
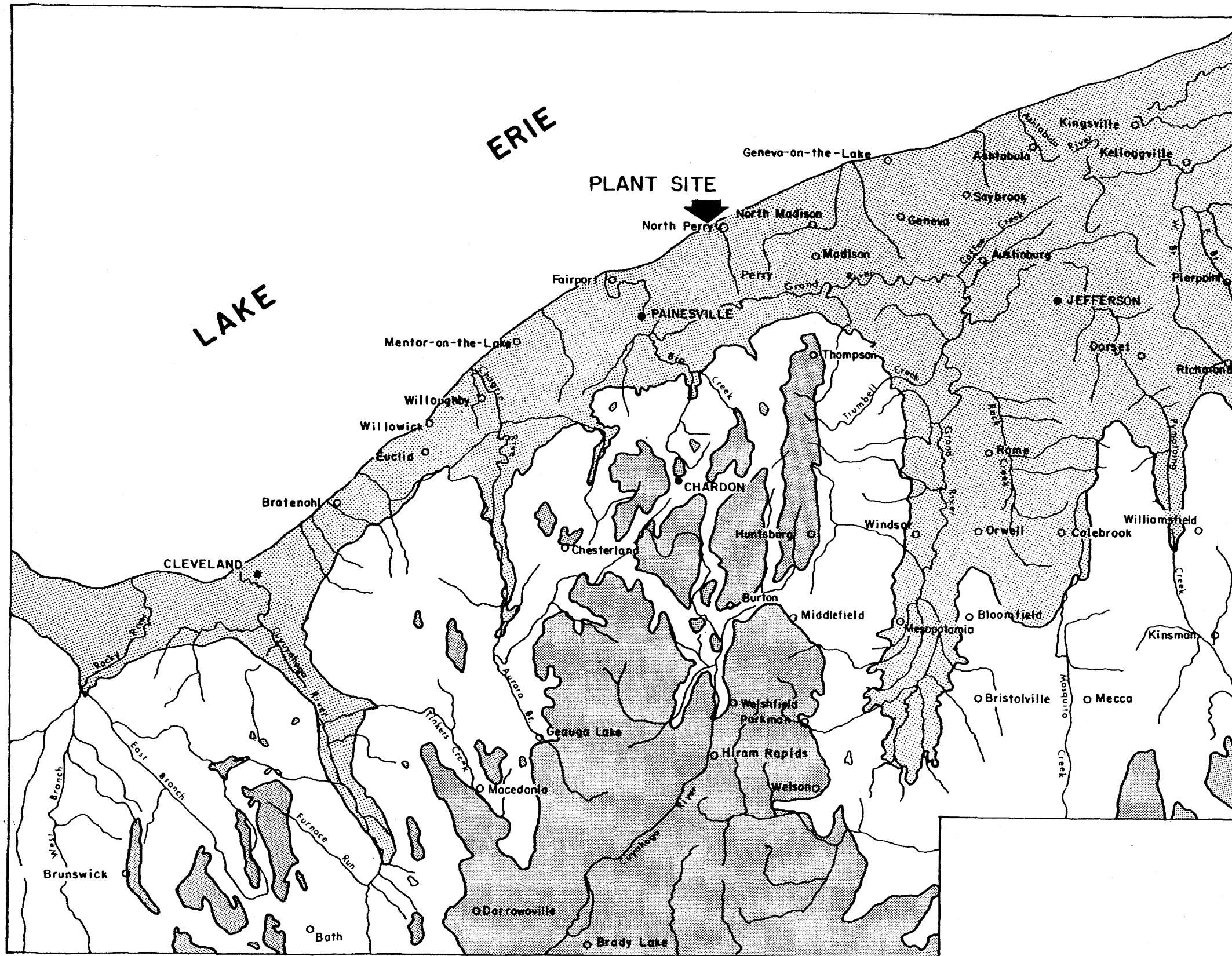




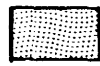
(Rev. 12 1/03)

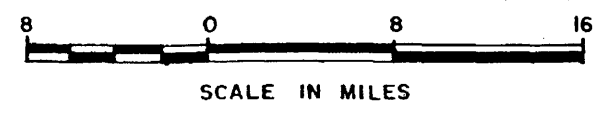
 **PERRY NUCLEAR POWER PLANT**

Tunneling Plan  
Figure 2D-3




**LEGEND**

-  POTTSVILLE & ALLEGHENY  
(COAL, S.S., SH, L.S.)  
PENNSYLVANIAN
-  WAVERLY & MAXVILLE  
(SH, S.S., L.S.)  
MISSISSIPPI
-  OLENTANGY & OHIO (SHALES)  
DEVONIAN



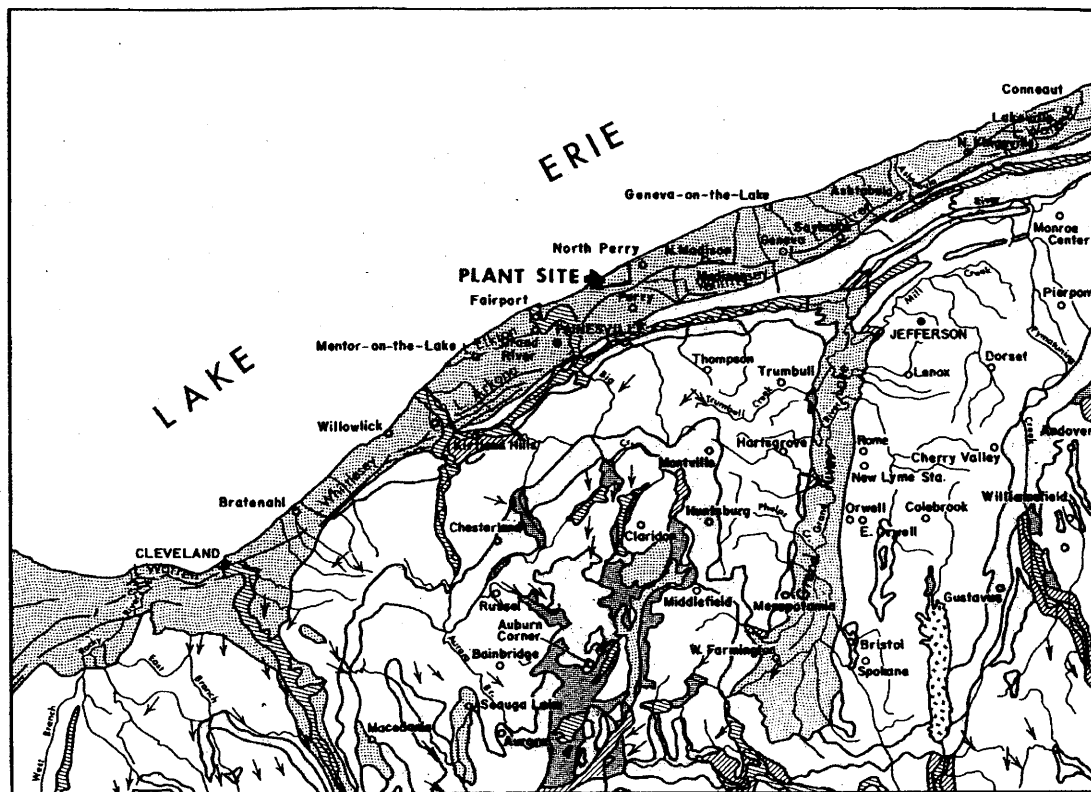
(Rev. 13 12/03)



**PERRY NUCLEAR POWER PLANT**











Bedrock Geologic Map of  
Northeastern Ohio

Figure 2D-4




(AFTER REFERENCE 83)

**LEGEND**

-  GROUND MORAINES - ILLINOIS
-  LACUSTRINE DEPOSITS - WISCONSIN
-  LACUSTRINE DEPOSITS - PRE-WISCONSIN
-  ALLUVIUM - WISCONSIN
-  OUTWASH - WISCONSIN
-  KAMES AND ESKERS - WISCONSIN
-  GROUND MORAINES - WISCONSIN
-  END MORAINES - WISCONSIN
-  Elkton BEACH DEPOSITS - WISCONSIN
-  STRIATIONS



(Rev. 13 12/03)



**PERRY NUCLEAR POWER PLANT**

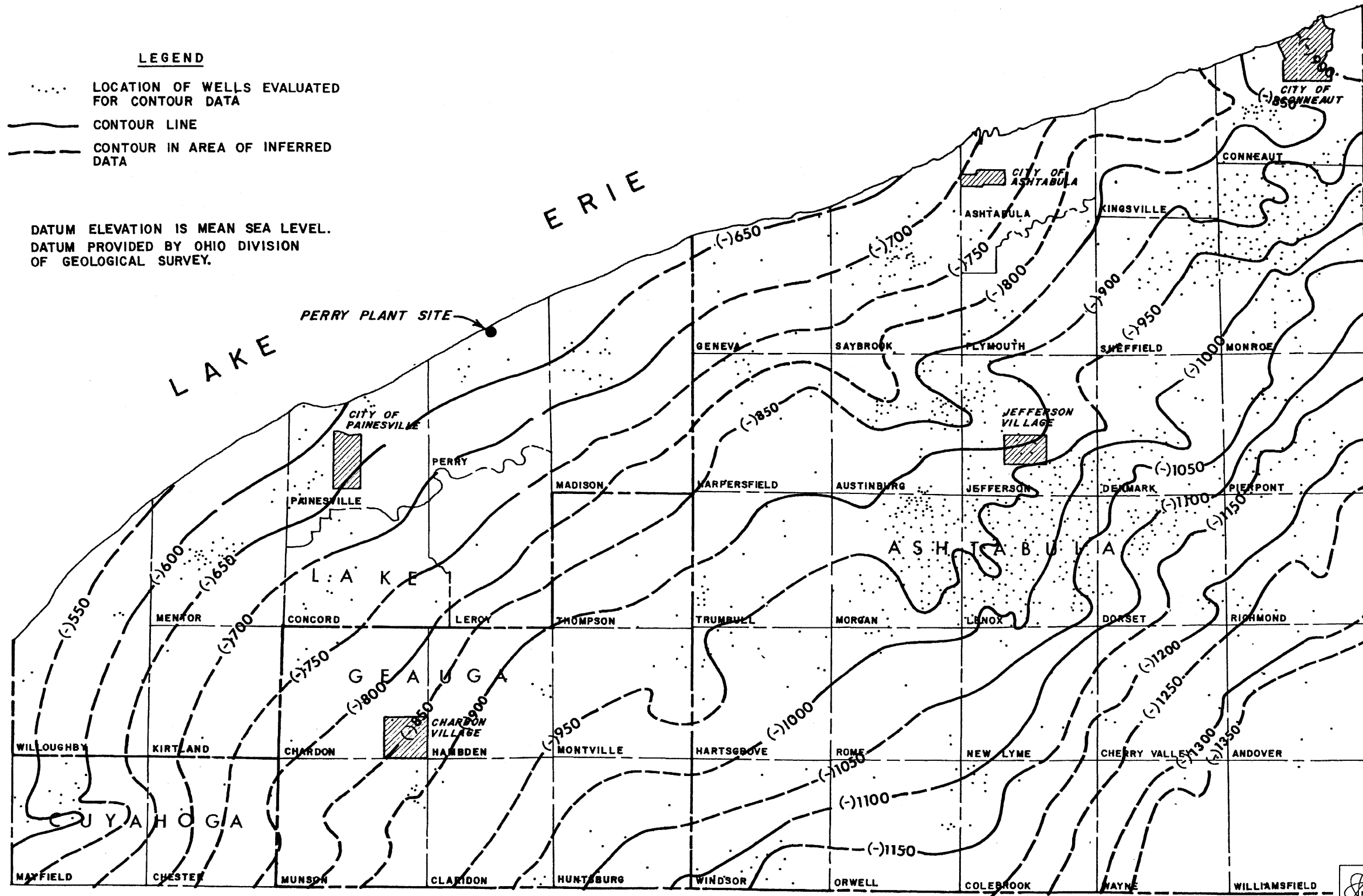
Glacial Map of  
Northeastern Ohio

Figure 2D-5


**LEGEND**

- ..... LOCATION OF WELLS EVALUATED FOR CONTOUR DATA
- CONTOUR LINE
- - - - CONTOUR IN AREA OF INFERRED DATA

DATUM ELEVATION IS MEAN SEA LEVEL.  
 DATUM PROVIDED BY OHIO DIVISION  
 OF GEOLOGICAL SURVEY.



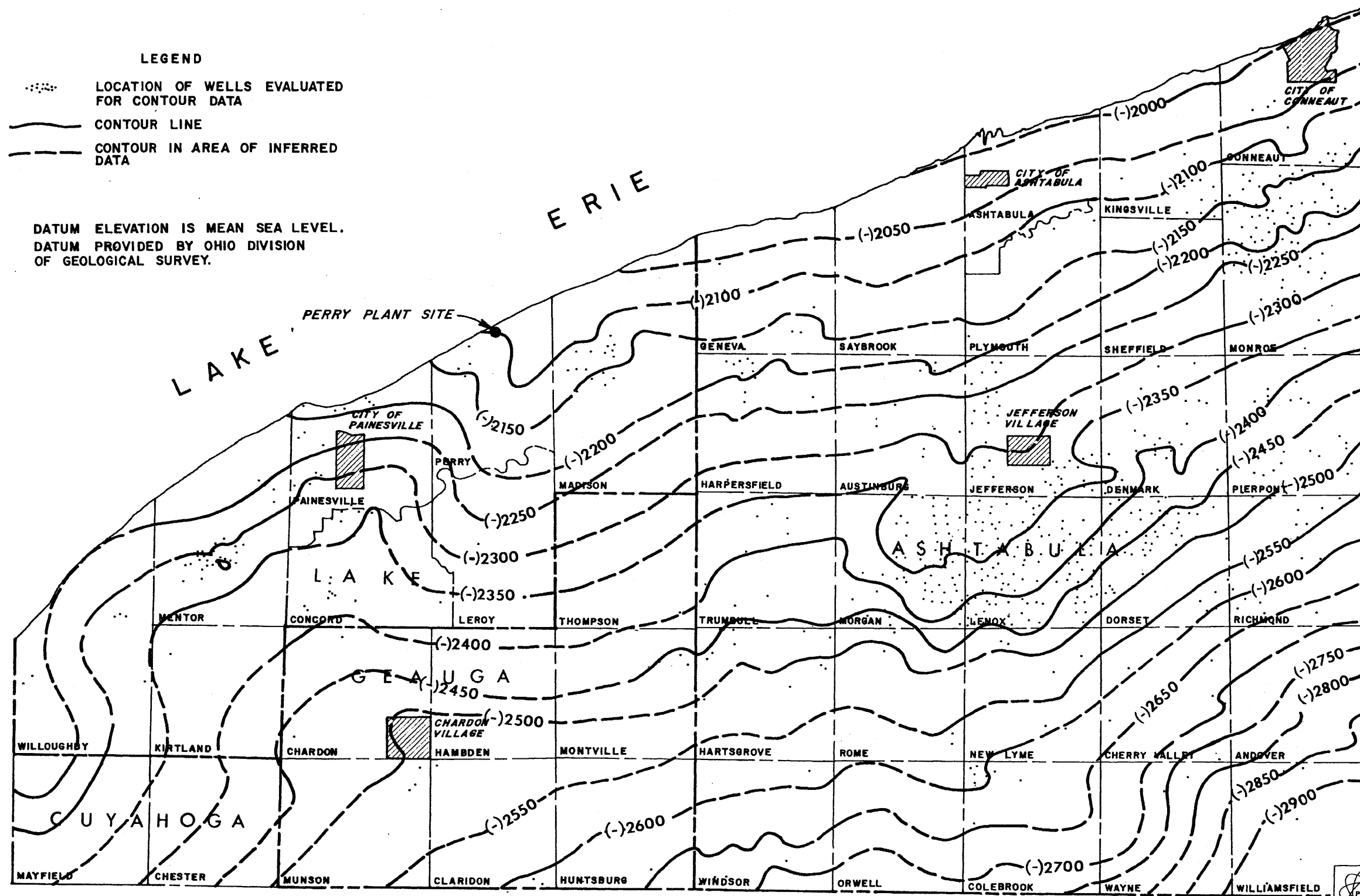
(Rev. 12 1/03)



**PERRY NUCLEAR POWER PLANT**

Structural Contour Map -  
 Top of Big Lime

Figure 2D-6

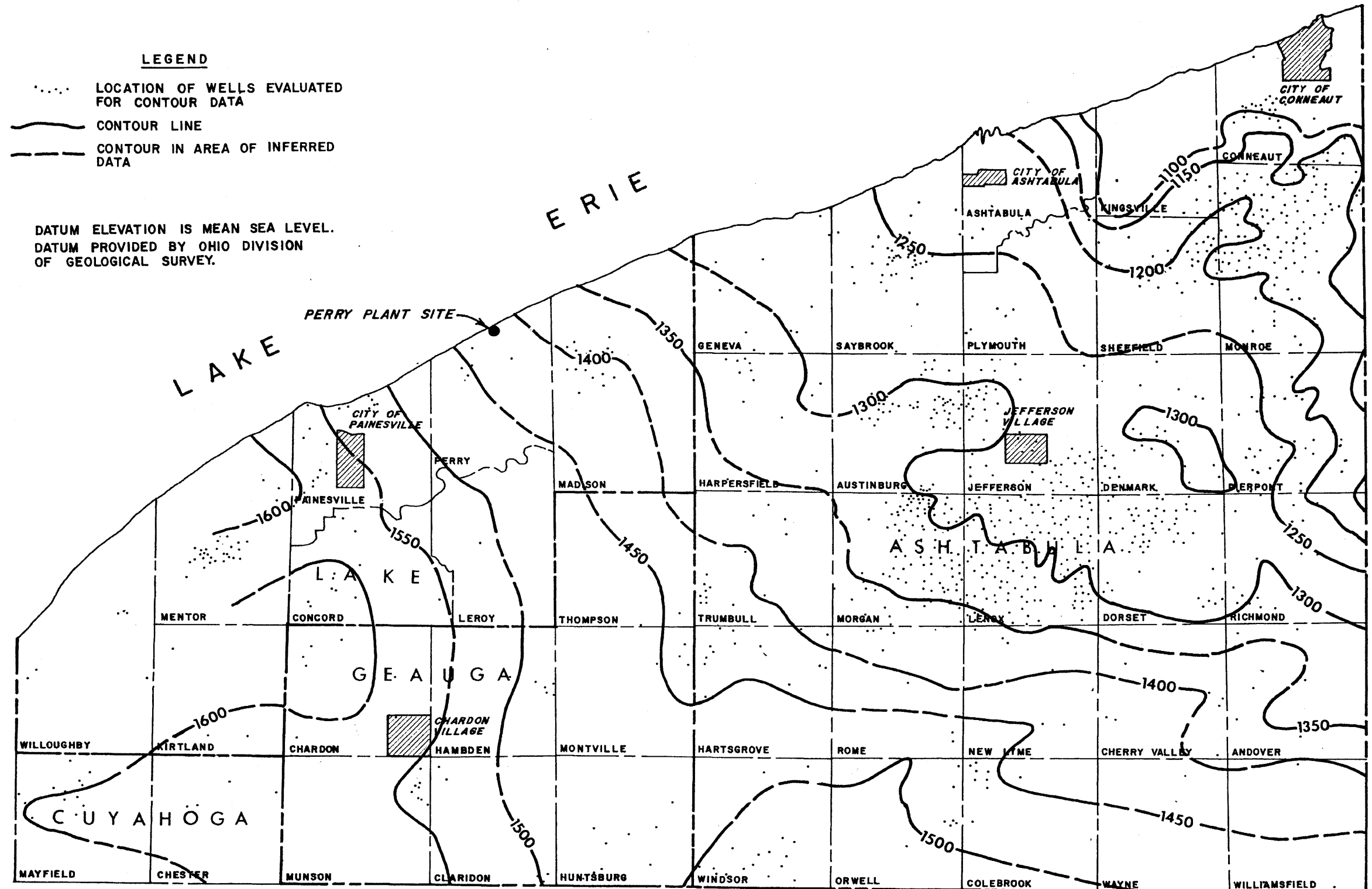


(Rev. 12 1/03)

