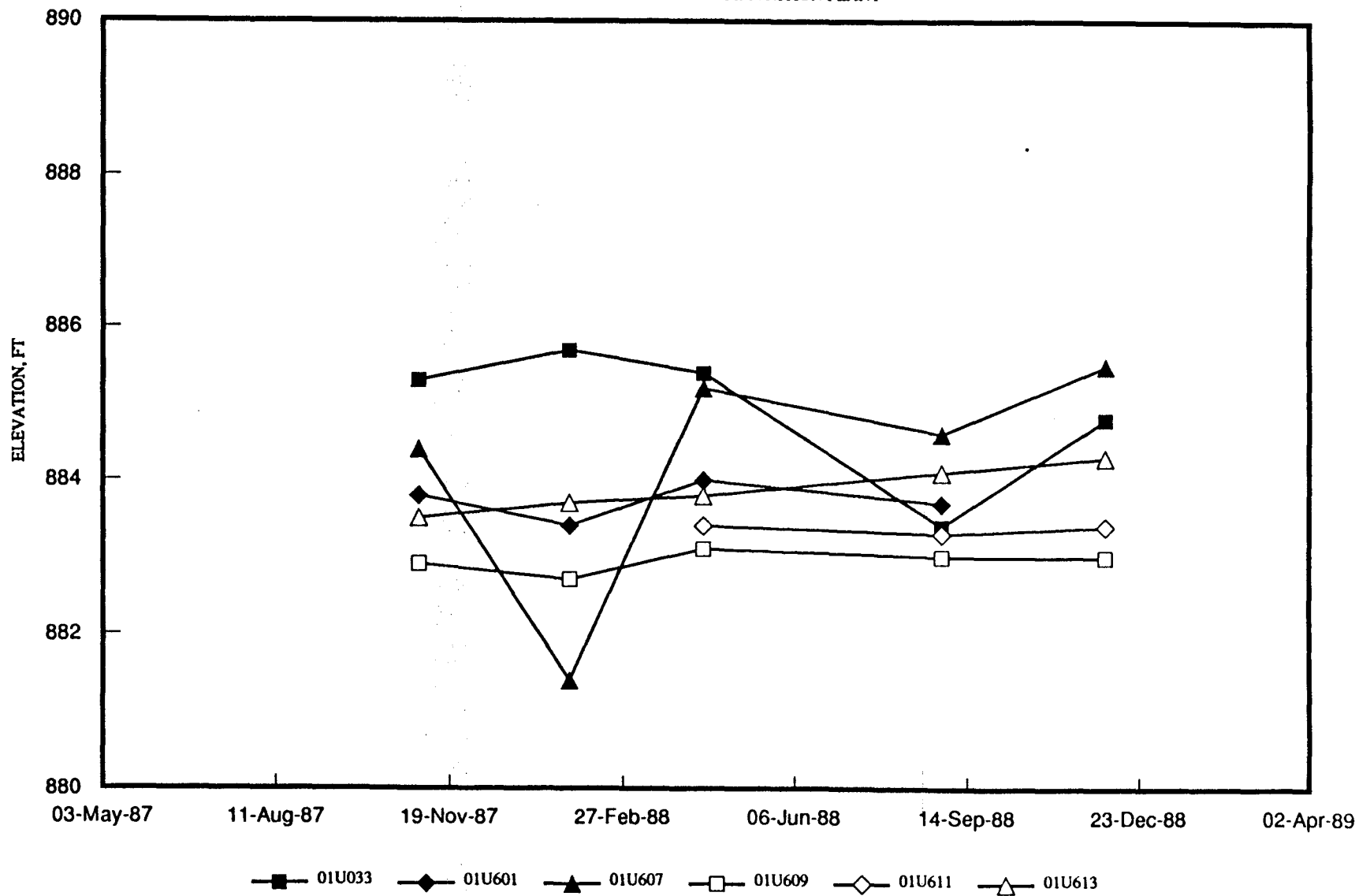


FIG. H-11, October, 1989
WENCK ASSOCIATES, INC.

GROUNDWATER HYDROGRAPHS

TWIN CITIES ARMY AMMUNITION PLANT

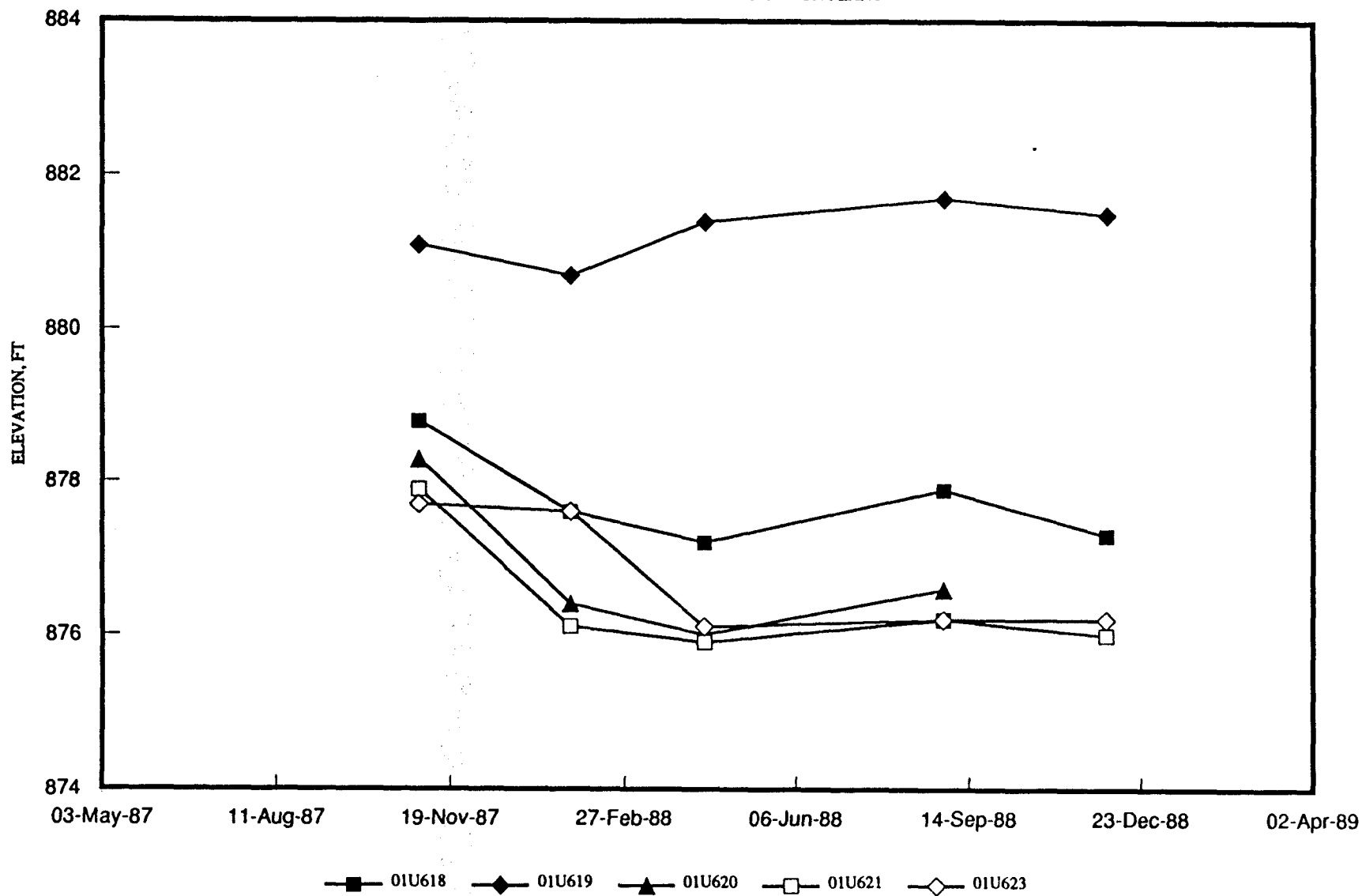


FIG. H-12, October, 1989
WENCK ASSOCIATES, INC.

GROUNDWATER HYDROGRAPHS

TWIN CITIES ARMY AMMUNITION PLANT

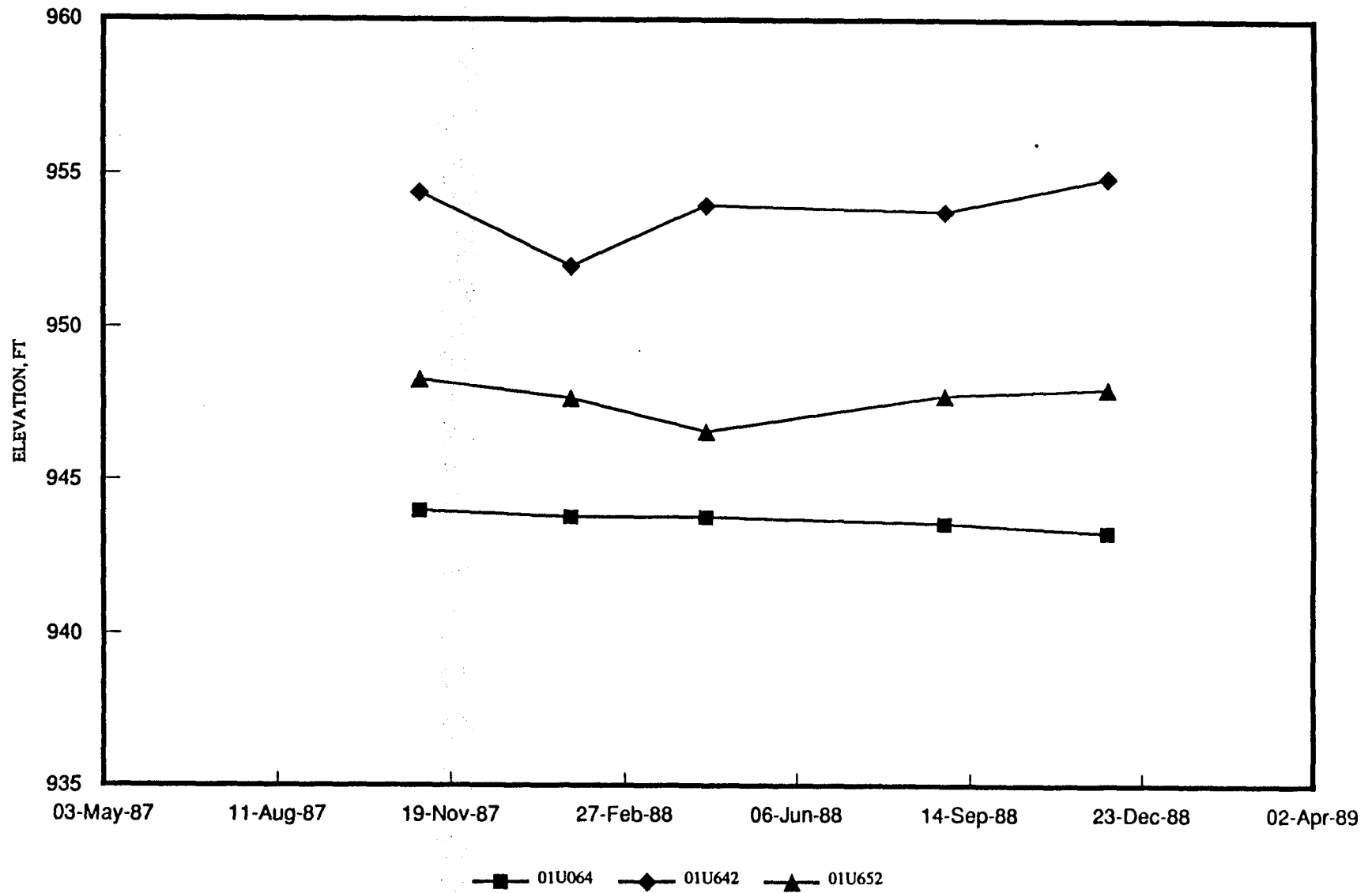


FIG. H-13, October, 1989
WENCK ASSOCIATES, INC.

I. UNIT 3 GROUNDWATER HYDROGRAPHS

GROUNDWATER HYDROGRAPHS

TWIN CITIES ARMY AMMUNITION PLANT

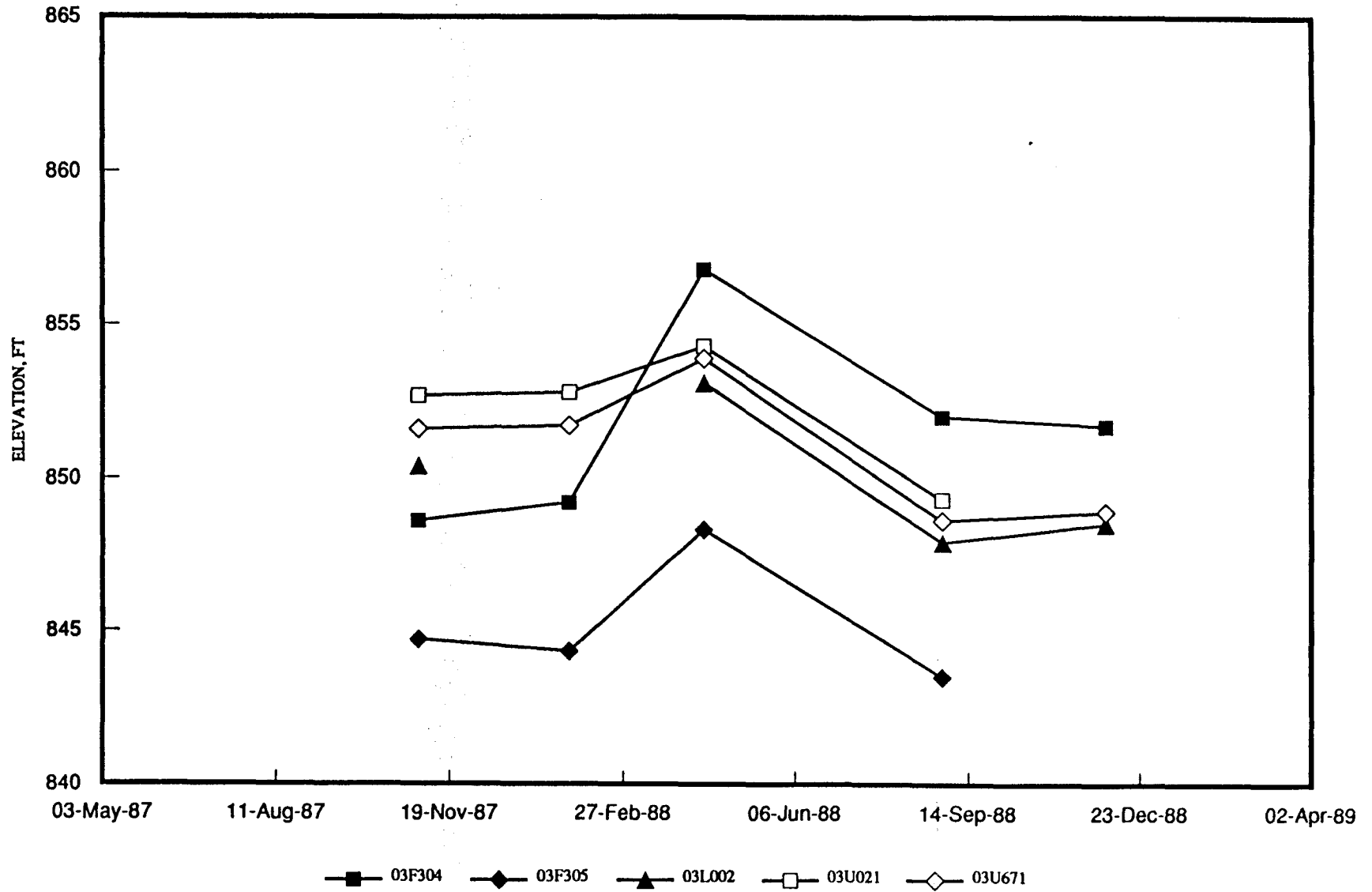


FIG. I-1, October, 1989
WENCK ASSOCIATES, INC.

GROUNDWATER HYDROGRAPHS

TWIN CITIES ARMY AMMUNITION PLANT

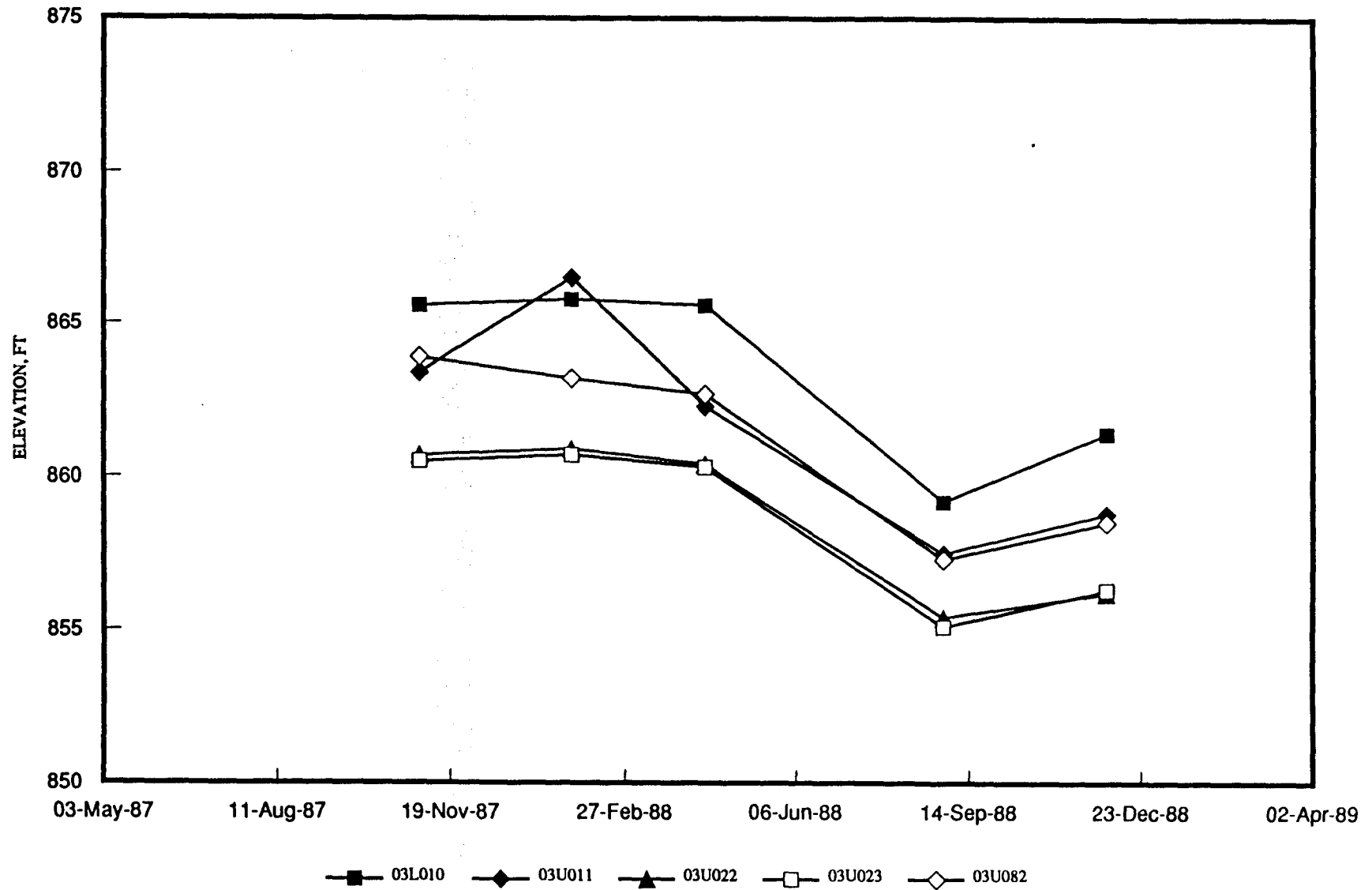


FIG. I-2, October, 1989
WENCK ASSOCIATES, INC.

GROUNDWATER HYDROGRAPHS

TWIN CITIES ARMY AMMUNITION PLANT

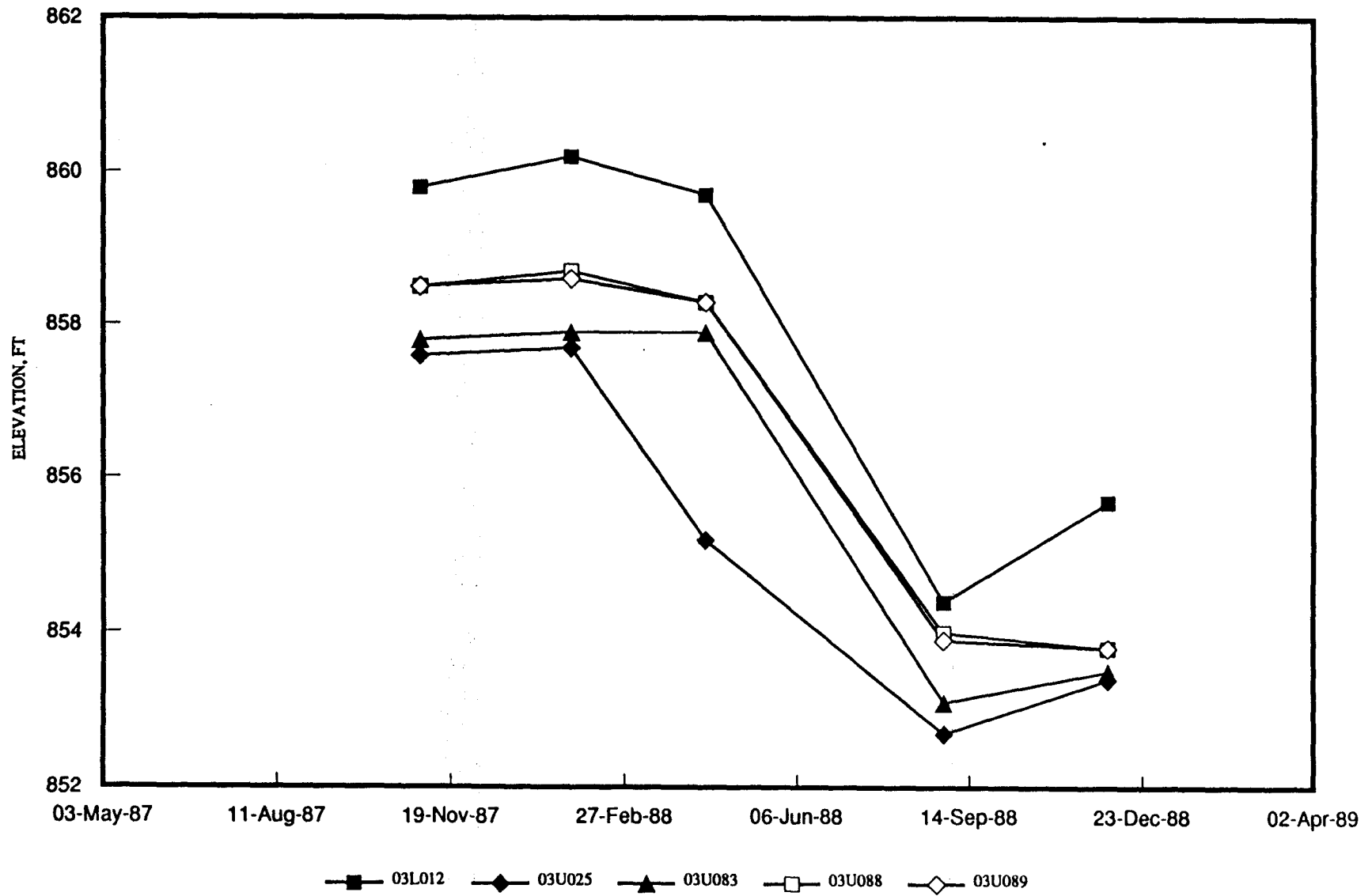


FIG. I-3, October, 1989
WENCK ASSOCIATES, INC.

GROUNDWATER HYDROGRAPHS

TWIN CITIES ARMY AMMUNITION PLANT

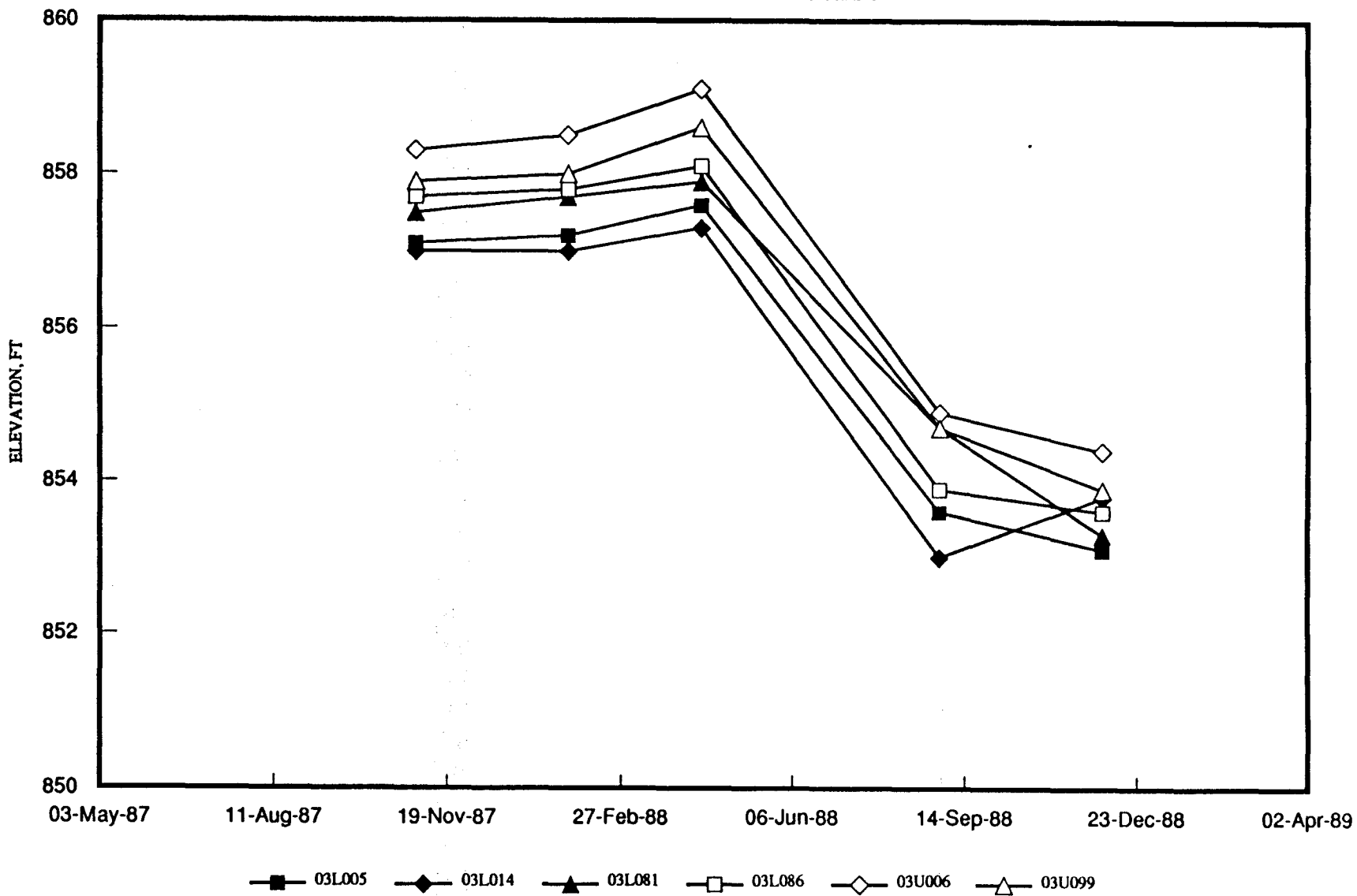


FIG. I-4, October, 1989
WENCK ASSOCIATES, INC.

GROUNDWATER HYDROGRAPHS

TWIN CITIES ARMY AMMUNITION PLANT

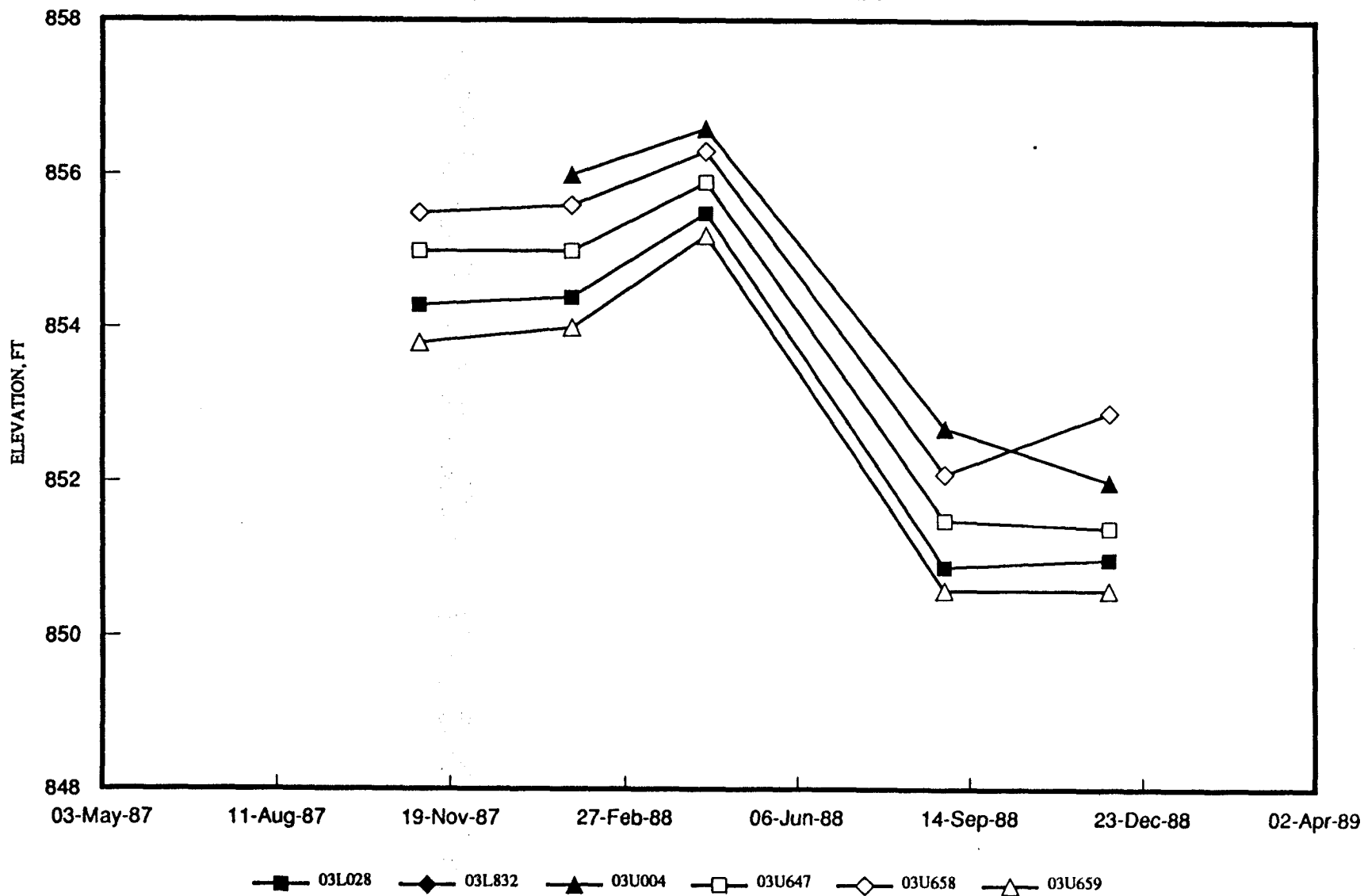


FIG. I-5, October, 1989
WENCK ASSOCIATES, INC.

GROUNDWATER HYDROGRAPHS

TWIN CITIES ARMY AMMUNITION PLANT

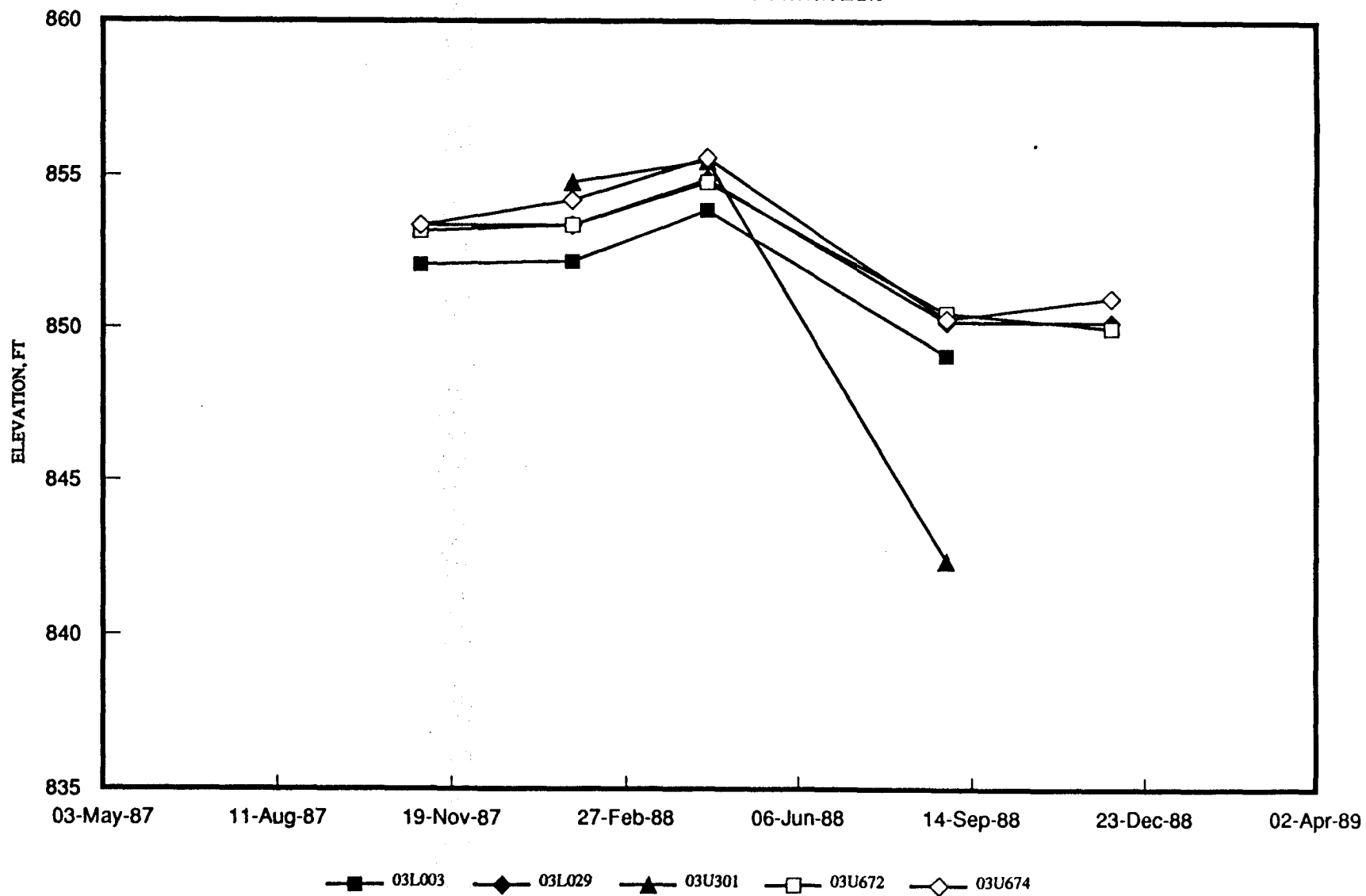


FIG. I-6, October, 1989
WENCK ASSOCIATES, INC.

GROUNDWATER HYDROGRAPHS

TWIN CITIES ARMY AMMUNITION PLANT

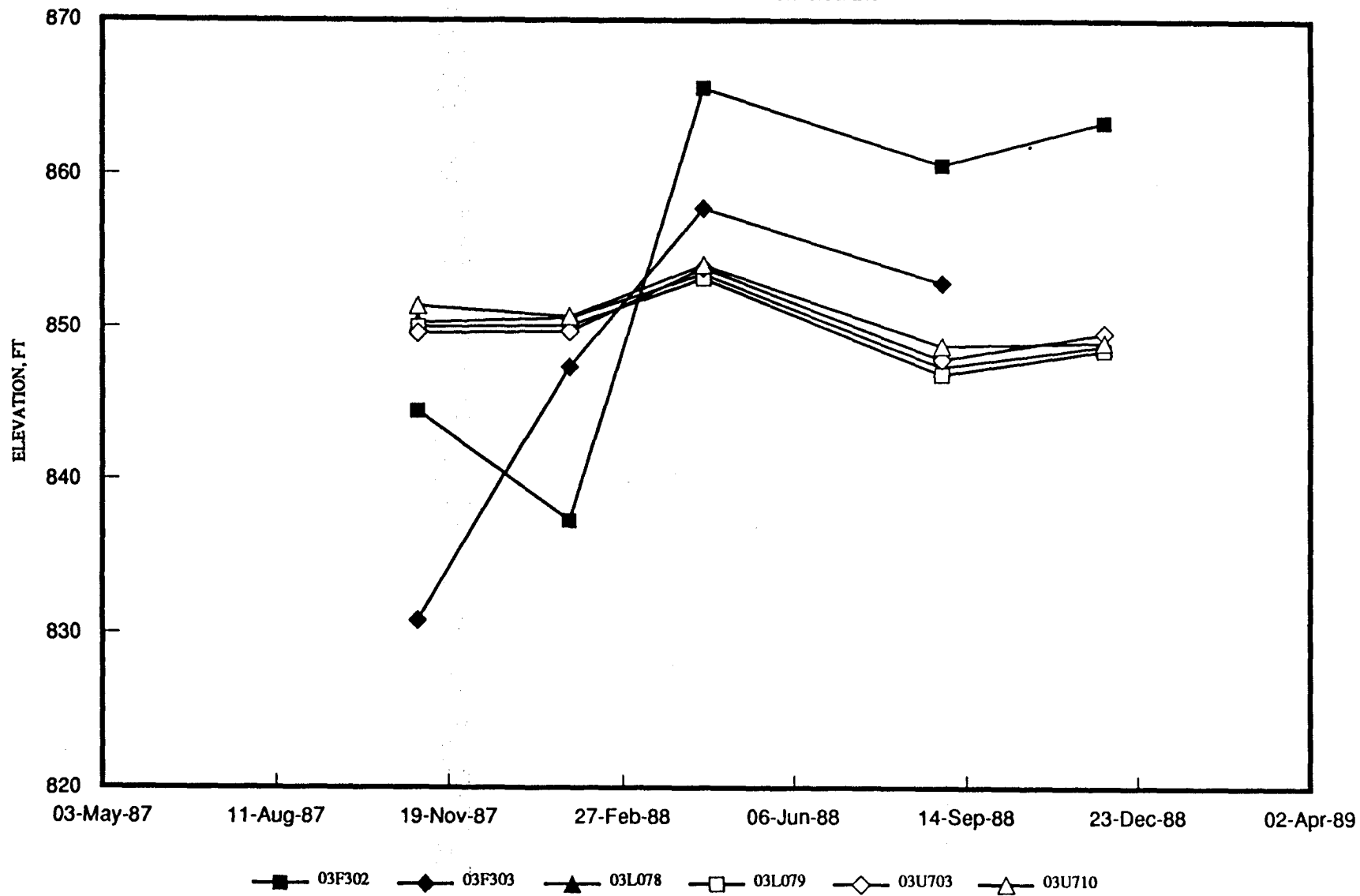


FIG. I-7, October, 1989
WENCK ASSOCIATES, INC.

GROUNDWATER HYDROGRAPHS

TWIN CITIES ARMY AMMUNITION PLANT

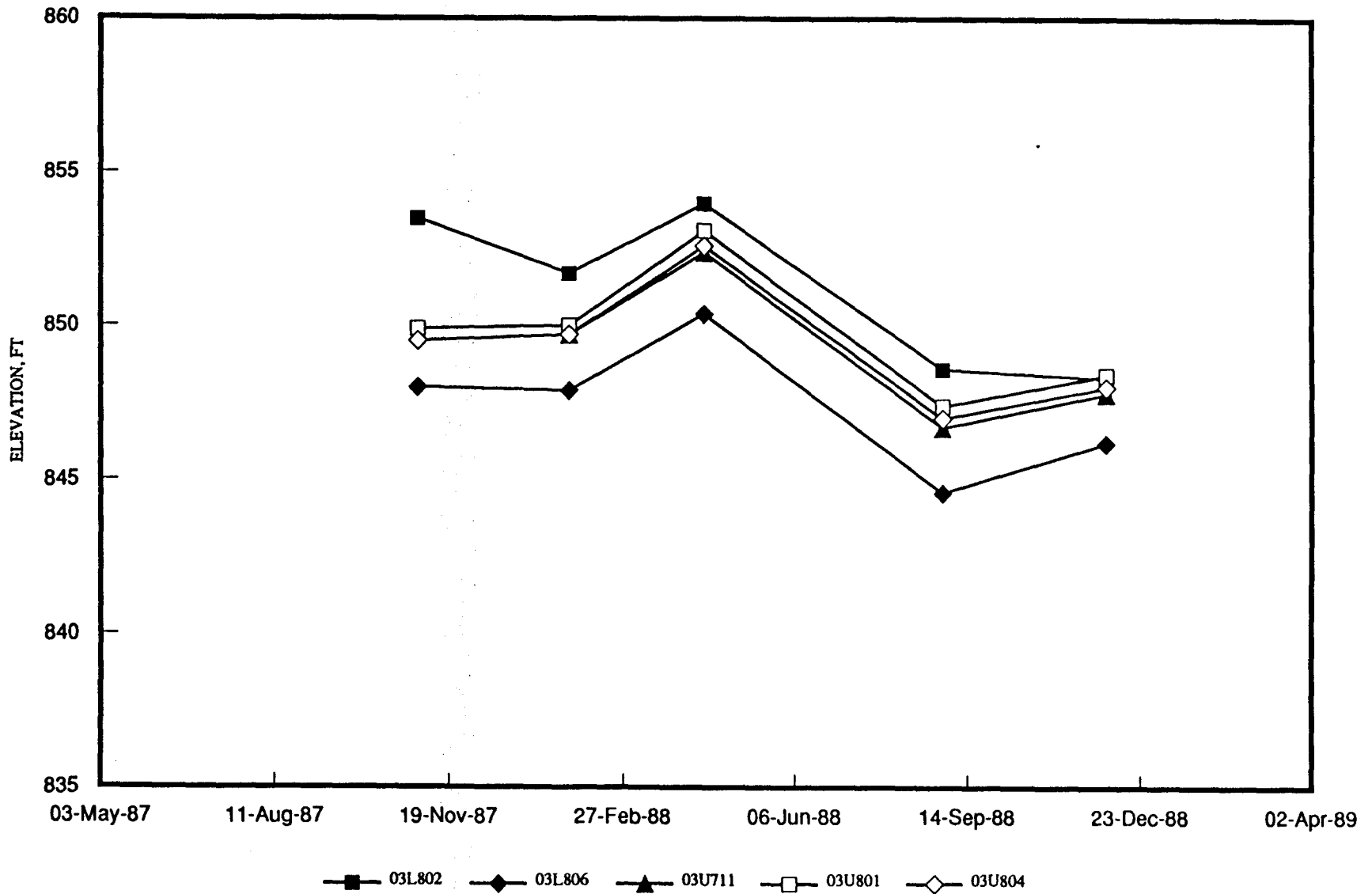


FIG. I-8, October, 1989
WENCK ASSOCIATES, INC.

GROUNDWATER HYDROGRAPHS

TWIN CITIES ARMY AMMUNITION PLANT

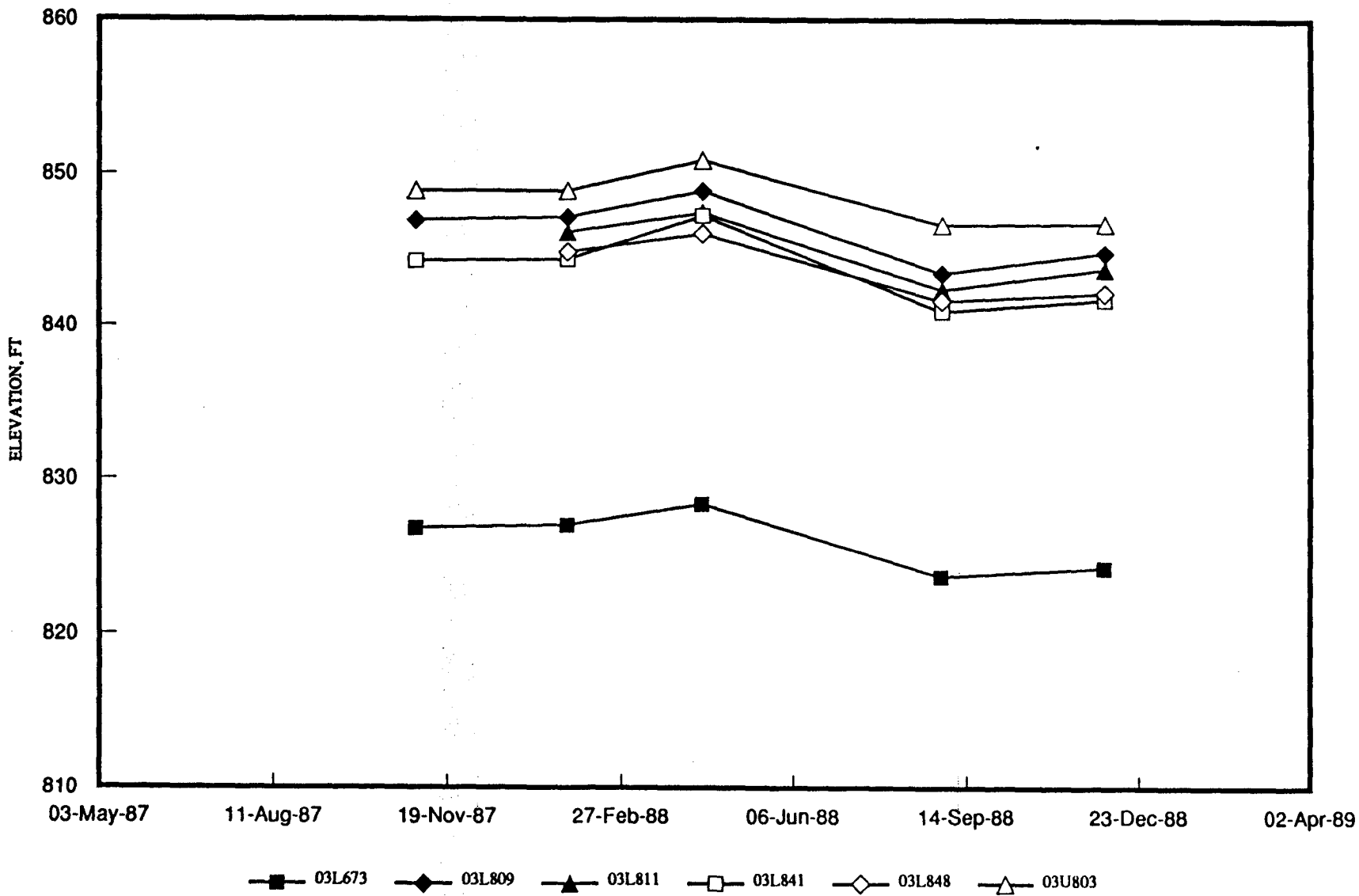


FIG. I-9, October, 1989
WENCK ASSOCIATES, INC.

GROUNDWATER HYDROGRAPHS

TWIN CITIES ARMY AMMUNITION PLANT

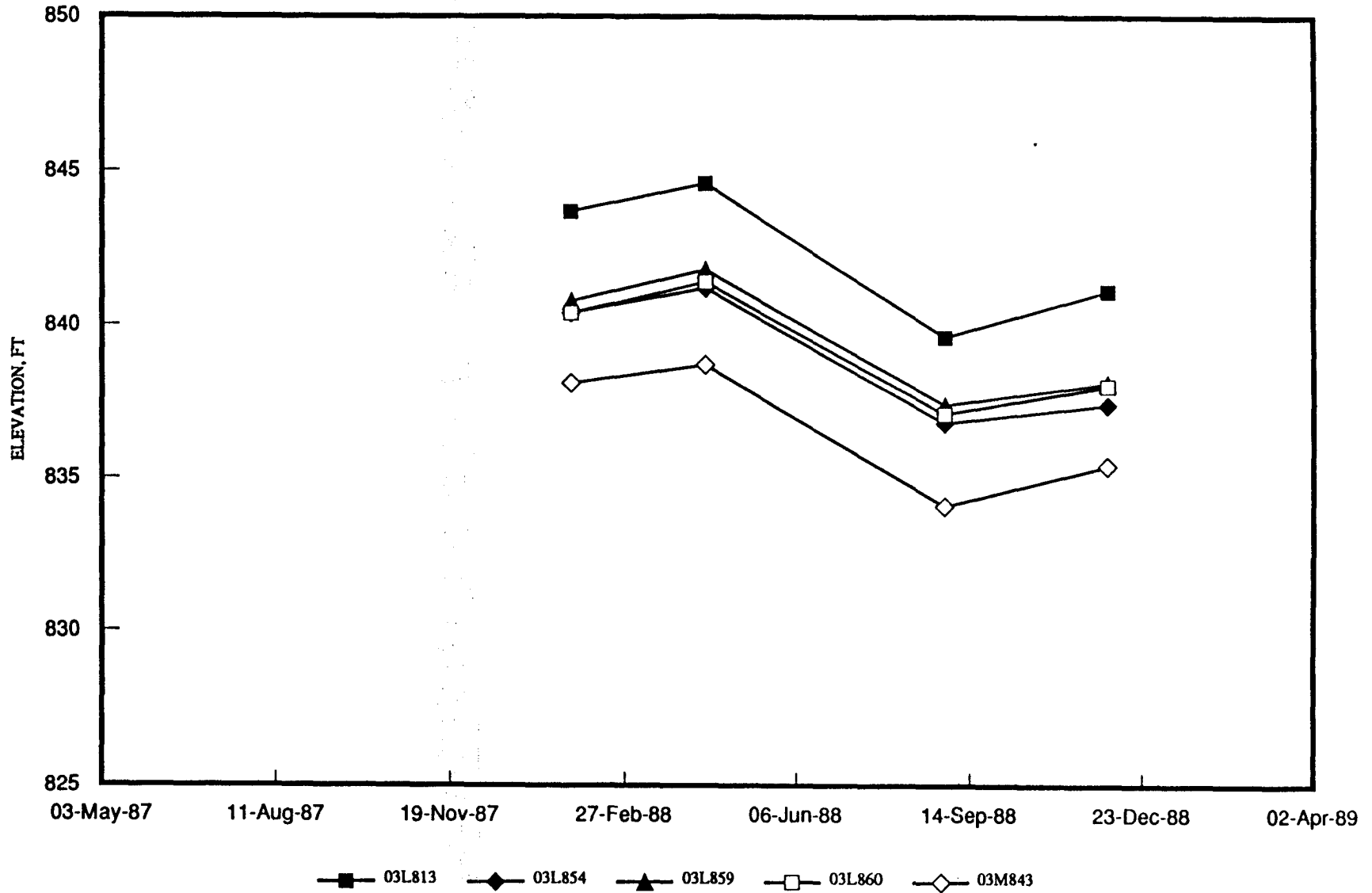


FIG. I-10, October, 1989
WENCK ASSOCIATES, INC.

GROUNDWATER HYDROGRAPHS

TWIN CITIES ARMY AMMUNITION PLANT

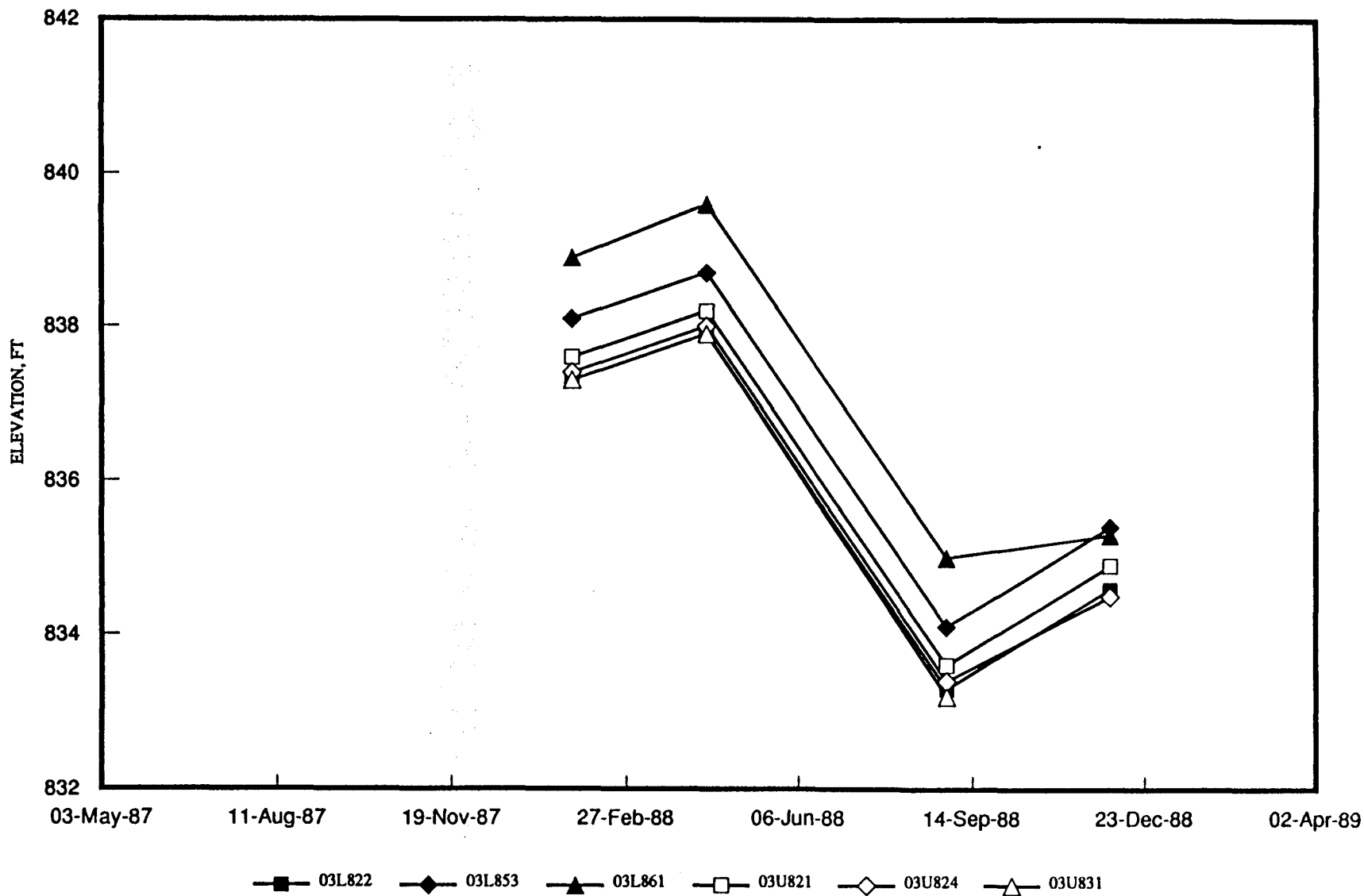


FIG. I-11, October, 1989
WENCK ASSOCIATES, INC.

GROUNDWATER HYDROGRAPHS

TWIN CITIES ARMY AMMUNITION PLANT

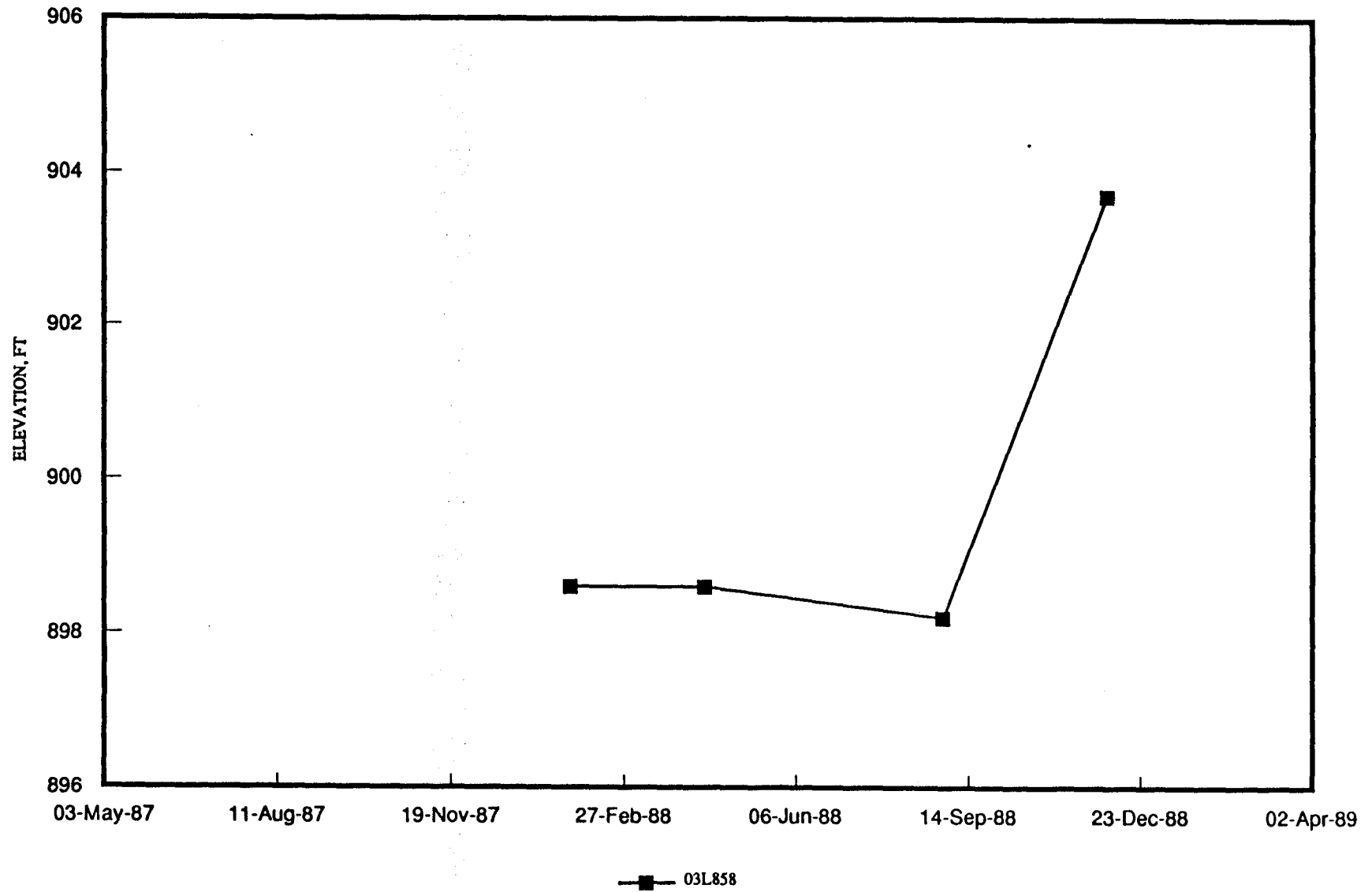


FIG. I-12, October, 1989
WENCK ASSOCIATES, INC.

GROUNDWATER HYDROGRAPHS

TWIN CITIES ARMY AMMUNITION PLANT

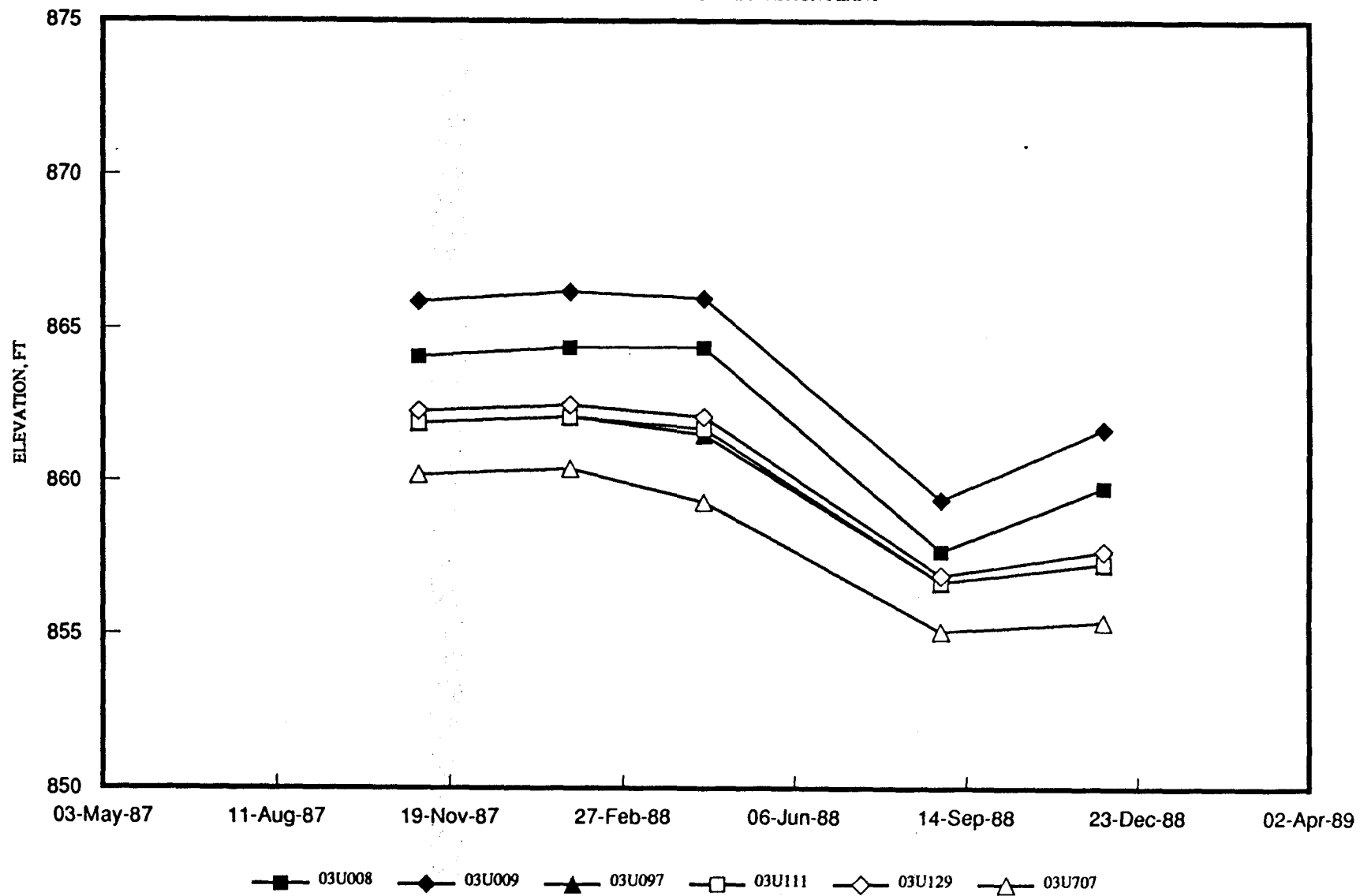


FIG. I-13, October, 1989
WENCK ASSOCIATES, INC.

