

AD-A273 301



1984

NORTH BOUNDARY CONTAINMENT / TREATMENT SYSTEM PERFORMANCE REPORT

ROCKY MOUNTAIN ARSENAL, DENVER, COLORADO

S
DTIC
ELECTE
NOV 30 1993



ROCKY MOUNTAIN ARSENAL
US ARMY MATERIEL COMMAND

Volume II

by

Edwin W. Berry
Brian L. Anderson

James H. May
Richard L. Hunt

Technical Operations Directorate
Rocky Mountain Arsenal

Geotechnical Laboratory
USAE Waterways Experiment Station

Douglas W. Thompson

Environmental Laboratory
USAE Waterways Experiment Station

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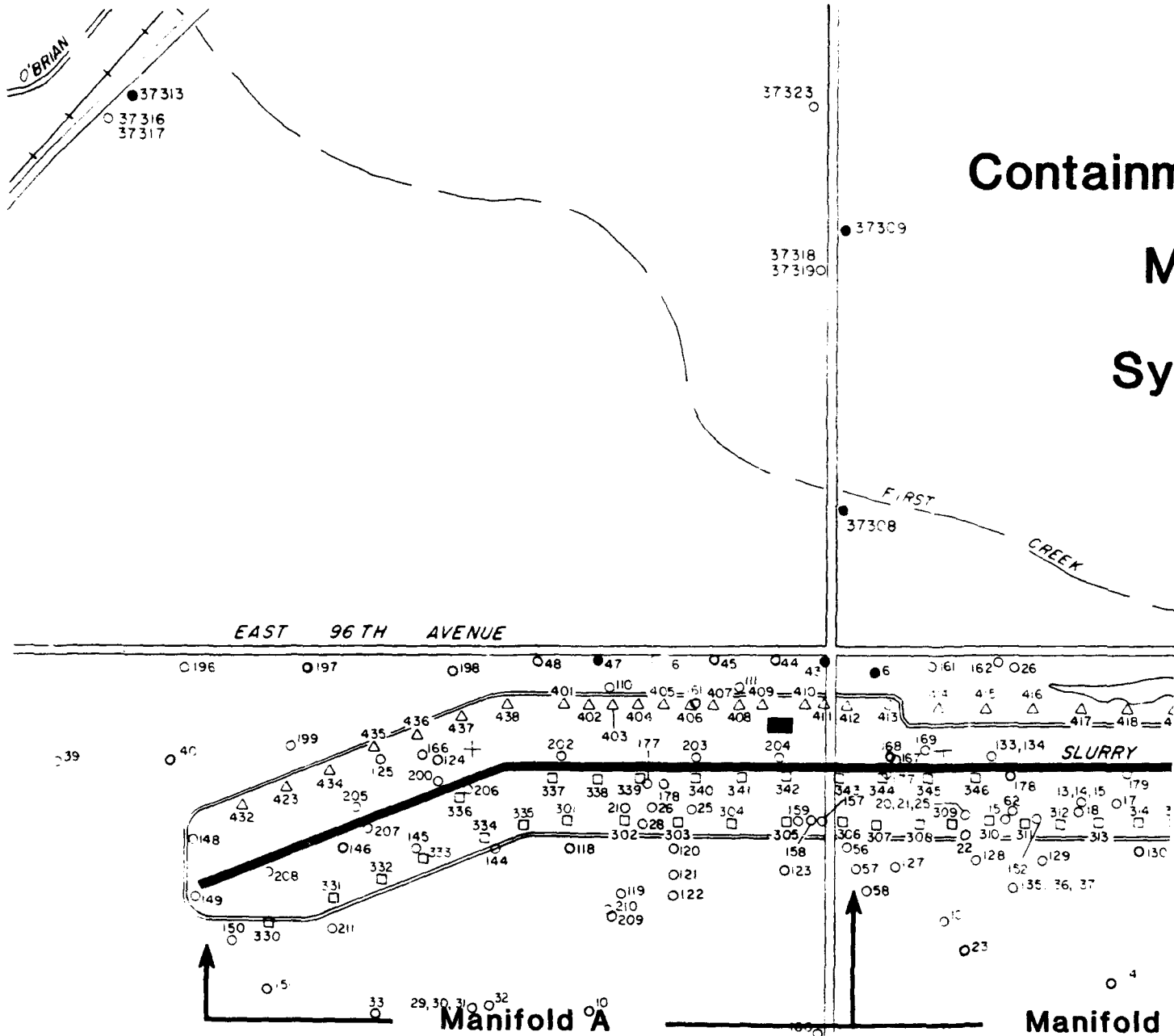


93-29167

December 1985

99 11 29 02A

2



ALLUVIAL WELLS
 301, 302, 303, 304
 305, 306, 330, 331
 332, 333, 334, 335

DENVER WELLS
 336, 337, 338, 339
 340, 341, 342, 343
 344, 345, 346

ALLUVIAL WE
 307, 308, 309,
 311, 312, 313,
 315, 316, 317,

①

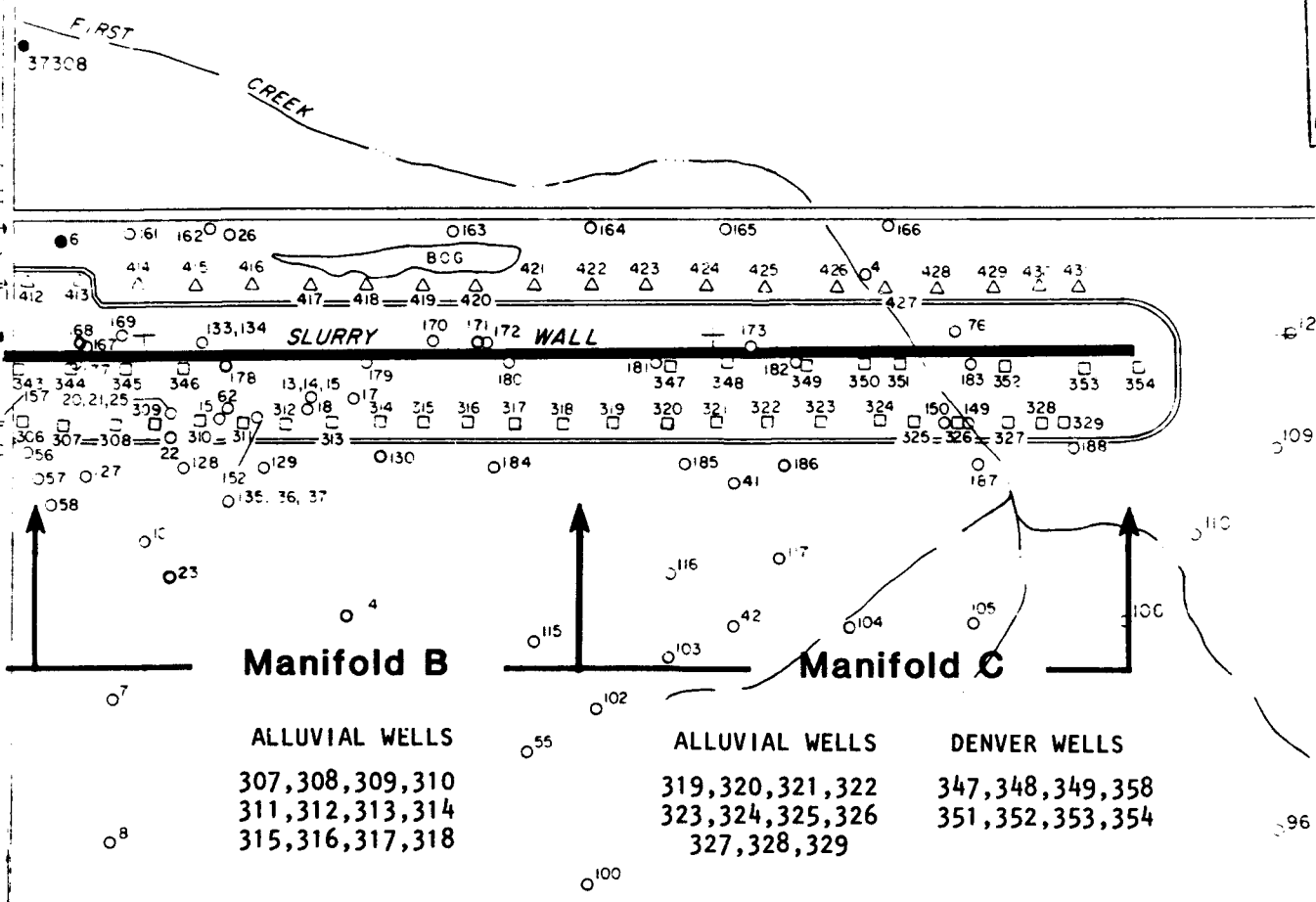
8607-1

DTIC QUALITY INSPECTED

North Boundary Containment / Treatment System

Manifold Alignment and System Configuration

Accession For	
NTIS CRASH	<input checked="" type="checkbox"/>
DTIC TAB	<input type="checkbox"/>
Unannounced	<input type="checkbox"/>
Justification	
By	
Distribution	
Availability Codes	
Dist	Avail and/or Special
A-1	



Manifold B

ALLUVIAL WELLS
 307, 308, 309, 310
 311, 312, 313, 314
 315, 316, 317, 318

Manifold C

ALLUVIAL WELLS
 319, 320, 321, 322
 323, 324, 325, 326
 327, 328, 329

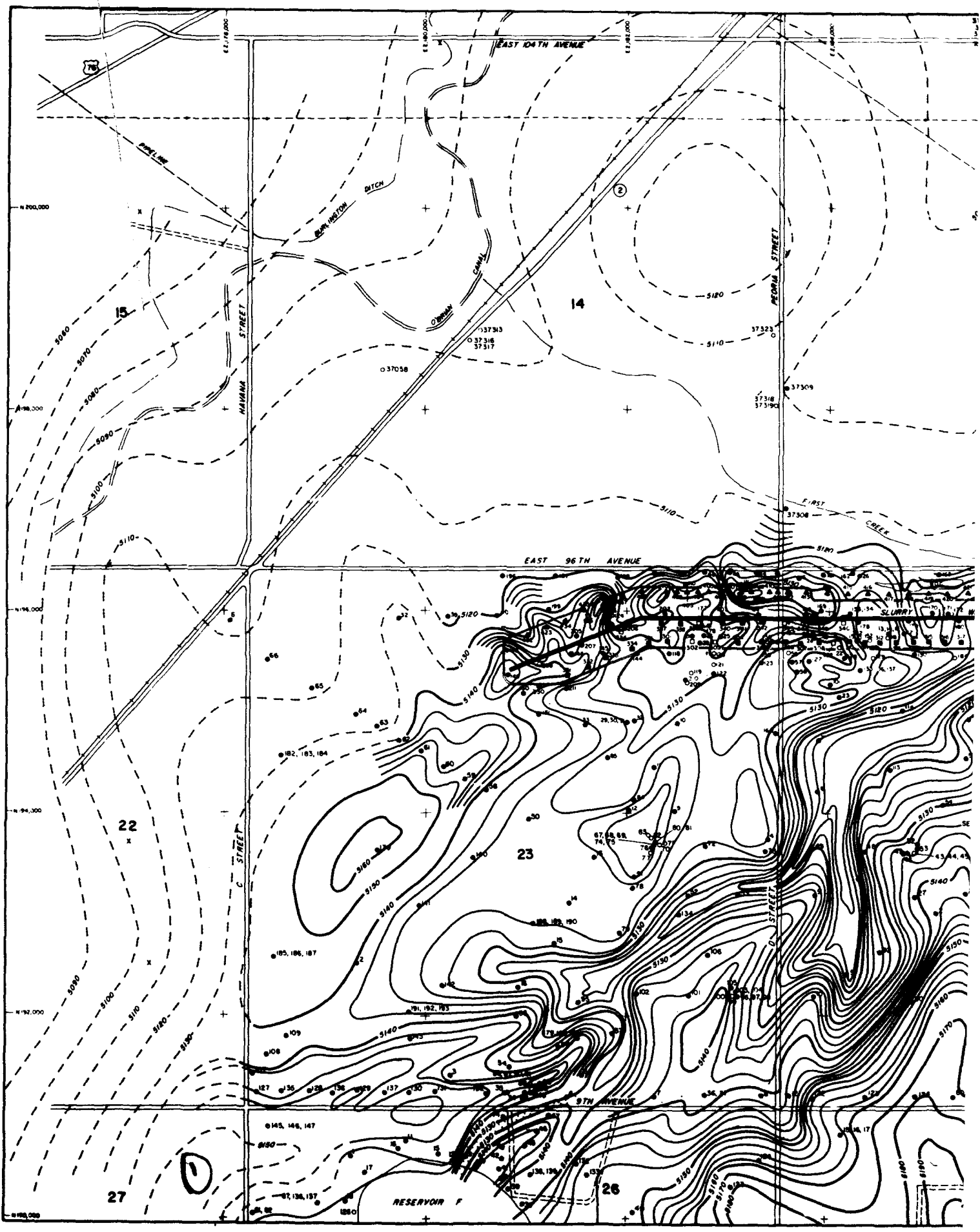
DENVER WELLS
 347, 348, 349, 358
 351, 352, 353, 354

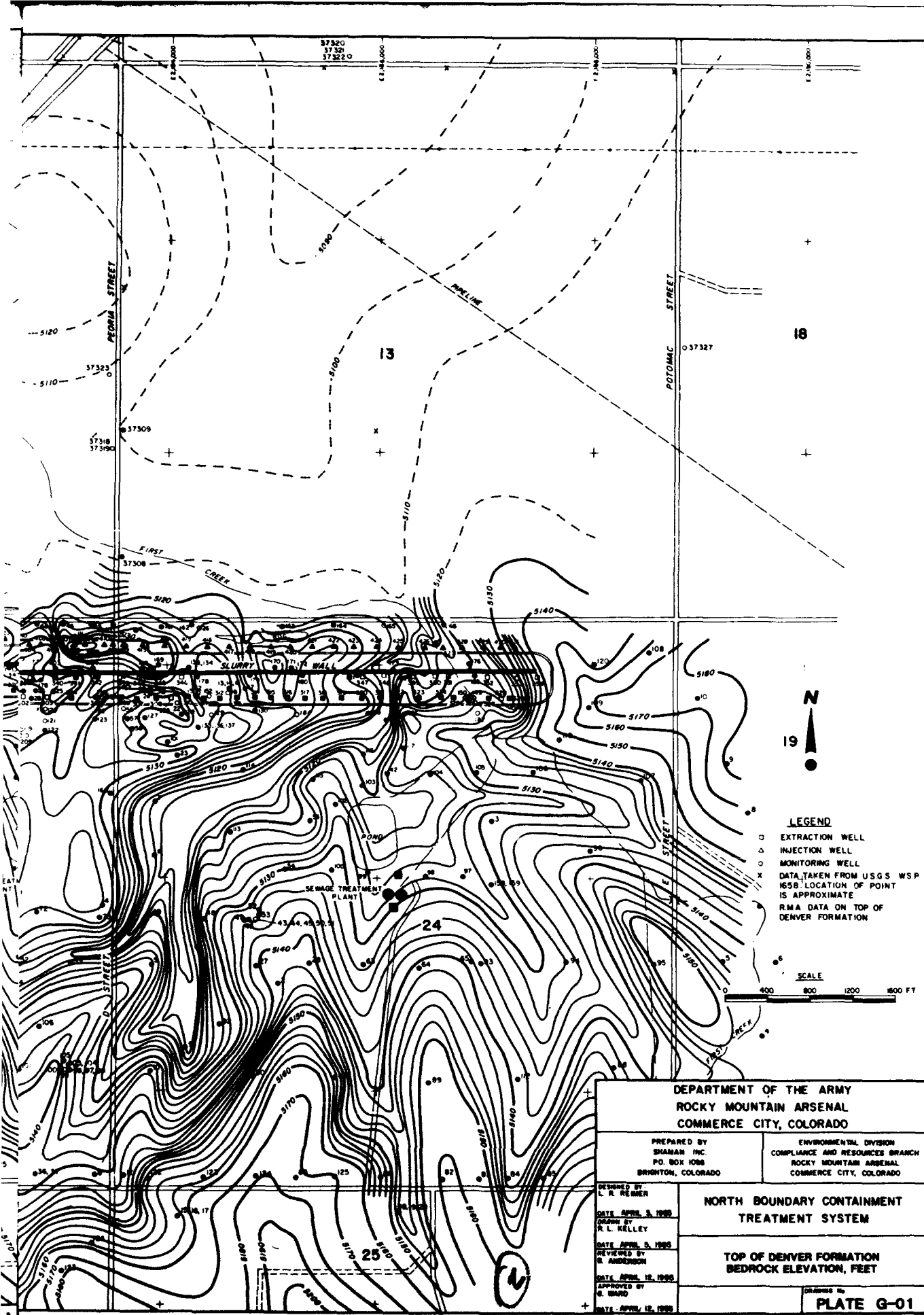
Plate 1

2

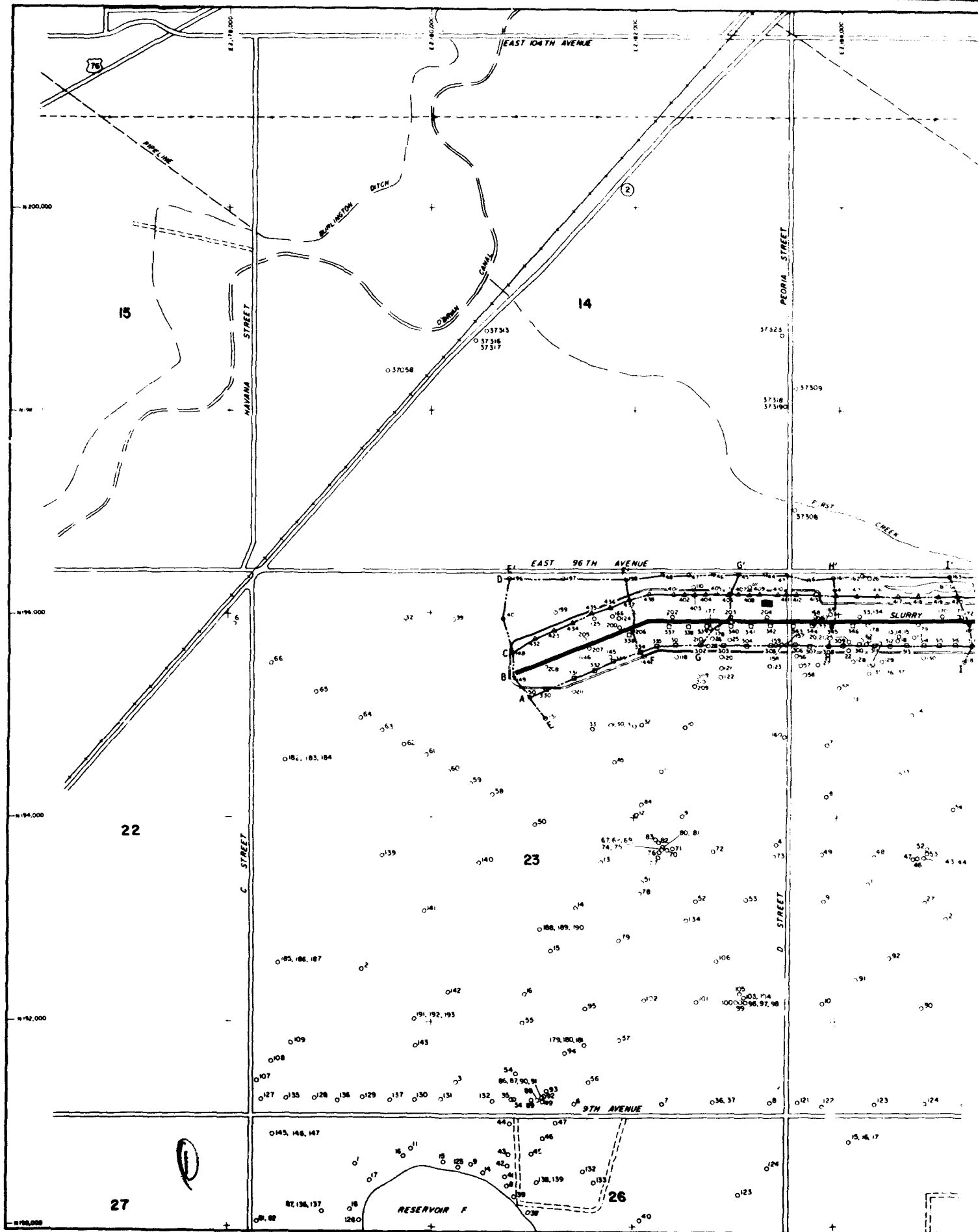
GEOLOGY PLATES

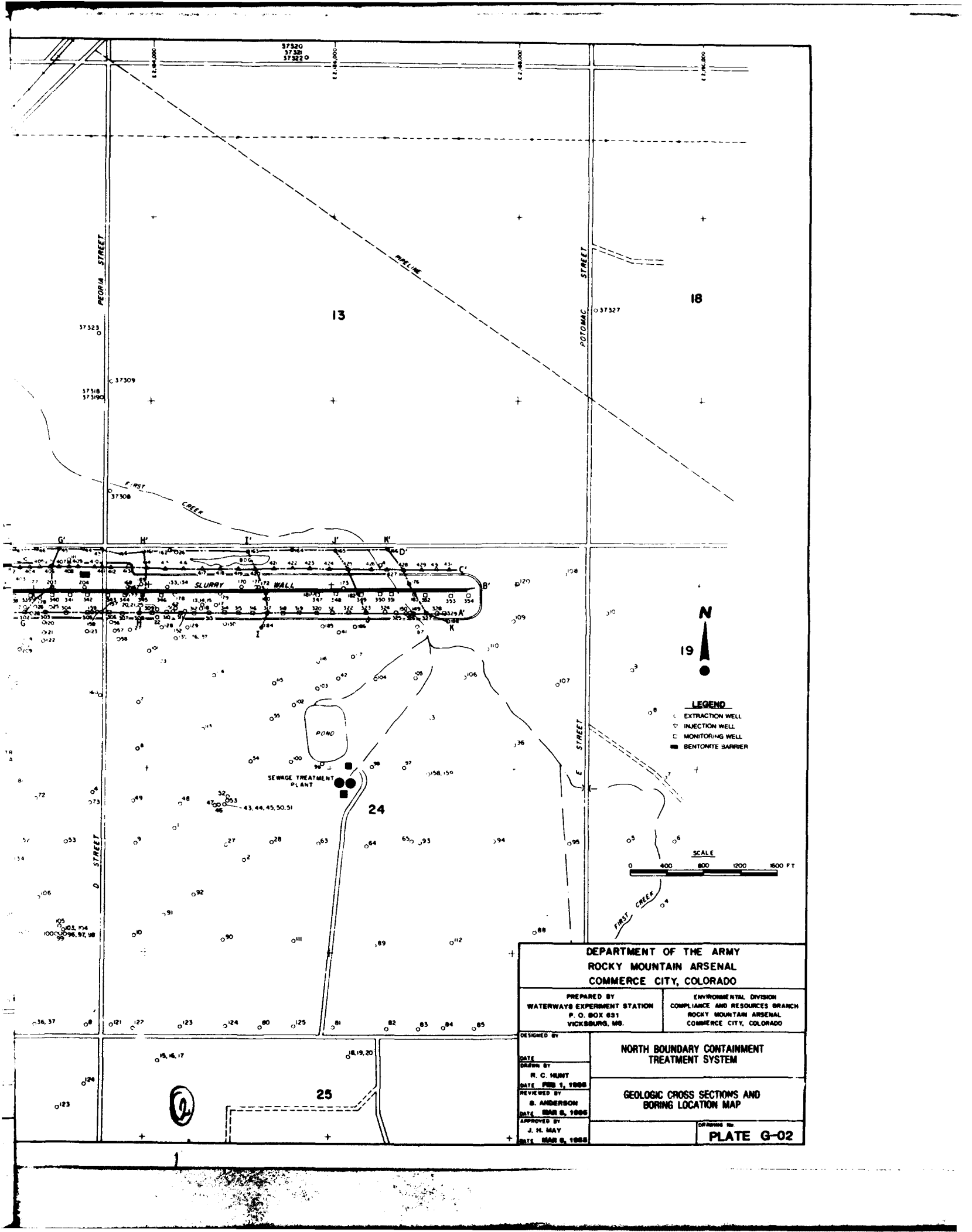
G-01 thru G-08



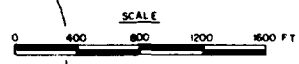


DEPARTMENT OF THE ARMY ROCKY MOUNTAIN ARSENAL COMMERCE CITY, COLORADO	
PREPARED BY SHAMAR INC. P.O. BOX 1086 BRYANTON, COLORADO	ENVIRONMENTAL DIVISION COMPLIANCE AND RESOURCES BRANCH ROCKY MOUNTAIN ARSENAL COMMERCE CITY, COLORADO
DESIGNED BY L. R. REIMER DATE APRIL 9, 1989 DRAWN BY R. L. KELLEY DATE APRIL 9, 1989 REVIEWED BY B. ANDERSON DATE APRIL 12, 1989 APPROVED BY S. WARD DATE APRIL 12, 1989	NORTH BOUNDARY CONTAINMENT TREATMENT SYSTEM TOP OF DENVER FORMATION BEDROCK ELEVATION, FEET
	DRAWING NO. PLATE G-01

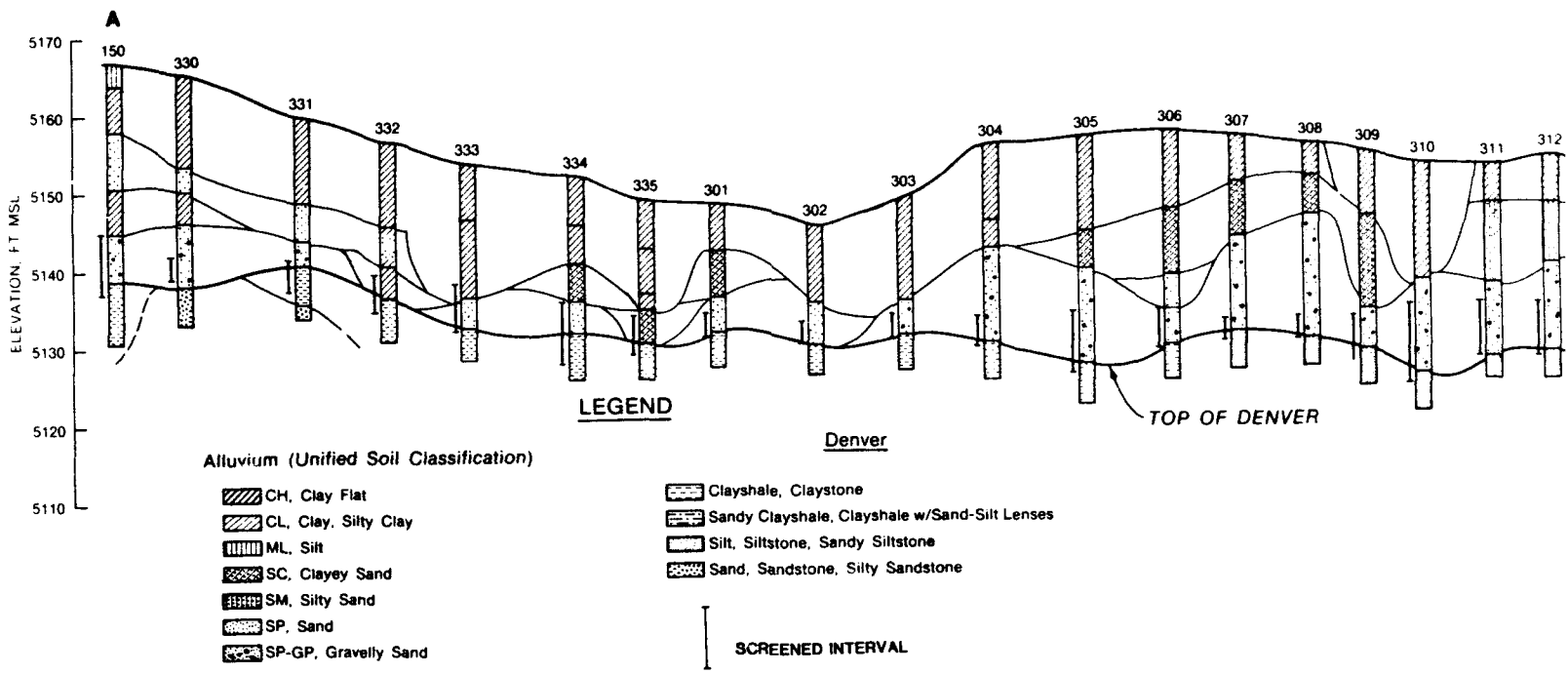




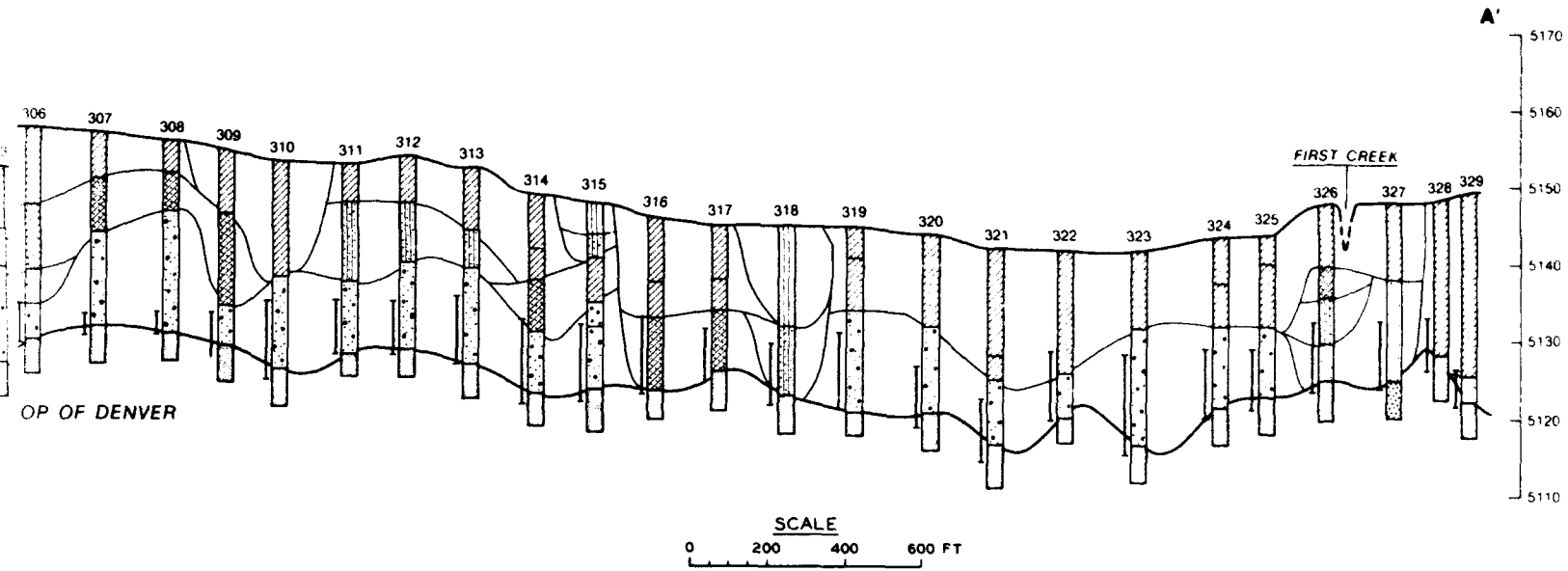
- LEGEND**
- EXTRACTION WELL
 - INJECTION WELL
 - MONITORING WELL
 - BENTONITE BARRIER



DEPARTMENT OF THE ARMY ROCKY MOUNTAIN ARSENAL COMMERCE CITY, COLORADO	
PREPARED BY WATERWAYS EXPERIMENT STATION P. O. BOX 631 VICKSBURG, MS.	ENVIRONMENTAL DIVISION COMPLIANCE AND RESOURCES BRANCH ROCKY MOUNTAIN ARSENAL COMMERCE CITY, COLORADO
DESIGNED BY DATE DRAWN BY R. C. HUNT DATE FEB 1, 1986 REVIEWED BY S. ANDERSON DATE MAR 6, 1986 APPROVED BY J. H. MAY DATE MAR 6, 1986	NORTH BOUNDARY CONTAINMENT TREATMENT SYSTEM GEOLOGIC CROSS SECTIONS AND BORING LOCATION MAP DRAWING NO: PLATE G-02

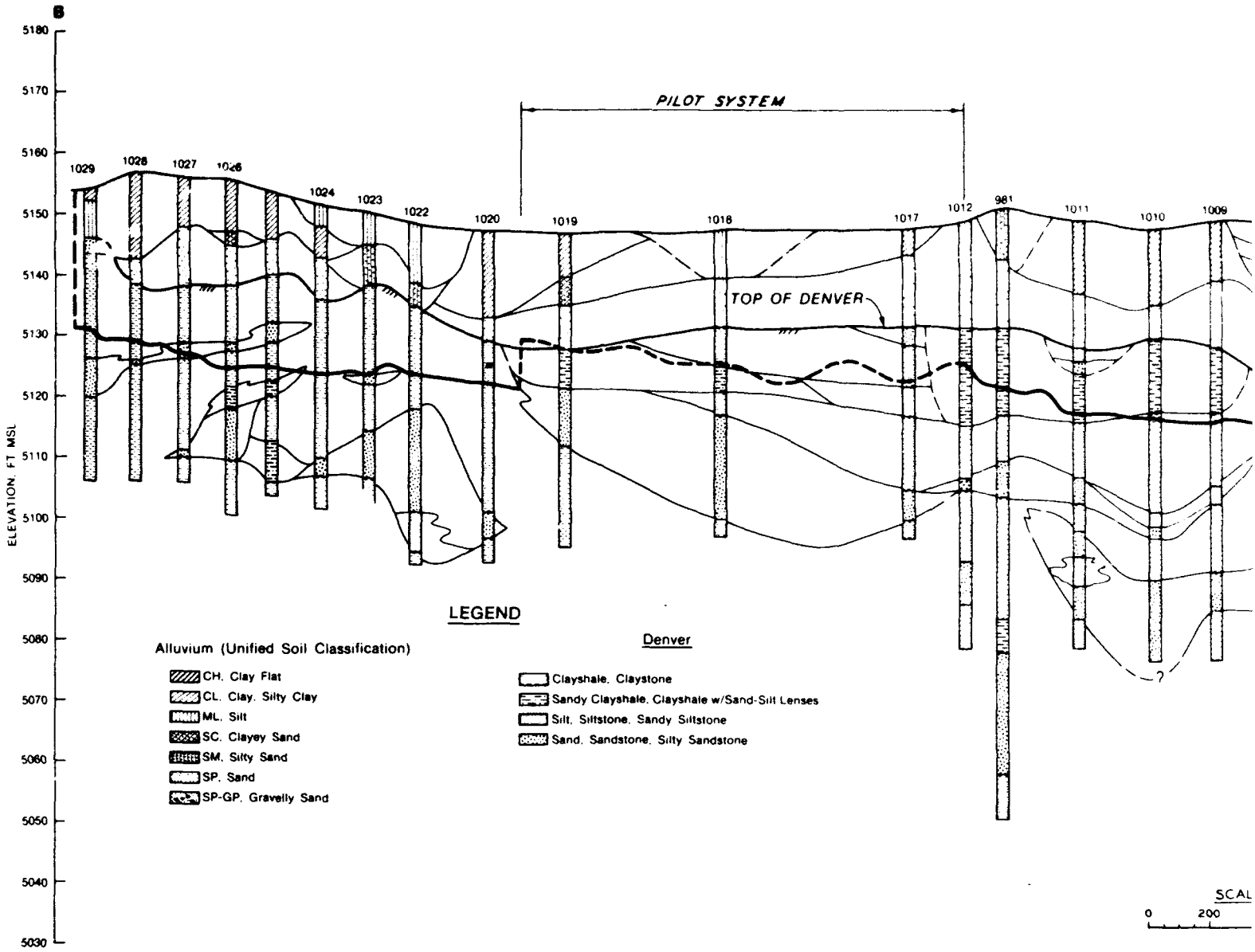


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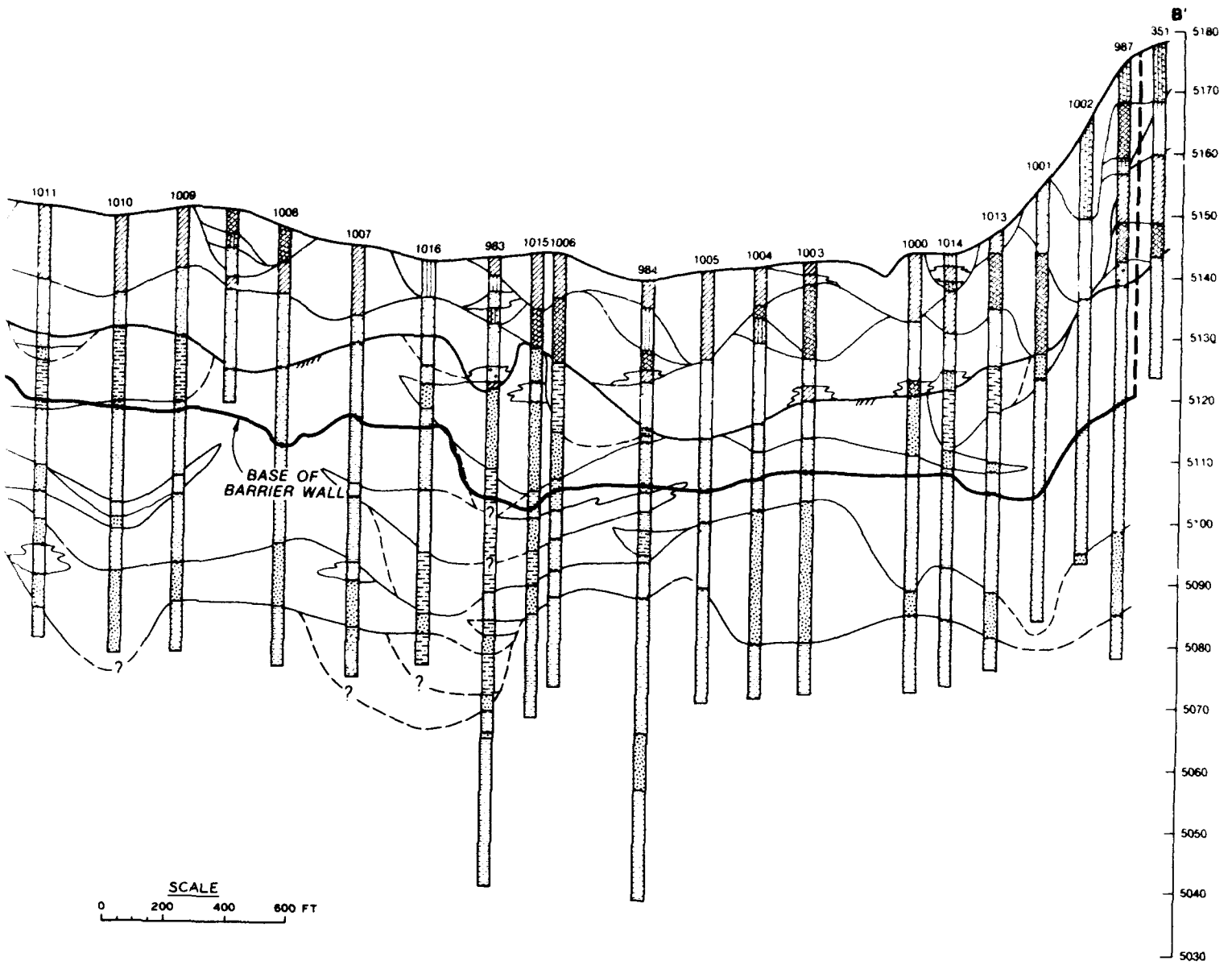


DEPARTMENT OF THE ARMY ROCKY MOUNTAIN ARSENAL COMMERCE CITY, COLORADO	
PREPARED BY WATERWAYS EXPERIMENT STATION P. O. BOX 631 VICKSBURG, MS.	ENVIRONMENTAL DIVISION COMPLIANCE AND RESOURCES BRANCH ROCKY MOUNTAIN ARSENAL COMMERCE CITY, COLORADO
DESIGNED BY DATE	NORTH BOUNDARY CONTAINMENT TREATMENT SYSTEM
DRAWN BY R. C. HUNT DATE FEB 1, 1985	
REVIEWED BY B. ANDERSON DATE MAR 8, 1985	CROSS SECTION A-A'
APPROVED BY J. H. MAY DATE MAR 8, 1985	DRAWING No PLATE G-03

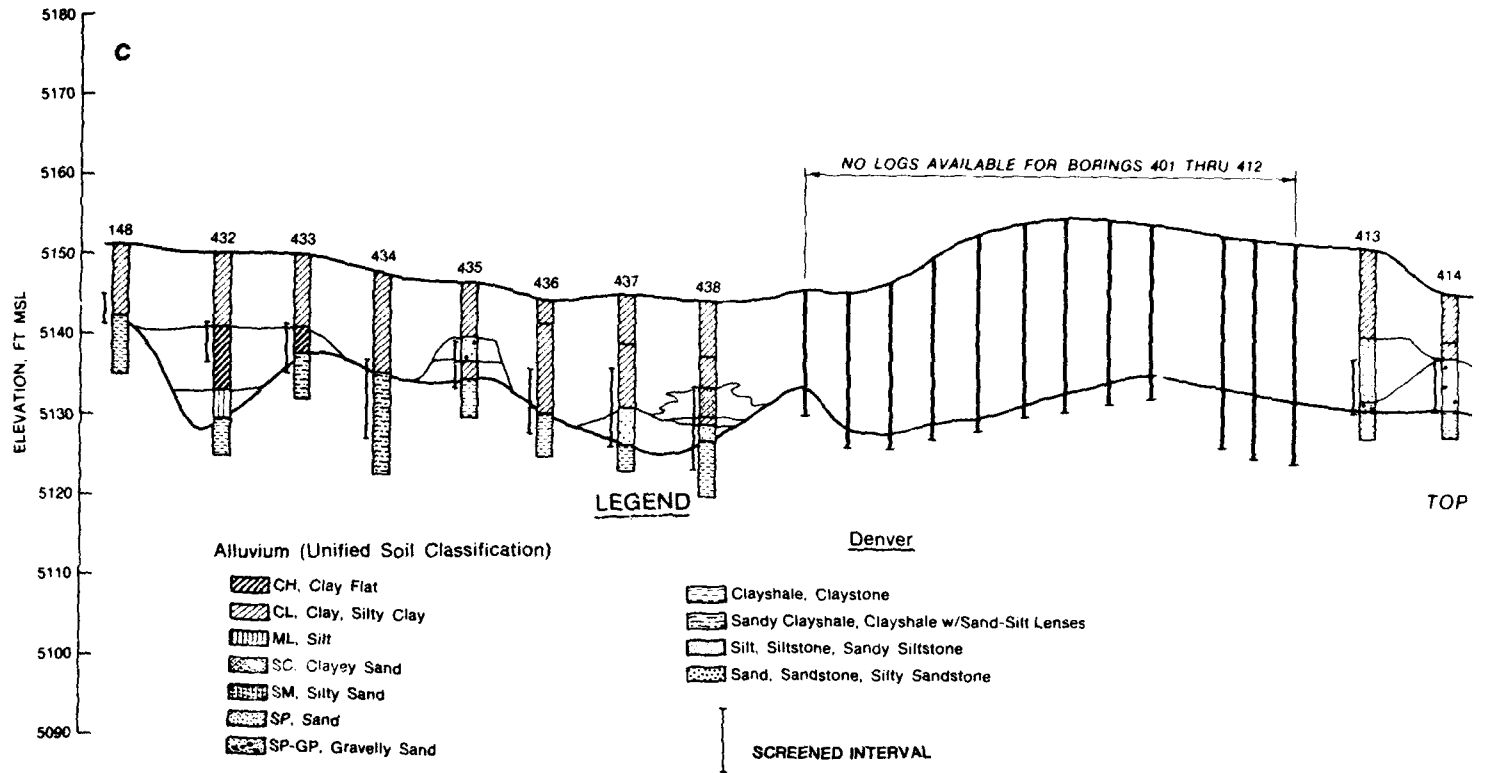
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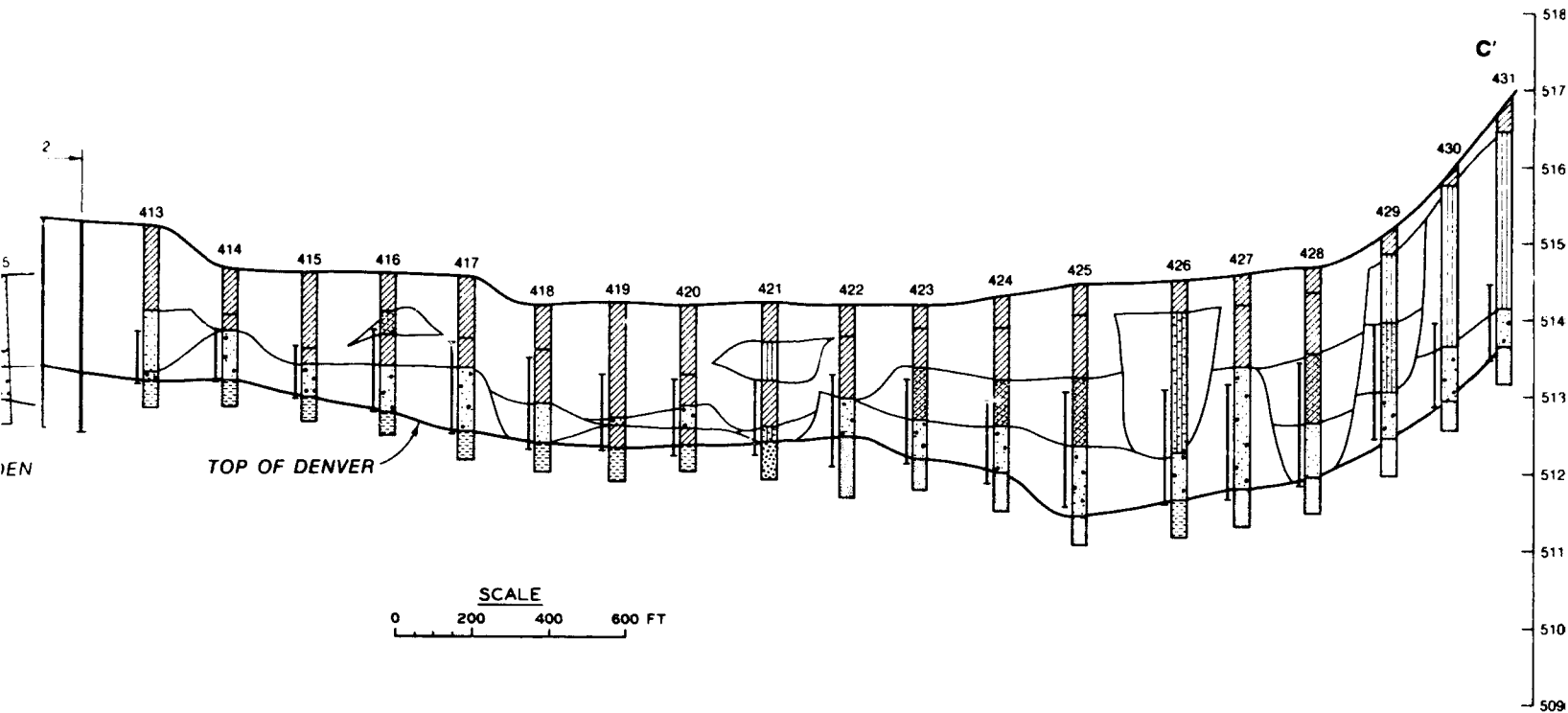
①



DEPARTMENT OF THE ARMY ROCKY MOUNTAIN ARSENAL COMMERCE CITY, COLORADO	
PREPARED BY WATERWAYS EXPERIMENT STATION P. O. BOX 631 VICKSBURG, MS.	ENVIRONMENTAL DIVISION COMPLIANCE AND RESOURCES BRANCH ROCKY MOUNTAIN ARSENAL COMMERCE CITY, COLORADO
DESIGNED BY DATE DRAWN BY R. C. HUNT DATE FEB 1, 1985 REVIEWED BY B. ANDERSON DATE MAR 8, 1985 APPROVED BY J. H. MAY DATE MAR 8, 1985	NORTH BOUNDARY CONTAINMENT TREATMENT SYSTEM CROSS SECTION B-B'
	DRAWING No. PLATE G-04



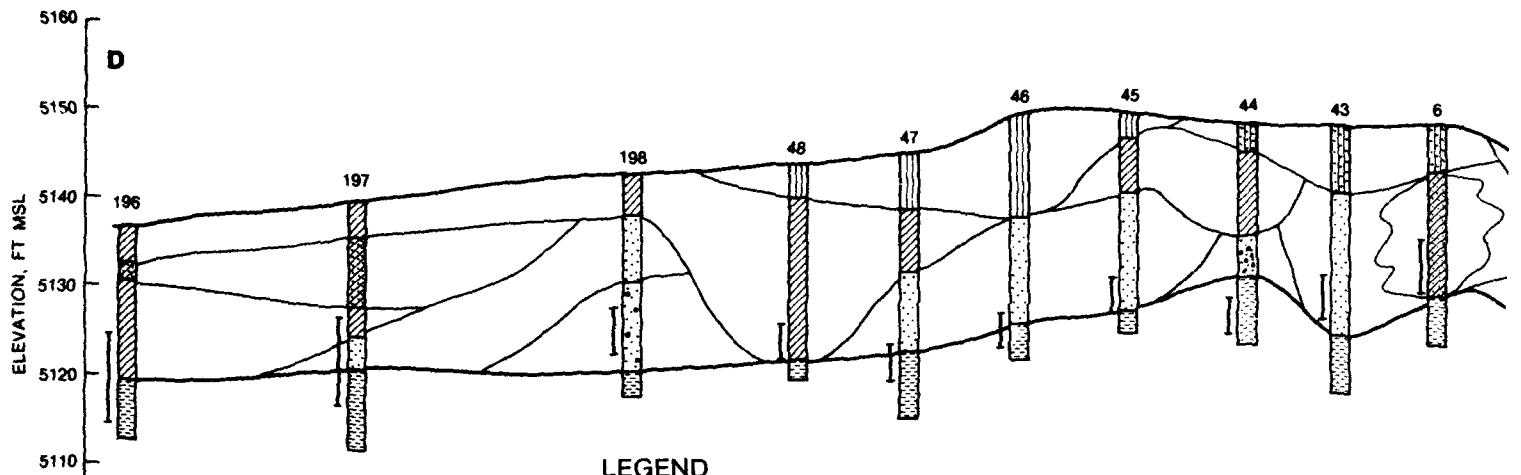
①



SCALE
0 200 400 600 FT

DEPARTMENT OF THE ARMY ROCKY MOUNTAIN ARSENAL COMMERCE CITY, COLORADO	
PREPARED BY WATERWAYS EXPERIMENT STATION P. O. BOX 631 VICKSBURG, MS.	ENVIRONMENTAL DIVISION COMPLIANCE AND RESOURCES BRANCH ROCKY MOUNTAIN ARSENAL COMMERCE CITY, COLORADO
DESIGNED BY DATE DRAWN BY R. C. HUNT DATE FEB 1, 1985 REVIEWED BY B. ANDERSON DATE MAR 8, 1985 APPROVED BY J. H. MAY DATE MAR 8, 1985	NORTH BOUNDARY CONTAINMENT TREATMENT SYSTEM CROSS SECTION C-C' DRAWING No PLATE G-05

(12)



LEGEND

Alluvium (Unified Soil Classification)

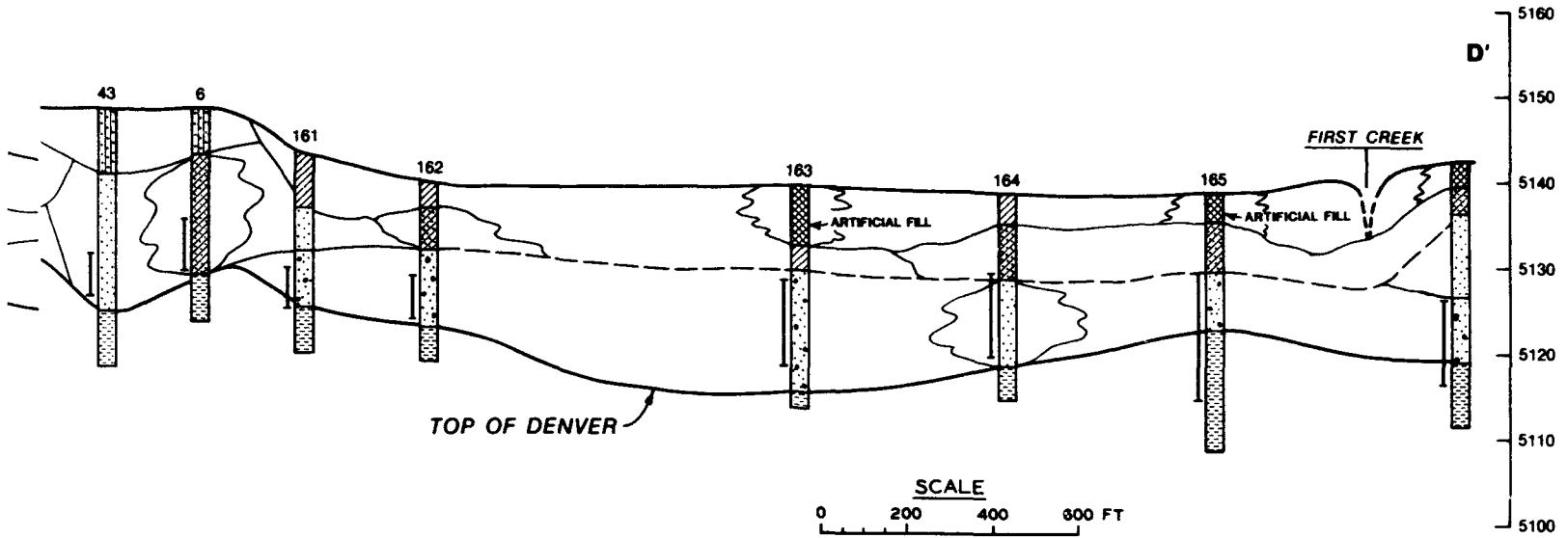
- CH, Clay Flat
- CL, Clay, Silty Clay
- ML, Silt
- SC, Clayey Sand
- SM, Silty Sand
- SP, Sand
- SP-GP, Gravelly Sand

Denver

- Clayshale, Claystone
- Sandy Clayshale, Clayshale w/Sand-Silt Lenses
- Silt, Siltstone, Sandy Siltstone
- Sand, Sandstone, Silty Sandstone

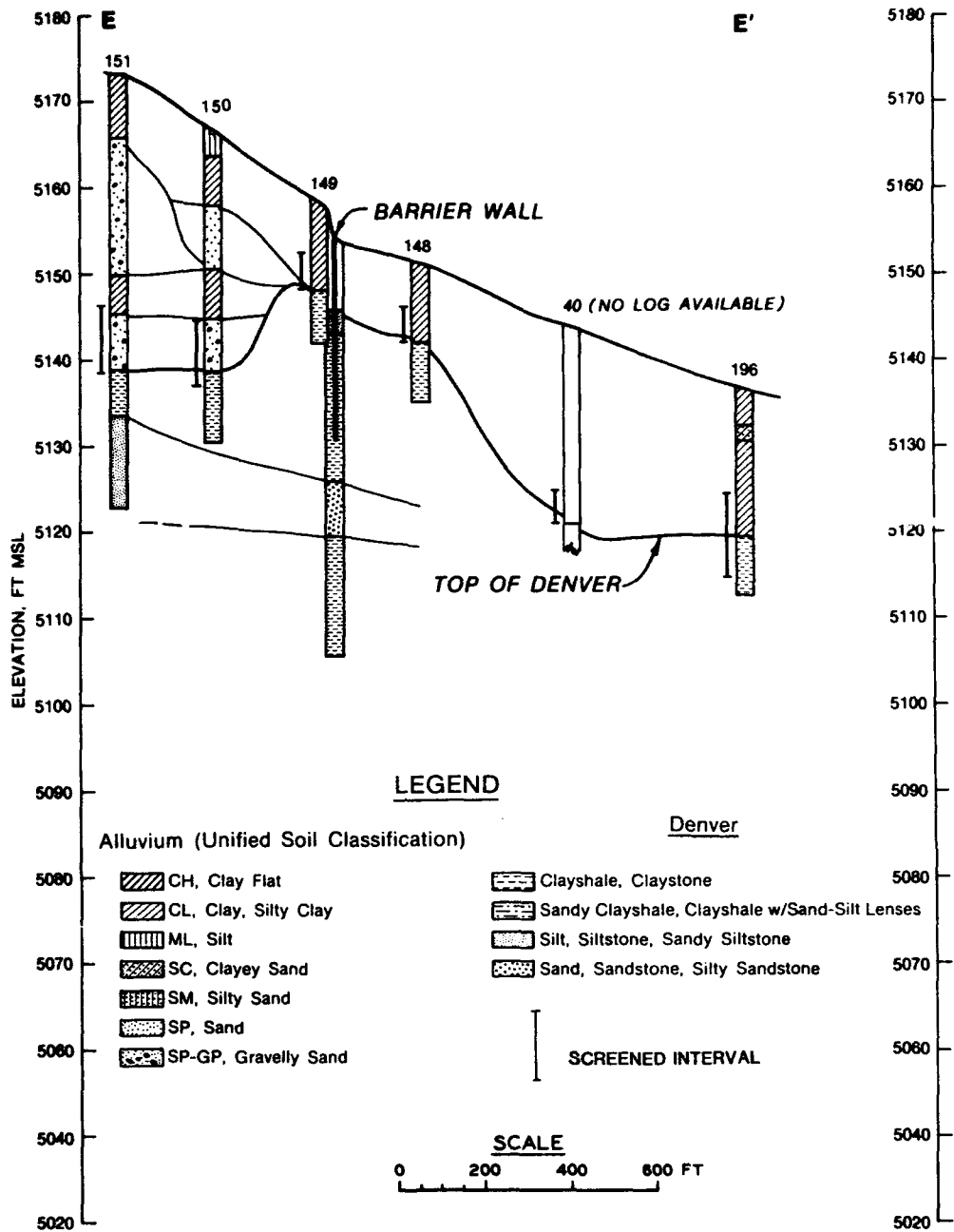
SCREENED INTERVAL

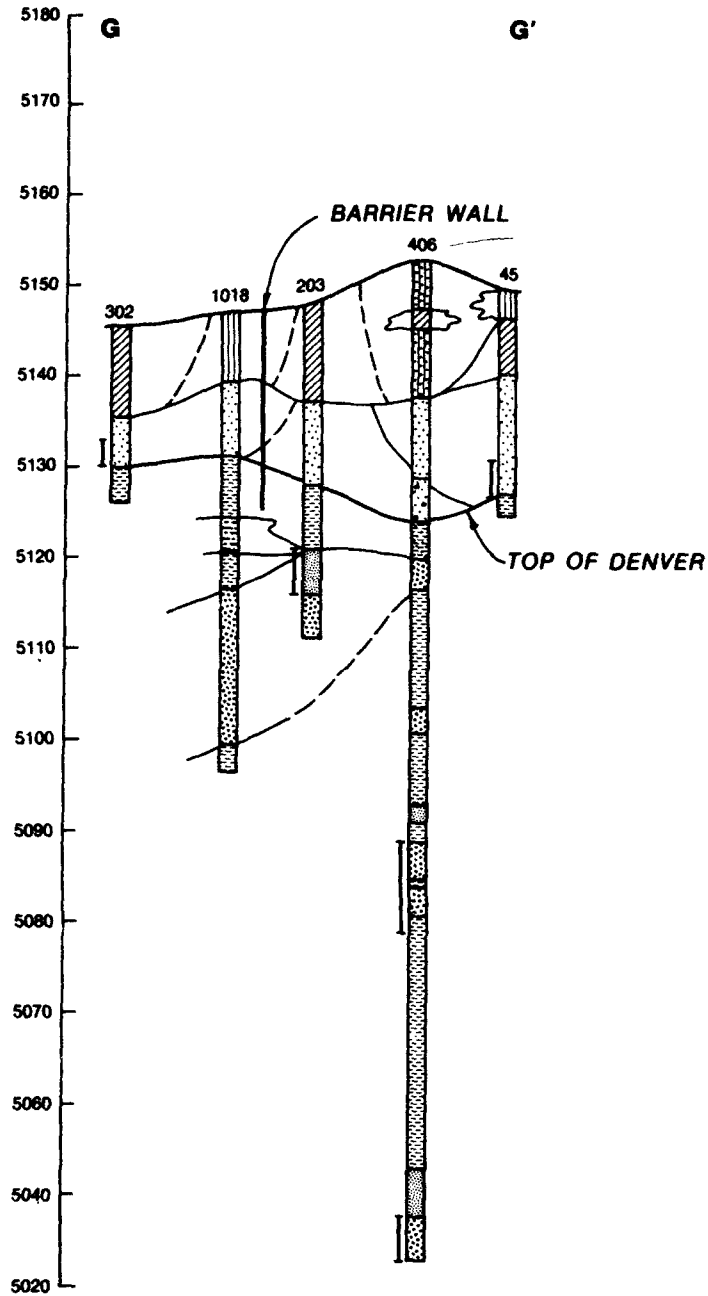
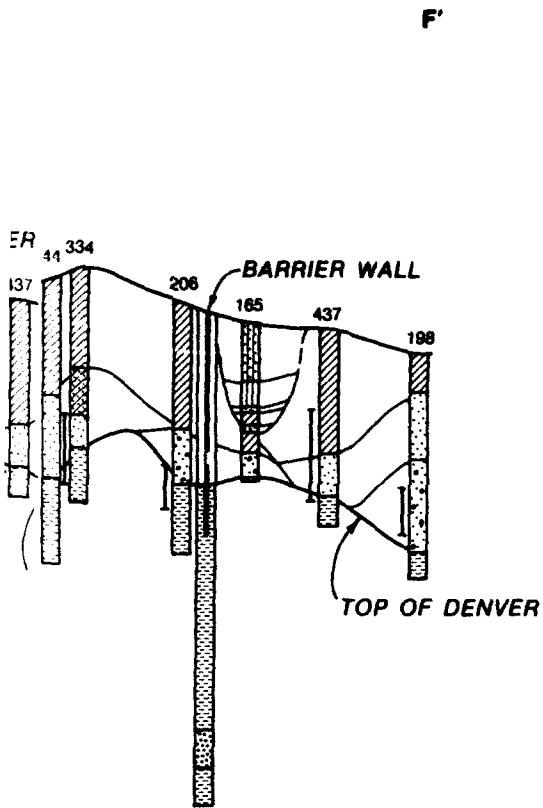




DEPARTMENT OF THE ARMY ROCKY MOUNTAIN ARSENAL COMMERCE CITY, COLORADO	
PREPARED BY WATERWAYS EXPERIMENT STATION P. O. BOX 631 VICKSBURG, MS.	ENVIRONMENTAL DIVISION COMPLIANCE AND RESOURCES BRANCH ROCKY MOUNTAIN ARSENAL COMMERCE CITY, COLORADO
DESIGNED BY DATE DRAWN BY R. C. HUNT DATE FEB 1, 1985 REVIEWED BY B. ANDERSON DATE MAR 8, 1985 APPROVED BY J. H. MAY DATE MAR 8, 1985	NORTH BOUNDARY CONTAINMENT TREATMENT SYSTEM CROSS SECTION D-D' DRAWING No. PLATE G-06

