

- GGNS BUILDING LEGEND:**
- ① UNIT 1
  - ② UNIT 2 (NOT COMPLETED)
  - ③ UNIT 1 NDCT
  - ④ UNIT 2 NDCT BASIN
  - ⑤ SWITCHYARD
  - ⑥ WAREHOUSE
  - ⑦ ADMINISTRATION BUILDING
  - ⑧ ESC BUILDING
  - ⑨ RADIAL WELLS
  - ⑩ AUXILIARY COOLING TOWER

**NOTES:**  
 PROPOSED NEW PLANT CONSTRUCTION AREAS.  
 UTM COORD. GRID SHOWN.

**SOURCE:**  
 USGS TOPD MAP GRAND GULF, MS - LA (1963-1973) AND WIDOWS CREEK, MS - LA (1986 PROVISIONAL)

SERI  
 GRAND GULF NUCLEAR STATION SITE  
 EARLY SITE PERMIT APPLICATION  
 ENVIRONMENTAL REPORT

SITE LAYOUT

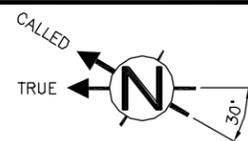
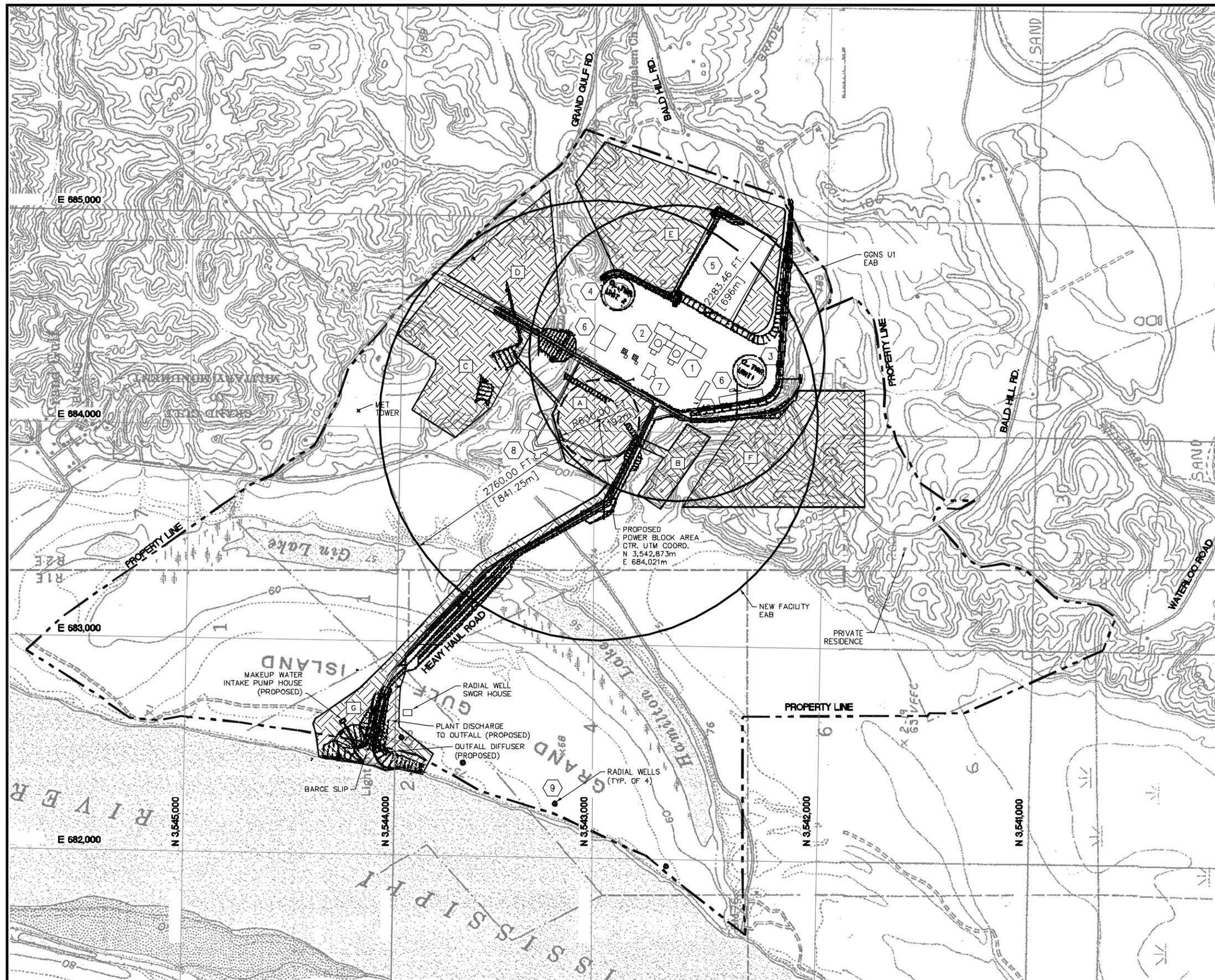


NOTES:  
 PROPOSED NEW PLANT CONSTRUCTION AREAS.  
 - - - - PROPERTY LINE

SOURCE:  
 DEC. 21, 2001 USACE AERIAL SITE PHOTO

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 EARLY SITE PERMIT APPLICATION  
 ENVIRONMENTAL REPORT

AERIAL VIEW GRAND GULF SITE  
 NOVEMBER 21, 2001



**GGNS BUILDING LEGEND:**

- ① UNIT 1
- ② UNIT 2 (NOT COMPLETED)
- ③ UNIT 1 NDCT
- ④ UNIT 2 NDCT BASIN
- ⑤ SWITCHYARD
- ⑥ WAREHOUSE
- ⑦ ADMINISTRATION BUILDING
- ⑧ ESC BUILDING
- ⑨ RADIAL WELLS
- ⑩ AUXILIARY COOLING TOWER

**NOTES:**

▨ PROPOSED NEW PLANT CONSTRUCTION AREAS.

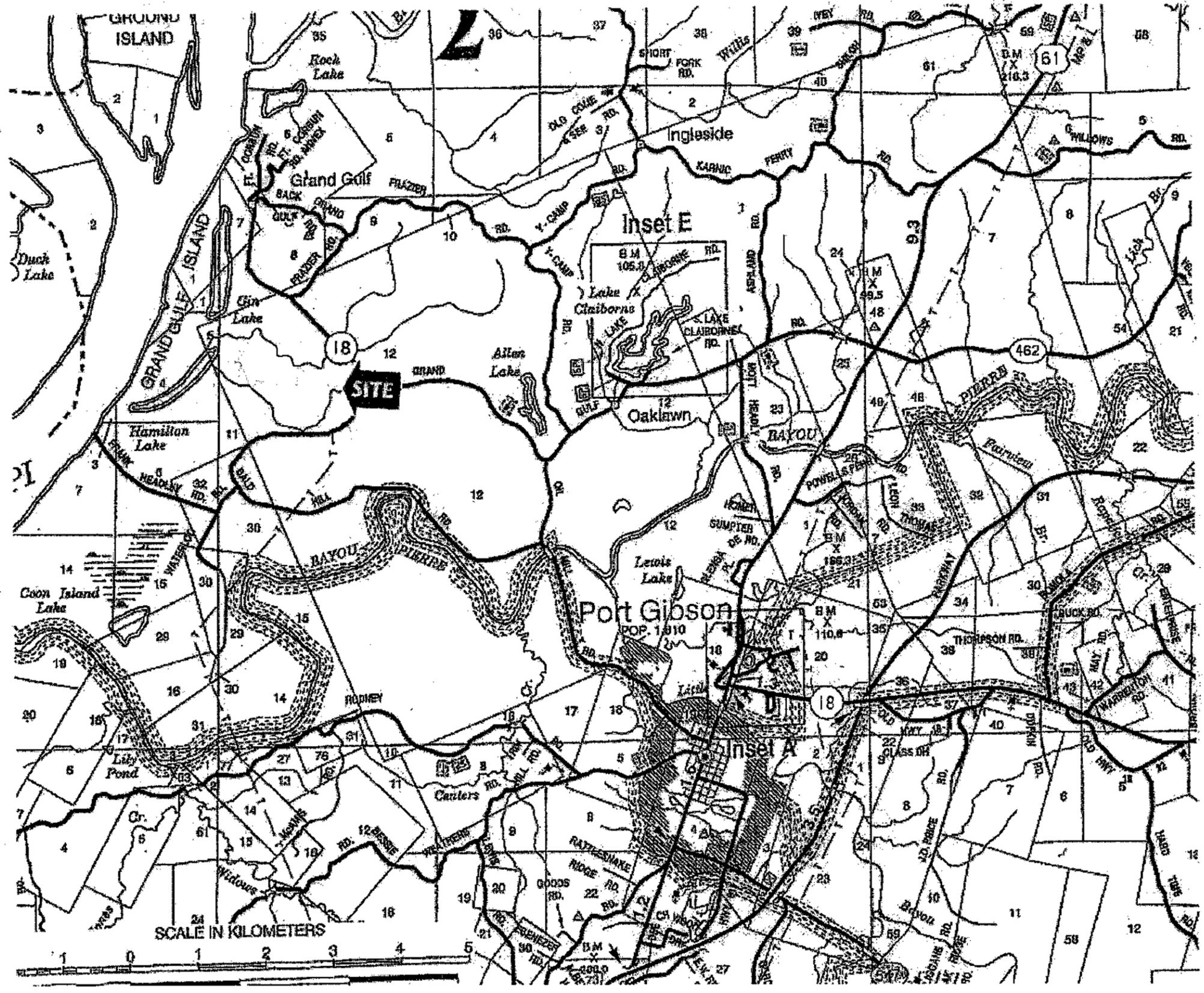
UTM COORD. GRID SHOWN.

Ⓐ REFER TO TABLE 2.2-1 FOR APPROXIMATE ACREAGE OF CONSTRUCTION AREAS Ⓐ THRU Ⓒ

SOURCE:  
USGS TOPO MAP GRAND GULF, MS - LA (1963-1973) AND MIDOWS CREEK, MS - LA (1986 PROVISIONAL)

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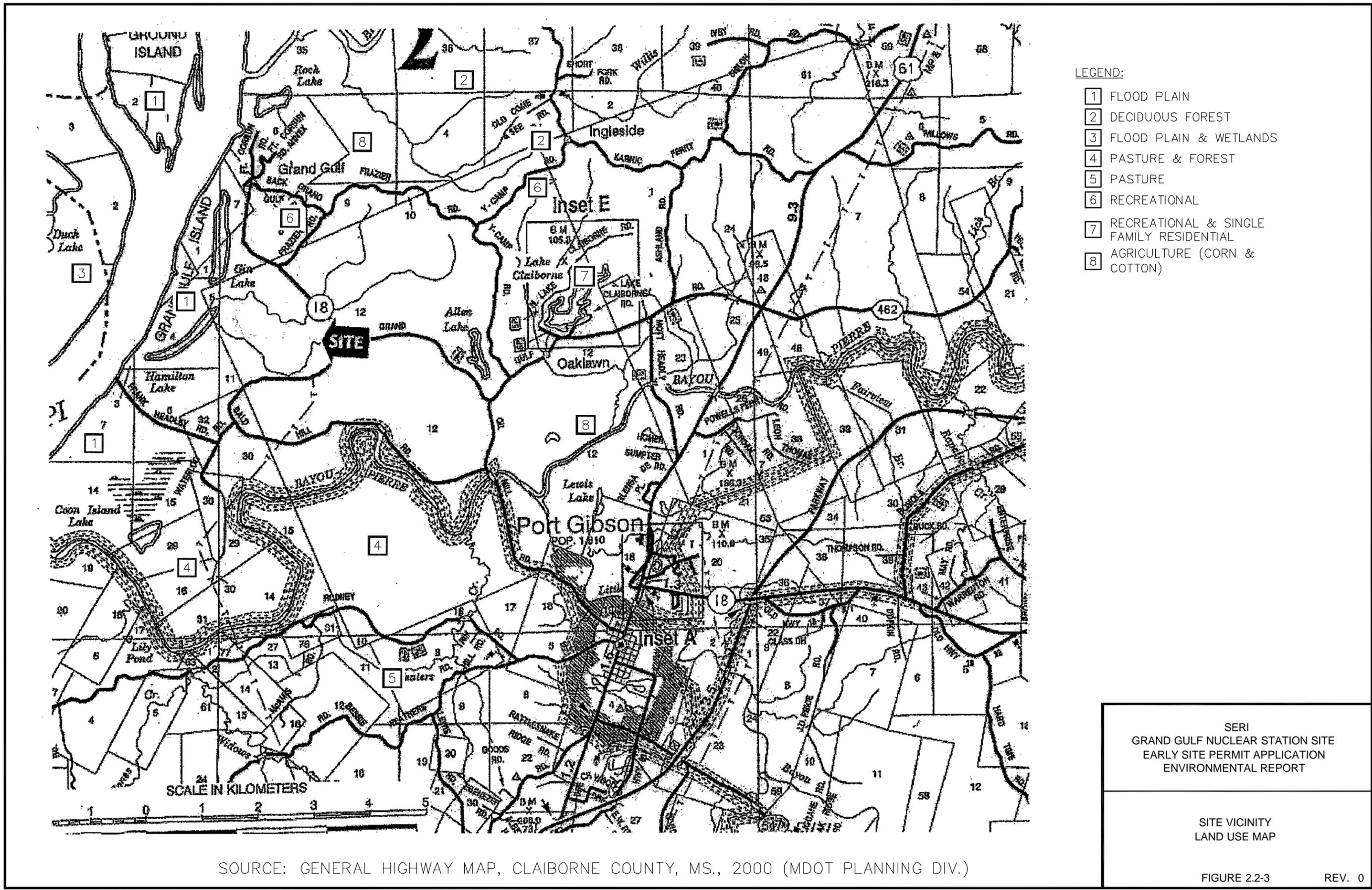
SITE LAYOUT



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SITE VICINITY  
 TRANSPORTATION MAP  
 AREA HIGHWAYS - MISSISSIPPI

SOURCE: GENERAL HIGHWAY MAP, CLAIBORNE COUNTY, MS., 2000 (MDOT PLANNING DIV.)



SOURCE: GENERAL HIGHWAY MAP, CLAIBORNE COUNTY, MS., 2000 (MDOT PLANNING DIV.)

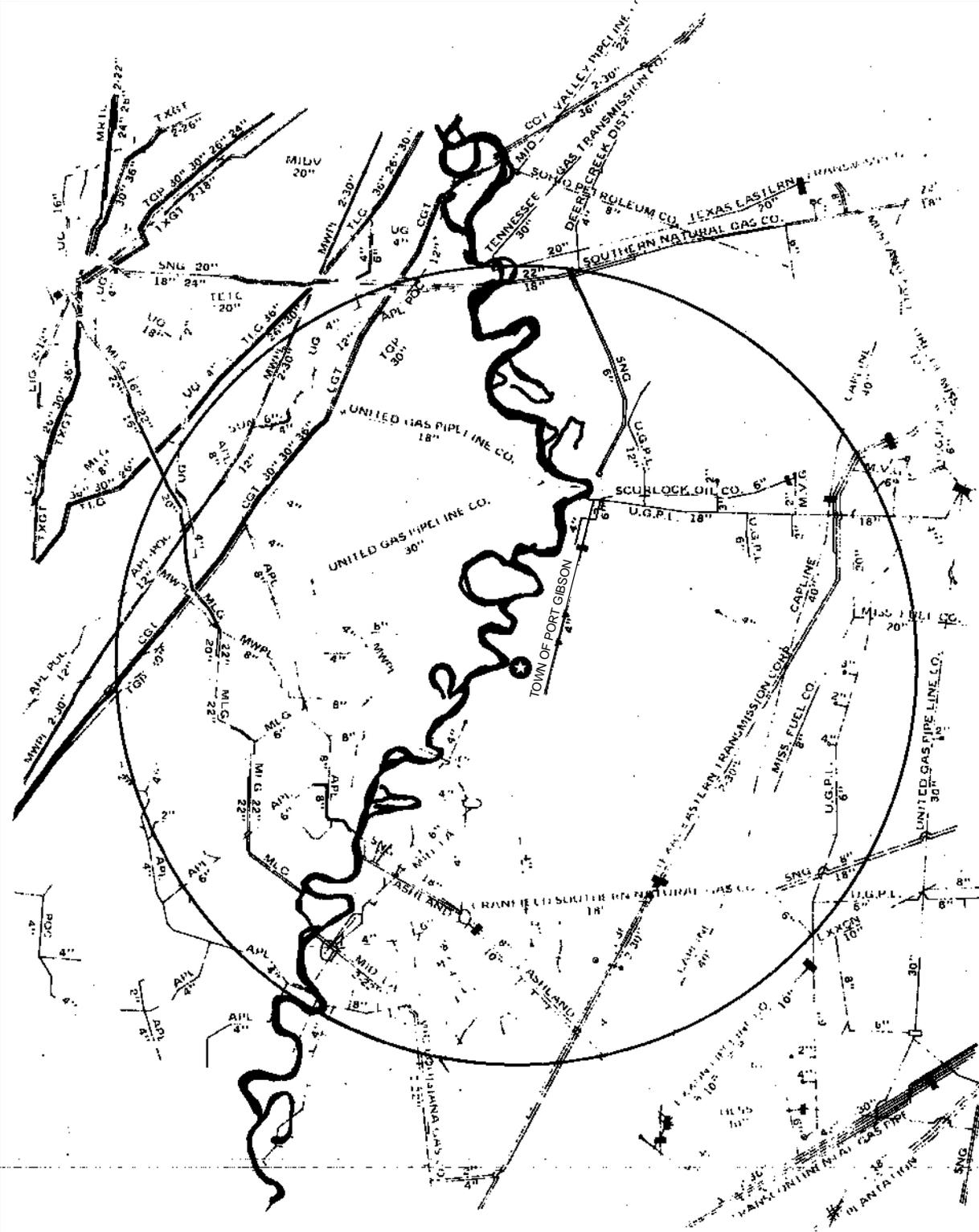
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EARLY SITE PERMIT APPLICATION  
ENVIRONMENTAL REPORT

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SITE VICINITY  
LAND USE MAP

---

FIGURE 2.2-3      REV. 0



▲ — ISOLATION VALVES - ROCKWELL TYPE



SCALE IN MILES

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ENVIRONMENTAL REPORT

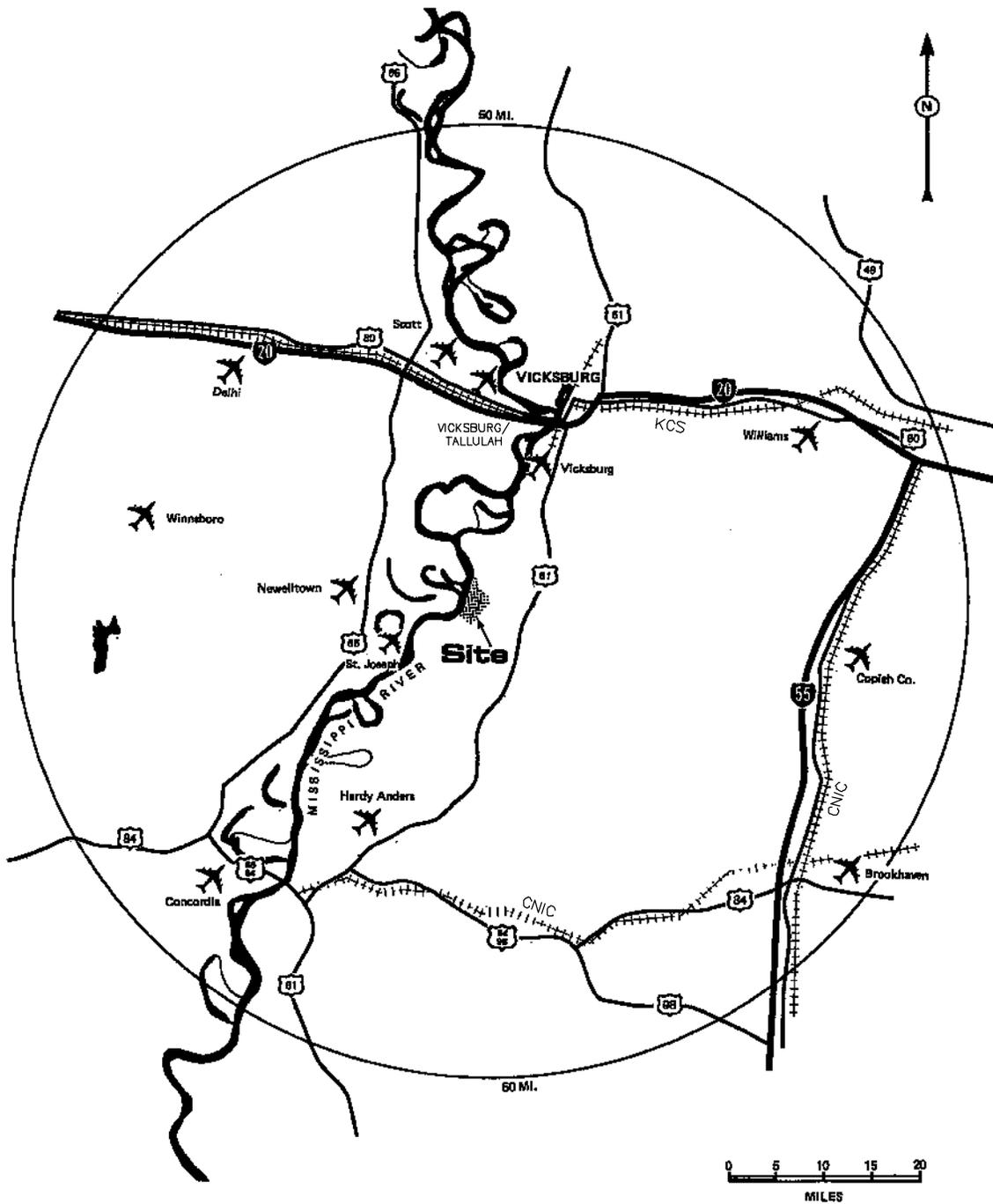
OIL AND GAS LINE MAP  
(UFSAR FIGURE 2.2-1)

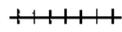


SOURCE: Official highway map - Louisiana (1970)  
 Official highway map - Mississippi (1971)

