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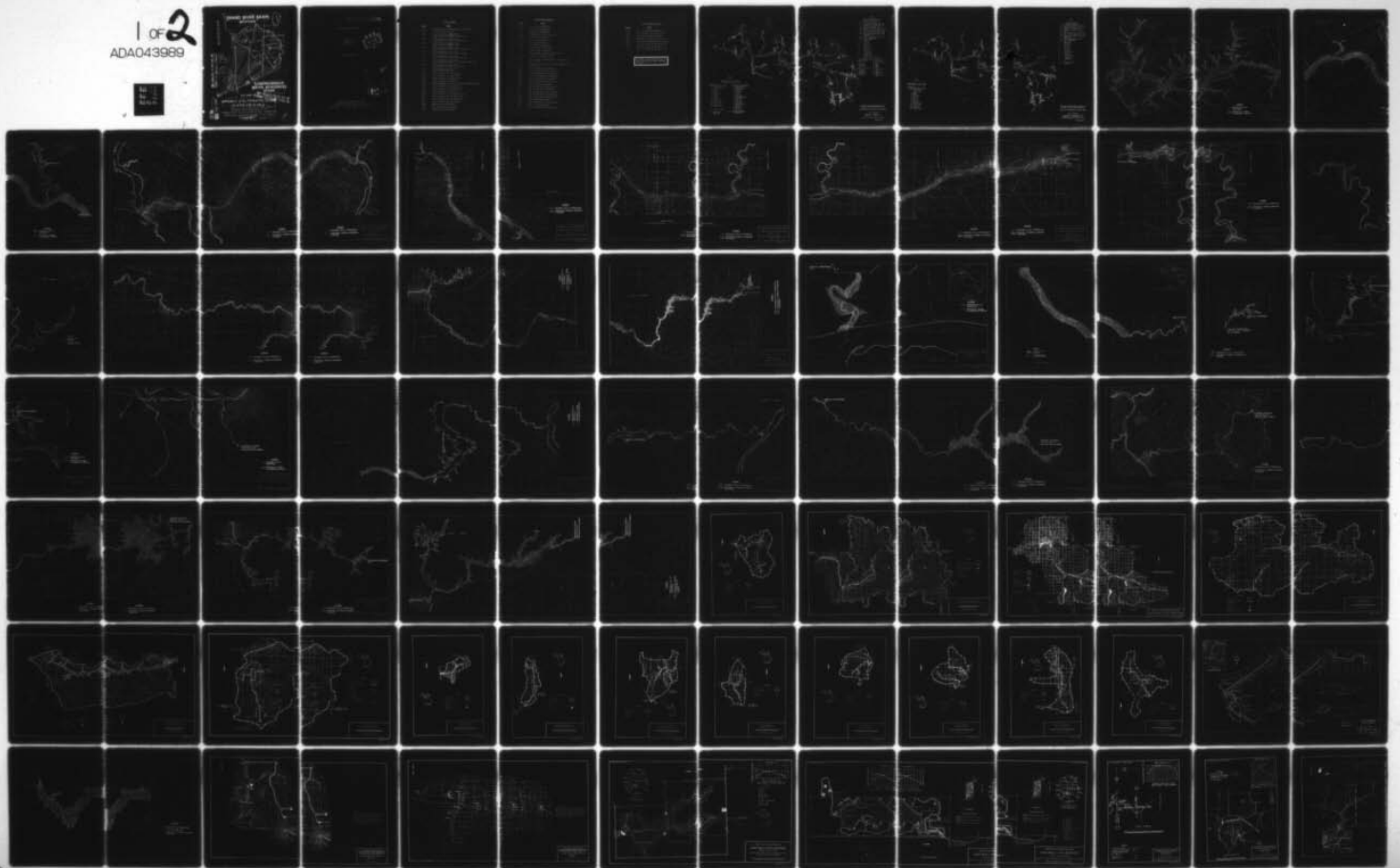
GRAND RIVER BASIN COORDINATING COMMITTEE DETROIT MI
GRAND RIVER BASIN MICHIGAN. COMPREHENSIVE WATER RESOURCES STUDY--ETC(U)
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1 OF 2
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GRAND RIVER BASIN MICHIGAN

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APPENDIX Q-ALTERNATIVE PLANS PLATES FOR PLAN A

Prepared Under Supervision of the
GRAND RIVER BASIN COORDINATING COMMITTEE
Chairmanship: U. S. Army Engineer District, Detroit

11 August 1973

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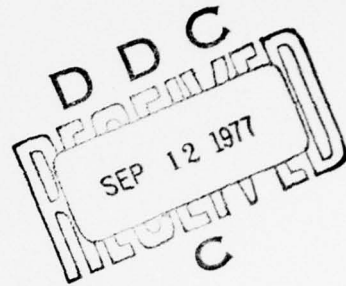
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Grand River Basin Study

APPENDIX Q
ALTERNATIVE PLANS



PLATES FOR PLAN A

ADDRESS	Section 10
TIME	Section 11
BY	Section 12
BY DISTRICT/STATE/AGENCY CODES	
DATE	SPECIAL
A 23	
05	

Prepared Under Supervision of the
GRAND RIVER BASIN COORDINATING COMMITTEE
Chairmanship: U. S. Army Engineer District, Detroit

LIST OF PLATES

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Q-4	Valley Preserve I, Reach (1-2) Ottawa-Kent County Line to Rogue River
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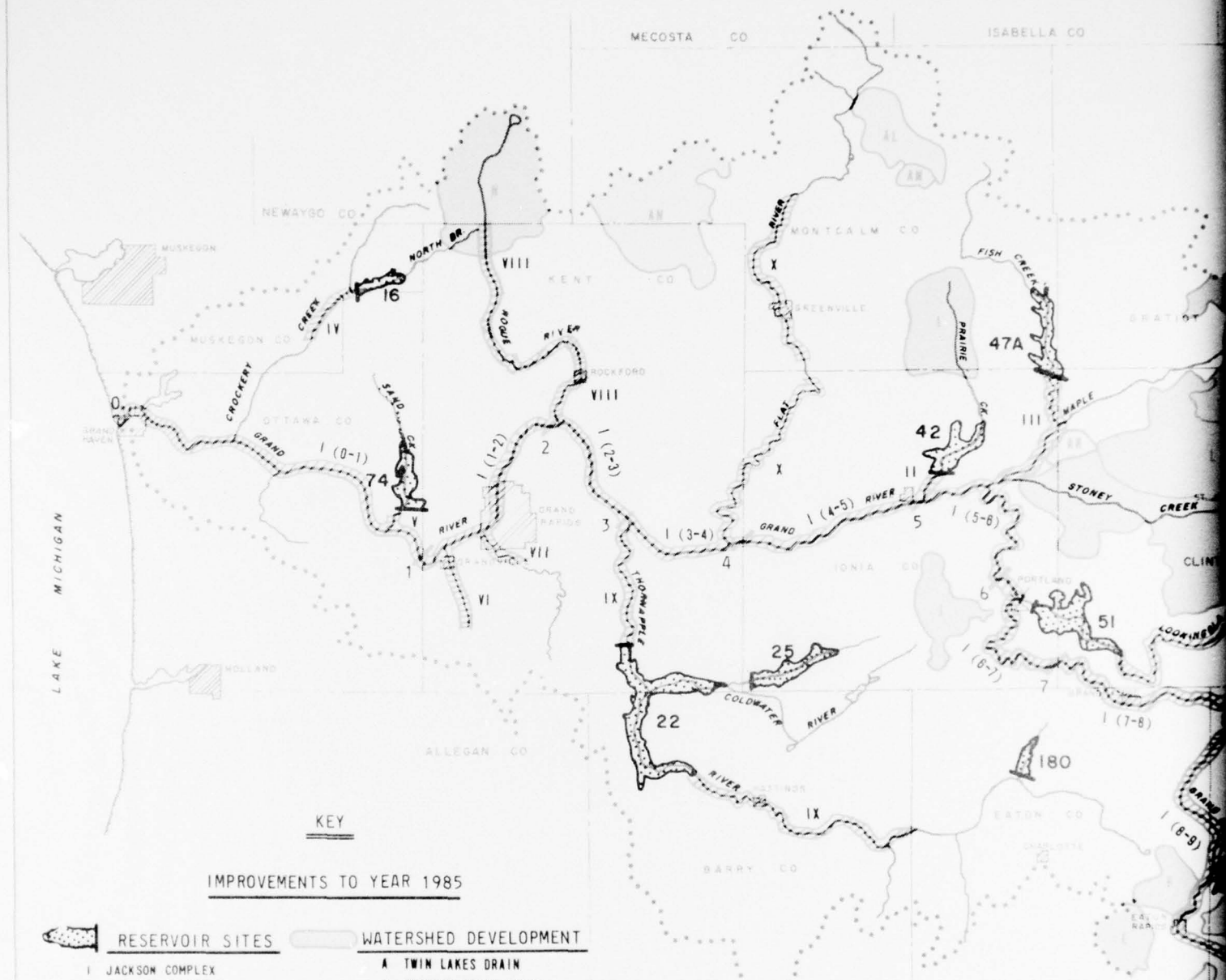
LIST OF PLATES (Cont'd)

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THE ABOVE LISTED PLATES, PLATES Q-I
THRU Q-64, APPLY TO PLAN A AND NOT
TO PLAN B.



KEY

IMPROVEMENTS TO YEAR 1985

- | | |
|---|--|
|  <u>RESERVOIR SITES</u> |  <u>WATERSHED DEVELOPMENT</u> |
| 1 JACKSON COMPLEX | A TWIN LAKES DRAIN |
| 2 RED CEDAR COMPLEX | B FREEMAN MARSH DRAIN |
| 16 RAVENNA | C HUNTOON LAKE |
| 22 LABARGE | D PERRY CREEK |
| 25 DUCK CREEK | E BLY LAKE |
| 42 PRAIRIE CREEK | F EATON RAPIDS |
| 47A FISH CREEK | G UPPER COLUMBIA CREEK |
| 51 PORTLAND | H PORTAGE RIVER |
| 74 SAND CREEK | I PRAIRIE CREEK |
| 109 BEAR CREEK | J LIBHART CREEK |
| 110 SLEEPY HOLLOW | K UPPER MAPLE RIVER |
| 144 COLUMBIA CREEK | L HAYWORTH CREEK |
| 148 LOOKINGGLASS | M STONEY CREEK |
| 149 GRUB CREEK | N ROGUE RIVER |
| 180 NO NAME CREEK | |
| 171 PORTAGE RIVER | |
|  <u>VALLEY PRESERVES</u> |  <u>RECREATION AREAS</u> |
| II PRAIRIE CREEK | ROGUE RIVER |
| III MAPLE RIVER | |

KEY

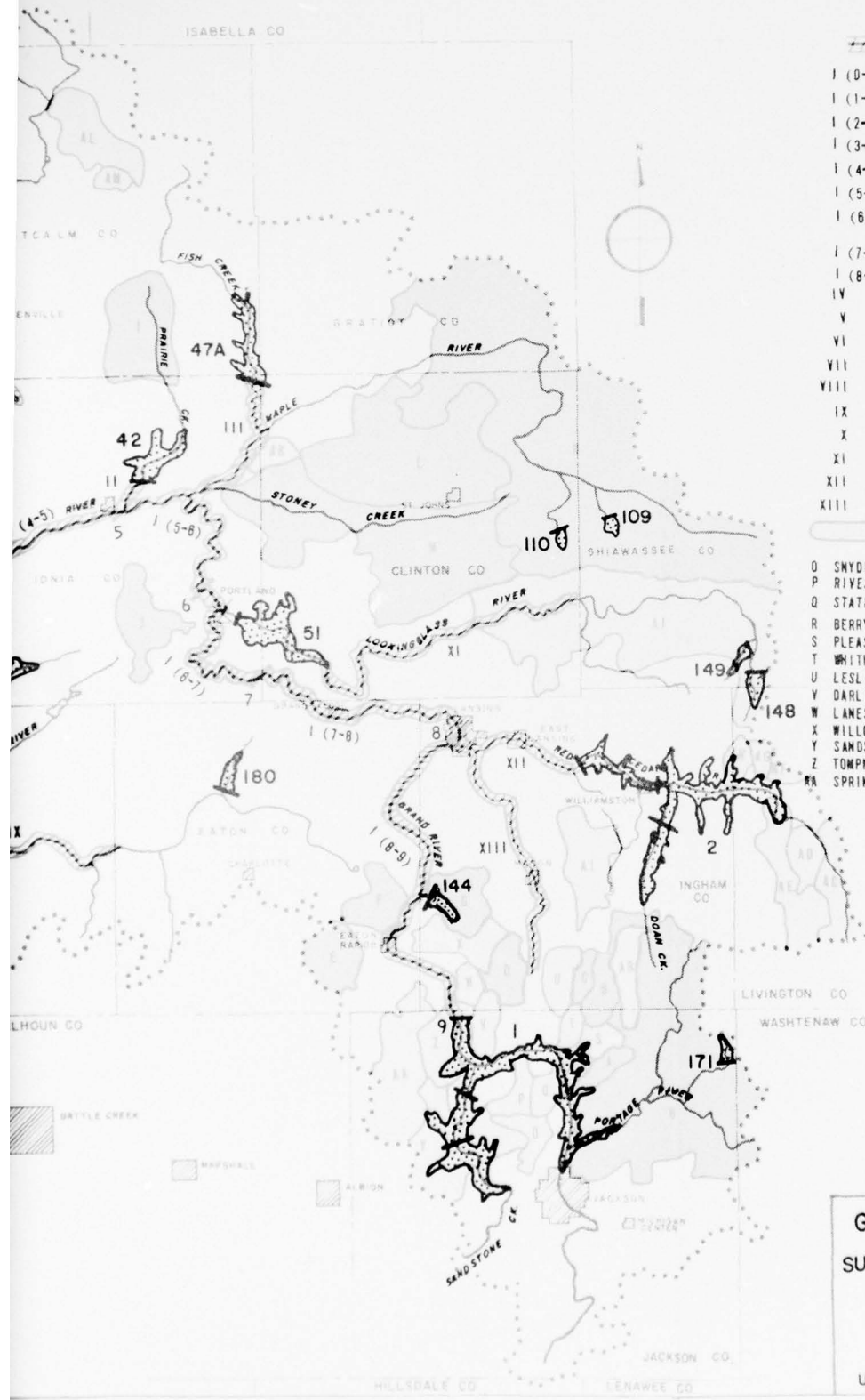
YEAR 1985 TO YEAR 2020

VALLEY PRESERVES

- I (0-1) GRAND HAVEN TO OTTAWA-KENT COUNTY LINE
- I (1-2) OTTAWA-KENT COUNTY LINE TO ROGUE RIVER
- I (2-3) ROGUE RIVER TO THORNAPPLE RIVER
- I (3-4) THORNAPPLE RIVER TO KENT-IONIA COUNTY LINE
- I (4-5) KENT-IONIA COUNTY LINE TO PRAIRIE CREEK
- I (5-6) PRAIRIE CREEK TO PORTLAND MUNICIPAL DAM
- I (6-7) PORTLAND MUNICIPAL DAM TO IONIA CLINTON COUNTY LINE
- I (7-8) IONIA-CLINTON COUNTY LINE TO LANSING
- I (8-9) LANSING TO ONONDAGA DAM
- IV CROCKERY CREEK
- V SAND CREEK
- VI BUCK CREEK
- VII PLASTER CREEK
- VIII ROGUE RIVER
- IX THORNAPPLE RIVER
- X FLAT RIVER
- XI LOOKINGGLASS RIVER
- XII RED CEDAR RIVER
- XIII SYCAMORE CREEK

WATERSHED DEVELOPMENT

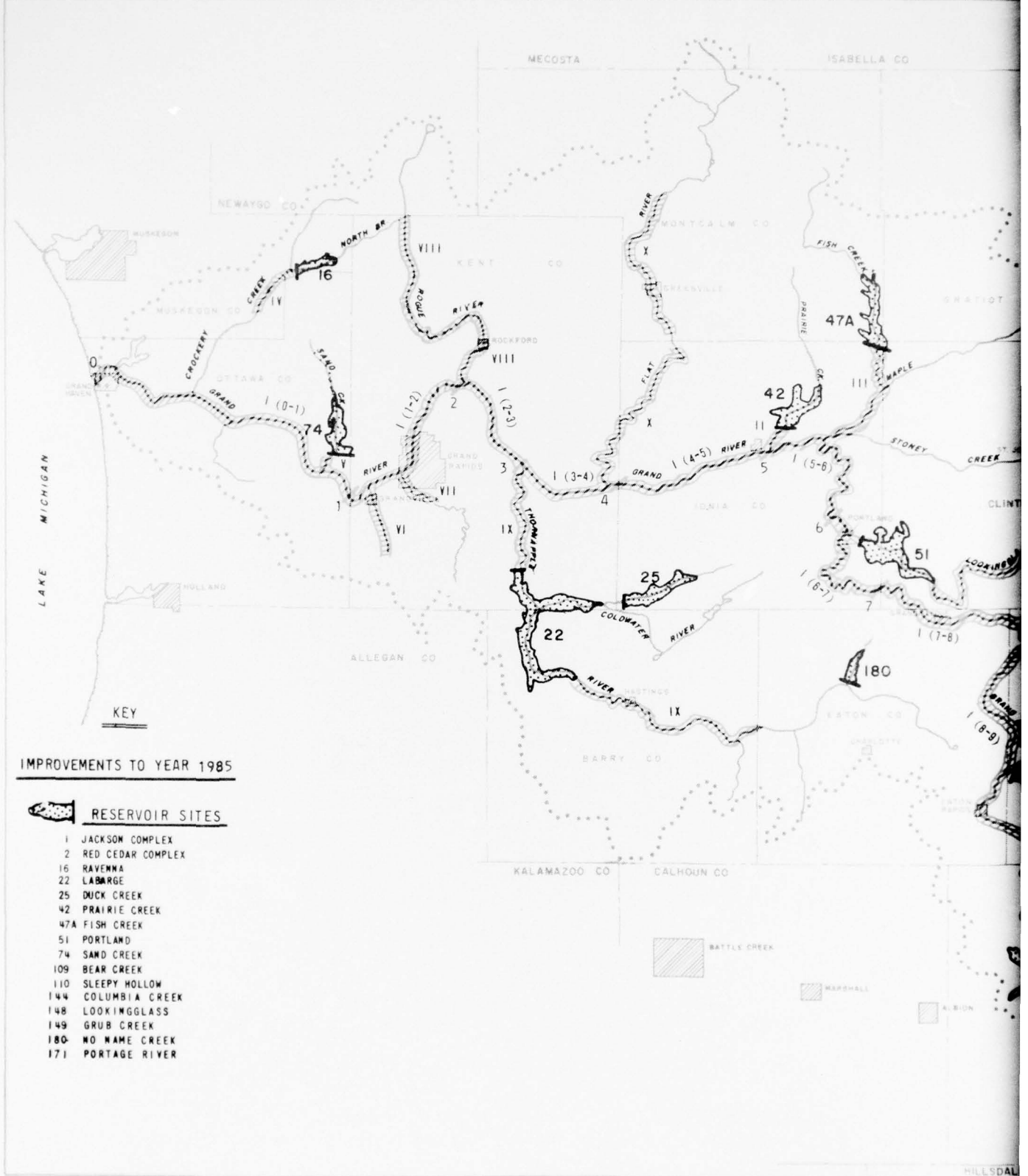
- | | |
|----------------------------|----------------------------------|
| Q SNYDER AND WHEELER DRAIN | AB BATEESE CREEK |
| P RIVES JUNCTION | AC UPPER CEDAR RIVER |
| Q STATE | AD WINEGAR |
| R BERRY LAKE | AE MIDDLE CEDAR RIVER |
| S PLEASANT LAKE | AF RANDAL |
| T WHITNEY DRAIN | AG GRANT |
| U LESLIE | AH BROWN |
| Y DARLING CHRISTIE DRAIN | AI MUD CREEK |
| W LAMES LAKE | AJ LOOKINGGLASS RIVER |
| X WILLOW CREEK | AK PEWAMO |
| Y SANDSTONE CREEK | AL PENNY CREEK |
| Z TOMPKINS | AM HEMMINGWAY LAKE |
| RA SPRING BROOK | AN BLACK CREEK (Montcalm & Kent) |



GRAND RIVER BASIN, MICH.
SUGGESTED PLAN TO YEAR 2020

SCALE OF MILES
 5 0 5 10 15

U.S. ARMY ENGINEER DISTRICT, DETROIT



IMPROVEMENTS TO YEAR 1985



RESERVOIR SITES

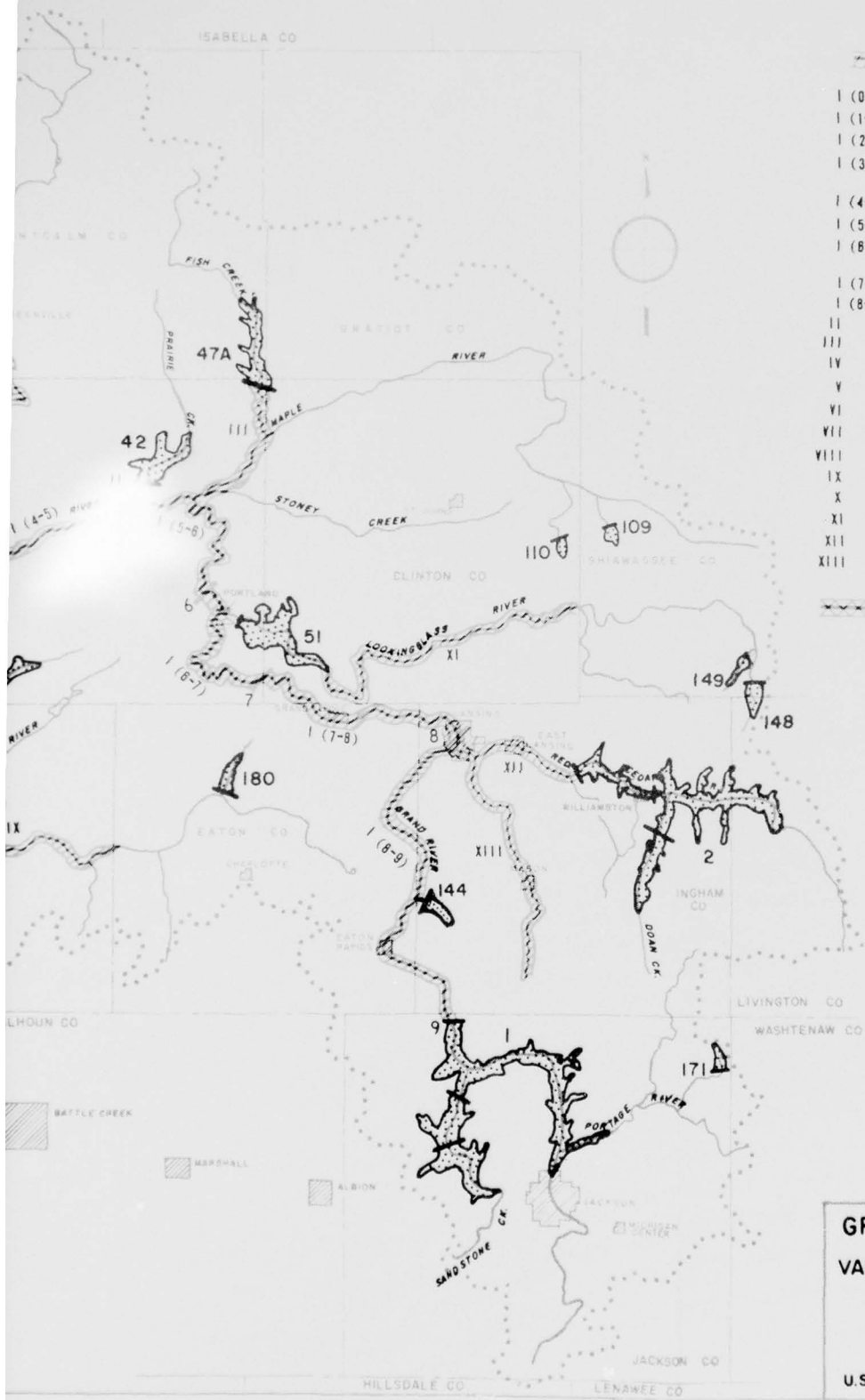
- 1 JACKSON COMPLEX
- 2 RED CEDAR COMPLEX
- 16 RAVENNA
- 22 LABARGE
- 25 DUCK CREEK
- 42 PRAIRIE CREEK
- 47A FISH CREEK
- 51 PORTLAND
- 74 SAND CREEK
- 109 BEAR CREEK
- 110 SLEEPY HOLLOW
- 144 COLUMBIA CREEK
- 148 LOOKINGGLASS
- 149 GRUB CREEK
- 180 NO NAME CREEK
- 171 PORTAGE RIVER

KEY

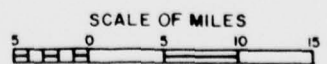
VALLEY PRESERVES

- I (0-1) GRAND HAVEN TO OTTAWA-KENT COUNTY LINE
- I (1-2) OTTAWA-KENT COUNTY LINE TO ROGUE RIVER
- I (2-3) ROGUE RIVER TO THORNAPPLE RIVER
- I (3-4) THORNAPPLE RIVER TO KENT-IONIA COUNTY LINE
- I (4-5) KENT-IONIA COUNTY LINE TO PRAIRIE CREEK
- I (5-6) PRAIRIE CREEK TO PORTLAND MUNICIPAL DAM
- I (6-7) PORTLAND MUNICIPAL DAM TO IONIA CLINTON COUNTY LINE
- I (7-8) IONIA-CLINTON COUNTY LINE TO LANSING
- I (8-9) LANSING TO OMONDAGA DAM
- II PRAIRIE CREEK
- III MAPLE RIVER
- IV CROCKERY CREEK
- V SAND CREEK
- VI BUCK CREEK
- VII PLASTER CREEK
- VIII ROGUE RIVER
- IX THORNAPPLE RIVER
- X FLAT RIVER
- XI LOOKINGGLASS RIVER
- XII RED CEDAR RIVER
- XIII SYCAMORE CREEK

RECREATION AREAS
ROGUE RIVER



GRAND RIVER BASIN, MICH
VALLEY PRESERVE INDEX MAP



U.S. ARMY ENGINEER DISTRICT, DETROIT



LEGEND

- PROPOSED VALLEY PRESERVES
- PROPOSALS SHOWN ELSEWHERE IN REPORT

GRAND RIVER BASIN, MICHIGAN
 GRAND RIVER VALLEY PRESERVE
 REACH I (G-1)
 GRAND HAVEN TO OTTAWA-KENT COUNTY LINE
 U S ARMY ENGINEER DISTRICT, DETROIT

SCALE OF MILES

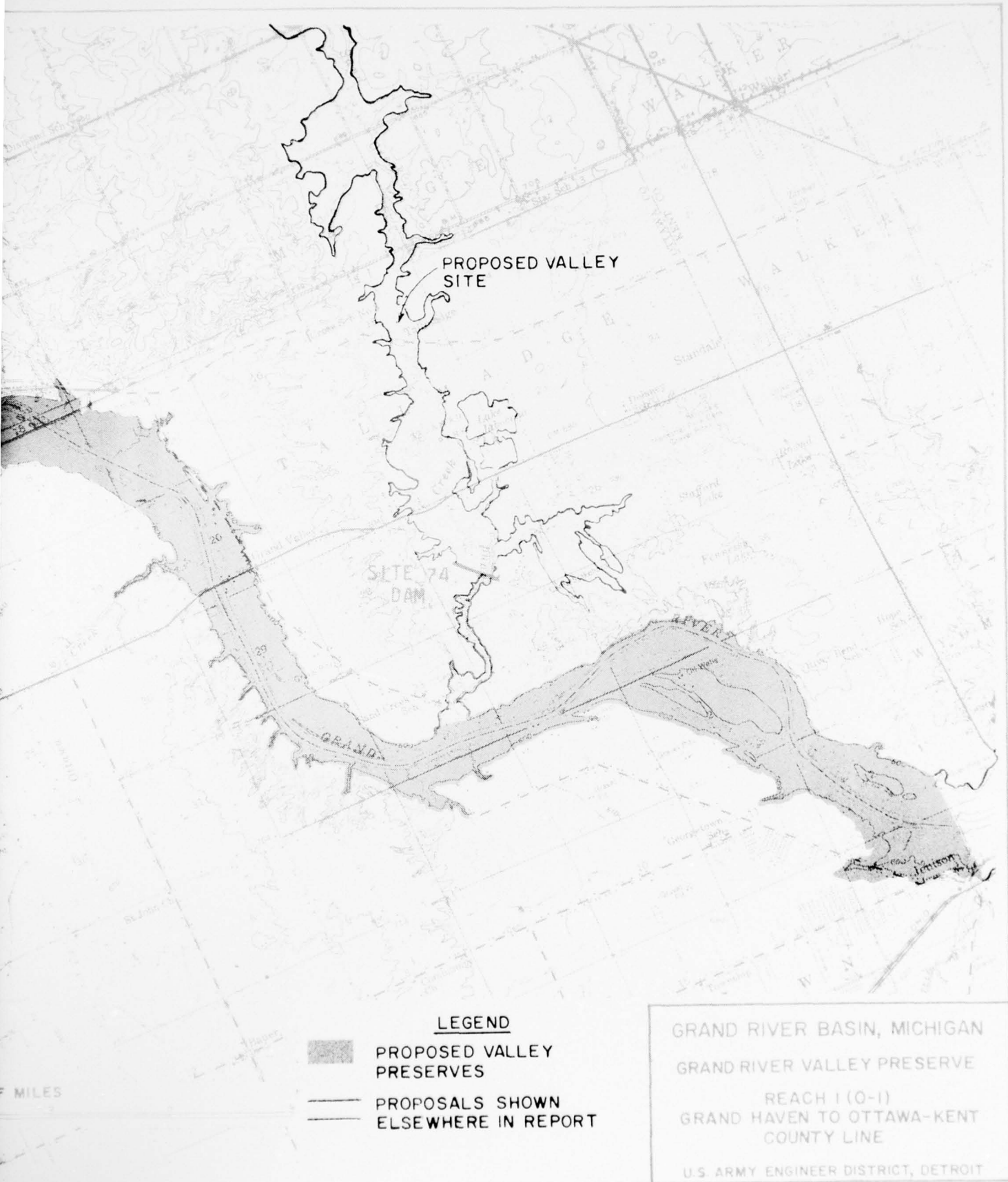
MATCH LINE



SCALE OF MILES

BASED ON U.S. GEOLOGICAL SURVEY QUADRANGLES

PROJECT
PROPOSED
ELEVATION



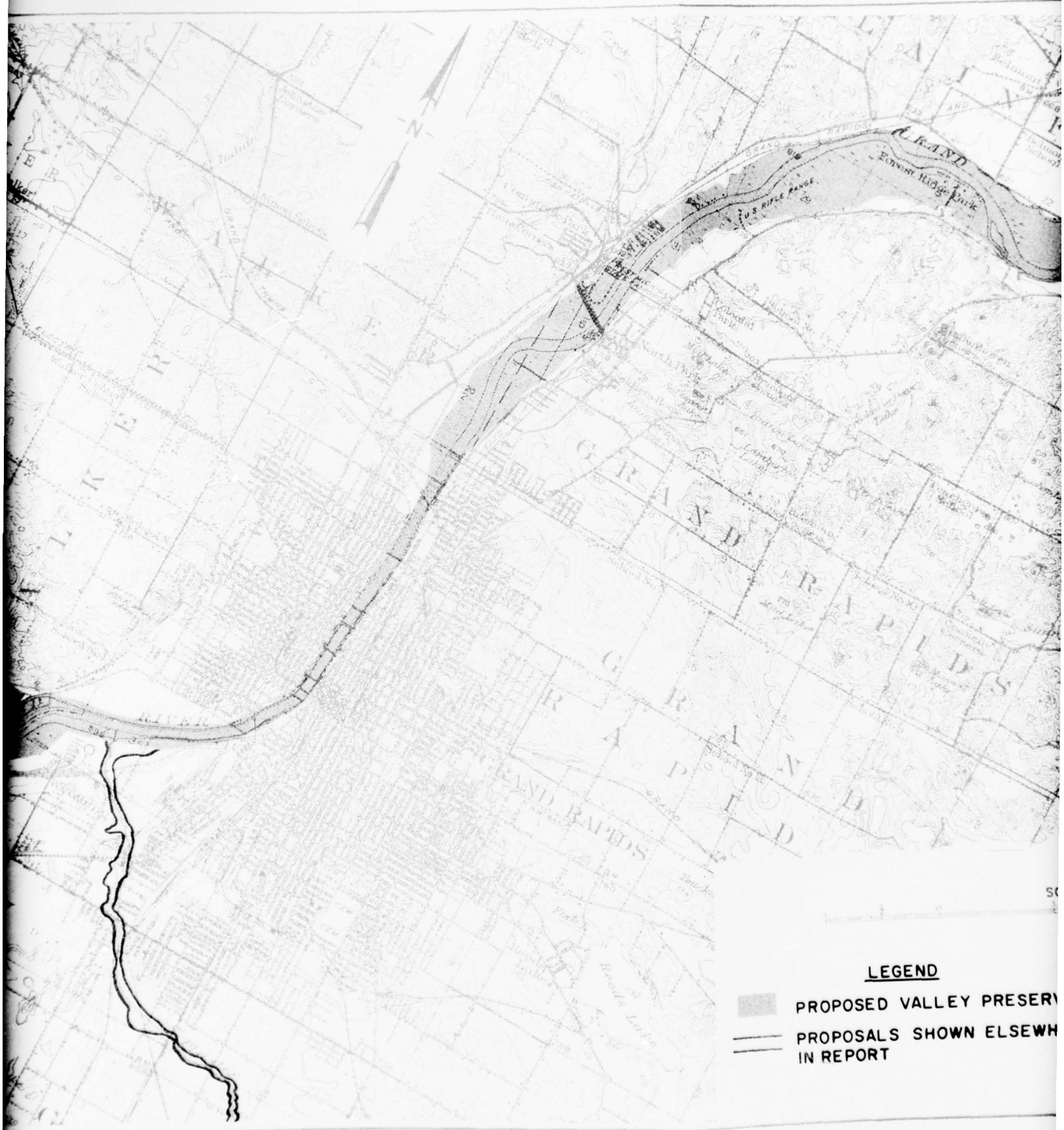
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- PROPOSED VALLEY PRESERVES
- PROPOSALS SHOWN ELSEWHERE IN REPORT



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 GRAND RIVER VALLEY PRESERVE
 REACH I (0-1)
 GRAND HAVEN TO OTTAWA-KENT COUNTY LINE
 U.S. ARMY ENGINEER DISTRICT, DETROIT

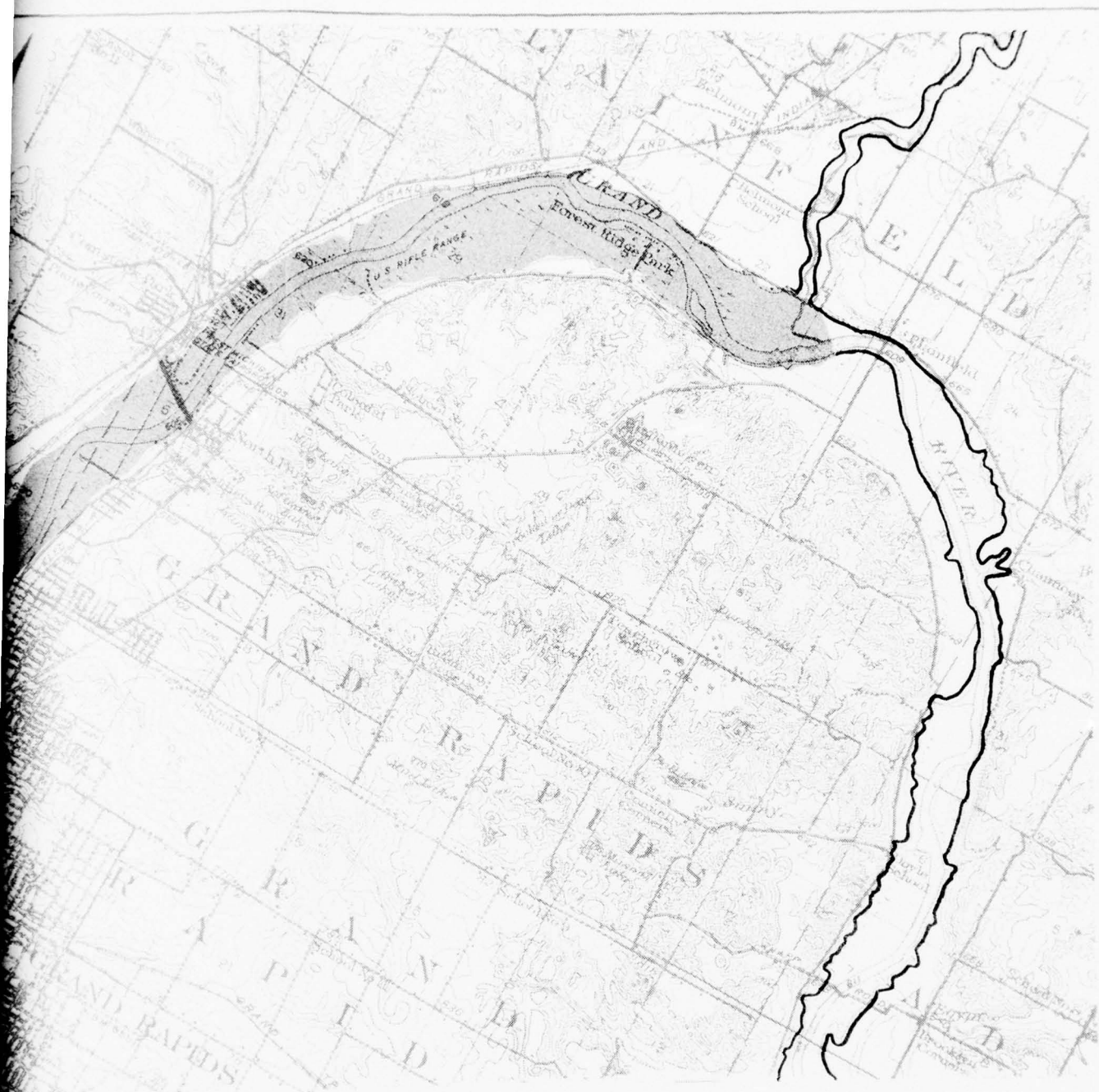


BASED ON U.S. GEOLOGICAL SURVEY QUADRANGLES



LEGEND

-  PROPOSED VALLEY PRESERVE
-  PROPOSALS SHOWN ELSEWHERE IN REPORT



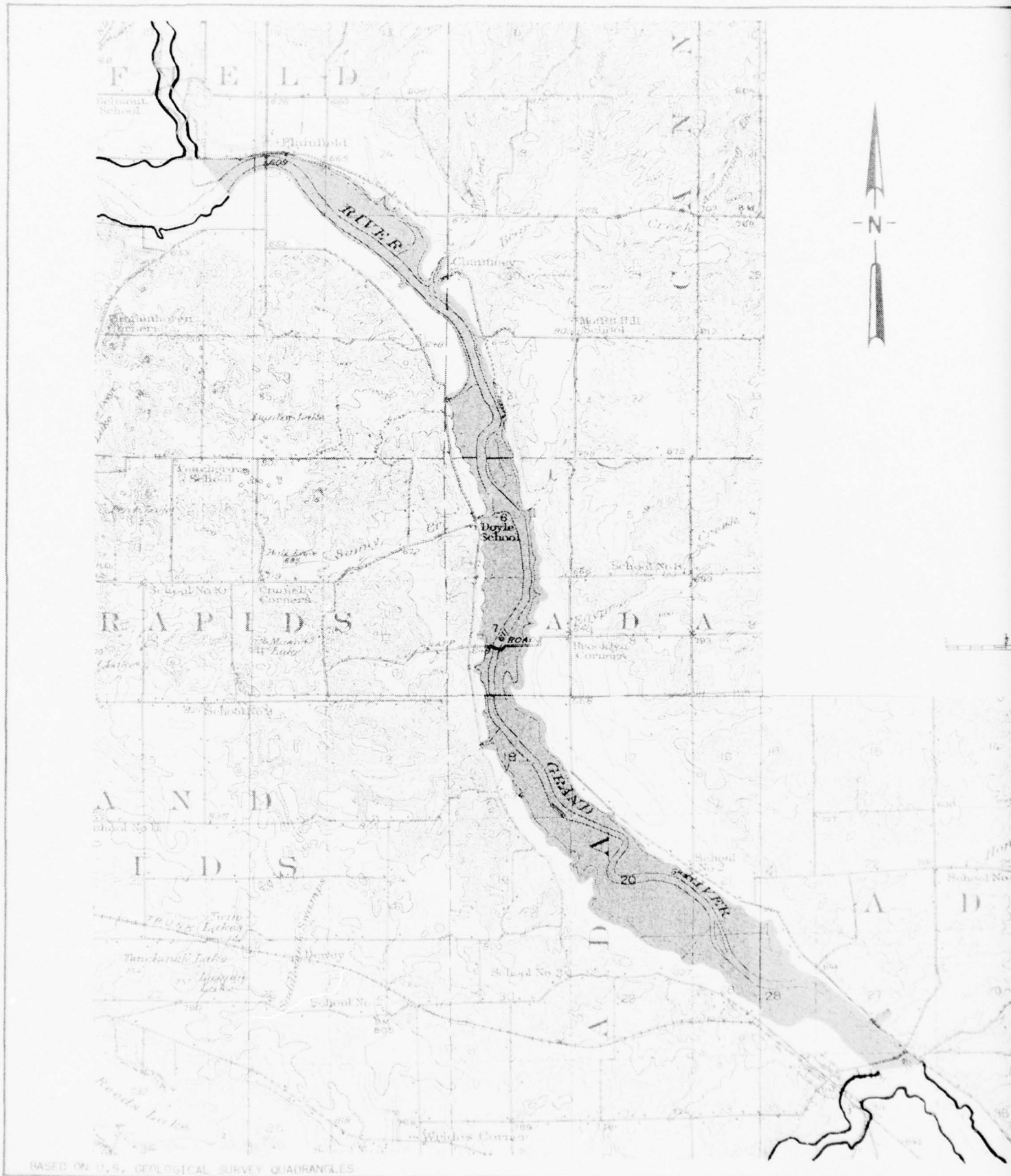
SCALE OF MILES

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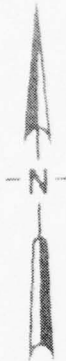
- PROPOSED VALLEY PRESERVES
- PROPOSALS SHOWN ELSEWHERE IN REPORT

GRAND RIVER BASIN, MICHIGAN
 GRAND RIVER VALLEY PRESERVE
 REACH 1 (1-2)
 OTTAWA-KENT COUNTY LINE TO
 ROGUE RIVER
 U.S. ARMY ENGINEER DISTRICT, DETROIT

3





BASED ON U.S. GEOLOGICAL SURVEY QUADRANGLES



SCALE OF MILES



LEGEND

-  PROPOSED VALLEY PRESERVES
-  PROPOSALS SHOWN ELSEWHERE IN REPORT

GRAND RIVER BASIN, MICHIGAN
 GRAND RIVER VALLEY PRESERVE
 REACH 1 (2-3)
 ROGUE RIVER TO THORNAPPLE RIVER
 U.S. ARMY ENGINEER DISTRICT, DETROIT



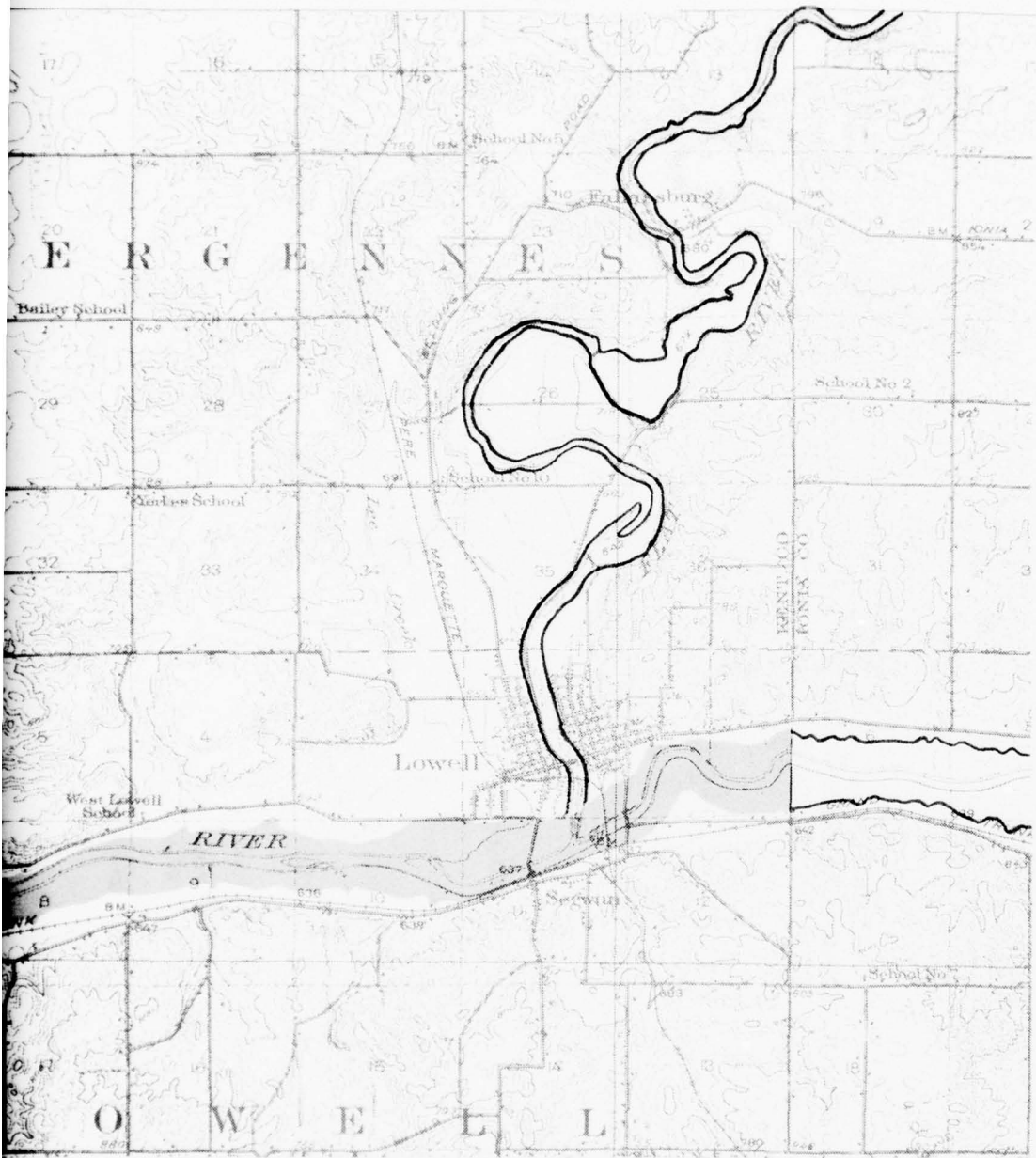
SCALE OF MILES



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- PROPOSED
- PROPOSALS
- IN REPORT



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SCALE OF MILES



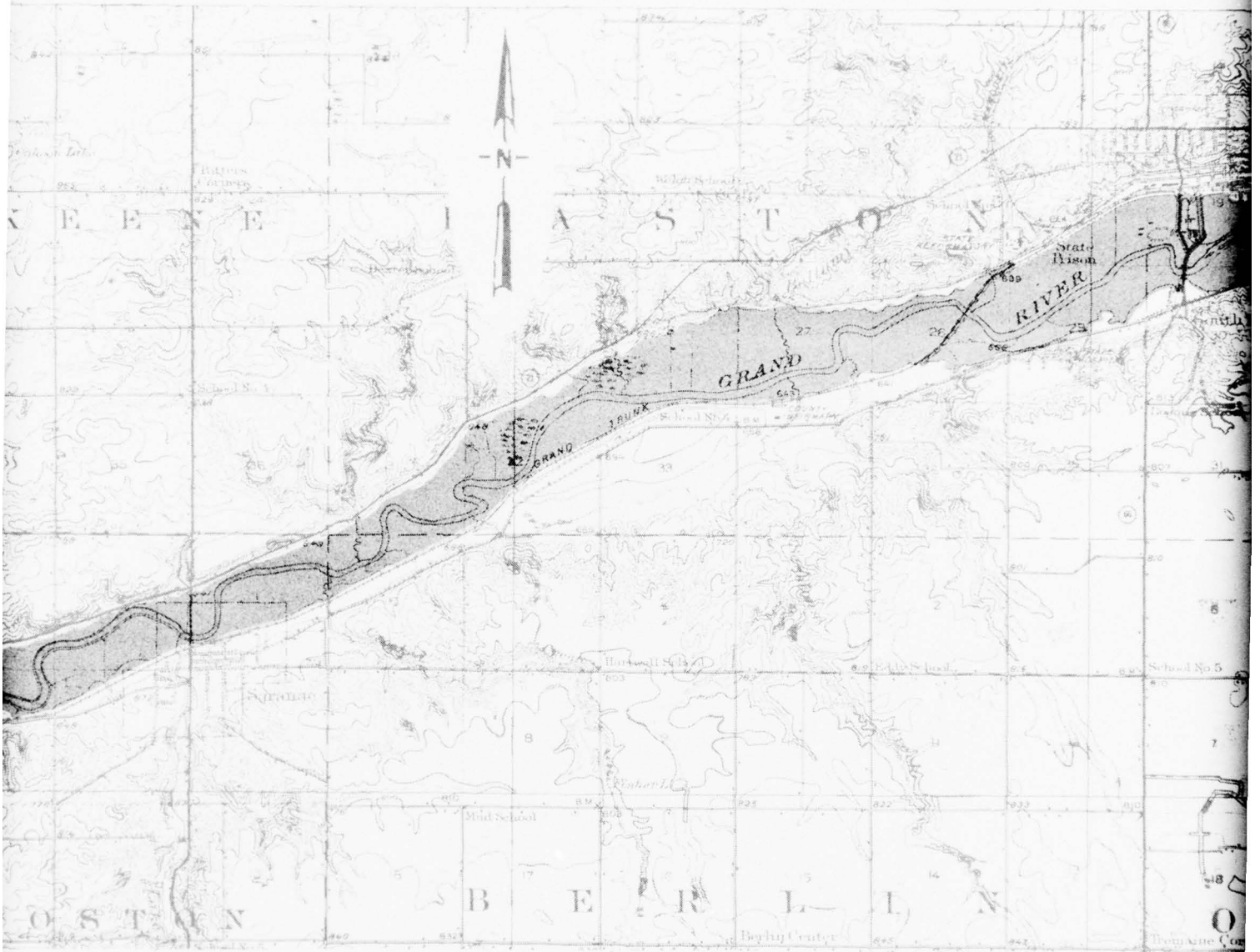
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-  PROPOSED VALLEY PRESERVES
-  PROPOSALS SHOWN ELSEWHERE IN REPORT

GRAND RIVER BASIN, MICHIGAN
 GRAND RIVER VALLEY PRESERVE
 REACH 1 (3-4)
 THORNAPPLE RIVER TO KENT-IONIA
 COUNTY LINE
 U.S. ARMY ENGINEER DISTRICT, DETROIT