GROUNDWATER HYDROGRAPHS

TWIN CITIES ARMY AMMUNITION PLANT

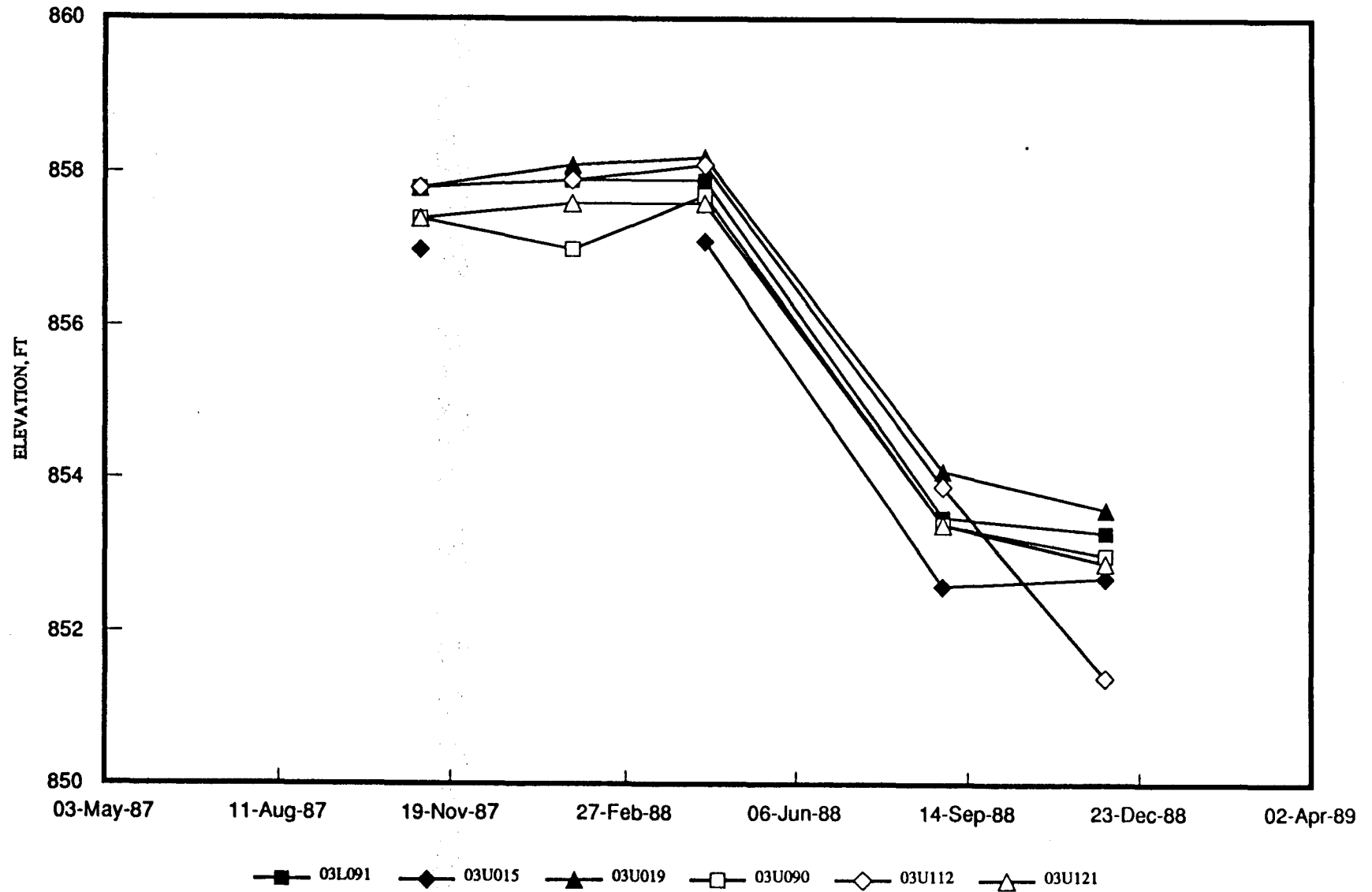


FIG. I-14, October, 1989
WENCK ASSOCIATES, INC.

GROUNDWATER HYDROGRAPHS

TWIN CITIES ARMY AMMUNITION PLANT

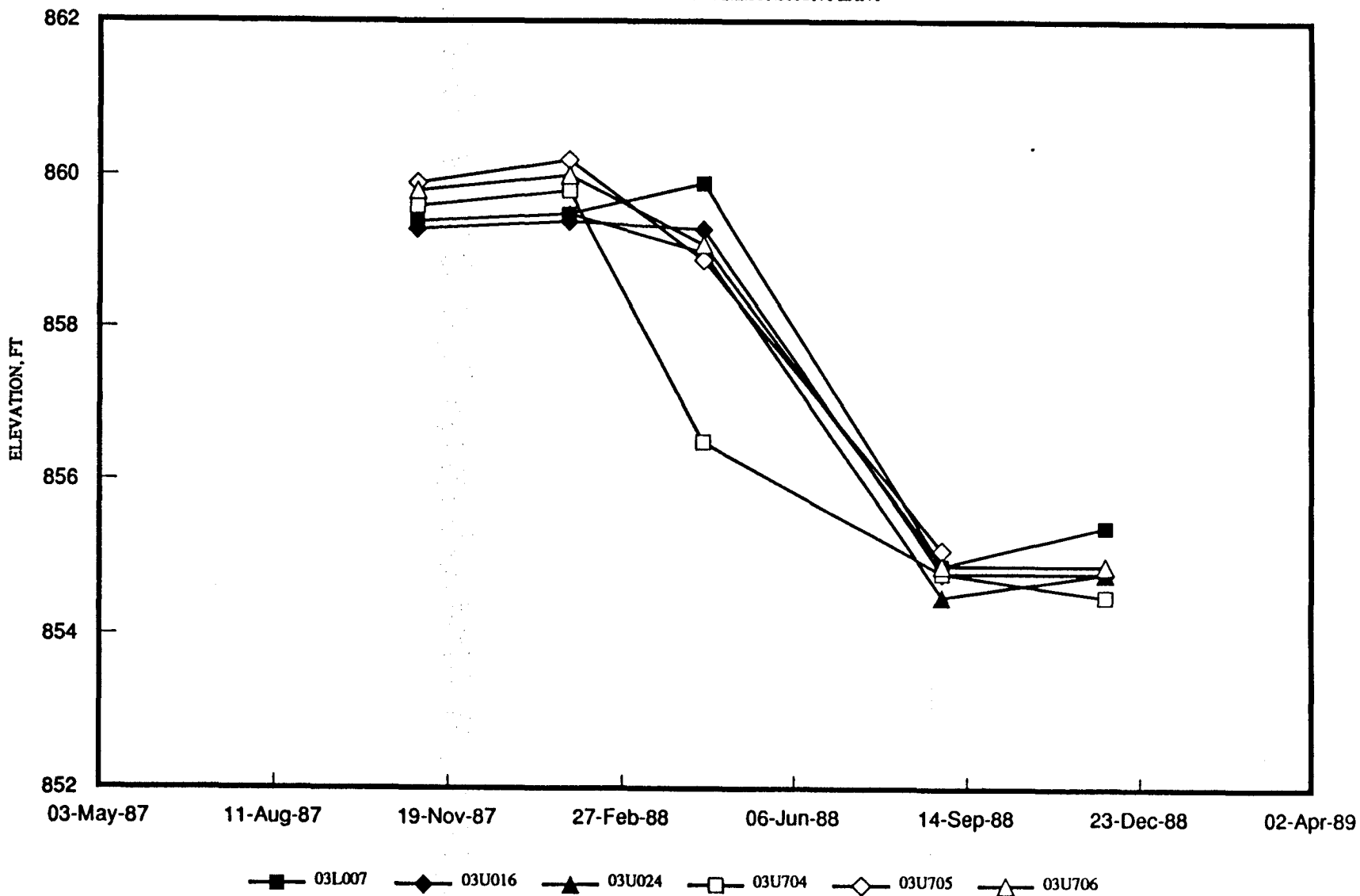


FIG. I-15, October, 1989
WENCK ASSOCIATES, INC.

GROUNDWATER HYDROGRAPHS

TWIN CITIES ARMY AMMUNITION PLANT

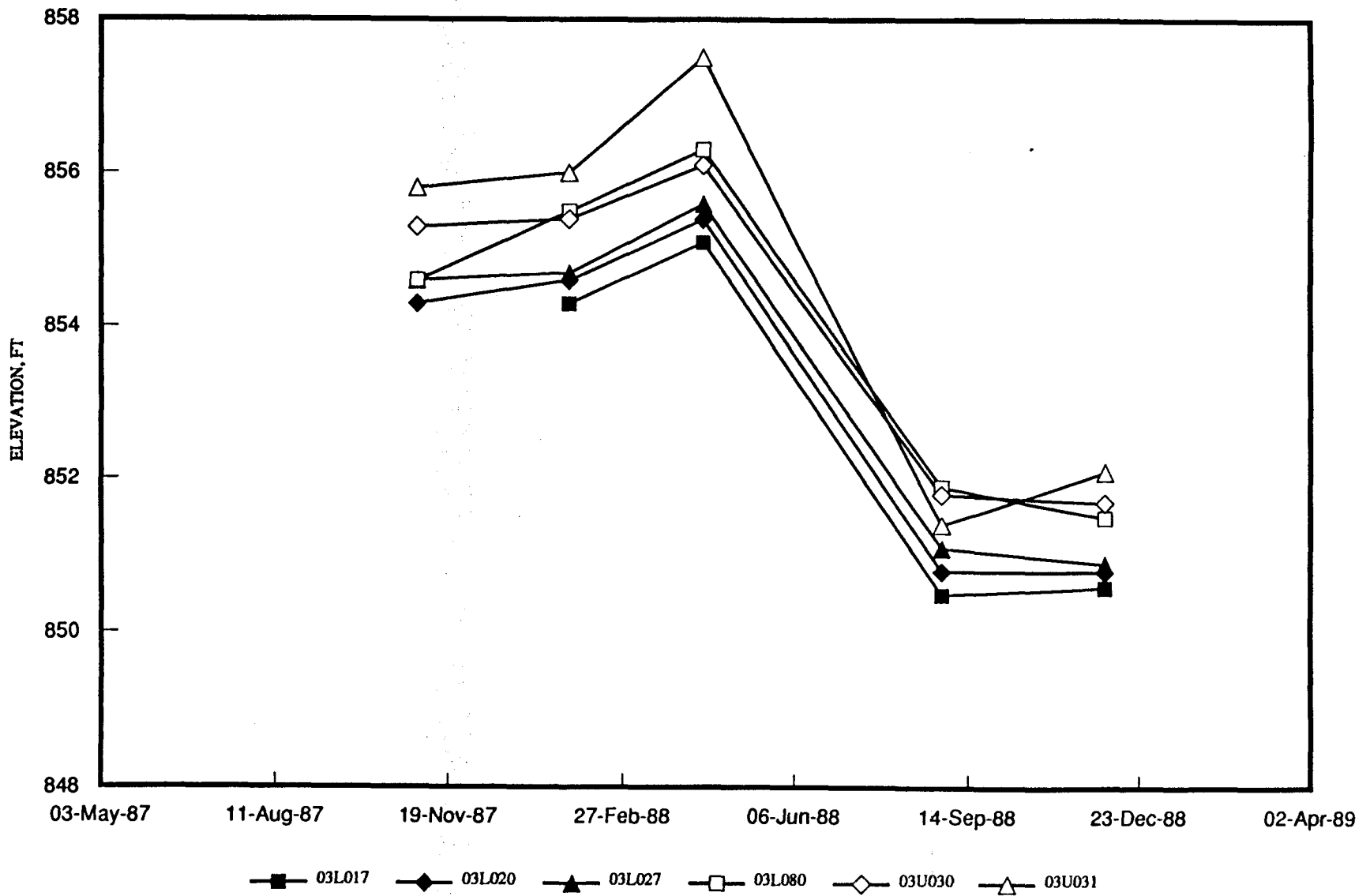


FIG. I-16, October, 1989
WENCK ASSOCIATES, INC.

GROUNDWATER HYDROGRAPHS

TWIN CITIES ARMY AMMUNITION PLANT

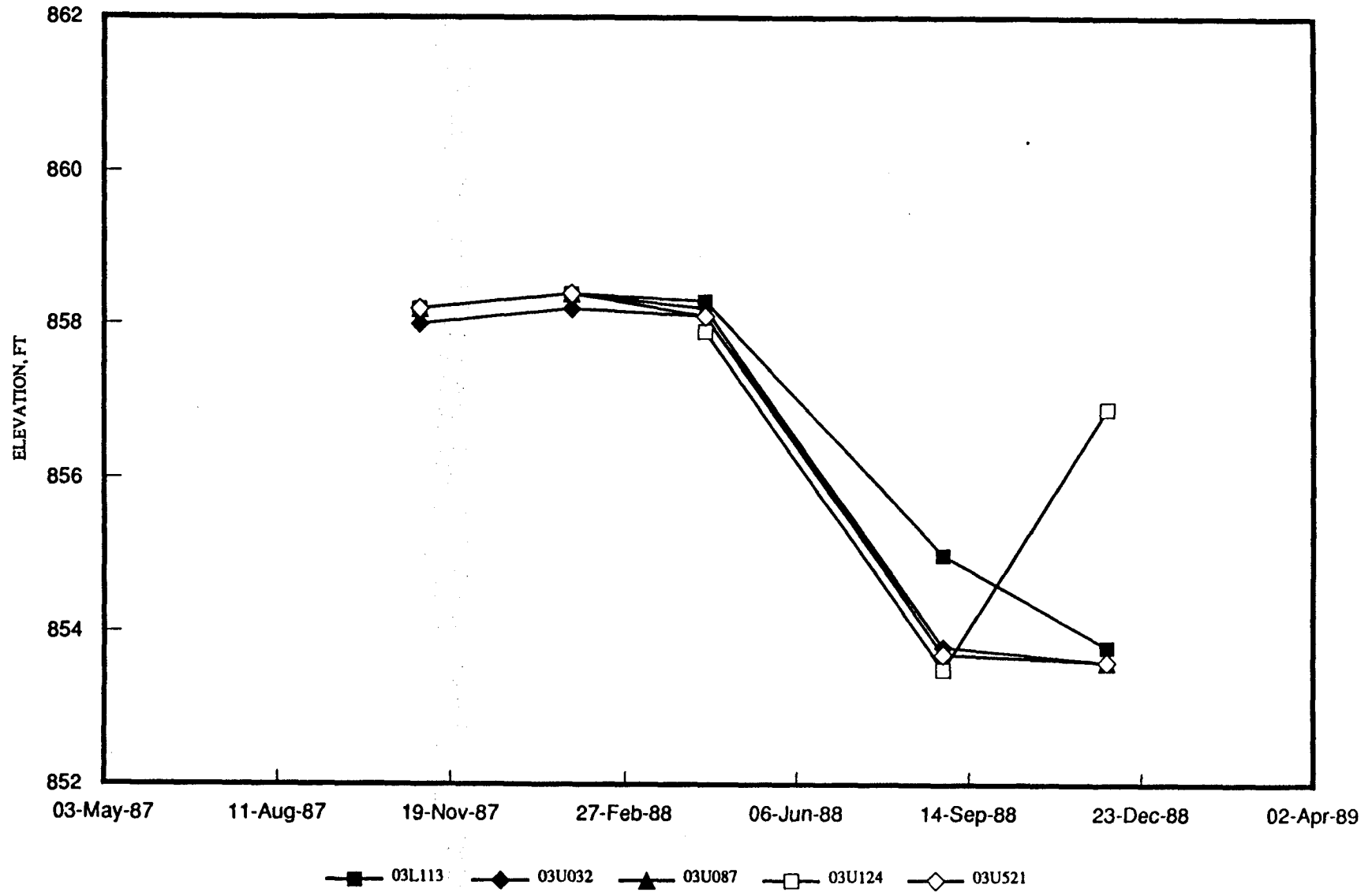


FIG. I-17, October, 1989
WENCK ASSOCIATES, INC.

GROUNDWATER HYDROGRAPHS

TWIN CITIES ARMY AMMUNITION PLANT

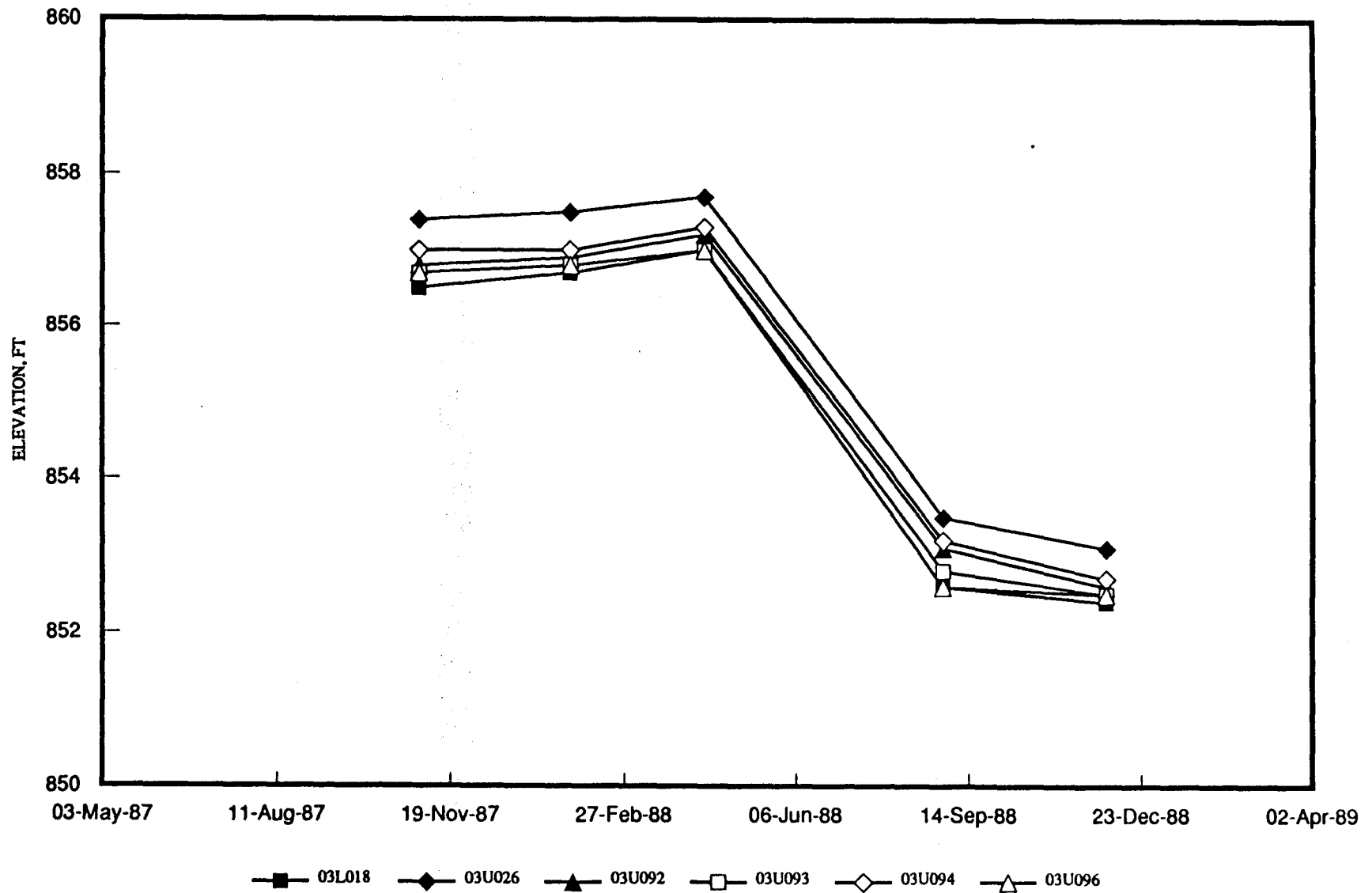


FIG. I-18, October, 1989
WENCK ASSOCIATES, INC.

GROUNDWATER HYDROGRAPHS

TWIN CITIES ARMY AMMUNITION PLANT

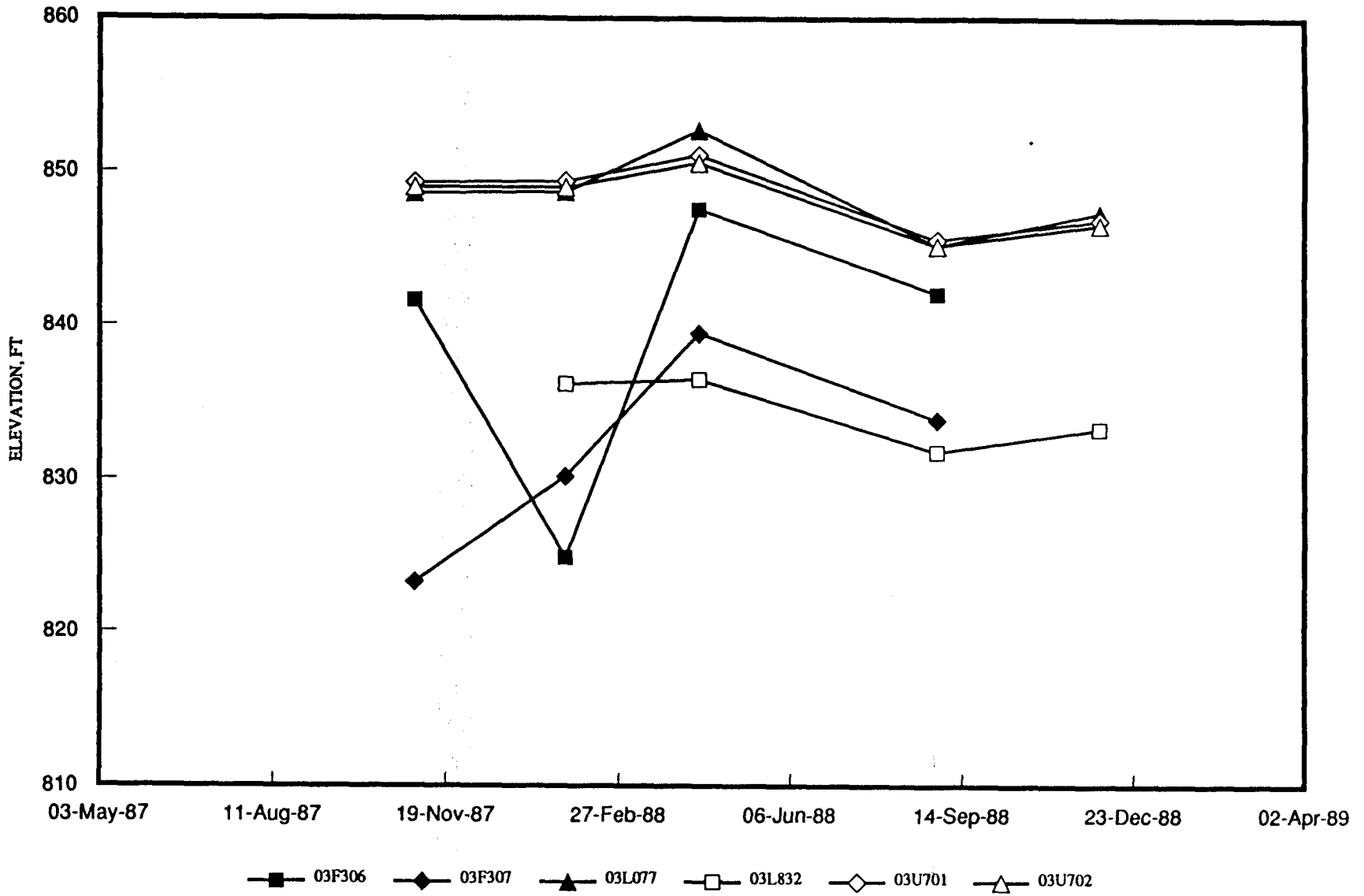


FIG. I-19, October, 1989
WENCK ASSOCIATES, INC.

J. UNIT 4 GROUNDWATER HYDROGRAPHS

GROUNDWATER HYDROGRAPHS

TWIN CITIES ARMY AMMUNITION PLANT

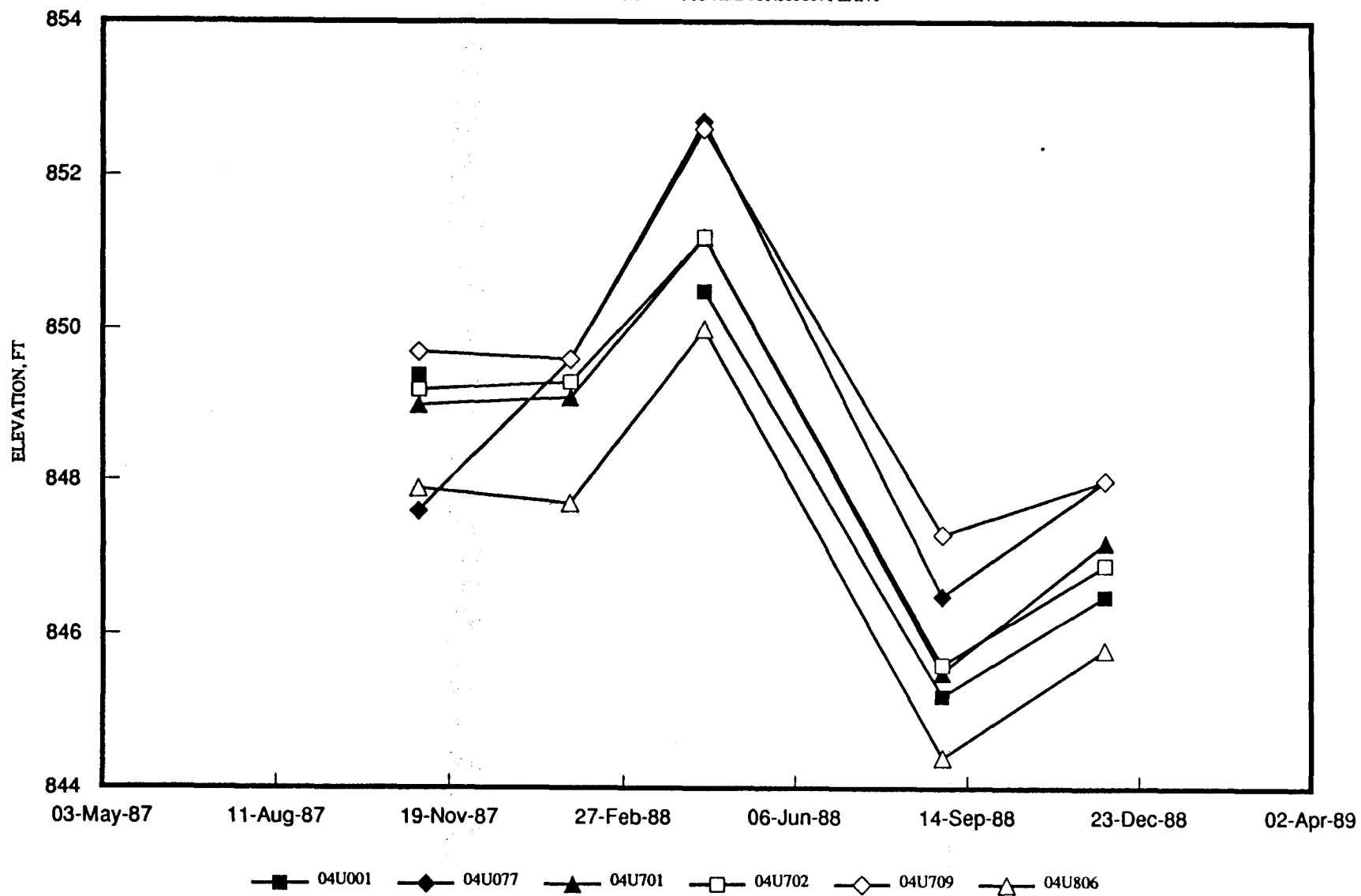


FIG. J-1, October, 1989
WENCK ASSOCIATES, INC.

GROUNDWATER HYDROGRAPHS

TWIN CITIES ARMY AMMUNITION PLANT

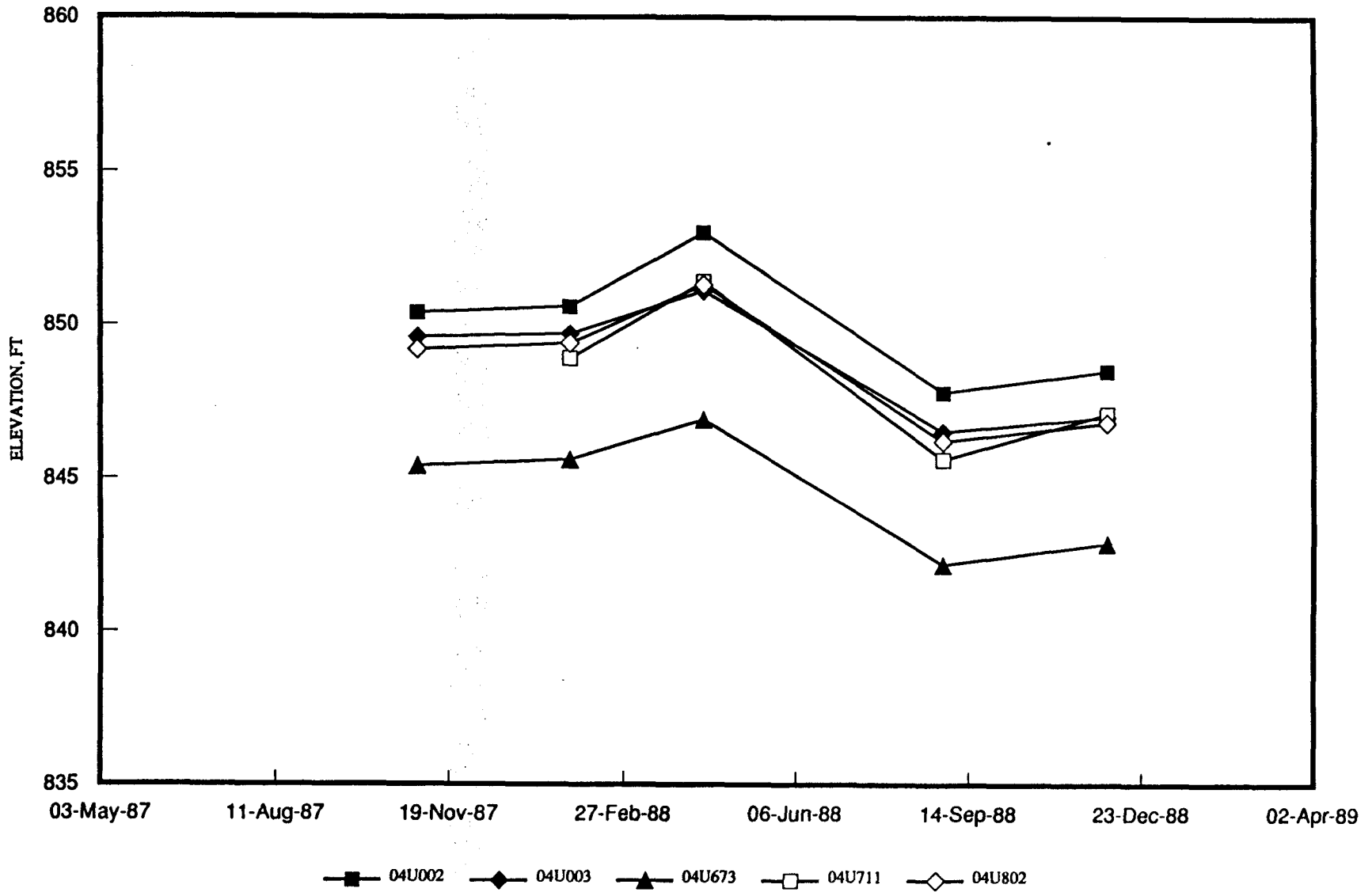


FIG. J-2, October, 1989
WENCK ASSOCIATES, INC.

GROUNDWATER HYDROGRAPHS

TWIN CITIES ARMY AMMUNITION PLANT

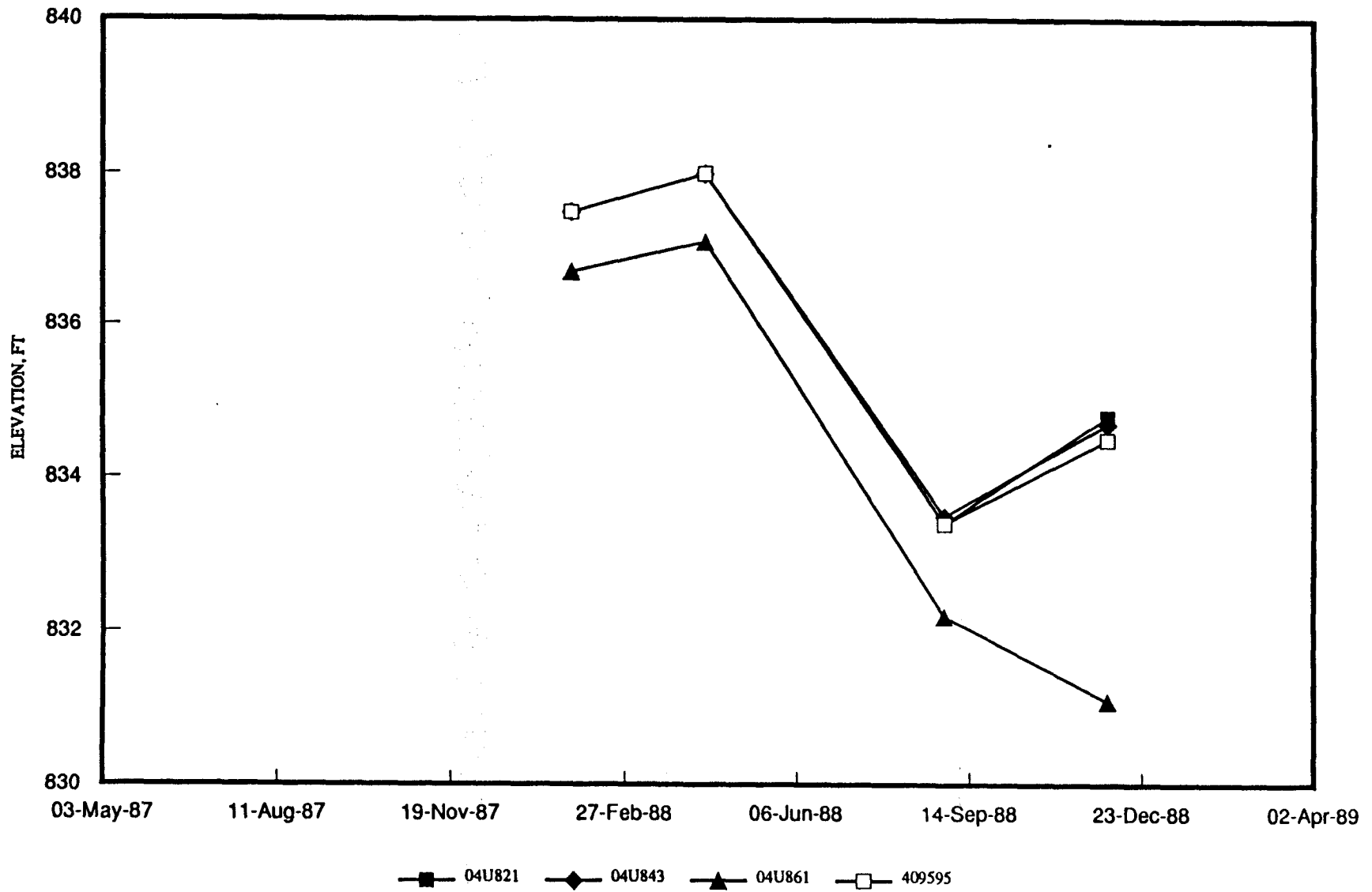


FIG. J-3, October, 1989
WENCK ASSOCIATES, INC.

GROUNDWATER HYDROGRAPHS

TWIN CITIES ARMY AMMUNITION PLANT

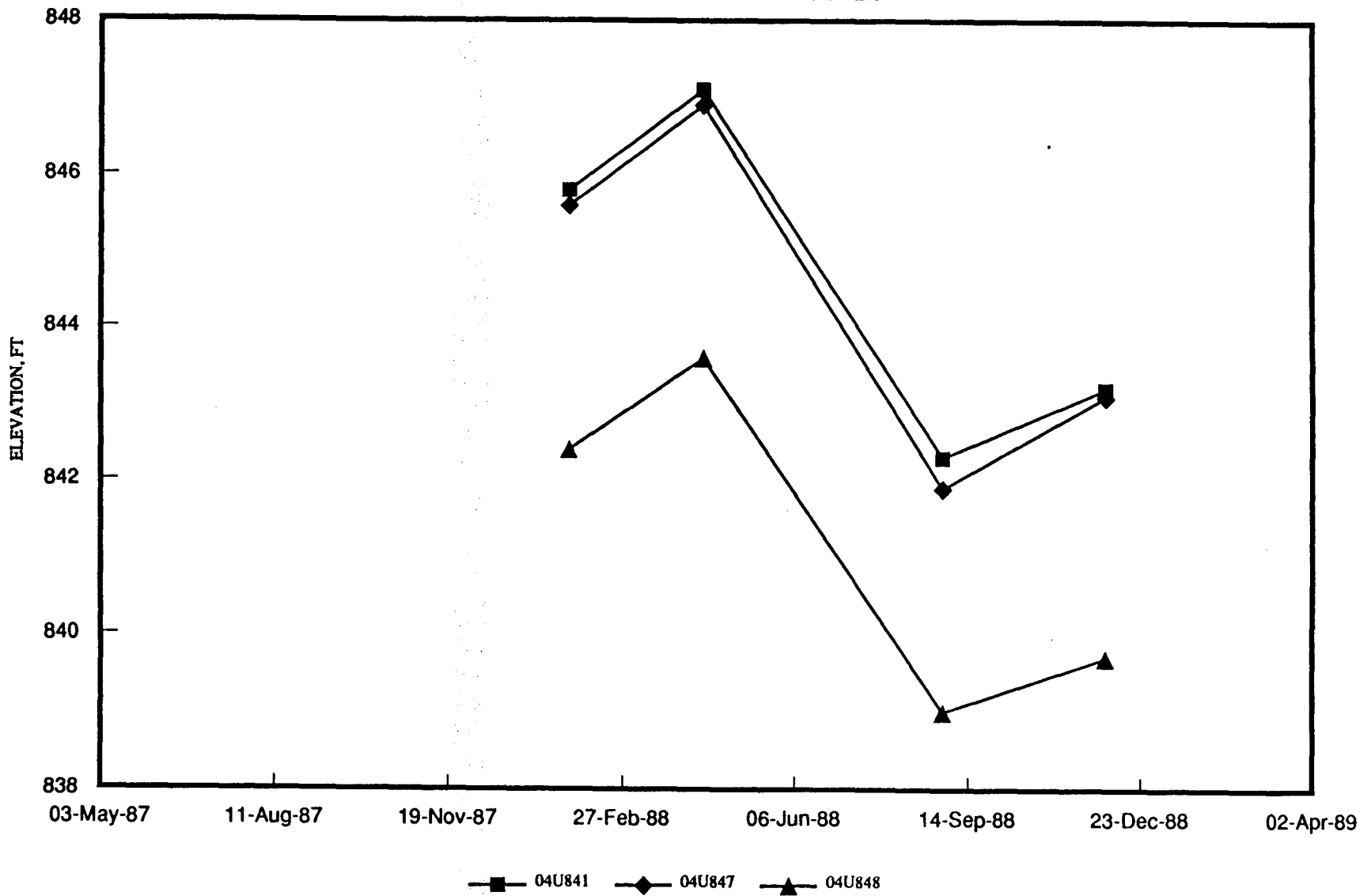


FIG. J-4, October, 1989
WENCK ASSOCIATES, INC.

GROUNDWATER HYDROGRAPHS

TWIN CITIES ARMY AMMUNITION PLANT

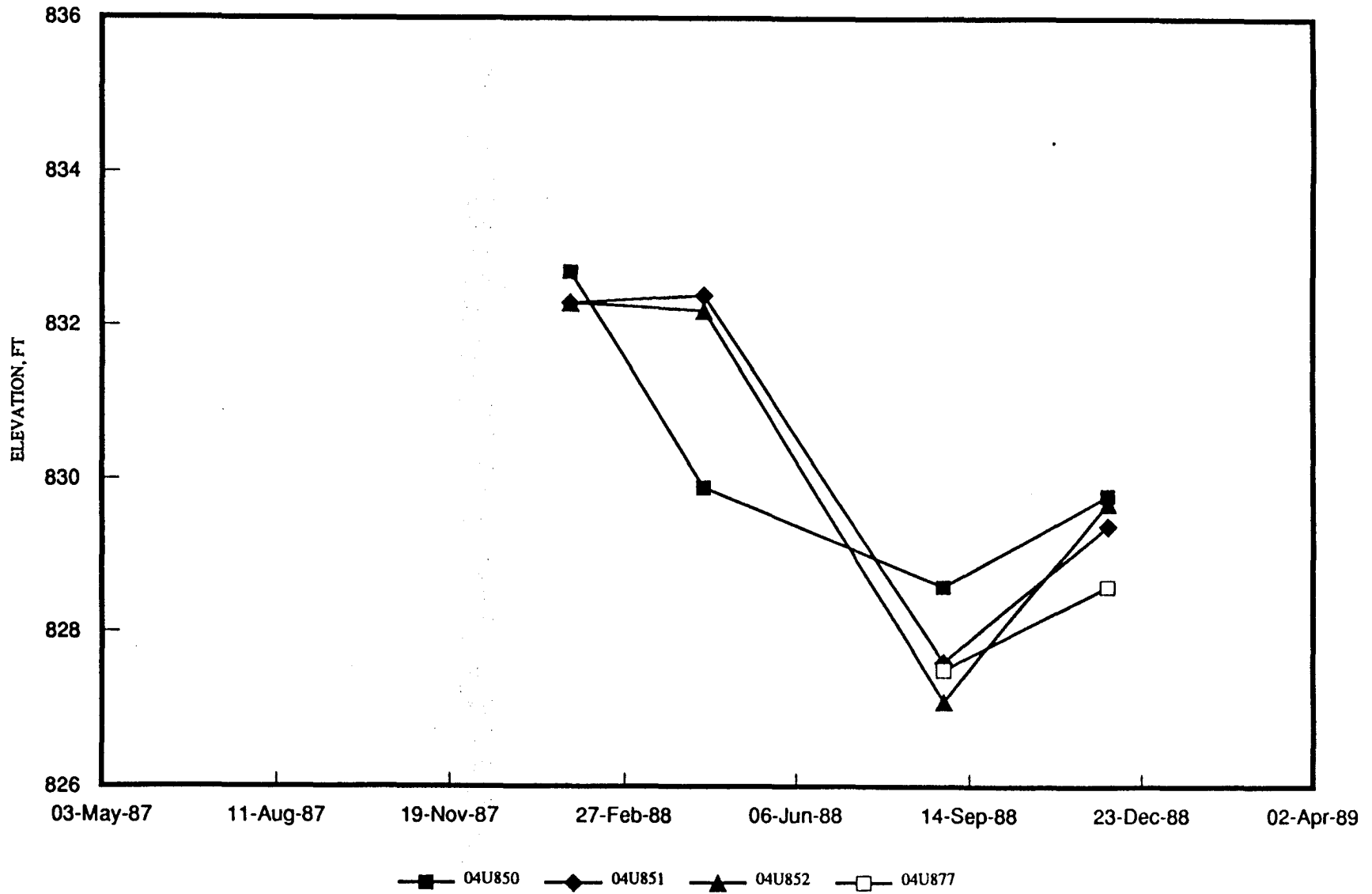


FIG. J-5, October. 1989
WENCK ASSOCIATES, INC.

GROUNDWATER HYDROGRAPHS

TWIN CITIES ARMY AMMUNITION PLANT

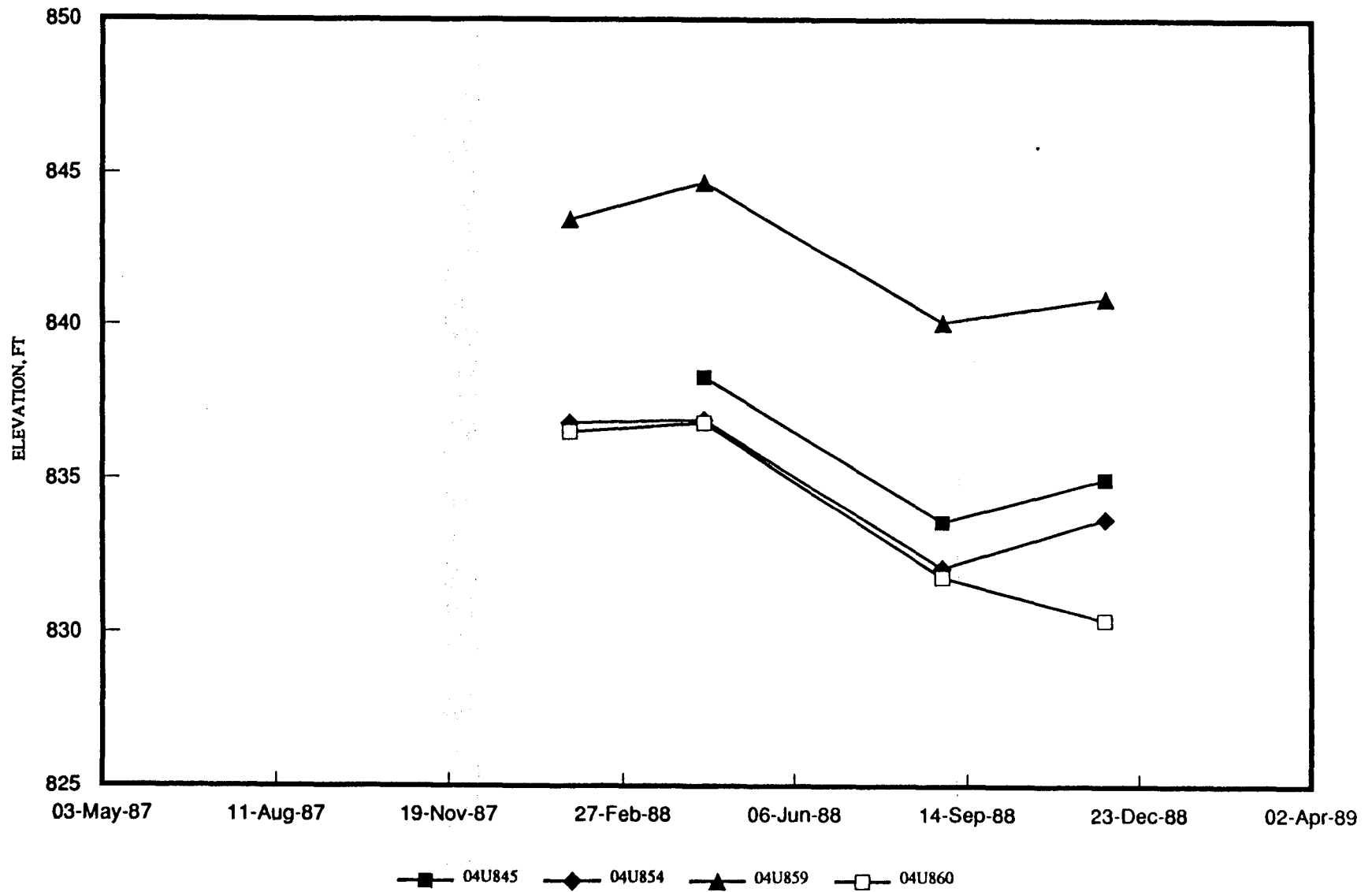


FIG. J-6, October, 1989
WENCK ASSOCIATES, INC.

GROUNDWATER HYDROGRAPHS

TWIN CITIES ARMY AMMUNITION PLANT

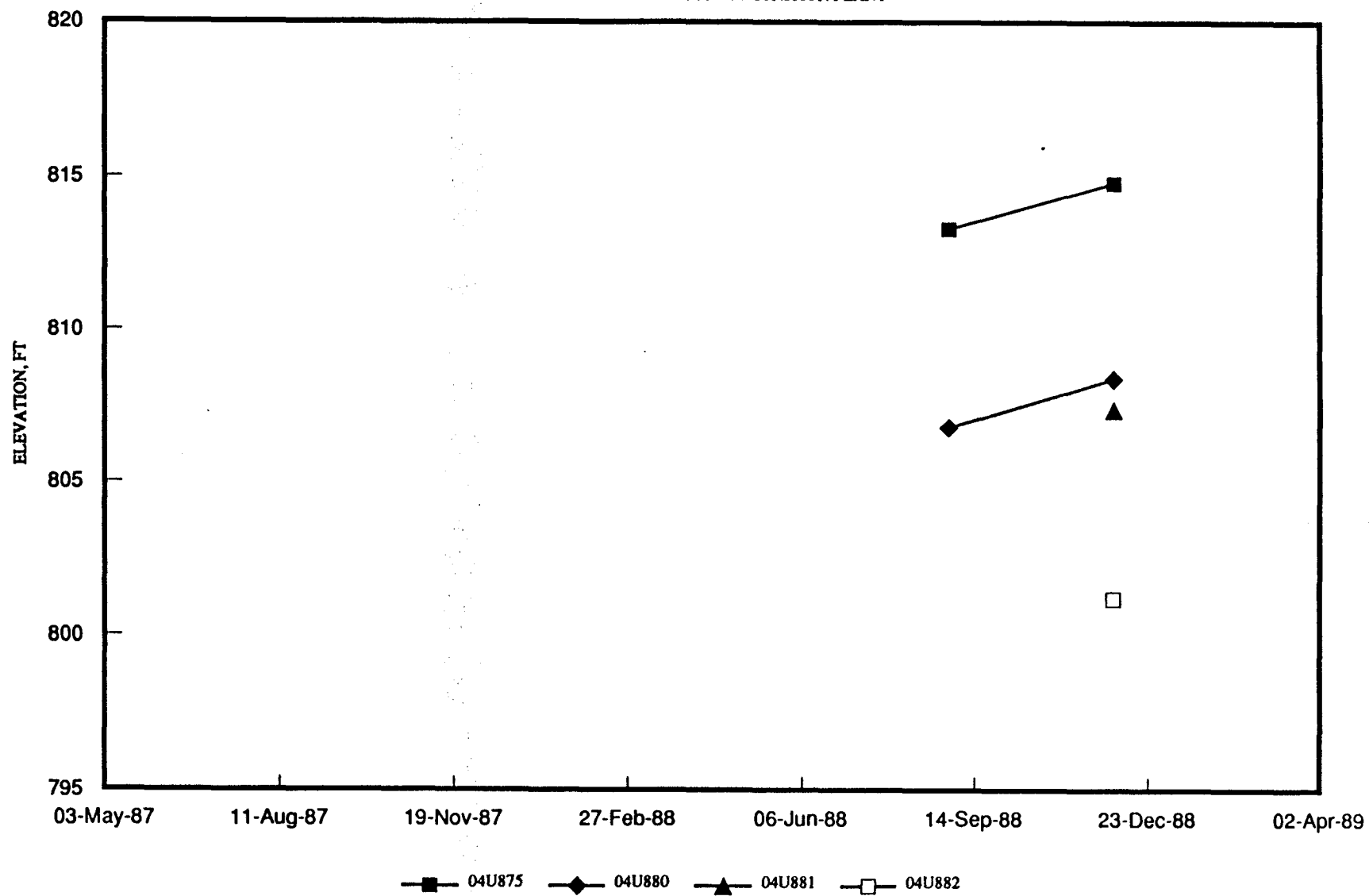


FIG. J-7, October, 1989
WENCK ASSOCIATES, INC.

GROUNDWATER HYDROGRAPHS

TWIN CITIES ARMY AMMUNITION PLANT

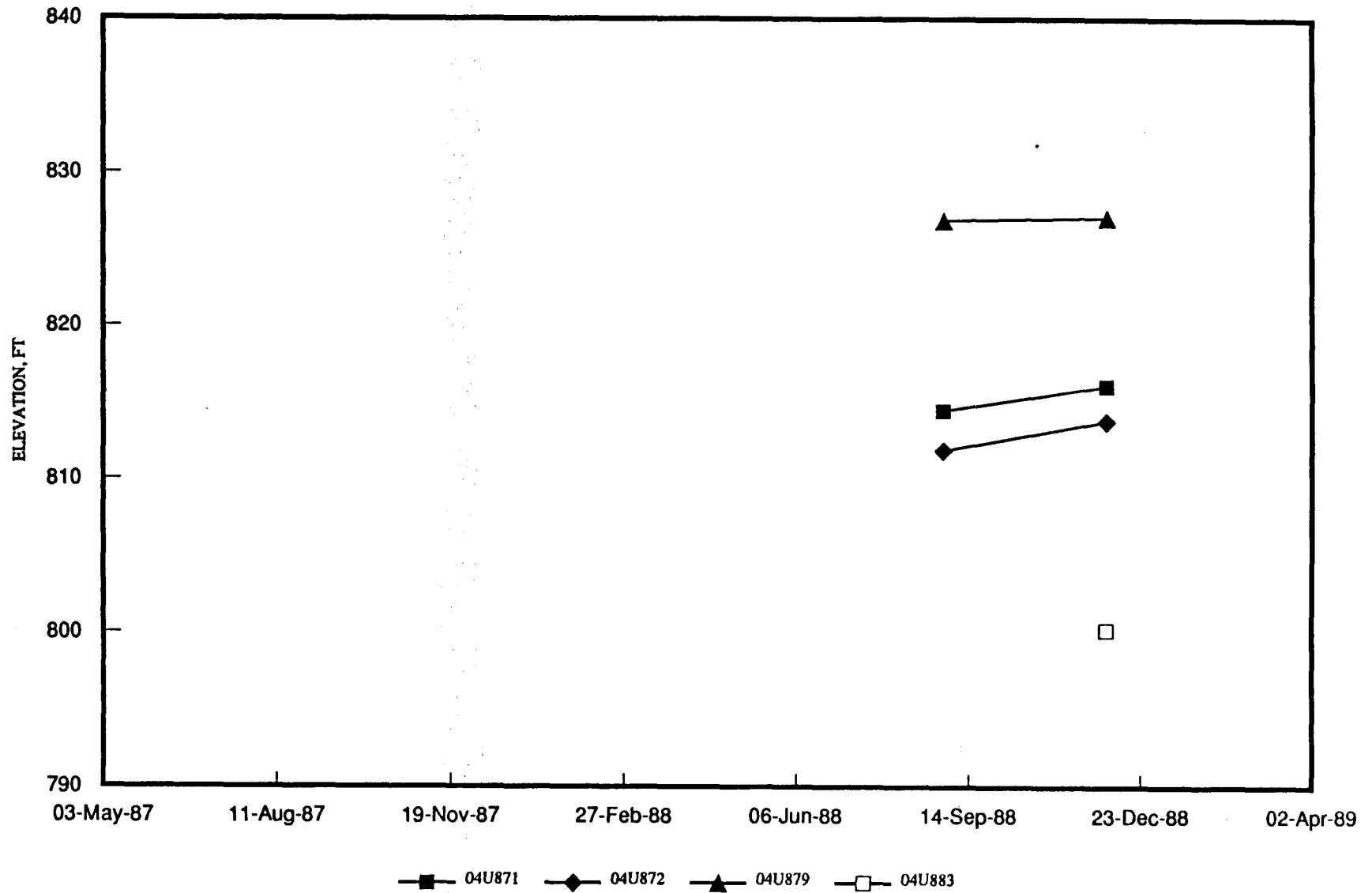


FIG. J-8, October, 1989
WENCK ASSOCIATES, INC.

GROUNDWATER HYDROGRAPHS

TWIN CITIES ARMY AMMUNITION PLANT

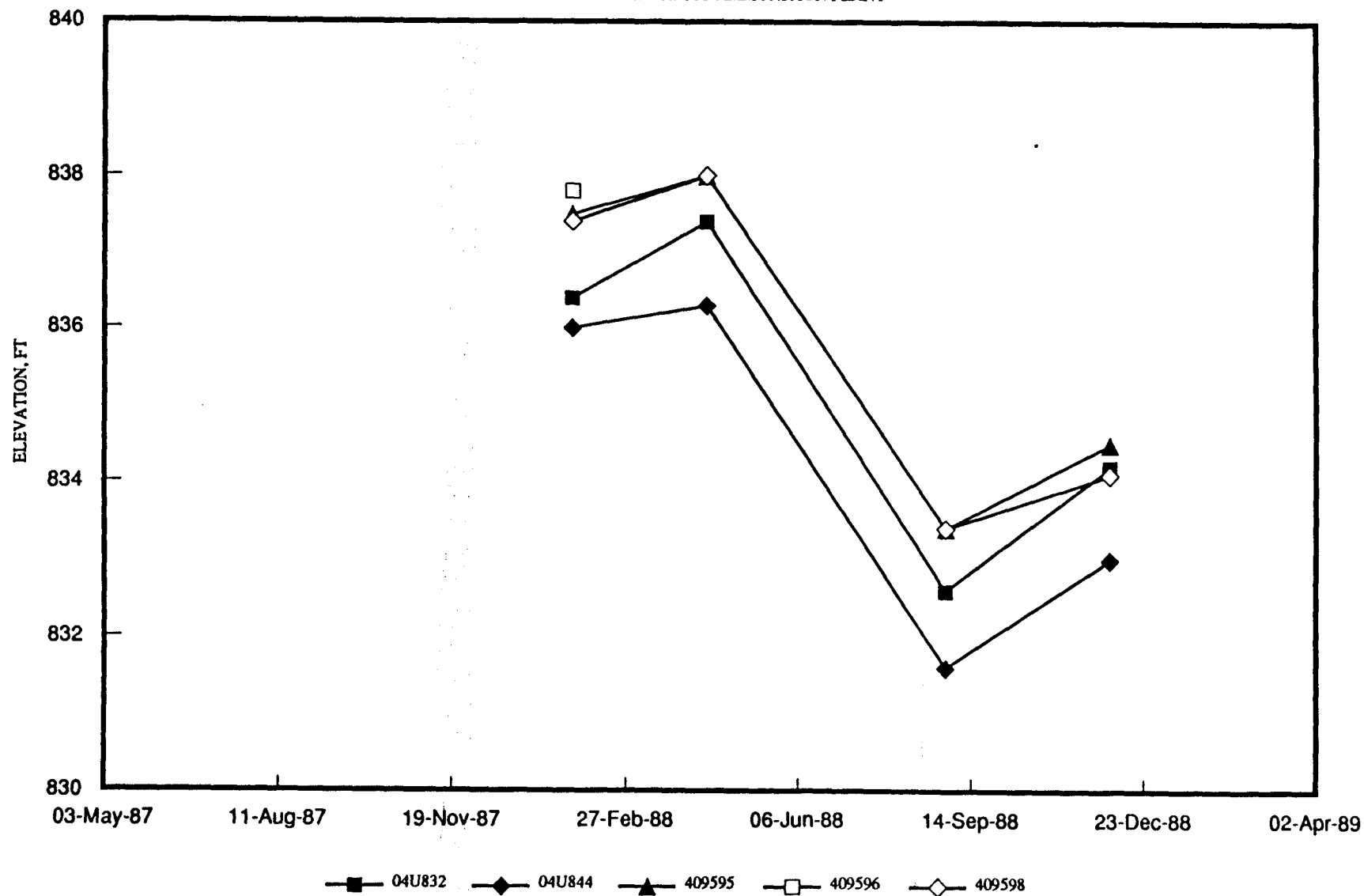


FIG. J-9, October, 1989
WENCK ASSOCIATES, INC.

GROUNDWATER HYDROGRAPHS

TWIN CITIES ARMY AMMUNITION PLANT

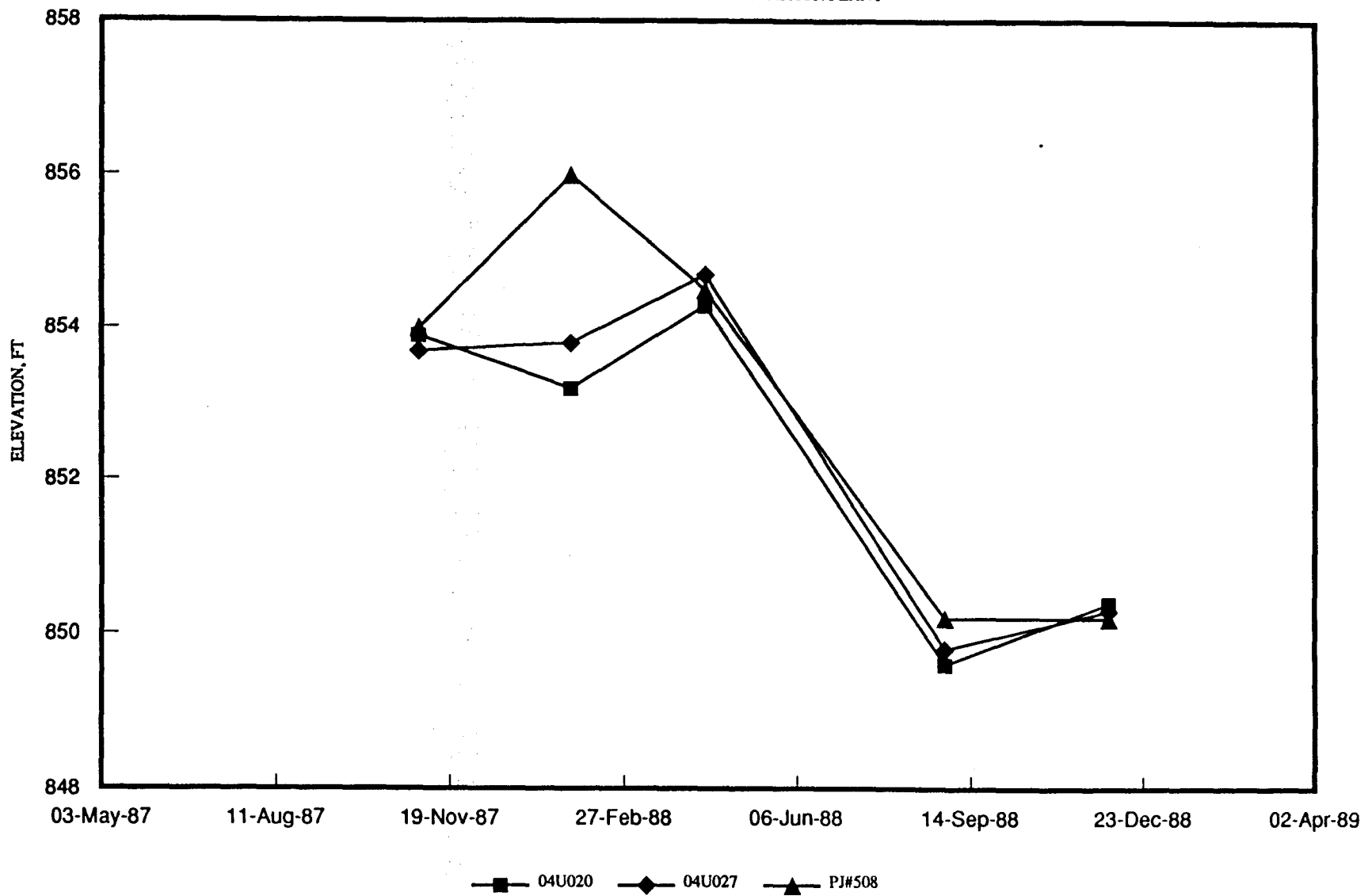


FIG. J-10, October, 1989
WENCK ASSOCIATES, INC.