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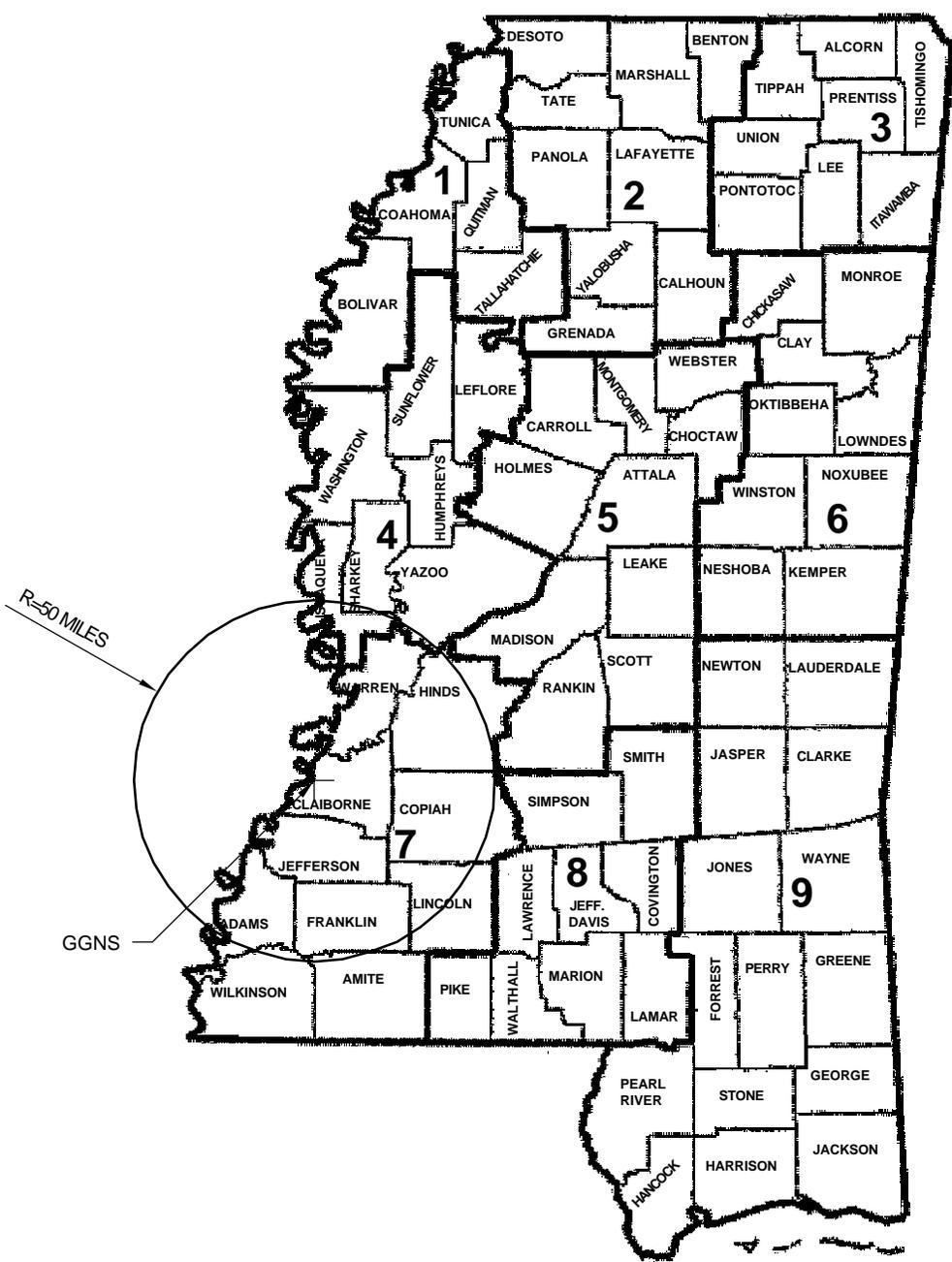
TRANSMISSION LINE ROUTES  
 (FER FIGURE 3.9-2)



-  AIRPORT
-  RAILROAD
-  FEDERAL HIGHWAY
-  INTERSTATE HIGHWAY

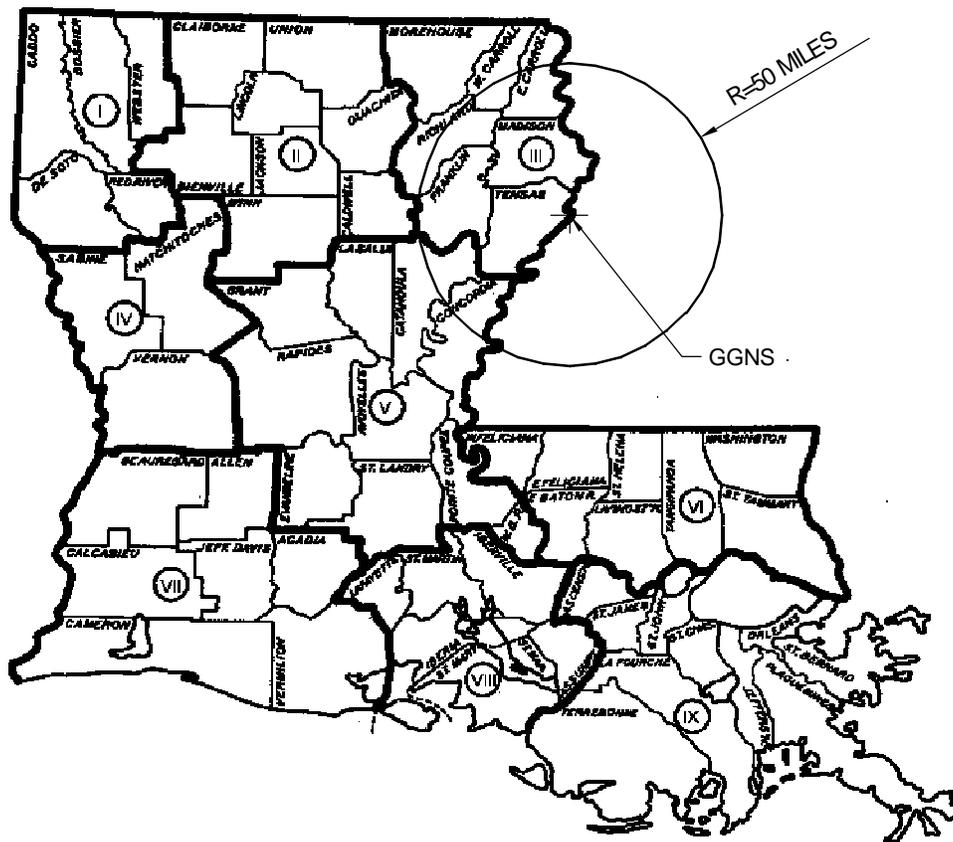
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TRANSPORTATION MAP  
 GENERAL AREA



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MISSISSIPPI AGRICULTURAL  
 STATISTICS SERVICES  
 DISTRICTS



**District I**

Bossier  
Caddo  
DeSoto  
Red River  
Webster

**District II**

Bienville  
Caldwell  
Claiborne  
Jackson  
Lincoln  
Ouachita  
Union  
Winn

**District III**

East Carroll  
Franklin  
Madison  
Morehouse  
Richland  
Tensas  
West Carroll

**District IV**

Natchitoches  
Sabine  
Vernon

**District V**

Avoyelles  
Catahoula  
Concordia  
Evangeline  
Grant  
LaSalle  
Pointe Coupee  
Rapides  
St. Landry  
W. Baton Rouge

**District VI**

E. Baton Rouge  
E. Feliciana  
Livingston  
St. Helena  
St. Tammany  
Tangipahoa  
Washington  
W. Feliciana

**District VII**

Acadia  
Allen  
Beauregard  
Calcasieu  
Cameron  
Jeff Davis  
Vermillion

**District VIII**

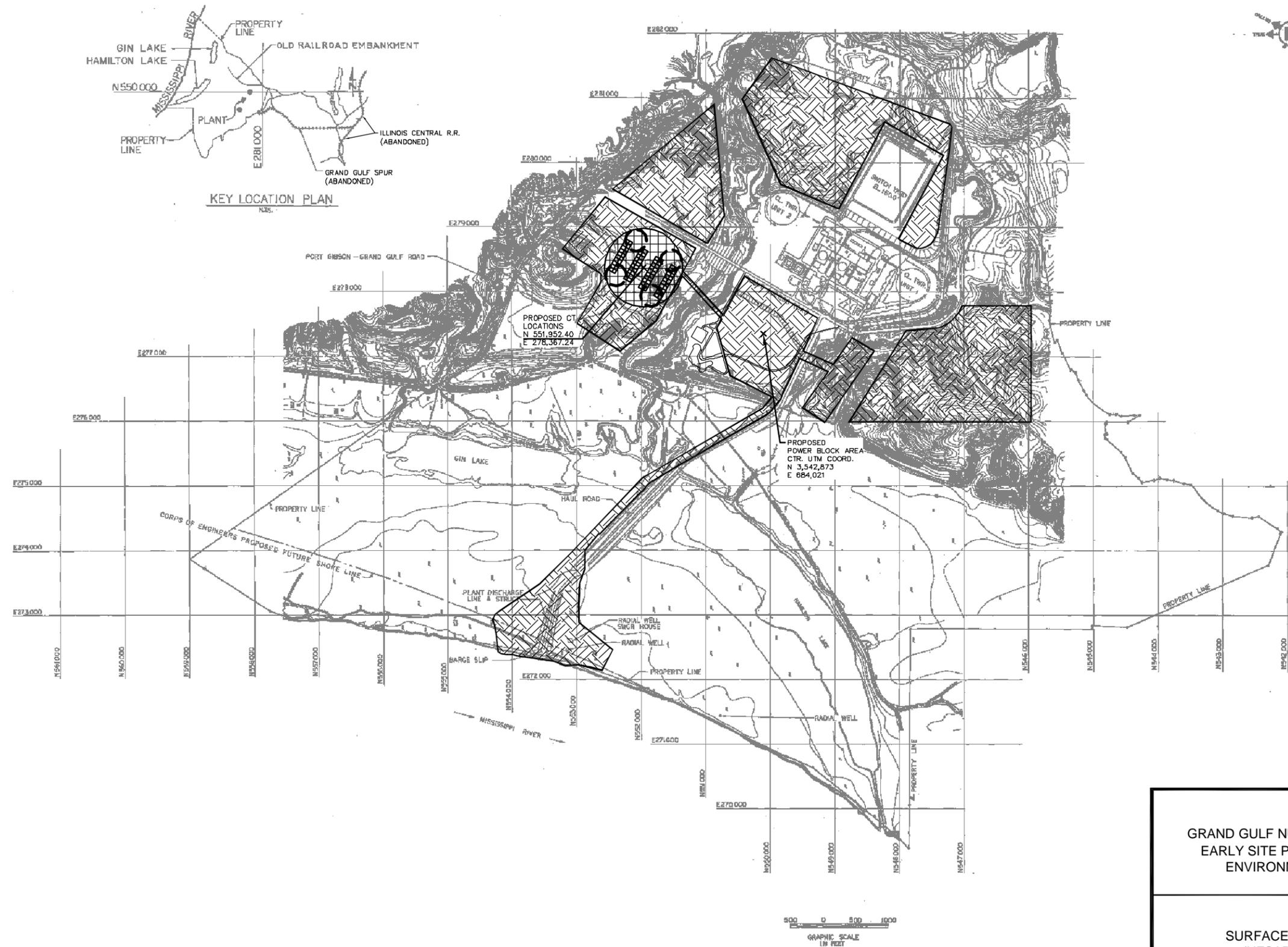
Assumption  
Iberia  
Iberville  
Lafayette  
St. Martin  
St. Mary

**District IX**

Ascension  
Jefferson  
LaFourche  
Orleans  
Plaquemines  
St. Bernard  
St. Charles  
St. James  
St. John  
Terrebonne

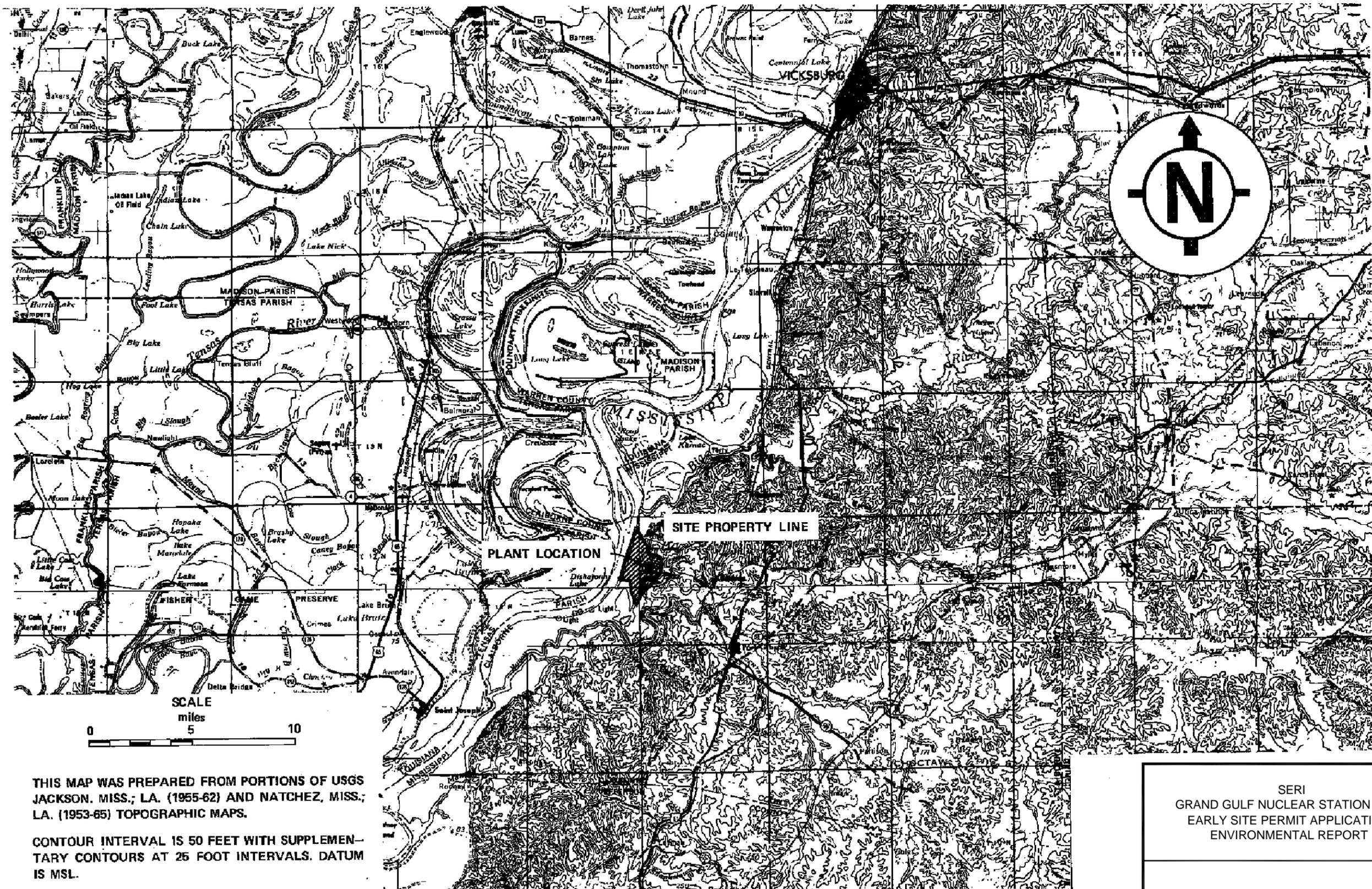
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LOUISIANA AGRICULTURAL  
STATISTICS DISTRICTS



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SURFACE DRAINAGE PLAN  
 (UFSAR FIGURE 2.4-1)

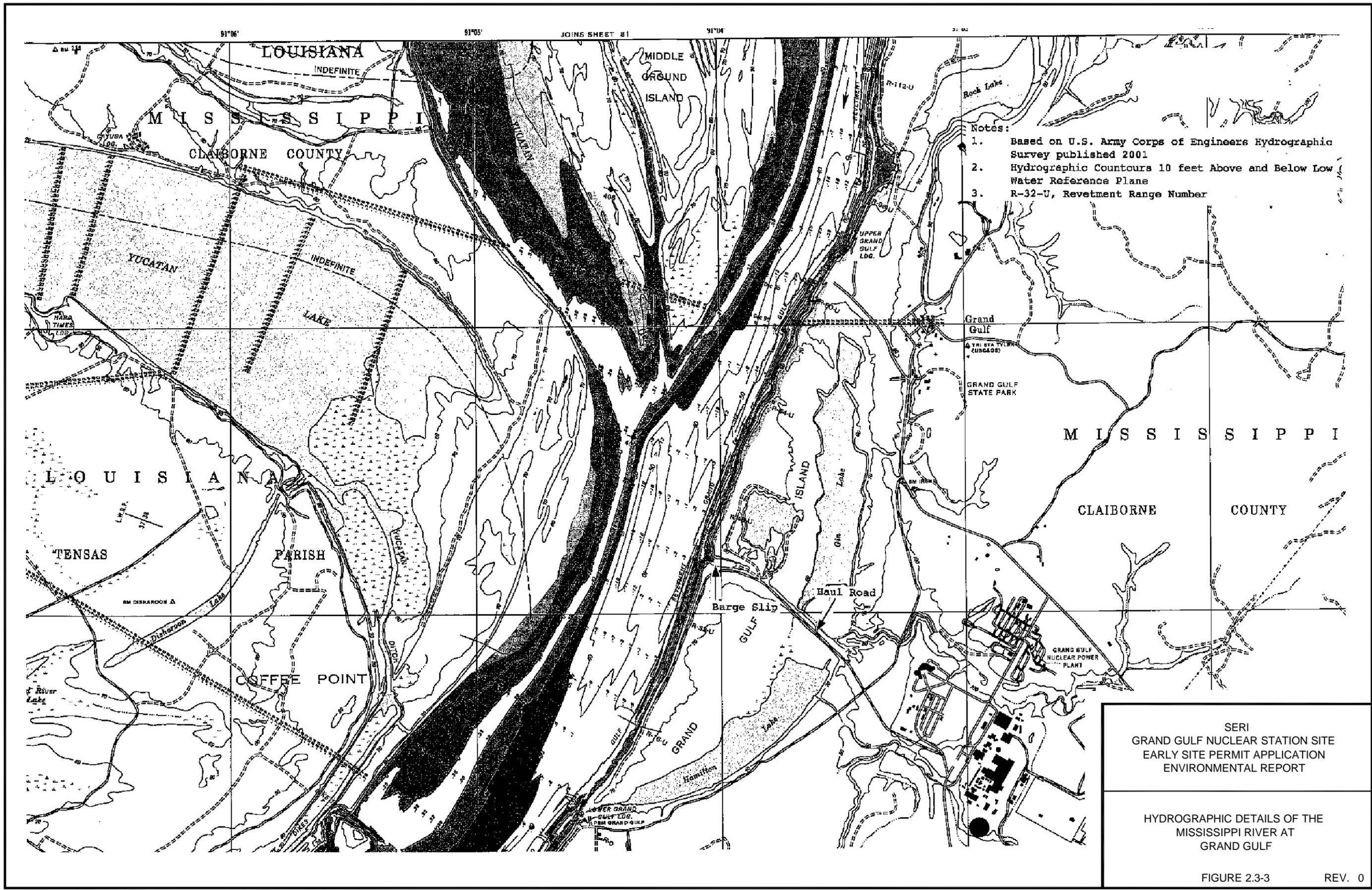


THIS MAP WAS PREPARED FROM PORTIONS OF USGS JACKSON, MISS.; LA. (1955-62) AND NATCHEZ, MISS.; LA. (1953-65) TOPOGRAPHIC MAPS.

CONTOUR INTERVAL IS 50 FEET WITH SUPPLEMENTARY CONTOURS AT 25 FOOT INTERVALS. DATUM IS MSL.