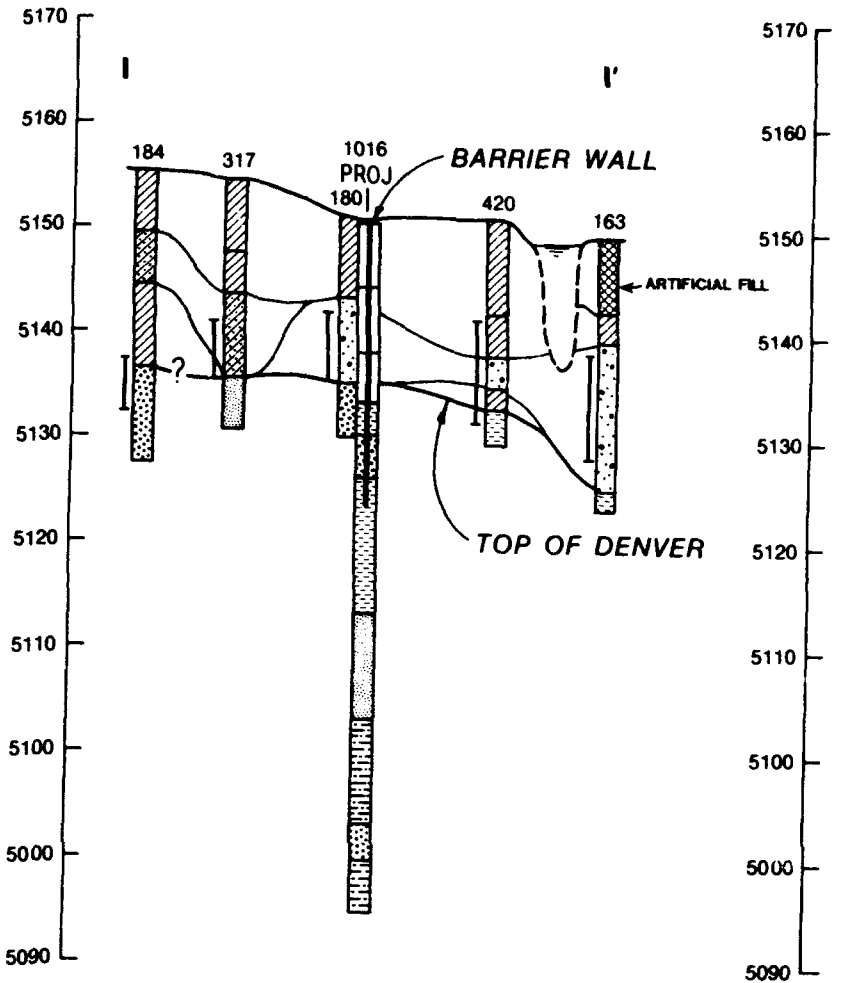
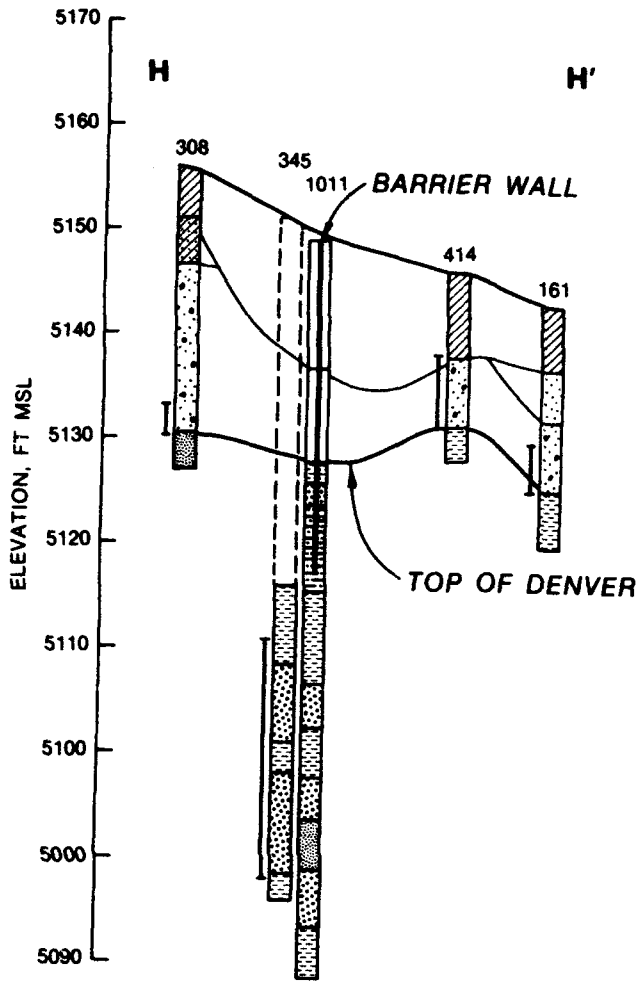
(2)





DEPARTMENT OF THE ARMY ROCKY MOUNTAIN ARSENAL COMMERCE CITY, COLORADO	
PREPARED BY WATERWAYS EXPERIMENT STATION P. O. BOX 631 VICKSBURG, MS.	ENVIRONMENTAL DIVISION COMPLIANCE AND RESOURCES BRANCH ROCKY MOUNTAIN ARSENAL COMMERCE CITY, COLORADO
DESIGNED BY:	NORTH BOUNDARY CONTAINMENT TREATMENT SYSTEM
DATE:	
DRAWN BY: R. C. HUNT	CROSS SECTIONS E-E', F-F' and G-G'
DATE: FEB 1, 1985	
REVIEWED BY: B. ANDERSON	DRAWING / No. PLATE G-07
DATE: MAR 8, 1985	
APPROVED BY: J. H. MAY	
DATE: MAR 8, 1985	

②



LEGEND

Alluvium (Unified Soil Classification)

- CH, Clay Flat
- CL, Clay, Silty Clay
- ML, Silt
- SC, Clayey Sand
- SM, Silty Sand
- SP, Sand
- SP-GP, Gravelly Sand

Denver

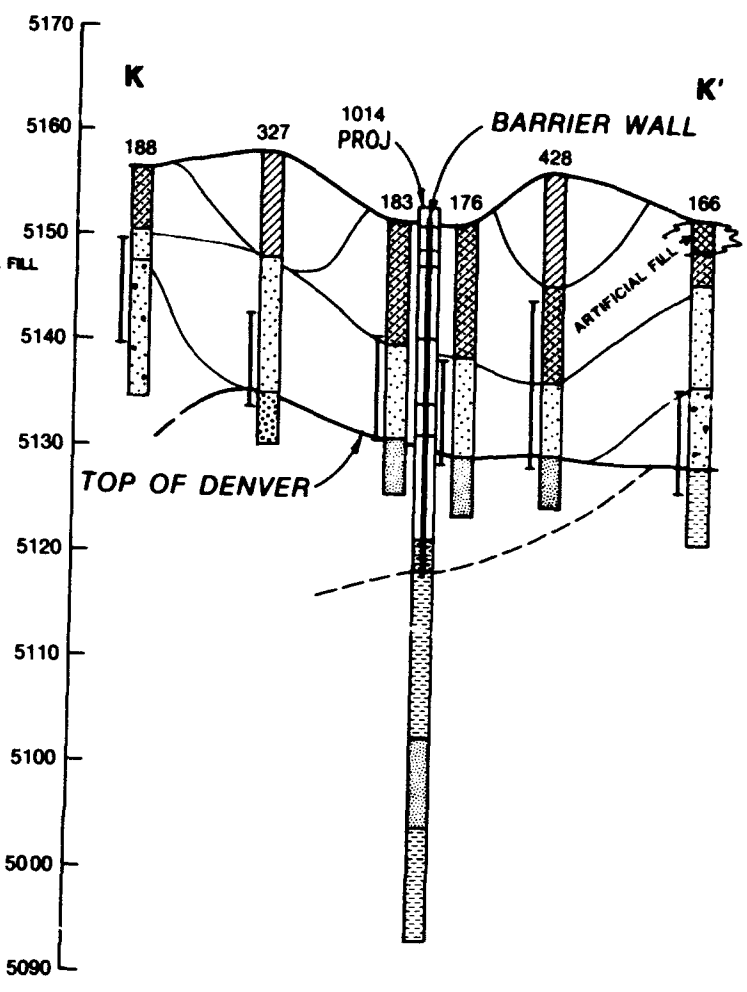
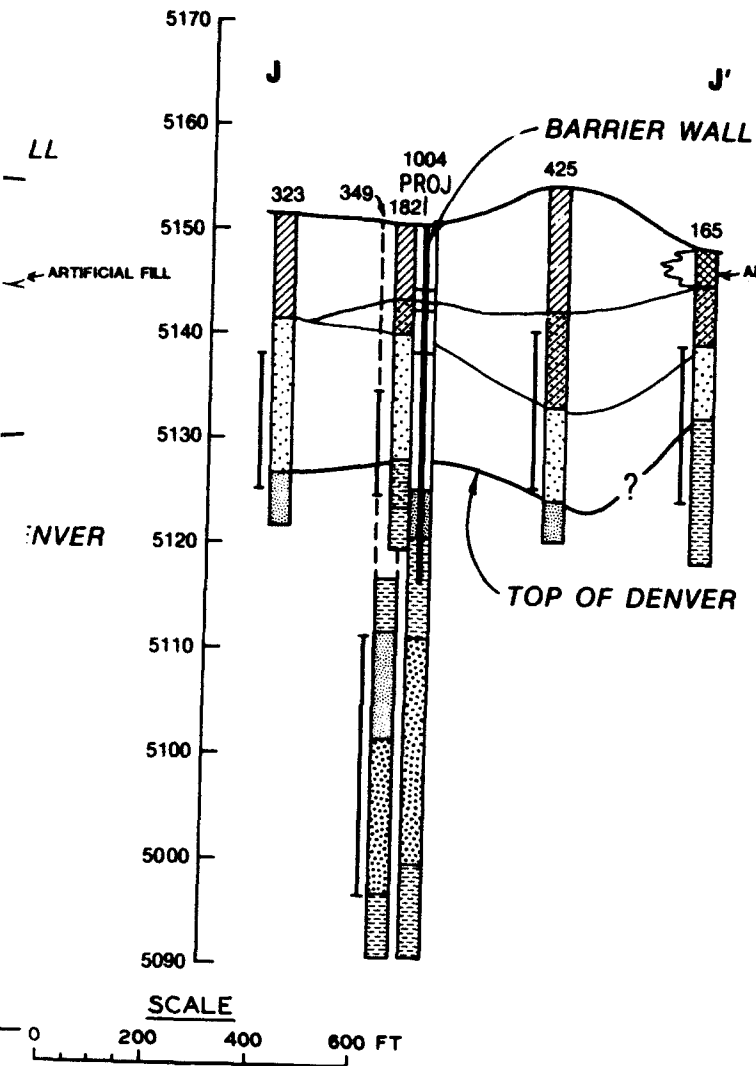
- Clayshale, Claystone
- Sandy Clayshale, Clayshale w/Sand-Silt Lenses
- Silt, Siltstone, Sandy Siltstone
- Sand, Sandstone, Silty Sandstone

SCREENED INTERVAL

SCALE



①

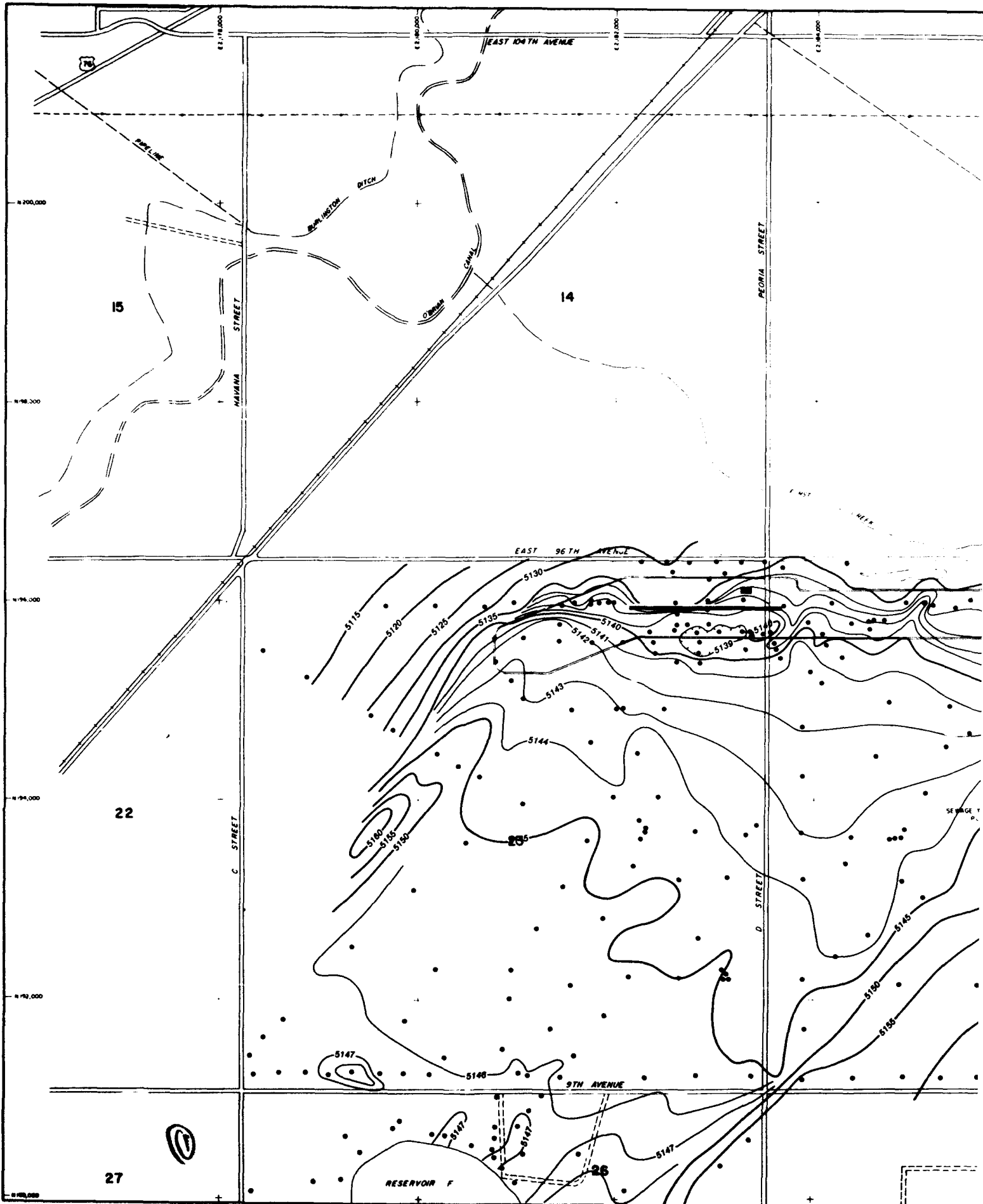


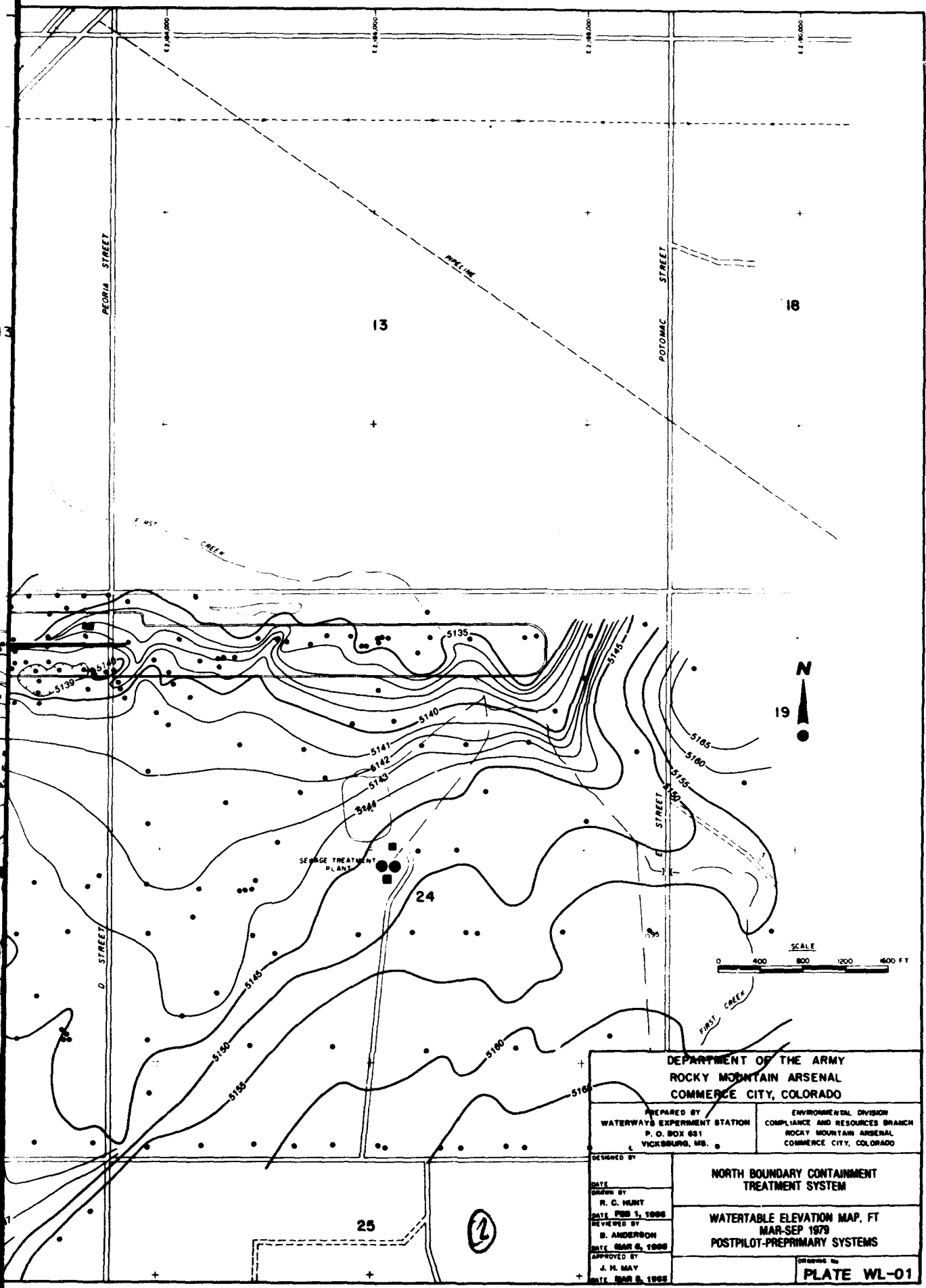
DEPARTMENT OF THE ARMY ROCKY MOUNTAIN ARSENAL COMMERCE CITY, COLORADO	
PREPARED BY WATERWAYS EXPERIMENT STATION P. O. BOX 631 VICKSBURG, MS.	ENVIRONMENTAL DIVISION COMPLIANCE AND RESOURCES BRANCH ROCKY MOUNTAIN ARSENAL COMMERCE CITY, COLORADO
DESIGNED BY	NORTH BOUNDARY CONTAINMENT TREATMENT SYSTEM
DATE	
DRAWN BY: R. C. HUNT DATE: FEB 1, 1985	CROSS SECTIONS H-H', I-I', J-J' and K-K'
REVIEWED BY: B. ANDERSON DATE: MAR 8, 1985	
APPROVED BY: J. H. MAY DATE: MAR 8, 1985	
	DRAWING No. PLATE G-08

2

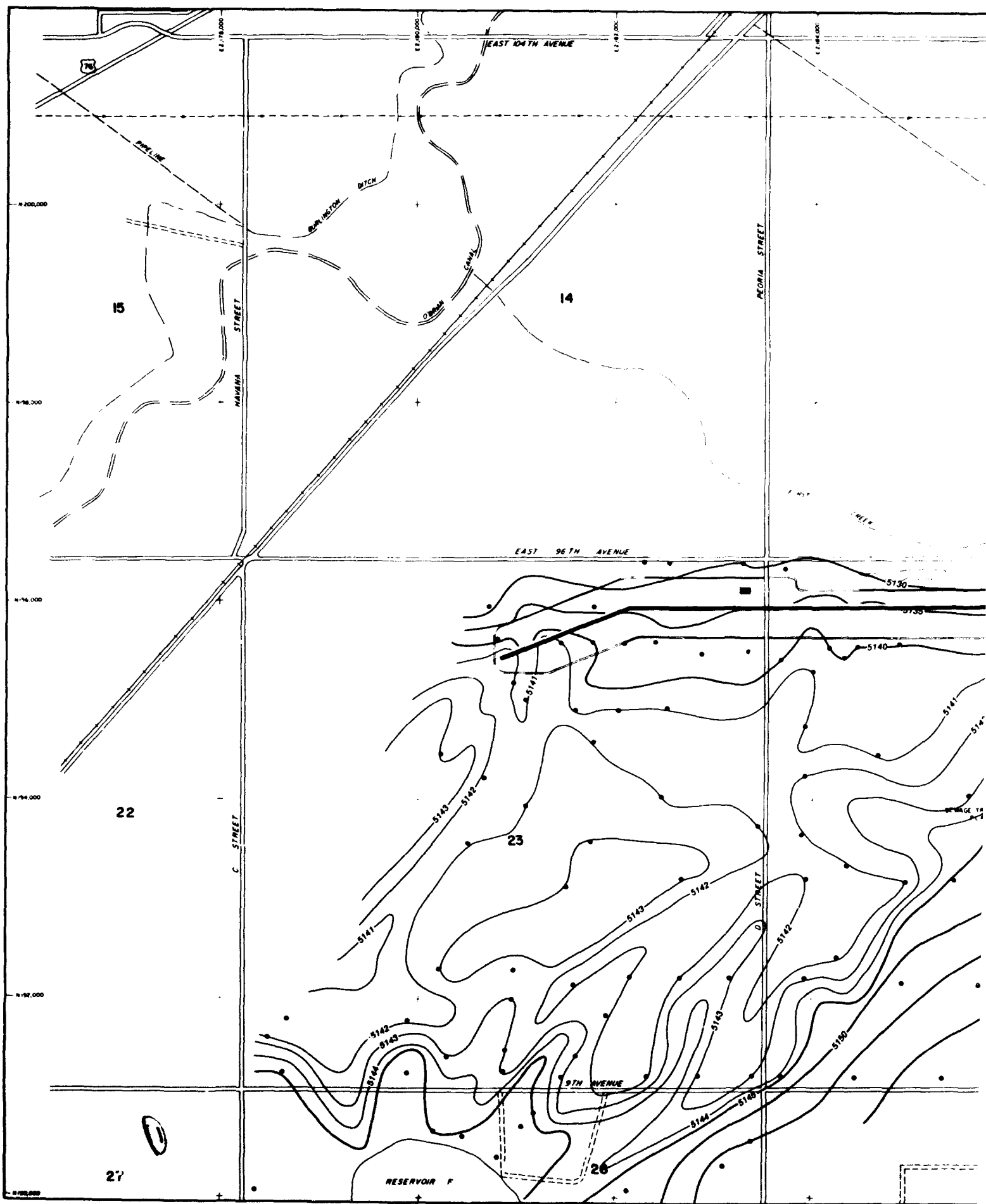
HYDROLOGY PLATES

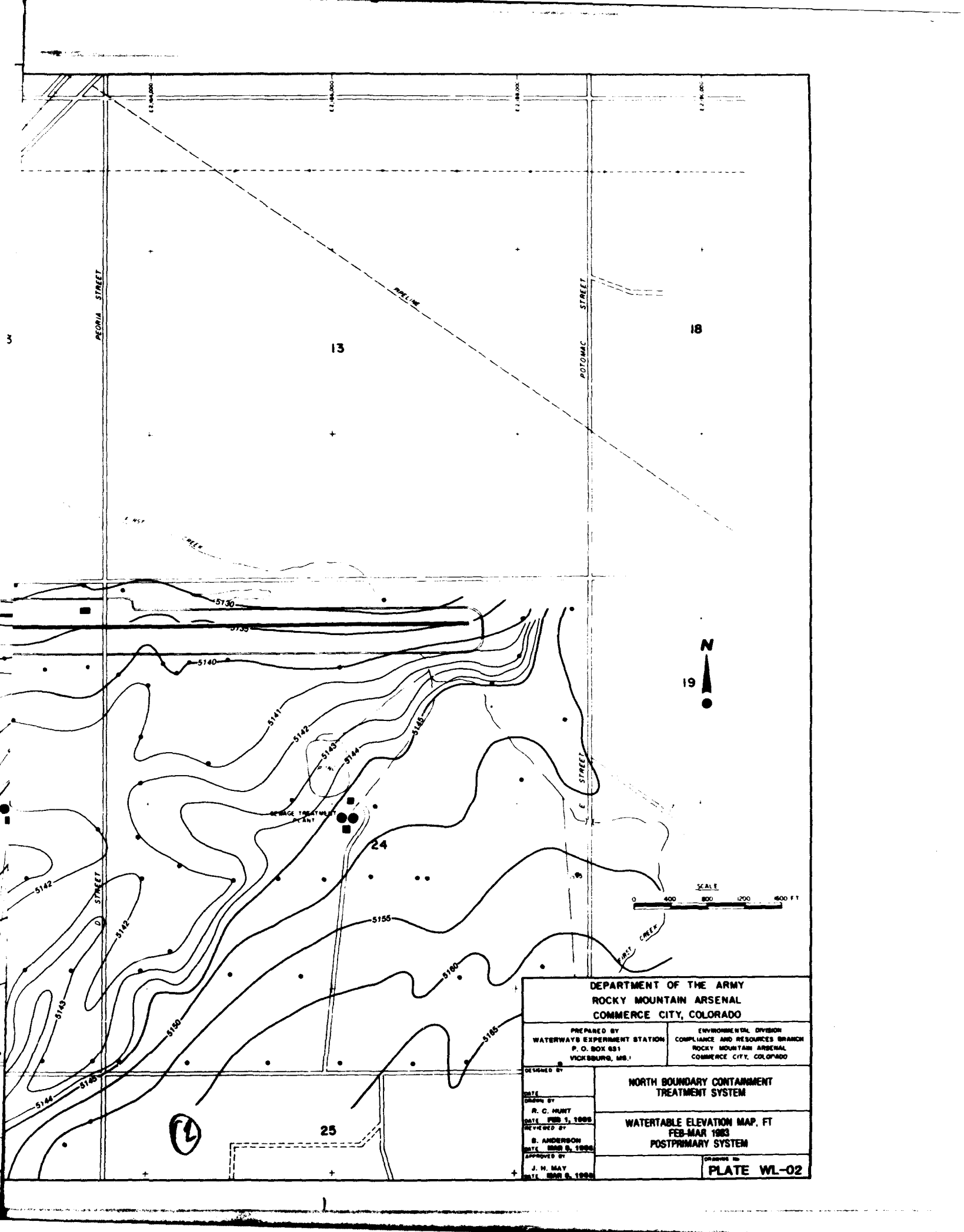
WL-01 thru WL-05





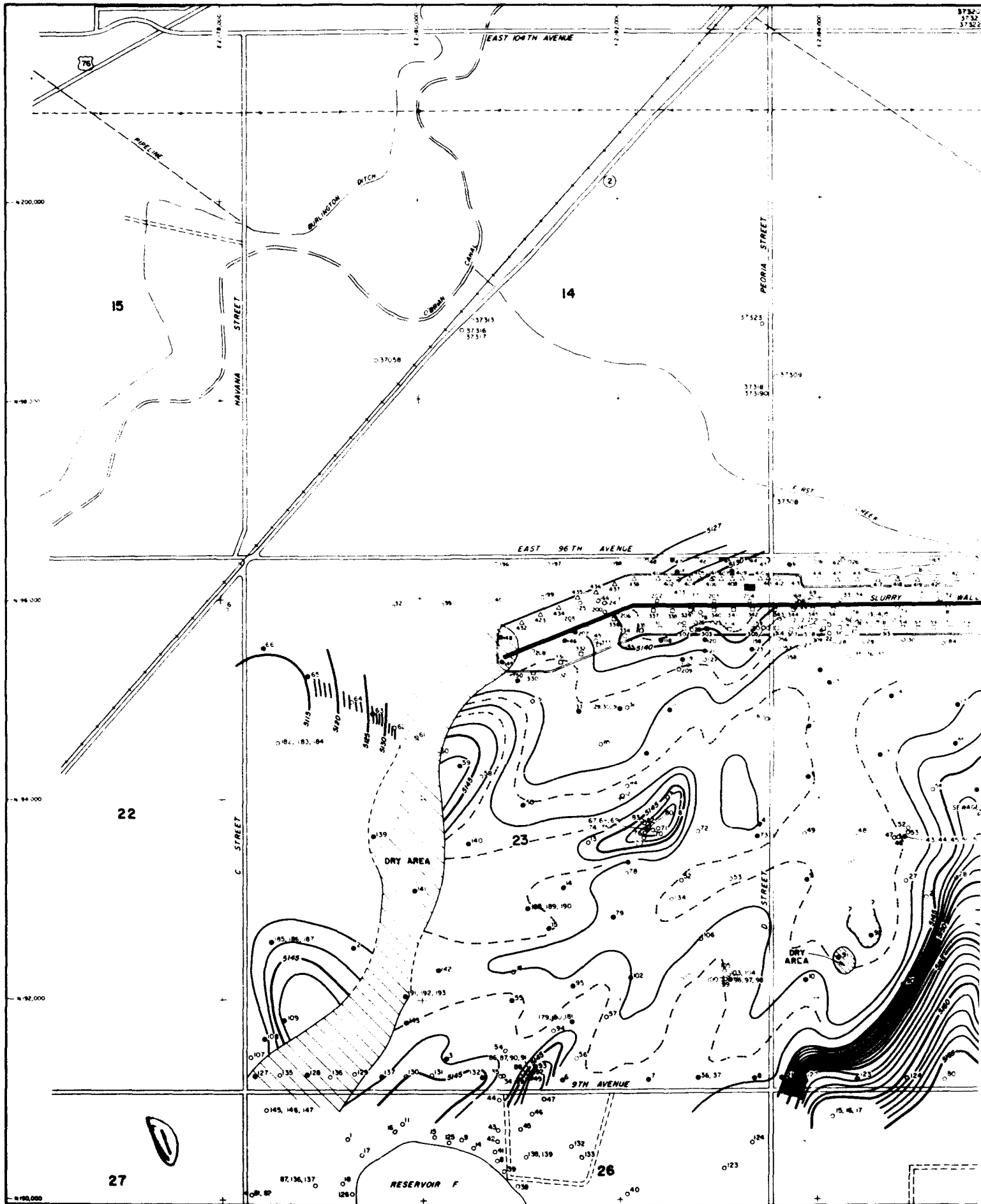
DEPARTMENT OF THE ARMY ROCKY MOUNTAIN ARSENAL COMMERCE CITY, COLORADO	
PREPARED BY WATERWAYS EXPERIMENT STATION P. O. BOX 651 VICKSBURG, MS.	ENVIRONMENTAL DIVISION COMPLIANCE AND RESOURCES BRANCH ROCKY MOUNTAIN ARSENAL COMMERCE CITY, COLORADO
DESIGNED BY DATE DRAWN BY R. C. HUNT DATE FEB 1, 1988 REVIEWED BY B. ANDERSON DATE MAR 8, 1988 APPROVED BY J. M. MAY DATE MAR 8, 1988	NORTH BOUNDARY CONTAINMENT TREATMENT SYSTEM WATERTABLE ELEVATION MAP, FT MAR-SEP 1979 POSTPILOT-PREPRIMARY SYSTEMS
25 ②	DRAWING NO. PLATE WL-01

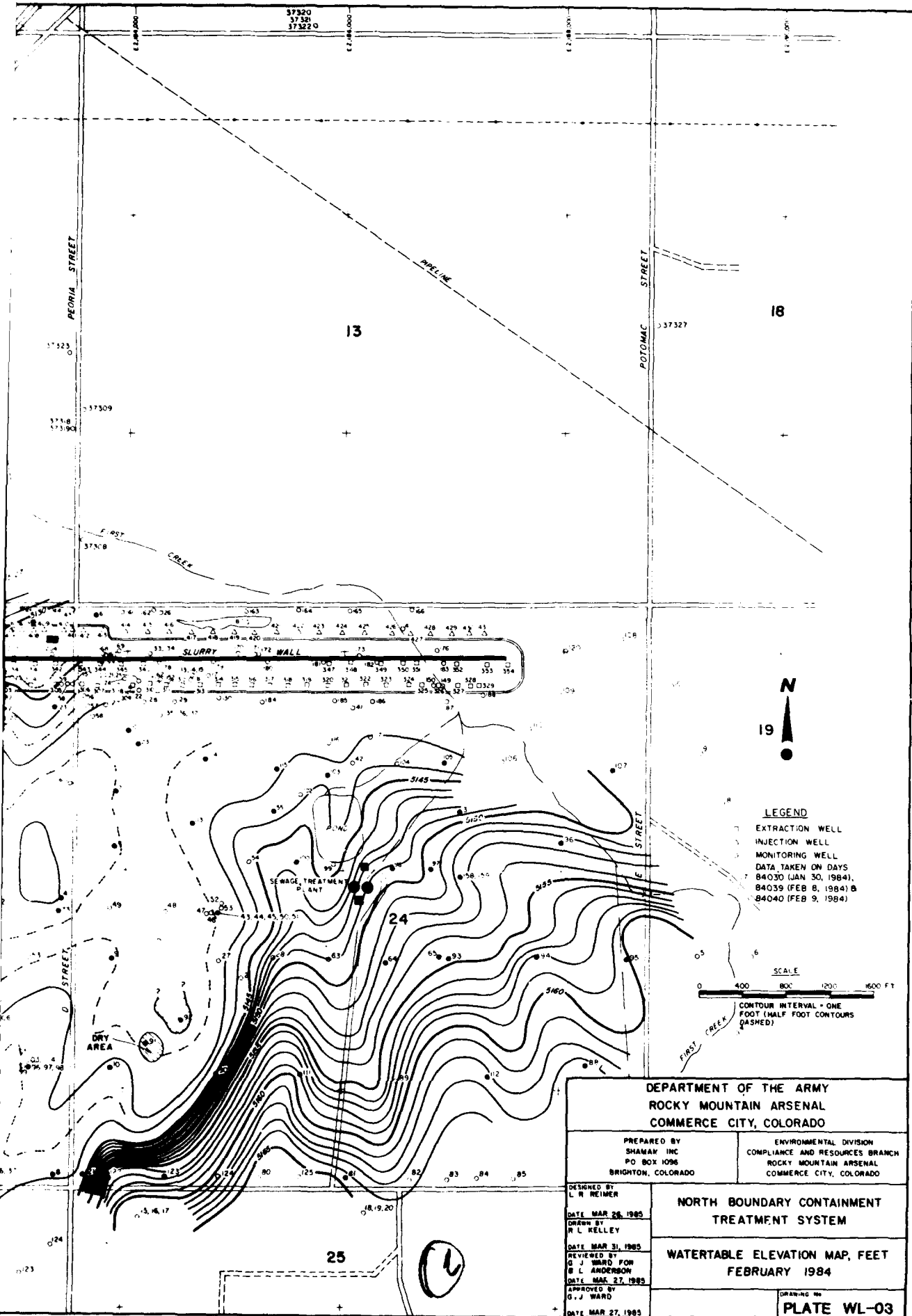




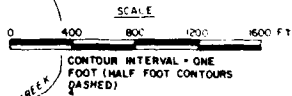
DEPARTMENT OF THE ARMY ROCKY MOUNTAIN ARSENAL COMMERCE CITY, COLORADO	
PREPARED BY WATERWAYS EXPERIMENT STATION P. O. BOX 631 VICKSBURG, MS.	ENVIRONMENTAL DIVISION COMPLIANCE AND RESOURCES BRANCH ROCKY MOUNTAIN ARSENAL COMMERCE CITY, COLORADO
DESIGNED BY DATE DRAWN BY R. C. HUNT DATE FEB 5, 1983 REVIEWED BY B. ANDERSON DATE MAR 9, 1983 APPROVED BY J. M. MAY DATE MAR 9, 1983	NORTH BOUNDARY CONTAINMENT TREATMENT SYSTEM WATERTABLE ELEVATION MAP, FT FEB-MAR 1983 POSTPRIMARY SYSTEM
	DRAWING NO PLATE WL-02

④

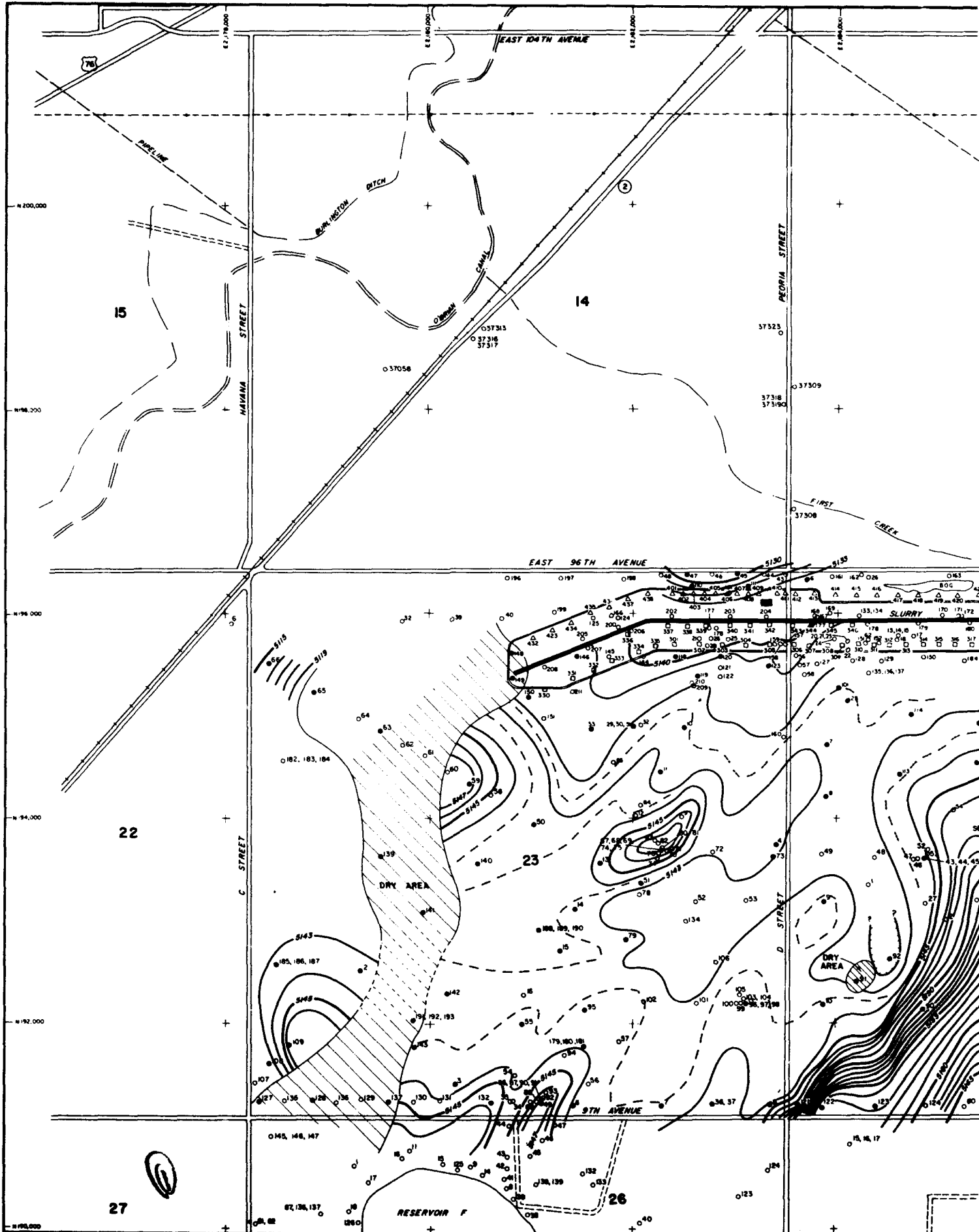


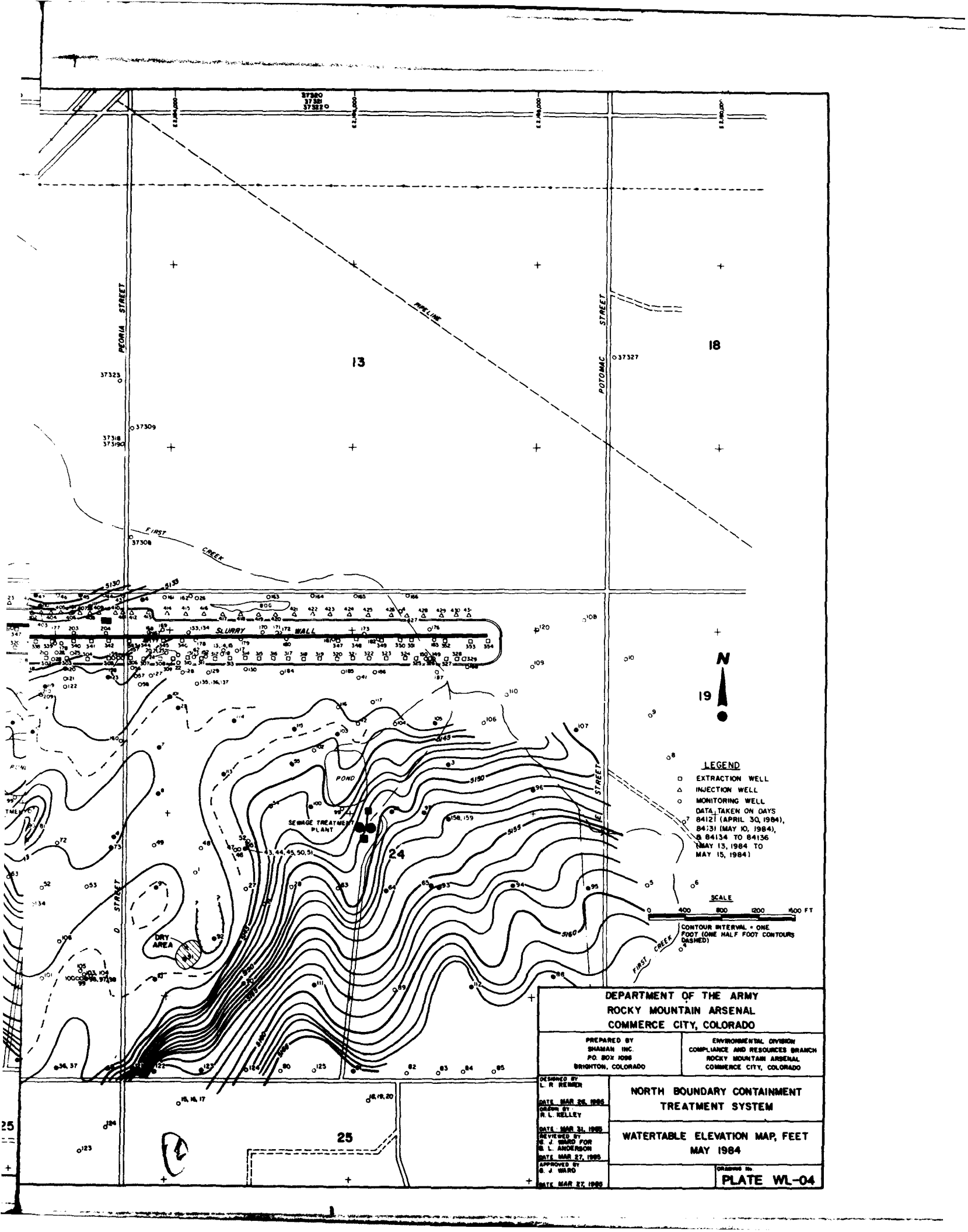


- LEGEND**
- EXTRACTION WELL
 - INJECTION WELL
 - MONITORING WELL
 - DATA TAKEN ON DAYS
 - 84030 (JAN 30, 1984)
 - 84039 (FEB 8, 1984) B
 - 84040 (FEB 9, 1984)



DEPARTMENT OF THE ARMY ROCKY MOUNTAIN ARSENAL COMMERCE CITY, COLORADO	
PREPARED BY SHAMAK INC PO BOX 1096 BRIGHTON, COLORADO	ENVIRONMENTAL DIVISION COMPLIANCE AND RESOURCES BRANCH ROCKY MOUNTAIN ARSENAL COMMERCE CITY, COLORADO
DESIGNED BY L. R. REIMER DATE MAR 26, 1985 DRAWN BY R. L. KELLEY DATE MAR 31, 1985 REVIEWED BY G. J. WARD FOR B. L. ANDERSON DATE MAR 27, 1985 APPROVED BY G. J. WARD DATE MAR 27, 1985	NORTH BOUNDARY CONTAINMENT TREATMENT SYSTEM WATERTABLE ELEVATION MAP, FEET FEBRUARY 1984
	DRAWING NO. PLATE WL-03





PEORIA STREET

POTOMAC STREET

13

18

FIRST CREEK

N

19

LEGEND

- EXTRACTION WELL
- △ INJECTION WELL
- MONITORING WELL
- DATA TAKEN ON DAYS
84121 (APRIL 30, 1984),
84131 (MAY 10, 1984),
& 84134 TO 84136
(MAY 13, 1984 TO
MAY 15, 1984)

SCALE

0 400 800 1200 1600 FT

CONTOUR INTERVAL - ONE
FOOT (ONE HALF FOOT CONTOURS
DASHED)

DEPARTMENT OF THE ARMY
ROCKY MOUNTAIN ARSENAL
COMMERCE CITY, COLORADO

PREPARED BY
SHAMAN INC.
P.O. BOX 1098
BRIGHTON, COLORADO

ENVIRONMENTAL DIVISION
COMPLIANCE AND RESOURCES BRANCH
ROCKY MOUNTAIN ARSENAL
COMMERCE CITY, COLORADO

**NORTH BOUNDARY CONTAINMENT
TREATMENT SYSTEM**

**WATERTABLE ELEVATION MAP, FEET
MAY 1984**

DESIGNED BY
L. R. REMMER
DATE MAR 26, 1983
DRAWN BY
R. L. KELLEY
DATE MAR 31, 1983
REVIEWED BY
R. J. WARD FOR
R. L. ANDERSON
DATE MAR 27, 1983
APPROVED BY
R. J. WARD
DATE MAR 27, 1983

DRAWING NO.
PLATE WL-04

37380
37375
37370

37325

37309

37318
37310

37308

37327

PIPELINE

SLURRY WALL

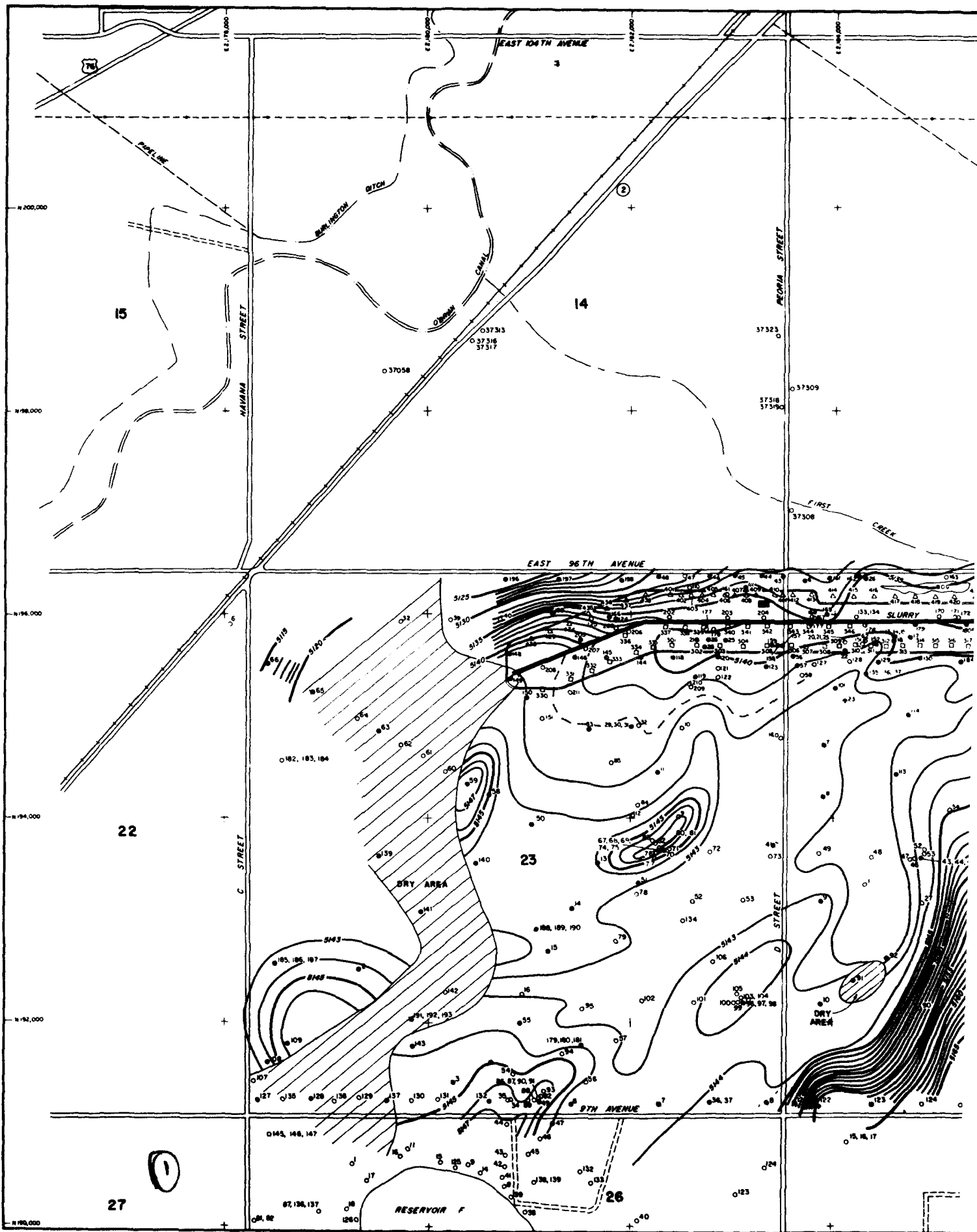
SEWAGE TREATMENT PLANT

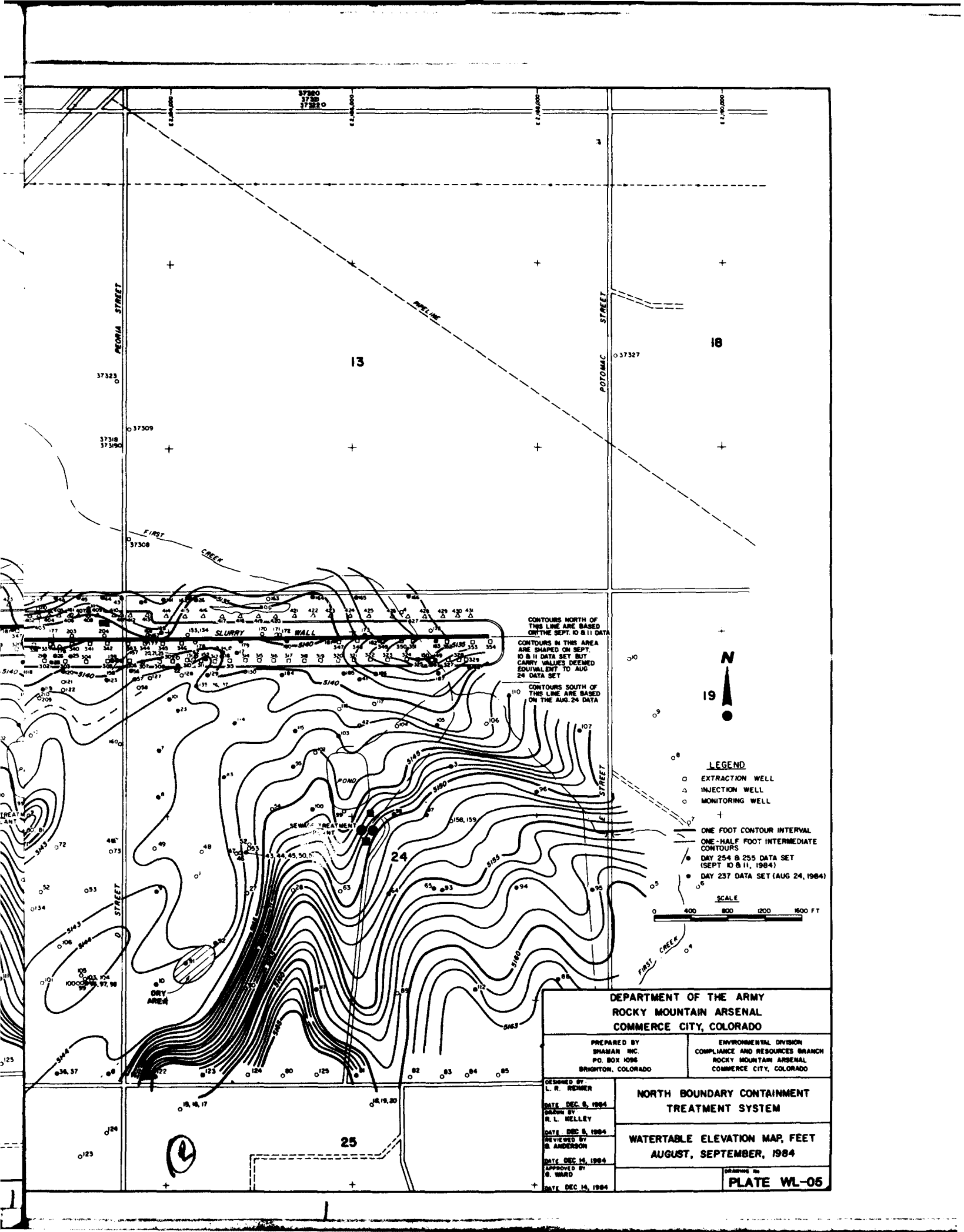
POND

DRY AREA

25

25





CONTOURS NORTH OF THIS LINE ARE BASED ON THE SEPT. 10 & 11 DATA

CONTOURS IN THIS AREA ARE SHAPED ON SEPT. 10 & 11 DATA SET BUT CARRY VALUES DEEMED EQUIVALENT TO AUG. 24 DATA SET

CONTOURS SOUTH OF THIS LINE ARE BASED ON THE AUG. 24 DATA



LEGEND

- EXTRACTION WELL
- △ INJECTION WELL
- ◇ MONITORING WELL
- +

ONE FOOT CONTOUR INTERVAL
ONE-HALF FOOT INTERMEDIATE CONTOURS

- DAY 254 & 255 DATA SET (SEPT. 10 & 11, 1984)
- DAY 237 DATA SET (AUG. 24, 1984)

SCALE

0 400 800 1200 1600 FT

**DEPARTMENT OF THE ARMY
ROCKY MOUNTAIN ARSENAL
COMMERCE CITY, COLORADO**

PREPARED BY SHAMAN INC. P.O. BOX 1096 BRIGHTON, COLORADO

ENVIRONMENTAL DIVISION COMPLIANCE AND RESOURCES BRANCH ROCKY MOUNTAIN ARSENAL COMMERCE CITY, COLORADO

DESIGNED BY L. R. REMER
DATE DEC 8, 1984
DRAWN BY R. L. KELLEY
DATE DEC 8, 1984
REVIEWED BY S. ANDERSON
DATE DEC 14, 1984
APPROVED BY S. WARD
DATE DEC 14, 1984

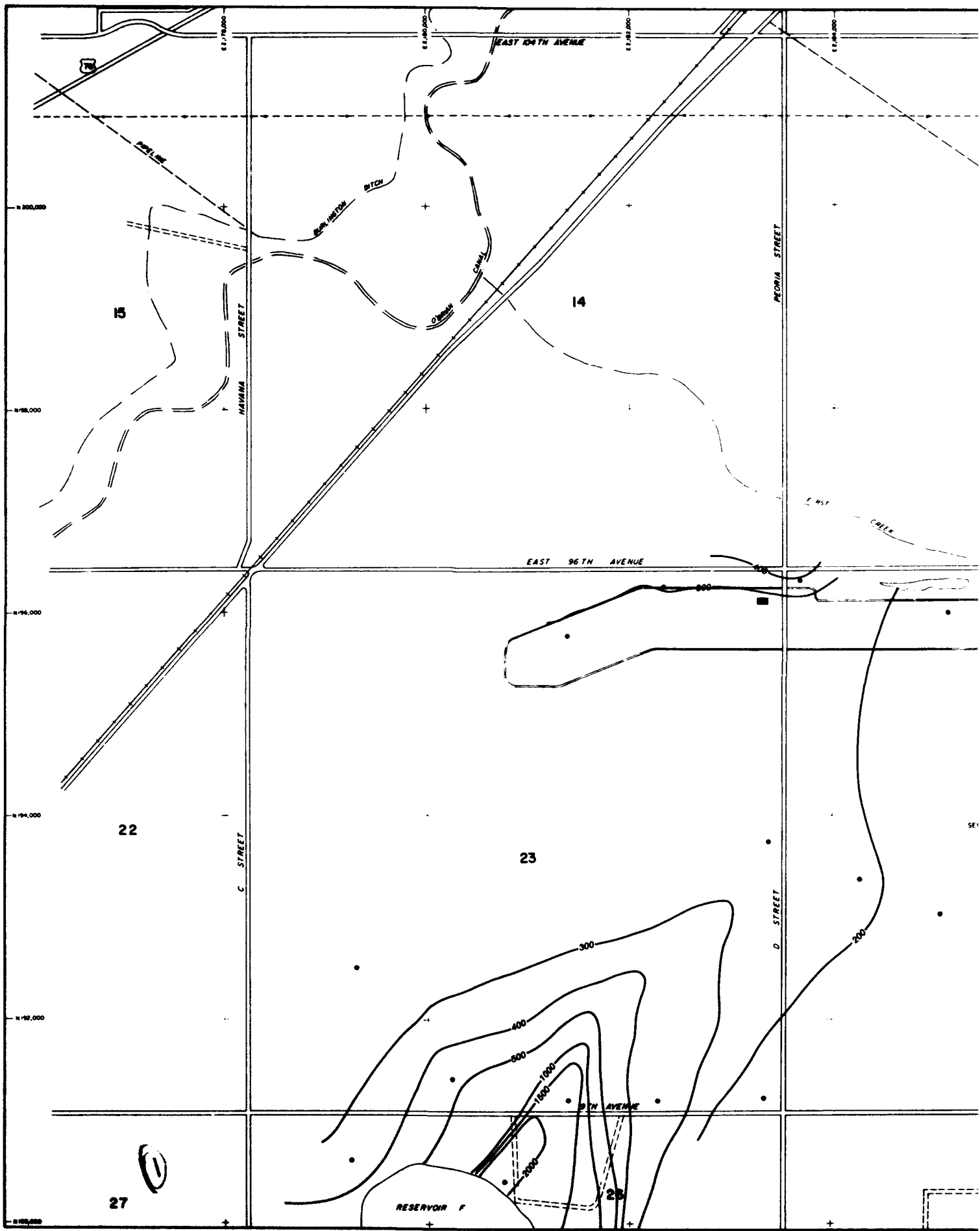
**NORTH BOUNDARY CONTAINMENT
TREATMENT SYSTEM**

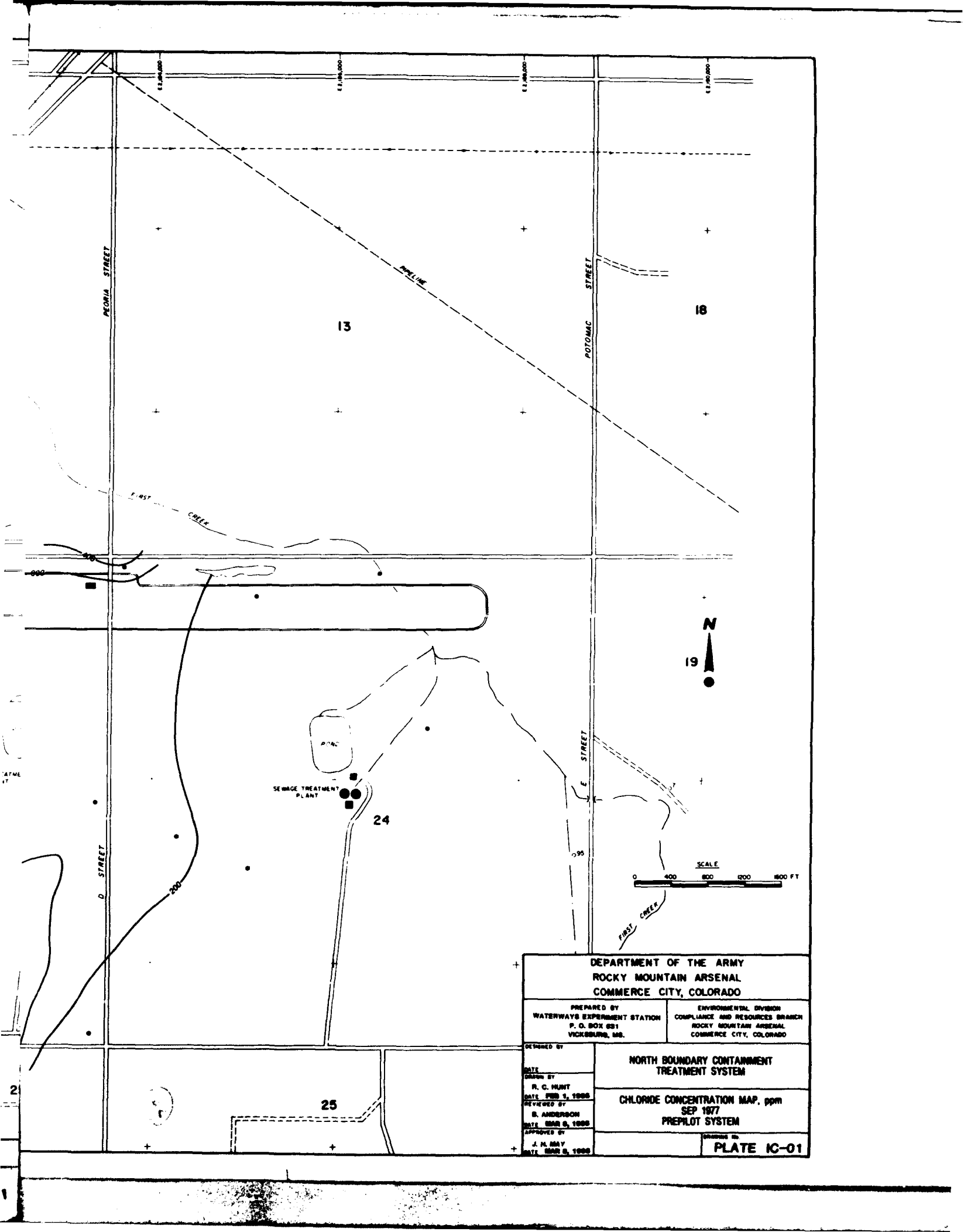
**WATERTABLE ELEVATION MAP, FEET
AUGUST, SEPTEMBER, 1984**

DRAWING NO. **PLATE WL-05**

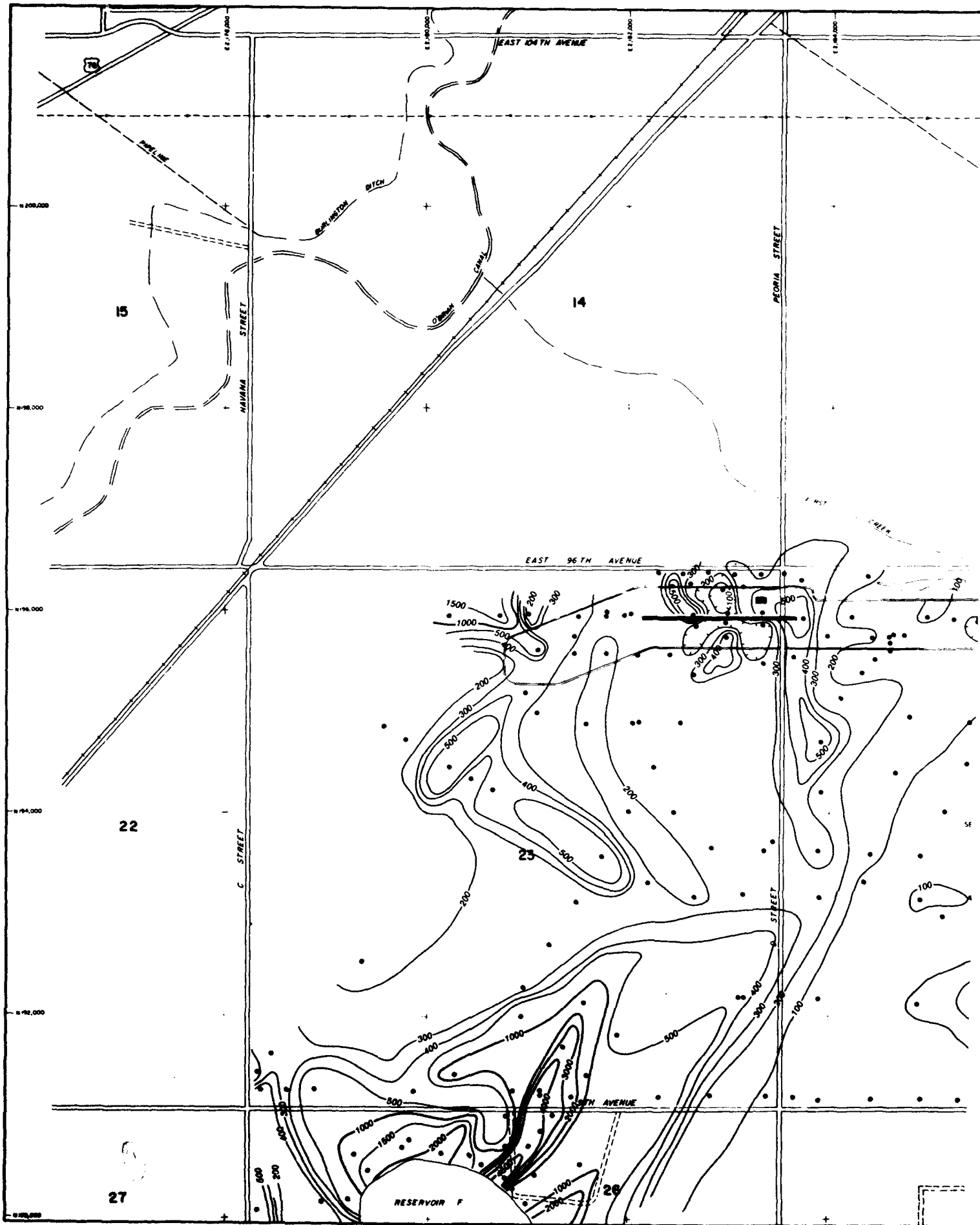
CONTAMINANT DISTRIBUTION PLATES

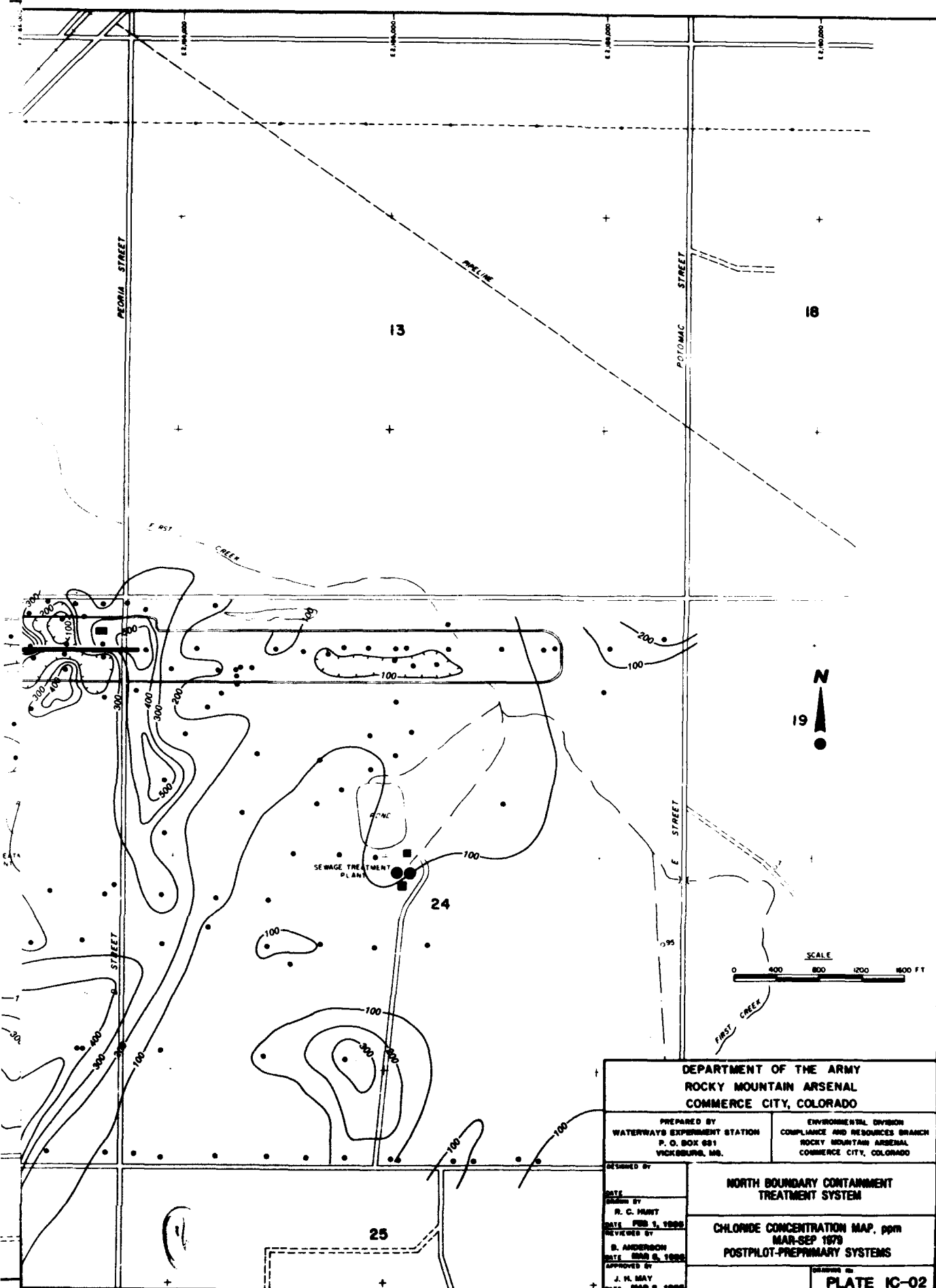
IC-01 thru IC-47





DEPARTMENT OF THE ARMY ROCKY MOUNTAIN ARSENAL COMMERCE CITY, COLORADO	
PREPARED BY WATERWAYS EXPERIMENT STATION P. O. BOX 631 VICKSBURG, MS.	ENVIRONMENTAL DIVISION COMPLIANCE AND RESOURCES BRANCH ROCKY MOUNTAIN ARSENAL COMMERCE CITY, COLORADO
DESIGNED BY DATE DRAWN BY R. C. HUNT DATE FEB 1, 1986 REVIEWED BY B. ANDERSON DATE MAR 6, 1986 APPROVED BY J. H. MAY DATE MAR 6, 1986	NORTH BOUNDARY CONTAINMENT TREATMENT SYSTEM CHLORIDE CONCENTRATION MAP, ppm SEP 1977 PREPILOT SYSTEM <small>PLATE NO.</small> PLATE IC-01





**DEPARTMENT OF THE ARMY
ROCKY MOUNTAIN ARSENAL
COMMERCE CITY, COLORADO**

PREPARED BY
WATERWAYS EXPERIMENT STATION
P. O. BOX 681
VICKSBURG, MS.