2







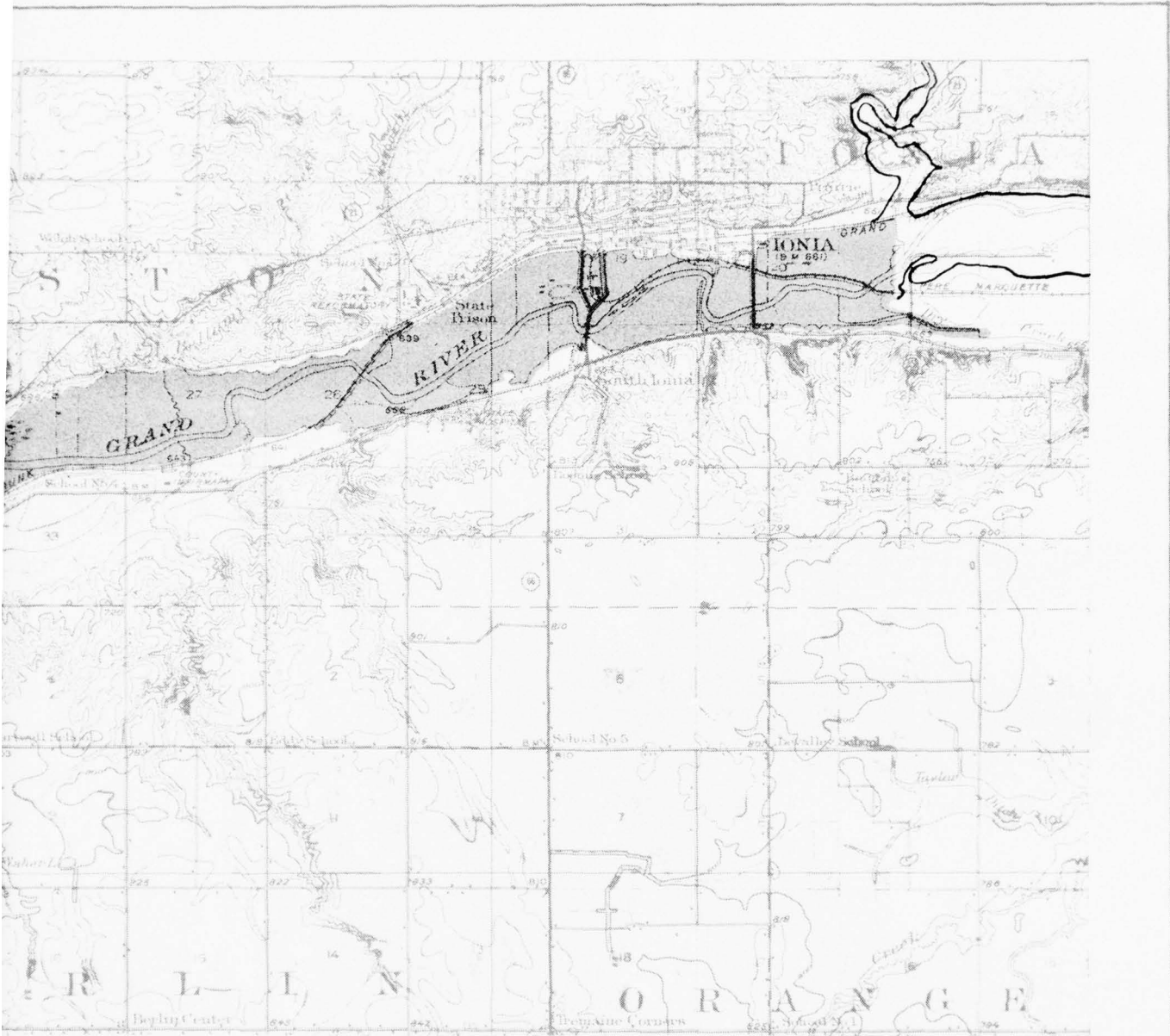
SCALE OF MILES



LEGEND

-  PROPOSED VALLEY PRESERVES
-  PROPOSALS SHOWN ELSEWHERE IN REPORT

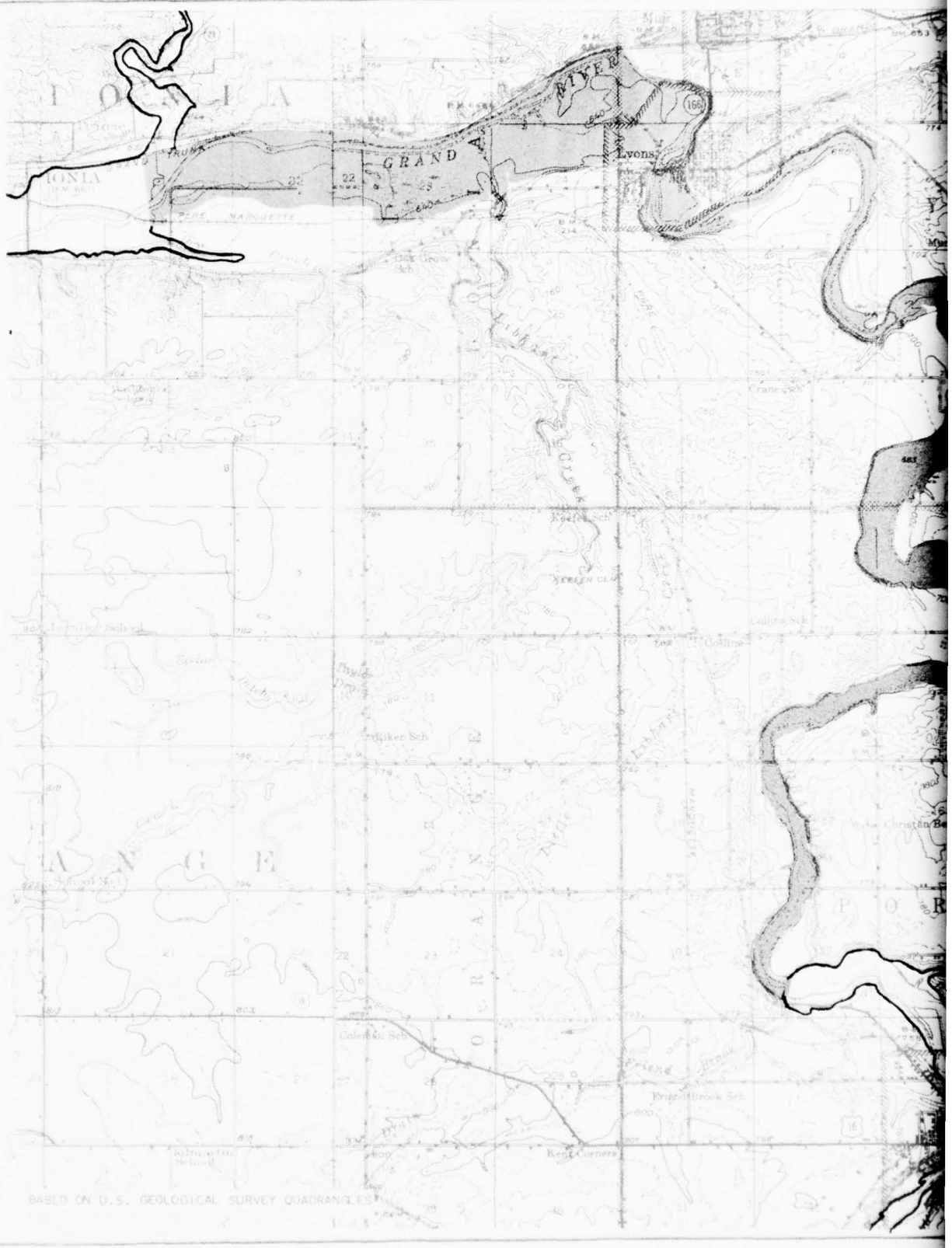
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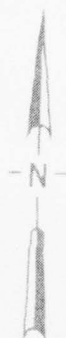
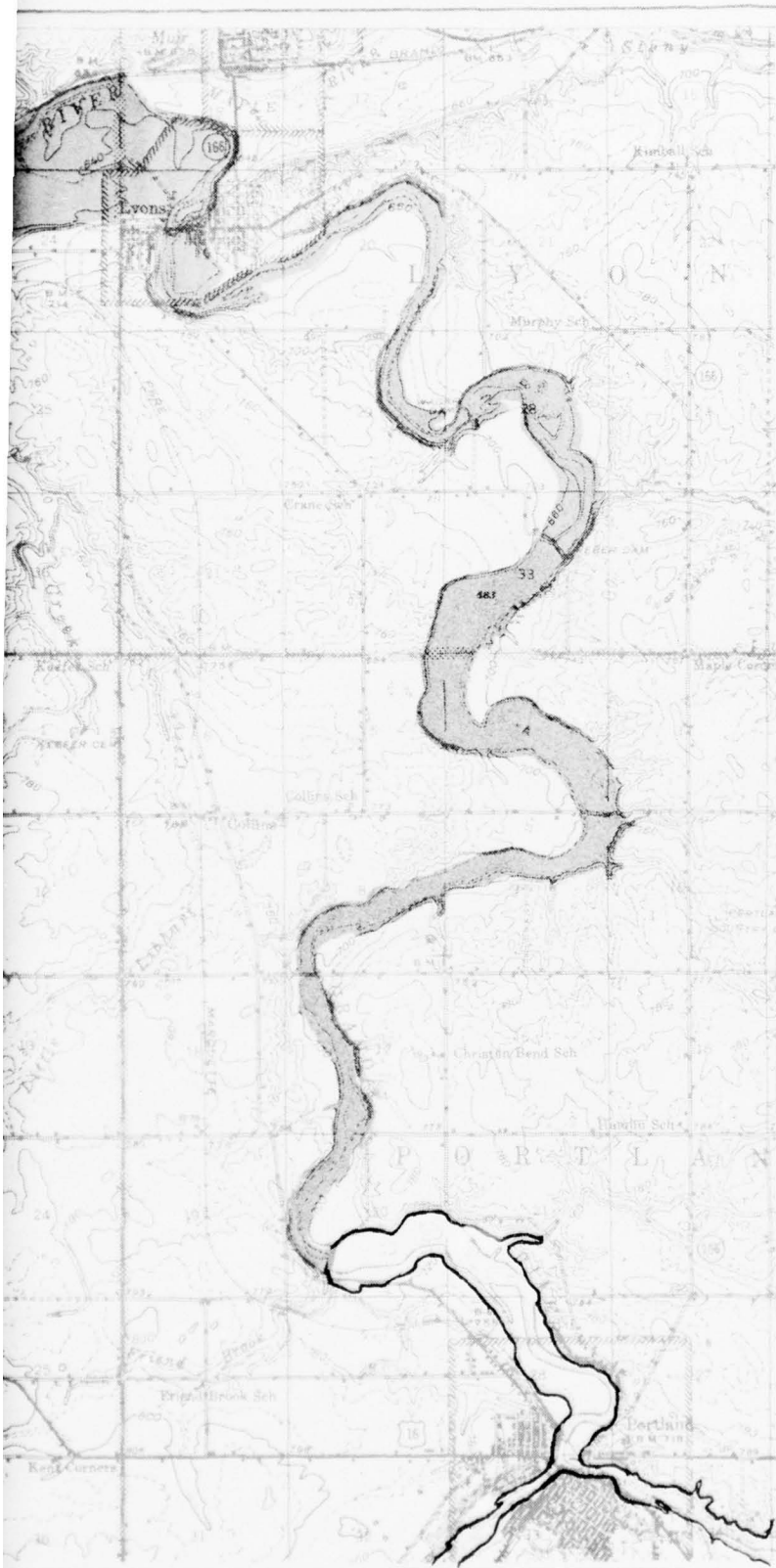
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- PROPOSED VALLEY PRESERVES
- PROPOSALS SHOWN ELSEWHERE IN REPORT



GRAND RIVER BASIN, MICHIGAN
 GRAND RIVER VALLEY PRESERVE
 REACH 1(4-5)
 KENT-IONIA COUNTY LINE TO
 PRAIRIE CREEK
 U.S. ARMY ENGINEER DISTRICT, DETROIT



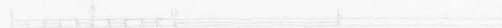
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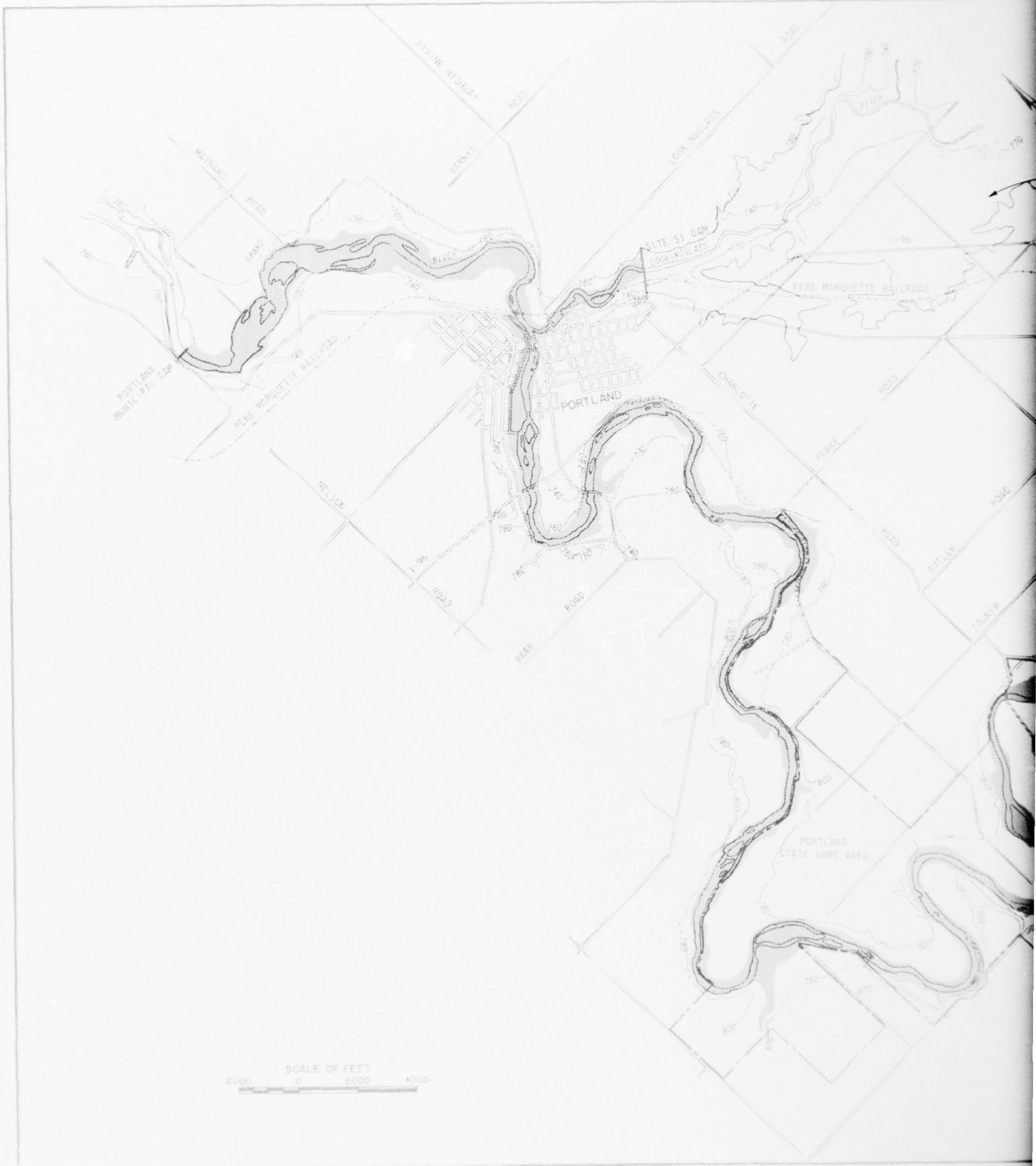
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-  PROPOSED VALLEY PRESERVES
-  PROPOSALS SHOWN ELSEWHERE IN REPORT

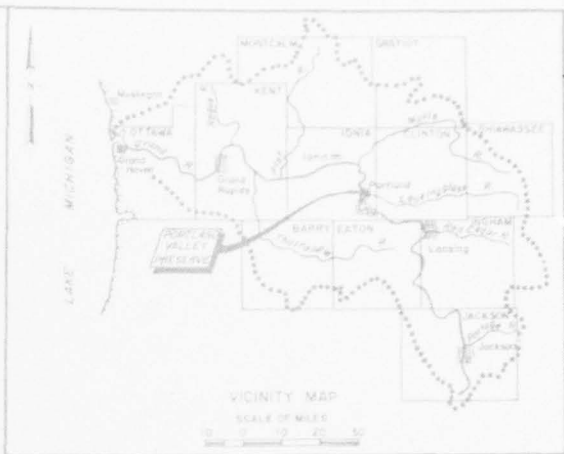
SCALE OF MILES



GRAND RIVER BASIN, MICHIGAN
 GRAND RIVER VALLEY PRESERVE
 REACH 1(5-6)
 PRAIRIE CREEK TO PORTLAND
 MUNICIPAL DAM
 U.S. ARMY ENGINEER DISTRICT, DETROIT



SCALE OF FEET
0 2000 4000



LEGEND

- PROPOSED VALLEY PRESERVES
- PROPOSALS SHOWN ELSEWHERE IN REPORT

GRAND RIVER BASIN, MICHIGAN
 GRAND RIVER VALLEY PRESERVE
 REACH 1(6-7)
 PORTLAND MUNICIPAL DAM TO IONIA - CLINTON
 COUNTY LINE
 U.S. ARMY ENGINEER DISTRICT, DETROIT

W A T E R T O W N

D E L T A



D E L T A

D E L T A

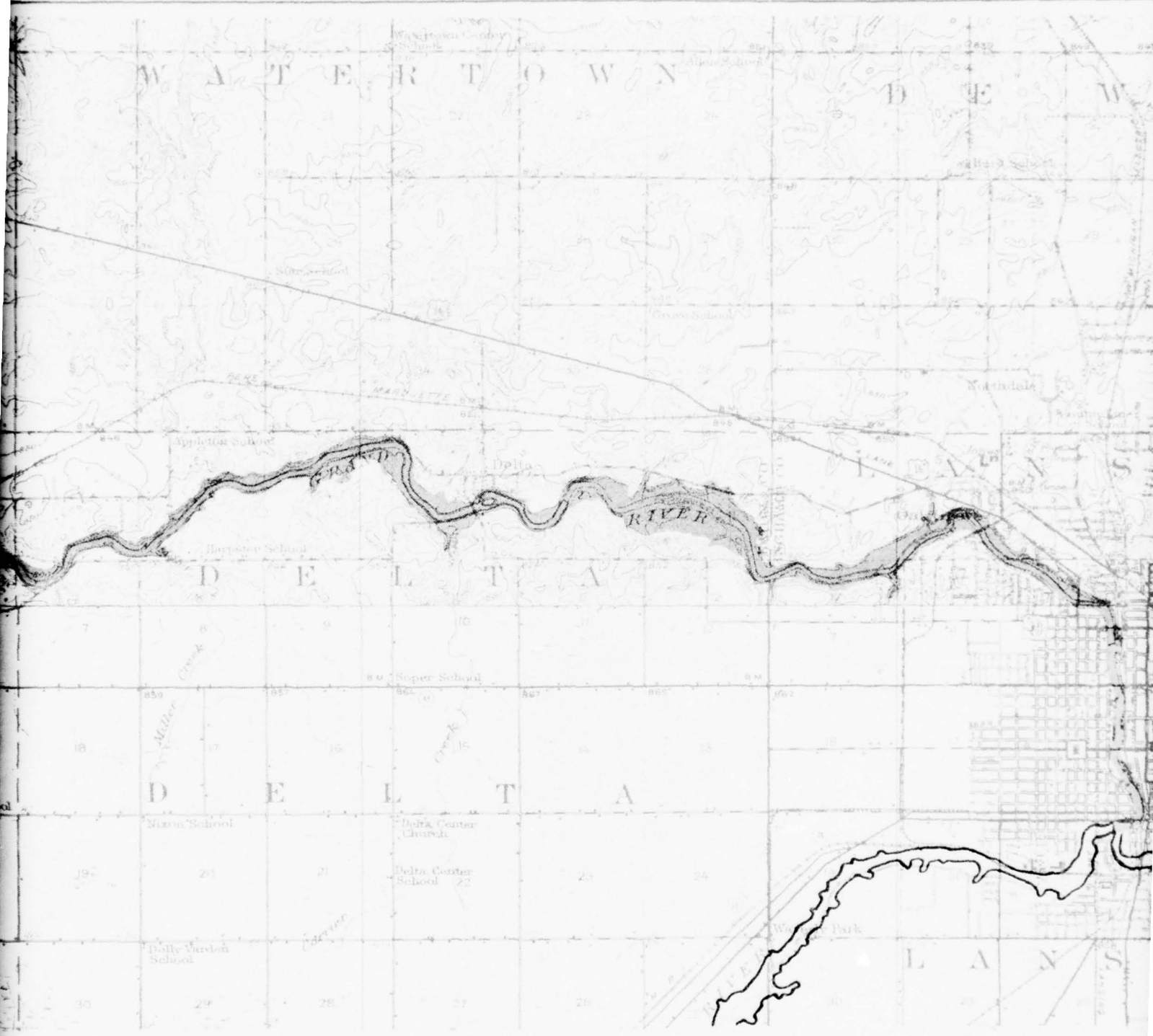
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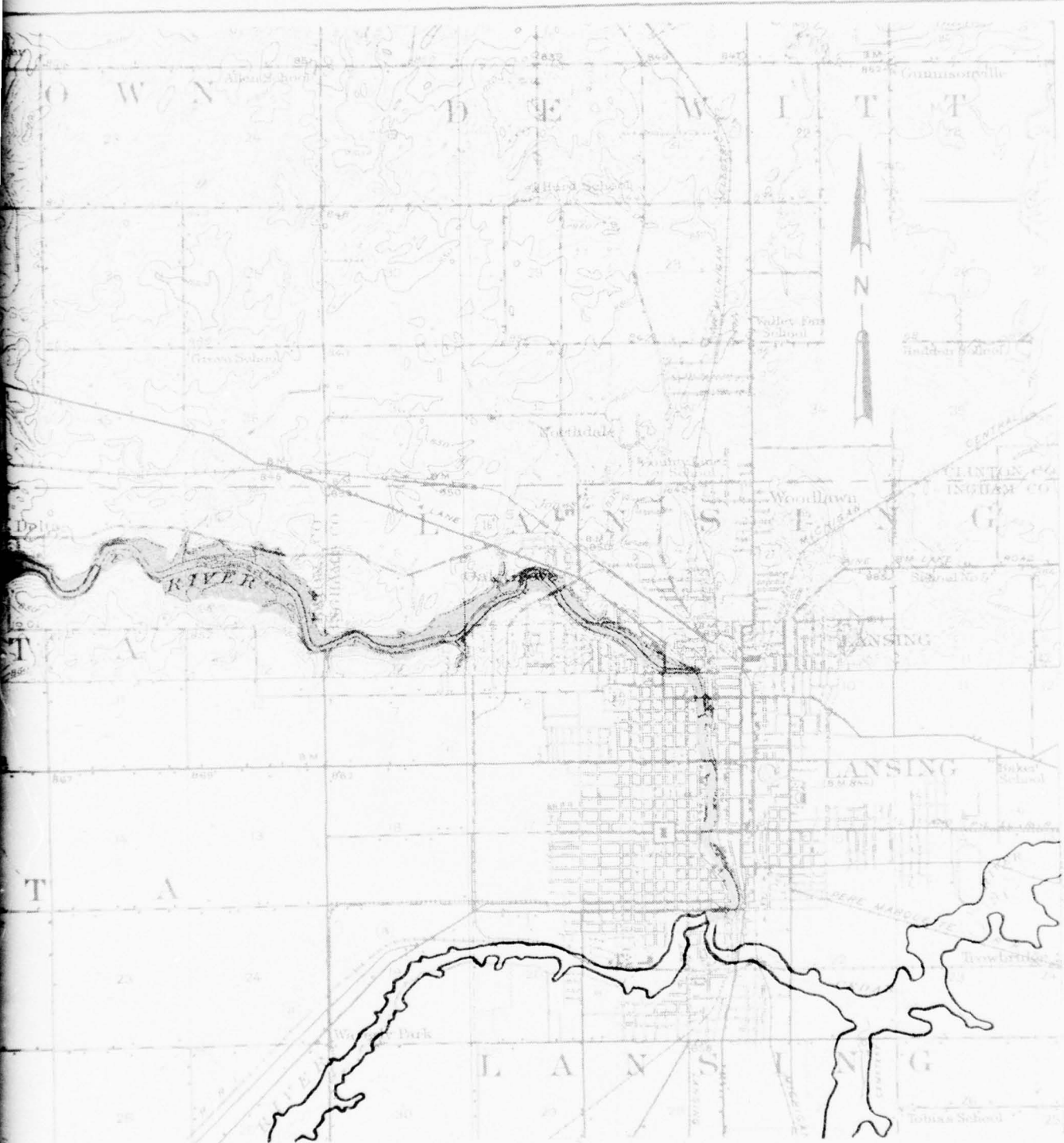
OF MILES

LEGEND

-  PROPOSED VALLEY PRESERVES
-  PROPOSALS SHOWN ELSEWHERE IN REPORT

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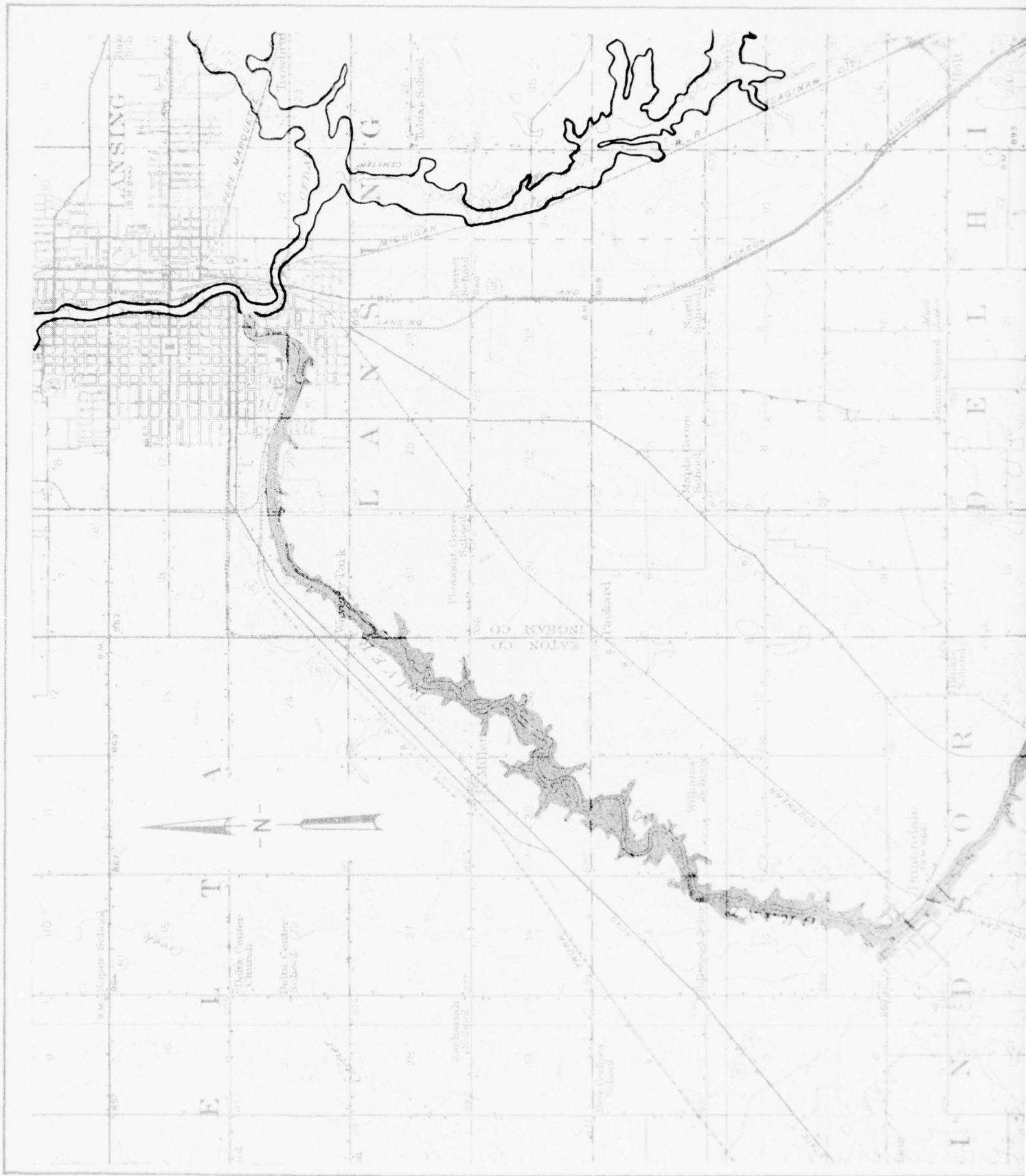


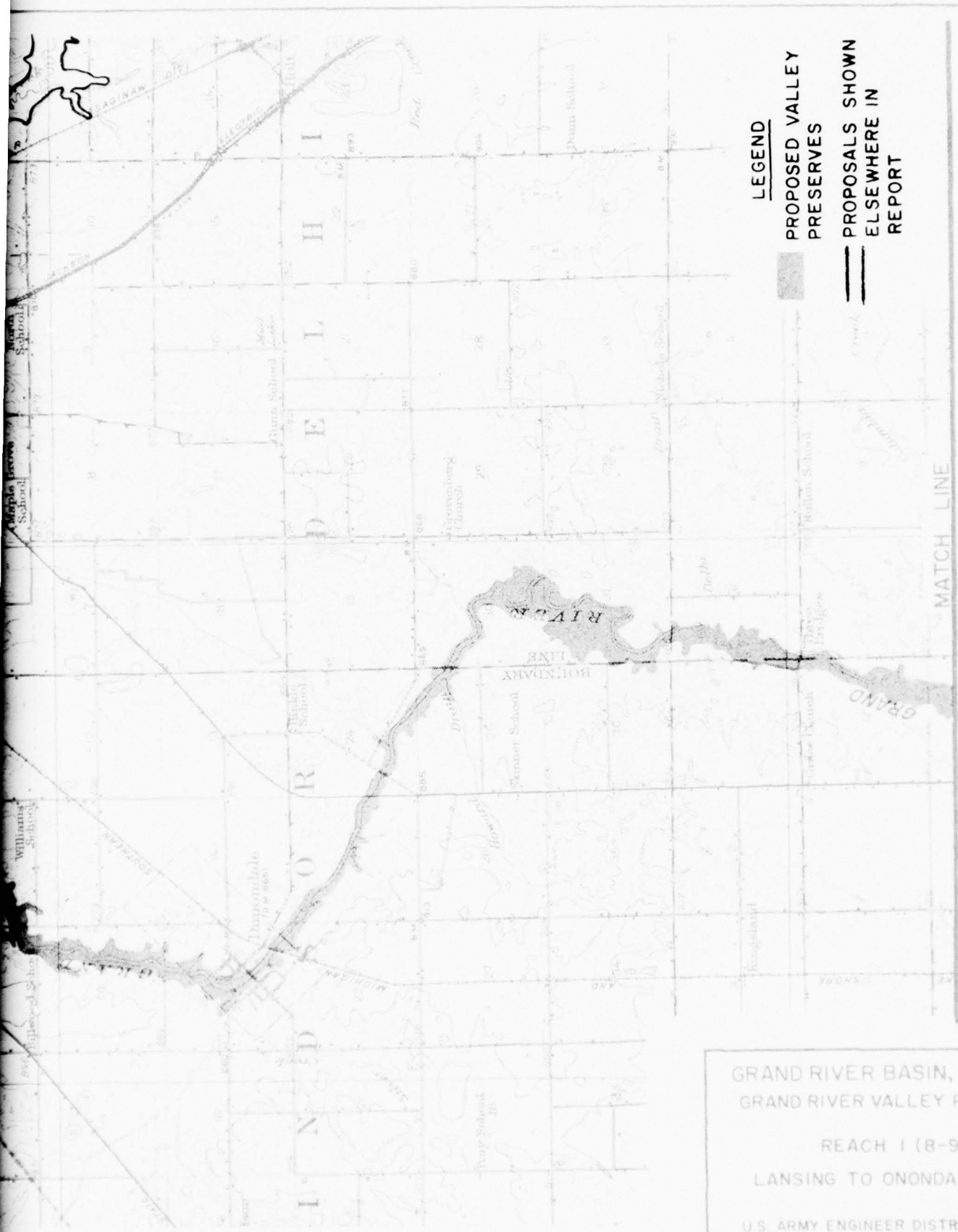
LEGEND

- PROPOSED VALLEY PRESERVES
- PROPOSALS SHOWN ELSEWHERE IN REPORT

GRAND RIVER BASIN, MICHIGAN
 GRAND RIVER VALLEY PRESERVE
 REACH 1 (7-8)
 IONIA-CLINTON COUNTY LINE TO LANSING
 U.S. ARMY ENGINEER DISTRICT, DETROIT

3





LEGEND
 PROPOSED VALLEY PRESERVES
 PROPOSALS SHOWN ELSEWHERE IN REPORT

SCALE OF MILES

MATCH LINE

GRAND RIVER BASIN, MICHIGAN
 GRAND RIVER VALLEY PRESERVE

REACH I (8-9)

LANSING TO ONONDAGA DAM

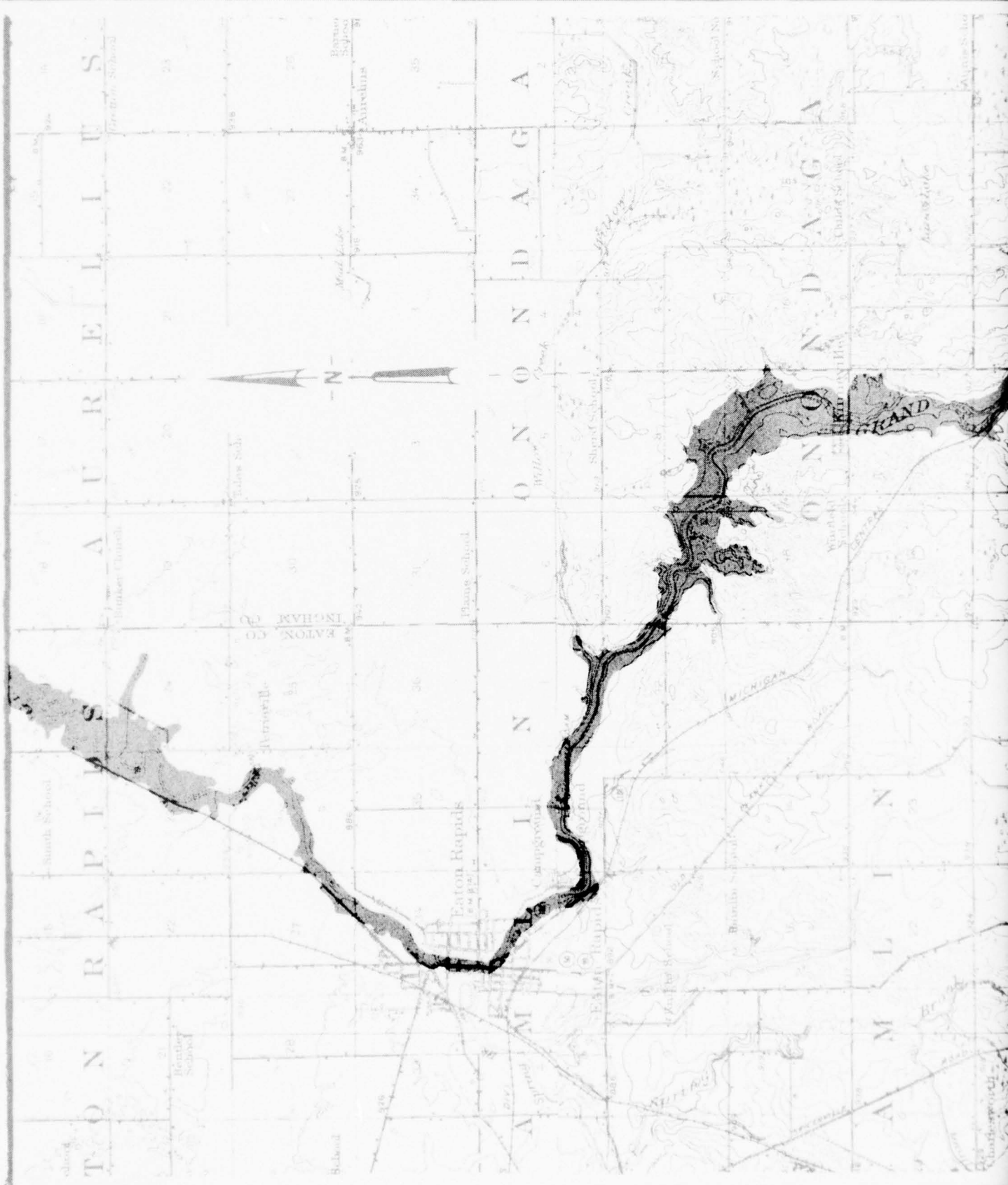
U.S. ARMY ENGINEER DISTRICT, DETROIT

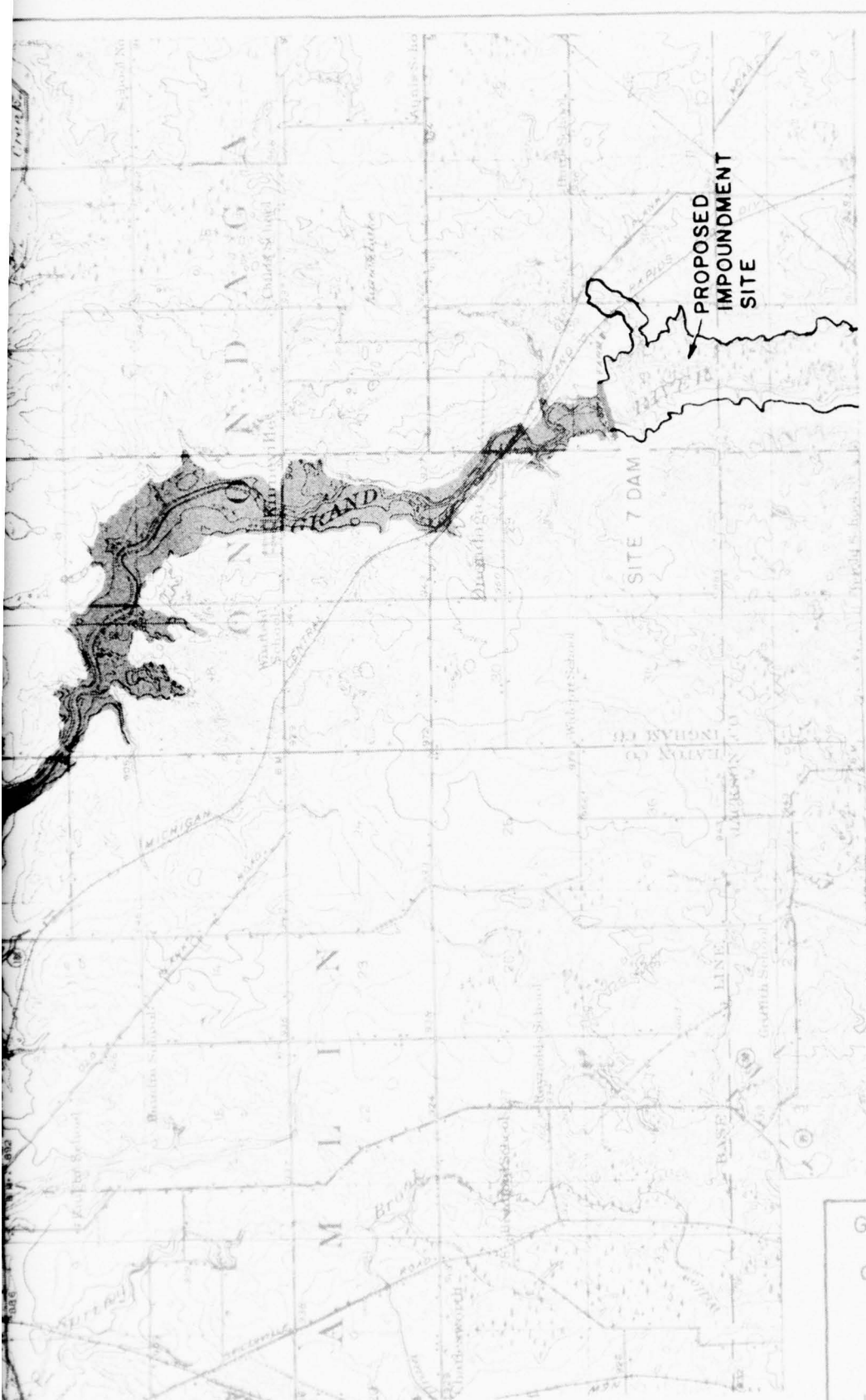
PLATE Q-11a

2

BASED ON U.S. DEPARTMENTAL SURVEY QUADRANGLE ES

MATCH LINE







PROPOSED
IMPOUNDMENT
SITE

SITE 7 DAM

SCALE OF MILES

LEGEND

-  PROPOSED VALLEY PRESERVES
-  PROPOSALS SHOWN ELSEWHERE IN REPORT

GRAND RIVER BASIN, MICHIGAN

GRAND RIVER VALLEY PRESERVE

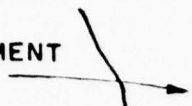
REACH 1(8-9)

LANSING TO ONONDAGA DAM

U.S. ARMY ENGINEER DISTRICT, DETROIT

BASED ON U.S. GEOLOGICAL SURVEY QUADRANGLE 5

PROPOSED IMPOUNDMENT
SITE



SITE 42 DAM

KELLOGG RD.

M-21



PRAIRIE

PRAIRIE CR. RD.

HILCREST RD.

M-21

CREEK

POND

CEMETERY

OLD DAM

STAGE RD.

GRAND TRUNK W

RIVER

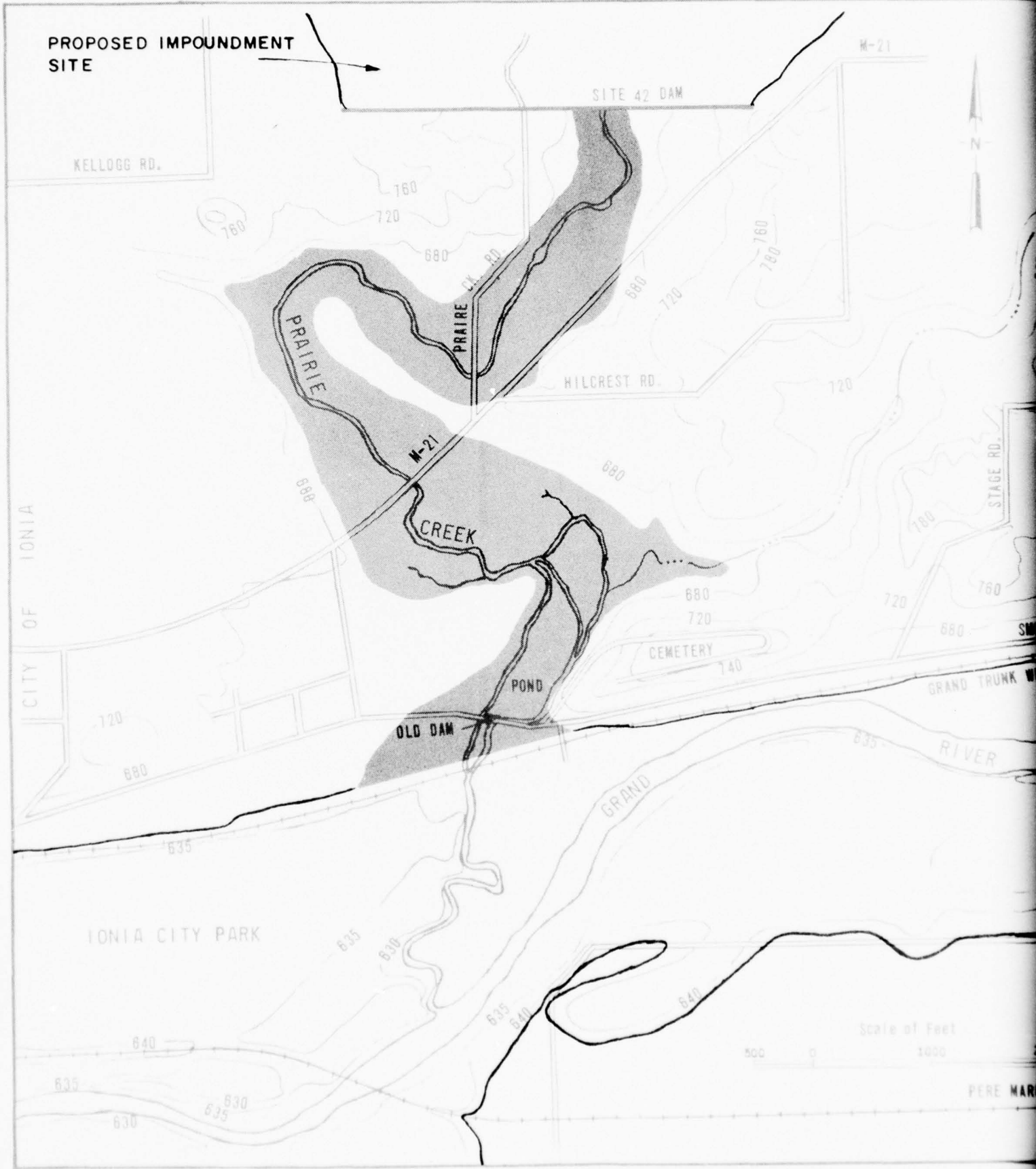
CITY OF IONIA

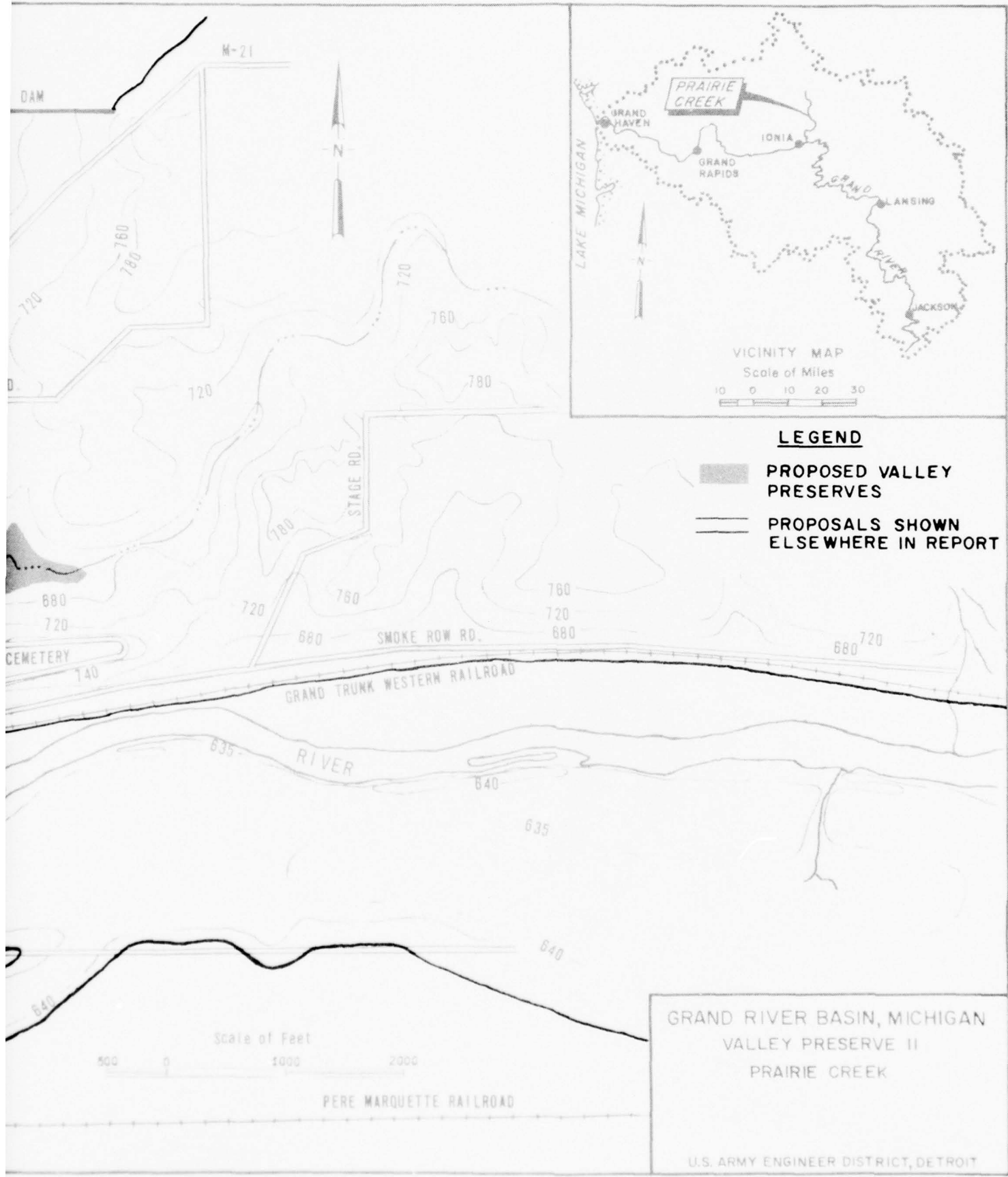
IONIA CITY PARK

Scale of Feet



PERE MAR





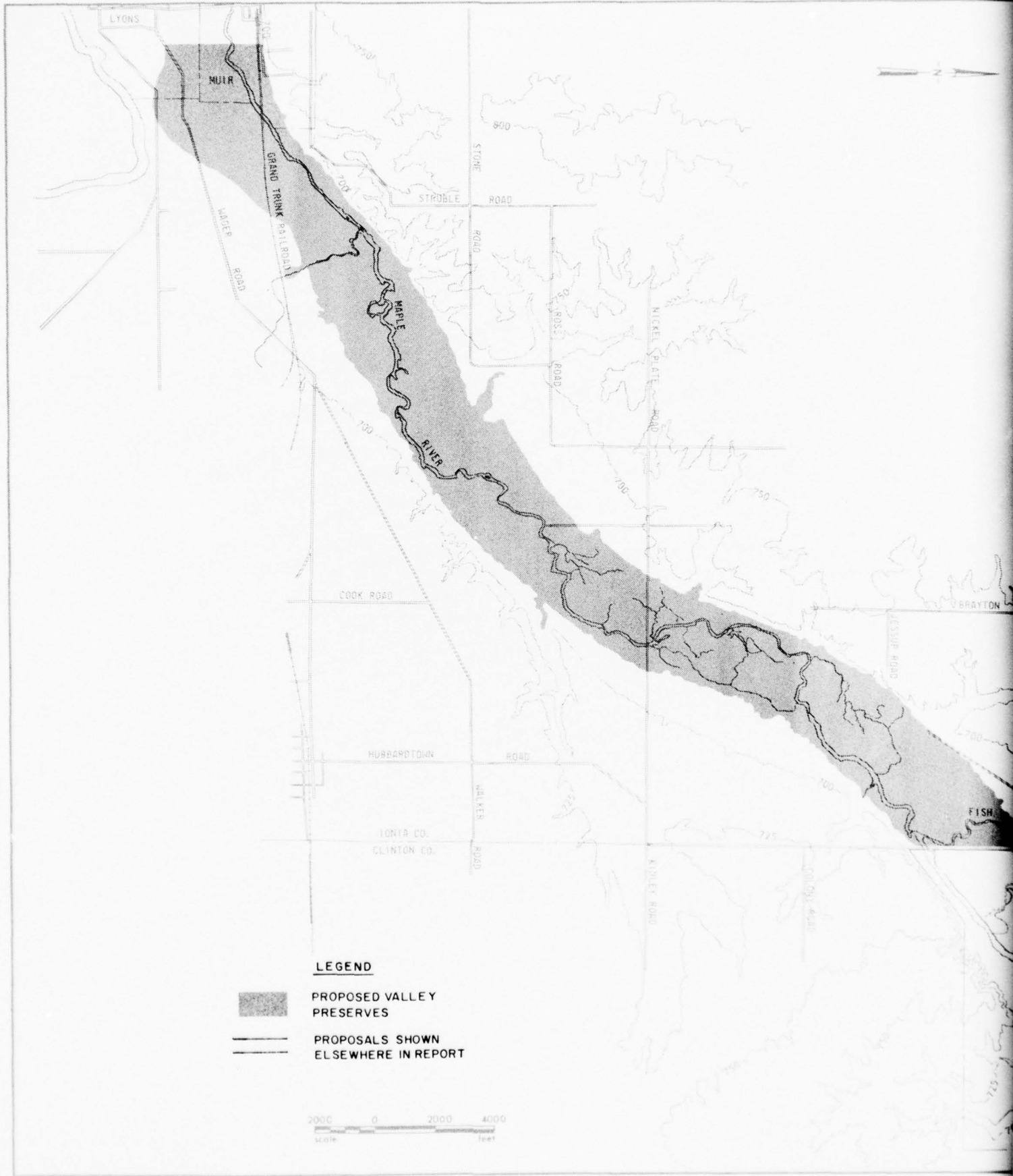
LEGEND

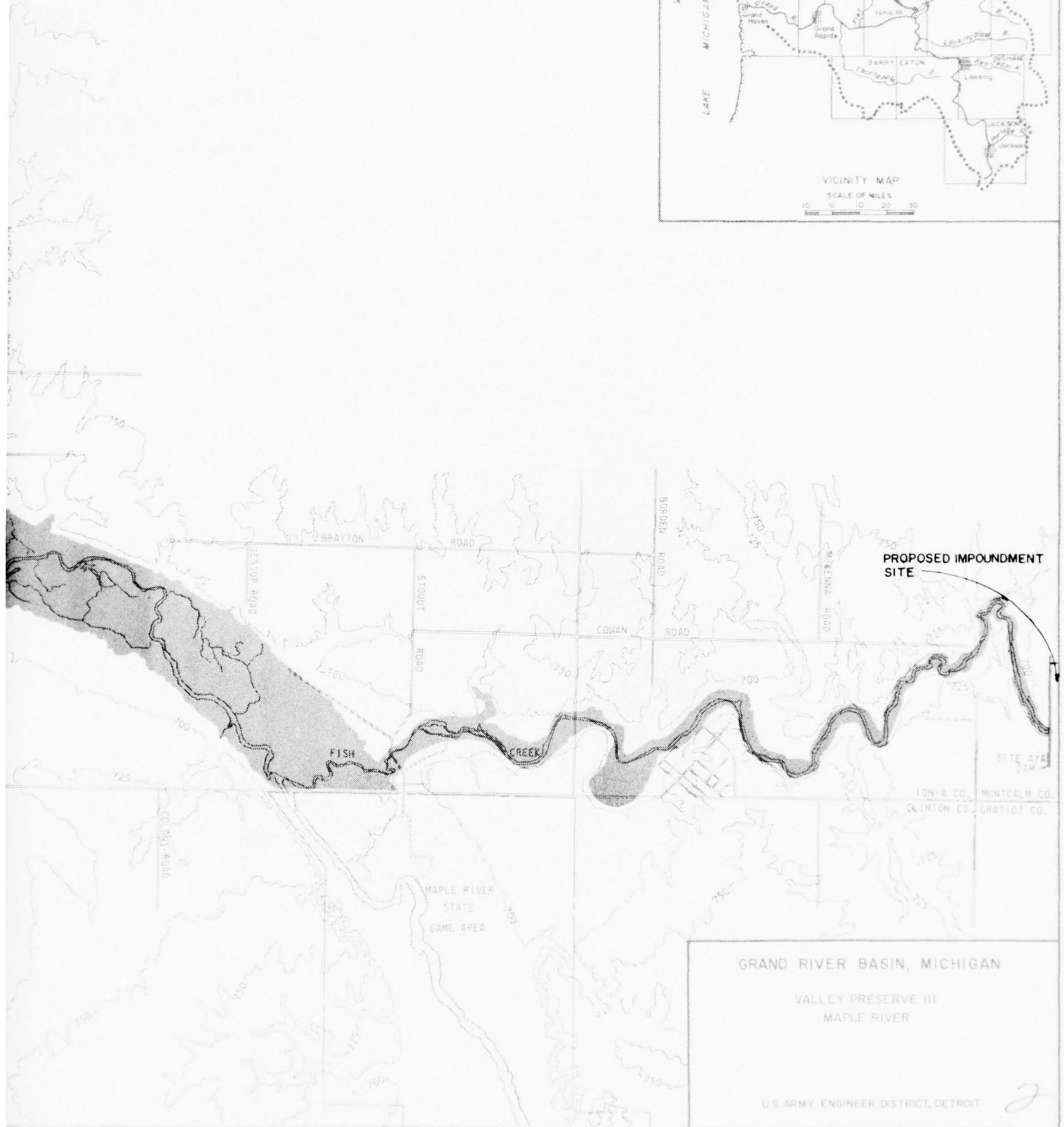
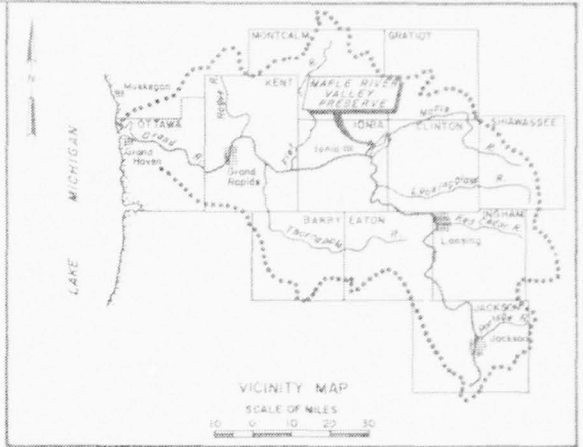
- PROPOSED VALLEY PRESERVES
- PROPOSALS SHOWN ELSEWHERE IN REPORT