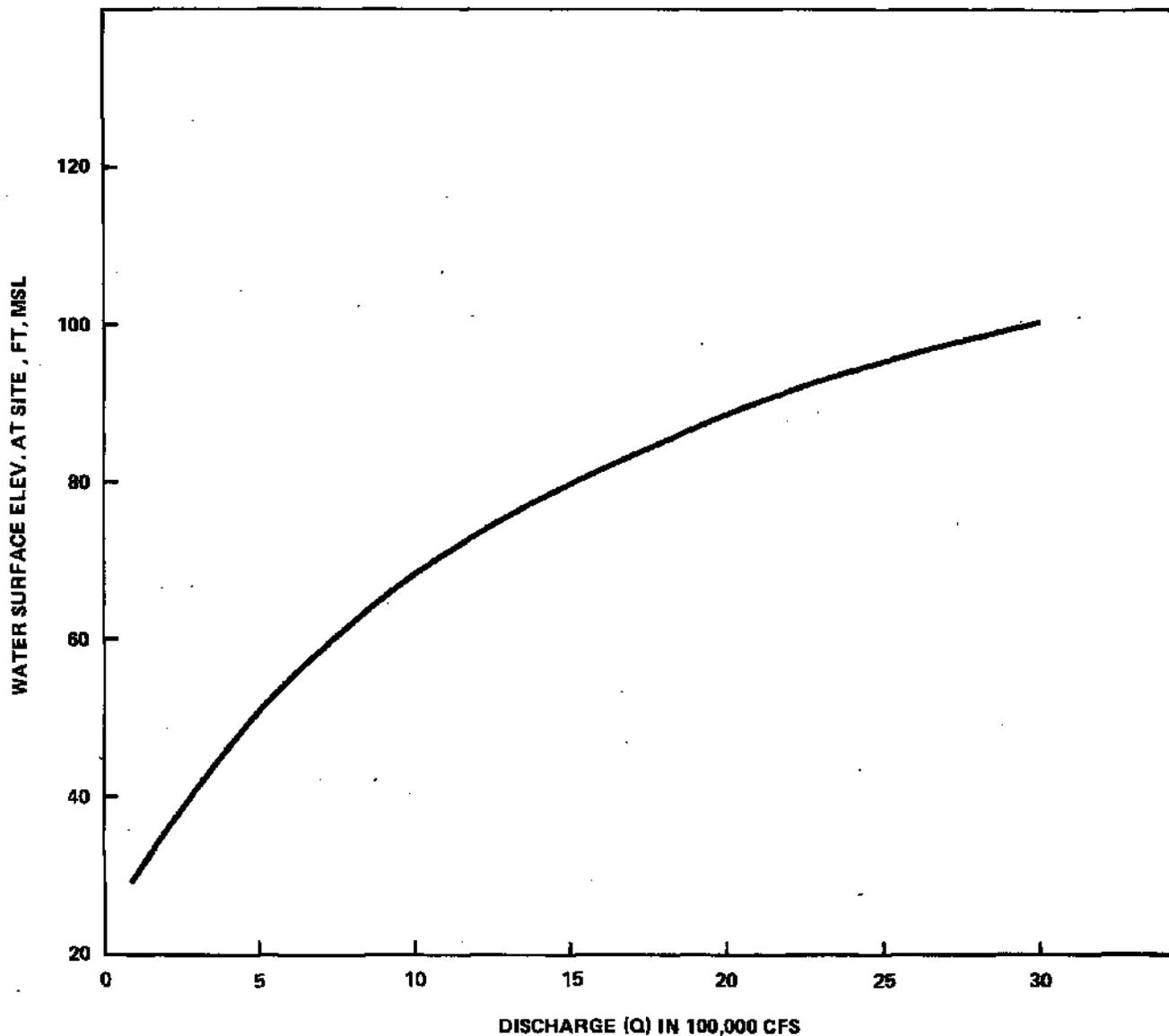
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REGIONAL TOPOGRAPHY  
 (FER FIGURE 2.4-1)



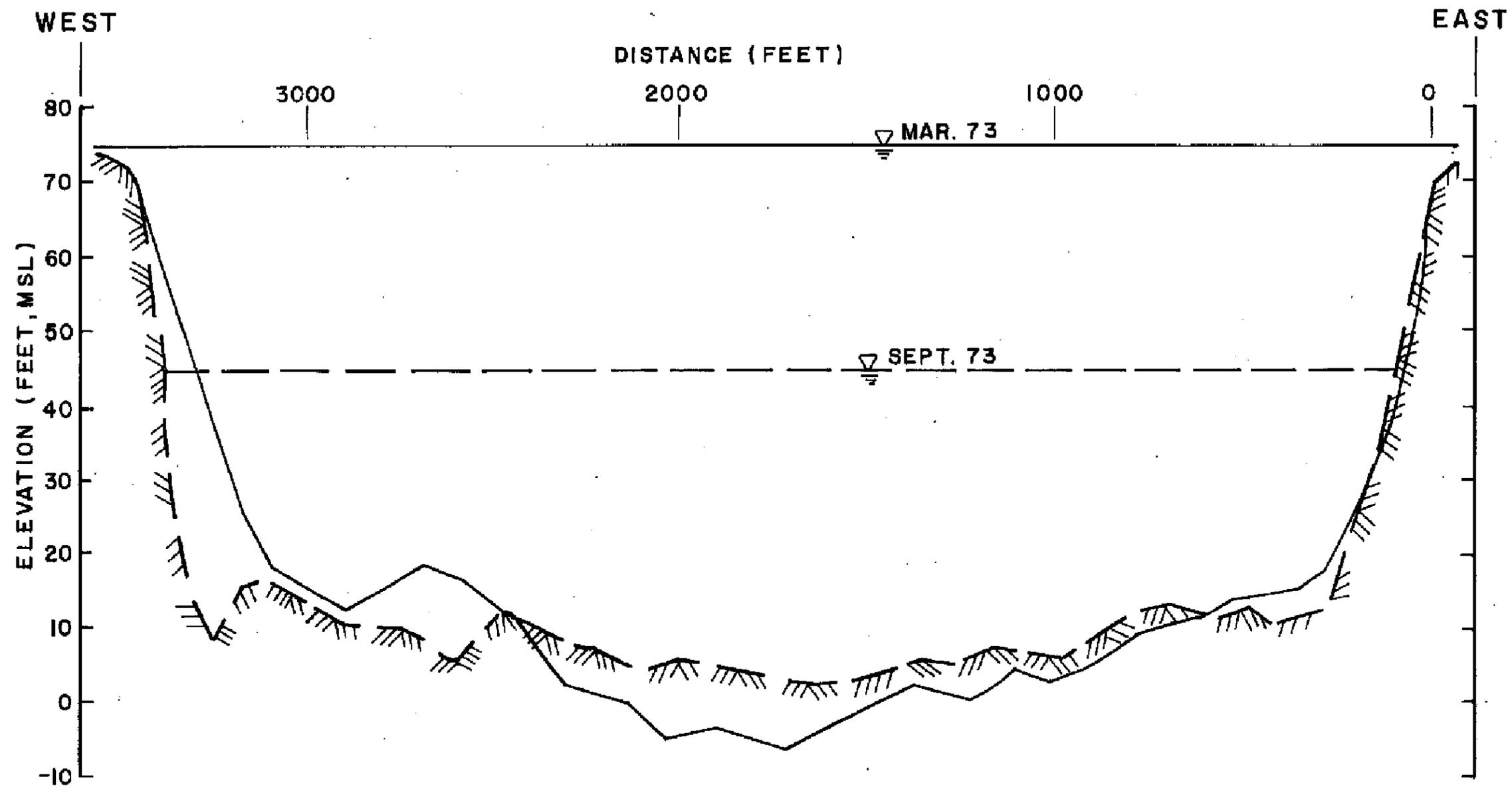
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HYDROGRAPHIC DETAILS OF THE  
 MISSISSIPPI RIVER AT  
 GRAND GULF



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RATING CURVE FOR THE MISSISSIPPI  
RIVER AT GRAND GULF SITE  
(FER FIGURE 2.4-5)



**NOTE:**

CROSS SECTIONS SHOWN LOOKING UPSTREAM.

**LEGEND:**

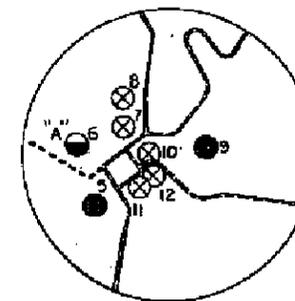
- SURVEY MARCH 19, 1973
- //// // SURVEY SEPTEMBER 24, 1973

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 EARLY SITE PERMIT APPLICATION  
 ENVIRONMENTAL REPORT

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CHANNEL CROSS SECTIONS  
 OF THE MISSISSIPPI RIVER IN THE  
 VICINITY OF THE DISCHARGE STRUCTURE  
 (FER FIGURE 2.4-3)

FIGURE 2.3-5      REV. 0



GRAND GULF  
DET. I

**LEGEND**

- WATER WELL - UNSAMPLED
- ◐ WATER WELL - SAMPLED
- ⊗ RAIN WATER CISTERN
- TEST WATER WELL - SAMPLED
- ▲<sup>OW 4</sup> OBSERVATION WELL - SAMPLED
- <sup>P 11</sup> PIEZOMETER - SAMPLED
- ⊗<sup>SW</sup> SURFACE WATER SAMPLE

**NOTES**

1. FOR TABULATION OF WATER USERS, SEE FER TABLE 2.4-23  
CHEMICAL ANALYSIS OF WATER SAMPLES PRESENTED IN  
TABLE 2.3-31 (FER TABLE 2.4-21).

**REFERENCES**

USGS QUADRANGLES: GRAND GULF MISS-LA, 1963  
SAINT JOSEPH MISS-LA, 1958  
GENERAL HIGHWAY MAP, CLAIBORNE CO.,  
MISSISSIPPI, 1967

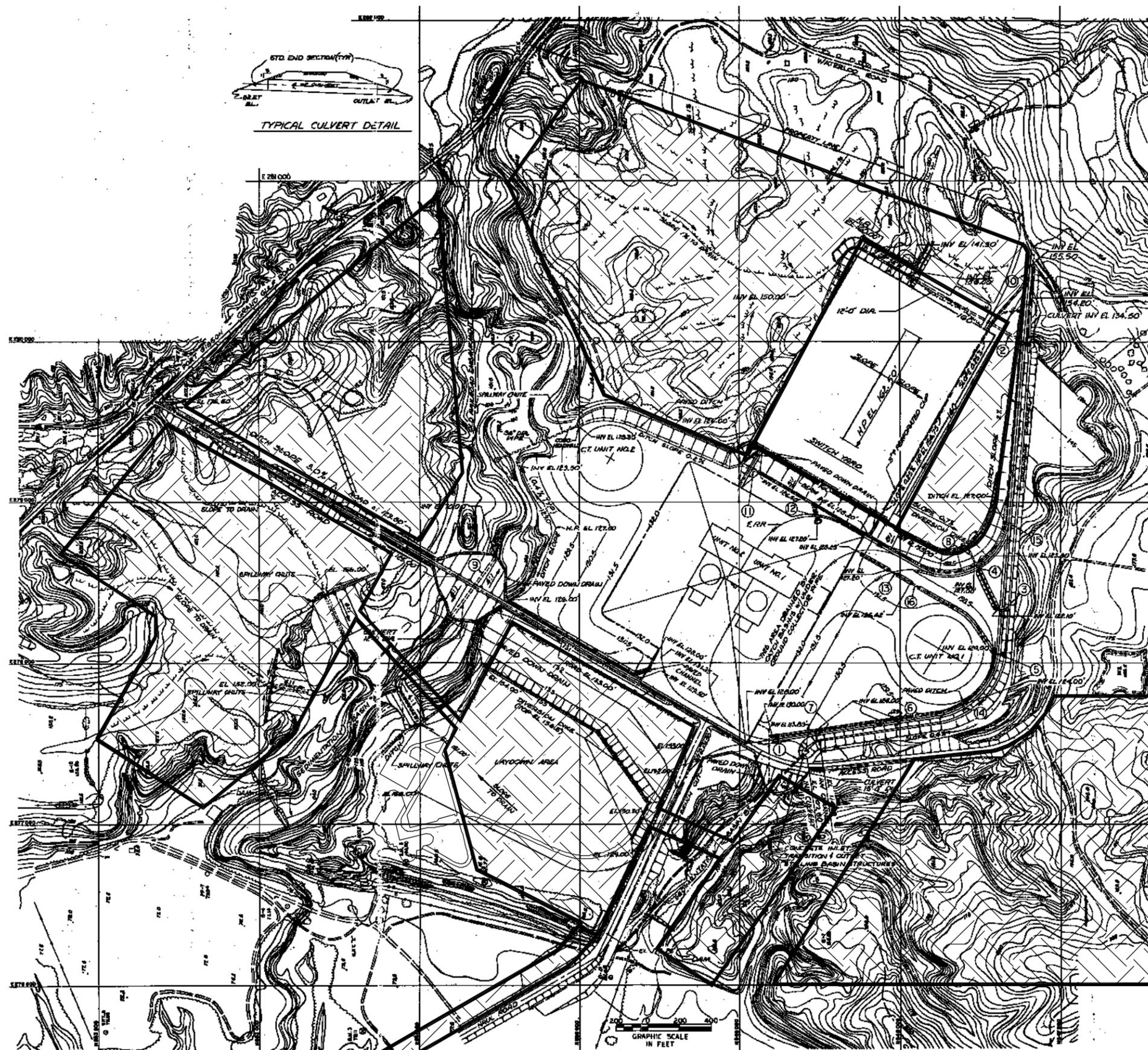
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INITIAL WATER SAMPLING LOCATIONS  
(FER FIGURE 2.4-10)

FIGURE 2.3-6

REV. 0





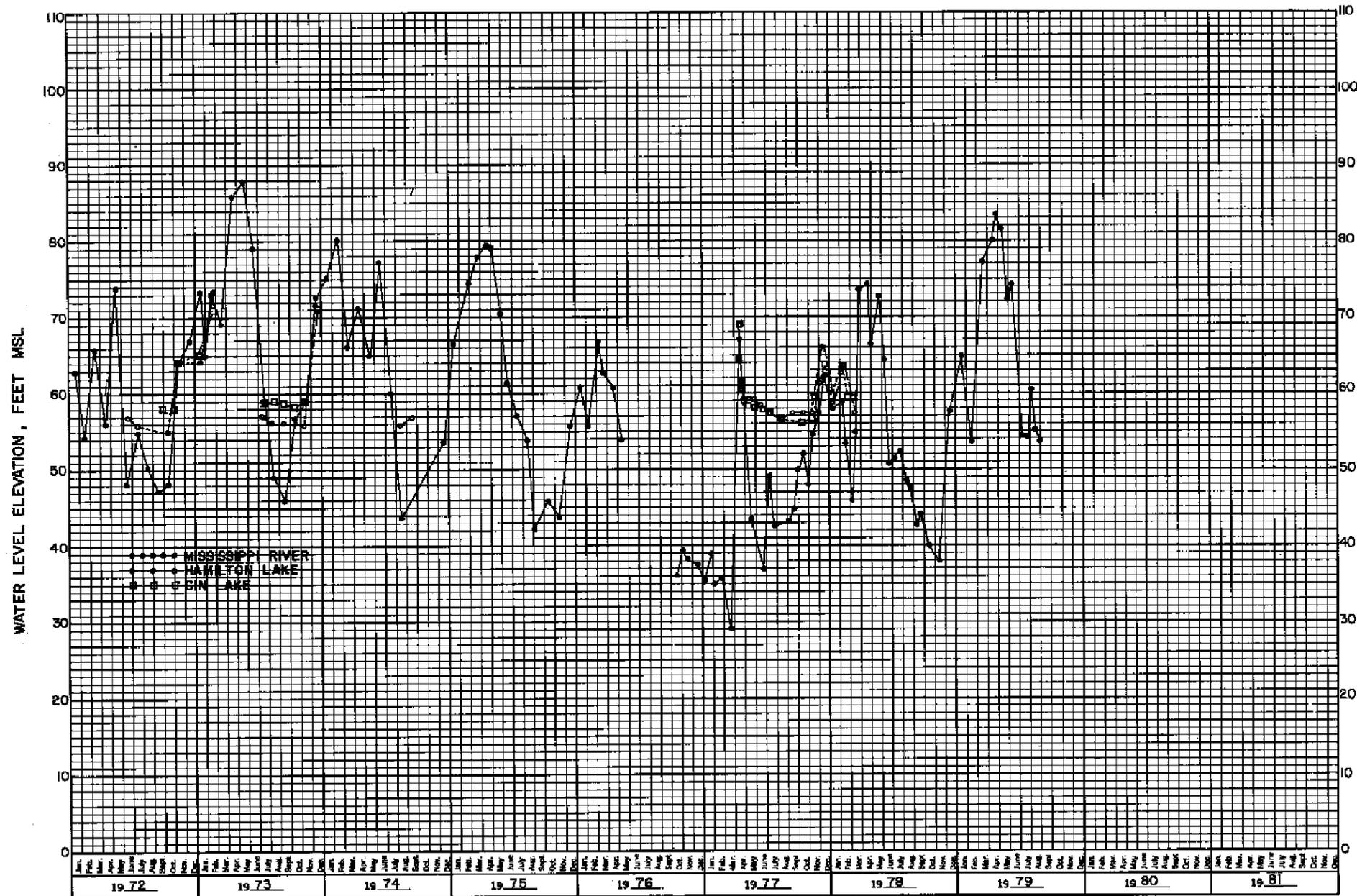
**LEGEND:**

- GRASS LINED DITCHES
- GRASS LINED WATERWAYS
- PAVED DITCHES  
(3" GRANITE OR 4" CONCRETE)
- SPILLWAY CHUTES  
(GMP WITH BASIN)
- PAVED DOWN DRAIN
- RAILROAD
- CULVERTS
- PROPOSED NEW FACILITY  
CONSTRUCTION AREAS.

- NOTES:**
1. STRUCTURES FOR GGNS UNIT 2 ARE FOR INFORMATION ONLY, SINCE CONSTRUCTION OF UNIT 2 WAS SUSPENDED ON 8/21/91.
  2. RAILROAD DATA AND LOCATIONS ARE FOR INFORMATION ONLY TO IDENTIFY LOCATION OF ORIGINAL RR BED. MOST OF THE RR HAS BEEN REMOVED.

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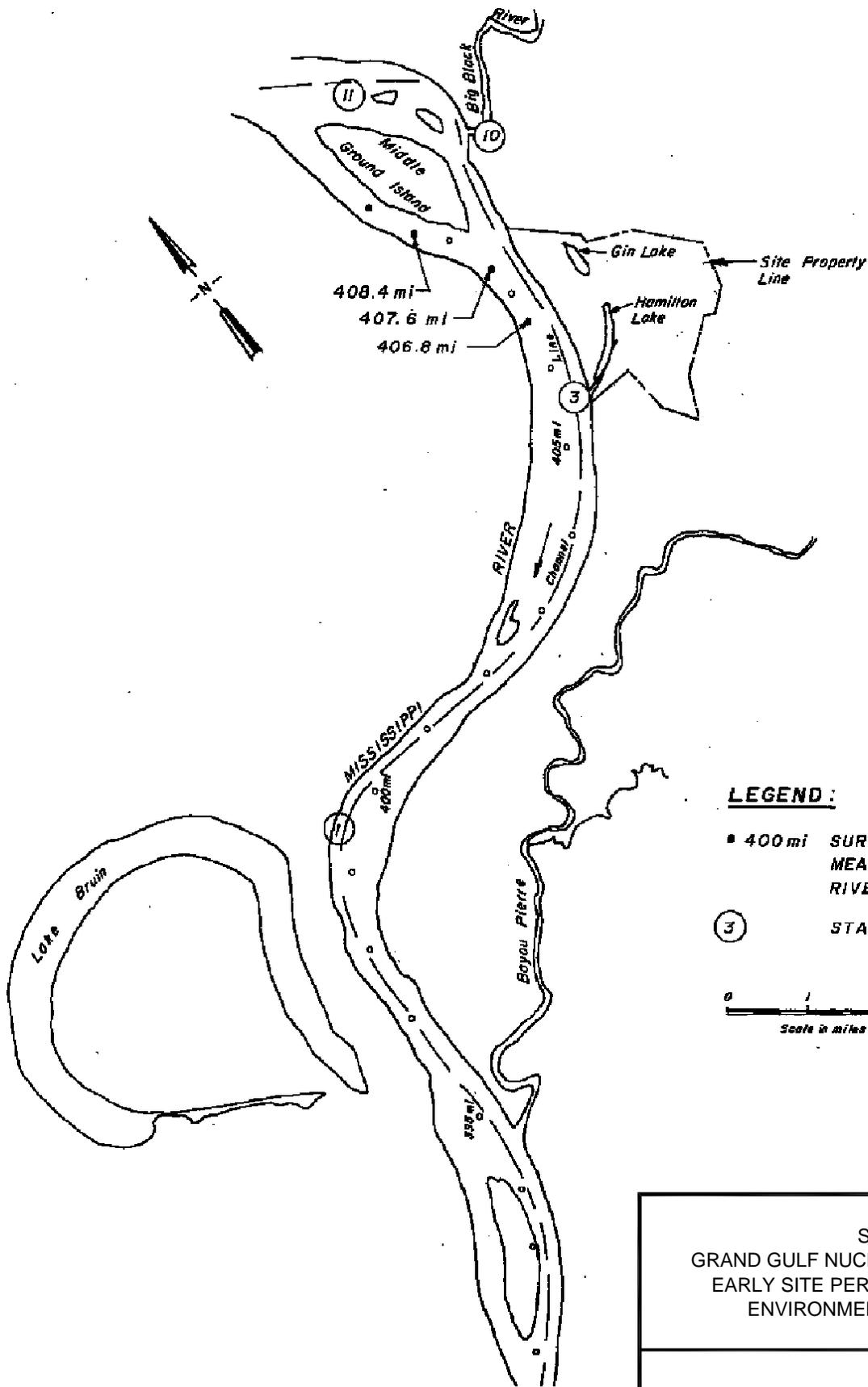
SITE DRAINAGE PLAN  
(UFSAR FIGURE 2.4-7)



NOTES:  
 1. LOCATIONS OF MISSISSIPPI RIVER, HAMILTON & GIN LAKES ARE SHOWN IN FIGURE 2.3-20 (UFSAR FIGURE 2.4-27).

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HYDROGRAPHS OF MISSISSIPPI RIVER,  
 GIN LAKE, AND HAMILTON LAKE  
 (UFSAR FIGURE 2.4-33)



**LEGEND :**

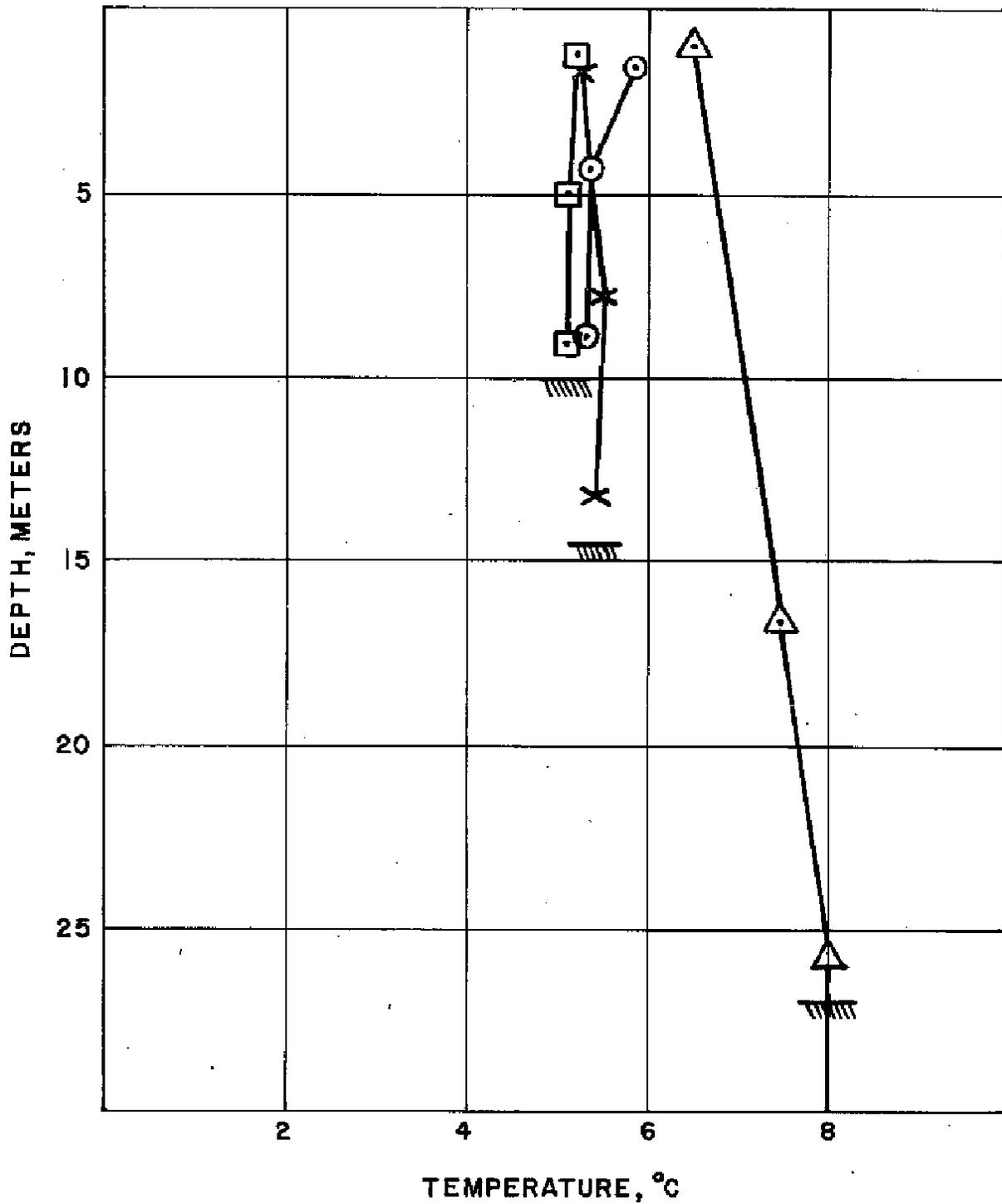
• 400 mi SURFACE VELOCITY MEASUREMENTS AND RIVER MILES