GROUNDWATER HYDROGRAPHS

TWIN CITIES ARMY AMMUNITION PLANT

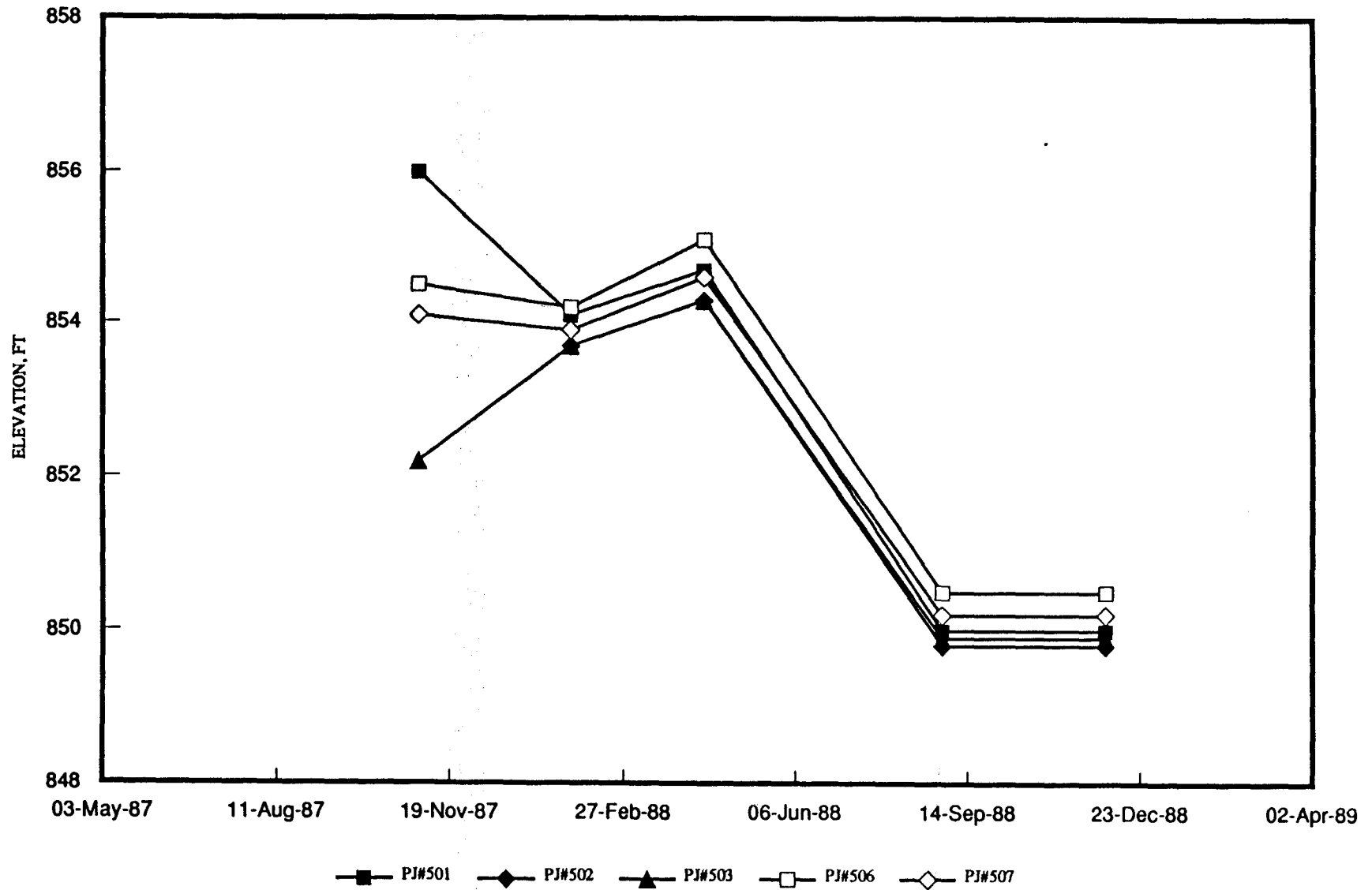


FIG. J-11, October, 1989
WENCK ASSOCIATES, INC.

K. MONITOR WELL NEST GROUNDWATER HYDROGRAPHS

GROUNDWATER HYDROGRAPHS

TWIN CITIES ARMY AMMUNITION PLANT

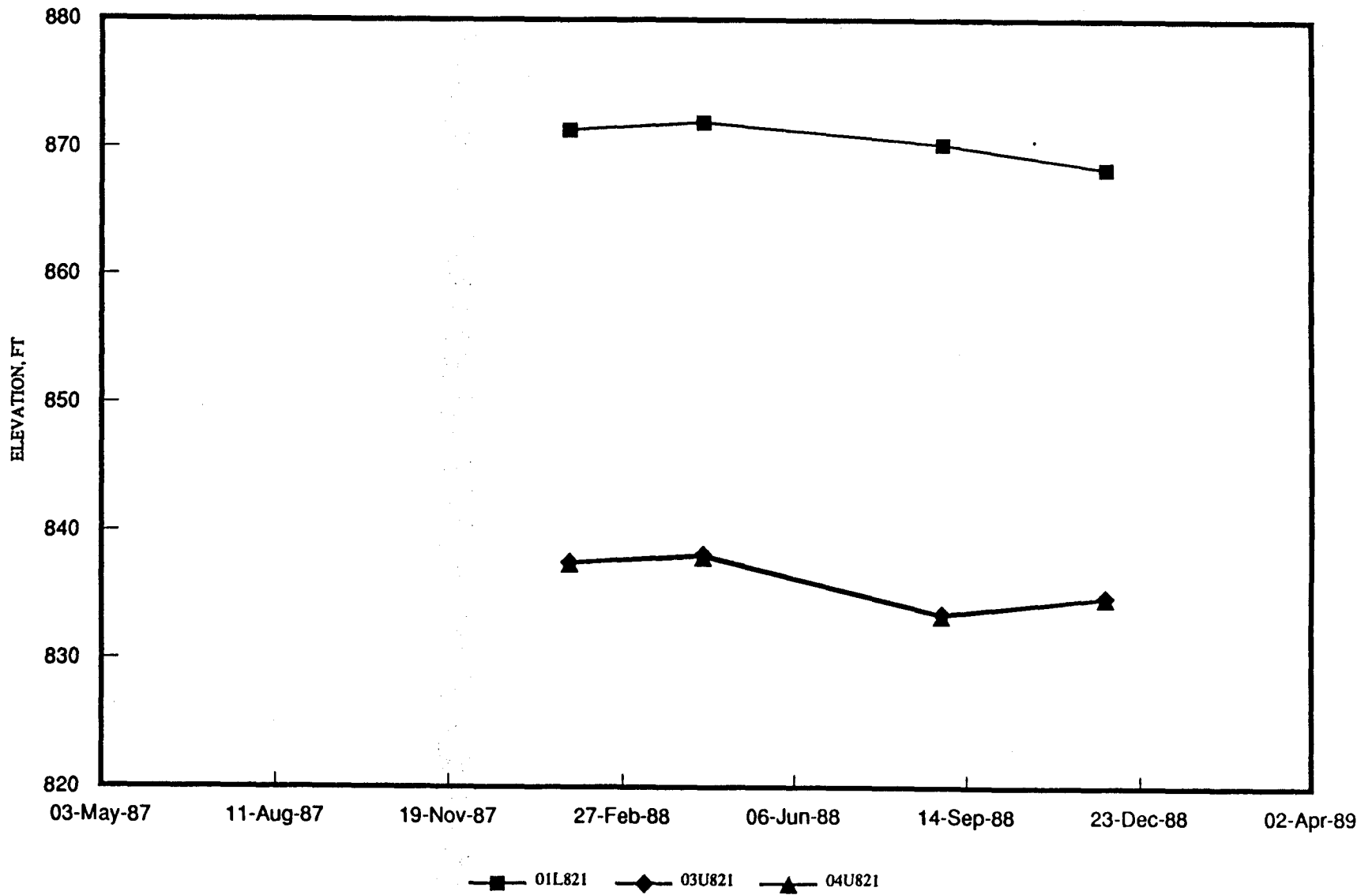


FIG. K-1, October, 1989
WENCK ASSOCIATES, INC.

GROUNDWATER HYDROGRAPHS

TWIN CITIES ARMY AMMUNITION PLANT

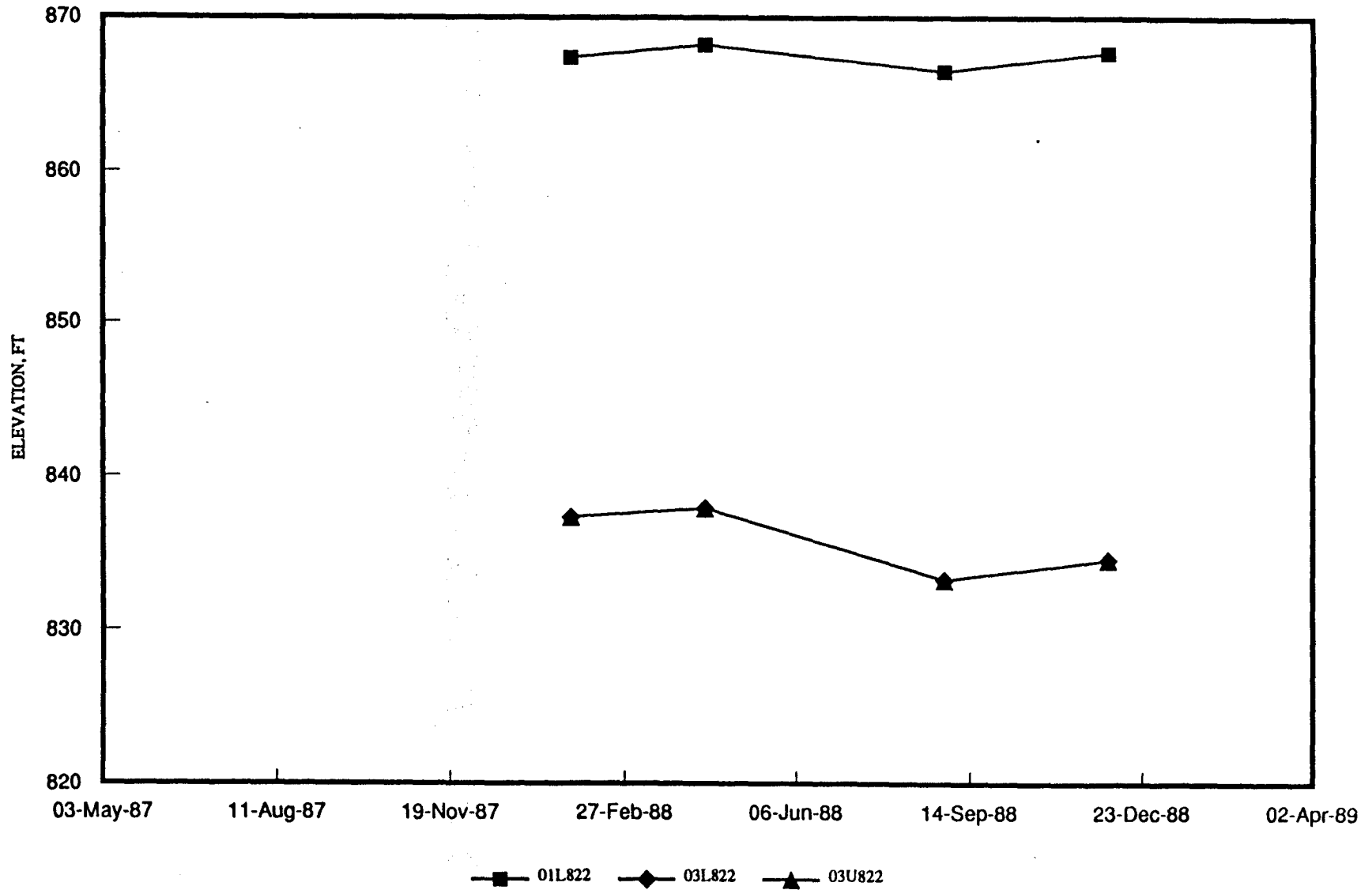


FIG. K-2, October, 1989
WENCK ASSOCIATES, INC.

GROUNDWATER HYDROGRAPHS

TWIN CITIES ARMY AMMUNITION PLANT

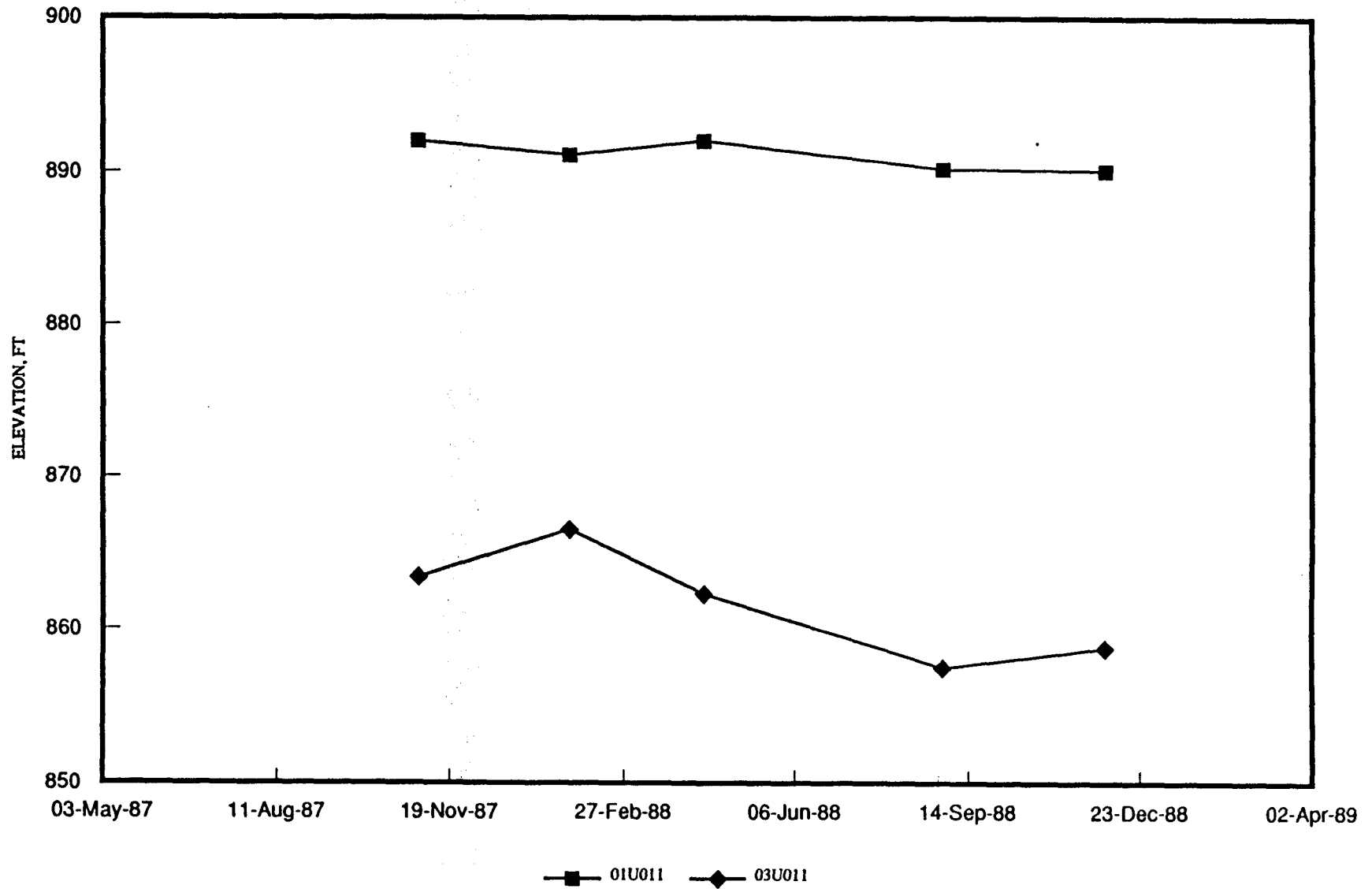


FIG. K-3, October, 1989
WENCK ASSOCIATES, INC.

GROUNDWATER HYDROGRAPHS

TWIN CITIES ARMY AMMUNITION PLANT

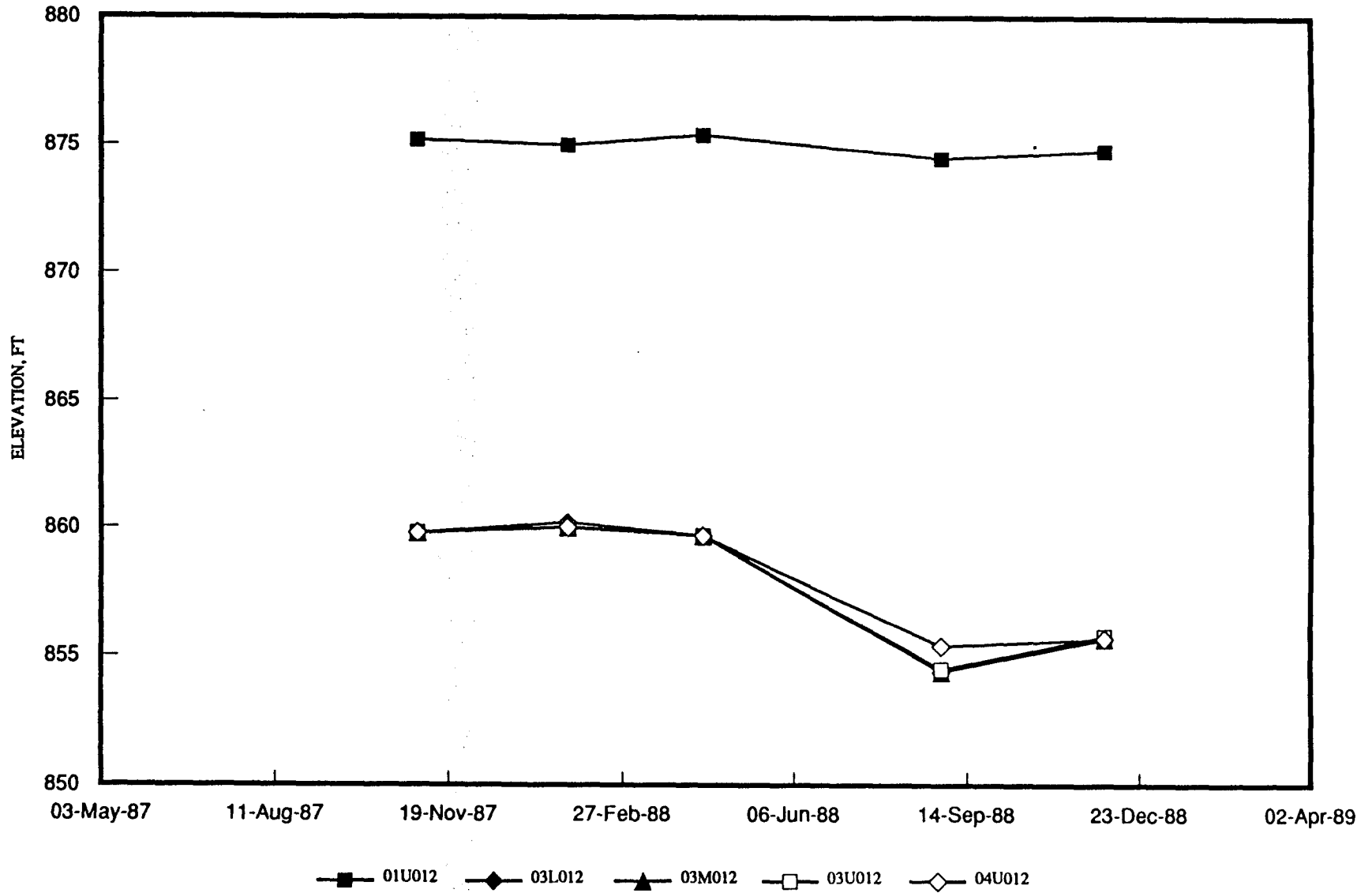


FIG. K-4, October, 1989
WENCK ASSOCIATES, INC.

GROUNDWATER HYDROGRAPHS

TWIN CITIES ARMY AMMUNITION PLANT

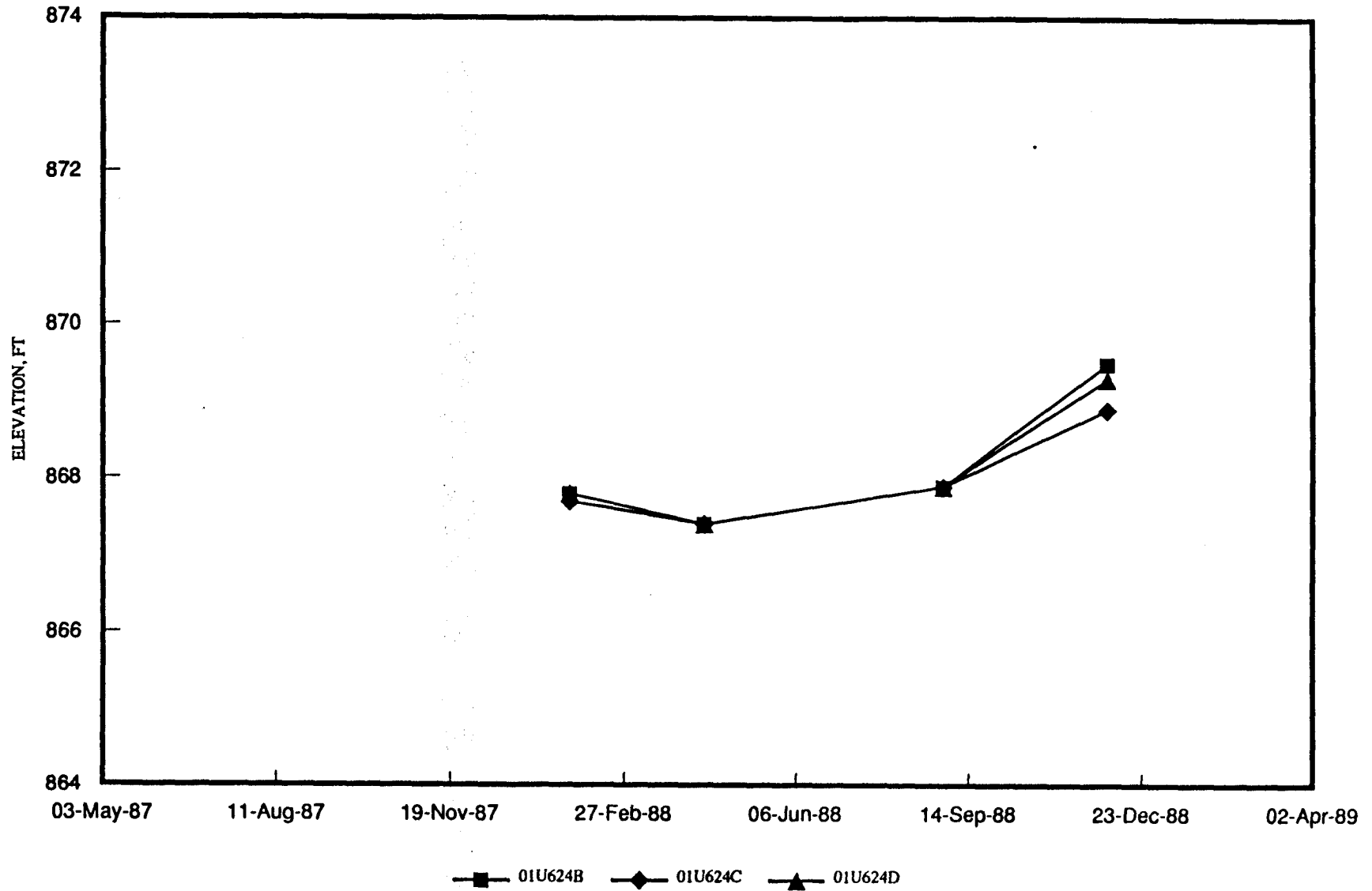


FIG. K-5, October, 1989
WENCK ASSOCIATES, INC.

GROUNDWATER HYDROGRAPHS

TWIN CITIES ARMY AMMUNITION PLANT

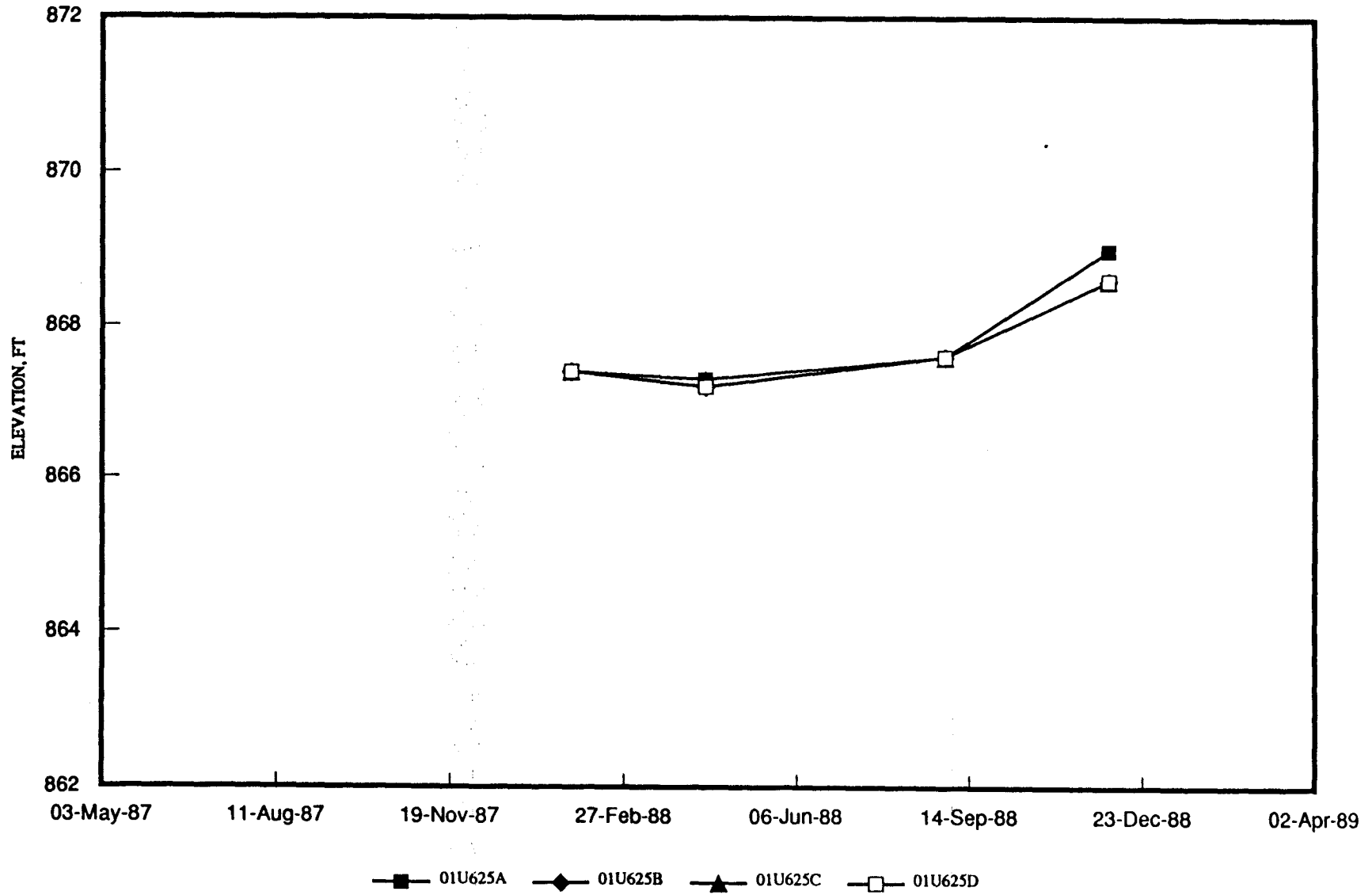


FIG. K-6, October. 1989
WENCK ASSOCIATES, INC.

GROUNDWATER HYDROGRAPHS

TWIN CITIES ARMY AMMUNITION PLANT

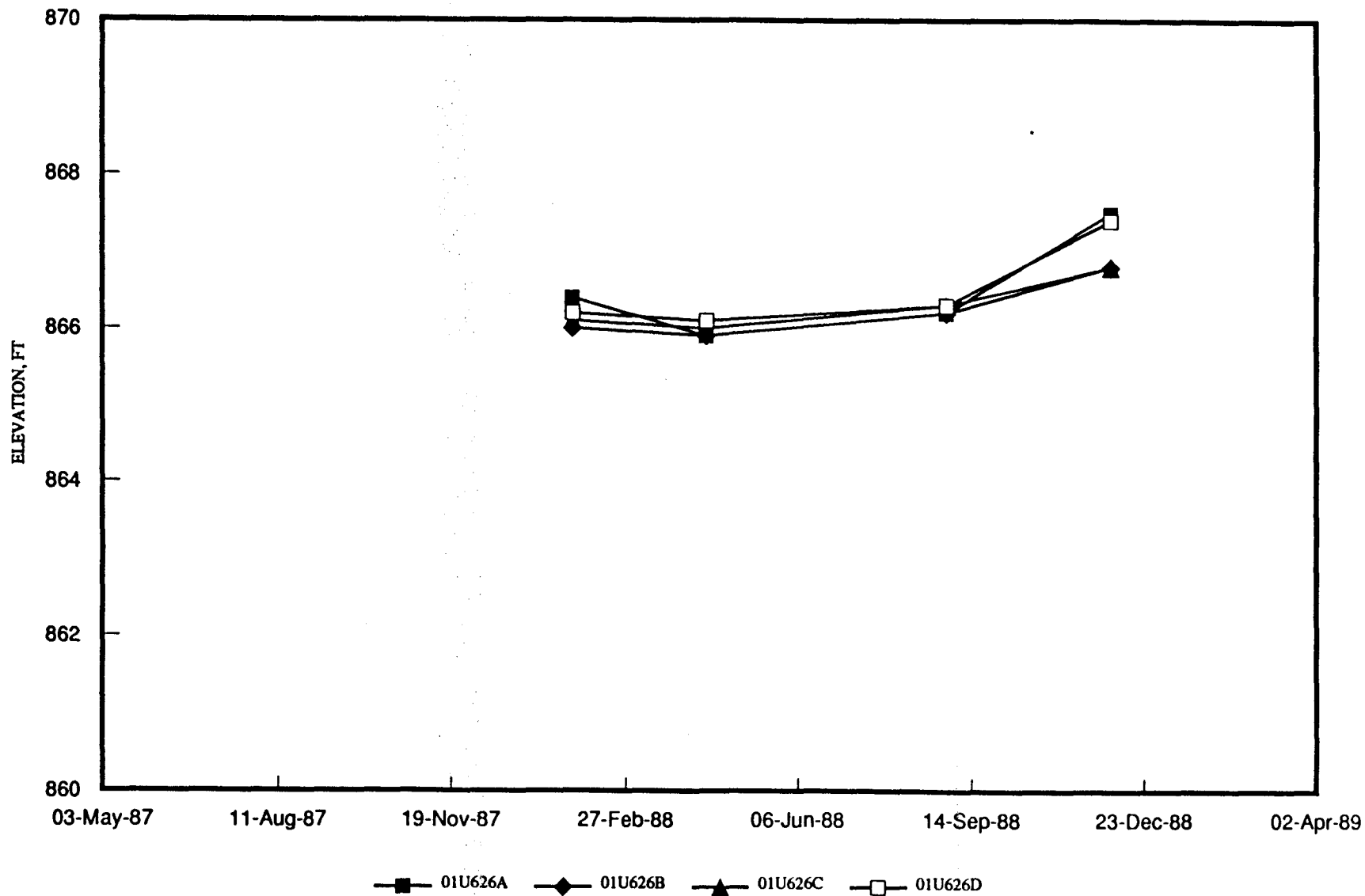


FIG. K-7, October, 1989
WENCK ASSOCIATES, INC.

GROUNDWATER HYDROGRAPHS

TWIN CITIES ARMY AMMUNITION PLANT

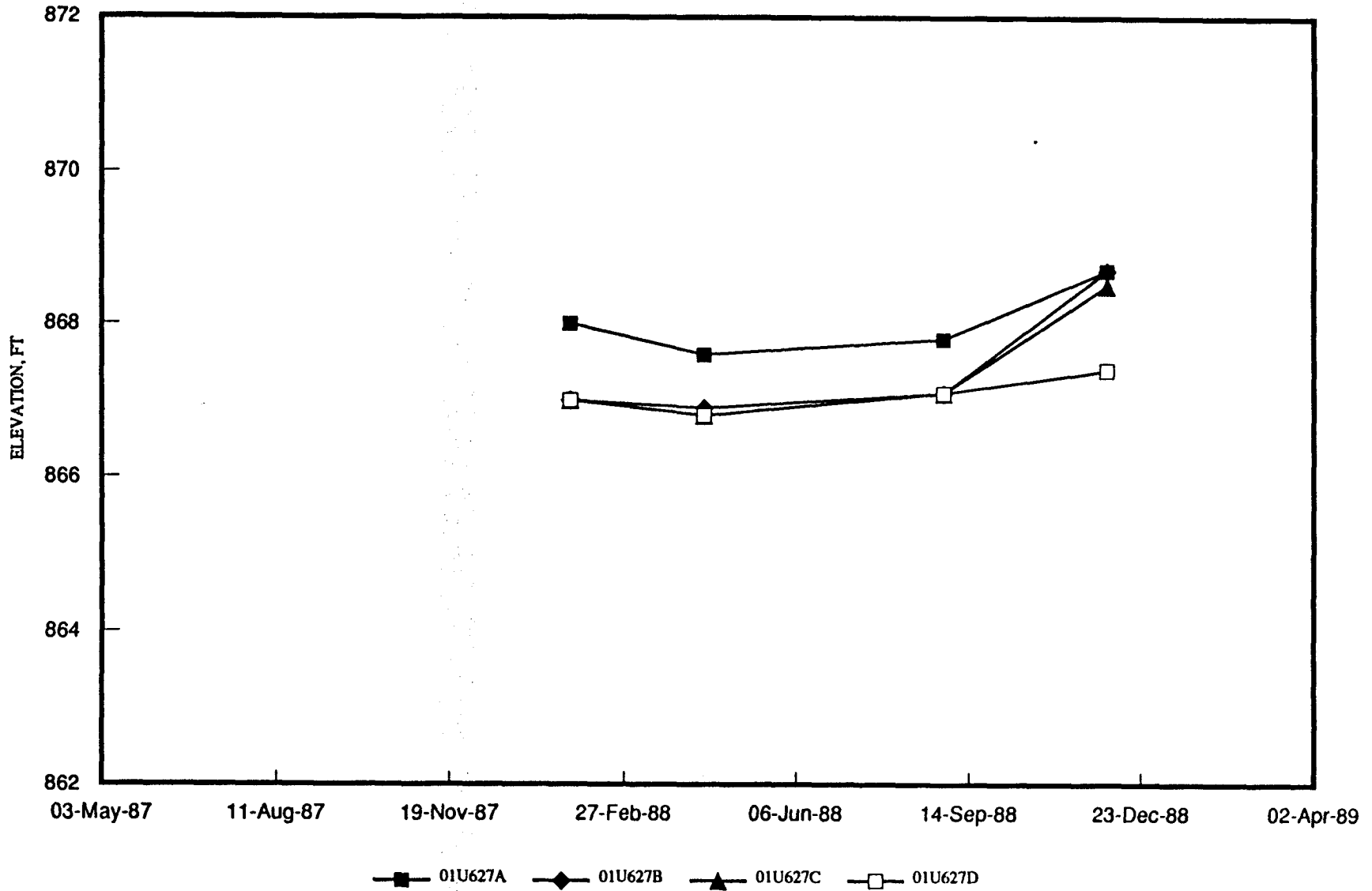


FIG. K-8, October, 1989
WENCK ASSOCIATES, INC.

GROUNDWATER HYDROGRAPHS

TWIN CITIES ARMY AMMUNITION PLANT

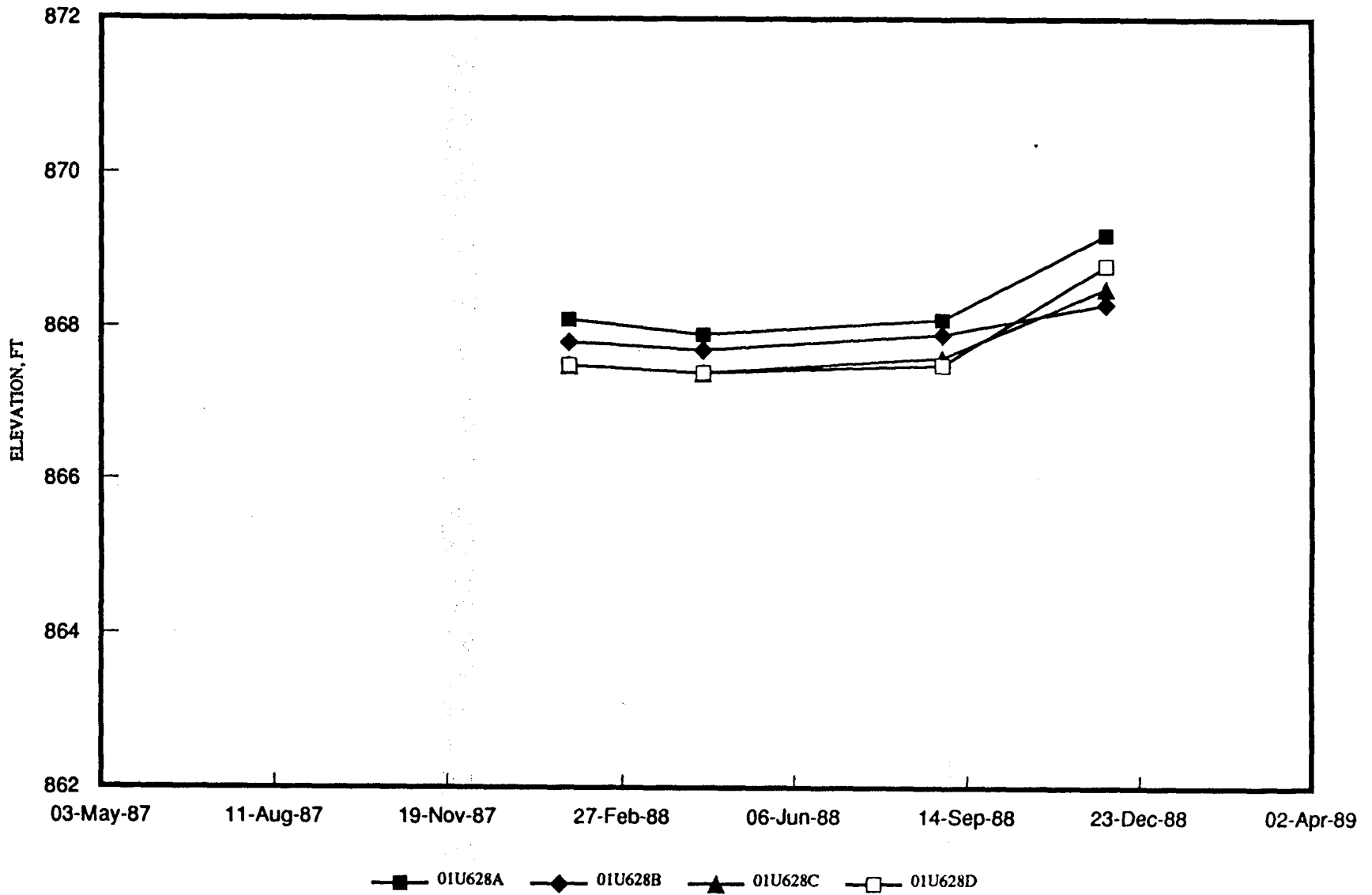


FIG. K-9, October, 1989
WENCK ASSOCIATES, INC.

GROUNDWATER HYDROGRAPHS

TWIN CITIES ARMY AMMUNITION PLANT

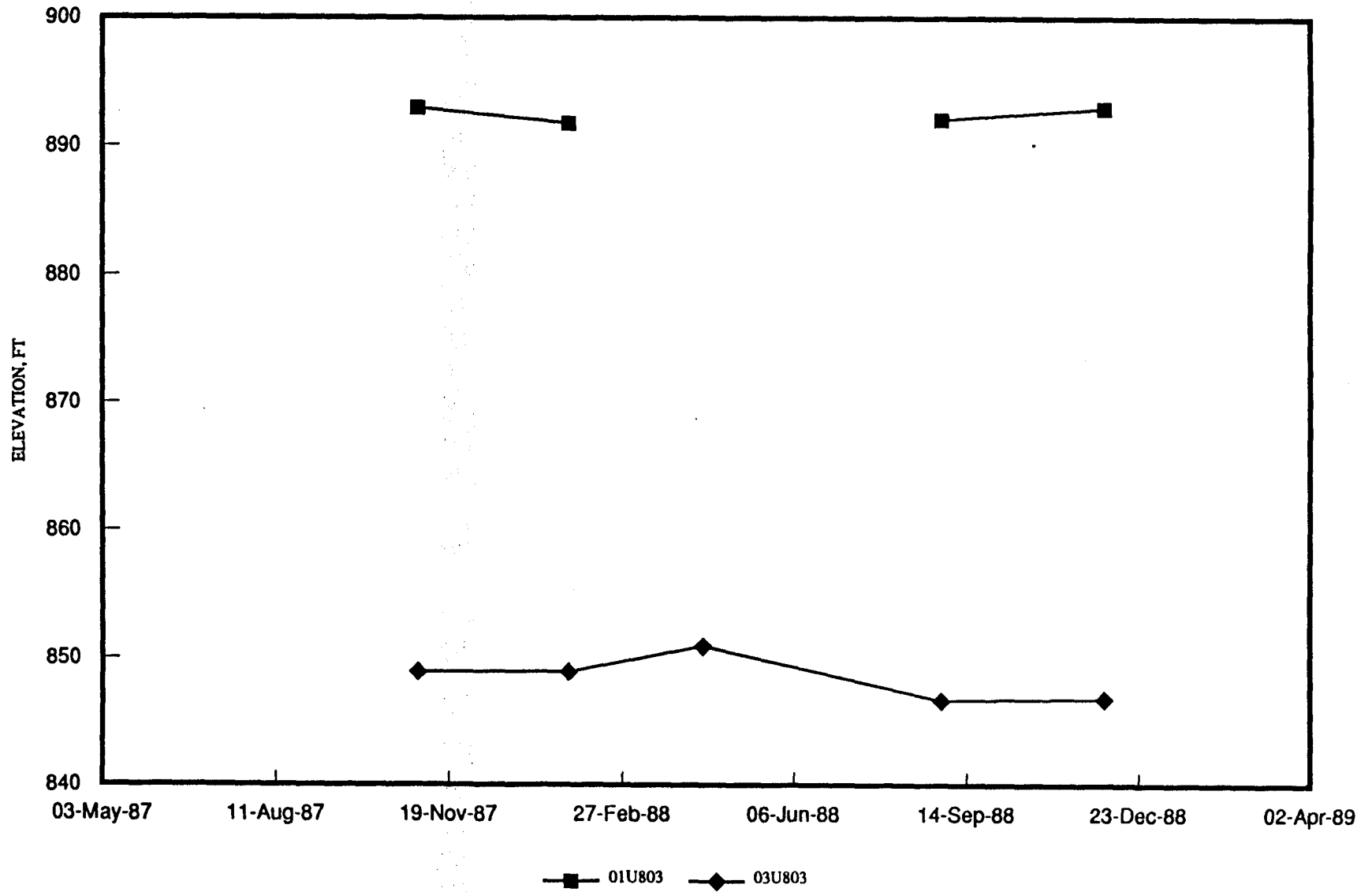


FIG. K-10, October, 1989
WENCK ASSOCIATES, INC.

GROUNDWATER HYDROGRAPHS

TWIN CITIES ARMY AMMUNITION PLANT

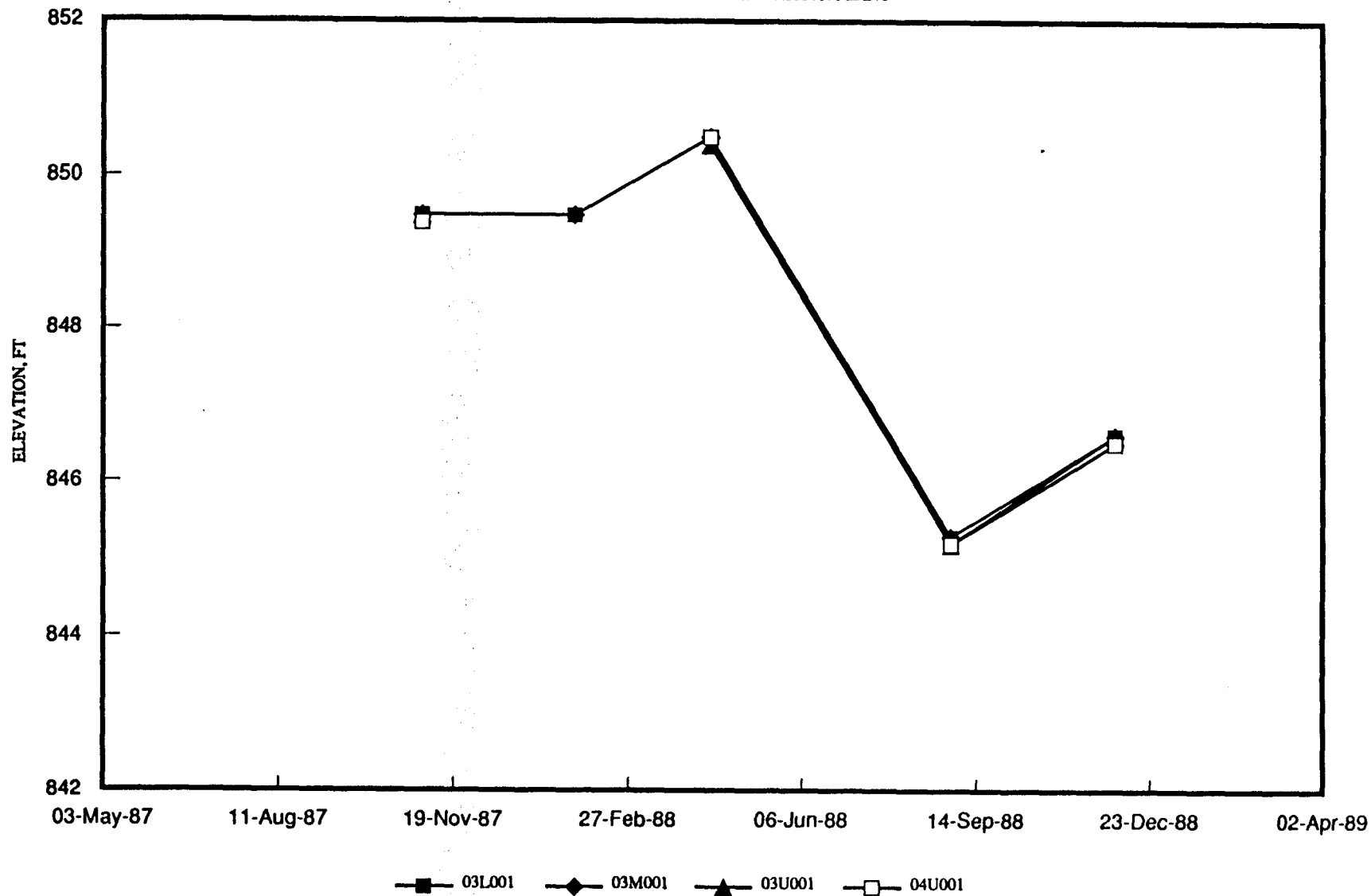


FIG. K-11, October. 1989
WENCK ASSOCIATES, INC.

GROUNDWATER HYDROGRAPHS

TWIN CITIES ARMY AMMUNITION PLANT

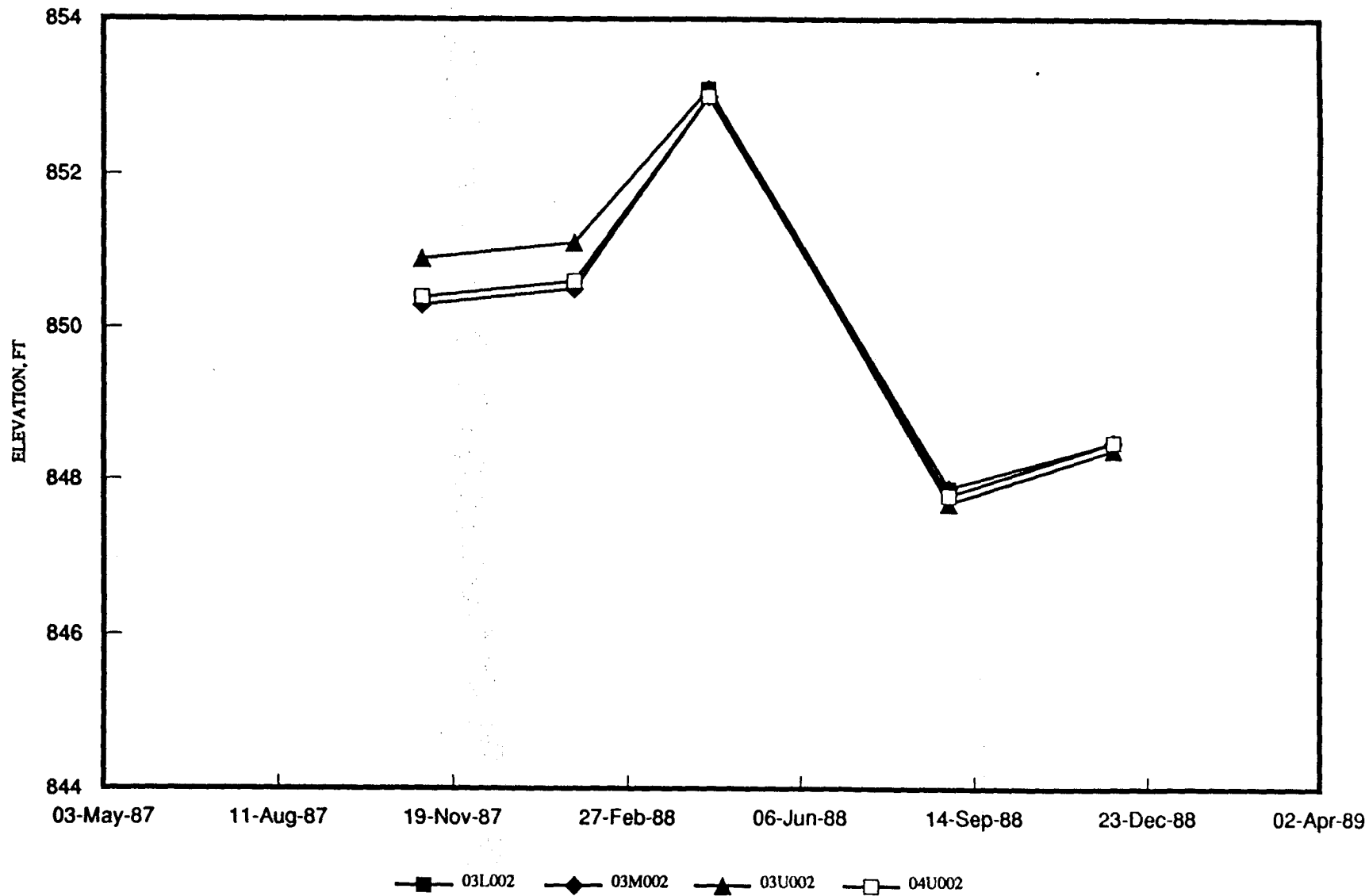


FIG. K-12, October, 1989
WENCK ASSOCIATES, INC.

GROUNDWATER HYDROGRAPHS

TWIN CITIES ARMY AMMUNITION PLANT

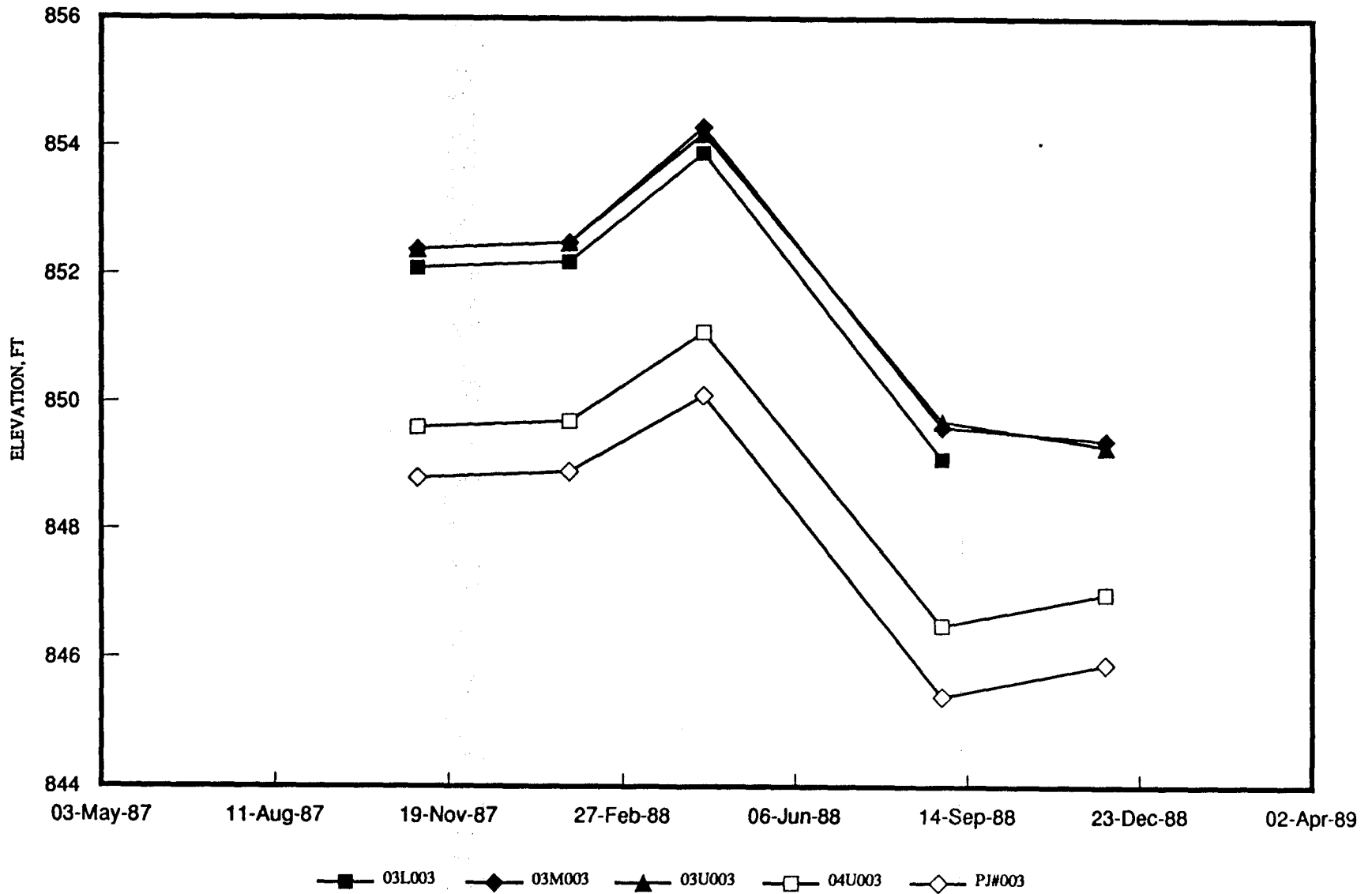


FIG. K-13, October, 1989
WENCK ASSOCIATES, INC.

GROUNDWATER HYDROGRAPHS

TWIN CITIES ARMY AMMUNITION PLANT

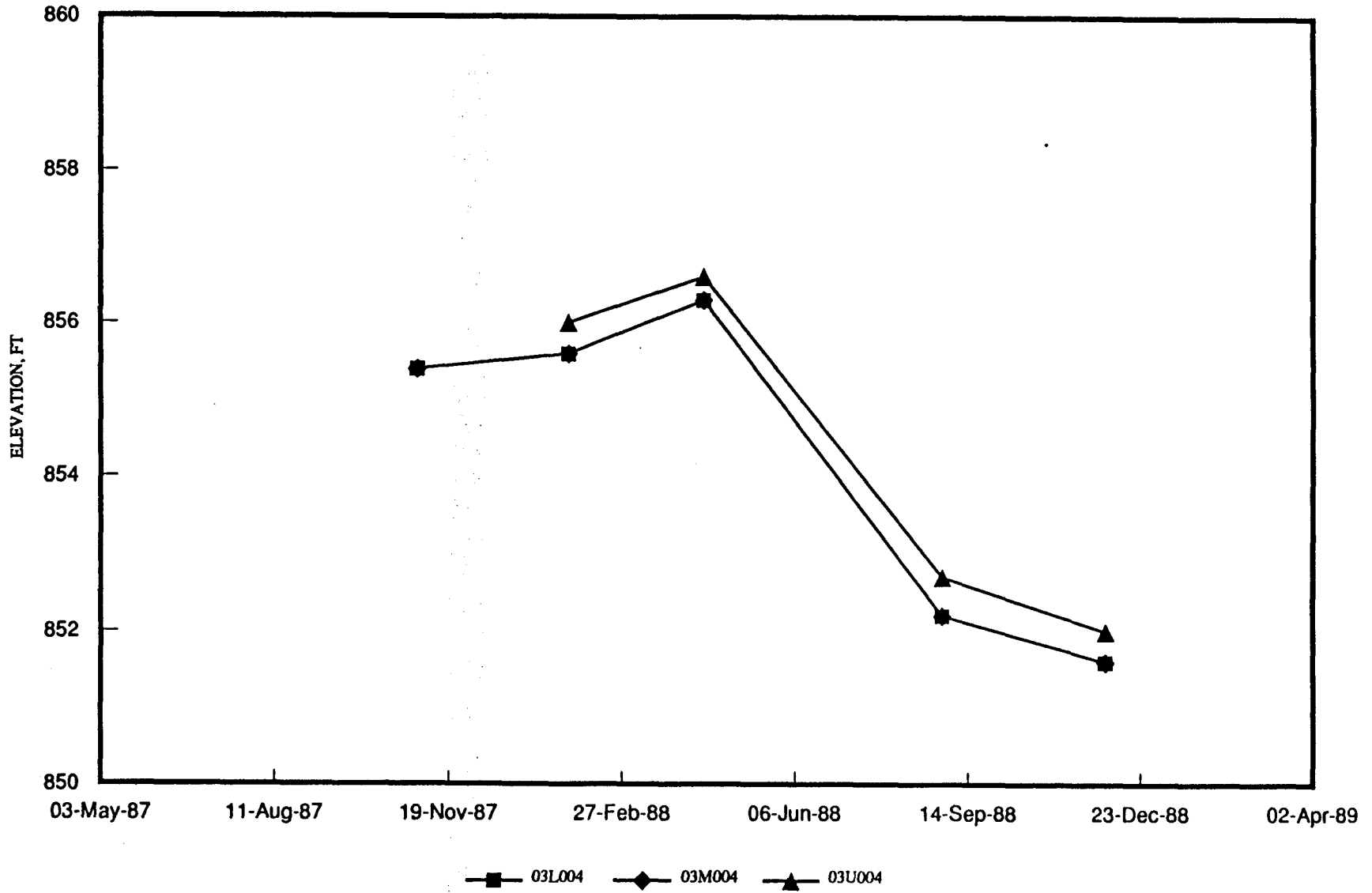


FIG. K-14, October, 1989
WENCK ASSOCIATES, INC.

GROUNDWATER HYDROGRAPHS

TWIN CITIES ARMY AMMUNITION PLANT

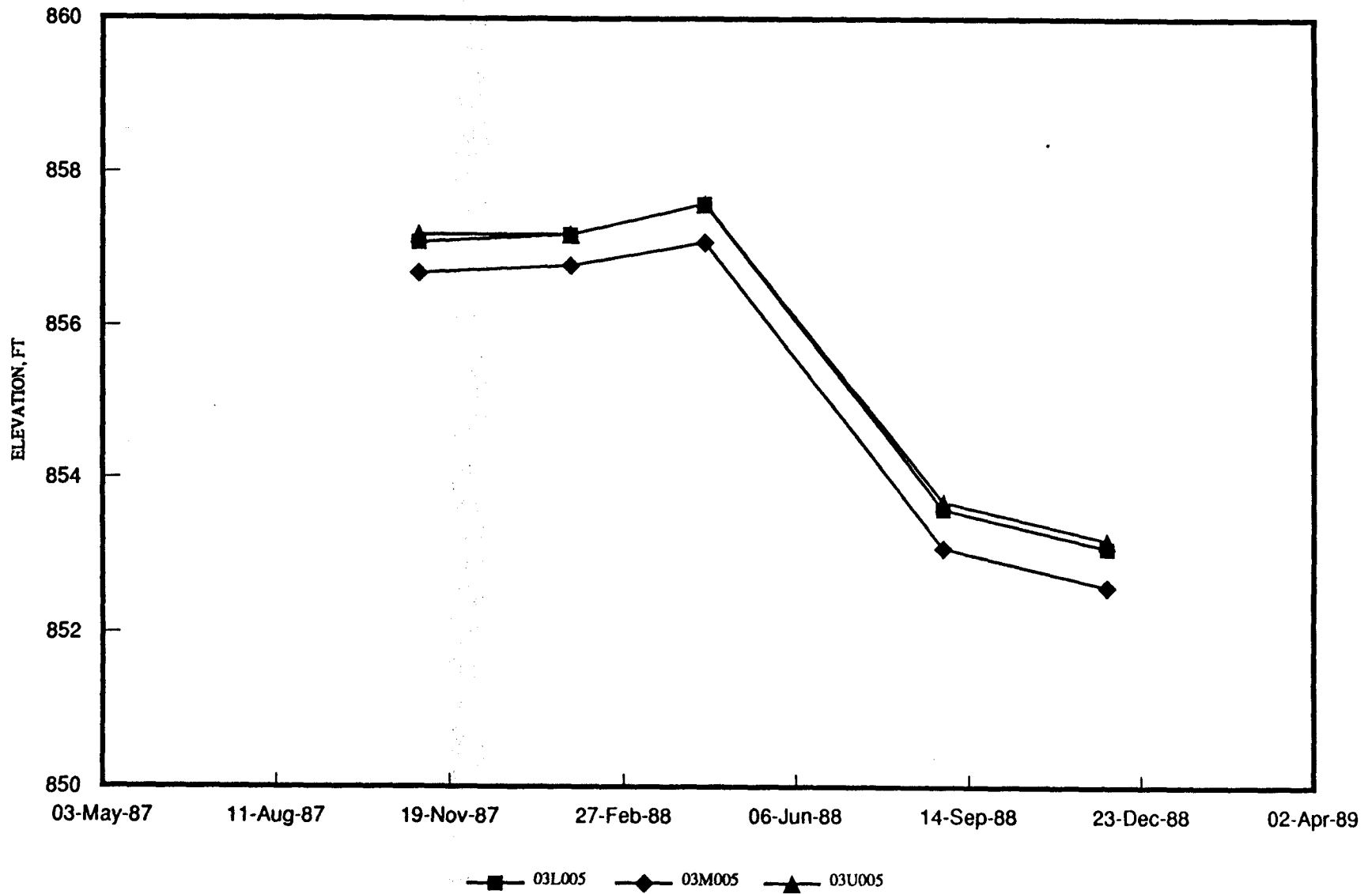


FIG. K-15, October, 1989
WENCK ASSOCIATES, INC.