**PERRY NUCLEAR POWER PLANT**

Structural Contour Map -  
 Top of Packer Shell

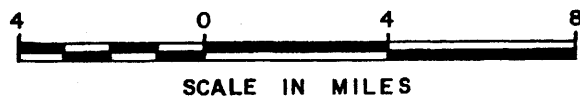
Figure 2D-7




**LEGEND**

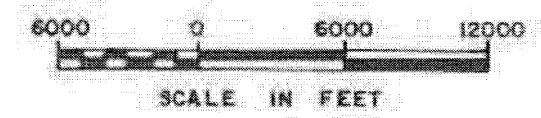
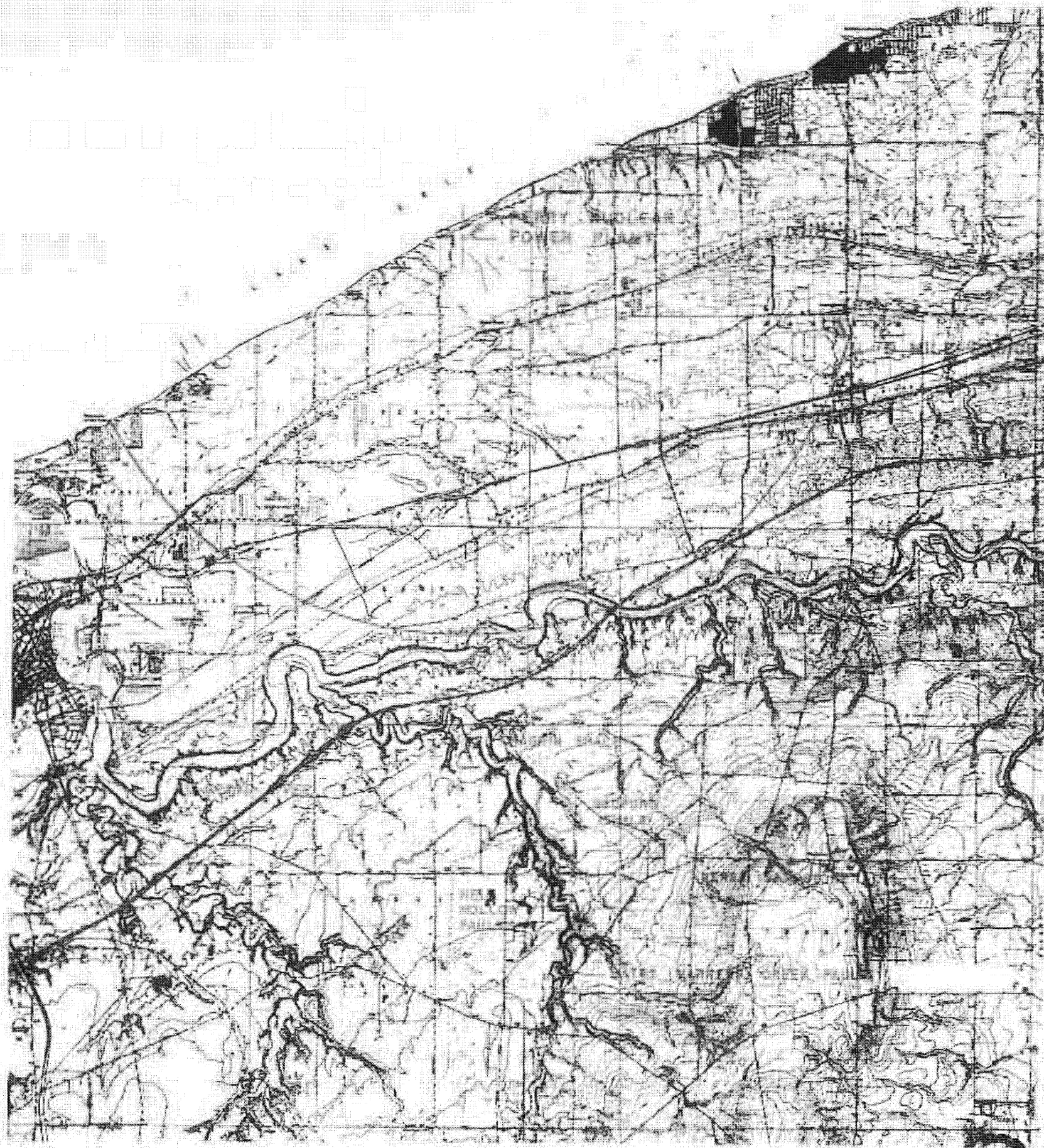
- ..... LOCATION OF WELLS EVALUATED FOR CONTOUR DATA
- CONTOUR LINE
- - - - CONTOUR IN AREA OF INFERRED DATA

DATUM ELEVATION IS MEAN SEA LEVEL.  
 DATUM PROVIDED BY OHIO DIVISION OF GEOLOGICAL SURVEY.






(Rev. 12 1/03)


	<b>PERRY NUCLEAR POWER PLANT</b>
	Isopath Map Of Big Lime And Niagaran Shale
	Figure 2D-8



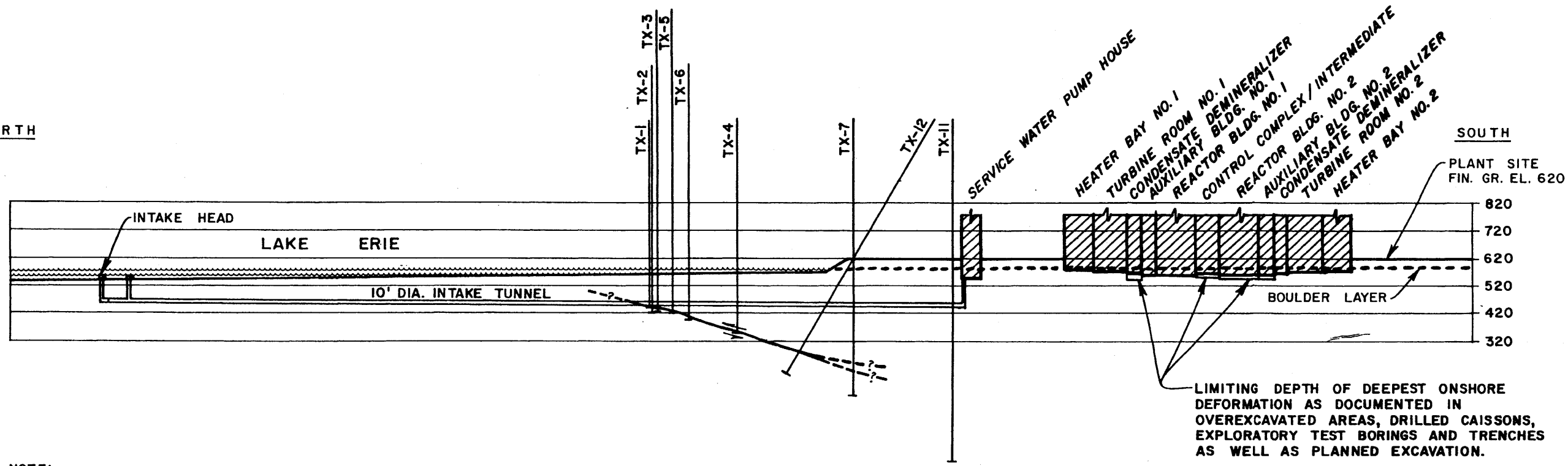
**LEGEND**

-  OBSERVED OUTCROPS
-  APPROXIMATE CONTACT OF  
CHAGRIN SHALE - BEDFORD SHALE
-  APPROXIMATE CONTACT OF  
BEDFORD SHALE - BEREA SANDSTONE

(Rev. 12 1/83)

 <b>PERRY NUCLEAR POWER PLANT</b>
Fault and Outcrop Location Map
Figure 2D-9


NORTH



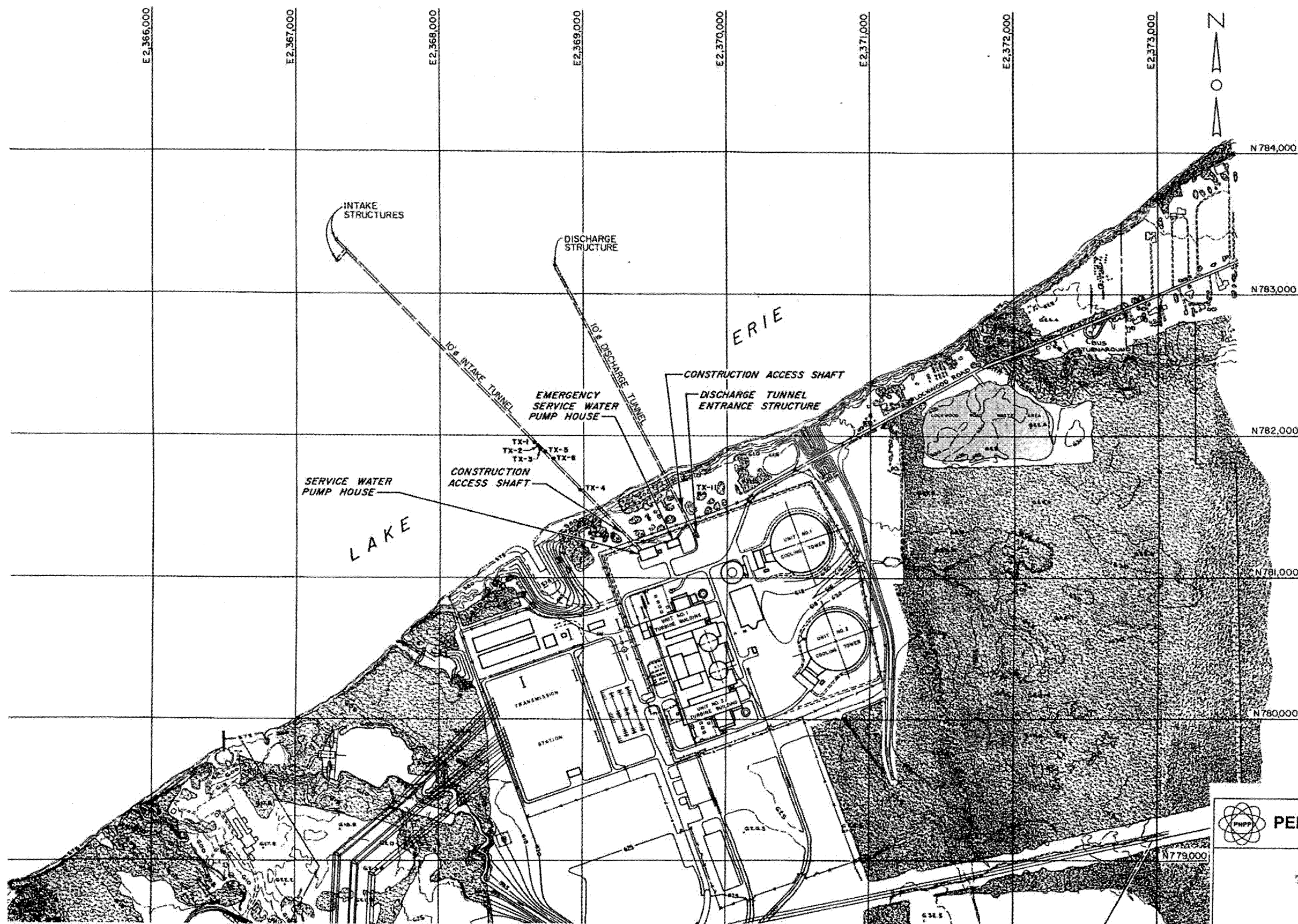
NOTE:  
 PLANNED EXCAVATION LIMITS ARE  
 SHOWN BY DIAGONAL PATTERN, AND  
 OVEREXCAVATION BY STIPPLED PATTERN.




(Rev. 12 1/03)

	<b>PERRY NUCLEAR POWER PLANT</b>
	Schematic Northwest-Southeast Cross Section, Perry Nuclear Power Plant  Figure 2D-10



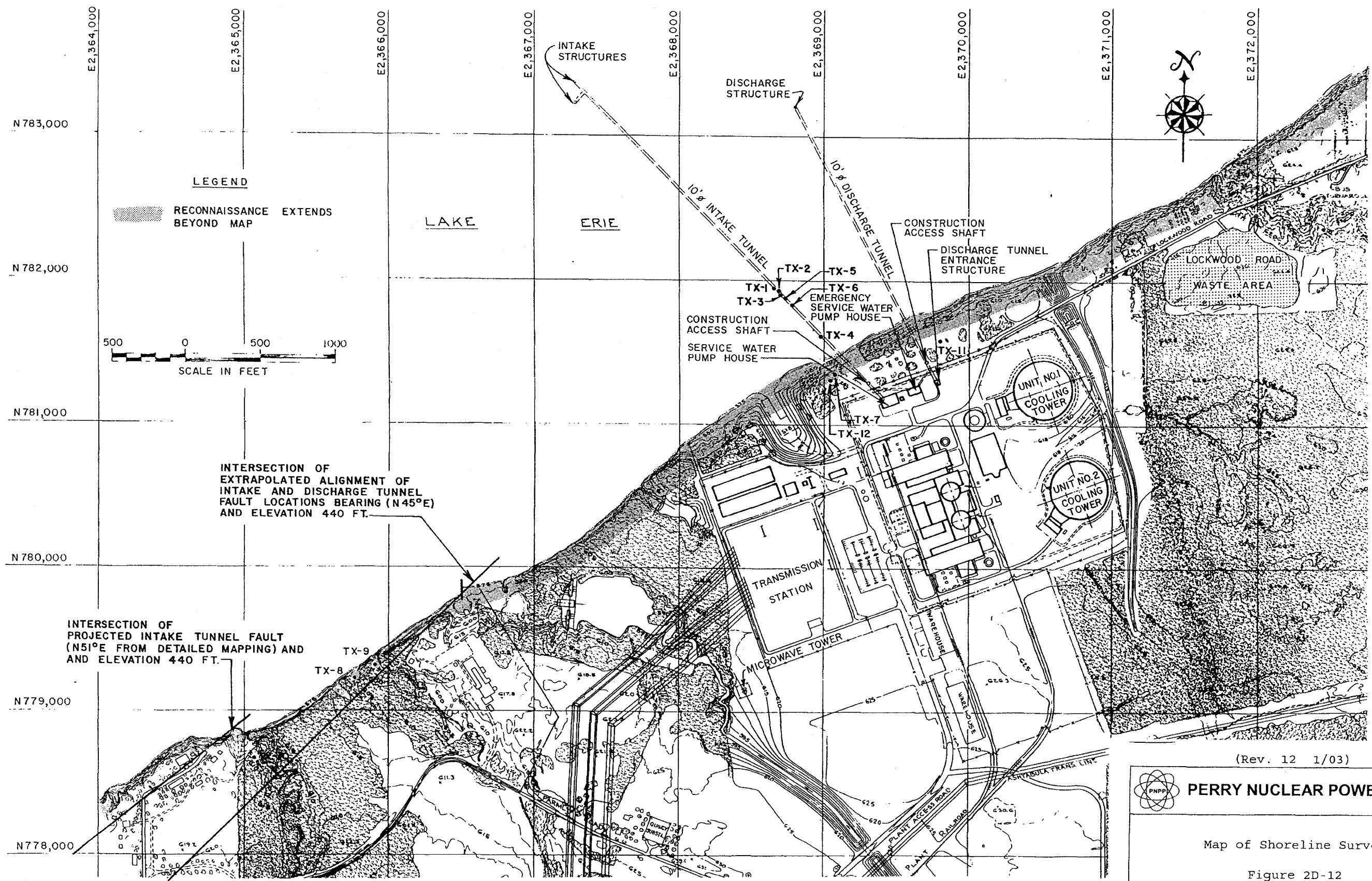


(Rev. 12 1/03)


 **PERRY NUCLEAR POWER PLANT**

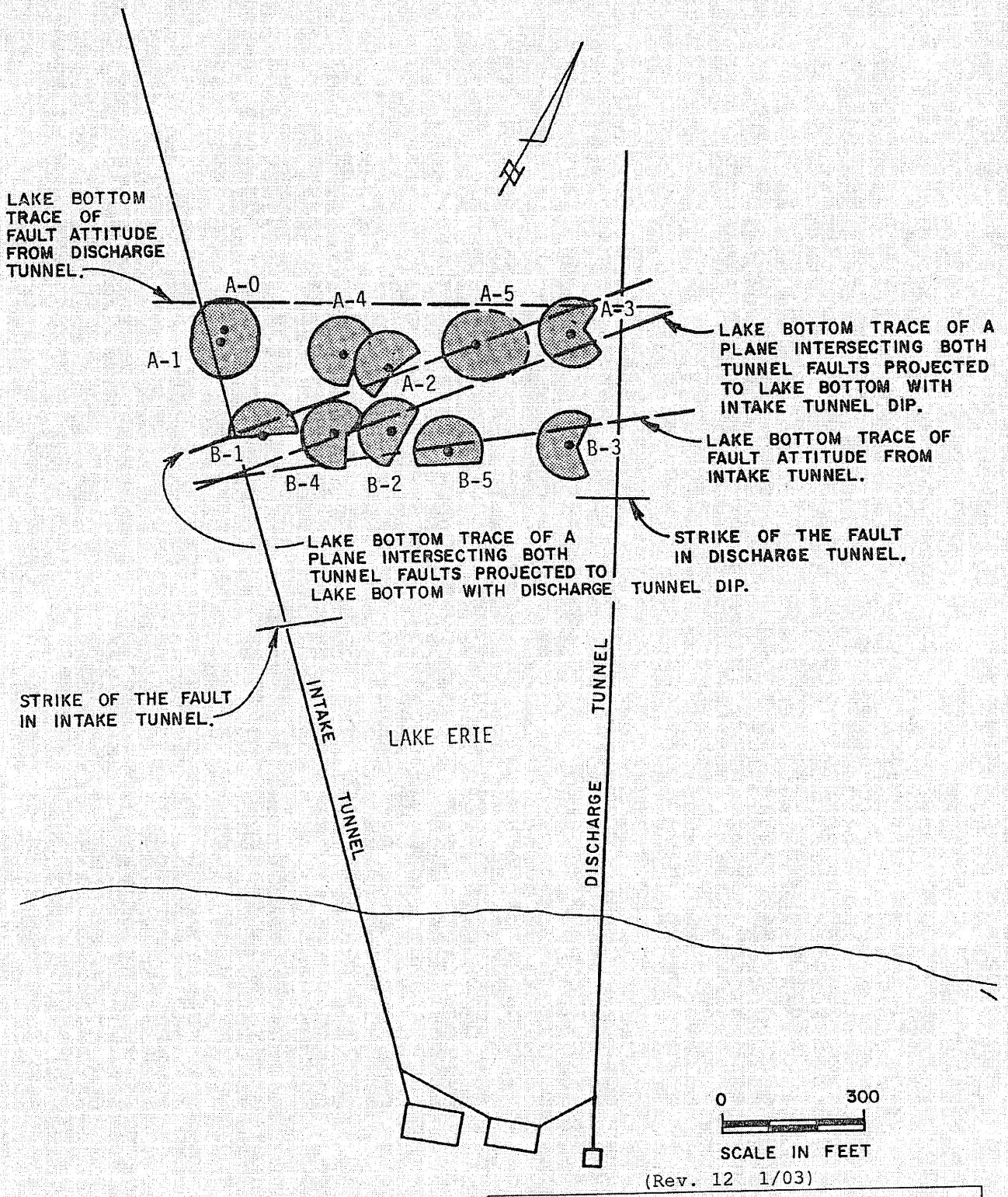
TX-Series Boring Plant

Figure 2D-11





(Rev. 12 1/03)