③ STATION NUMBER



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LOCATIONS OF INITIAL VELOCITY AND  
 TEMPERATURE MEASUREMENTS  
 (FER FIGURE 2.4-8)

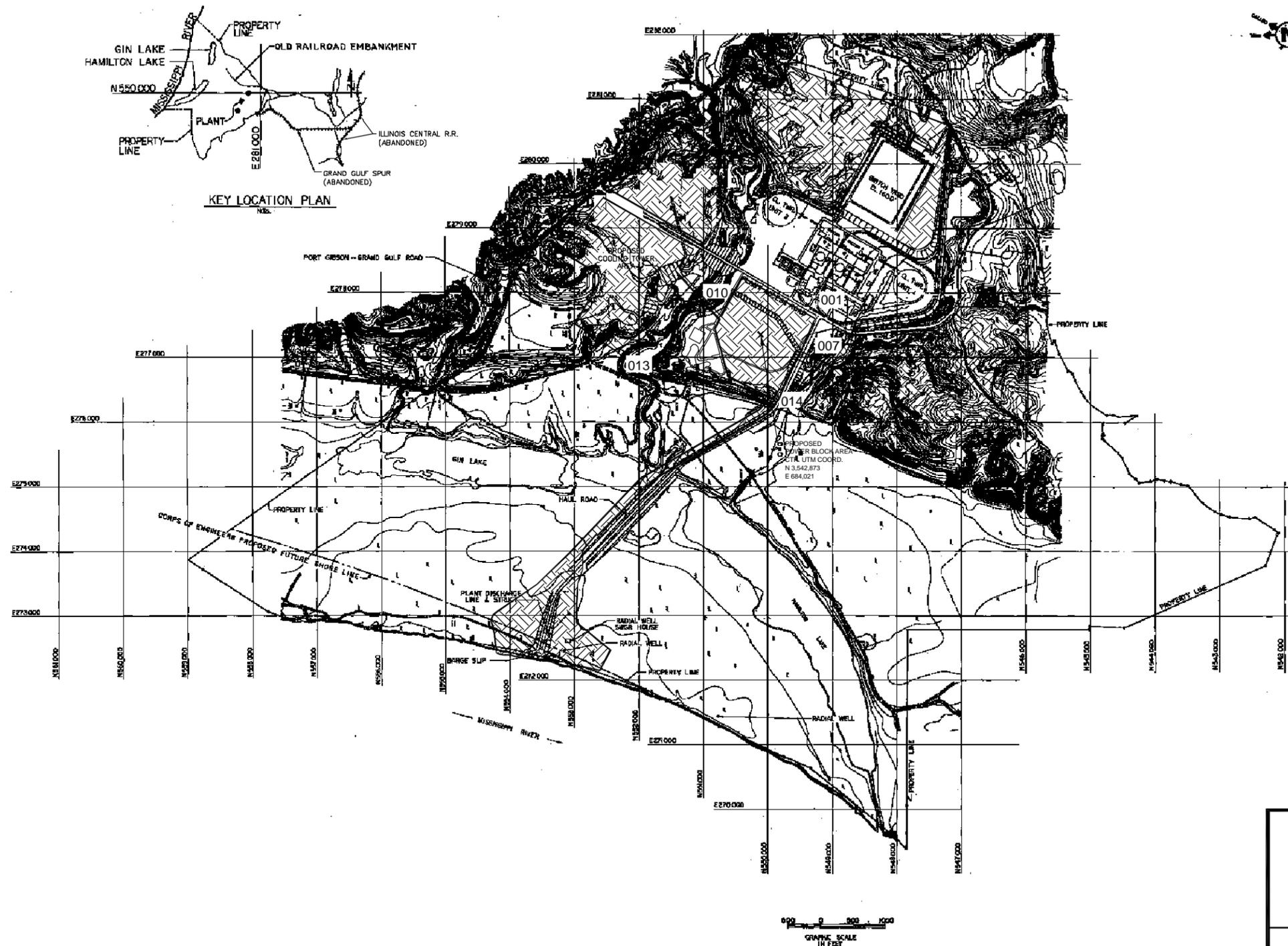


**LEGEND:**

-  **STATION 1**
-  **STATION 3**
-  **STATION 10**
-  **STATION 11**
-  **APPROX. BOTTOM**

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VERTICAL TEMPERATURE PROFILE  
 MISSISSIPPI RIVER  
 FEBRUARY 19, 1973  
 (FER FIGURE 2.4-7)



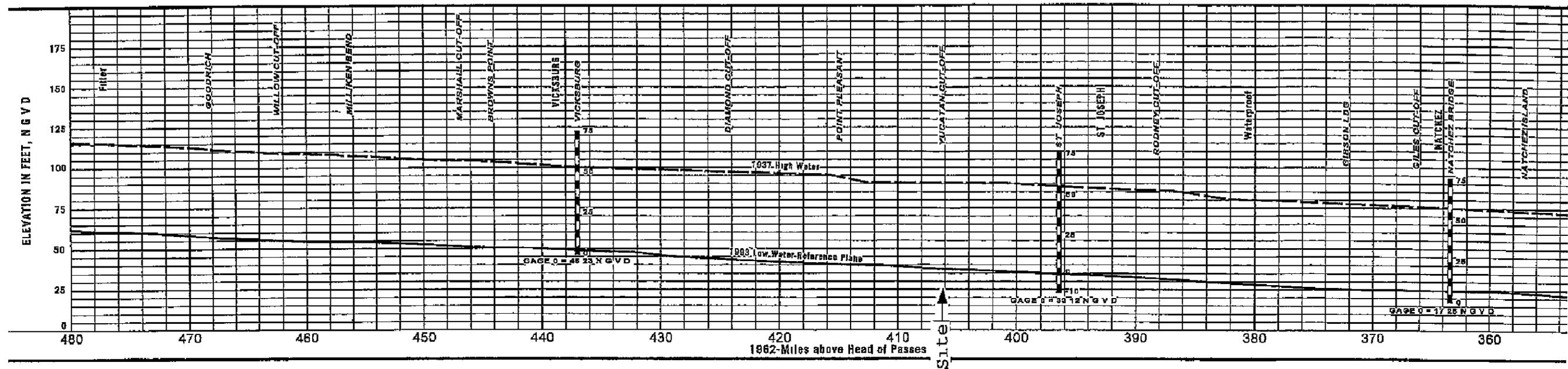
LEGEND:  
007 - OUTFALL NO. 007 LOCATION

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EARLY SITE PERMIT APPLICATION  
ENVIRONMENTAL REPORT

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APPROXIMATE LOCATIONS OF  
GGNS NPDES OUTFALL

FIGURE 2.3-12 REV. 0



**LEGEND**  
 430 1982 Mileage above Head of Passes  
 — Low Water Reference Plane\*  
 - - - 1937 High Water

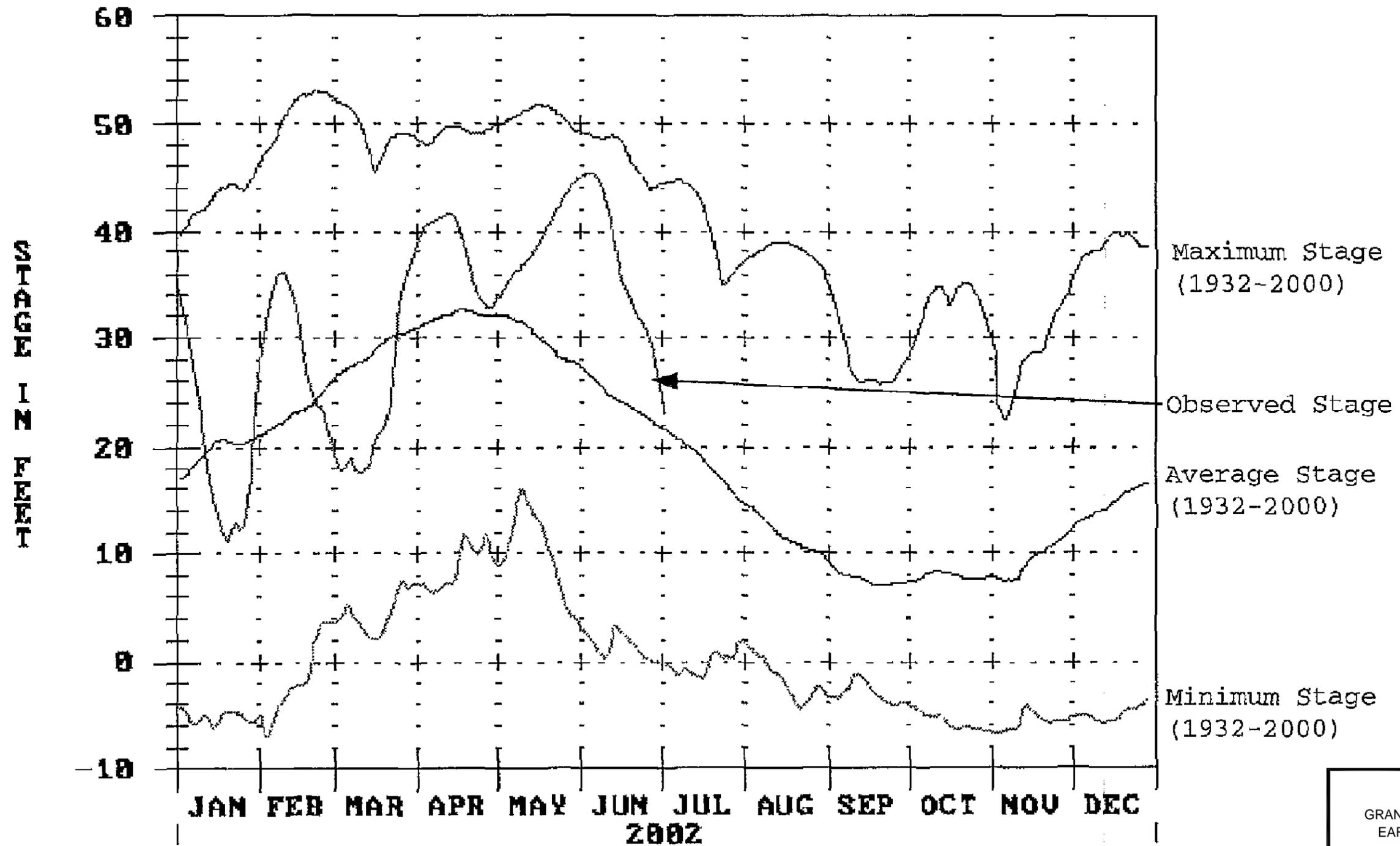
Source: Adapted from USACE, 2001

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 EARLY SITE PERMIT APPLICATION  
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WATER SURFACE PROFILES FOR 1937 HIGH  
 FLOW AND 1993 LOW WATER REFERENCE  
 PLANE

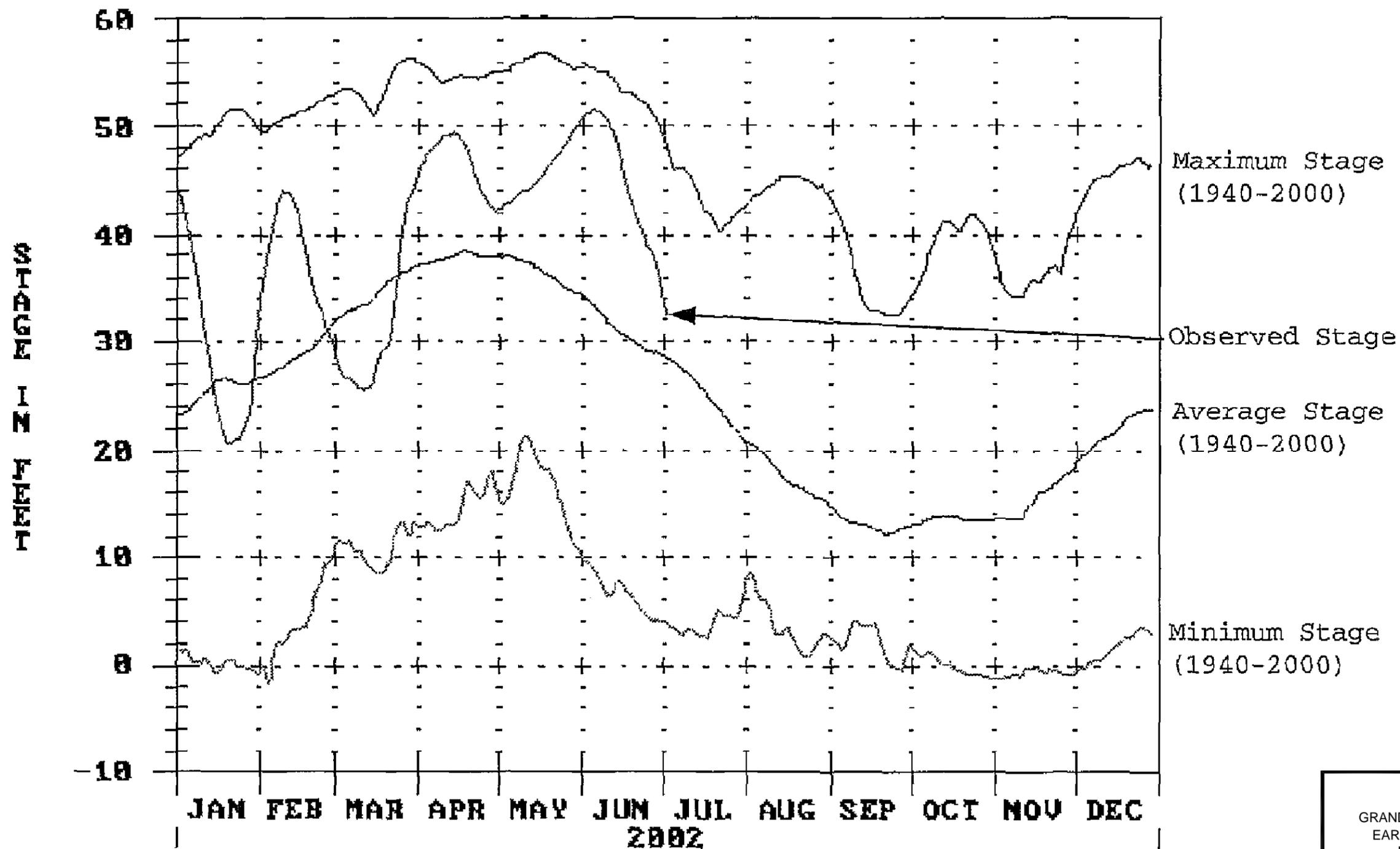
FIGURE 2.3-13      REV. 0



Source: Adapted from U.S. Army Corps of Engineers

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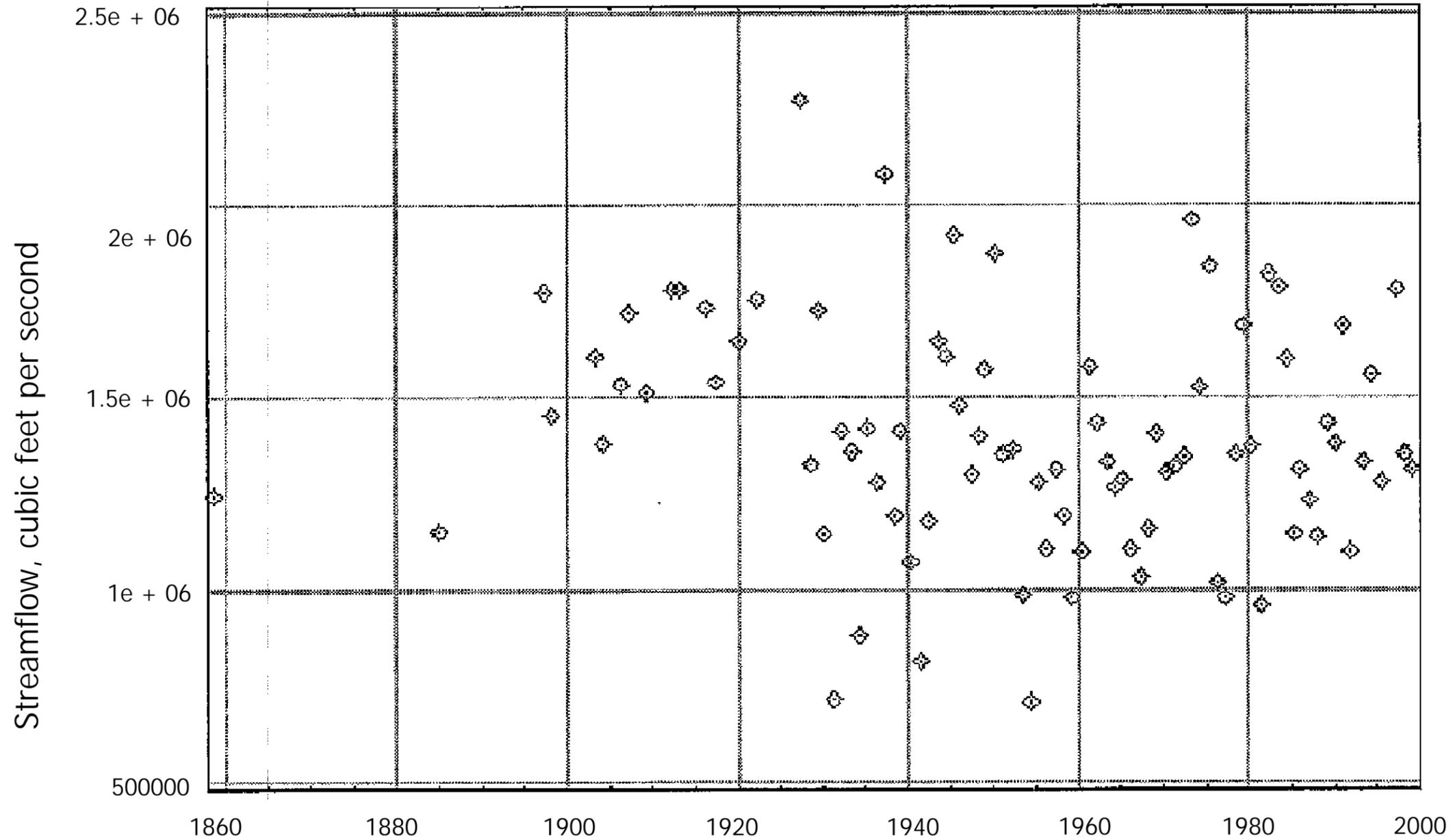
HYDROGRAPH FOR THE MISSISSIPPI  
 RIVER AT VICKSBURG, MS



Source: Adapted from U.S. Army Corps of Engineers

<p>SERI          GRAND GULF NUCLEAR STATION SITE          EARLY SITE PERMIT APPLICATION          ENVIRONMENTAL REPORT</p>
<p>HYDROGRAPH FOR MISSISSIPPI RIVER          AT NATCHEZ, MS</p>
<p>FIGURE 2.3-15      REV. 0</p>

USGS 07289000 MISSISSIPPI RIVER AT VICKSBURG, MS



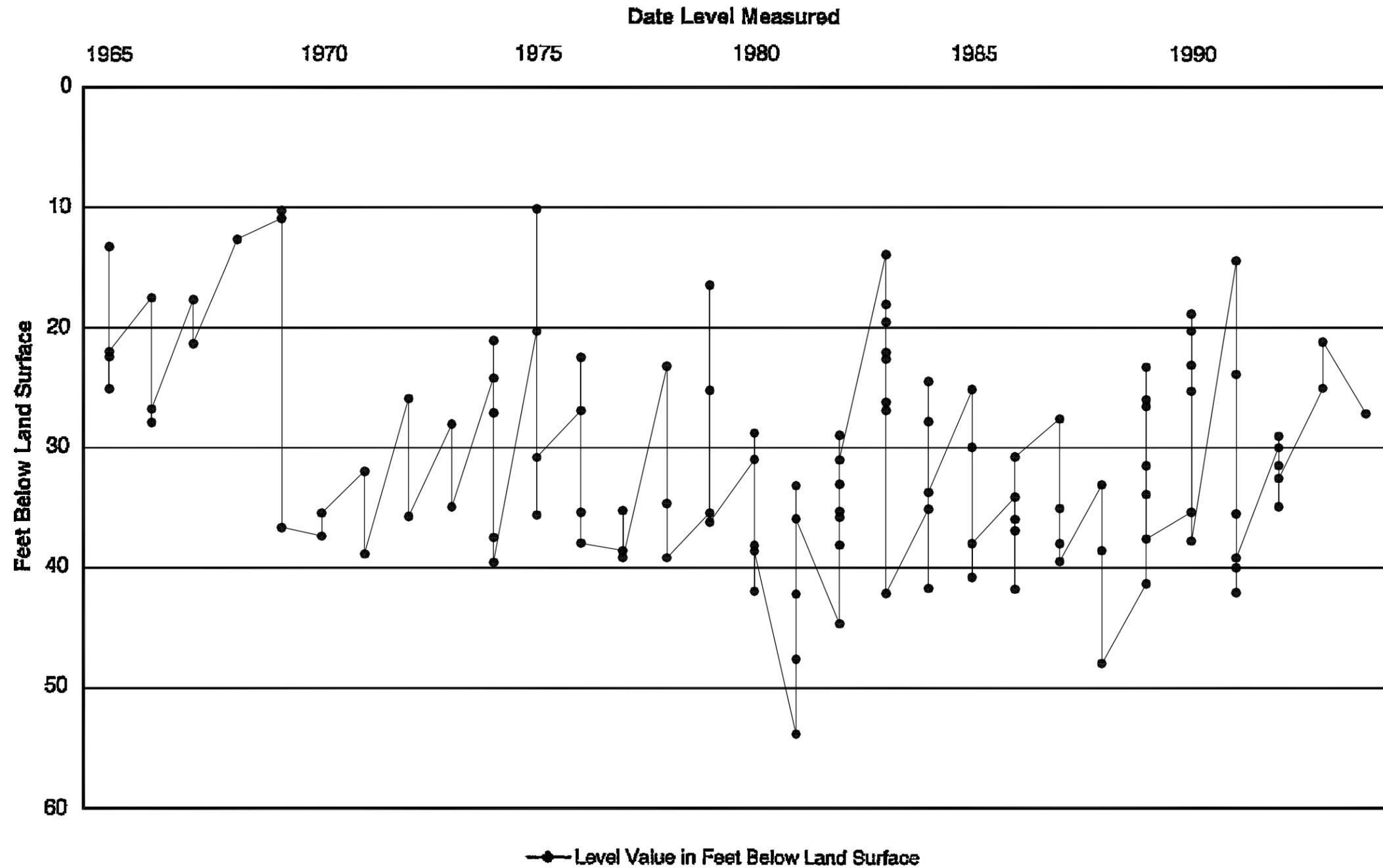
DATES: 06/24/1858 to 02/13/1999

Source: U.S.G.S.