GROUNDWATER HYDROGRAPHS

TWIN CITIES ARMY AMMUNITION PLANT

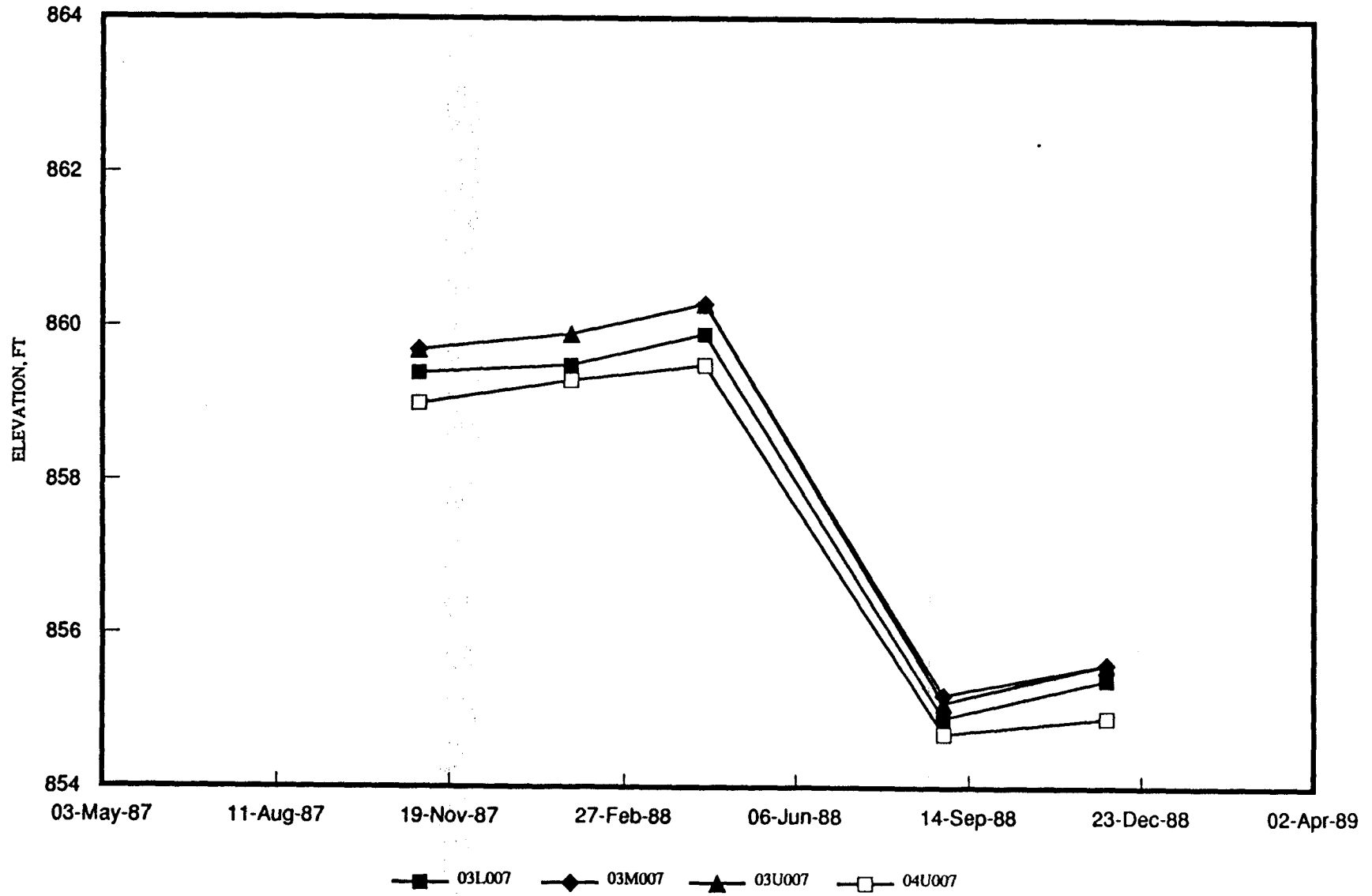


FIG. K-16, October, 1989
WENCK ASSOCIATES, INC.

GROUNDWATER HYDROGRAPHS

TWIN CITIES ARMY AMMUNITION PLANT

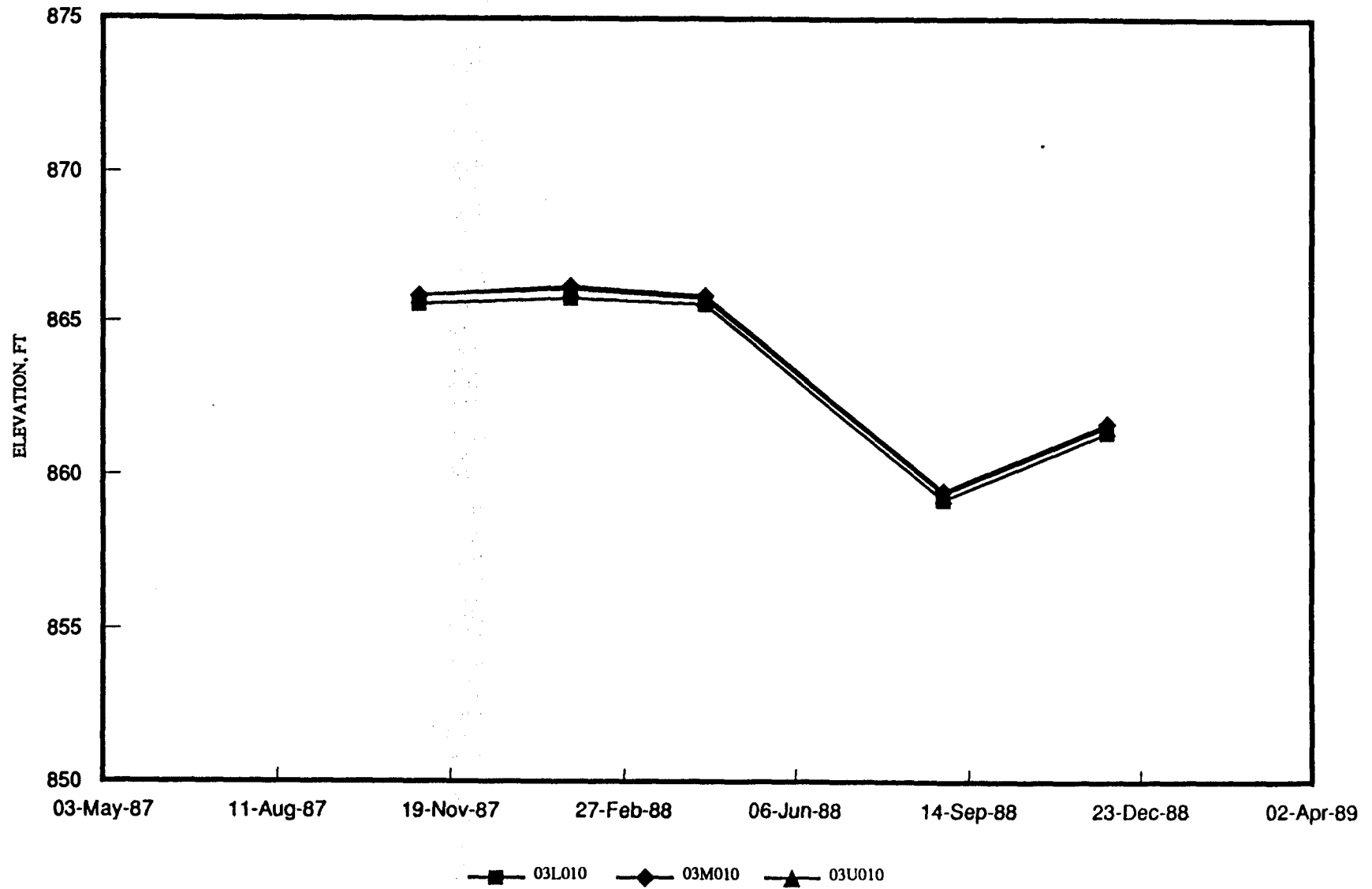


FIG. K-17, October, 1989
WENCK ASSOCIATES, INC.

GROUNDWATER HYDROGRAPHS

TWIN CITIES ARMY AMMUNITION PLANT

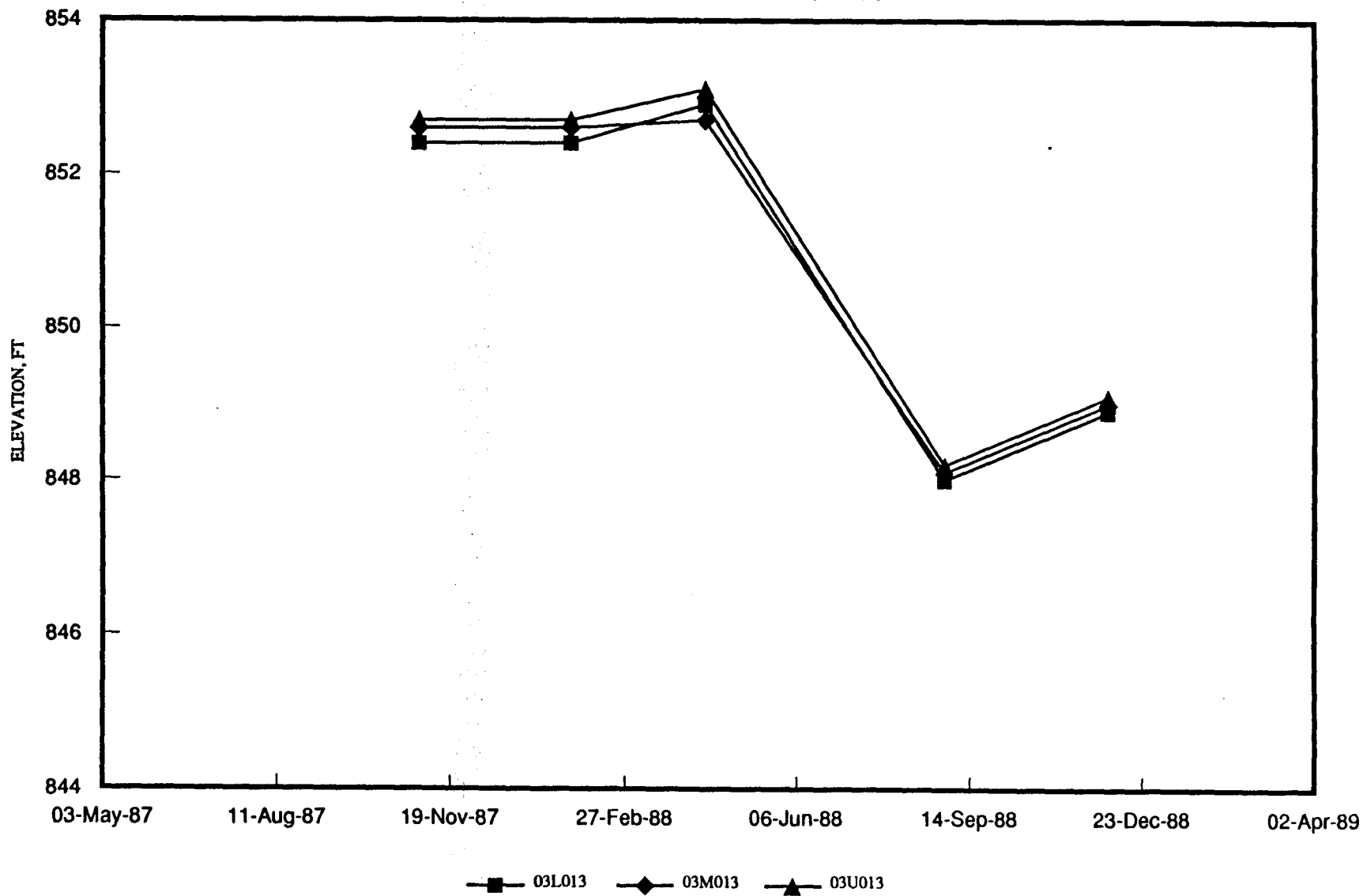


FIG. K-18, October, 1989
WENCK ASSOCIATES, INC.

GROUNDWATER HYDROGRAPHS

TWIN CITIES ARMY AMMUNITION PLANT

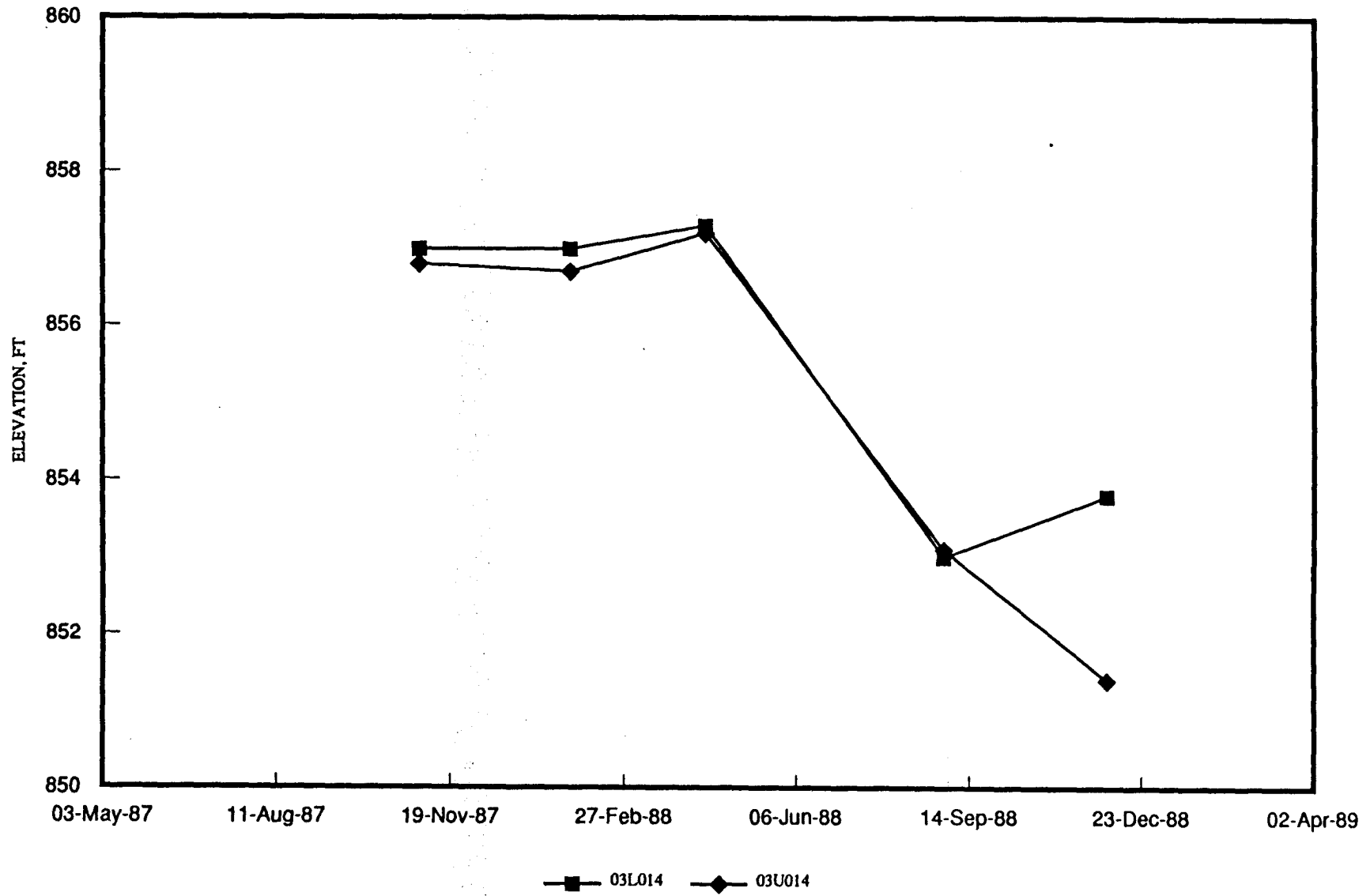


FIG. K-19, October, 1989
WENCK ASSOCIATES, INC.

GROUNDWATER HYDROGRAPHS

TWIN CITIES ARMY AMMUNITION PLANT

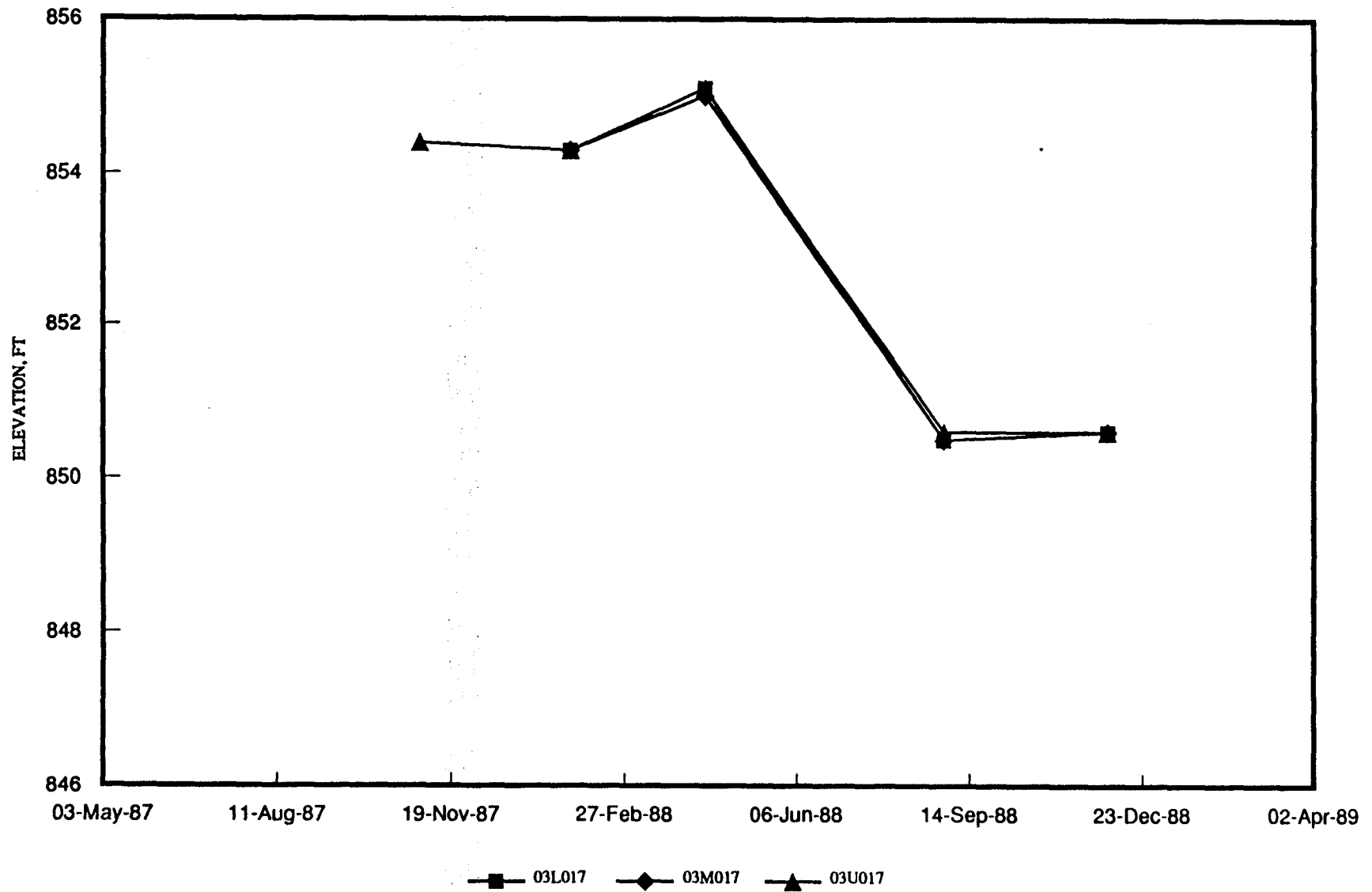


FIG. K-20, October, 1989
WENCK ASSOCIATES, INC.

GROUNDWATER HYDROGRAPHS

TWIN CITIES ARMY AMMUNITION PLANT

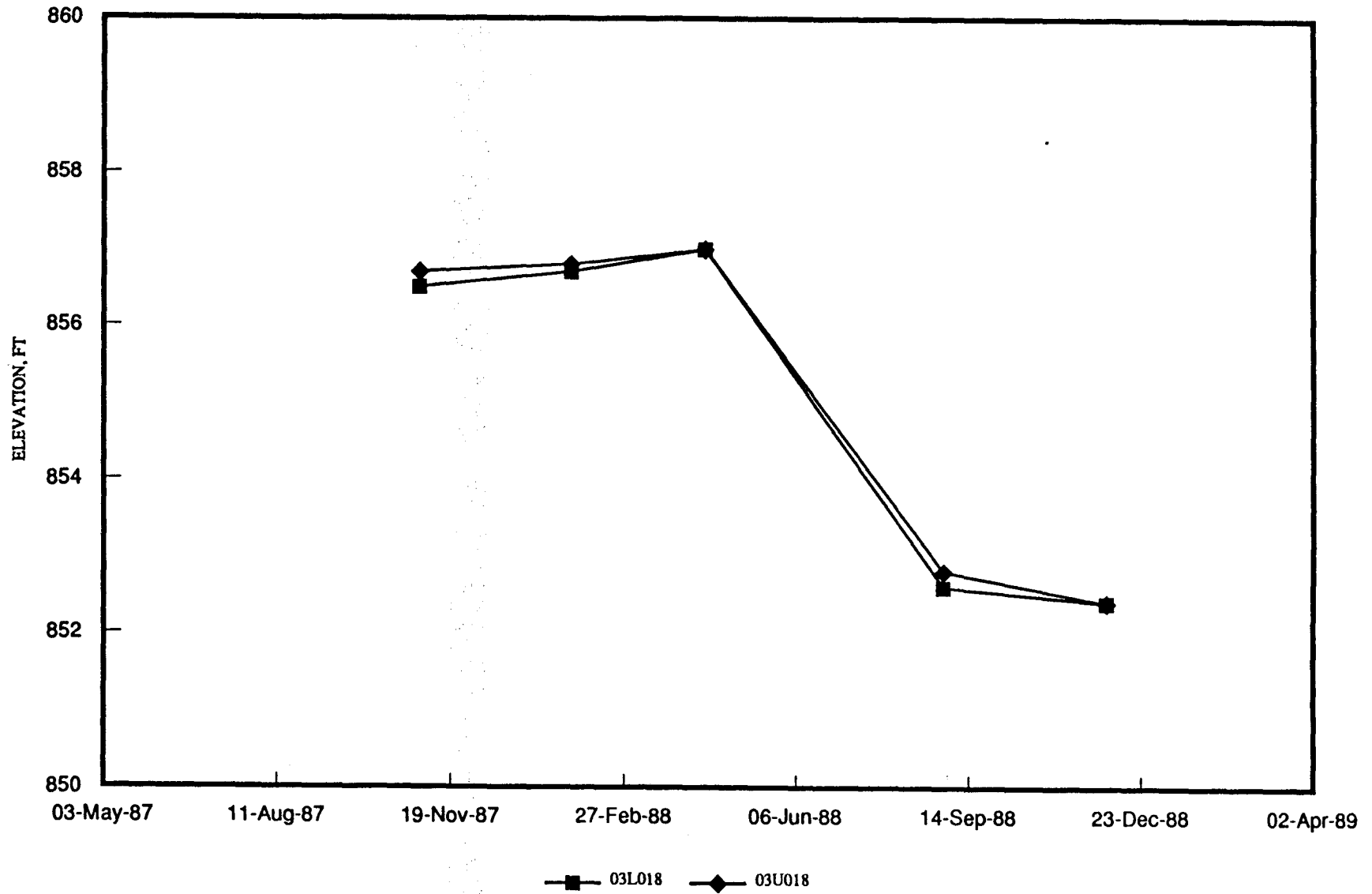


FIG. K-21, October, 1989
WENCK ASSOCIATES, INC.

GROUNDWATER HYDROGRAPHS

TWIN CITIES ARMY AMMUNITION PLANT

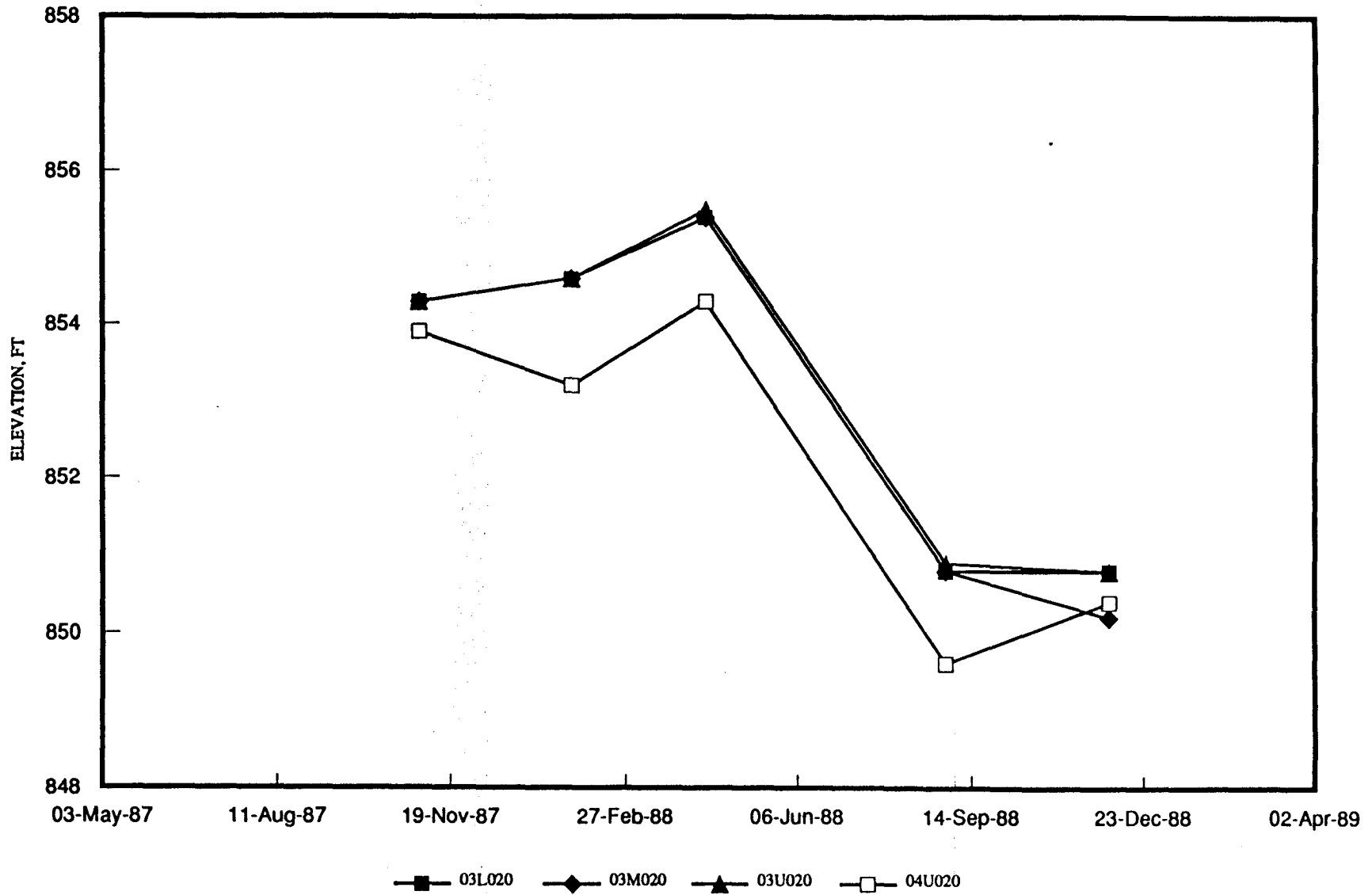


FIG. K-22, October, 1989
WENCK ASSOCIATES, INC.

GROUNDWATER HYDROGRAPHS

TWIN CITIES ARMY AMMUNITION PLANT

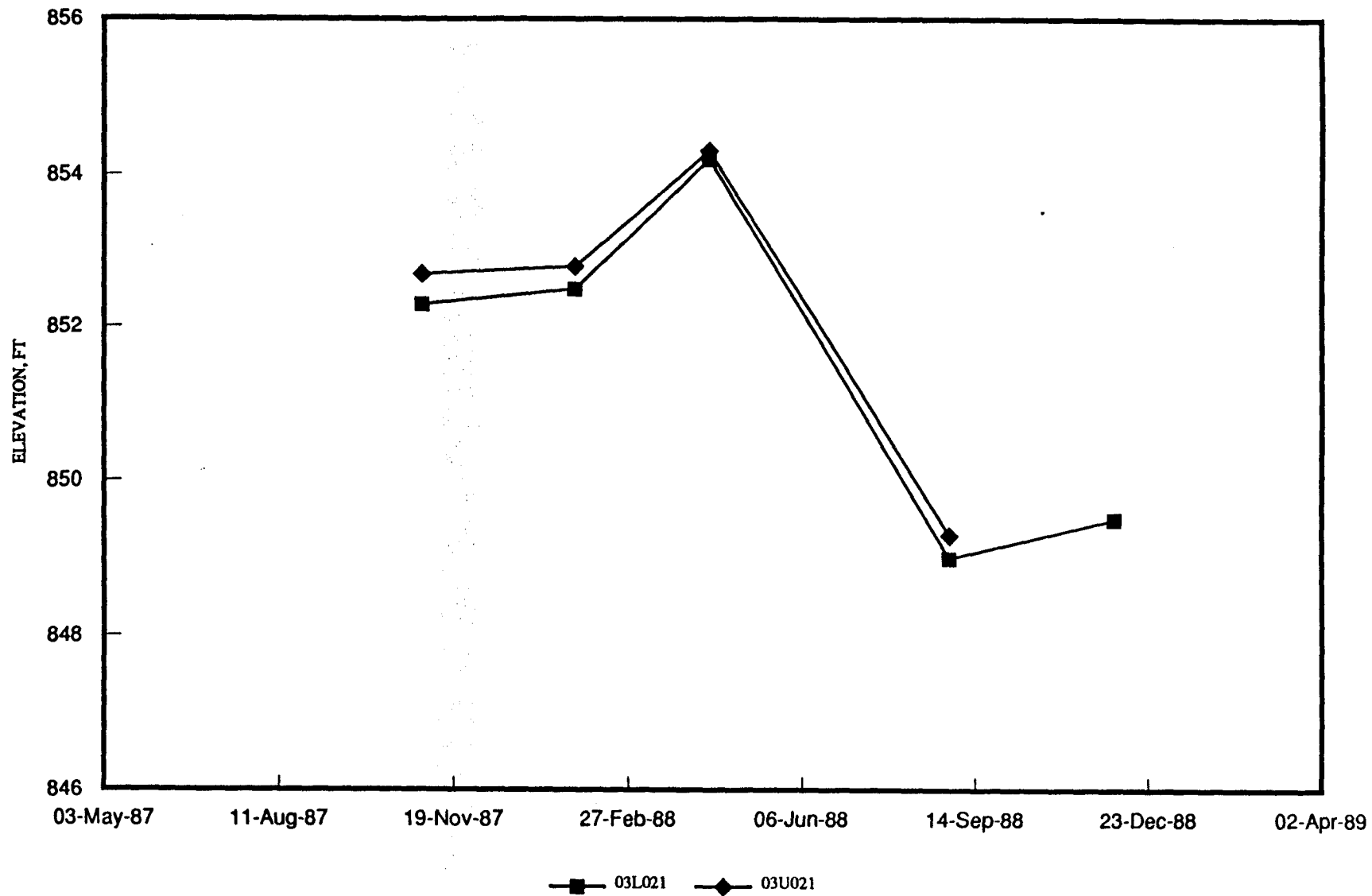


FIG. K-23, October, 1989
WENCK ASSOCIATES, INC.

GROUNDWATER HYDROGRAPHS

TWIN CITIES ARMY AMMUNITION PLANT

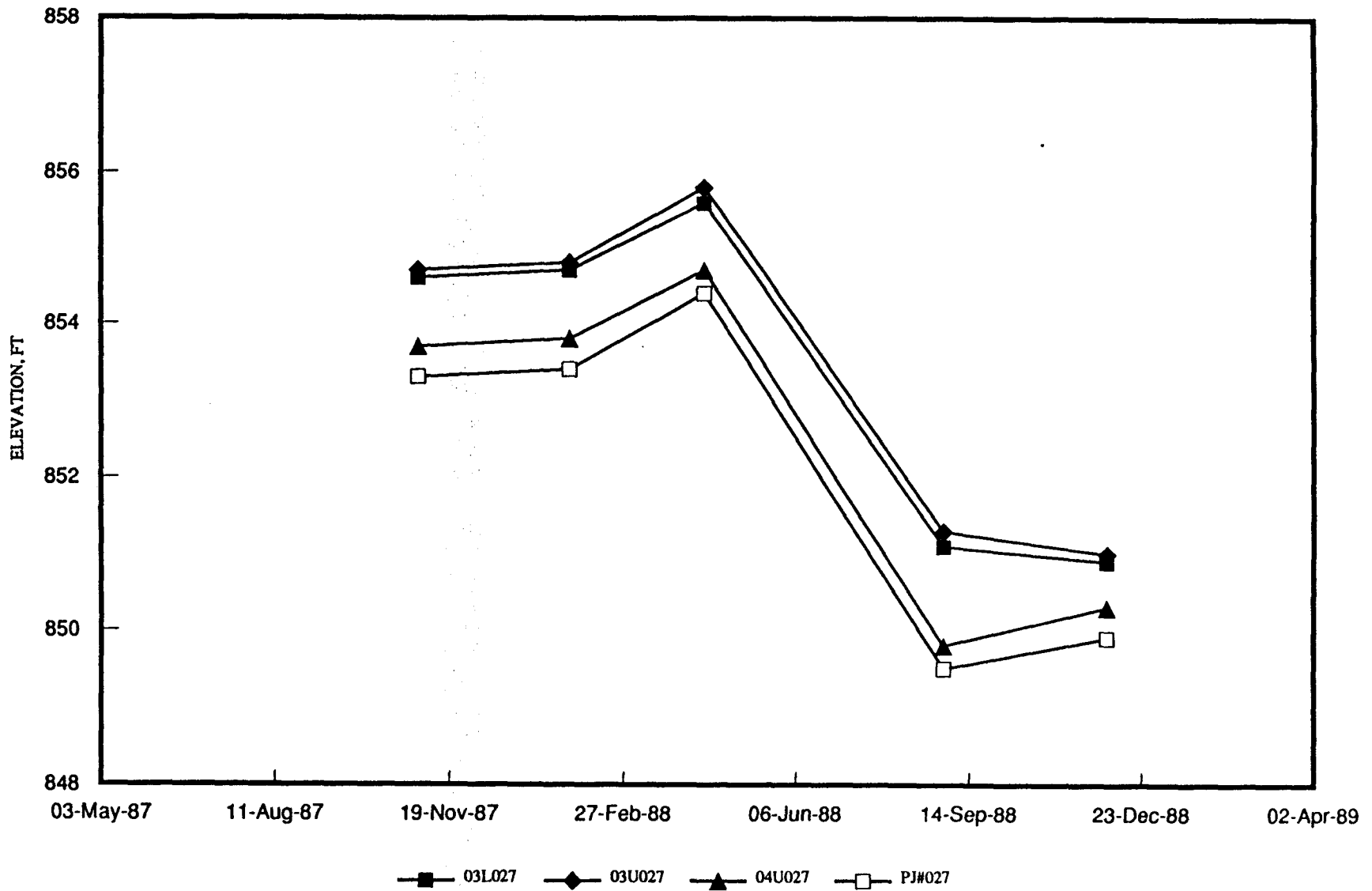


FIG. K-24, October, 1989
WENCK ASSOCIATES, INC.

GROUNDWATER HYDROGRAPHS

TWIN CITIES ARMY AMMUNITION PLANT

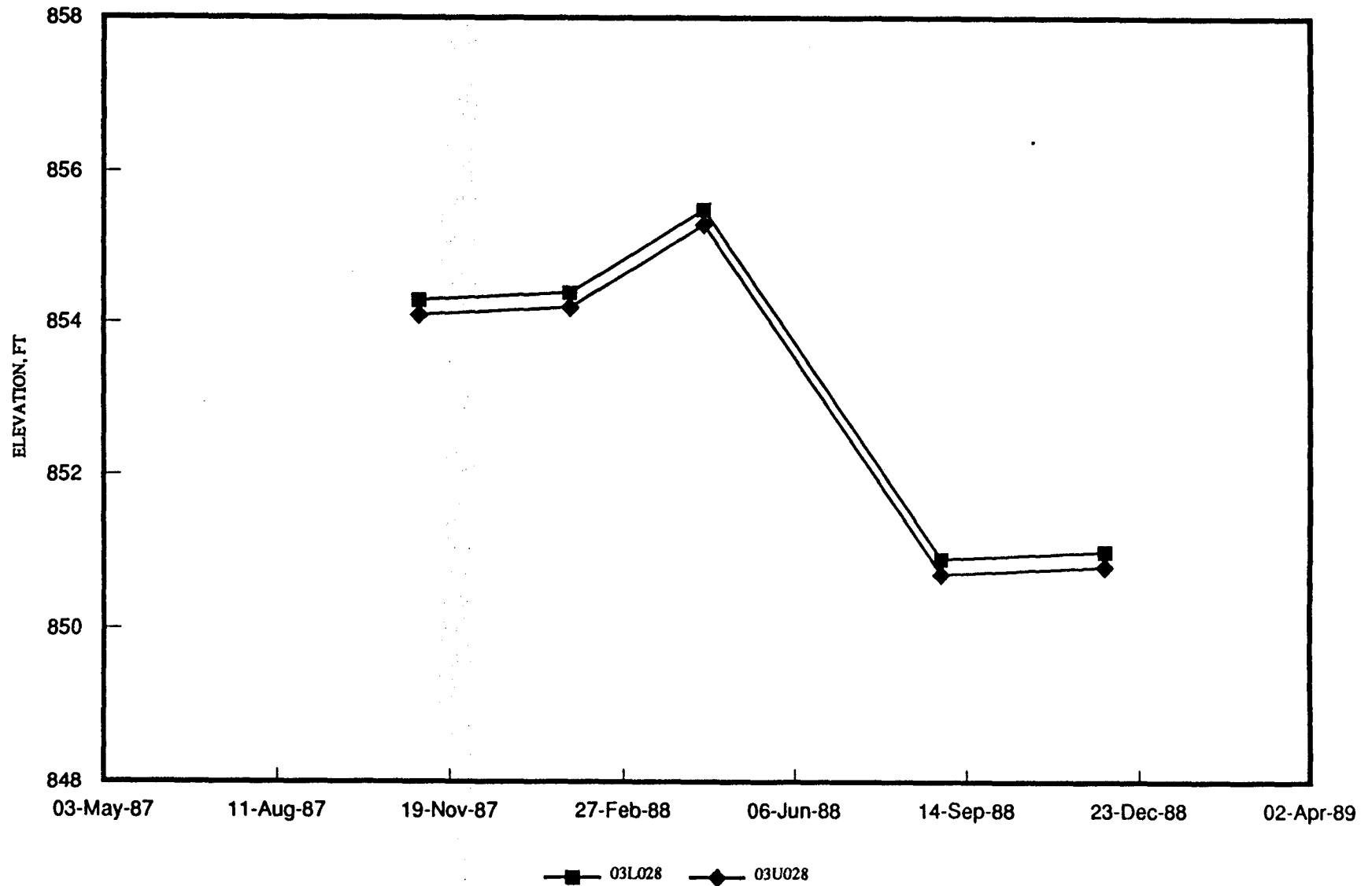


FIG. K-25, October, 1989
WENCK ASSOCIATES, INC.

GROUNDWATER HYDROGRAPHS

TWIN CITIES ARMY AMMUNITION PLANT

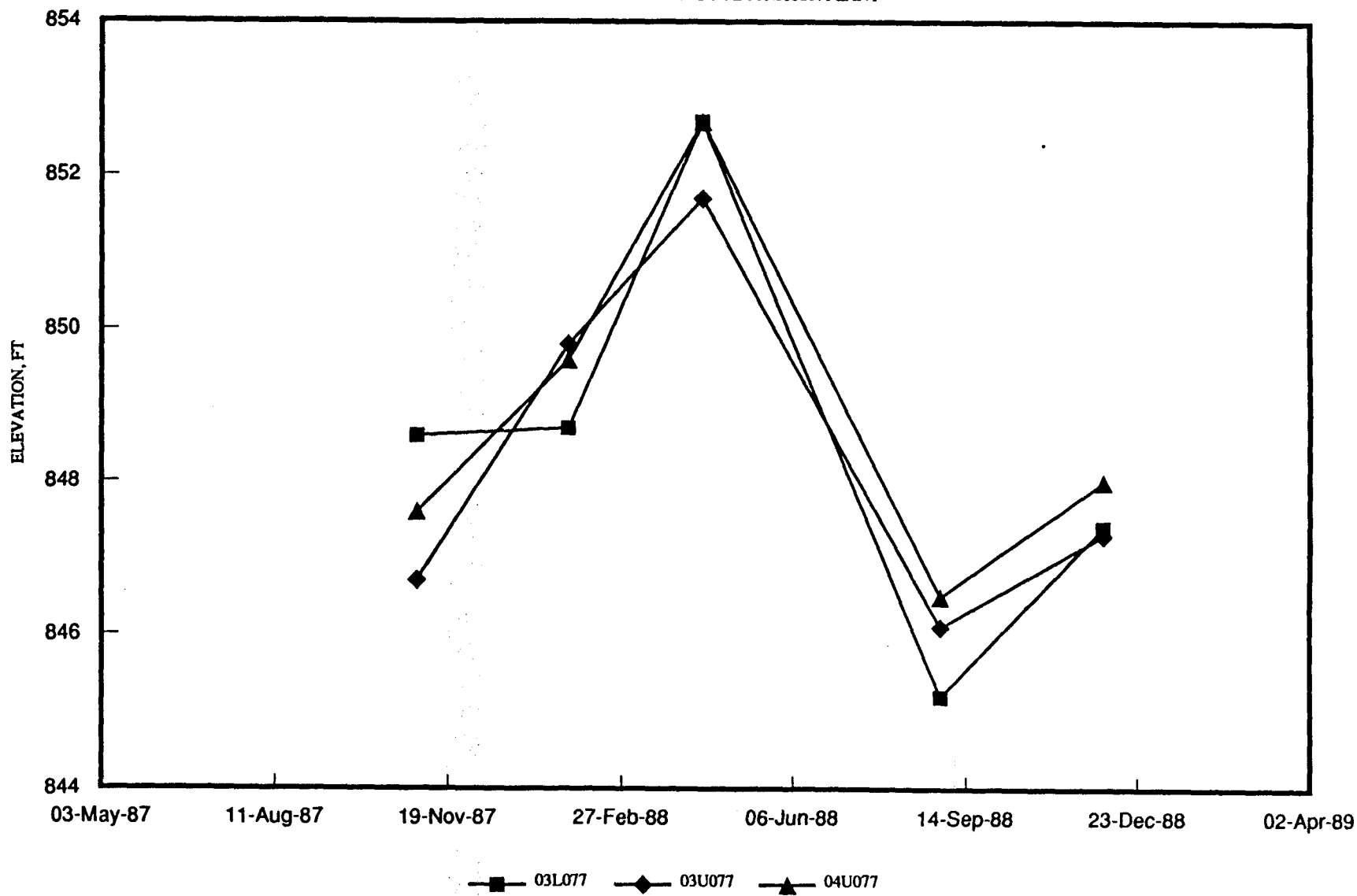


FIG. K-26, October, 1989
WENCK ASSOCIATES, INC.

GROUNDWATER HYDROGRAPHS

TWIN CITIES ARMY AMMUNITION PLANT

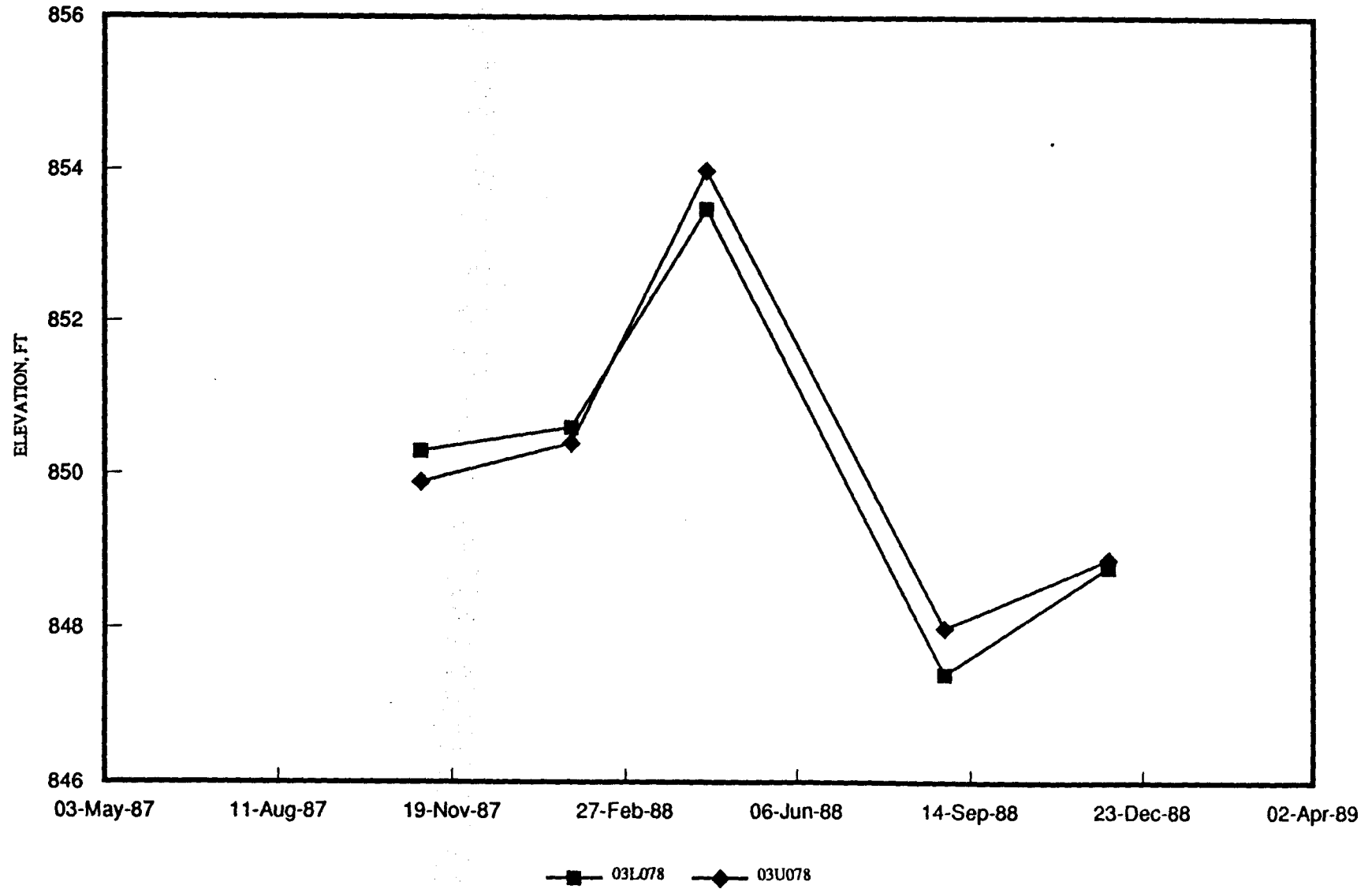


FIG. K-27, October, 1989
WENCK ASSOCIATES, INC.

GROUNDWATER HYDROGRAPHS

TWIN CITIES ARMY AMMUNITION PLANT

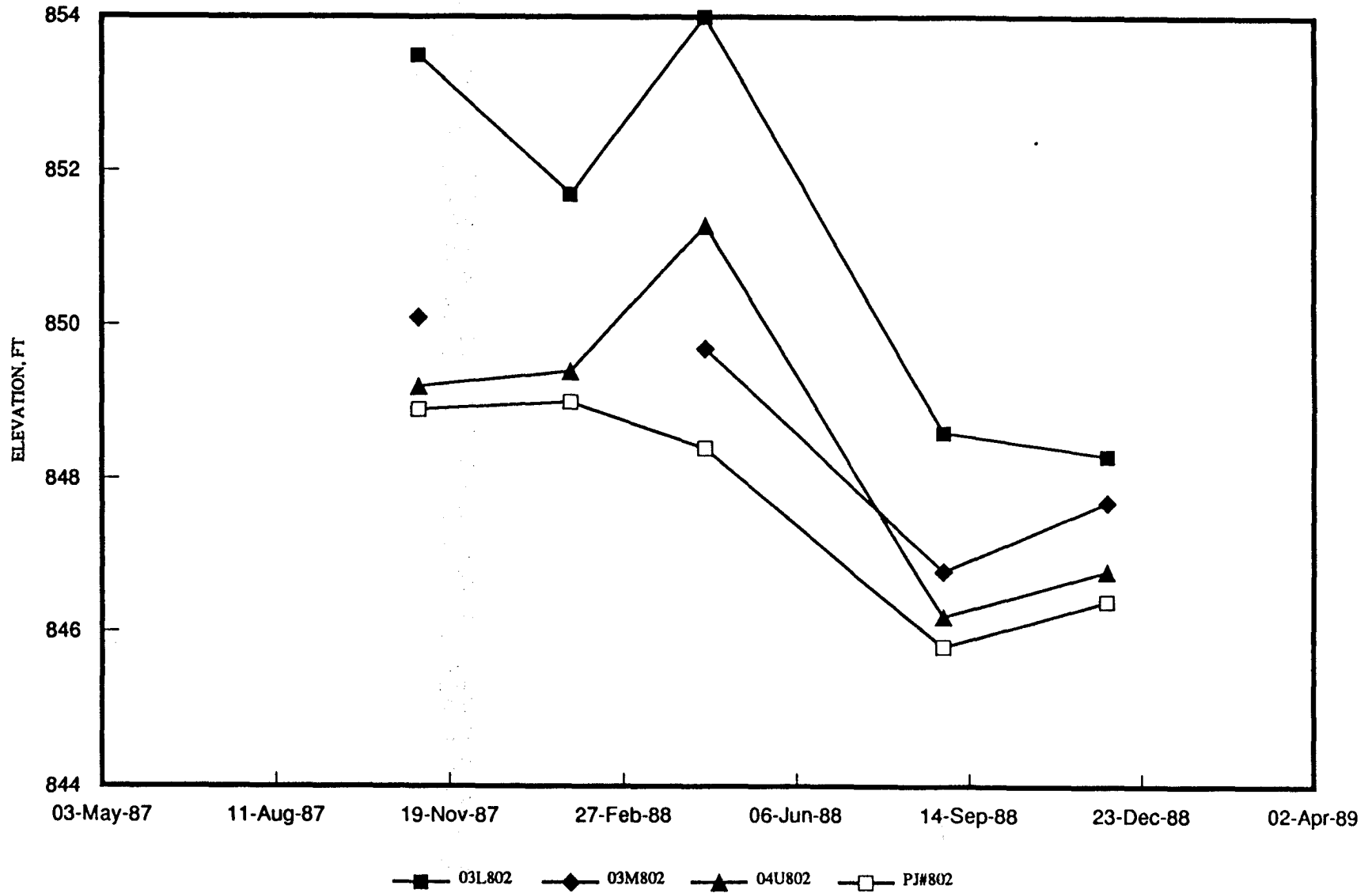


FIG. K-28, October, 1989
WENCK ASSOCIATES, INC.

GROUNDWATER HYDROGRAPHS

TWIN CITIES ARMY AMMUNITION PLANT

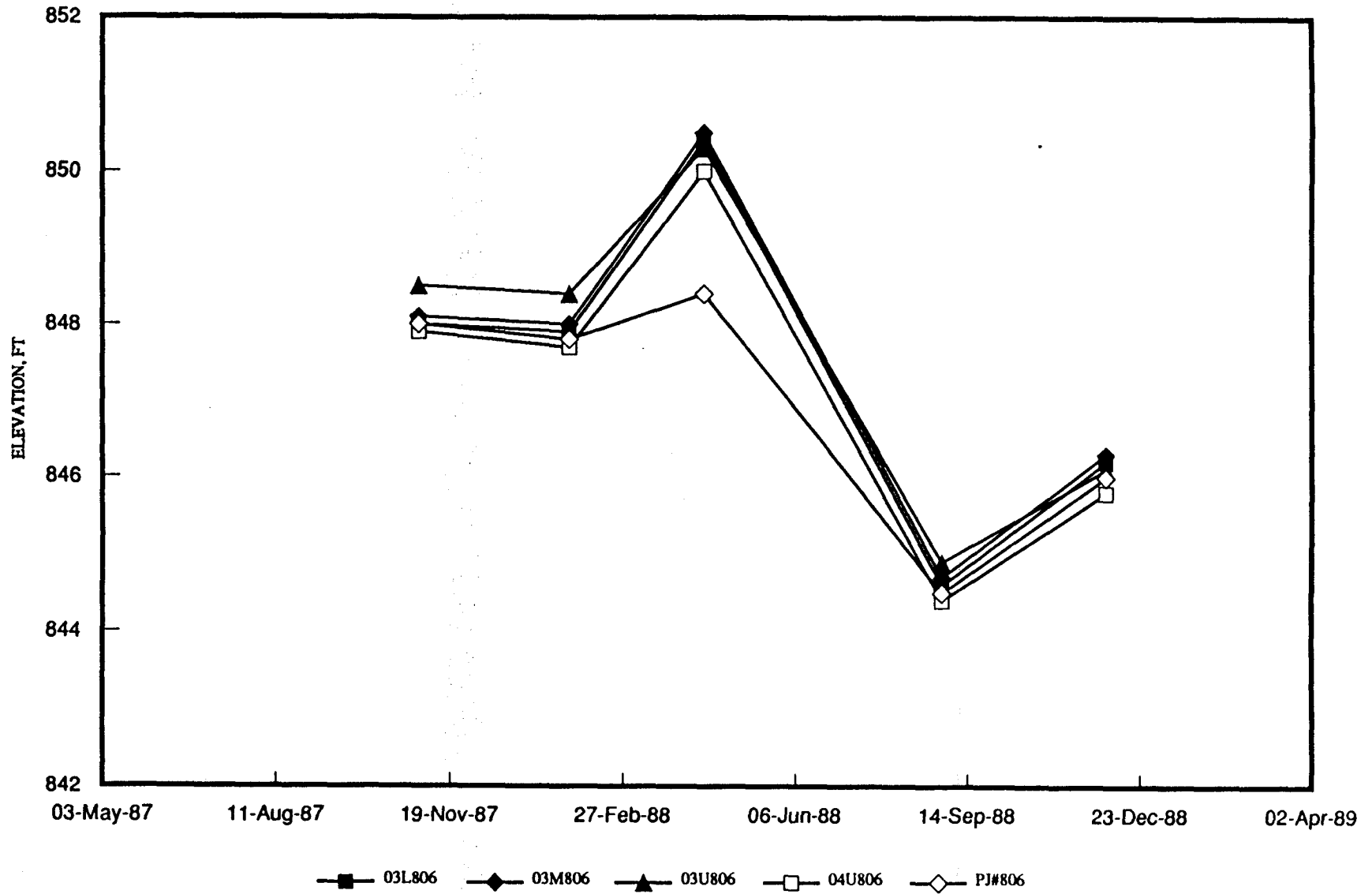


FIG. K-29, October, 1989
WENCK ASSOCIATES, INC.

GROUNDWATER HYDROGRAPHS

TWIN CITIES ARMY AMMUNITION PLANT

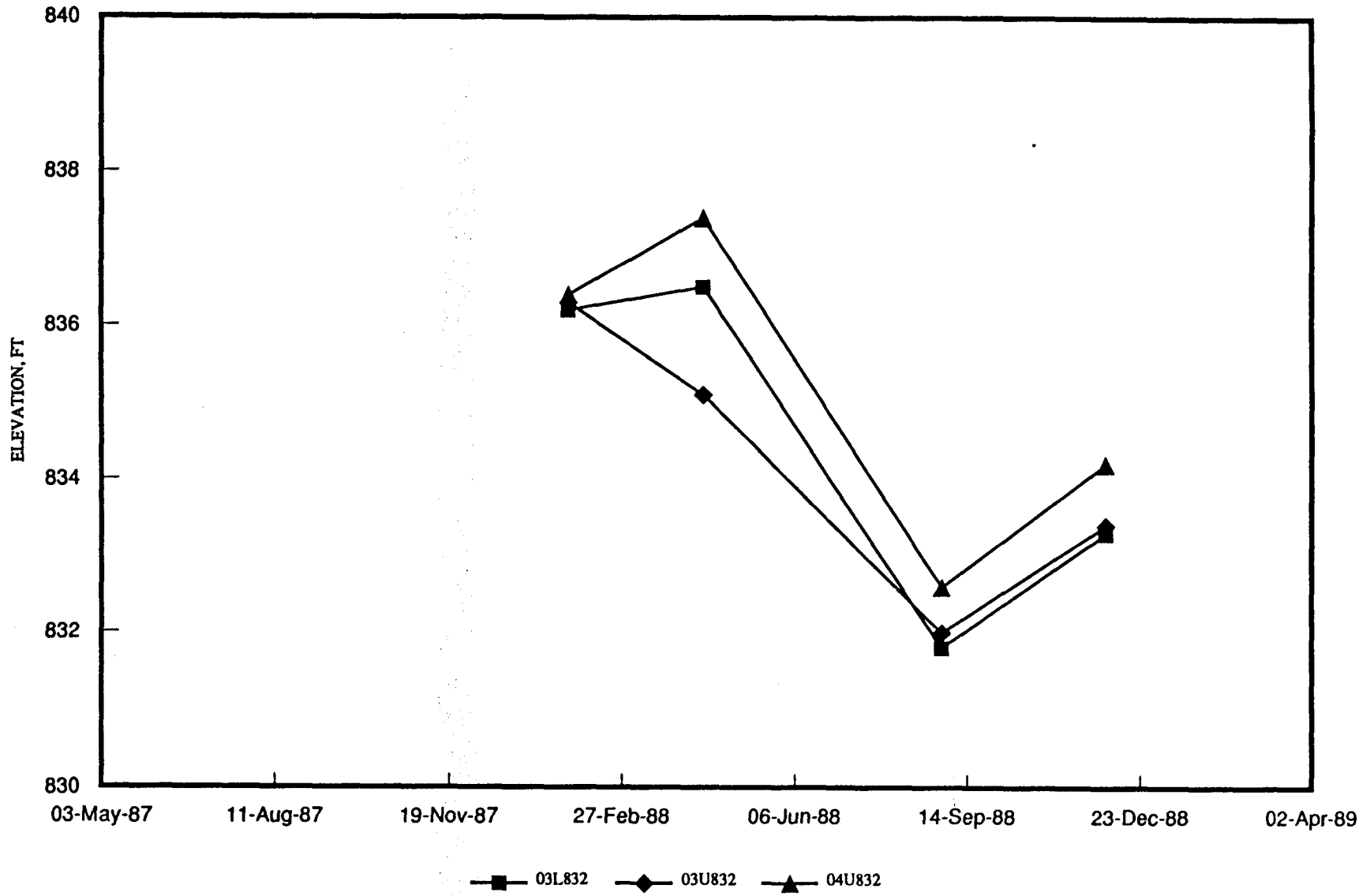


FIG. K-30, October, 1989
WENCK ASSOCIATES, INC.

GROUNDWATER HYDROGRAPHS

TWIN CITIES ARMY AMMUNITION PLANT

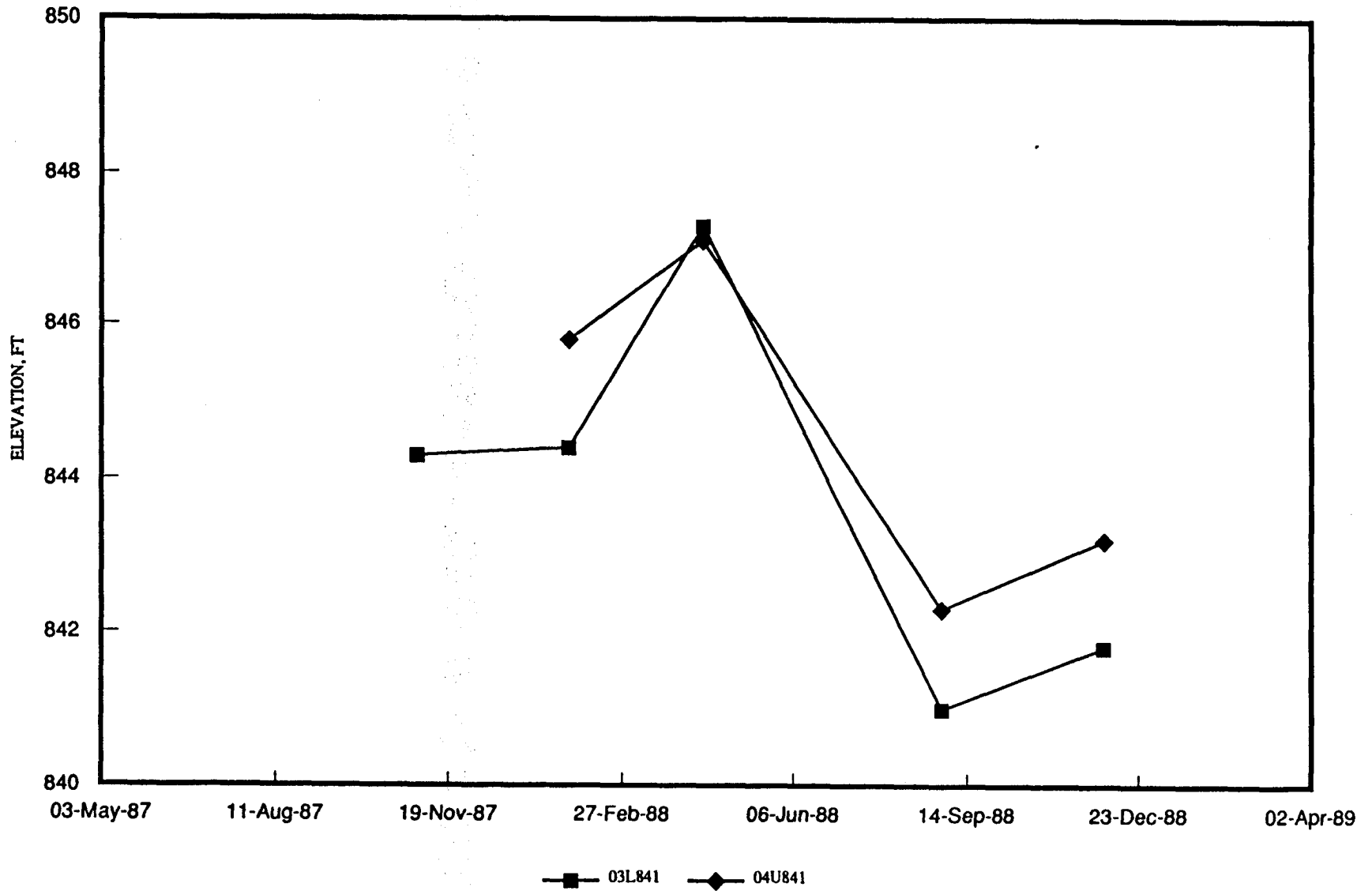


FIG. K-31, October, 1989
WENCK ASSOCIATES, INC.