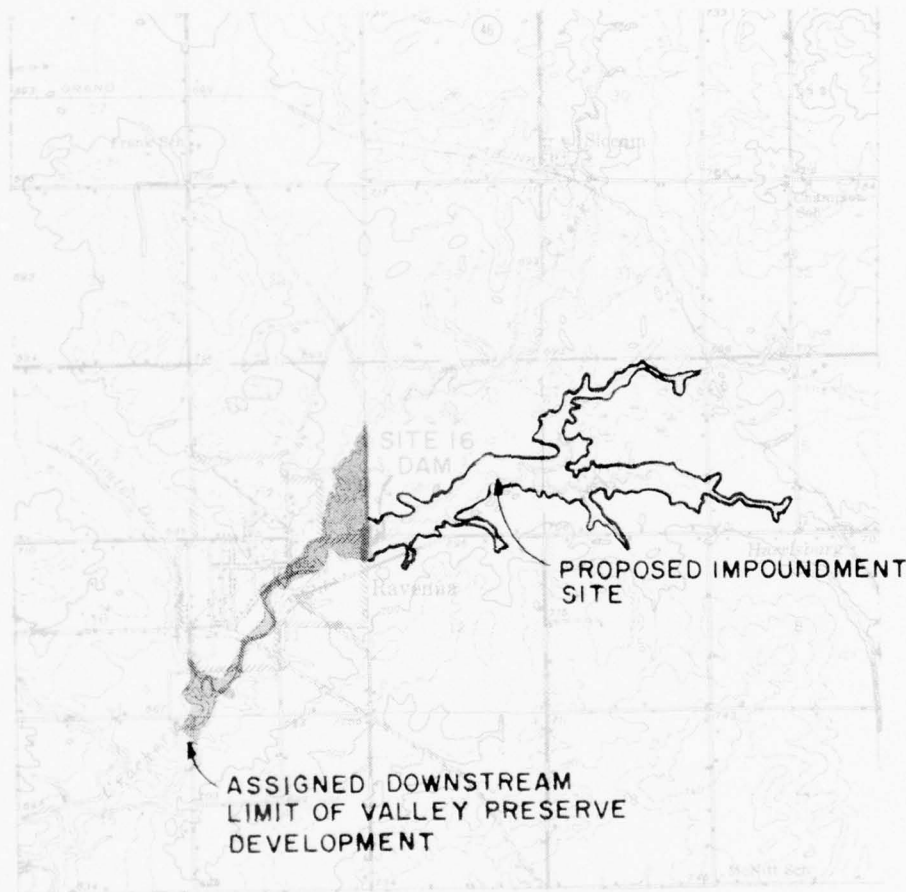
GRAND RIVER BASIN, MICHIGAN
 VALLEY PRESERVE II
 PRAIRIE CREEK

U.S. ARMY ENGINEER DISTRICT, DETROIT

PLATE Q-12









SCALE OF MILES

LEGEND

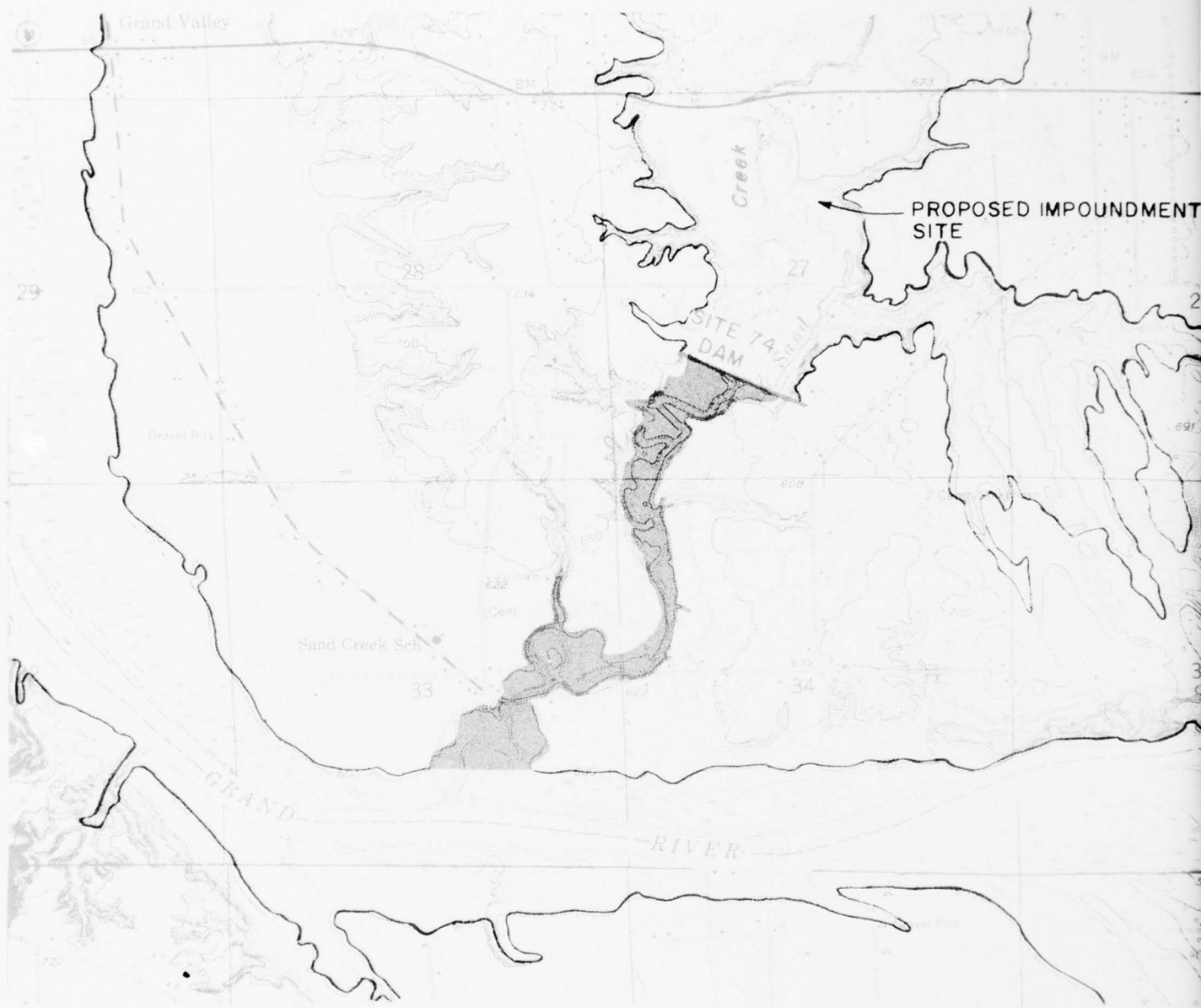
-  PROPOSED VALLEY PRESERVES
-  PROPOSALS SHOWN ELSEWHERE IN REPORT

GRAND RIVER BASIN, MICH.
 VALLEY PRESERVE IV
 CROCKERY CREEK

BASED ON U.S. GEOLOGICAL SURVEY QUADRANGLES

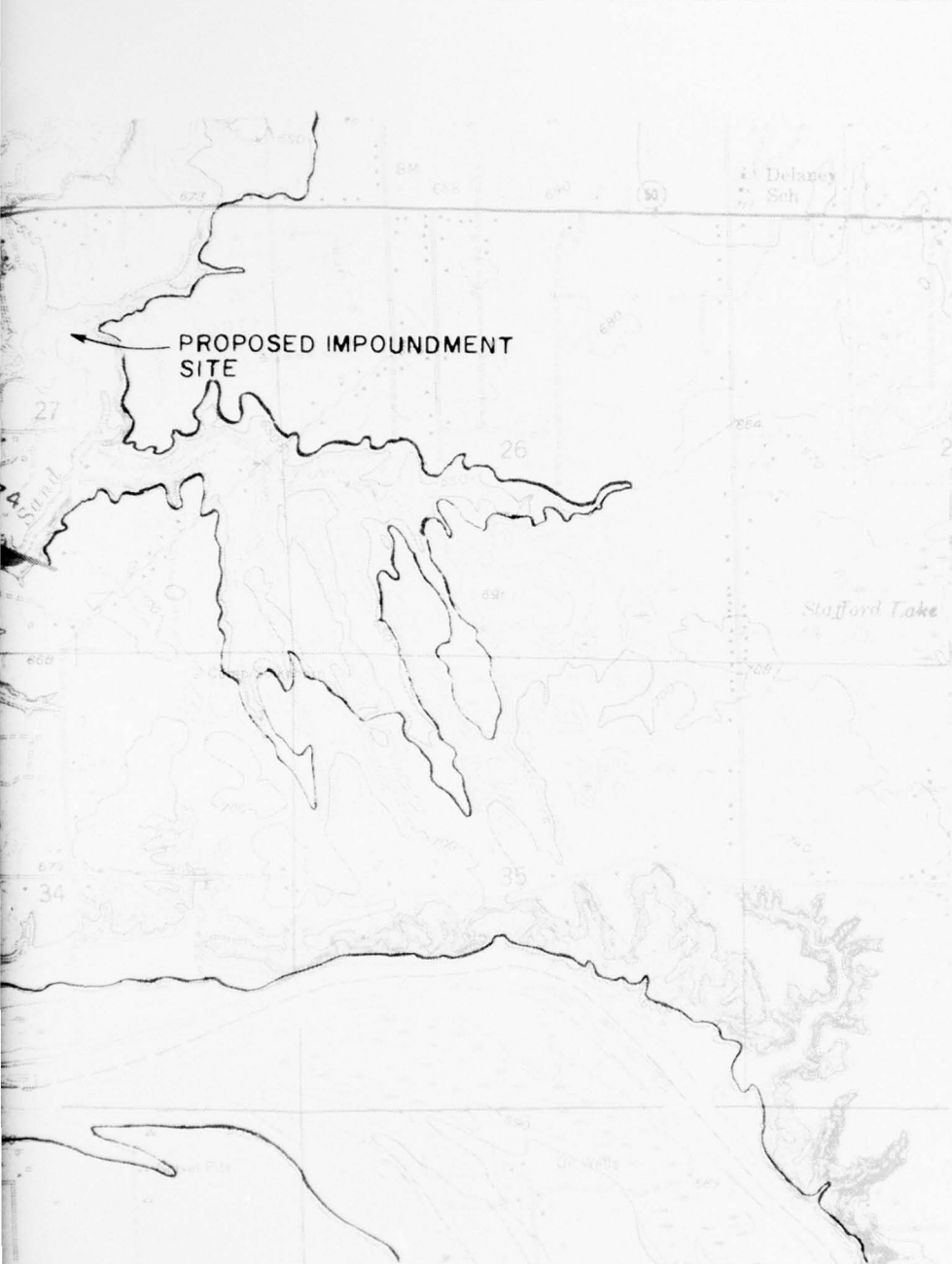
U.S. ARMY ENGINEER DISTRICT, DETROIT

PLATE Q-14



SCALE OF MILES

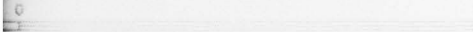




LEGEND

- PROPOSED VALLEY PRESERVES
- PROPOSALS SHOWN ELSEWHERE IN REPORT

OF MILES



GRAND RIVER BASIN, MICHIGAN
 VALLEY PRESERVE V
 SAND CREEK

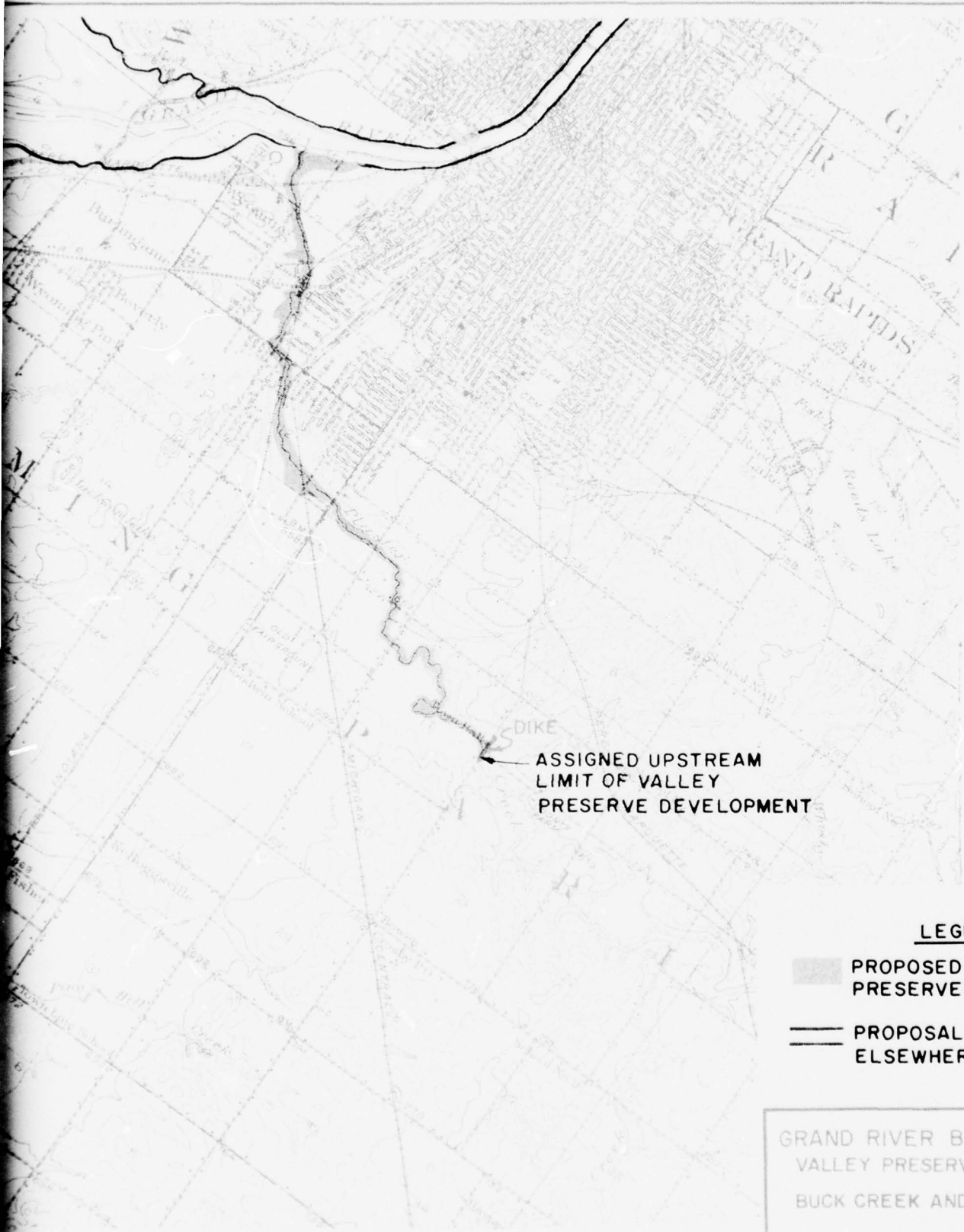
U.S. ARMY ENGINEER DISTRICT, DETROIT

2





SCALE OF MILES

BASED ON U.S. GEOLOGICAL SURVEY QUADRANGLES



LEGEND

-  PROPOSED VALLEY PRESERVES
-  PROPOSALS SHOWN ELSEWHERE IN REPORT

GRAND RIVER BASIN, MICHIGAN
 VALLEY PRESERVES VI AND VII
 BUCK CREEK AND PLASTER CREEK

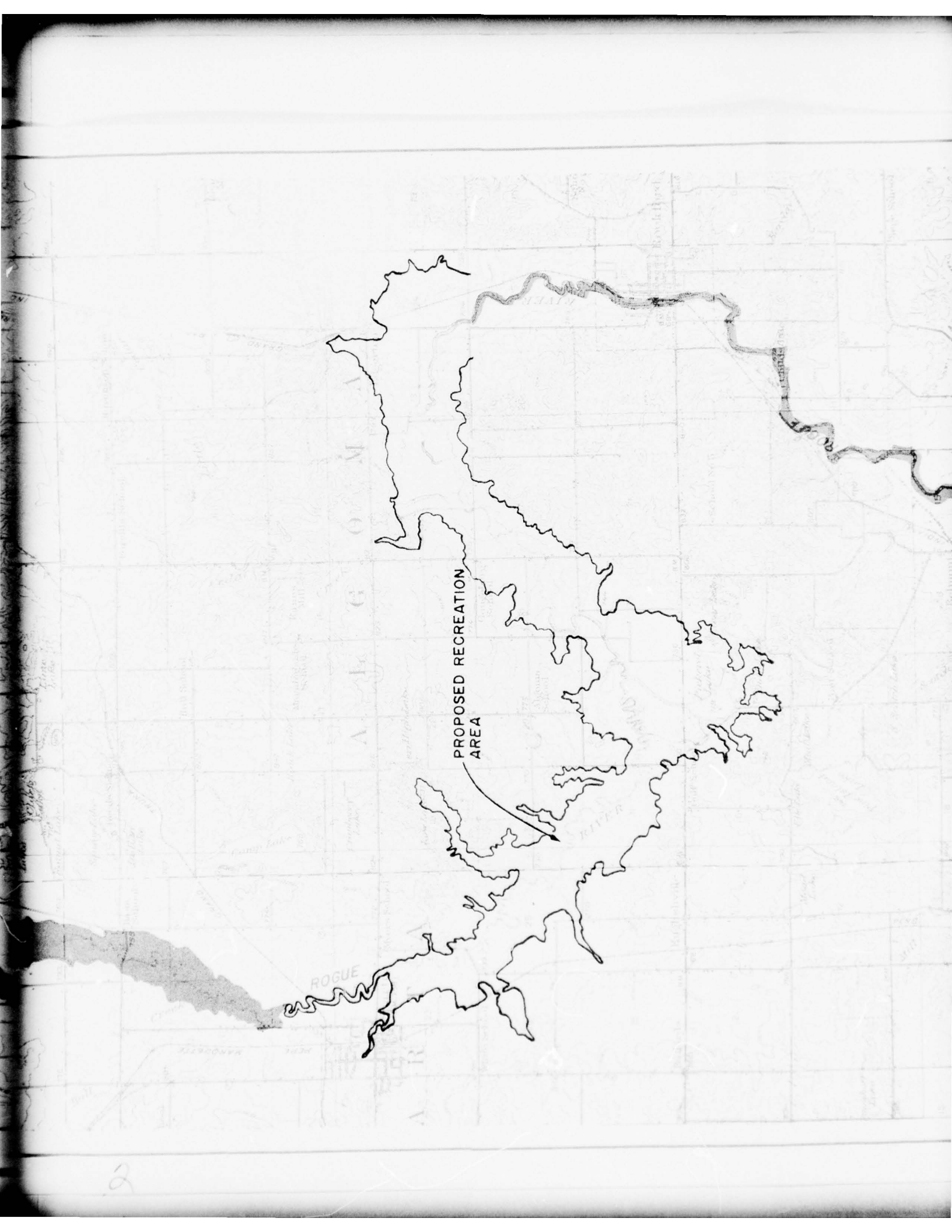
U.S. ARMY ENGINEER DISTRICT, DETROIT

PLATE Q-16

SCALE OF MILES

2





PROPOSED RECREATION
AREA

ROGUE



LEGEND

- PROPOSED VALLEY PRESERVES
- PROPOSALS SHOWN ELSEWHERE IN REPORT

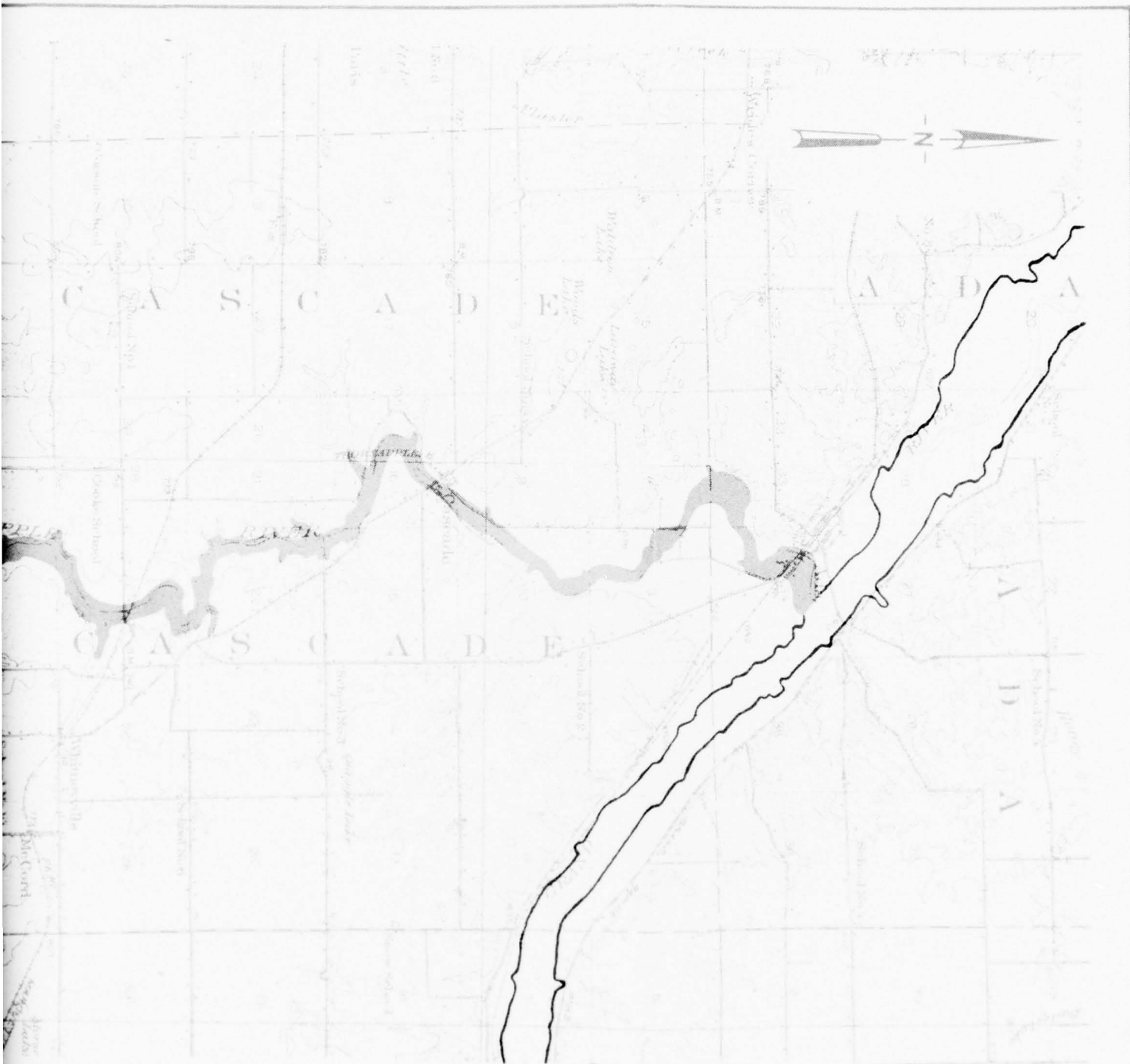
SCALE OF MILES

GRAND RIVER BASIN, MICHIGAN
 VALLEY PRESERVE VIII
 ROGUE RIVER

U.S. ARMY ENGINEER DISTRICT, DETROIT

PLATE Q-17

BASED ON U.S. GEOLOGICAL SURVEY QUADRANGLES



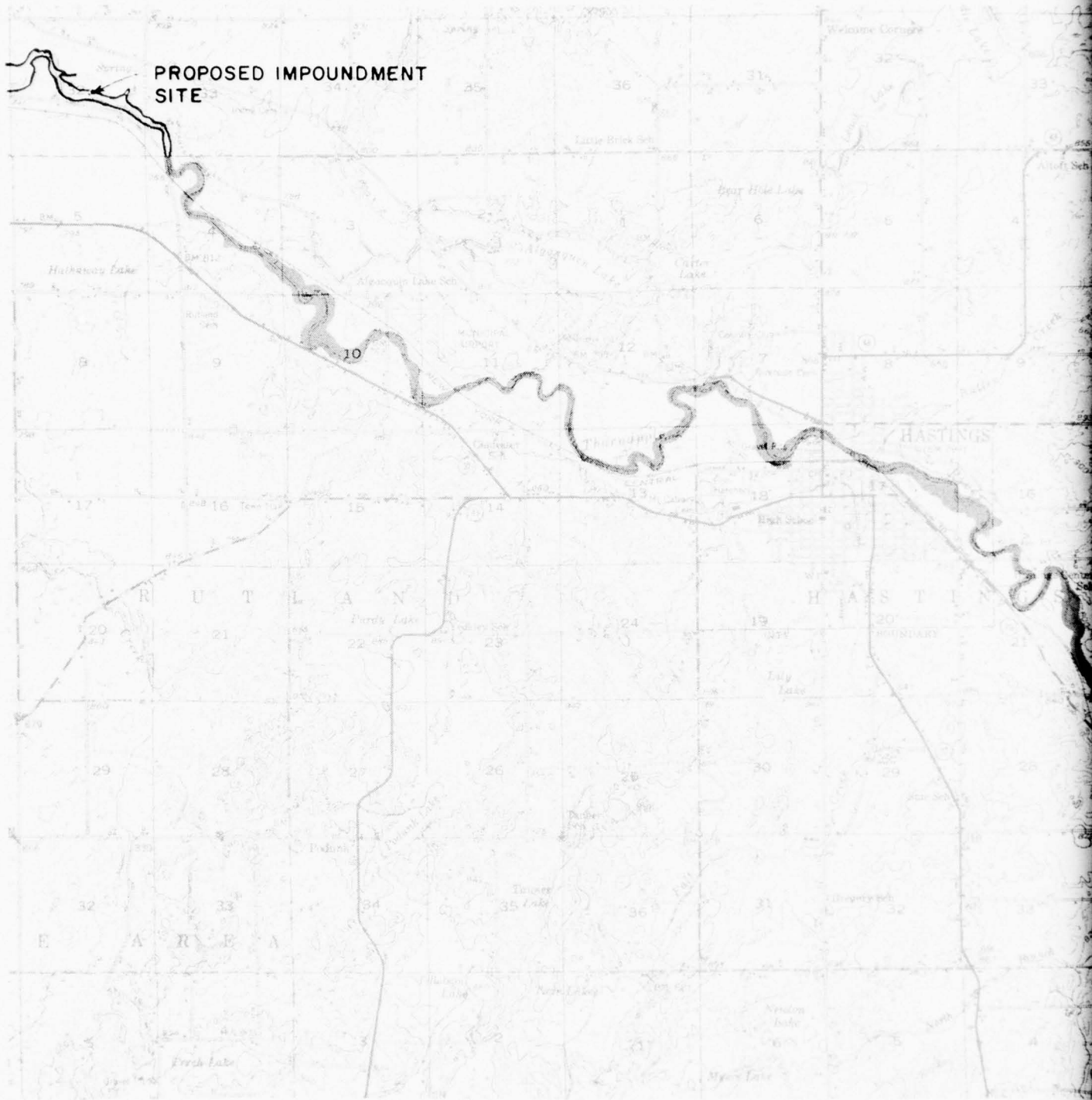
LEGEND

- PROPOSED VALLEY PRESERVES
- PROPOSALS SHOWN ELSEWHERE IN REPORT

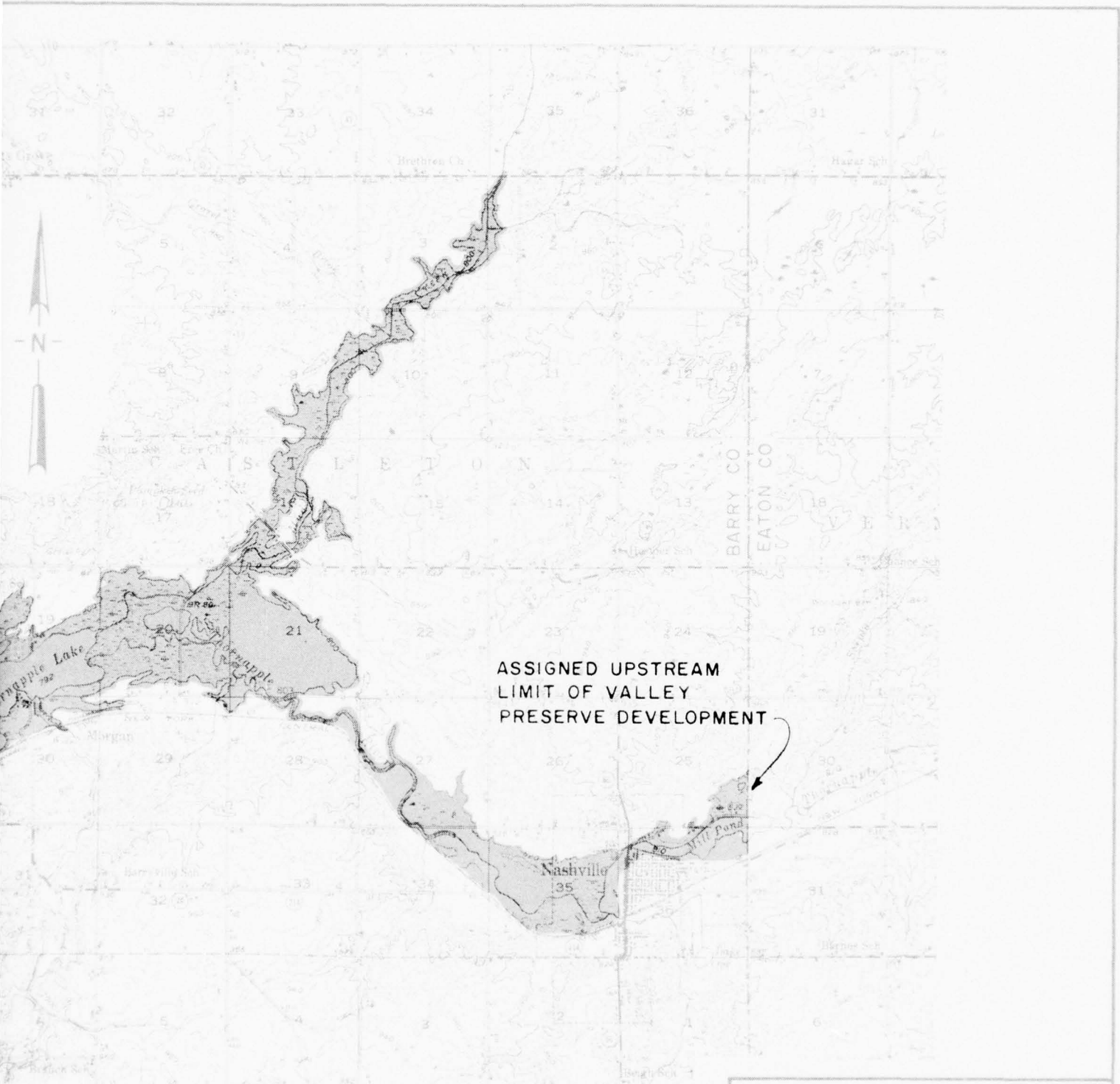
GRAND RIVER BASIN, MICHIGAN
VALLEY PRESERVE IX
THORNAPPLE RIVER

U.S. ARMY ENGINEER DISTRICT, DETROIT

PLATE Q-18a



**PROPOSED IMPOUNDMENT
SITE**



ASSIGNED UPSTREAM
LIMIT OF VALLEY
PRESERVE DEVELOPMENT

LEGEND

- PROPOSED VALLEY PRESERVES
- PROPOSALS SHOWN ELSEWHERE IN REPORT

GRAND RIVER BASIN, MICHIGAN
VALLEY PRESERVE IX
THORNAPPLE RIVER
U.S. ARMY ENGINEER DISTRICT, DETROIT

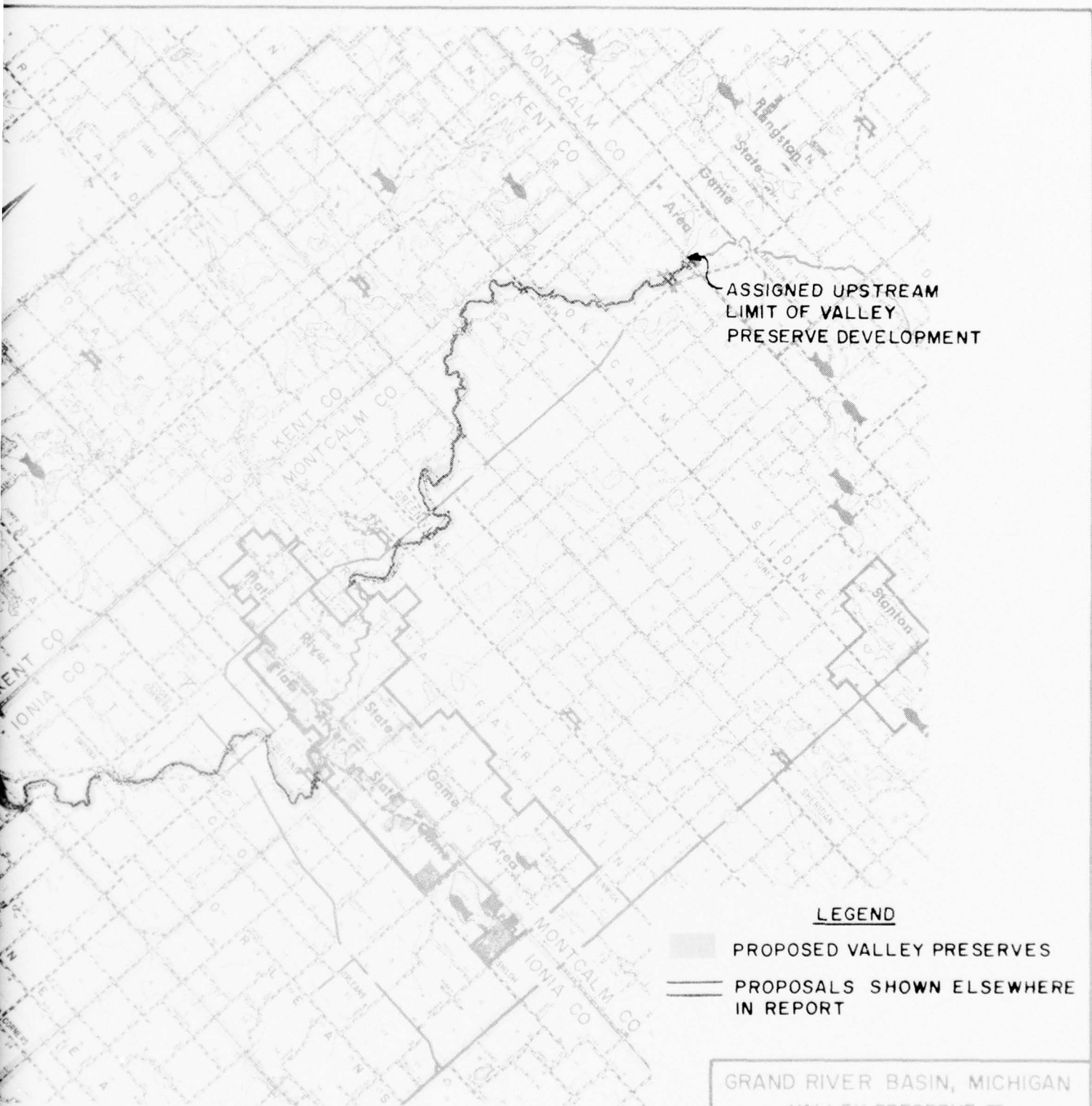
3



SCALE OF MILES



BASE MAP BY MICHIGAN STATE HIGHWAY DEPARTMENT



ASSIGNED UPSTREAM
LIMIT OF VALLEY
PRESERVE DEVELOPMENT

LEGEND

- PROPOSED VALLEY PRESERVES
- PROPOSALS SHOWN ELSEWHERE
IN REPORT

GRAND RIVER BASIN, MICHIGAN
VALLEY PRESERVE X

FLAT RIVER

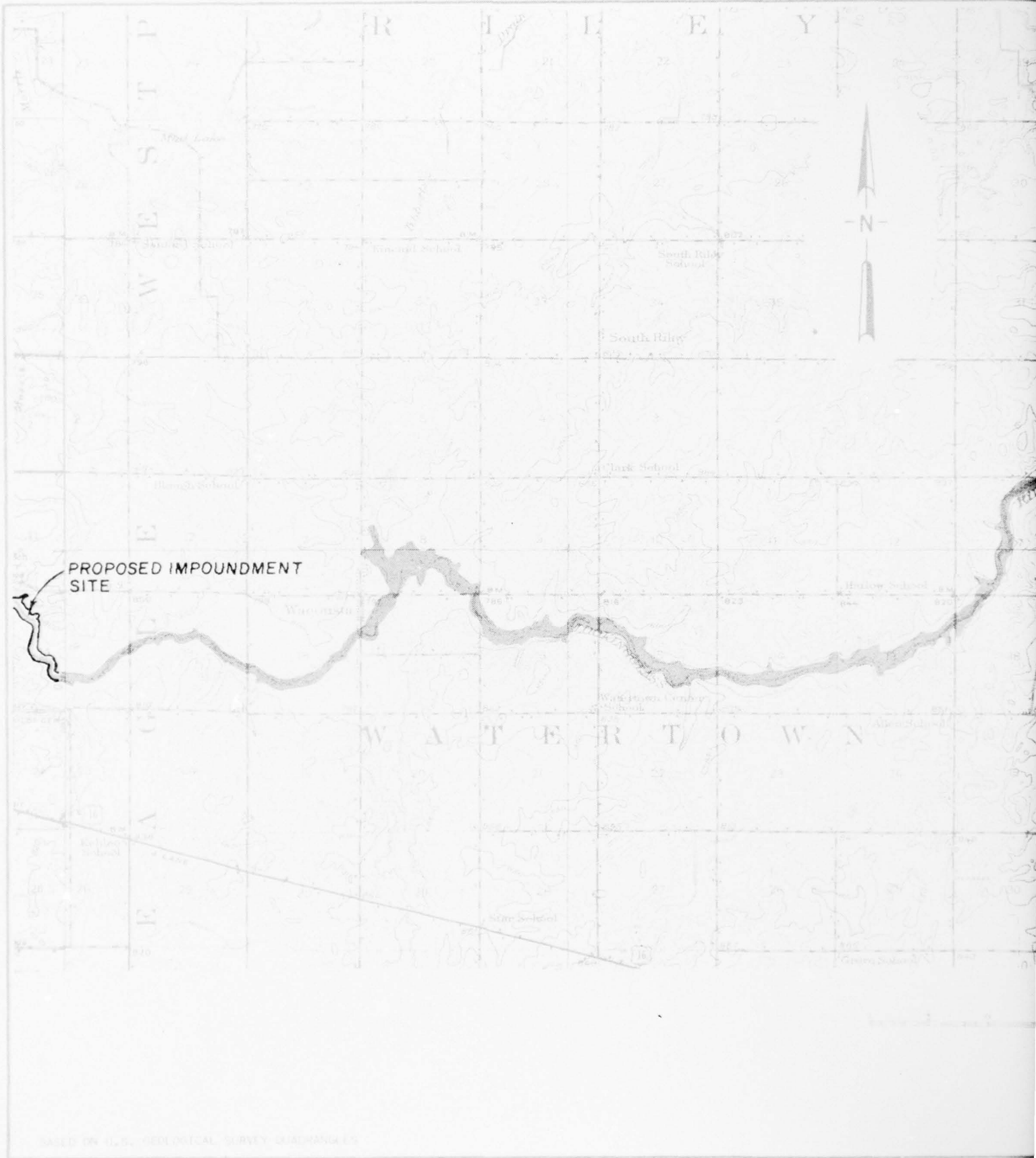
U.S. ARMY ENGINEER DISTRICT, DETROIT

PLATE Q-19

SCALE OF MILES



2



BASED ON U.S. GEOLOGICAL SURVEY QUADRANGLES



SCALE OF MILES

LEGEND

- PROPOSED VALLEY PRESERVATION
- PROPOSALS SHOWN ELSEWHERE IN REPORT

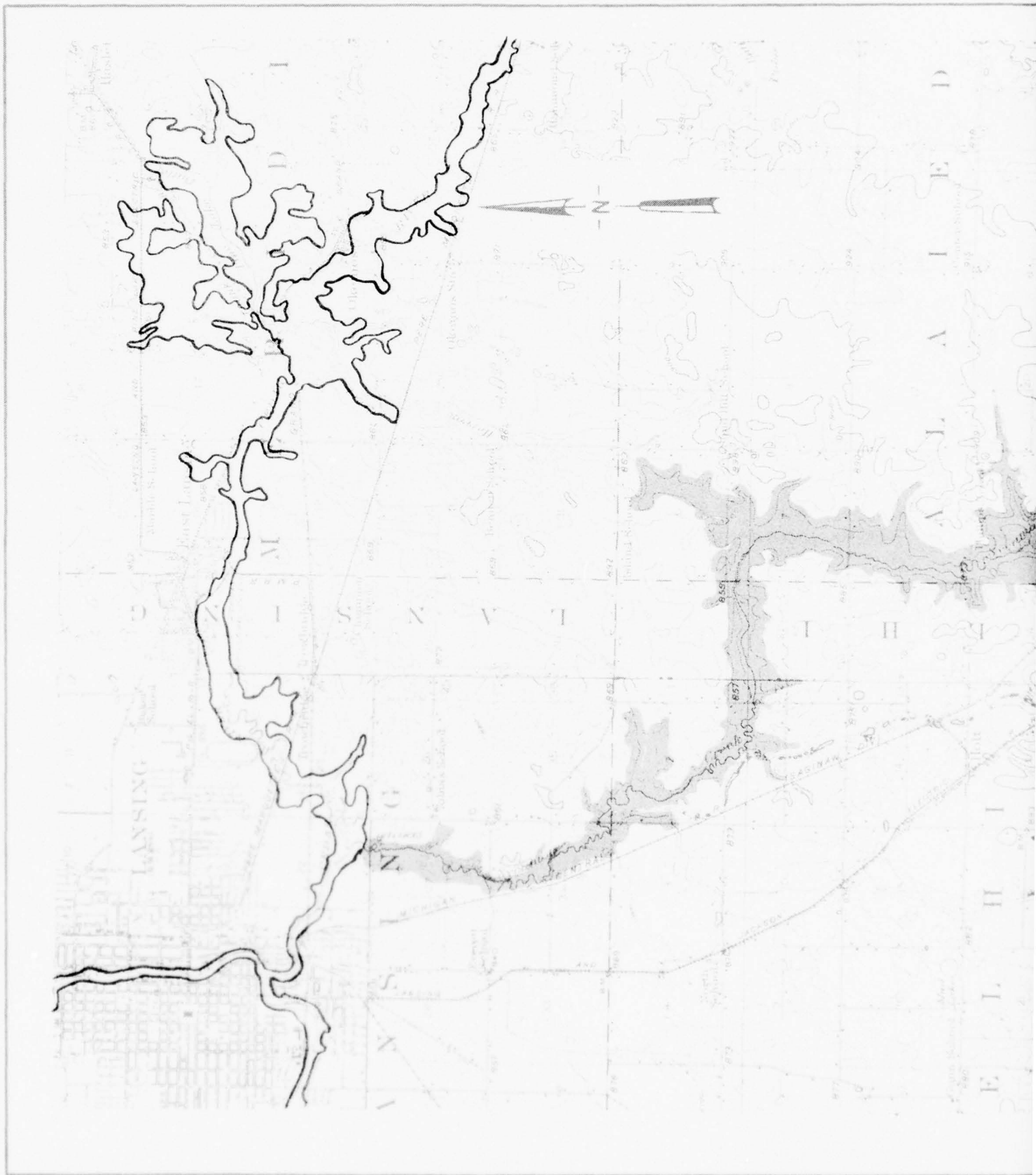


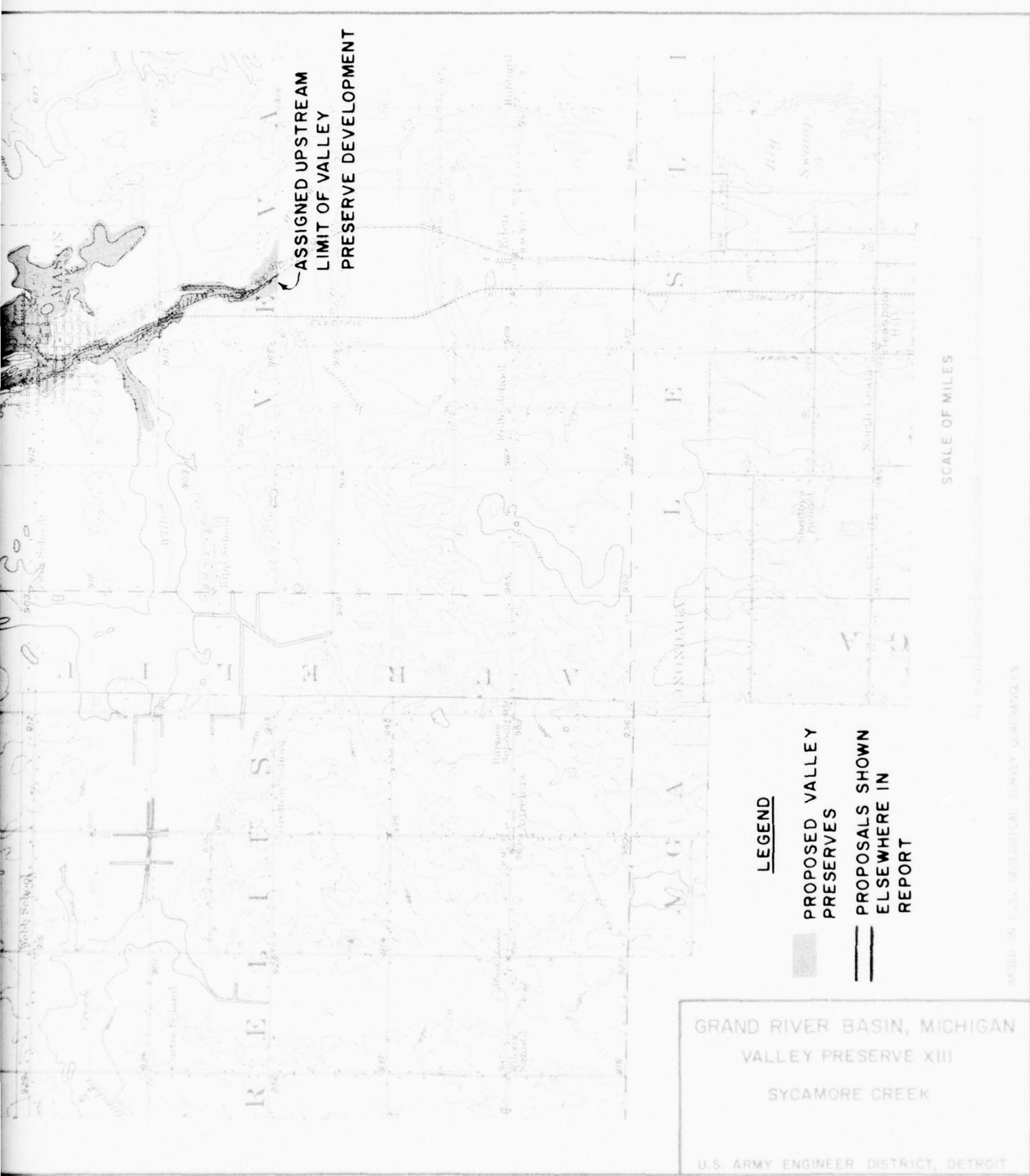
SCALE OF MILES



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BASED ON U.S. GEOLOGICAL SURVEY QUADRANGLES





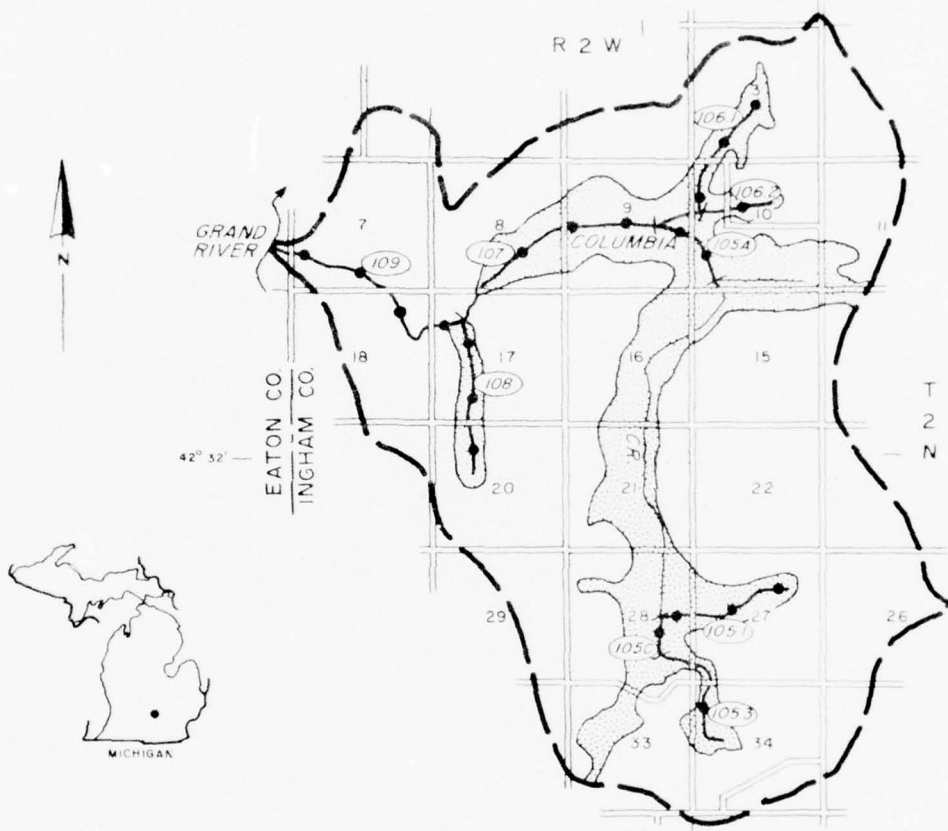
ASSIGNED UPSTREAM
LIMIT OF VALLEY
PRESERVE DEVELOPMENT

LEGEND

- PROPOSED VALLEY PRESERVES
- == PROPOSALS SHOWN ELSEWHERE IN REPORT

SCALE OF MILES


GRAND RIVER BASIN, MICHIGAN
VALLEY PRESERVE XIII
SYCAMORE CREEK
U.S. ARMY ENGINEER DISTRICT, DETROIT



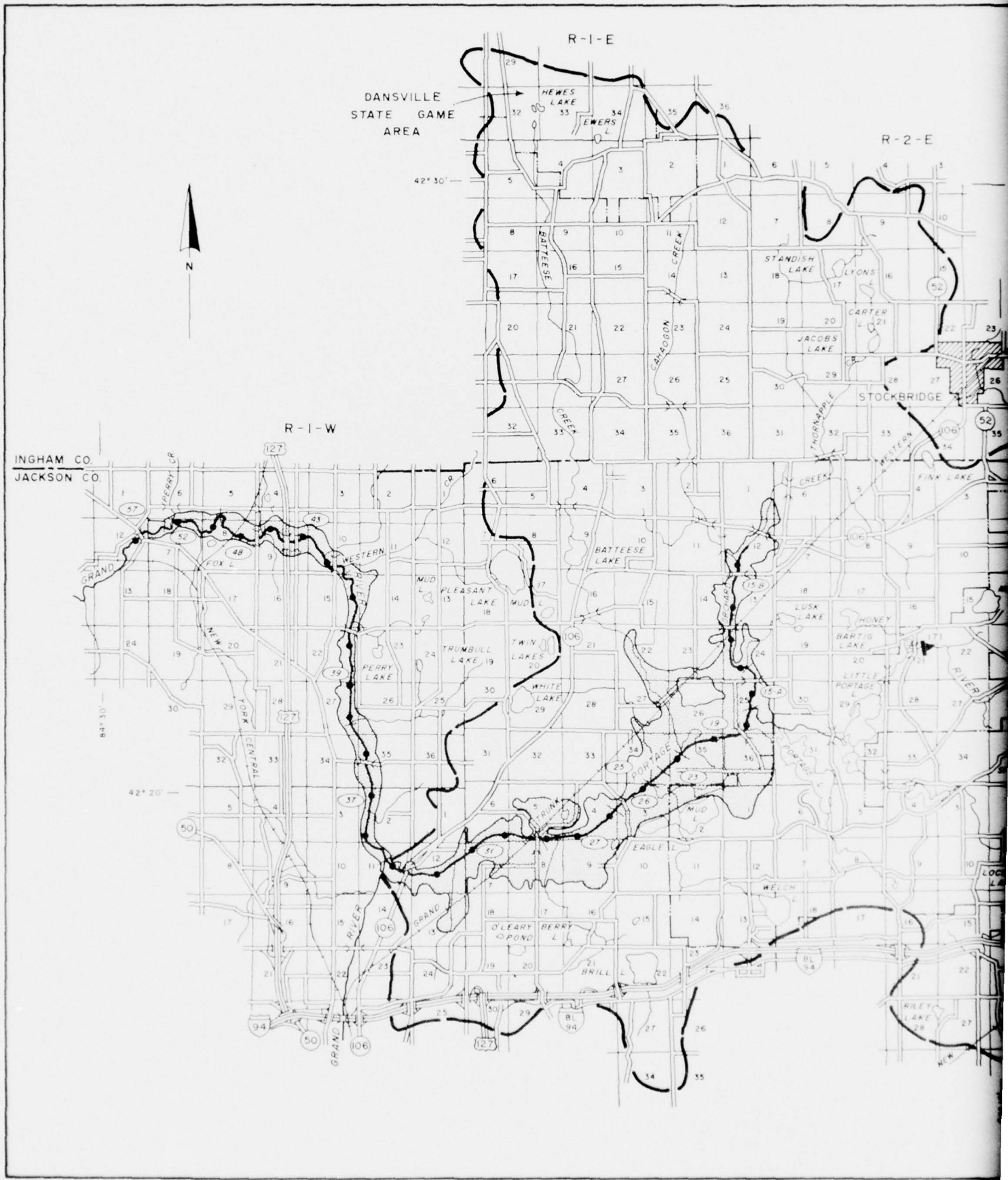
LEGEND

- BENEFITED AREA 
- CHANNEL IMPROVEMENT F.P. & D. 
- REACH BREAK 
- REACH NUMBER 

GRAND RIVER BASIN
UPPER COLUMBIA CREEK SUBWATERSHED
INGHAM COUNTY, MICHIGAN

SCALE  MILES

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE



R-1-E

DANSVILLE
STATE GAME
AREA

R-2-E

42° 30'



R-1-W

INGHAM CO.
JACKSON CO.