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ANNUAL MAXIMUM INSTANTANEOUS PEAK  
STREAMFLOW - MISSISSIPPI RIVER  
USGS STATION, VICKSBURG, MS

# Ground Water Levels Vicksburg Well Completed in the Mississippi River Alluvial Aquifer



SOURCE: USGS

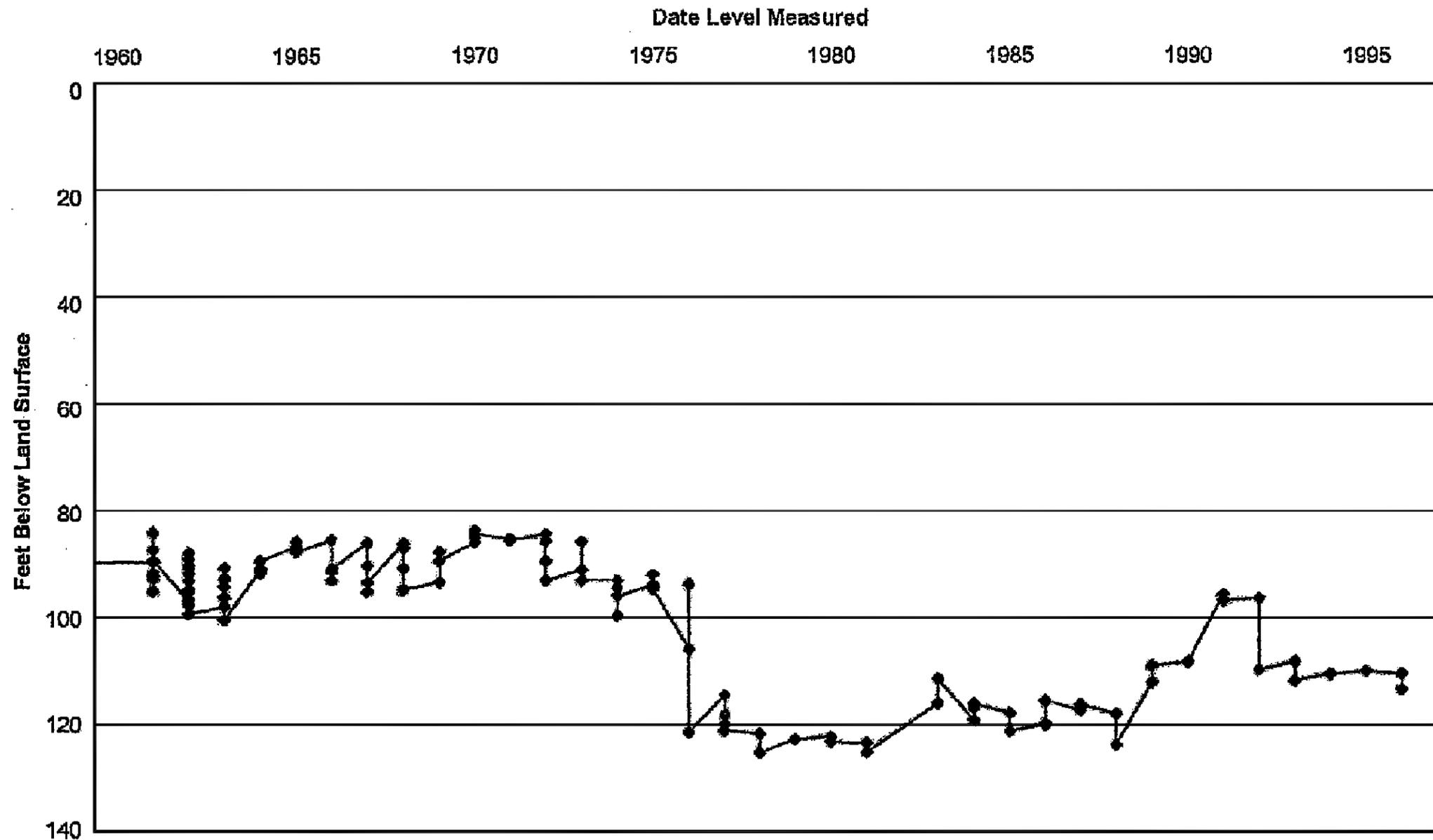
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HYDROGRAPH OF A WELL COMPLETED  
 IN THE MS RIVER ALLUVIAL AQUIFER,  
 VICKSBURG, MS

FIGURE 2.3-17 REV. 0

# Ground Water Levels - Port Gibson, Well Completed in the Lower Catahoula Formation



—◆— Level Value in Feet Below Land Surface

SOURCE: USGS

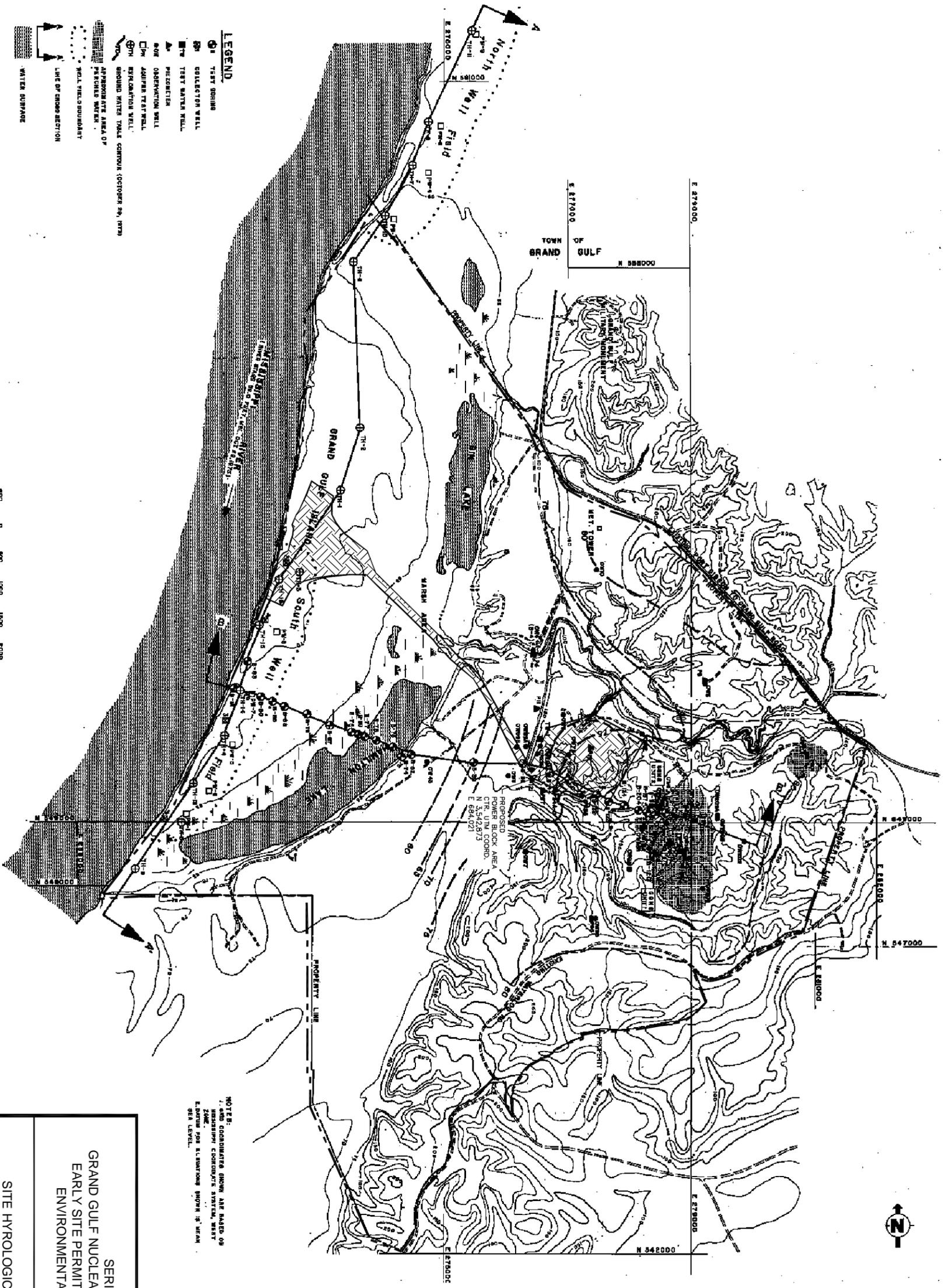
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HYDROGRAPH OF A WELL COMPLETED IN THE  
LOWER CATAHOULA FORMATION,  
PORT GIBSON, MS

FIGURE 2.3-18

REV. 0





**LEGEND**

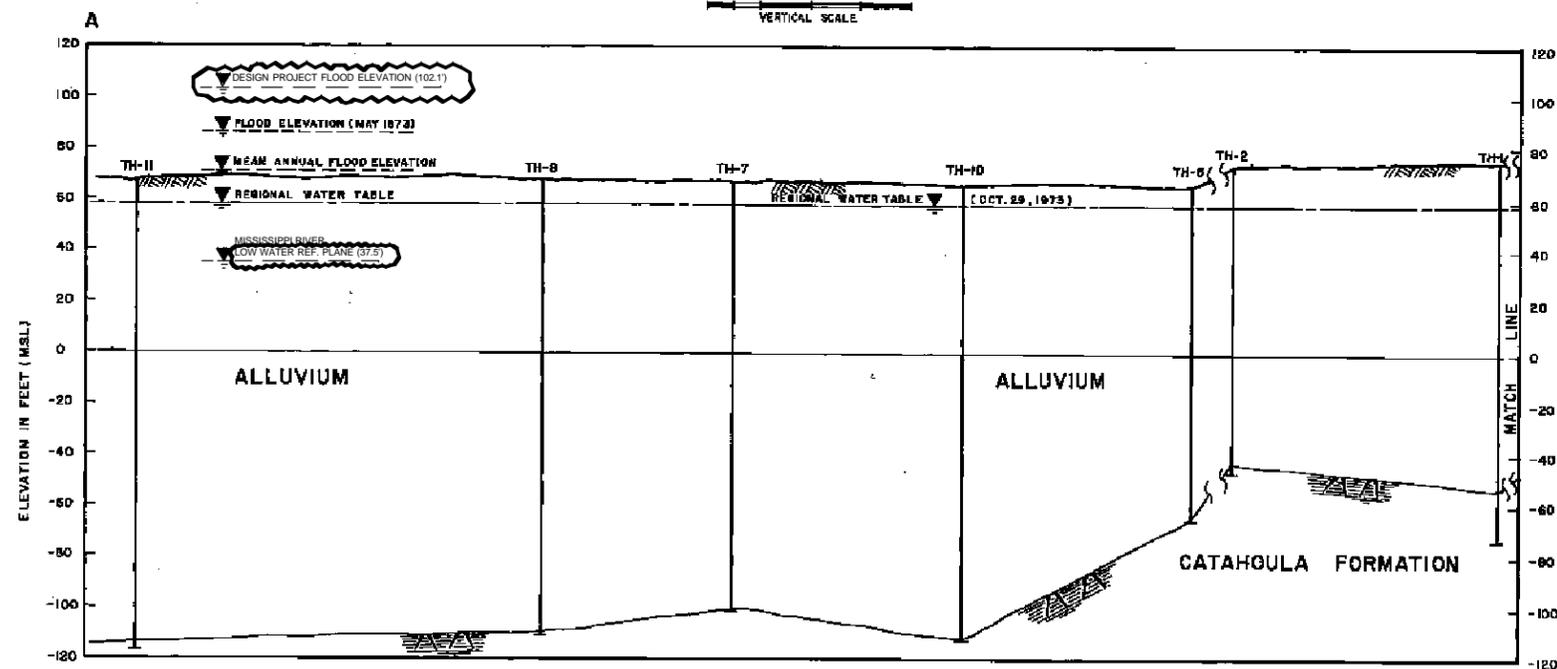
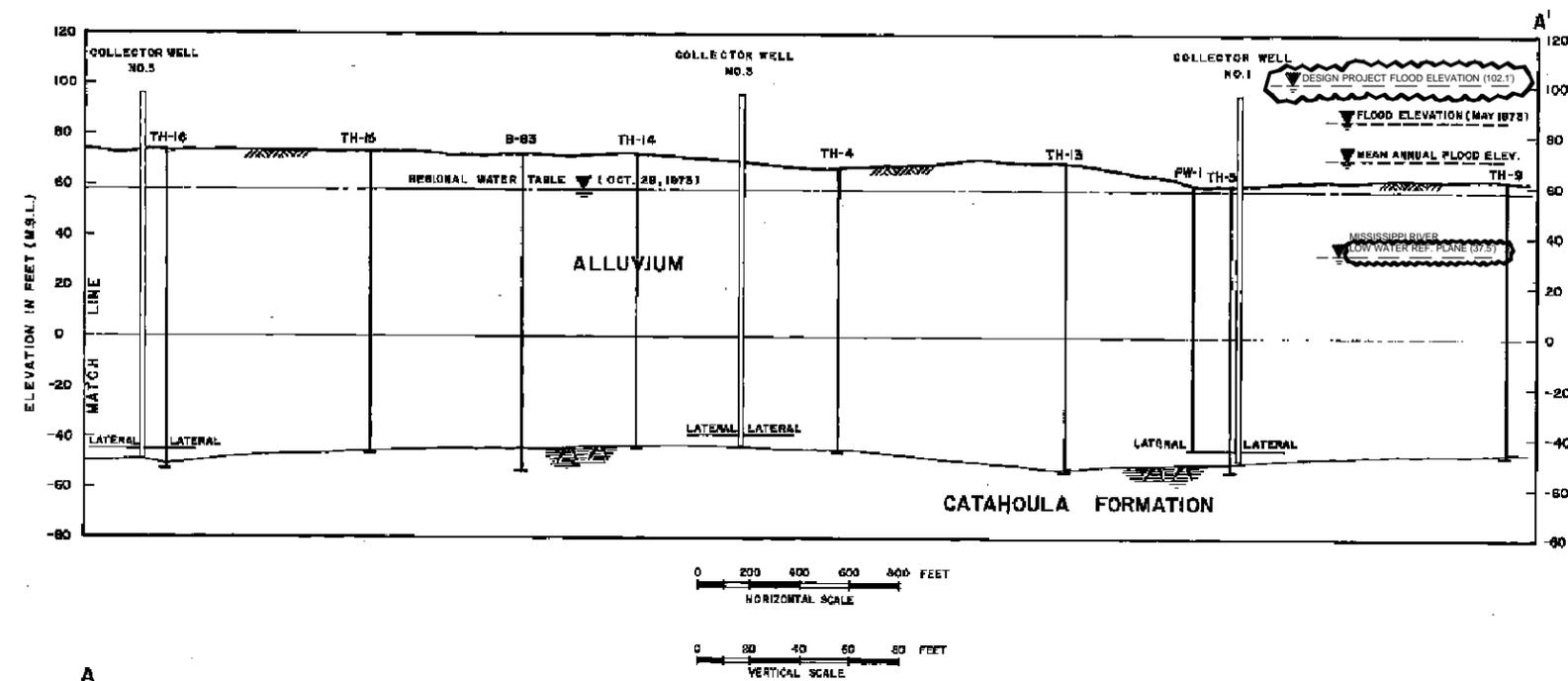
- TEST BORING
- ⊗ COLLECTION WELL
- ⊖ TEST WATER WELL
- ▲ PIEZOMETER
- ⊕ OBSERVATION WELL
- ⊞ ADAPTER TEST WELL
- ⊟ REPLETION WELL
- ⊠ GROUND WATER TREAT CONTROL (OCTOBER 84, 1973)
- ▨ APPROXIMATE AREA OF FRESH WATER
- ▧ SALT WATER BOUNDARY
- ▩ LINE OF SAND DETECTION
- ▧ WATER SUPPLY
- ▨ PROPOSED NEW PLANT CONSTRUCTION AREAS



NOTE:  
1. GRID COORDINATES SHOWN ARE BASED ON MISSISSIPPI COORDINATE SYSTEM, WEST ZONE, FOR N. LINDBERG BROWN 3" X 4" 8" SCALE.

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SITE HYDROLOGIC FEATURES  
 (NORMAL CONDITIONS)  
 (UFSAR FIGURE 2.4-27)

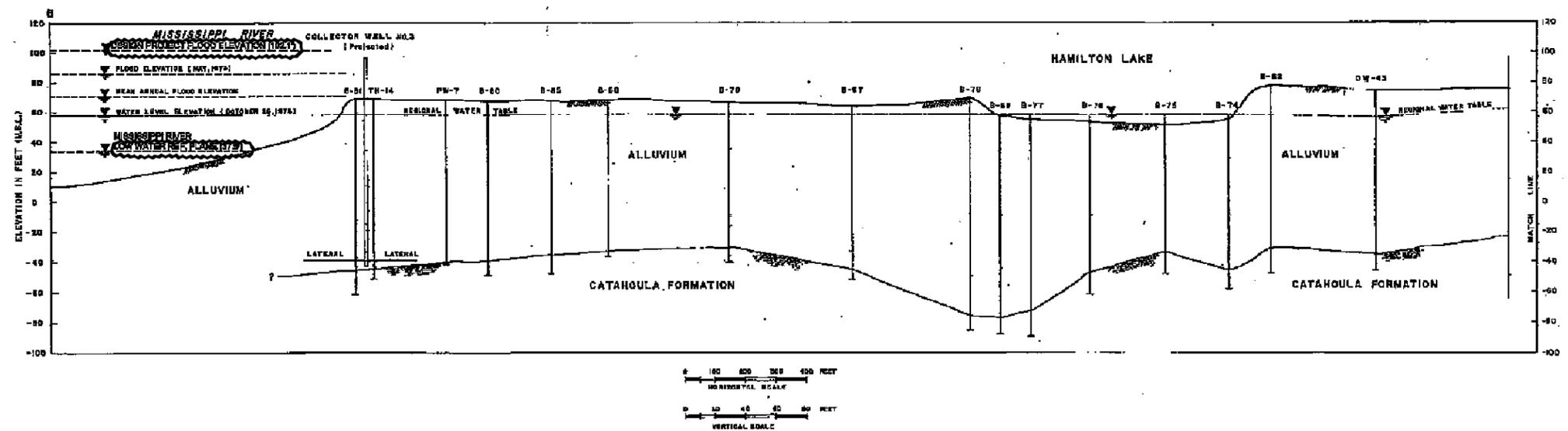
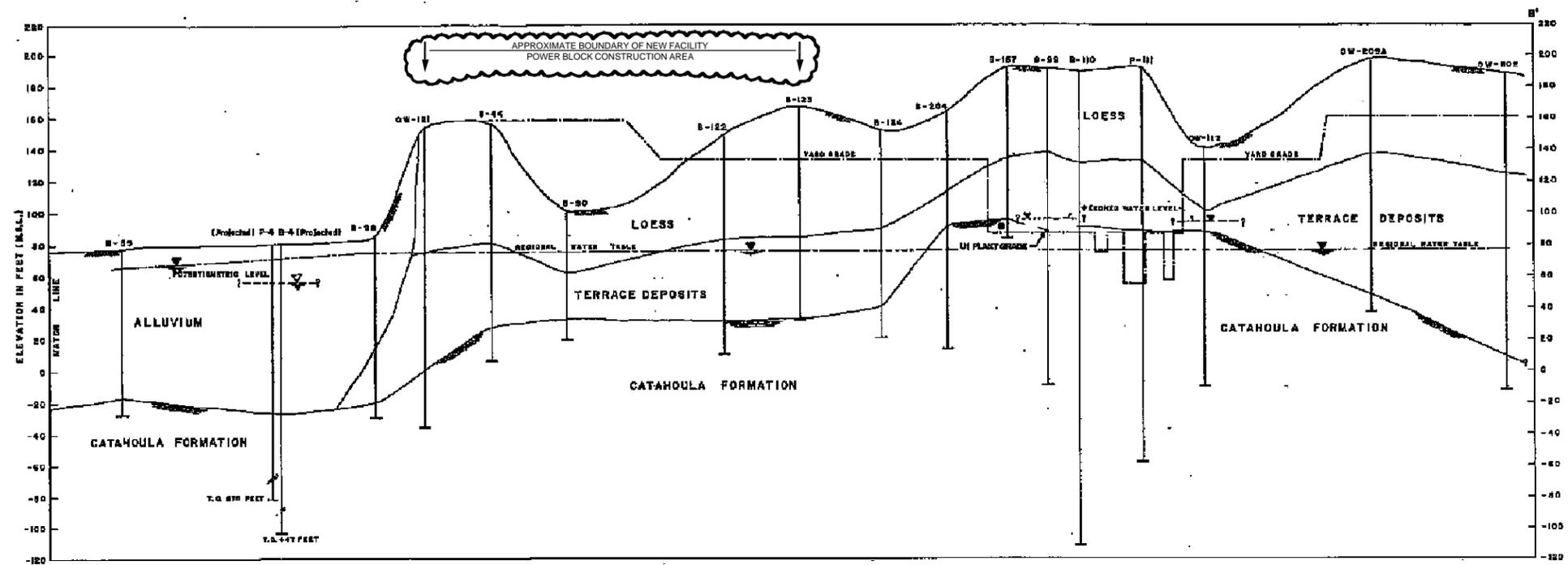


NOTES:  
 1. ☉ CLOUDS INDICATE ESP APPLICATION DATA.