GROUNDWATER HYDROGRAPHS

TWIN CITIES ARMY AMMUNITION PLANT

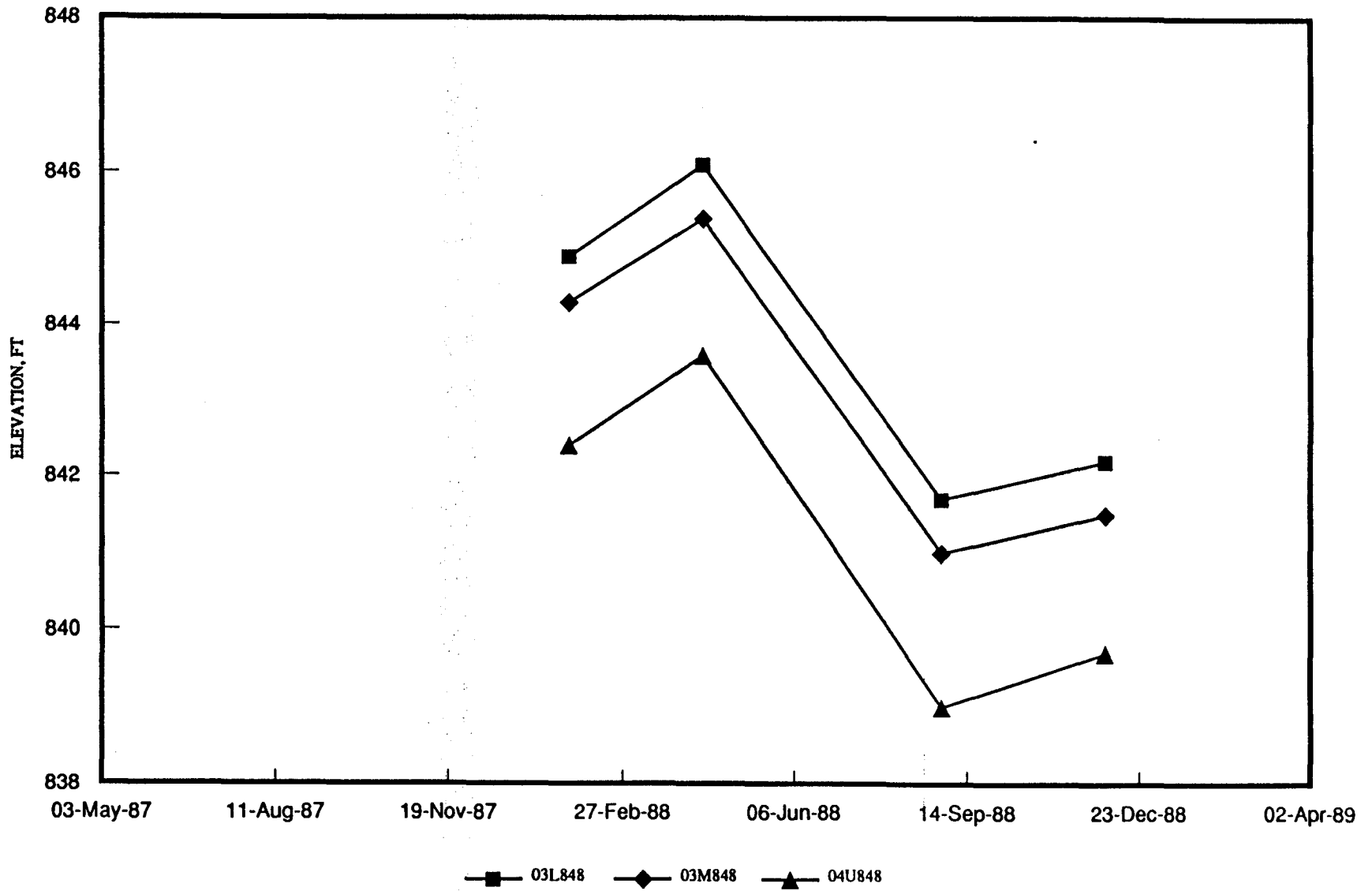


FIG. K-32, October, 1989
WENCK ASSOCIATES, INC.

GROUNDWATER HYDROGRAPHS

TWIN CITIES ARMY AMMUNITION PLANT

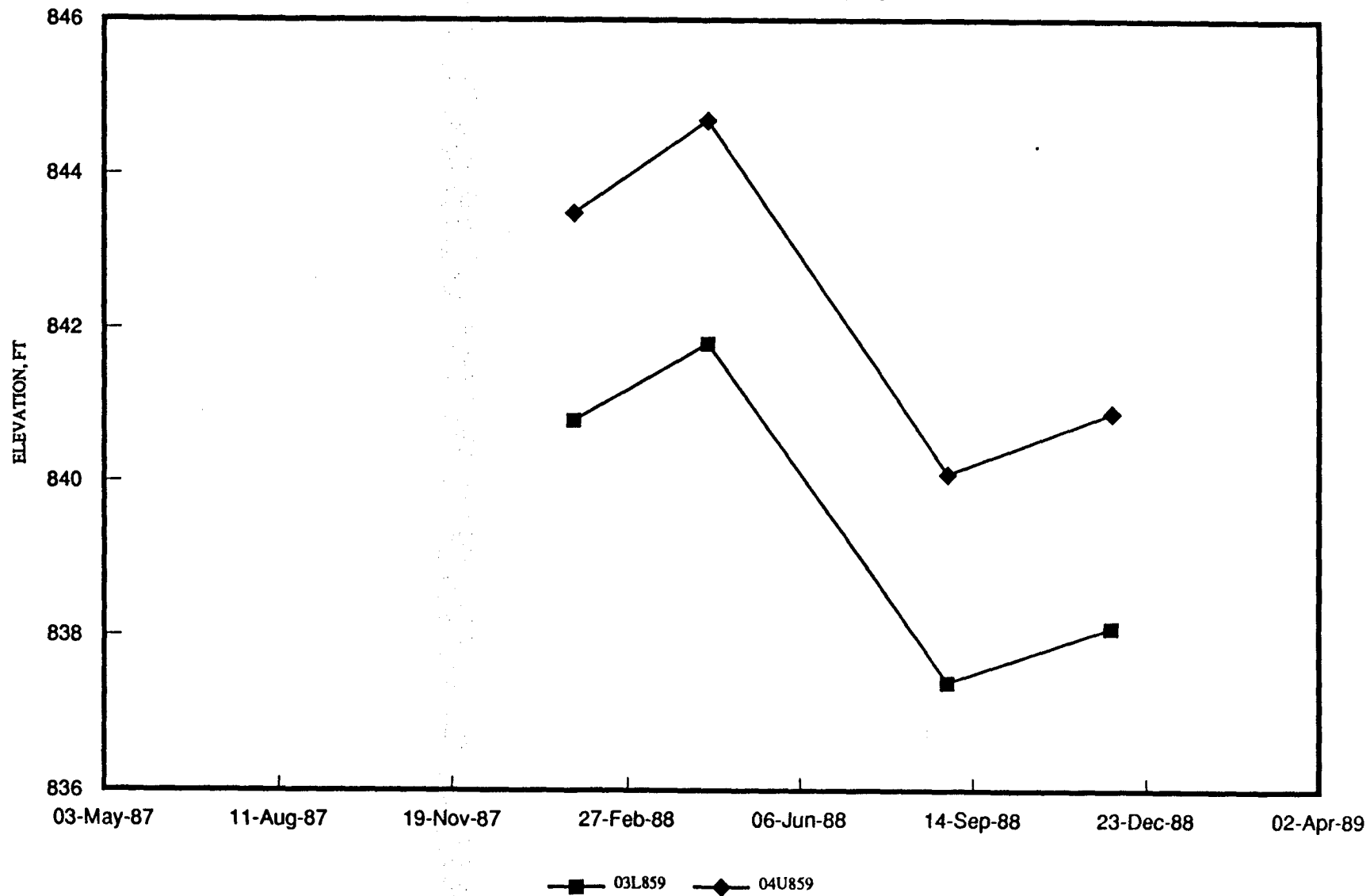


FIG. K-33, October, 1989
WENCK ASSOCIATES, INC.

GROUNDWATER HYDROGRAPHS

TWIN CITIES ARMY AMMUNITION PLANT

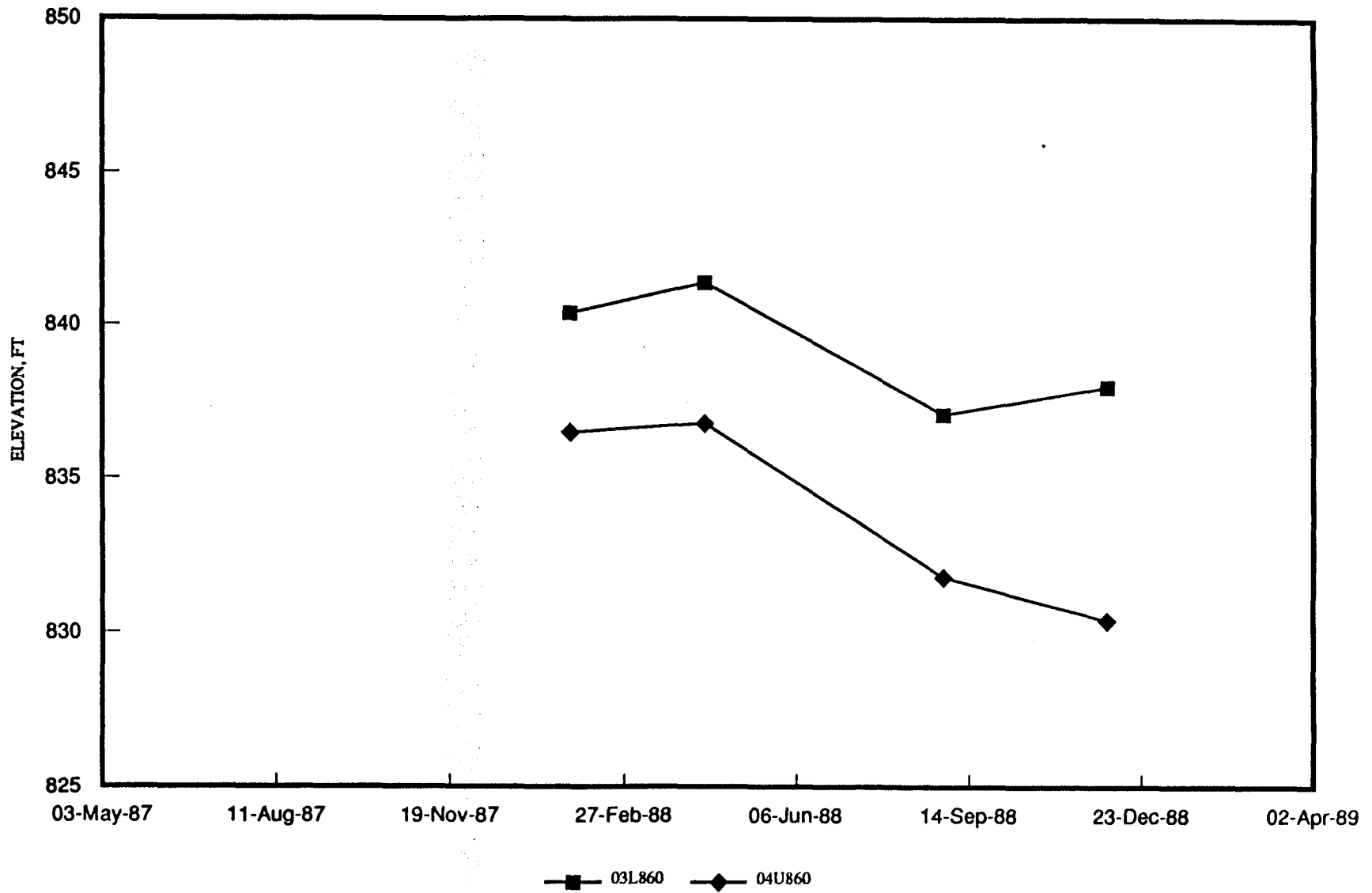


FIG. K-34, October, 1989
WENCK ASSOCIATES, INC.

GROUNDWATER HYDROGRAPHS

TWIN CITIES ARMY AMMUNITION PLANT

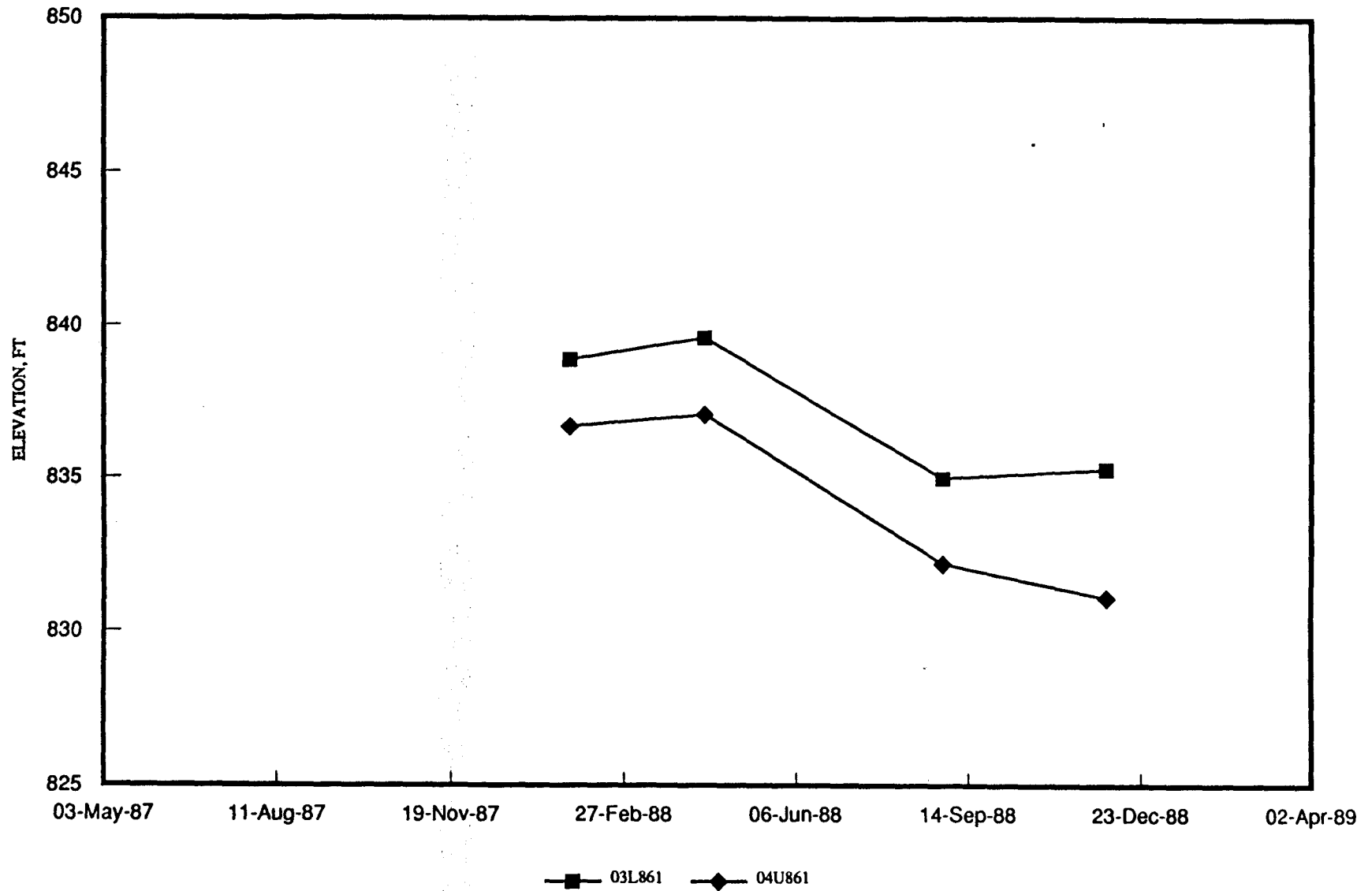
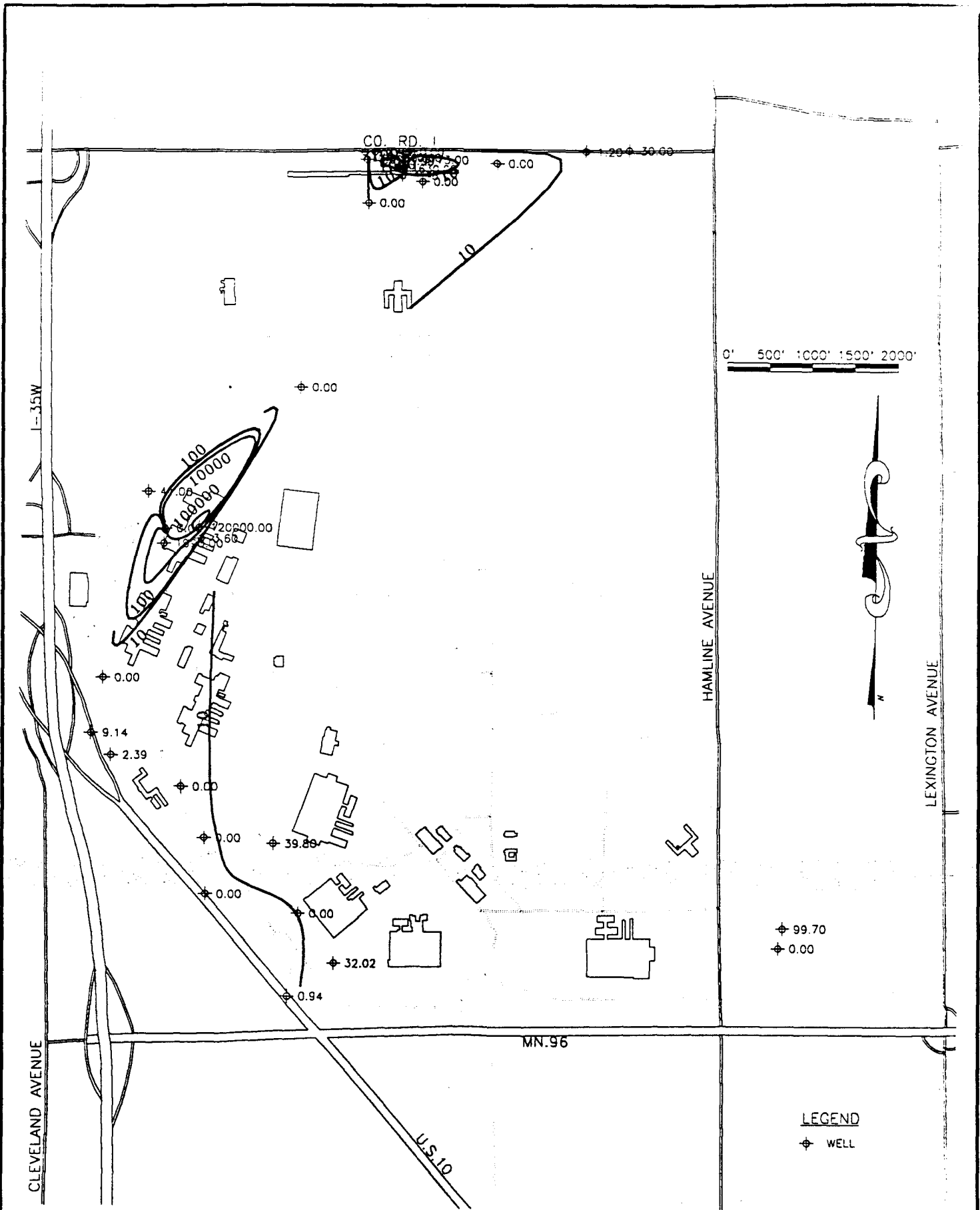


FIG. K-35, October, 1989
WENCK ASSOCIATES, INC.

L. UNIT 1 GROUNDWATER QUALITY ISOCONCENTRATION MAPS - ORGANICS



TWIN CITIES ARMY AMMUNITION PLANT

Isoconcentration Map Unit 1 Total VOC's Quarter 16



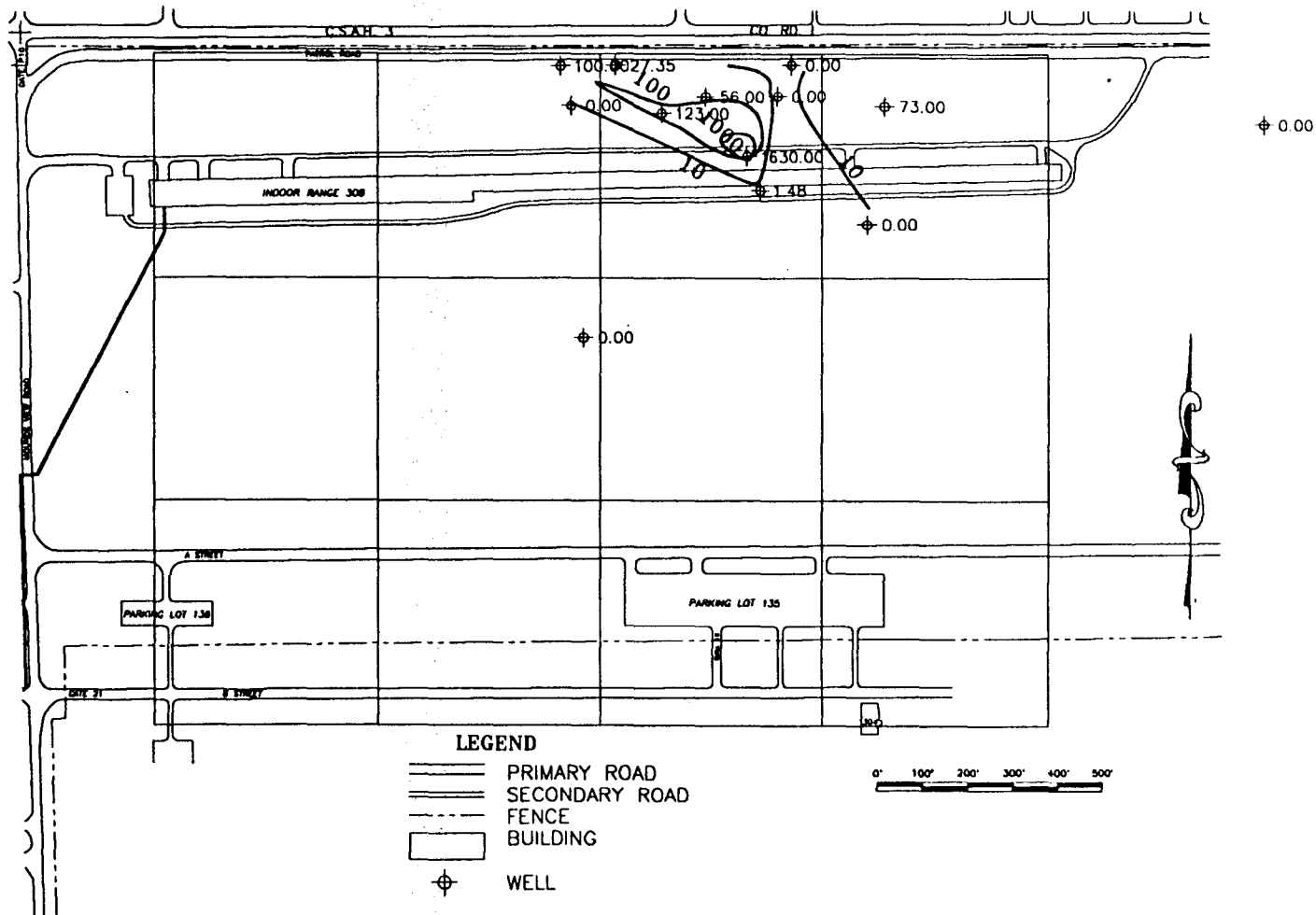
Wenck Associates, Inc.

Consulting Engineers

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Fig. L-1



TWIN CITIES ARMY AMMUNITION PLANT

Isoconcentration Map Unit 1 (Site A) Total VOC's Quarter 16



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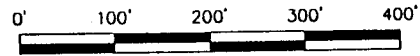
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Fig. L-2

I-35W

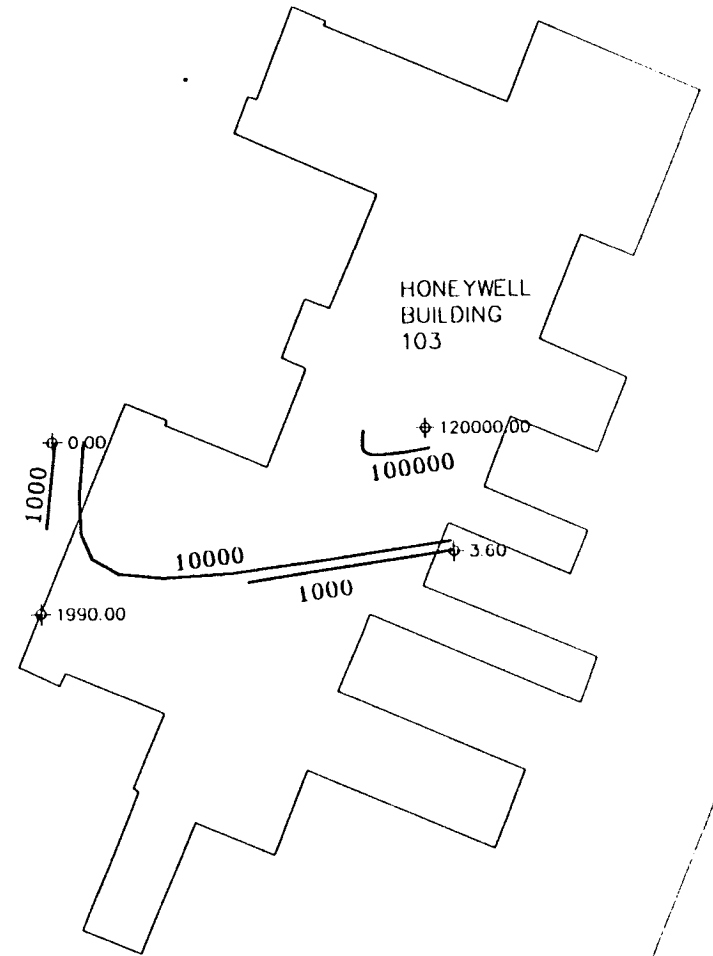
CO. RD. H



LEGEND

⊕ WELL

⊕ 41.00



TWIN CITIES ARMY AMMUNITION PLANT

Isoconcentration Map Unit 1 (Honeywell building 103 Area) Total VOC's Quarter 16



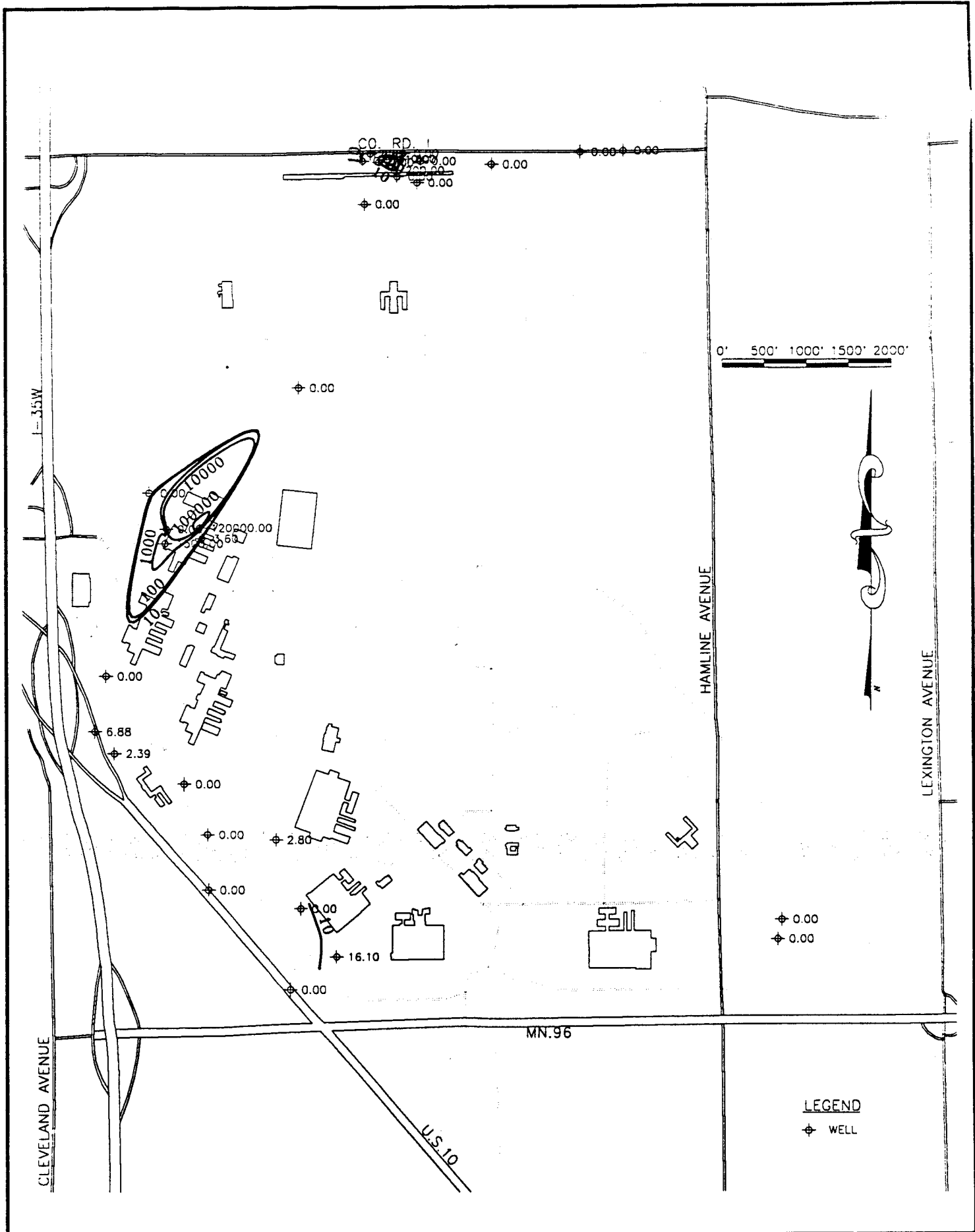
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Sheet 1 of 1

Fig. L-3



TWIN CITIES ARMY AMMUNITION PLANT

Isoconcentration Map Unit 1 Trichloroethylene Qtr. 16



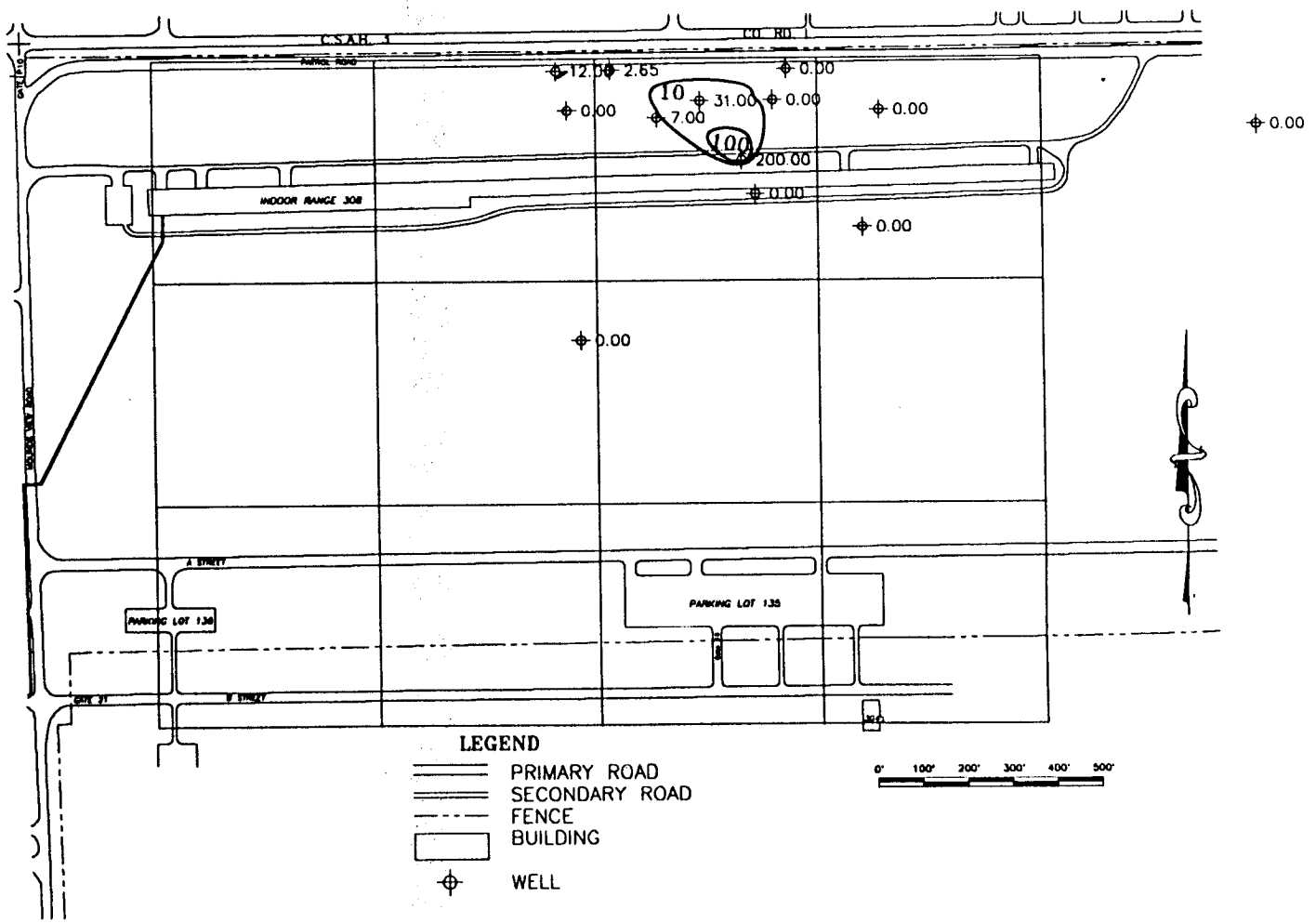
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Fig. L-4



TWIN CITIES ARMY AMMUNITION PLANT

Isoconcentration Map Unit 1 (Site A) Trichloroethylene Quarter 16



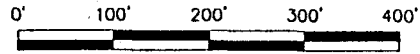
Wenck Associates, Inc.

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Sheet 1 of 9

Fig. L-5



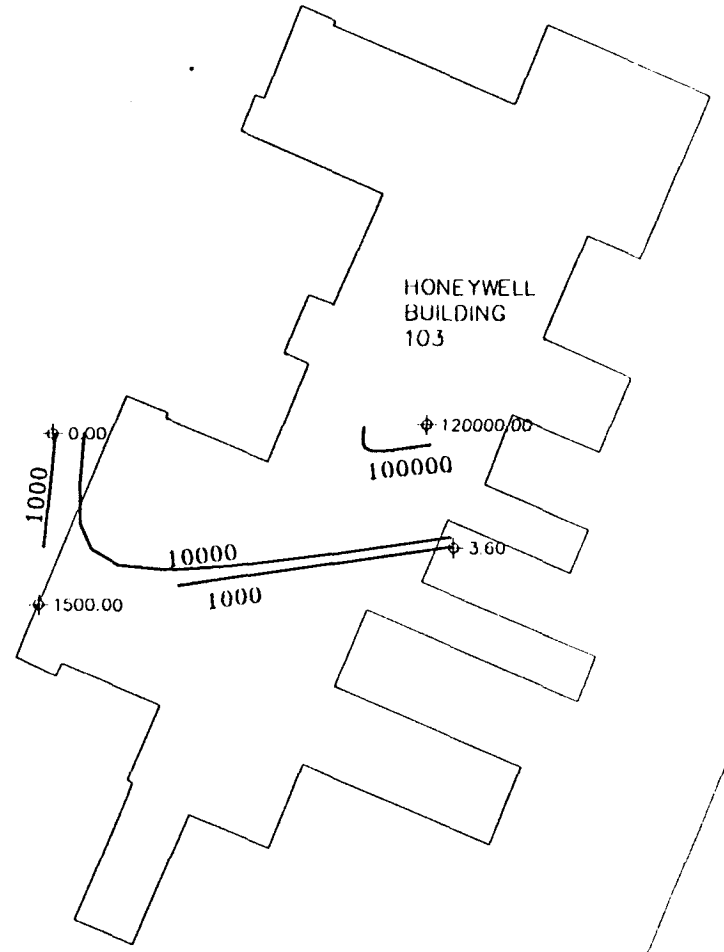
LEGEND

⊕ WELL

⊕ 0.00

I-35W

CO. RD. H



TWIN CITIES ARMY AMMUNITION PLANT

Isoconcentration Map Unit 1 (Honeywell Building 103 Area) Trichloroethylene Quarter 16



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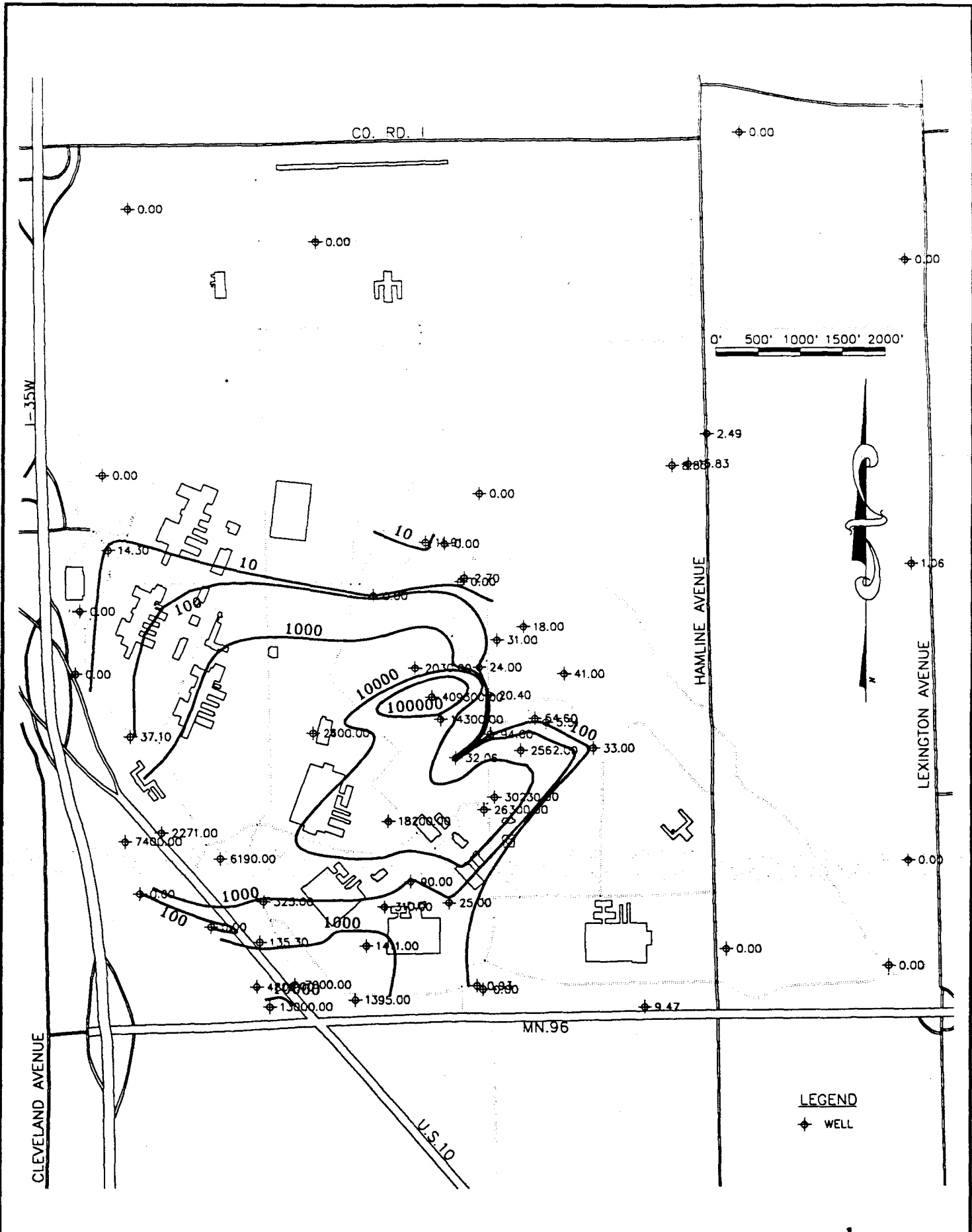
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Fig. L-6

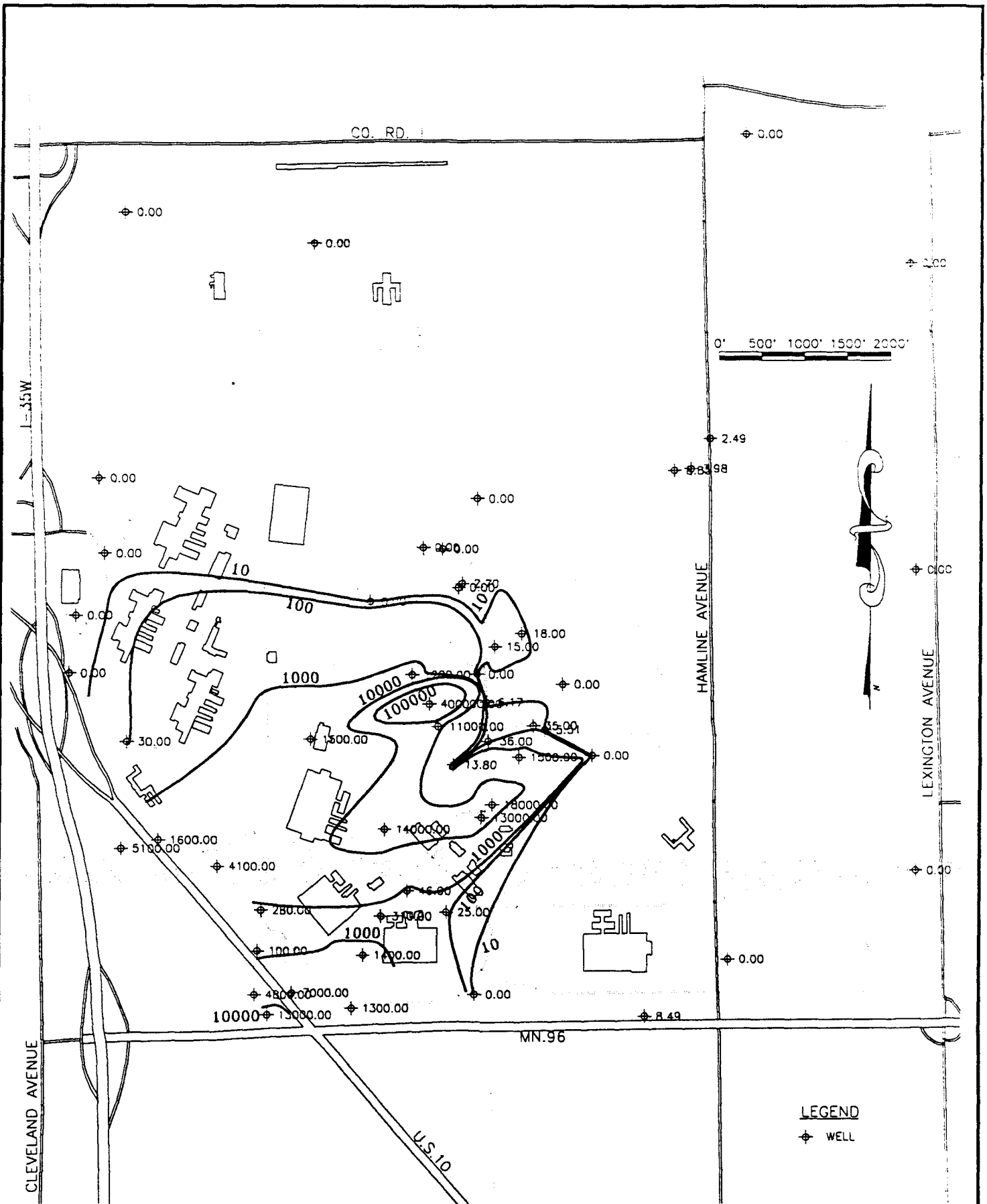
M. UNIT 3 GROUNDWATER QUALITY ISOCONCENTRATION MAPS - ORGANICS



TWIN CITIES ARMY AMMUNITION PLANT
 Isoconcentration Map Unit 3 Total VOC's Qtr. 16

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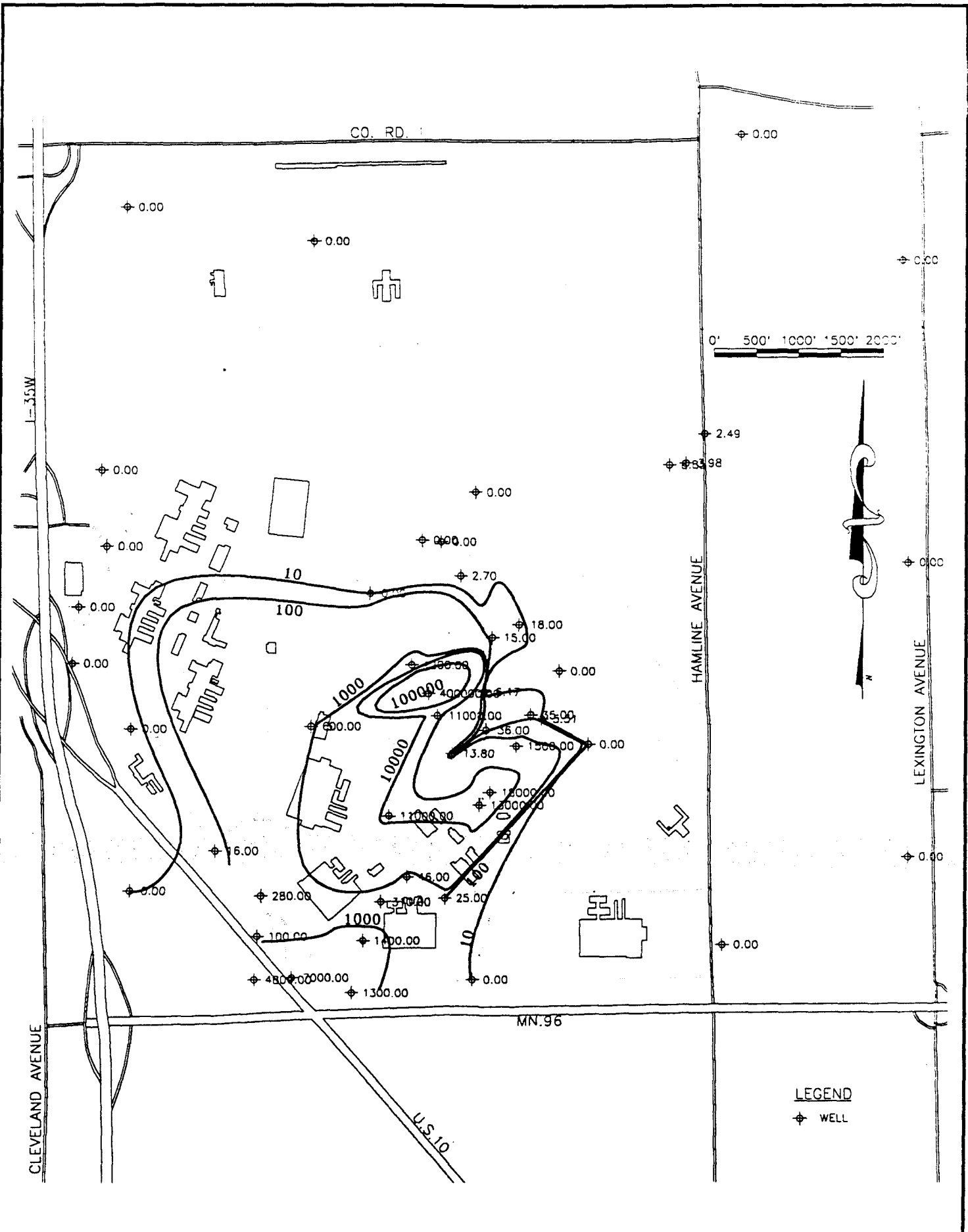
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 Fig. M-1



TWIN CITIES ARMY AMMUNITION PLANT
 Isoconcentration Map Unit 3 Trichloroethylene Qtr. 16


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 Fig. M-2



TWIN CITIES ARMY AMMUNITION PLANT

Isoconcentration Map Upper Unit 3 Trichloroethylene Qtr. 16



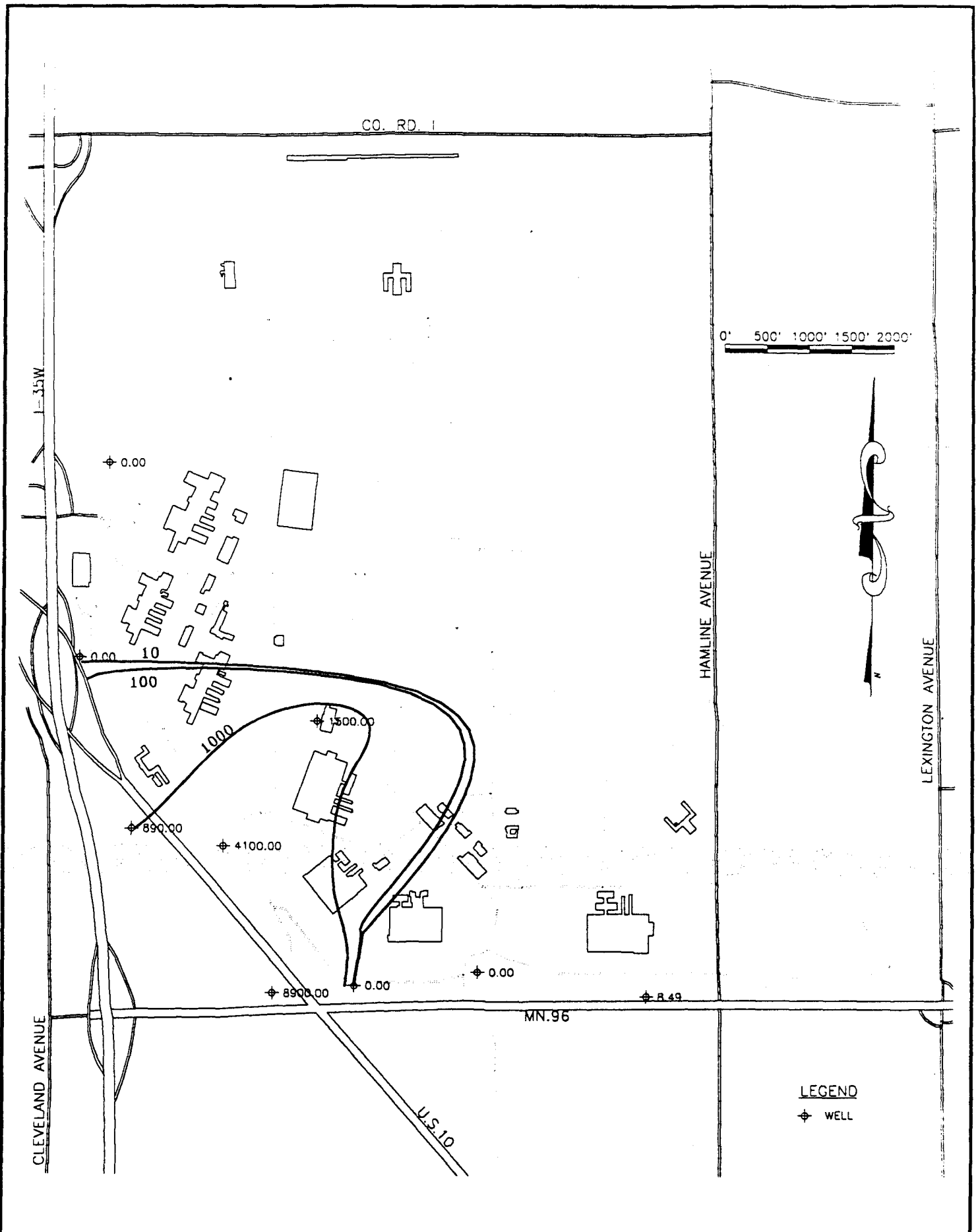
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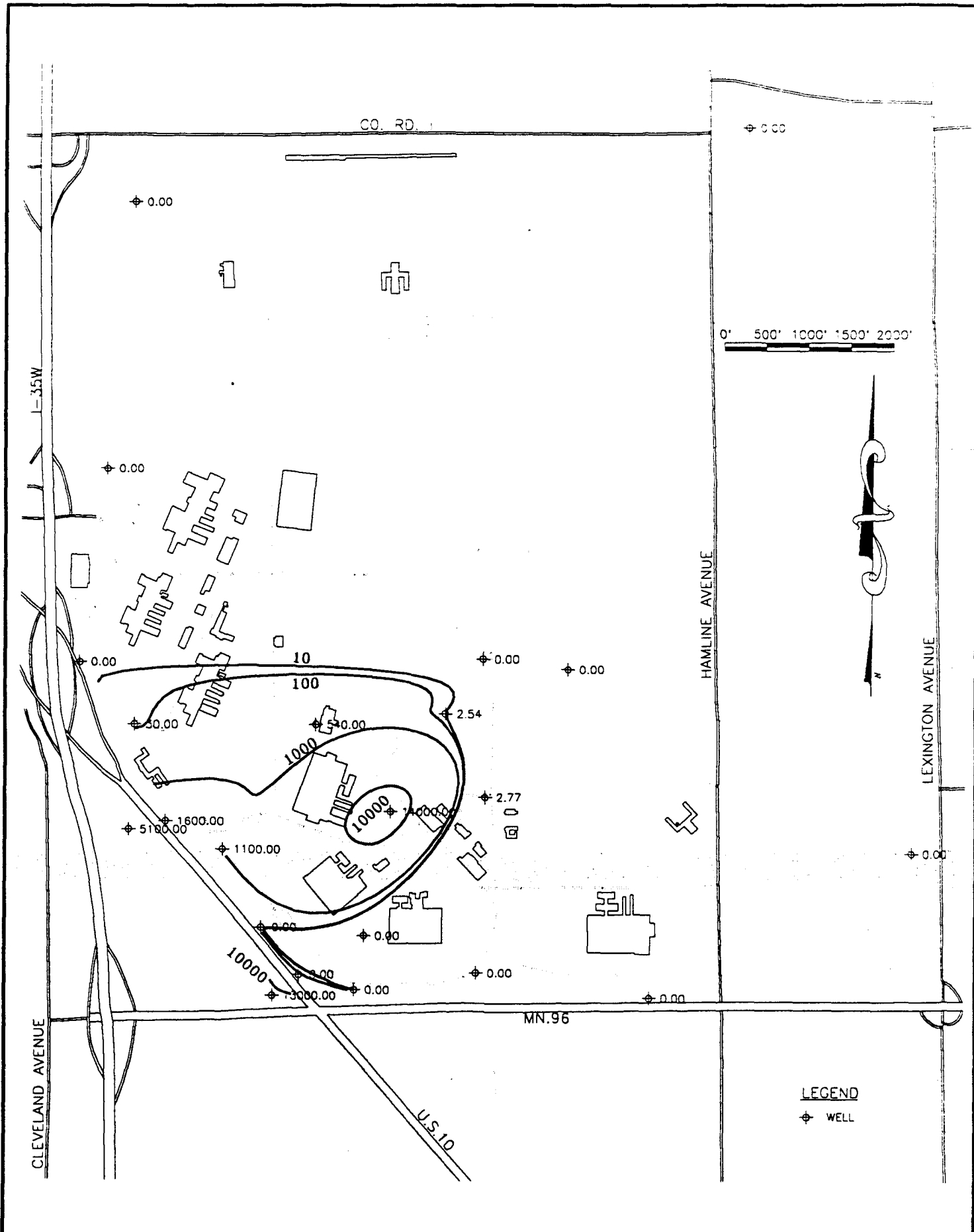
Fig. M-3



TWIN CITIES ARMY AMMUNITION PLANT
 Isoconcentration Map Middle Unit 3 Trichloroethylene Qtr. 16

W A W
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 Fig. M-4




0' 500' 1000' 1500' 2000'



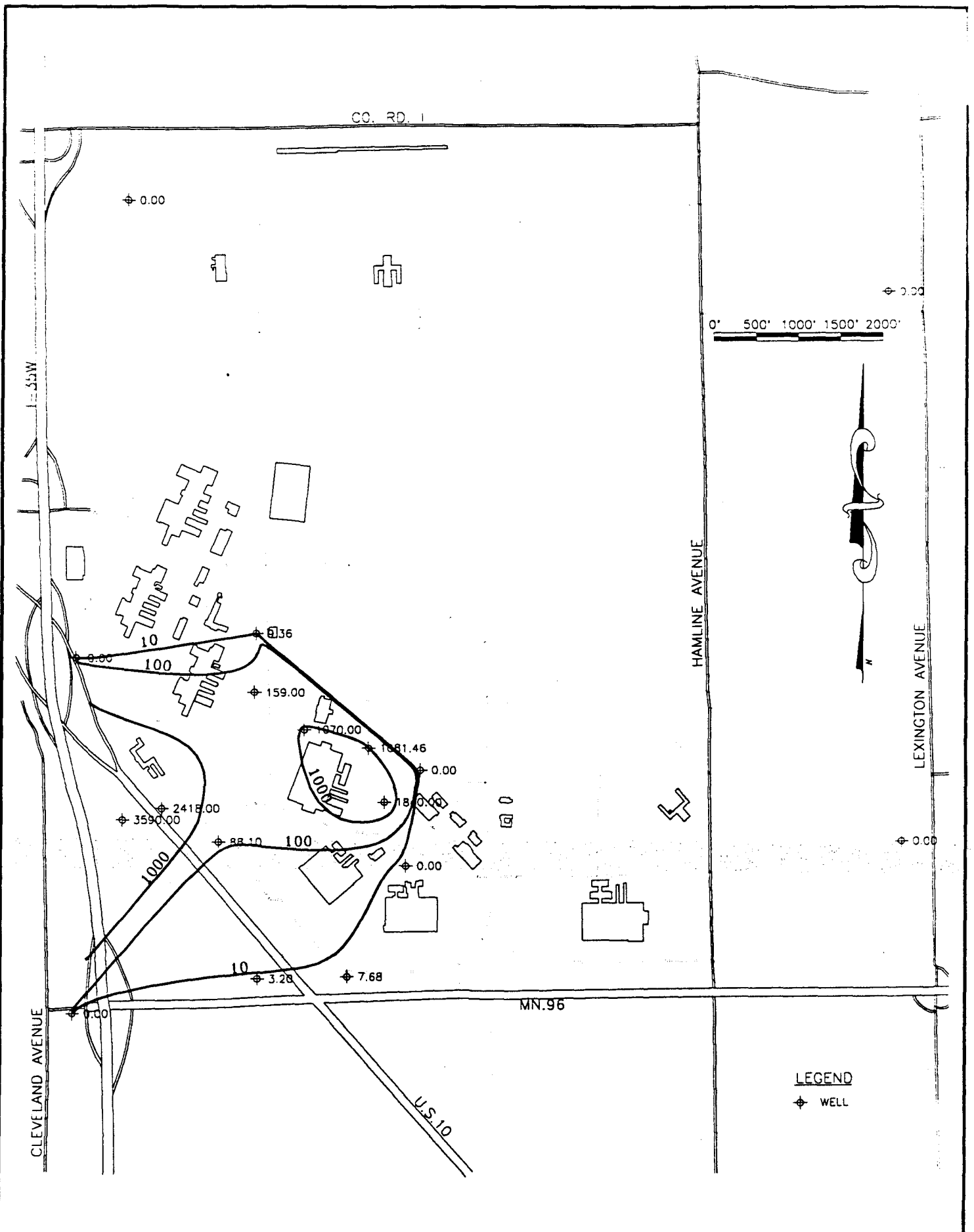
LEGEND
 ⊕ WELL

TWIN CITIES ARMY AMMUNITION PLANT
 Isoconcentration Map Lower Unit 3 Trichloroethylene Qtr. 16