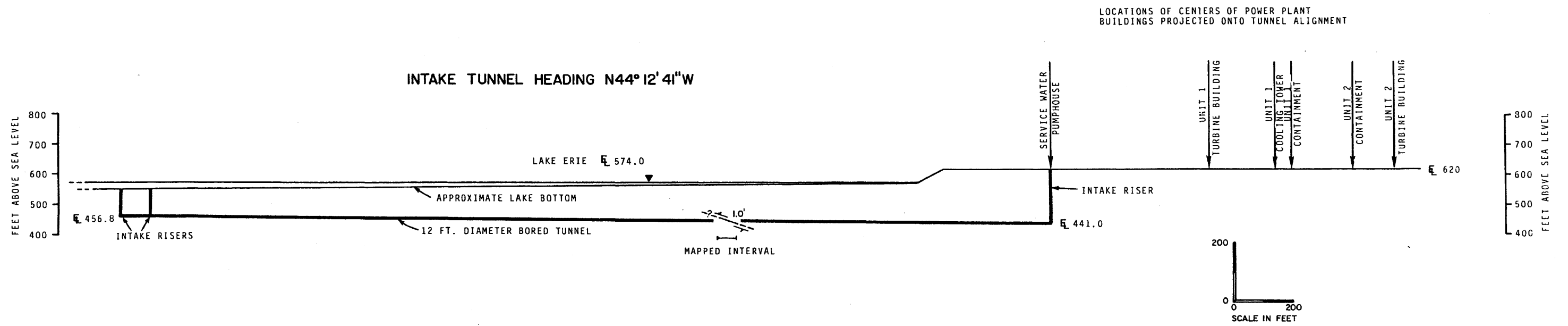
	<b>PERRY NUCLEAR POWER PLANT</b>
	Map of Shoreline Survey
	Figure 2D-12



• = STATION LOCATION

 = AREA OF COVERAGE ABOUT EACH STATION


	<b>PERRY NUCLEAR POWER PLANT</b>
Location Map, Video Survey Lake Erie Bottom	
Figure 2D-13	



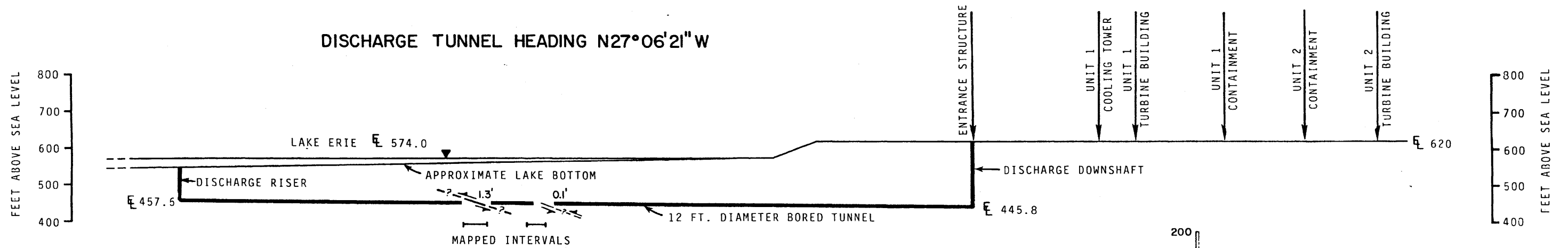
**EXPLANATION**

1.0' THRUST FAULT, DASHED AND QUESTIONED WHERE PROJECTED. ARROWS INDICATE DIRECTION OF RELATIVE MOVEMENT. DISPLACEMENT IN FEET AND TENTHS.

(Rev. 12 1/03)

	<b>PERRY NUCLEAR POWER PLANT</b>
Longitudinal Section, Intake Tunnel	
Figure 2D-14	

LOCATIONS OF CENTERS OF POWER PLANT BUILDINGS PROJECTED ONTO TUNNEL ALIGNMENT



DISCHARGE TUNNEL HEADING N27°06'21\"W

LAKE ERIE E 574.0

APPROXIMATE LAKE BOTTOM

DISCHARGE RISER

E 457.5

MAPPED INTERVALS

12 FT. DIAMETER BORED TUNNEL

ENTRANCE STRUCTURE

DISCHARGE DOWNSHAFT

E 445.8

UNIT 1  
COOLING TOWER

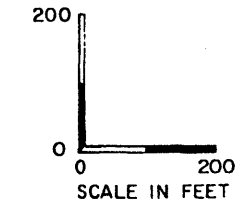
UNIT 1  
TURBINE BUILDING

UNIT 1  
CONTAINMENT

UNIT 2  
CONTAINMENT

UNIT 2  
TURBINE BUILDING

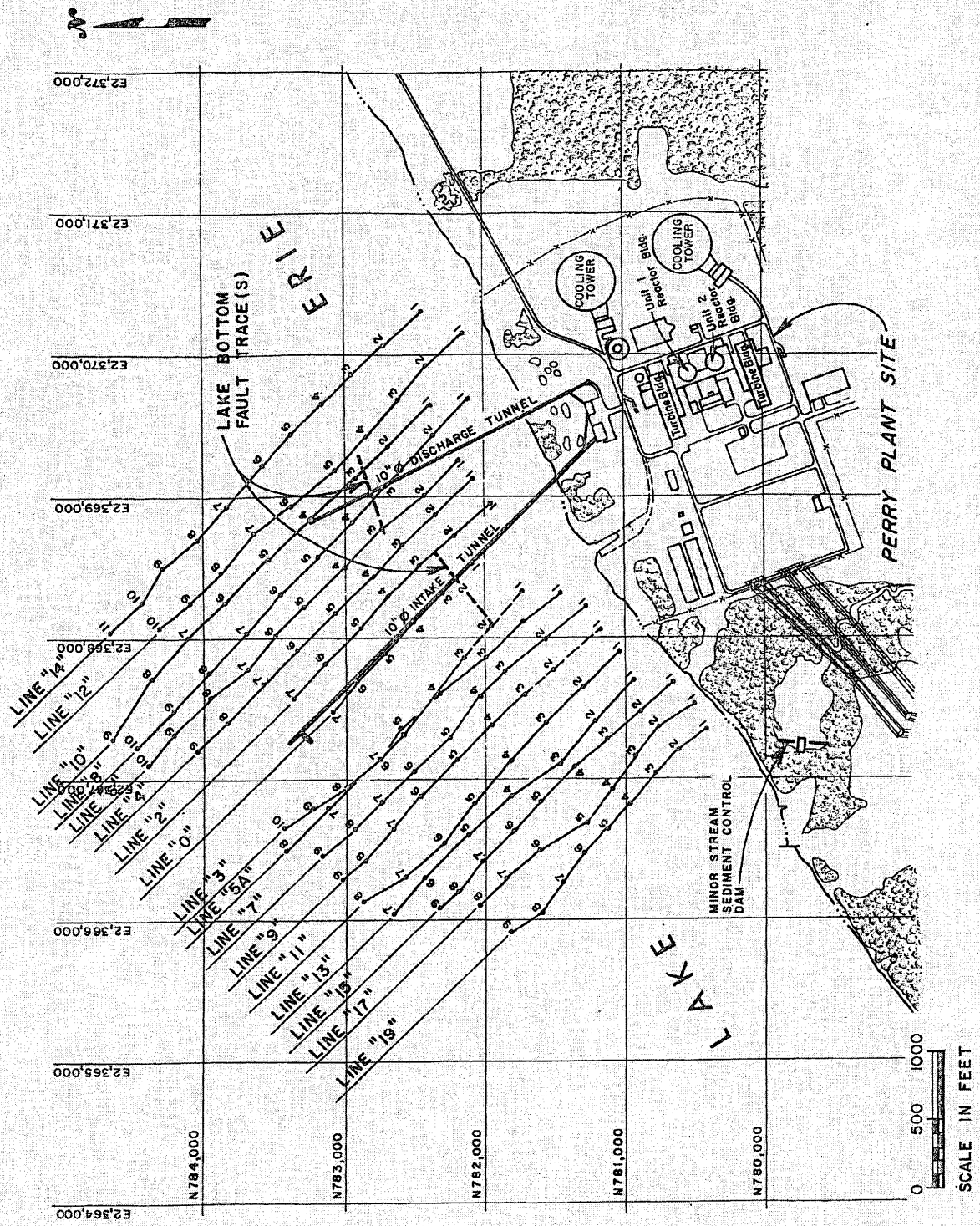
E 620




**EXPLANATION**  
 1.3'  
 THRUST FAULT, DASHED AND QUESTIONED WHERE PROJECTED. ARROWS INDICATE DIRECTION OF RELATIVE MOVEMENT. DISPLACEMENT IN FEET AND TENTHS.

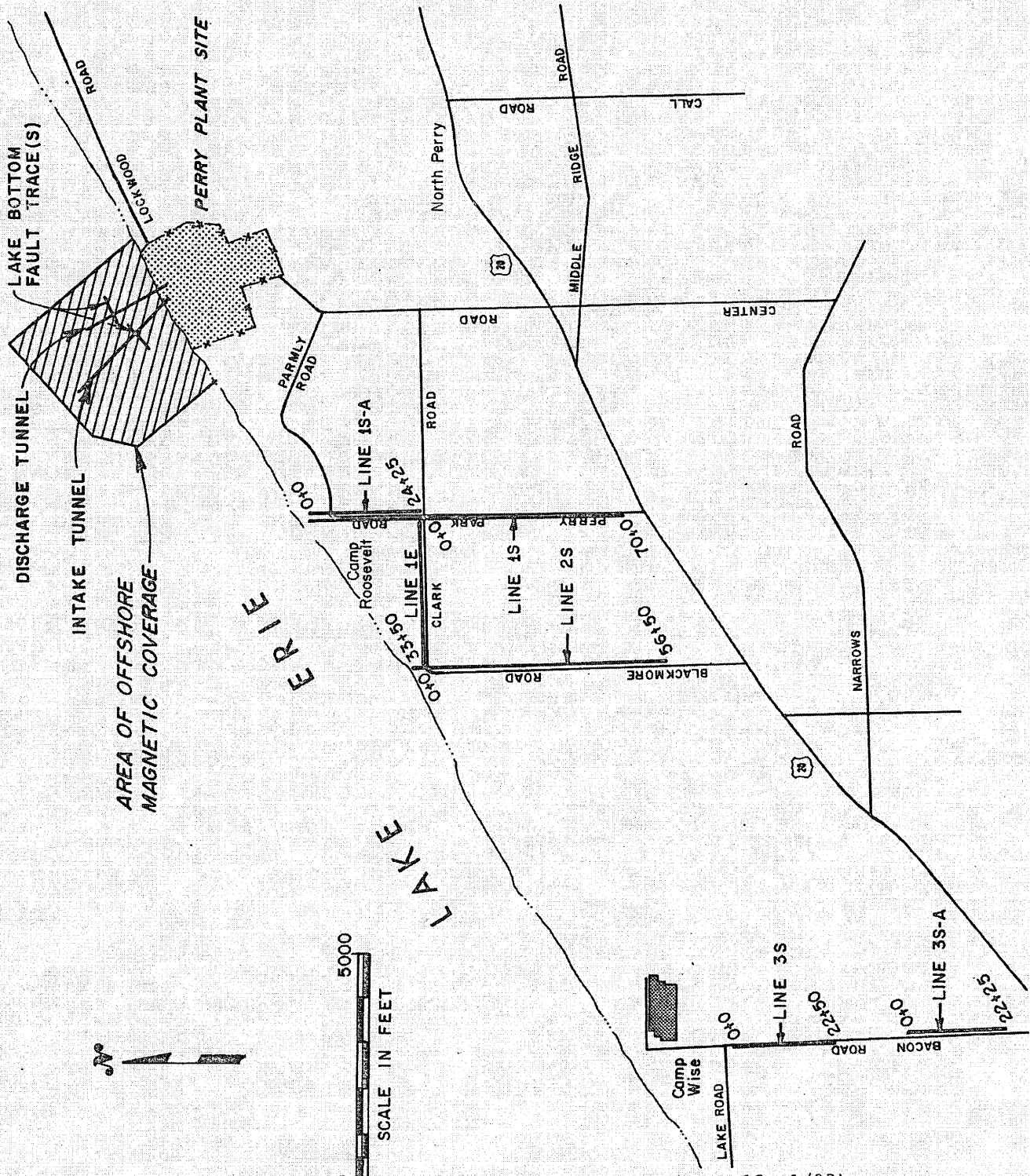
(Rev. 12 1/03)

	<b>PERRY NUCLEAR POWER PLANT</b>
	Longitudinal Section, Discharge Tunnel
	Figure 2D-15




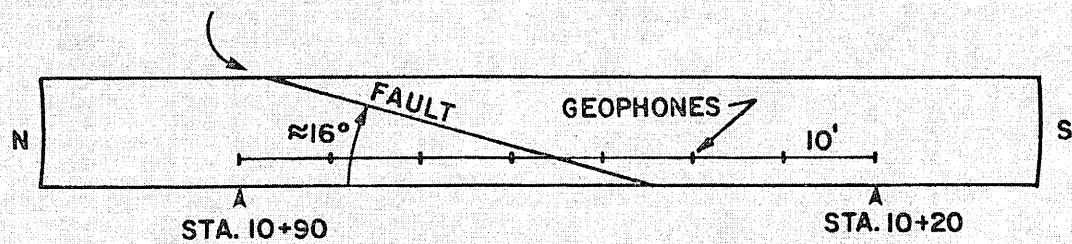
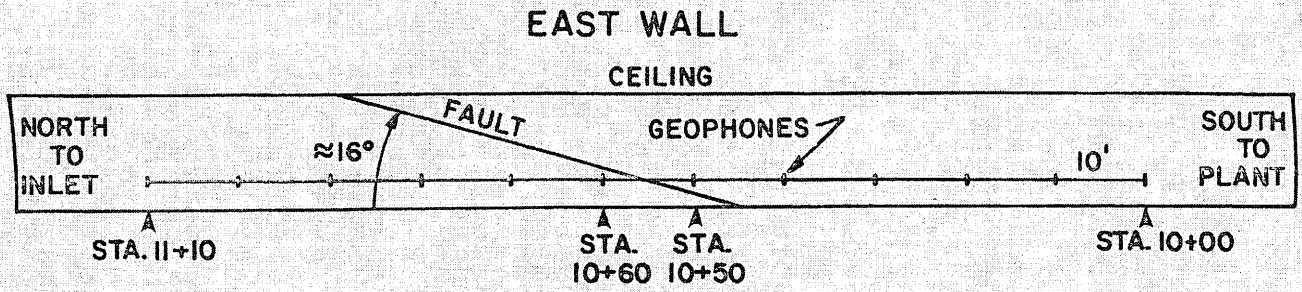
(Rev. 12 1/03)

	<b>PERRY NUCLEAR POWER PLANT</b>
Location Map, Offshore Magnetic Survey	
Figure 2D-16	

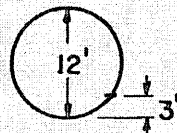


(Rev. 12 1/03)


**PERRY NUCLEAR POWER PLANT**  
 Location Map,  
 Onshore Magnetic Survey  
 Figure 2D-17



3 ELEMENT GEOPHONE  
AT EACH STATION



(Rev. 12 1/03)

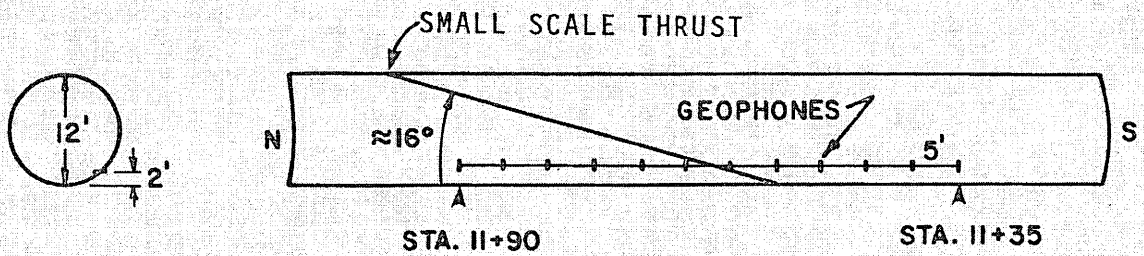
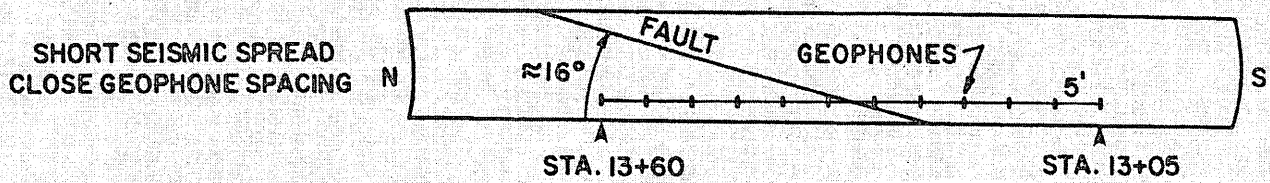
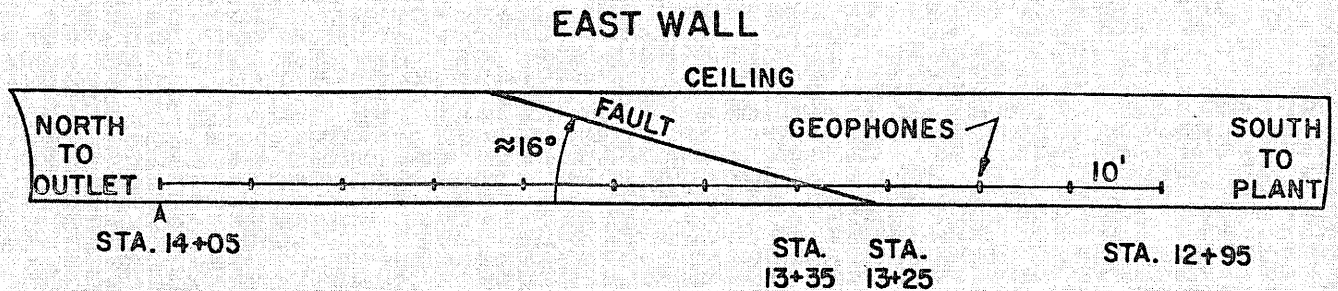