84° 30'

42° 20'

127

127

94

50

106

127

94

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106

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106

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106

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106

94

50

HEWES LAKE

EWERS L.

BATEESE

CALOGON CREEK

STANDISH LAKE

LYONS

CARTER L.

JACOBS LAKE

STOCKBRIDGE

THORNTON CREEK

WESTERN

FINN LAKE

GRAND

PERRY CR.

FOX L.

NEW

YORK CENTRAL

WESTERN

MUD L.

PLEASANT LAKE

MUD L.

TRUMBULL LAKE

TWIN LAKES

WHITE LAKE

PERRY LAKE

GRAND RIVER

BRANG

O'LEARY BERRY POND L.

BRILL L.

EAGLE L.

WELCH

RILEY LAKE

NEW

LOC L.

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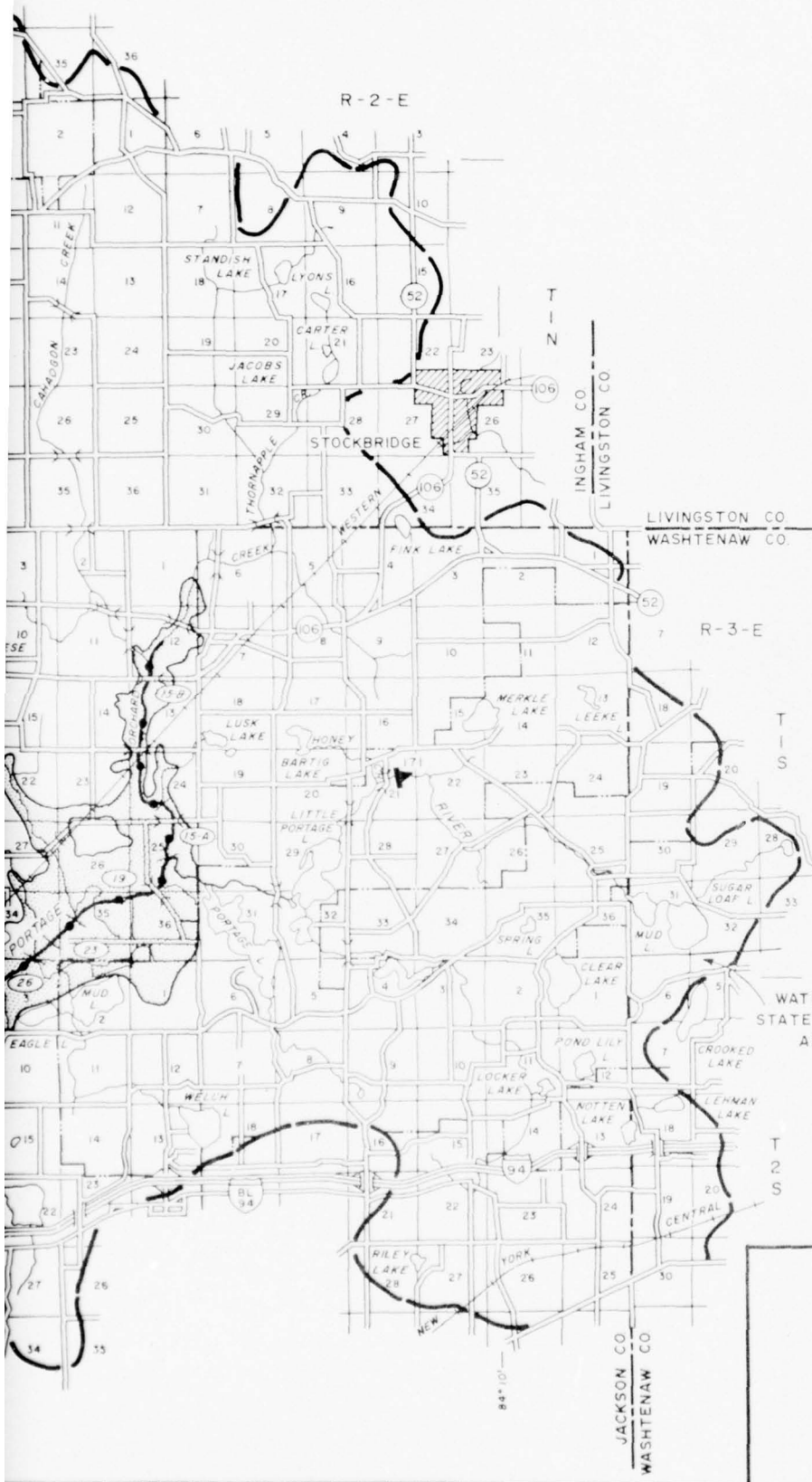
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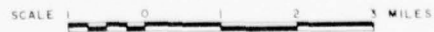
WELCH



LEGEND

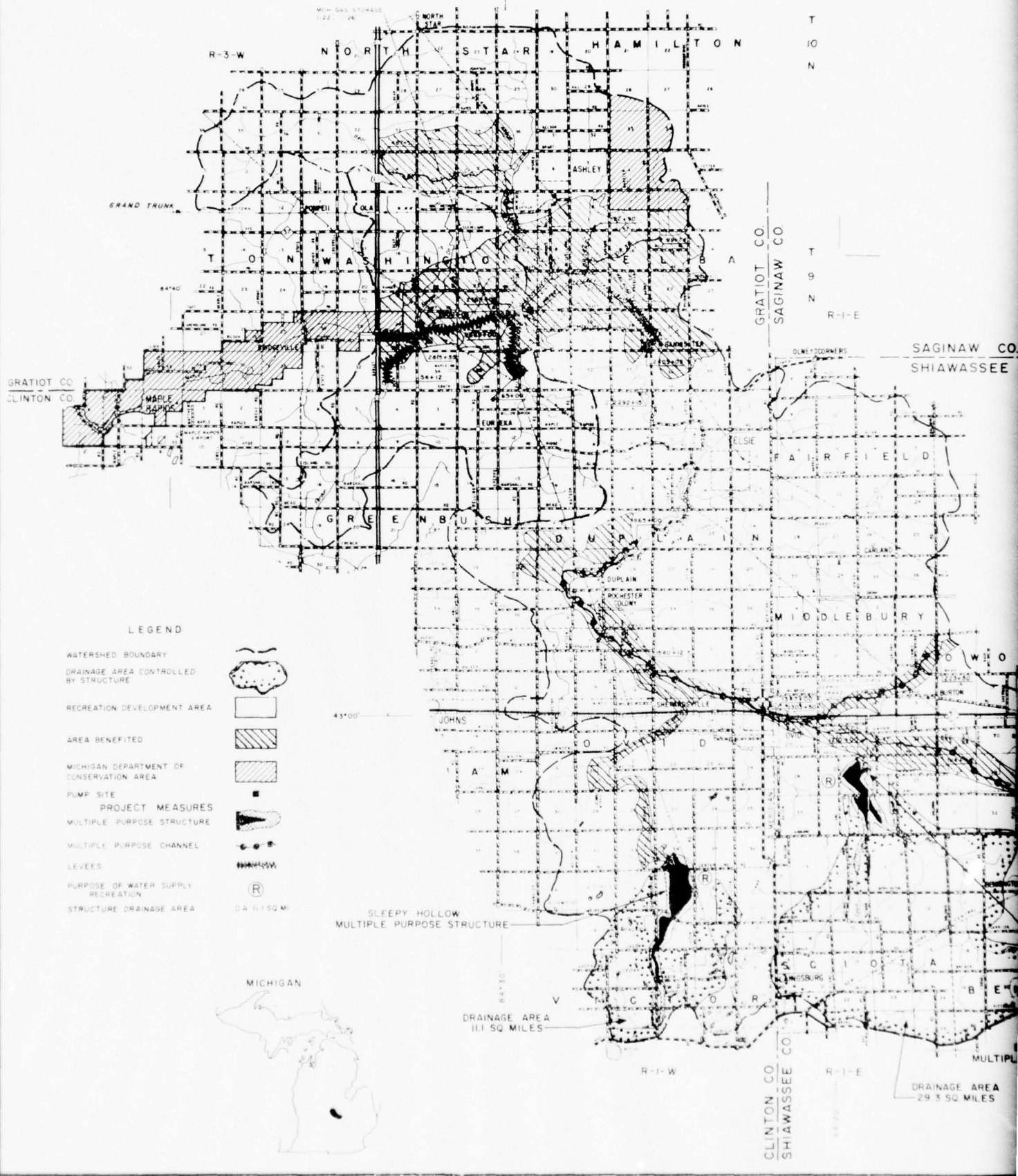
- BENEFITED AREA 
- MULTIPLE PURPOSE CHANNEL IMPROVEMENT F P & D 
- SINGLE PURPOSE RECREATION STRUCTURE, AND NUMBER 
- REACH BREAK 
- REACH NUMBER 
- STATE GAME AREA 

GRAND RIVER BASIN, MICHIGAN
 PORTAGE RIVER SUBWATERSHED
 INGHAM, JACKSON, AND WASHTENAW COUNTIES, MICHIGAN



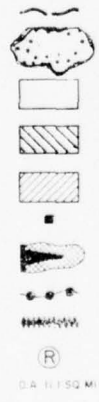
U. S. DEPARTMENT OF AGRICULTURE
 SOIL CONSERVATION SERVICE

2



LEGEND

- WATERSHED BOUNDARY
- DRAINAGE AREA CONTROLLED BY STRUCTURE
- RECREATION DEVELOPMENT AREA
- AREA BENEFITED
- MICHIGAN DEPARTMENT OF CONSERVATION AREA
- PUMP SITE
- PROJECT MEASURES
- MULTIPLE PURPOSE STRUCTURE
- MULTIPLE PURPOSE CHANNEL
- LEVEES
- PURPOSE OF WATER SUPPLY
- RECREATION
- STRUCTURE DRAINAGE AREA



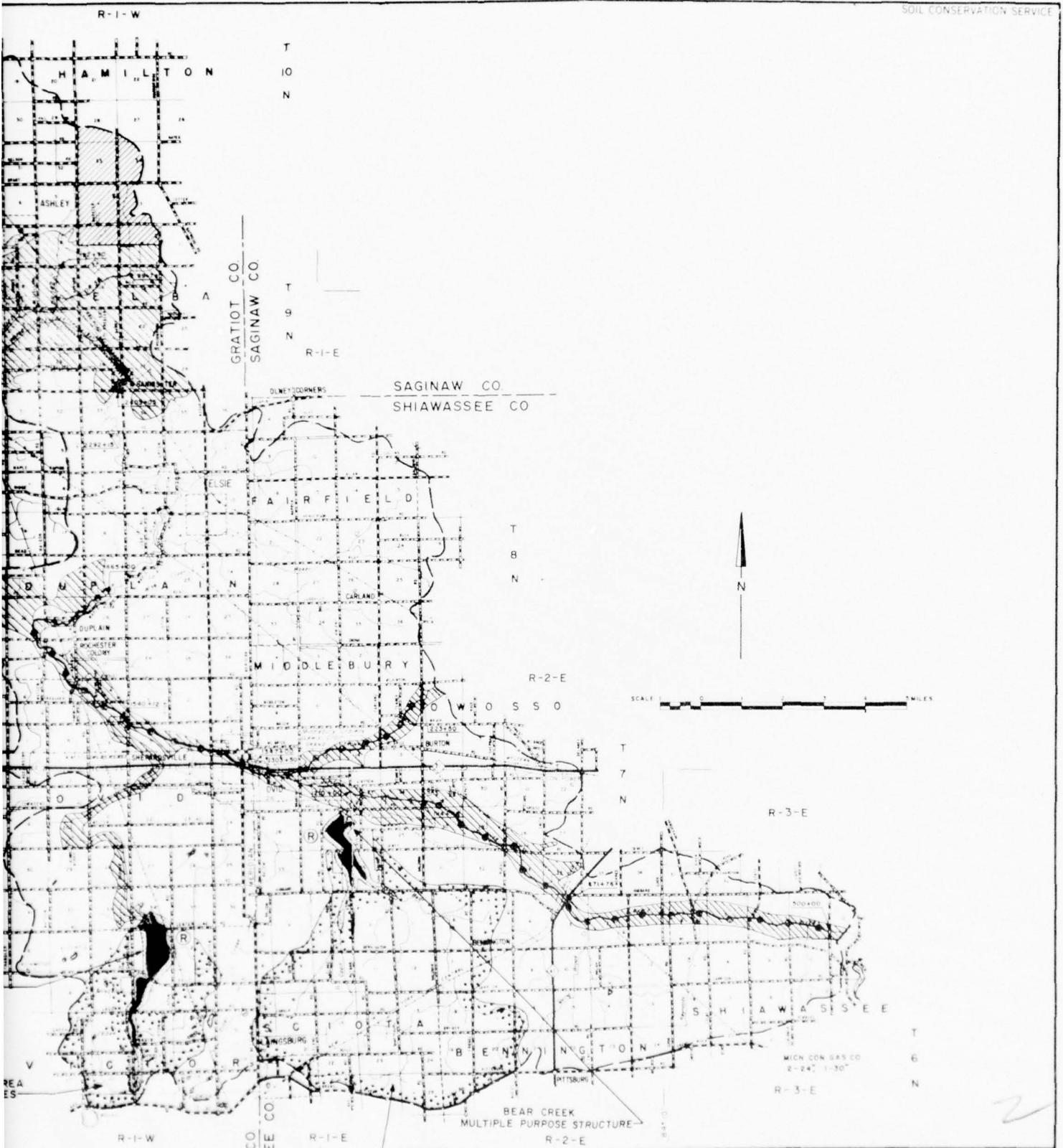
SLEEPY HOLLOW MULTIPLE PURPOSE STRUCTURE

DRAINAGE AREA A 111 SQ MILES

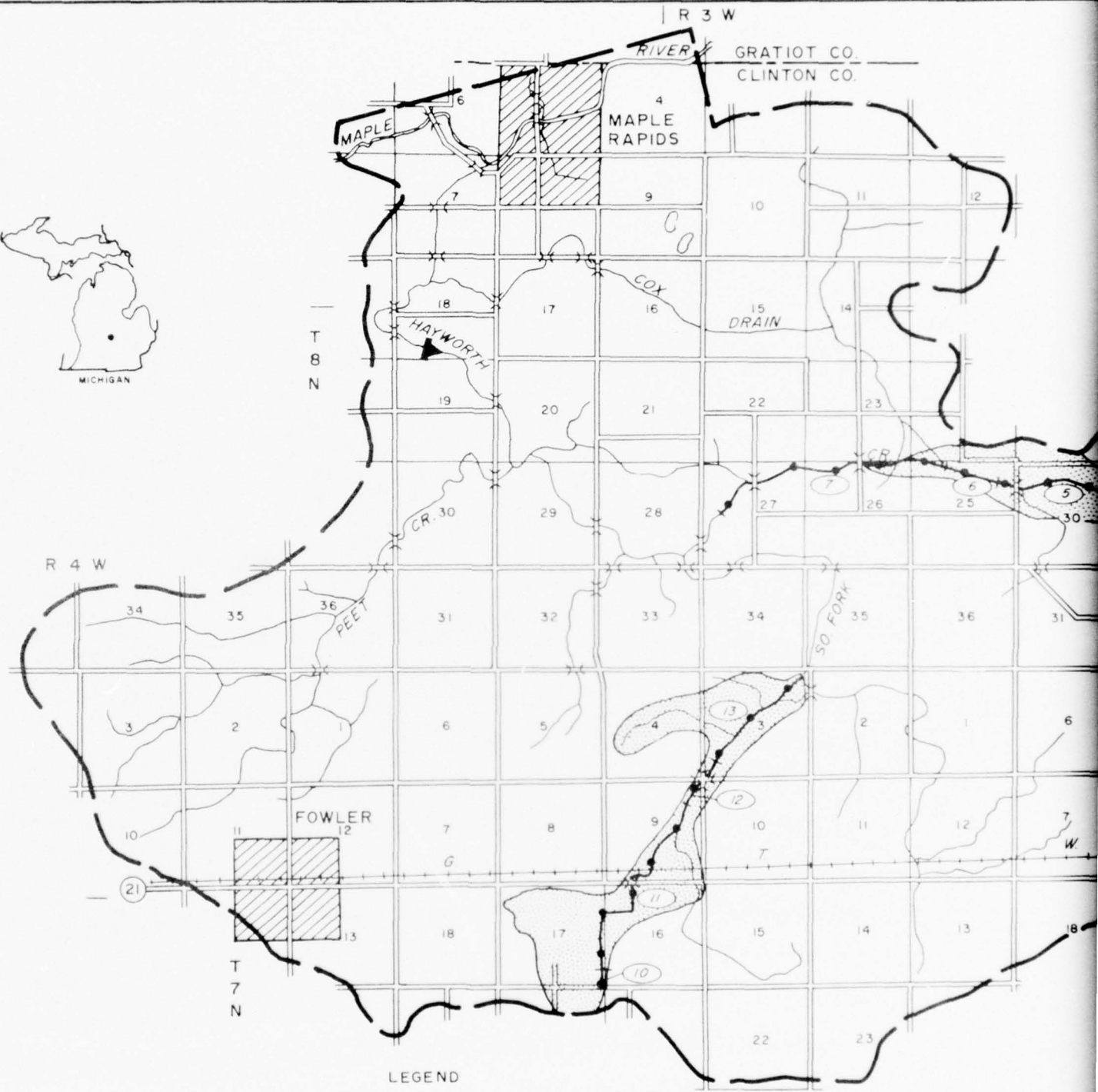
DRAINAGE AREA 29.3 SQ MILES



MICHIGAN



GRAND RIVER BASIN, MICHIGAN
 UPPER MAPLE RIVER WATERSHED
 GRATIOT, CLINTON AND SHIAWASSEE COUNTIES, MICHIGAN



LEGEND

- BENEFITED AREA
- MULTIPLE PURPOSE CHANNEL IMPROVEMENT
- REACH BREAK
- REACH NUMBER
- SINGLE PURPOSE RECREATION STRUCTURE



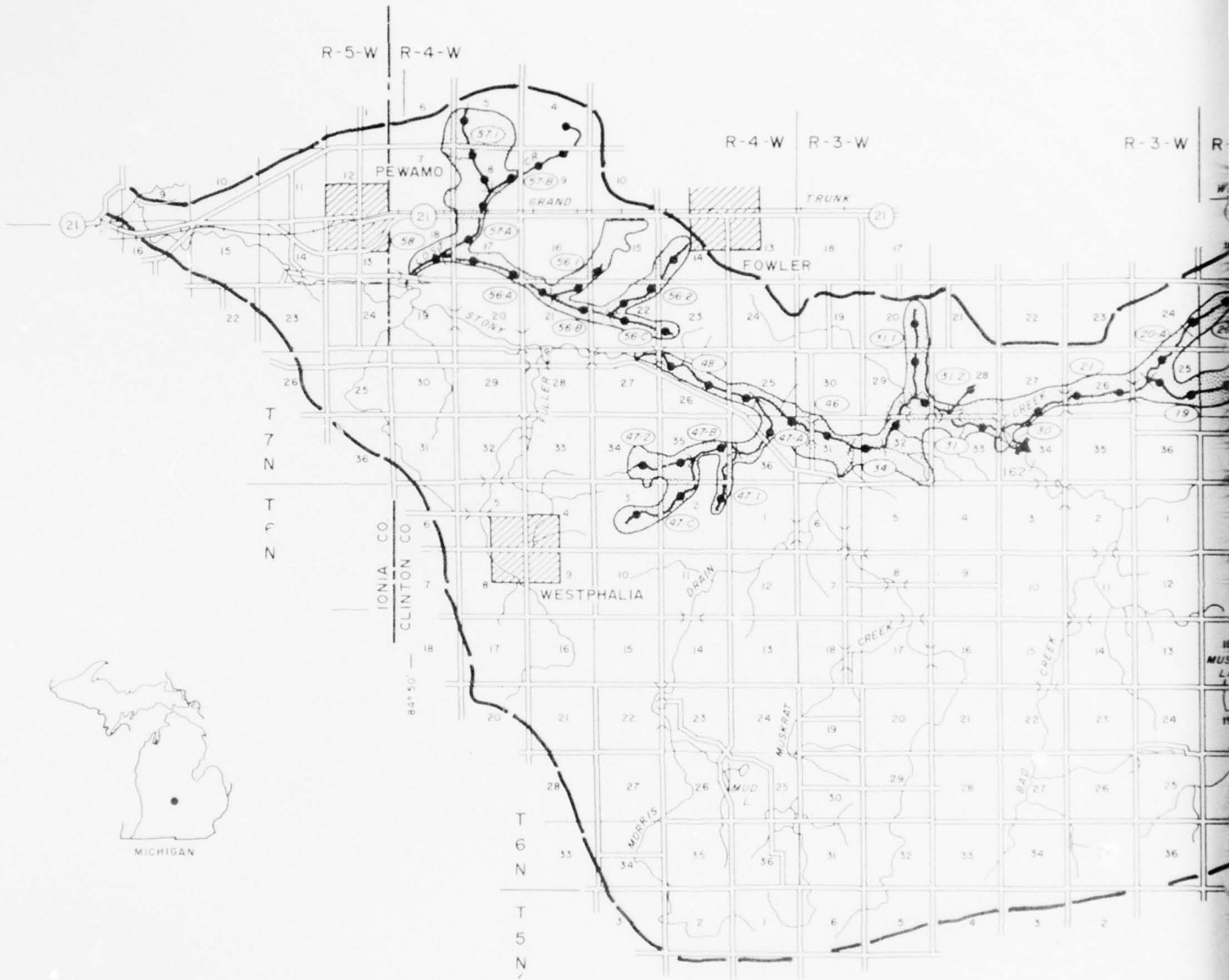
84° 40'



GRAND RIVER BASIN
 HAYWORTH CREEK SUBWATERSHED
 CLINTON COUNTY, MICHIGAN

SCALE 0 1 2 MILES

U. S. DEPARTMENT OF AGRICULTURE
 SOIL CONSERVATION SERVICE








LEGEND

- BENEFITED AREA
- MULTIPLE PURPOSE CHANNEL IMPROVEMENT F P & D
- SINGLE PURPOSE RECREATION STRUCTURE, AND NUMBER 162
- REACH BREAK
- REACH NUMBER 6.3



LEGEND

- ED AREA 
- E PURPOSE CHANNEL
MENT F P B D 
- PURPOSE RECREATION
URE, AND NUMBER 
- BREAK 
- NUMBER 

GRAND RIVER BASIN, MICHIGAN
 STONY CREEK SUBWATERSHED
 CLINTON AND IONIA COUNTIES, MICHIGAN

SCALE 0 1 2 3 MILES

U. S. DEPARTMENT OF AGRICULTURE
 SOIL CONSERVATION SERVICE

R-12-W R-11-W

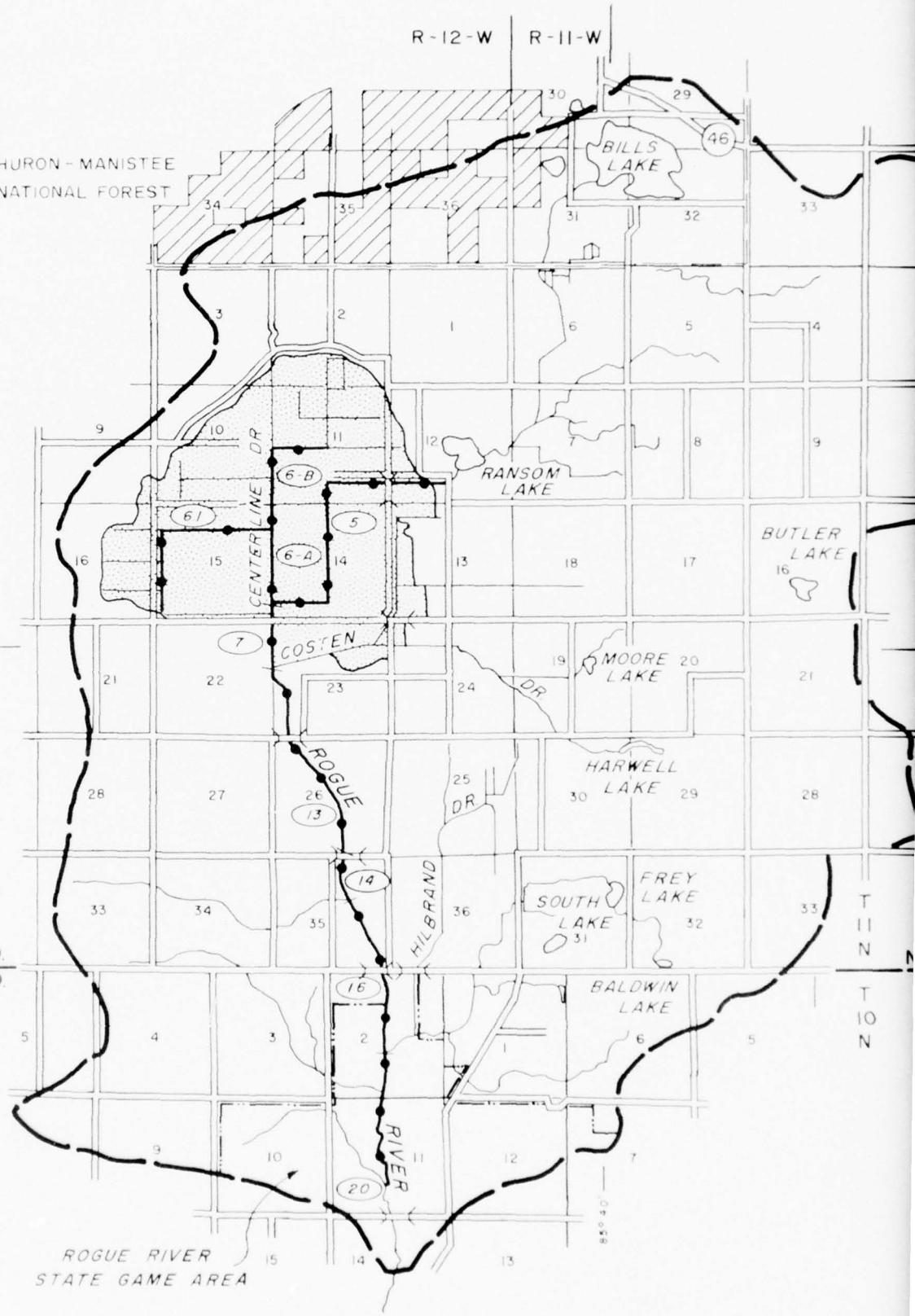
HURON - MANISTEE
NATIONAL FOREST



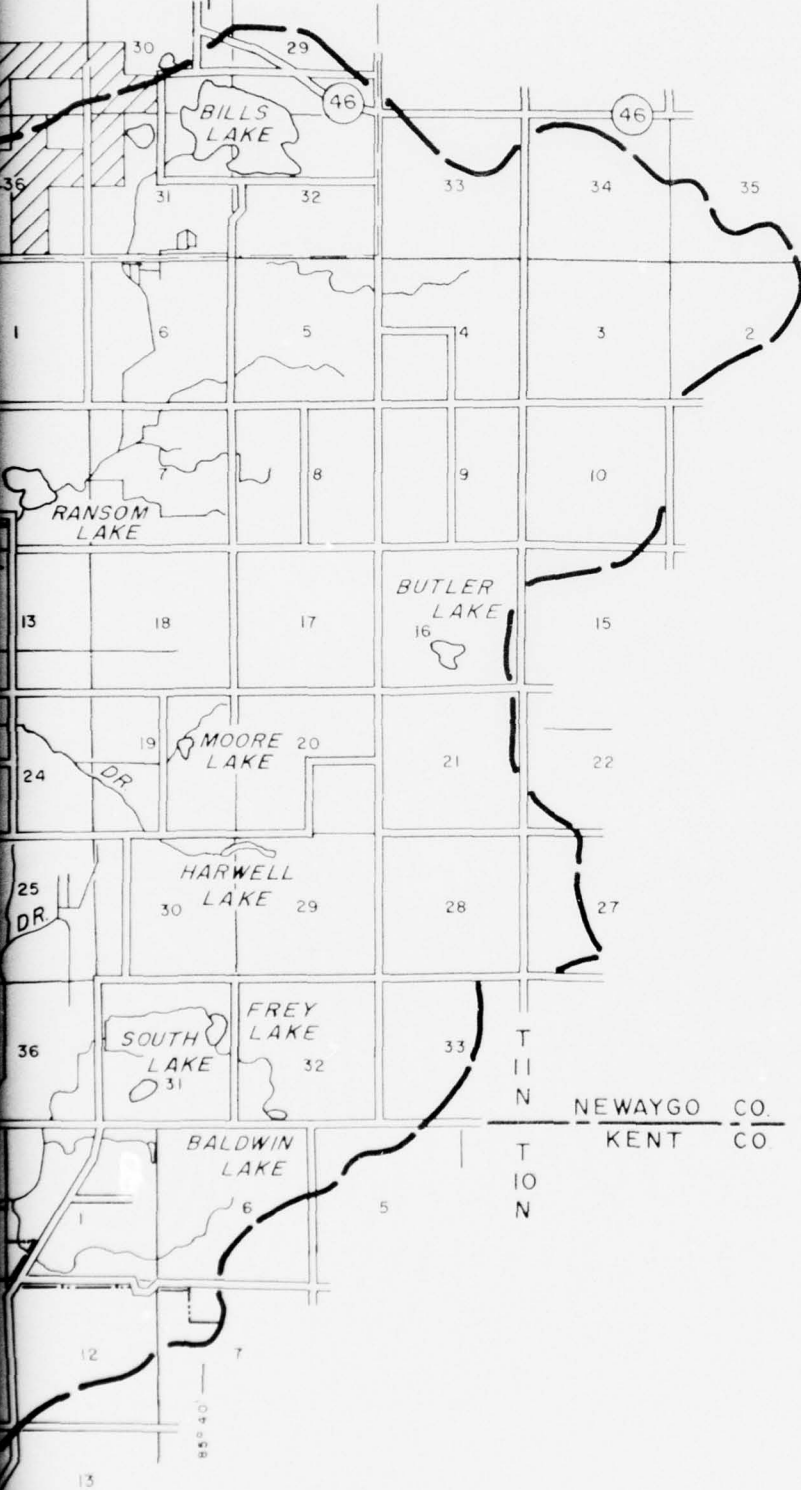
43° 20'

NEWAYGO CO.
KENT CO.








ROGUE RIVER
STATE GAME AREA




12-W R-II-W



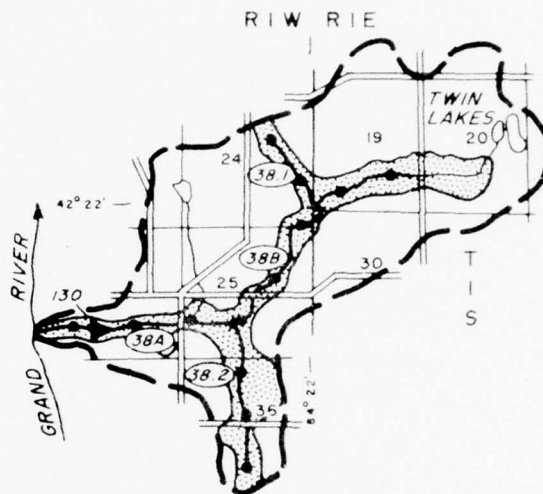
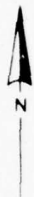
LEGEND

- BENEFITED AREA 
- MULTIPLE PURPOSE CHANNEL IMPROVEMENT 
- REACH BREAK 
- REACH NUMBER 
- STATE GAME AREA 
- NATIONAL FOREST:
 - PROCLAMATION BOUNDARY 
 - FEDERAL OWNERSHIP 






GRAND RIVER BASIN
 ROGUE RIVER SUBWATERSHED
 KENT & NEWAYGO COUNTIES, MICHIGAN

SCALE  2 MILES

U. S. DEPARTMENT OF AGRICULTURE
 SOIL CONSERVATION SERVICE



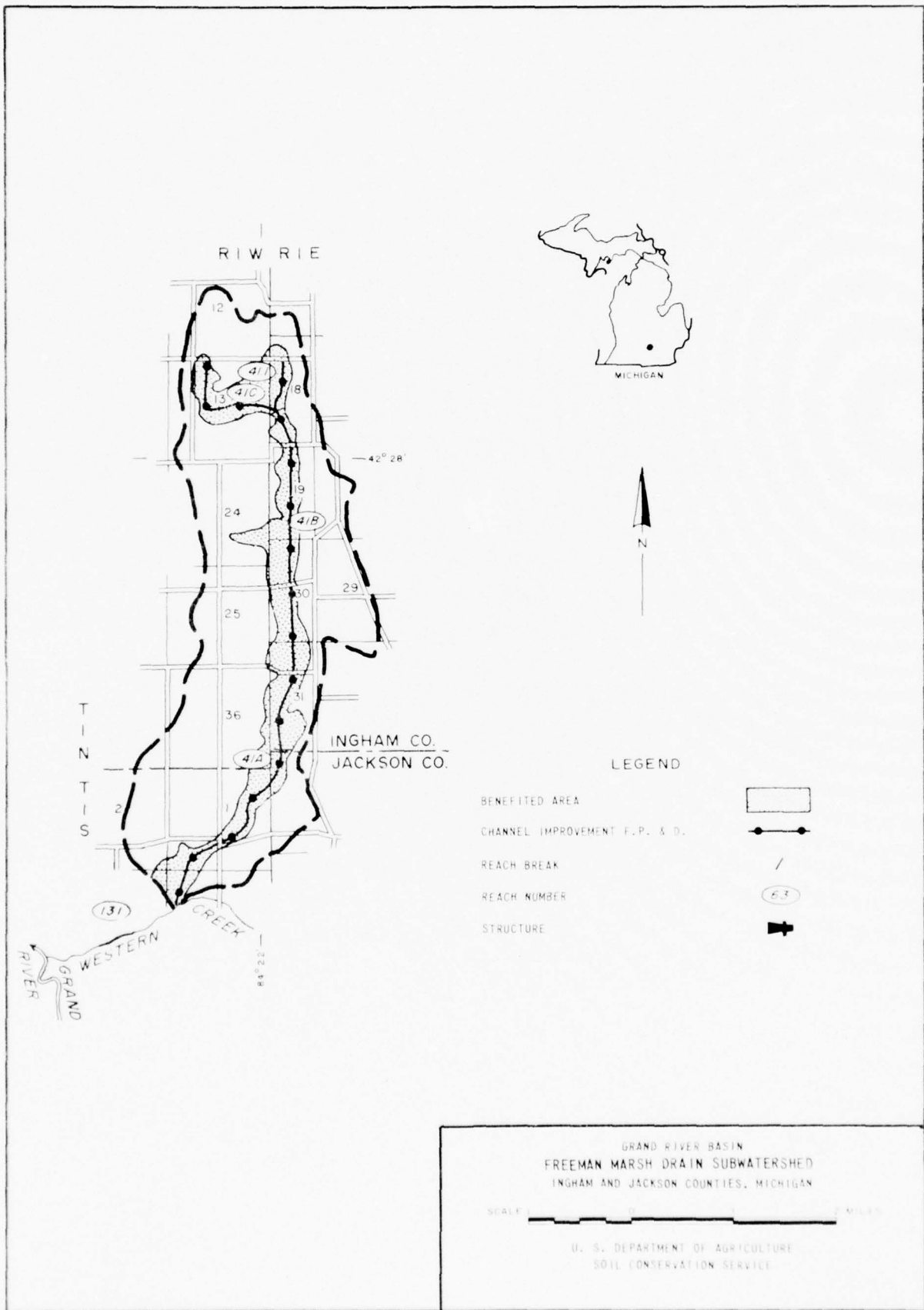
LEGEND

- BENEFITED AREA 
- CHANNEL IMPROVEMENT F. P. & D. 
- REACH BREAK 
- REACH NUMBER 
- SINGLE PURPOSE STRUCTURE AND NUMBER 

GRAND RIVER BASIN
TWIN LAKES SUBWATERSHED
JACKSON COUNTY, MICHIGAN

SCALE 1 0 1 2 MILES


U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE



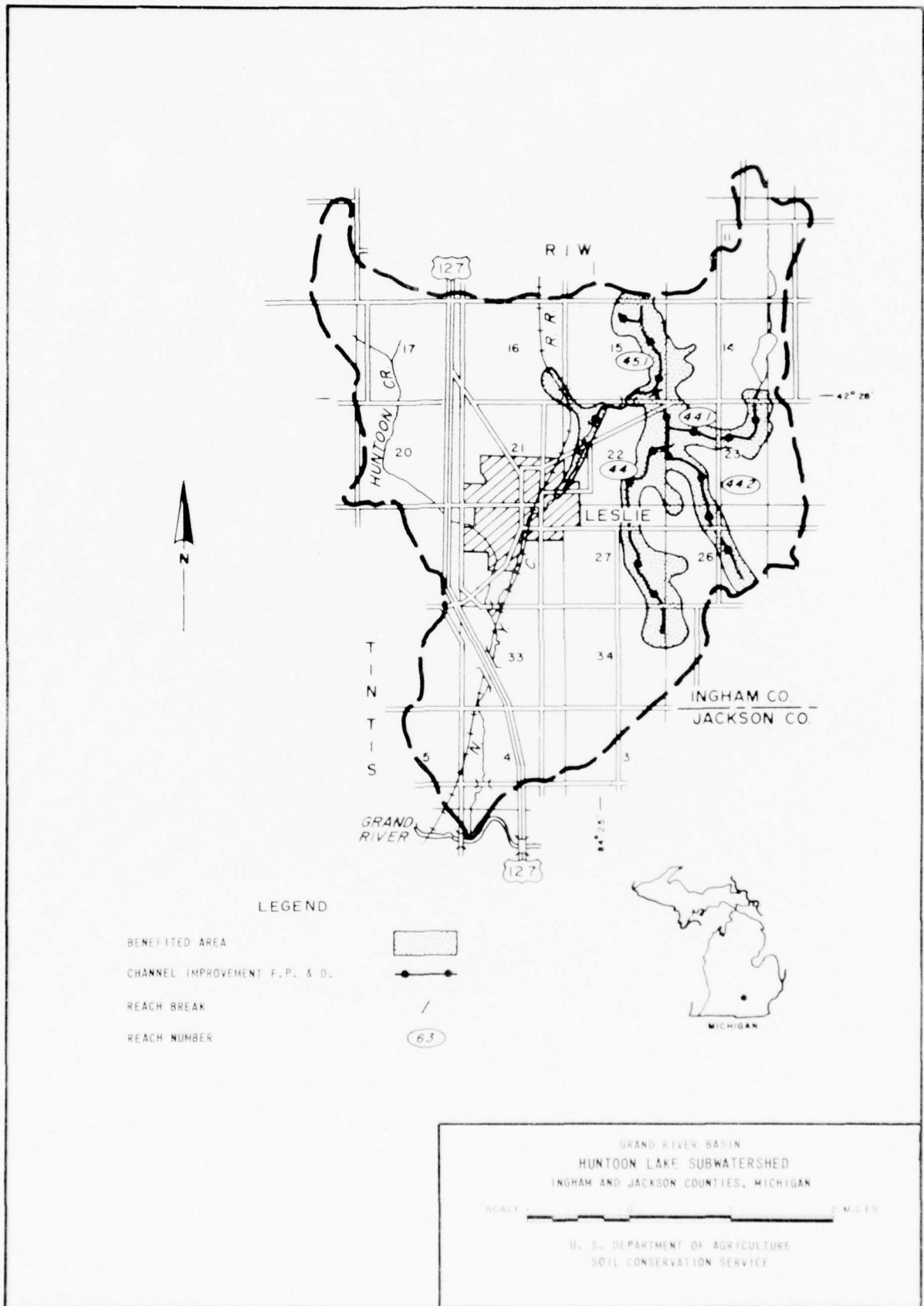
LEGEND

- BENEFITED AREA 
- CHANNEL IMPROVEMENT F. P. & D. 
- REACH BREAK 
- REACH NUMBER 
- STRUCTURE 

GRAND RIVER BASIN
 FREEMAN MARSH DRAIN SUBWATERSHED
 INGHAM AND JACKSON COUNTIES, MICHIGAN

SCALE  MILES

U. S. DEPARTMENT OF AGRICULTURE
 SOIL CONSERVATION SERVICE



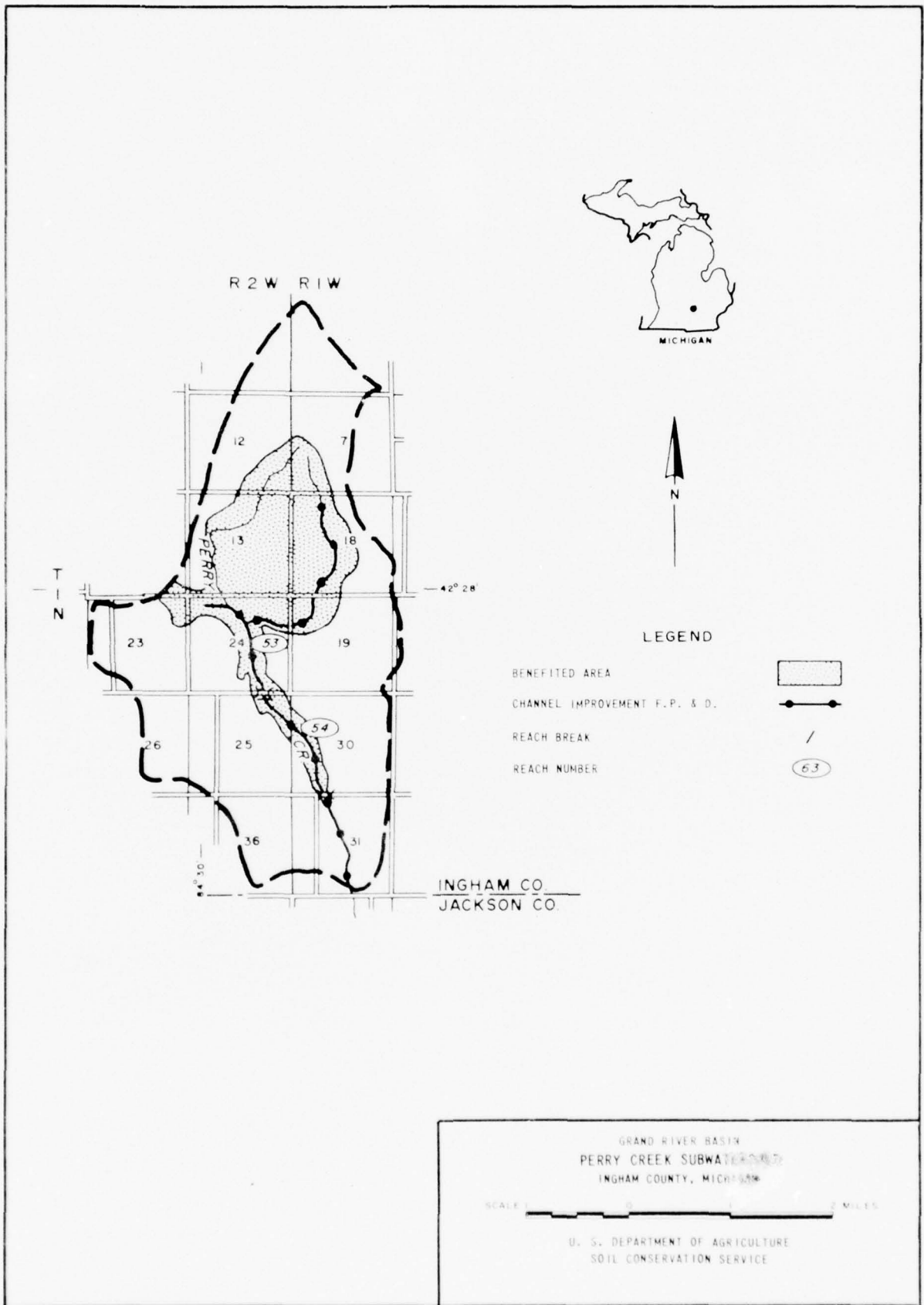
LEGEND

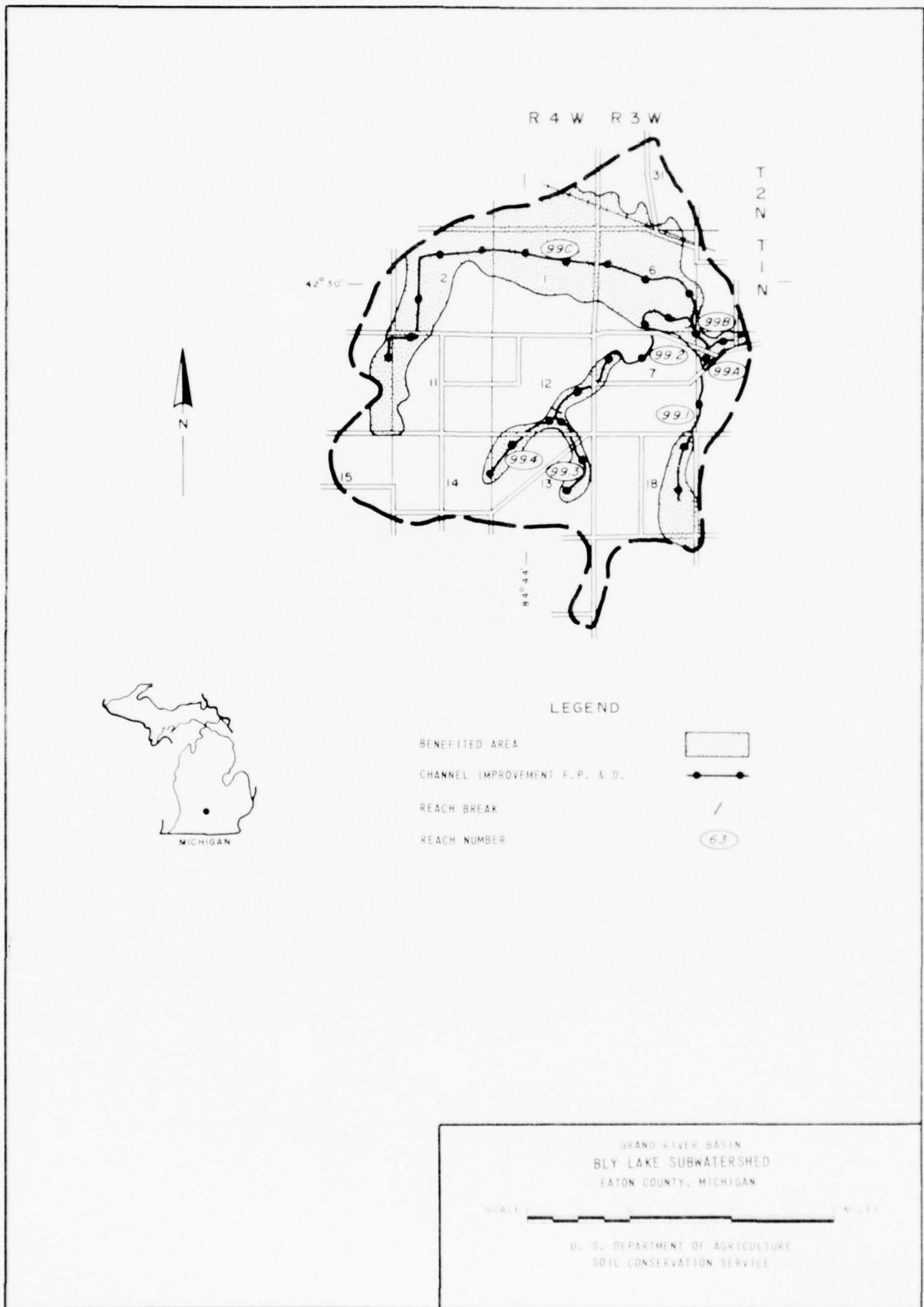
- BENEFITED AREA 
- CHANNEL IMPROVEMENT F.P. & D. 
- REACH BREAK 
- REACH NUMBER 

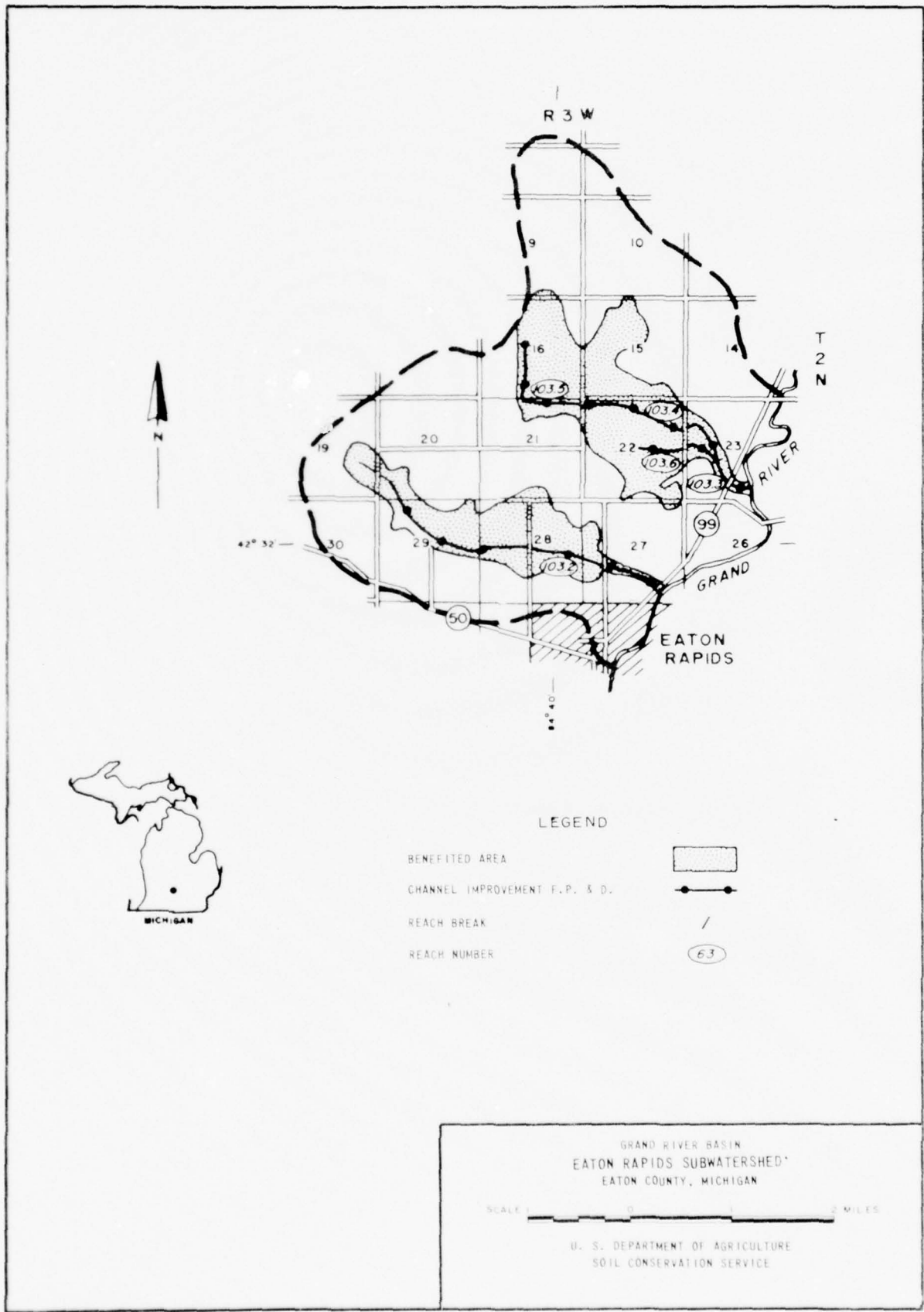
GRAND RIVER BASIN
 HUNTOON LAKE SUBWATERSHED
 INGHAM AND JACKSON COUNTIES, MICHIGAN