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 Fig. M-5

N. UNIT 4 GROUNDWATER QUALITY ISOCONCENTRATION MAPS - ORGANICS



TWIN CITIES ARMY AMMUNITION PLANT

Isoconcentration Map Unit 4 Total VOC's Qtr. 16



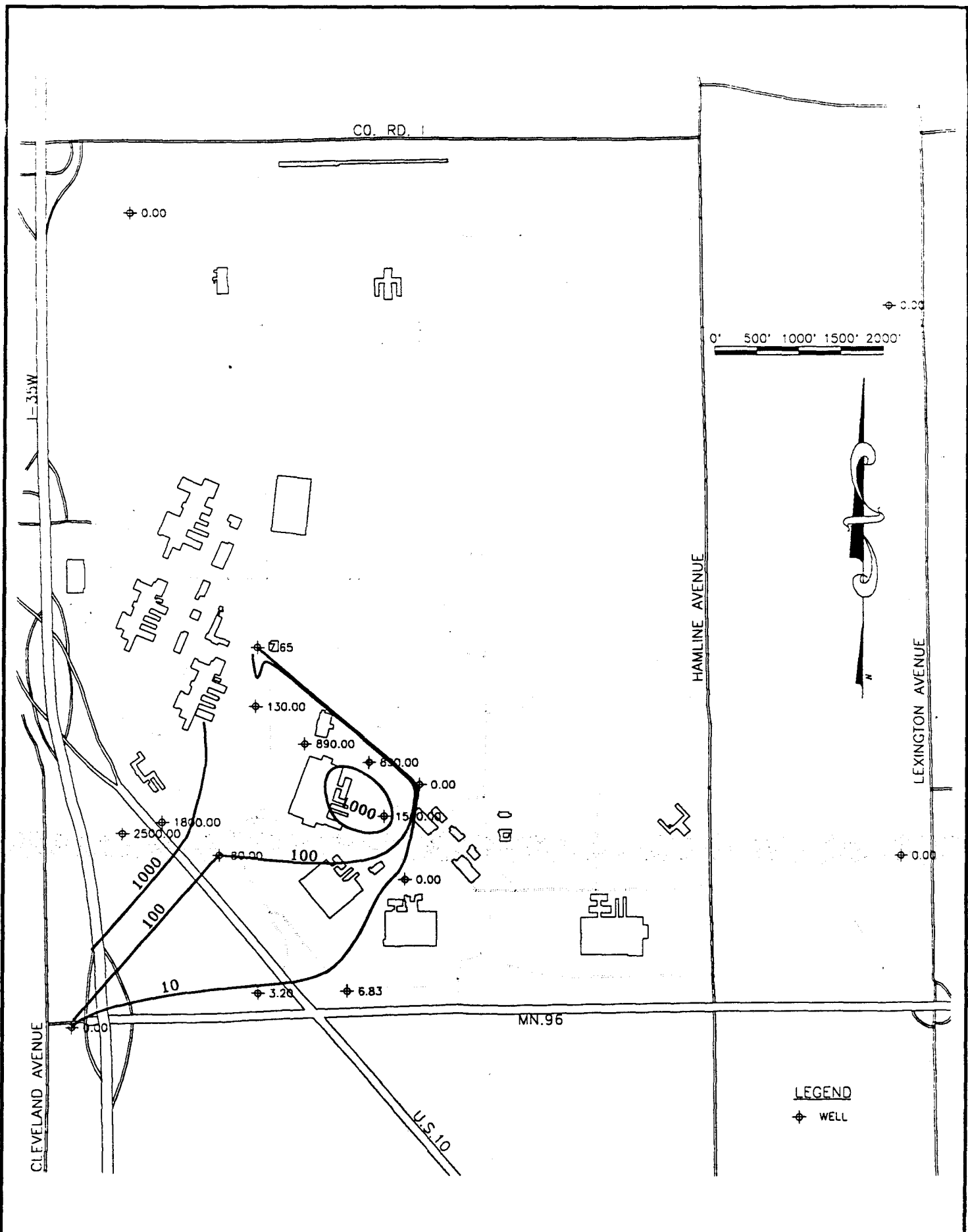
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Fig. N-1



TWIN CITIES ARMY AMMUNITION PLANT

Isoconcentration Map Unit 4 Trichloroethylene Qtr. 16

W A

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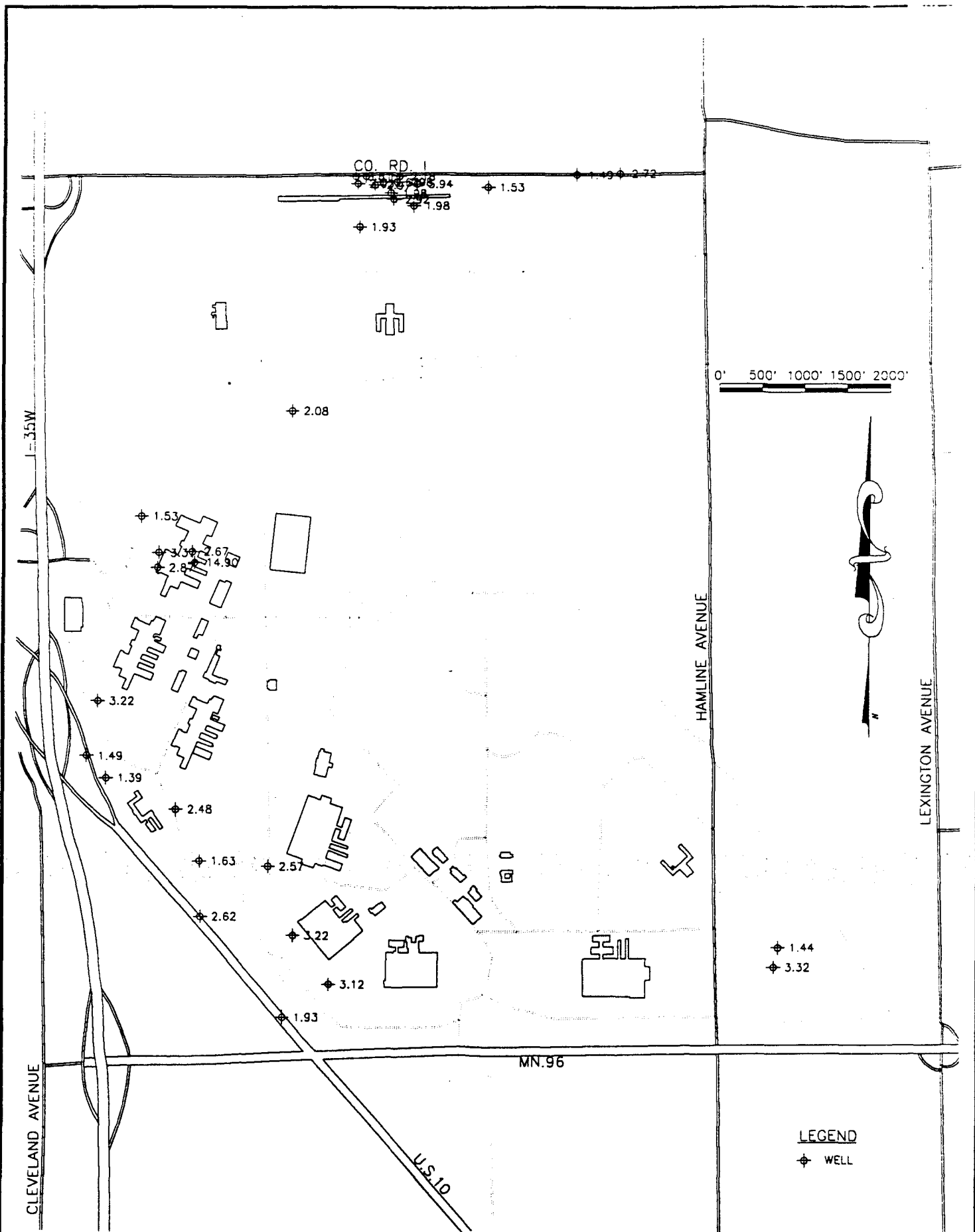
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Fig. N-2

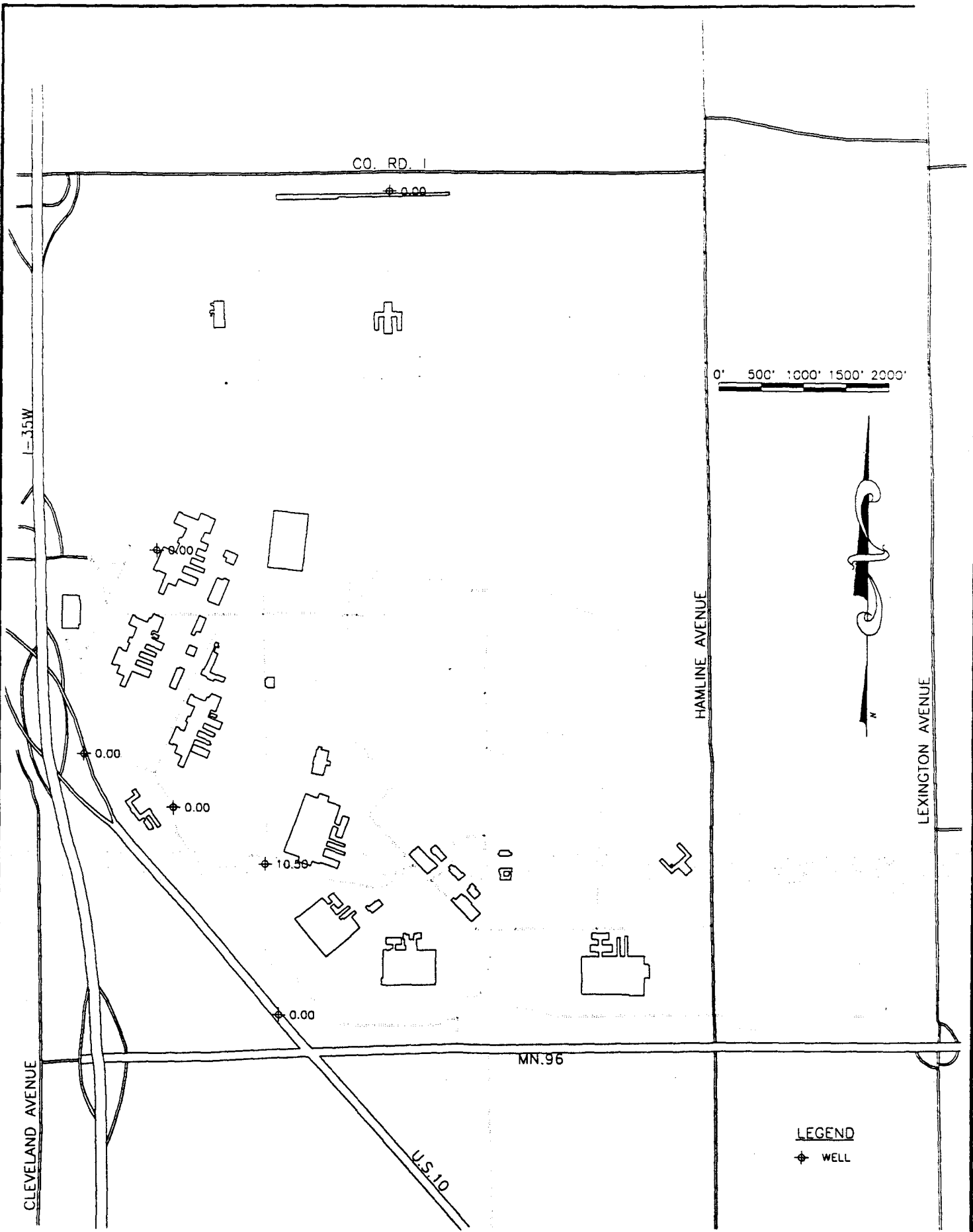
O. UNIT 1 GROUNDWATER QUALITY MAPS - INORGANICS



TWIN CITIES ARMY AMMUNITION PLANT
 Groundwater Quality Map Unit 1 Copper Concentration Qtr. 16

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 Fig. O-1



TWIN CITIES ARMY AMMUNITION PLANT

Groundwater Quality Map Unit 1 Cyanide Concentration Qtr. 16



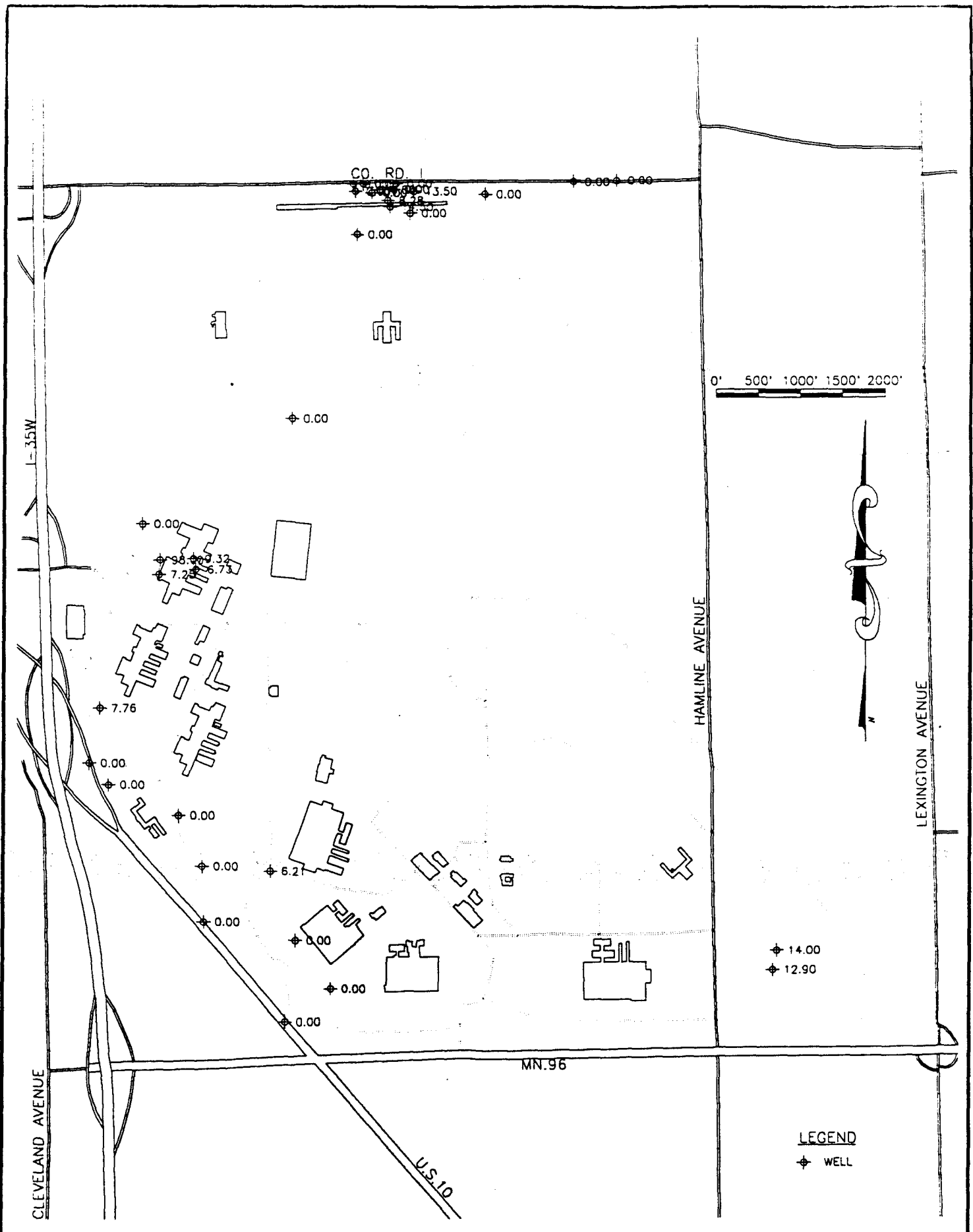
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Fig. O-2



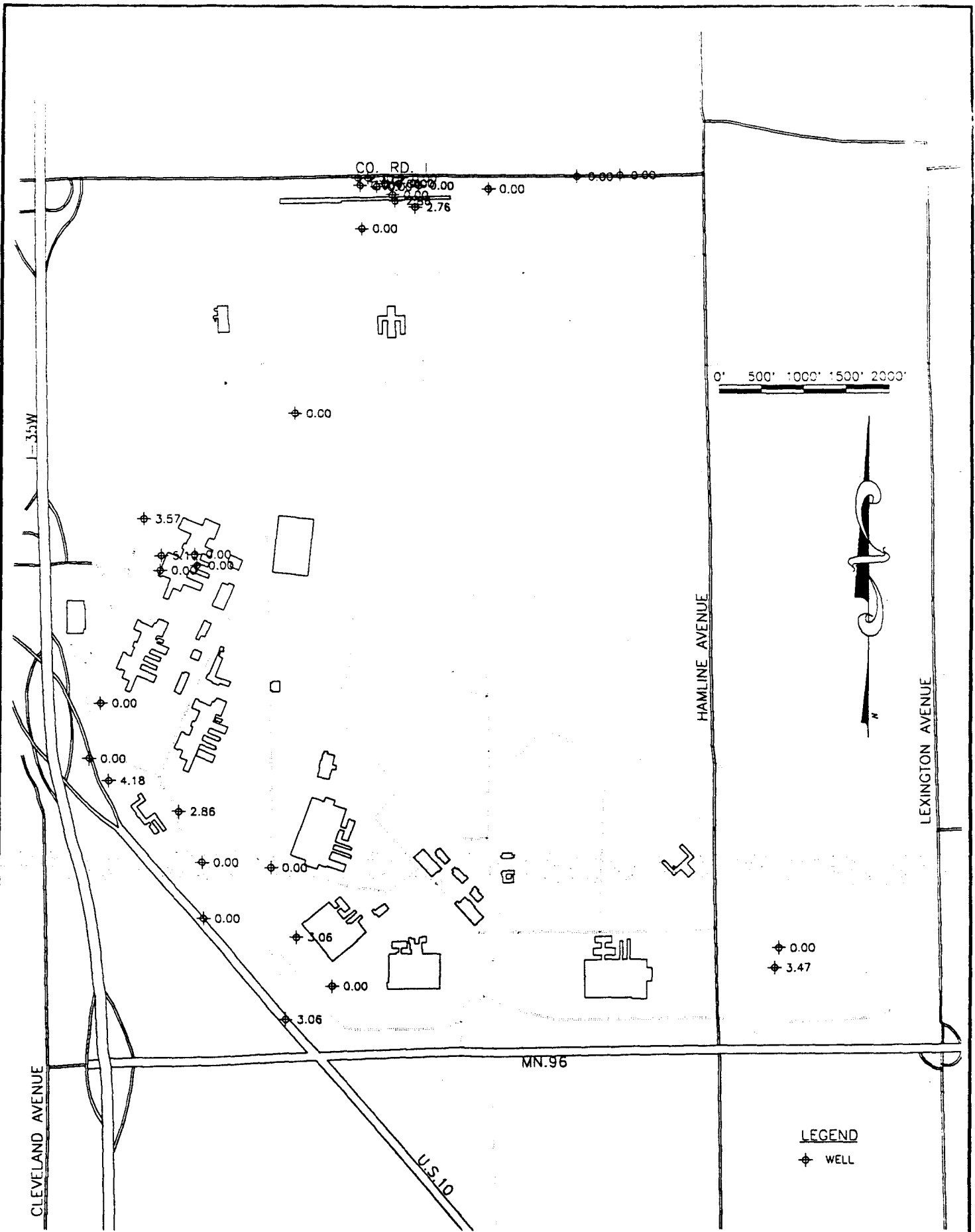
TWIN CITIES ARMY AMMUNITION PLANT

Groundwater Quality Map Unit 1 Nickel Concentration Qtr. 16

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Fig. O-3



TWIN CITIES ARMY AMMUNITION PLANT

Groundwater Quality Map Unit 1 Lead Concentration Qtr. 16



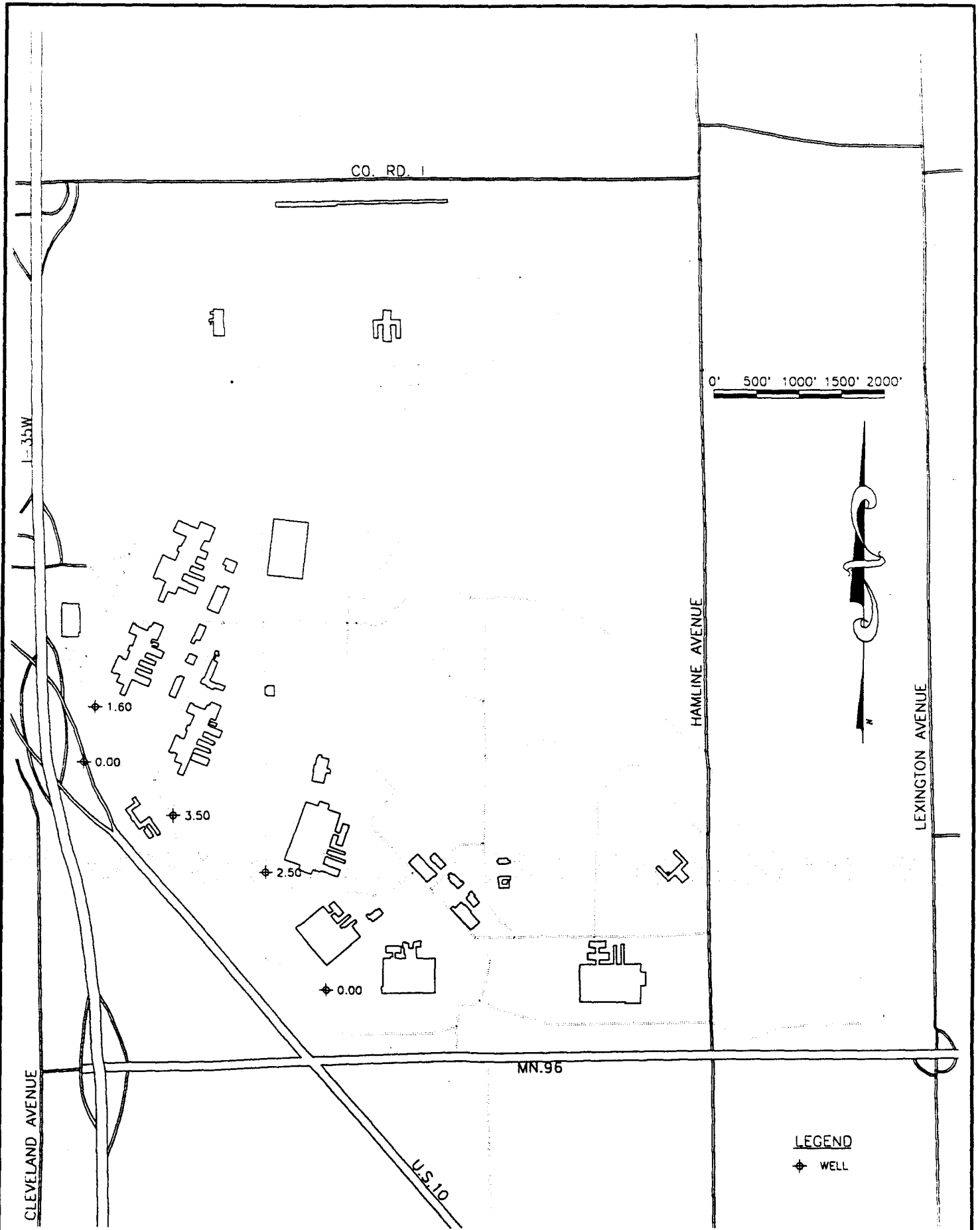
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Fig. O-4



TWIN CITIES ARMY AMMUNITION PLANT

Groundwater Quality Map Unit 1 Alpha Radionuclides Concentration Qtr. 16



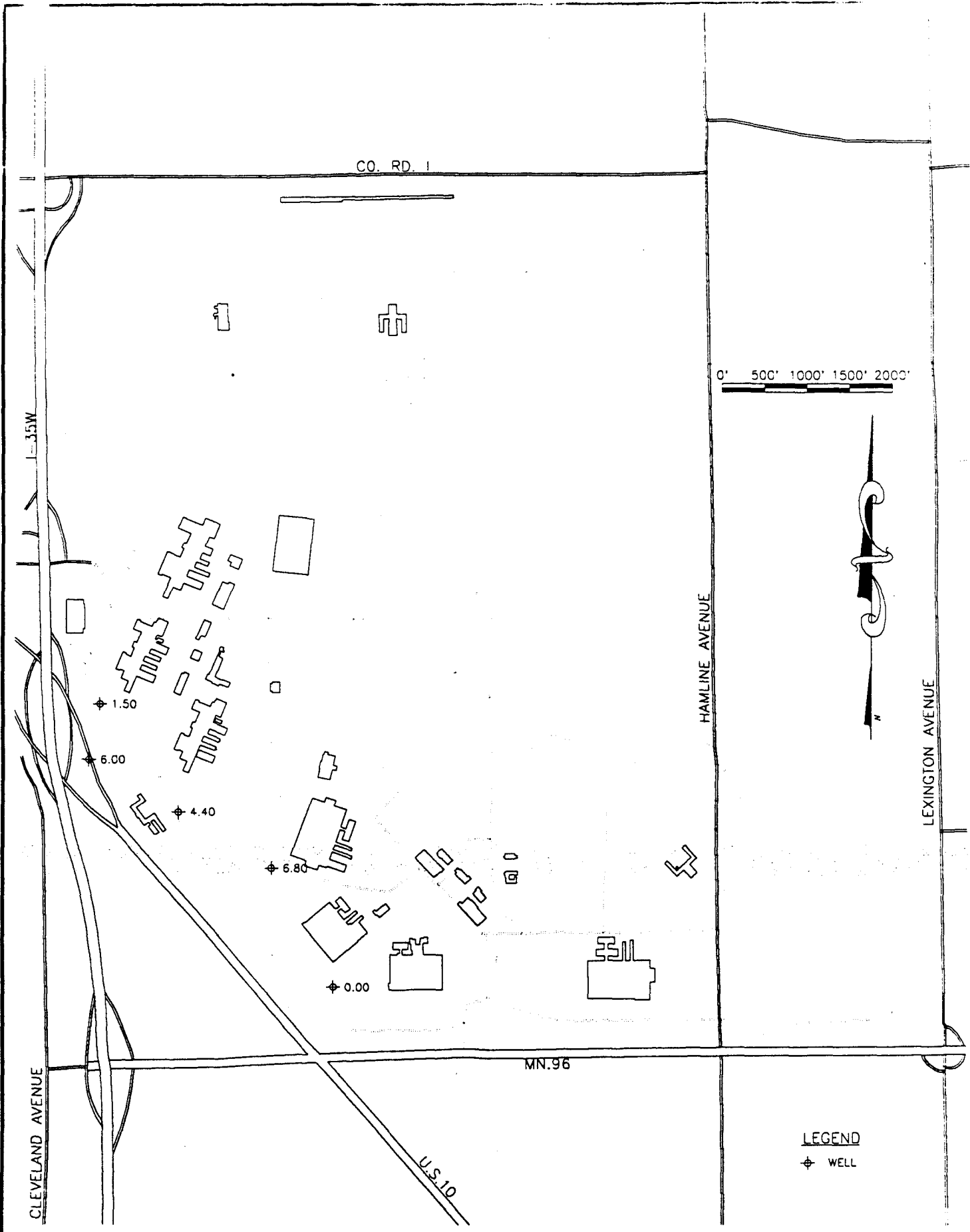
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Fig. O-5



TWIN CITIES ARMY AMMUNITION PLANT

Groundwater Quality Map Unit 1 Beta Radionuclides Concentration Qtr. 16



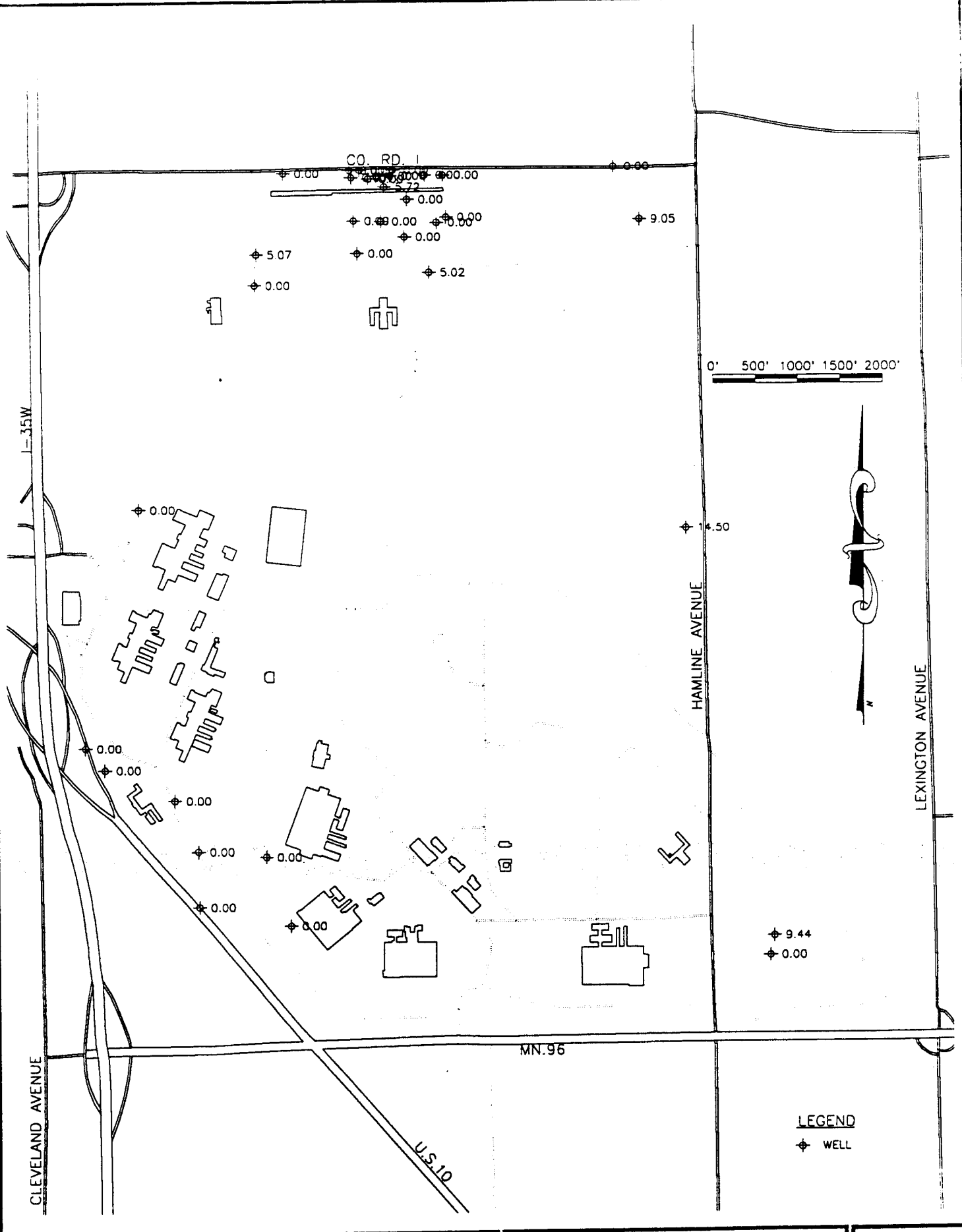
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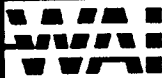
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Fig. O-6



TWIN CITIES ARMY AMMUNITION PLANT

Groundwater Quality Map Unit 1 Nickel Concentration Qtr. 18



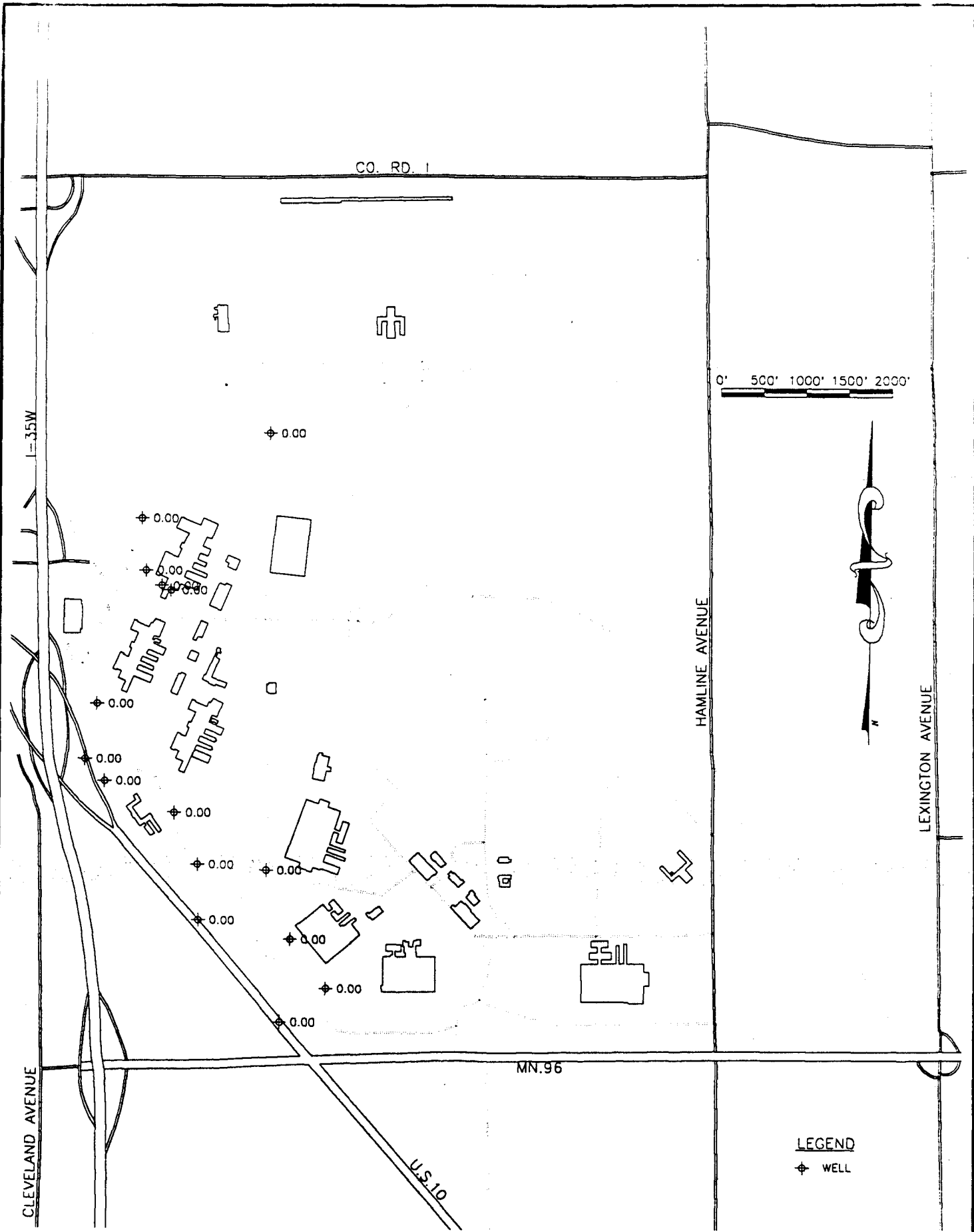
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Fig. O-7



TWIN CITIES ARMY AMMUNITION PLANT

Groundwater Quality Map Unit 1 Cyanide Concentration Qtr. 19



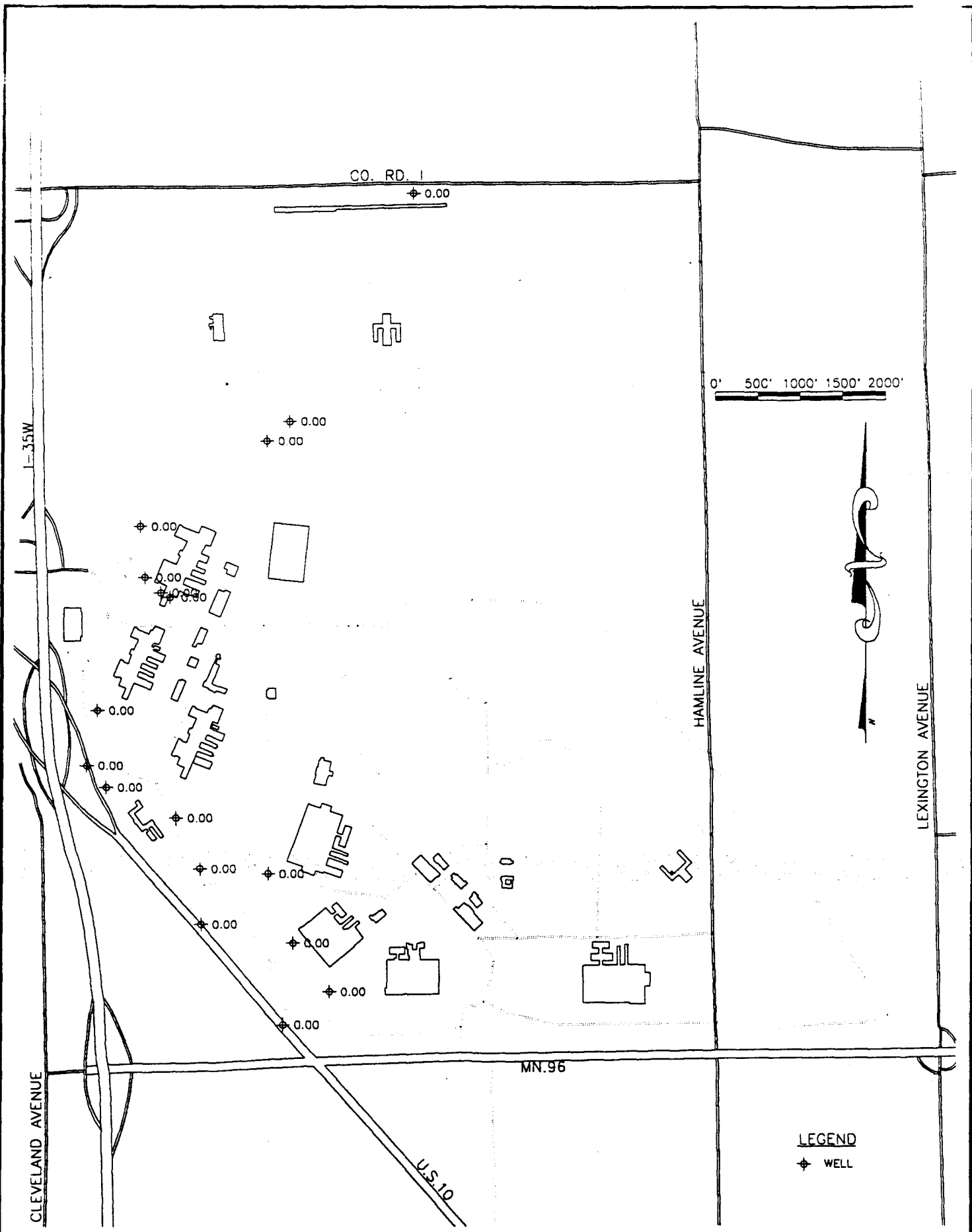
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Fig. O-9



TWIN CITIES ARMY AMMUNITION PLANT

Groundwater Quality Map Unit 1 Nickel Concentration Qtr. 19



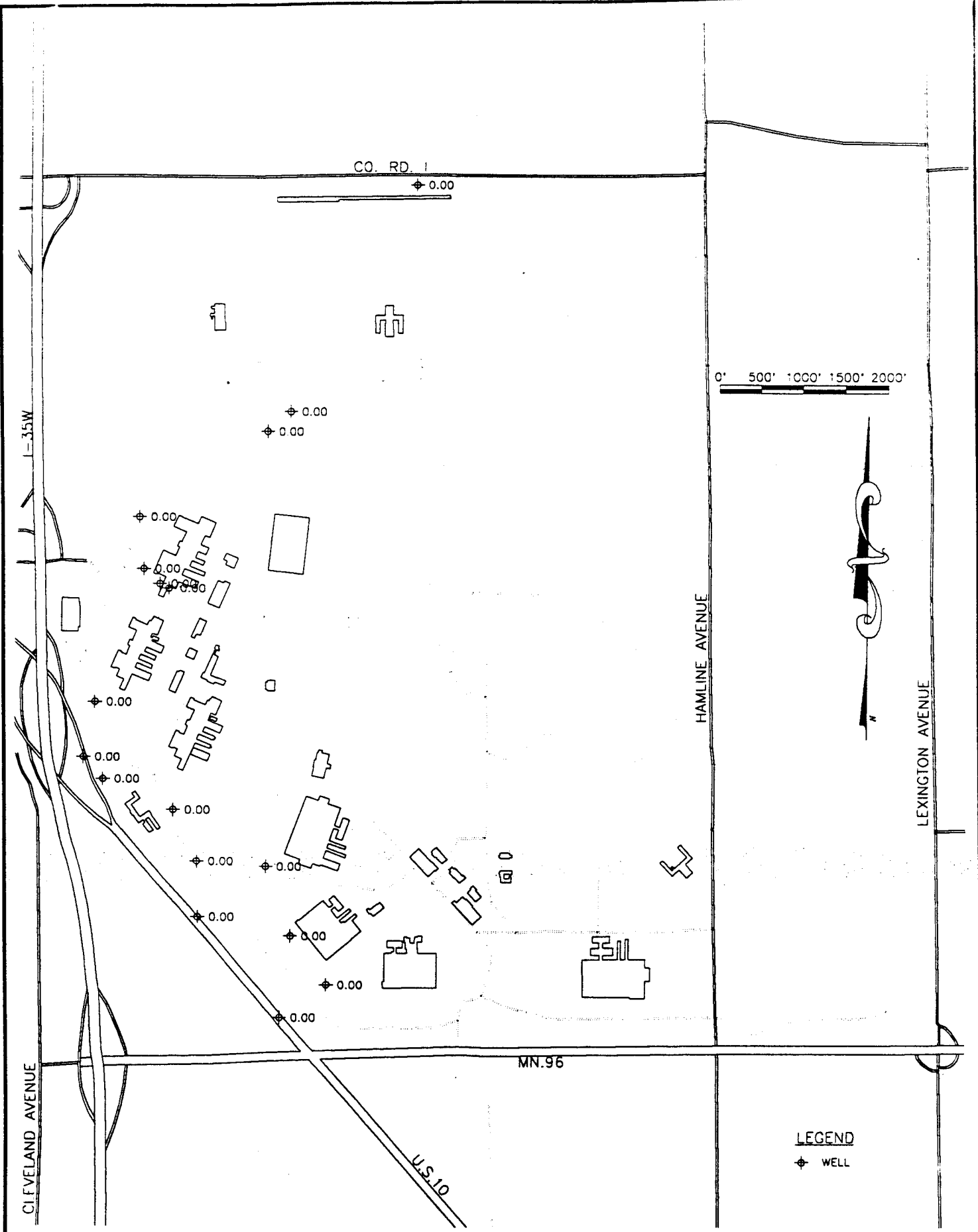
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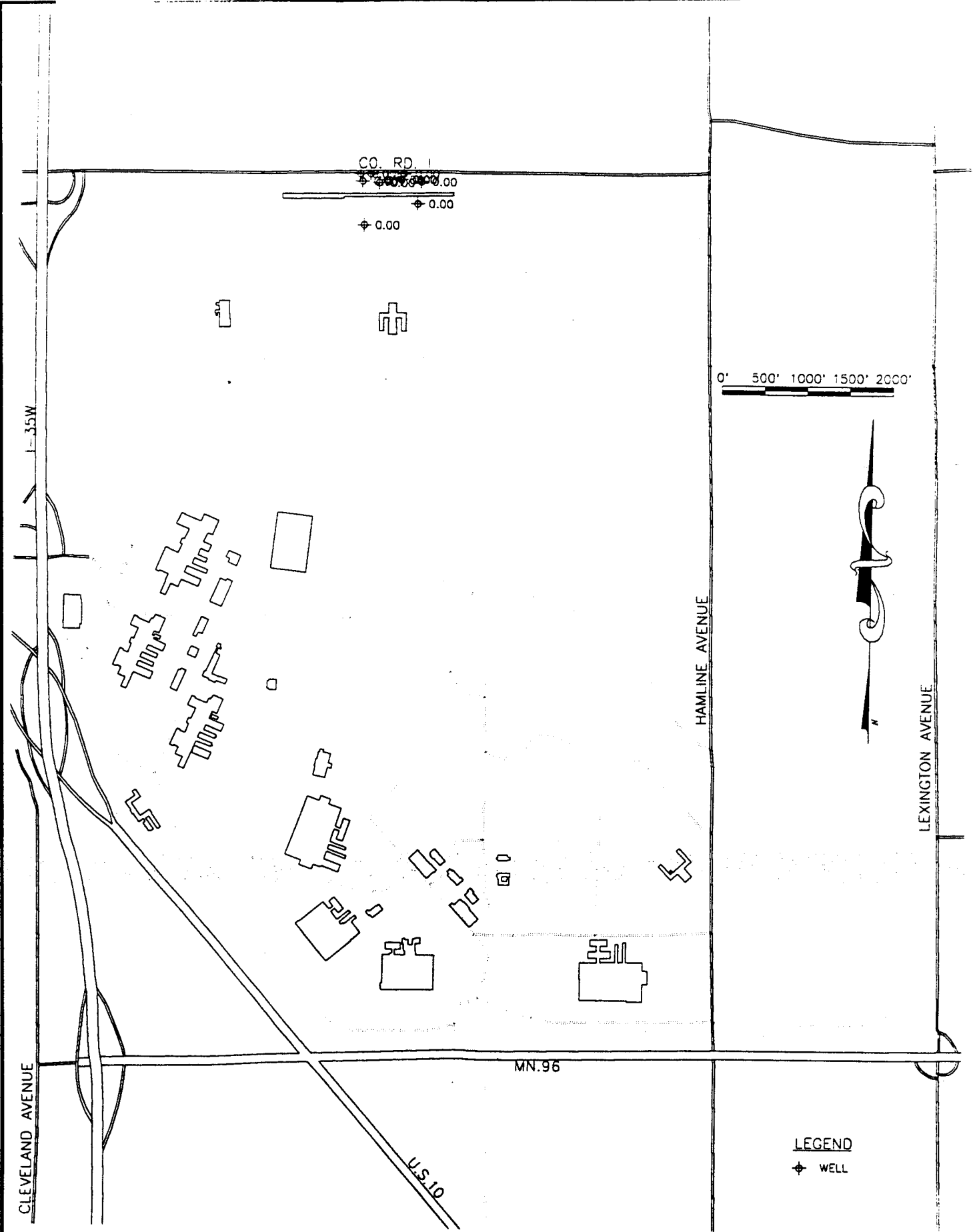
Fig. O-10



TWIN CITIES ARMY AMMUNITION PLANT
 Groundwater Quality Map Unit 1 Lead Concentration Qtr. 19

W A A
W A A
W A A
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 Fig. O-11



TWIN CITIES ARMY AMMUNITION PLANT

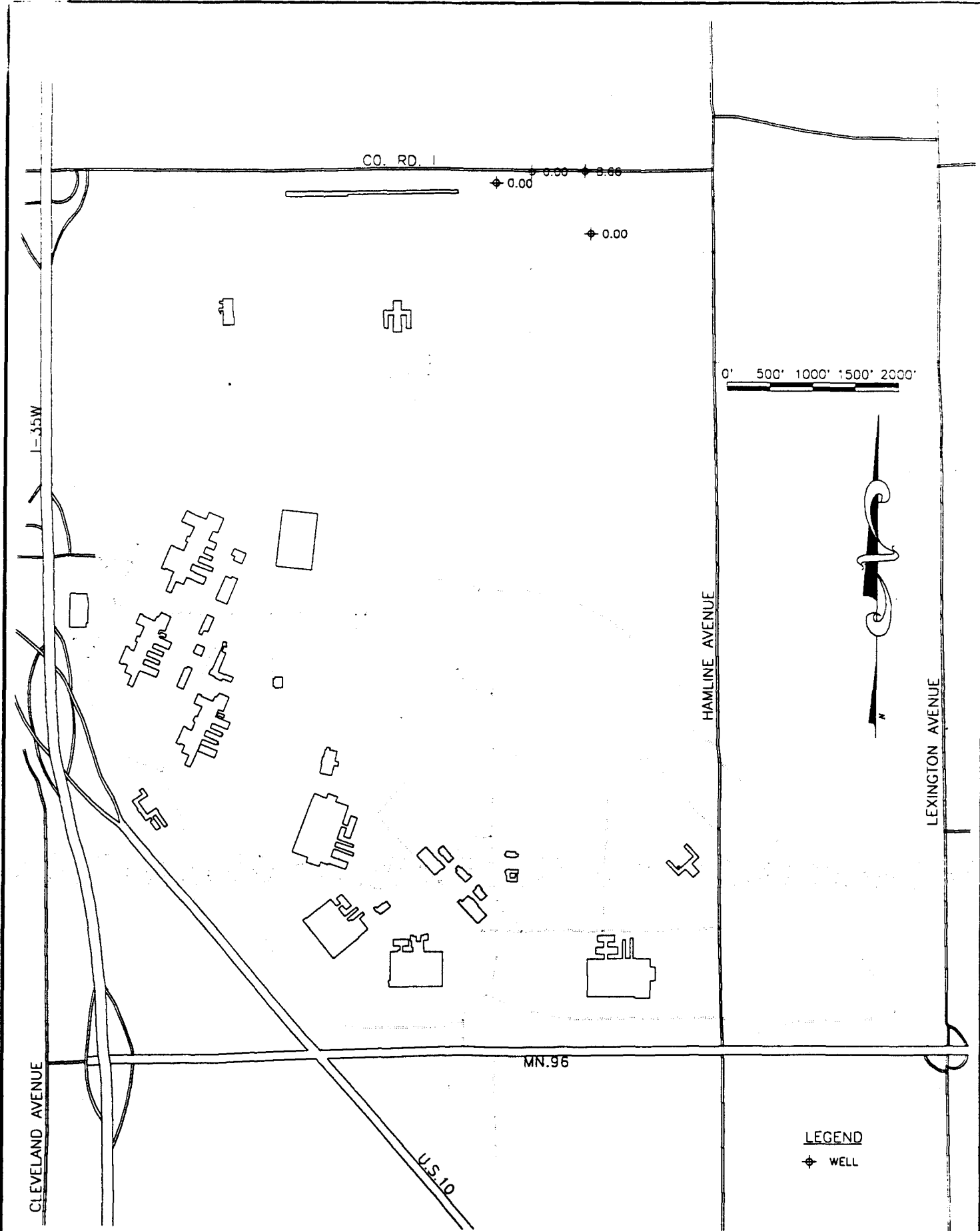
Groundwater Quality Map Unit 1 Cyanide Concentration Qtr. 20

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Fig. O-12



TWIN CITIES ARMY AMMUNITION PLANT

Groundwater Quality Map Unit 1 Nickel Concentration Qtr. 20



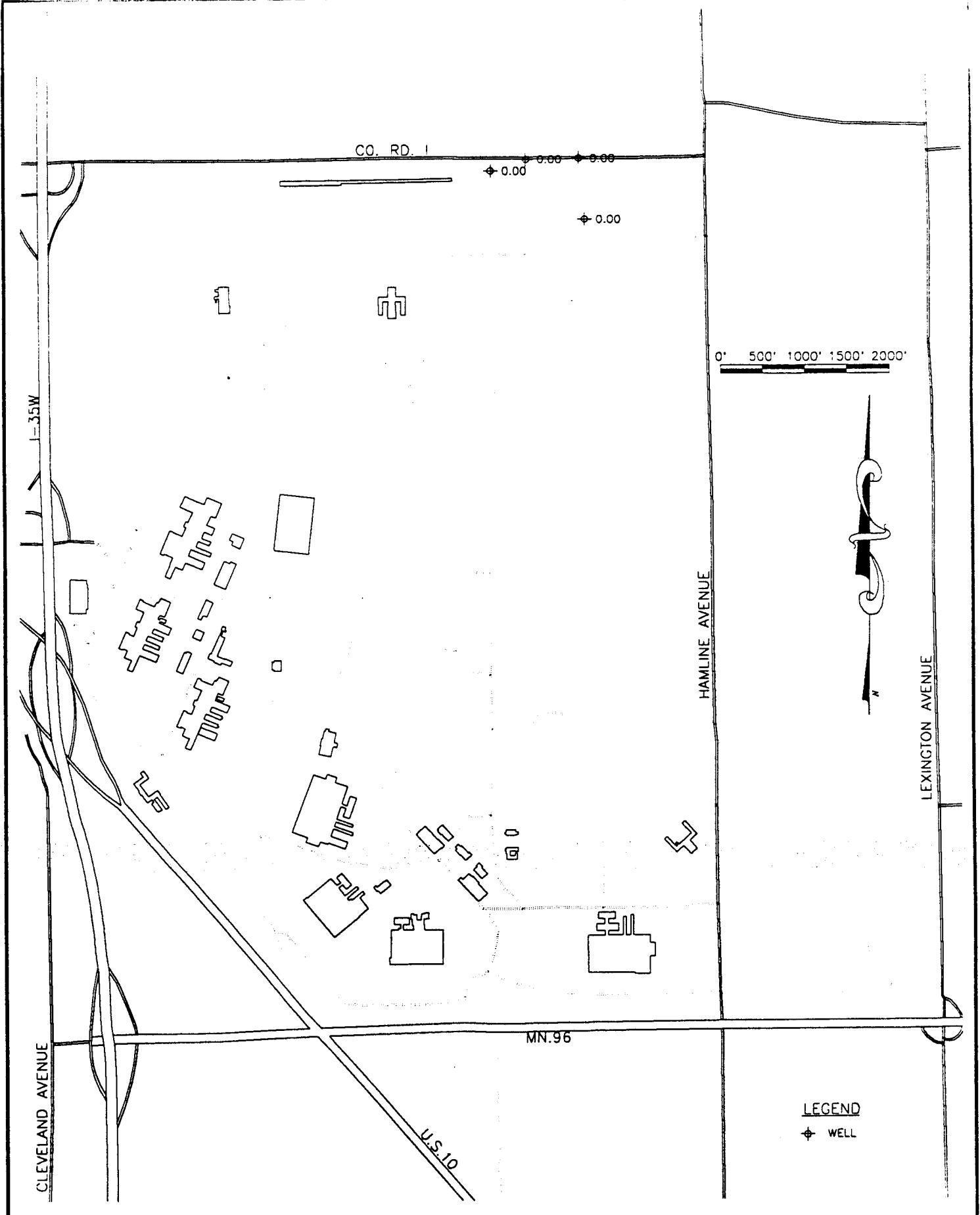
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Fig. O-13



TWIN CITIES ARMY AMMUNITION PLANT

Groundwater Quality Map Unit 1 Lead Concentration Qtr. 20



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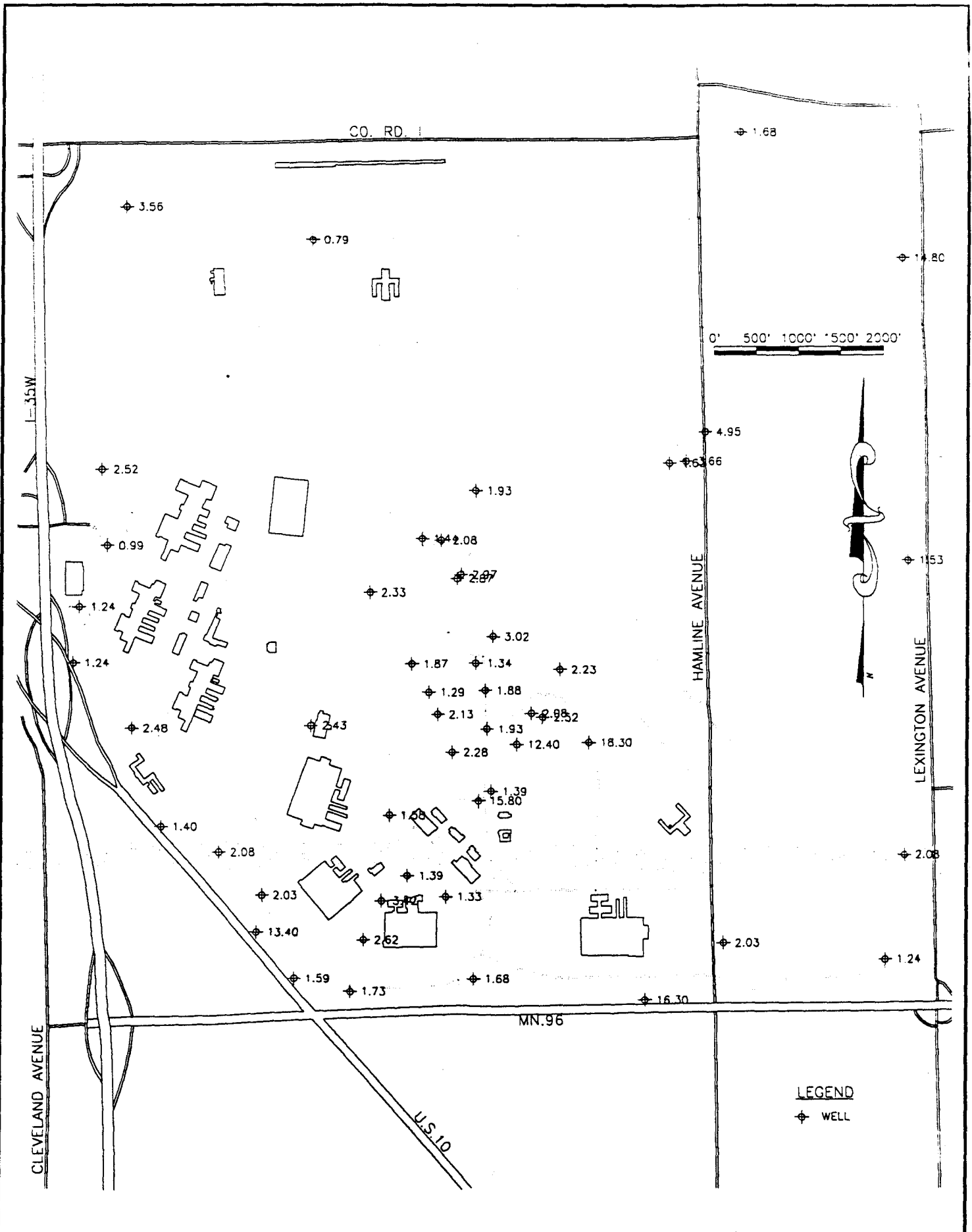
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Fig. O-14

P. UNIT 3 GROUNDWATER QUALITY MAPS - INORGANICS



TWIN CITIES ARMY AMMUNITION PLANT

Groundwater Quality Map Unit 3 Copper Concentration Qtr. 16



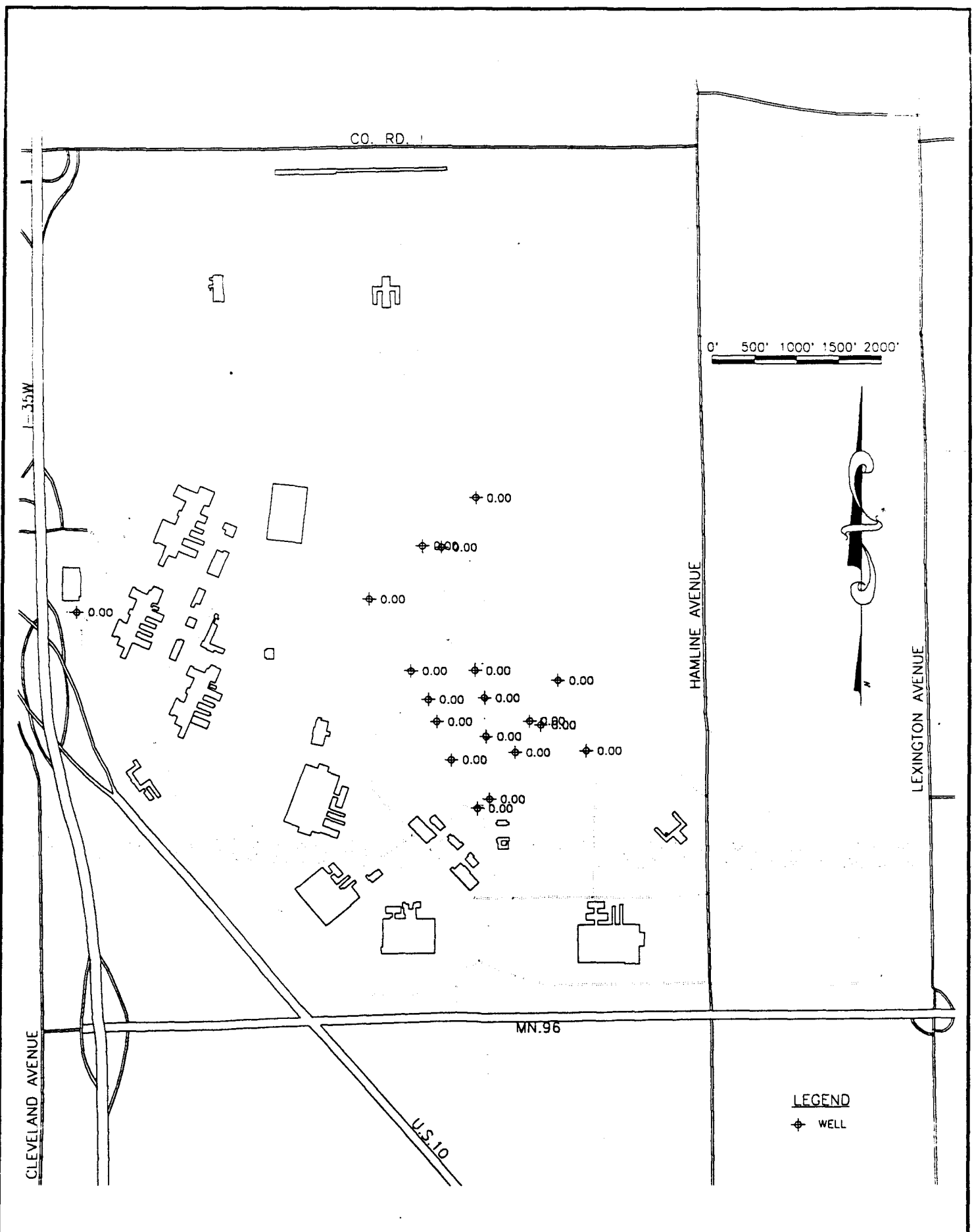
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Fig. P-1