**PERRY NUCLEAR POWER PLANT**

Location Map,  
Seismic Spreads, Intake Tunnel

Figure 2D-18





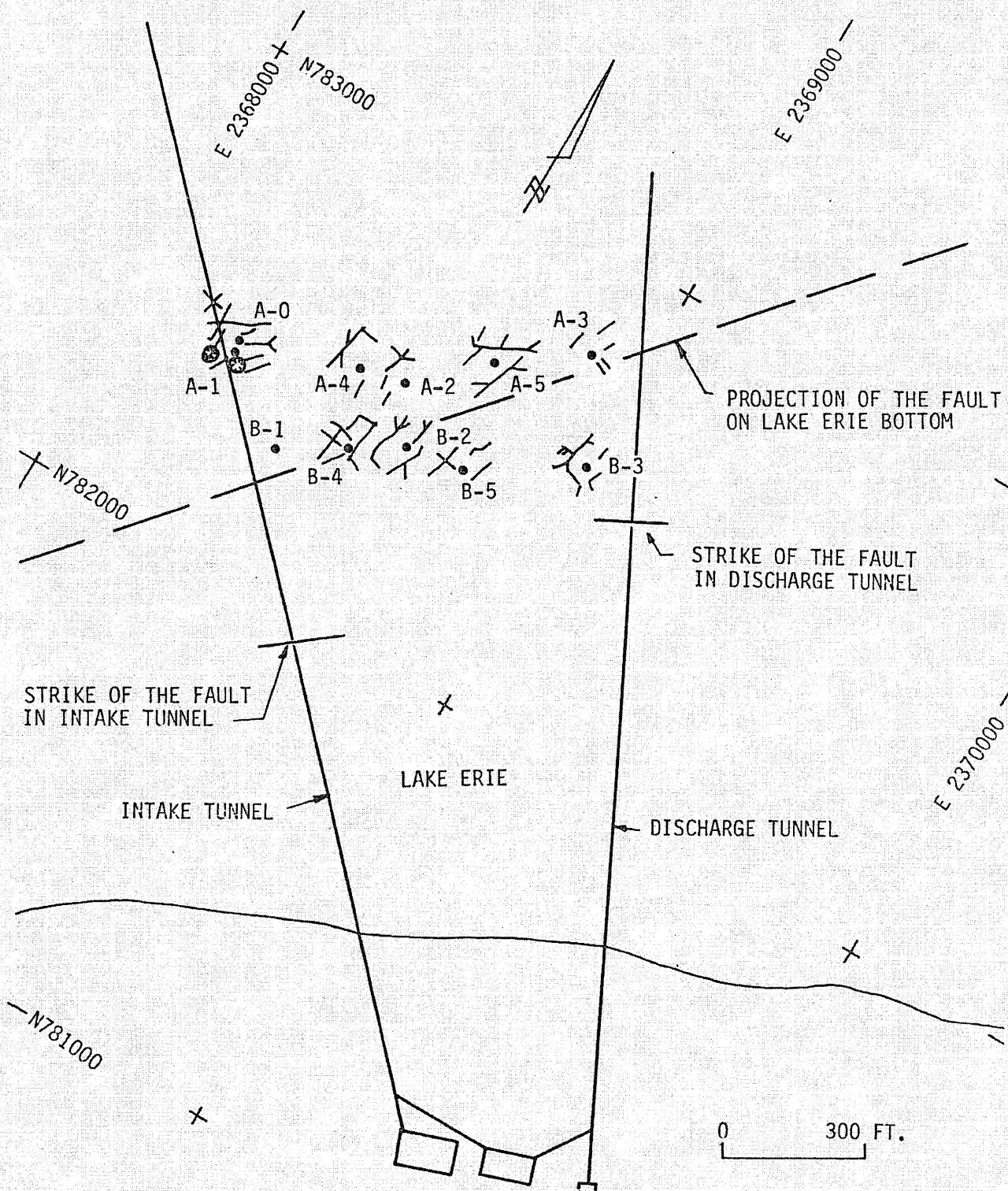
(Rev. 12 1/03)



**PERRY NUCLEAR POWER PLANT**


Location Map,  
Seismic Spreads, Discharge Tunnel

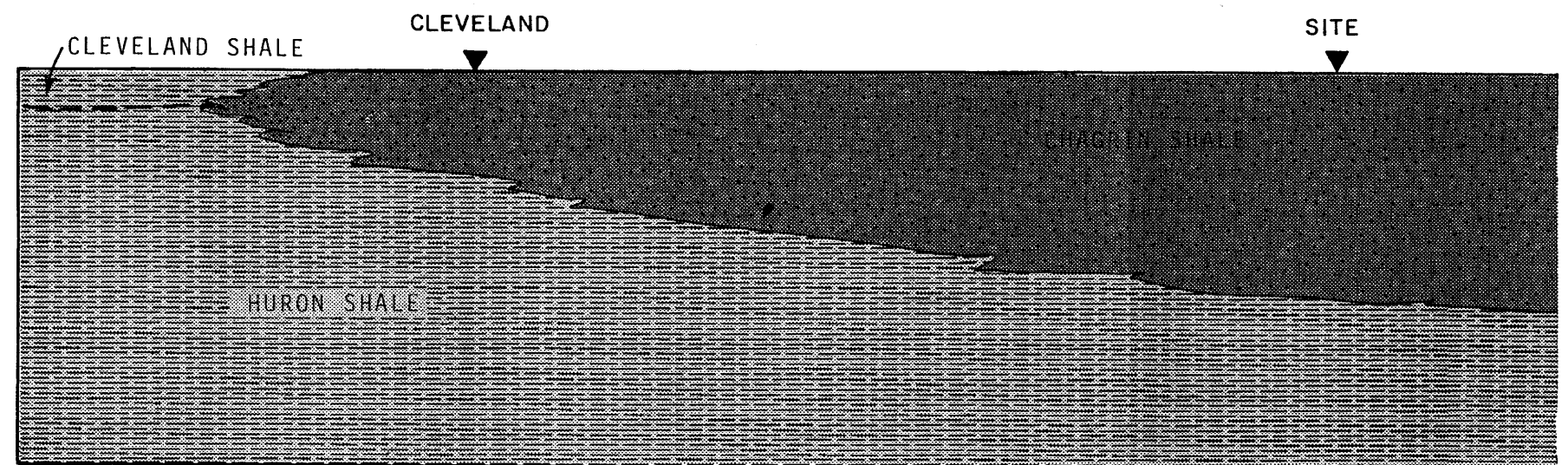
Figure 2D-19



- = STATION LOCATION
- ↗ = FRACTURE
- ⊗ = SHALLOW DEPRESSION IN BEDROCK SURFACE

(Rev. 12 1/03)

	<b>PERRY NUCLEAR POWER PLANT</b>
Schematic Map, Lake Bottom Fractures	
Figure 2D-20	



NOTE: SECTION ORIENTED NORTHEASTERLY.

(Rev. 12 1/03)



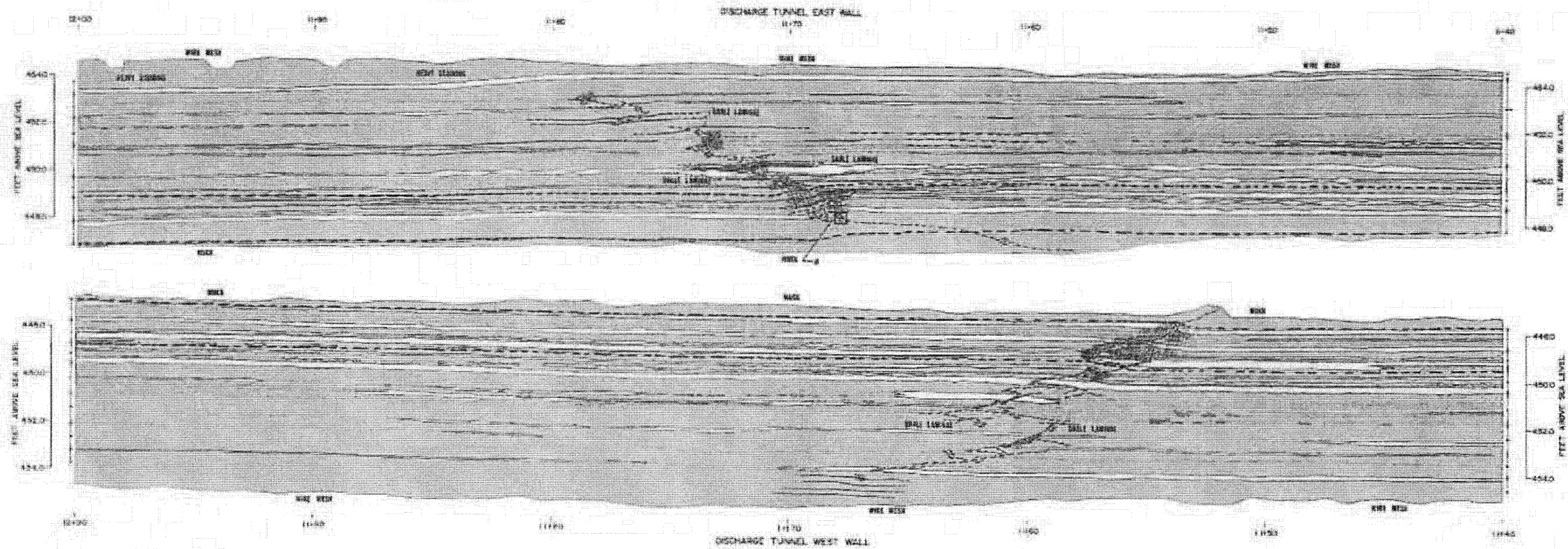
**PERRY NUCLEAR POWER PLANT**

Sketch of Facies Relationships  
Among the Huron, Chagrin,  
& Cleveland Shales

Figure 2D-21

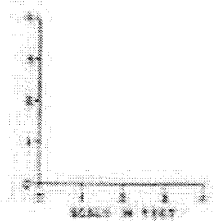






**EXPLANATION**

- FAULT ZONE. GRAY, PLASTIC CLAY GOUGE MATRIX WITH AGGREGATE OF RANDOMLY ORIENTED SILTSTONE AND SHALE FRAGMENTS.
- FAULT ZONE STRINGER <0.1 FT. THICK. ARROWS INDICATE DIRECTION OF RELATIVE MOVEMENT.
- JOINT/FRACTURE PATTERNS.
- SILTSTONE.
- SILTSTONE LAMINA, DASHED WHERE BEDDING PLANE CONTINUOUSLY MAPPED BUT SILTSTONE LITHOLOGY PINCHED OUT.
- SHALE.
- SHALE LAMINA, AS LABELED.
- IRONSTONE CONCRETIONS.
- MICRO-CRACK SAMPLE LOCATION. NUMBER GIVEN.



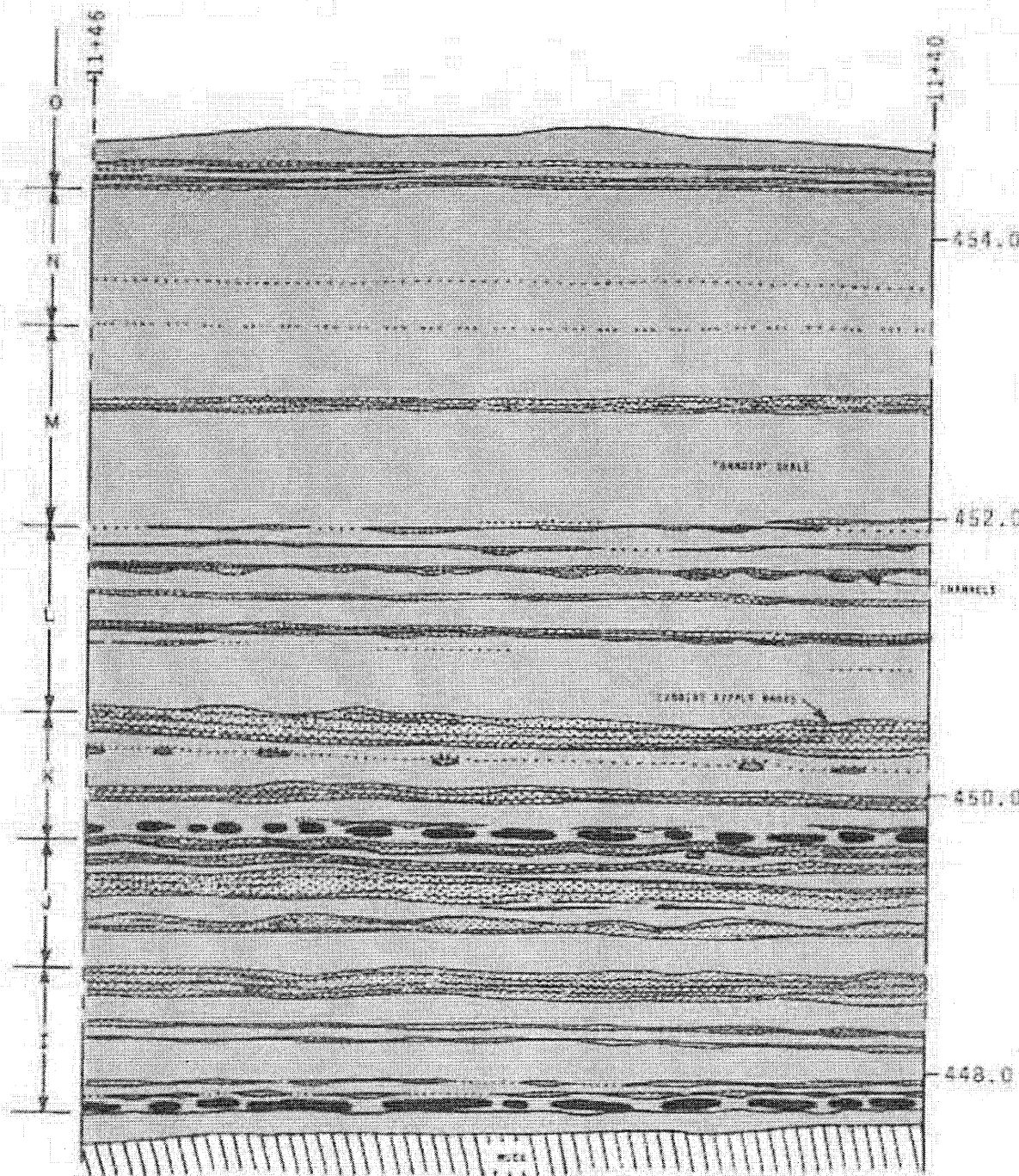
(Rev. 12 1/03)

**PERRY NUCLEAR POWER PLANT**

Detailed Stratigraphic Section,  
Intake Tunnel East Wall Station  
10-30-10:40

Figure 2D-24

DISCHARGE TUNNEL EAST WALL



UNIT O: CLAY SHALE: DARK GRAY, WITH BLOCKY FRACTURE, WITH SEVERAL PLANAR PARALLEL LAMINAE OF BROWNISH-BLACK (DISCONTINUOUS) CLAY SHALE. TOP OF UNIT IS 2 IN THICK ZONE OF INTERLAMINATED SILTSTONE AND SILTY SHALE. BASEL 2 TO 3 IN THICK, WITH INTERLAMINATED BROWNISH-BLACK CLAY SHALE, LIGHT GRAY SILTSTONE, AND DISCONTINUOUS CLAY SHALE. SILTSTONE IN LOWER PART THIN AND SWELL. RANGE FROM 2 TO 3 MM IN THICKNESS. UPPER AND MIDDLE PART OF THIS UNIT BECOMES MUCH THICKER SOUTH OF STATION 11+35.

UNIT N: CLAY SHALE: DARK GRAY, WITH BLOCKY TO CONCHOIDAL FRACTURE, WITH DISCONTINUOUS PARALLEL SILTSTONE LAMINAE, ABOUT 1 CM THICK. DISCONTINUOUS PARALLEL SILTSTONE LAMINAE 1 TO 2 MM THICK, OF LIGHT GRAY SILTSTONE AND BROWNISH-BLACK (DISCONTINUOUS) CLAY SHALE. VERY DISCONTINUOUS SILTSTONE LAMINAE. BASE OF UNIT, UNIT N-JAY N. FUNDAMENT IS A SLOPING SURFACE AT THIS STATION, NORTHWARD FROM STATION 11+35. A FUNDAMENT SILTSTONE SEPARATES UNIT N AND O.

UNIT M: CLAY SHALE AND SILTSTONE: DARK GRAY, MASSIVE, WITH BLOCKY TO CONCHOIDAL FRACTURE. MIDDLE ZONE OF SILTSTONE CONSISTS OF BROWNISH GRAY (DISCONTINUOUS) OF LIGHT GRAY SILTSTONE AND BROWNISH GRAY SILTY SHALE, OVERLAIN BY A SINGLE DISCONTINUOUS (LENTICULAR) BED OF LIGHT GRAY SILTSTONE. PARALLEL TO CLAY SHALE AS VERY THIN DISCONTINUOUS PARALLEL LAMINAE ABOVE MEDIA SILTSTONE, AND AS PLANAR CONTINUOUS PARALLEL LAMINAE IN LOWER PART OF UNIT. BASAL CLAY SHALE HAS "BANDING" ASPECT.

UNIT L: CLAY SHALE AND SILTSTONE: LOWER ONE-HALF IS CLAY SHALE, DARK GRAY, WITH NUMEROUS DARK BROWNISH-GRAY, FINGERING (75% BROADLY WAVY LAMINAE, WITH "BANDING" ASPECT), BLOCKY FRACTURE. UPPER ONE-HALF IS GRAY CLAY SHALE WITH SEVERAL BROADLY WAVY SILTSTONE BEDS UP TO 2 CM IN THICKNESS. UPPER PART DISCONTINUOUS, LOWER PART CONTINUOUS. SMALL CHANNELS PRESENT AS SHOWN.

UNIT K: CLAY SHALE, SILTSTONE, AND IRONSTONE: DARK GRAY, SLIGHTLY SILTY CLAY SHALE WITH CONCHOIDAL FRACTURE, WITH NUMEROUS BROADLY WAVY THIN LAMINAE OF BROWNISH-GRAY (DISCONTINUOUS) CLAY SHALE, APPROXIMATELY 2 CM. 2 MM THICK. TOP OF UNIT IS SILTY. INTERLAMINATED SILTSTONE AND SILTY SILTSTONE WITH PARALLEL OF DARK GRAY SHALE. SOUTHWARD THE TOP OF THIS SILTSTONE IS SIMPLY MARKED. MEDIA SILTSTONE, UP TO 2 CM THICK, HAS STRAIGHT-UPSET CURRENT RIPPLES AT TOP. BASE OF UNIT CONTAINS BED OF CLOSELY SPACED IRONSTONE CONCRETIONS ABOUT 1.5 CM THICK.

UNIT J: CLAY SHALE AND SILTSTONE: DARK GRAY CLAY SHALE, WITH NUMEROUS THIN LAMINAE, 1 TO 2 MM THICK, OF DARK BROWNISH-GRAY (DISCONTINUOUS) CLAY SHALE. UPPER PART IS 2 CM WAVE BEDED ZONE OF FLATLY, FINELY INTERLAMINATED LIGHT GRAY SILTSTONE AND DDT. DARK GRAY SHALE. MEDIA LAMINAE CONSIST OF WAVY SILTSTONE LAMINAE, MICRO-BURIED UNDER LOCALLY AT TOPS OF SILTSTONE LAMINAE. SOUTHWARD UNIT J CONTAINS A MEDIA PINCHING AND SWELLING OF SILTSTONE.