SCALE 0 2 MILES

U. S. DEPARTMENT OF AGRICULTURE
 SOIL CONSERVATION SERVICE







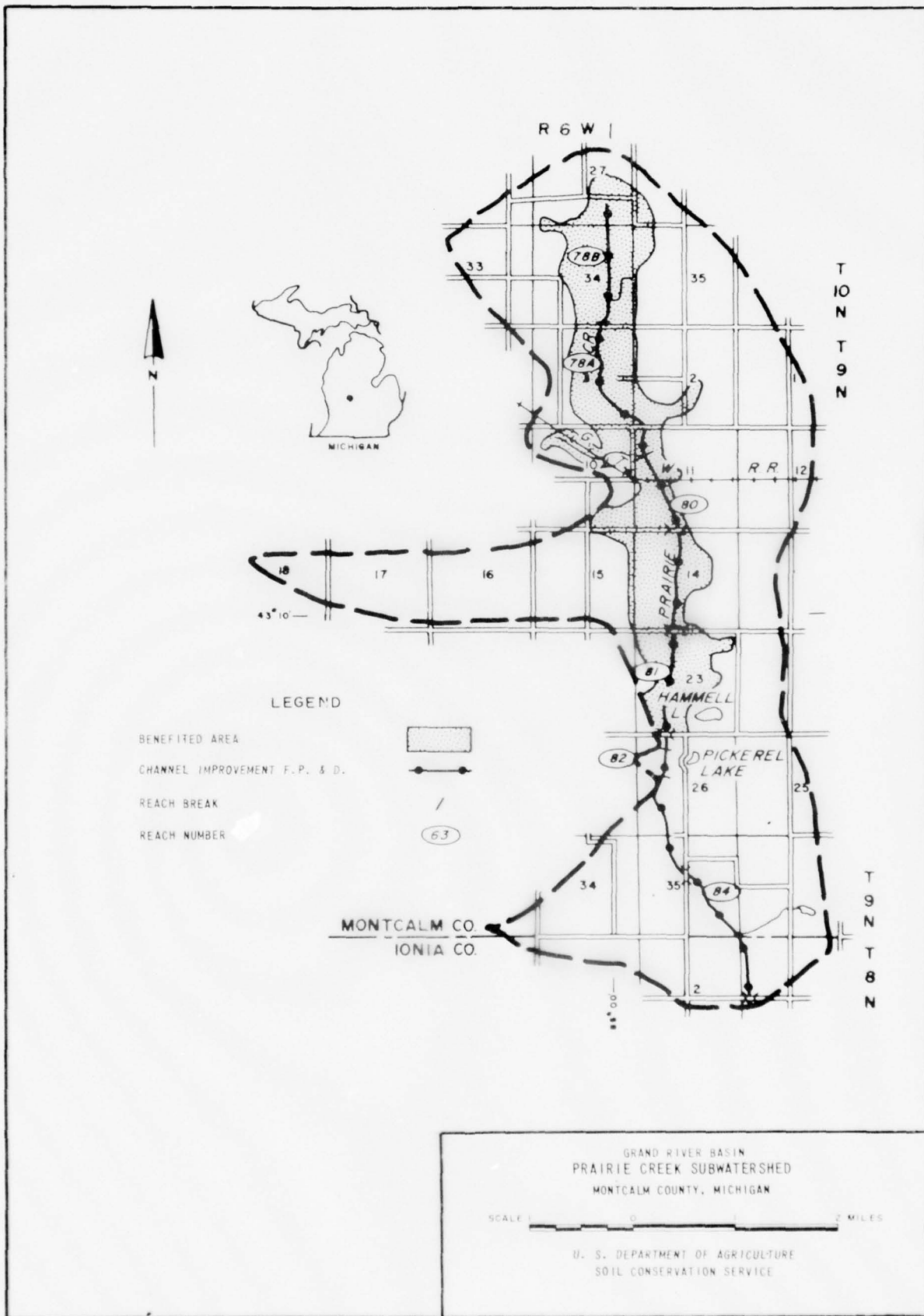
LEGEND

- BENEFITED AREA
- CHANNEL IMPROVEMENT F. P. & D.
- REACH BREAK
- REACH NUMBER 63

GRAND RIVER BASIN
 EATON RAPIDS SUBWATERSHED
 EATON COUNTY, MICHIGAN

SCALE 0 1 2 MILES

U. S. DEPARTMENT OF AGRICULTURE
 SOIL CONSERVATION SERVICE



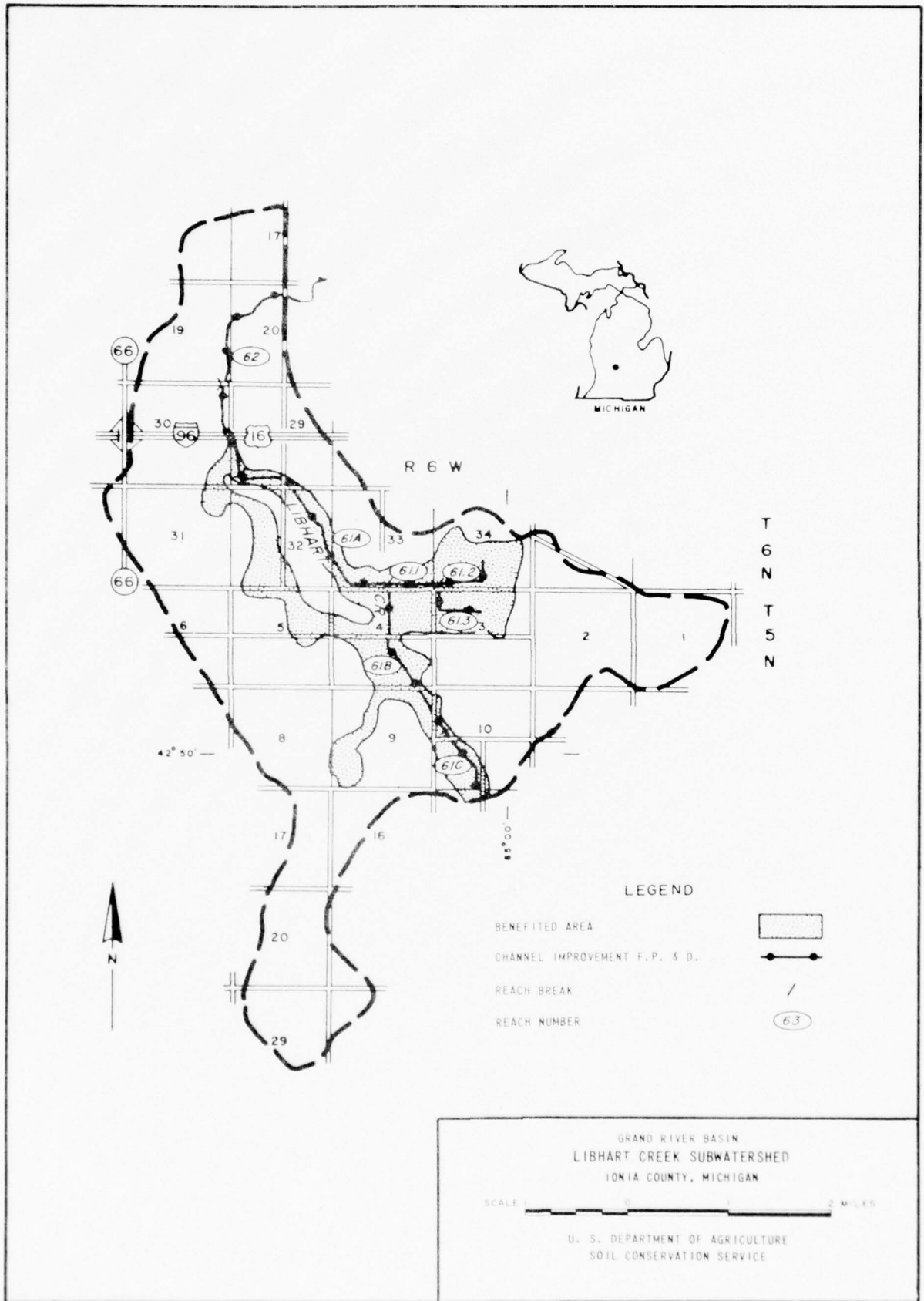
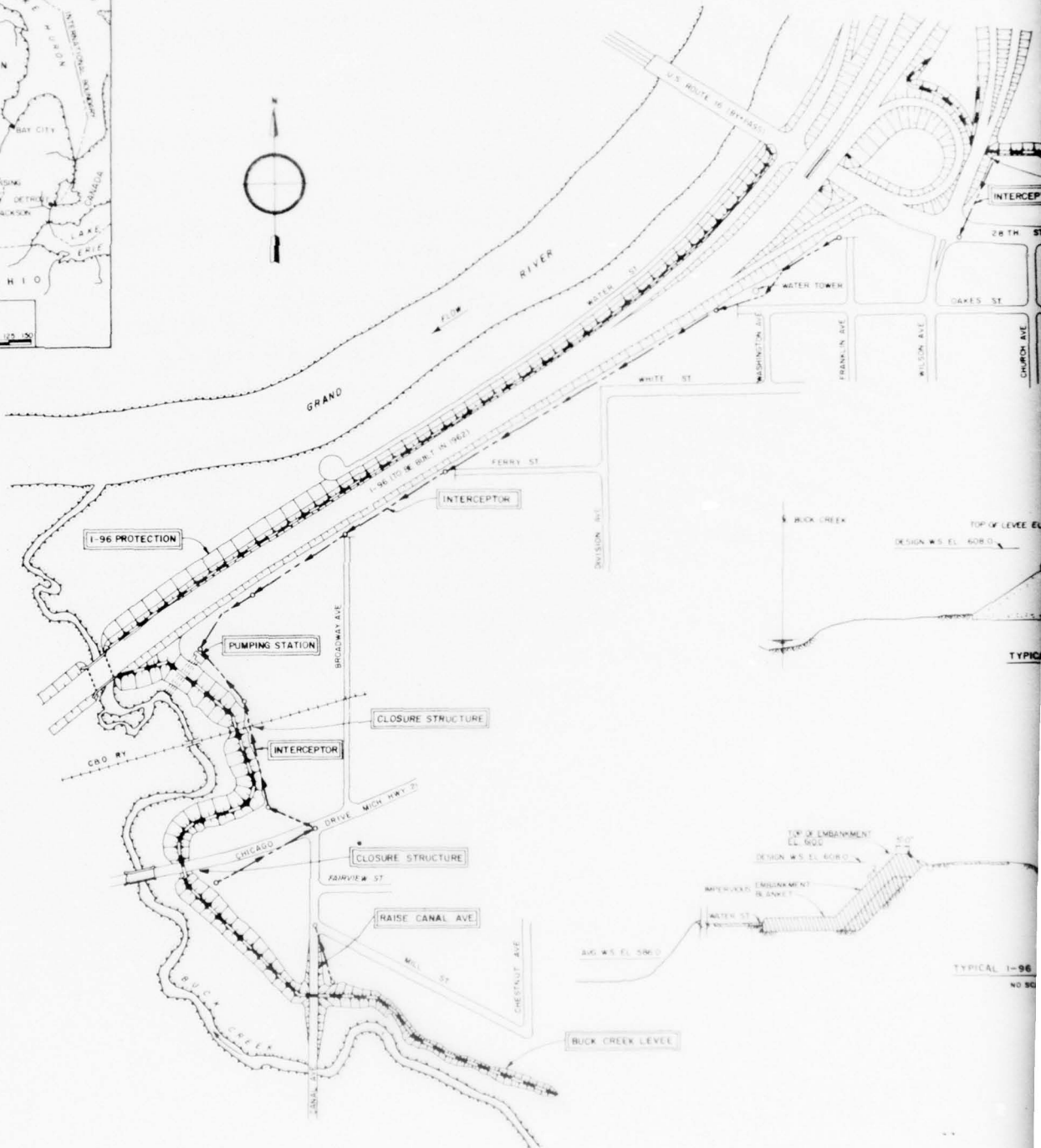
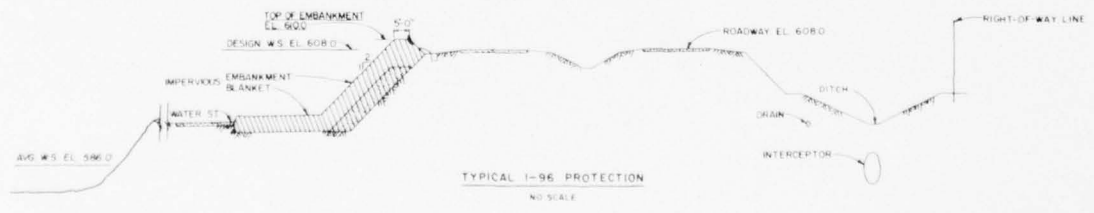
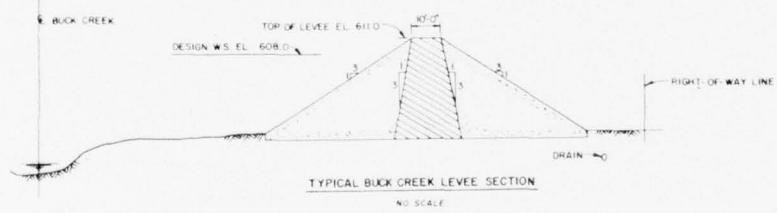
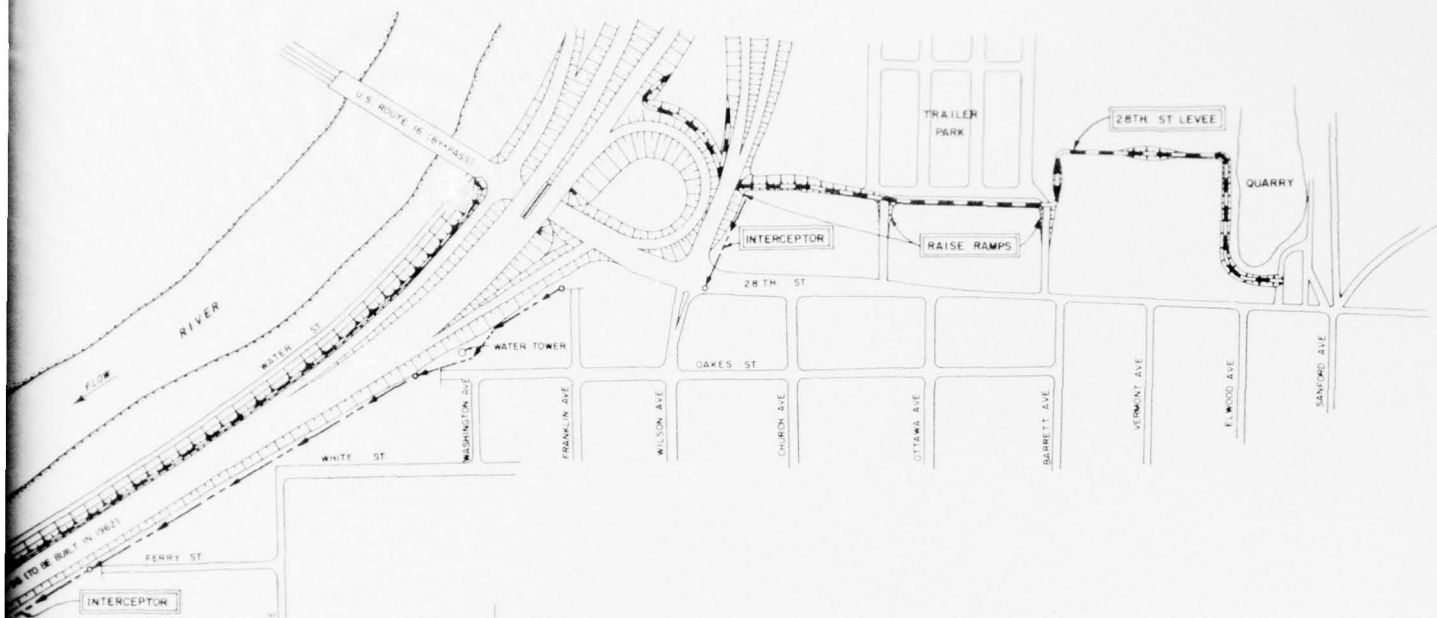


PLATE Q-36

CORPS OF ENGINEERS





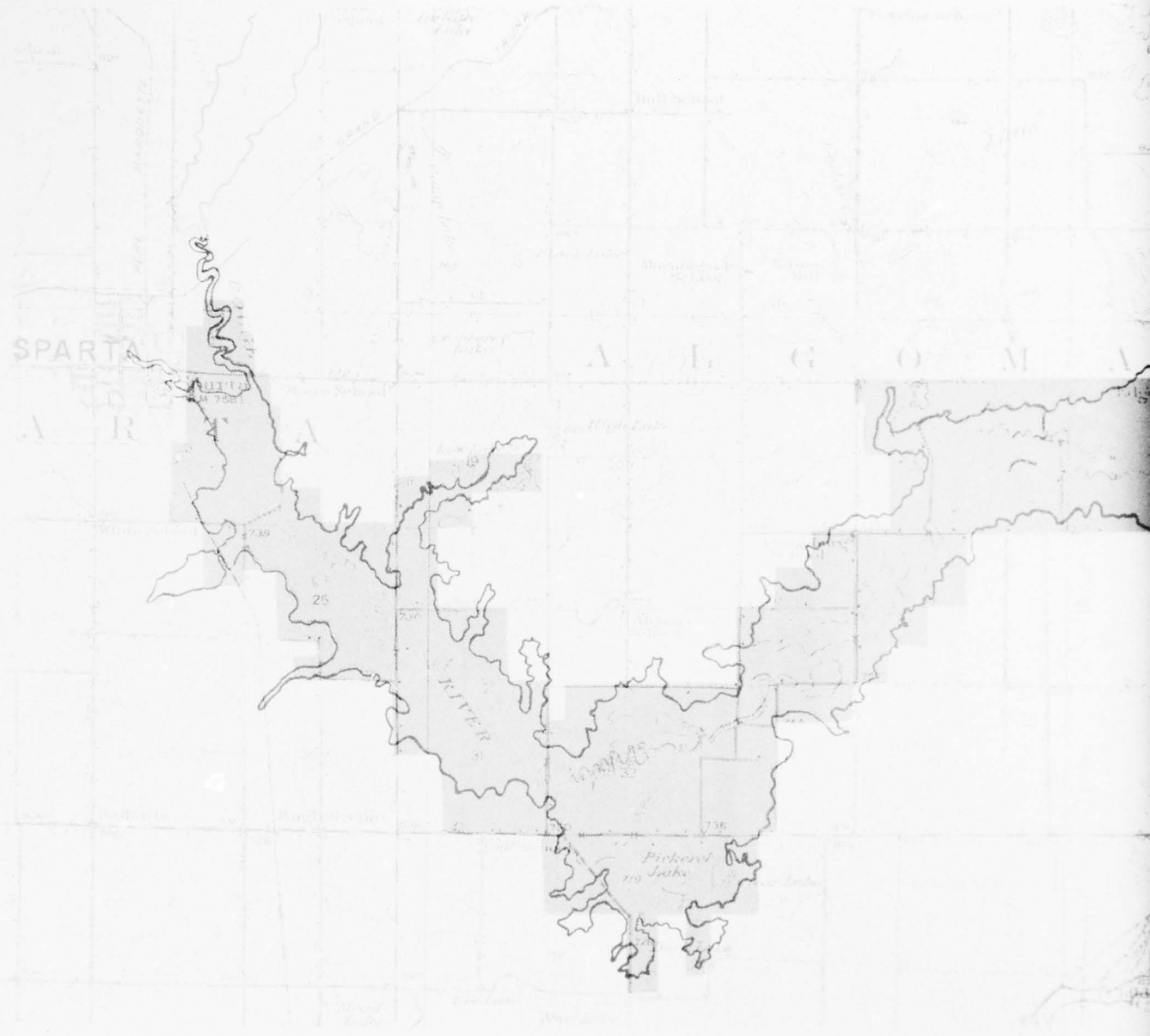
- LEGEND
- Recommended Interceptor Drain
 - Line of Protection
 - Proposed Pumping Station
 - Proposed Levee or Embankment Profile
 - Interstate 96

**GRAND RIVER, MICHIGAN
FLOOD CONTROL AT GRANDVILLE
PLAN OF PROTECTION**

Scale of Feet
0 100 200 300 400 500 600 700 800

U. S. Army Engineer District, Detroit
James B. [Signature] *John [Signature]* *R. [Signature]*
 Major [Rank] Captain [Rank] Major [Rank]
 District Engineer District Engineer District Engineer

Drawn by *[Signature]* File No. To Accompany Survey Report
 Checked by *[Signature]* DM 127698 Dated 1962



SCALE OF MILES



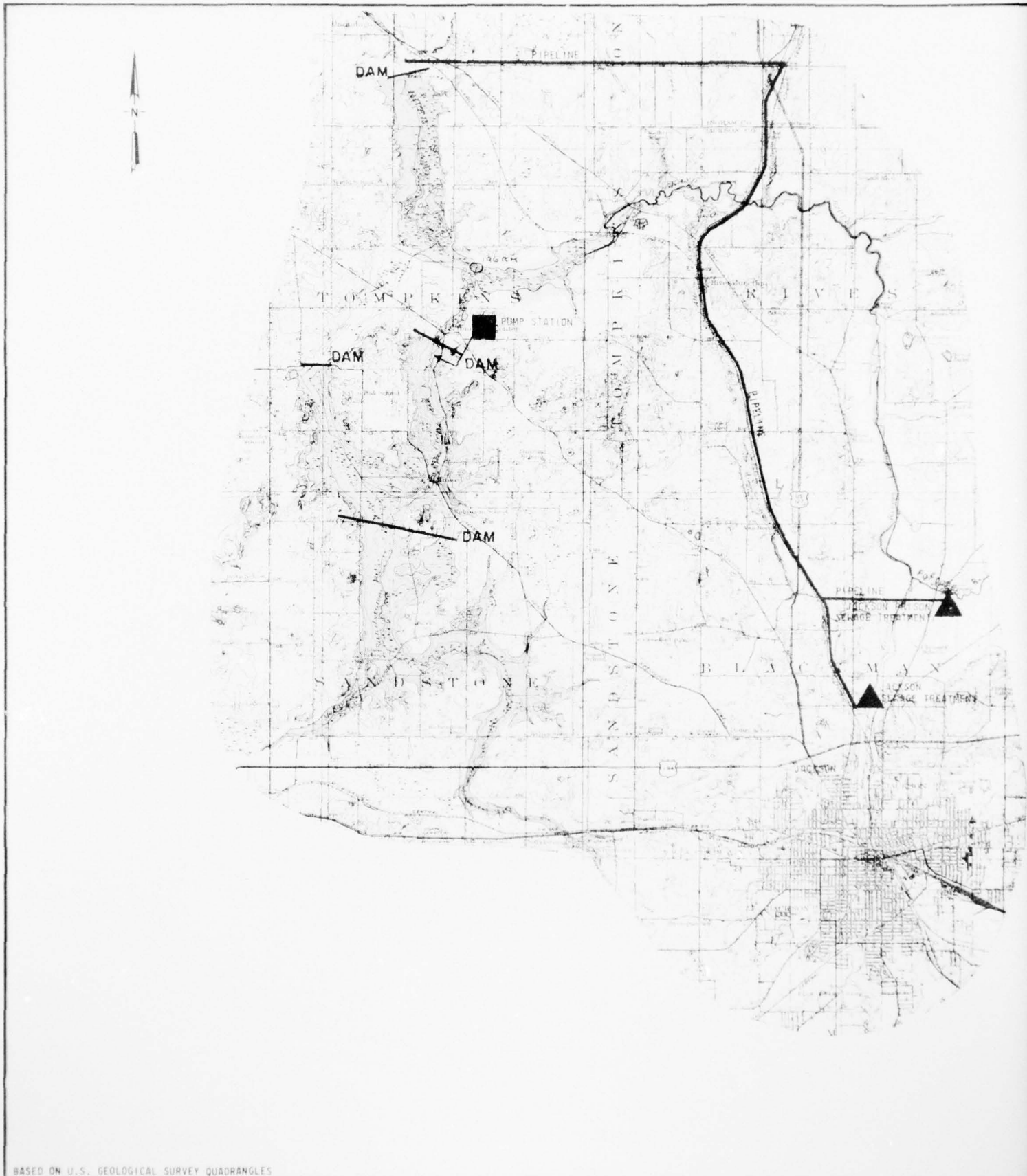
LEGEND

- PROPERTY LINE (ACREAGE)
- 740 CONTOUR LINE
- PROPOSALS SHOWN ELSEWHERE IN REPORT

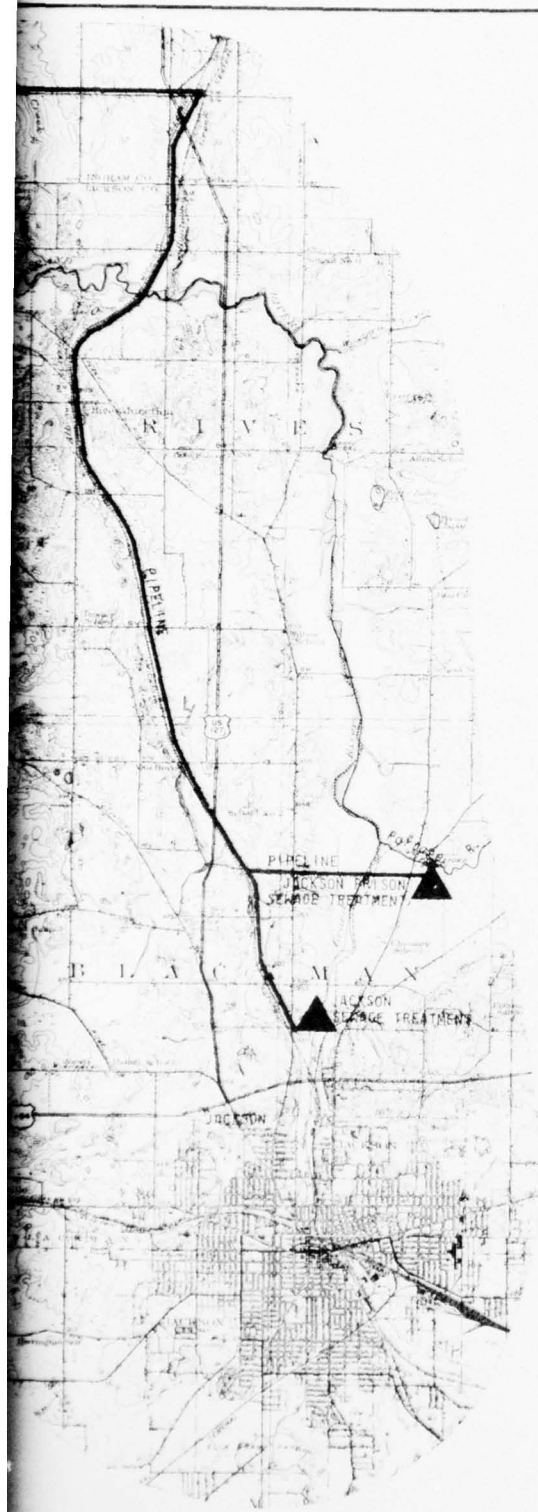
SCALE OF MILES

GRAND RIVER BASIN, MICHIGAN
 ROGUE RIVER
 RECREATION AREA

U.S. ARMY ENGINEER DISTRICT, DETROIT



BASED ON U.S. GEOLOGICAL SURVEY QUADRANGLES



JACKSON COMPLEX

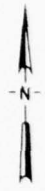
SEPARATE POOLS NAMED ONONDAGA, SANDSTONE AND MINARD MAKE UP THE JACKSON COMPLEX. ONONDAGA, THE LOWER POOL ON THE GRAND RIVER WOULD SERVE PRIMARILY FOR FLOOD CONTROL. IT MAY ALSO SERVE FOR WATER QUALITY STORAGE AND A TAILWATER POOL FOR PUMPING EXCESS FLOWS INTO SANDSTONE. THE MIDDLE POOL LOCATED ON SANDSTONE CREEK, SANDSTONE POOL WOULD BE USED TO SATISFY WATER QUALITY, RECREATION AND FISH AND WILDLIFE NEEDS. THE REQUIRED WATER TO FILL THIS POOL WOULD BE OBTAINED FROM GRAND RIVER FLOWS AND PUMPING FROM ONONDAGA. MINARD, THE UPPER POOL IS LOCATED ON SANDSTONE CREEK AND WOULD BE MANAGED FOR A CONSTANT POOL ELEVATION FOR RECREATIONAL AND FISH AND WILDLIFE NEEDS. THE MAXIMUM POOL ELEVATIONS IN FEET WOULD BE, ONONDAGA 905, SANDSTONE 950, AND MINARD 950.

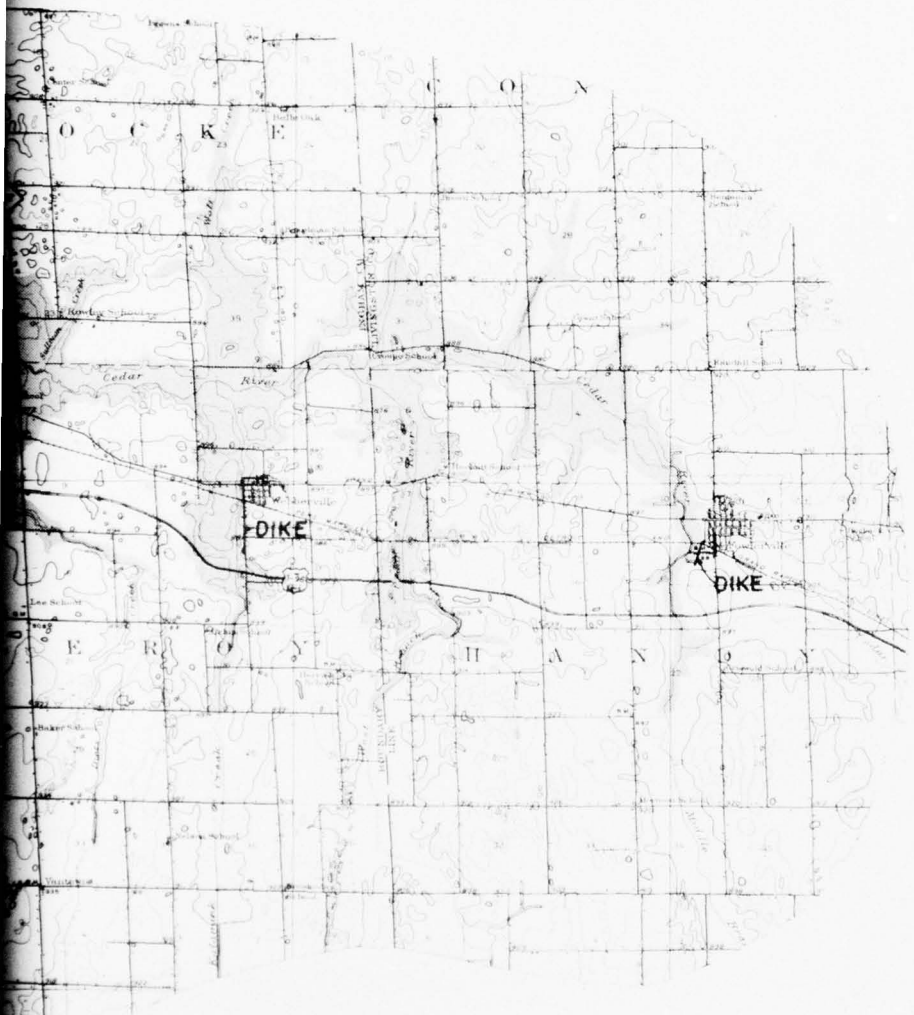
**GRAND RIVER BASIN, MICHIGAN
UPPER GRAND RIVER RESERVOIR
SYSTEM (JACKSON COMPLEX)**

ONONDAGA POOL, SANDSTONE POOL,
MINARD POOL

SCALE OF FEET

U.S. ARMY ENGINEER DISTRICT, DETROIT

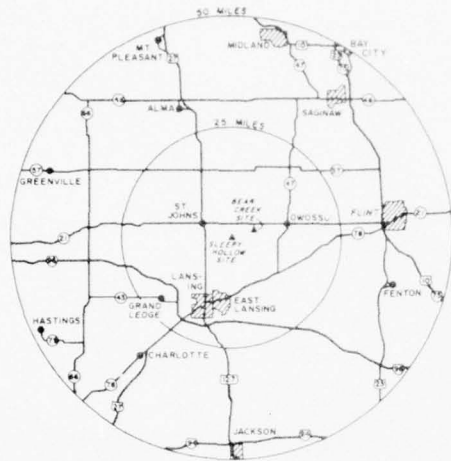




RED CEDAR COMPLEX

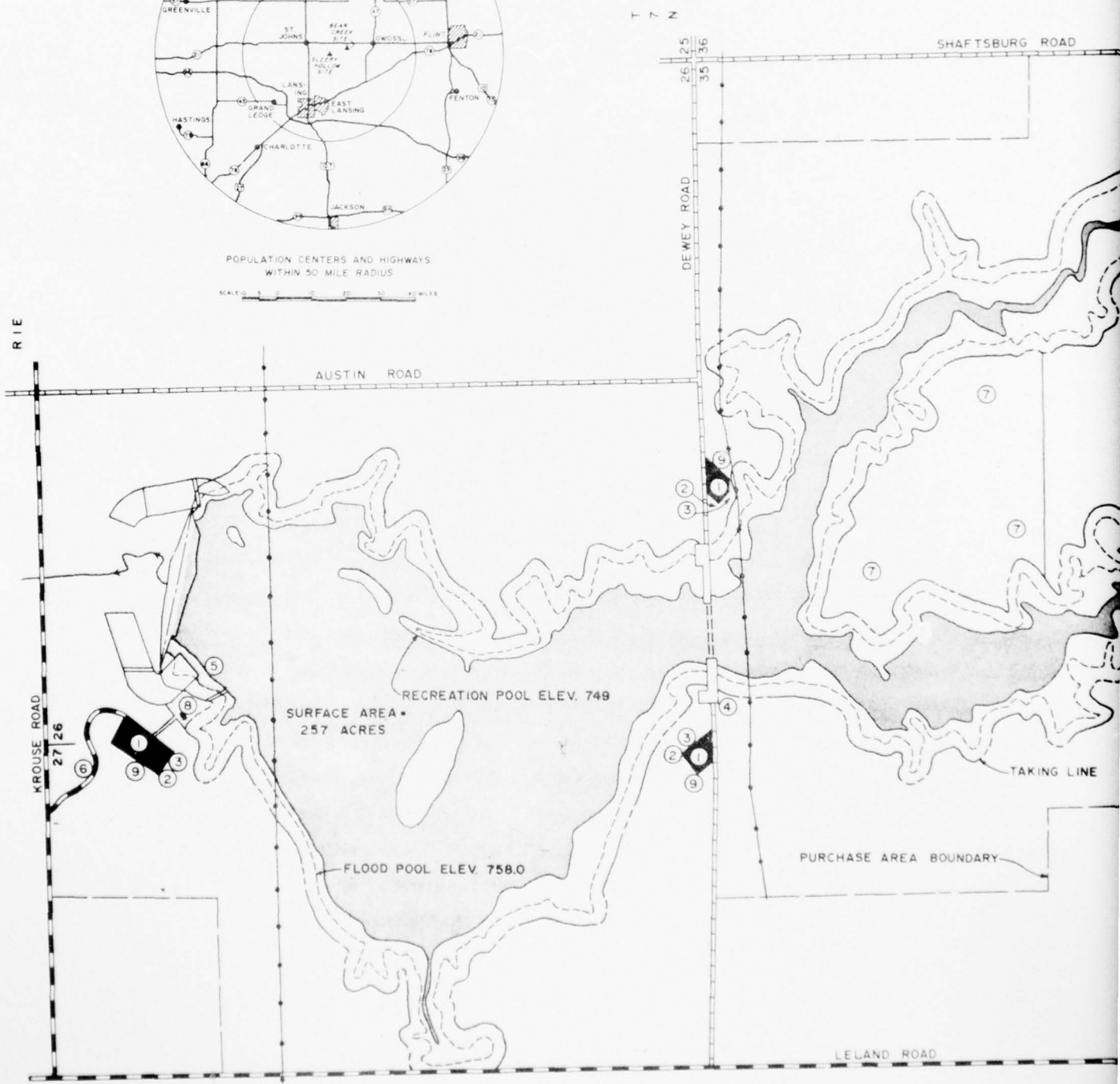
THIS COMPLEX WOULD BE COMPRISED OF THREE SEPARATE POOLS. OKEMOS, THE LOWER POOL WOULD BE ON THE MAIN STEM OF THE RED CEDAR RIVER AND WOULD BE MANAGED PRIMARILY AS A FLOOD CONTROL OR DRY POOL. WILLIAMSTON, THE MIDDLE POOL WOULD ALSO BE ON THE MAIN STEM AND WOULD BE A FLUCTUATING POOL. MAJOR STORAGE CAPACITY WOULD BE FOR FLOOD CONTROL WITH ADDITIONAL STORAGE FOR WATER QUALITY. DOAN THE UPPER POOL WOULD BE LOCATED ON DOAN CREEK. IT WOULD CONTAIN A STABLE POOL FOR RECREATION AND FISH AND WILDLIFE NEEDS. THE MAXIMUM POOL ELEVATIONS, IN FEET, WOULD BE, OKEMOS 865, WILLIAMSTON 884; AND DOAN 900 FEET.

GRAND RIVER BASIN, MICHIGAN
**UPPER GRAND RIVER RESERVOIR
 SYSTEM (RED CEDAR COMPLEX)**
 OKEMOS POOL, WILLIAMSTON POOL,
 DOAN POOL
 SCALE OF FEET
 U.S. ARMY ENGINEER DISTRICT, DETROIT



POPULATION CENTERS AND HIGHWAYS
WITHIN 50 MILE RADIUS

SCALE 0 10 20 30 40 50 MILES



RECREATION POOL ELEV. 749
SURFACE AREA •
257 ACRES

FLOOD POOL ELEV. 758.0

PURCHASE AREA BOUNDARY

TAKING LINE

R 1 E

AUSTIN ROAD

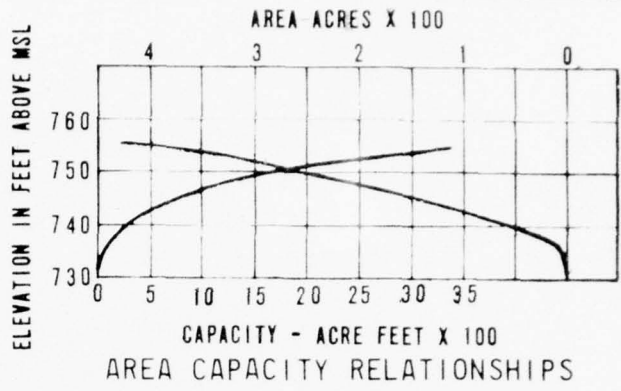
T 7 N

SHAFTSBURG ROAD

KROUSE ROAD
27 26

DEWEY ROAD
26 25
35 36

LELAND ROAD

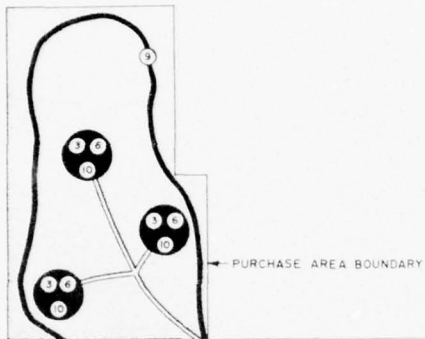
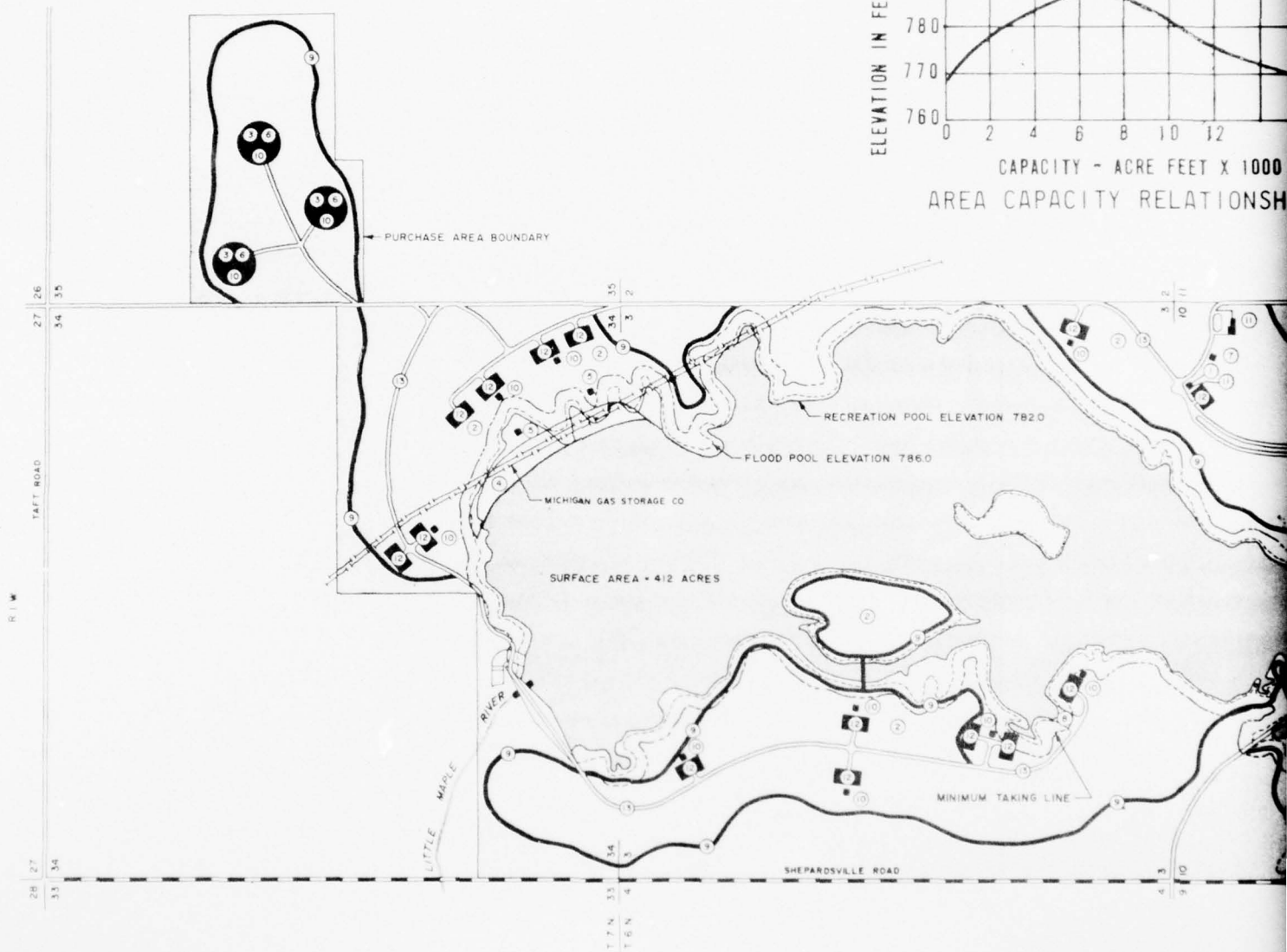
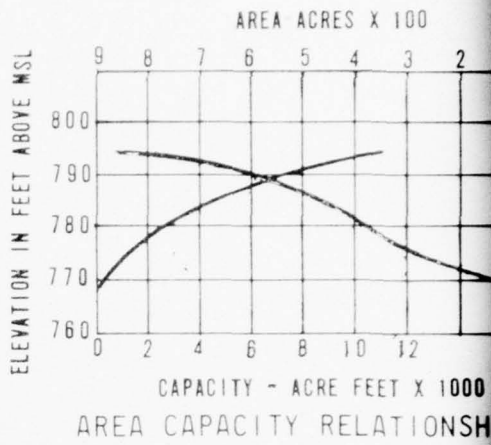


- LEGEND
- ① PARKING LOT
 - ② WELL
 - ③ TOILET
 - ④ BOAT RAMP
 - ⑤ SAND BEACH
 - ⑥ ROAD
 - ⑦ PRIMITIVE CAMPING AREA
 - ⑧ BEACH HOUSE
 - ⑨ PICNIC AREA

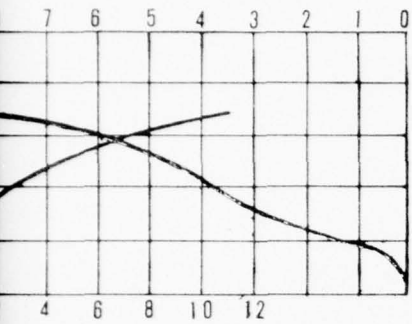


GRAND RIVER BASIN, MICHIGAN
 UPPER MAPLE RIVER WATERSHED
 SHIAWASSEE COUNTY, MICHIGAN
 SITE 109 BEAR CREEK MULTIPLE PURPOSE STRUCTURE
 PUBLIC RECREATION DEVELOPMENT

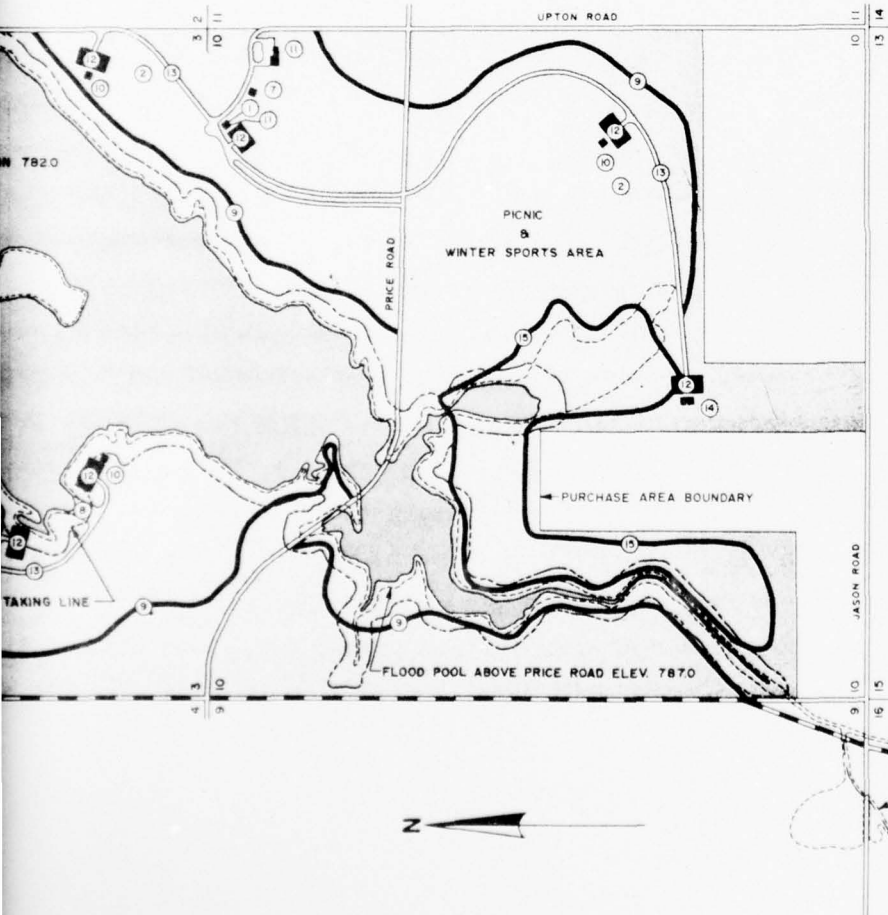




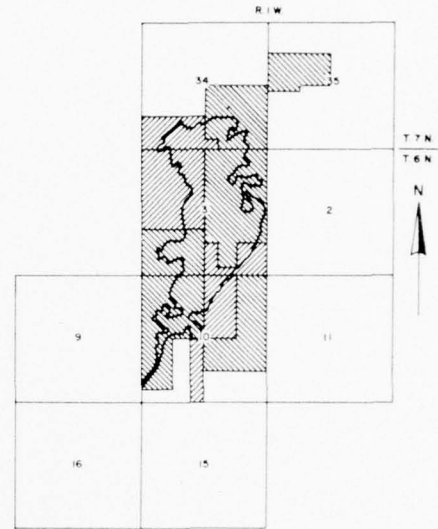
AREA - ACRES X 100



CAPACITY - ACRE FEET X 1000
CAPACITY RELATIONSHIPS



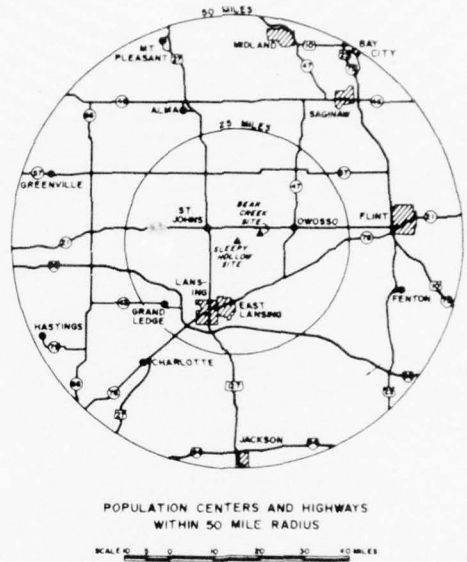
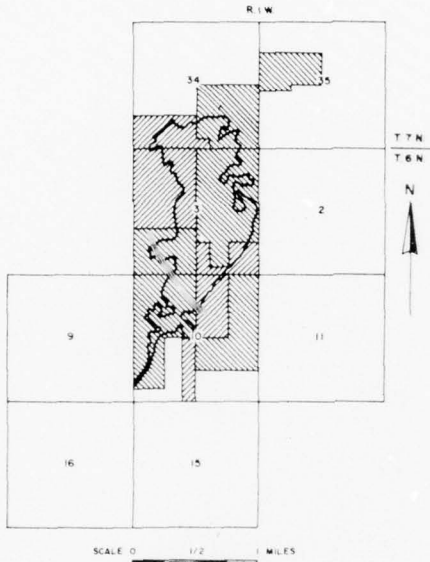
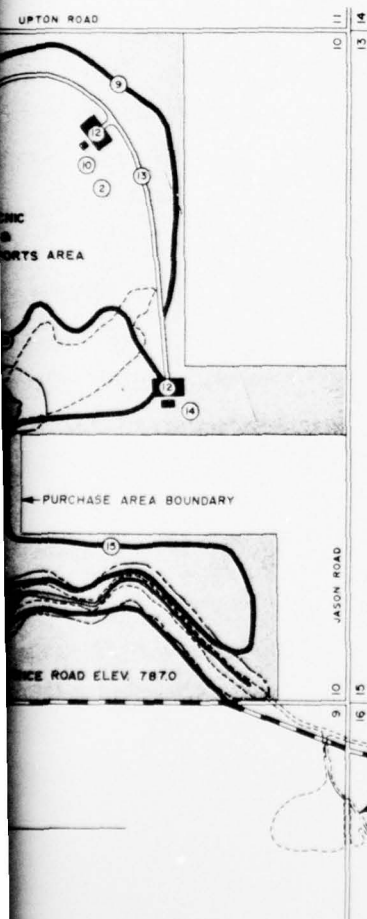
SCALE 500 0 500 1000 1500 FEET