ENVIRONMENTAL DIVISION
COMPLIANCE AND RESOURCES BRANCH
ROCKY MOUNTAIN ARSENAL
COMMERCE CITY, COLORADO

DESIGNED BY
DATE
DRAWN BY
R. C. HUNT
DATE FEB 5, 1988
REVIEWED BY
B. ANDERSON
DATE MAR 8, 1988
APPROVED BY
J. H. MAY
DATE MAR 8, 1988

**NORTH BOUNDARY CONTAINMENT
TREATMENT SYSTEM**

**CHLORIDE CONCENTRATION MAP, ppm
MAR-SEP 1979
POSTPILOT-PREPRIMARY SYSTEMS**

DRAWN BY
PLATE IC-02

25

24

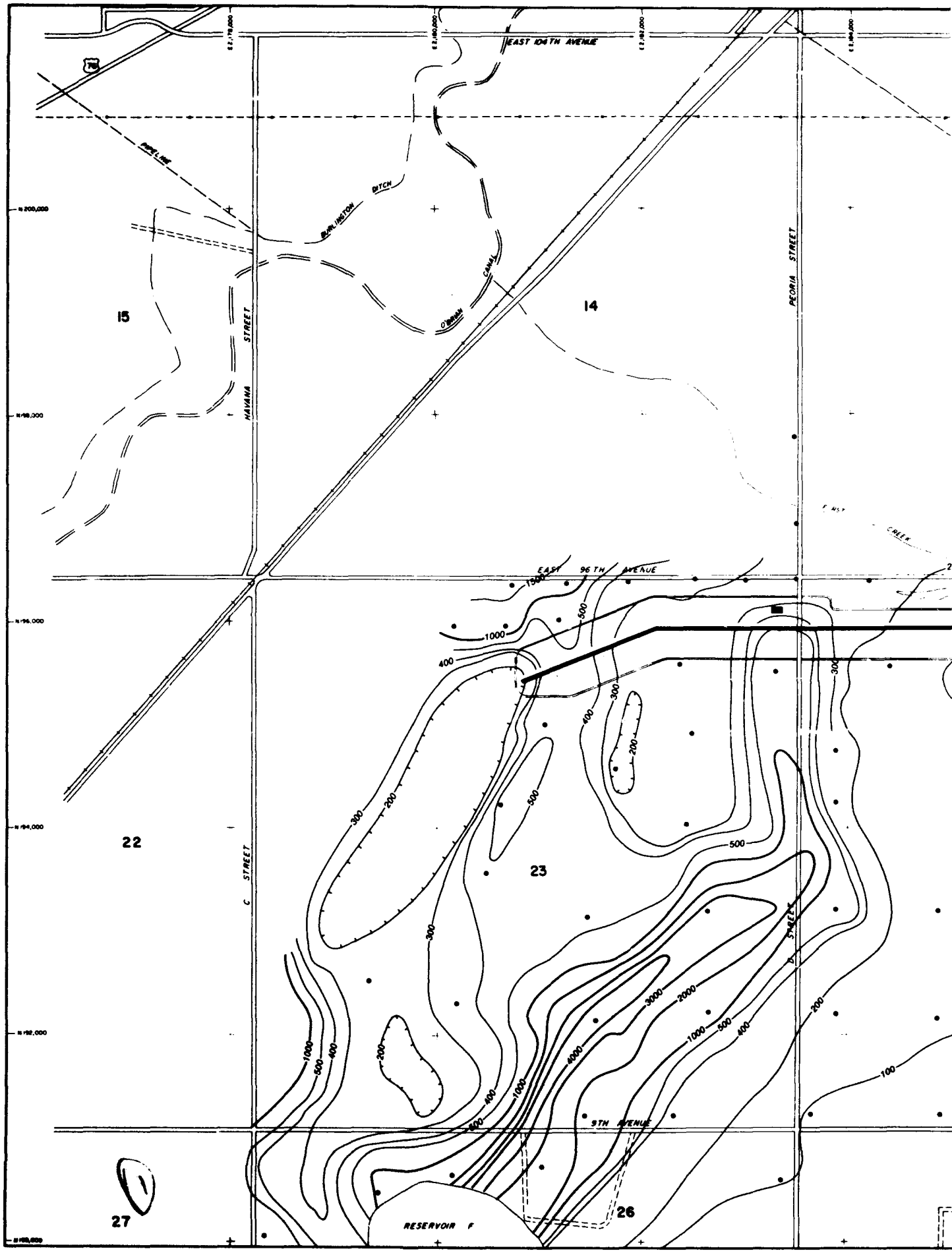
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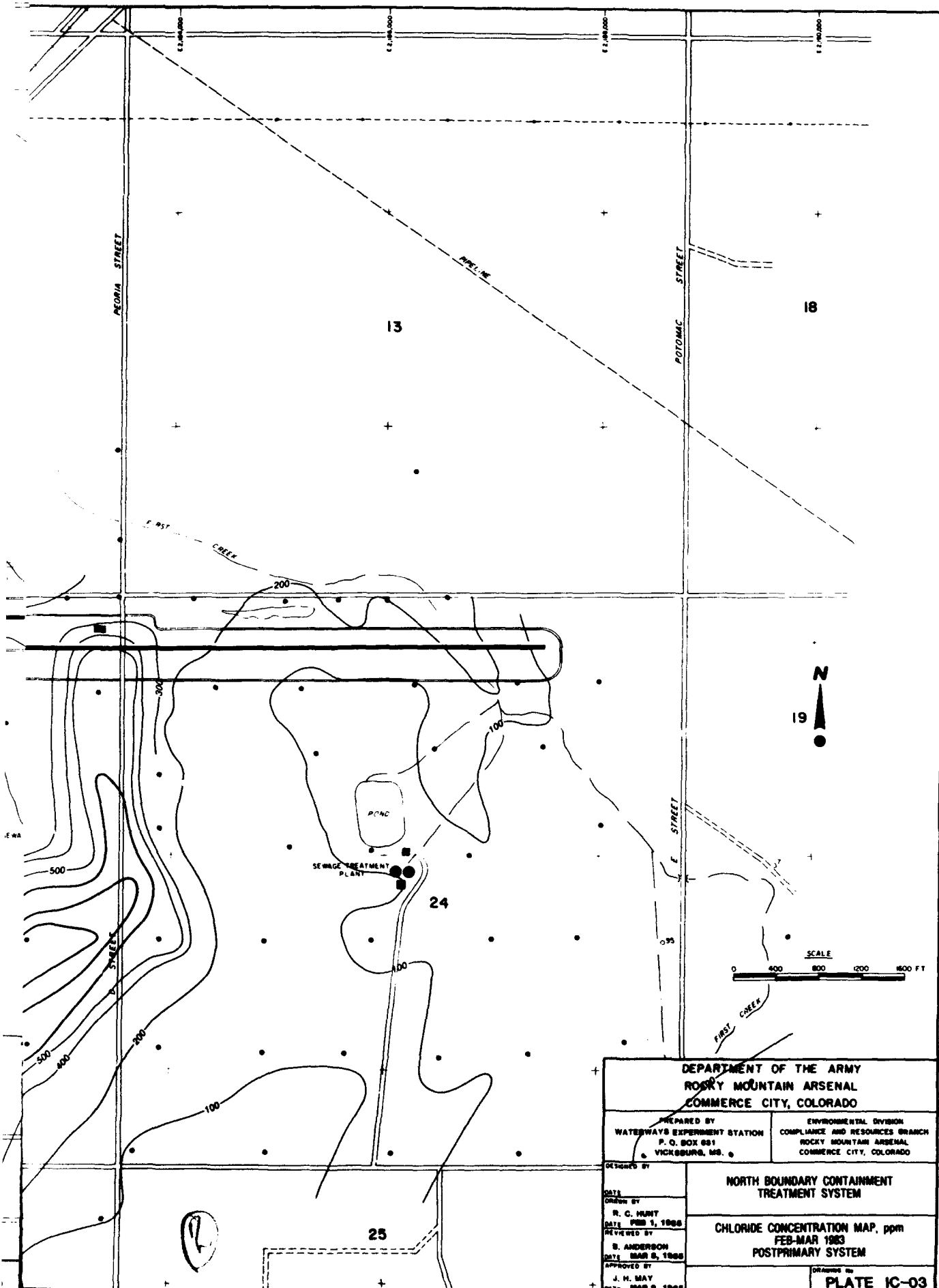
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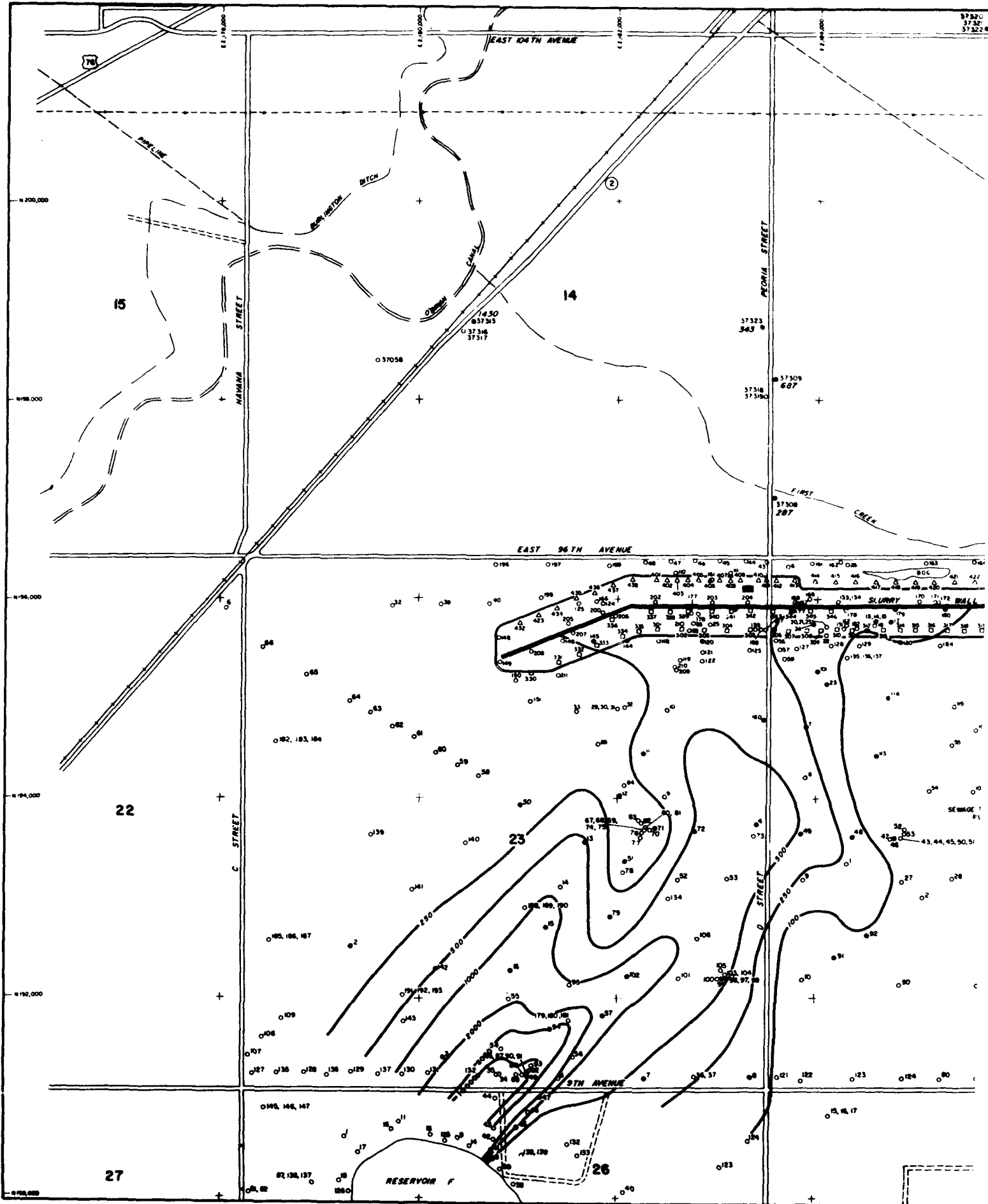
N

SCALE
0 400 800 1200 1600 FT





DEPARTMENT OF THE ARMY ROCKY MOUNTAIN ARSENAL COMMERCE CITY, COLORADO	
PREPARED BY WATERWAYS EXPERIMENT STATION P. O. BOX 681 VICKSBURG, MS.	ENVIRONMENTAL DIVISION COMPLIANCE AND RESOURCES BRANCH ROCKY MOUNTAIN ARSENAL COMMERCE CITY, COLORADO
DESIGNED BY DATE DRAWN BY R. C. HUNT DATE FEB 1, 1983 REVIEWED BY S. ANDERSON DATE MAR 8, 1983 APPROVED BY J. H. MAY DATE MAR 8, 1983	NORTH BOUNDARY CONTAINMENT TREATMENT SYSTEM CHLORIDE CONCENTRATION MAP, ppm FEB-MAR 1983 POSTPRIMARY SYSTEM
	DRAWING NO. PLATE IC-03



37320
37321
37322

EAST 104TH AVENUE

PIPELINE

DITCH

CANAL

15

14

37323
3463

37309
687

37318
37319

FIRST
37308
287

CREEK

EAST 96TH AVENUE

SLURRY

22

23

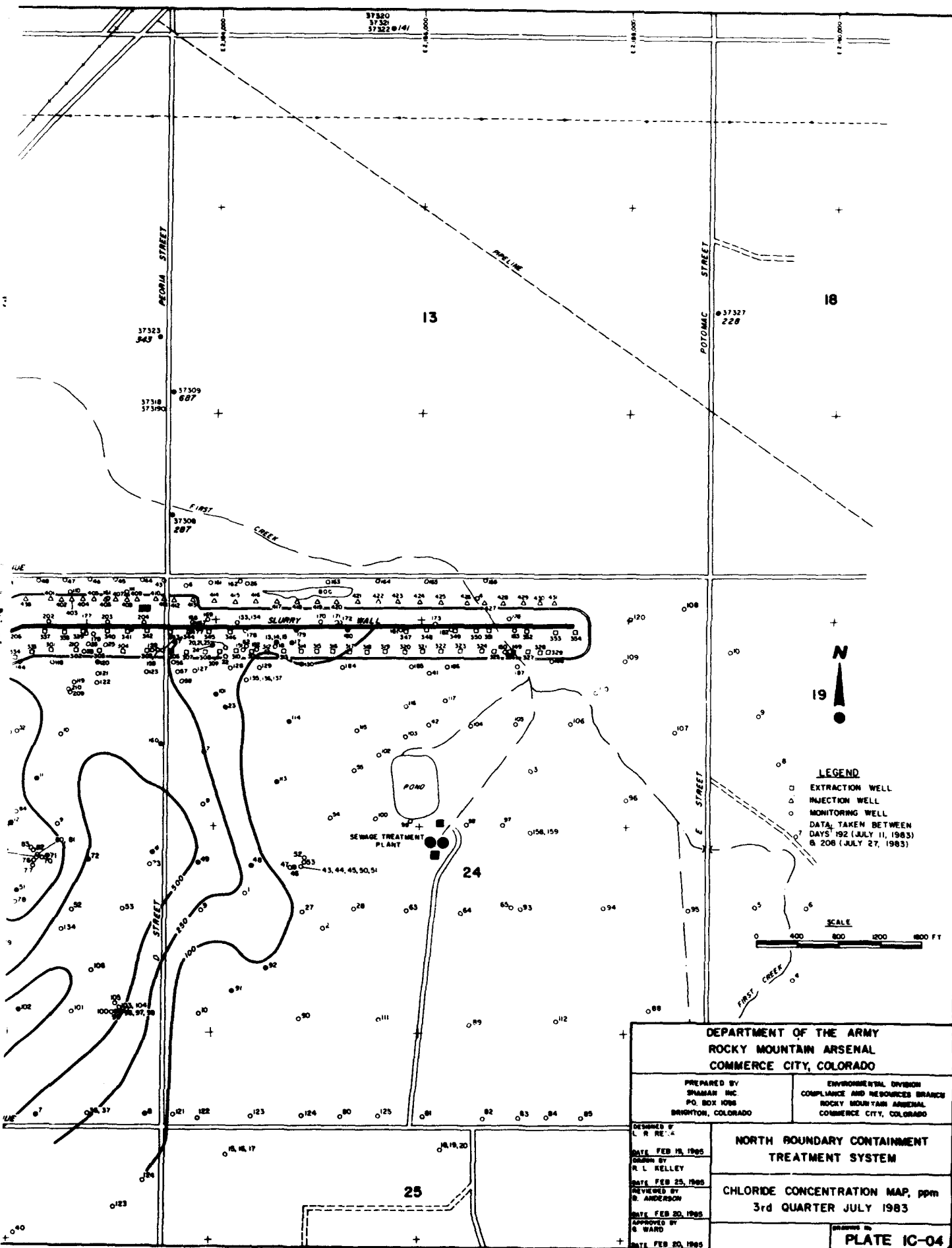
SEWAGE FL

EAST 97TH AVENUE

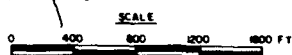
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26

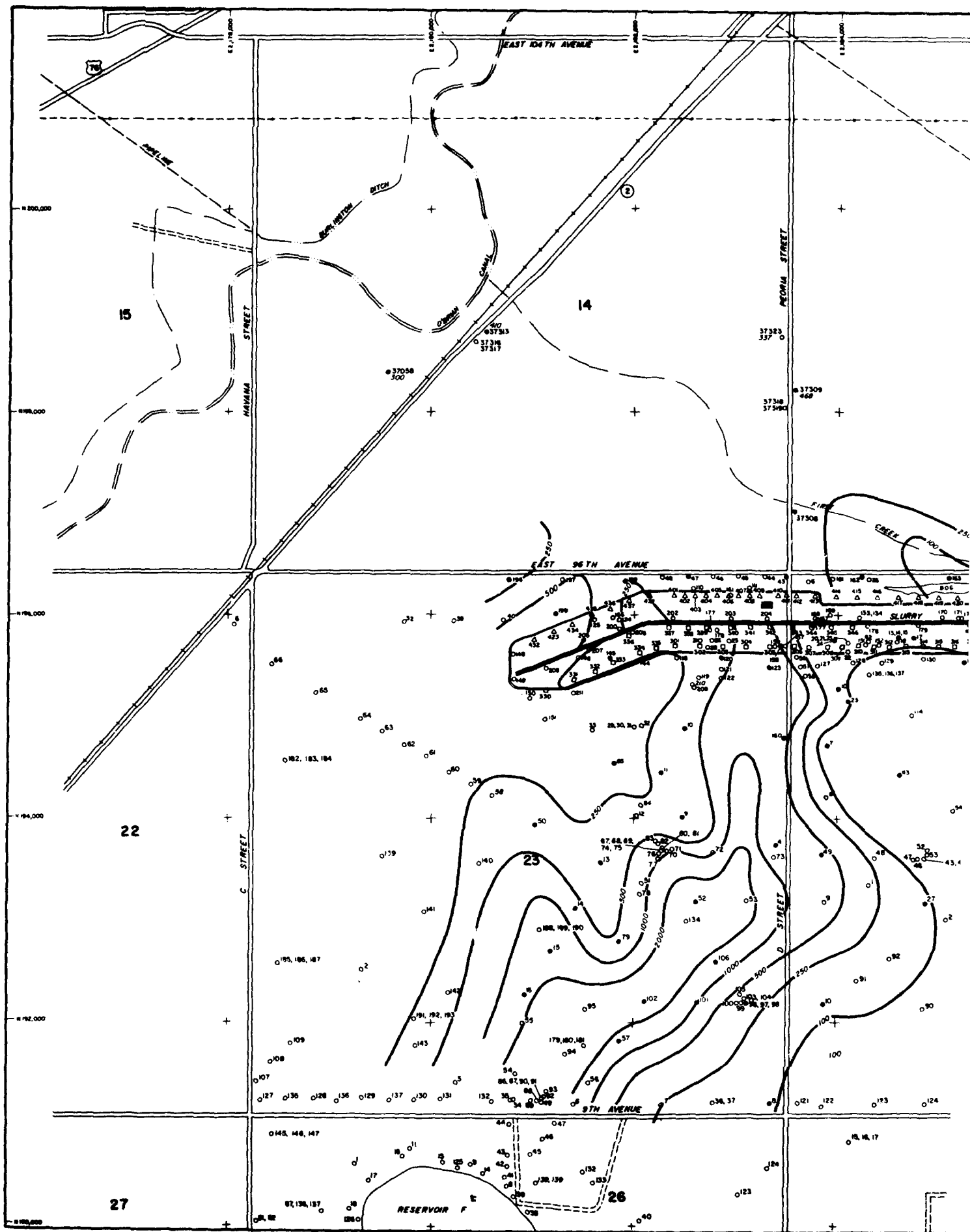
RESERVOIR F

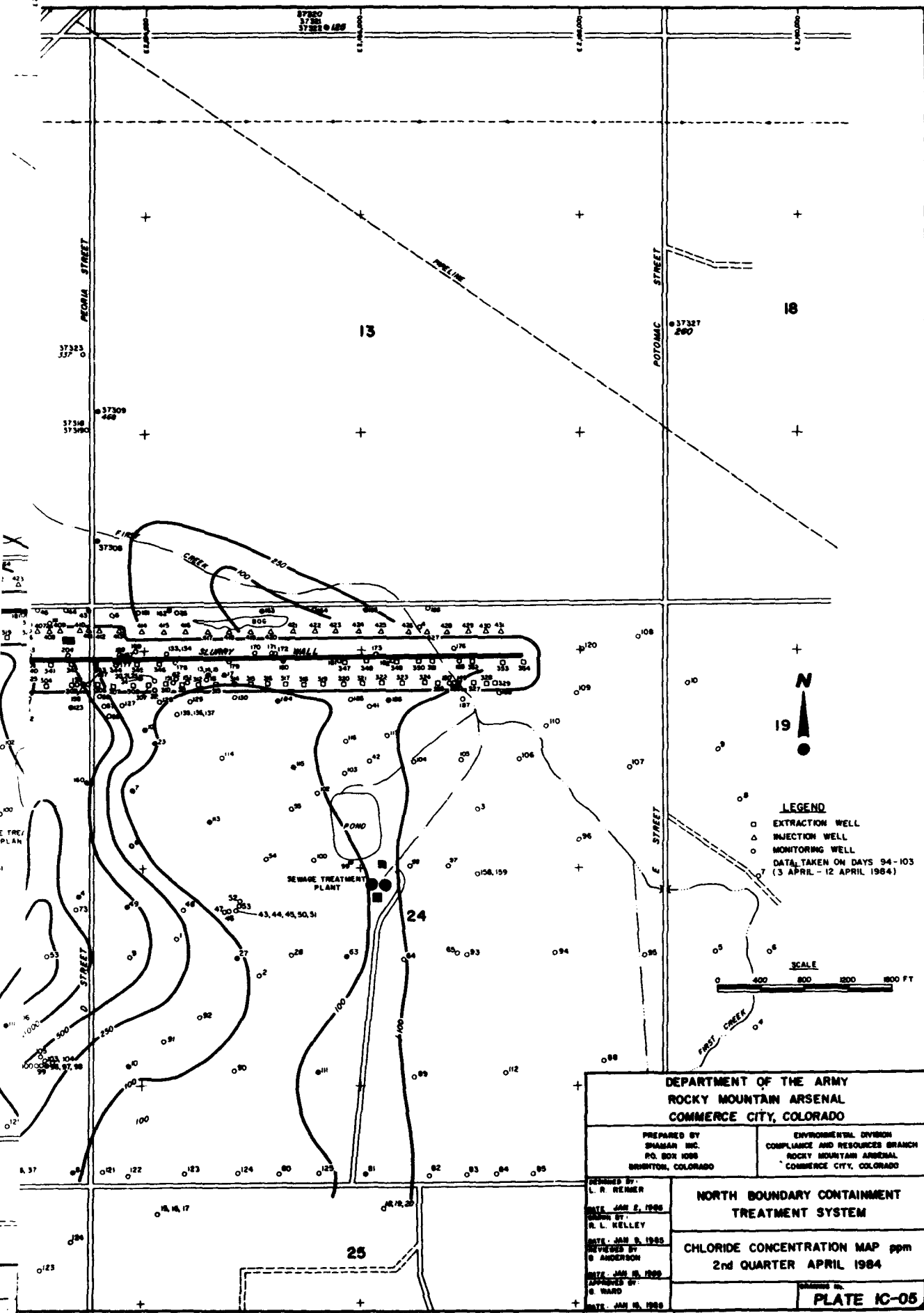


LEGEND
 □ EXTRACTION WELL
 △ INJECTION WELL
 ○ MONITORING WELL
 DATA TAKEN BETWEEN
 DAYS 192 (JULY 11, 1983)
 & 208 (JULY 27, 1983)

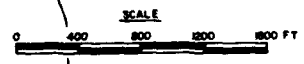


DEPARTMENT OF THE ARMY ROCKY MOUNTAIN ARSENAL COMMERCE CITY, COLORADO	
PREPARED BY SPANAN INC. P.O. BOX 1096 BRIGHTON, COLORADO	ENVIRONMENTAL DIVISION COMPLIANCE AND RESOURCES BRANCH ROCKY MOUNTAIN ARSENAL COMMERCE CITY, COLORADO
DESIGNED BY L. R. RE: 4 DATE FEB 15, 1985 DRAWN BY R. L. KELLEY DATE FEB 25, 1985 REVIEWED BY R. ANDERSON DATE FEB 20, 1985 APPROVED BY S. WARD DATE FEB 20, 1985	NORTH BOUNDARY CONTAINMENT TREATMENT SYSTEM CHLORIDE CONCENTRATION MAP, ppm 3rd QUARTER JULY 1983
	DRAWING NO. PLATE IC-04

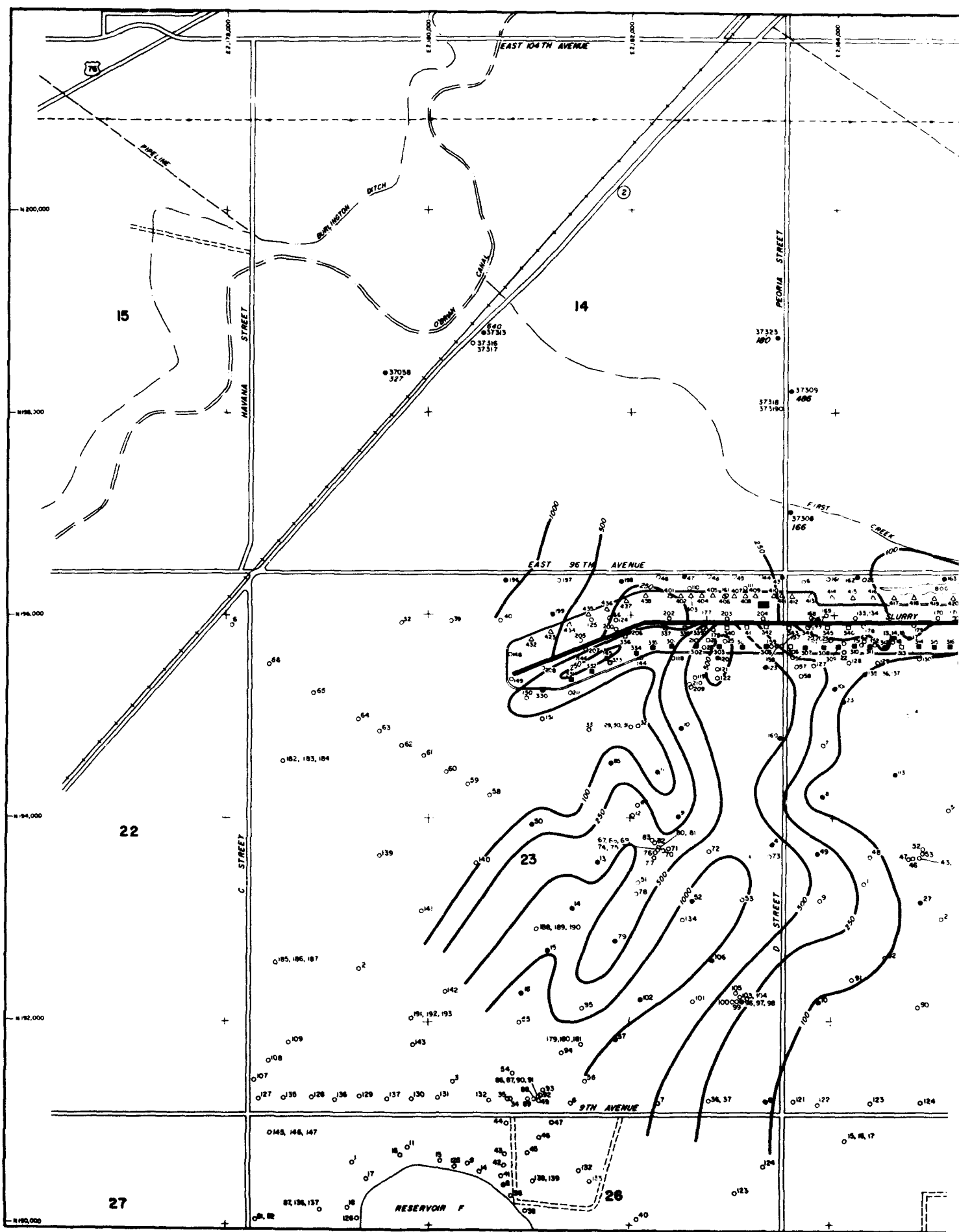


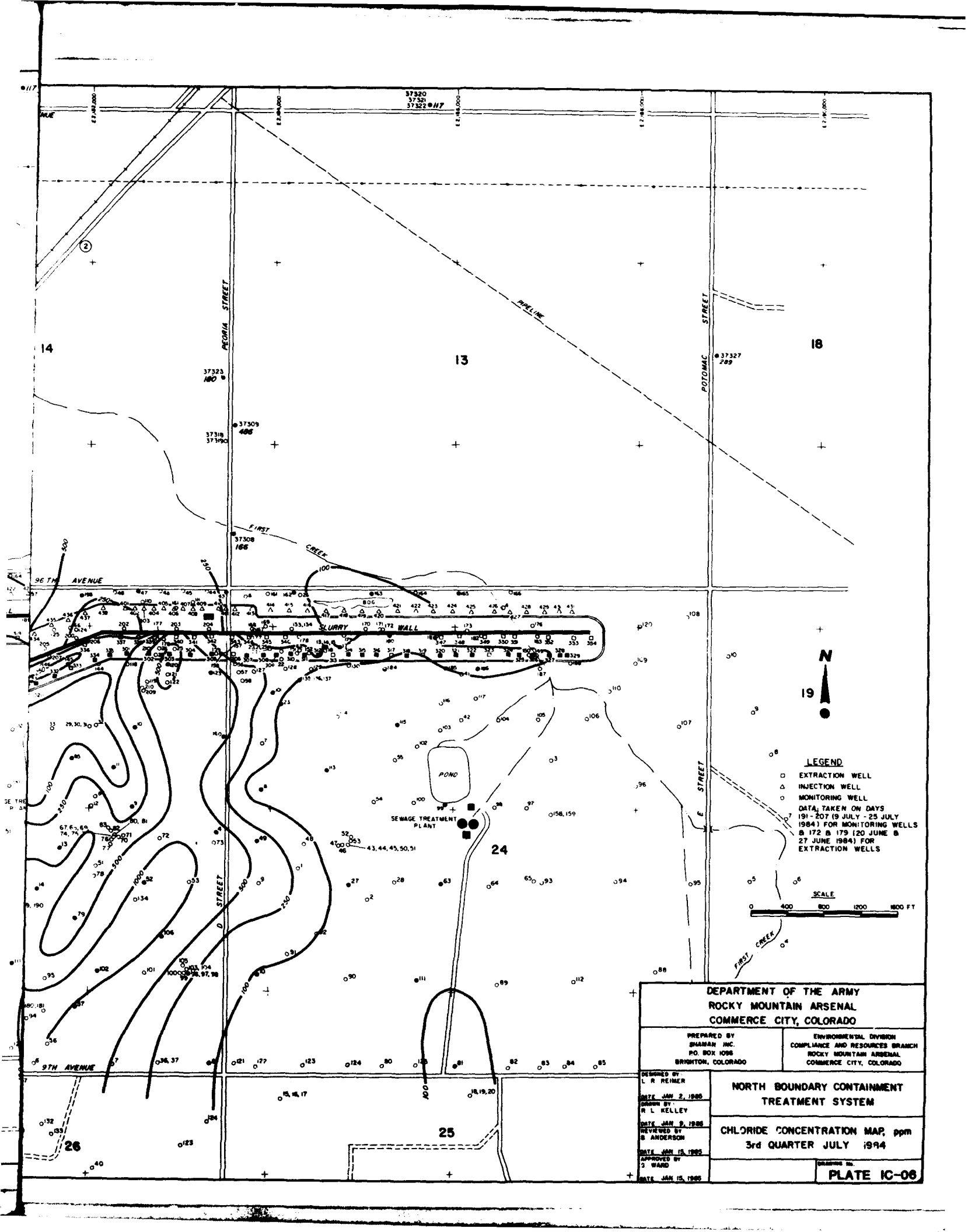


LEGEND
 □ EXTRACTION WELL
 △ INJECTION WELL
 ○ MONITORING WELL
 DATA TAKEN ON DAYS 94-103
 (3 APRIL - 12 APRIL 1984)



DEPARTMENT OF THE ARMY ROCKY MOUNTAIN ARSENAL COMMERCE CITY, COLORADO	
PREPARED BY SHAMAR INC. P.O. BOX 1098 BRIGHTON, COLORADO	ENVIRONMENTAL DIVISION COMPLIANCE AND RESOURCES BRANCH ROCKY MOUNTAIN ARSENAL COMMERCE CITY, COLORADO
DESIGNED BY L. R. REIMER DATE: JAN 2, 1985 DRAWN BY R. L. KELLEY DATE: JAN 8, 1985 REVIEWED BY G. ANDERSON DATE: JAN 15, 1985 APPROVED BY G. WARD DATE: JAN 16, 1985	NORTH BOUNDARY CONTAINMENT TREATMENT SYSTEM CHLORIDE CONCENTRATION MAP ppm 2nd QUARTER APRIL 1984
	DRAWING NO. PLATE IC-05

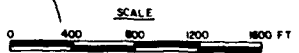




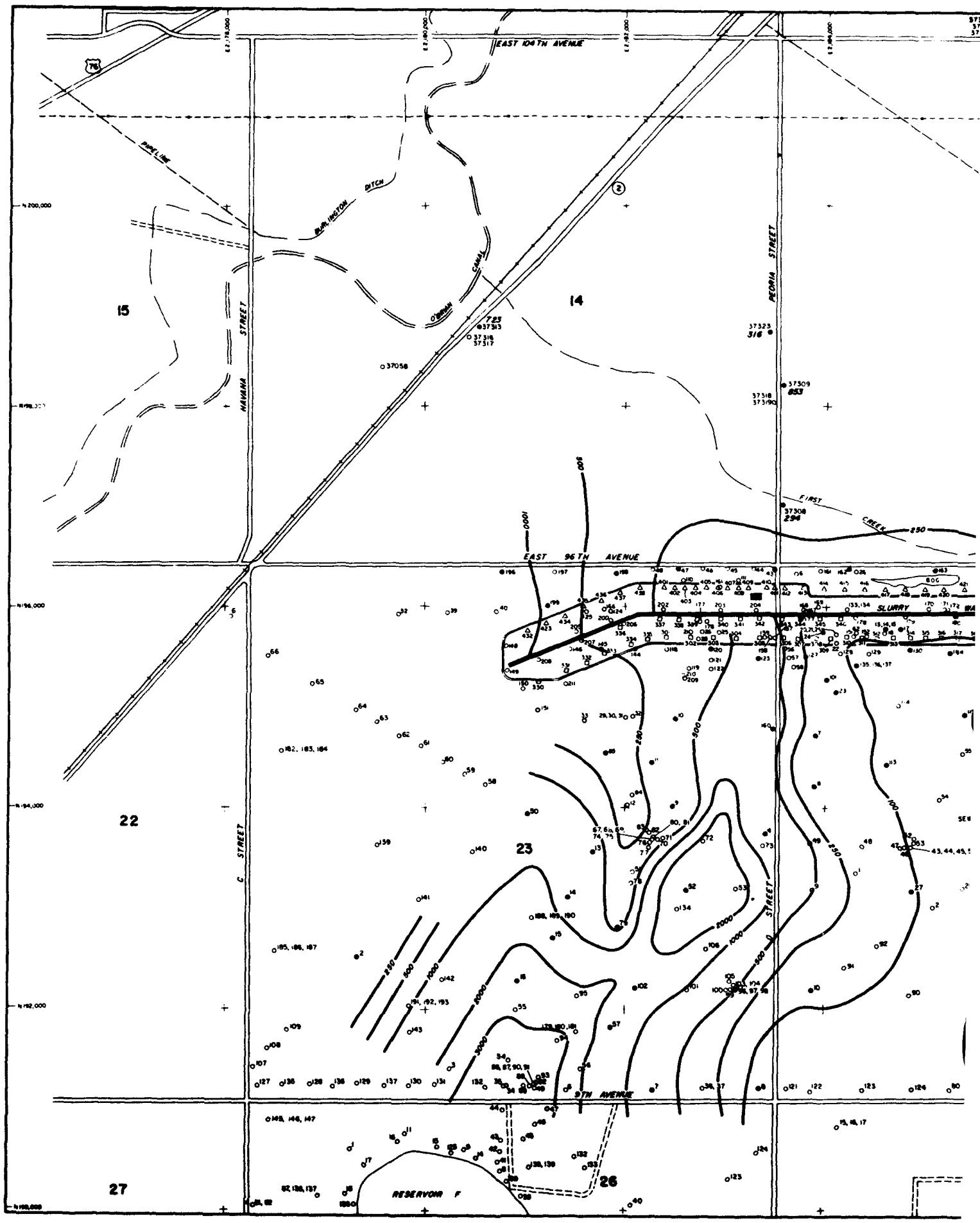
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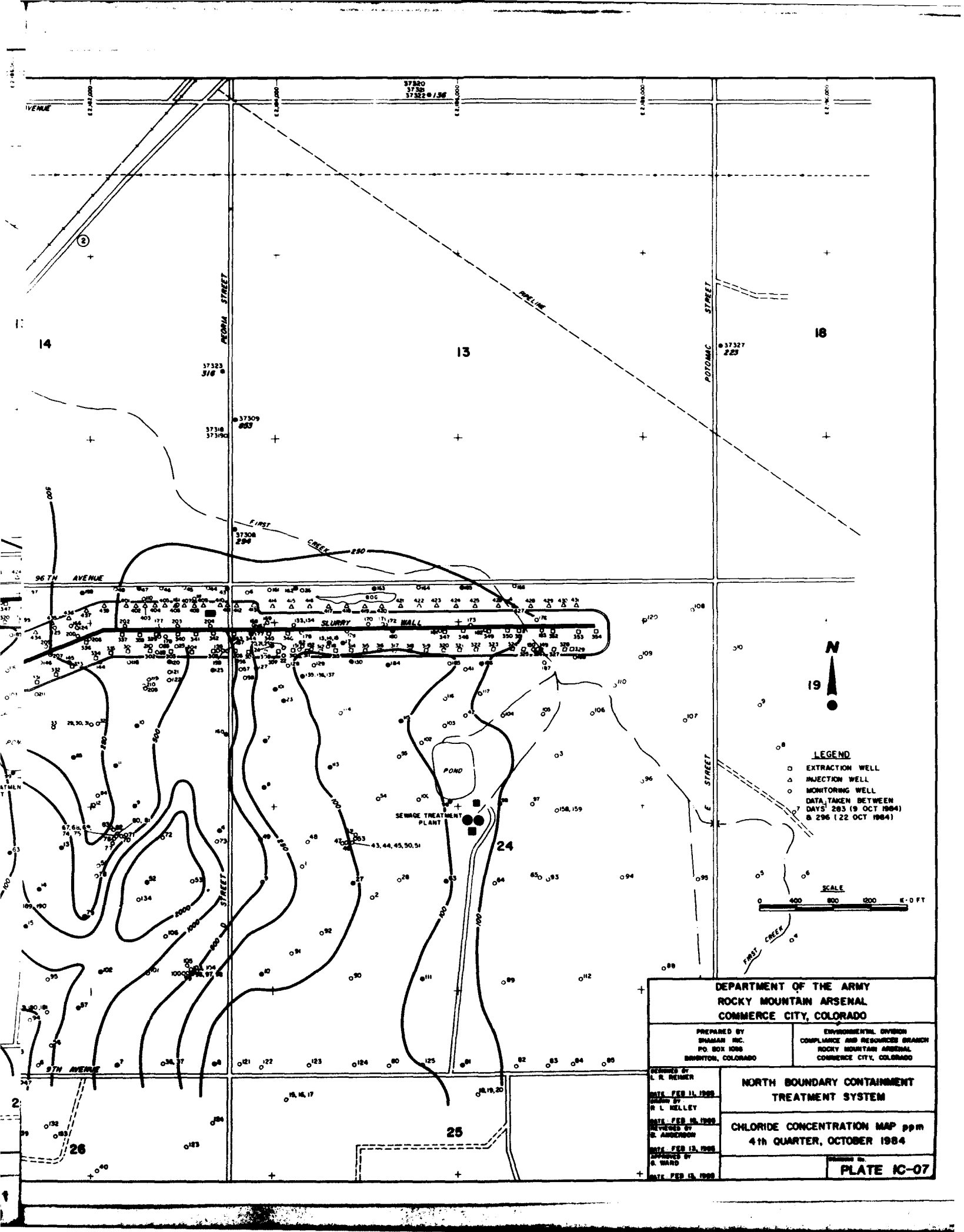
- EXTRACTION WELL
- △ INJECTION WELL
- MONITORING WELL

DATA TAKEN ON DAYS
 191-207 (9 JULY - 25 JULY 1984) FOR MONITORING WELLS
 B 172 B 179 (20 JUNE B 27 JUNE 1984) FOR EXTRACTION WELLS



DEPARTMENT OF THE ARMY ROCKY MOUNTAIN ARSENAL COMMERCE CITY, COLORADO	
PREPARED BY SHAMAN INC. P.O. BOX 1096 BRINTON, COLORADO	ENVIRONMENTAL DIVISION COMPLIANCE AND RESOURCES BRANCH ROCKY MOUNTAIN ARSENAL COMMERCE CITY, COLORADO
DESIGNED BY L. R. REIMER DATE JAN 2, 1985 DRAWN BY R. L. KELLEY DATE JAN 9, 1985 REVIEWED BY B. ANDERSON DATE JAN 15, 1985 APPROVED BY D. WARD DATE JAN 15, 1985	NORTH BOUNDARY CONTAINMENT TREATMENT SYSTEM
	CHLORIDE CONCENTRATION MAP, ppm 3rd QUARTER JULY 1994
	PLATE IC-06

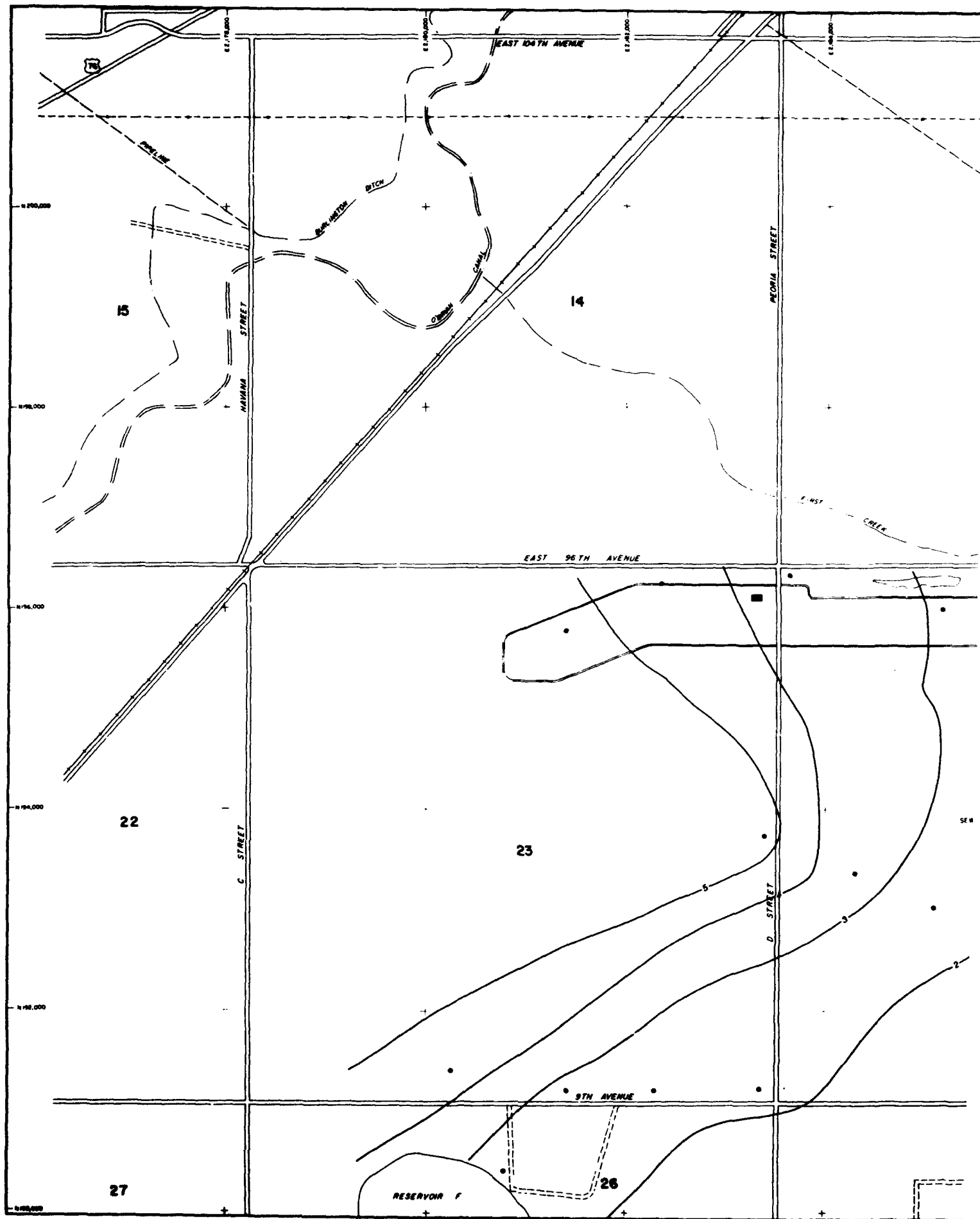


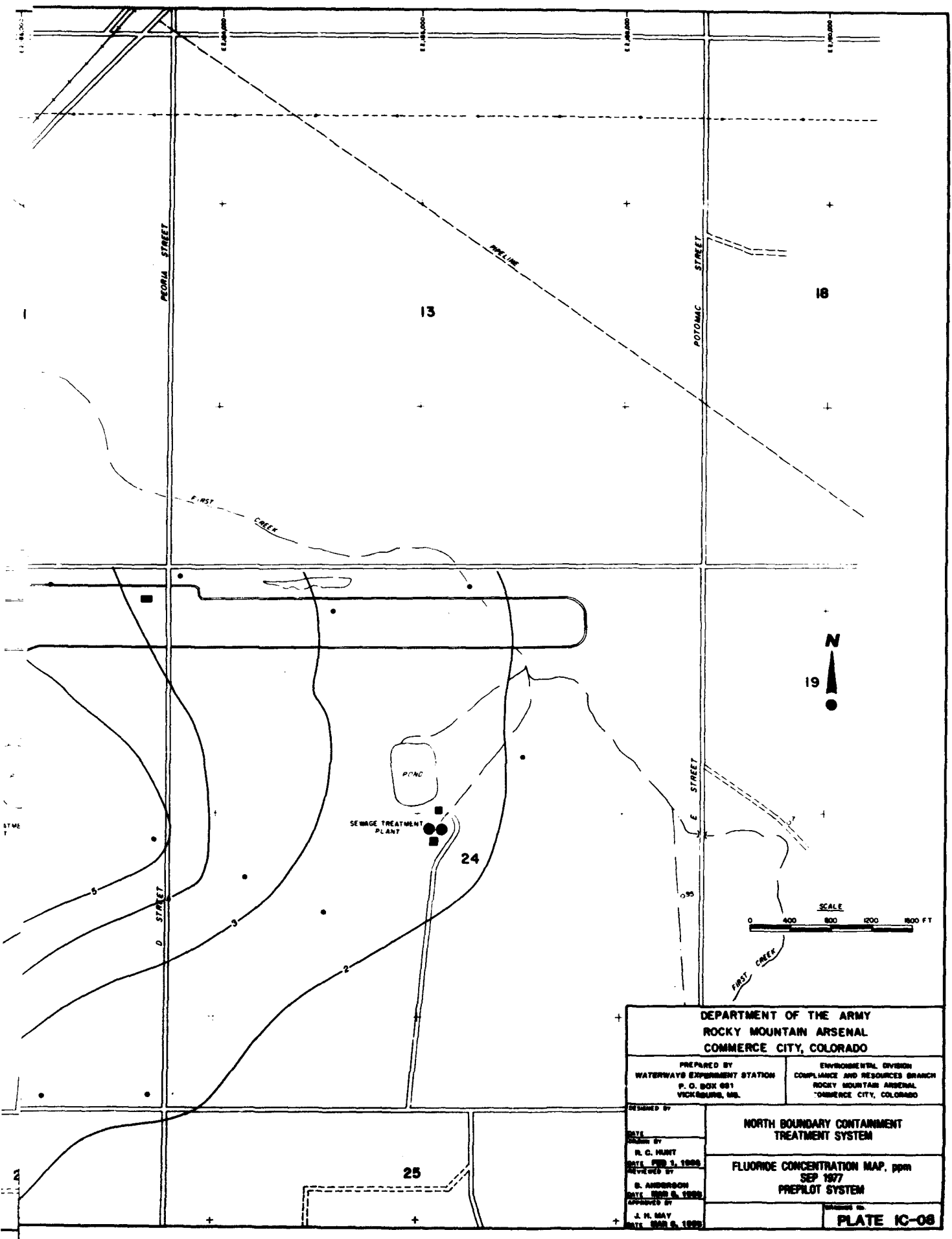


LEGEND
 □ EXTRACTION WELL
 △ INJECTION WELL
 ○ MONITORING WELL
 DATA TAKEN BETWEEN
 DAYS 283 (19 OCT 1984)
 & 296 (22 OCT 1984)

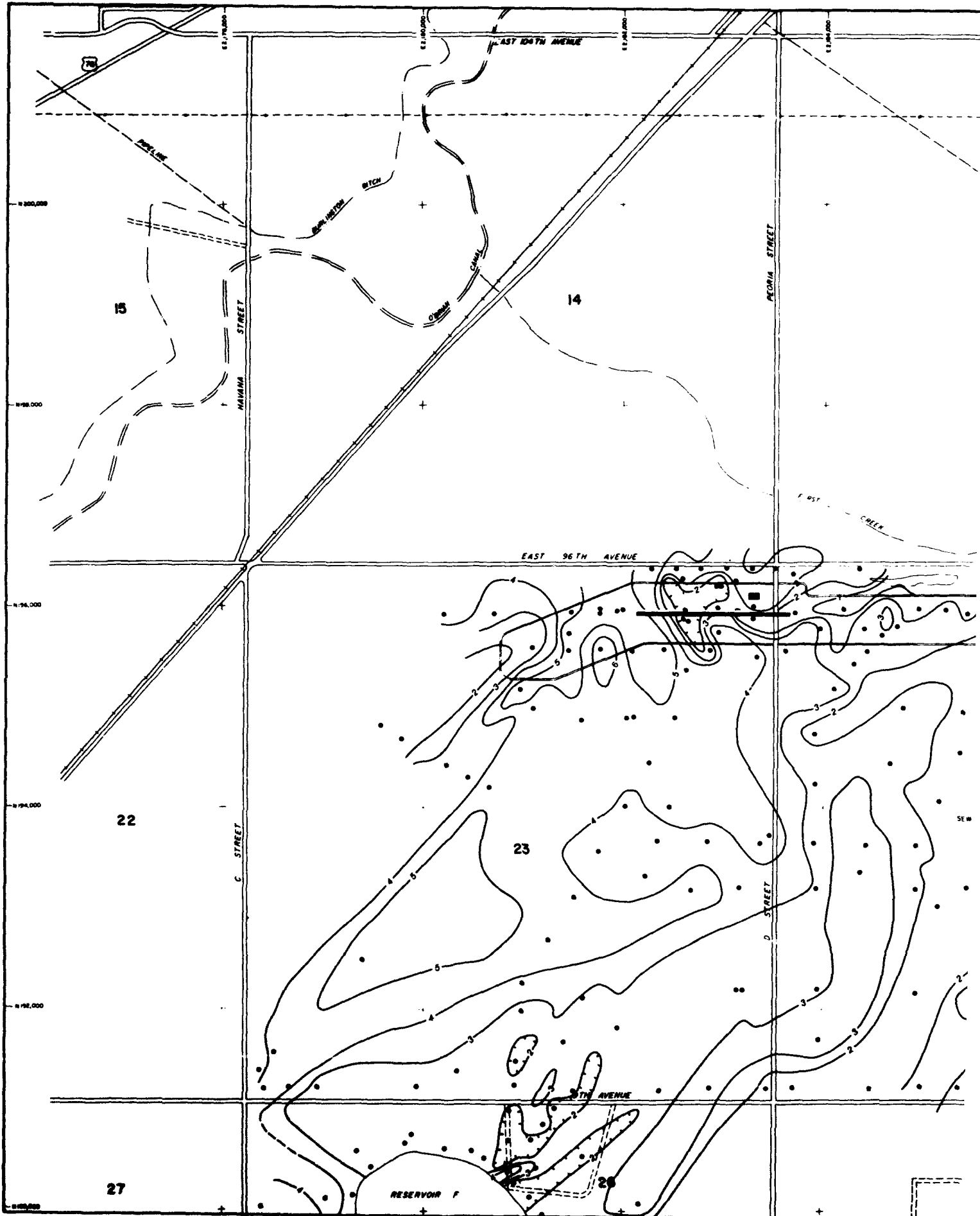


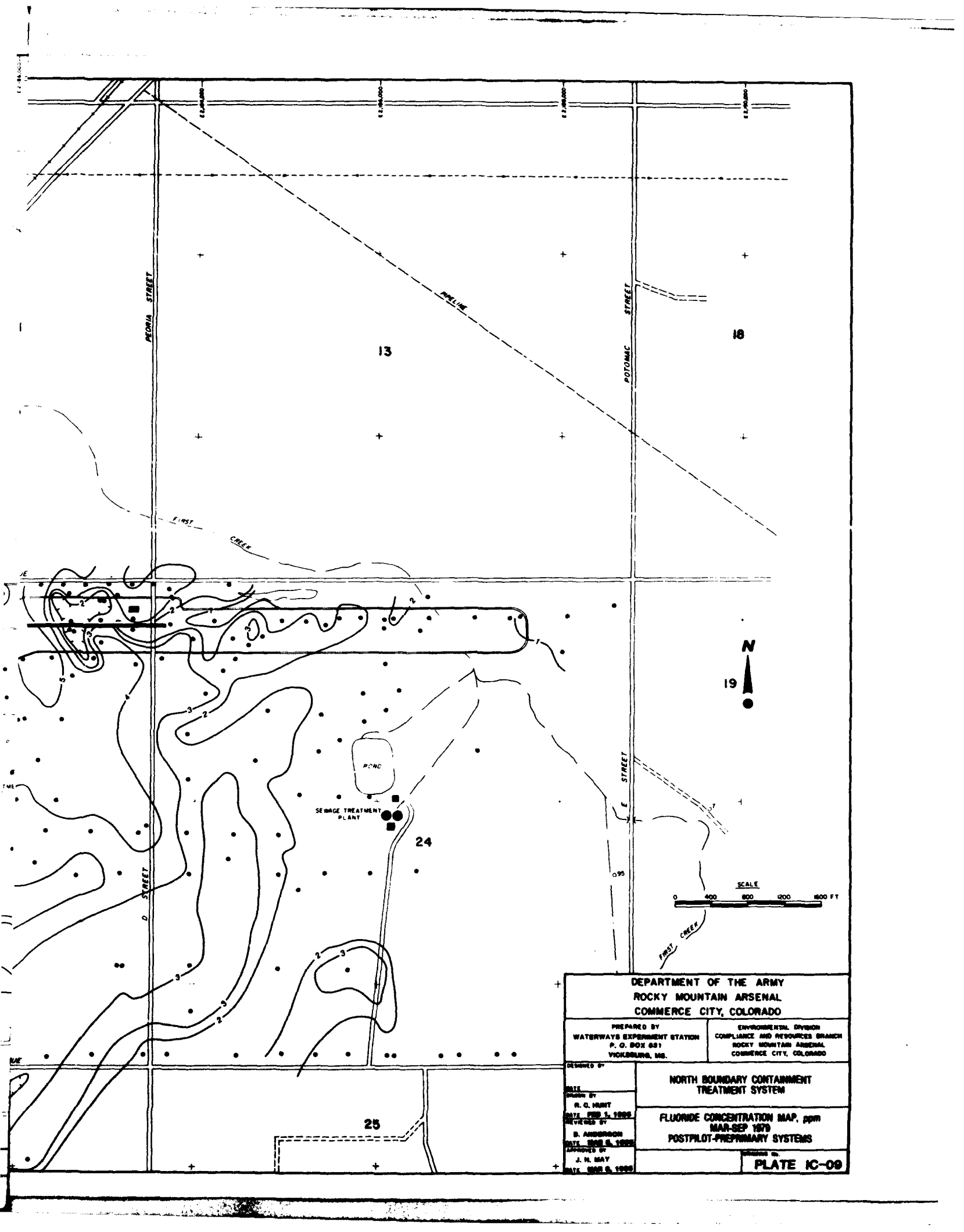
DEPARTMENT OF THE ARMY ROCKY MOUNTAIN ARSENAL COMMERCE CITY, COLORADO	
PREPARED BY SHAMAR INC. P.O. BOX 1088 BRIGHTON, COLORADO	ENVIRONMENTAL DIVISION COMPLIANCE AND RESOURCE BRANCH ROCKY MOUNTAIN ARSENAL COMMERCE CITY, COLORADO
DESIGNED BY L. R. REIMER DATE: FEB 11, 1985 CHECKED BY R. L. KELLEY DATE: FEB 19, 1985 REVIEWED BY S. ANDERSON DATE: FEB 13, 1985 APPROVED BY R. WARD DATE: FEB 15, 1985	NORTH BOUNDARY CONTAINMENT TREATMENT SYSTEM CHLORIDE CONCENTRATION MAP ppm 4th QUARTER, OCTOBER 1984 DRAWING NO. PLATE IC-07