SECTION LOCATION IS SHOWN IN (UFSAR FIGURE 2.4-27) FIGURE 2.3-20

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HYDROGEOLOGIC  
 CROSS SECTION A-A  
 (UFSAR FIGURE 2.4-28)

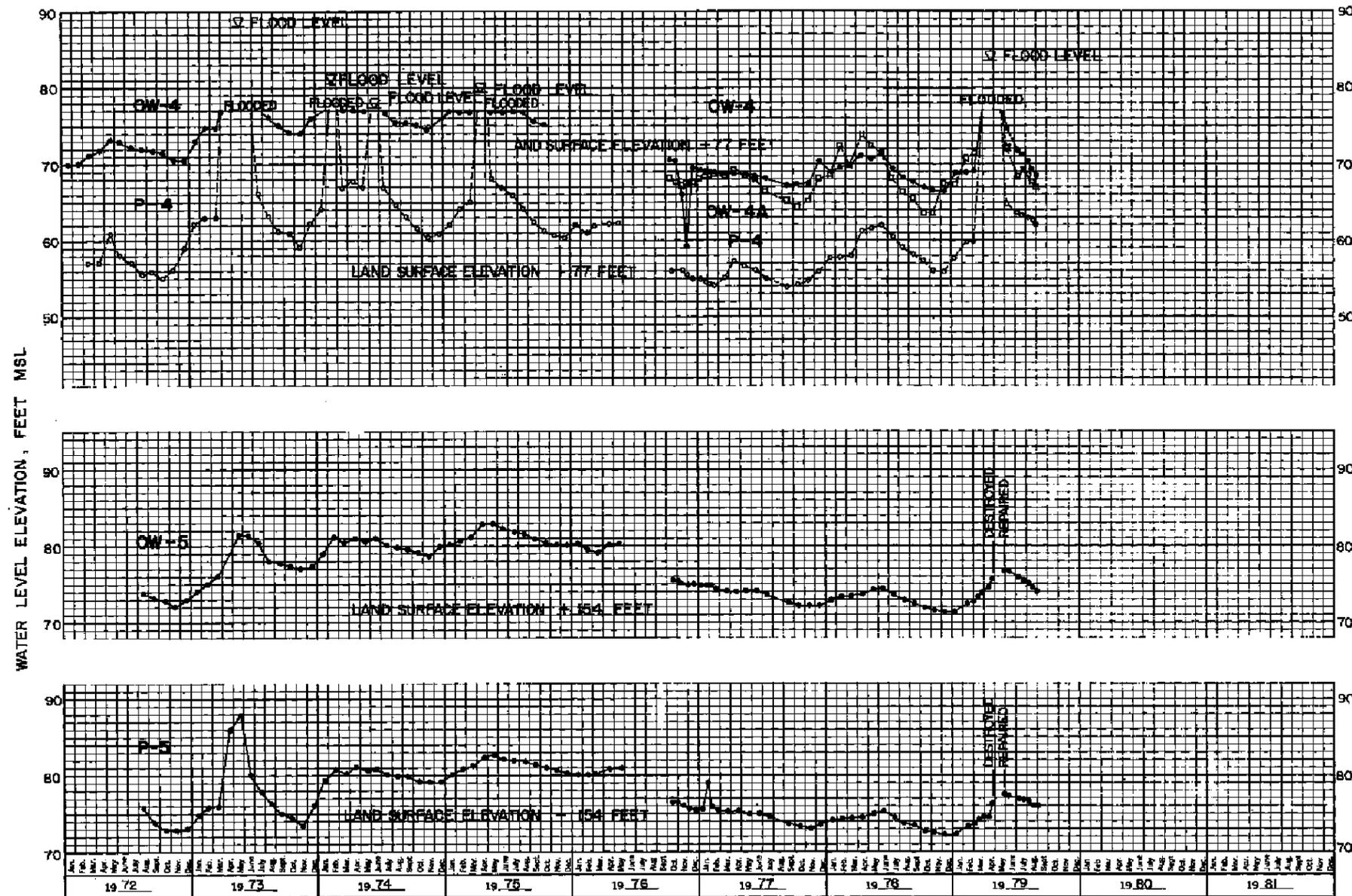


NOTES:  
 1. CLOUDS INDICATE ESP APPLICATION CHANGES.

SECTION LOCATION IS SHOWN IN (UFSAR FIGURE 2.4-27) FIGURE 2.3-20

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HYDROGEOLOGIC  
 CROSS SECTION B-B'  
 (UFSAR FIGURE 2.4-29)



NOTES:  
 1. OBSERVATION WELL AND PIEZOMETER LOCATIONS ARE SHOWN IN FIGURE 2.3-20 (UFSAR FIGURE 2.4-27).

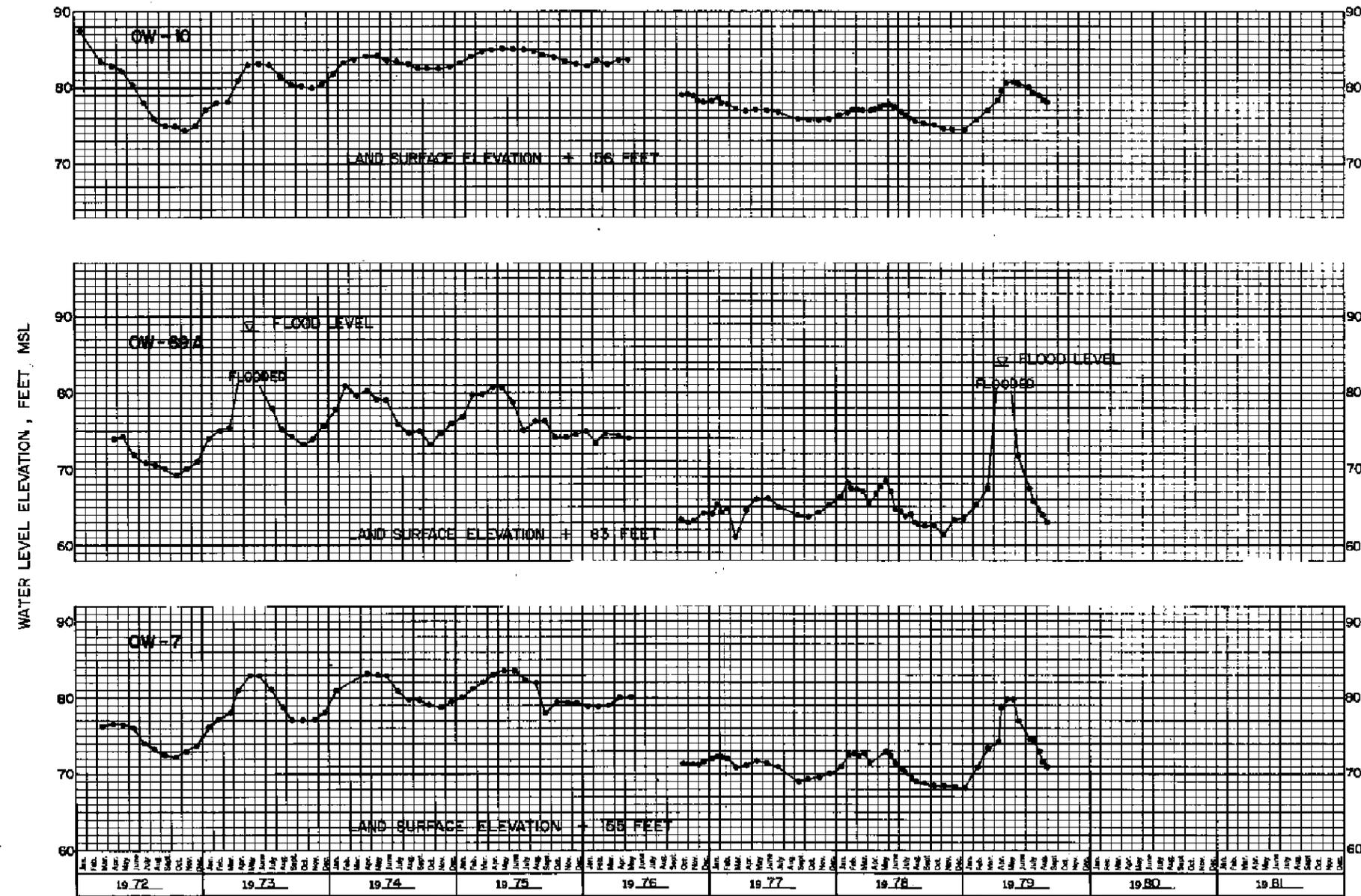
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HYDROGRAPHS OF WELLS AND  
 PIEZOMETERS  
 (UFSAR FIGURE 2.4-32, SH.1)

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FIGURE 2.3-23 SHEET 1 OF 5 REV. 0

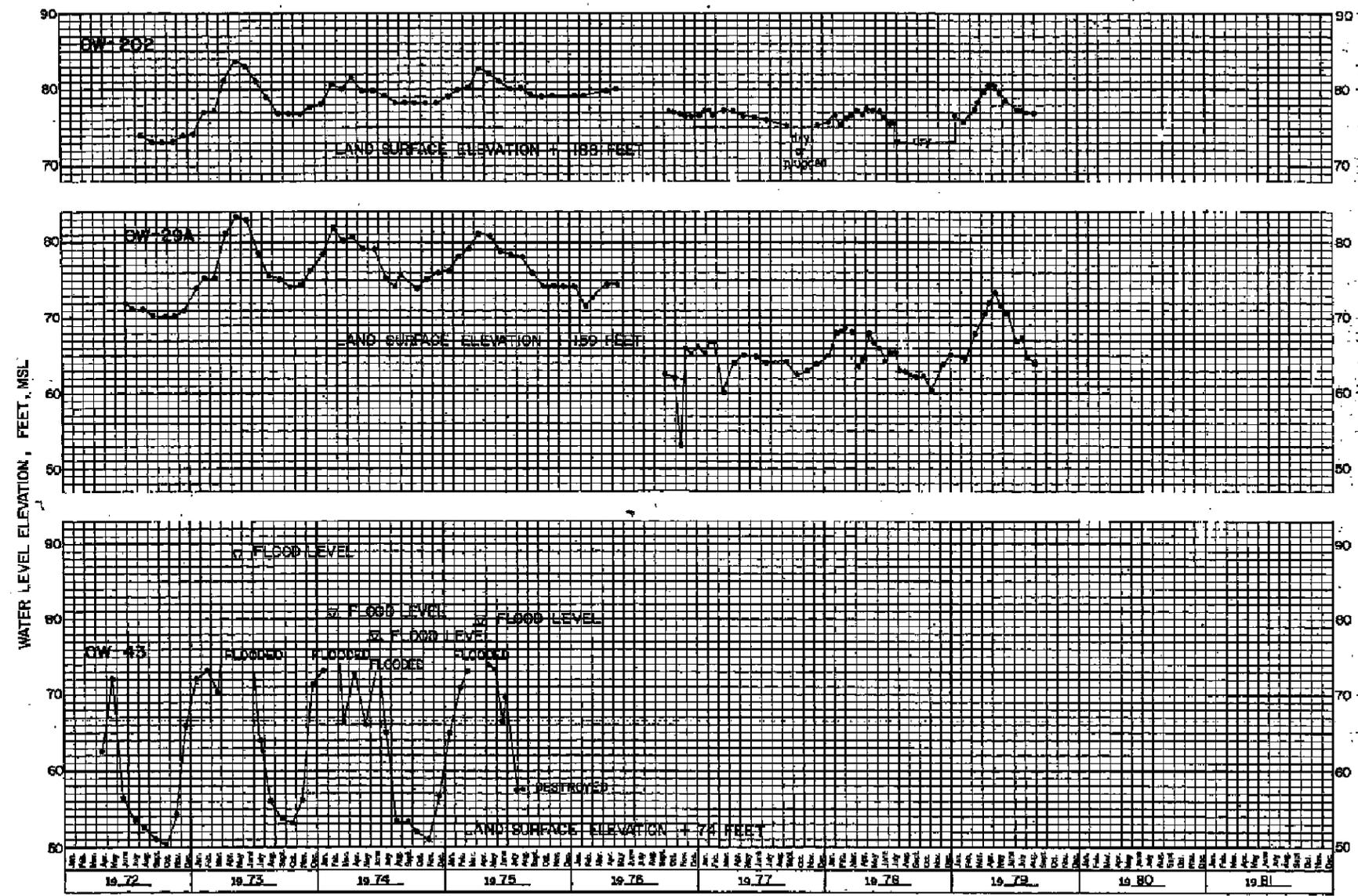


NOTES:  
1. OBSERVATION WELL AND PIEZOMETER LOCATIONS  
ARE SHOWN IN FIGURE 2.3-20 (UFSAR FIGURE 2.4-27).

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EARLY SITE PERMIT APPLICATION  
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HYDROGRAPHS OF WELLS AND  
PIEZOMETERS  
(UFSAR FIGURE 2.4-32. SH.2)

FIGURE 2.3-23 SHEET 2 OF 5 REV. 0

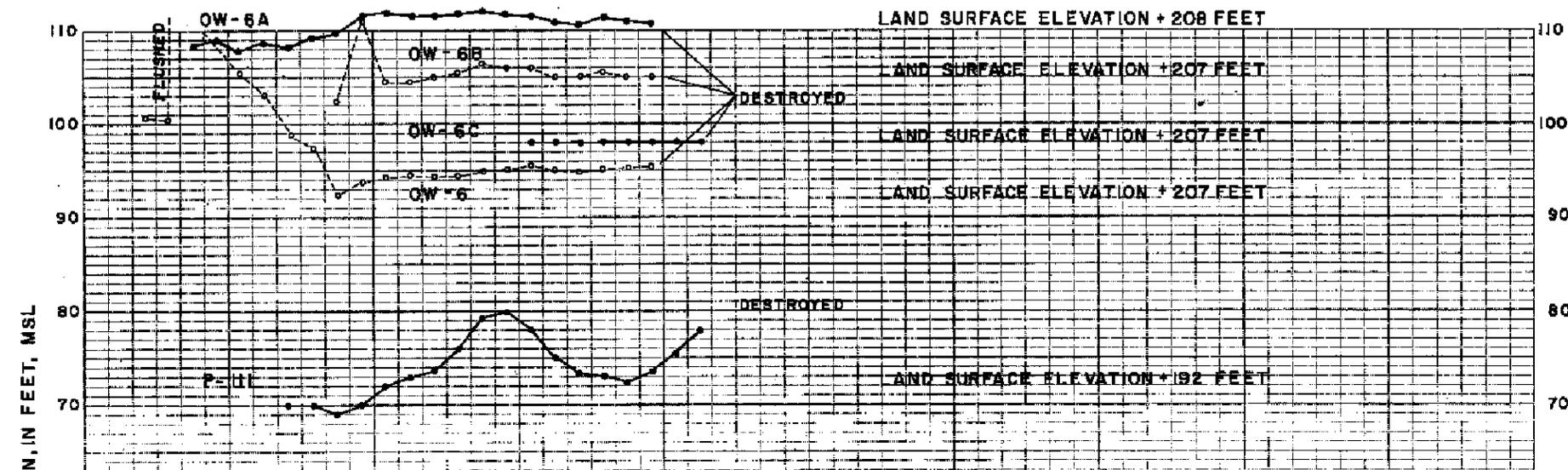


NOTES:  
 1. OBSERVATION WELL AND PIEZOMETER LOCATIONS  
 ARE SHOWN IN FIGURE 2.3-20 (UFSAR FIGURE 2.4-27).

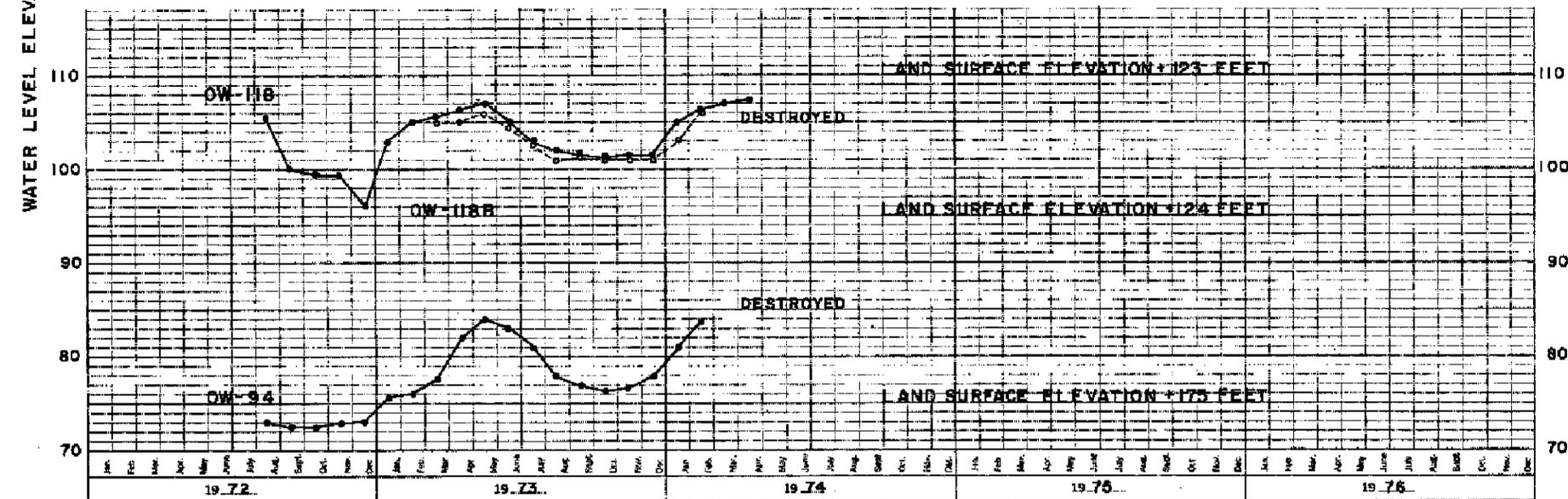
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 EARLY SITE PERMIT APPLICATION  
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HYDROGRAPHS OF REPLACEMENT  
 PIEZOMETERS  
 (UFSAR FIGURE 2.4-32, SH.3)

FIGURE 2.3-23 SHEET 3 OF 5 REV. 0



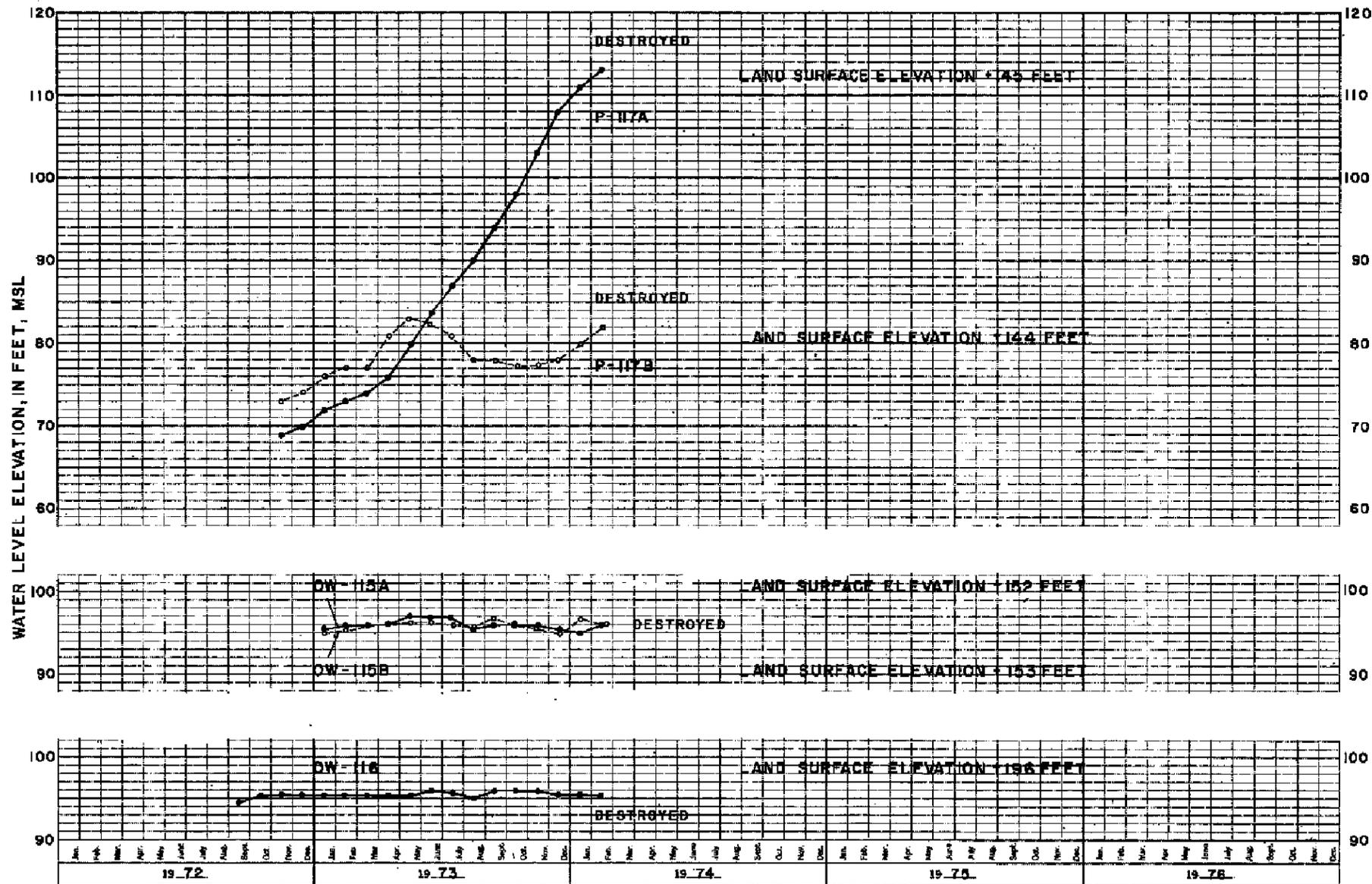
NOTES:  
1. OBSERVATION WELL AND PIEZOMETER LOCATIONS  
ARE SHOWN IN FIGURE 2.3-20 (UFSAR FIGURE 2.4-27).