LAND STATUS MAP

- LAND TO BE FURNISHED BY STATE (444 Ac)
- AREA FOR PL-566 COST SHARING (983 Ac)
- RECREATION POOL ELEVATION 7820

GRAND RIVER BAS
UPPER MAPLE RIV
CLINTON COUNT
SITE 110 SLEEPY HOLLOW MULT
PUBLIC RECREATION



LAND STATUS MAP

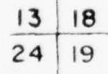
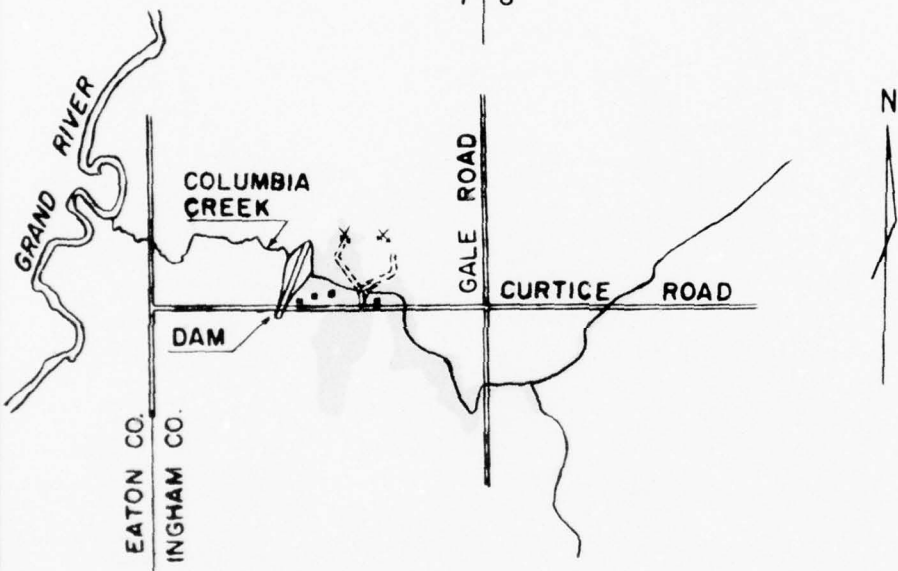
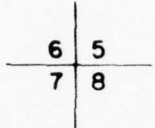
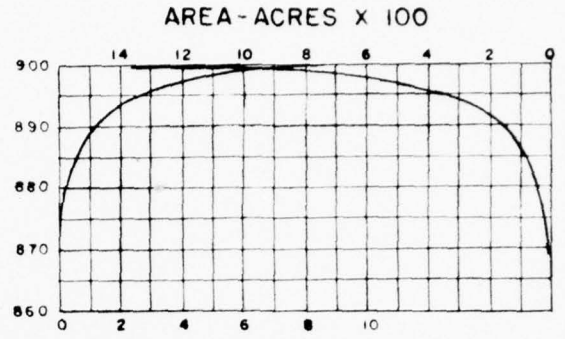
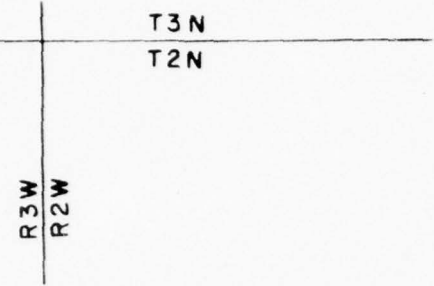
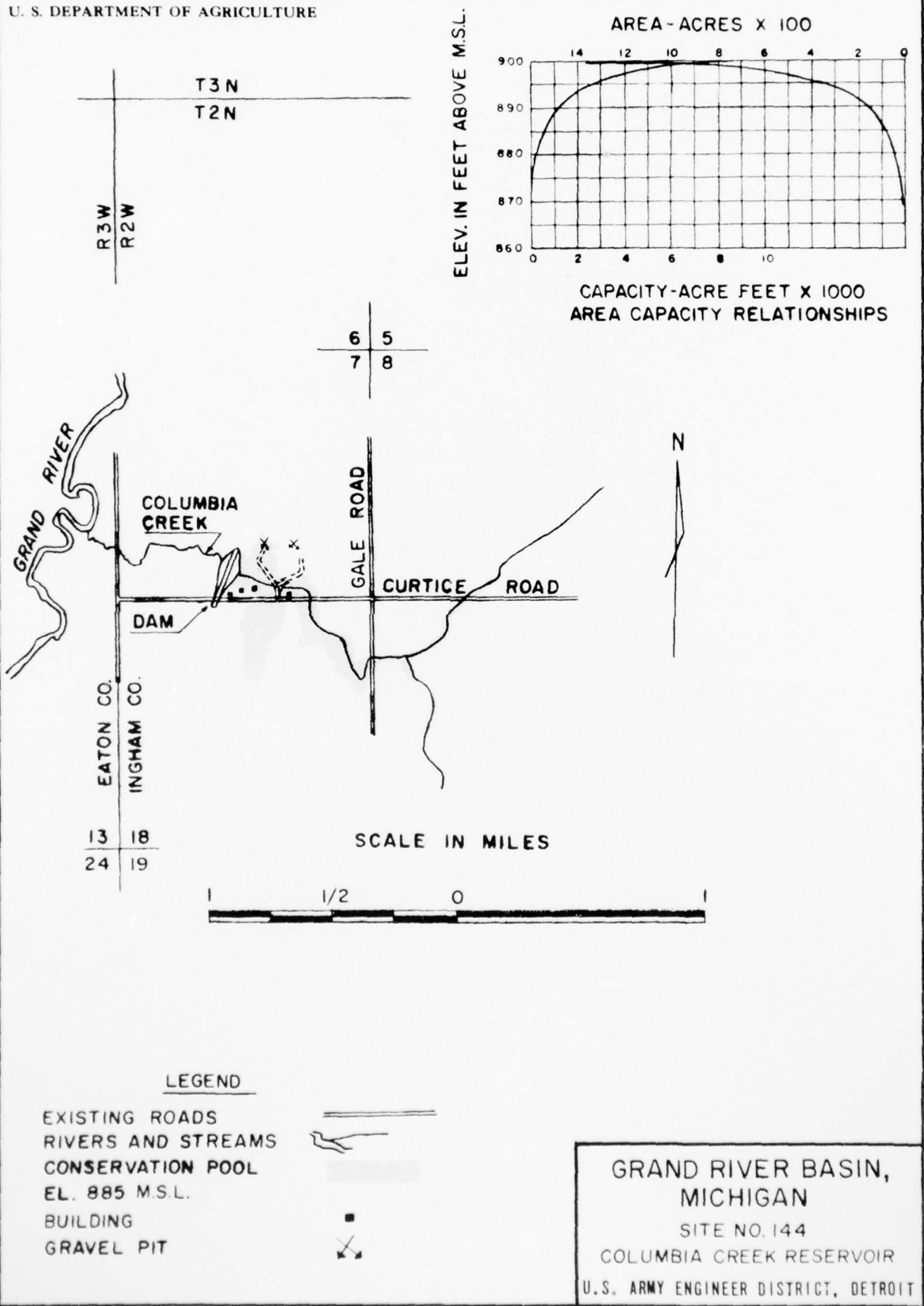
- LAND TO BE FURNISHED BY STATE (444 Ac)
- AREA FOR PL-566 COST SHARING (983 Ac)
- RECREATION POOL ELEVATION 782.0

LEGEND

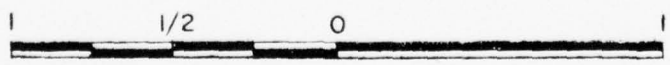
- ① GATE HOUSE
- ② PICNIC AREA
- ③ TRAILER CAMPING
- ④ SAND BEACH
- ⑤ BEACH HOUSE
- ⑥ TENT CAMPING
- ⑦ PARK SUPT & ASST SUPT RESIDENCES
- ⑧ BOAT RAMP
- ⑨ NATURE AND HIKING TRAIL
- ⑩ TOILETS
- ⑪ OFFICE, SHOP & GARAGE
- ⑫ PARKING LOT
- ⑬ ROAD
- ⑭ INTERPRETIVE CENTER
- ⑮ INTERPRETIVE NATURE TRAIL

GRAND RIVER BASIN, MICHIGAN
 UPPER MAPLE RIVER WATERSHED
 CLINTON COUNTY, MICHIGAN
 SITE 110 SLEEPY HOLLOW MULTIPLE PURPOSE STRUCTURE
 PUBLIC RECREATION DEVELOPMENT

U. S. DEPARTMENT OF AGRICULTURE



SCALE IN MILES

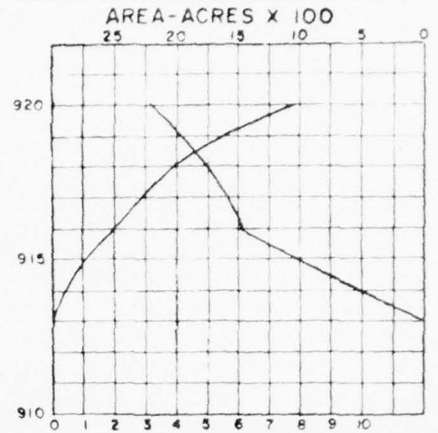


LEGEND

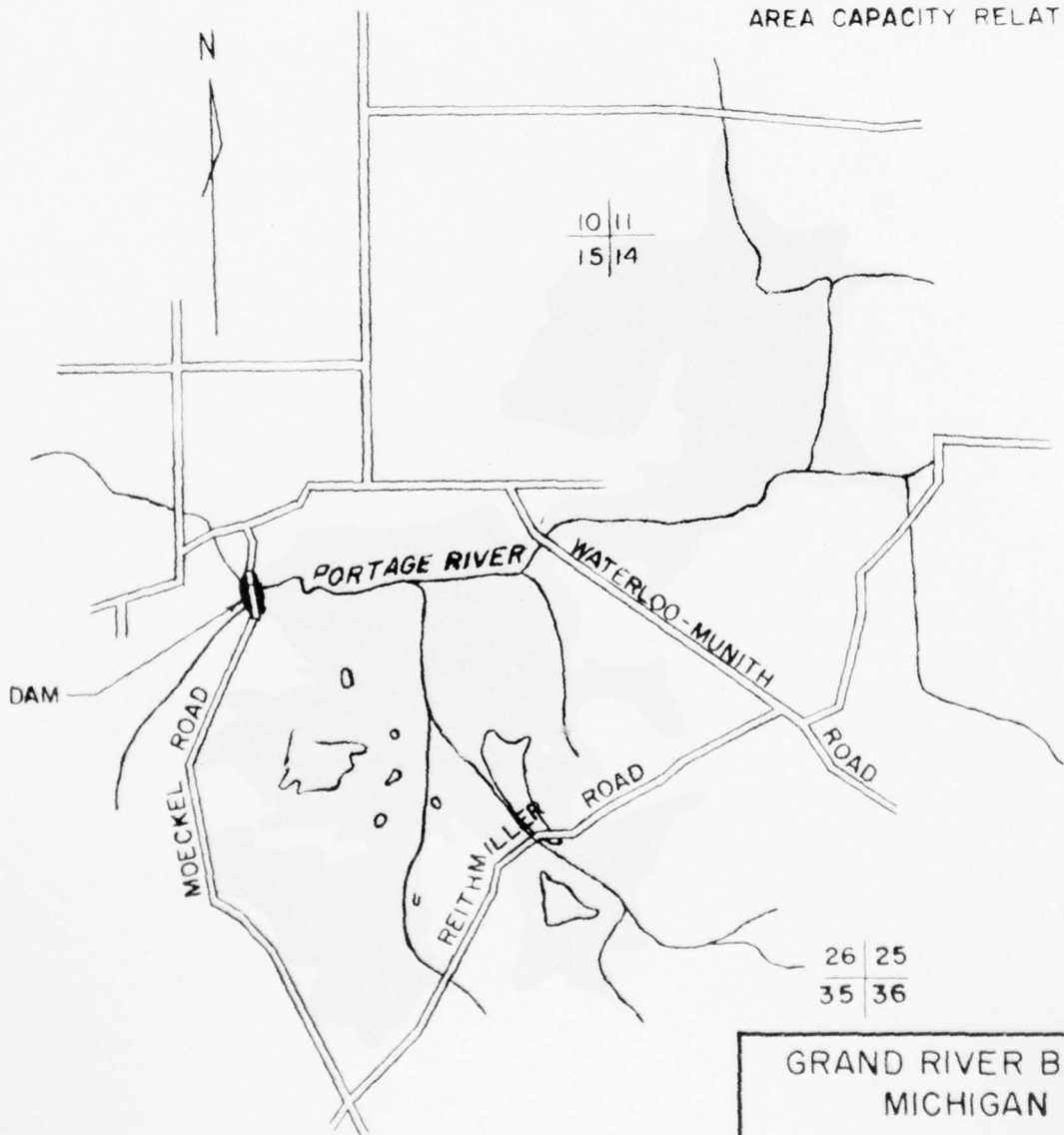
- EXISTING ROADS
- RIVERS AND STREAMS
- CONSERVATION POOL
- EL. 885 M.S.L.
- BUILDING
- GRAVEL PIT

GRAND RIVER BASIN,
MICHIGAN
SITE NO. 144
COLUMBIA CREEK RESERVOIR
U.S. ARMY ENGINEER DISTRICT, DETROIT

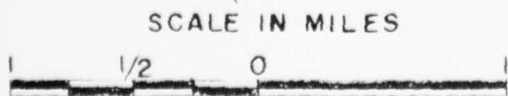
LEGEND
 EXISTING ROADS
 RIVERS AND STREAMS
 CONSERVATION POOL
 EL. 920 M.S.L.



CAPACITY-ACRE FEET X 1000
 AREA CAPACITY RELATIONSHIPS



JACKSON CO.
 INGHAM CO.



GRAND RIVER BASIN,
 MICHIGAN
 SITE NO. 171
 PORTAGE RIVER RESERVOIR
 U.S. ARMY ENGINEER DISTRICT, DETROIT



BASED ON U.S. GEOLOGICAL SURVEY QUADRANGLES

AD-A043 989

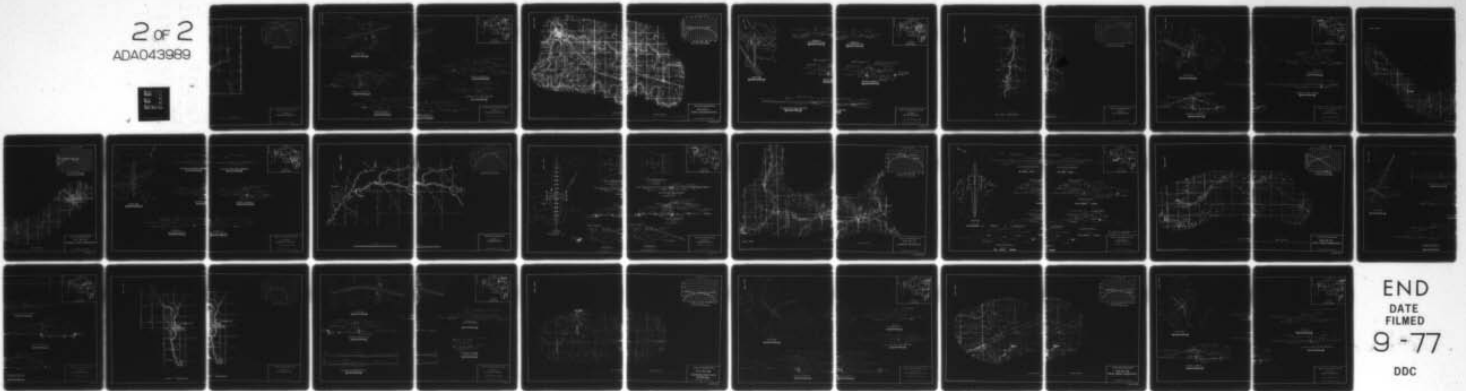
GRAND RIVER BASIN COORDINATING COMMITTEE DETROIT MI
GRAND RIVER BASIN MICHIGAN. COMPREHENSIVE WATER RESOURCES STUDY--ETC(U)
AUG 73

F/G 8/6

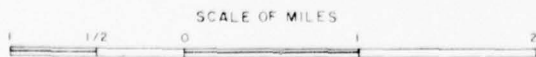
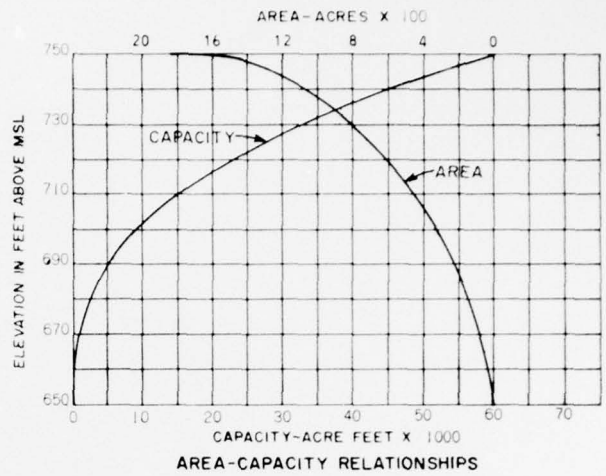
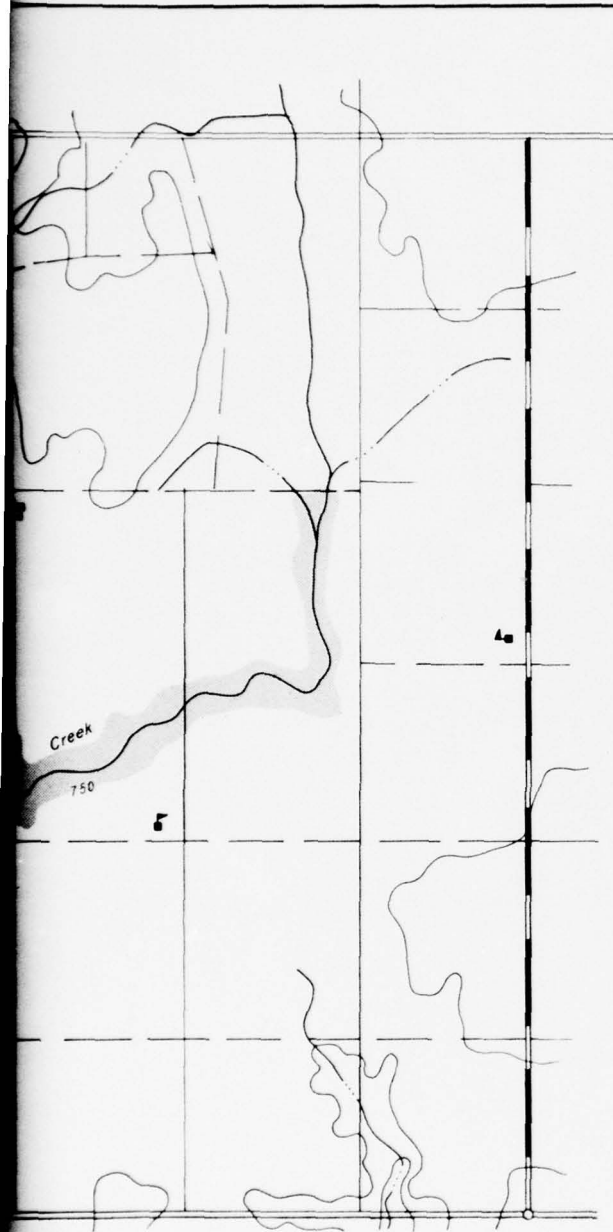
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NL

2 of 2
ADA043989



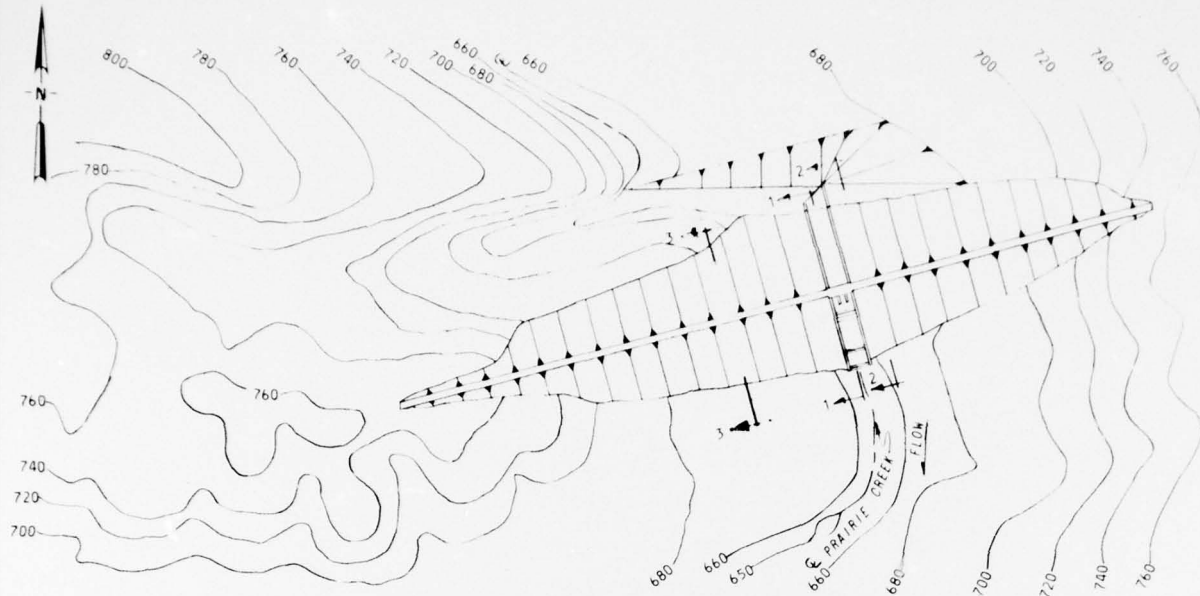
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DATE
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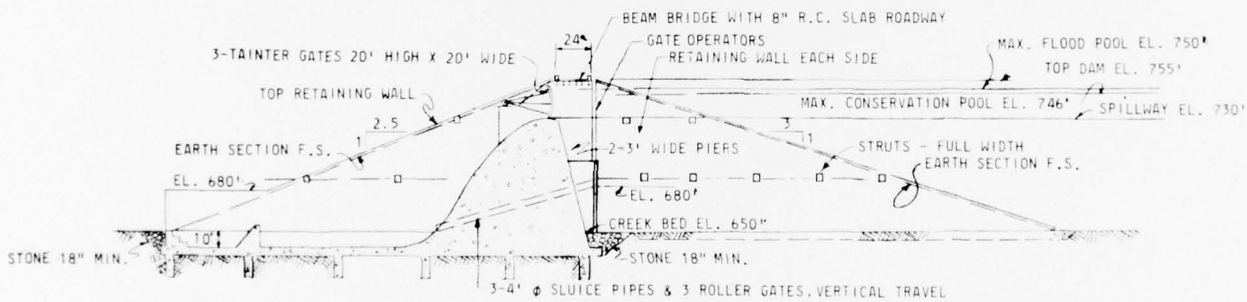
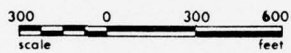
GRAND RIVER BASIN, MICHIGAN

SITE NO. 42
PRAIRIE CREEK RESERVOIR

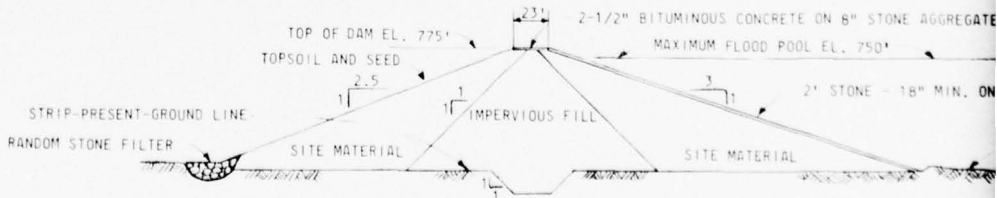
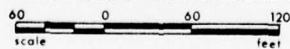
U.S. ARMY ENGINEER DISTRICT, DETROIT



PLAN OF DAM

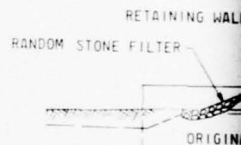
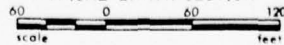


SECTIONAL ELEVATION I-I

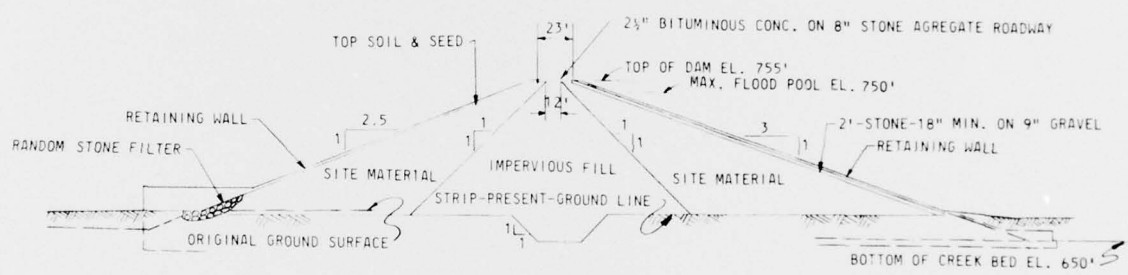
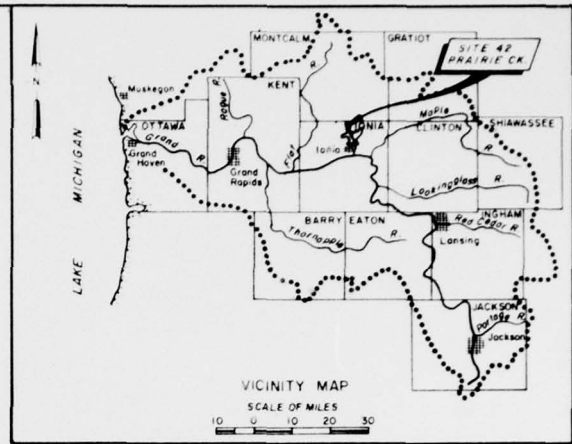
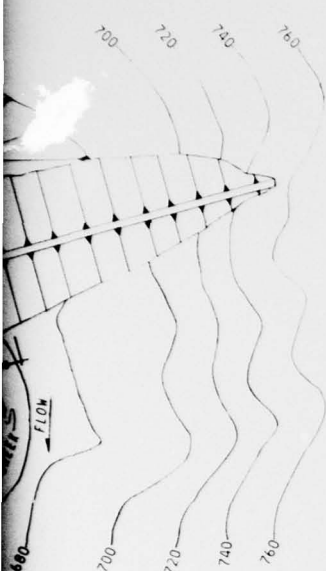


SECTIONAL ELEVATION 3-3

TYPICAL EARTH SECTION



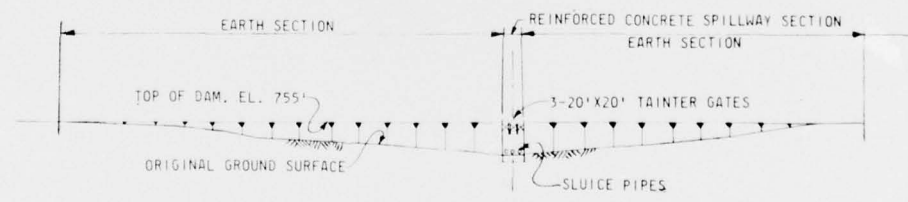
TOP
OR



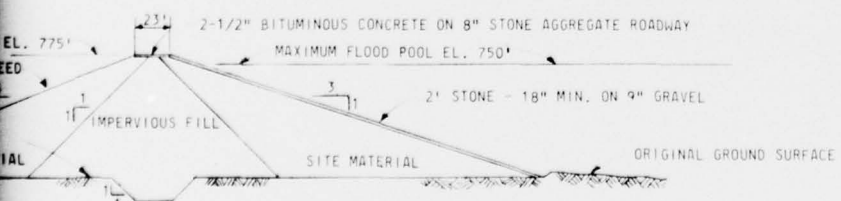
SECTIONAL ELEVATION 2-2
 60 0 60 120
 scale feet

SLAB ROADWAY
 SIDE
 MAX. FLOOD POOL EL. 750'
 TOP DAM EL. 755'
 CONSERVATION POOL EL. 746'
 SPILLWAY EL. 730'

STRUTS - FULL WIDTH
 EARTH SECTION F.S.

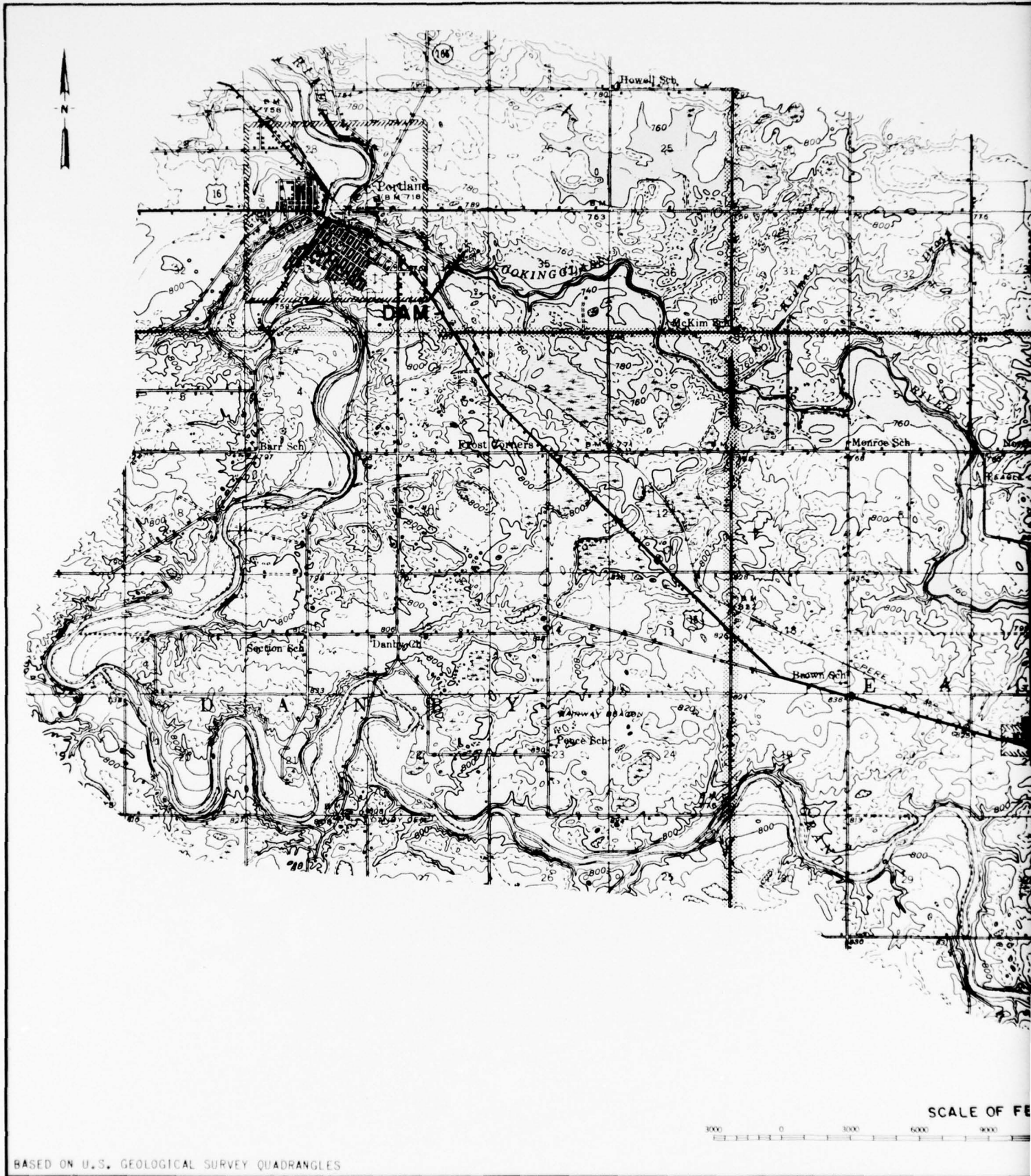
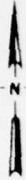


ELEVATION OF DAM LOOKING UPSTREAM
 300 0 300 600
 scale feet



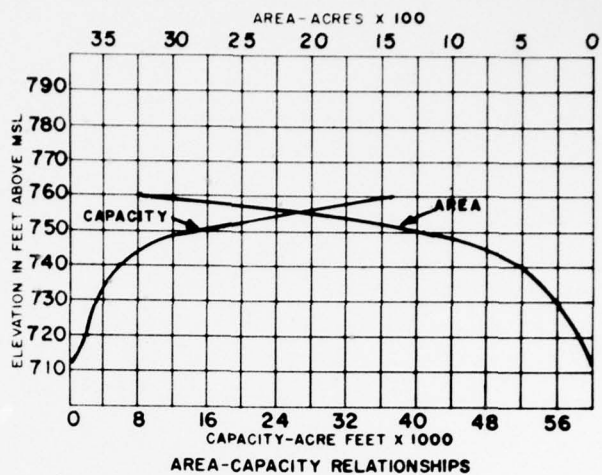
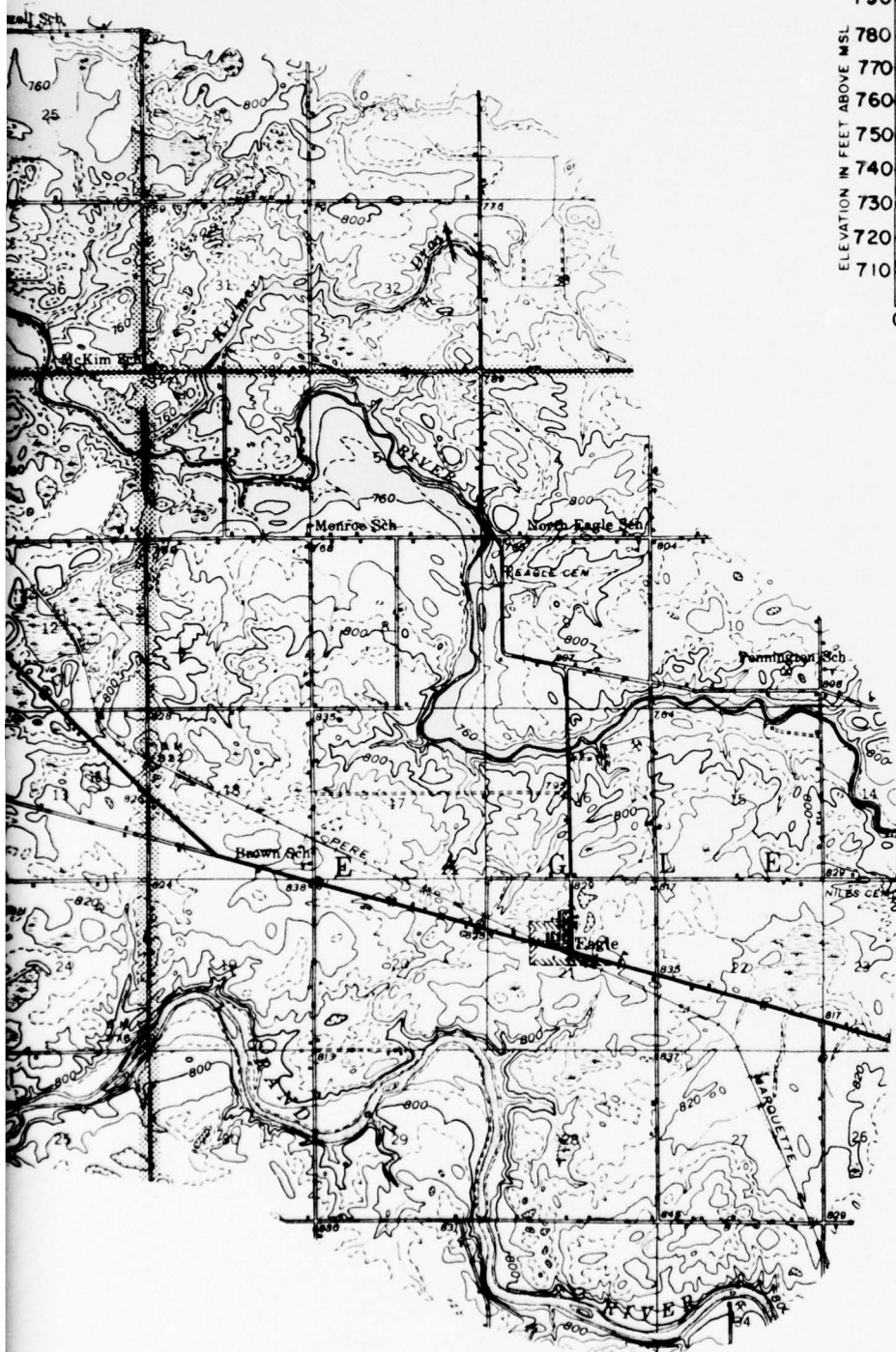
SECTIONAL ELEVATION 3-3
 TYPICAL EARTH SECTION
 0 60 120
 scale feet

GRAND RIVER BASIN, MICHIGAN
 SITE NO. 42
 PRAIRIE CREEK RESERVOIR
 PLAN AND SECTIONS OF DAM
 U.S. ARMY ENGINEER DISTRICT, DETROIT



BASED ON U.S. GEOLOGICAL SURVEY QUADRANGLES

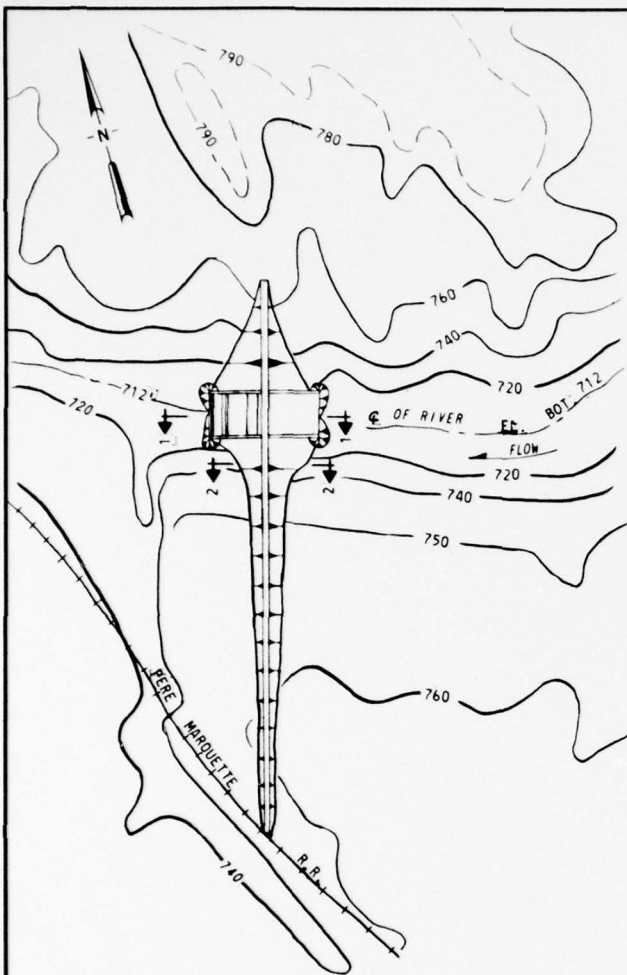
SCALE OF FE
0 3000 6000 9000



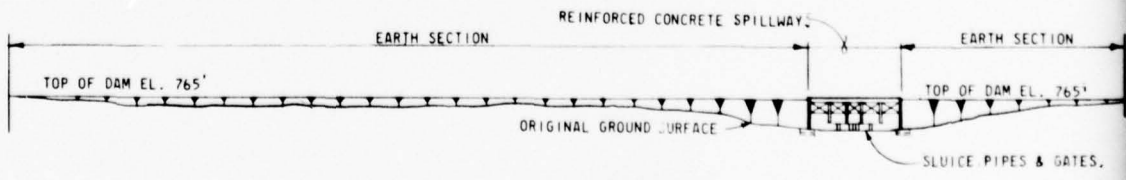
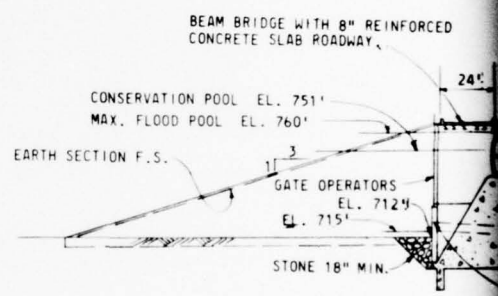
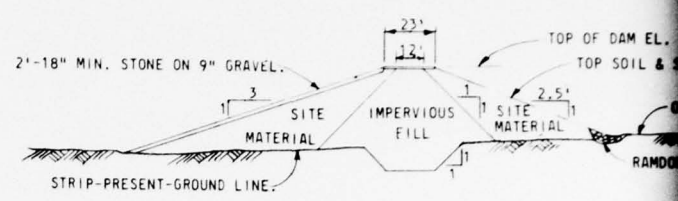
SCALE OF FEET

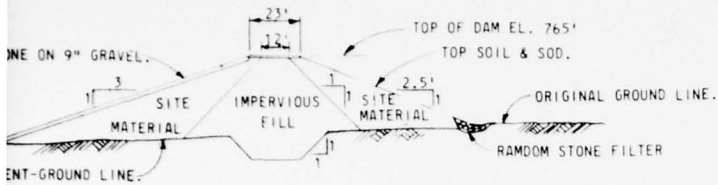


GRAND RIVER BASIN, MICHIGAN
 SITE NO. 51
 PORTLAND RESERVOIR
 U.S. ARMY ENGINEER DISTRICT, DETROIT

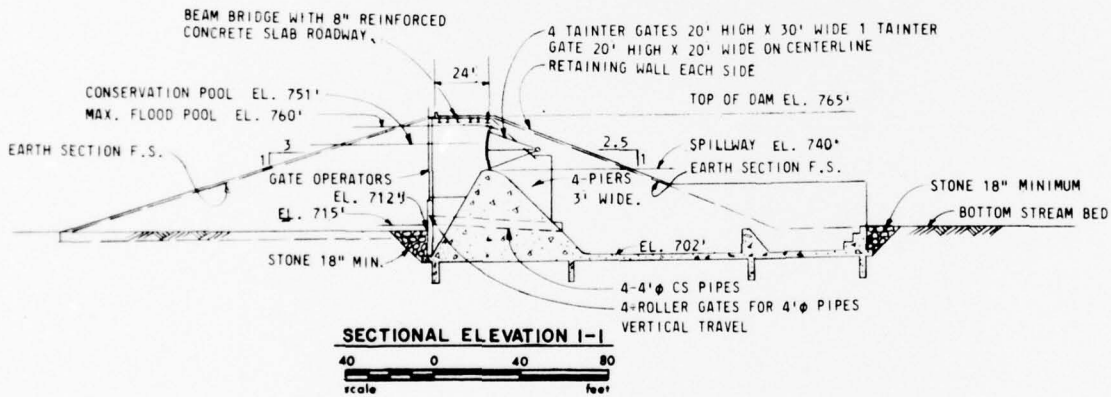
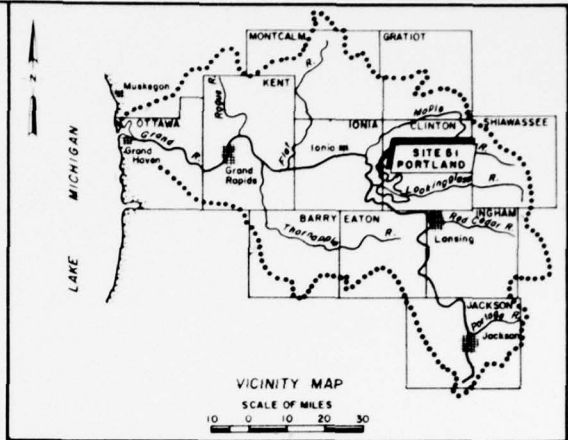


PLAN OF DAM
 300 0 300 600
 scale feet

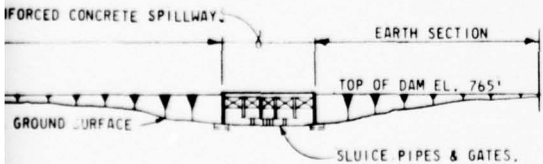




SECTION 2-2
TYPICAL FOR EARTH SECTIONS
 20 0 20 40
 scale feet

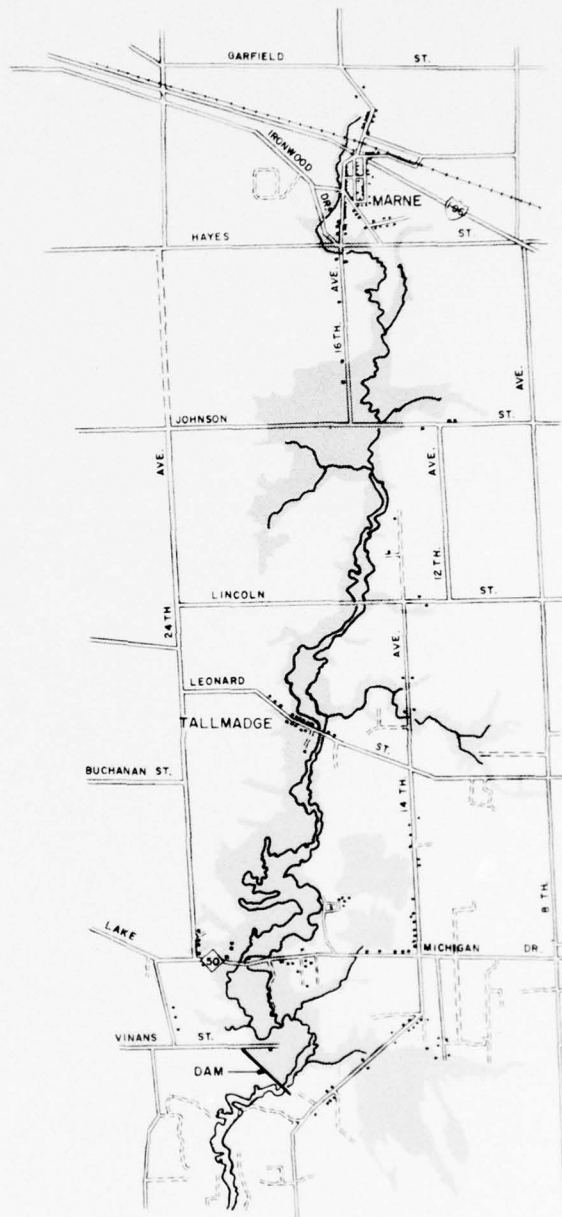
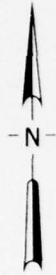


SECTIONAL ELEVATION 1-1
 40 0 40 80
 scale feet



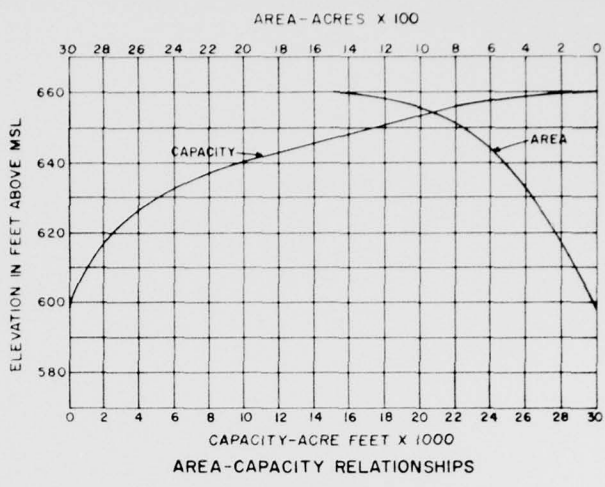
DOWNSTREAM
 100
 feet

GRAND RIVER BASIN, MICHIGAN
 SITE NO. 51
 PORTLAND RESERVOIR
 PLAN AND SECTIONS OF DAM
 U.S. ARMY ENGINEER DISTRICT, DETROIT



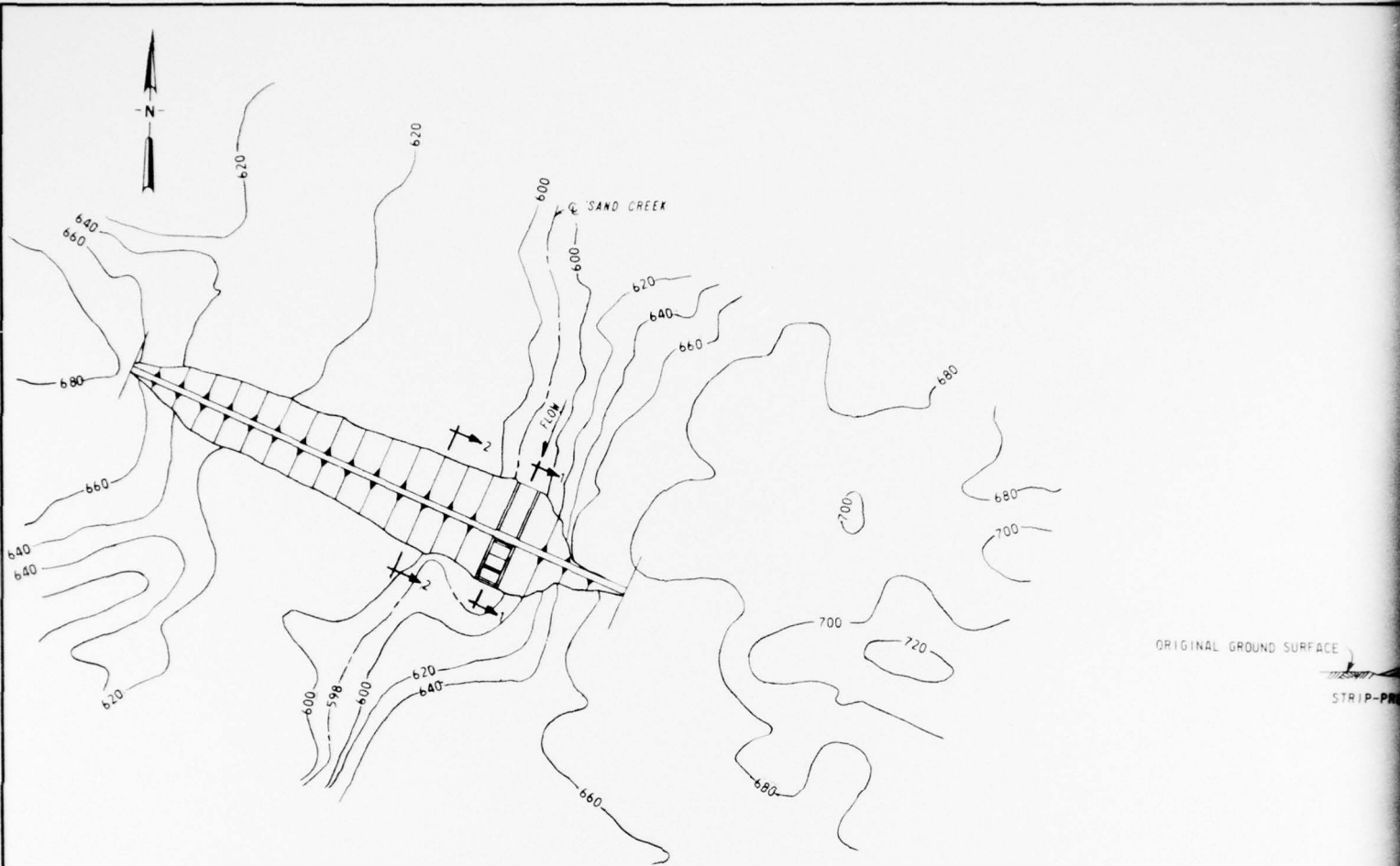
SCALE OF MILES



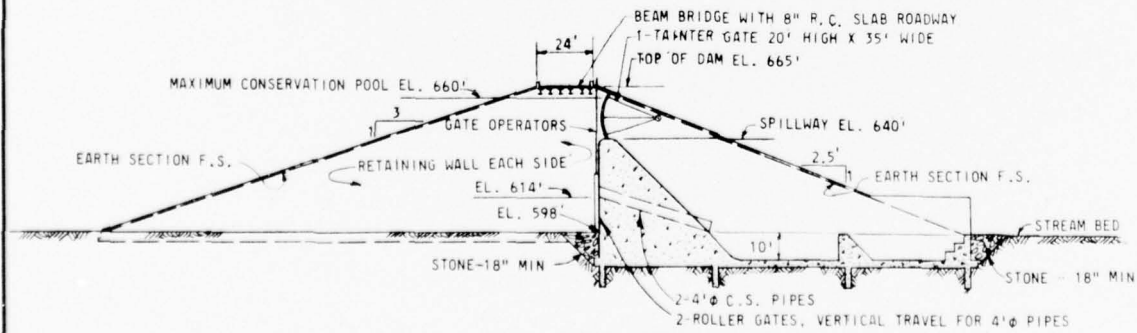
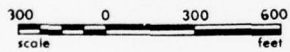