DEPARTMENT OF THE ARMY ROCKY MOUNTAIN ARSENAL COMMERCE CITY, COLORADO	
PREPARED BY WATERWAYS EXPERIMENT STATION P. O. BOX 951 VICKSBURG, MS.	ENVIRONMENTAL DIVISION COMPLIANCE AND RESOURCES BRANCH ROCKY MOUNTAIN ARSENAL COMMERCE CITY, COLORADO
DESIGNED BY DATE DRAWN BY R. C. HUNT DATE FEB 3, 1968 REVIEWED BY S. ANDERSON DATE 1968 8, 1968 APPROVED BY J. H. BAY DATE 1968 8, 1968	NORTH BOUNDARY CONTAINMENT TREATMENT SYSTEM FLUORIDE CONCENTRATION MAP, ppm SEP 1977 PREPILOT SYSTEM
	PLATE IC-08





PEORIA STREET

POTOMAC STREET

D STREET

E STREET

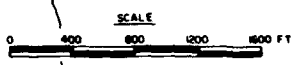
APPLINE

FIRST CREEK

FIRST CREEK

SEWAGE TREATMENT PLANT

POND



DEPARTMENT OF THE ARMY ROCKY MOUNTAIN ARSENAL COMMERCE CITY, COLORADO	
PREPARED BY WATERWAYS EXPERIMENT STATION P. O. BOX 681 VICKSBURG, MS.	ENVIRONMENTAL DIVISION COMPLIANCE AND RESOURCES BRANCH ROCKY MOUNTAIN ARSENAL COMMERCE CITY, COLORADO
DESIGNED BY DATE DRAWN BY R. C. HART DATE FEB 5, 1988 REVISED BY B. ANDERSON DATE 08B 6, 1988 APPROVED BY J. H. MAY DATE 08B 6, 1988	NORTH BOUNDARY CONTAINMENT TREATMENT SYSTEM FLUORIDE CONCENTRATION MAP, ppm MAR-SEP 1979 POSTPILOT-PREPRIMARY SYSTEMS DRAWING NO. PLATE IC-09

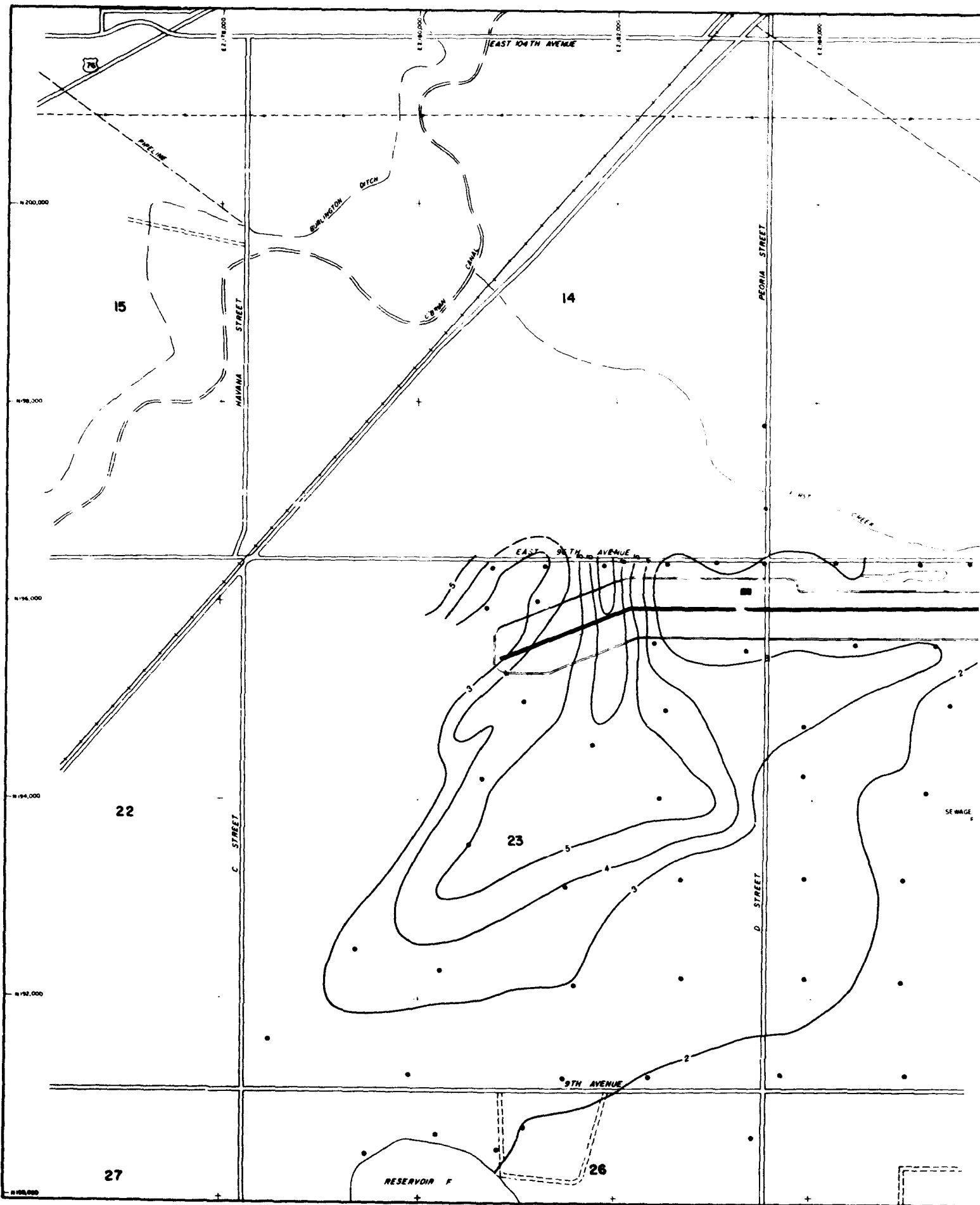
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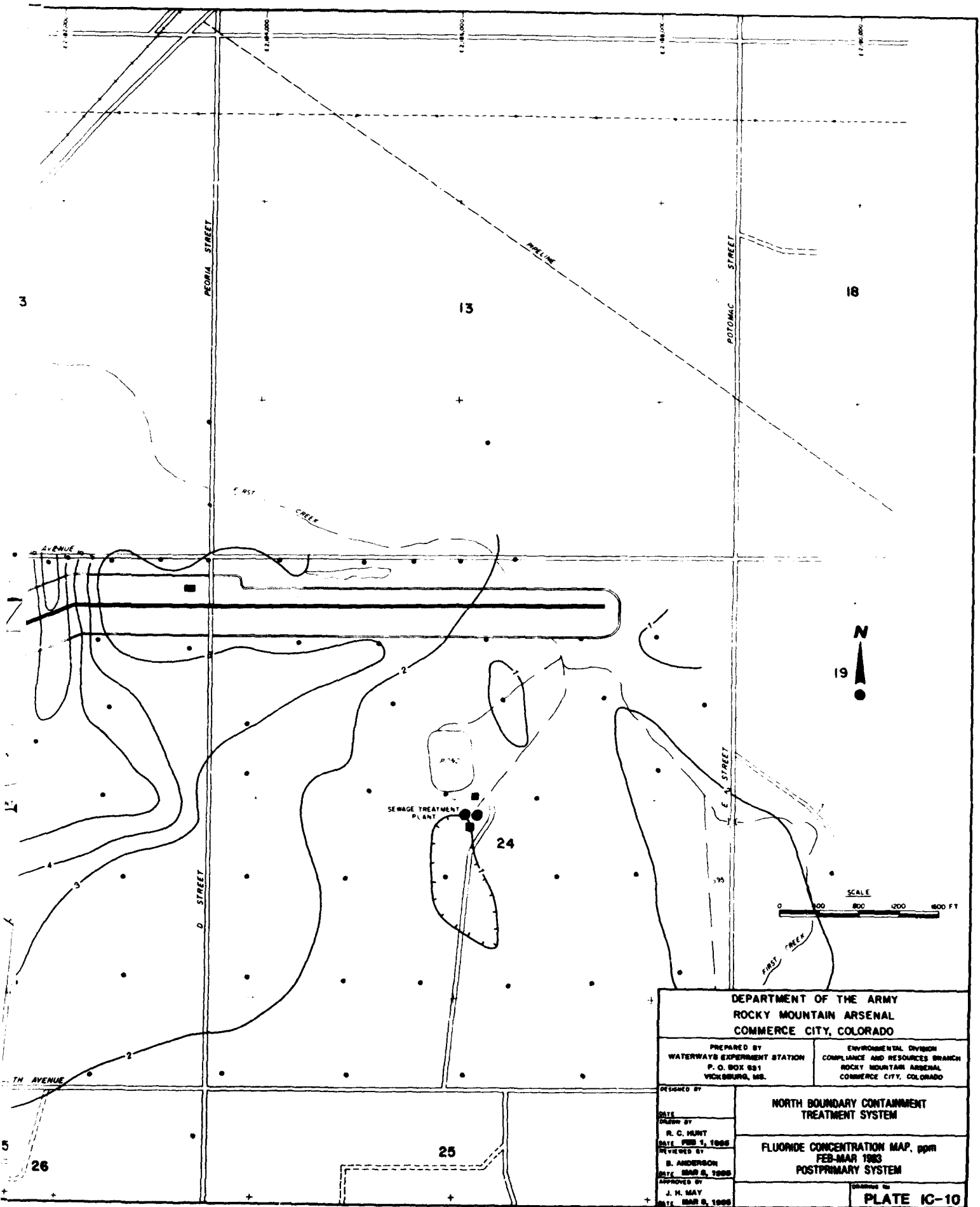
18

24

19

25





**DEPARTMENT OF THE ARMY
ROCKY MOUNTAIN ARSENAL
COMMERCE CITY, COLORADO**

PREPARED BY
WATERWAYS EXPERIMENT STATION
P. O. BOX 851
WICKSBURG, MS.

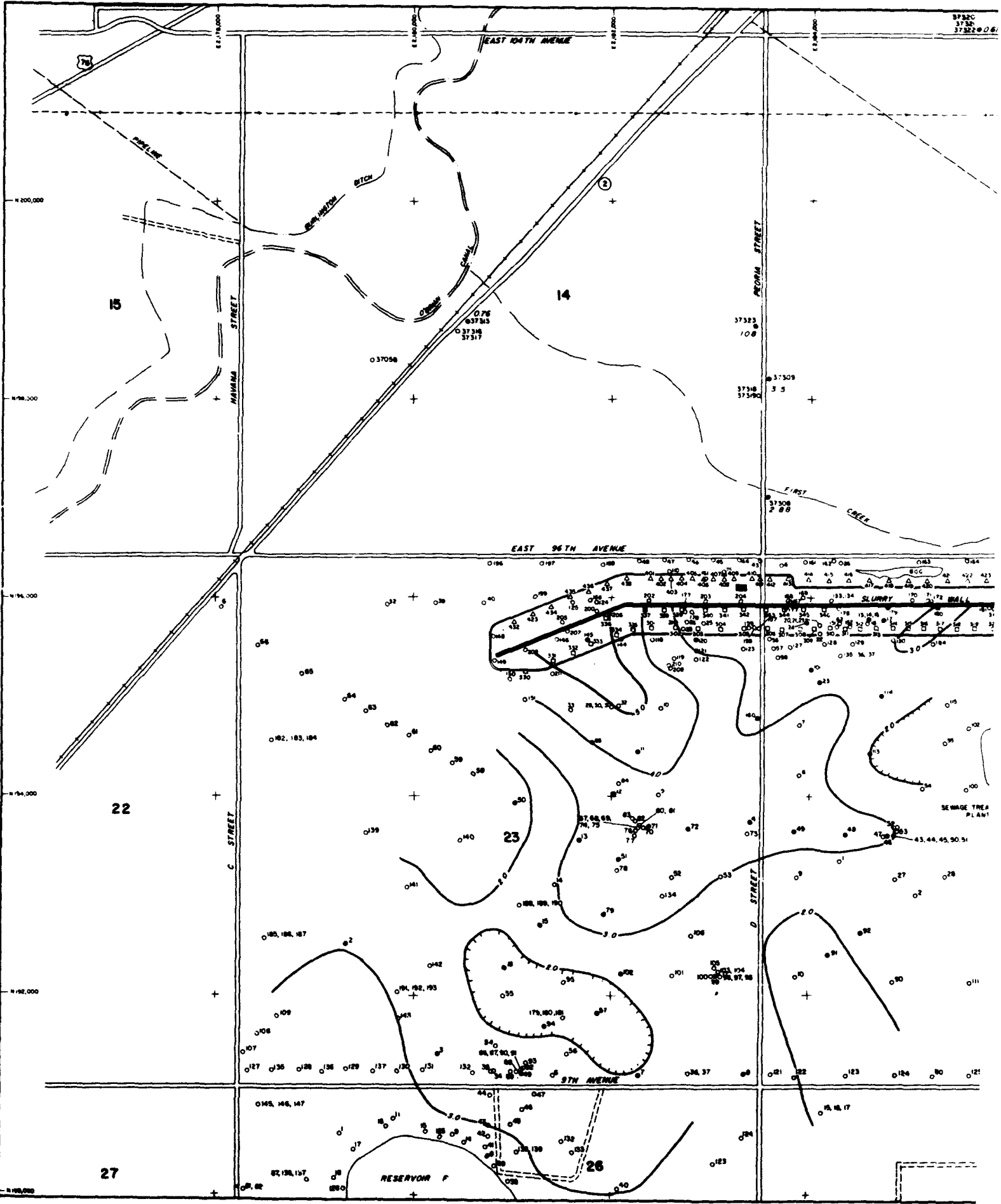
ENVIRONMENTAL DIVISION
COMPLIANCE AND RESOURCES BRANCH
ROCKY MOUNTAIN ARSENAL
COMMERCE CITY, COLORADO

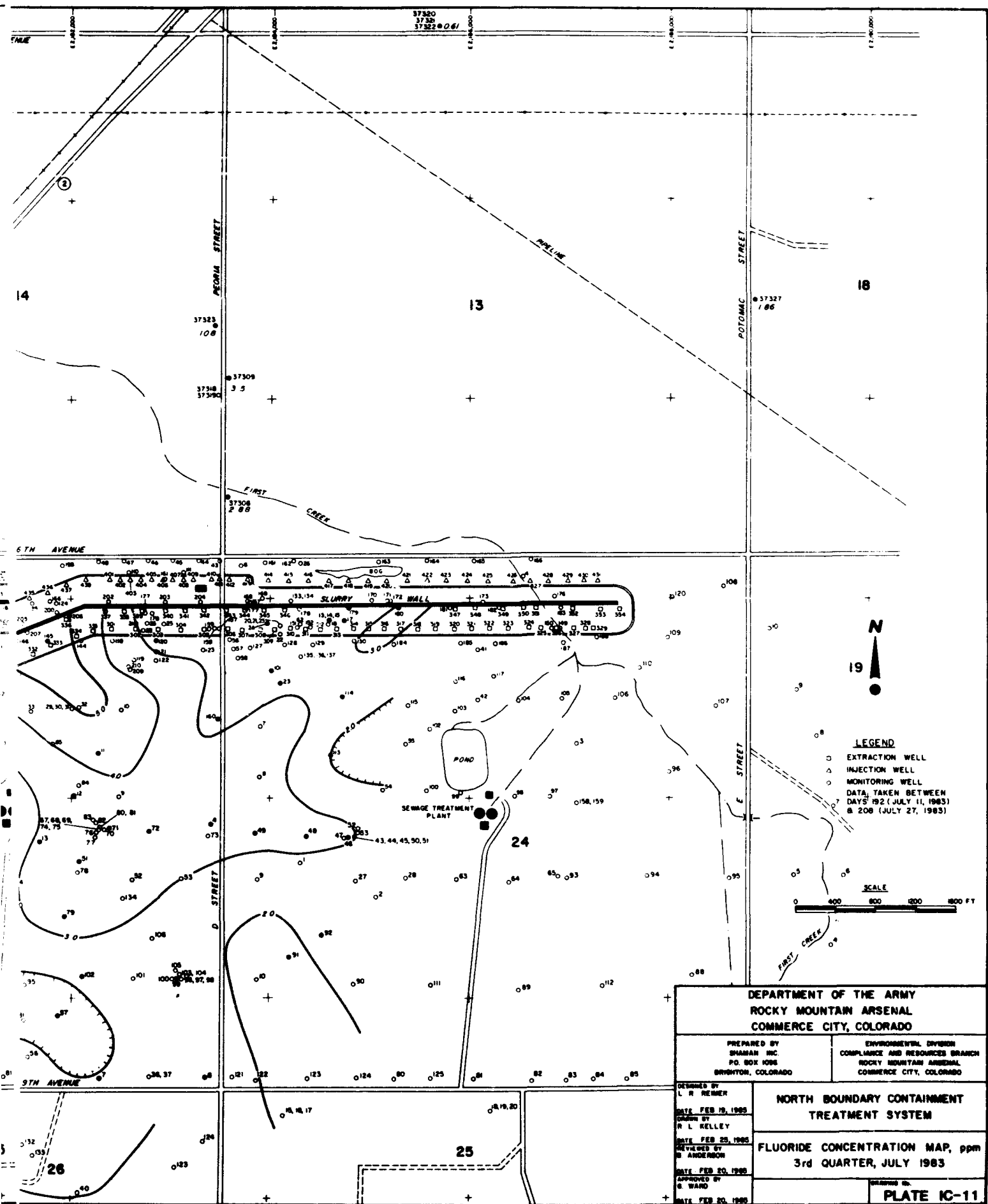
DESIGNED BY
DATE
DRAWN BY
R. C. HUNT
DATE FEB 1, 1983
REVIEWED BY
B. ANDERSON
DATE MAR 8, 1983
APPROVED BY
J. H. MAY
DATE MAR 8, 1983

**NORTH BOUNDARY CONTAINMENT
TREATMENT SYSTEM**

**FLUORIDE CONCENTRATION MAP, ppm
FEB-MAR 1983
POSTPRIMARY SYSTEM**

DRAWING NO.
PLATE IC-10

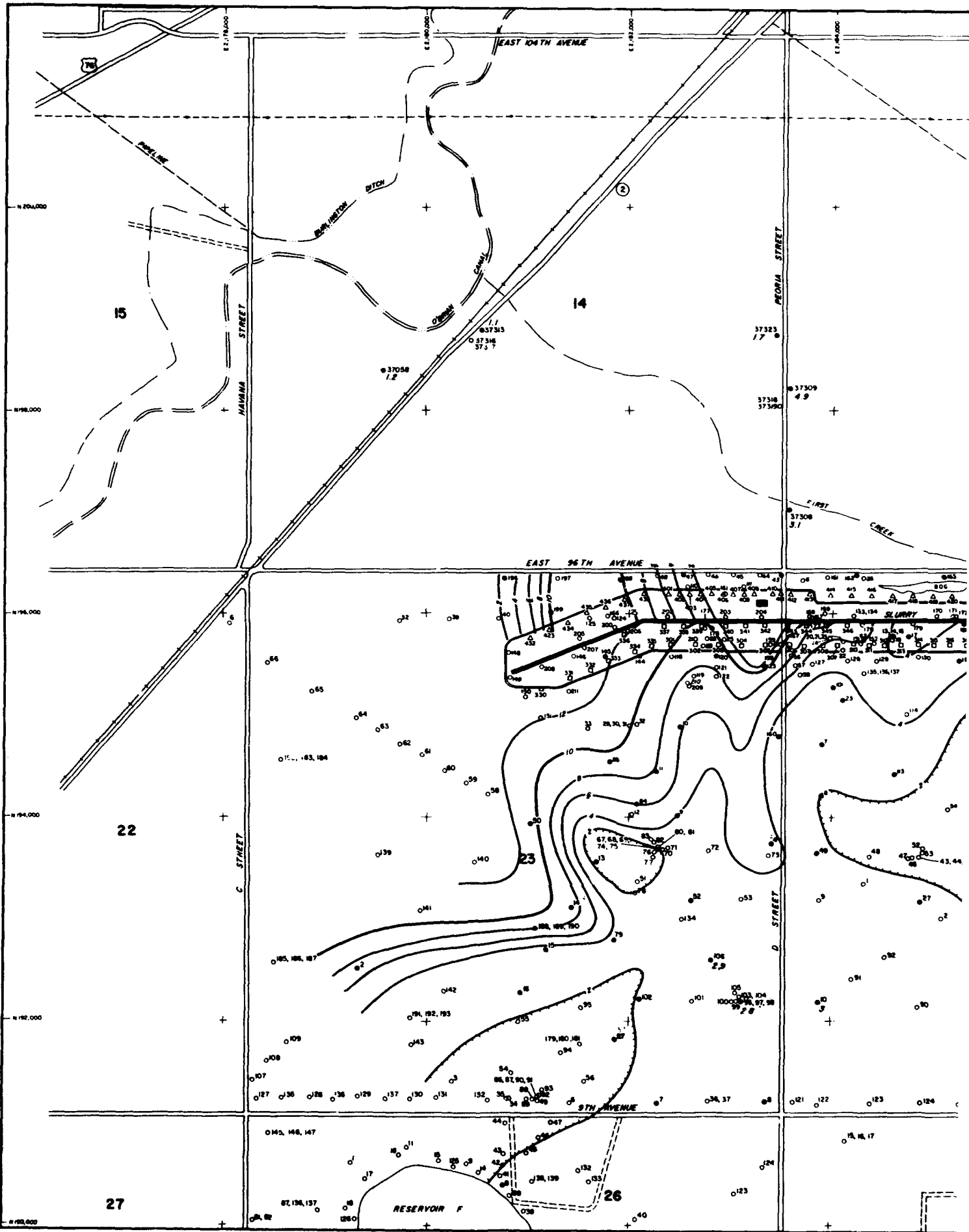


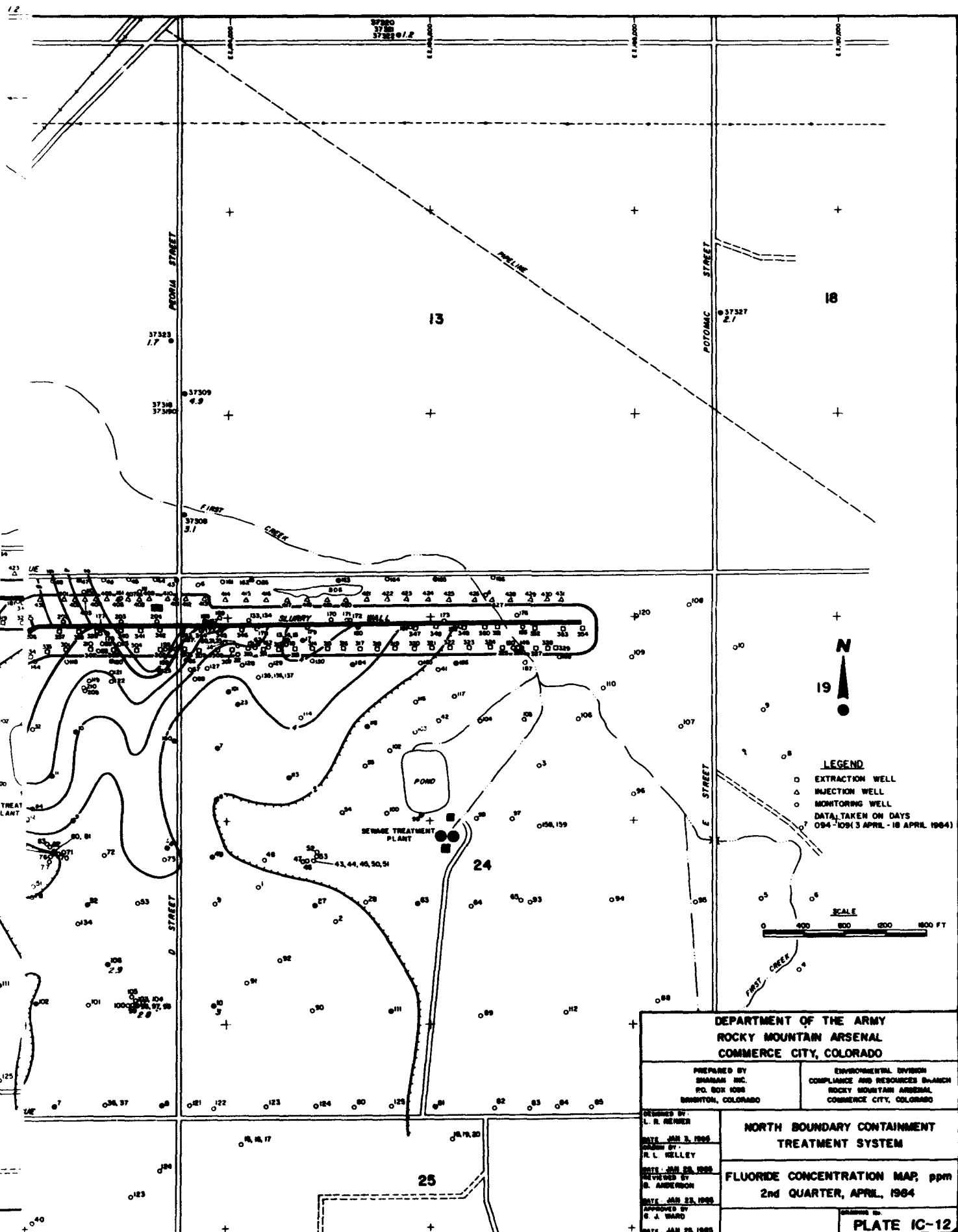


LEGEND
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 △ INJECTION WELL
 ○ MONITORING WELL
 DATA TAKEN BETWEEN
 DAYS 192 (JULY 11, 1983)
 & 208 (JULY 27, 1983)

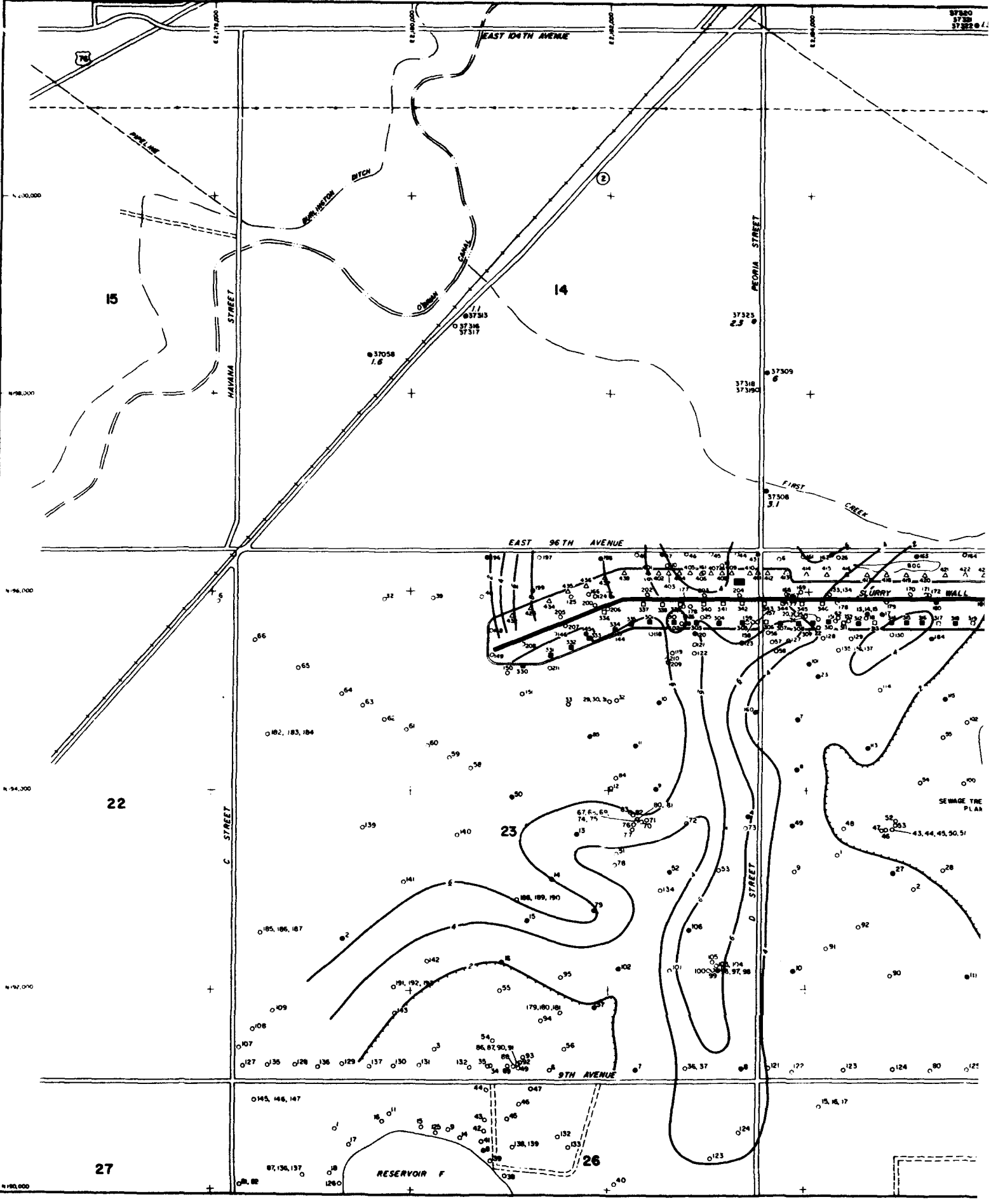
SCALE
 0 400 800 1200 1600 FT

DEPARTMENT OF THE ARMY ROCKY MOUNTAIN ARSENAL COMMERCE CITY, COLORADO	
PREPARED BY SHAMAN INC. P.O. BOX 1098 BRYANTON, COLORADO	ENVIRONMENTAL DIVISION COMPLIANCE AND RESOURCES BRANCH ROCKY MOUNTAIN ARSENAL COMMERCE CITY, COLORADO
DESIGNED BY L. R. REBER DATE FEB 19, 1985 DRAWN BY R. L. KELLEY DATE FEB 25, 1985 REVIEWED BY B. ANDERSON DATE FEB 20, 1985 APPROVED BY S. WARD DATE FEB 20, 1985	NORTH BOUNDARY CONTAINMENT TREATMENT SYSTEM FLUORIDE CONCENTRATION MAP, ppm 3rd QUARTER, JULY 1983
	DRAWING NO. PLATE IC-11





DEPARTMENT OF THE ARMY ROCKY MOUNTAIN ARSENAL COMMERCE CITY, COLORADO	
PREPARED BY SHAMAN INC. P.O. BOX 1086 BRINNON, COLORADO	ENVIRONMENTAL DIVISION COMPLIANCE AND RESOURCES BRANCH ROCKY MOUNTAIN ARSENAL COMMERCE CITY, COLORADO
DESIGNED BY: L. R. KEMER DATE: JAN 2, 1965 DRAWN BY: R. L. KELLEY DATE: JAN 28, 1965 CHECKED BY: R. ANDERSON DATE: JAN 23, 1965 APPROVED BY: S. J. WARD DATE: JAN 28, 1965	NORTH BOUNDARY CONTAINMENT TREATMENT SYSTEM FLUORIDE CONCENTRATION MAP, ppm 2nd QUARTER, APRIL, 1964
	DRAWING NO. PLATE IC-12



37320
37321
37322

EAST 104TH AVENUE

15

14

37325
2.3

37318
37319

37309
6

37308
3.1

EAST 96TH AVENUE

22

23

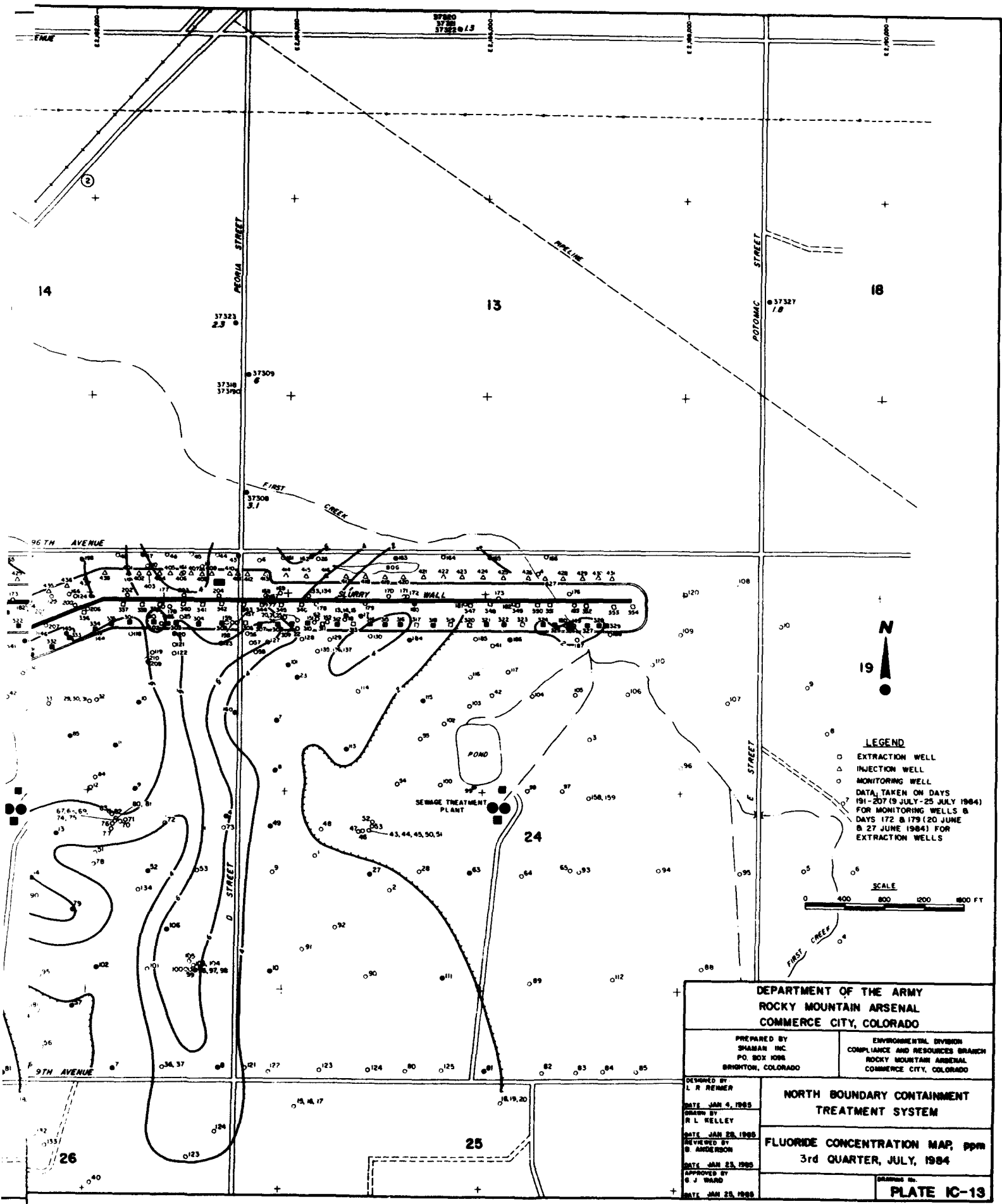
SEWAGE TIE PLAN

EAST 9TH AVENUE

27

26

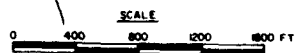
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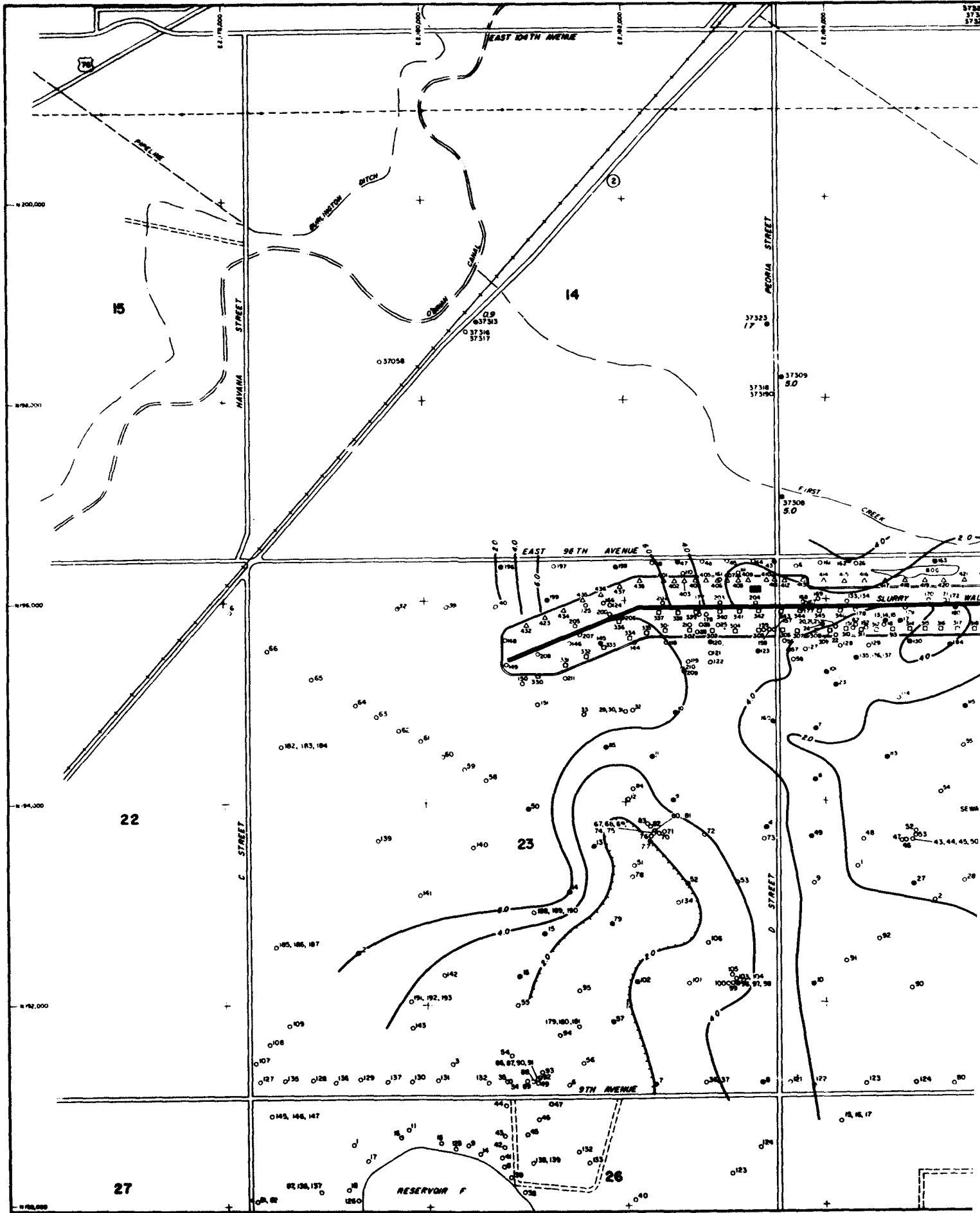
LEGEND

- EXTRACTION WELL
- △ INJECTION WELL
- MONITORING WELL

DATA TAKEN ON DAYS
191-207 (9 JULY-25 JULY 1984)
FOR MONITORING WELLS &
DAYS 172 & 179 (20 JUNE
& 27 JUNE 1984) FOR
EXTRACTION WELLS



DEPARTMENT OF THE ARMY ROCKY MOUNTAIN ARSENAL COMMERCE CITY, COLORADO	
PREPARED BY SHAMAR INC. P.O. BOX 1098 BRIGHTON, COLORADO	ENVIRONMENTAL DIVISION COMPLIANCE AND RESOURCES BRANCH ROCKY MOUNTAIN ARSENAL COMMERCE CITY, COLORADO
DESIGNED BY L. R. RENNER DATE JAN 4, 1985 DRAWN BY R. L. KELLEY DATE JAN 28, 1985 REVIEWED BY B. ANDERSON DATE JAN 23, 1985 APPROVED BY G. J. WARD DATE JAN 23, 1985	NORTH BOUNDARY CONTAINMENT TREATMENT SYSTEM FLUORIDE CONCENTRATION MAP, ppn 3rd QUARTER, JULY, 1984
	DRAWING NO. PLATE IC-13



37325
37318
37315

EAST 104TH AVENUE

15

14

37325
17

37309
5.0

37318
37315

37308
5.0

EAST 98TH AVENUE

EAST 97TH AVENUE

22

23

27

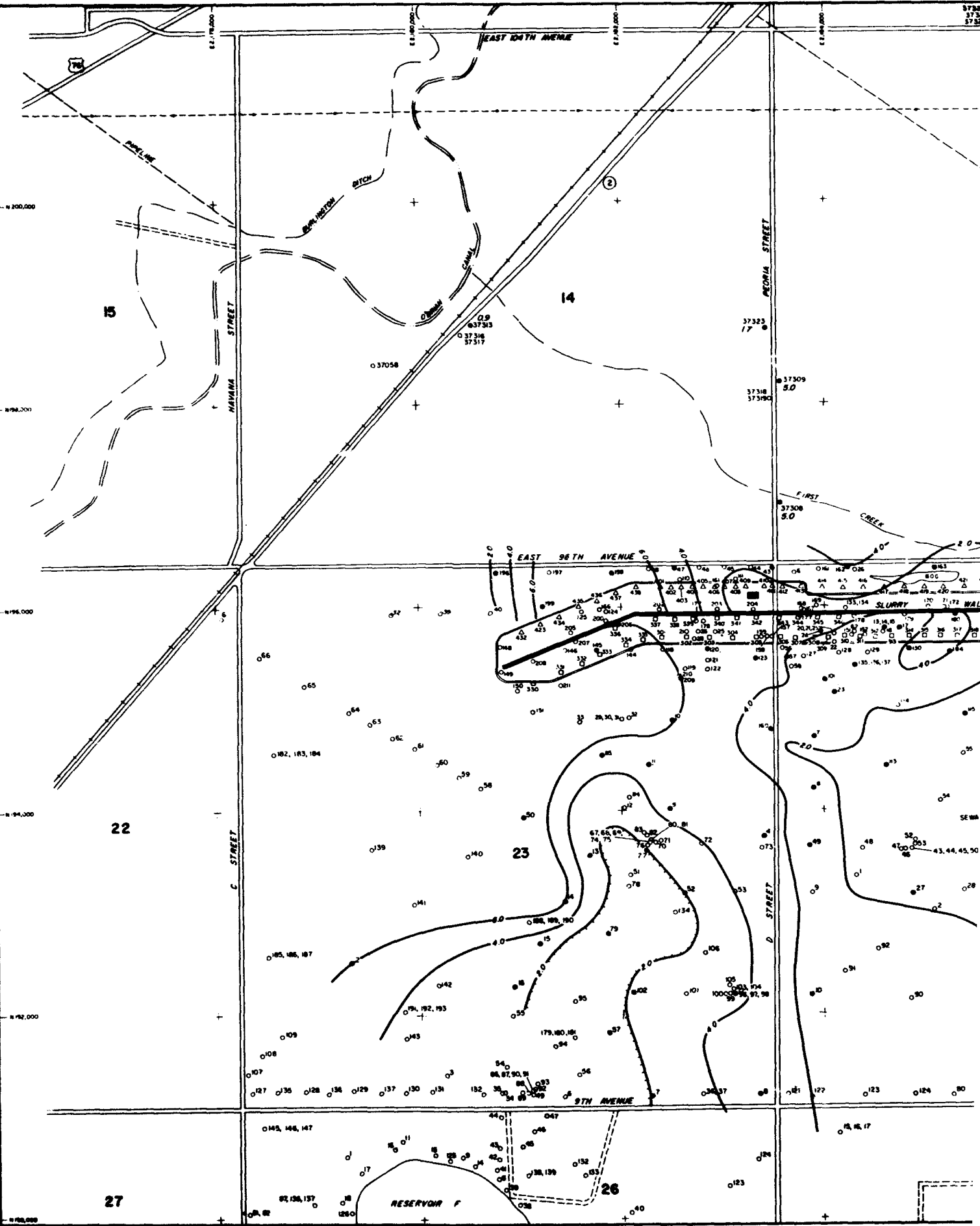
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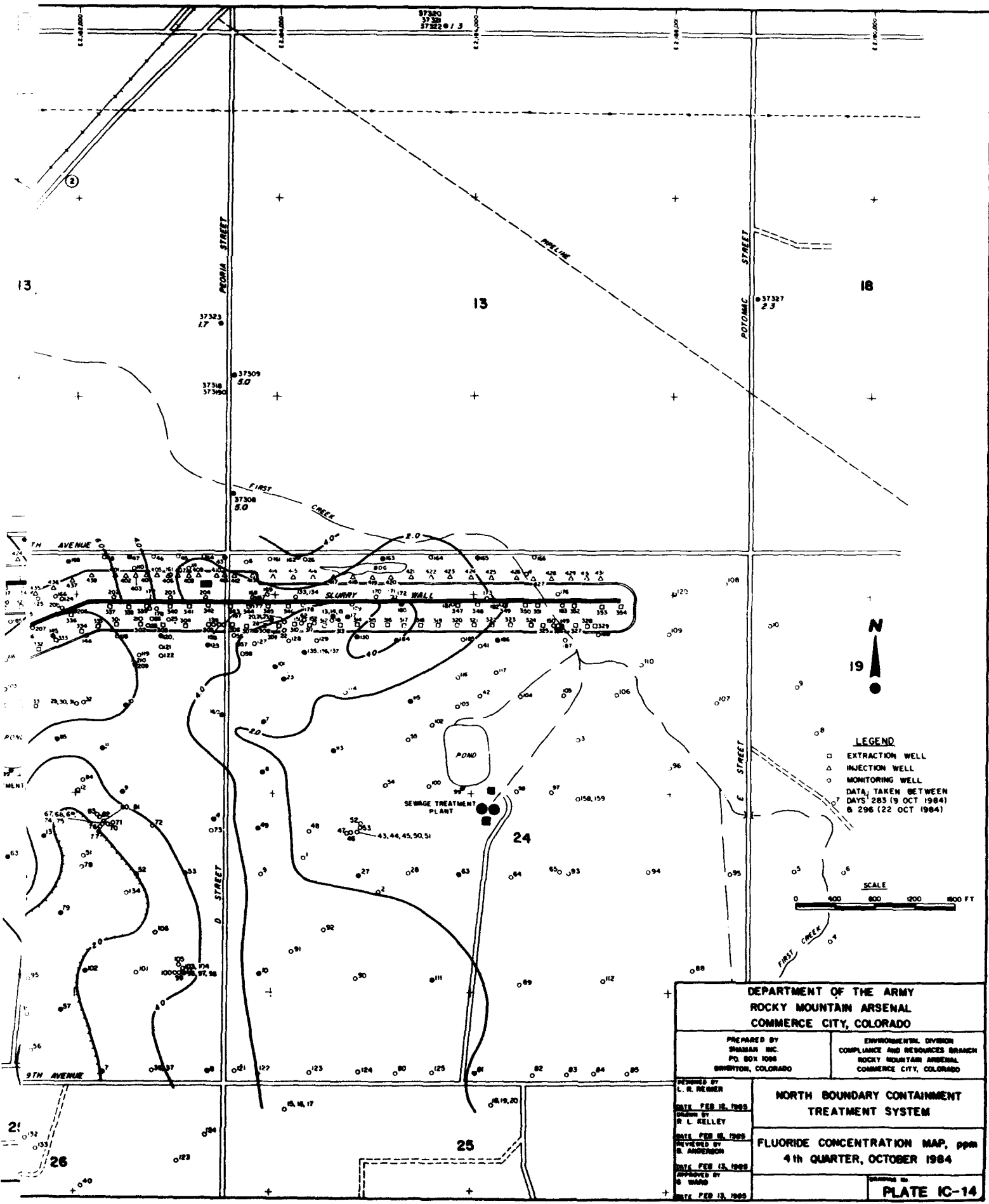
RESERVOIR F

SLURRY WALL

FIRST CREEK

SEWA

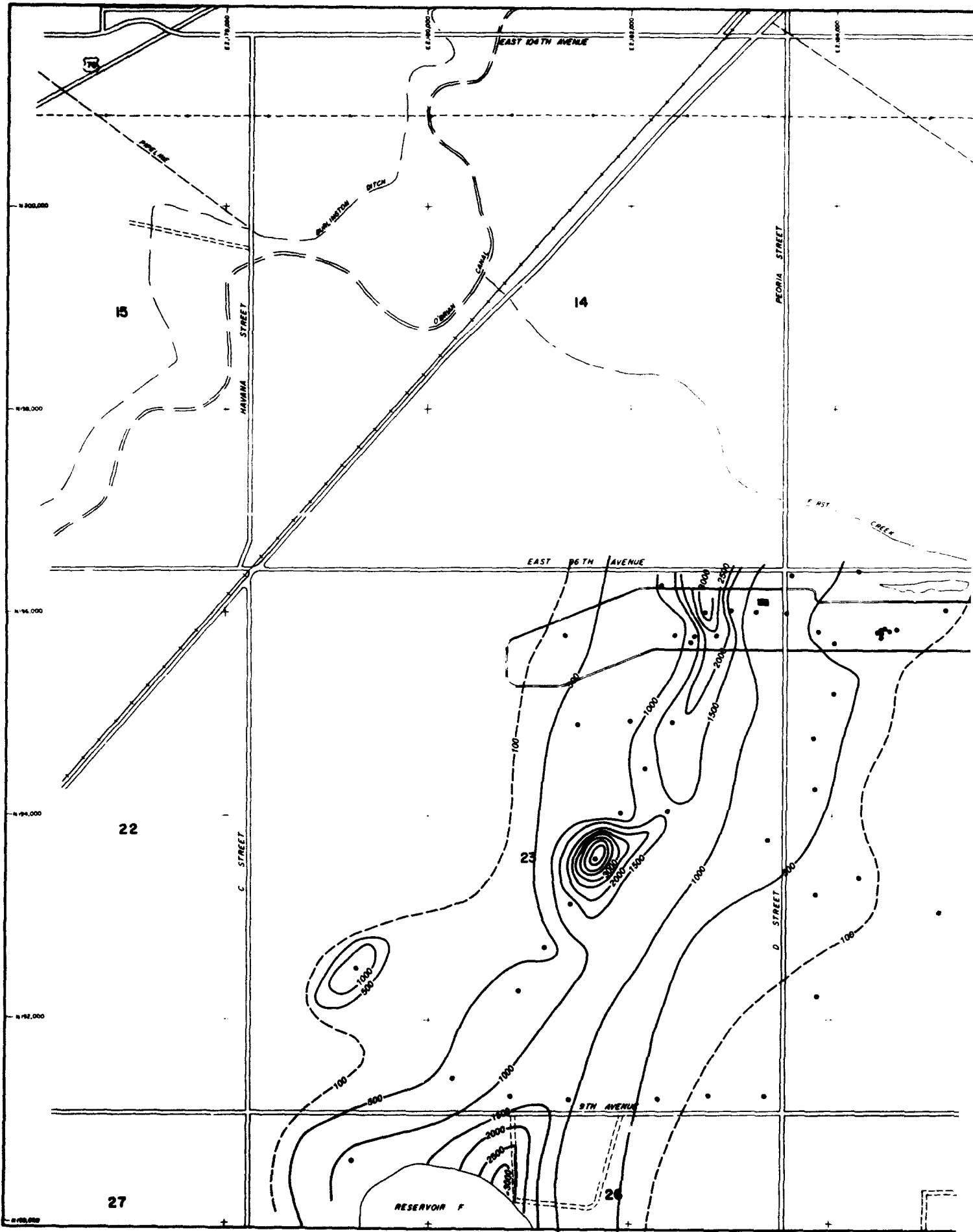


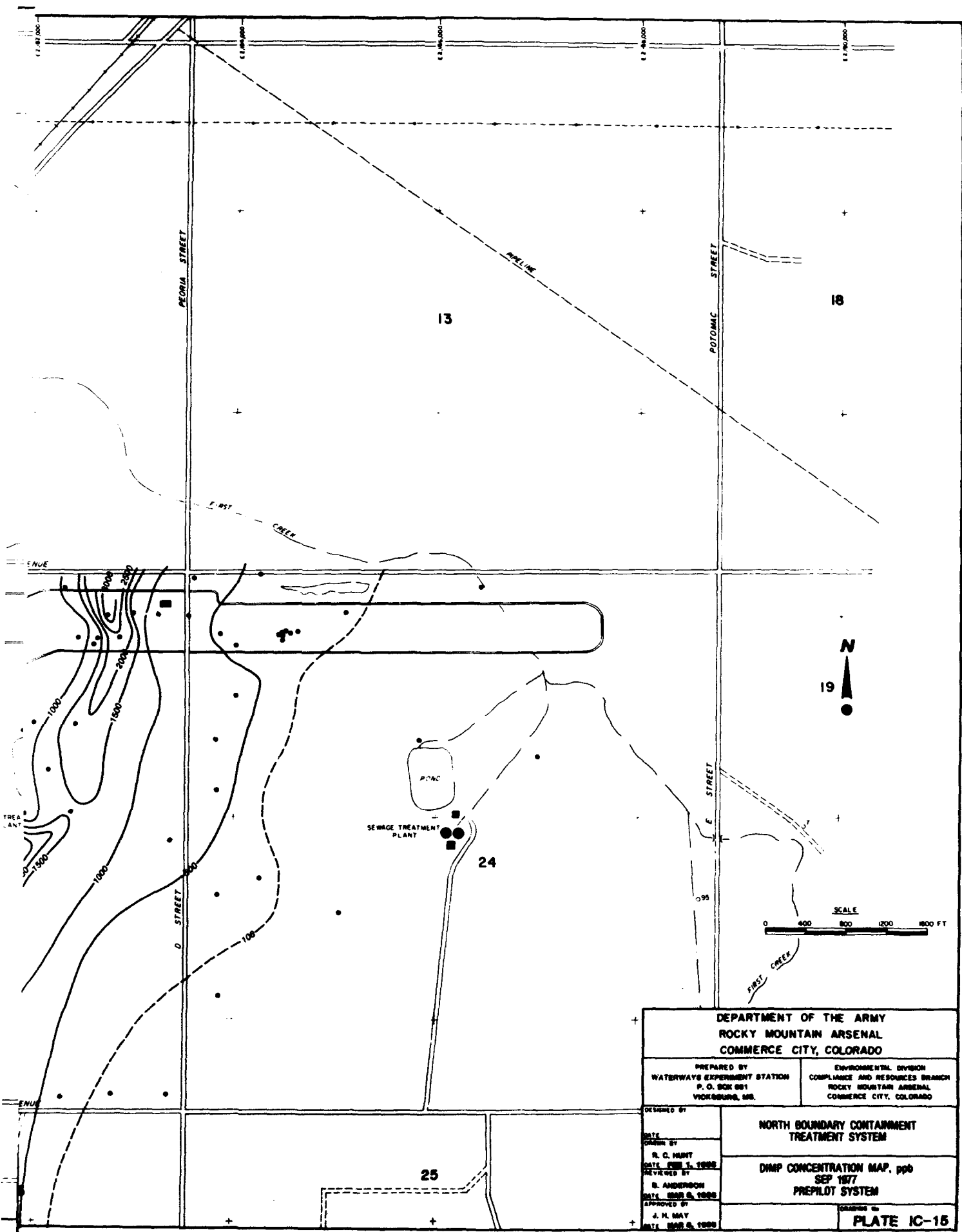


LEGEND
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 △ INJECTION WELL
 ○ MONITORING WELL
 DATA, TAKEN BETWEEN
 DAYS 283 (9 OCT 1984)
 & 296 (22 OCT 1984)

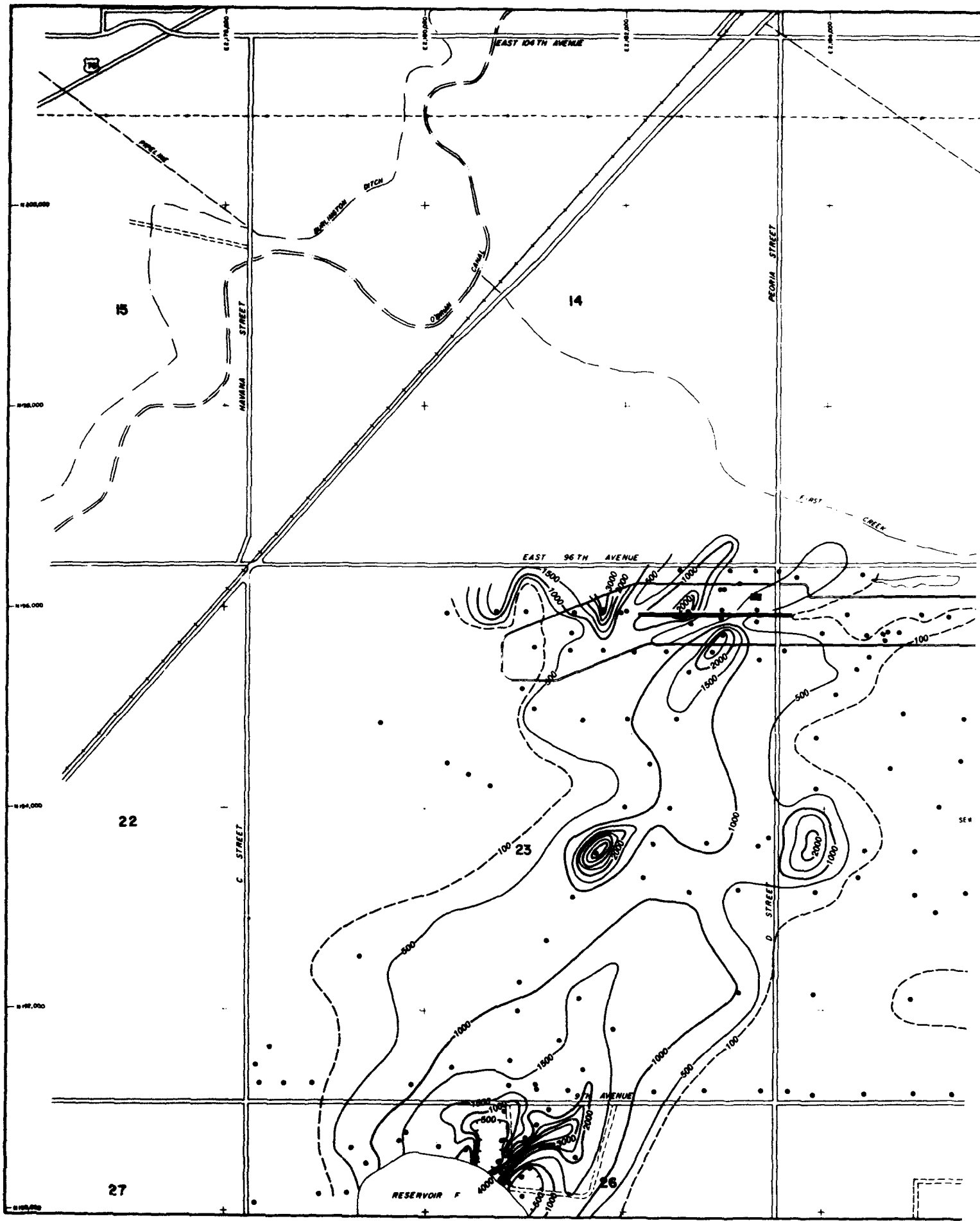
SCALE
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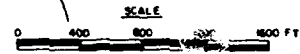
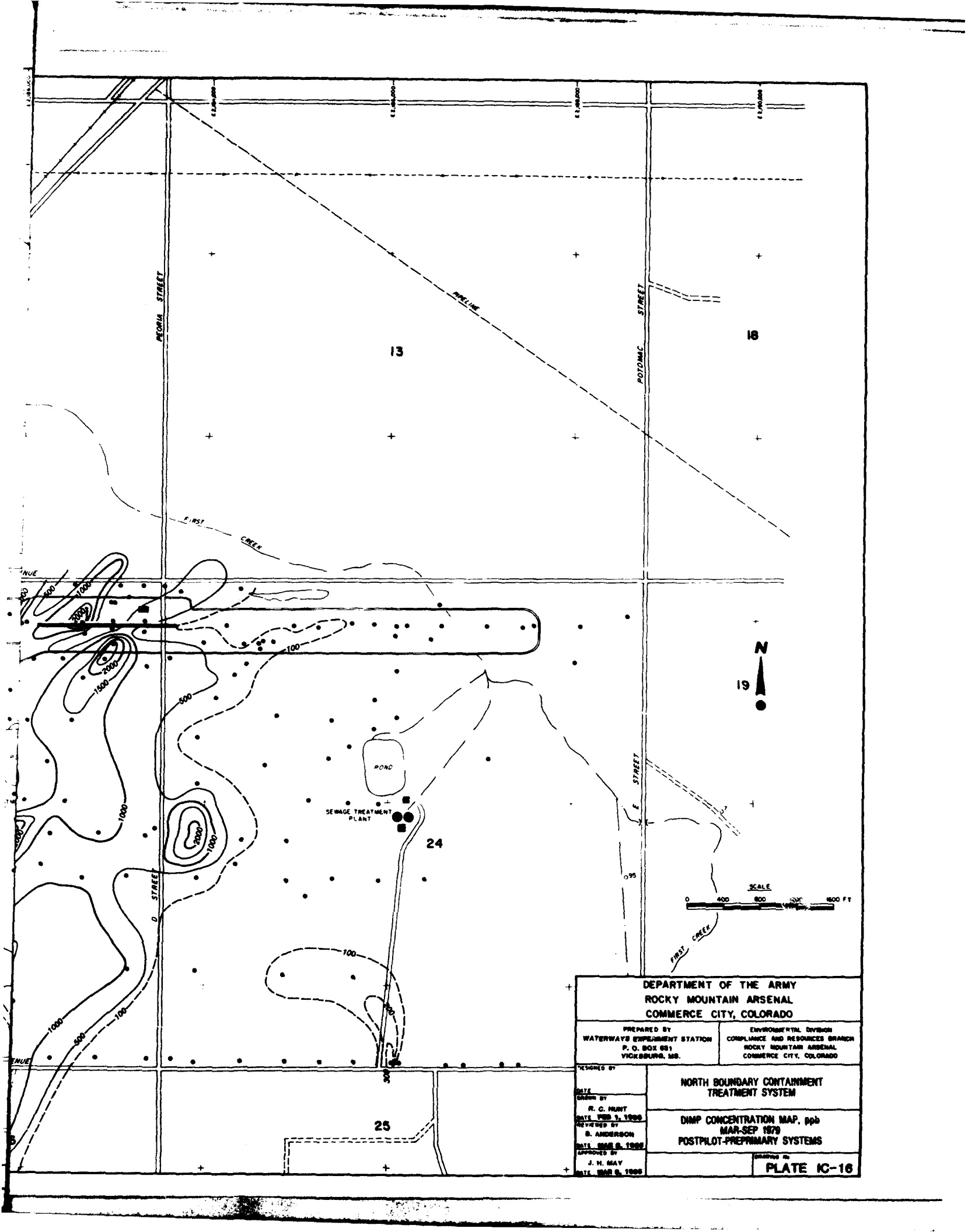
DEPARTMENT OF THE ARMY ROCKY MOUNTAIN ARSENAL COMMERCE CITY, COLORADO	
PREPARED BY SHAMAN INC. P.O. BOX 1098 BIRMGHAM, COLORADO	ENVIRONMENTAL DIVISION COMPLIANCE AND RESOURCES BRANCH ROCKY MOUNTAIN ARSENAL COMMERCE CITY, COLORADO
DESIGNED BY L. R. NEMER DATE FEB 15, 1985 DRAWN BY R. L. KELLEY DATE FEB 15, 1985 REVIEWED BY R. ANDERSON DATE FEB 15, 1985 APPROVED BY S. WARD DATE FEB 15, 1985	NORTH BOUNDARY CONTAINMENT TREATMENT SYSTEM FLUORIDE CONCENTRATION MAP, ppm 4th QUARTER, OCTOBER 1984
	DRAWING NO. PLATE IC-14