UNIT I: CLAY SHALE, SILTSTONE, AND IRONSTONE: SAME TENDENCY AS UNIT K, EXCEPT AS INDICATED GRAPHICALLY.

NOTE: UNITS J AND K WERE MEASURED AND DESCRIBED AT STATION 11+40, UNITS L THROUGH O WERE MEASURED AND DESCRIBED AT STATION 11+46.

EXPLANATION

- SILTSTONE.
- SILTSTONE LAMINA, DASHED WHERE BEDDING PLANE CONTINUOUSLY MAPPED BUT SILTSTONE LITHOLOGY PINCHED OUT.
- SHALE.
- IRONSTONE CONCRETIONS.

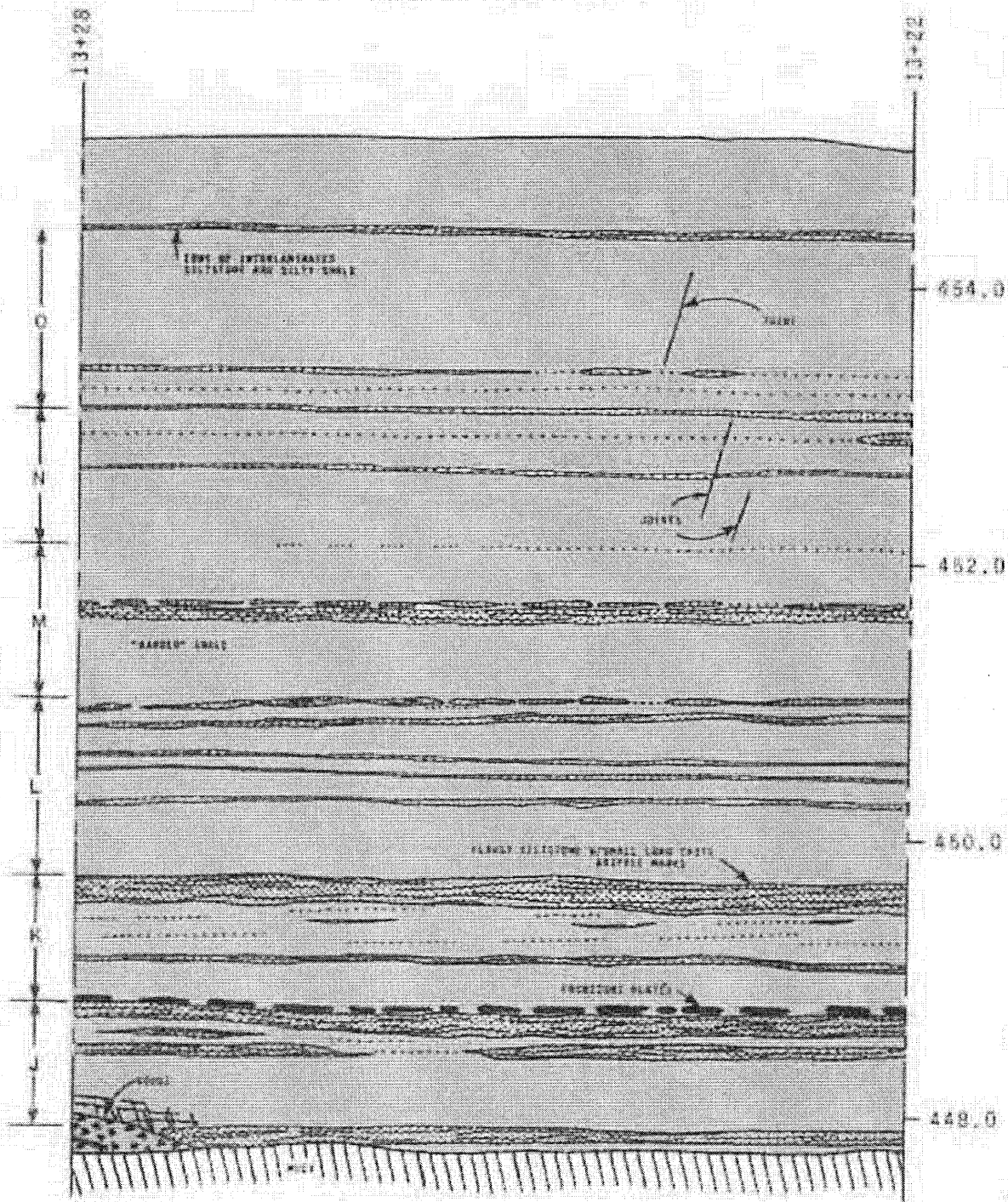
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**PERRY NUCLEAR POWER PLANT**

Detailed Stratigraphic Section,  
Discharge Tunnel  
East Wall Station 11+40-11+46

Figure 2D-25

DISCHARGE TUNNEL EAST WALL



- UNIT O: CLAY SHALE. DARK GRAY, WITH BLOCKY TO CONCHOIDAL FRACTURE; WITH SEVERAL PLACED LAMINAE; AREAS OF BROWNISH-BLACK SILTSTONE; CLAY SHALE TOP OF UNIT IS 8 IN THICK ZONE OF INTERLAMINATED SILTSTONE AND SILTY SHALE; BASE OF UNIT IS BROADLY WAVE, UNDEVELOPED BROWNISH-BLACK SILTY SHALE, LIGHT-GRAY SILTSTONE, AND SUBORDINATE GREAT CLAY SHALE. IT OCCURS IN LOWER PART OF UNIT AND IS 2 TO 3 IN THICK; UPPER MOST SILTSTONE AT THIS POINT IS 1/2 IN THICKER NORTH OF STATION 13+22.
- UNIT N: CLAY SHALE. DARK GRAY, WITH BLOCKY TO CONCHOIDAL FRACTURE; WITH ONE PROMINENT MEDIAL SILTSTONE ZONE, ABOUT 2 IN THICK; DISCONTINUOUS PARALLEL LAMINAE 1 TO 2 IN THICK; OF INTERLAMINATED SILTSTONE AND BROWNISH-BLACK (FERRUGINOUS?) CLAY SHALE VERY COMMON ABOVE MEDIAL SILTSTONE; SINGLE DISCONTINUOUS SILTSTONE LAMINAE NEAR BASE OF UNIT; UNIT N-WEST OF BOUNDARY IS A BIRDING SURFACE AT THIS STATION; NORTHWARD FROM STATION 13+25, A PROMINENT SILTSTONE SEPARATES UNITS N AND M.
- UNIT M: CLAY SHALE AND SILTSTONE. DARK GRAY, WAVE, WITH BLOCKY TO CONCHOIDAL FRACTURE; MEDIAL ZONE OF SILTSTONE CONSISTS OF BROADLY WAVE INTERLAMINATIONS OF LIGHT-GRAY SILTSTONE AND BROWNISH-GRAY SILTY SHALE, OVERLAIN BY A SINGLE DISCONTINUOUS (LENTICULAR) BED OF LIGHT-GRAY SILTSTONE; FERRUGINOUS(?) CLAY SHALE AS VERY THIN DISCONTINUOUS PARALLEL LAMINAE ABOVE MEDIAL SILTSTONE; AND AS PLAIN CONCHOIDAL PARALLEL LAMINAE IN LOWER PART OF UNIT; BASE ONE-HALF HAS "BANDS" ASPECT.
- UNIT L: CLAY SHALE AND SILTSTONE. LOWER ONE-HALF IS CLAY SHALE, DARK GRAY, WITH NUMEROUS DARK BROWNISH-GRAY, FERRUGINOUS(?) BRITTLE MARK LAMINAE, WITH "BRAND" ASPECT, BLOCKY FRACTURE; UPPER ONE-HALF IS GRAY CLAY SHALE WITH SEVERAL IRREGULAR SILTSTONE BEDS UP TO 1 IN IN THICKNESS; UPPER BEDS FERRUGINOUS; LOWER BEDS CONTINUOUS; SMALL CHANNELS PRESENT AT BASE.
- UNIT K: CLAY SHALE, SILTSTONE, AND IRONSTONE. DARK GRAY, TO SILTY SILTY CLAY SHALE WITH CONCHOIDAL FRACTURE; WITH NUMEROUS IRREGULAR WAVE THIN LAMINAE OF BROWNISH-WAVE FERRUGINOUS(?) CLAY SHALE; UPPERMOST 6 IN IS WAVE MEDIAL ZONE OF PLACED, BLOCKY INTERLAMINATED SILTSTONE AND SILTY SILTSTONE WITH PATTERNS OF DARK GRAY SHALE, DOWNWARD TO THIS SILTSTONE IS RUGELY WAVE; MEDIAL SILTSTONE, UP TO 2 IN THICK, HAS DIRECTION-CHANGING CONCENTRIC RIPPLES AT TOP; BASE OF UNIT CONSISTS OF 2 TO 3 IN THICK IRONSTONE CONCRETIONS ABOUT 2 IN IN DIAMETER.
- UNIT J: CLAY SHALE AND SILTSTONE. DARK GRAY CLAY SHALE, WITH NUMEROUS THIN LAMINAE, 1 TO 2 IN THICK, OF DARK BROWNISH-GRAY FERRUGINOUS(?) CLAY SHALE; UPPERMOST 10 IN IS WAVE THIN INTERLAMINATED LIGHT-GRAY SILTSTONE AND SILTY, DARK GRAY SHALE; DARK LENS WITH COARSE GRAIN OF WAVE SILTSTONE LAMINAE; WAVE-APPLIED DIPS LOCALLY ON TOP OF SILTSTONE LAMINAE, SOUTHWARD; UNIT J CONTAINS A MEDIAL FERRUGINOUS AND SWELLING BED OF SILTSTONE.
- UNIT I: CLAY SHALE, SILTSTONE, AND IRONSTONE. DARK GRAY, TO SILTY SILTY CLAY SHALE, WITH NUMEROUS IRREGULAR WAVE THIN LAMINAE OF BROWNISH-WAVE FERRUGINOUS(?) CLAY SHALE; UPPERMOST 6 IN IS WAVE MEDIAL ZONE OF PLACED, BLOCKY INTERLAMINATED SILTSTONE AND SILTY SILTSTONE WITH PATTERNS OF DARK GRAY SHALE, DOWNWARD TO THIS SILTSTONE IS RUGELY WAVE; MEDIAL SILTSTONE, UP TO 2 IN THICK, HAS DIRECTION-CHANGING CONCENTRIC RIPPLES AT TOP; BASE OF UNIT CONSISTS OF 2 TO 3 IN THICK IRONSTONE CONCRETIONS ABOUT 2 IN IN DIAMETER.

NOTE: UNITS I AND J WERE MEASURED AND DESCRIBED AT STATION 13+40; UNITS K THROUGH O WERE MEASURED AND DESCRIBED AT STATION 13+22.

EXPLANATION

- FAULT GOUGE ZONE. GRAY, PLASTIC CLAY GOUGE MATRIX WITH AGGREGATE OF RANDOMLY ORIENTED SILTSTONE AND SHALE FRAGMENTS.
- SILTSTONE.
- SILTSTONE LAMINA, DASHED WHERE BEDDING PLANE CONTINUOUSLY MAPPED BUT SILTSTONE LITHOLOGY PINCHED OUT.
- SHALE.
- IRONSTONE CONCRETIONS.

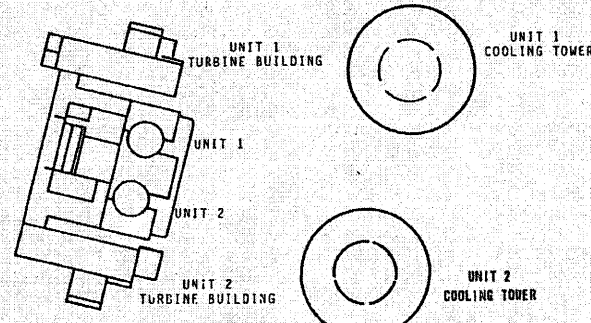
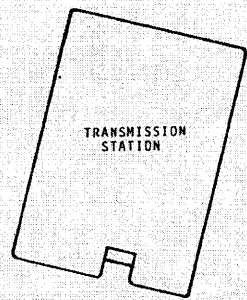
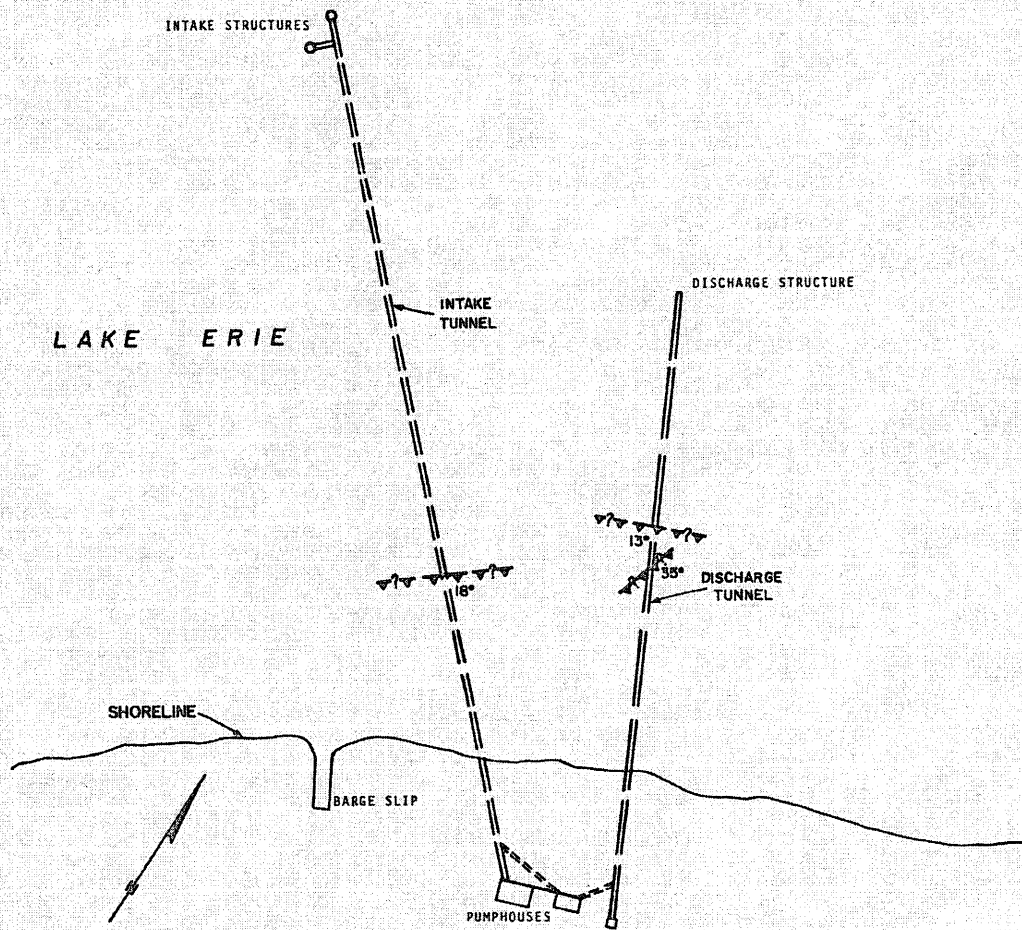
(Rev. 12 1/63)

**PERRY NUCLEAR POWER PLANT**

Detailed Stratigraphic Section,  
Discharge Tunnel East Wall  
Station 13+22-13+28

Figure 2D-26






**EXPLANATION**  
 THRUST FAULT WITH DIP INDICATED.  
 SAW TEETH ON UPPER PLATE.  
 DASHED AND QUESTIONED WHERE  
 PROJECTED.  
 FAULTS ARE DRAWN AS THEY APPEAR  
 AT ELEVATION 450.0.

300 0 300 600  
 SCALE IN FEET

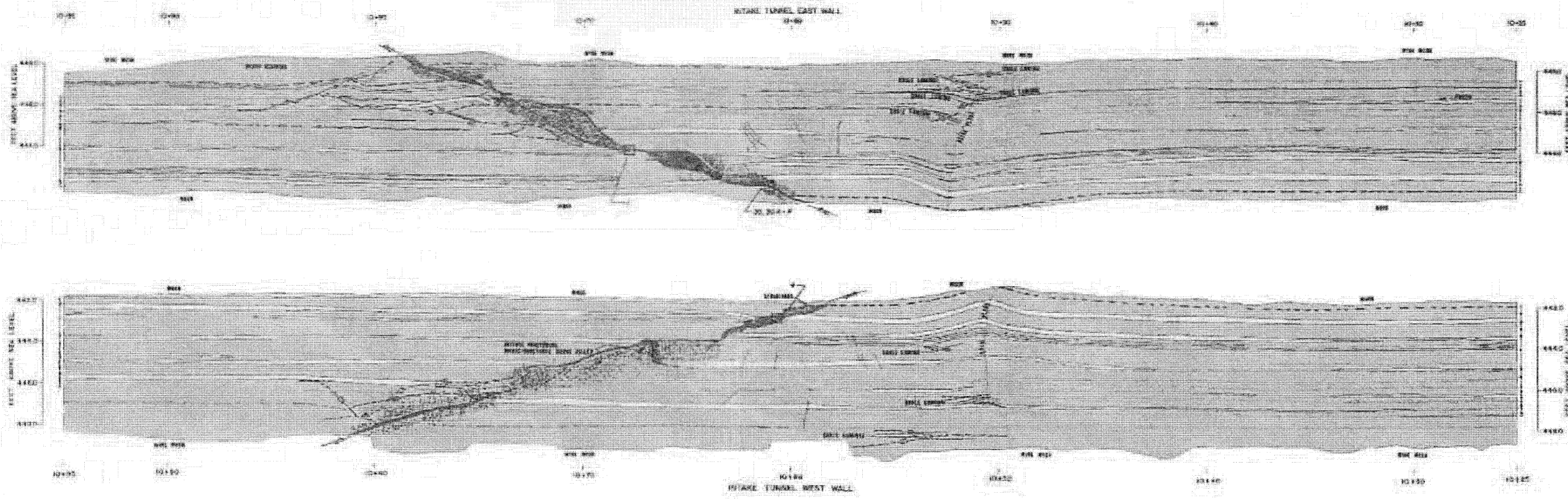
(Rev. 12 1/03)











## PERRY NUCLEAR POWER PLANT

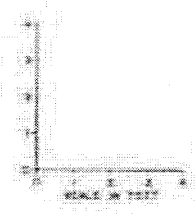
Geologic Structure Map,  
Intake & Discharge Tunnel Faults

Figure 2D-27

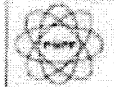


**EXPLANATION**

-  FRESH WATER WITH AGGREGATE OF RANDOMLY ORIENTED SILTSTONE AND SHALE FRAGMENTS
-  FAULT ZONE STRIKESLIP - 40 FT. THICK. ARROWS INDICATE DIRECTION OF RELATIVE MOVEMENT.
-  JOINT-FRACTURE PATTERN.
-  SILTSTONE.
-  SILTSTONE LAMINA, DASHED WHERE BEDDING PLANE DISTINGUISHLY MARKED BY SILTSTONE LITHOLOGY TURNED OUT.
-  SHALE.
-  IRONSTONE CONCRETIONS.
-  MICRO-CRACK SAMPLE LOCATION NUMBER GIVEN.