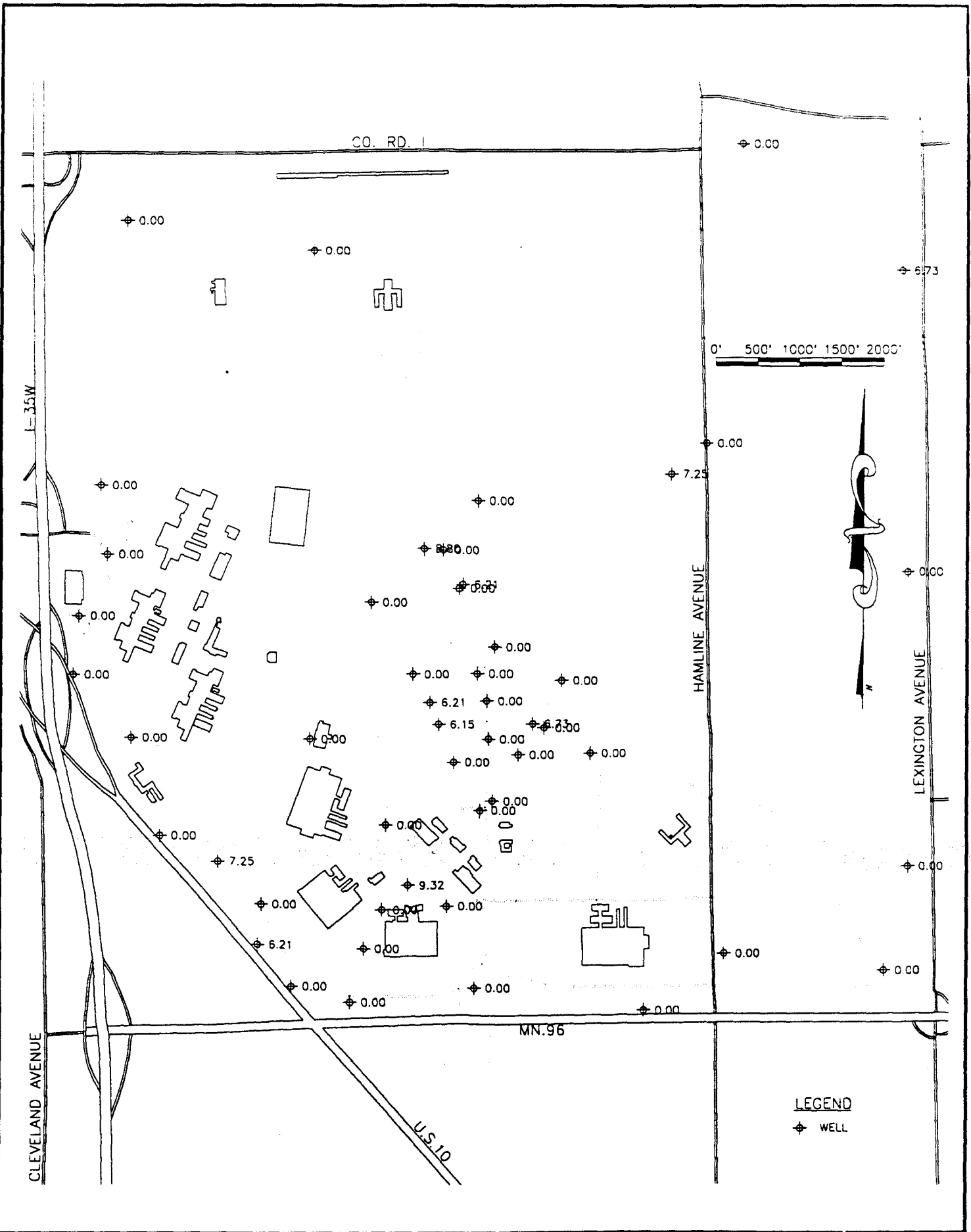
TWIN CITIES ARMY AMMUNITION PLANT

Groundwater Quality Map Unit 3 Cyanide Concentration Qtr. 16


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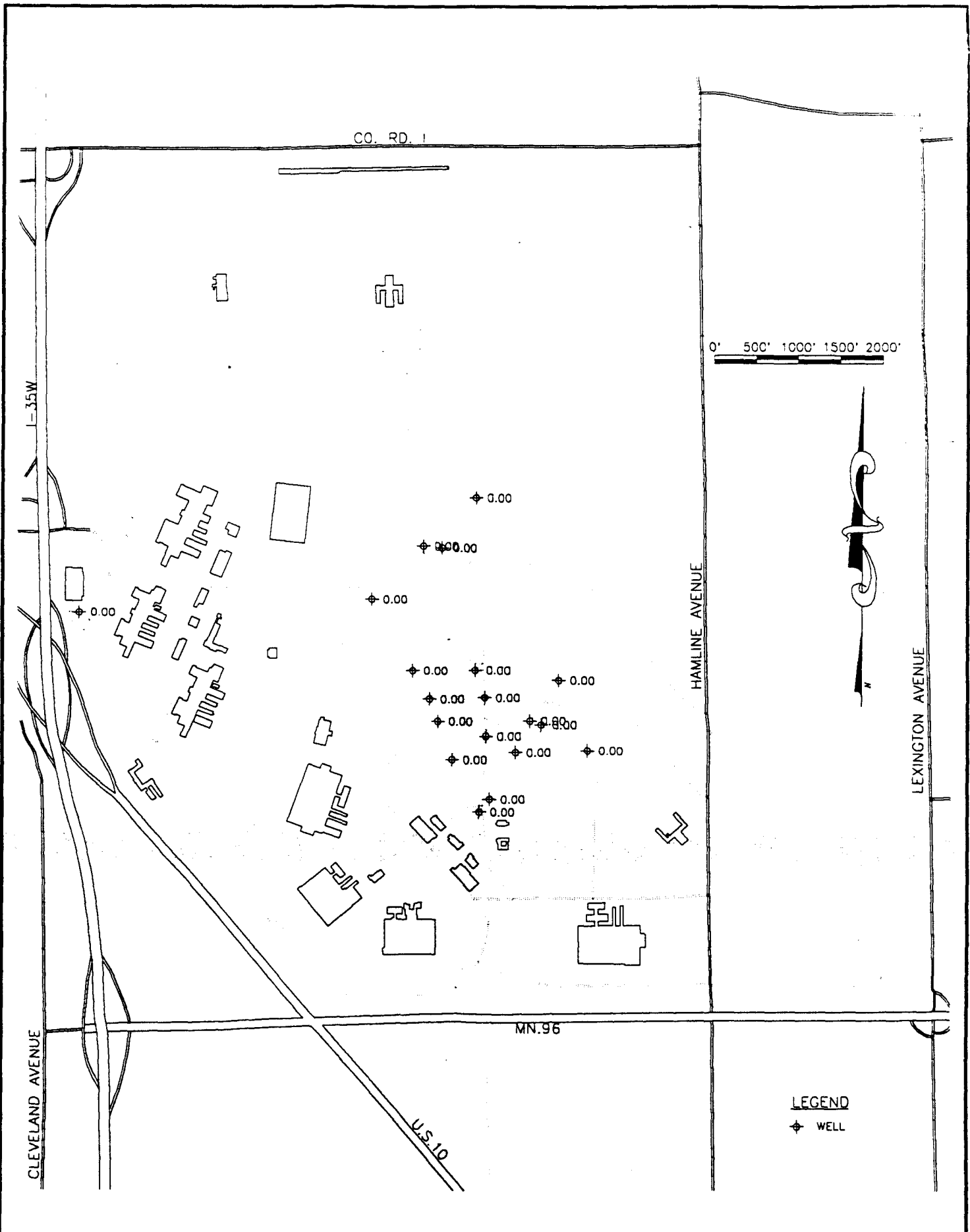
Fig. P-2



TWIN CITIES ARMY AMMUNITION PLANT
 Groundwater Quality Map Unit 3 Nickel Concentration Qtr. 16

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 Fig. P-3



TWIN CITIES ARMY AMMUNITION PLANT

Groundwater Quality Map Unit 3 Lead Concentration Qtr. 16



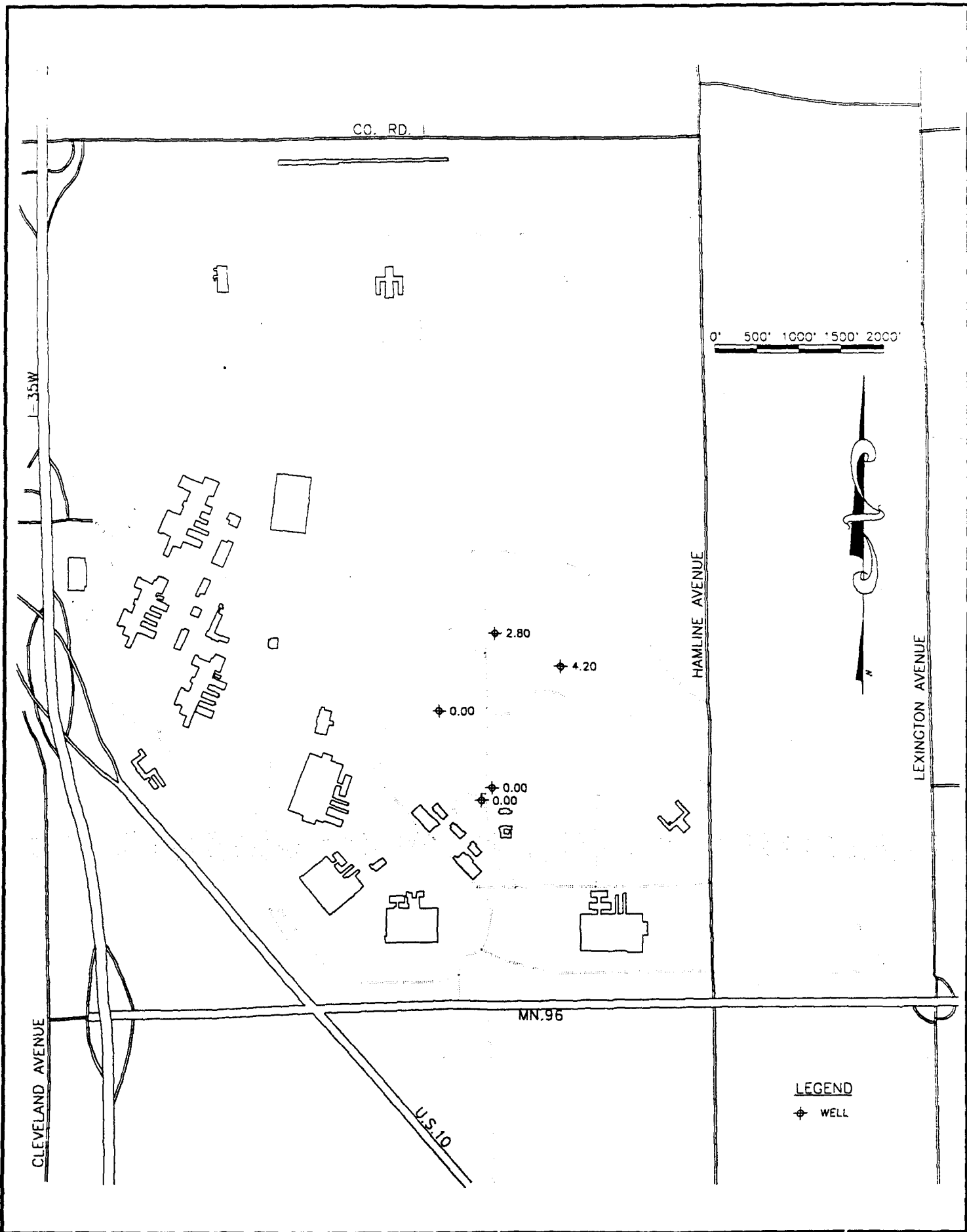
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Fig. P-4



TWIN CITIES ARMY AMMUNITION PLANT

Groundwater Quality Map Unit 3 Alpha Radionuclides Concentration Qtr. 16



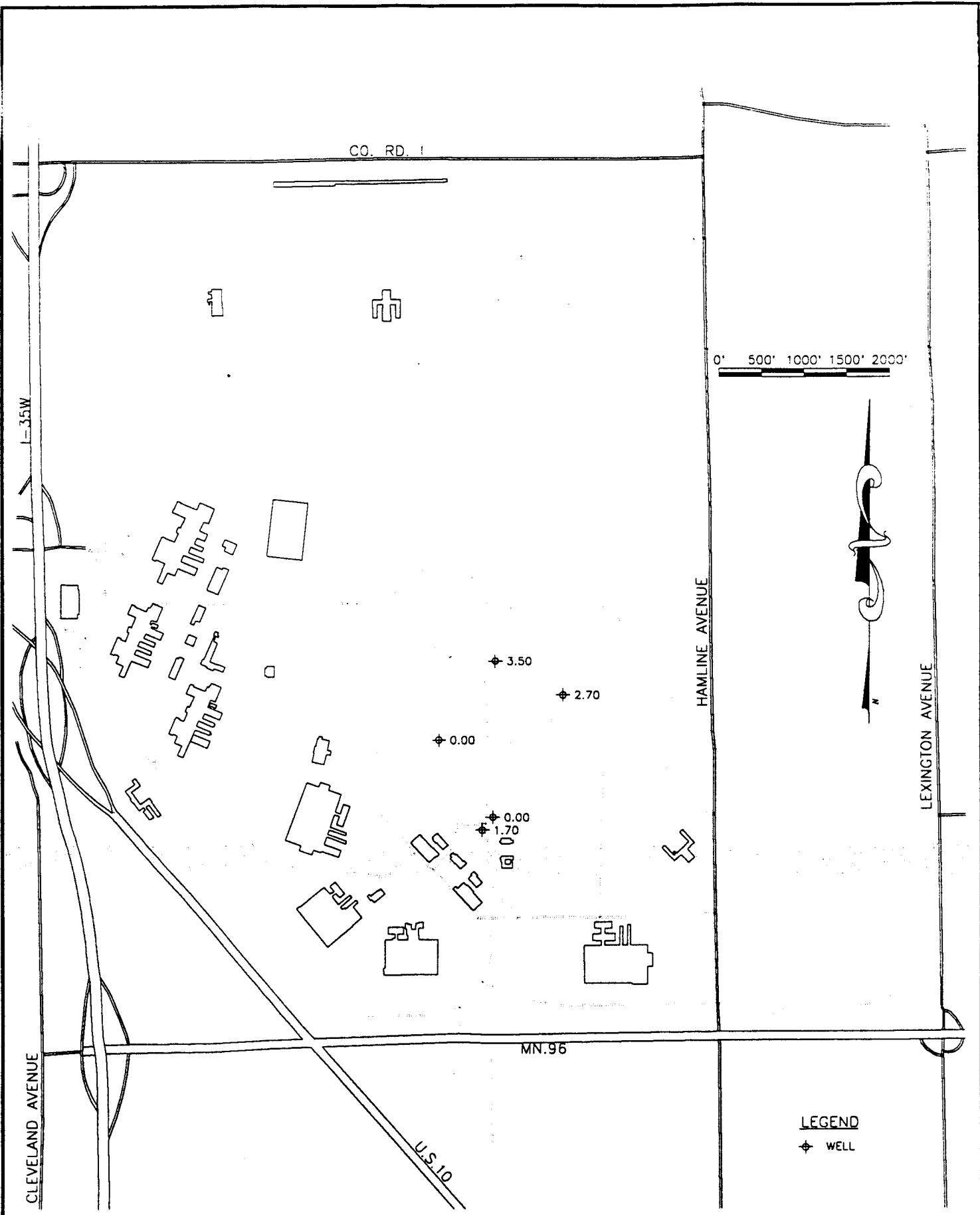
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Fig. P-5



TWIN CITIES ARMY AMMUNITION PLANT

Groundwater Quality Map Unit 3 Beta Radionuclides Concentration Qtr. 16



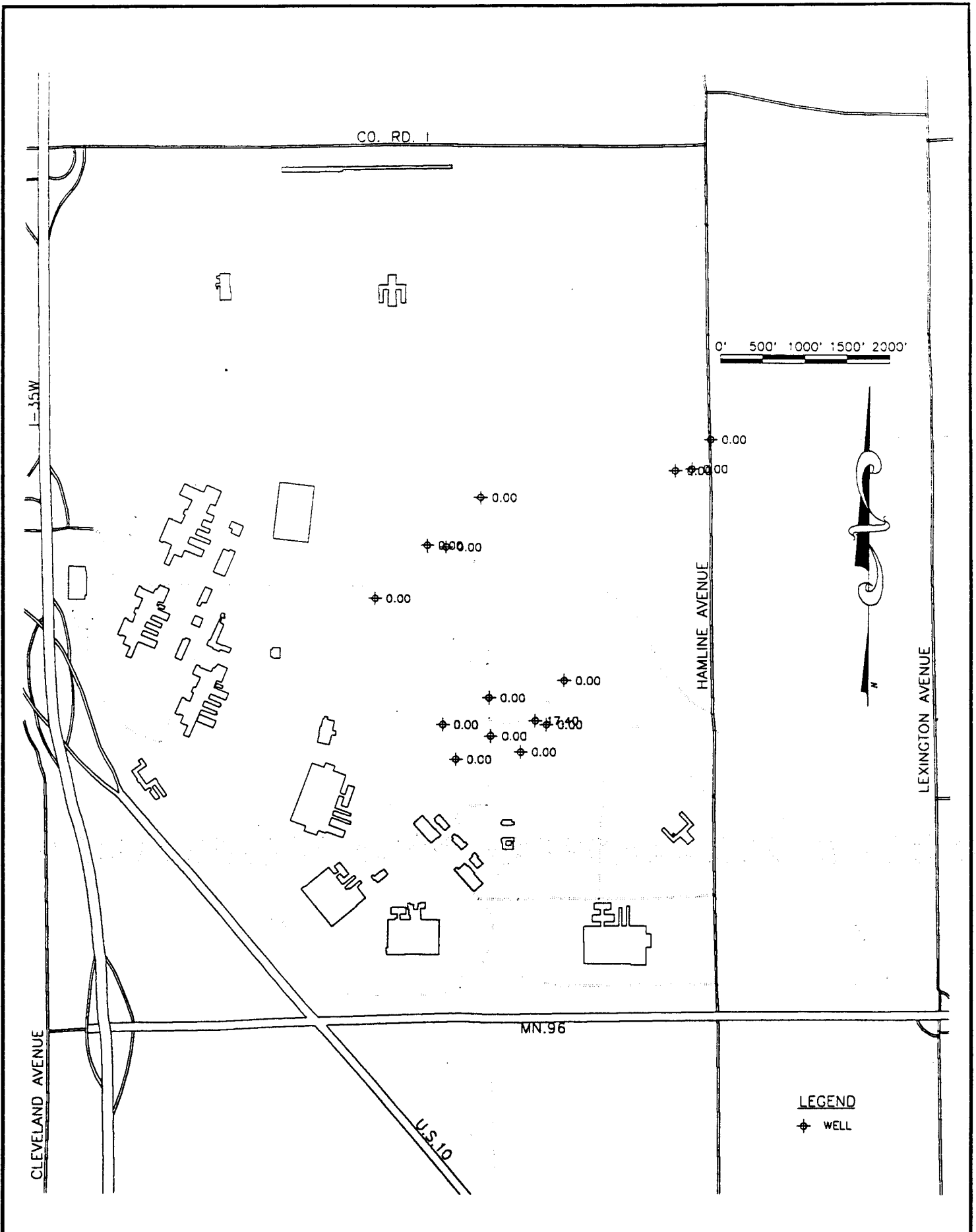
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Fig. P-6



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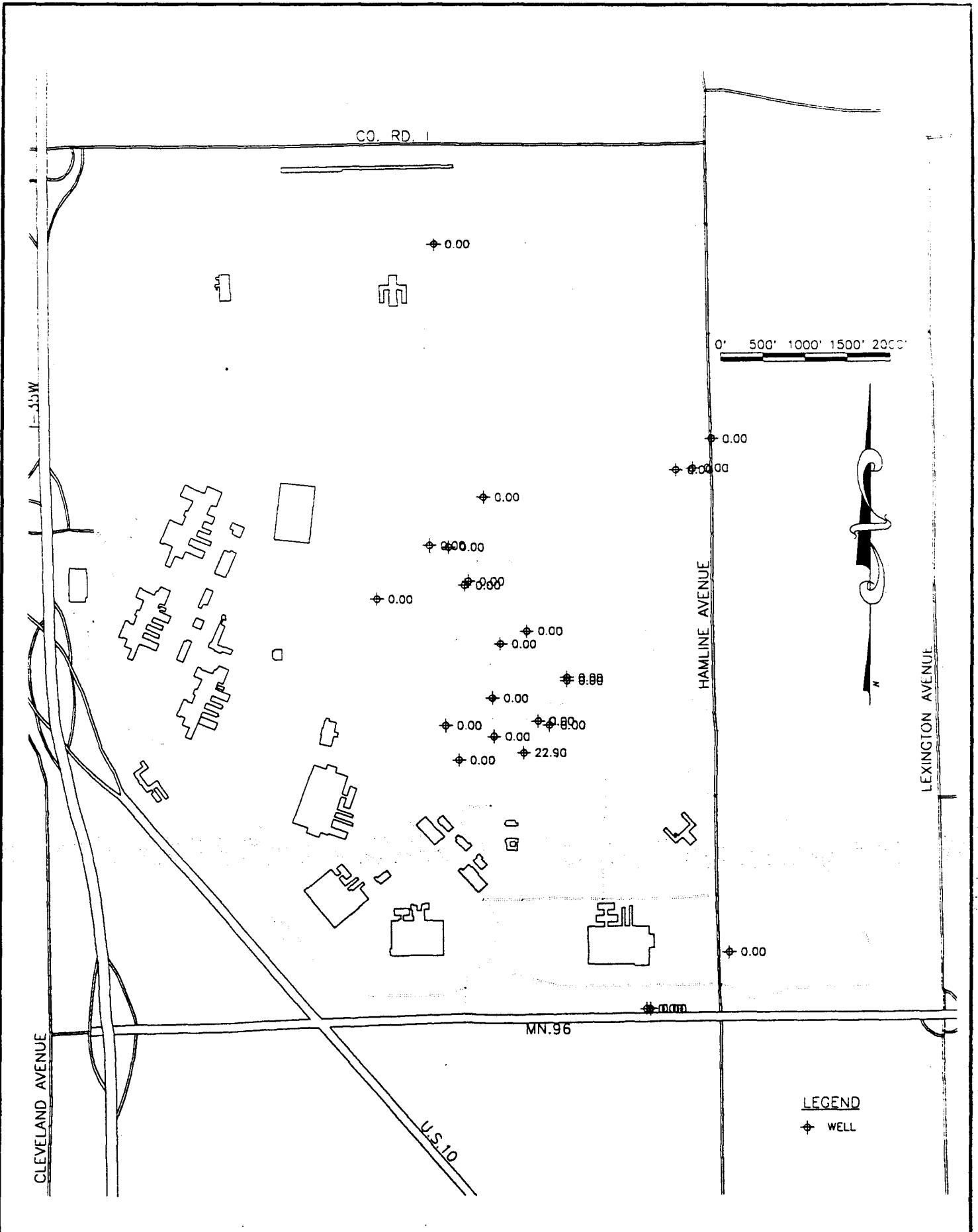
Groundwater Quality Map Unit 3 Cyanide Concentration Qtr. 18

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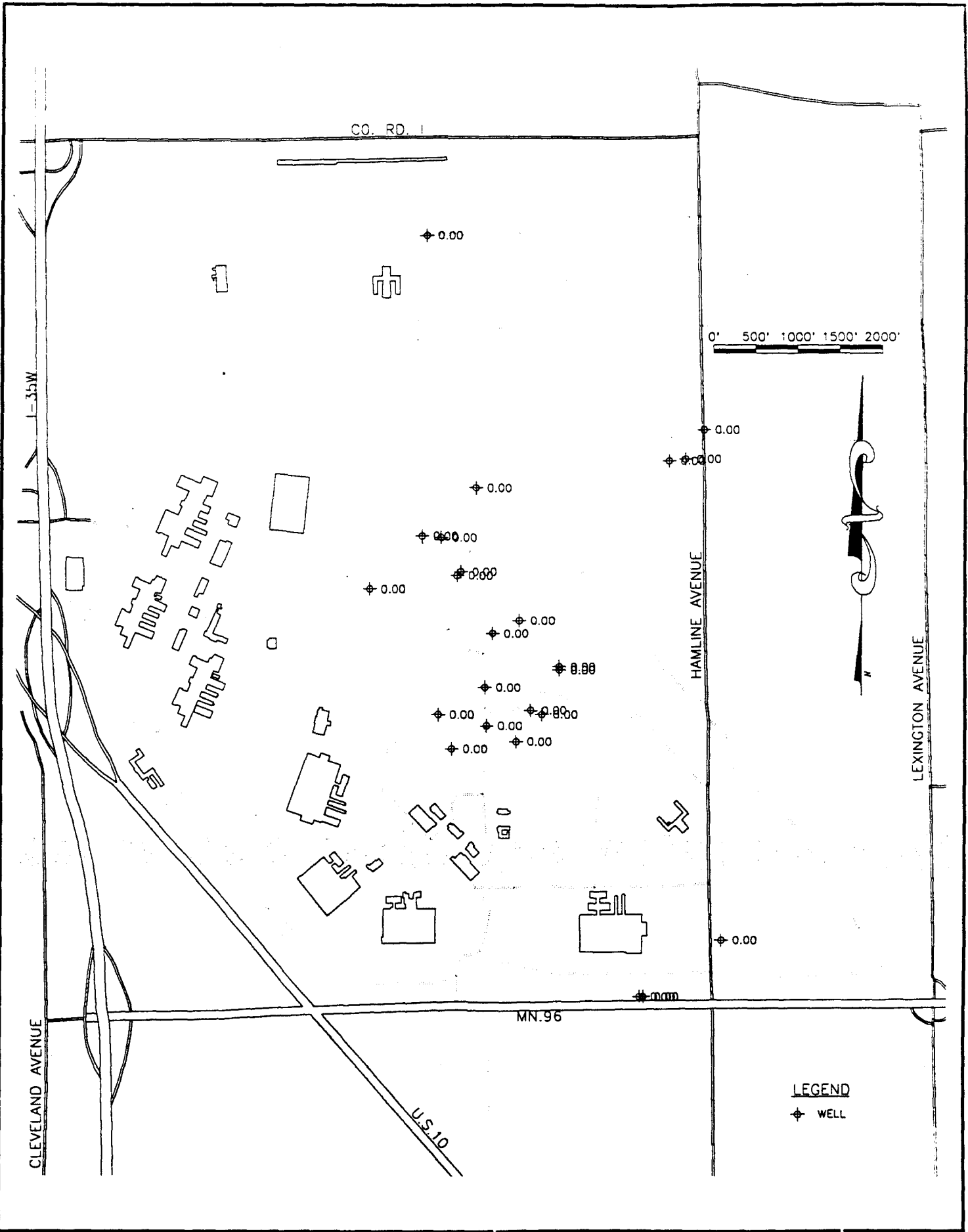
Fig. P-7



TWIN CITIES ARMY AMMUNITION PLANT
 Groundwater Quality Map Unit 3 Nickel Concentration Qtr. 18


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 Fig. P-8



TWIN CITIES ARMY AMMUNITION PLANT

Groundwater Quality Map Unit 3 Lead Concentration Qtr. 18

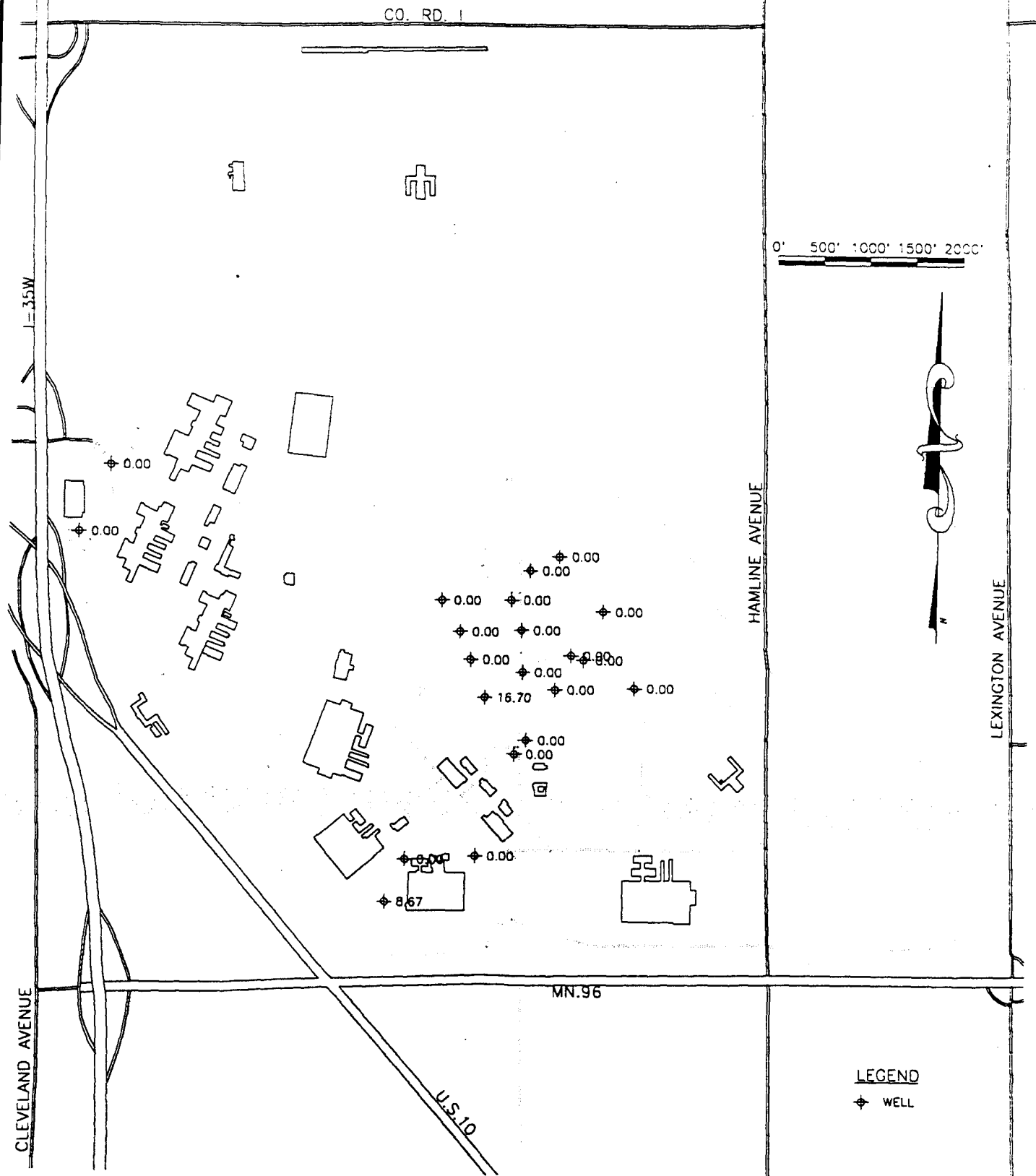


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Fig. P-9



TWIN CITIES ARMY AMMUNITION PLANT

Groundwater Quality Map Unit 3 Cyanide Concentration Qtr. 19



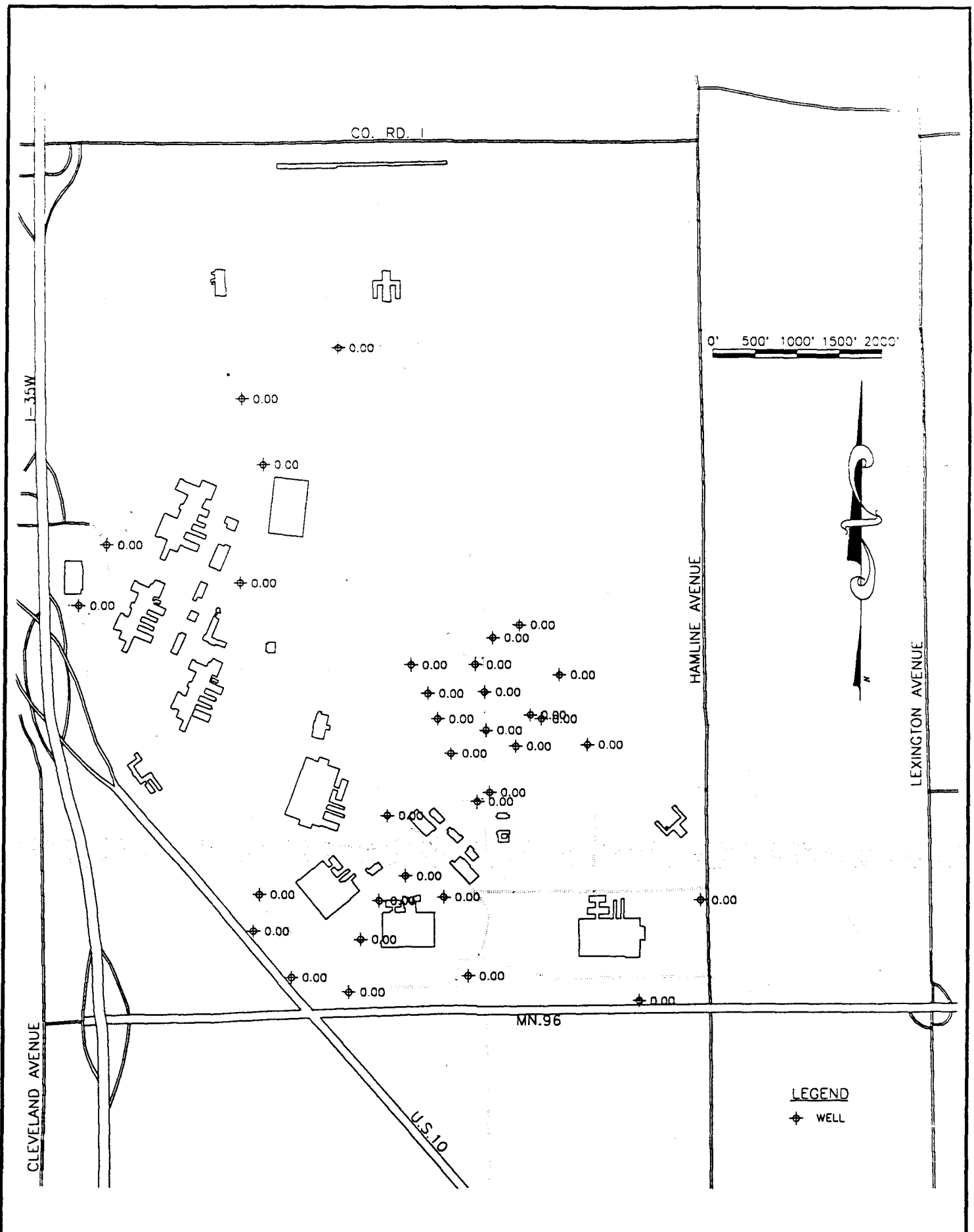
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Fig. P-10



TWIN CITIES ARMY AMMUNITION PLANT

Groundwater Quality Map Unit 3 Nickel Concentration Qtr. 19

W A

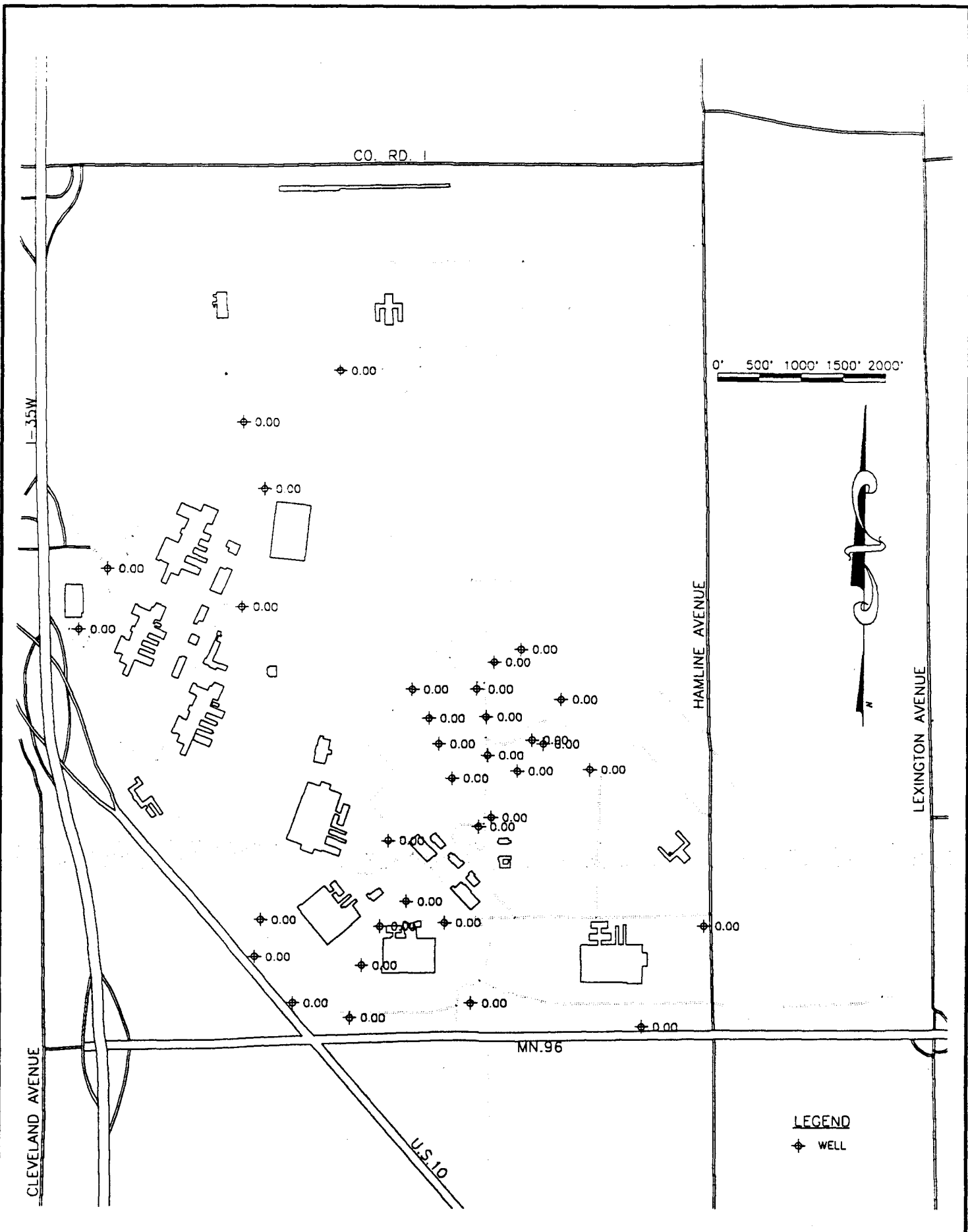
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Fig. P-11



TWIN CITIES ARMY AMMUNITION PLANT

Groundwater Quality Map Unit 3 Lead Concentration Qtr. 19

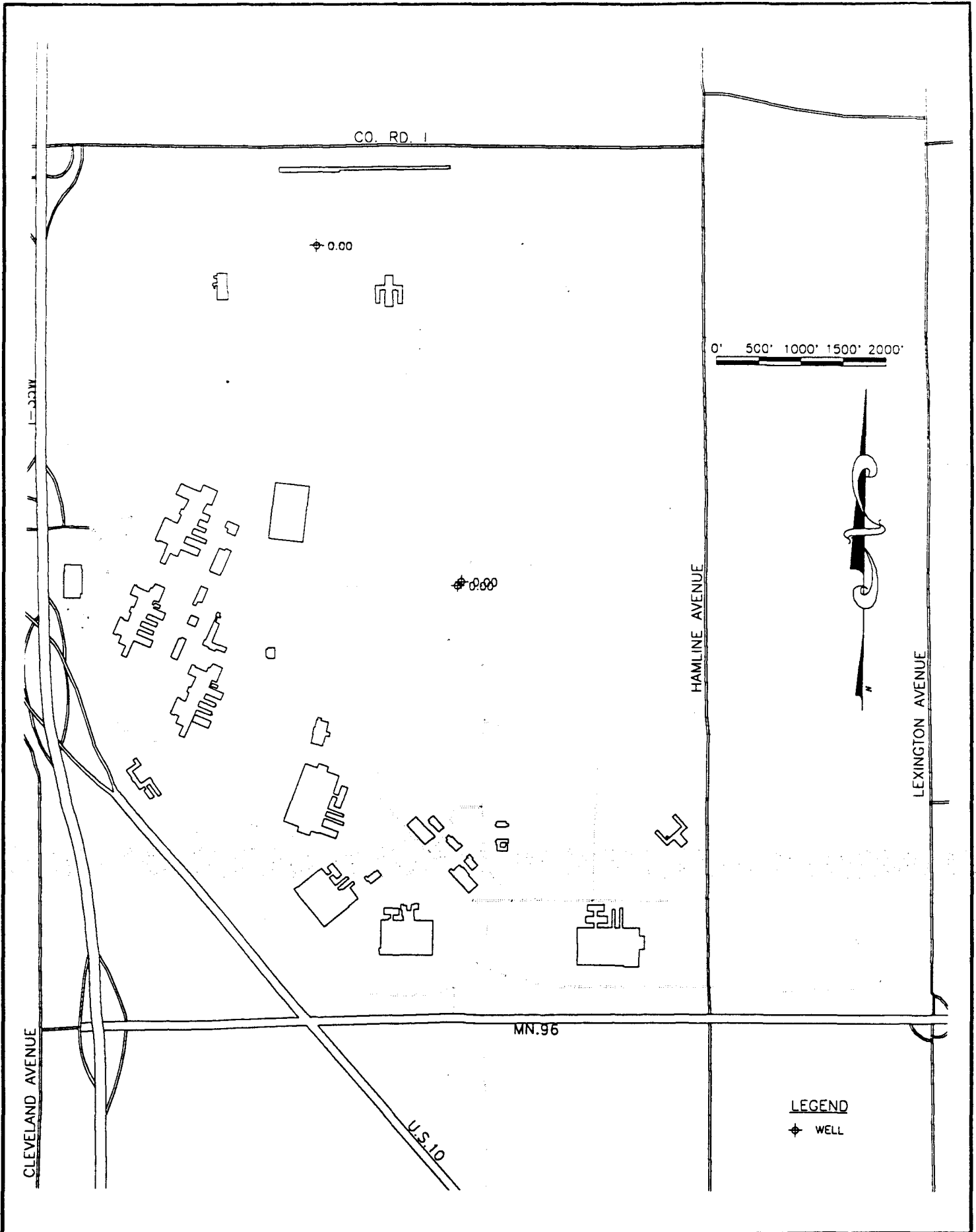
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Fig. P-12



TWIN CITIES ARMY AMMUNITION PLANT

Groundwater Quality Map Unit 3 Nickel Concentration Qtr. 20

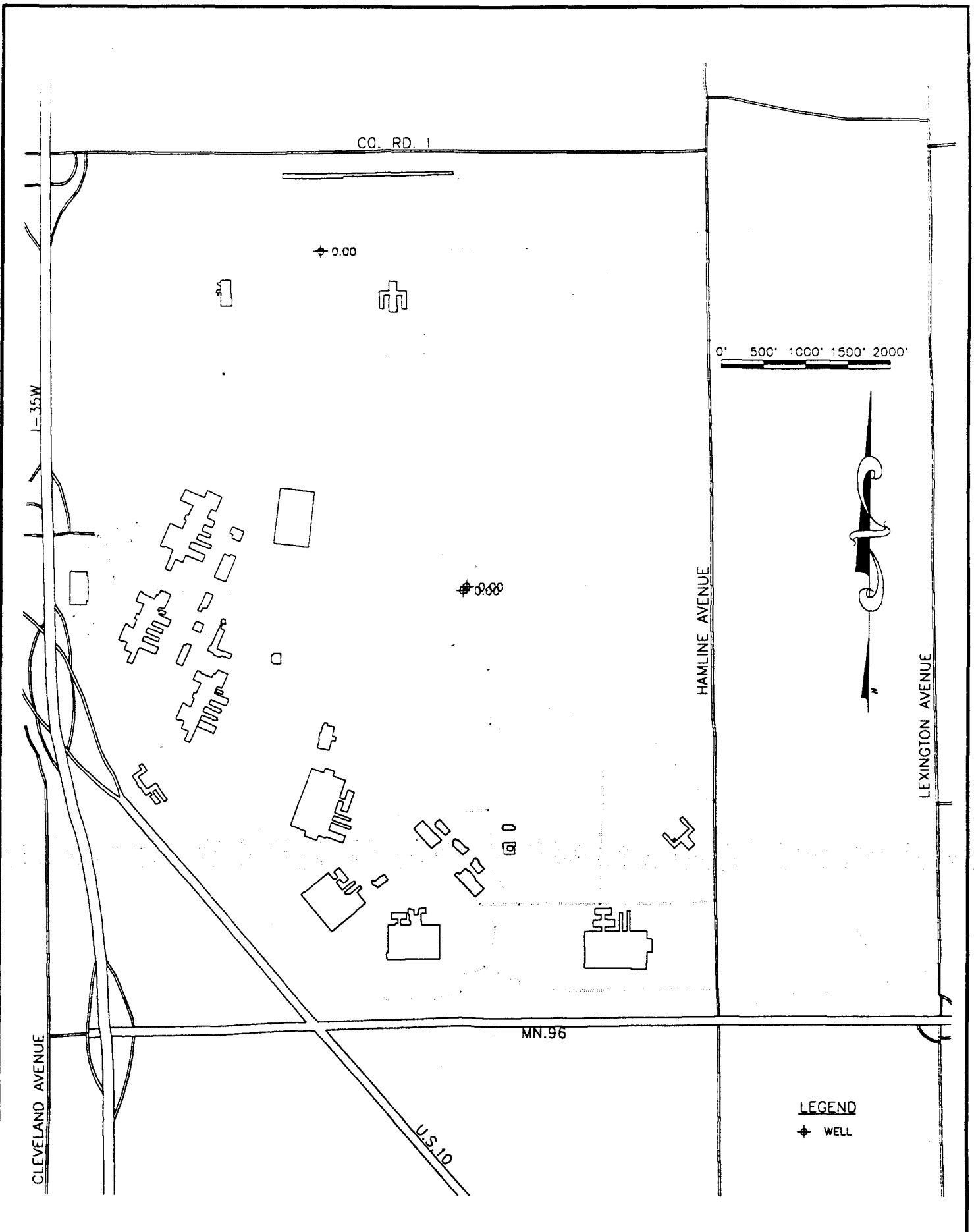
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Fig. P-13



TWIN CITIES ARMY AMMUNITION PLANT

Groundwater Quality Map Unit 3 Lead Concentration Qtr. 20



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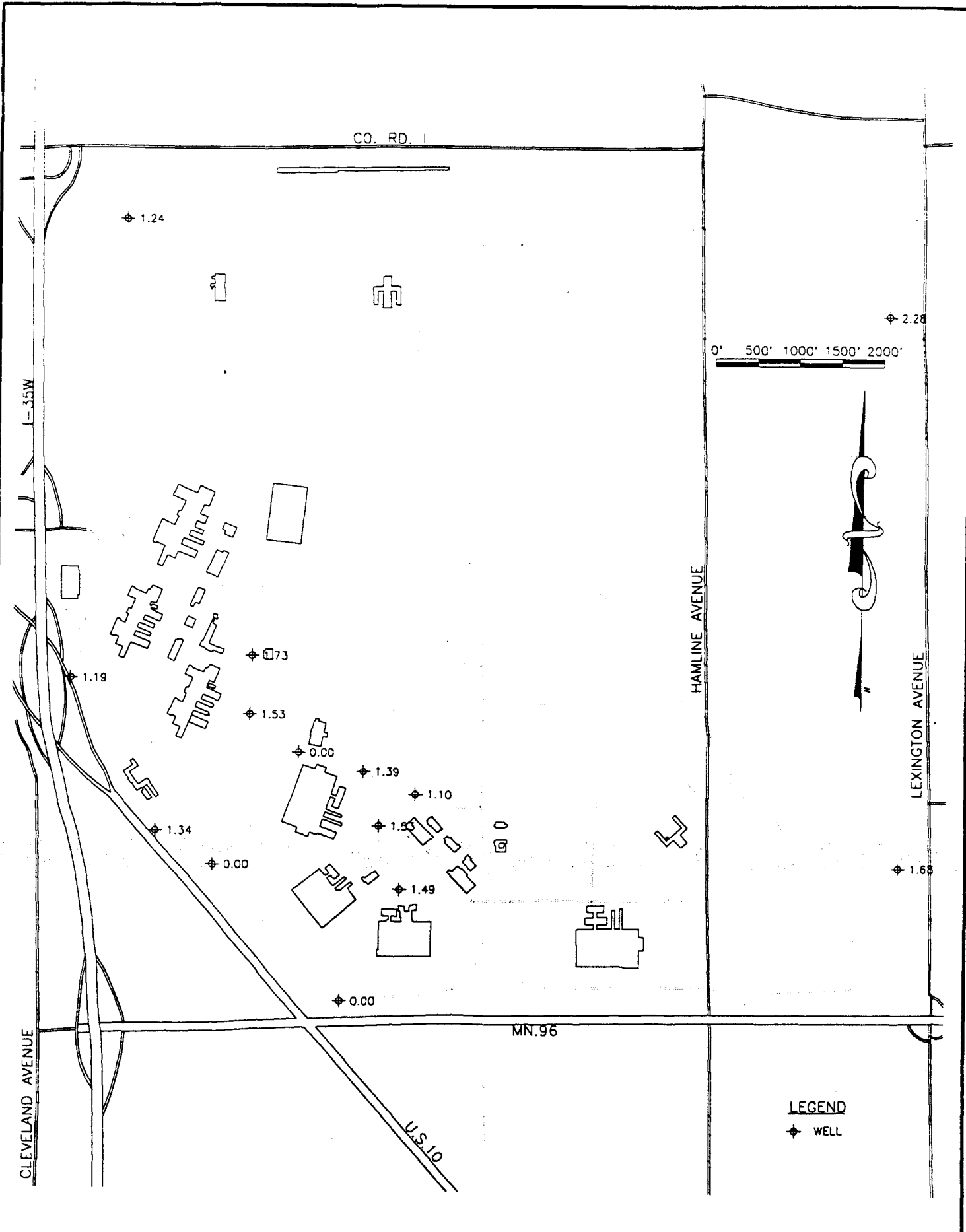
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Fig. P-14

Q. UNIT 4 GROUNDWATER QUALITY MAPS - INORGANICS



TWIN CITIES ARMY AMMUNITION PLANT

Groundwater Quality Map Unit 4 Copper Concentration Qtr. 16



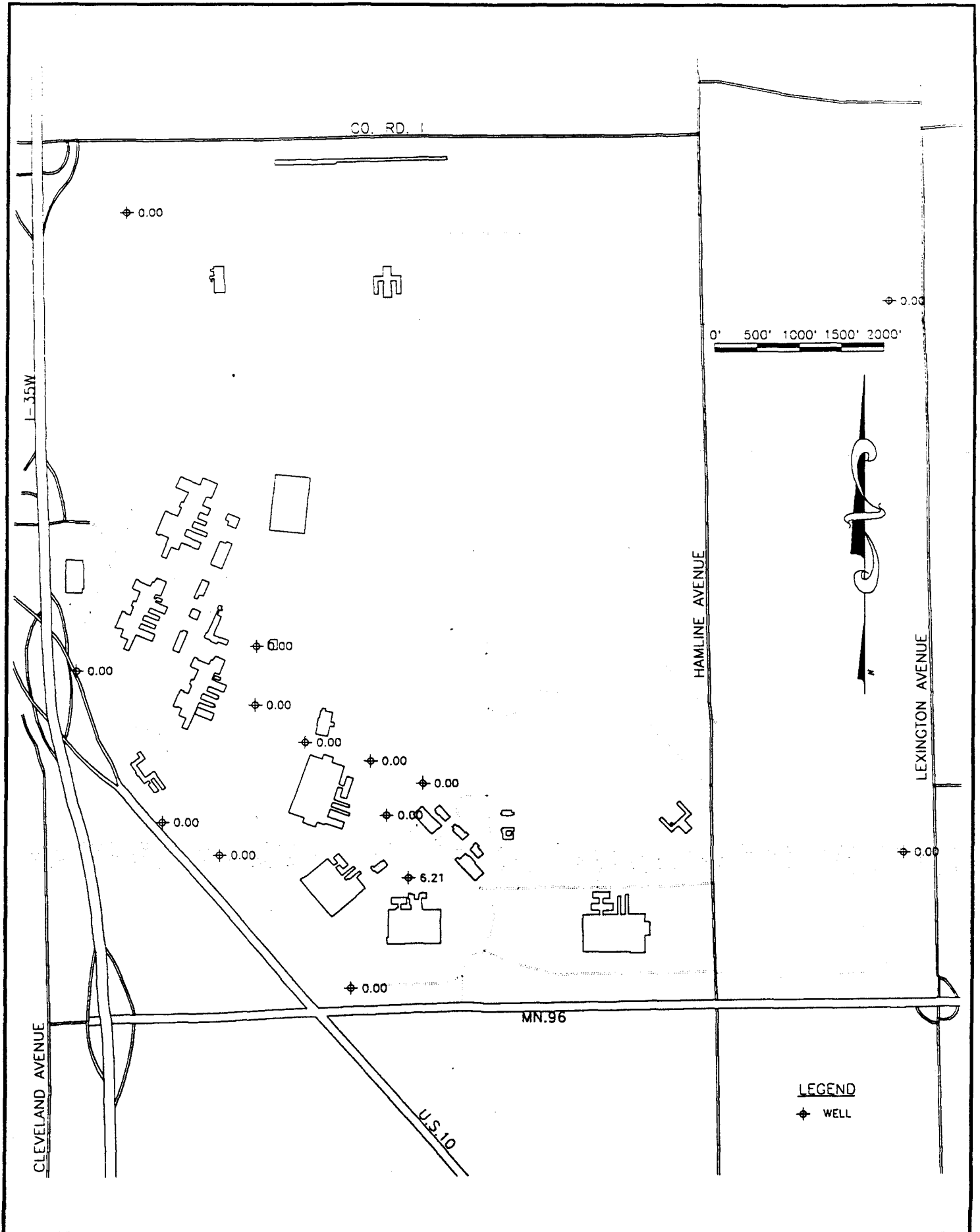
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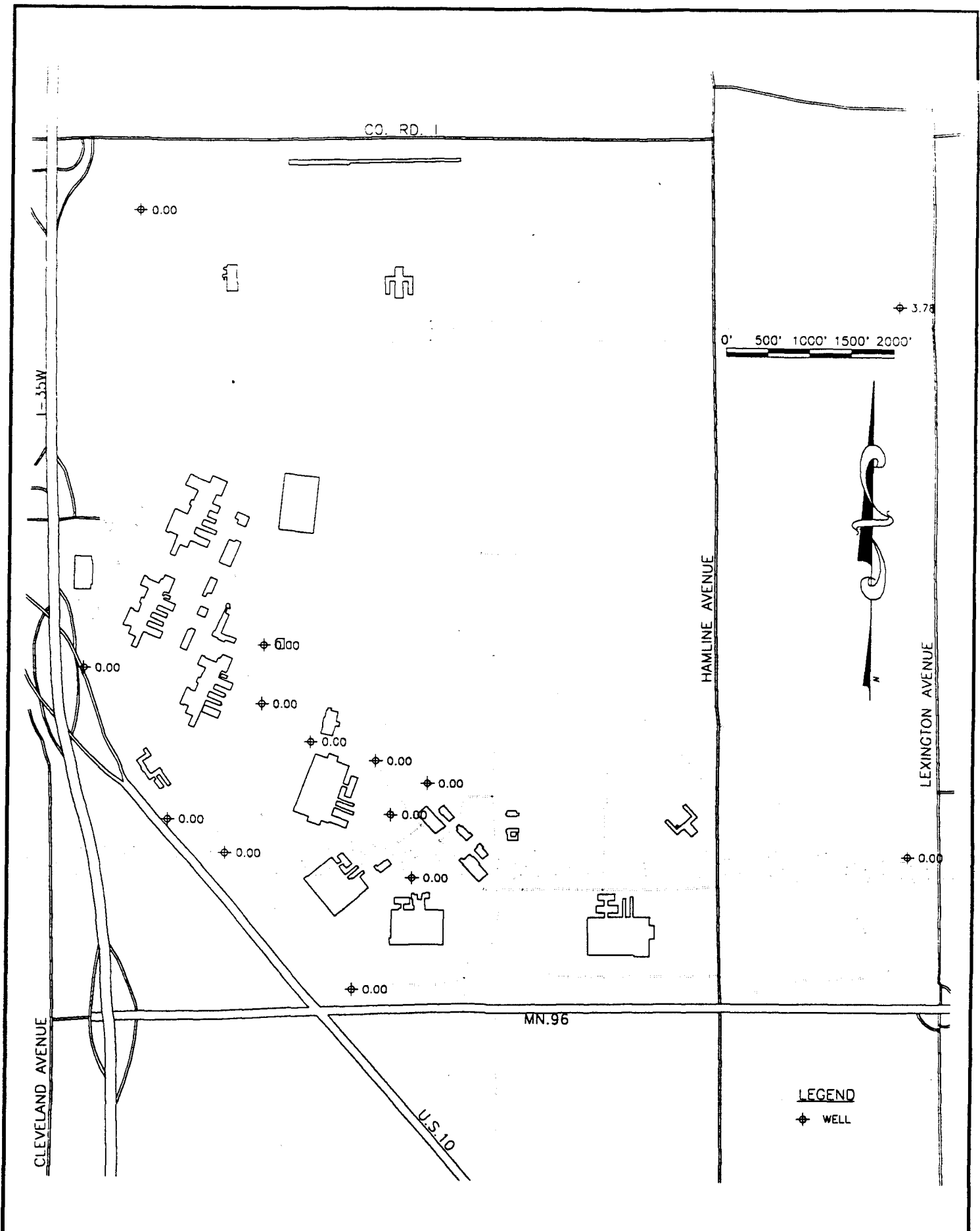
Fig. Q-1



TWIN CITIES ARMY AMMUNITION PLANT
 Groundwater Quality Map Unit 4 Nickel Concentration Qtr. 16

WVA
WVA
WVA
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 Fig. Q-2



TWIN CITIES ARMY AMMUNITION PLANT

Groundwater Quality Map Unit 4 Lead Concentration Qtr. 16



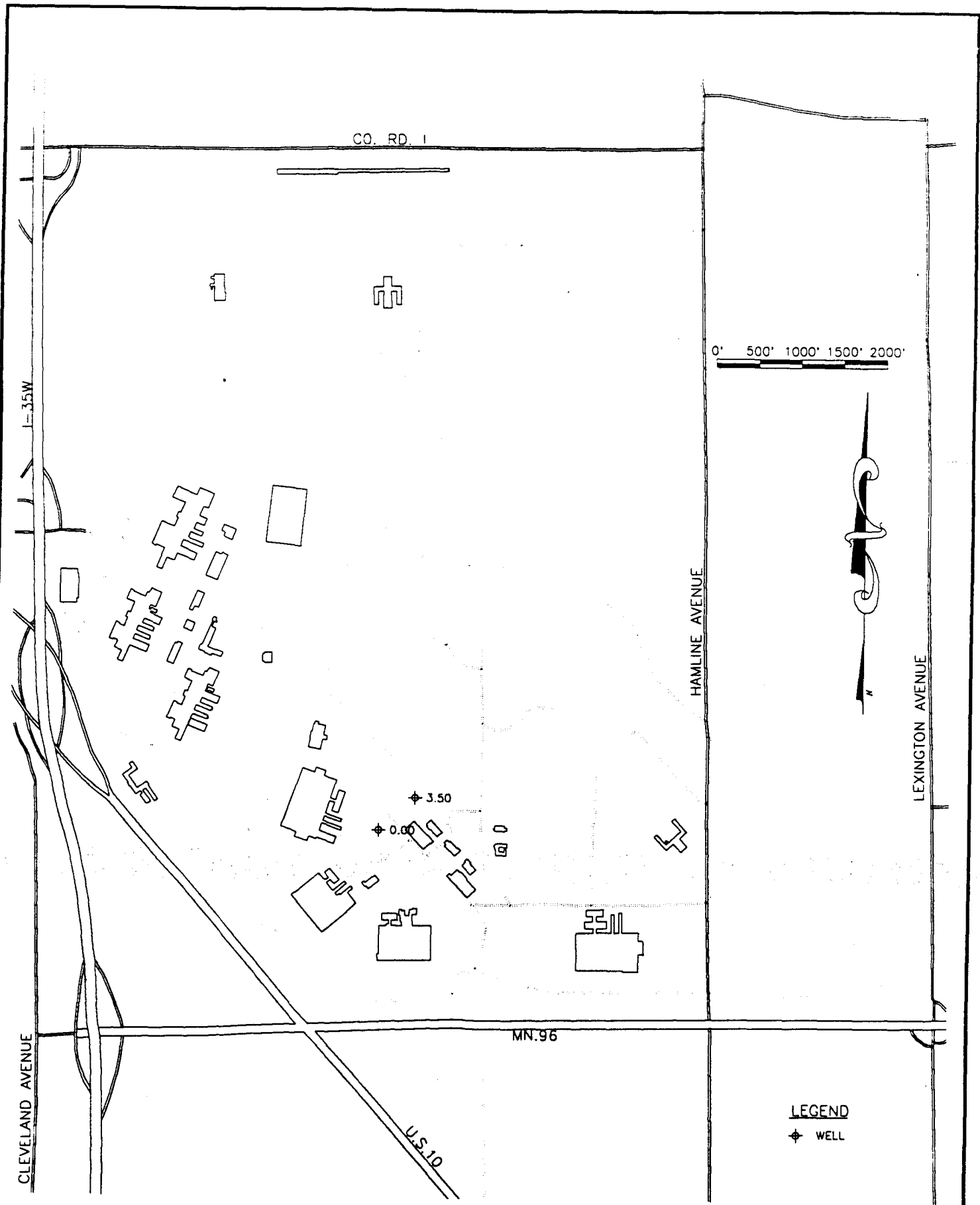
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Fig. Q-3



TWIN CITIES ARMY AMMUNITION PLANT

Groundwater Quality Map Unit 4 Alpha Radionuclides Concentration Qtr. 16



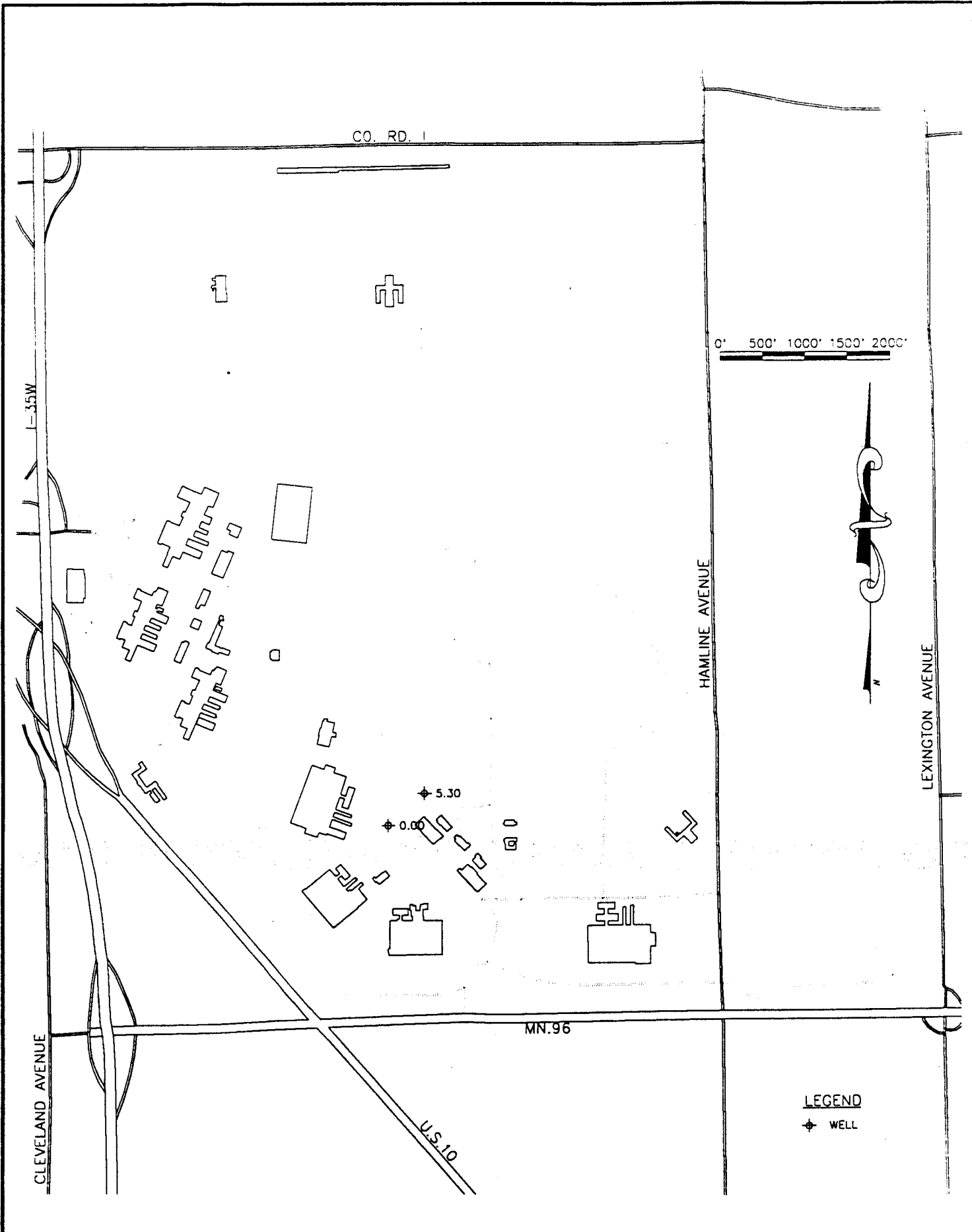
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Fig. Q-4