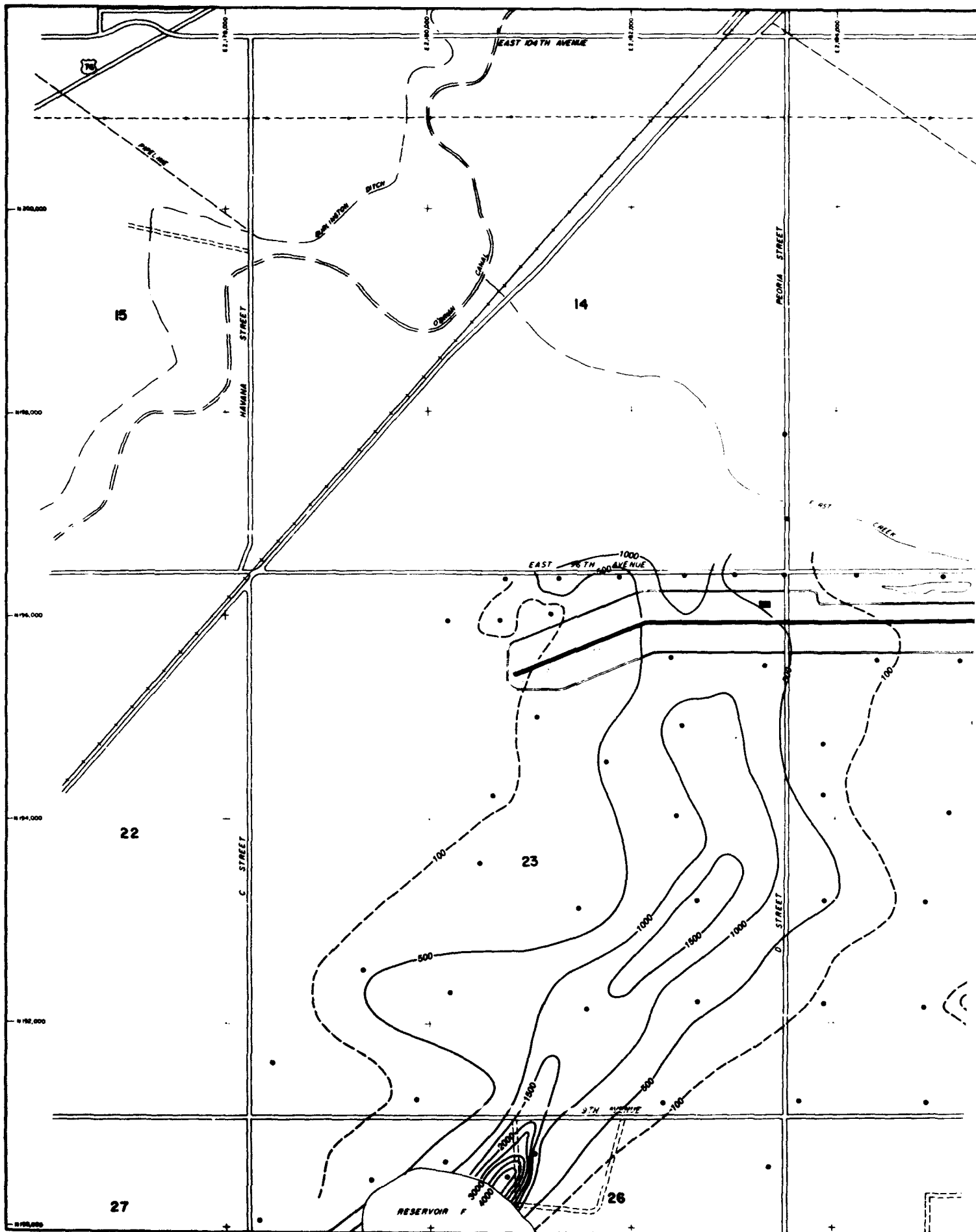


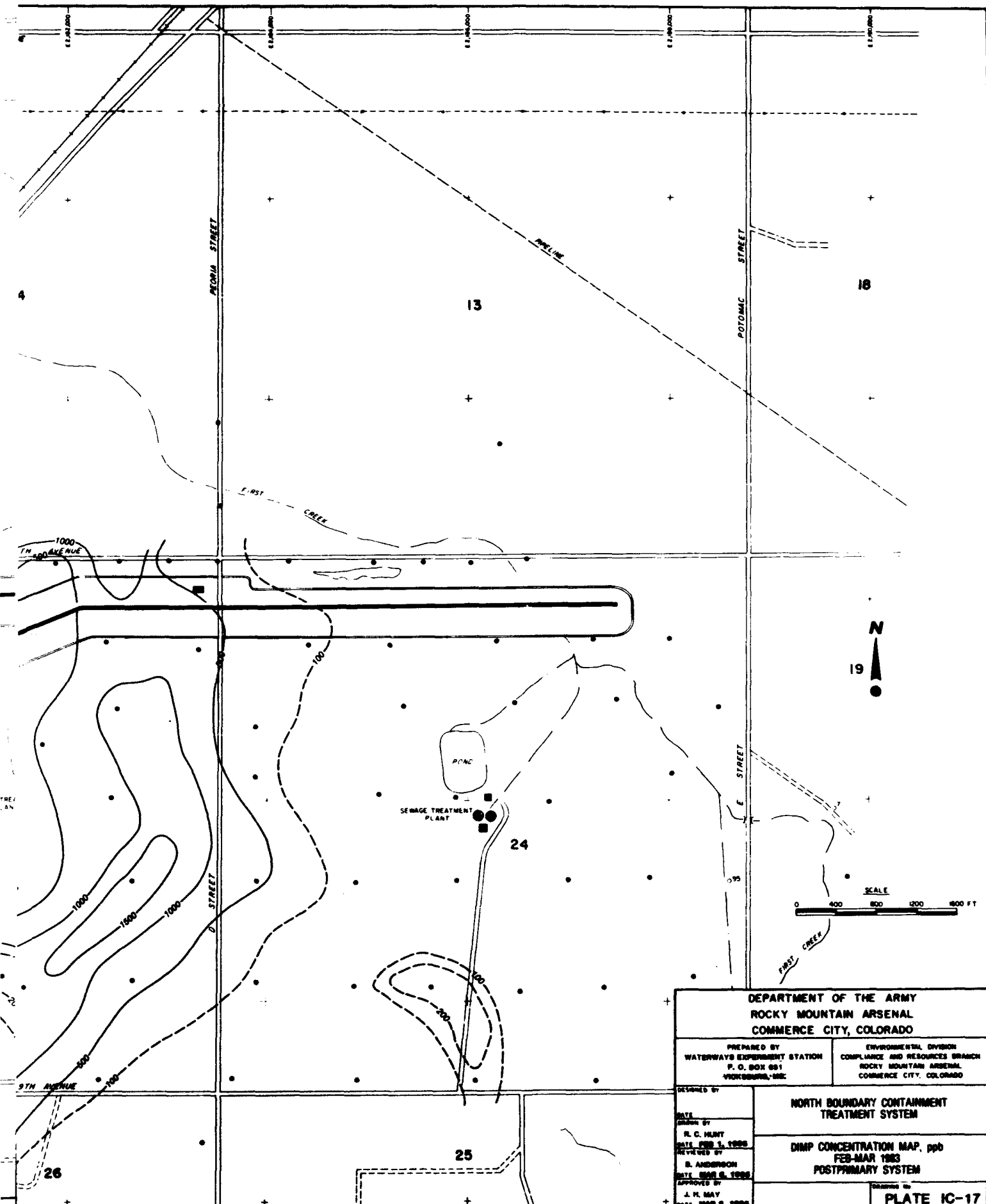
DEPARTMENT OF THE ARMY ROCKY MOUNTAIN ARSENAL COMMERCE CITY, COLORADO	
PREPARED BY WATERWAYS EXPERIMENT STATION P. O. BOX 881 VICKSBURG, MS.	ENVIRONMENTAL DIVISION COMPLIANCE AND RESOURCES BRANCH ROCKY MOUNTAIN ARSENAL COMMERCE CITY, COLORADO
DESIGNED BY DATE DRAWN BY R. C. HUNT DATE: FEB. 1, 1985 REVIEWED BY B. ANDERSON DATE: MAR. 8, 1985 APPROVED BY J. H. MAY DATE: MAR. 8, 1985	NORTH BOUNDARY CONTAINMENT TREATMENT SYSTEM DMP CONCENTRATION MAP, ppb SEP 1977 PREPILOT SYSTEM
DRAWING NO. PLATE IC-15	



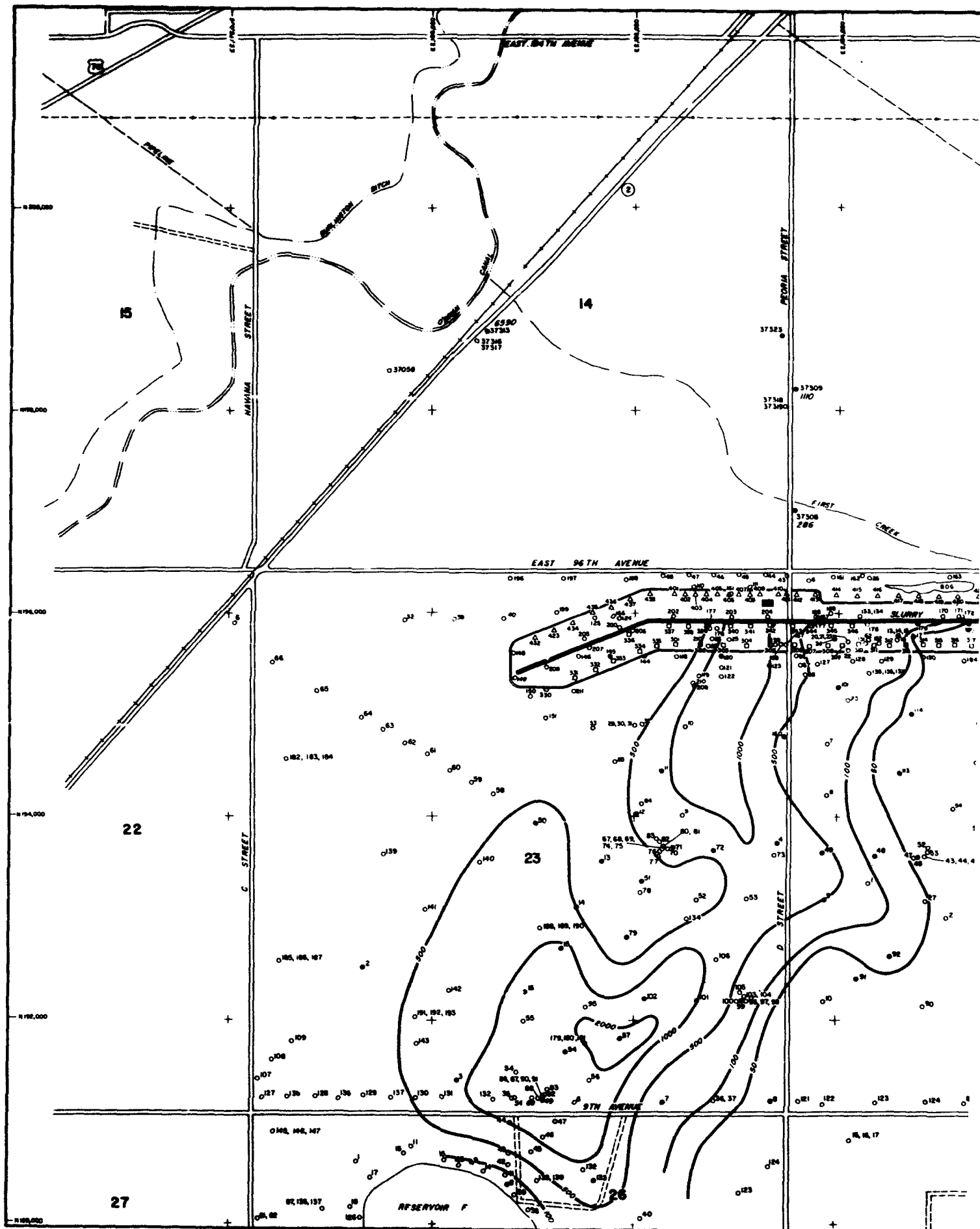


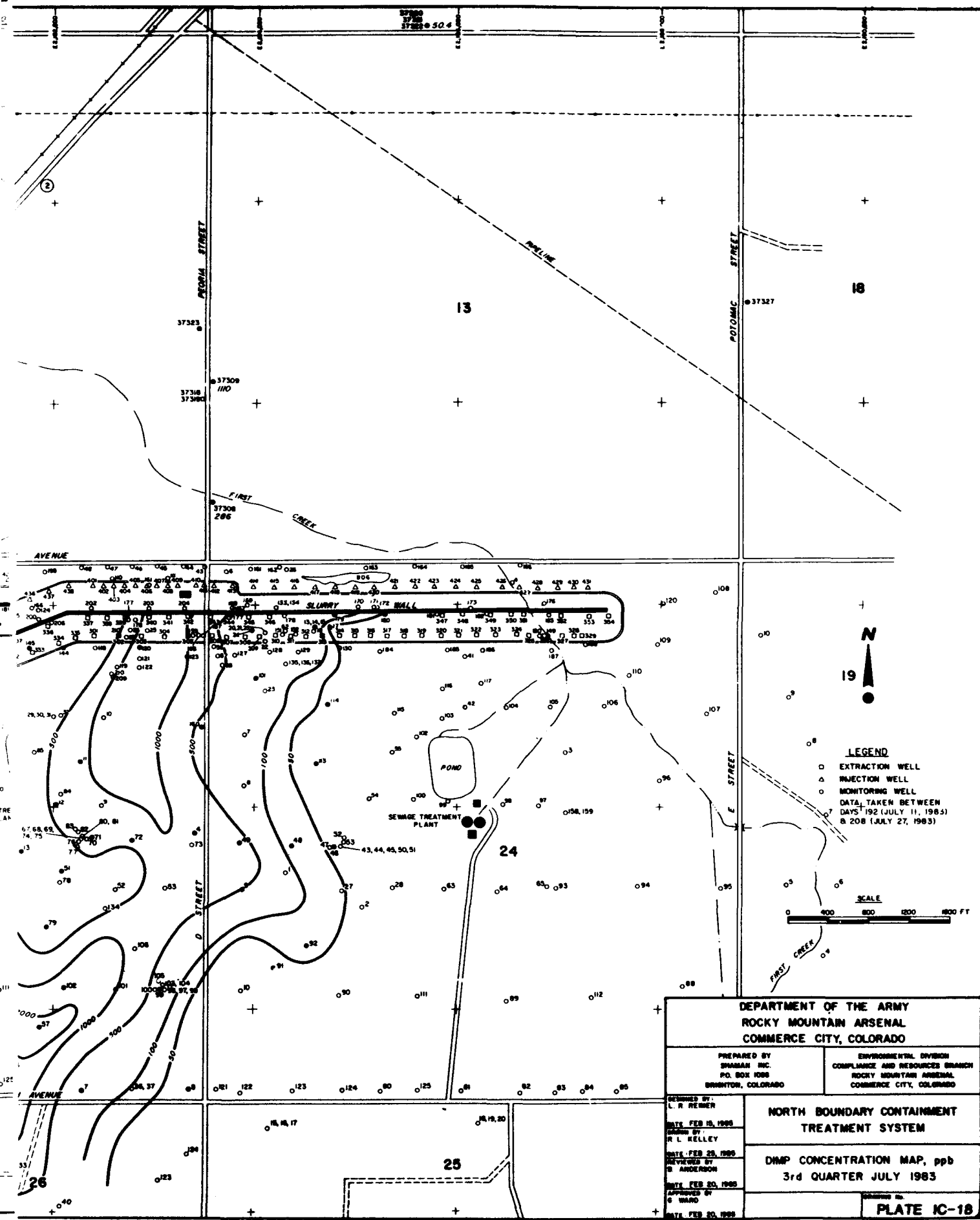
DEPARTMENT OF THE ARMY ROCKY MOUNTAIN ARSENAL COMMERCE CITY, COLORADO	
PREPARED BY WATERWAYS EXPERIMENT STATION P. O. BOX 681 VICKSBURG, MS.	ENVIRONMENTAL DIVISION COMPLIANCE AND RESPONSES BRANCH ROCKY MOUNTAIN ARSENAL COMMERCE CITY, COLORADO
DESIGNED BY DATE DRAWN BY R. C. MUNT DATE FEB 3, 1988 REVIEWED BY B. ANDERSON DATE MAR 8, 1988 APPROVED BY J. H. MAY DATE MAR 8, 1988	NORTH BOUNDARY CONTAINMENT TREATMENT SYSTEM DIMP CONCENTRATION MAP, ppb MAR-SEP 1979 POSTPILOT-PREPRIMARY SYSTEMS DRAWING NO. PLATE IC-18





DEPARTMENT OF THE ARMY ROCKY MOUNTAIN ARSENAL COMMERCE CITY, COLORADO	
PREPARED BY WATERWAYS EXPERIMENT STATION P. O. BOX 601 WASHINGTON, D.C.	ENVIRONMENTAL DIVISION COMPLIANCE AND RESOURCES BRANCH ROCKY MOUNTAIN ARSENAL COMMERCE CITY, COLORADO
DESIGNED BY DATE DRAWN BY R. C. HUNT DATE FEB 5, 1983 REVIEWED BY B. ANDERSON DATE MAR 8, 1983 APPROVED BY J. H. MAY DATE MAR 5, 1983	NORTH BOUNDARY CONTAMMENT TREATMENT SYSTEM DIMP CONCENTRATION MAP, ppb FEB-MAR 1983 POSTPRIMARY SYSTEM <small>Drawn to</small> PLATE IC-17





N

19

LEGEND

- EXTRACTION WELL
 - △ INJECTION WELL
 - MONITORING WELL
- DATA TAKEN BETWEEN
DAYS 192 (JULY 11, 1983)
& 208 (JULY 27, 1983)

SCALE



**DEPARTMENT OF THE ARMY
ROCKY MOUNTAIN ARSENAL
COMMERCE CITY, COLORADO**

PREPARED BY
SHAWKIN INC.
P.O. BOX 1088
BRIGHTON, COLORADO

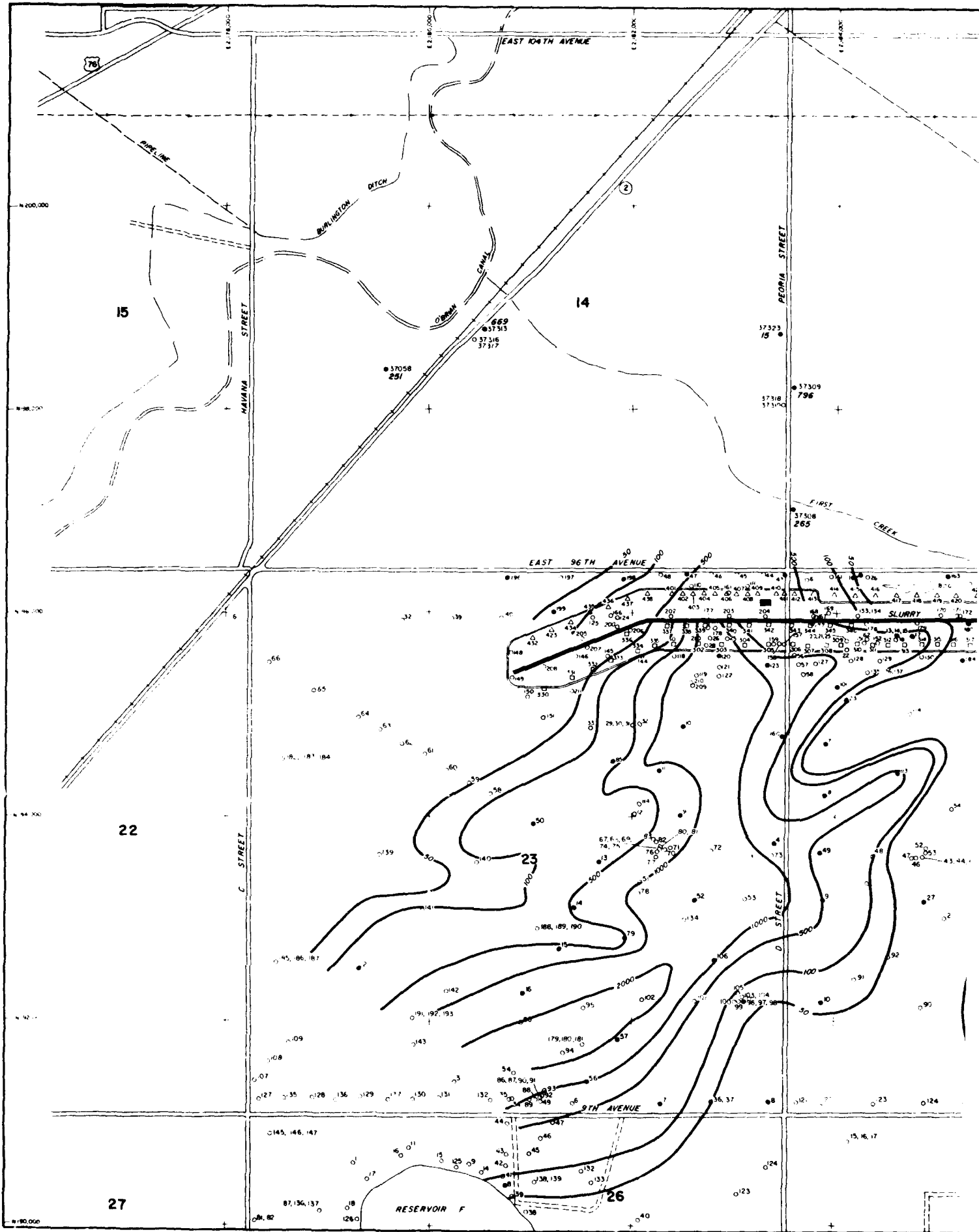
ENVIRONMENTAL DIVISION
COMPLIANCE AND RESOURCES BRANCH
ROCKY MOUNTAIN ARSENAL
COMMERCE CITY, COLORADO

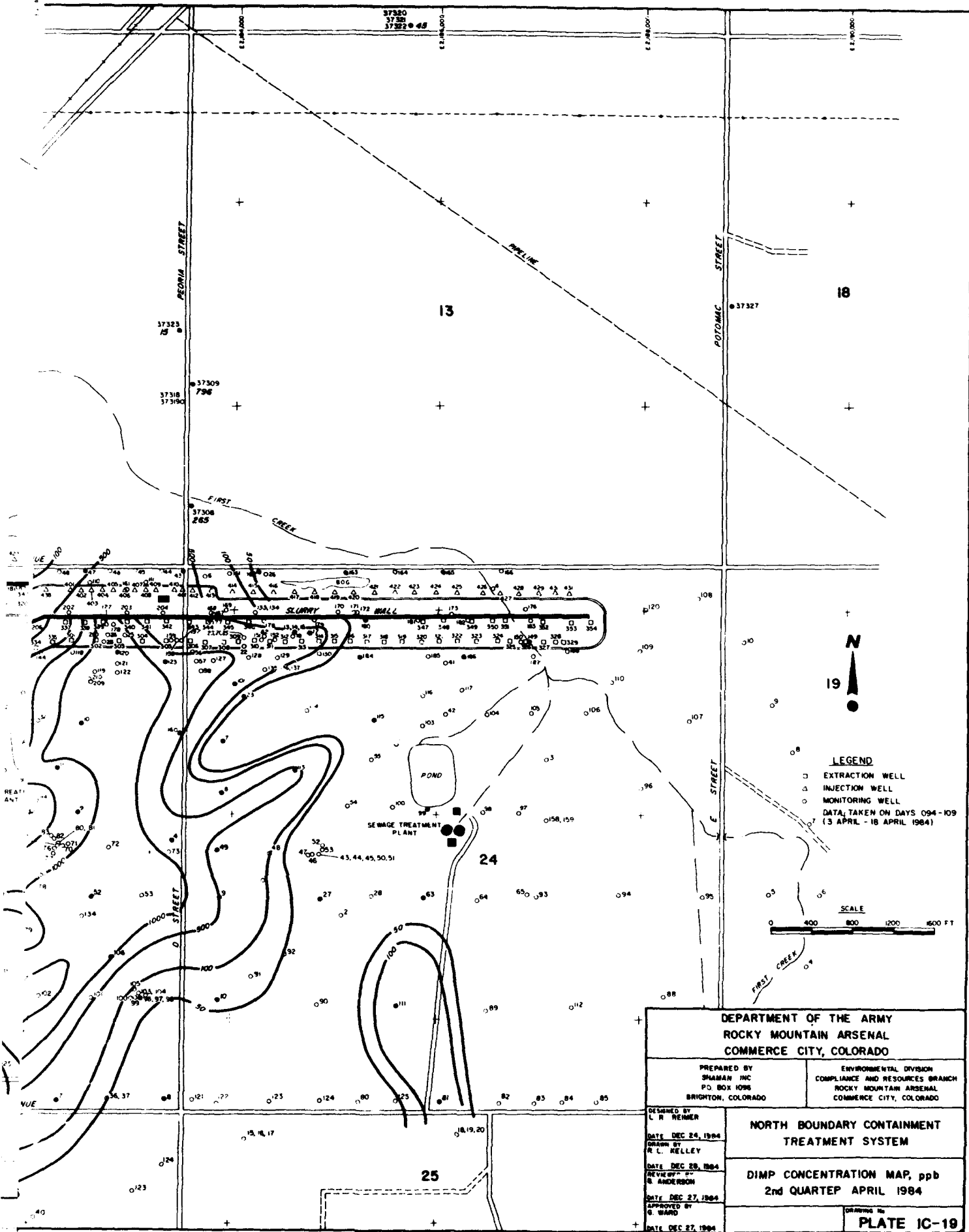
DESIGNED BY
L. R. REHNER
DATE FEB 18, 1983
DRAWN BY
R. L. KELLEY
DATE FEB 25, 1983
REVIEWED BY
S. ANDERSON
DATE FEB 20, 1983
APPROVED BY
G. WARD
DATE FEB 20, 1983

**NORTH BOUNDARY CONTAINMENT
TREATMENT SYSTEM**

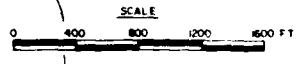
**DMP CONCENTRATION MAP, ppb
3rd QUARTER JULY 1983**

PLATE IC-18





LEGEND
 □ EXTRACTION WELL
 △ INJECTION WELL
 ○ MONITORING WELL
 DATA TAKEN ON DAYS 094-109
 (13 APRIL - 18 APRIL 1984)



**DEPARTMENT OF THE ARMY
 ROCKY MOUNTAIN ARSENAL
 COMMERCE CITY, COLORADO**

PREPARED BY
 SHAMAN INC
 P.O. BOX 1096
 BRIGHTON, COLORADO

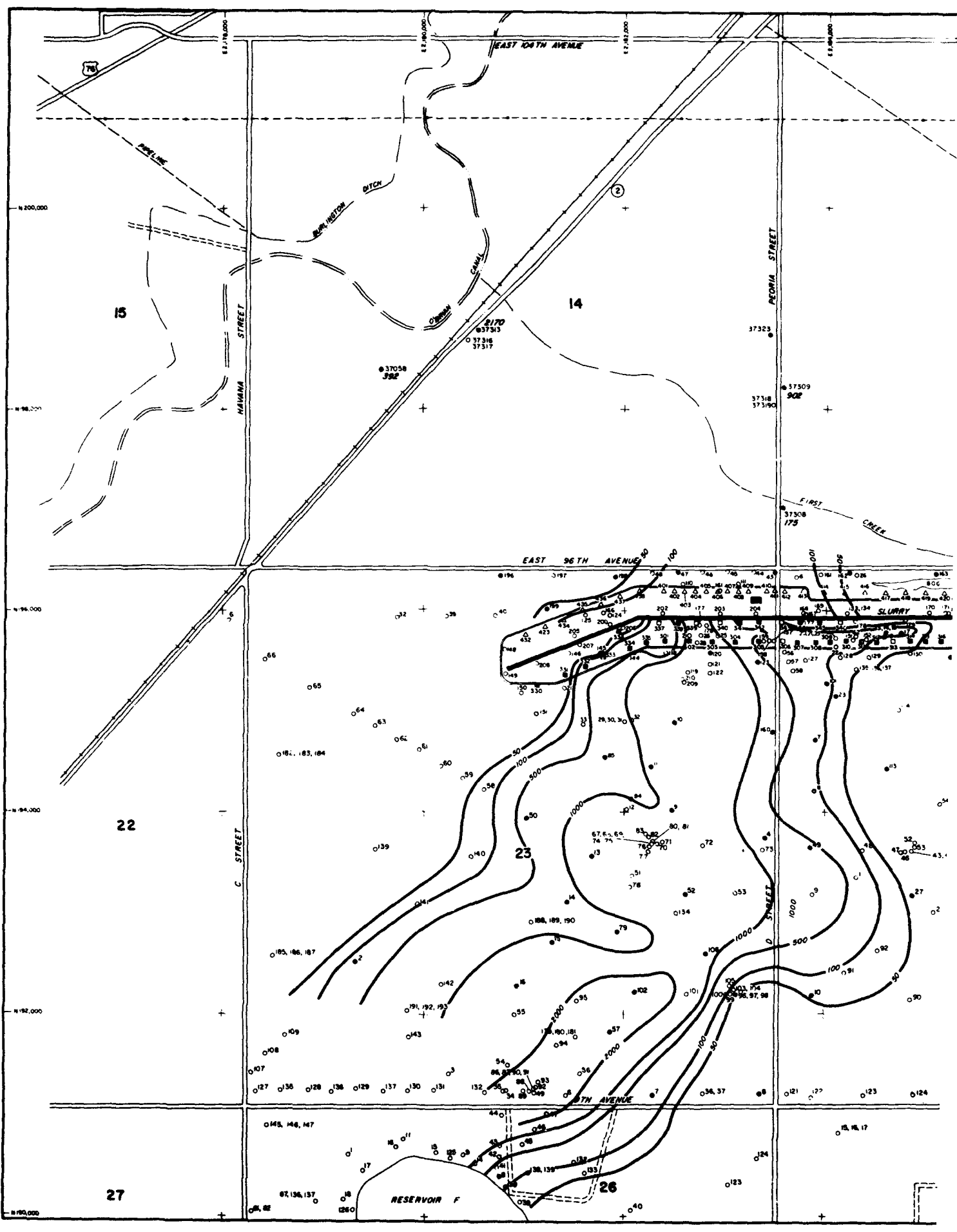
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 COMPLIANCE AND RESOURCES BRANCH
 ROCKY MOUNTAIN ARSENAL
 COMMERCE CITY, COLORADO

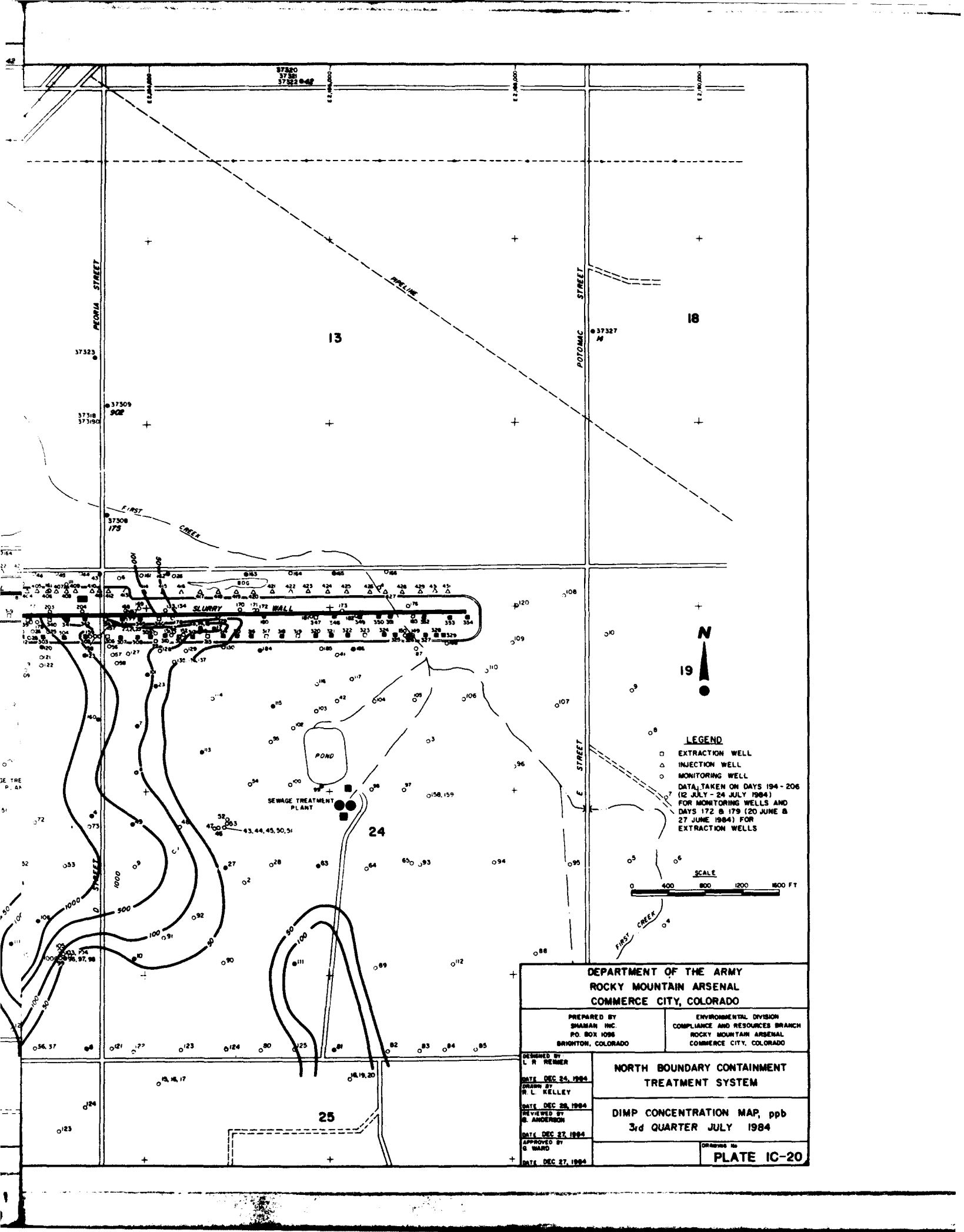
DESIGNED BY
 L. R. REMER
 DATE DEC 24, 1984
 DRAWN BY
 R. L. KELLEY
 DATE DEC 28, 1984
 CHECKED BY
 S. ANDERSON
 DATE DEC 27, 1984
 APPROVED BY
 G. WARD
 DATE DEC 27, 1984

**NORTH BOUNDARY CONTAINMENT
 TREATMENT SYSTEM**

**DIMP CONCENTRATION MAP, ppb
 2nd QUARTEP APRIL 1984**

DRAWING No
PLATE IC-19

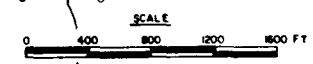




LEGEND

- EXTRACTION WELL
- △ INJECTION WELL
- MONITORING WELL

DATA TAKEN ON DAYS 194 - 206
(12 JULY - 24 JULY 1984)
FOR MONITORING WELLS AND
DAYS 172 & 179 (20 JUNE &
27 JUNE 1984) FOR
EXTRACTION WELLS



**DEPARTMENT OF THE ARMY
ROCKY MOUNTAIN ARSENAL
COMMERCE CITY, COLORADO**

PREPARED BY
SHAMAN INC.
PO. BOX 1088
BRIGHTON, COLORADO

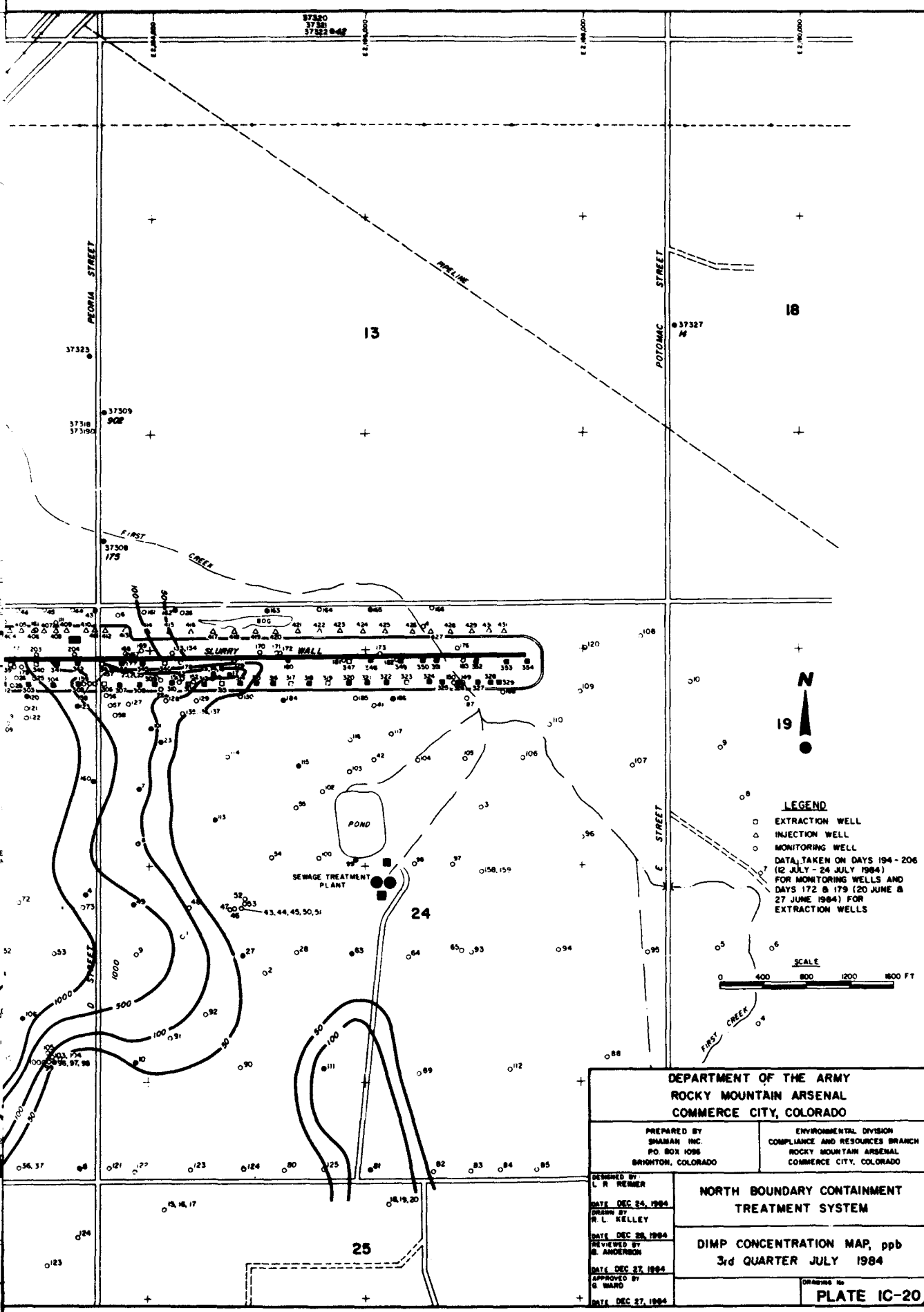
ENVIRONMENTAL DIVISION
COMPLIANCE AND RESOURCES BRANCH
ROCKY MOUNTAIN ARSENAL
COMMERCE CITY, COLORADO

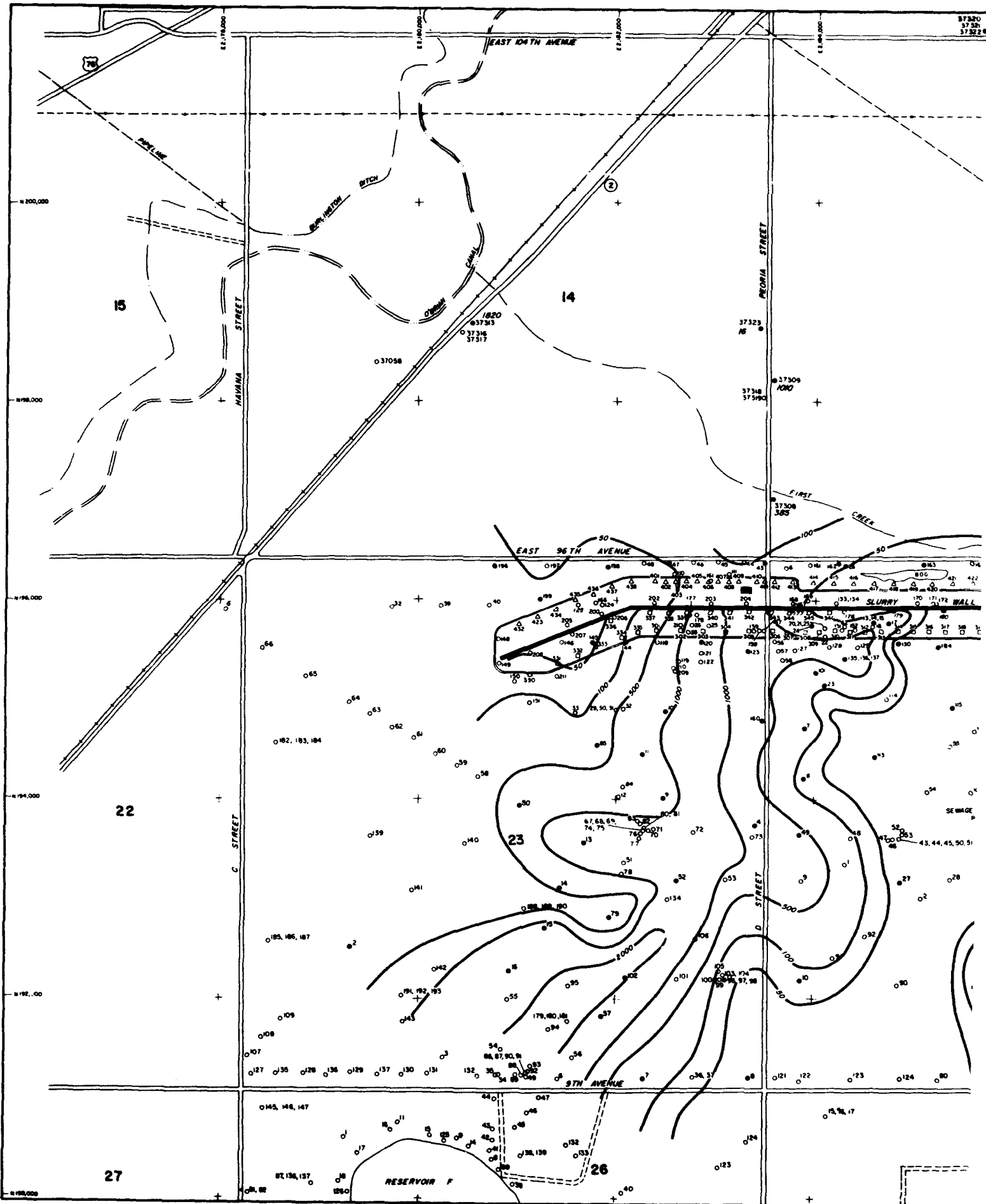
DESIGNED BY
L. R. REISNER
DATE DEC 24, 1984
DRAWN BY
R. L. KELLEY
DATE DEC 28, 1984
REVIEWED BY
B. ANDERSON
DATE DEC 27, 1984
APPROVED BY
G. WARD
DATE DEC 27, 1984

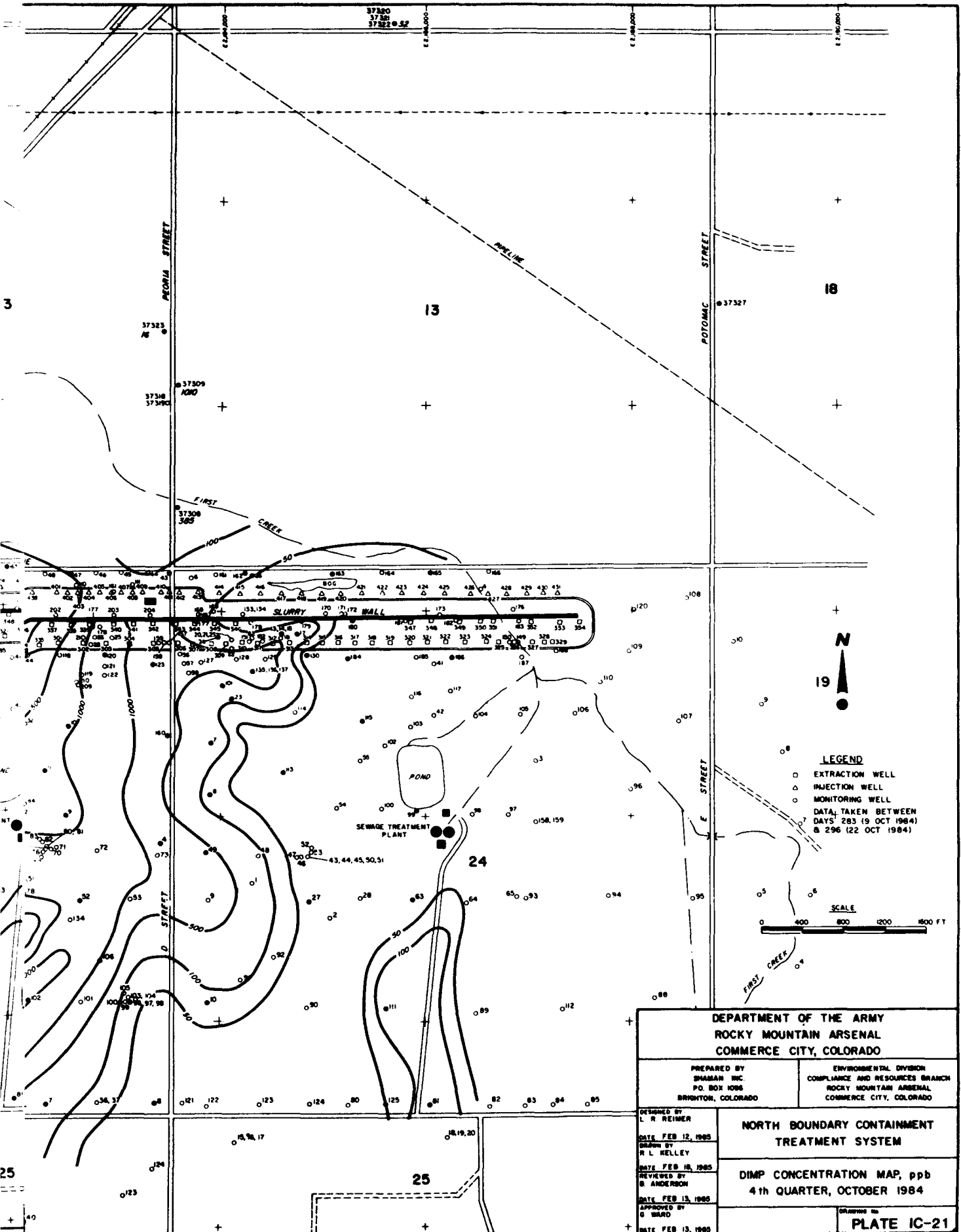
**NORTH BOUNDARY CONTAINMENT
TREATMENT SYSTEM**

**DIMP CONCENTRATION MAP, ppb
3rd QUARTER JULY 1984**

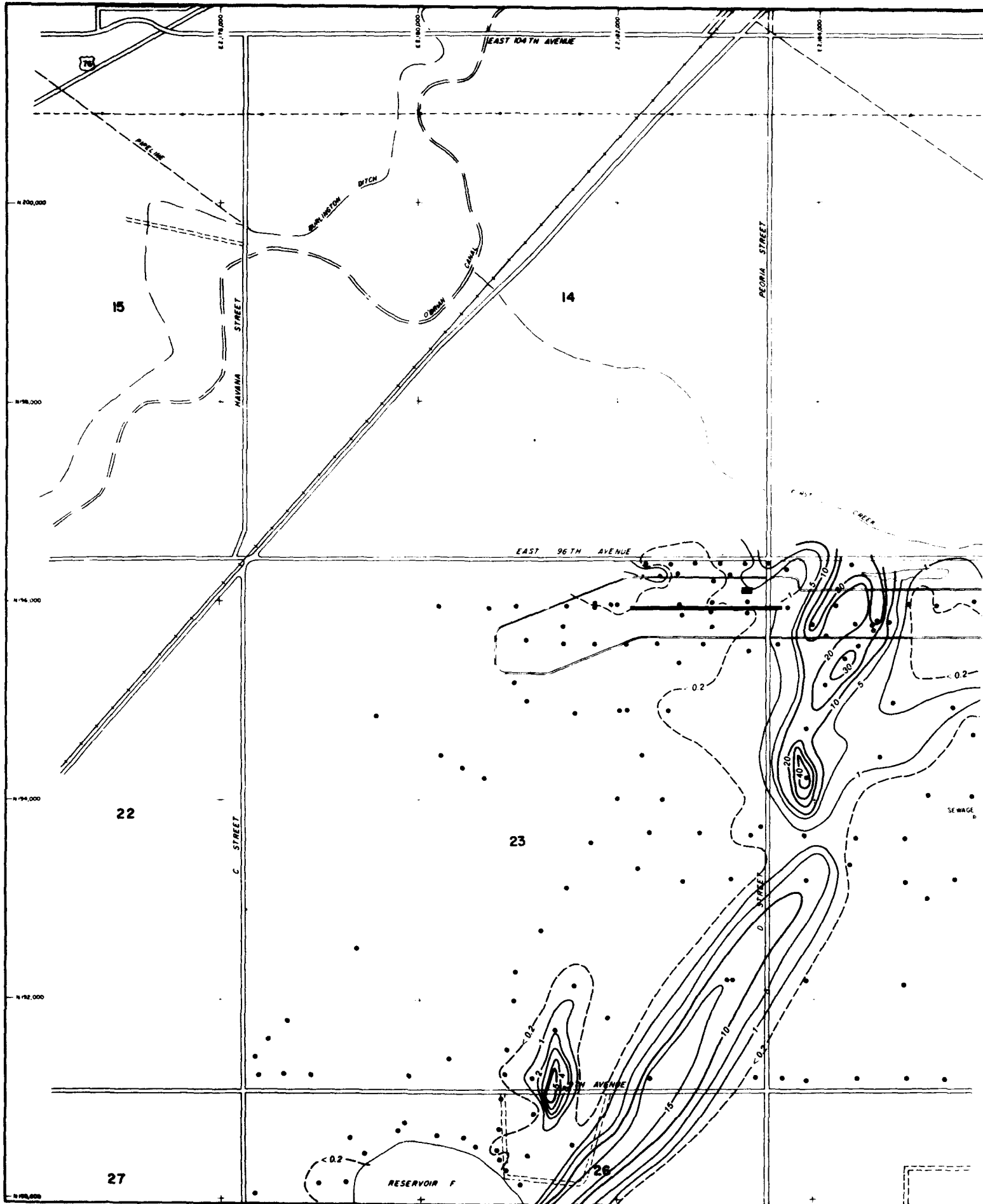
Drawing No
PLATE IC-20

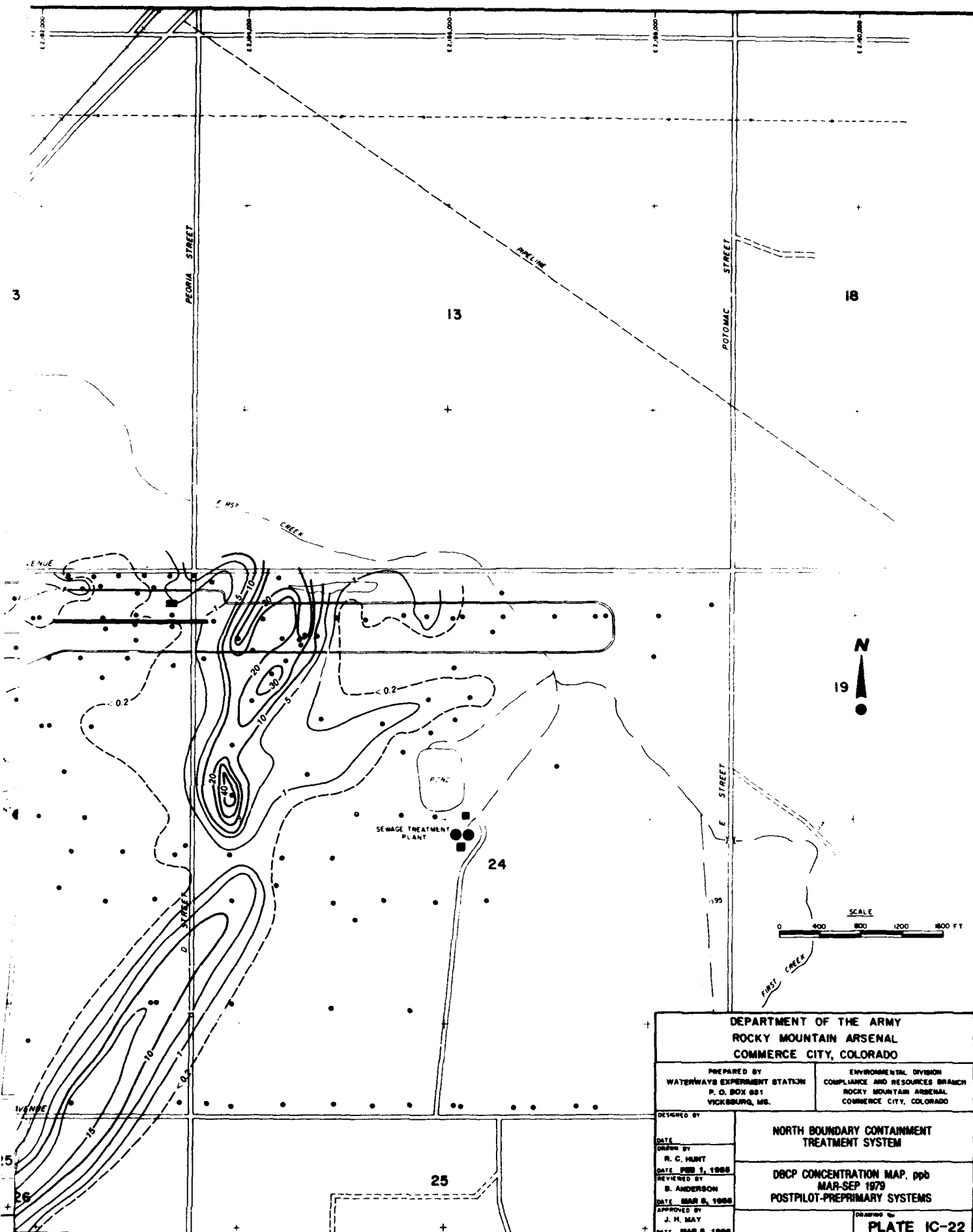




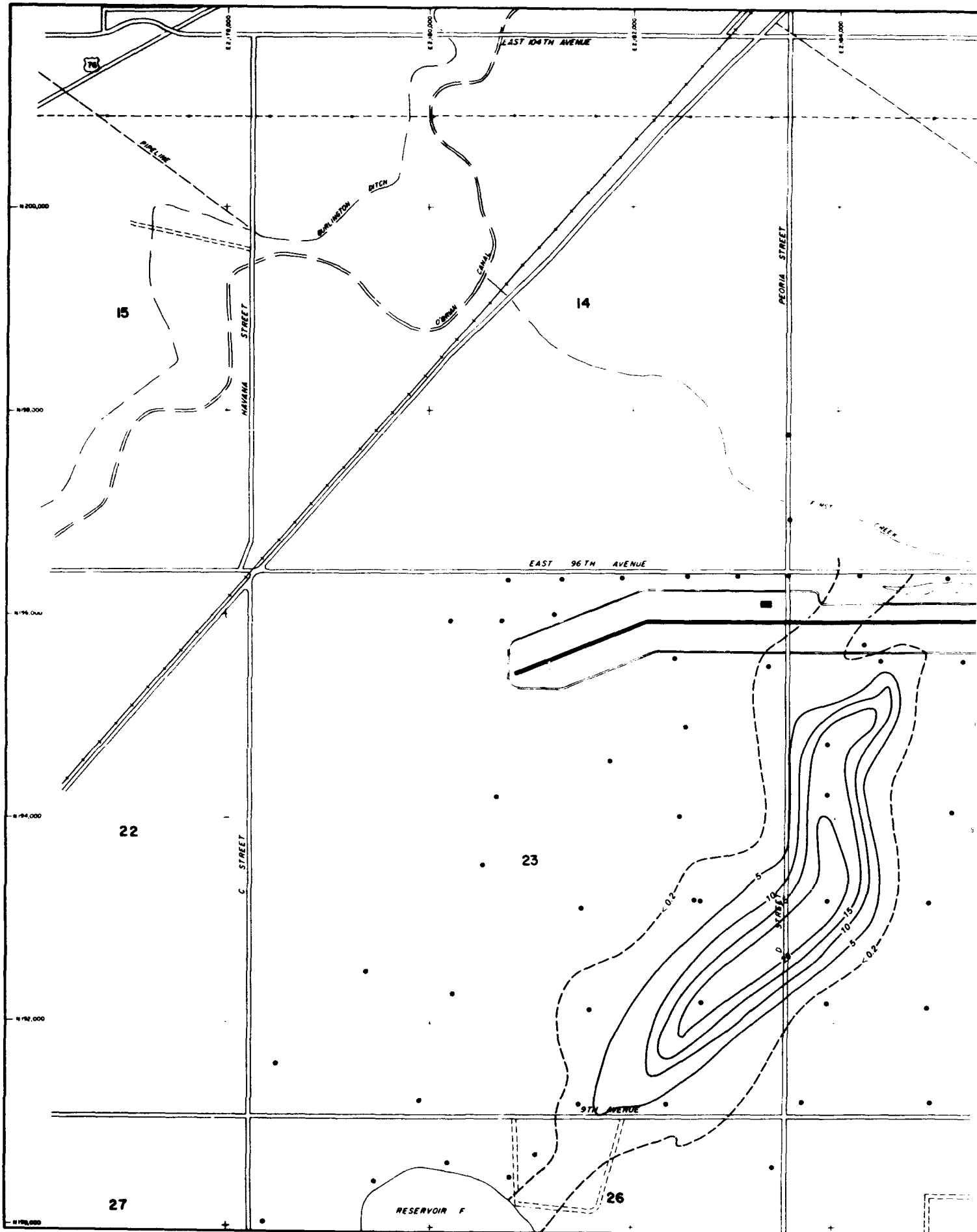


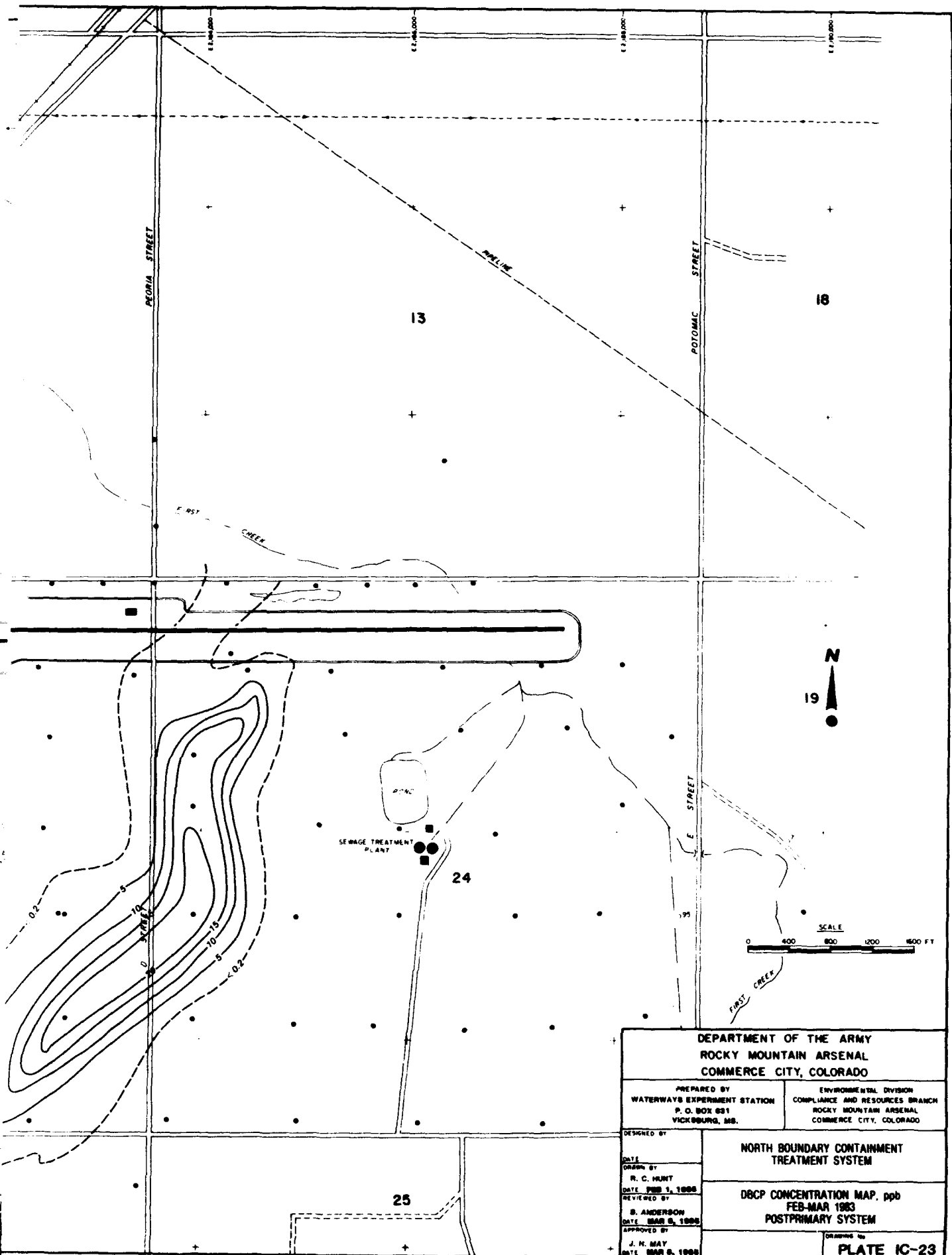
DEPARTMENT OF THE ARMY ROCKY MOUNTAIN ARSENAL COMMERCE CITY, COLORADO	
PREPARED BY SHAMAN INC. P.O. BOX 1086 BRIGHTON, COLORADO	ENVIRONMENTAL DIVISION COMPLIANCE AND RESOURCES BRANCH ROCKY MOUNTAIN ARSENAL COMMERCE CITY, COLORADO
DESIGNED BY L. R. REIMER DATE FEB 12, 1985 DRAWN BY R. L. KELLEY DATE FEB 18, 1985 REVIEWED BY B. ANDERSON DATE FEB 13, 1985 APPROVED BY G. WARD DATE FEB 13, 1985	NORTH BOUNDARY CONTAINMENT TREATMENT SYSTEM DIMP CONCENTRATION MAP, ppb 4th QUARTER, OCTOBER 1984
	DRAWING No. PLATE IC-21