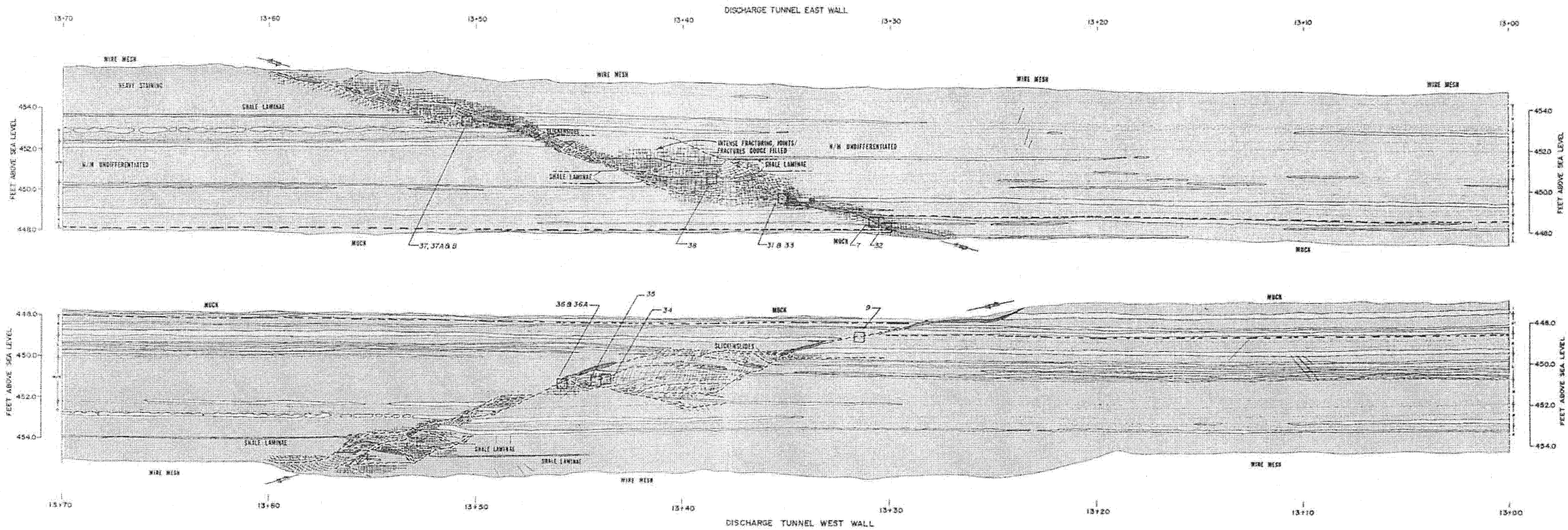
(Rev. 12 1/03)












**PERRY NUCLEAR POWER PLANT**

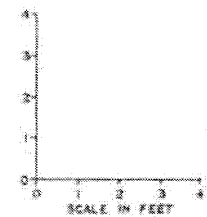
Intake Tunnel Wall Maps,  
Stations 10+25-10+35

Figure 2B-18

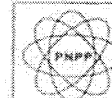


**EXPLANATION**

-  FAULT GOUGE ZONE. GRAY, PLASTIC CLAY GOUGE MATRIX WITH AGGREGATE OF RANDOMLY ORIENTED SILTSTONE AND SHALE FRAGMENTS.
-  FAULT GOUGE STRINGER <0.1 FT. THICK. ARROWS INDICATE DIRECTION OF RELATIVE MOVEMENT.
-  JOINT/FRACTURE PATTERN.
-  SILTSTONE.
-  SILTSTONE LAMINA, DASHED WHERE BEDDING PLANE CONTINUOUSLY MAPPED BUT SILTSTONE LITHOLOGY PINCHED OUT.
-  SHALE.
-  SHALE LAMINA, AS LABELED.
-  IRONSTONE CONCRETIONS.
-  MICRO-CRACK SAMPLE LOCATION NUMBER GIVEN.



(Rev. 12 1/03)

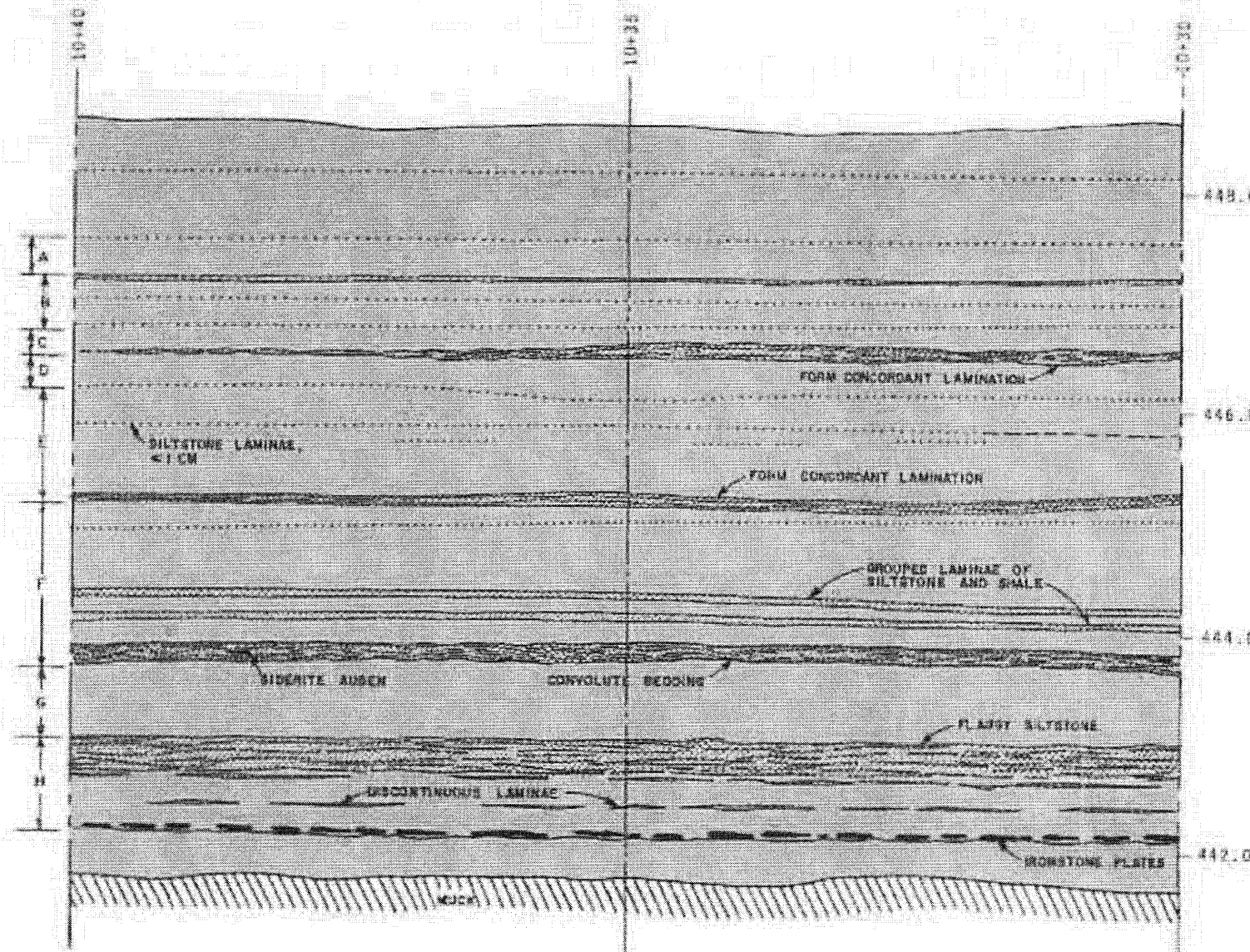


**PERRY NUCLEAR POWER PLANT**

Discharge Tunnel Wall Maps,  
Stations 13+100-12+00

Figure 2D-29

INTAKE TUNNEL EAST WALL



449.0 UNIT A: CLAY SHALE: DARK GRAY, WITH MINOR TO MODERATE FRACTURES; WITH CLAYEY SPACED BEDDING OF LATERAL TO POST-DIPOLAR PLANE; WITH OVER LAMINAE OF LIGHT GRAY SILTSTONE.

UNIT B: CLAY SHALE: DARK GRAY, WITH MINOR FRACTURES; WITH CLAYEY SPACED BEDDING OF LATERAL TO POST-DIPOLAR PLANE; WITH OVER LAMINAE OF LIGHT GRAY SILTSTONE.

UNIT C: CLAY SHALE AND SILTSTONE: DARK GRAY, WITH MINOR FRACTURES; WITH CLAYEY SPACED BEDDING OF LATERAL TO POST-DIPOLAR PLANE; WITH OVER LAMINAE OF LIGHT GRAY SILTSTONE.

446.0 UNIT D: CLAY SHALE: DARK GRAY, WITH MINOR FRACTURES; WITH CLAYEY SPACED BEDDING OF LATERAL TO POST-DIPOLAR PLANE; WITH OVER LAMINAE OF LIGHT GRAY SILTSTONE.

UNIT E: CLAY SHALE: DARK GRAY, WITH MINOR FRACTURES; WITH CLAYEY SPACED BEDDING OF LATERAL TO POST-DIPOLAR PLANE; WITH OVER LAMINAE OF LIGHT GRAY SILTSTONE.

UNIT F: CLAY SHALE AND SILTSTONE: DARK GRAY, WITH MINOR FRACTURES; WITH CLAYEY SPACED BEDDING OF LATERAL TO POST-DIPOLAR PLANE; WITH OVER LAMINAE OF LIGHT GRAY SILTSTONE.

444.0 UNIT G: CLAY SHALE: DARK GRAY, WITH MINOR FRACTURES; WITH CLAYEY SPACED BEDDING OF LATERAL TO POST-DIPOLAR PLANE; WITH OVER LAMINAE OF LIGHT GRAY SILTSTONE.

UNIT H: CLAY SHALE: DARK GRAY, WITH MINOR FRACTURES; WITH CLAYEY SPACED BEDDING OF LATERAL TO POST-DIPOLAR PLANE; WITH OVER LAMINAE OF LIGHT GRAY SILTSTONE.

442.0 UNIT I: CLAY SHALE: DARK GRAY, WITH MINOR FRACTURES; WITH CLAYEY SPACED BEDDING OF LATERAL TO POST-DIPOLAR PLANE; WITH OVER LAMINAE OF LIGHT GRAY SILTSTONE.

**EXPLANATION**

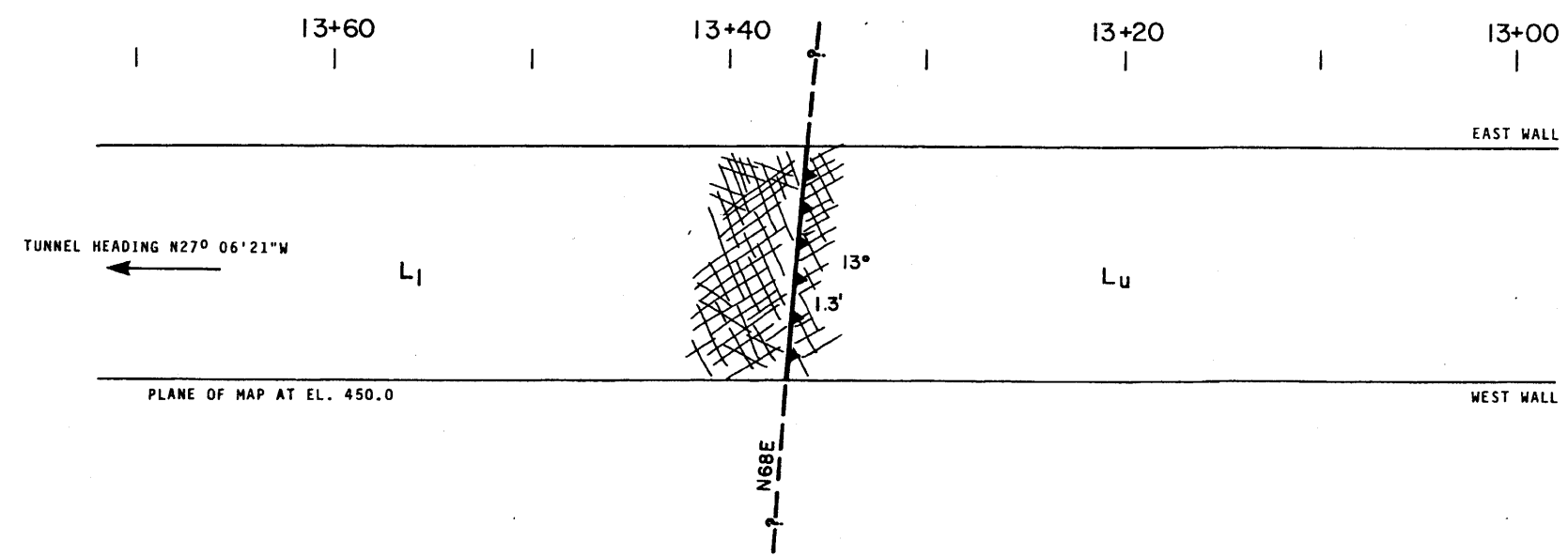
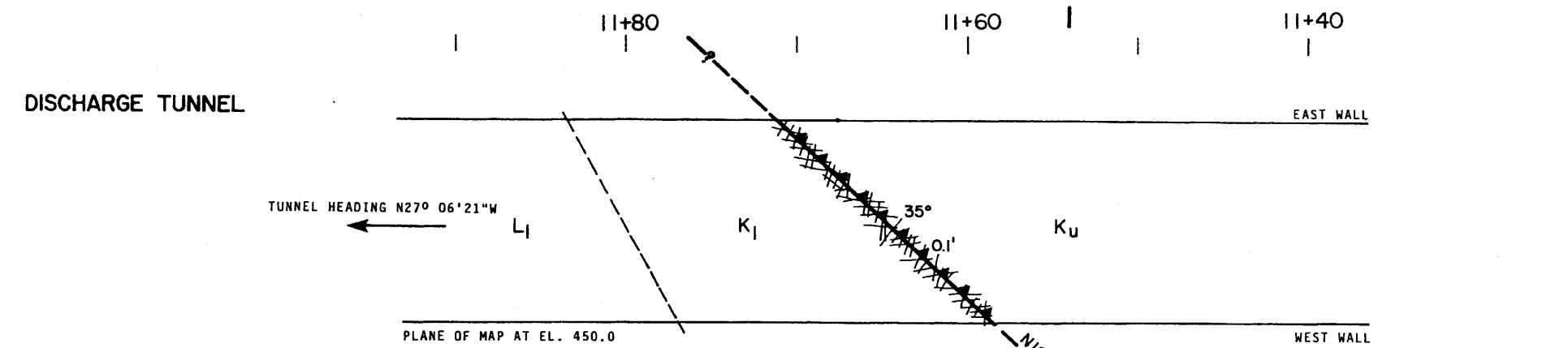
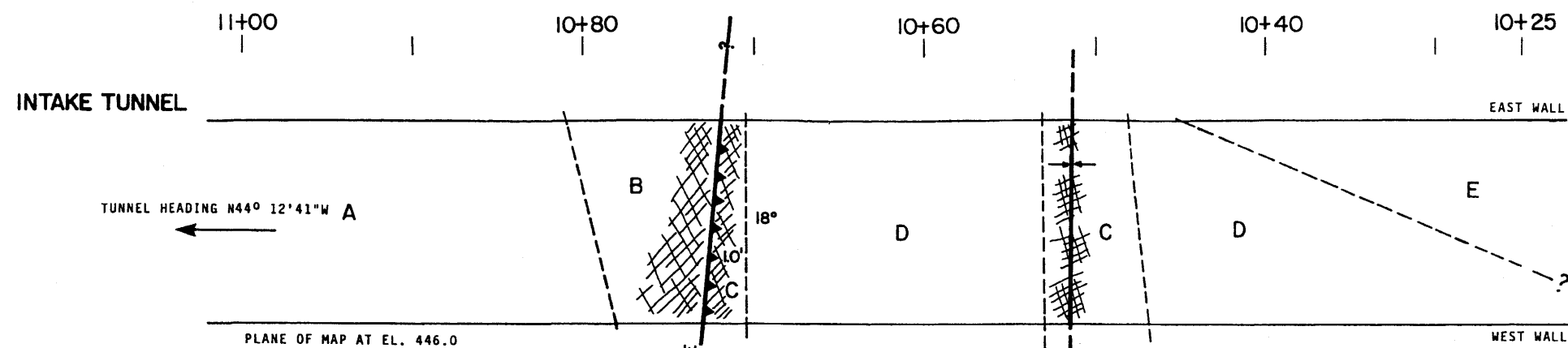
- SILTSTONE.
- SILTSTONE LAMINA, DASHED WHERE BEDDING PLANE CONTINUOUSLY MAPPED BUT SILTSTONE LITHOLOGY PINCHED OUT.
- SHALE.
- IRONSTONE CONCRETIONS.

(Rev. 12 1/03)

PERRY NUCLEAR POWER PLANT

Discharge Tunnel Wall Maps,  
Stations 11+40-12+00

Figure 2D-30



**EXPLANATION**

STRATIGRAPHIC UNITS: A, B, C, D, E, K, L. UNITS K AND L ARE SUBDIVIDED INTO UPPER AND LOWER SECTIONS AS INDICATED BY SUBSCRIPTS.

A

THRUST FAULT SHOWING DISPLACEMENT AND DIP  
STRATIGRAPHIC UNIT CONTACT.


SEVERELY FRACTURED ROCK.

SYNCLINAL FOLD AXIS.

NOTES: 1. SEE FIGURES 22, 23, AND 24 FOR STRATIGRAPHIC UNIT RELATIONSHIPS.