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HYDROGRAPHS OF WELLS AND  
PIEZOMETERS  
(UFSAR FIGURE 2.4-32, SH.4)

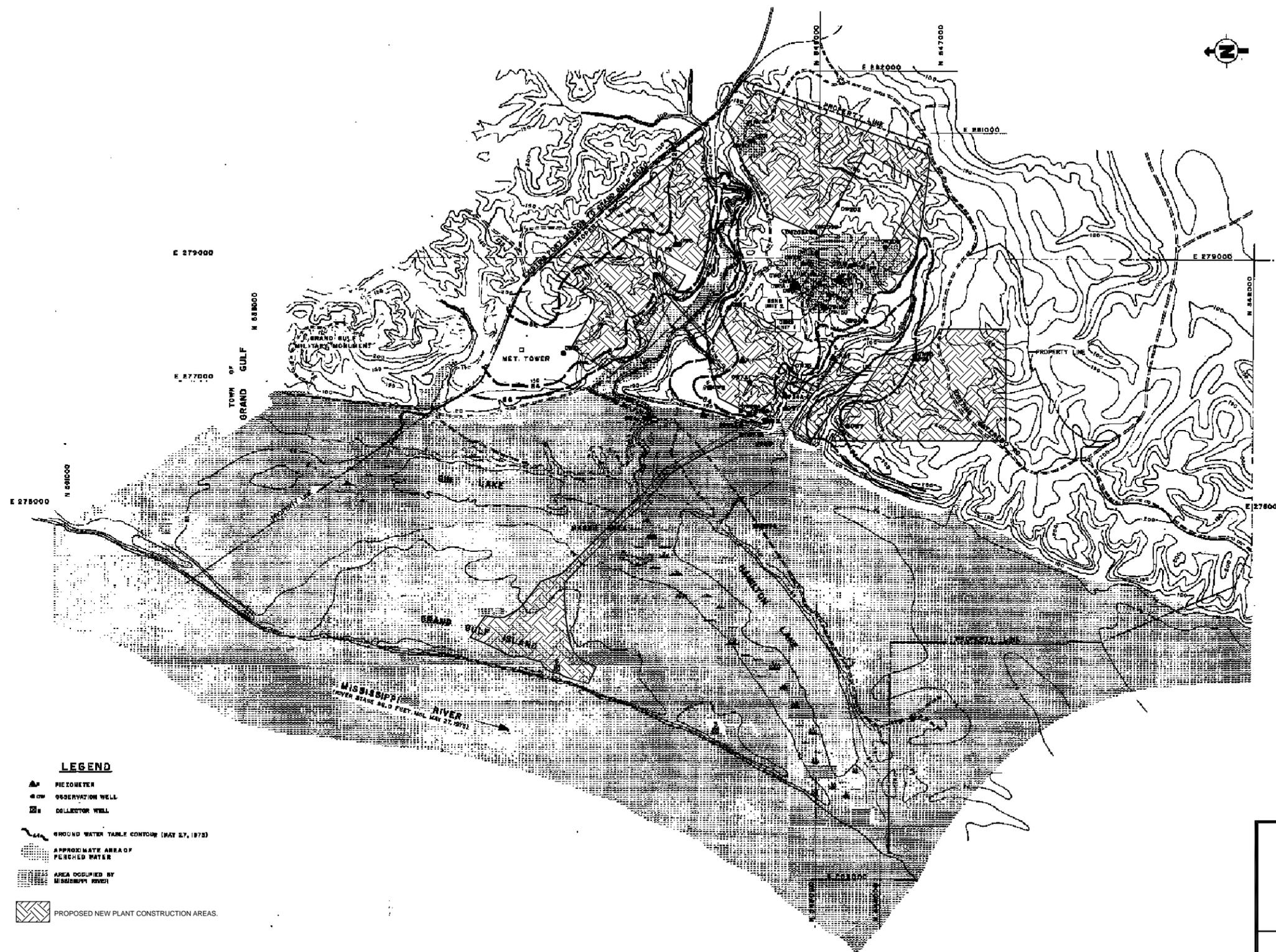
FIGURE 2.3-23 SHEET 4 OF 5 REV. 0



NOTES:  
 1. OBSERVATION WELL AND PIEZOMETER LOCATIONS  
 ARE SHOWN IN FIGURE 2.3-20 (UFSAR FIGURE 2.4-27).

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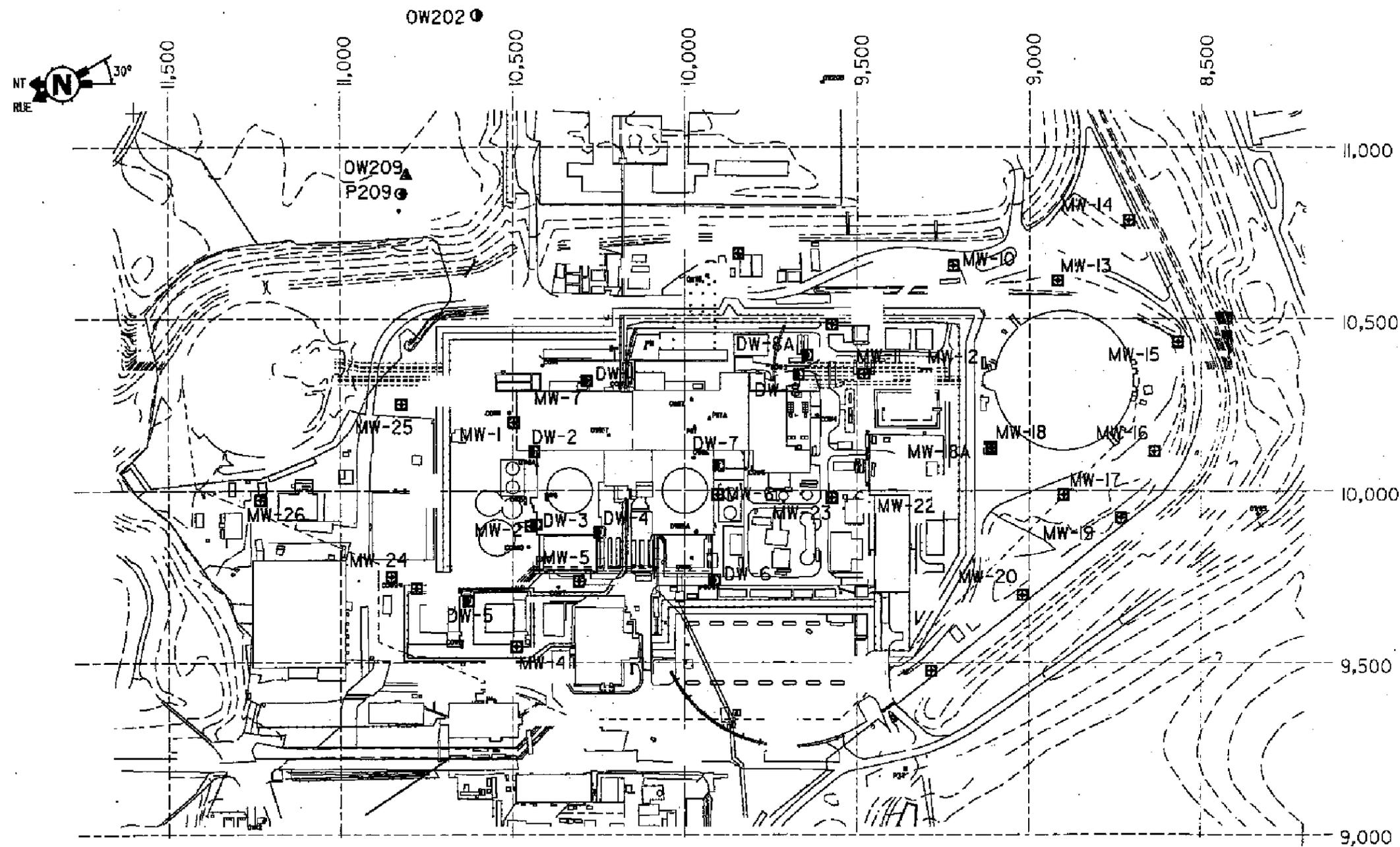
HYDROGRAPHS OF WELLS AND  
 PIEZOMETERS  
 (UFSAR FIGURE 2.4-32, SH.5)



- NOTES:
1. GRID COORDINATES SHOWN ARE BASED ON MISSISSIPPI COORDINATE SYSTEM, WEST ZONE.
  2. DATUM FOR ELEVATIONS SHOWN IS MEAN SEA LEVEL.
  3. GGNS UNIT 2 STRUCTURES ARE SHOWN FOR INFO ONLY.

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SITE HYDROLOGIC FEATURES  
 FLOOD CONDITIONS MAY 1973  
 (UFSAR FIGURE 2.4-34)



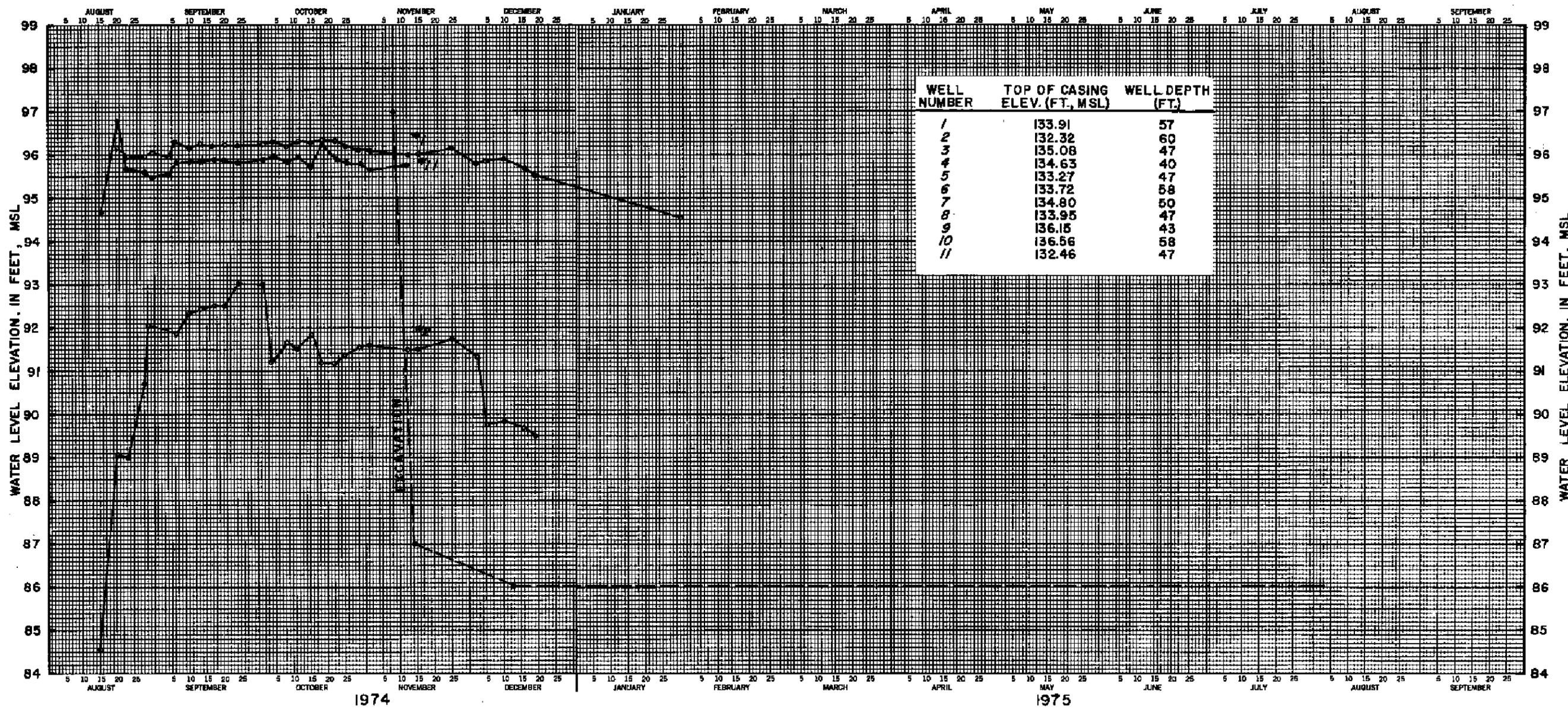
**LEGEND**

- ▲ HISTORICAL MONITORING WELL - CATAHOULA FORMATION
- HISTORICAL MONITORING WELL - TERRACE DEPOSITS
- ⊠ MONITORING WELL
- DEWATERING WELL
- TIE-BACK WALL PROJECTION

0 100 200 300  
SCALE IN FEET

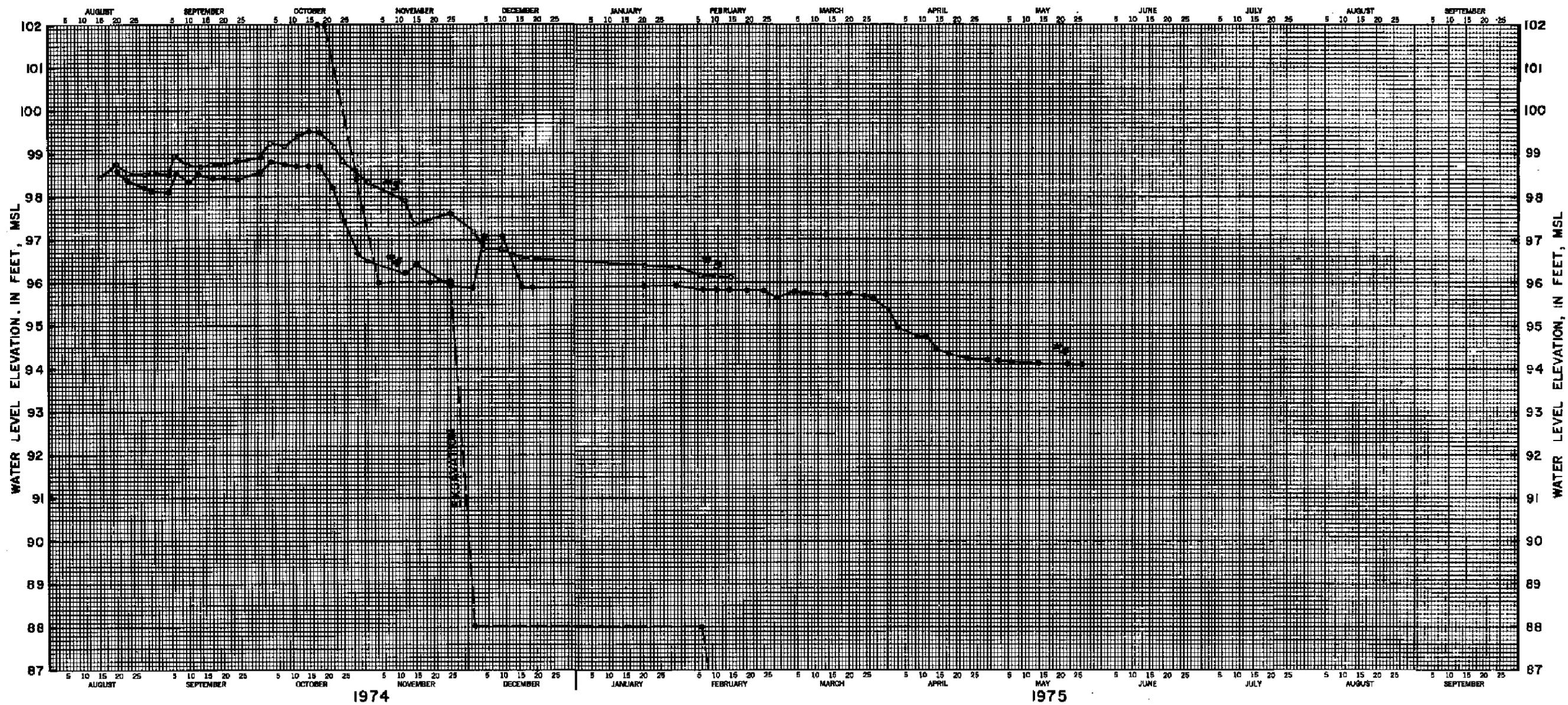
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PLANT SITE  
WELL PLAN  
(UFSAR FIGURE 2.4-35c)



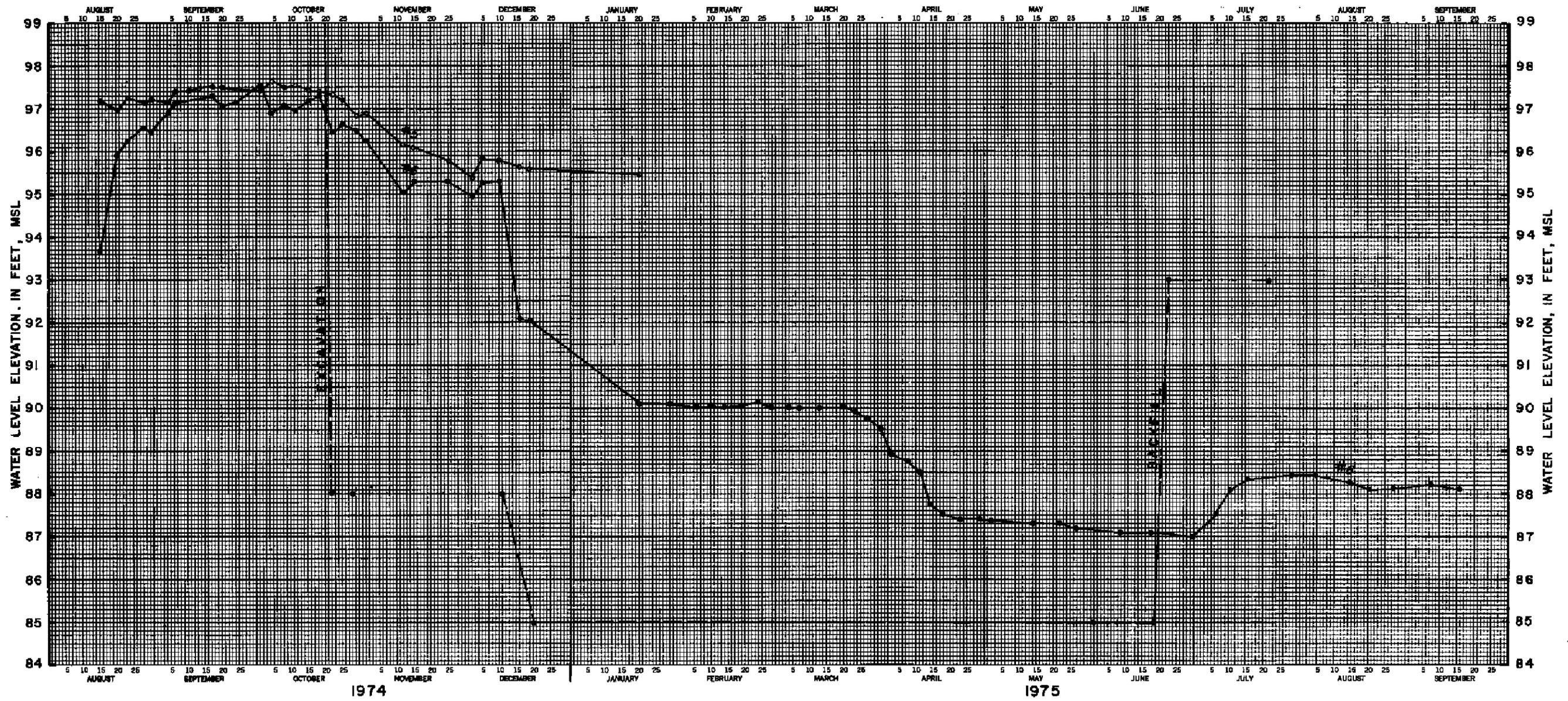
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HYDROGRAPHS OF  
 CONSTRUCTION OBSERVATION WELLS  
 (UFSAR FIGURE 2.4-36, SH.1)



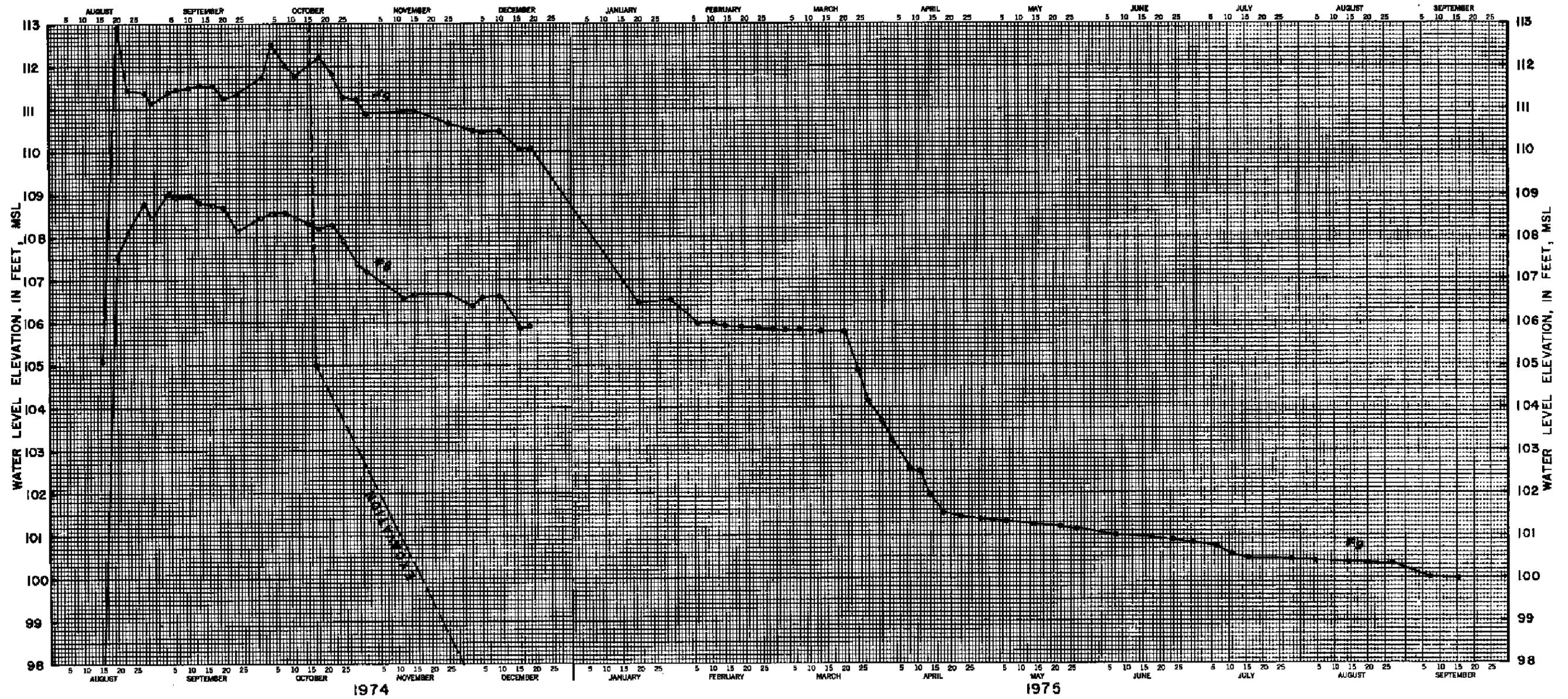
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HYDROGRAPHS OF  
 CONSTRUCTION OBSERVATION WELLS  
 (UFSAR FIGURE 2.4-36, SH.2)