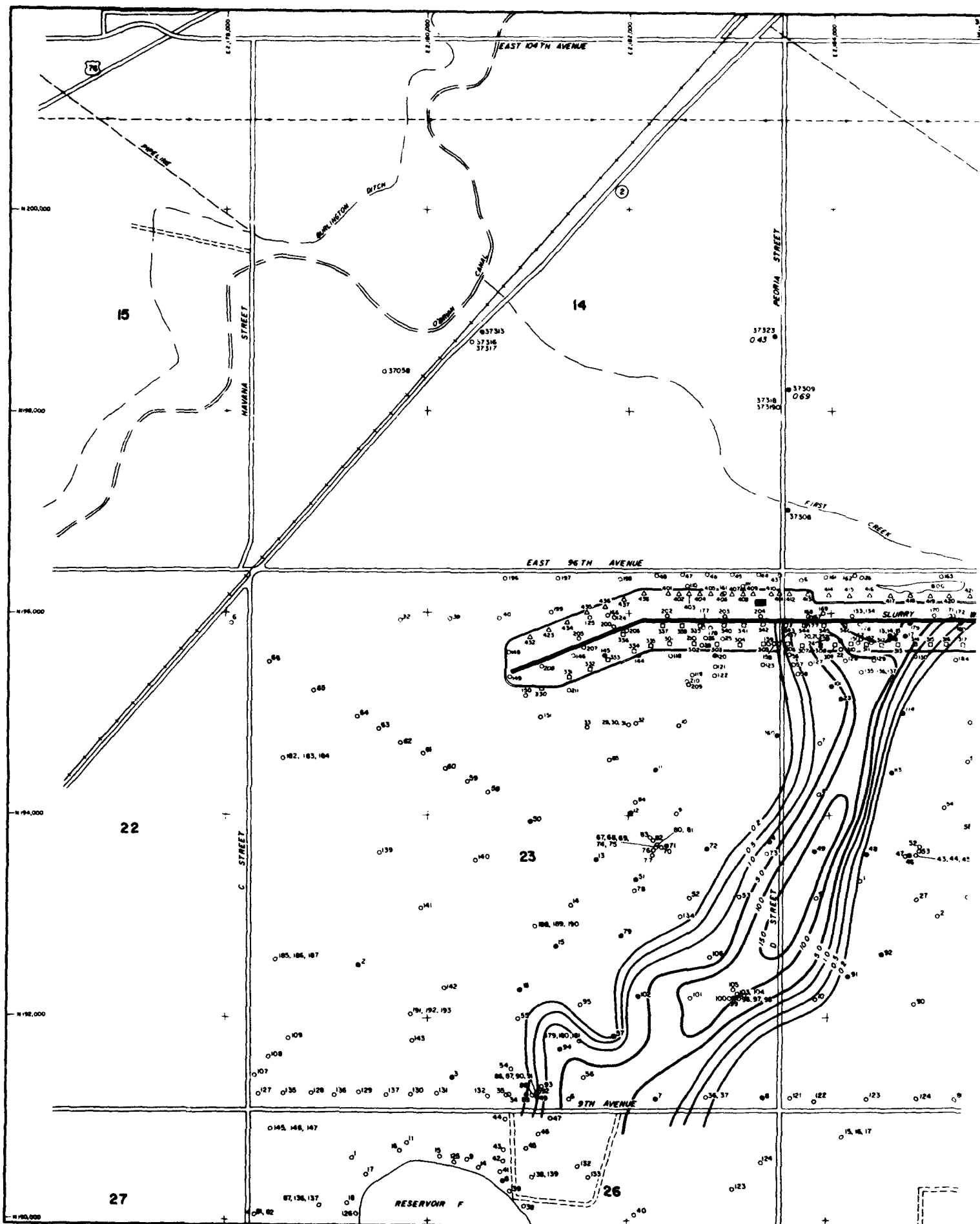


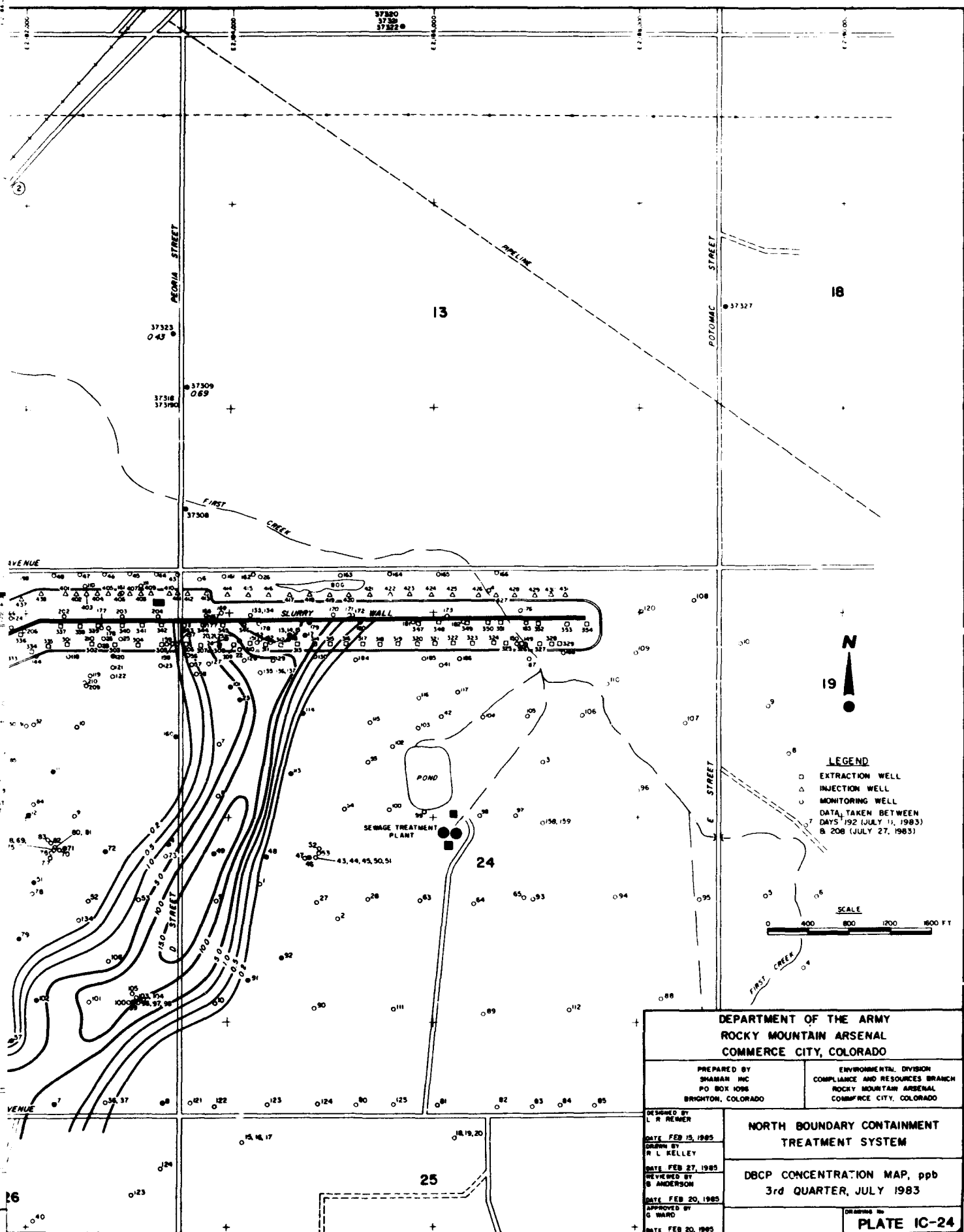
DEPARTMENT OF THE ARMY ROCKY MOUNTAIN ARSENAL COMMERCE CITY, COLORADO	
PREPARED BY WATERWAYS EXPERIMENT STATION P. O. BOX 681 VICKSBURG, MS.	ENVIRONMENTAL DIVISION COMPLIANCE AND RESOURCES BRANCH ROCKY MOUNTAIN ARSENAL COMMERCE CITY, COLORADO
DESIGNED BY DATE DRAWN BY R. C. HUNT DATE FEB 1, 1988 REVIEWED BY B. ANDERSON DATE MAR 6, 1988 APPROVED BY J. H. MAY DATE MAR 6, 1988	NORTH BOUNDARY CONTAINMENT TREATMENT SYSTEM DBCP CONCENTRATION MAP, ppb MAR-SEP 1979 POSTPILOT-PREPRIMARY SYSTEMS DRAWING NO. PLATE IC-22





DEPARTMENT OF THE ARMY ROCKY MOUNTAIN ARSENAL COMMERCE CITY, COLORADO	
PREPARED BY WATERWAYS EXPERIMENT STATION P. O. BOX 631 VICKSBURG, MS.	ENVIRONMENTAL DIVISION COMPLIANCE AND RESOURCES BRANCH ROCKY MOUNTAIN ARSENAL COMMERCE CITY, COLORADO
DESIGNED BY DATE DRAWN BY R. C. HUNT DATE FEB 1, 1983 REVIEWED BY S. ANDERSON DATE MAR 6, 1983 APPROVED BY J. N. MAY DATE MAR 9, 1983	NORTH BOUNDARY CONTAINMENT TREATMENT SYSTEM DBCp CONCENTRATION MAP, ppb FEB-MAR 1983 POSTPRIMARY SYSTEM DRAWING No. PLATE IC-23





**DEPARTMENT OF THE ARMY
ROCKY MOUNTAIN ARSENAL
COMMERCE CITY, COLORADO**

PREPARED BY
SHAMAR INC
PO BOX 1096
BRIGHTON, COLORADO

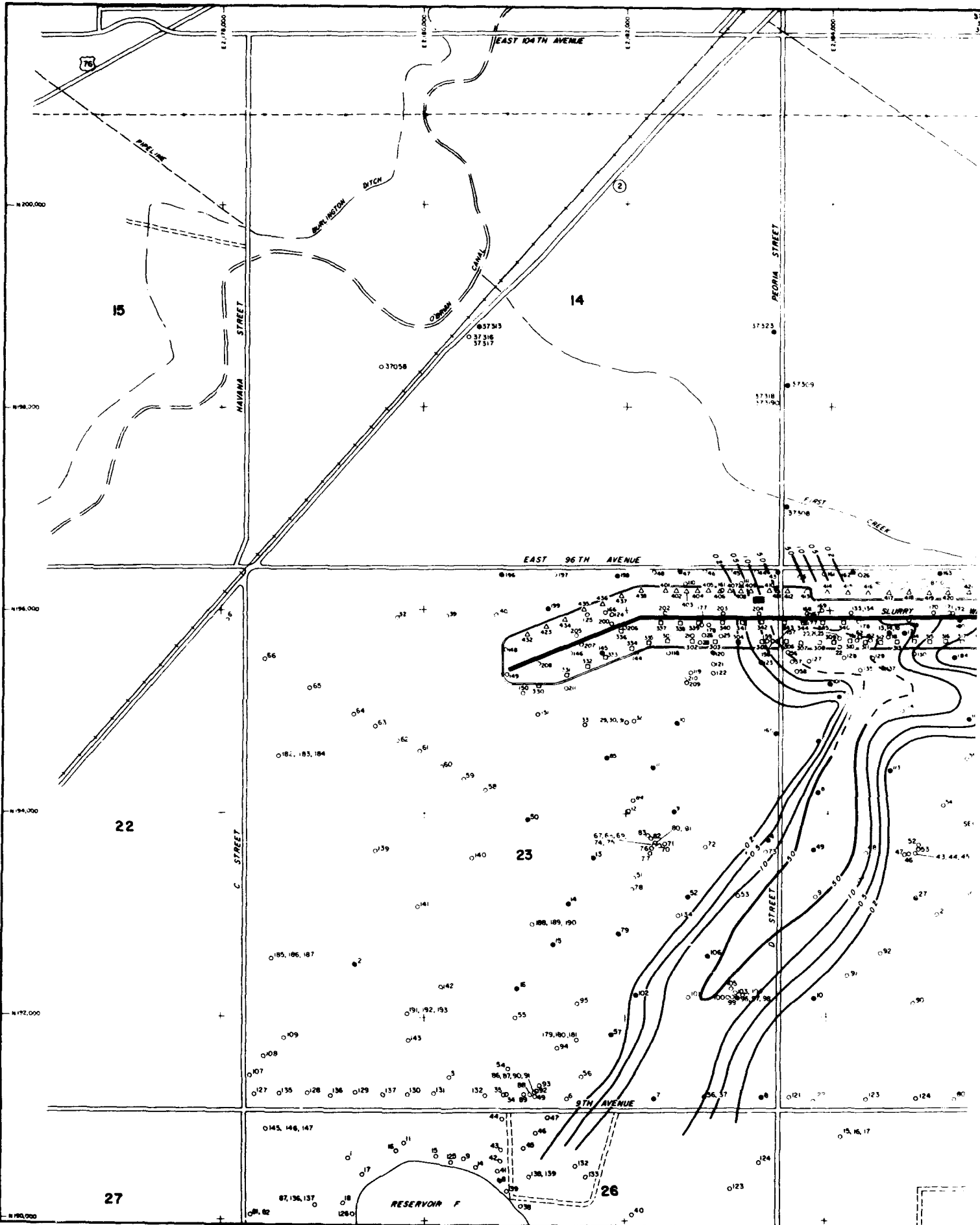
ENVIRONMENTAL DIVISION
COMPLIANCE AND RESOURCES BRANCH
ROCKY MOUNTAIN ARSENAL
COMMERCE CITY, COLORADO

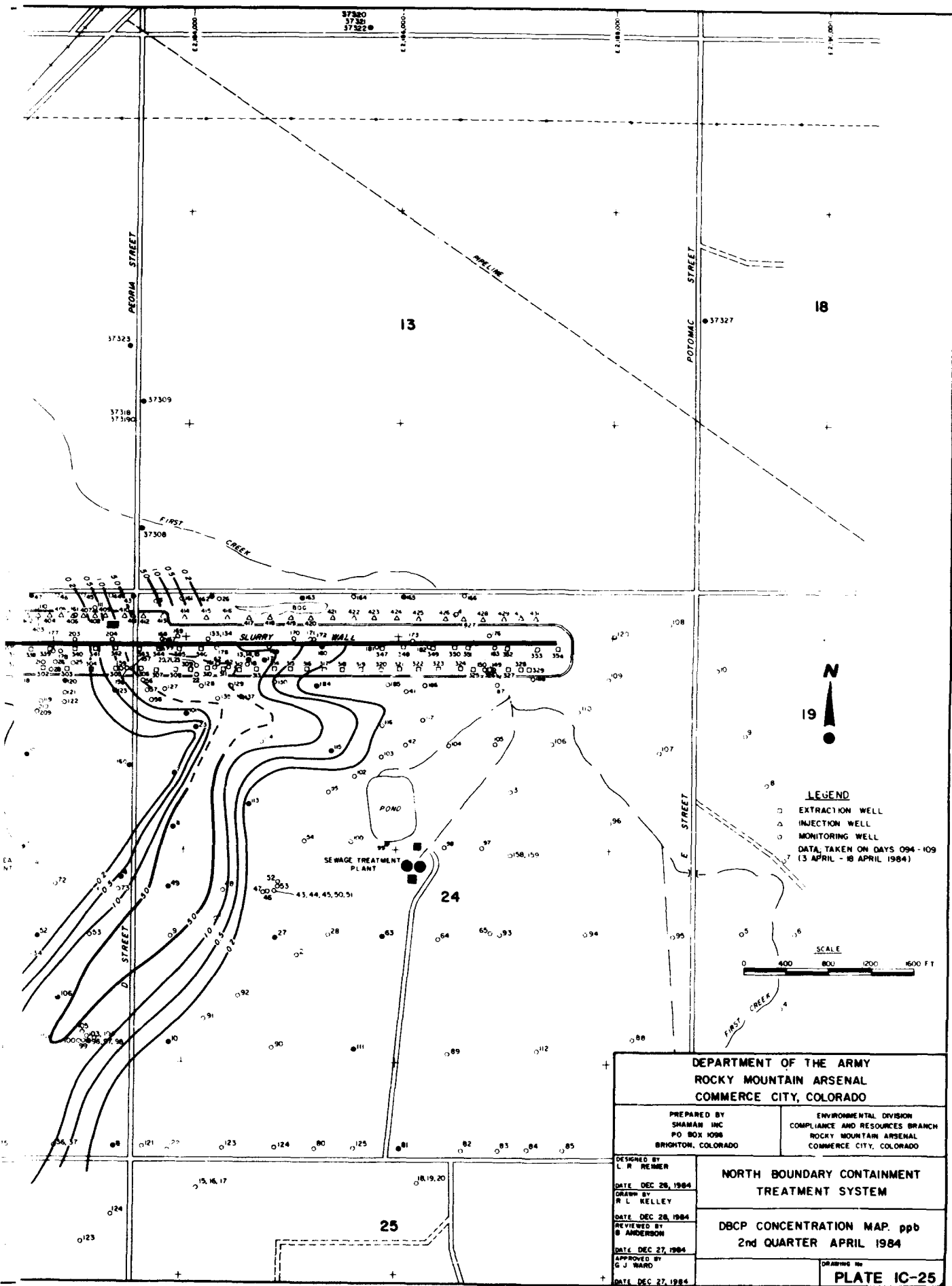
DESIGNED BY
L R REWER
DATE FEB 15, 1985
DRAWN BY
R L KELLEY
DATE FEB 27, 1985
CHECKED BY
B ANDERSON
DATE FEB 20, 1985
APPROVED BY
G WARD
DATE FEB 20, 1985

**NORTH BOUNDARY CONTAINMENT
TREATMENT SYSTEM**

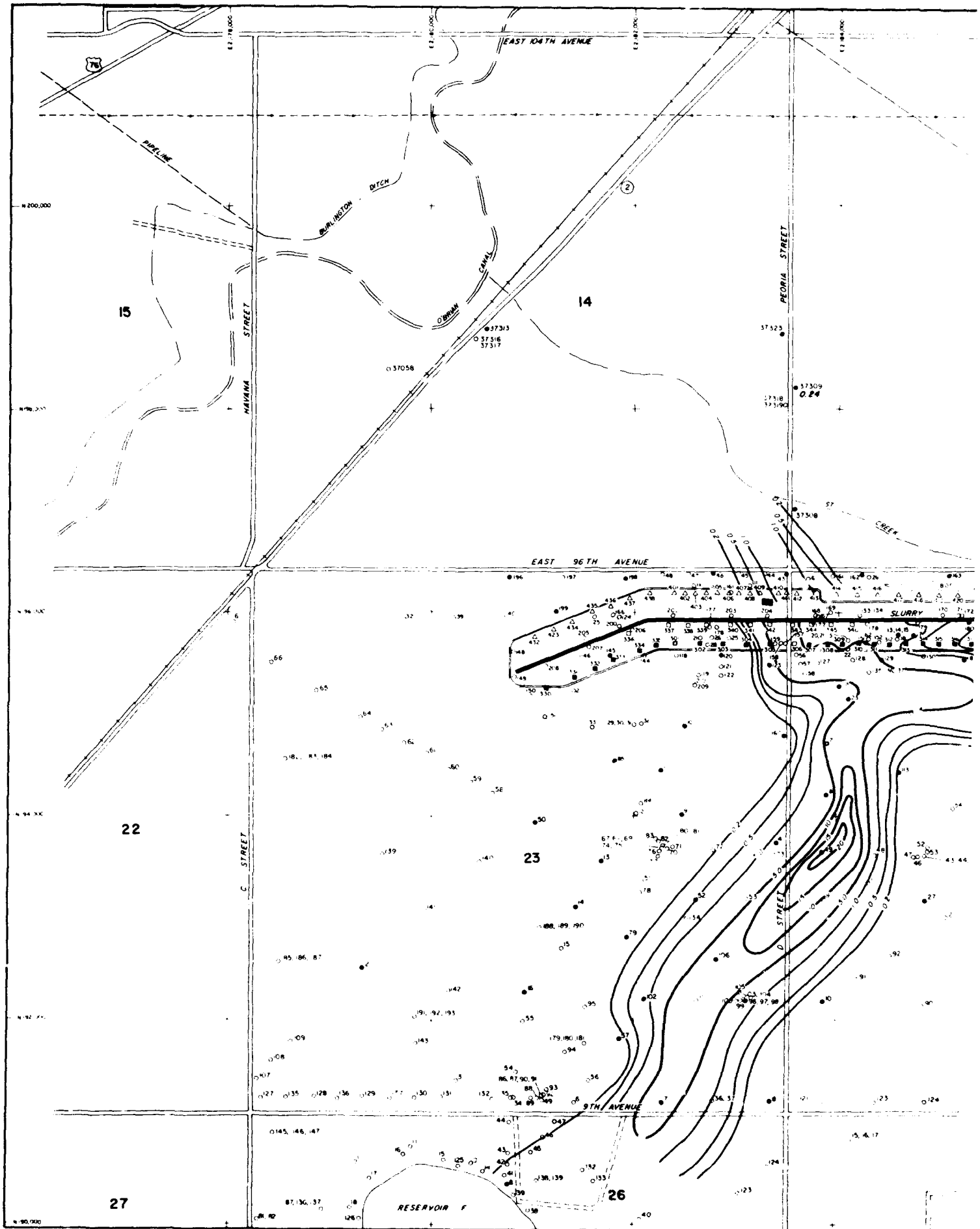
DBCP CONCENTRATION MAP, ppb
3rd QUARTER, JULY 1983

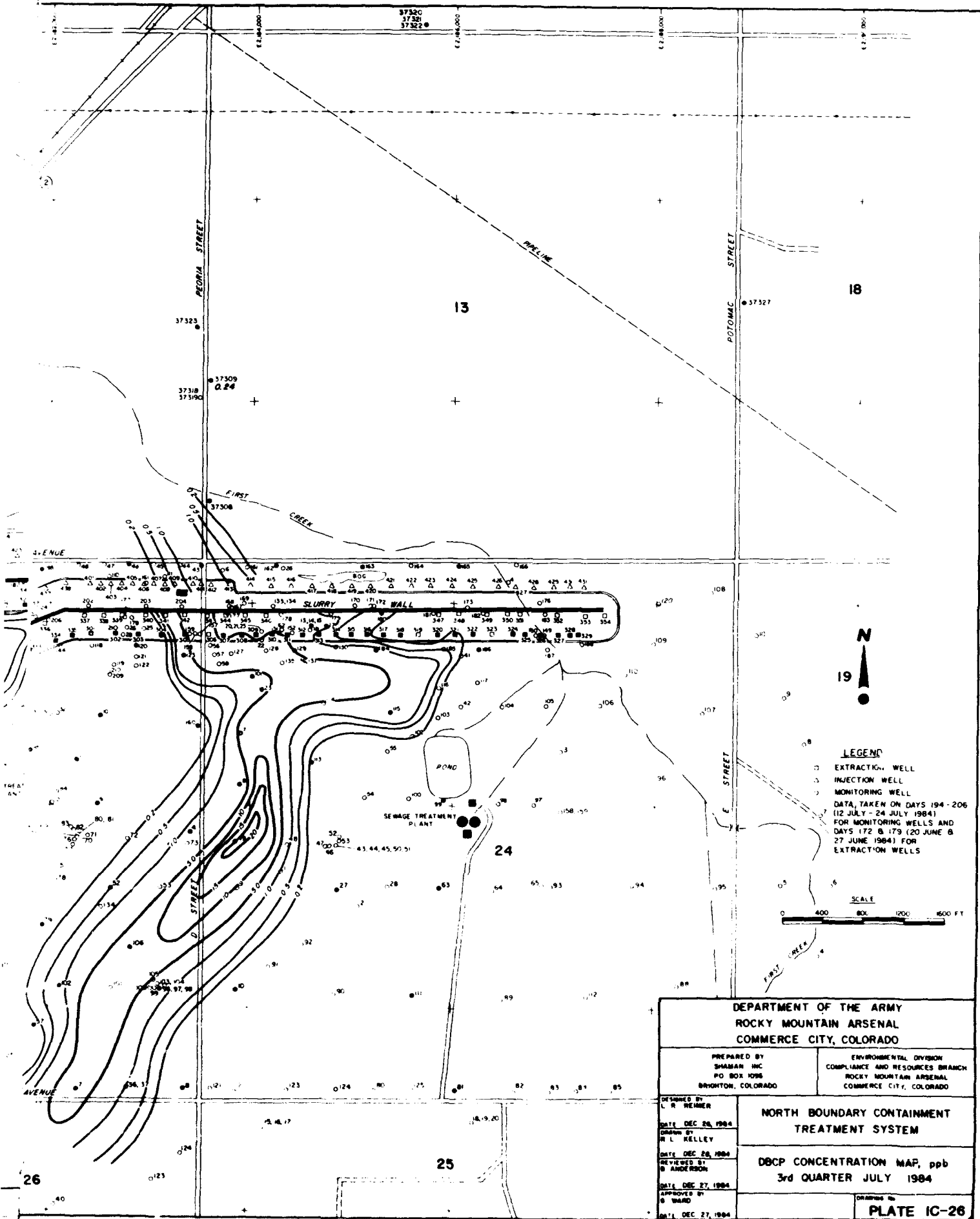
DRAWING NO.
PLATE IC-24





DEPARTMENT OF THE ARMY ROCKY MOUNTAIN ARSENAL COMMERCE CITY, COLORADO	
DESIGNED BY L. R. REMER DATE DEC 26, 1984 DRAWN BY R. L. KELLEY DATE DEC 26, 1984 REVIEWED BY B. ANDERSON DATE DEC 27, 1984 APPROVED BY G. J. WARD DATE DEC 27, 1984	ENVIRONMENTAL DIVISION COMPLIANCE AND RESOURCES BRANCH ROCKY MOUNTAIN ARSENAL COMMERCE CITY, COLORADO
NORTH BOUNDARY CONTAINMENT TREATMENT SYSTEM	
DBCp CONCENTRATION MAP. ppb 2nd QUARTER APRIL 1984	
DRAWING NO. PLATE IC-25	





LEGEND

- EXTRACTION WELL
- INJECTION WELL
- MONITORING WELL

DATA TAKEN ON DAYS 194 - 206
 (12 JULY - 24 JULY 1984)
 FOR MONITORING WELLS AND
 DAYS 172 & 179 (20 JUNE &
 27 JUNE 1984) FOR
 EXTRACTION WELLS

SCALE

0 400 800 1200 1600 FT

DEPARTMENT OF THE ARMY
 ROCKY MOUNTAIN ARSENAL
 COMMERCE CITY, COLORADO

PREPARED BY
 SHAMAR INC
 PO BOX 1098
 BRIGHTON, COLORADO

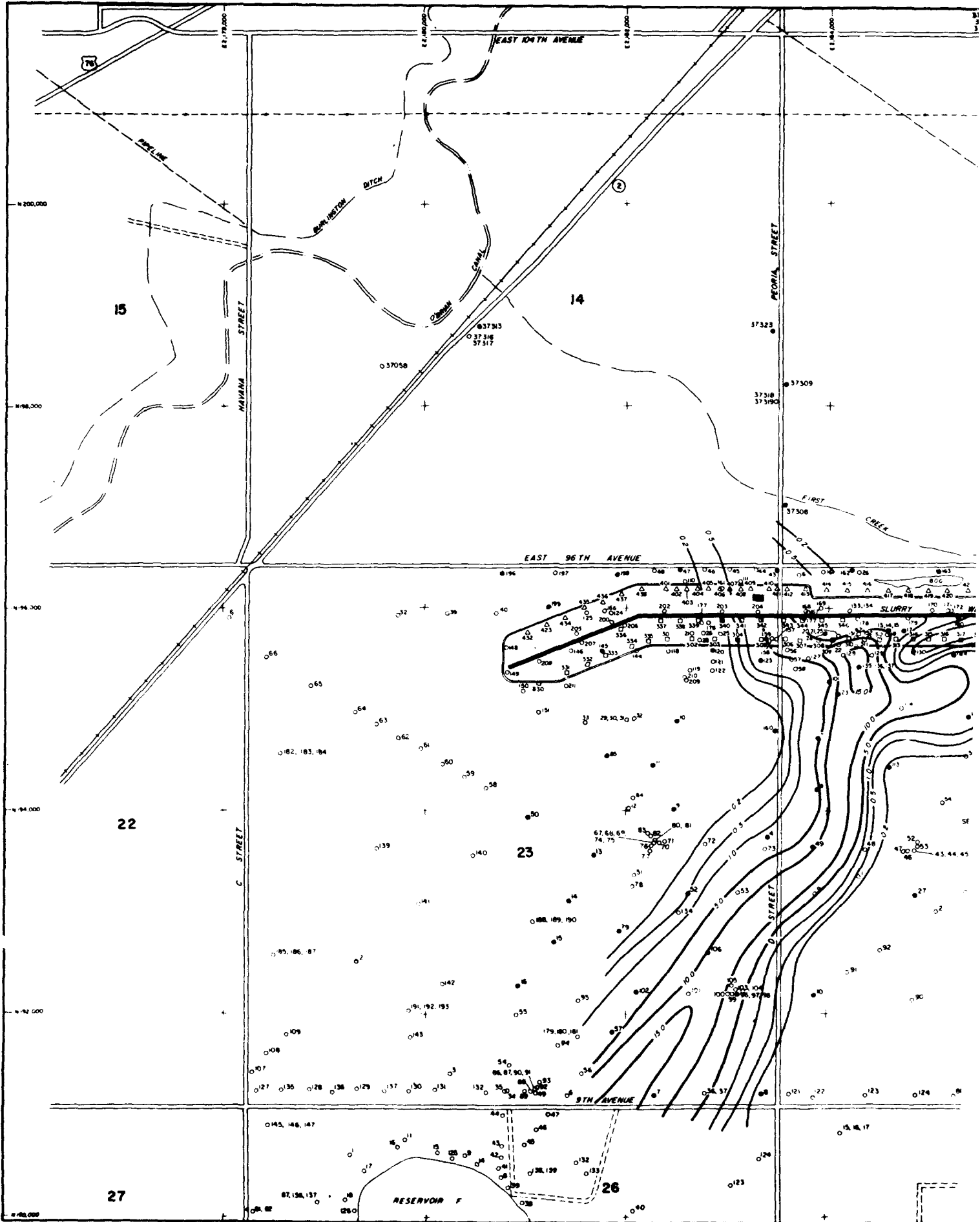
ENVIRONMENTAL DIVISION
 COMPLIANCE AND RESOURCES BRANCH
 ROCKY MOUNTAIN ARSENAL
 COMMERCE CITY, COLORADO

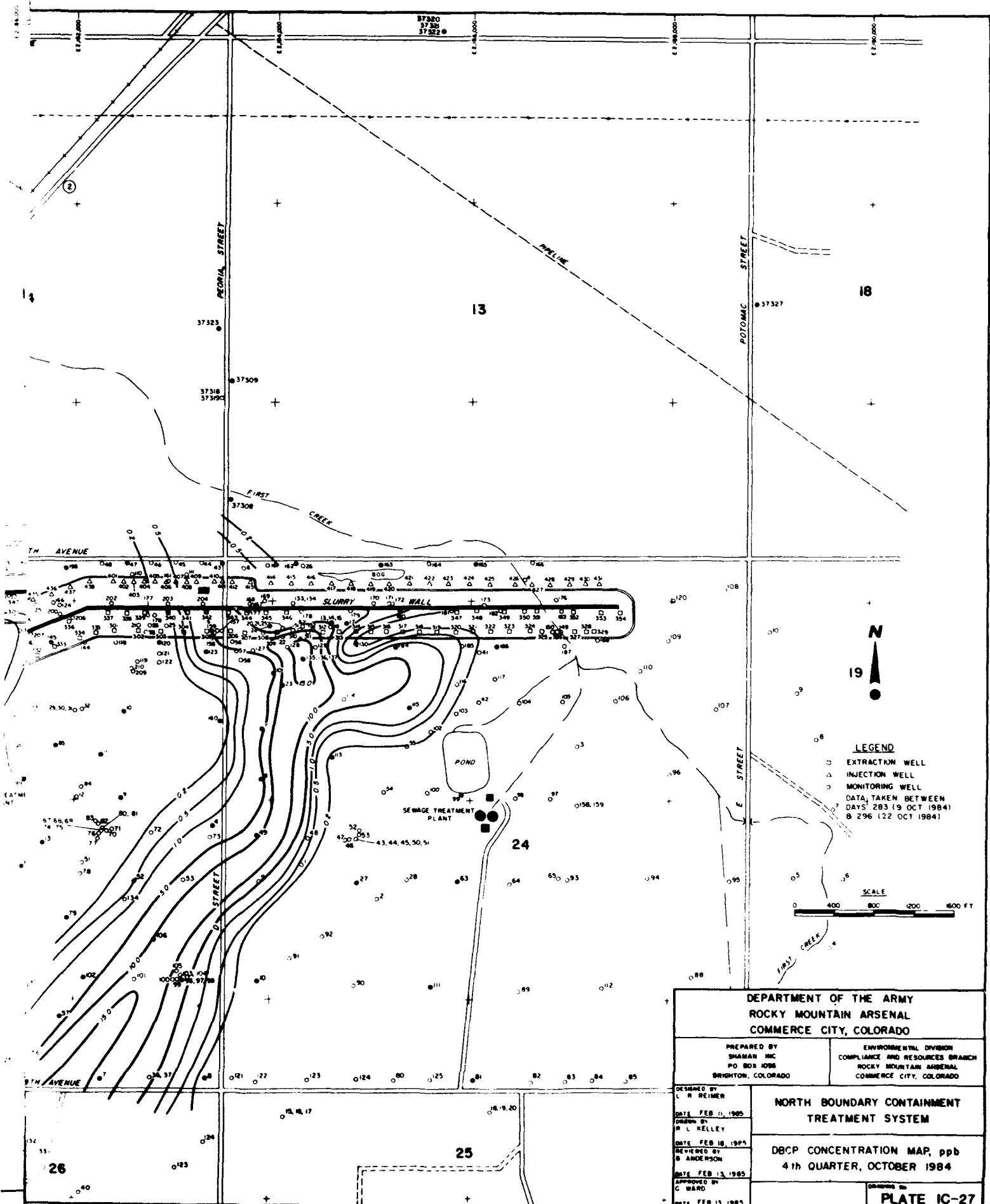
DESIGNED BY
 L R REIMER
 DATE DEC 26, 1984
 DRAWN BY
 R L KELLEY
 DATE DEC 26, 1984
 REVISED BY
 B ANDERSON
 DATE DEC 27, 1984
 APPROVED BY
 B WARD
 DATE DEC 27, 1984

**NORTH BOUNDARY CONTAINMENT
 TREATMENT SYSTEM**

**DBCP CONCENTRATION MAP, ppb
 3rd QUARTER JULY 1984**

DRAWING No.
PLATE IC-26





LEGEND

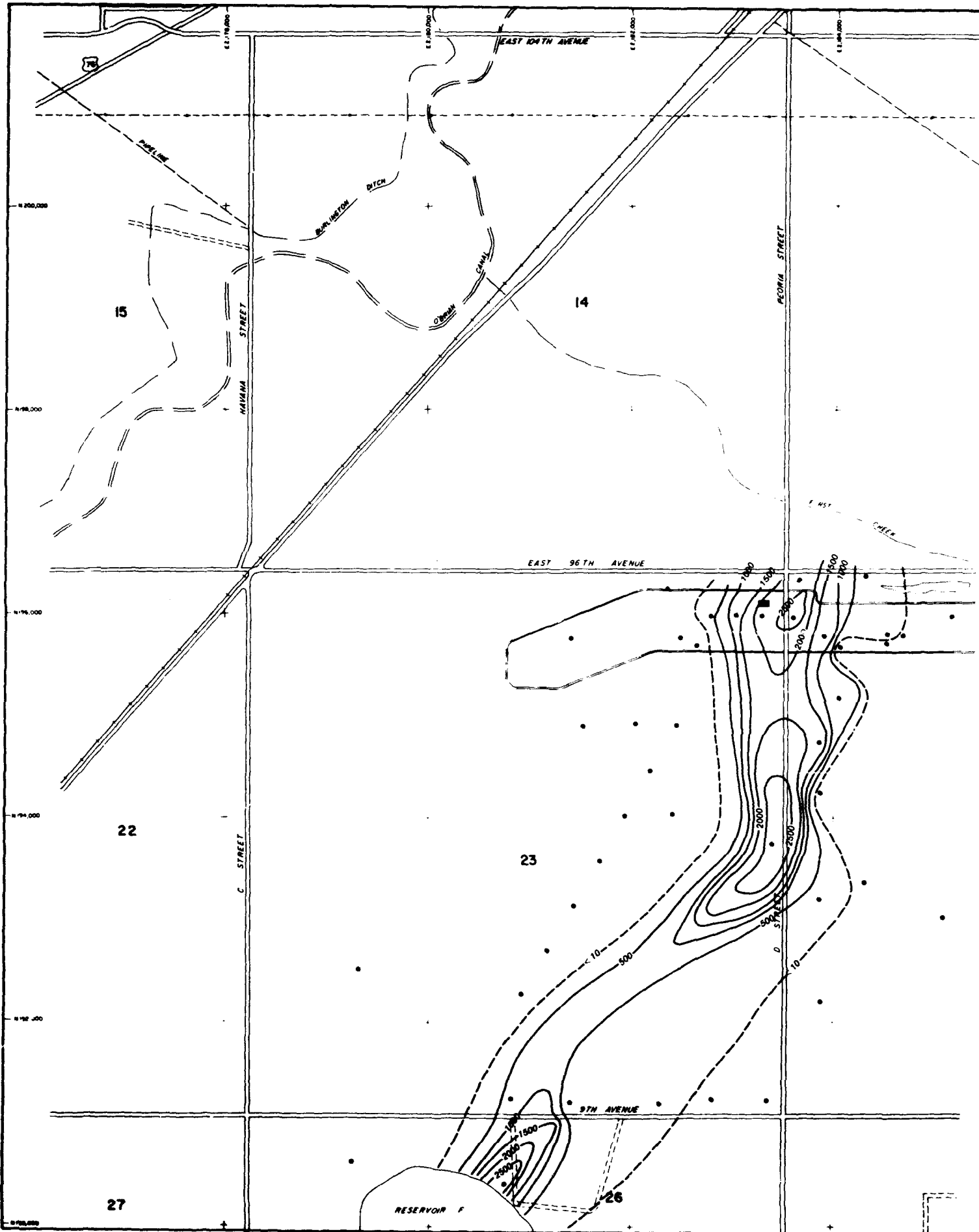
- EXTRACTION WELL
- △ INJECTION WELL
- MONITORING WELL

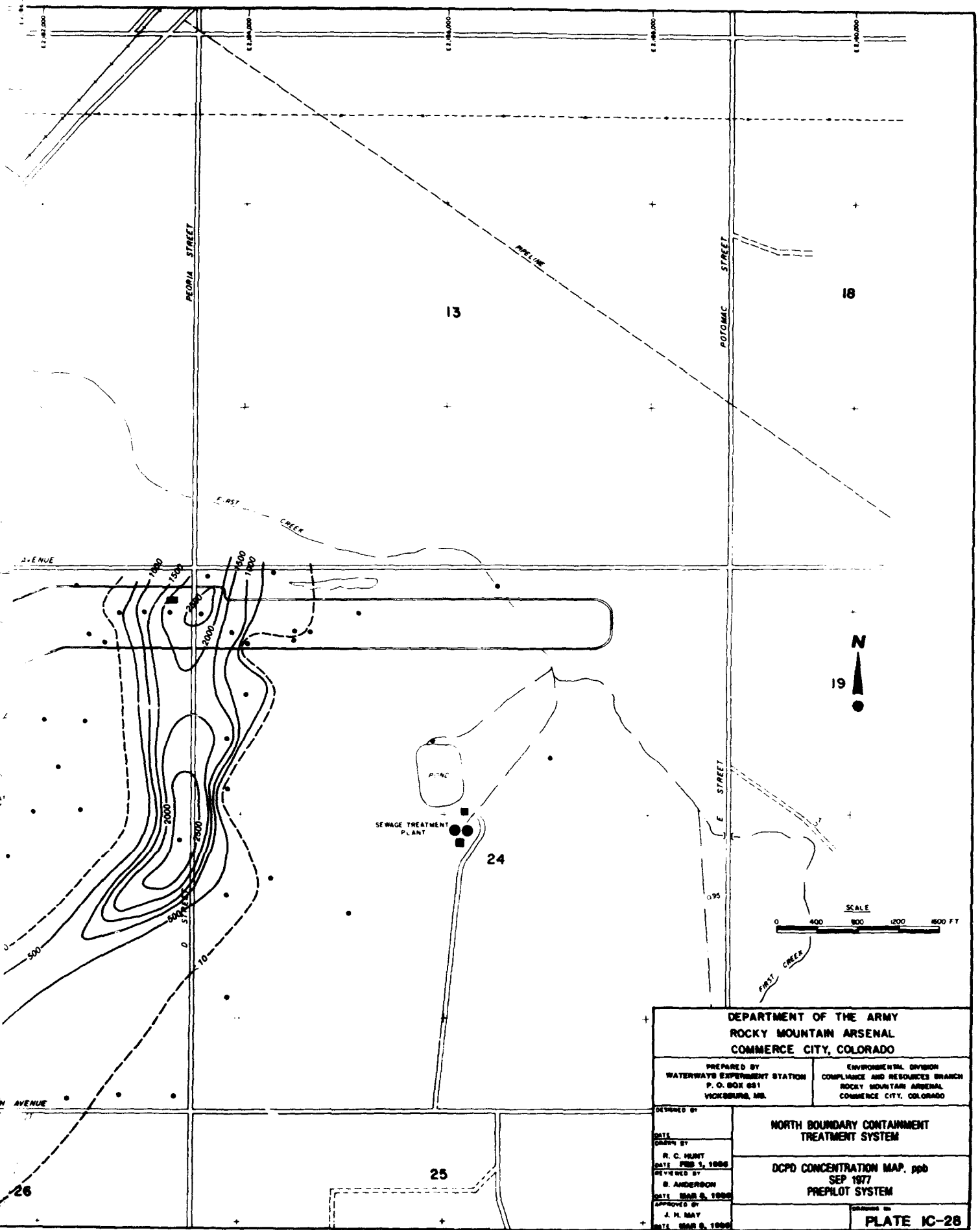
DATA TAKEN BETWEEN
 DAYS 283 (9 OCT 1984)
 & 296 (22 OCT 1984)

SCALE

0 400 800 1200 1600 FT

DEPARTMENT OF THE ARMY ROCKY MOUNTAIN ARSENAL COMMERCE CITY, COLORADO	
PREPARED BY SHAMAN INC PO BOX 1098 BRIGHTON, COLORADO	ENVIRONMENTAL DIVISION COMPLIANCE AND RESOURCES BRANCH ROCKY MOUNTAIN ARSENAL COMMERCE CITY, COLORADO
DESIGNED BY L. R. REIMER DATE FEB 11, 1985 DRAWN BY P. L. KELLEY DATE FEB 18, 1985 REVIEWED BY B. ANDERSON DATE FEB 13, 1985 APPROVED BY G. WARD DATE FEB 13, 1985	NORTH BOUNDARY CONTAINMENT TREATMENT SYSTEM DBCP CONCENTRATION MAP, ppb 4th QUARTER, OCTOBER 1984
DRAWING NO. PLATE IC-27	





DEPARTMENT OF THE ARMY
 ROCKY MOUNTAIN ARSENAL
 COMMERCE CITY, COLORADO

PREPARED BY
 WATERWAYS EXPERIMENT STATION
 P. O. BOX 651
 VICKSBURG, MS.

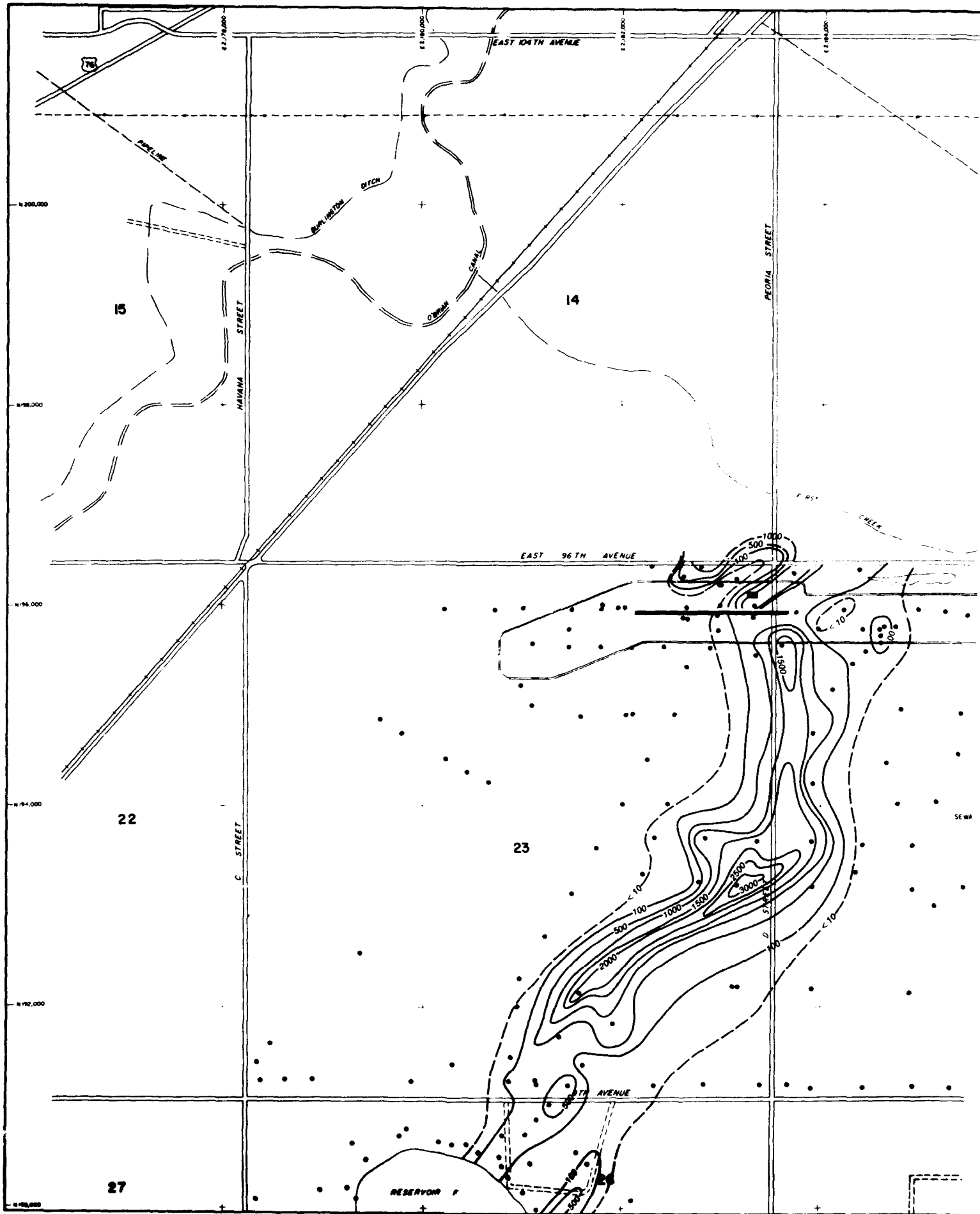
ENVIRONMENTAL DIVISION
 COMPLIANCE AND RESOURCES BRANCH
 ROCKY MOUNTAIN ARSENAL
 COMMERCE CITY, COLORADO

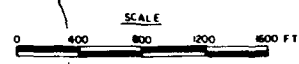
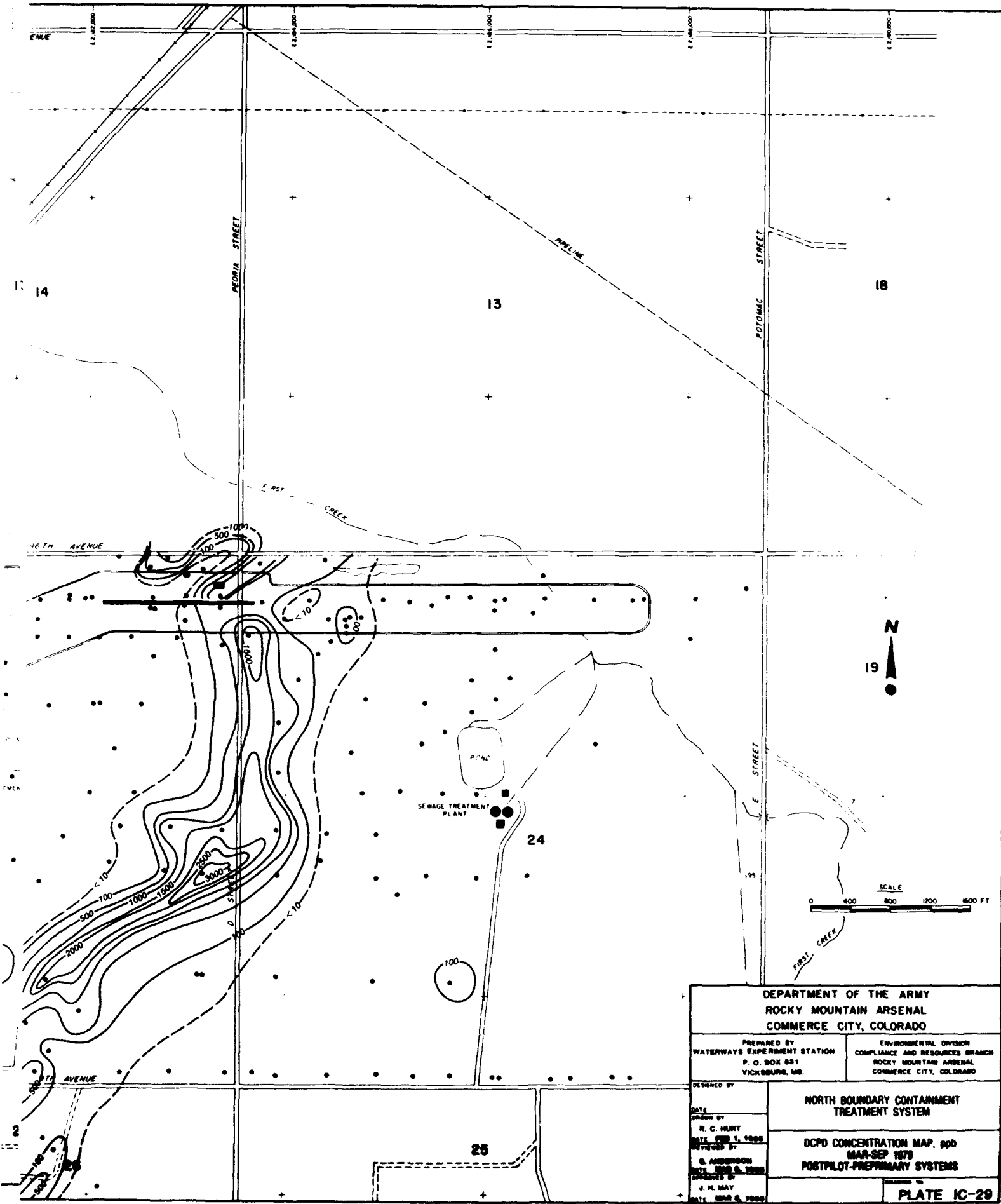
DESIGNED BY
 DATE
 CHECKED BY
 R. C. HUNT
 DATE FEB 3, 1986
 REVIEWED BY
 S. ANDERSON
 DATE MAR 8, 1986
 APPROVED BY
 J. H. MAY
 DATE MAR 8, 1986

NORTH BOUNDARY CONTAINMENT
 TREATMENT SYSTEM

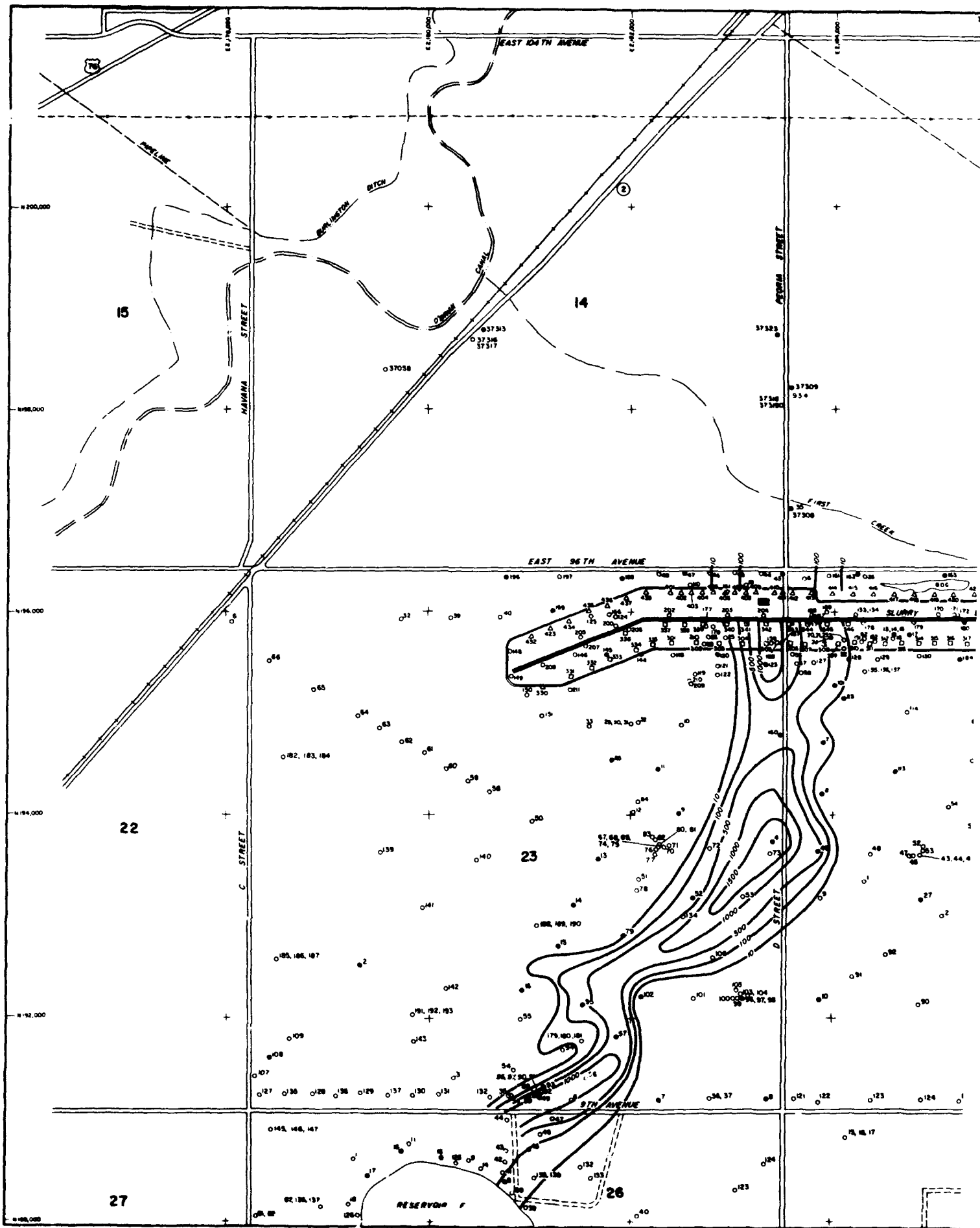
DCPD CONCENTRATION MAP, ppb
 SEP 1977
 PREPLOT SYSTEM

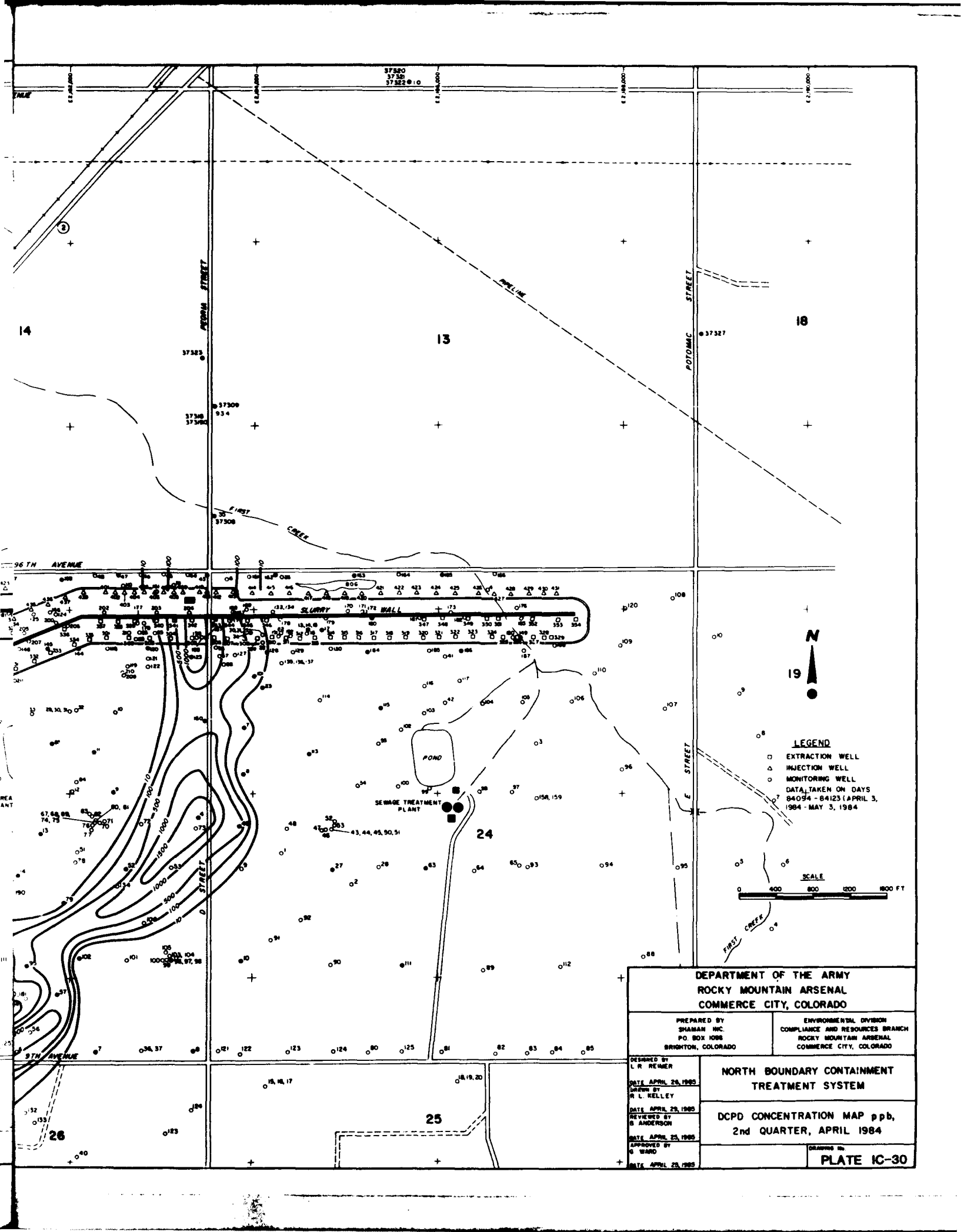
DRAWING NO.
PLATE IC-28





DEPARTMENT OF THE ARMY ROCKY MOUNTAIN ARSENAL COMMERCE CITY, COLORADO	
PREPARED BY WATERWAYS EXPERIMENT STATION P. O. BOX 831 VICKSBURG, MS.	ENVIRONMENTAL DIVISION COMPLIANCE AND RESOURCES BRANCH ROCKY MOUNTAIN ARSENAL COMMERCE CITY, COLORADO
DESIGNED BY DATE DRAWN BY R. C. HUNT DATE FEB 1, 1969 REVISED BY B. ANDERSON DATE MAR 8, 1970 CHECKED BY J. H. MAY DATE MAR 8, 1970	NORTH BOUNDARY CONTAINMENT TREATMENT SYSTEM DCPD CONCENTRATION MAP, ppb MAR-SEP 1970 POSTPILOT-PREPRIMARY SYSTEMS DRAWING NO. PLATE IC-29





37520
37521
37522 @ 1.0

14

13

18

37323
37309
37340
37350

37308
934

POTOMAC STREET
37327

96TH AVENUE

FIRST CREEK
37308

SLURRY WALL

POND

SEWAGE TREATMENT PLANT

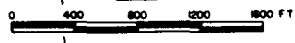
24

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19

LEGEND

- EXTRACTION WELL
- △ INJECTION WELL
- MONITORING WELL
- DATA TAKEN ON DAYS
84094 - 84123 (APRIL 3,
1984 - MAY 3, 1984)

SCALE



DEPARTMENT OF THE ARMY
ROCKY MOUNTAIN ARSENAL
COMMERCE CITY, COLORADO

PREPARED BY
SHAMAN INC.
P.O. BOX 1098
BRIGHTON, COLORADO

ENVIRONMENTAL DIVISION
COMPLIANCE AND RESOURCES BRANCH
ROCKY MOUNTAIN ARSENAL
COMMERCE CITY, COLORADO

DESIGNED BY
L. R. REIMER
DATE APRIL 26, 1983
DRAWN BY
R. L. KELLEY
DATE APRIL 29, 1983
REVIEWED BY
S. ANDERSON
DATE APRIL 25, 1983
APPROVED BY
G. WARD
DATE APRIL 23, 1983