TWIN CITIES ARMY AMMUNITION PLANT

Groundwater Quality Map Unit 4 Beta Radionuclides Concentration Qtr. 16



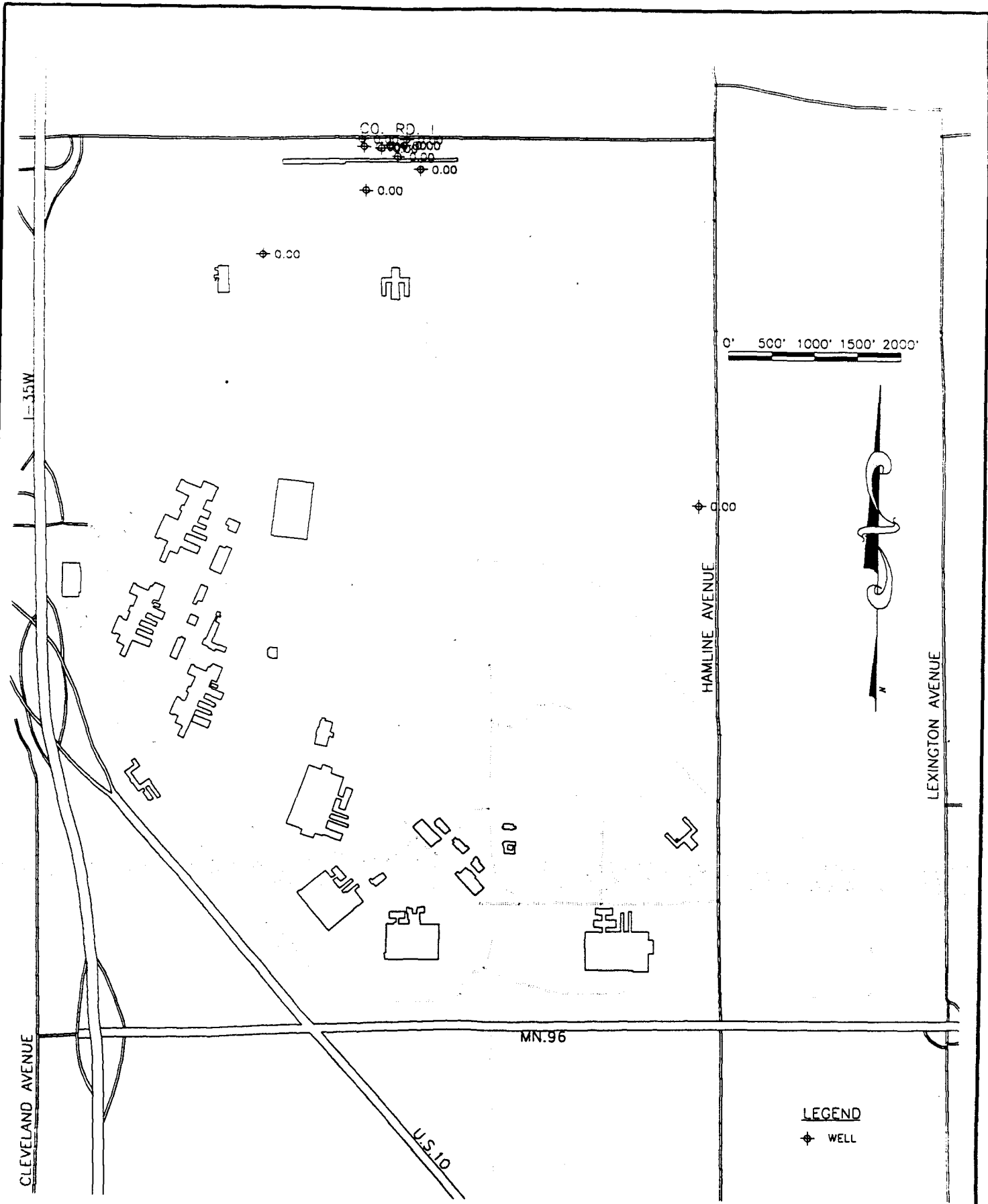
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Fig. Q-5



TWIN CITIES ARMY AMMUNITION PLANT

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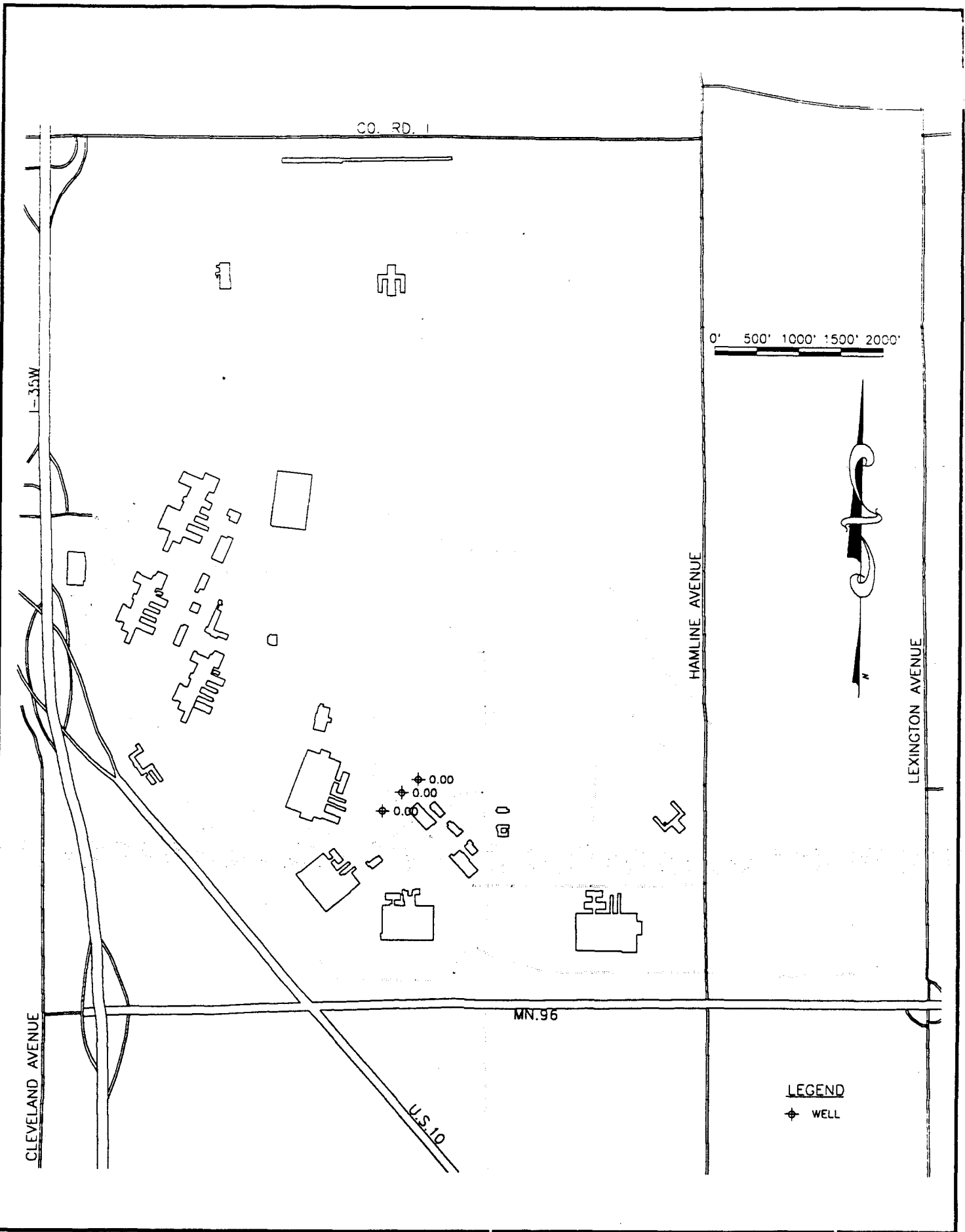
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Fig. Q-6



TWIN CITIES ARMY AMMUNITION PLANT

Groundwater Quality Map Unit 4 Nickel Concentration Qtr. 19



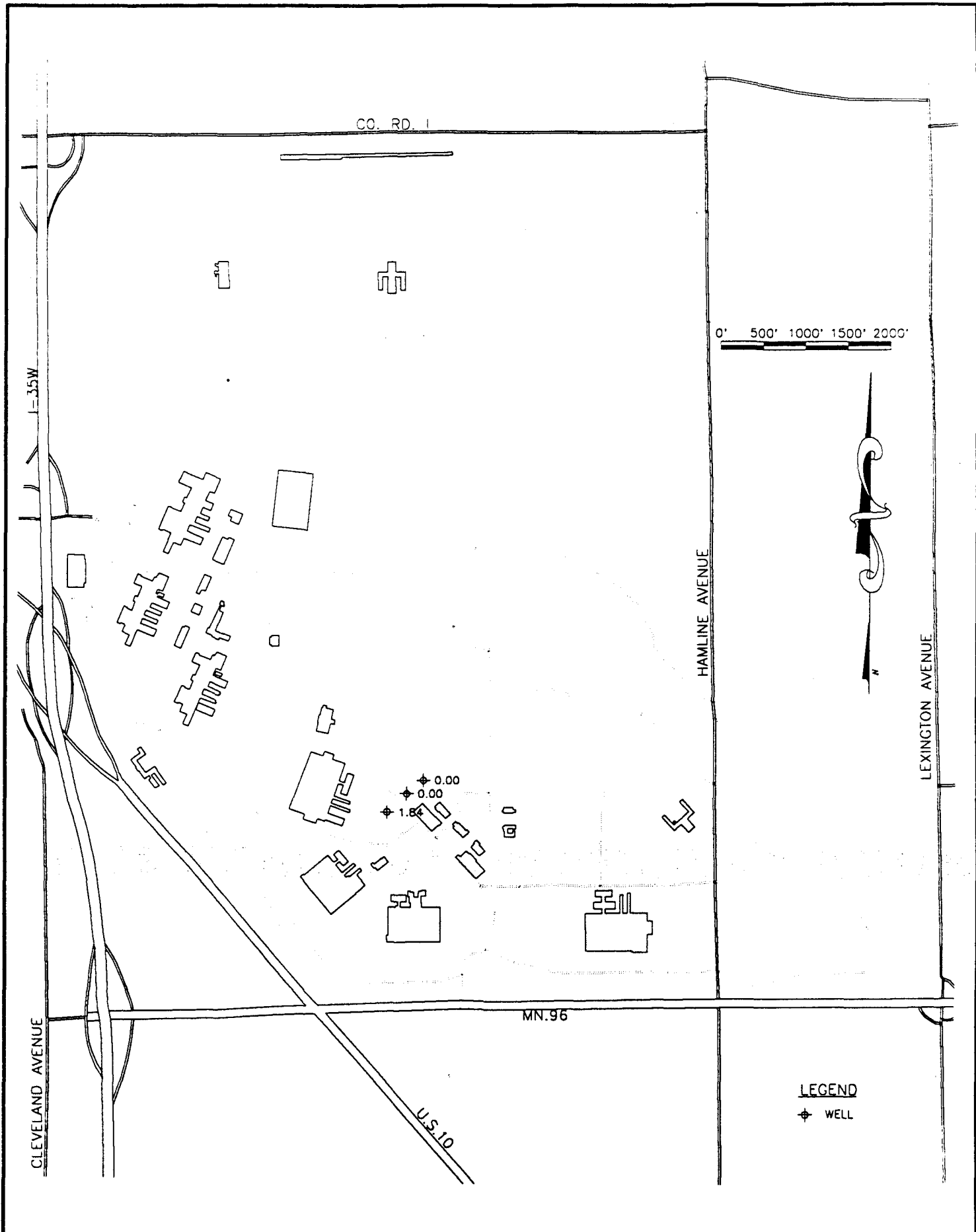
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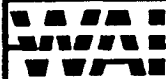
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Fig. Q-7



TWIN CITIES ARMY AMMUNITION PLANT

Groundwater Quality Map Unit 4 Lead Qtr. 19



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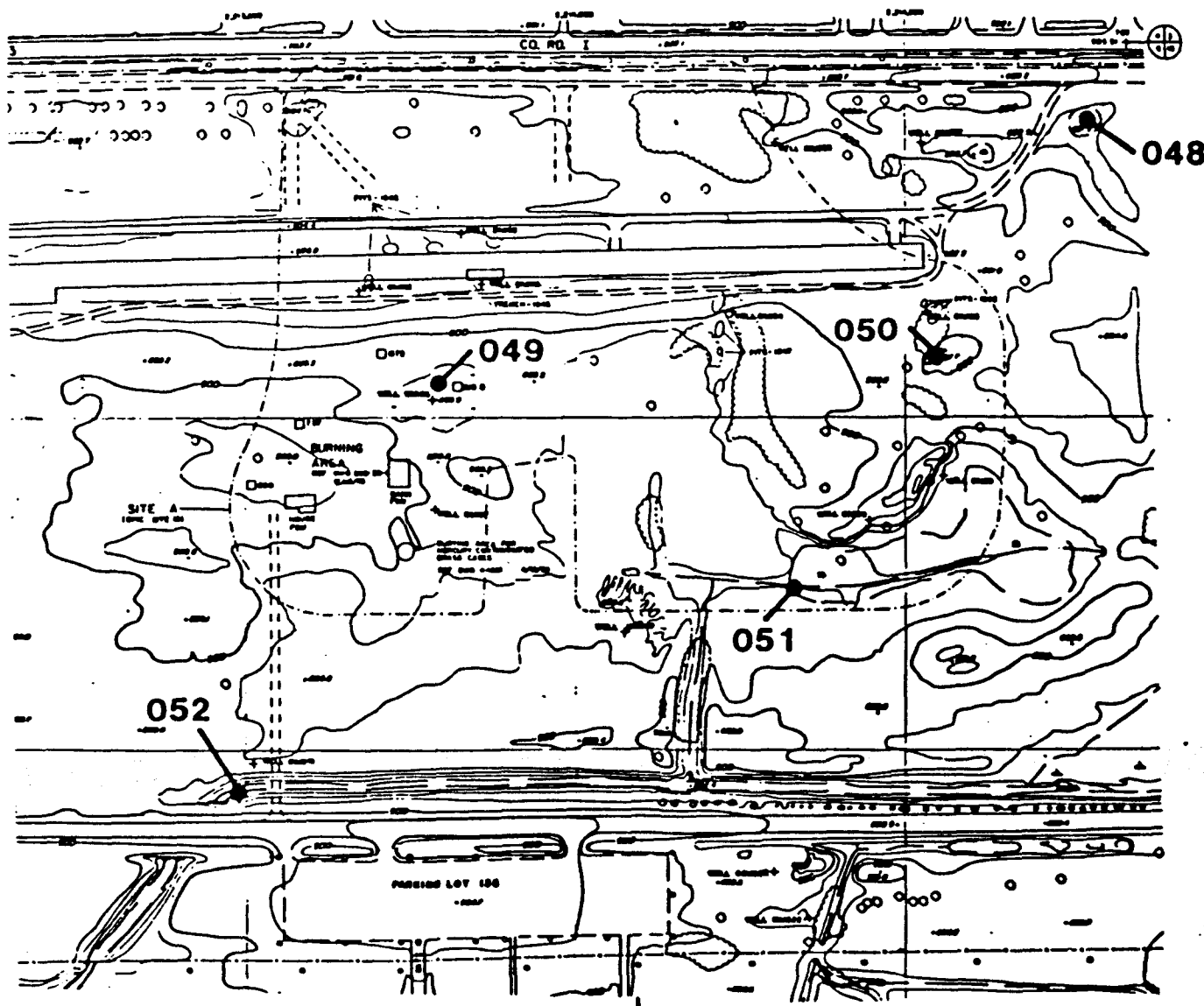
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Fig. Q-8

R. SURFACE WATER SAMPLING LOCATIONS



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Surface Water Sampling Location - Site A



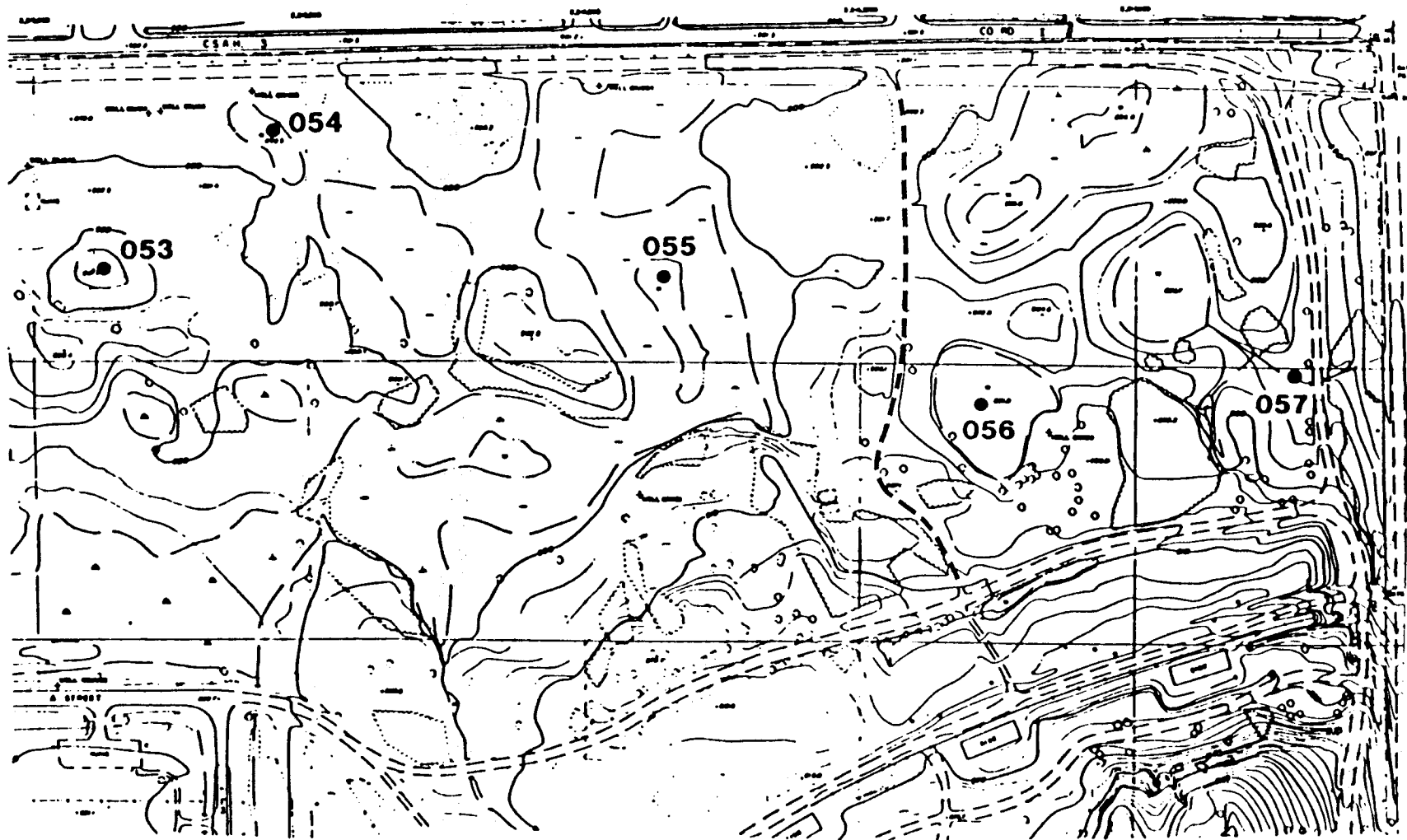
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Fig. R-1



TWIN CITIES ARMY AMMUNITION PLANT

Surface Water Sampling Location - Site B



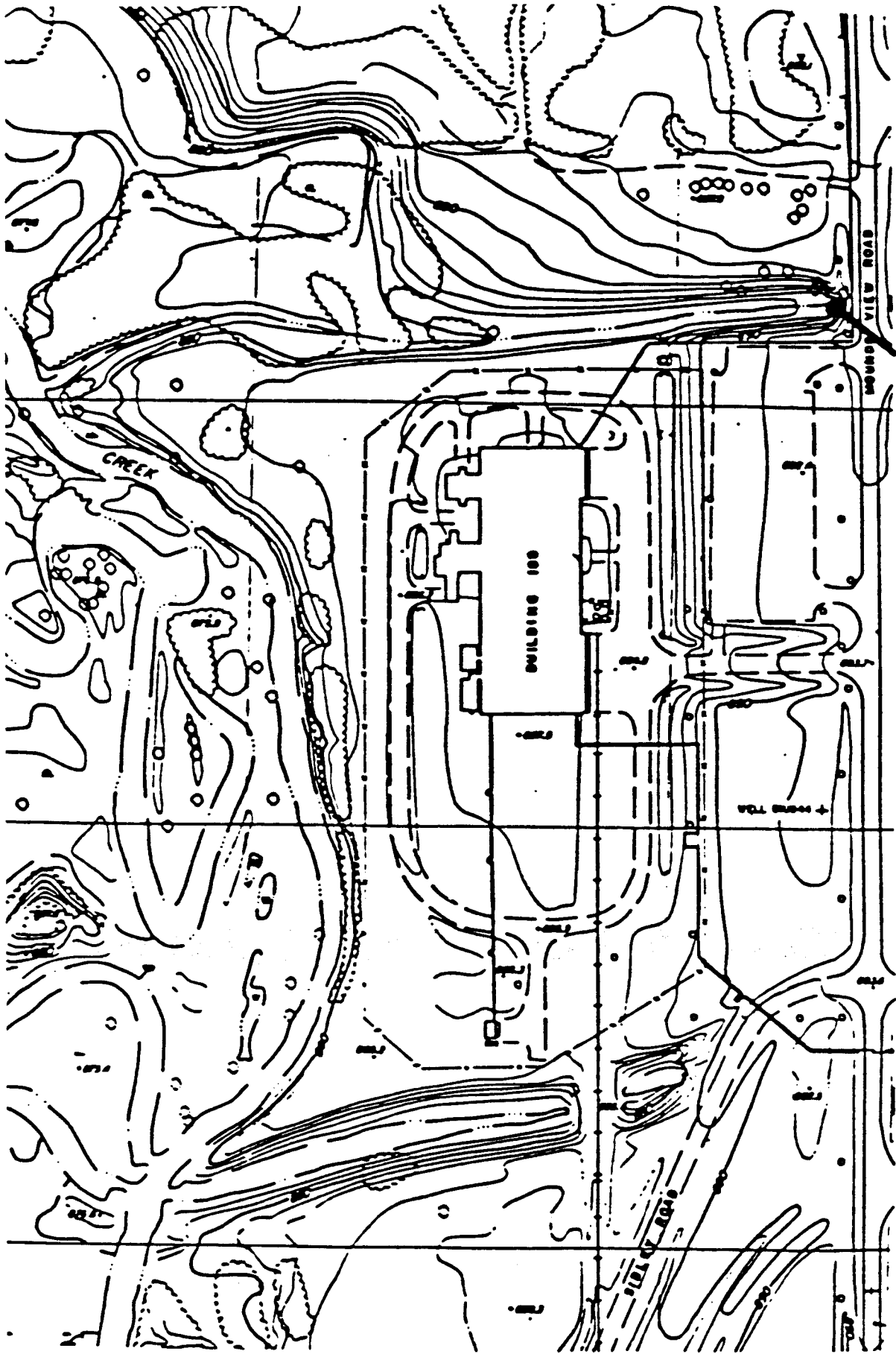
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Fig. R-2



058

TWIN CITIES ARMY AMMUNITION PLANT

Surface Water Sampling Location - Downstream of Site B



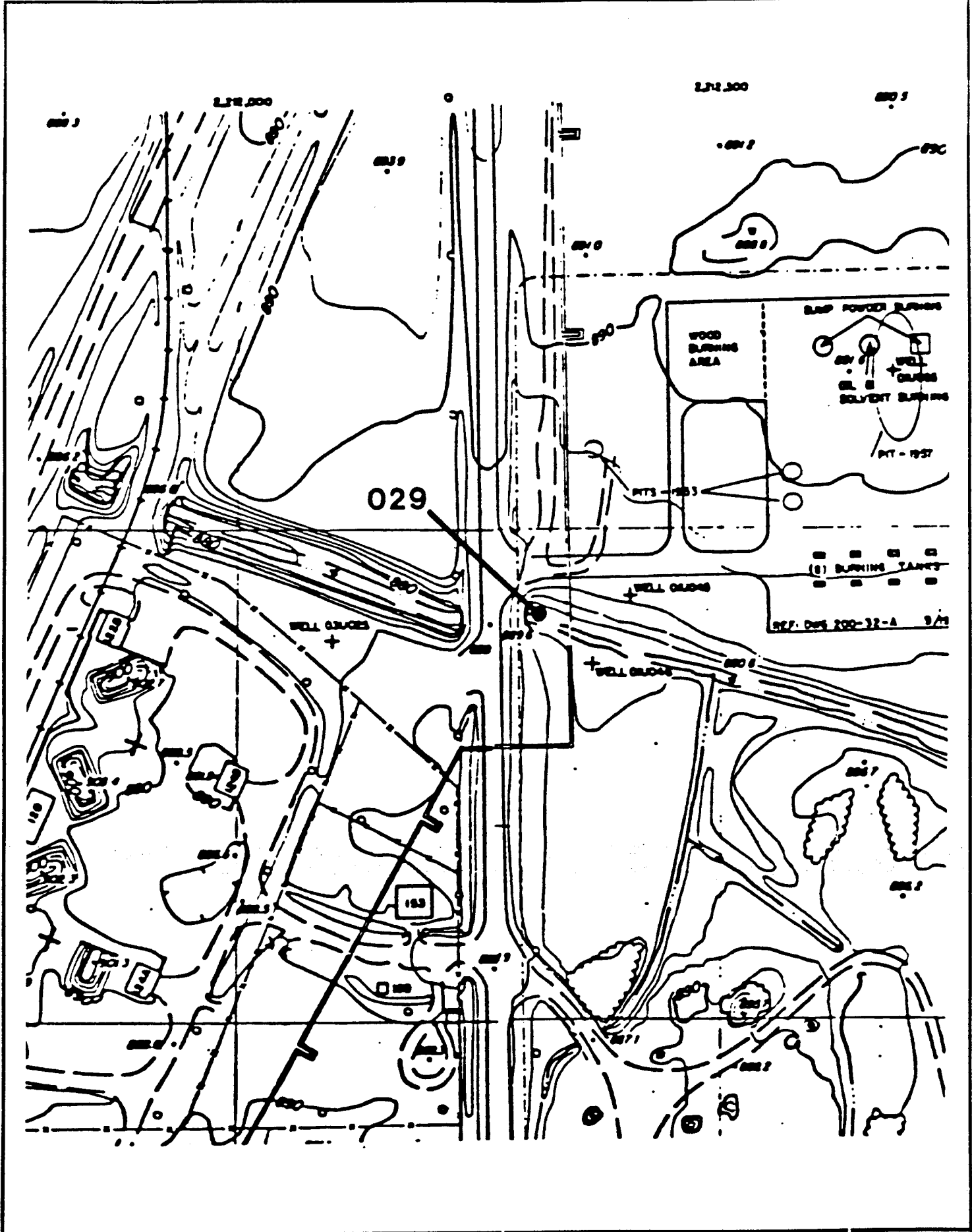
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Fig. R-3



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Surface Water Sampling Location - Site C


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Fig. R-4

047

SITE F
USAC INF. 21

SITE G
USAC INF. 21

065

046

TWIN CITIES ARMY AMMUNITION PLANT

Surface Water Sampling Location - Sites G & 129-15



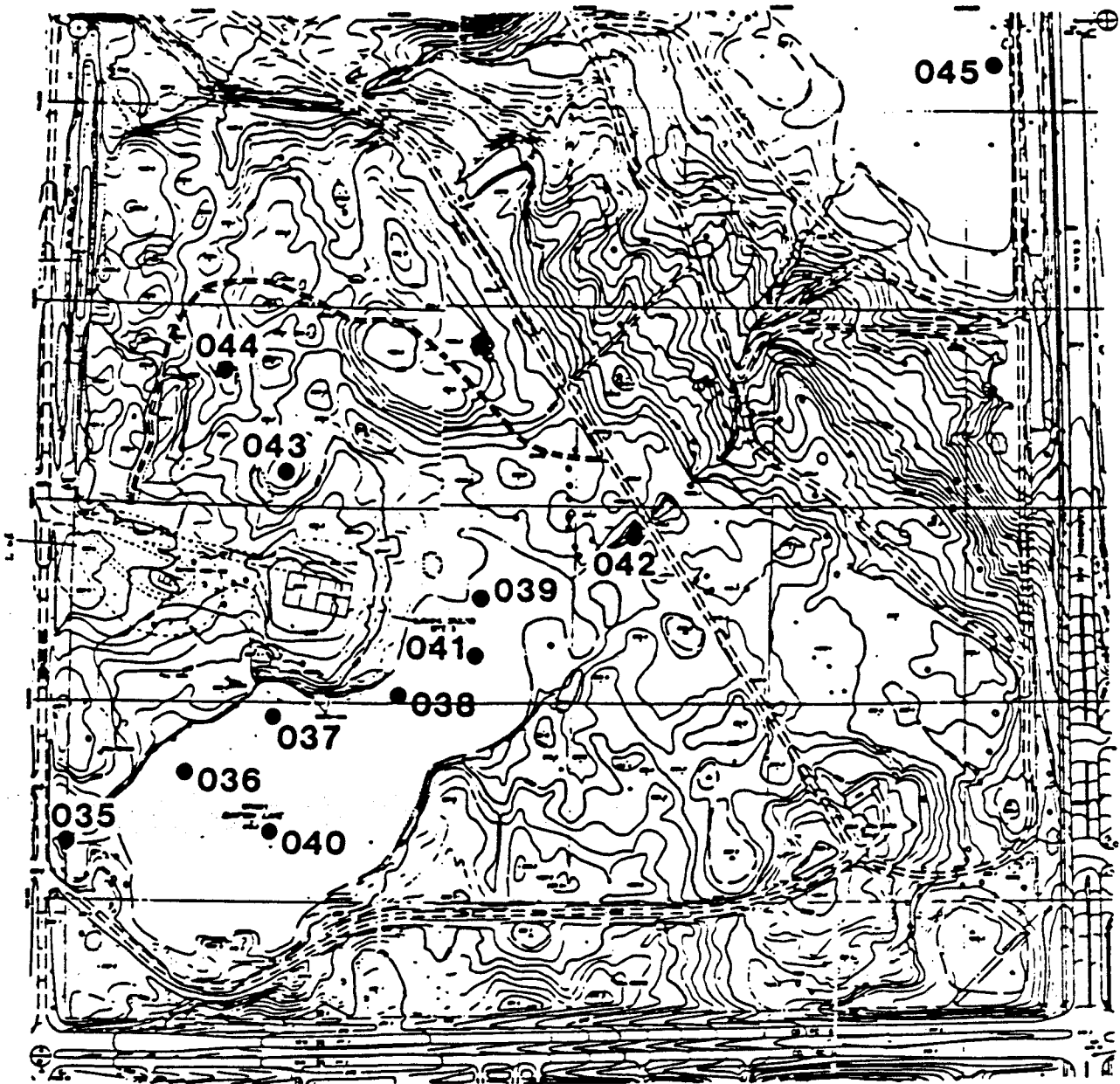
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Fig. R-5



TWIN CITIES ARMY AMMUNITION PLANT

Surface Water Sampling Location - Sites H & Marsden Lake



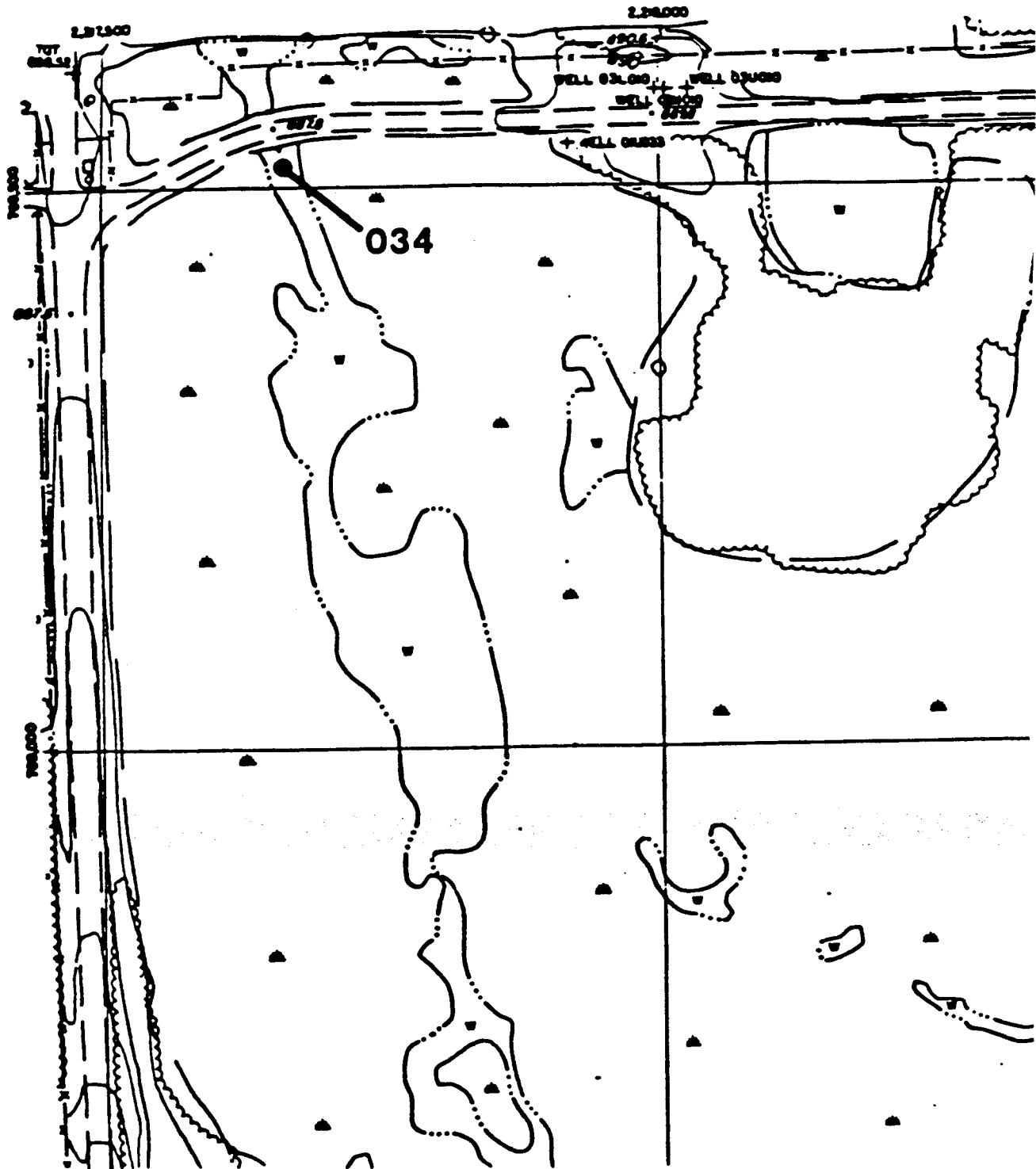
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Fig. R-6



TWIN CITIES ARMY AMMUNITION PLANT

Surface Water Sampling Location - Marsden Lake



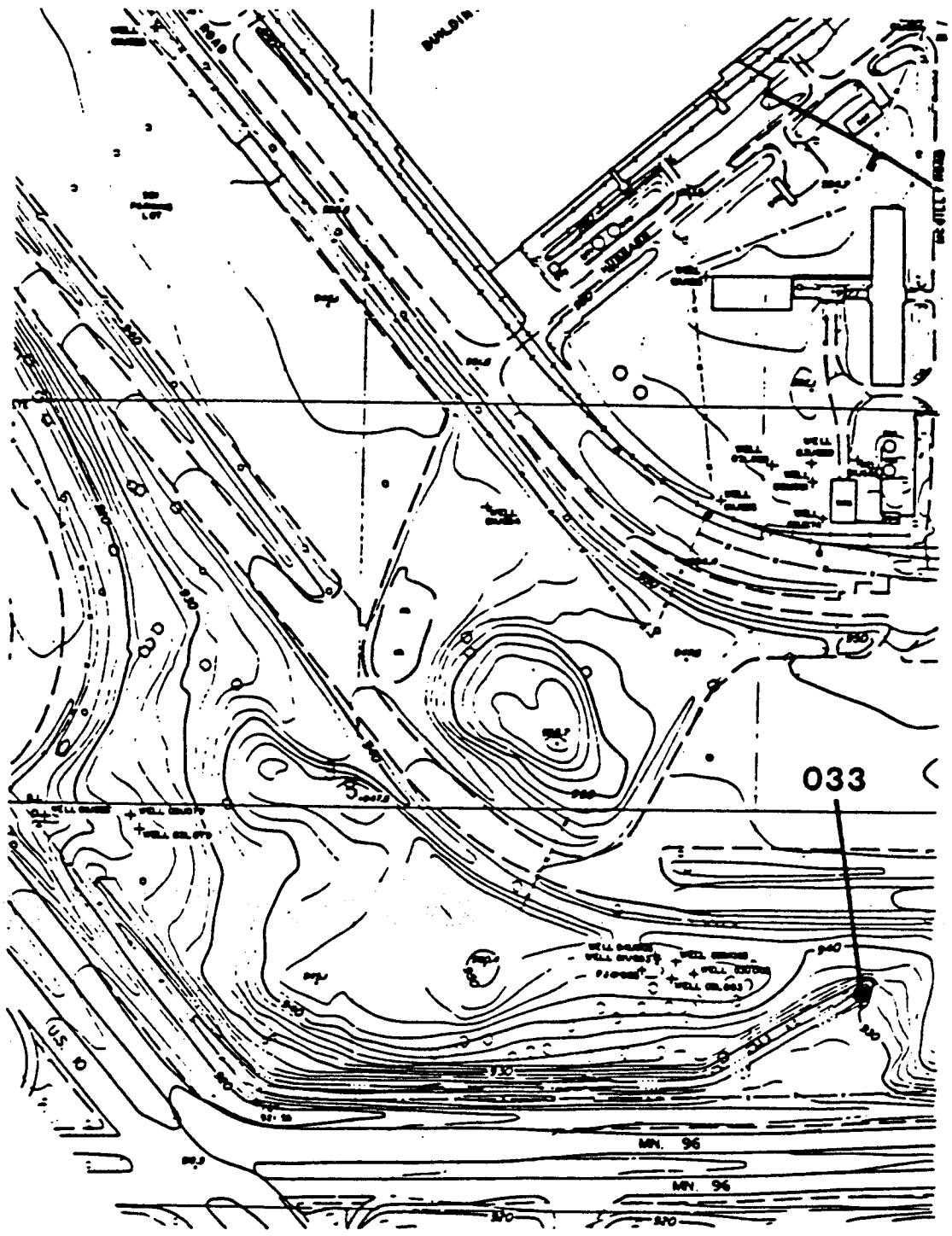
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Fig. R-7



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Surface Water Sampling Location - Site 1



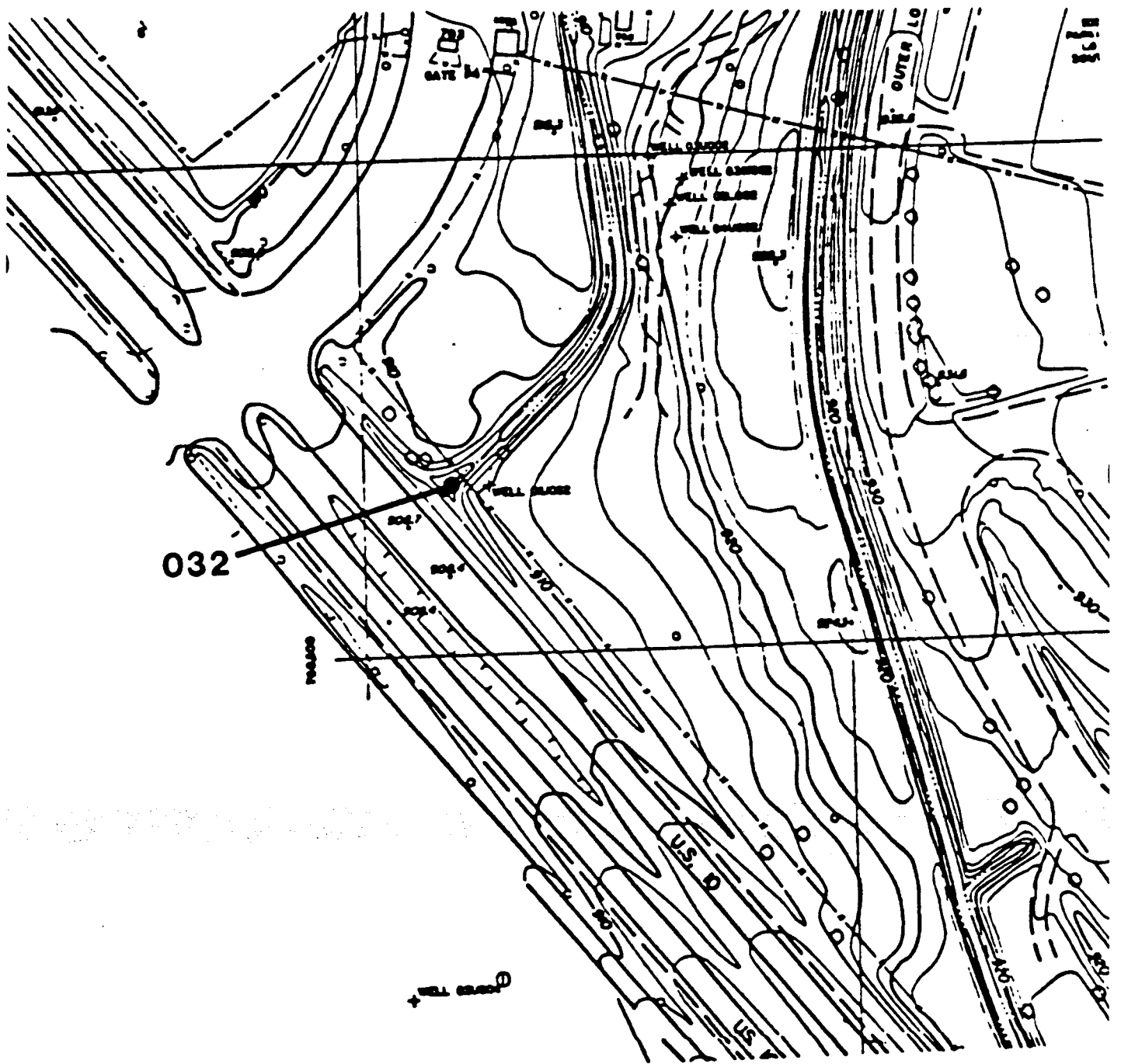
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Fig. R-8



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Surface Water Sampling Location - Near Site J



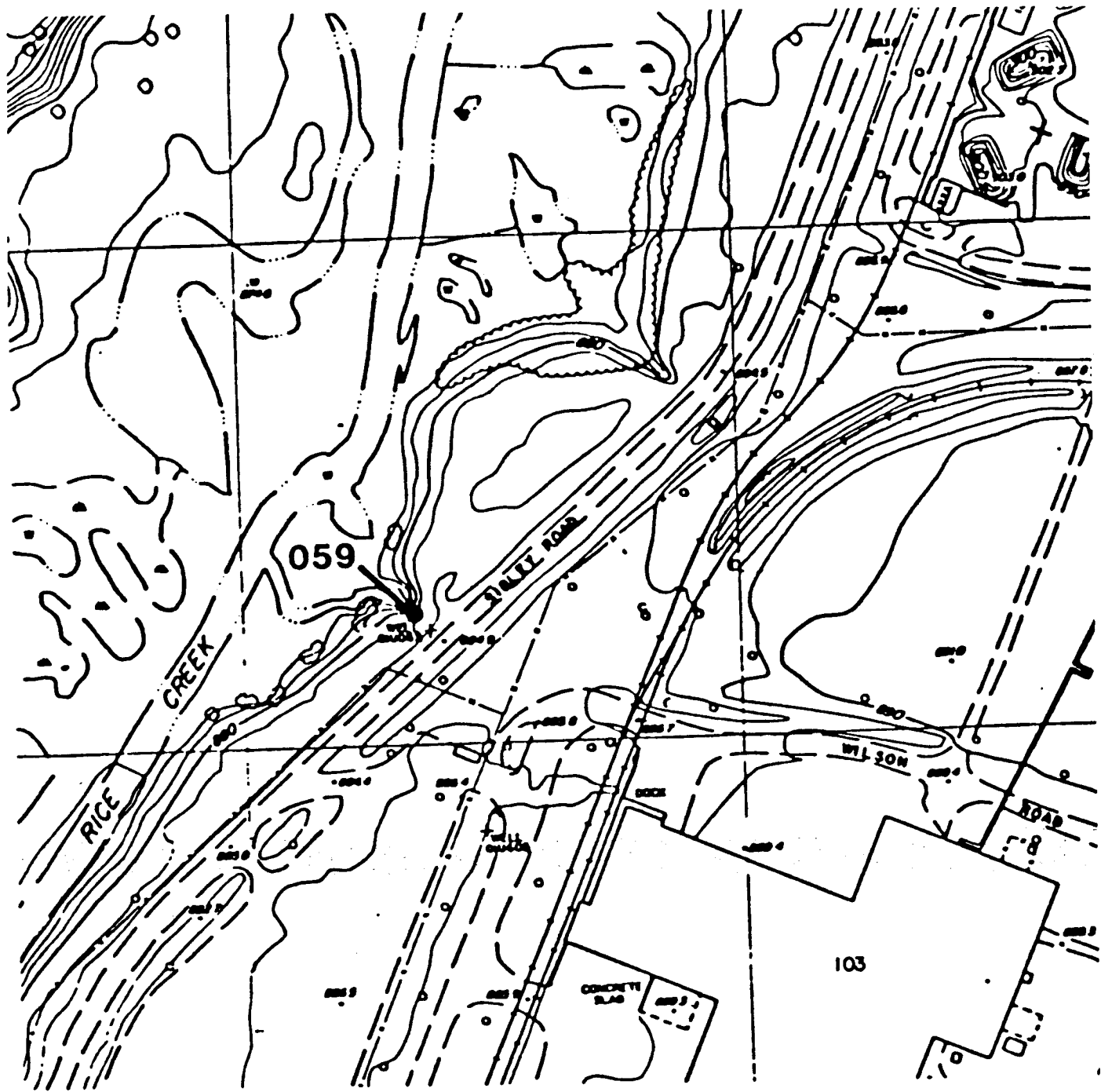
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Fig. R-9



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Surface Water Sampling Location - Site K



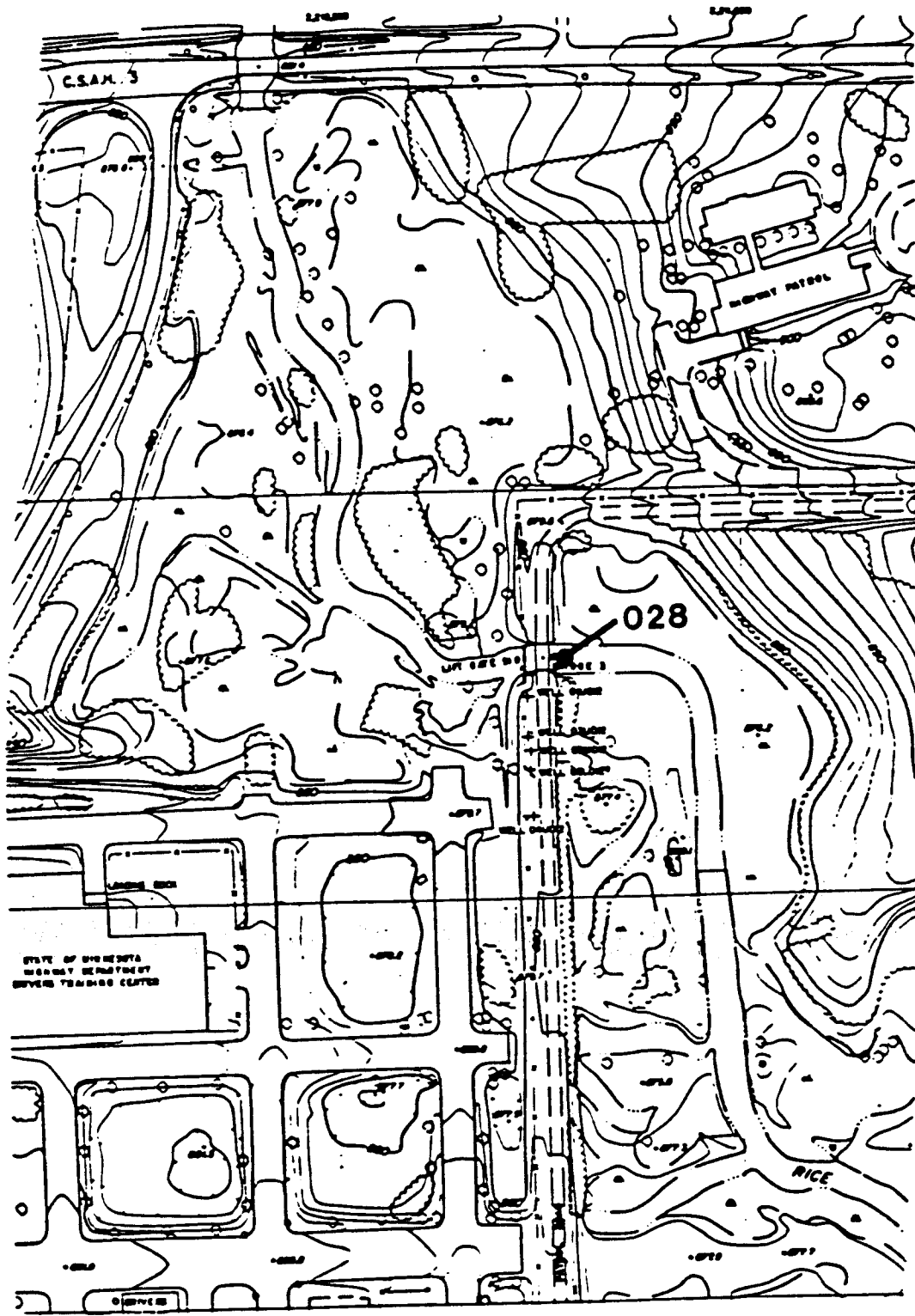
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Fig. R-10



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Surface Water Sampling Location - Rice Creek



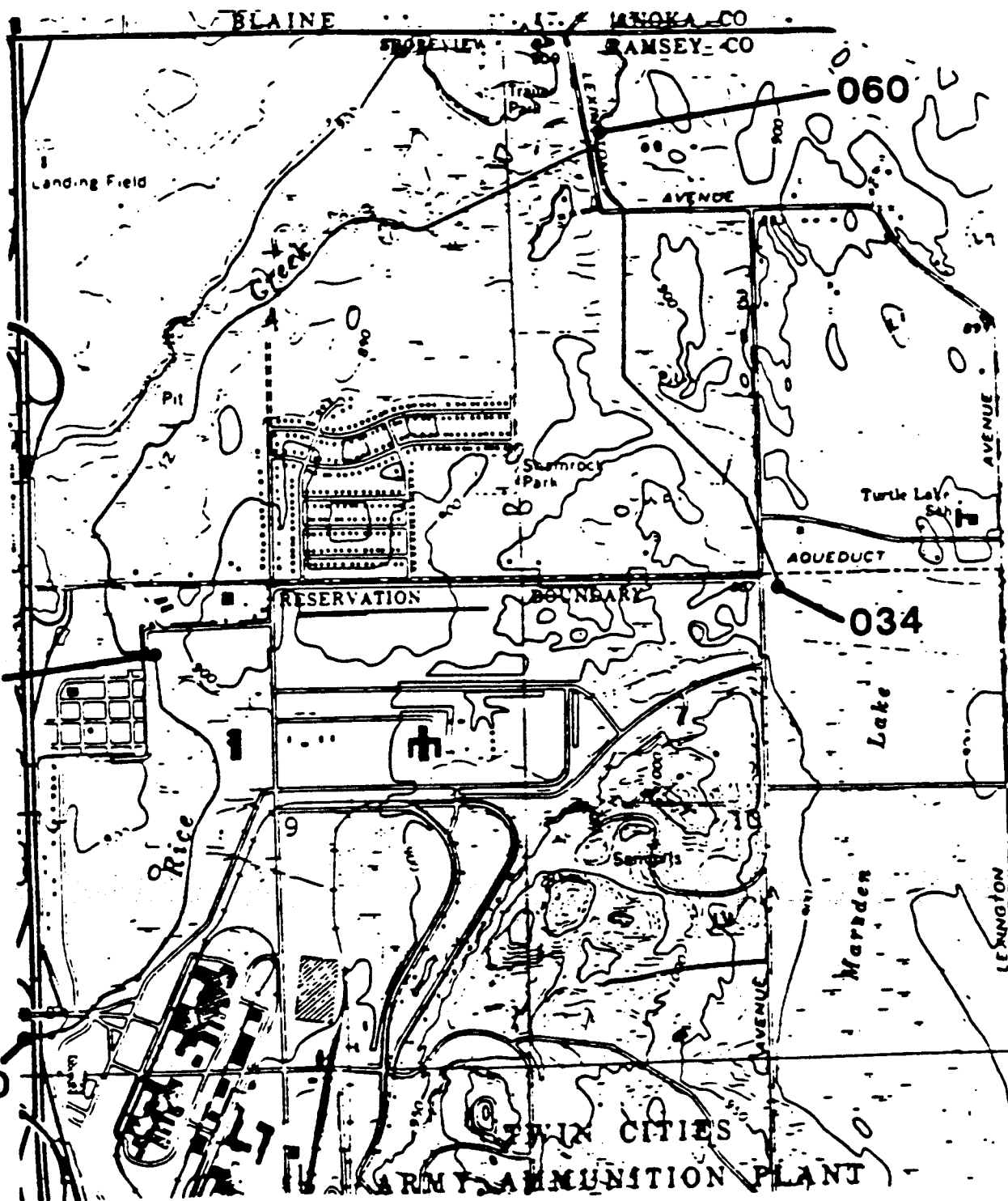
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Fig. R-11



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Surface Water Sampling Location - North & Western Boundaries



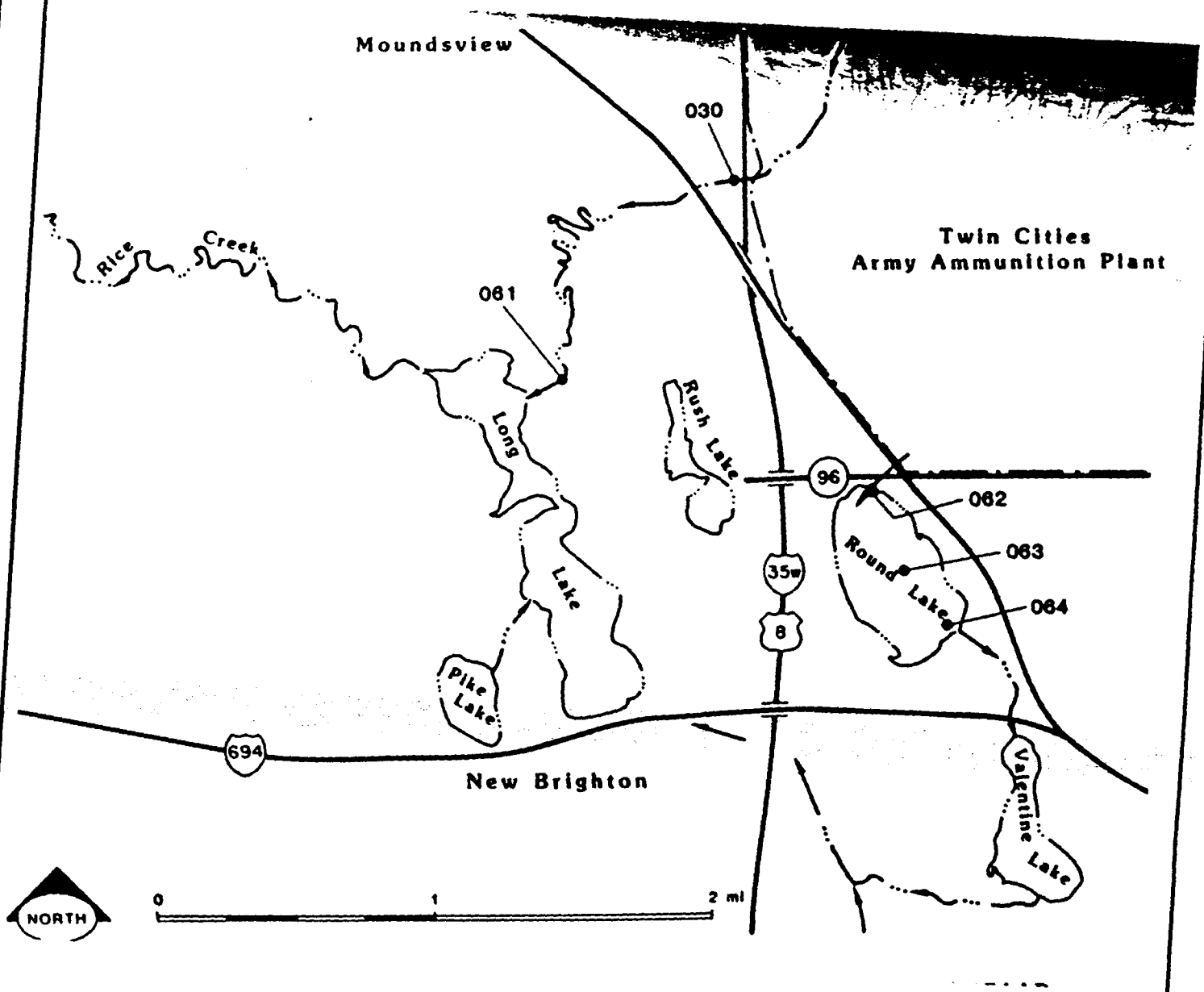
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Fig. R-12



TWIN CITIES ARMY AMMUNITION PLANT

Surface Water Sampling Location - South & Western Boundaries



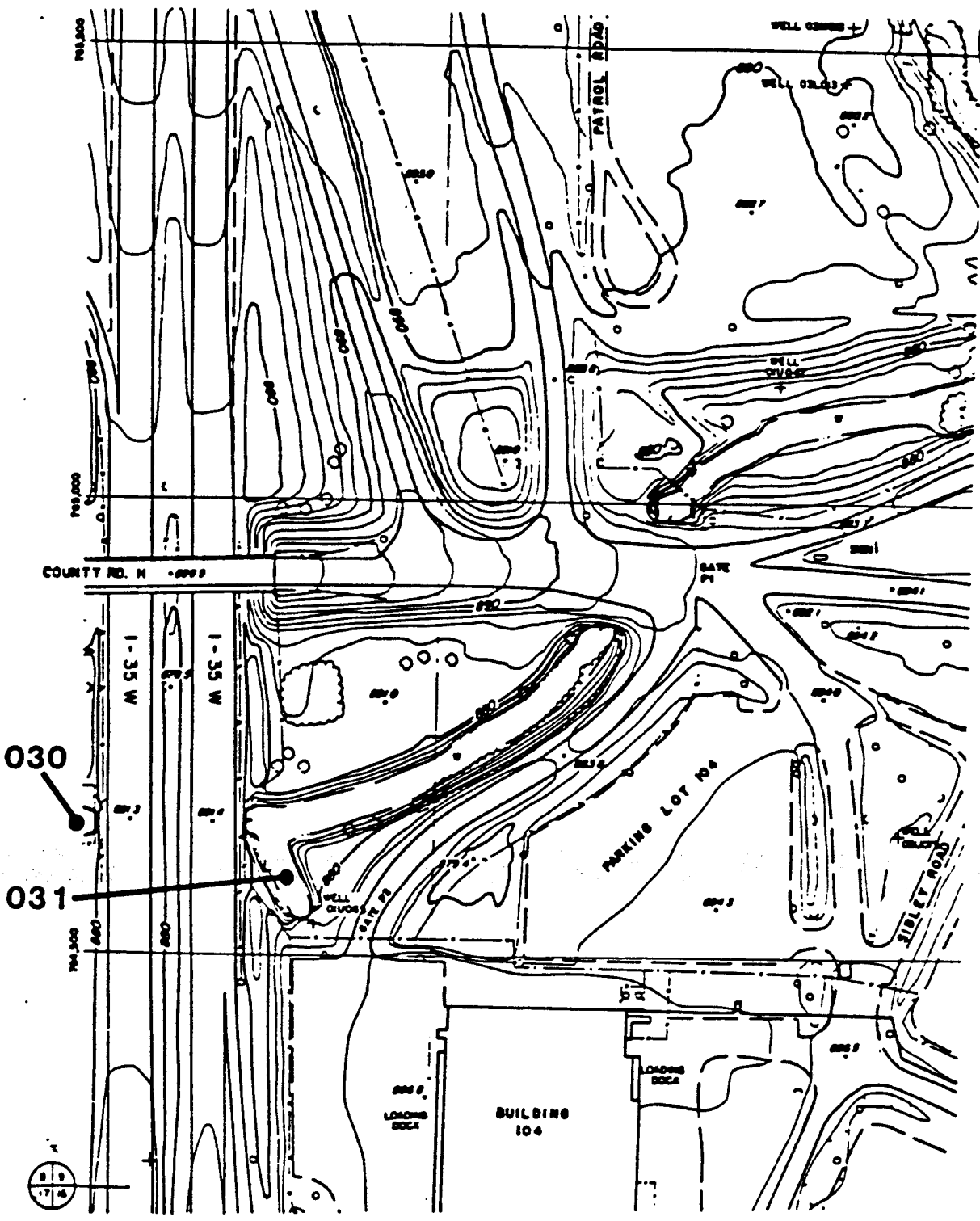
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Fig. R-13



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Surface Water Sampling Location - Rice Creek Near Site J



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Fig. R-14