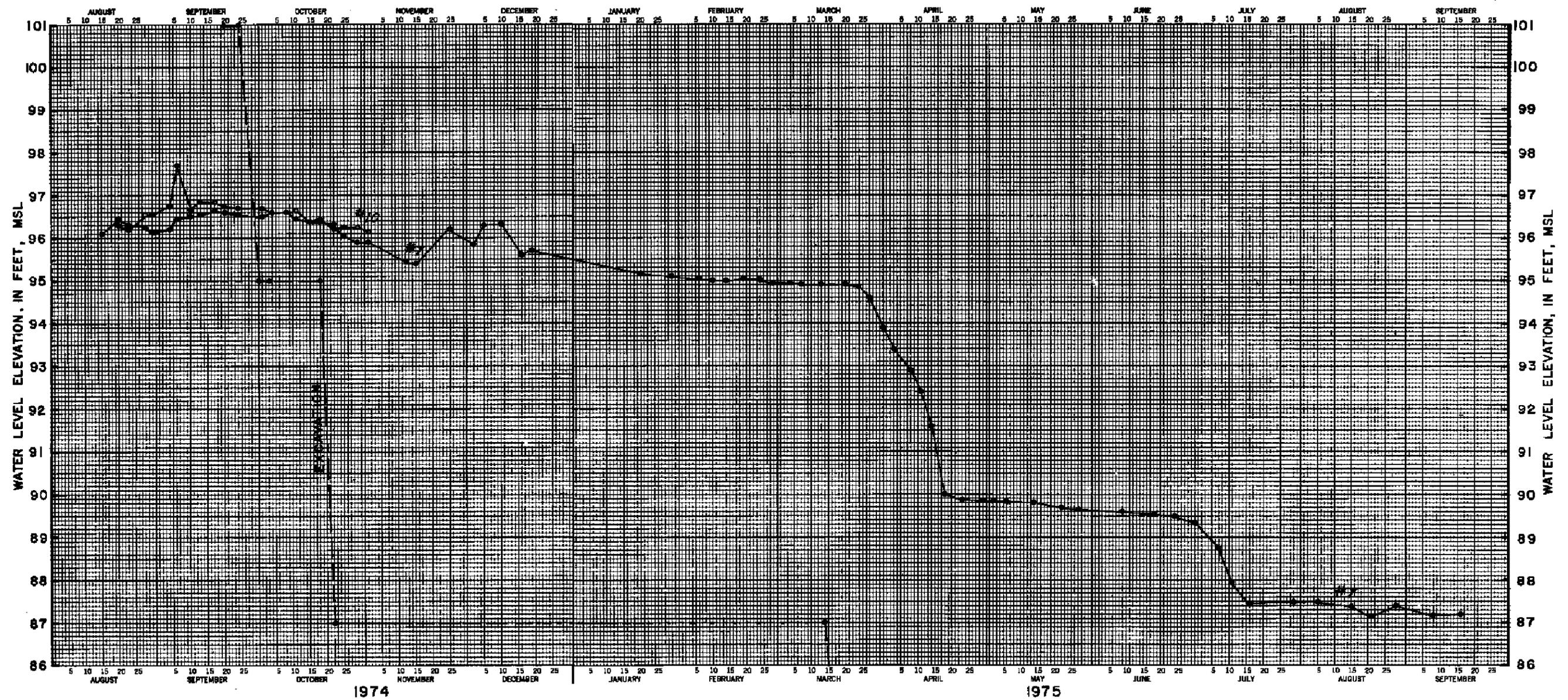
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HYDROGRAPHS OF  
 CONSTRUCTION OBSERVATION WELLS  
 (UFSAR FIGURE 2.4-36, SH.3)



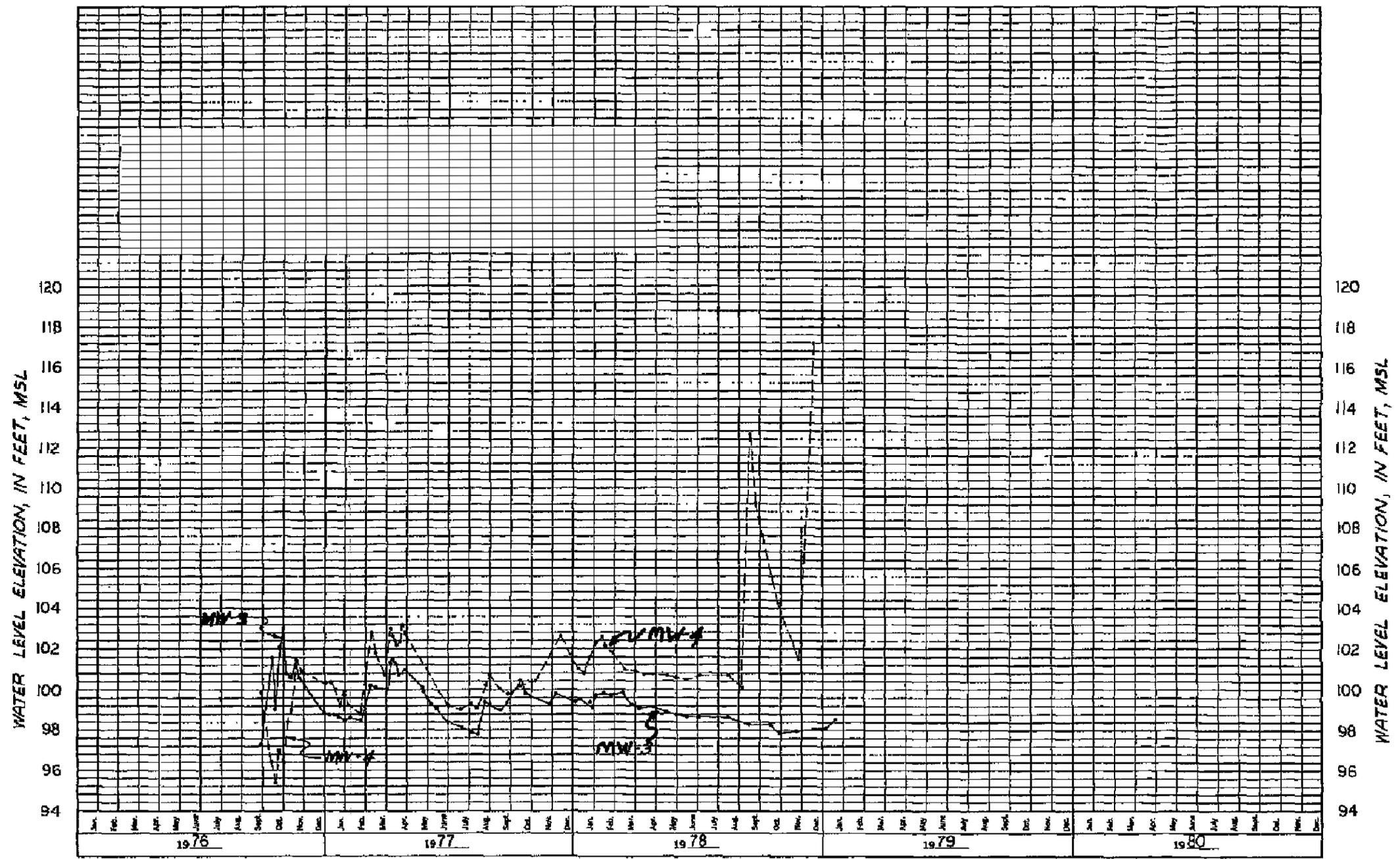
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HYDROGRAPHS OF  
 CONSTRUCTION OBSERVATION WELLS  
 (UFSAR FIGURE 2.4-36, SH.4)



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HYDROGRAPHS OF  
 CONSTRUCTION OBSERVATION WELLS  
 (UFSAR FIGURE 2.4-36, SH.5)



- NOTES:
1. OBSERVATION WELLS MW-1 AND MW-2 WERE DRY FROM SEPT., 1976 TO JAN., 1979.
  2. OBSERVATION WELL LOCATIONS SHOWN ON FIGURE 2.3-25 (UFSAR FIGURE 2.4-35c).
  3. TEMPORARY SITE DRAINAGE CAUSES RECHARGE INTO FILL NEAR MW-4. AREA TO BE REGRADED NEAR MW-4 FEB., 1979.

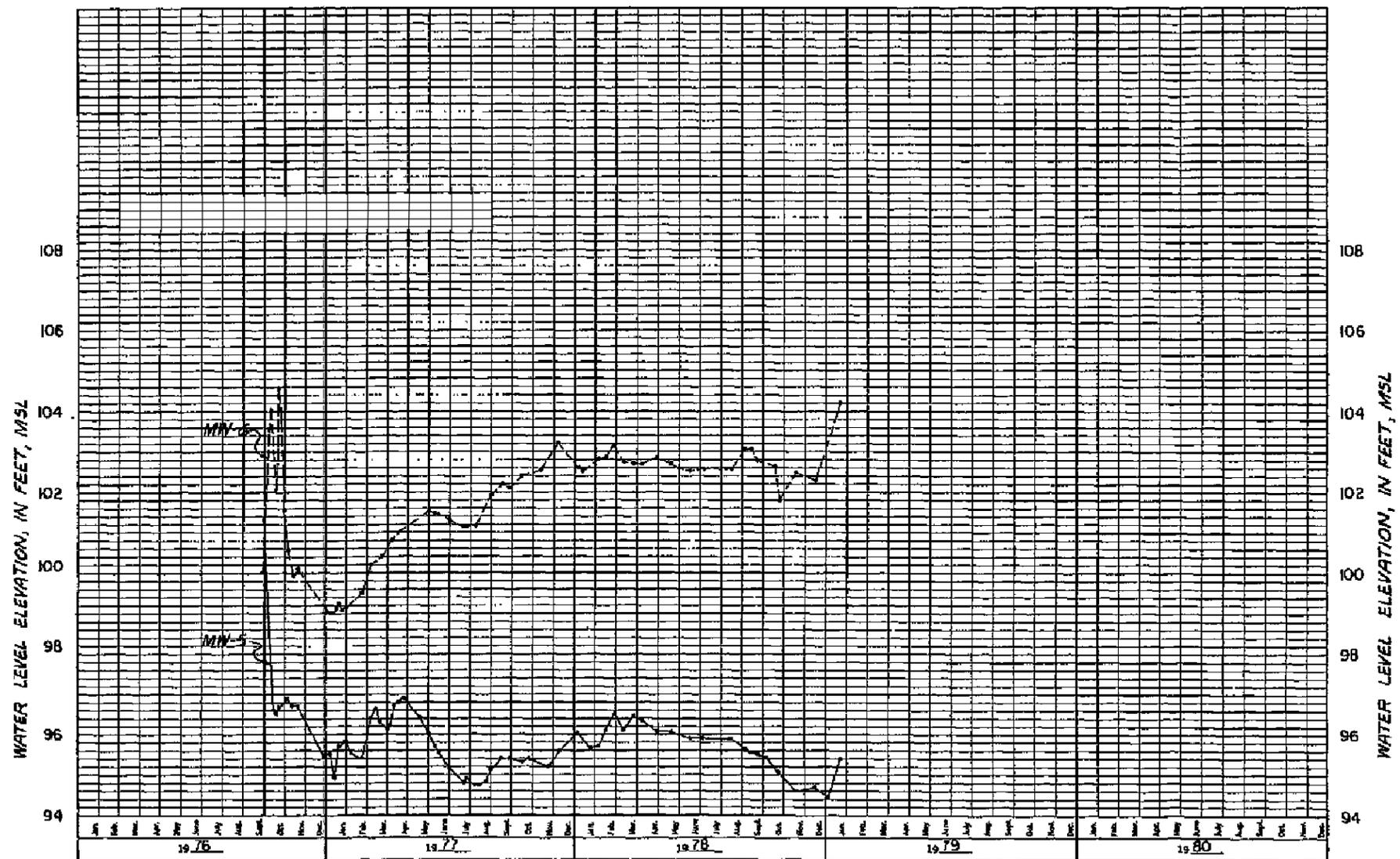
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HYDROGRAPHS OF REPLACEMENT  
 OBSERVATION WELLS  
 MW-3 AND MW-4  
 (UFSAR FIGURE 2.4-36a, SH.1)

---

FIGURE 2.3-27 SHEET 1 OF 2 REV. 0

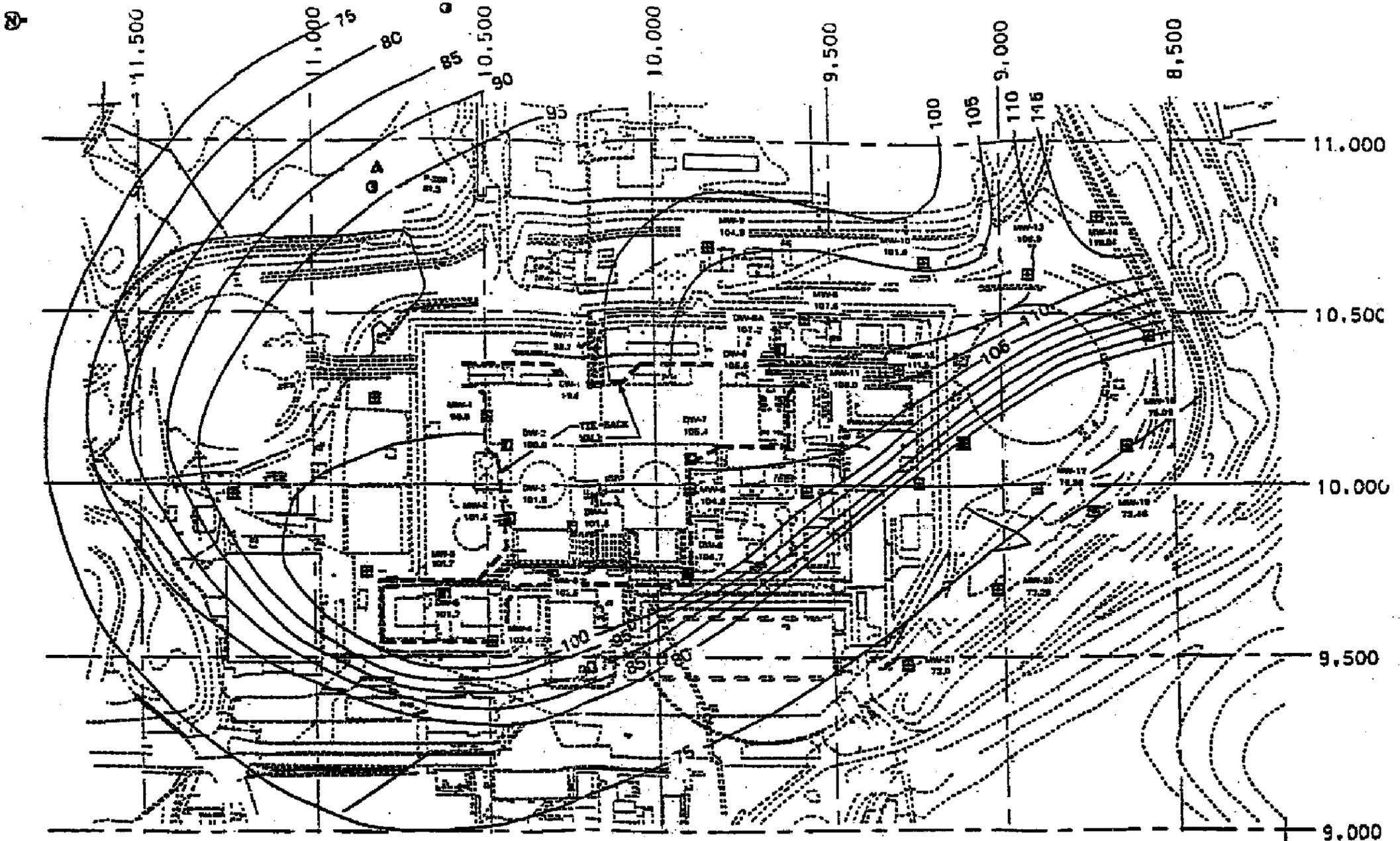


NOTES:  
 1. OBSERVATION WELL LOCATIONS SHOWN  
 ON FIGURE 2.3-25 (UFSAR FIGURE 2.4-35c).

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HYDROGRAPHS OF REPLACEMENT  
 OBSERVATION WELLS  
 MW-5 AND MW-6  
 (UFSAR FIGURE 2.4-36a, SH.2)

FIGURE 2.3-27 SHEET 2 OF 2 REV. 0



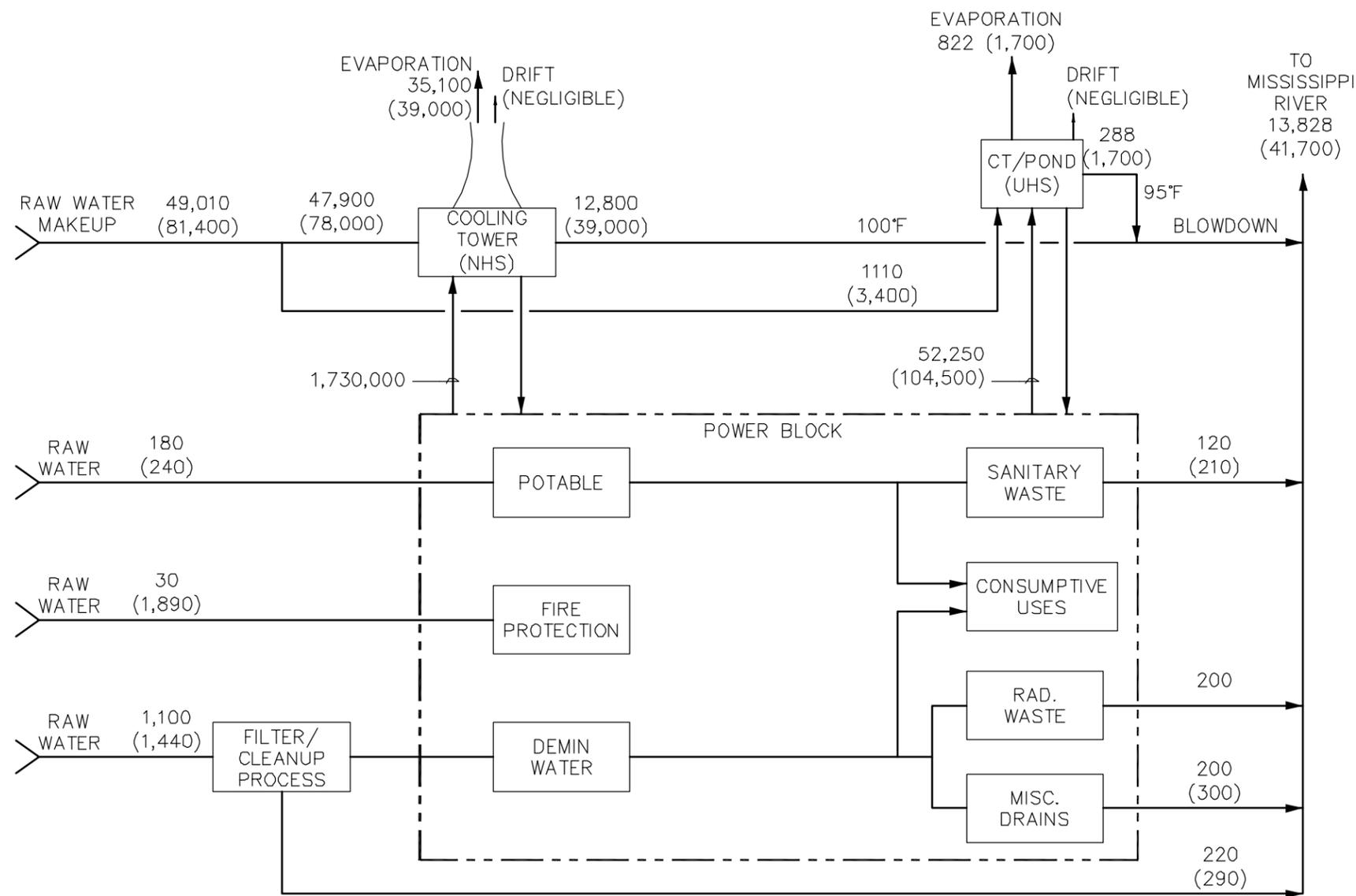
**LEGEND:**

- 
101.1  
101.2
Ground water dewatering wells, monitoring wells, observation wells and estimated average post-construction ground water elevations based on measurements taken on 11/08/90
- 
101.3  
101.7
- 
101.202  
78.8
- 
115
Ground water elevation contour; contour interval is 5 feet
- 
Tieback Wall Project

0 100 200 300  
SCALE IN FEET

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AVERAGE  
POST-CONSTRUCTION  
GROUND WATER ELEVATIONS  
(UFSAR FIGURE 2.4-48)



**NOTES:**

1. FLOW RATE VALUES SHOWN ARE EXPECTED OR MONTHLY AVERAGE. THE MAXIMUM VALUE IS SHOWN IN PARENTHESIS ( ). VALUES ARE IN GPM.

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PLANT WATER USE DIAGRAM



SOURCE:  
OCT. 11 1971 AERIAL SITE PHOTO

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AERIAL PHOTOGRAPH OF THE  
GGNS SITE AND VICINITY  
OCTOBER 11, 1971

FIGURE 2.4-1

REV. 0

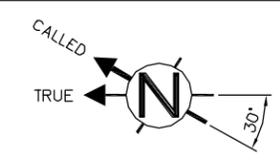


NOTES:  
 PROPOSED NEW PLANT CONSTRUCTION AREAS.  
 - - - - - PROPERTY LINE

SOURCE:  
 DEC. 21, 2001 USACE AERIAL SITE PHOTO

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AERIAL PHOTOGRAPH OF THE  
 GGNS SITE AND VICINITY  
 NOVEMBER 21, 2001



**LEGEND (ACREAGES LISTED ARE APPROXIMATE):**

-  UPLAND FIELD, NON-FORESTED  
- 155 ACRES
-  UPLAND FORESTED  
- 400 ACRES
-  UPLAND DEVELOPED AREA  
- 270 ACRES
-  BOTTOMLAND DEVELOPED AREA  
- 55 ACRES
-  UPLAND PALUSTRINE, EMERGENT, PERMANENTLY FLOODED WETLAND  
- 5 ACRES
-  BOTTOMLAND PALUSTRINE, SCRUB-SHRUB, SEASONALLY FLOODED  
- 10 ACRES
-  BOTTOMLAND LACUSTRINE, LITTORAL, UNCONSOLIDATED BOTTOM  
- 135 ACRES
-  BOTTOMLAND PALUSTRINE, EMERGENT, SEASONALLY FLOODED  
- 30 ACRES
-  BOTTOMLAND PALUSTRINE, SCRUB-SHRUB, SEASONALLY FLOODED, SYCAMORE  
- 70 ACRES
-  BOTTOMLAND PALUSTRINE, FORESTED, SEASONALLY FLOODED  
- 885 ACRES
-  ACREAGE LOST TO RIVER  
- 85 ACRES
-  UPLAND EPHEMERAL STREAMS  
- 19,744' TOTAL LENGTH
-  BOTTOMLAND EPHEMERAL STREAMS  
- 4,397' TOTAL LENGTH
-  AREA TO BE DEVELOPED IN UPLAND  
- 340 ACRES
-  AREA TO BE DEVELOPED IN BOTTOMLAND  
- 55 ACRES

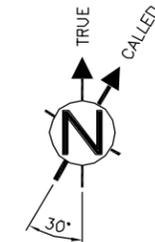


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TERRESTRIAL HABITAT TYPES AND  
WETLANDS ON THE GGNS SITE 2002

FIGURE 2.4-3      REV. 0



NOTES:  
 [Hatched Box Symbol] PROPOSED NEW PLANT CONSTRUCTION AREAS.  
 UTM COORD. GRID SHOWN.

SOURCE:  
 USGS TOPD MAP GRAND GULF, MS - LA (1963-1973) AND WIDOWS CREEK, MS - LA (1986 PROVISIONAL)

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SPECIES OF SPECIAL CONCERN  
 AROUND GGNS SITE