NORTH BOUNDARY CONTAINMENT
TREATMENT SYSTEM

DCPD CONCENTRATION MAP p/b,
2nd QUARTER, APRIL 1984

DRAWING NO.
PLATE IC-30

97TH AVENUE

26

25

15, 16, 17

18, 19, 20

123

122

123

124

125

126

127

128

129

130

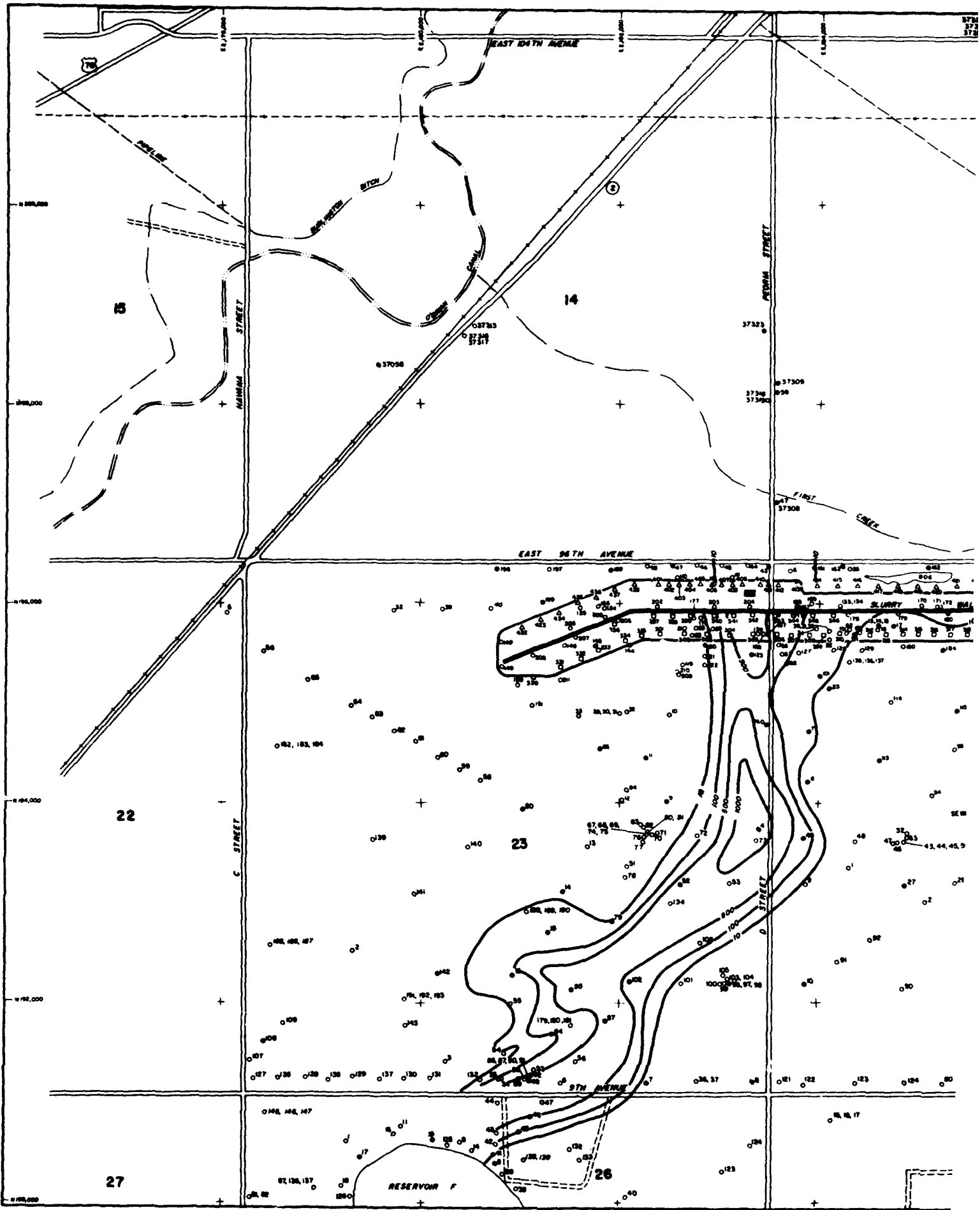
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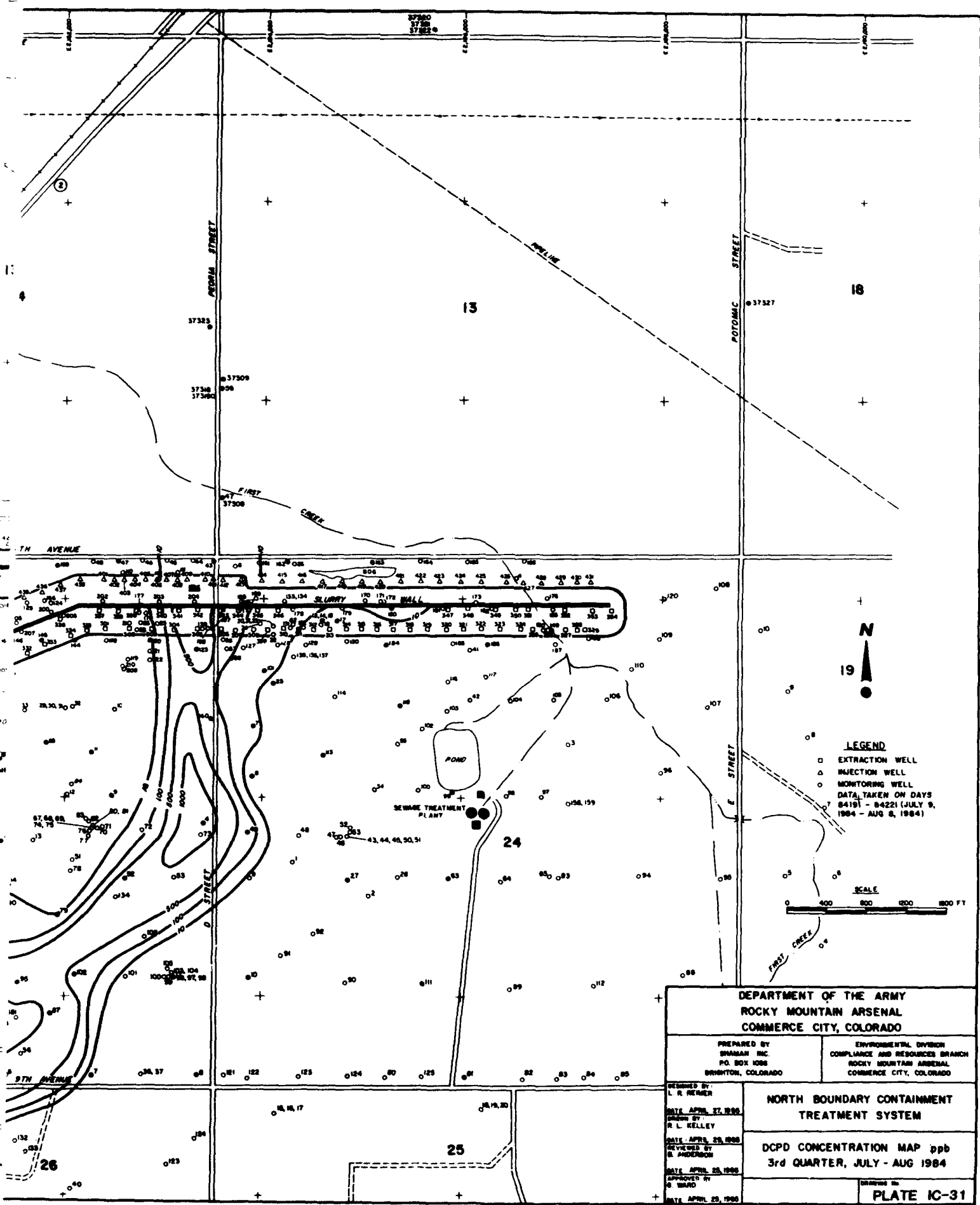
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133

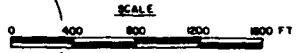
134

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LEGEND
 □ EXTRACTION WELL
 △ INJECTION WELL
 ○ MONITORING WELL
 DATA TAKEN ON DAYS
 84191 - 84221 (JULY 9,
 1984 - AUG 8, 1984)



**DEPARTMENT OF THE ARMY
 ROCKY MOUNTAIN ARSENAL
 COMMERCE CITY, COLORADO**

PREPARED BY
 SHAMAN INC.
 P.O. BOX 1086
 BRIGHTON, COLORADO

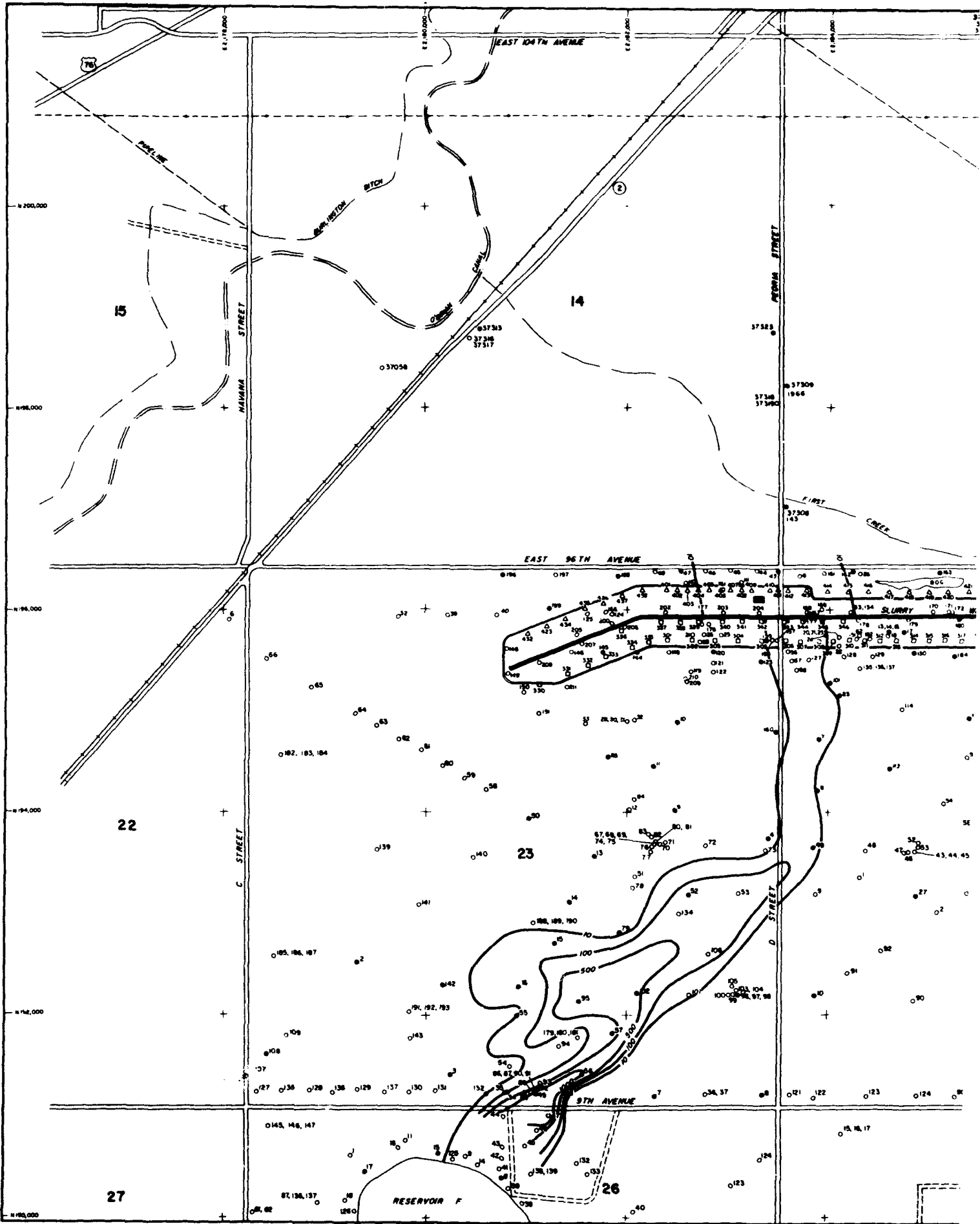
ENVIRONMENTAL DIVISION
 COMPLIANCE AND RESOURCES BRANCH
 ROCKY MOUNTAIN ARSENAL
 COMMERCE CITY, COLORADO

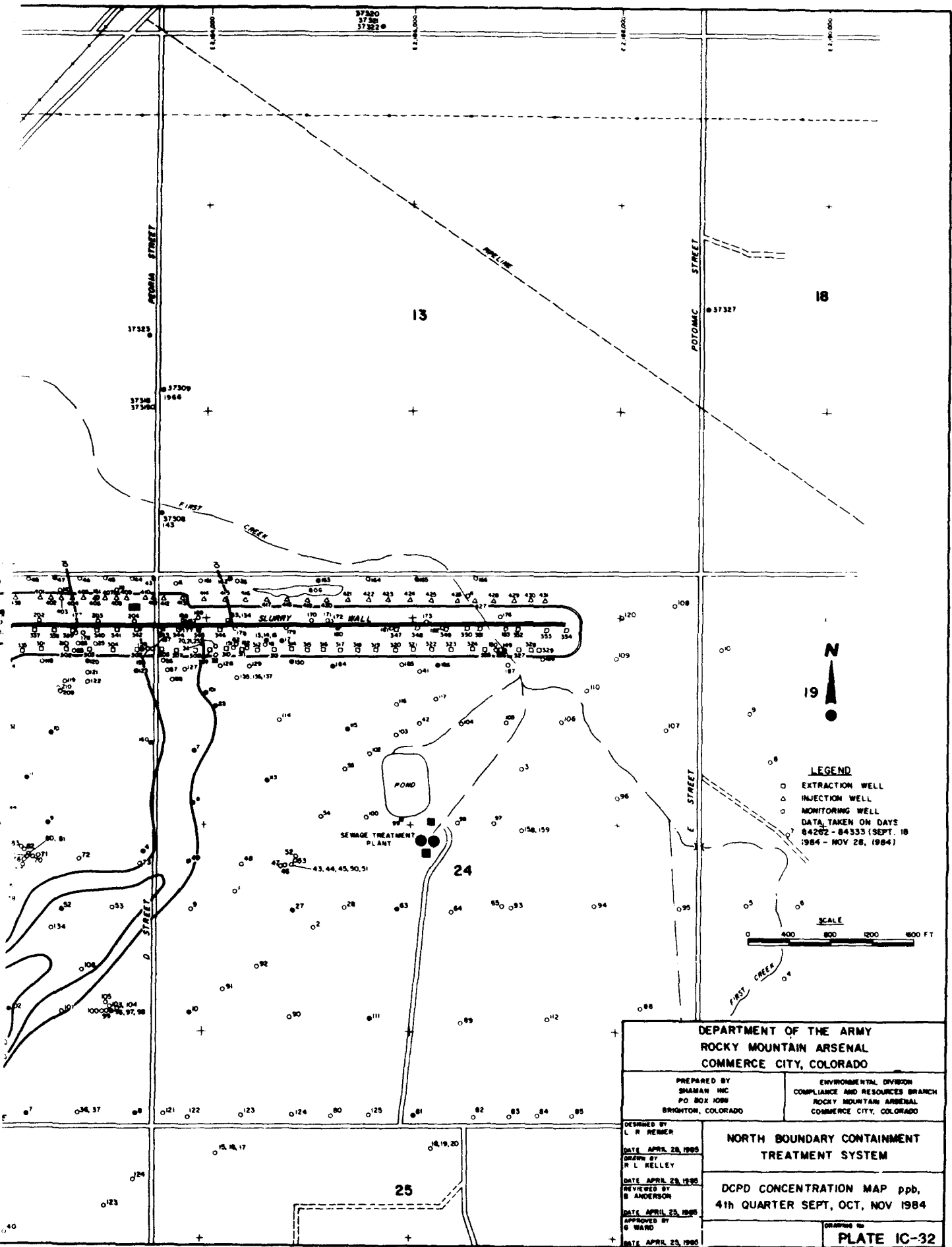
DESIGNED BY
 L. R. REISER
 DATE APRIL 27, 1983
 DRAWN BY
 R. L. KELLEY
 DATE APRIL 25, 1983
 CHECKED BY
 S. ANDERSON
 DATE APRIL 25, 1983
 APPROVED BY
 R. WARD
 DATE APRIL 25, 1983

**NORTH BOUNDARY CONTAINMENT
 TREATMENT SYSTEM**

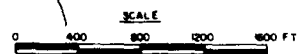
**DCPD CONCENTRATION MAP ppb
 3rd QUARTER, JULY - AUG 1984**

PLATE IC-31

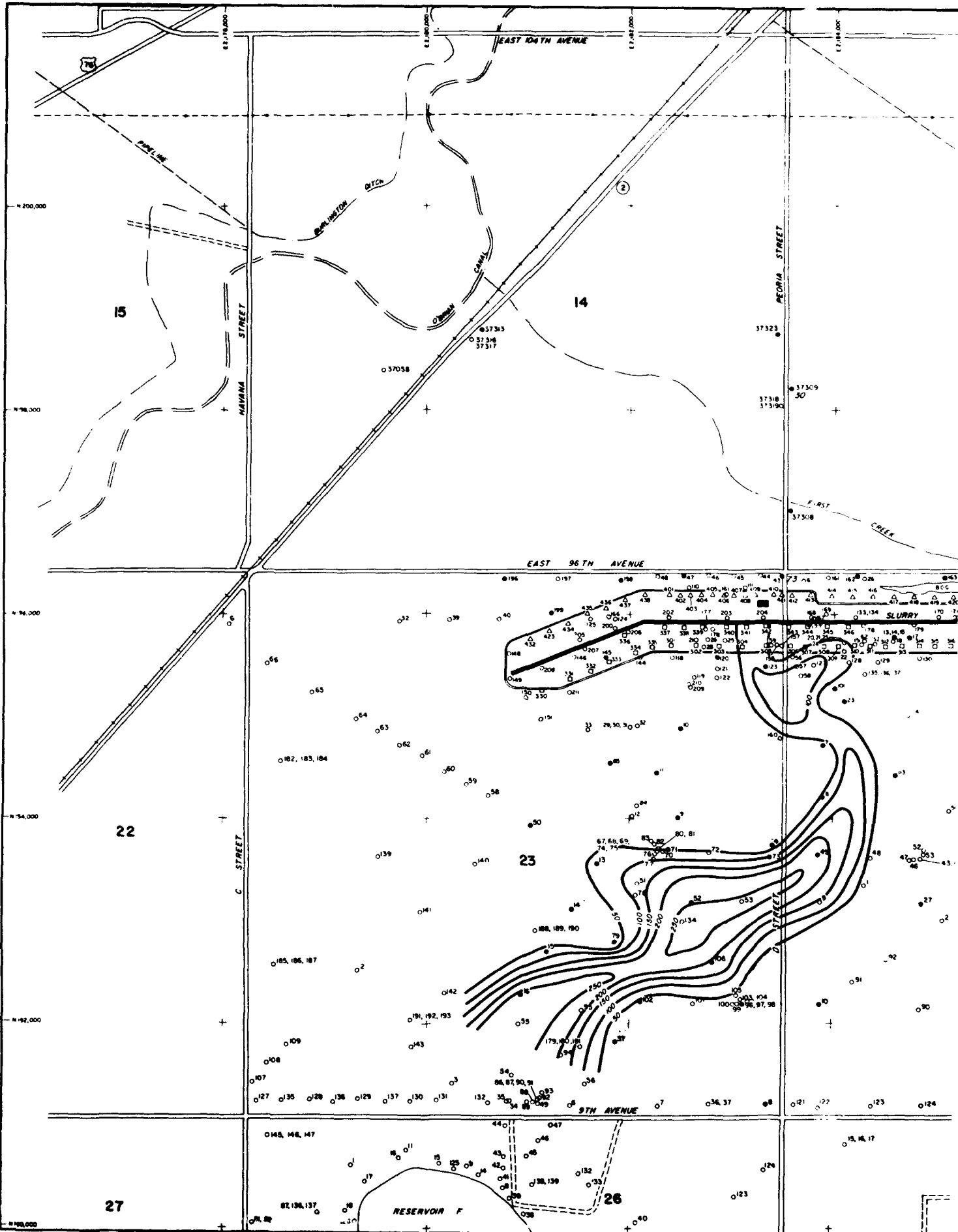


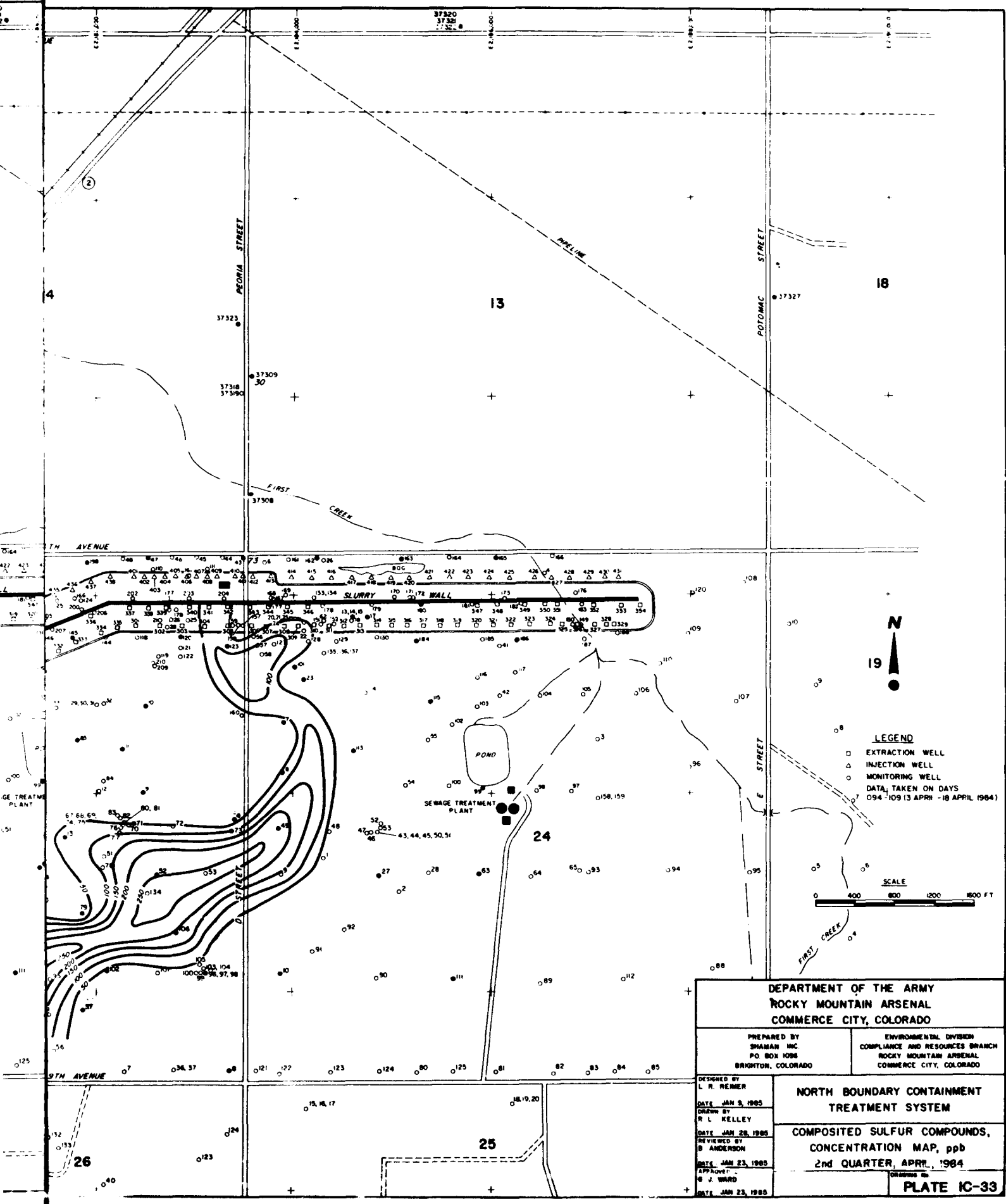


LEGEND
 ○ EXTRACTION WELL
 △ INJECTION WELL
 ○ MONITORING WELL
 DATA TAKEN ON DAYS
 84202 - 84333 (SEPT. 18
 1984 - NOV. 28, 1984)

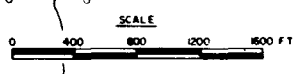


DEPARTMENT OF THE ARMY ROCKY MOUNTAIN ARSENAL COMMERCE CITY, COLORADO	
PREPARED BY SHAMAN INC PO BOX 109W BRIGHTON, COLORADO	ENVIRONMENTAL DIVISION COMPLIANCE AND RESOURCES BRANCH ROCKY MOUNTAIN ARSENAL COMMERCE CITY, COLORADO
DESIGNED BY L R REMER DATE APRIL 28, 1988 DRAWN BY R L KELLEY DATE APRIL 28, 1988 REVIEWED BY B ANDERSON DATE APRIL 25, 1988 APPROVED BY G WARD DATE APRIL 23, 1988	NORTH BOUNDARY CONTAINMENT TREATMENT SYSTEM DCPD CONCENTRATION MAP ppb, 4th QUARTER SEPT, OCT, NOV 1984
DRAWING NO. PLATE IC-32	

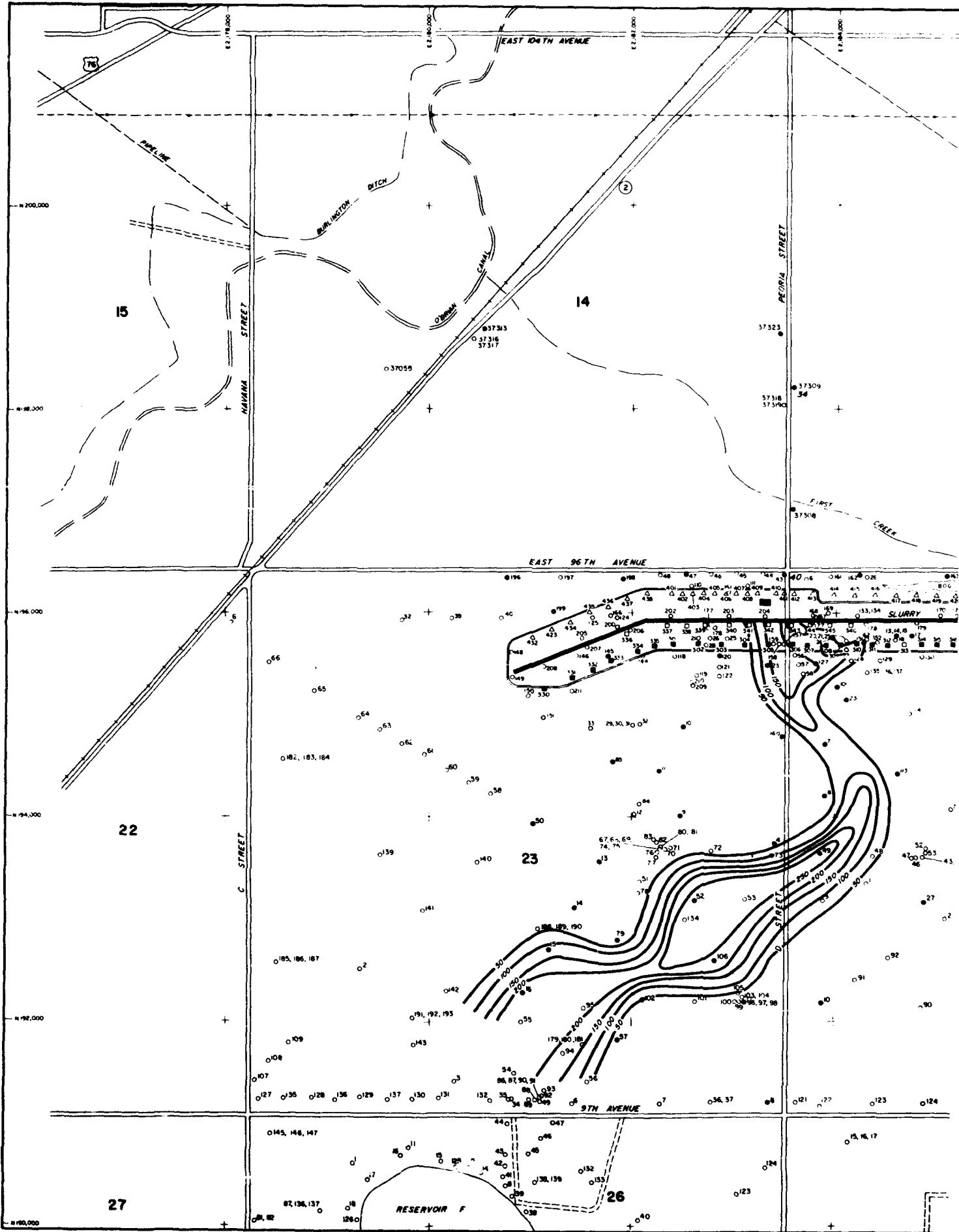


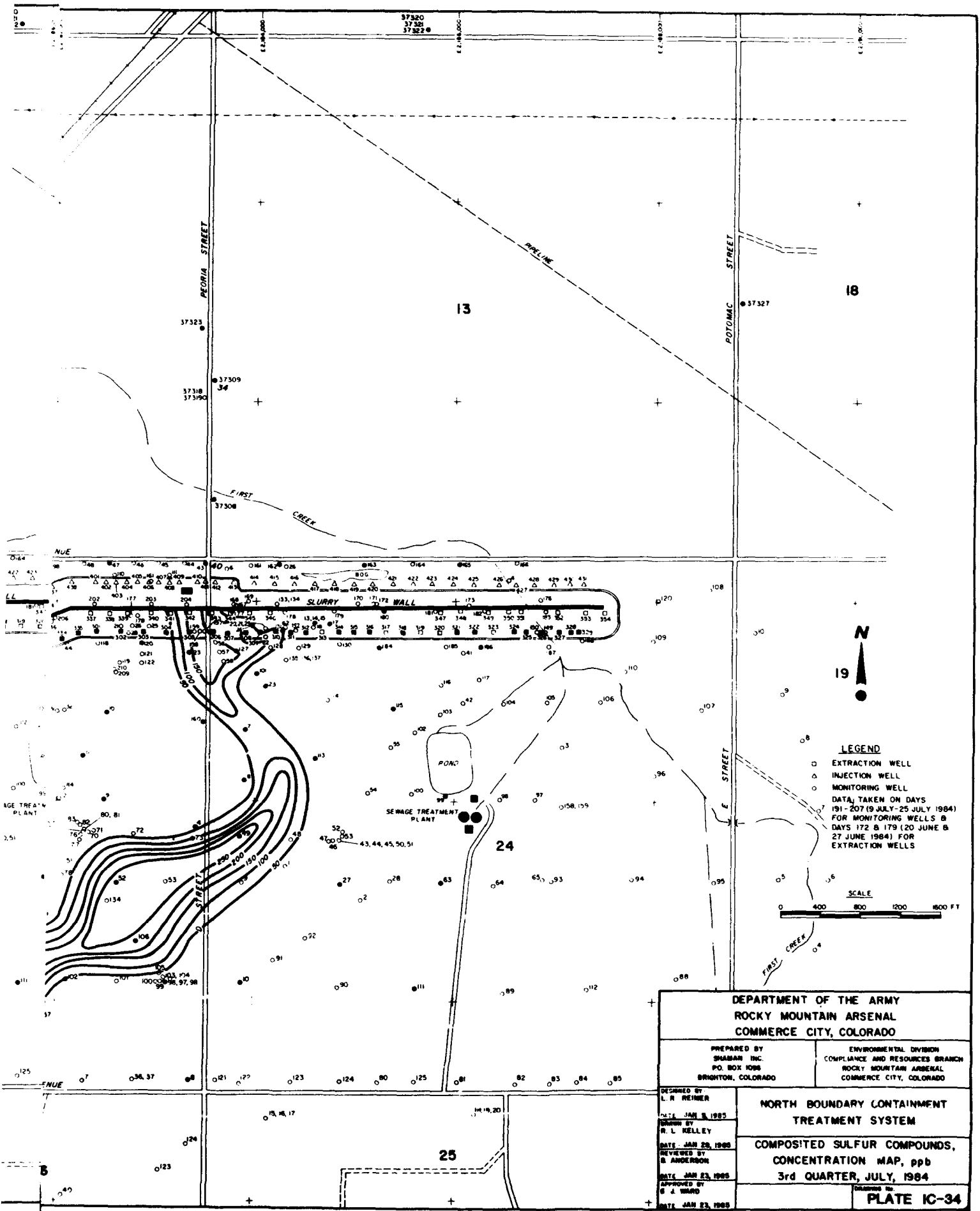


LEGEND
 □ EXTRACTION WELL
 △ INJECTION WELL
 ○ MONITORING WELL
 DATA TAKEN ON DAYS
 094-109 (13 APRIL - 18 APRIL 1984)



DEPARTMENT OF THE ARMY ROCKY MOUNTAIN ARSENAL COMMERCE CITY, COLORADO	
PREPARED BY SHAMAN INC. PO BOX 1098 BRIGHTON, COLORADO	ENVIRONMENTAL DIVISION COMPLIANCE AND RESOURCES BRANCH ROCKY MOUNTAIN ARSENAL COMMERCE CITY, COLORADO
DESIGNED BY L. R. REIMER DATE JAN 9, 1985 DRAWN BY R. L. KELLEY DATE JAN 28, 1985 REVIEWED BY B. ANDERSON DATE JAN 23, 1985 APPROVED BY S. J. WARD DATE JAN 23, 1985	NORTH BOUNDARY CONTAINMENT TREATMENT SYSTEM COMPOSITED SULFUR COMPOUNDS, CONCENTRATION MAP, ppb 2nd QUARTER, APRIL, 1984 DRAWING NO. PLATE IC-33

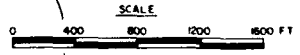




LEGEND

- EXTRACTION WELL
- △ INJECTION WELL
- MONITORING WELL

DATA TAKEN ON DAYS
 191 - 207 (9 JULY - 25 JULY 1984)
 FOR MONITORING WELLS &
 DAYS 172 & 179 (20 JUNE &
 27 JUNE 1984) FOR
 EXTRACTION WELLS



**DEPARTMENT OF THE ARMY
 ROCKY MOUNTAIN ARSENAL
 COMMERCE CITY, COLORADO**

PREPARED BY
 SHAMAN INC.
 P.O. BOX 1088
 BRIGHTON, COLORADO

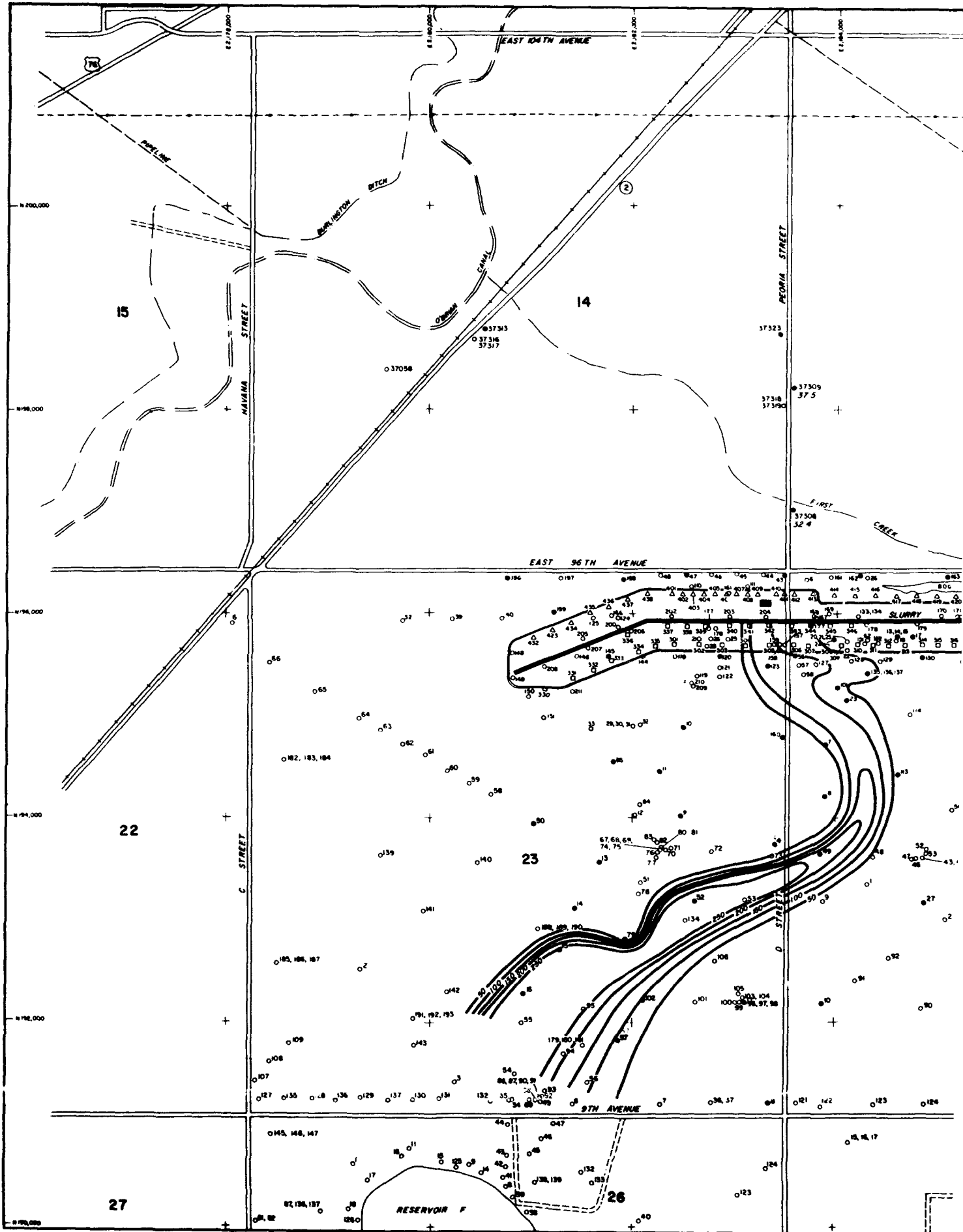
ENVIRONMENTAL DIVISION
 COMPLIANCE AND RESOURCES BRANCH
 ROCKY MOUNTAIN ARSENAL
 COMMERCE CITY, COLORADO

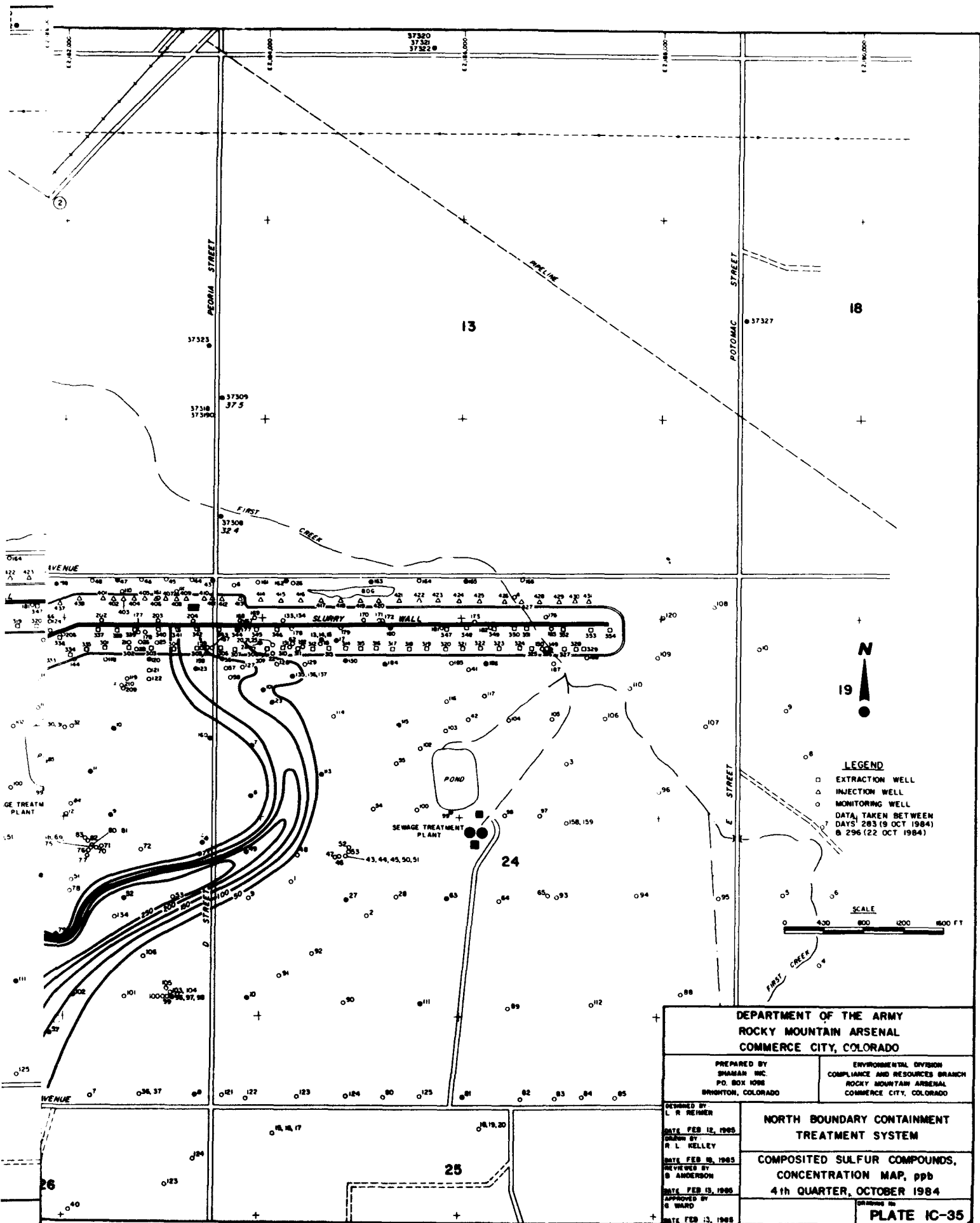
DESIGNED BY
 L. R. REIMER
 DATE JAN 8, 1985
 DRAWN BY
 R. L. KELLEY
 DATE JAN 29, 1985
 REVIEWED BY
 B. ANDERSON
 DATE JAN 23, 1985
 APPROVED BY
 G. J. WARD
 DATE JAN 23, 1985

**NORTH BOUNDARY CONTAINMENT
 TREATMENT SYSTEM**

**COMPOSITED SULFUR COMPOUNDS,
 CONCENTRATION MAP, ppb
 3rd QUARTER, JULY, 1984**

DRAWING NO.
PLATE IC-34





N

19

LEGEND
 □ EXTRACTION WELL
 △ INJECTION WELL
 ○ MONITORING WELL
 DATA TAKEN BETWEEN
 DAYS 283 (9 OCT 1984)
 & 296 (22 OCT 1984)

SCALE
 0 400 800 1200 1600 FT

**DEPARTMENT OF THE ARMY
 ROCKY MOUNTAIN ARSENAL
 COMMERCE CITY, COLORADO**

PREPARED BY
 SHAMAN INC
 P.O. BOX 1098
 BRIGHTON, COLORADO

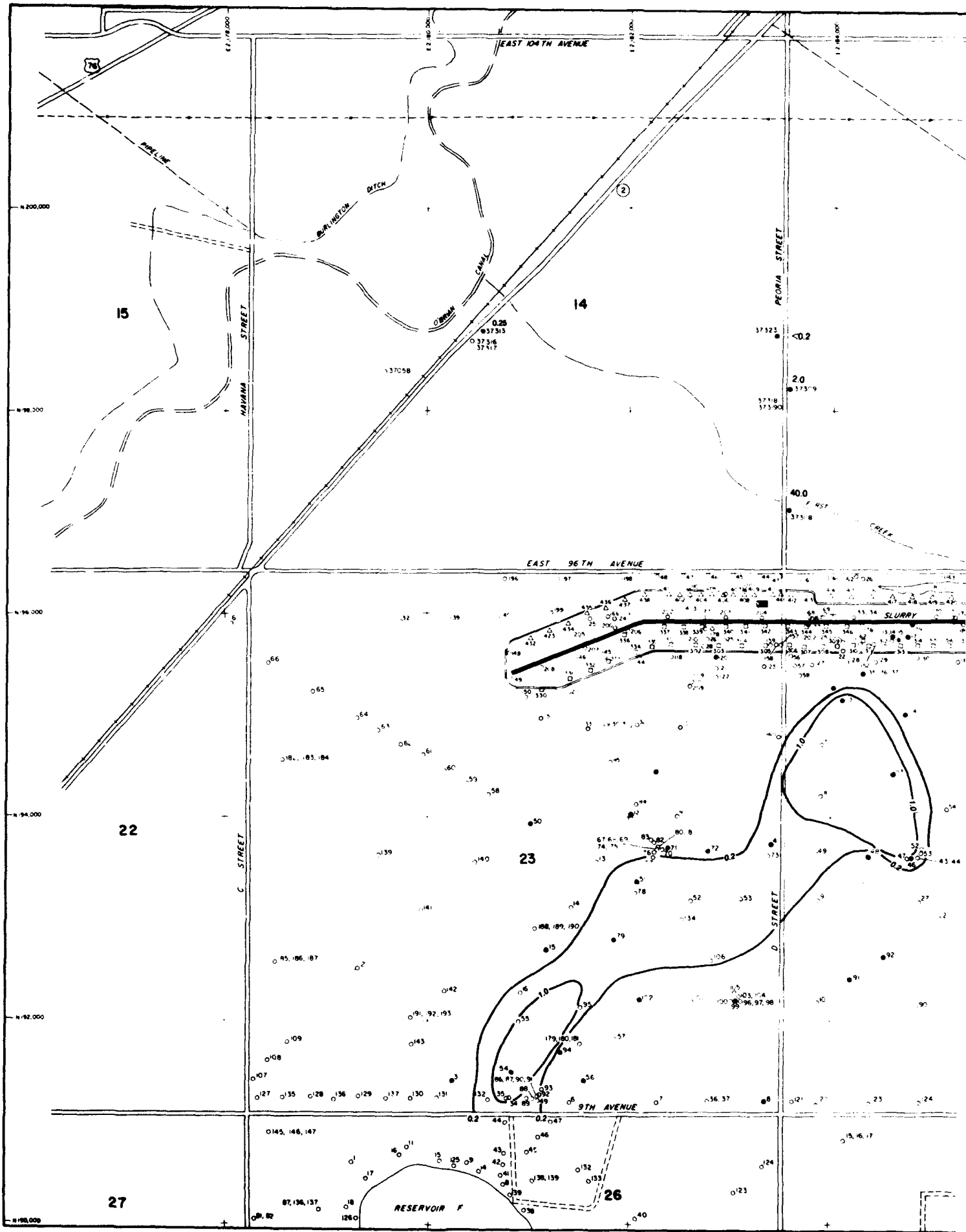
ENVIRONMENTAL DIVISION
 COMPLIANCE AND RESOURCES BRANCH
 ROCKY MOUNTAIN ARSENAL
 COMMERCE CITY, COLORADO

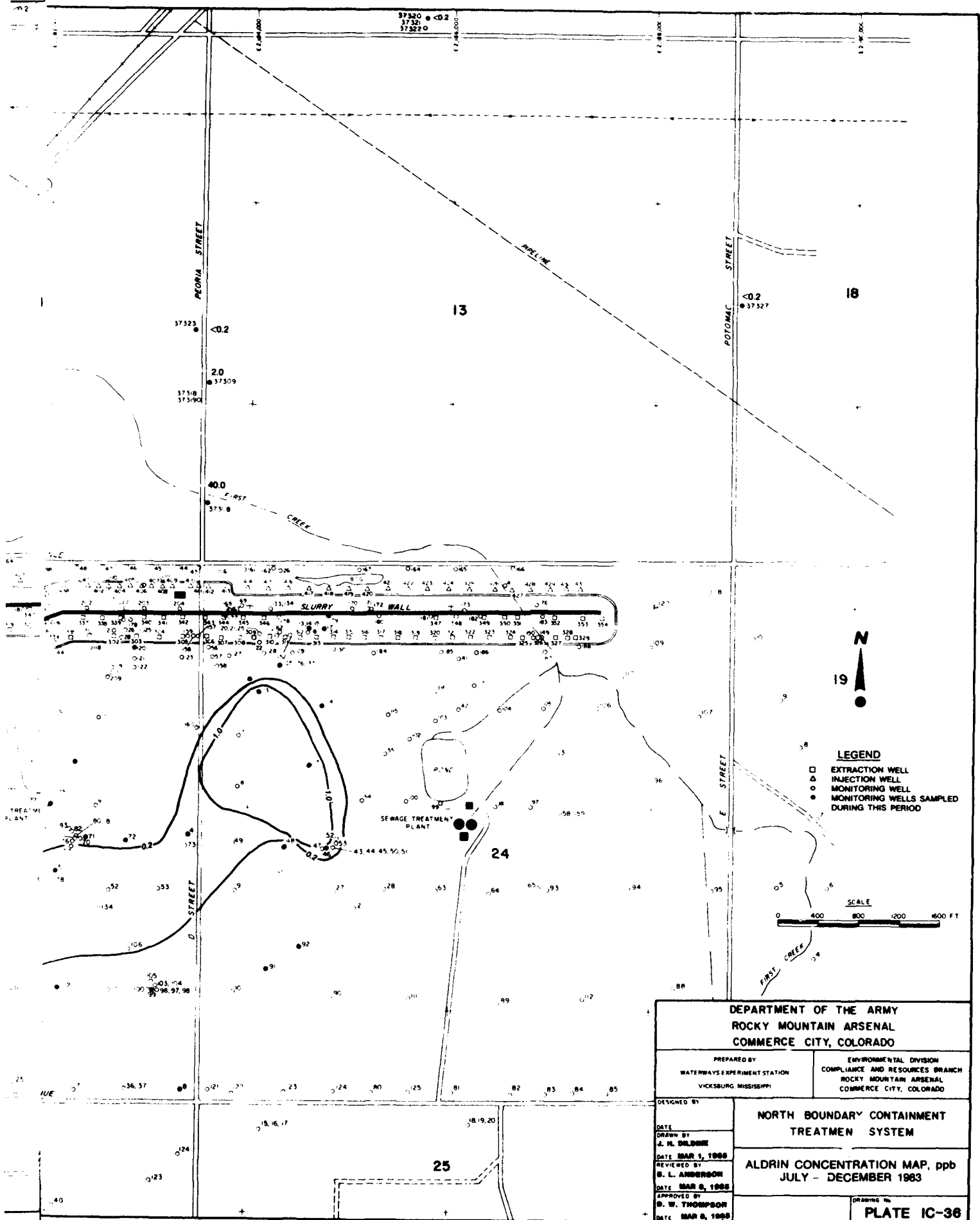
DESIGNED BY
 L. R. REIMER
 DATE FEB 12, 1985
 DRAWN BY
 R. L. KELLEY
 DATE FEB 20, 1985
 REVIEWED BY
 S. ANDERSON
 DATE FEB 13, 1985
 APPROVED BY
 G. WARD
 DATE FEB 13, 1985

**NORTH BOUNDARY CONTAINMENT
 TREATMENT SYSTEM**

**COMPOSITED SULFUR COMPOUNDS,
 CONCENTRATION MAP, ppb
 4th QUARTER, OCTOBER 1984**

DRAWING NO.
PLATE IC-35

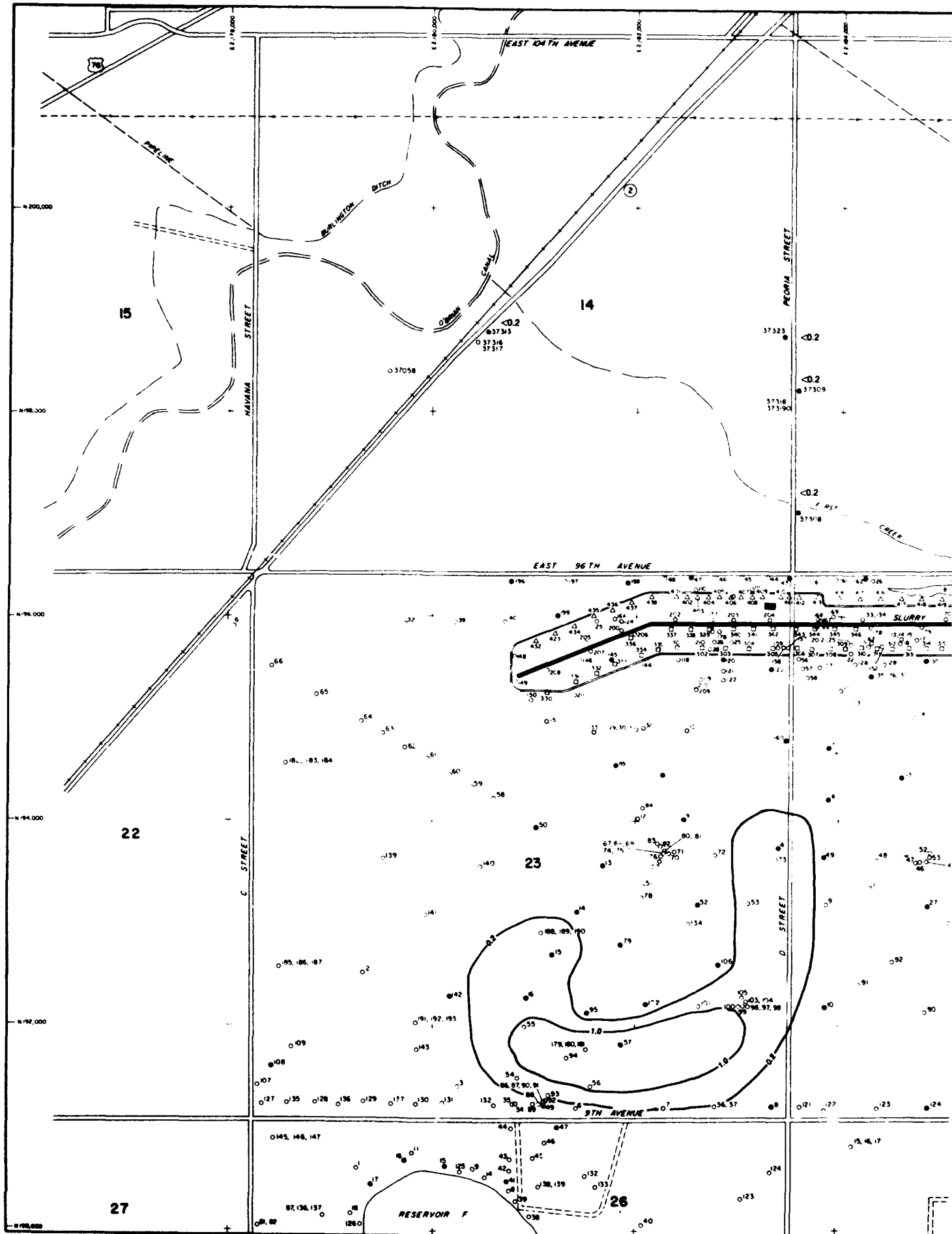




LEGEND
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 △ INJECTION WELL
 ○ MONITORING WELL
 ● MONITORING WELLS SAMPLED DURING THIS PERIOD

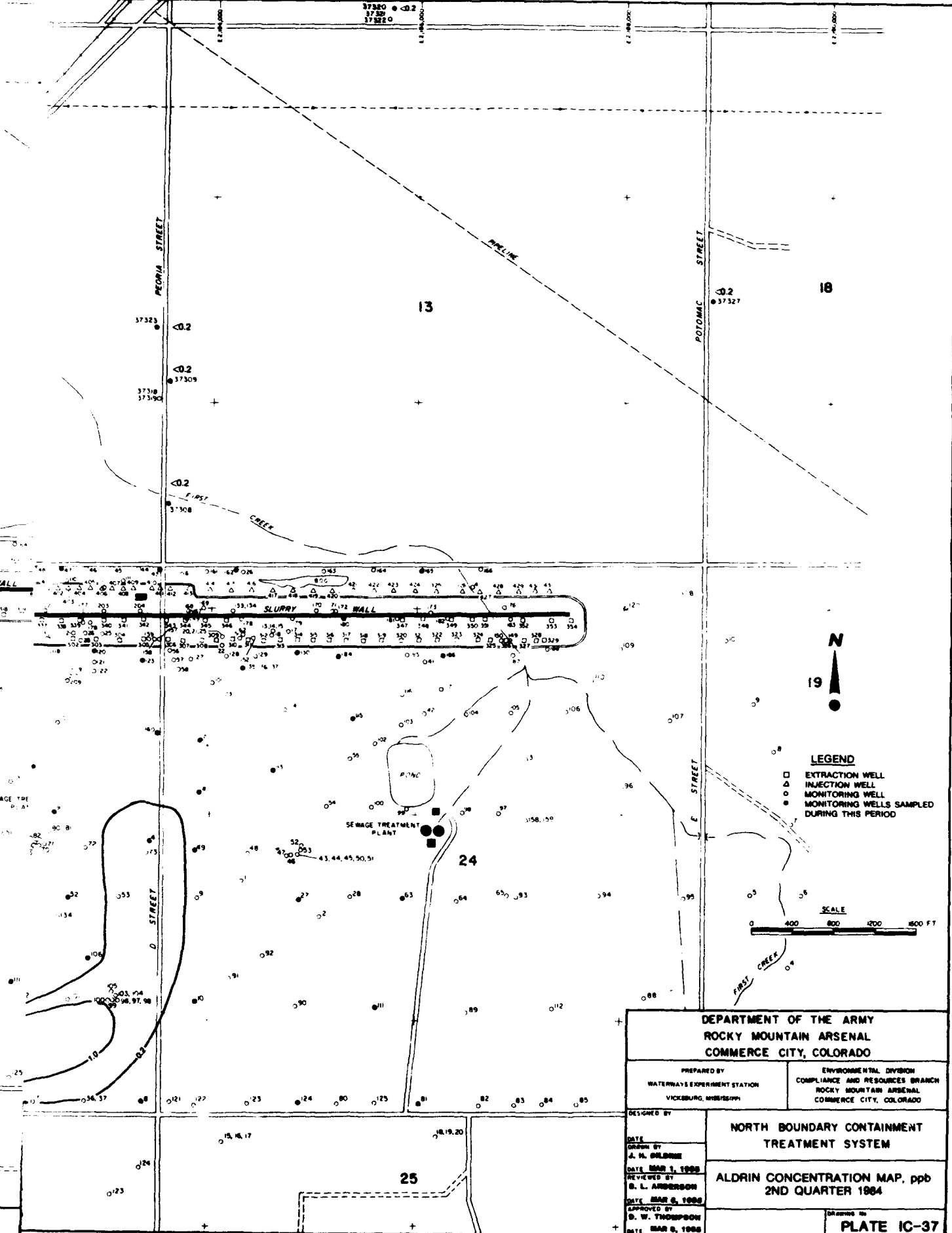


DEPARTMENT OF THE ARMY ROCKY MOUNTAIN ARSENAL COMMERCE CITY, COLORADO	
PREPARED BY WATERWAYS EXPERIMENT STATION VICKSBURG, MISSISSIPPI	ENVIRONMENTAL DIVISION COMPLIANCE AND RESOURCES BRANCH ROCKY MOUNTAIN ARSENAL COMMERCE CITY, COLORADO
DESIGNED BY DATE DRAWN BY J. M. DILLON DATE MAR 5, 1988 REVIEWED BY B. L. ANDERSON DATE MAR 8, 1988 APPROVED BY B. W. THOMPSON DATE MAR 8, 1988	NORTH BOUNDARY CONTAINMENT TREATMENT SYSTEM ALDRIN CONCENTRATION MAP, ppb JULY - DECEMBER 1983 DRAWING No. PLATE IC-38



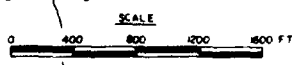
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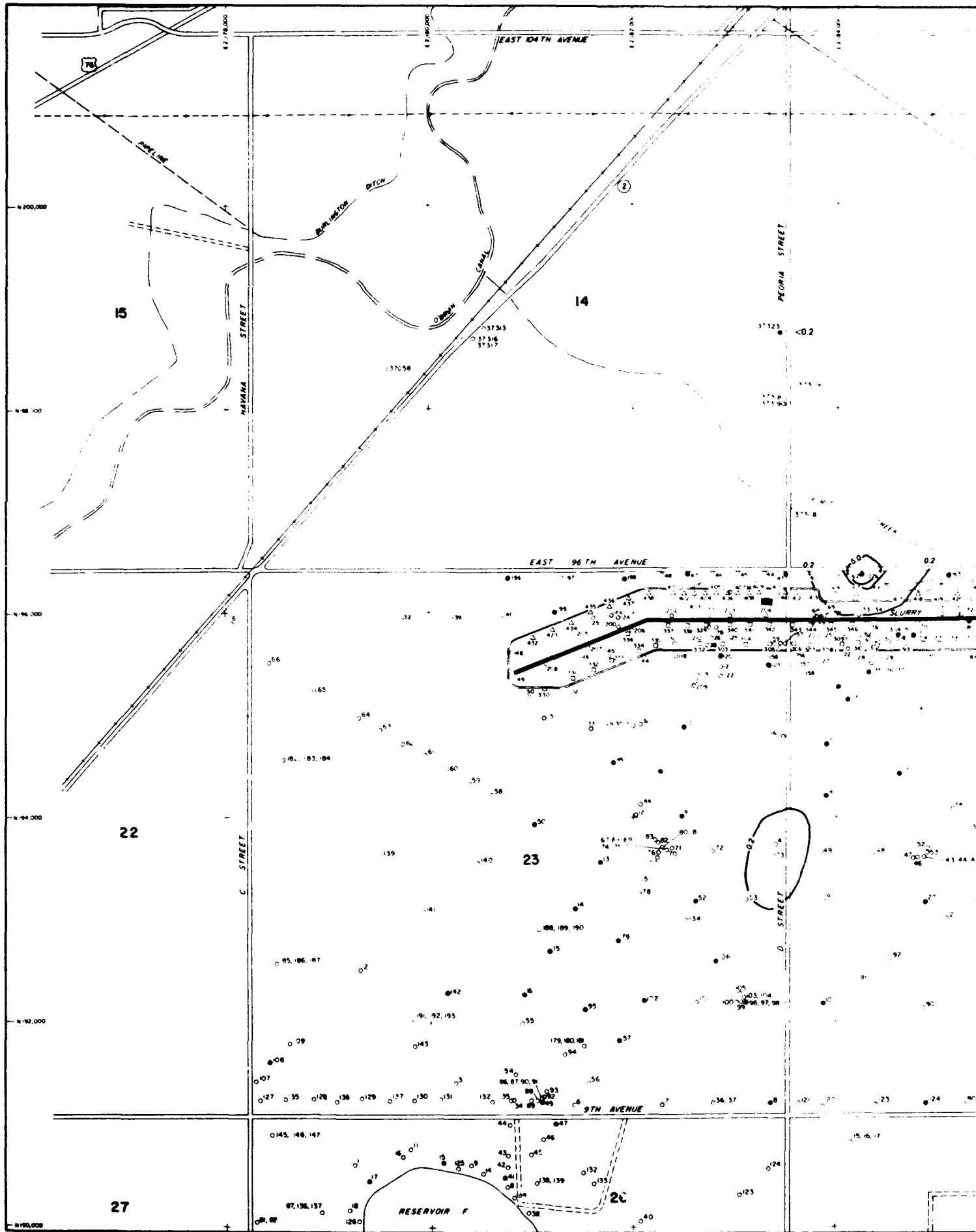