2. MAPS COMPILED FROM INTAKE AND DISCHARGE TUNNEL WALL MAPS, SEE FIGURES 26, 27, AND 28.

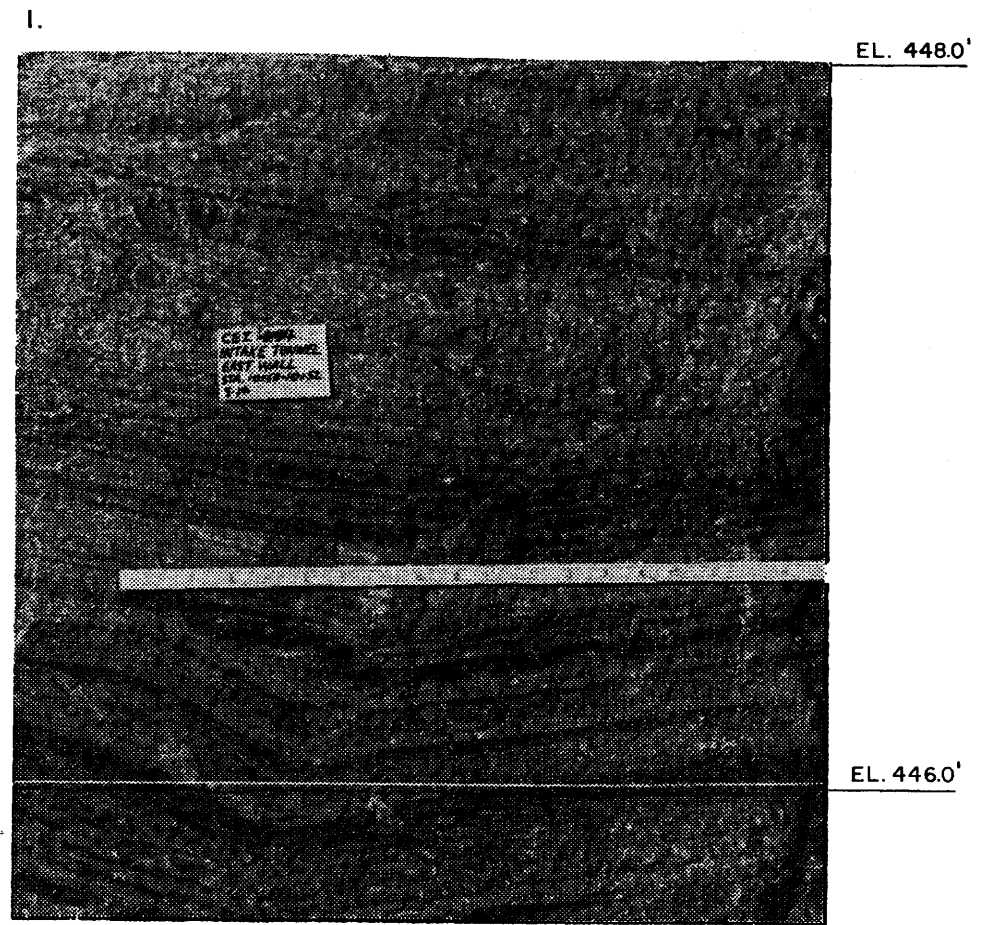
(Rev. 12 1/03)



**PERRY NUCLEAR POWER PLANT**

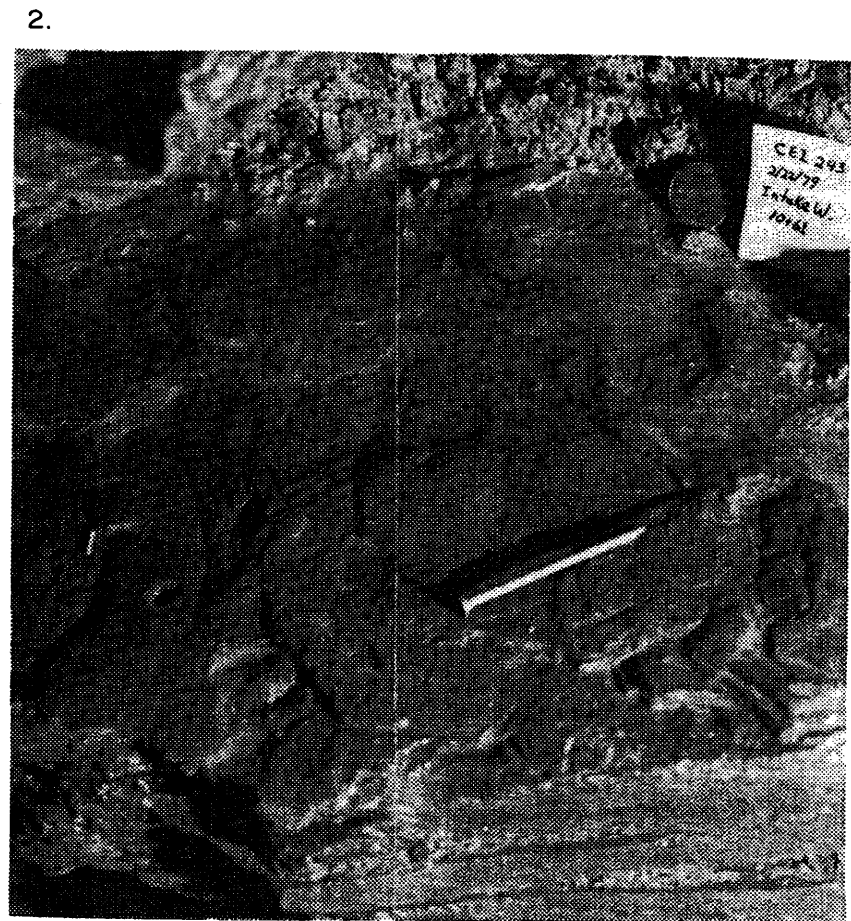
Geologic Maps,  
Intake & Discharge Tunnels

Figure 2D-31



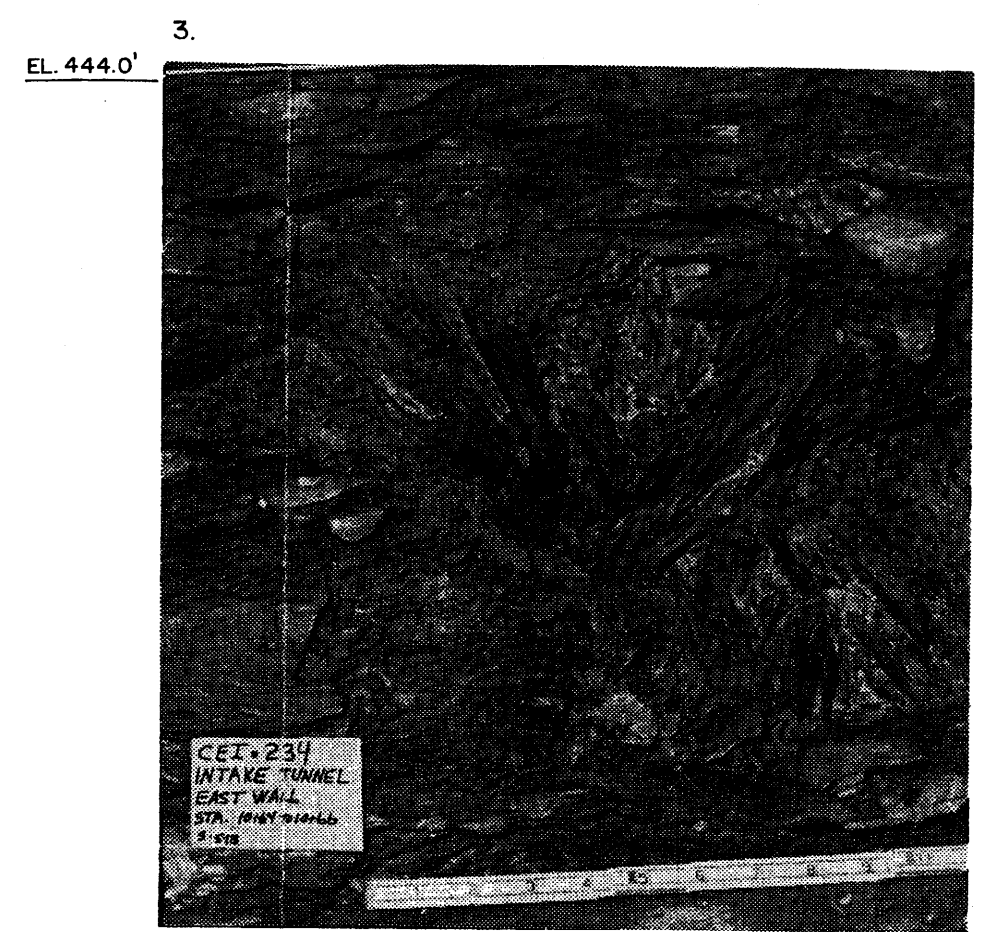
↑  
10+51

ASSYMMETRIC FOLD; STATION 10+51, EAST WALL INTAKE TUNNEL. NOTE FAULTED NW LIMB OF FOLD.



↑  
10+61


STRIATIONS; WEST WALL INTAKE TUNNEL, STATION 10+61. STRIATIONS ON FOOTWALL, TREND N 37° W PARALLEL TO NAIL.

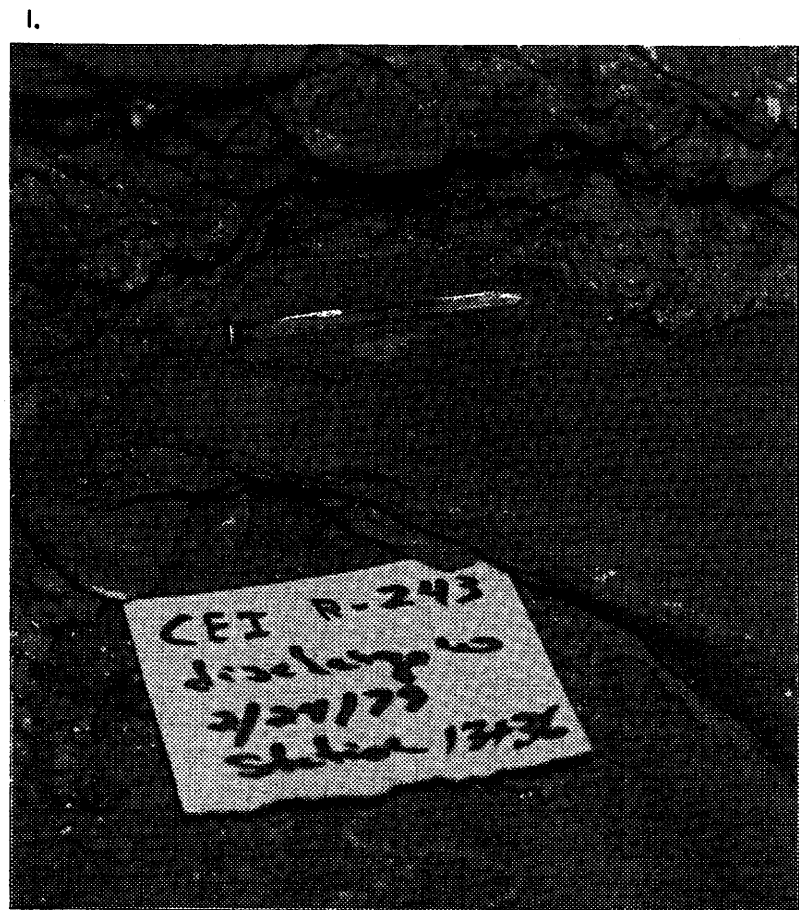


↑  
10+65

FRACTURED AND DRAGGED STRATA; EAST WALL INTAKE TUNNEL, STATION 10+65.

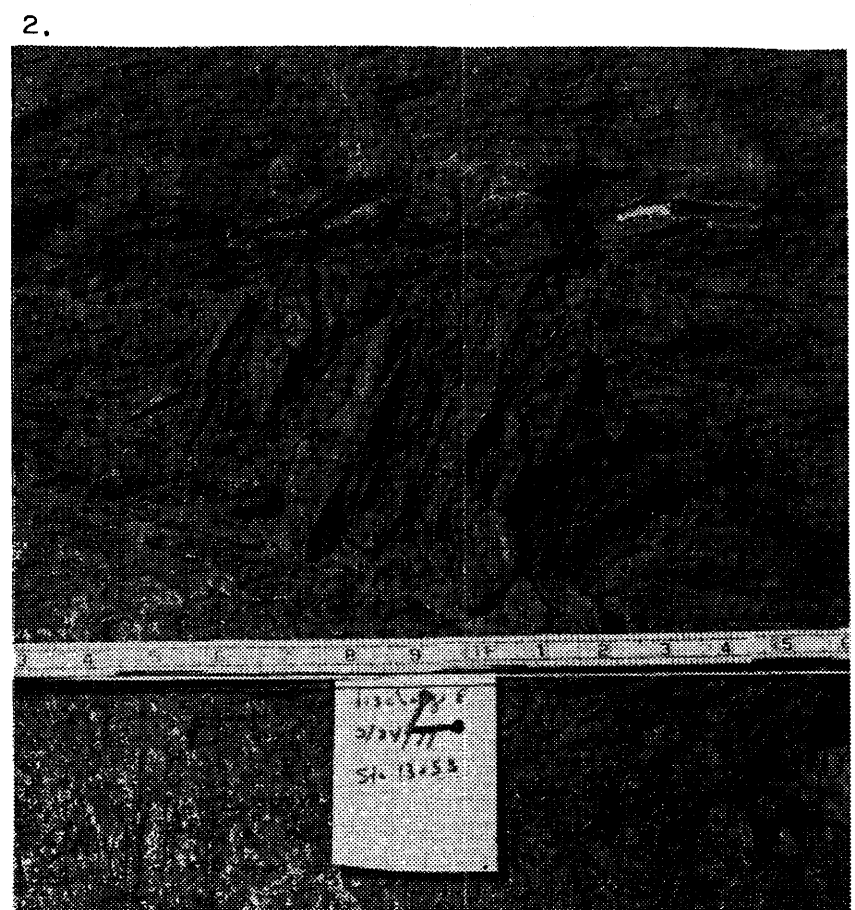
(Rev. 12 1/03)

	<b>PERRY NUCLEAR POWER PLANT</b>
	Photographs, Structural Details, Intake Tunnel
	Figure 2D-32



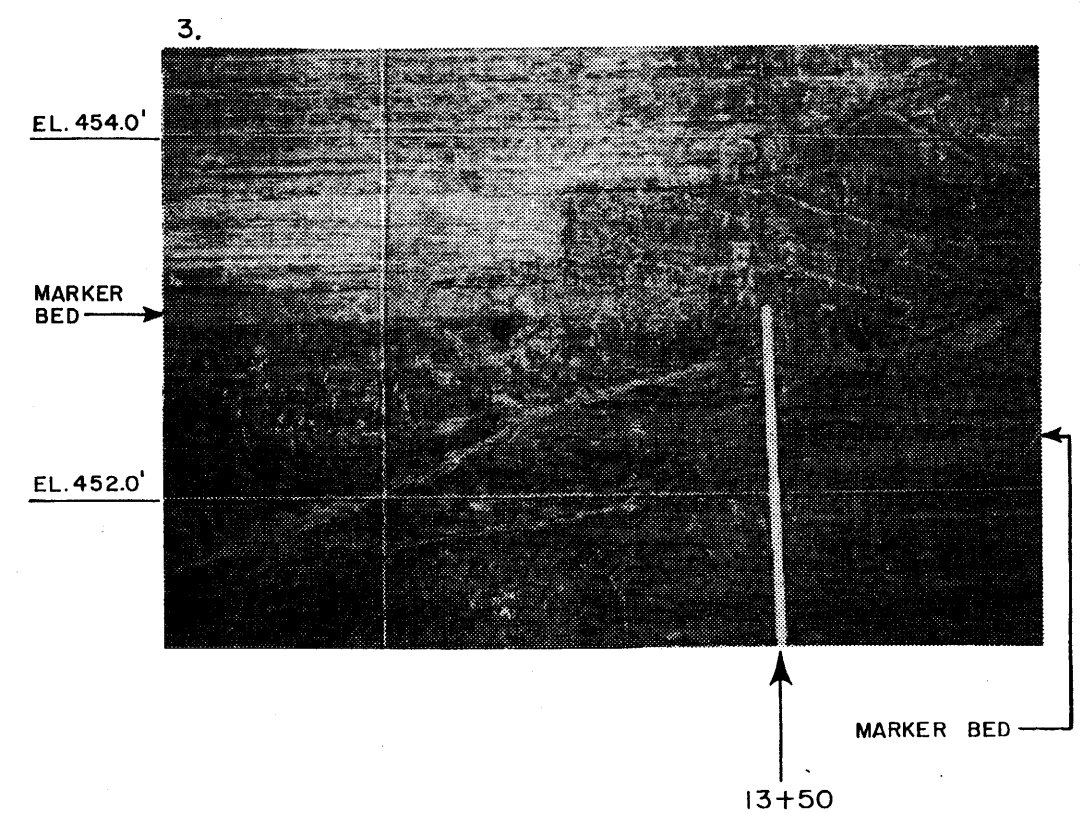
↑  
13+36

STRIATIONS AND GOUGE; WEST WALL DISCHARGE TUNNEL, STATION 13+36. STRIATIONS TREND N22°W PARALLEL TO NAIL (TWO INCHES LONG). NOTE ANGULAR SHALE AND SILTSTONE FRAGMENTS IN GOUGE.




↑  
13+53

DRAG FOLD; STATION 13+53, EAST WALL DISCHARGE TUNNEL.

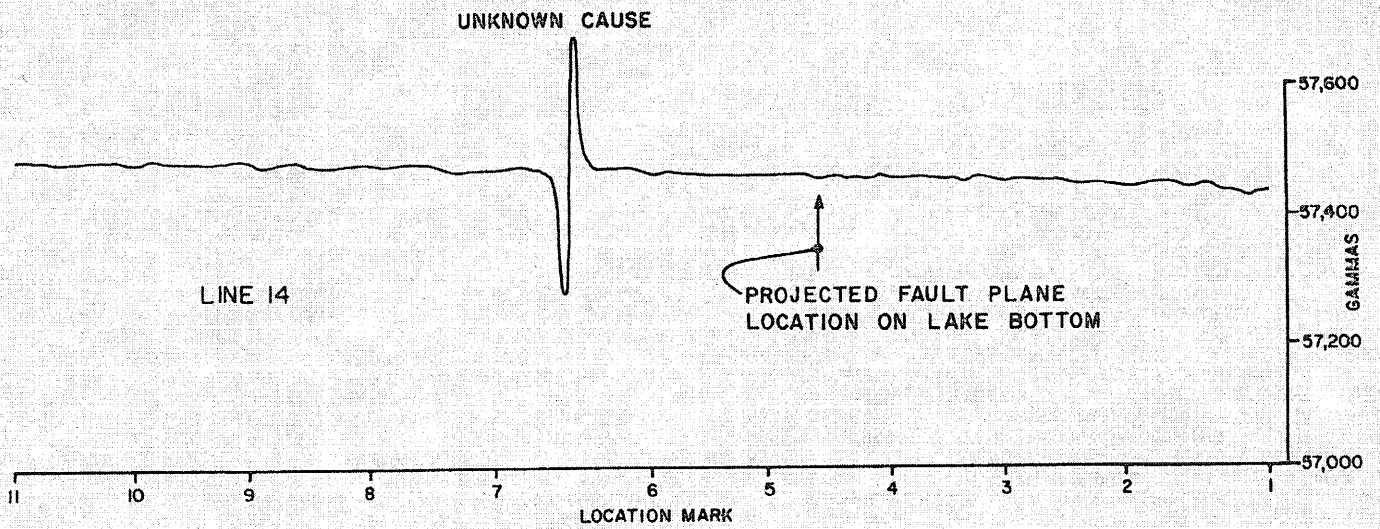


DRAG FOLDS, KINKING AND FAULT SPLAYS; STATION 13+50 WEST WALL DISCHARGE. SCALE GIVEN BY STATIONING AND RULE.