GRAND RIVER BASIN, MICHIGAN
 SITE NO. 74
 SAND CREEK RESERVOIR

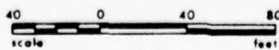
U.S. ARMY ENGINEER DISTRICT, DETROIT

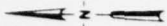


PLAN OF DAM



SECTIONAL ELEVATION I-I

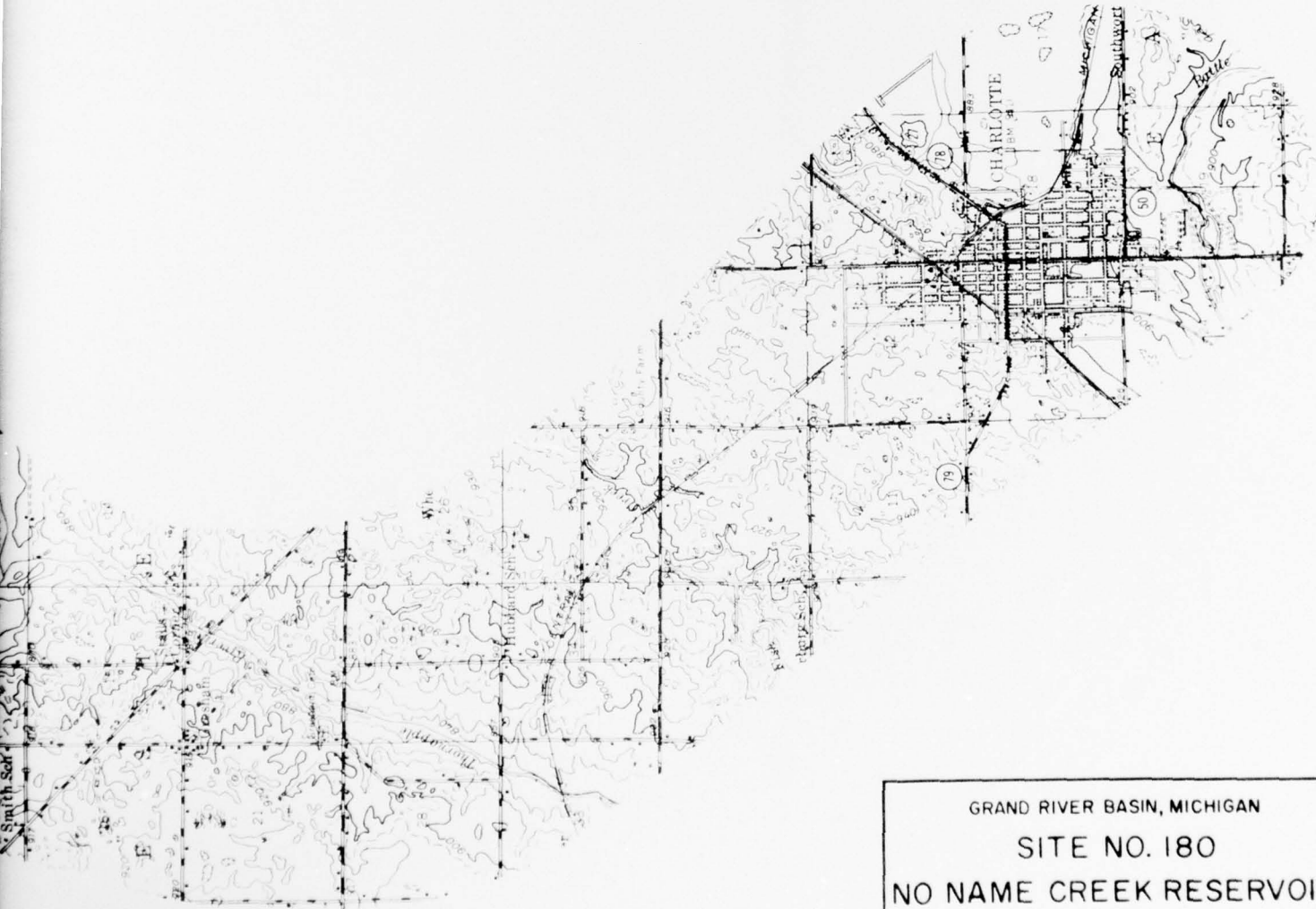
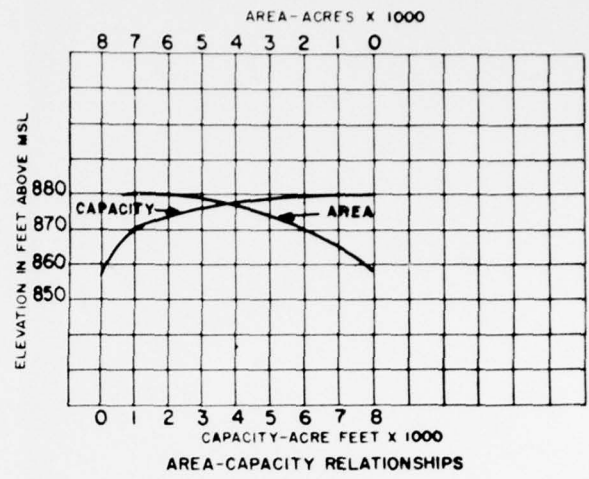




BASED ON U.S. GEOLOGICAL SURVEY QUADRANGLES



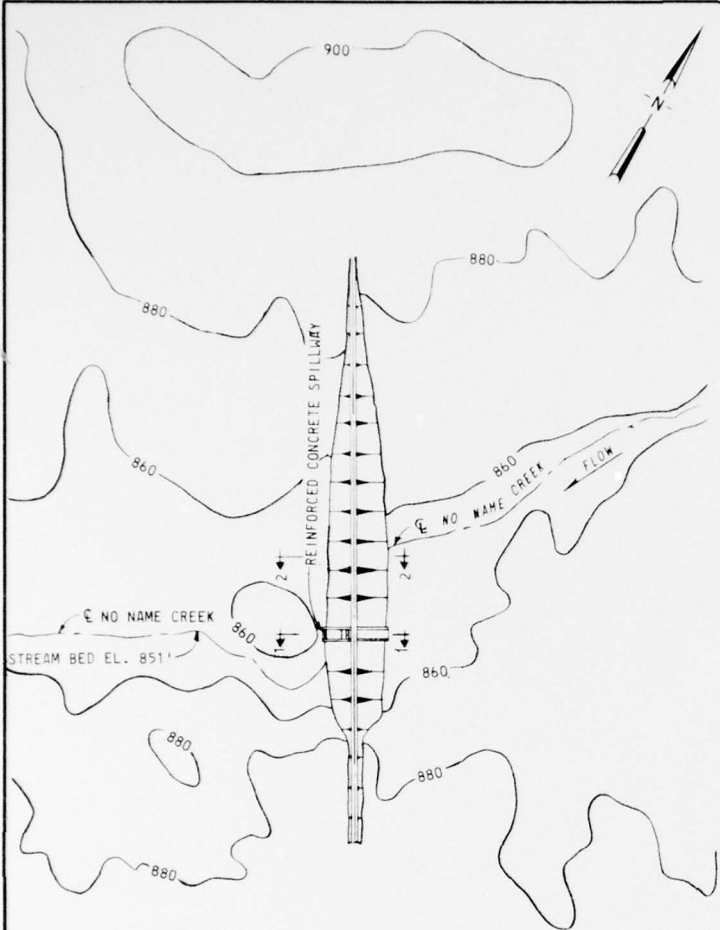
SCALE OF FEET



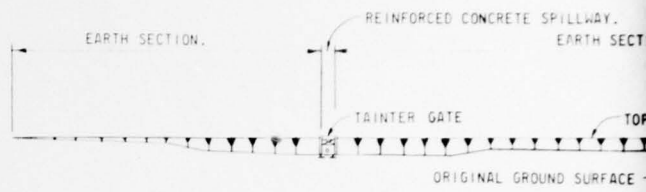
GRAND RIVER BASIN, MICHIGAN
 SITE NO. 180
 NO NAME CREEK RESERVOIR

U.S. ARMY ENGINEER DISTRICT, DETROIT

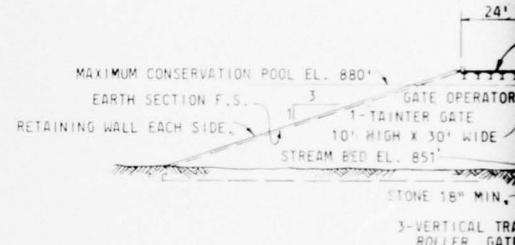




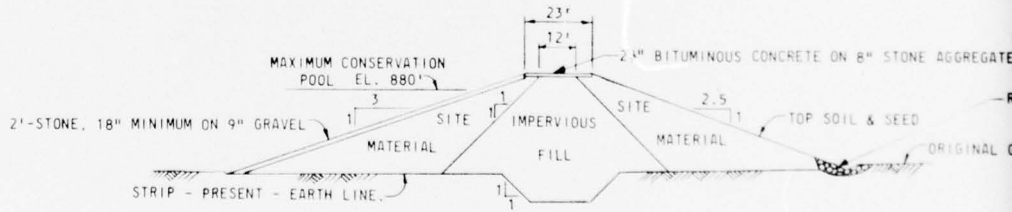
PLAN OF DAM
300 0 300 600
scale feet



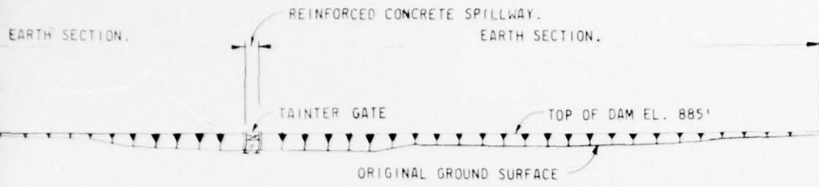
ELEVATION OF DAM LOOKING DOWNSTREAM
200 0 200 400
scale feet



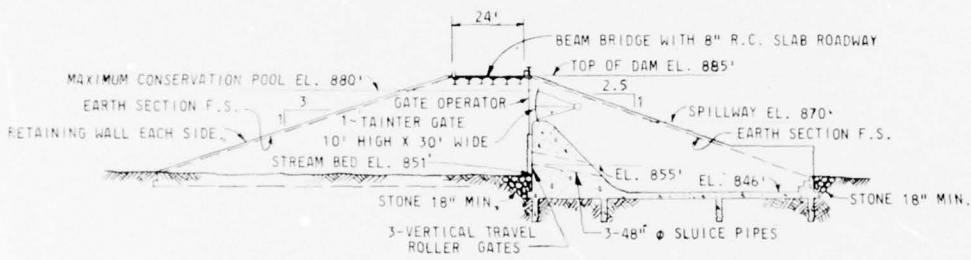
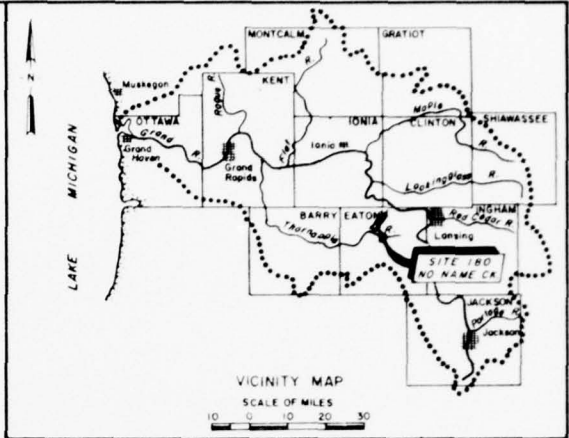
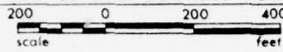
SECTIONAL ELEVATION
300 0
scale



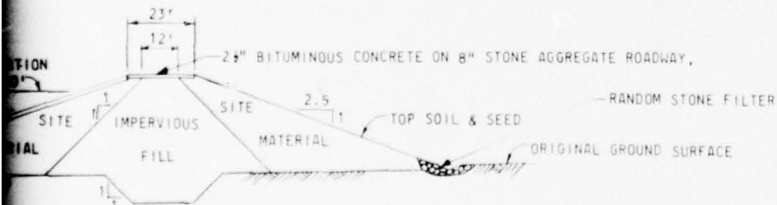
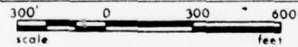
SECTION 2-2
TYPICAL FOR EARTH SECTIONS
300 0 300 600
scale feet



ELEVATION OF DAM LOOKING DOWNSTREAM

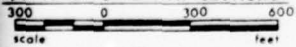


SECTIONAL ELEVATION I-1



SECTION 2-2

TYPICAL FOR EARTH SECTIONS



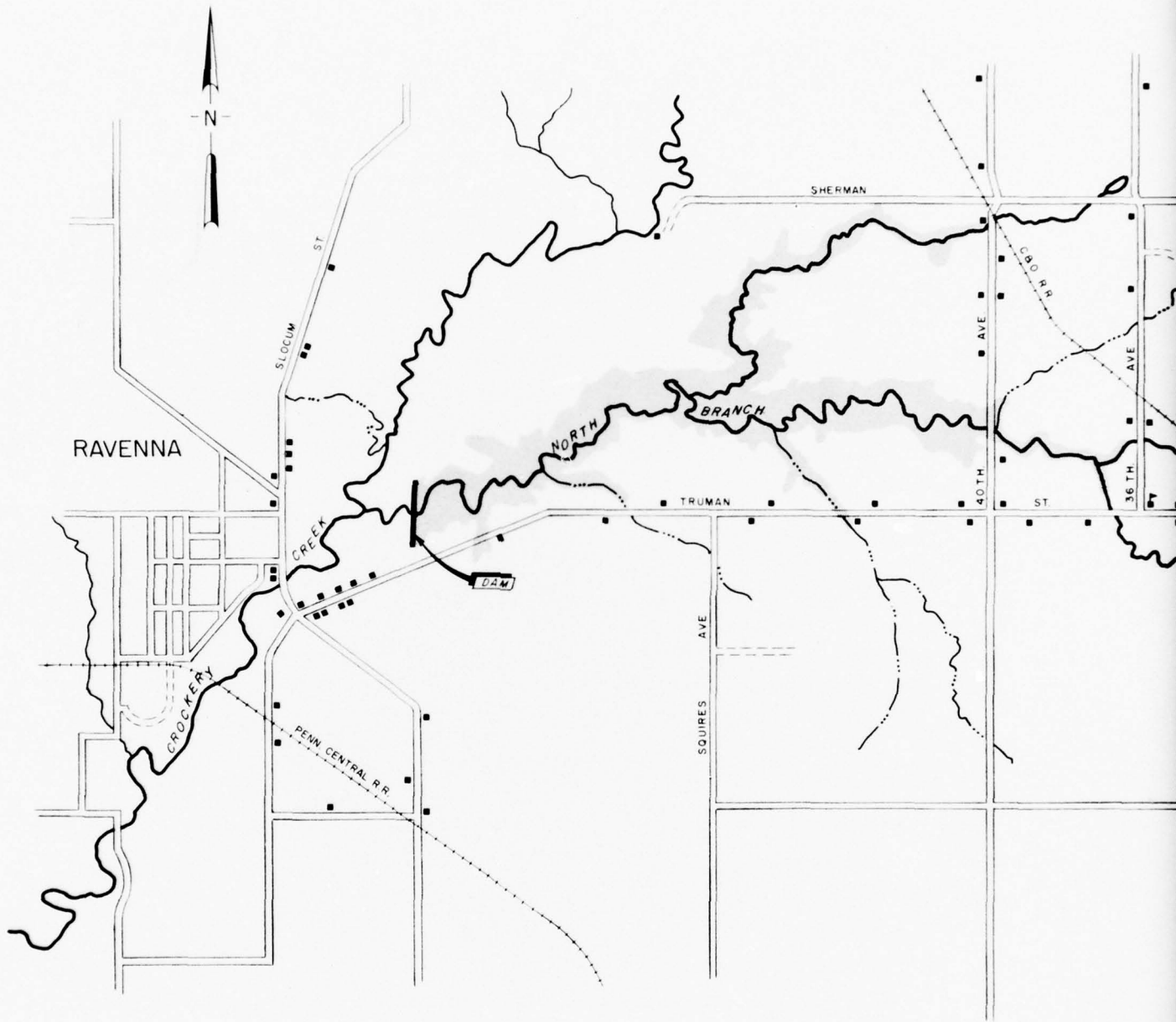
GRAND RIVER BASIN, MICHIGAN

SITE NO. 180

NO NAME CREEK RESERVOIR

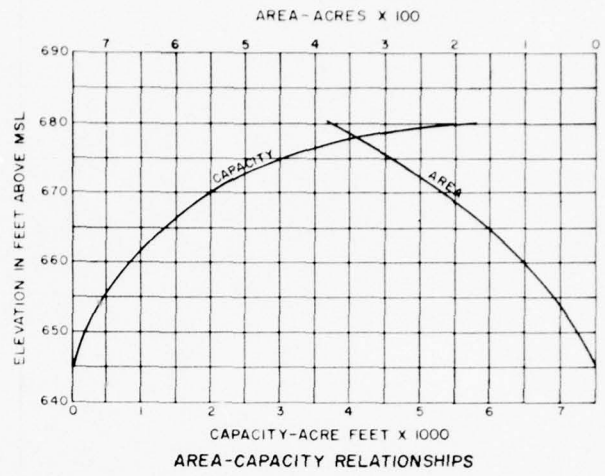
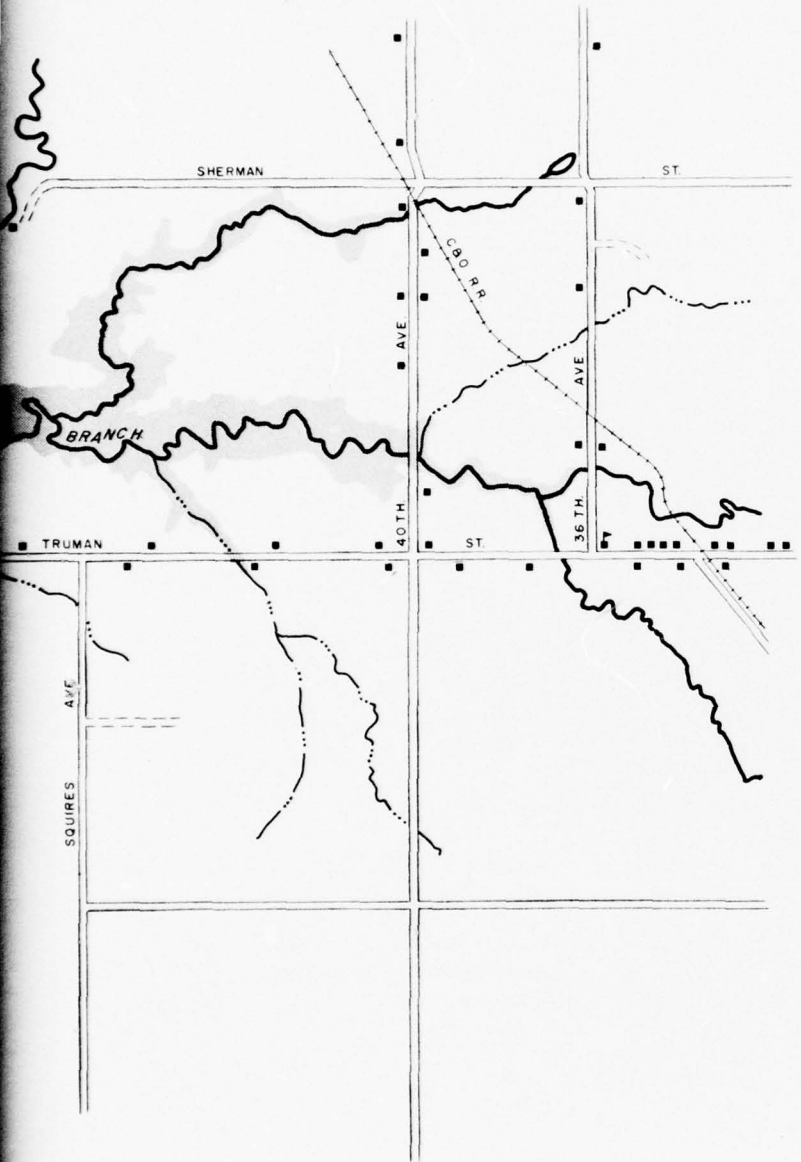
PLAN AND SECTIONS OF DAM

U.S. ARMY ENGINEER DISTRICT, DETROIT



SCALE OF MILES

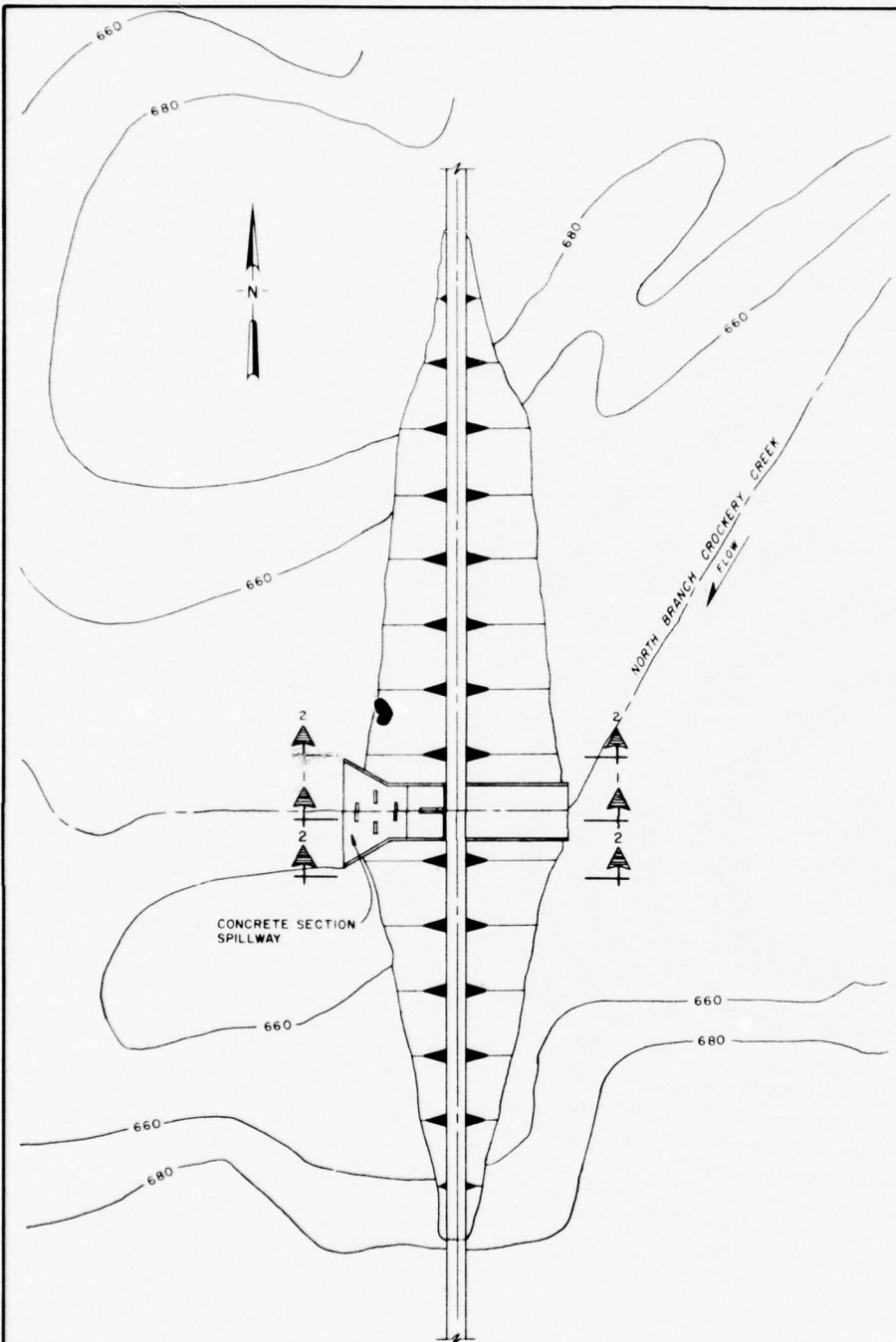




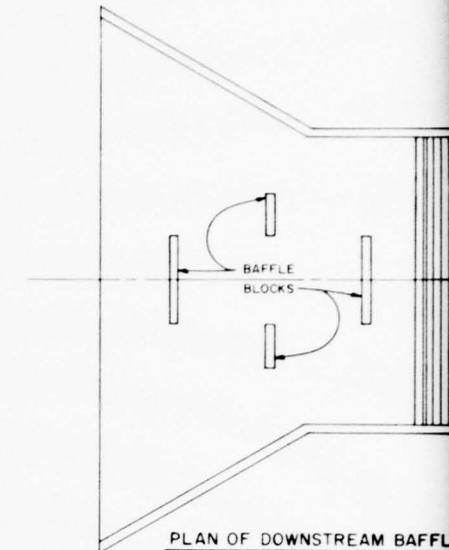
GRAND RIVER BASIN, MICHIGAN

SITE NO. 16
RAVENNA RESERVOIR

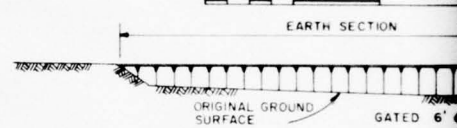
U.S. ARMY ENGINEER DISTRICT, DETROIT



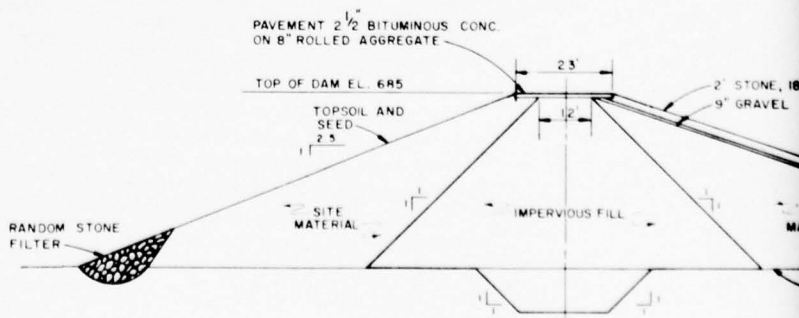
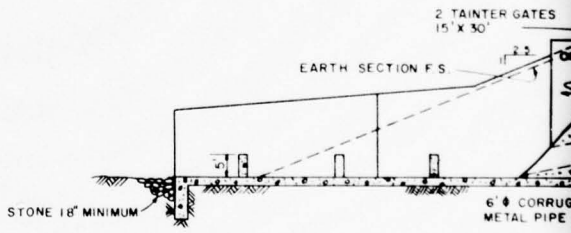
PLAN OF DAM
SCALE OF FEET
100 0 100 200



PLAN OF DOWNSTREAM BAFFLE
SCALE OF FEET
20 10 0 20

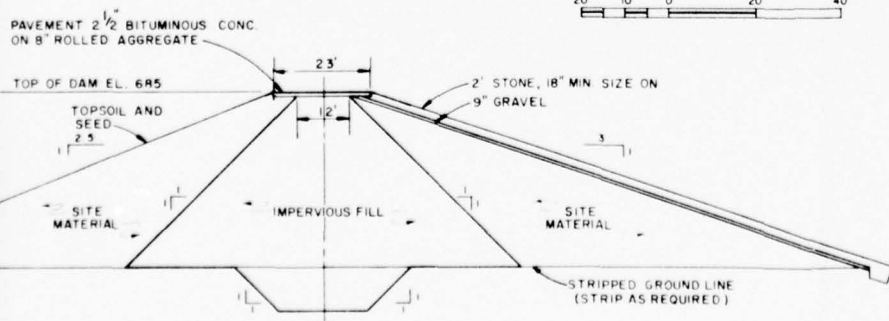
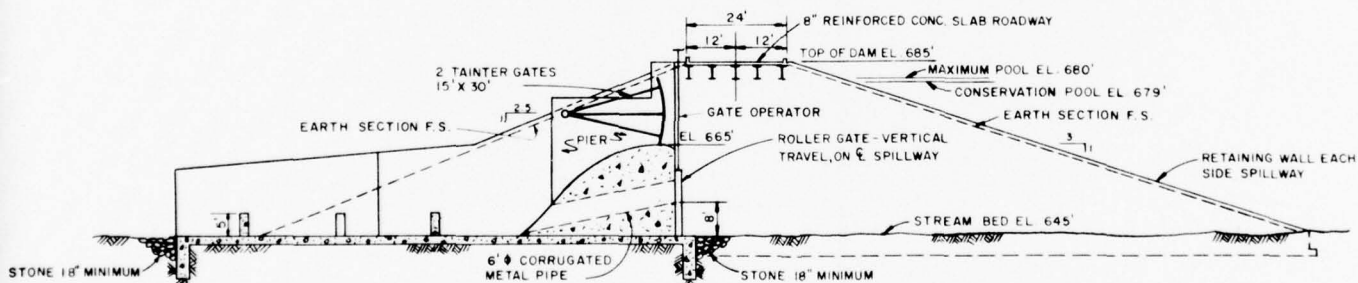
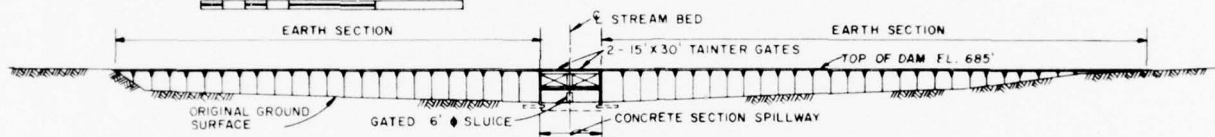
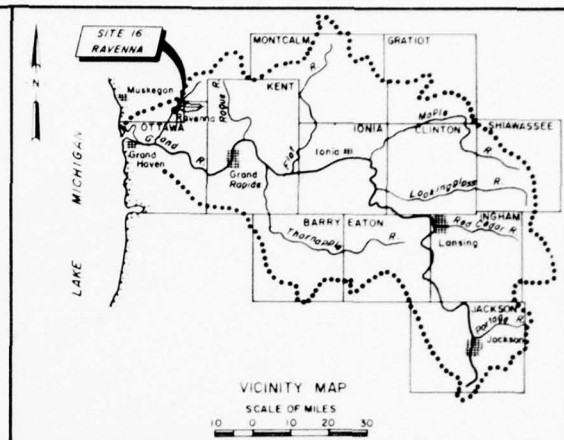
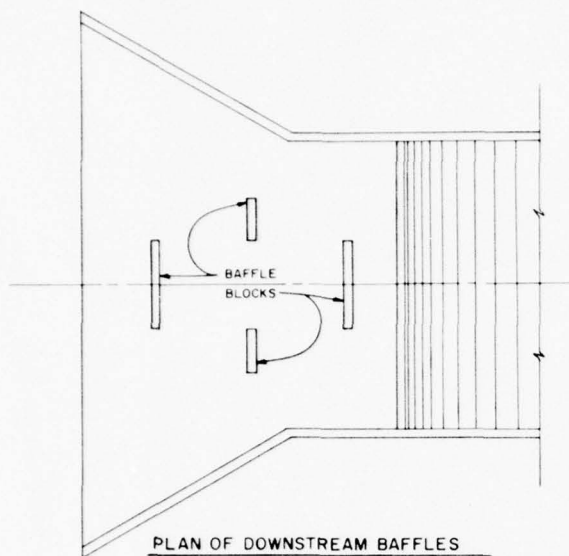


ELEVATION



SECTION 2-2
TYPICAL EARTH SECTION

SCALE OF FEET
20 10 0 20 40

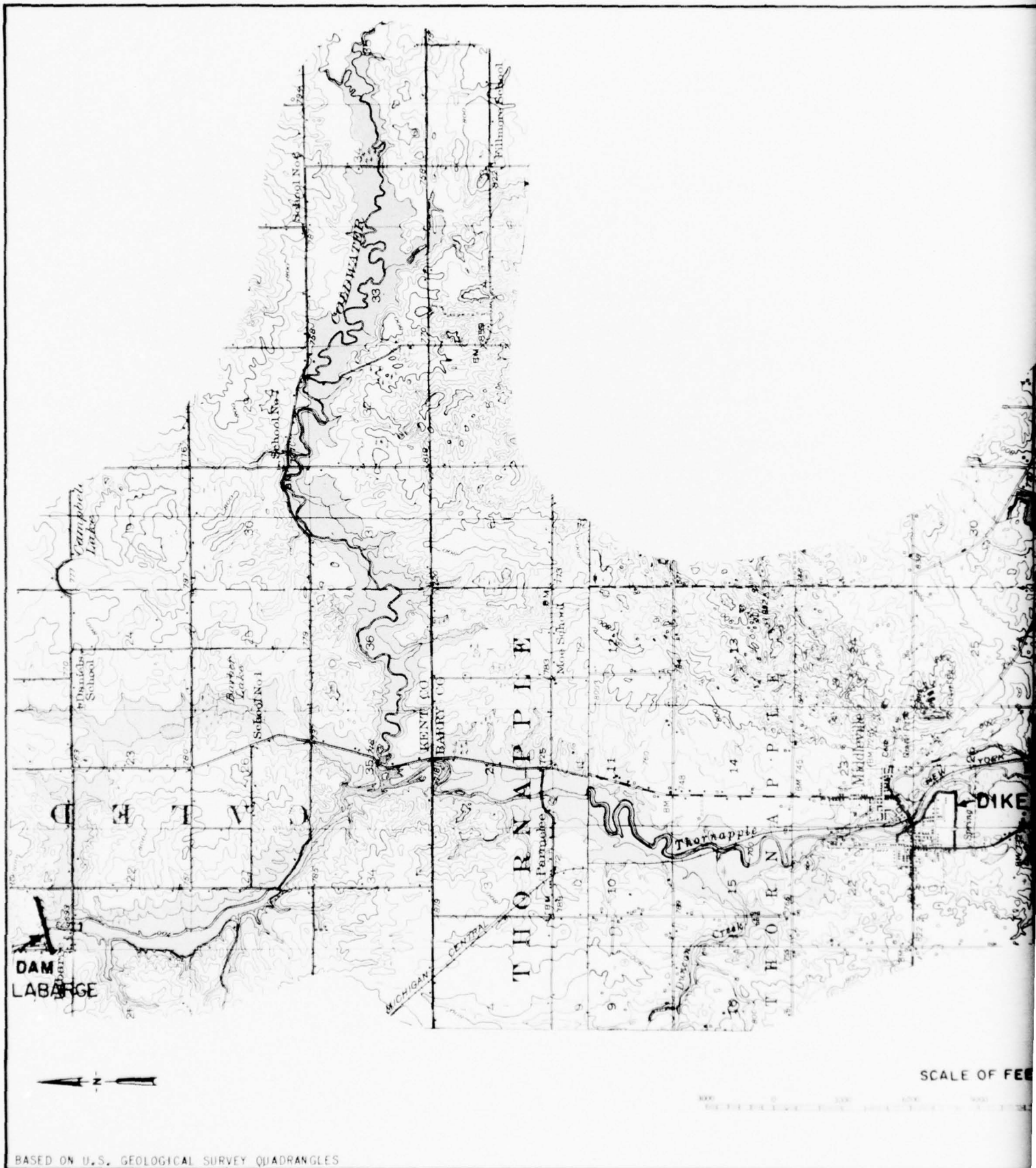


GRAND RIVER BASIN, MICHIGAN

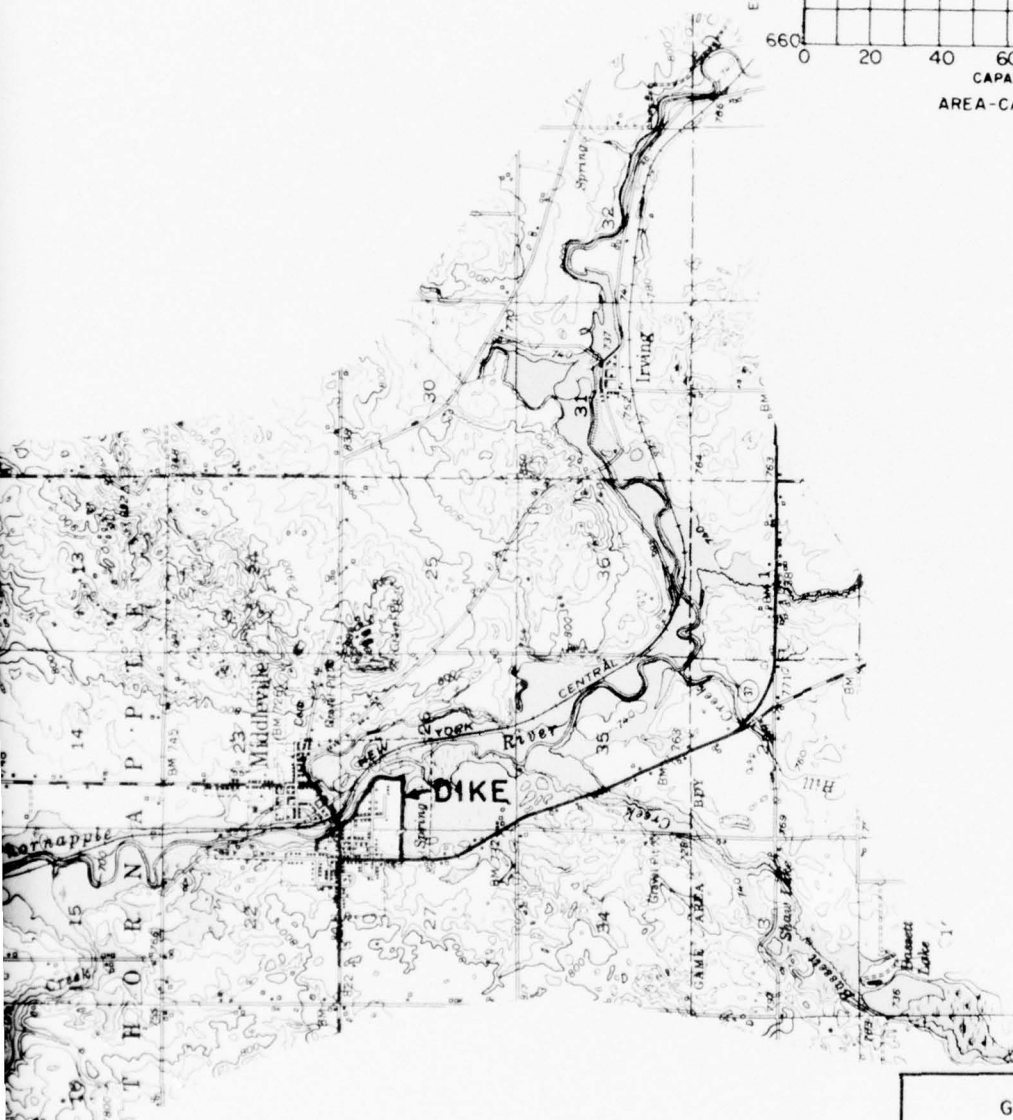
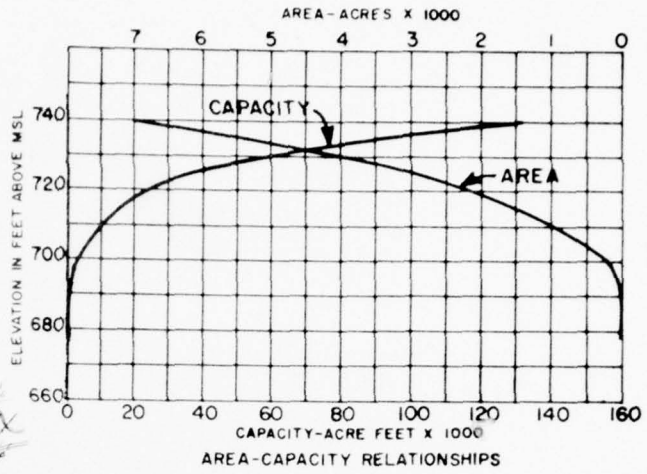
SITE NO. 16
RAVENNA RESERVOIR

PLAN AND SECTIONS OF DAM

U.S. ARMY ENGINEER DISTRICT, DETROIT



BASED ON U.S. GEOLOGICAL SURVEY QUADRANGLES



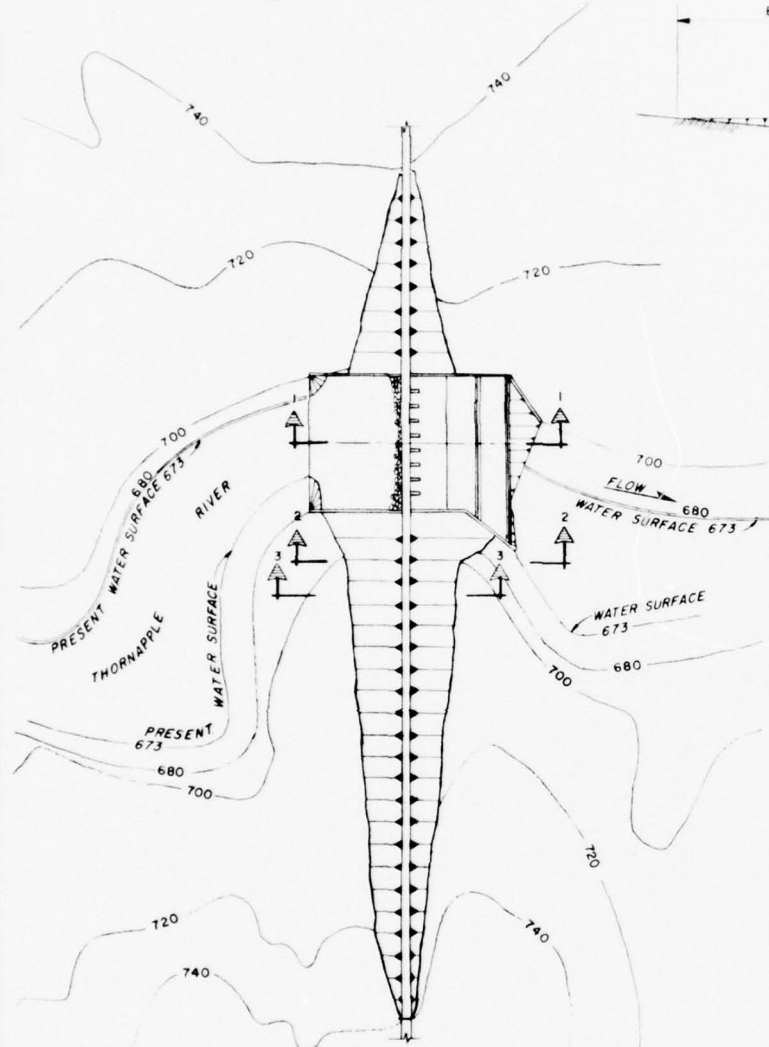
SCALE OF FEET



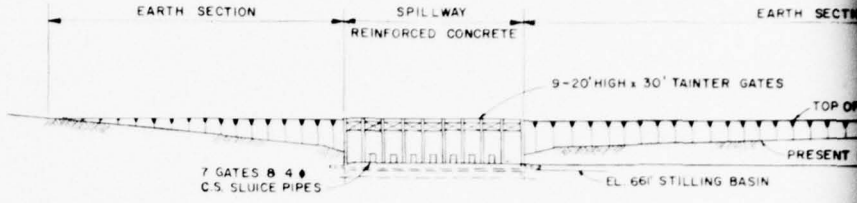
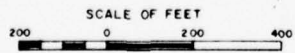
GRAND RIVER BASIN, MICHIGAN
 SITE NO. 22
 LABARGE RESERVOIR

U.S. ARMY ENGINEER DISTRICT, DETROIT

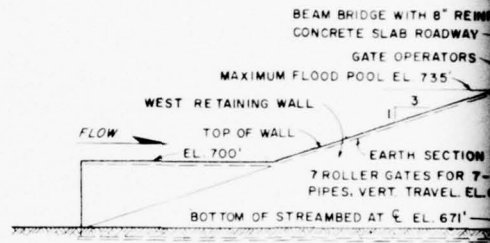
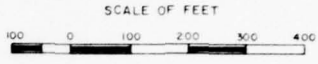
PLATE Q-55



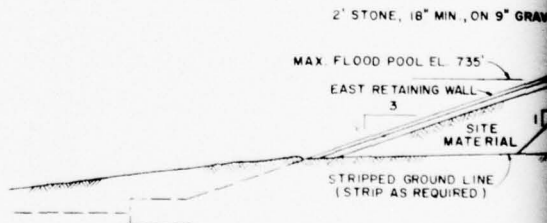
PLAN OF DAM



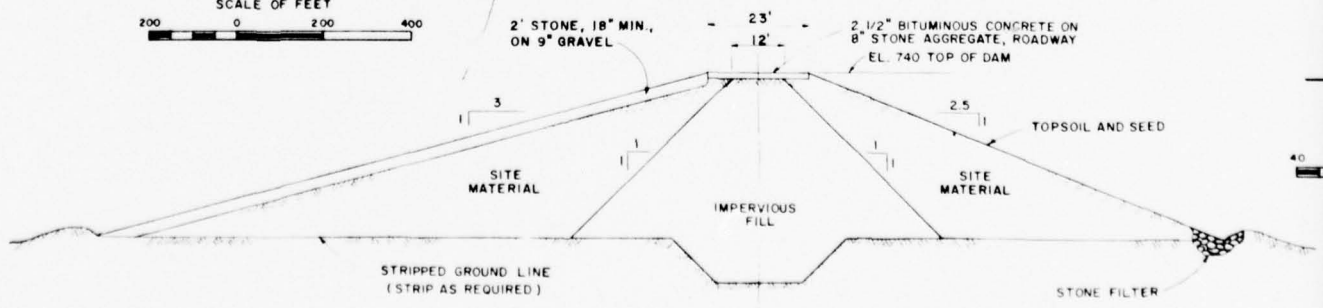
ELEVATION LOOKING DOWNSTREAM



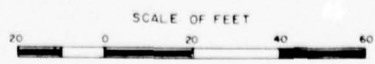
SECTION

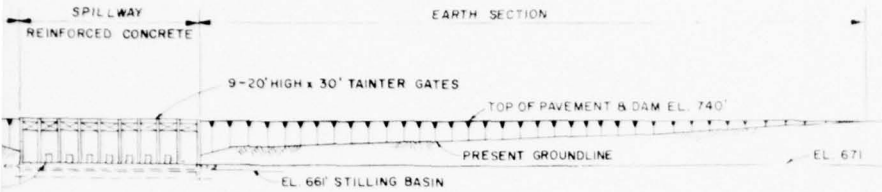


SECTION

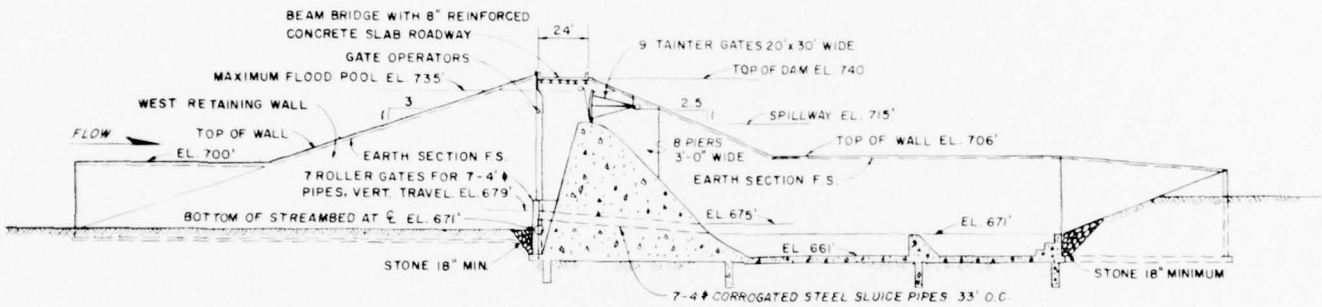
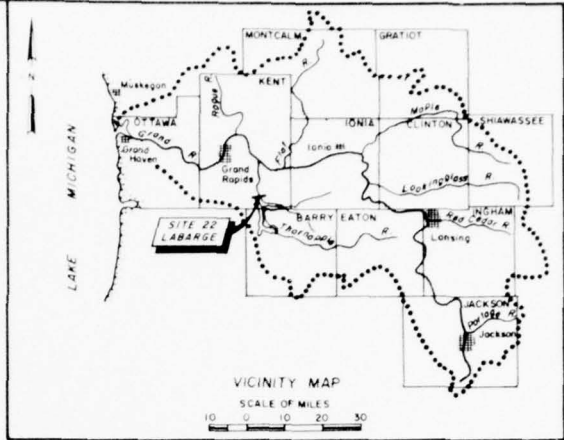
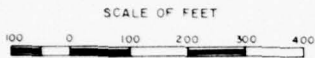


TYPICAL EARTH SECTION 3-3

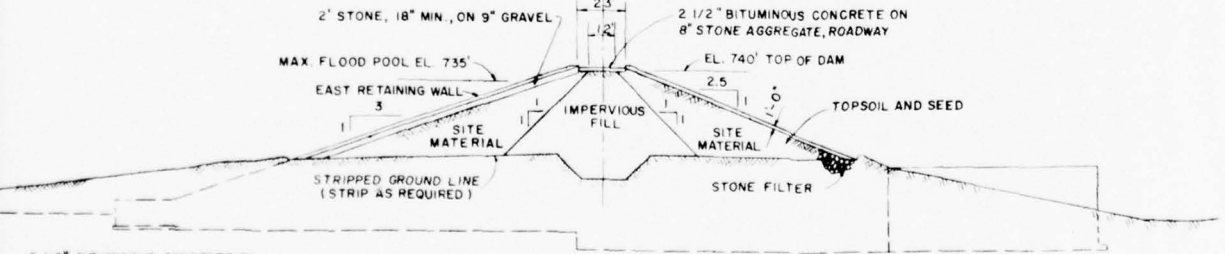
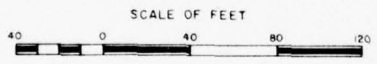




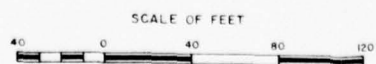
ELEVATION LOOKING DOWNSTREAM



SECTIONAL ELEVATION I-I



SECTIONAL ELEVATION 2-2

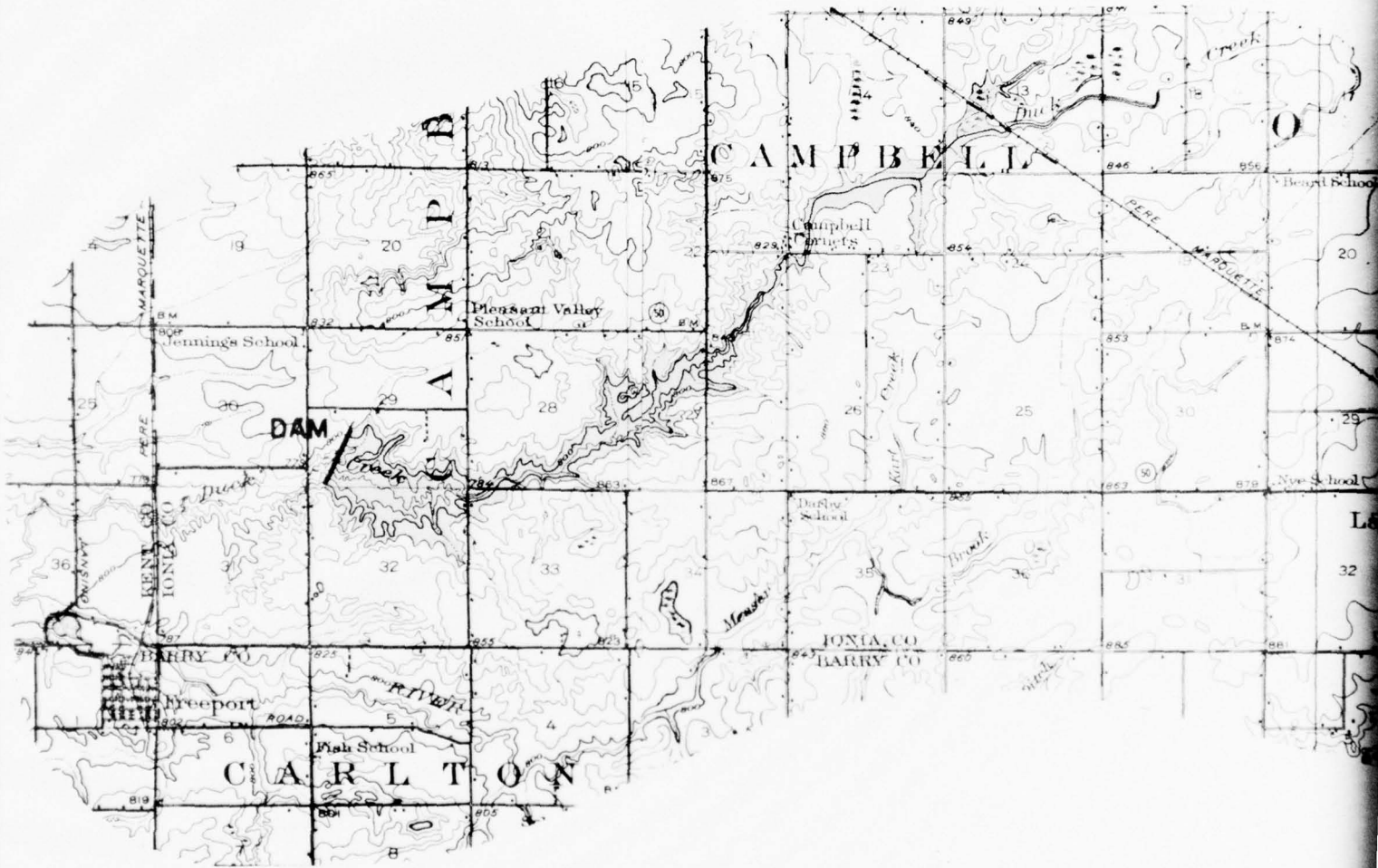
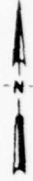


NOTE: SITE MATERIAL IS SAND OR GRAVEL SELECTED FROM BORROW PIT OR PITS NEAR DAM.