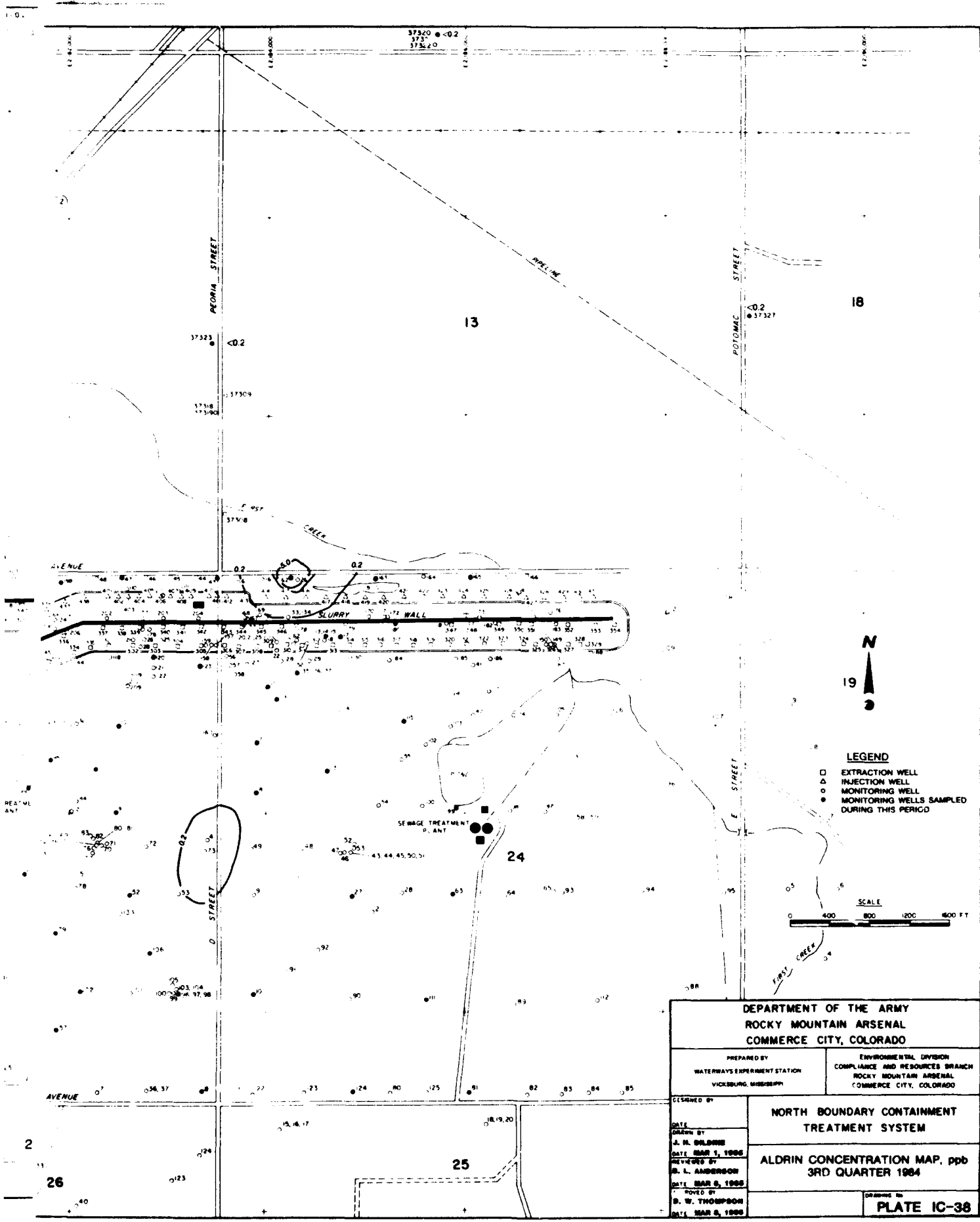
LEGEND

- EXTRACTION WELL
- △ INJECTION WELL
- MONITORING WELL
- MONITORING WELLS SAMPLED DURING THIS PERIOD

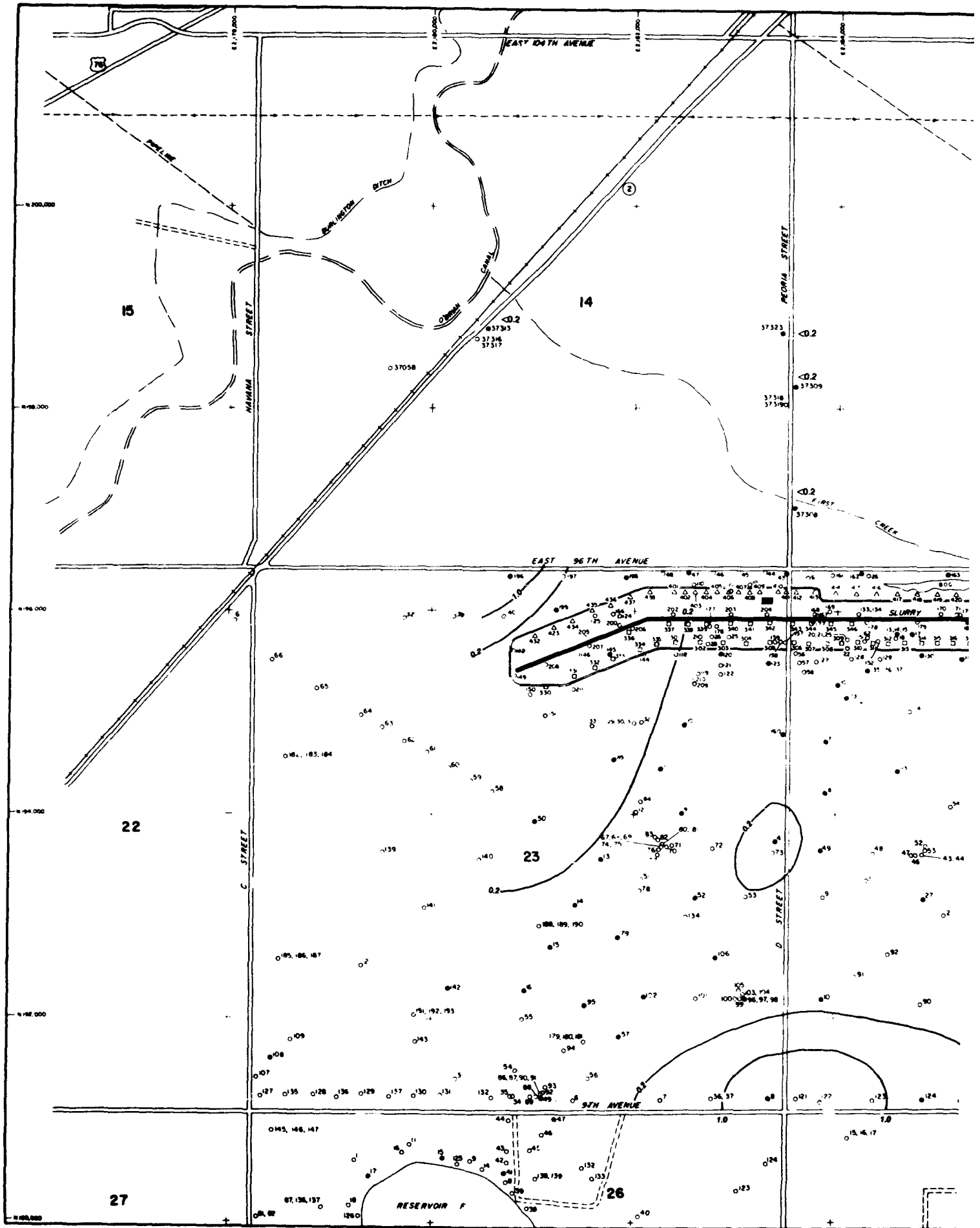


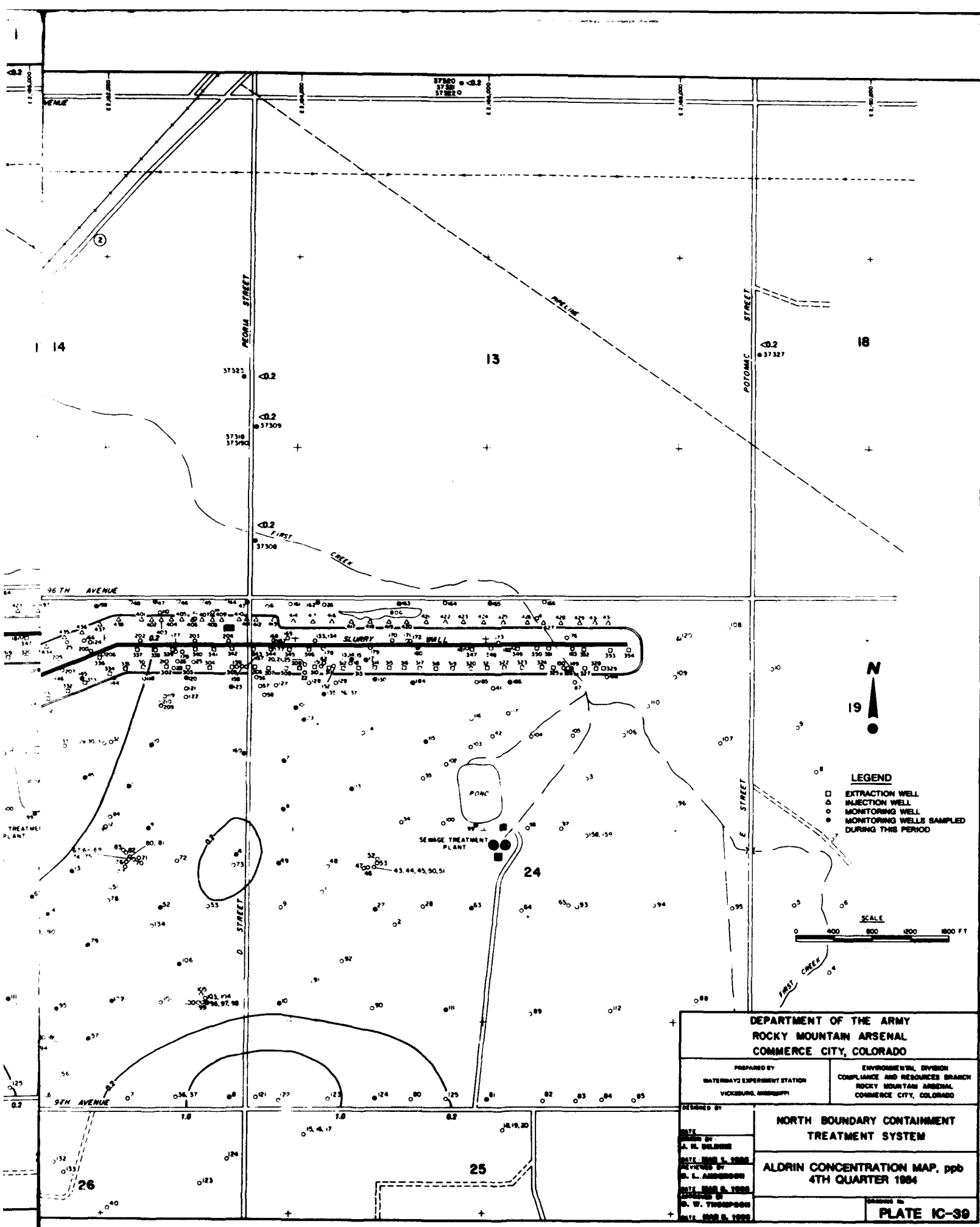
DEPARTMENT OF THE ARMY ROCKY MOUNTAIN ARSENAL COMMERCE CITY, COLORADO	
PREPARED BY WATERWAYS EXPERIMENT STATION VICKSBURG, MISSISSIPPI	ENVIRONMENTAL DIVISION COMPLIANCE AND RESOURCES BRANCH ROCKY MOUNTAIN ARSENAL COMMERCE CITY, COLORADO
DESIGNED BY	NORTH BOUNDARY CONTAINMENT TREATMENT SYSTEM
DATE DRAWN BY J. H. GILMORE	
DATE MAR 1, 1988 REVIEWED BY D. L. ANDERSON	
DATE MAY 6, 1988 APPROVED BY D. W. THOMPSON DATE MAR 8, 1988	
ALDRIN CONCENTRATION MAP, ppb 2ND QUARTER 1984	
Drawn to PLATE IC-37	





DEPARTMENT OF THE ARMY ROCKY MOUNTAIN ARSENAL COMMERCE CITY, COLORADO	
PREPARED BY WATERWAYS EXPERIMENT STATION VICKSBURG, MISSISSIPPI	ENVIRONMENTAL DIVISION COMPLIANCE AND RESOURCES BRANCH ROCKY MOUNTAIN ARSENAL COMMERCE CITY, COLORADO
DESIGNED BY DATE	NORTH BOUNDARY CONTAINMENT TREATMENT SYSTEM
DRAWN BY J. M. BILBINE DATE MAR 1, 1988	ALDRIN CONCENTRATION MAP, ppb 3RD QUARTER 1984
REVIEWED BY S. L. ANDERSON DATE MAR 6, 1988	DRAWING NO. PLATE IC-38
APPROVED BY S. W. THOMPSON DATE MAR 6, 1988	

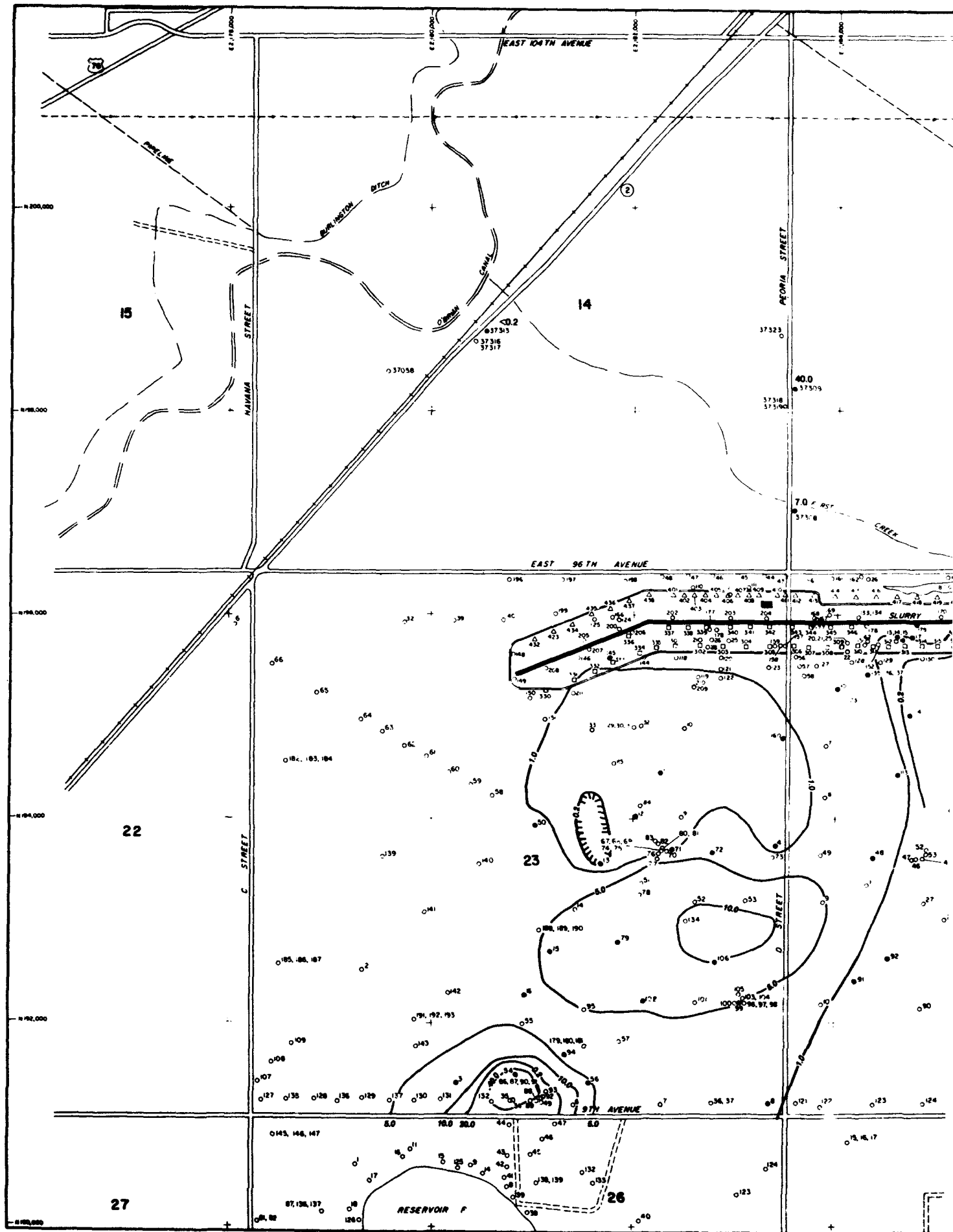


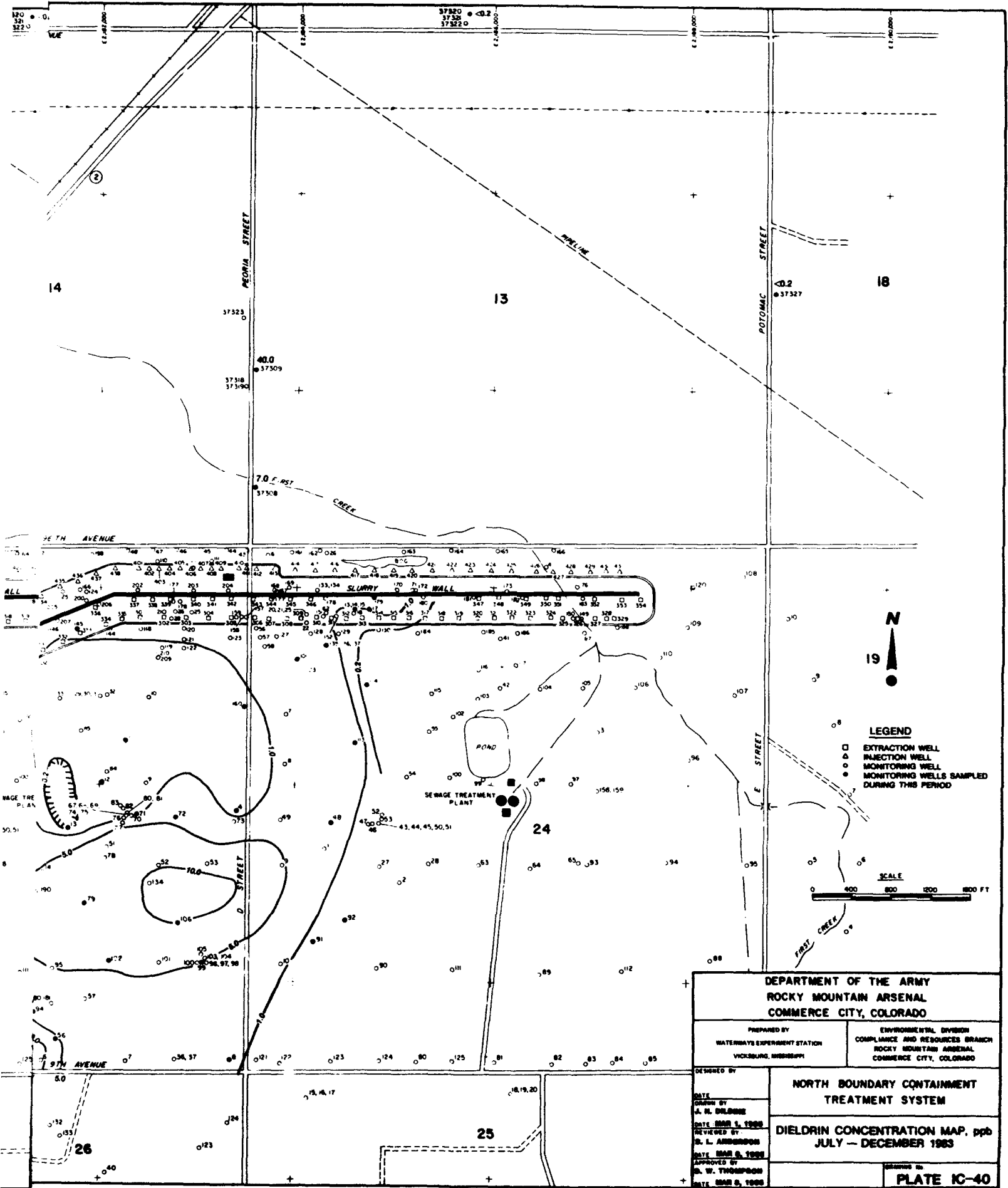


LEGEND
 □ EXTRACTION WELL
 △ INJECTION WELL
 ○ MONITORING WELL
 ● MONITORING WELLS SAMPLED DURING THIS PERIOD

SCALE
 0 400 800 1200 1600 FT

DEPARTMENT OF THE ARMY ROCKY MOUNTAIN ARSENAL COMMERCE CITY, COLORADO	
PREPARED BY WATERWAYS EXPERIMENT STATION VICKSBURG, MISSISSIPPI	ENVIRONMENTAL DIVISION COMPLIANCE AND RESOURCES BRANCH ROCKY MOUNTAIN ARSENAL COMMERCE CITY, COLORADO
DESIGNED BY DATE DRAWN BY DATE CHECKED BY DATE APPROVED BY DATE	
NORTH BOUNDARY CONTAINMENT TREATMENT SYSTEM	
ALDRIN CONCENTRATION MAP, ppb 4TH QUARTER 1984	
CLASSIFIED BY PLATE IC-39	





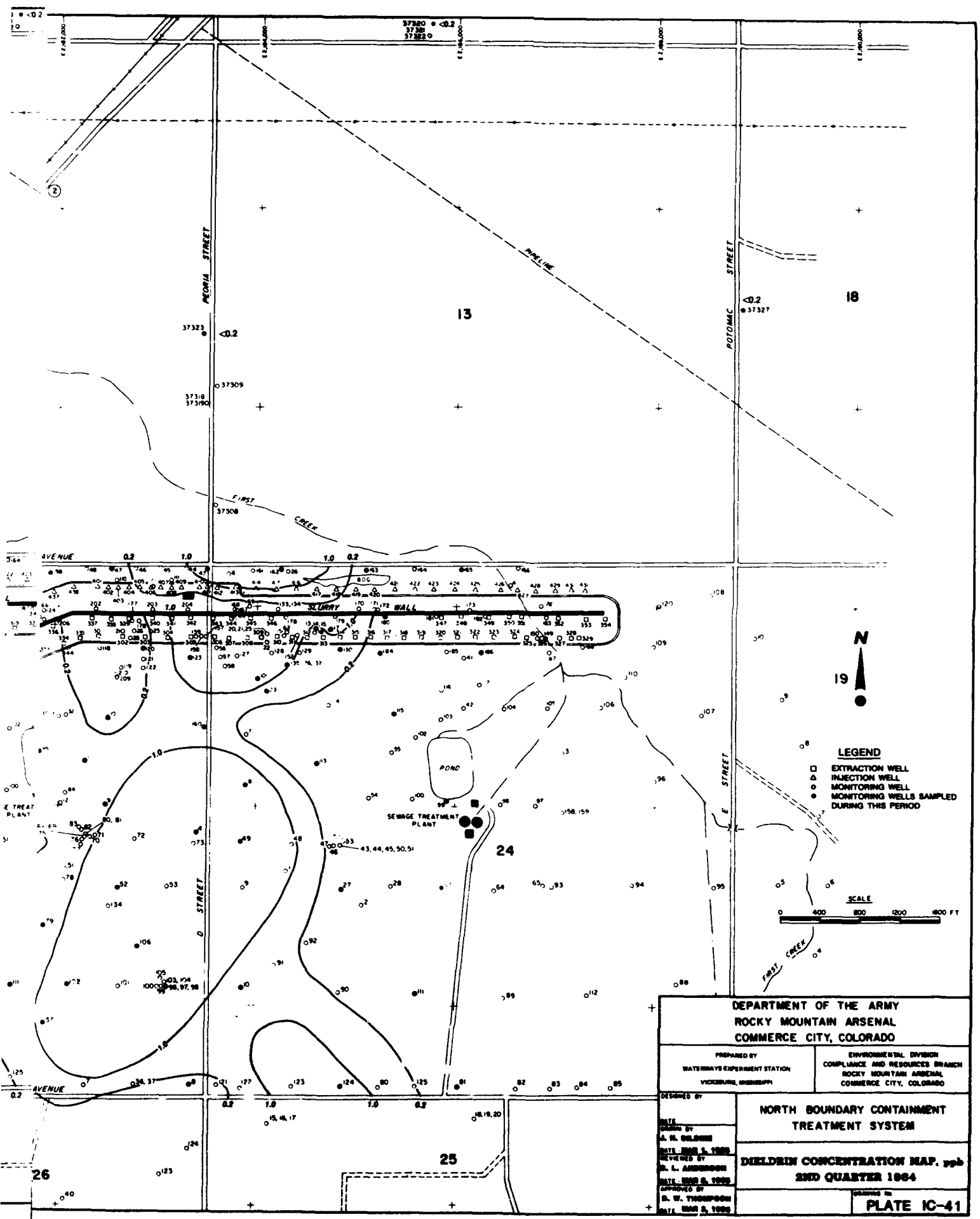
LEGEND

- EXTRACTION WELL
- △ INJECTION WELL
- MONITORING WELL
- MONITORING WELLS SAMPLED DURING THIS PERIOD

SCALE

0 400 800 1200 1600 FT

DEPARTMENT OF THE ARMY ROCKY MOUNTAIN ARSENAL COMMERCE CITY, COLORADO	
PREPARED BY WATERWAYS EXPERIMENT STATION VICKSBURG, MISSISSIPPI	ENVIRONMENTAL DIVISION COMPLIANCE AND RESOURCES BRANCH ROCKY MOUNTAIN ARSENAL COMMERCE CITY, COLORADO
NORTH BOUNDARY CONTAINMENT TREATMENT SYSTEM	
DIELDRIN CONCENTRATION MAP, ppb JULY - DECEMBER 1963	
DESIGNED BY DATE DRAWN BY A. W. BOLING REVIEWED BY S. L. ARMSTRONG DATE MAR 6, 1965 APPROVED BY S. W. THOMPSON DATE MAR 6, 1965	DRAWING NO. PLATE IC-40

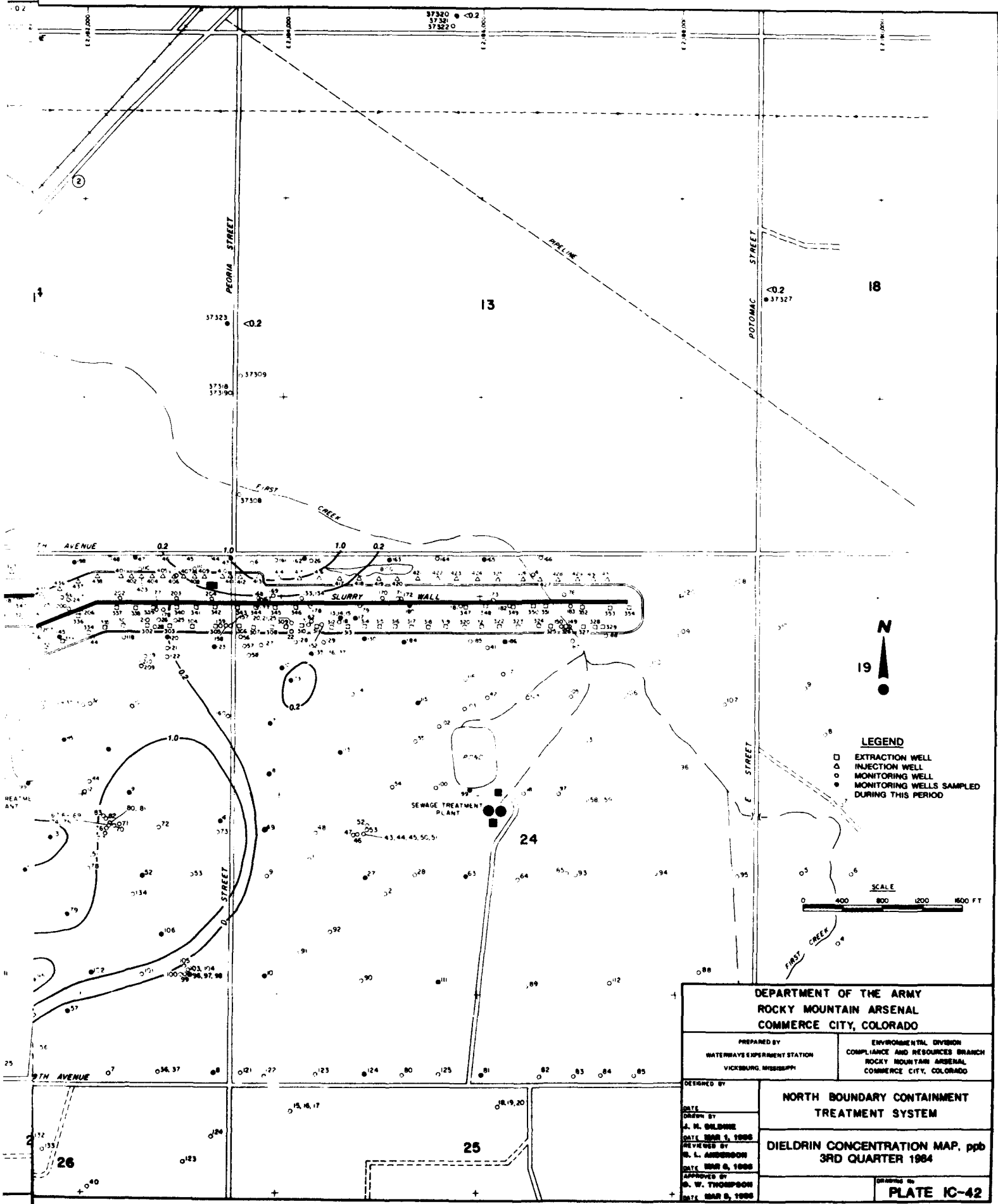


LEGEND

- EXTRACTION WELL
- △ INJECTION WELL
- MONITORING WELL
- MONITORING WELLS SAMPLED DURING THIS PERIOD



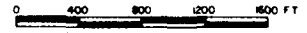
DEPARTMENT OF THE ARMY ROCKY MOUNTAIN ARSENAL COMMERCE CITY, COLORADO	
PREPARED BY WATERWAYS EXPERIMENT STATION VICKSBURG, MISSISSIPPI	ENVIRONMENTAL DIVISION COMPLIANCE AND RESOURCES BRANCH ROCKY MOUNTAIN ARSENAL COMMERCE CITY, COLORADO
NORTH BOUNDARY CONTAINMENT TREATMENT SYSTEM	
DIELDRIN CONCENTRATION MAP, ppb 2ND QUARTER 1964	
DESIGNED BY DATE CHECKED BY DATE REVIEWED BY DATE APPROVED BY DATE	PREPARED BY PLATE IC-41



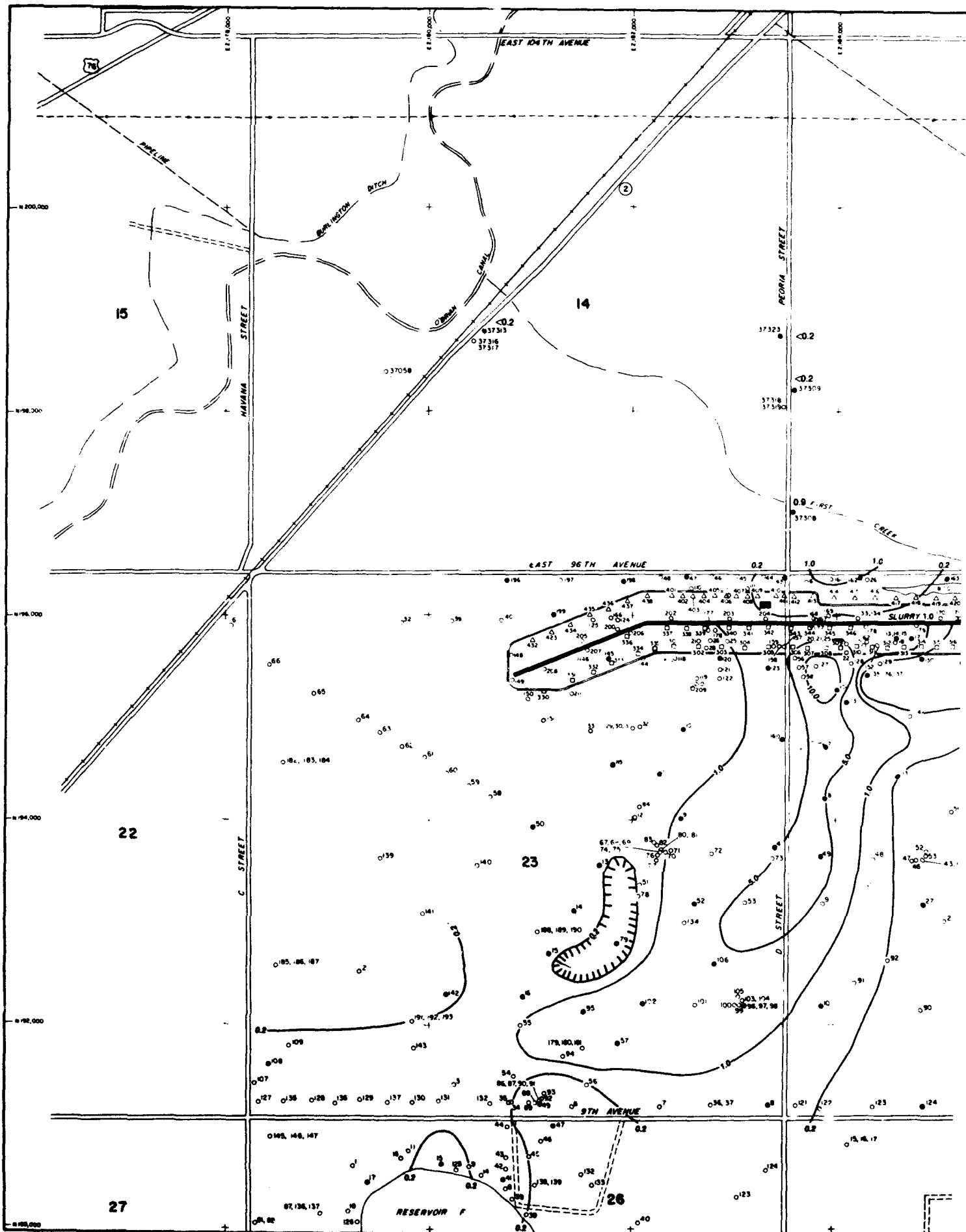
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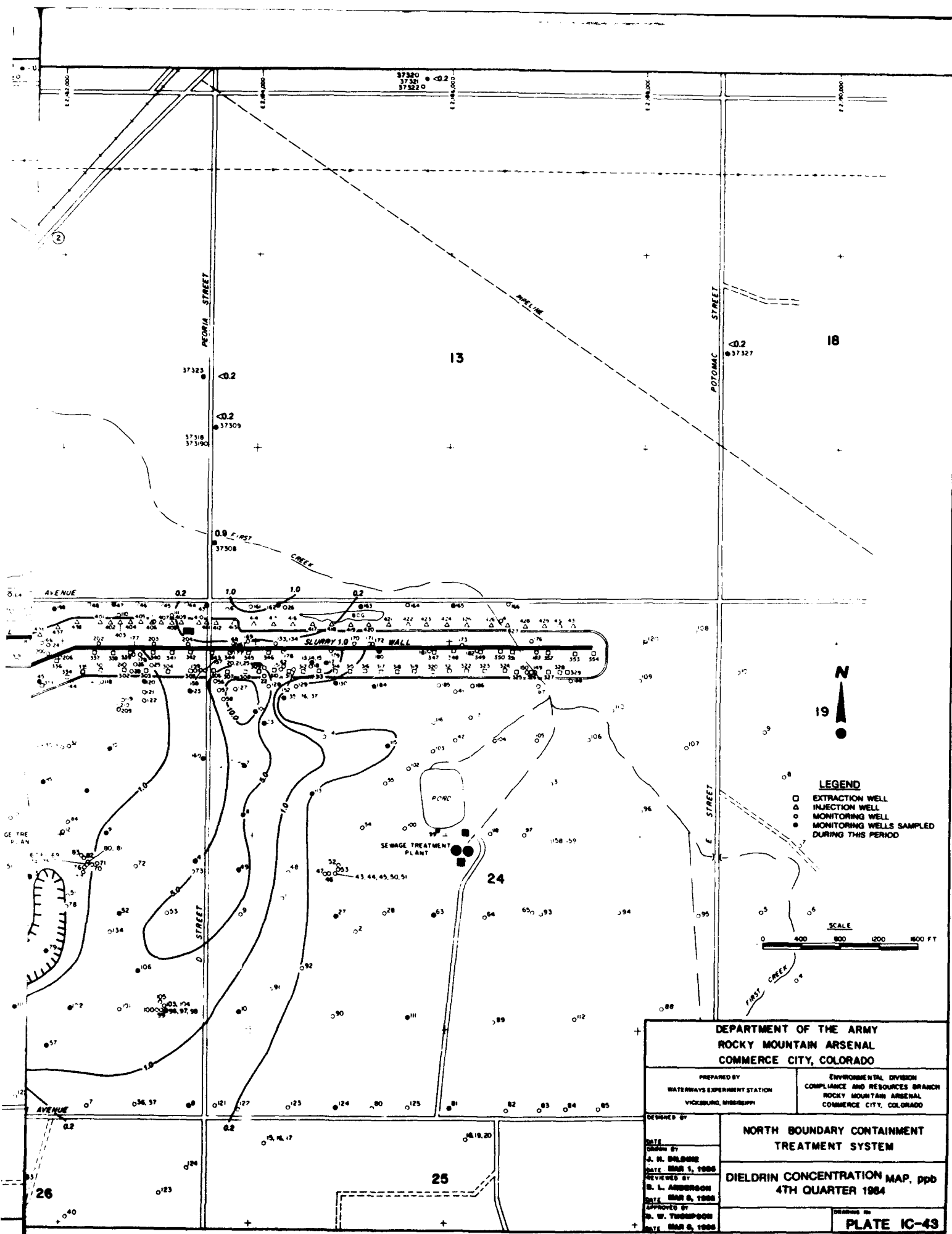
- EXTRACTION WELL
- △ INJECTION WELL
- MONITORING WELL
- MONITORING WELLS SAMPLED DURING THIS PERIOD

SCALE



DEPARTMENT OF THE ARMY ROCKY MOUNTAIN ARSENAL COMMERCE CITY, COLORADO	
PREPARED BY WATERWAYS EXPERIMENT STATION VICKSBURG, MISSISSIPPI	ENVIRONMENTAL DIVISION COMPLIANCE AND RESOURCES BRANCH ROCKY MOUNTAIN ARSENAL COMMERCE CITY, COLORADO
NORTH BOUNDARY CONTAINMENT TREATMENT SYSTEM	
DIELDRIN CONCENTRATION MAP, ppb 3RD QUARTER 1984	
DESIGNED BY DATE DRAWN BY DATE MAR 1, 1985 REVIEWED BY M. L. ANDERSON DATE MAR 6, 1985 APPROVED BY G. W. THOMPSON DATE MAR 8, 1985	DRAWING NO. PLATE IC-42





LEGEND

- EXTRACTION WELL
- △ INJECTION WELL
- MONITORING WELL
- MONITORING WELLS SAMPLED DURING THIS PERIOD

SCALE



DEPARTMENT OF THE ARMY
 ROCKY MOUNTAIN ARSENAL
 COMMERCE CITY, COLORADO

PREPARED BY
 WATERWAYS EXPERIMENT STATION
 VICKSBURG, MISSISSIPPI

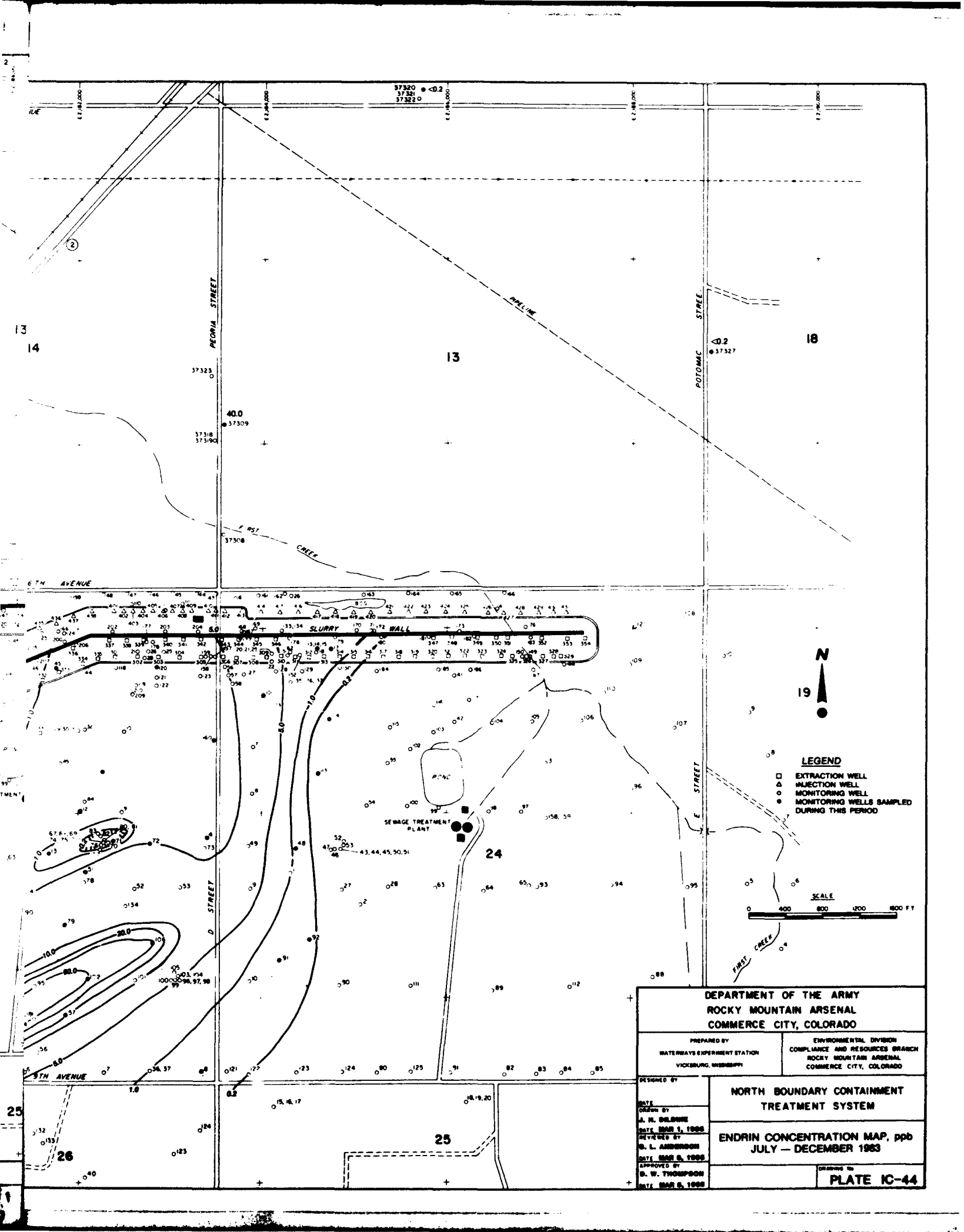
ENVIRONMENTAL DIVISION
 COMPLIANCE AND RESOURCES BRANCH
 ROCKY MOUNTAIN ARSENAL
 COMMERCE CITY, COLORADO

DESIGNED BY
 DATE
 DRAWN BY
 J. H. BALDRE
 DATE MAR 1, 1986
 REVIEWED BY
 B. L. ANDERSON
 DATE MAR 6, 1986
 APPROVED BY
 B. W. THOMPSON
 DATE MAR 6, 1986

**NORTH BOUNDARY CONTAINMENT
 TREATMENT SYSTEM**

**DIELDRIEN CONCENTRATION MAP, ppb
 4TH QUARTER 1984**

DRAWING NO.
PLATE IC-43



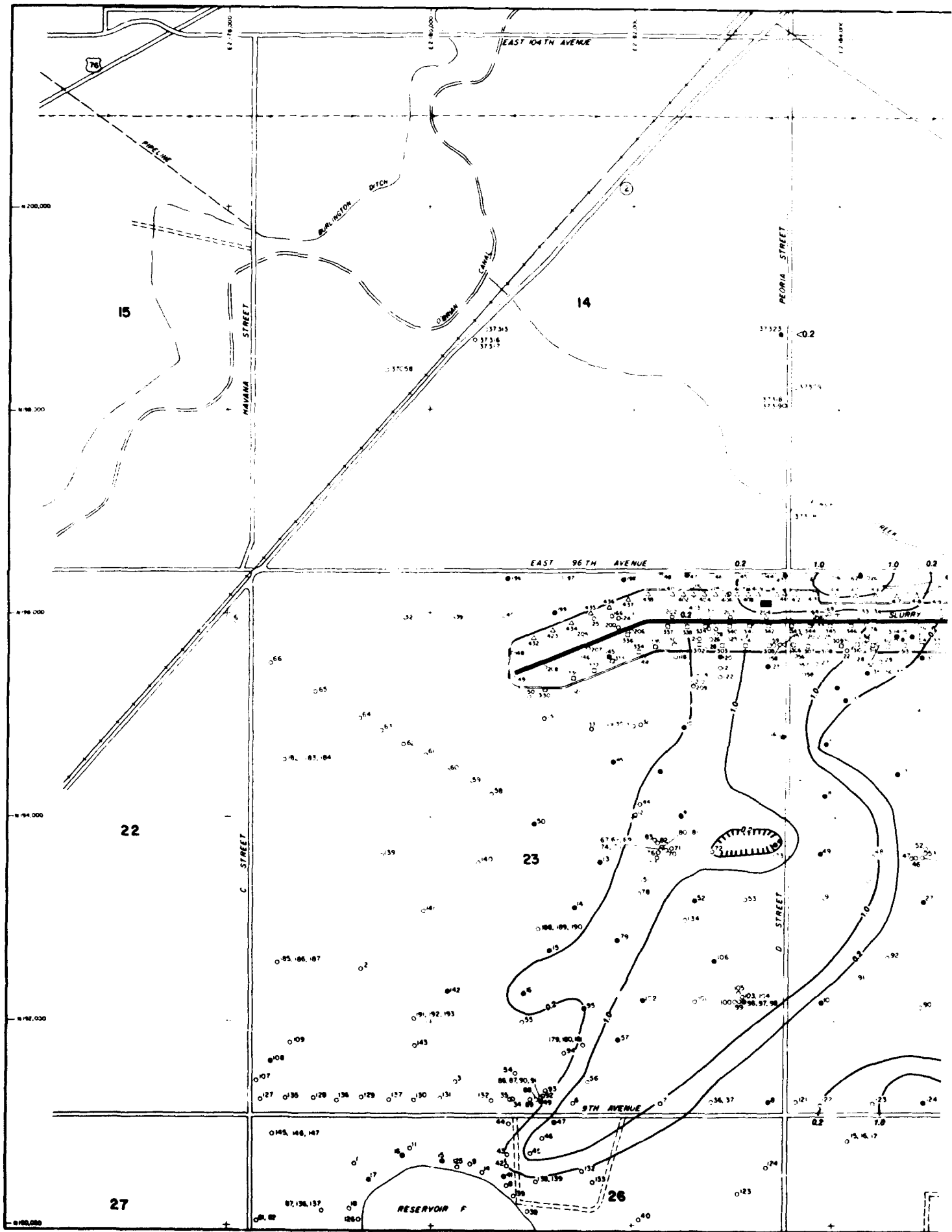
LEGEND

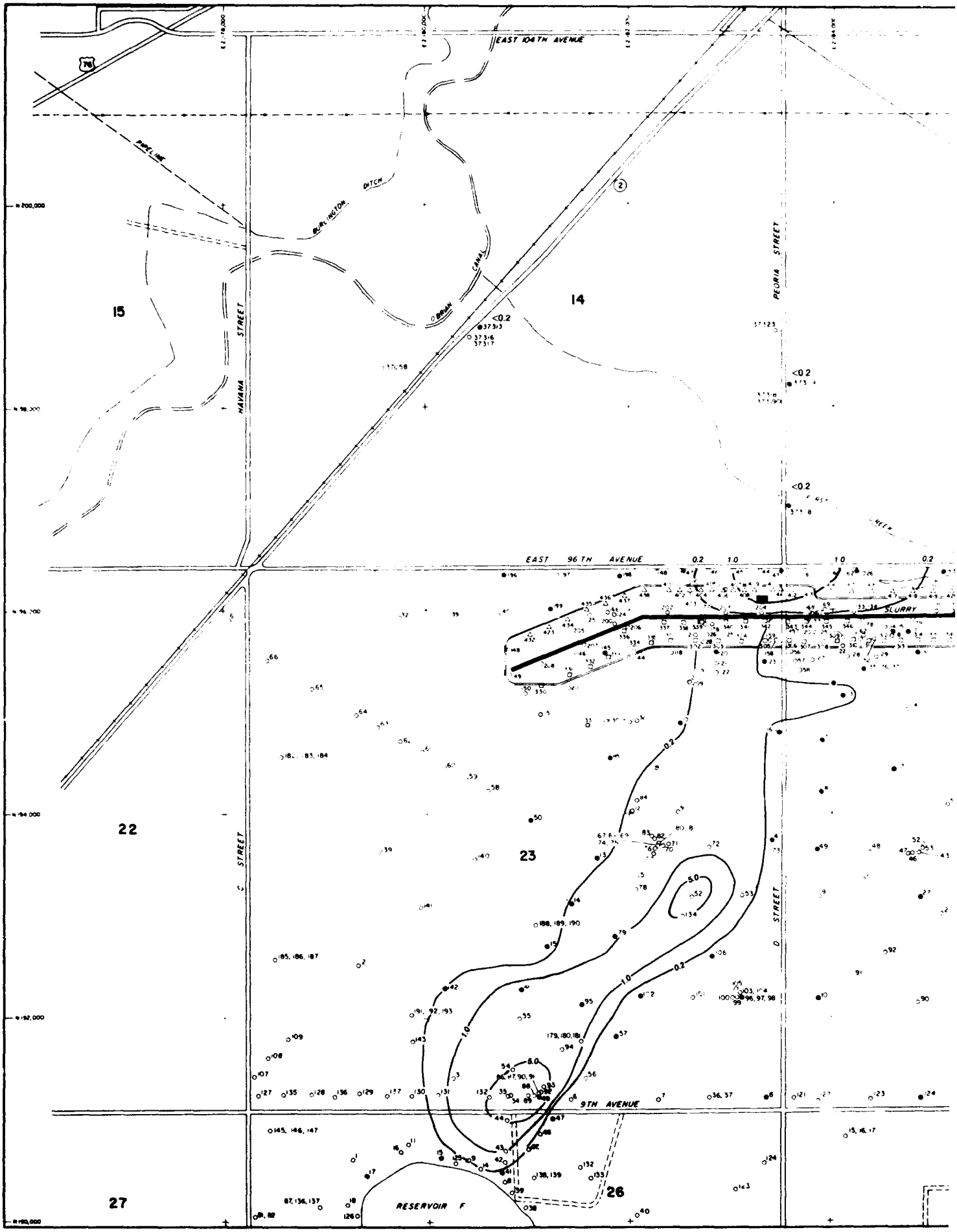
- EXTRACTION WELL
- △ INJECTION WELL
- MONITORING WELL
- MONITORING WELLS SAMPLED DURING THIS PERIOD

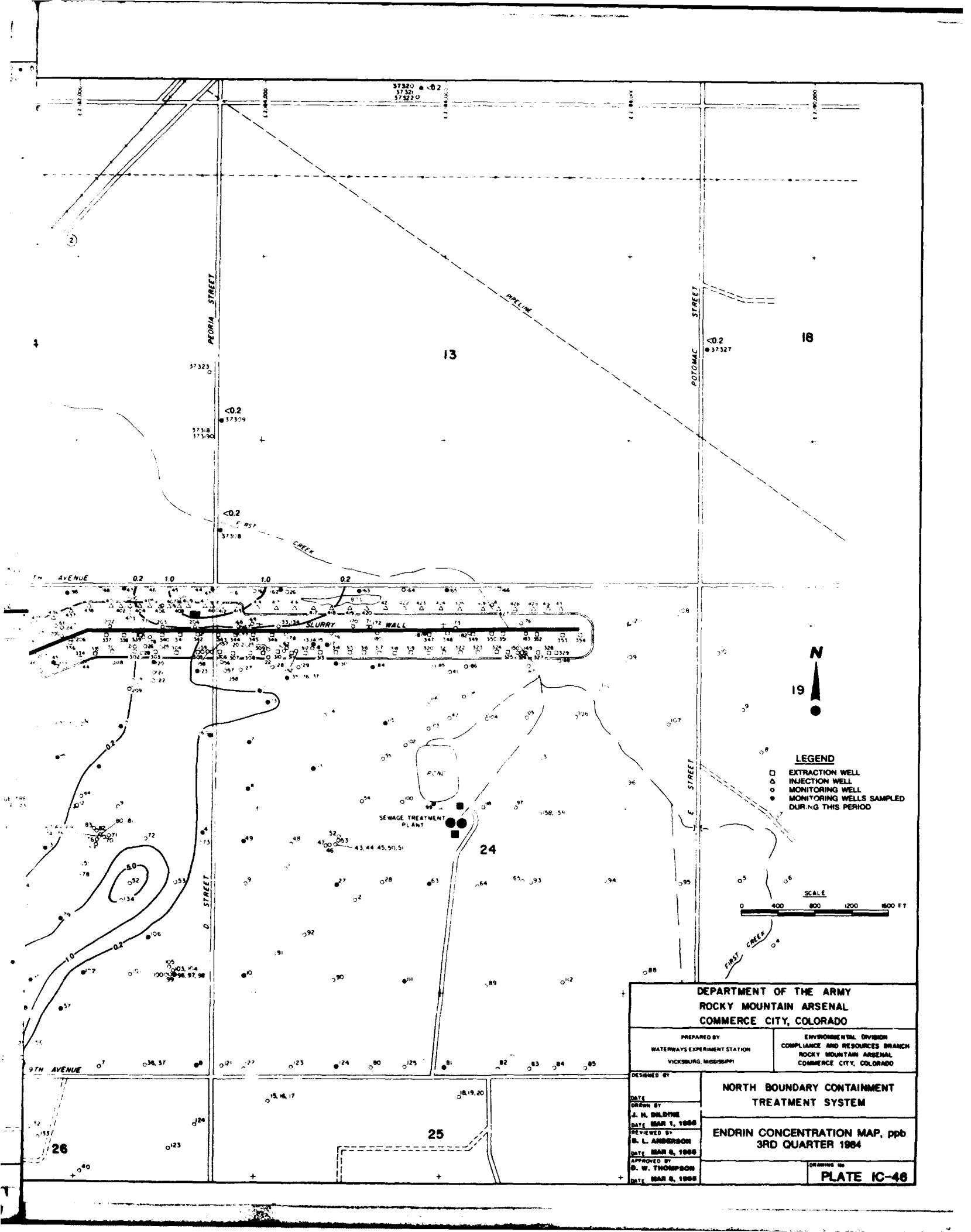
SCALE

0 400 800 1200 1600 FT

DEPARTMENT OF THE ARMY ROCKY MOUNTAIN ARSENAL COMMERCE CITY, COLORADO	
PREPARED BY WATERWAYS EXPERIMENT STATION VICKSBURG, MISSISSIPPI	ENVIRONMENTAL DIVISION COMPLIANCE AND RESOURCES BRANCH ROCKY MOUNTAIN ARSENAL COMMERCE CITY, COLORADO
DESIGNED BY DATE DRAWN BY A. H. OHLSONE DATE MAR 5, 1968 REVIEWED BY B. L. ANDERSON DATE MAR 5, 1968 APPROVED BY B. W. THOMPSON DATE MAR 5, 1968	NORTH BOUNDARY CONTAINMENT TREATMENT SYSTEM
ENDRIN CONCENTRATION MAP, ppb JULY - DECEMBER 1963	
DRAWING NO. PLATE IC-44	







18

13

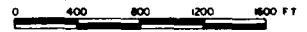


19

LEGEND

- EXTRACTION WELL
- △ INJECTION WELL
- MONITORING WELL
- MONITORING WELLS SAMPLED DURING THIS PERIOD

SCALE



**DEPARTMENT OF THE ARMY
ROCKY MOUNTAIN ARSENAL
COMMERCE CITY, COLORADO**

PREPARED BY
WATERWAYS EXPERIMENT STATION
VICKSBURG, MISSISSIPPI

ENVIRONMENTAL DIVISION
COMPLIANCE AND RESOURCES BRANCH
ROCKY MOUNTAIN ARSENAL
COMMERCE CITY, COLORADO

**NORTH BOUNDARY CONTAINMENT
TREATMENT SYSTEM**

**ENDRIN CONCENTRATION MAP, ppb
3RD QUARTER 1984**

DESIGNED BY
DATE
DRAWN BY
J. H. DELDINE
DATE MAR 1, 1985
REVIEWED BY
B. L. ANDERSON
DATE MAR 6, 1985
APPROVED BY
S. W. THOMPSON
DATE MAR 6, 1985

DRAWING NO.
PLATE IC-48

25

26

24

SEWAGE TREATMENT PLANT

SLURRY WALL

PEORIA STREET

POTOMAC STREET

D STREET

9TH AVENUE

9TH AVENUE

PIPELINE

CREEK

FIRST CREEK

37320
37321
37322

37325

37318
37319

37318

37327

37325

37318
37319

37318

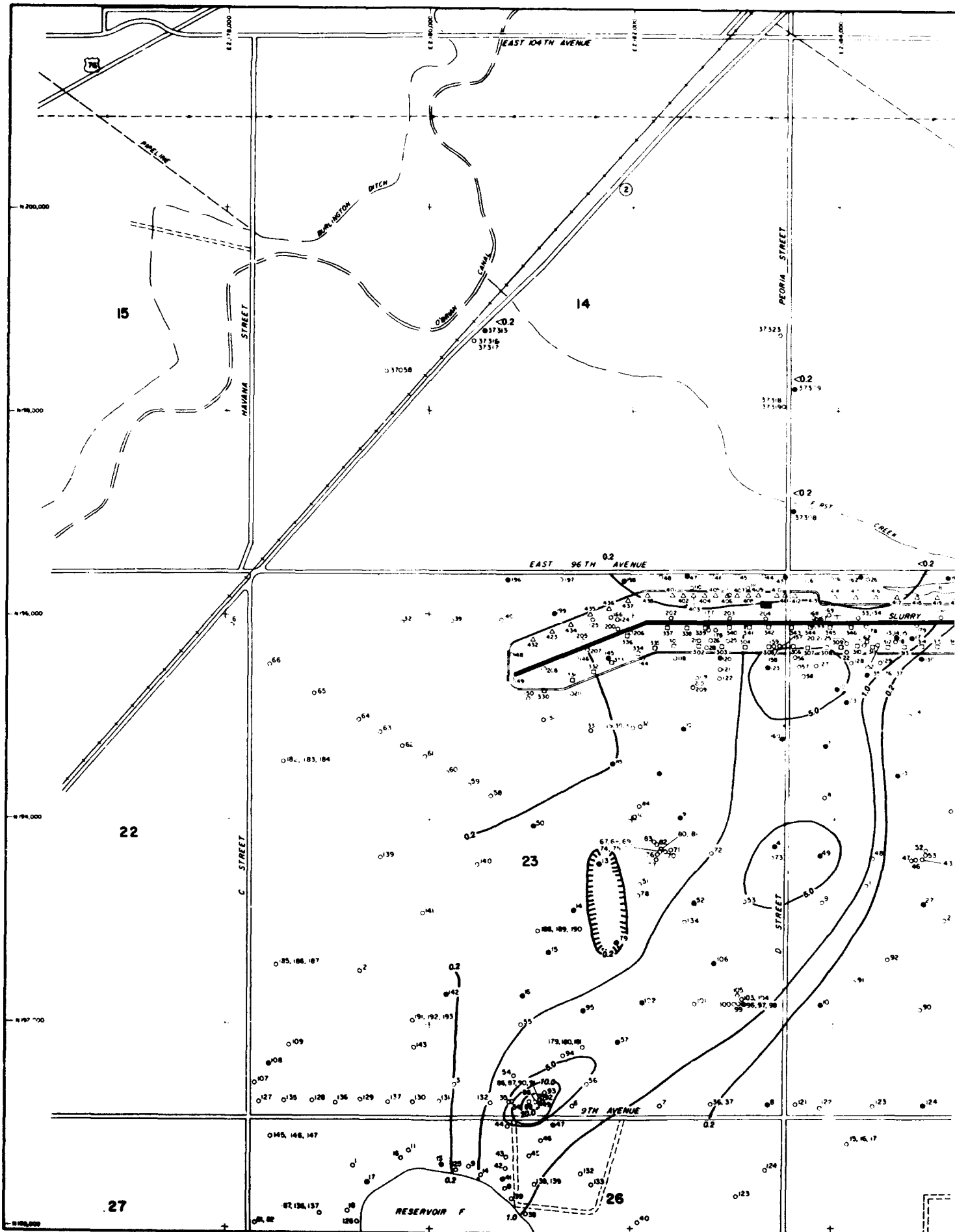
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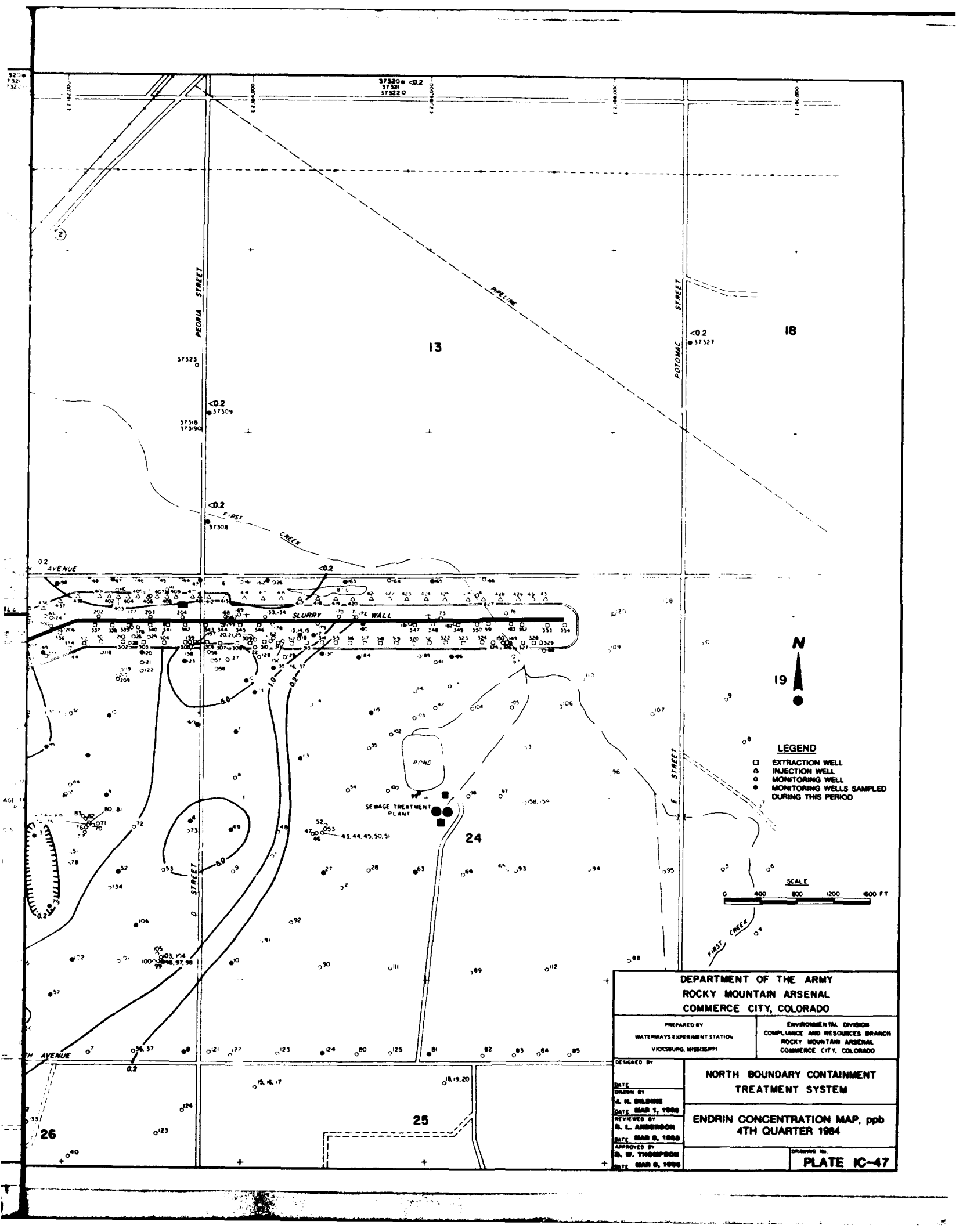
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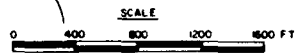
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37327





- LEGEND**
- EXTRACTION WELL
 - △ INJECTION WELL
 - MONITORING WELL
 - MONITORING WELLS SAMPLED DURING THIS PERIOD



DEPARTMENT OF THE ARMY ROCKY MOUNTAIN ARSENAL COMMERCE CITY, COLORADO	
PREPARED BY WATERWAYS EXPERIMENT STATION VICKSBURG, MISSISSIPPI	ENVIRONMENTAL DIVISION COMPLIANCE AND RESOURCES BRANCH ROCKY MOUNTAIN ARSENAL COMMERCE CITY, COLORADO
DESIGNED BY DATE DRAWN BY A. H. GILSON DATE MAR 1, 1988 REVIEWED BY R. L. ANDERSON DATE MAR 8, 1988 APPROVED BY S. W. THOMPSON DATE MAR 8, 1988	NORTH BOUNDARY CONTAINMENT TREATMENT SYSTEM ENDRIN CONCENTRATION MAP, ppb 4TH QUARTER 1984
	DRAWN BY PLATE IC-47