GRAND RIVER BASIN, MICHIGAN
SITE NO 22
LABARGE RESERVOIR
PLAN AND SECTIONS OF DAM
U.S. ARMY ENGINEER DISTRICT, DETROIT

SECTION 3-3

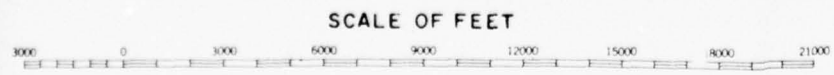
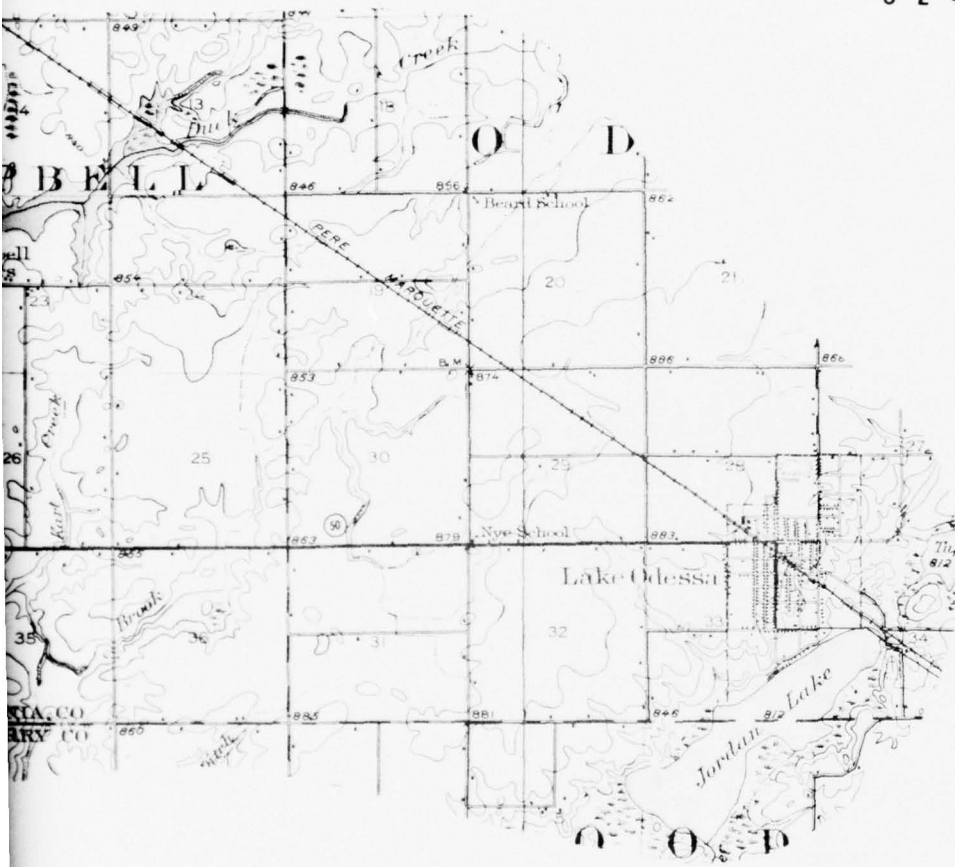
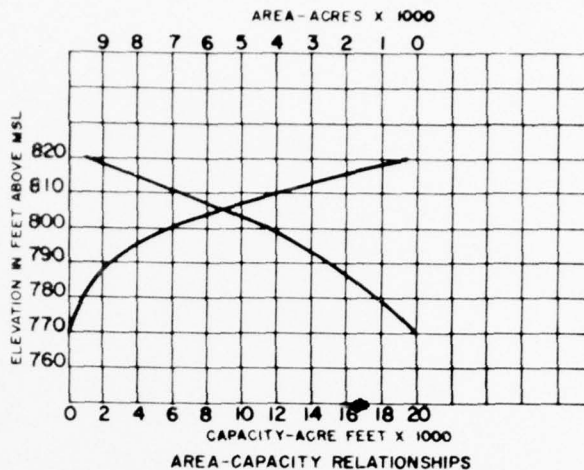




SCALE OF FEET



BASED ON U.S. GEOLOGICAL SURVEY QUADRANGLES

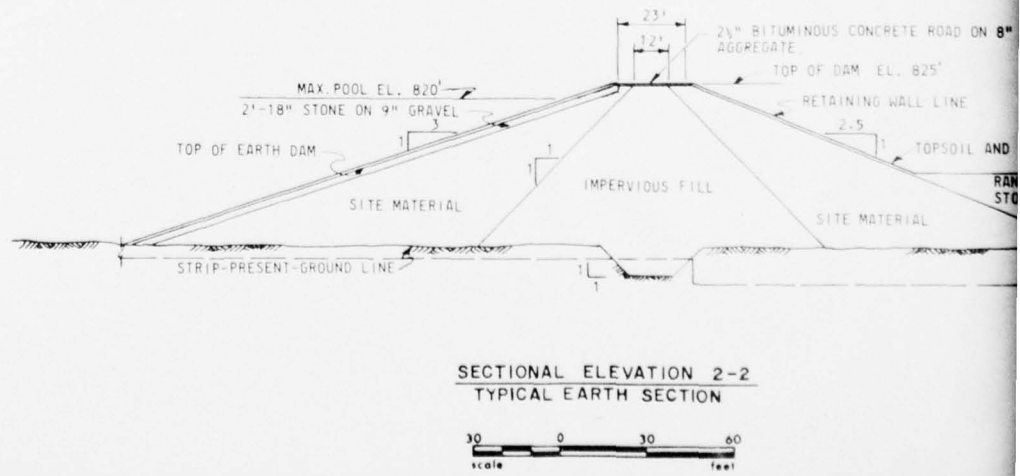
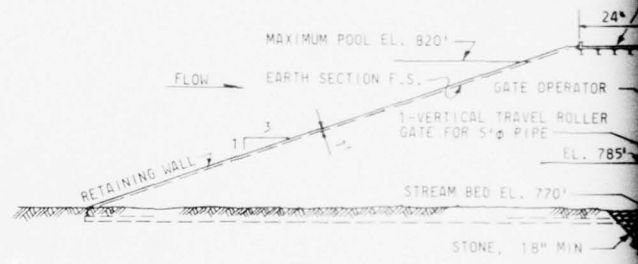
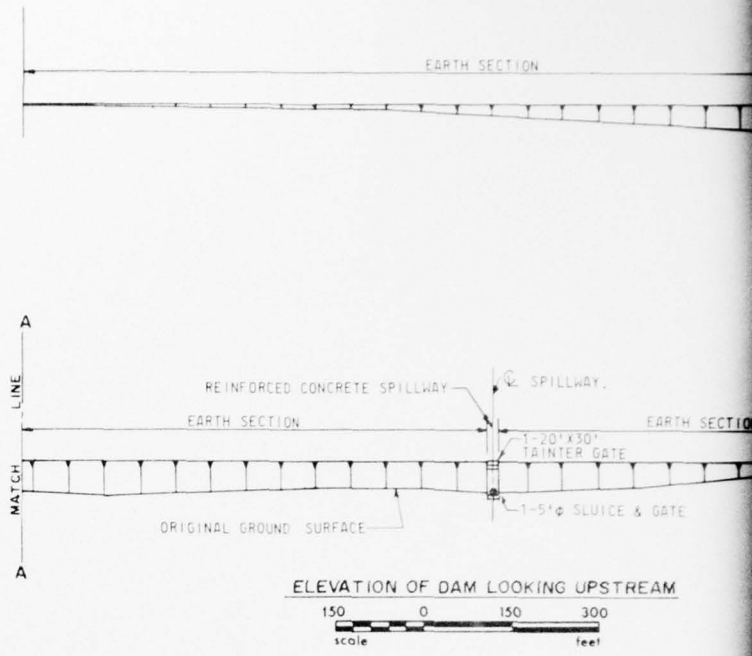
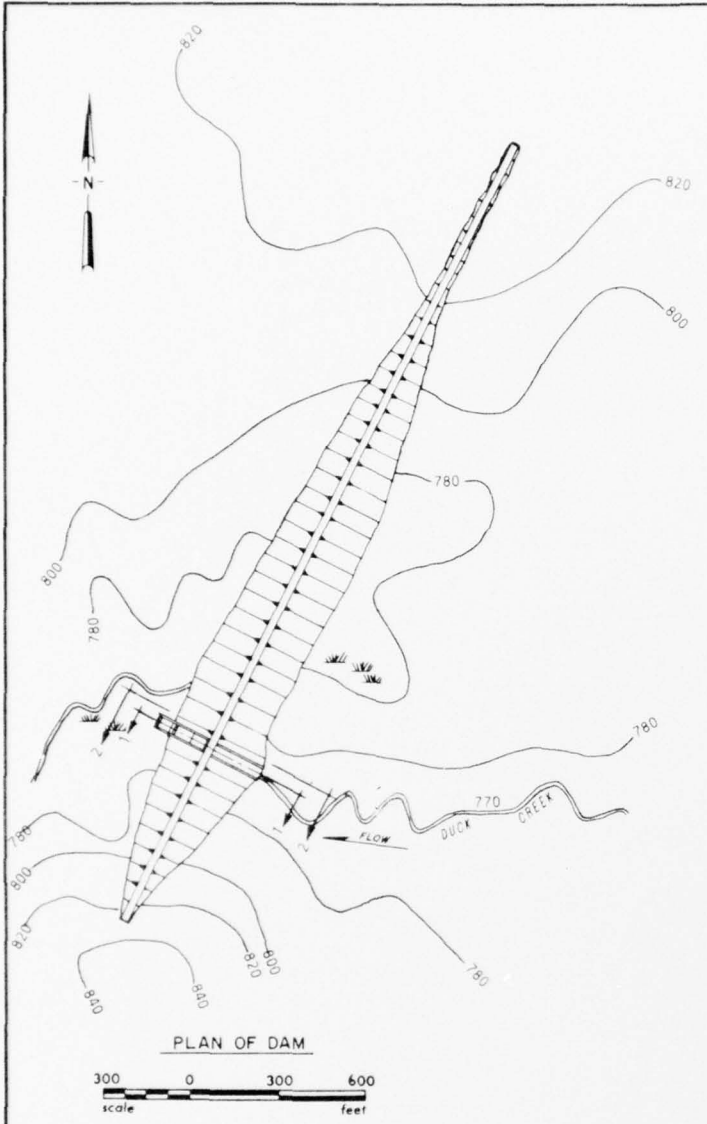


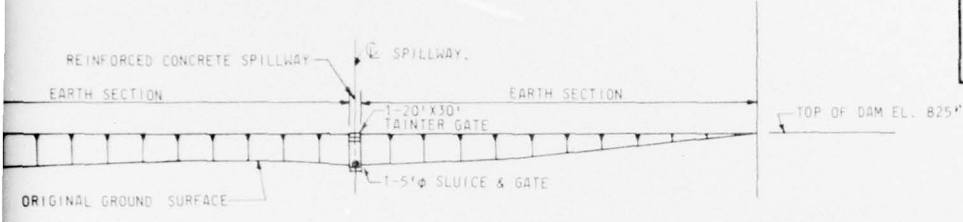
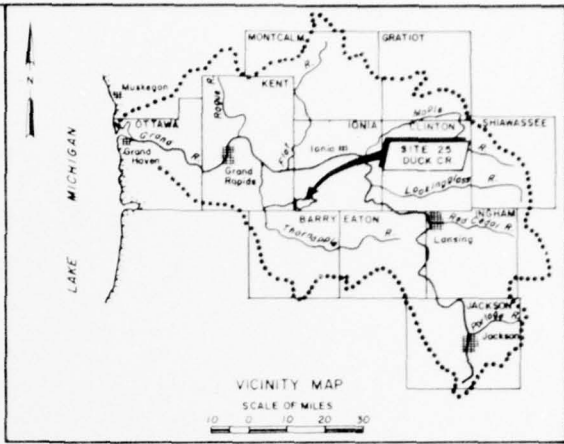
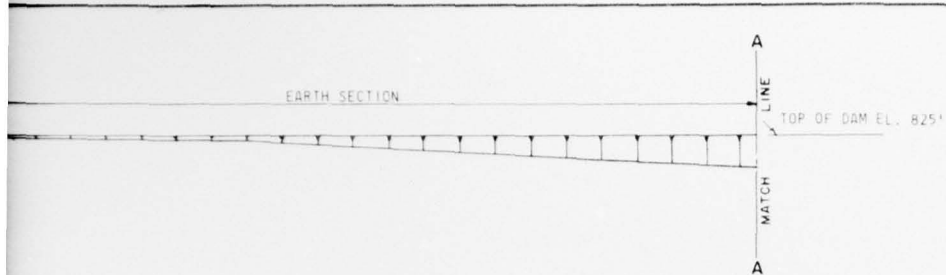
GRAND RIVER BASIN, MICHIGAN

SITE NO. 25

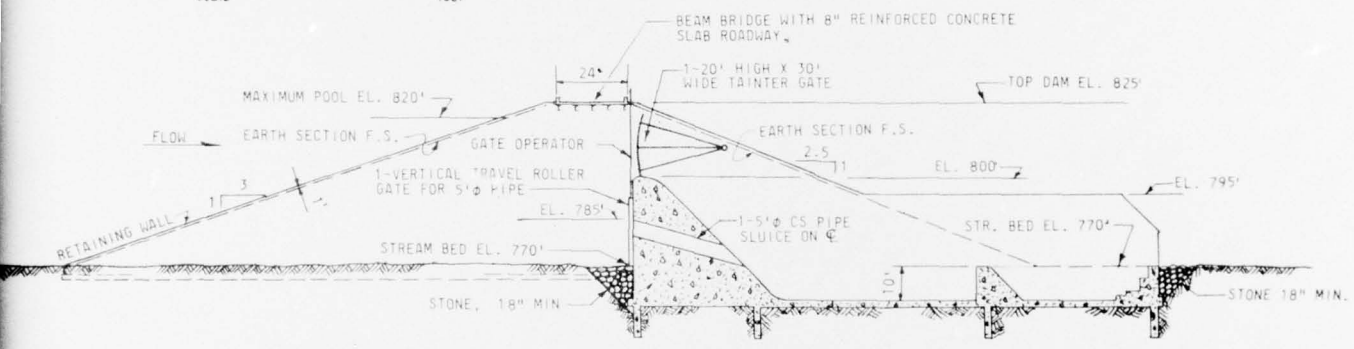
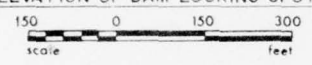
DUCK CREEK RESERVOIR

U.S. ARMY ENGINEER DISTRICT, DETROIT

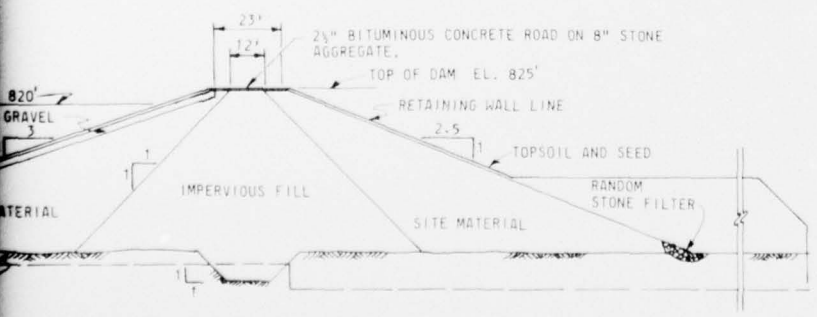




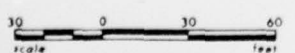
ELEVATION OF DAM LOOKING UPSTREAM



SECTIONAL ELEVATION 1-1



SECTIONAL ELEVATION 2-2
TYPICAL EARTH SECTION



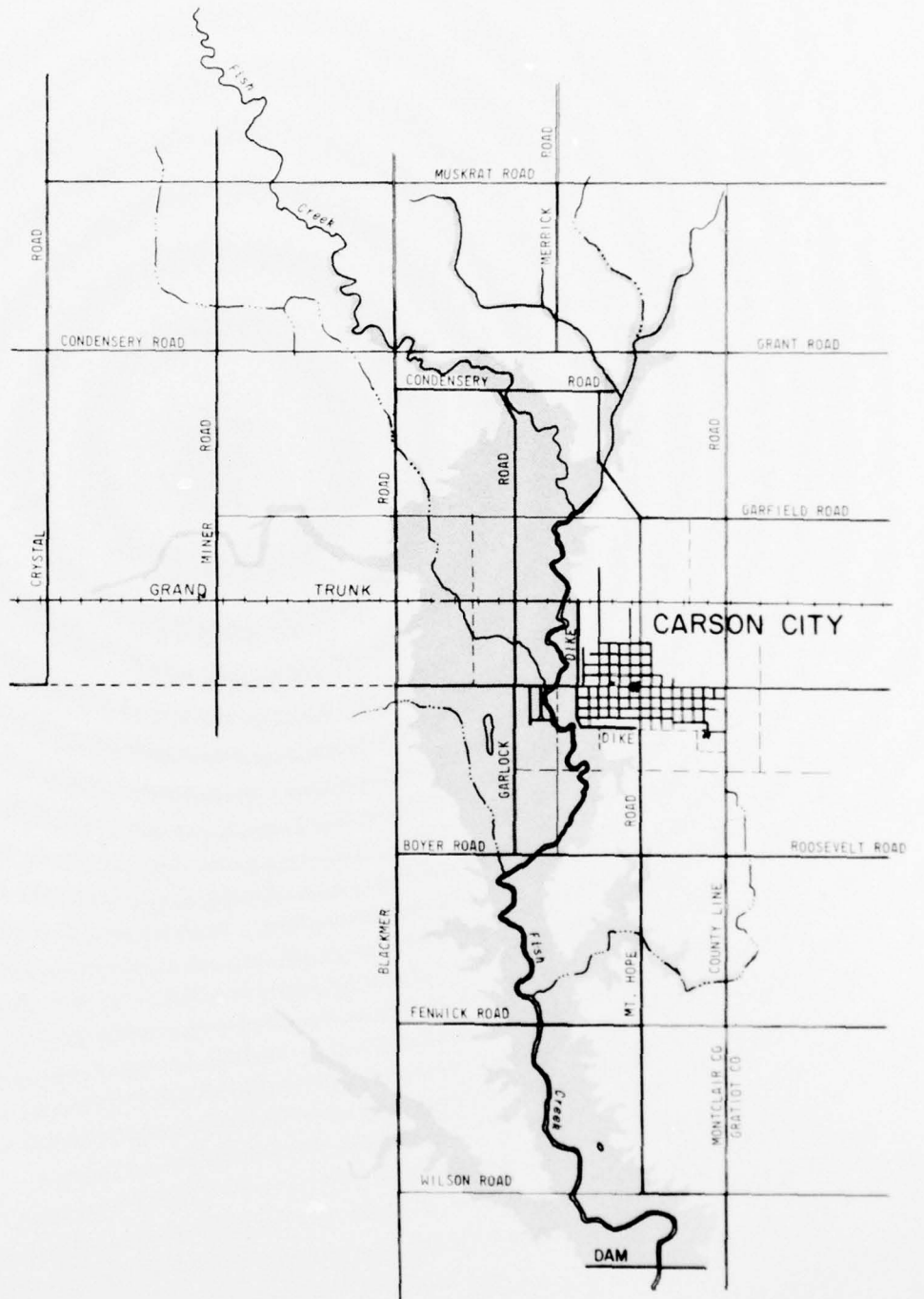
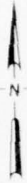
GRAND RIVER BASIN, MICHIGAN

SITE NO. 25

DUCK CREEK RESERVOIR

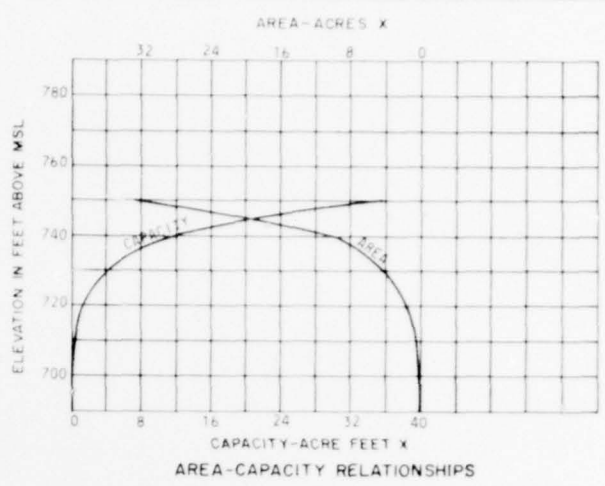
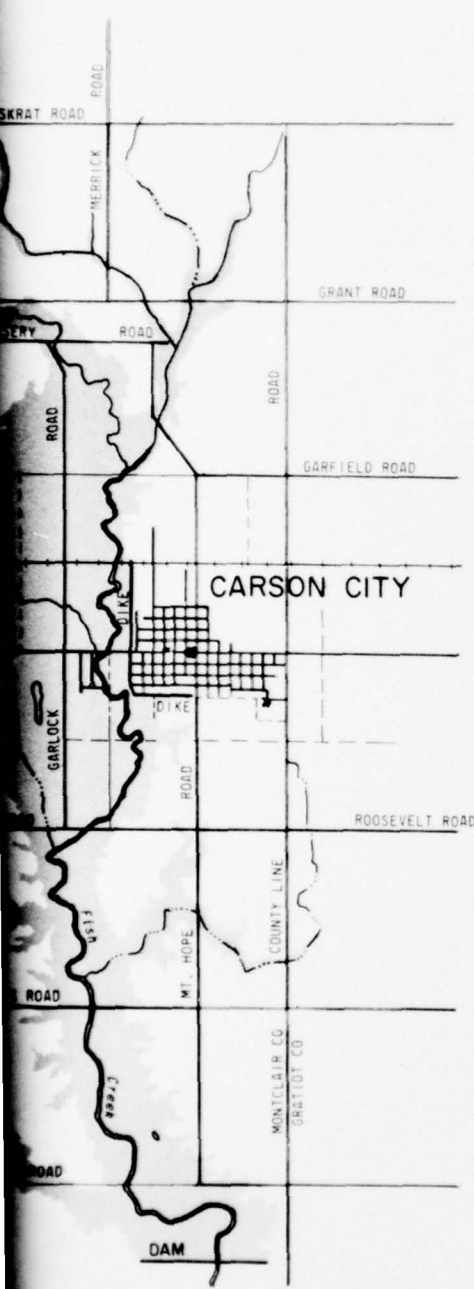
PLAN AND SECTIONS OF DAM

U.S. ARMY ENGINEER DISTRICT, DETROIT



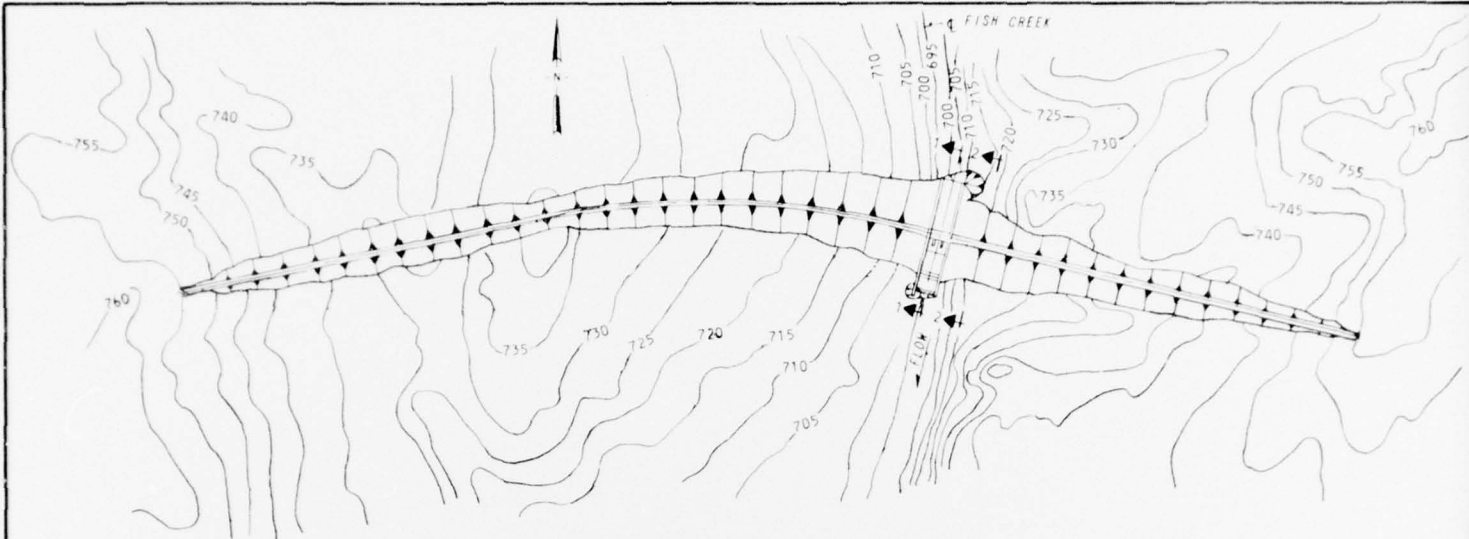
SCALE OF MILES



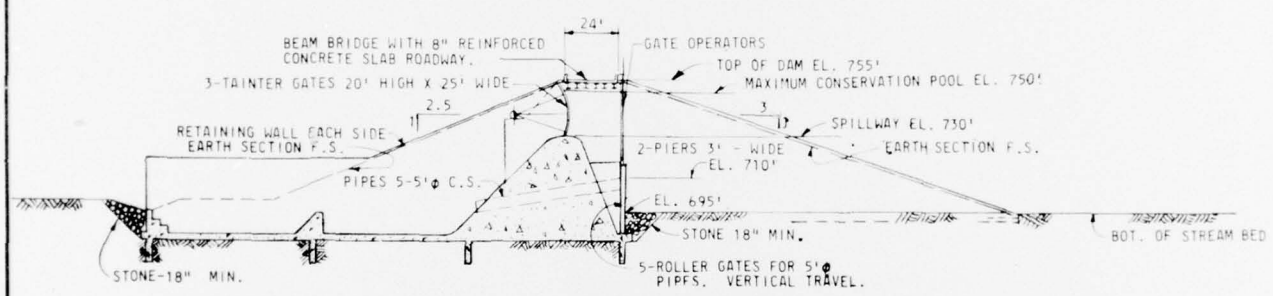
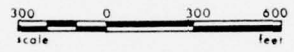


SCALE OF MILES
 1/2 0

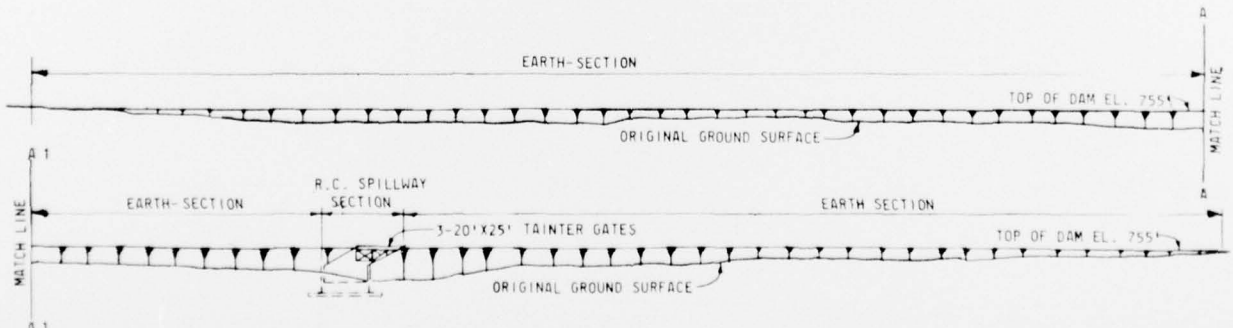
GRAND RIVER BASIN, MICHIGAN
 SITE NO 47A
 FISH CREEK RESERVOIR
 U.S. ARMY ENGINEER DISTRICT, DETROIT



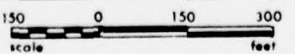
PLAN OF DAM

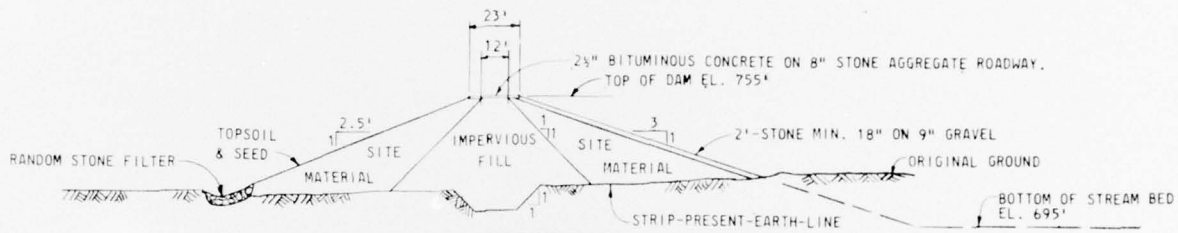
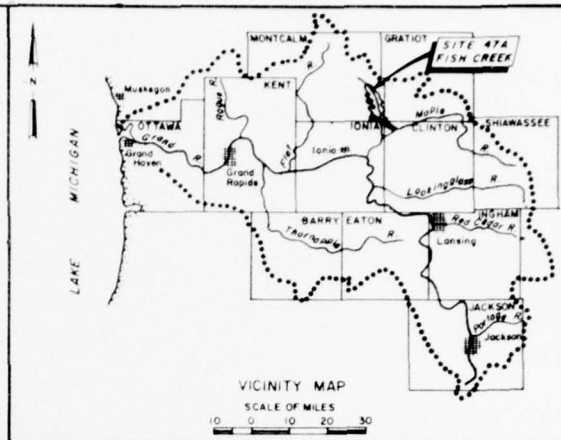
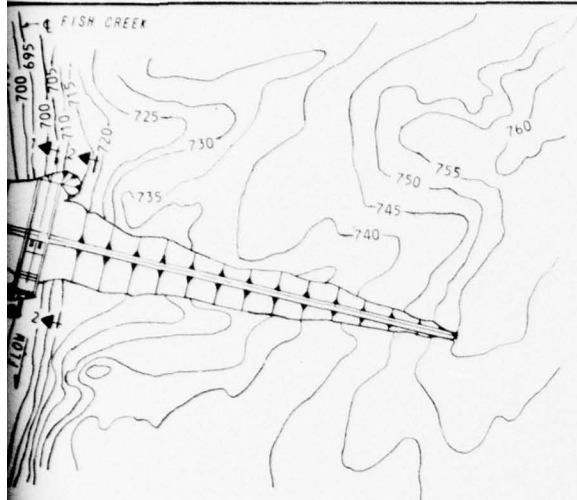


SECTIONAL ELEVATION I-I

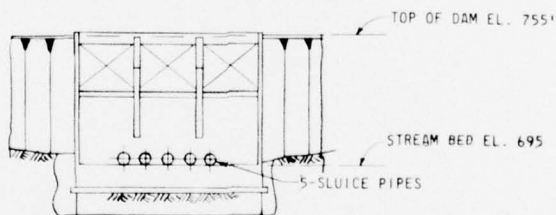


ELEVATION OF DAM LOOKING NORTH

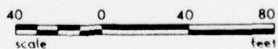




SECTION 2-2
TYPICAL EARTH SECTION



ELEVATION OF SPILLWAY
LOOKING UPSTREAM

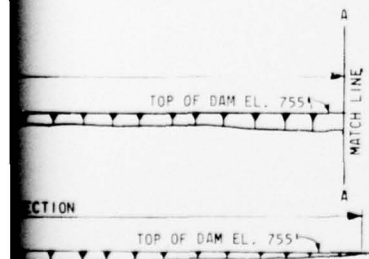


POOL EL. 750'

EL. 730'

SECTION F.S.

BOT. OF STREAM BED



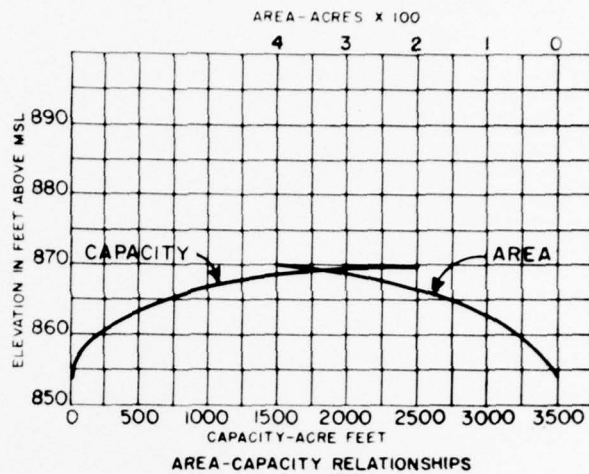
GRAND RIVER BASIN, MICHIGAN

SITE NO. 47A

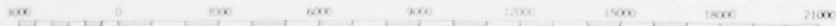
FISH CREEK RESERVOIR

PLAN AND SECTIONS OF DAM

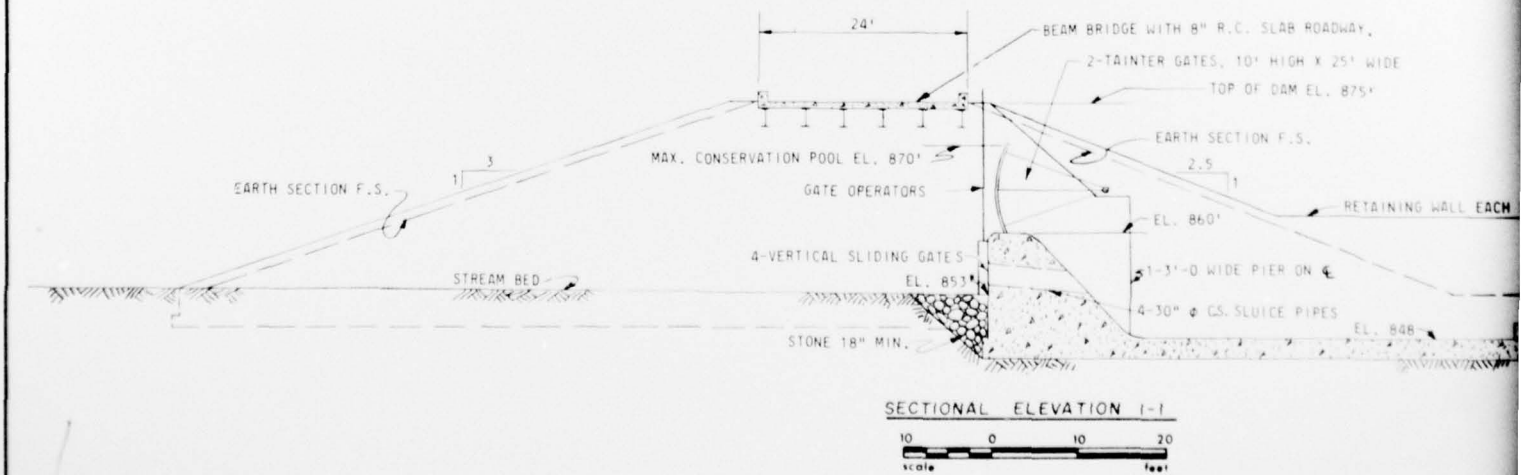
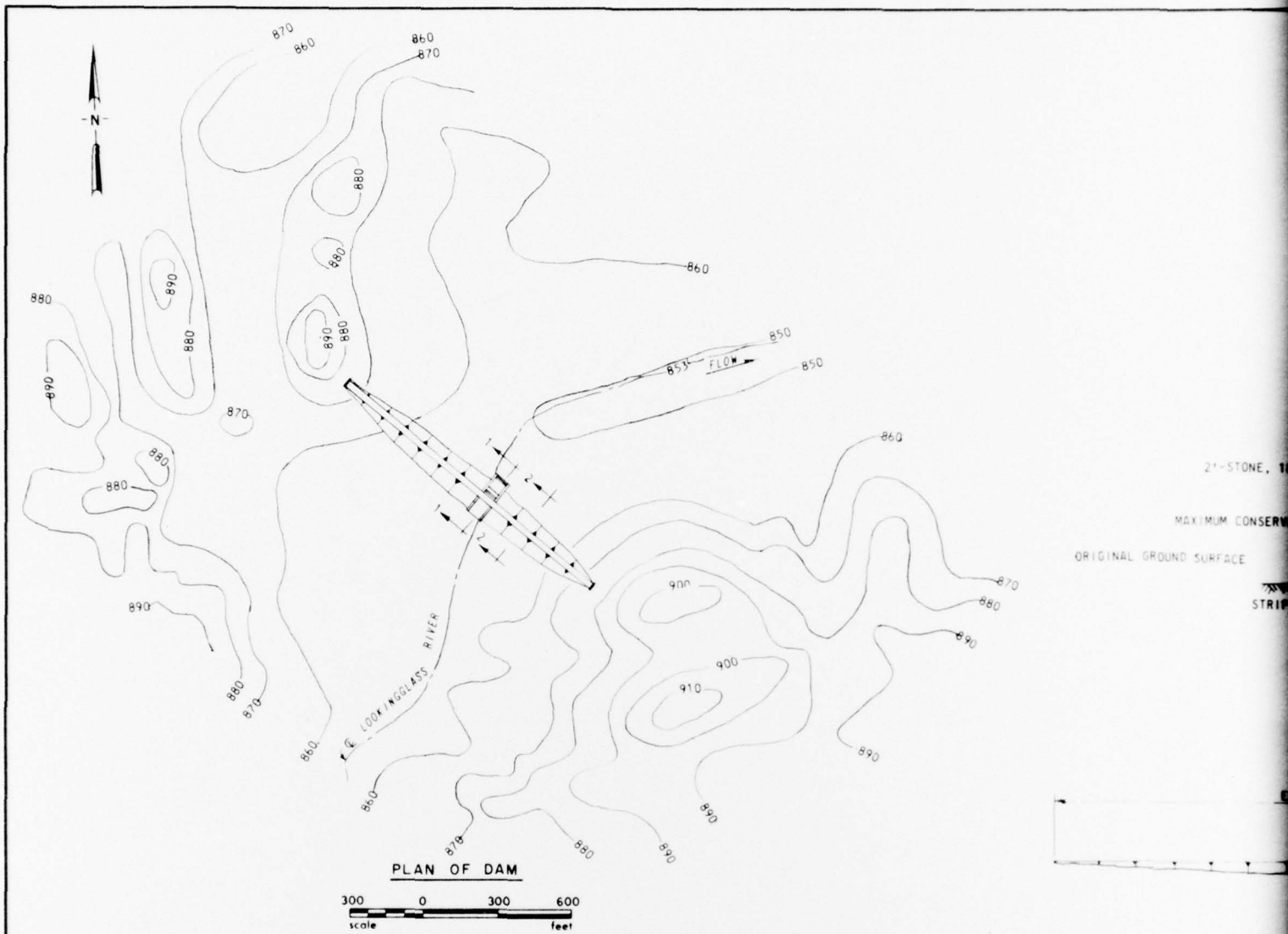
U.S. ARMY ENGINEER DISTRICT, DETROIT

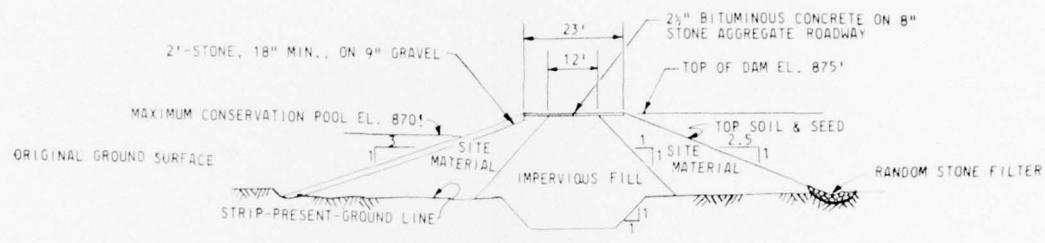
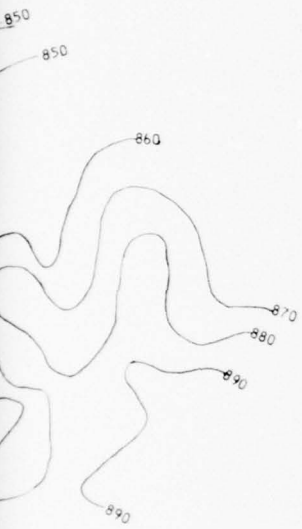
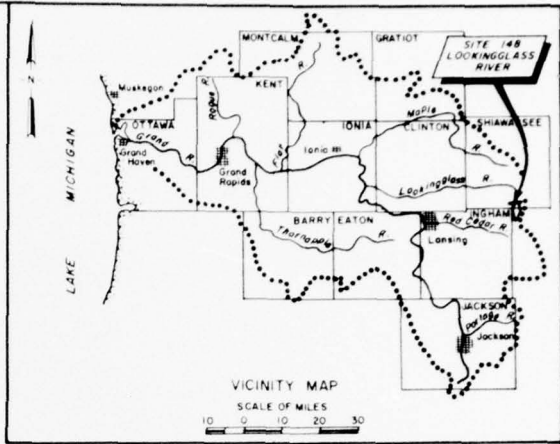


SCALE OF FEET

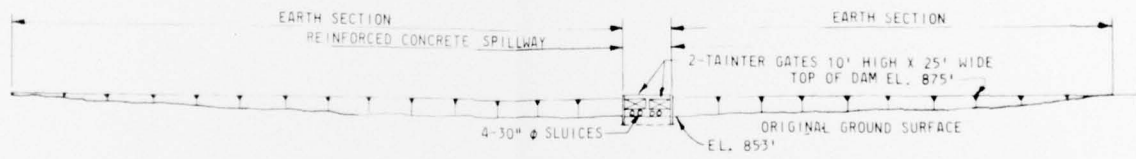


GRAND RIVER BASIN, MICHIGAN
SITE NO. 148
LOOKINGGLASS RIVER
RESERVOIR
 U.S. ARMY ENGINEER DISTRICT, DETROIT

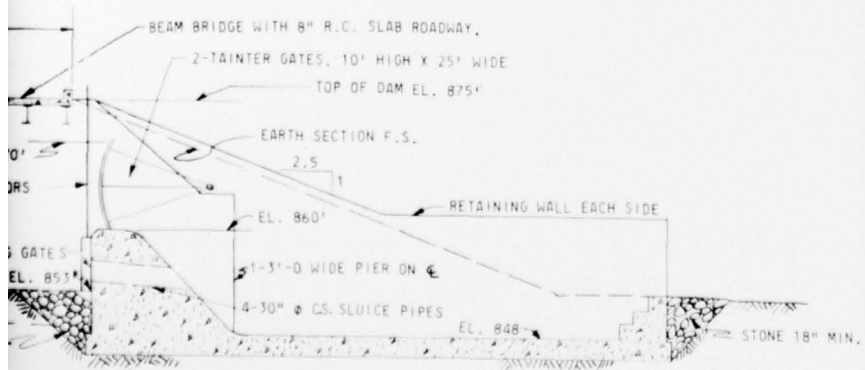




SECTION 2-2
TYPICAL EARTH SECTION
scale 0 20 40 feet

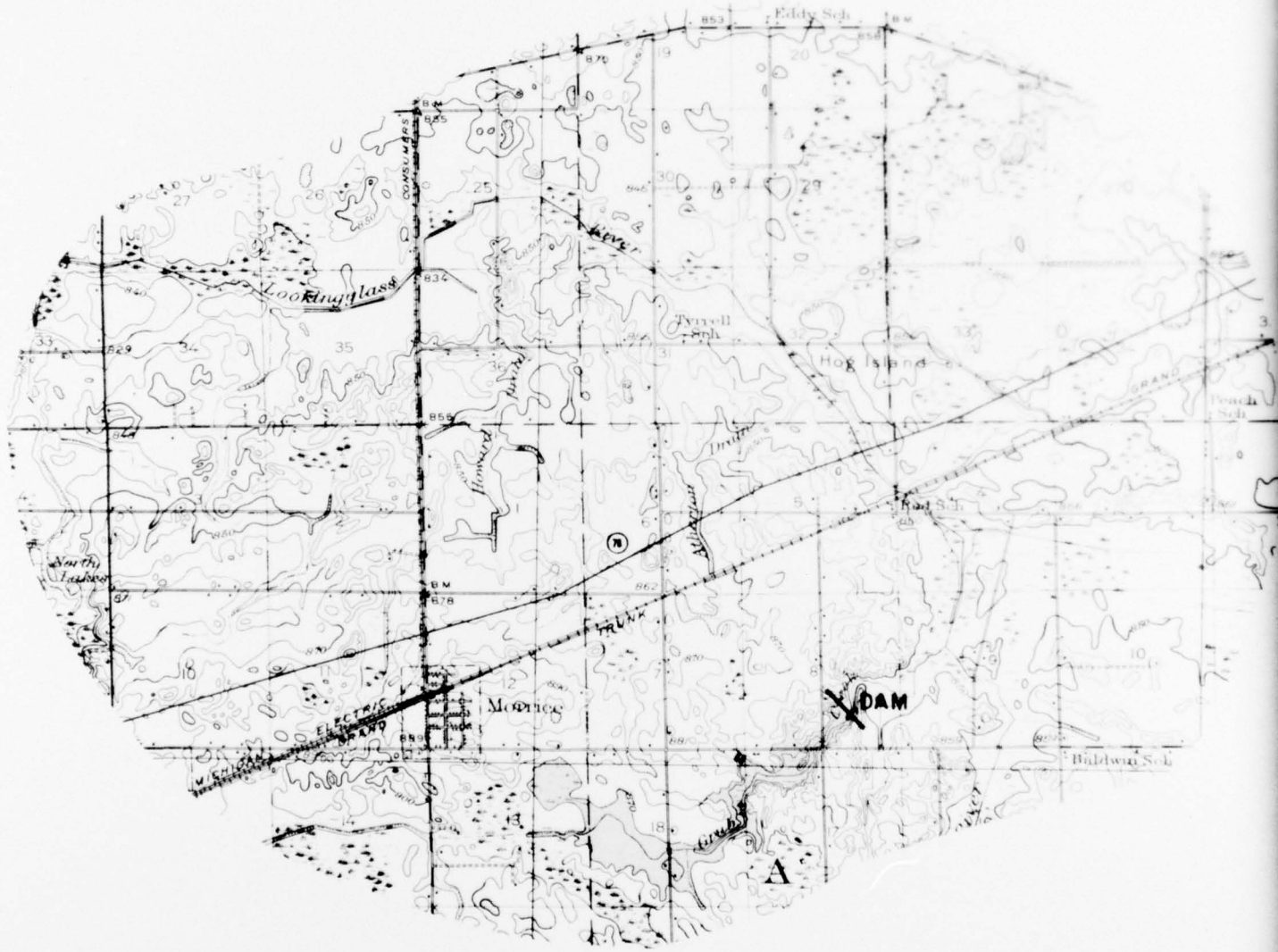
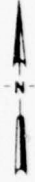


ELEVATION OF DAM LOOKING DOWNSTREAM
scale 0 100 200 feet



SECTIONAL ELEVATION 1-1
scale 0 10 20 feet

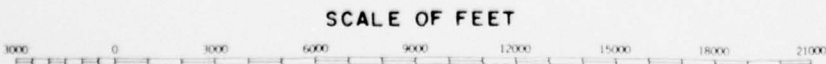
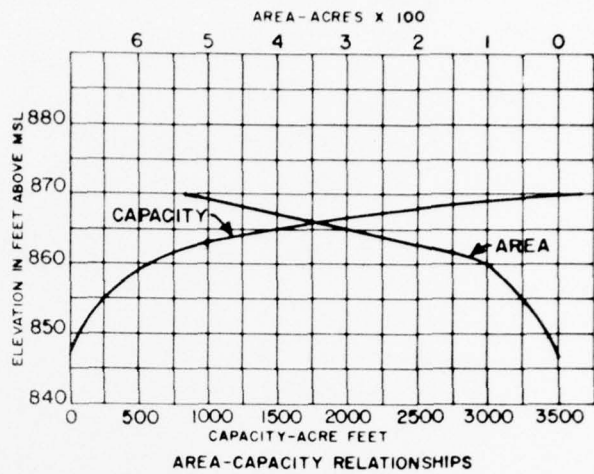
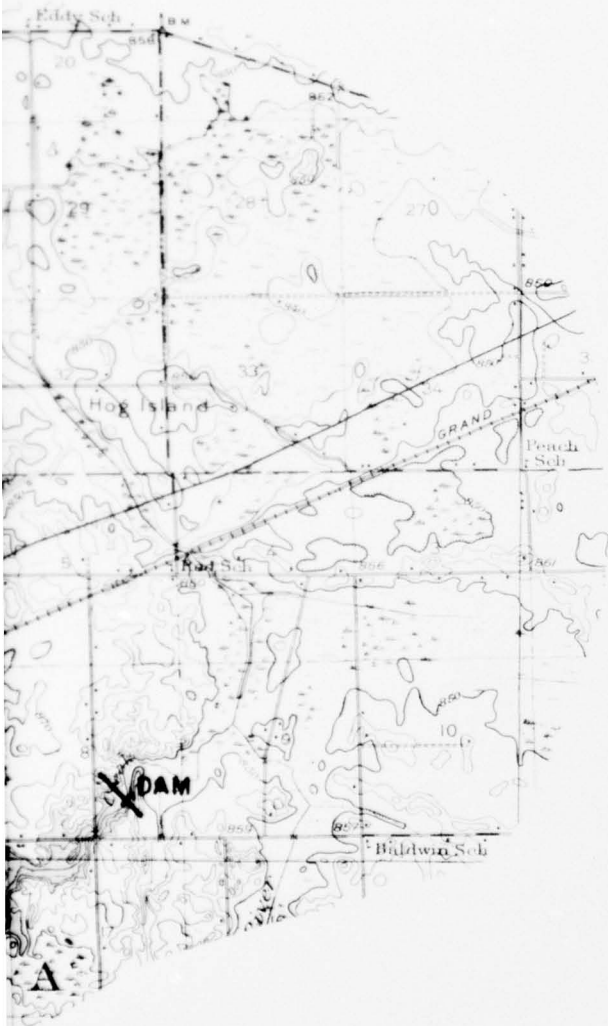
GRAND RIVER BASIN, MICHIGAN
SITE NO 148
LOOKINGGLASS RIVER RESERVOIR
PLAN AND SECTIONS OF DAM
U.S. ARMY ENGINEER DISTRICT, DETROIT



SCALE OF FEET



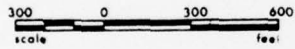
BASED ON U.S. GEOLOGICAL SURVEY QUADRANGLES



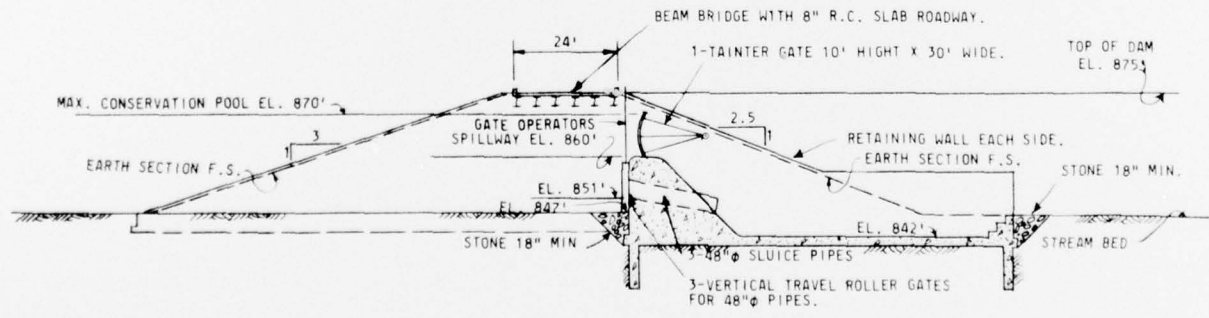
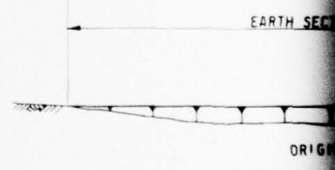
GRAND RIVER BASIN, MICHIGAN
 SITE NO. 149
 GRUB CREEK RESERVOIR
 U.S. ARMY ENGINEER DISTRICT, DETROIT



PLAN OF DAM

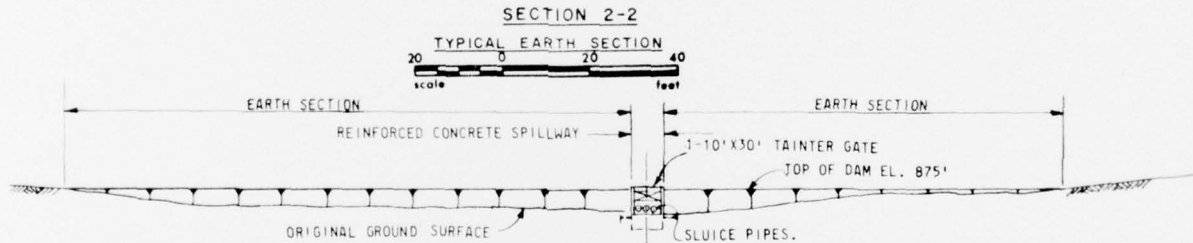
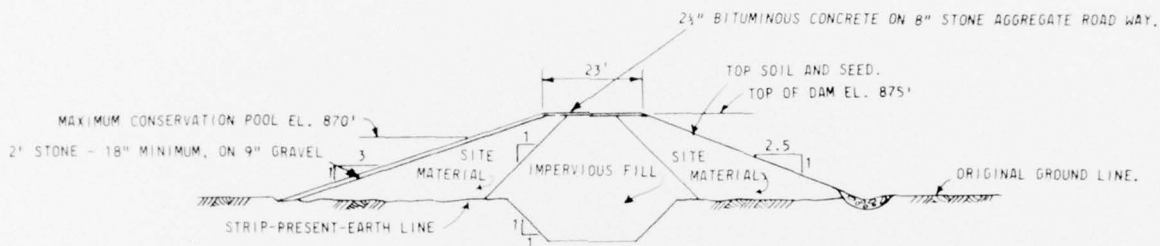
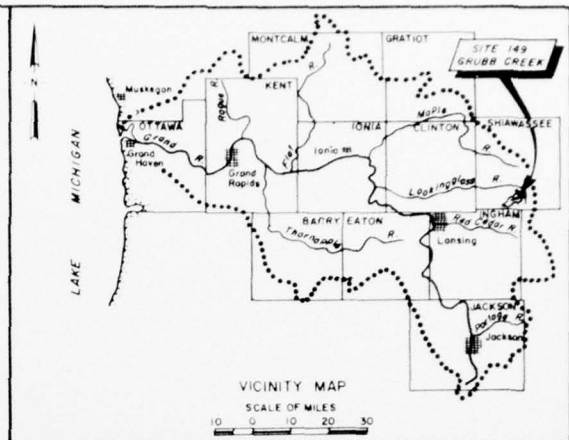


MAXIMUM CONSERVATION POOL EL. 870'
 2' STONE - 18" MINIMUM, ON 9" GRAVEL

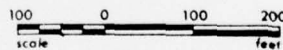


SECTIONAL ELEVATION I-I

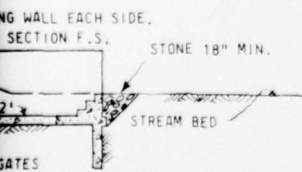




ELEVATION OF DAM LOOKING DOWNSTREAM



ROADWAY.
X 30' WIDE.
TOP OF DAM
EL. 875'



GRAND RIVER BASIN, MICHIGAN

SITE NO 149
GRUB CREEK RESERVOIR

PLAN AND SECTIONS OF DAM

U.S. ARMY ENGINEER DISTRICT, DETROIT