(Rev. 12 1/03)

	<b>PERRY NUCLEAR POWER PLANT</b>
Photographs, Structural Details, Discharge Tunnel	
Figure 2D-33	

NOTE: MARK SEPARATION APPROXIMATELY 1000'



(Rev. 12 1/03)



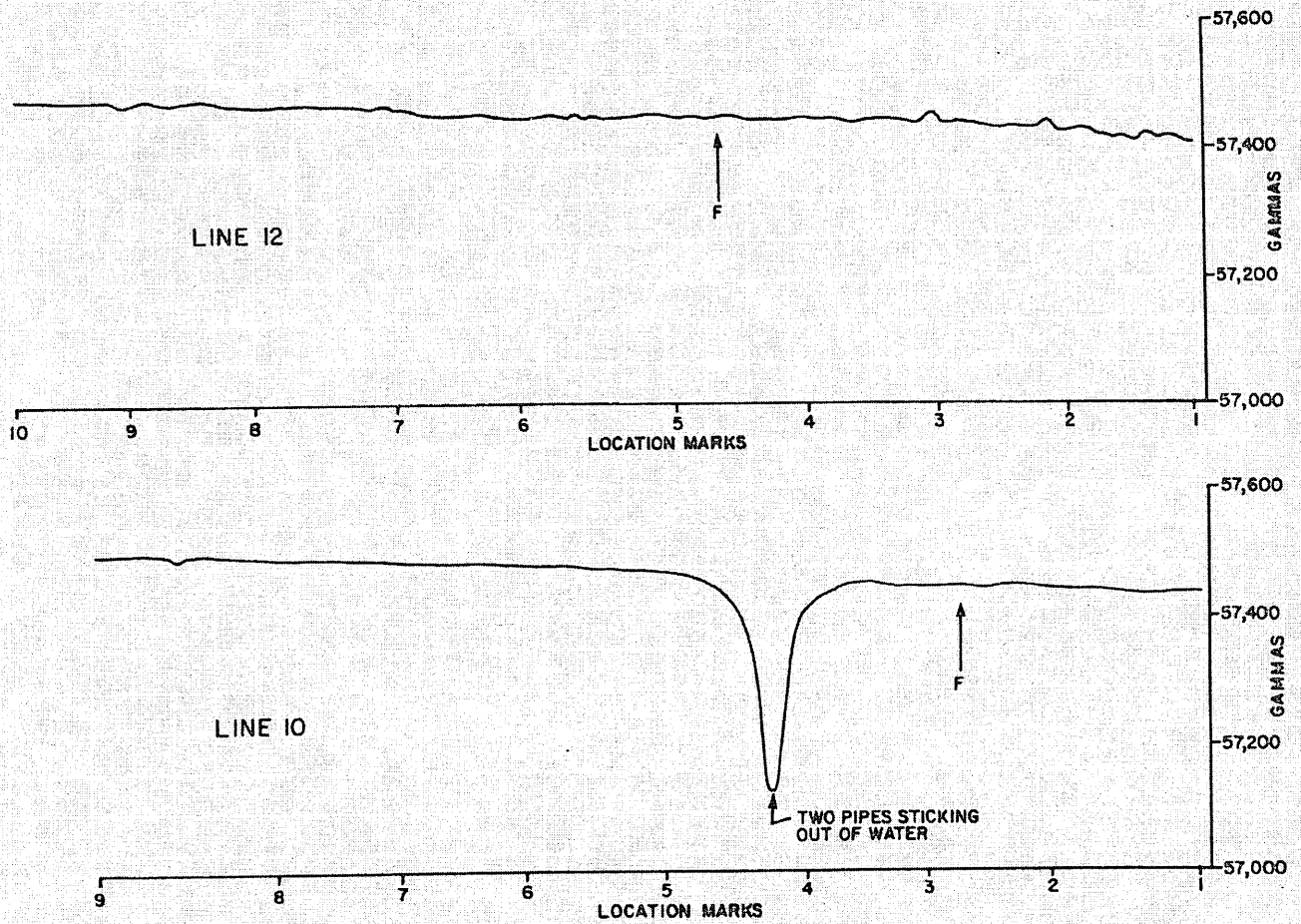
**PERRY NUCLEAR POWER PLANT**

Offshore for Shipborne  
Magnetic Profile 14

Figure 2D-34



NOTE: MARK SEPARATION APPROXIMATELY 1000'



EXPLANATION

↑ PROJECTED FAULT LOCATION ON LAKE BOTTOM.

(Rev. 12 1/03)

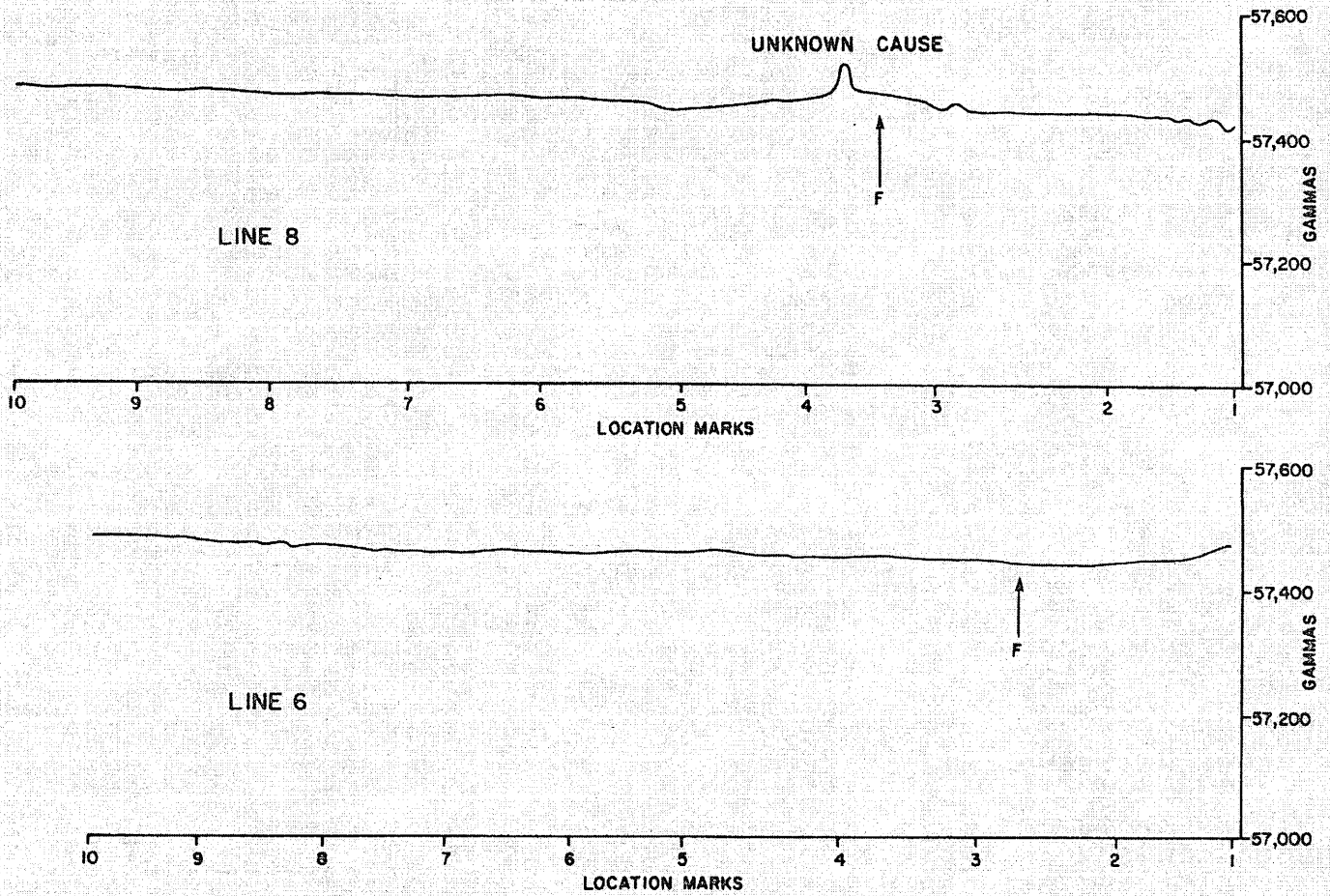


**PERRY NUCLEAR POWER PLANT**

Offshore for Shipborne  
Magnetic Profiles 10 and 12

Figure 2D-35

NOTE: MARK SEPARATION APPROXIMATELY 1000'



EXPLANATION

↑ PROJECTED FAULT LOCATION ON LAKE BOTTOM.

(Rev. 12 1/03)

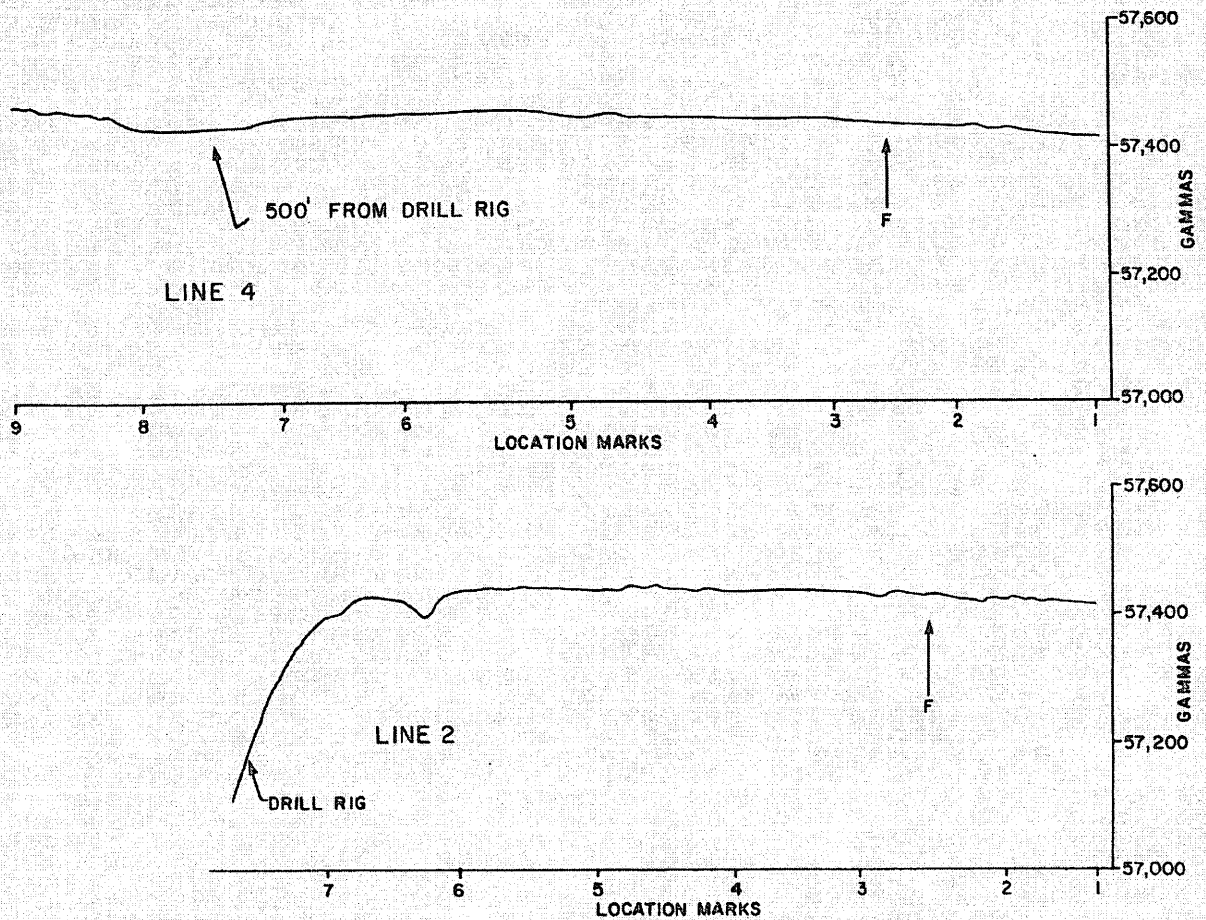


**PERRY NUCLEAR POWER PLANT**

Offshore for Shipborne  
Magnetic Profiles 6 and 8

Figure 2D-36

NOTE: MARK SEPARATION APPROXIMATELY 1000'



EXPLANATION

↑ PROJECTED FAULT LOCATION ON LAKE BOTTOM.

(Rev. 12 1/03)

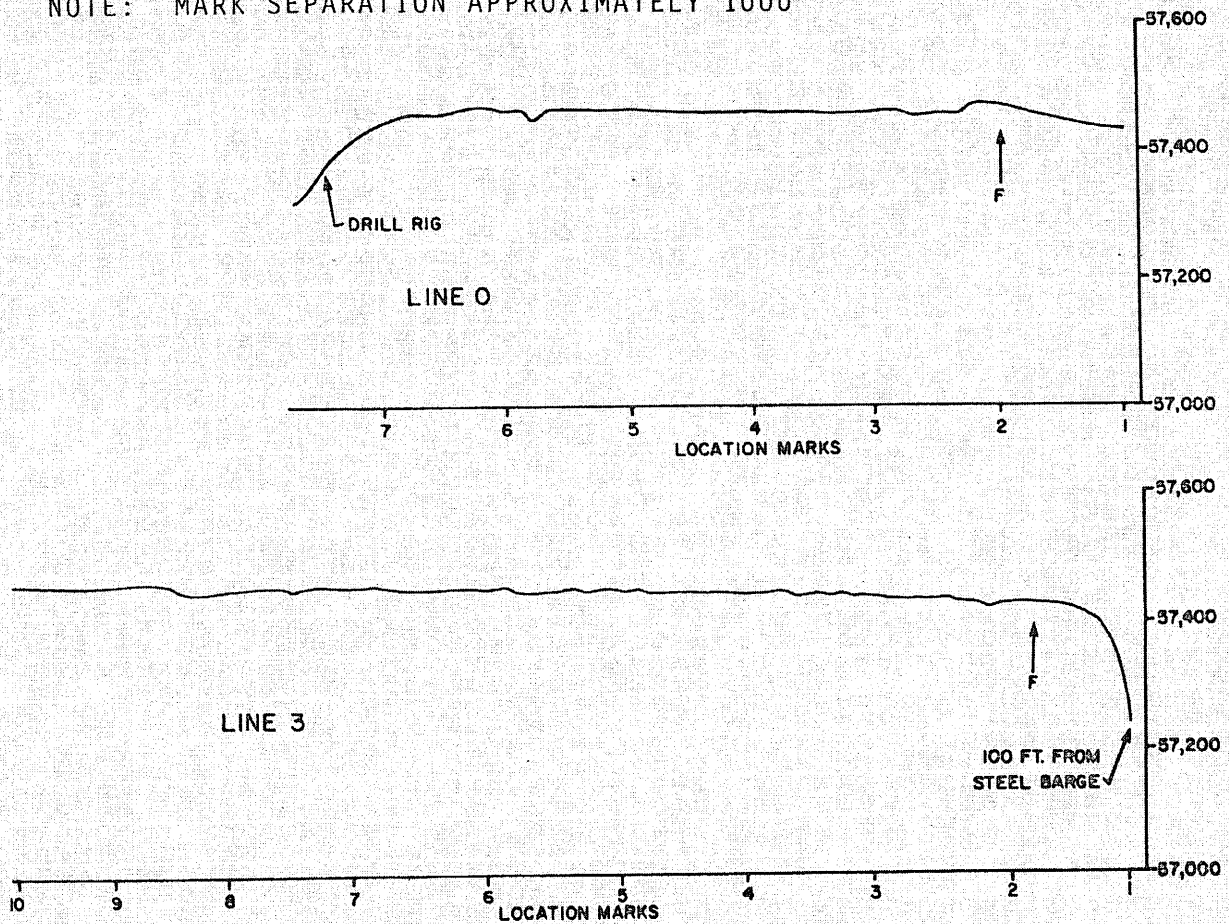


**PERRY NUCLEAR POWER PLANT**

Offshore for Shipborne  
Magnetic Profiles 2 and 4

Figure 2D-37

NOTE: MARK SEPARATION APPROXIMATELY 1000'



EXPLANATION

↑ PROJECTED FAULT LOCATION ON LAKE BOTTOM.

(Rev. 12 1/03)

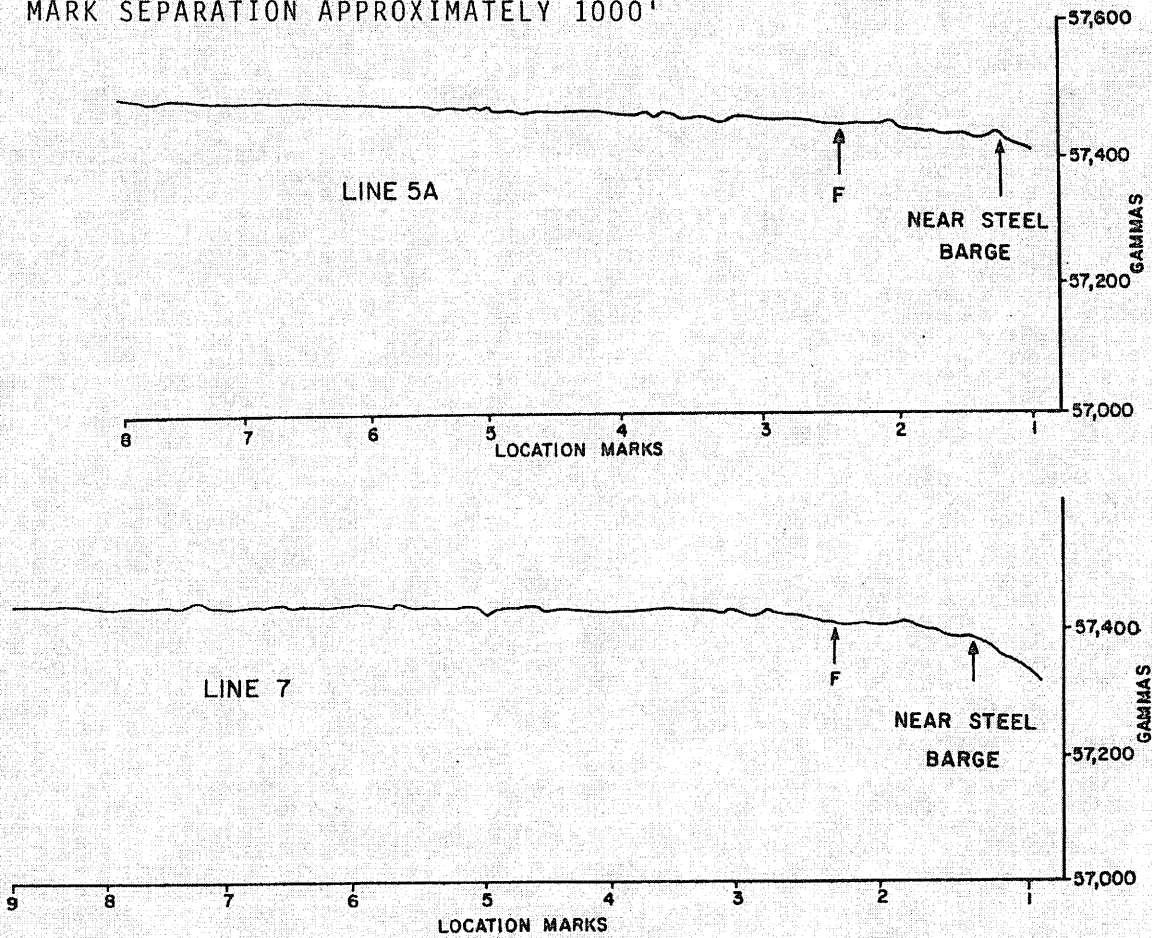


**PERRY NUCLEAR POWER PLANT**

Offshore for Shipborne  
Magnetic Profiles 0 and 3

Figure 2D-38

NOTE: MARK SEPARATION APPROXIMATELY 1000'



EXPLANATION

↑ PROJECTED FAULT LOCATION ON LAKE BOTTOM.

(Rev. 12 1/03)

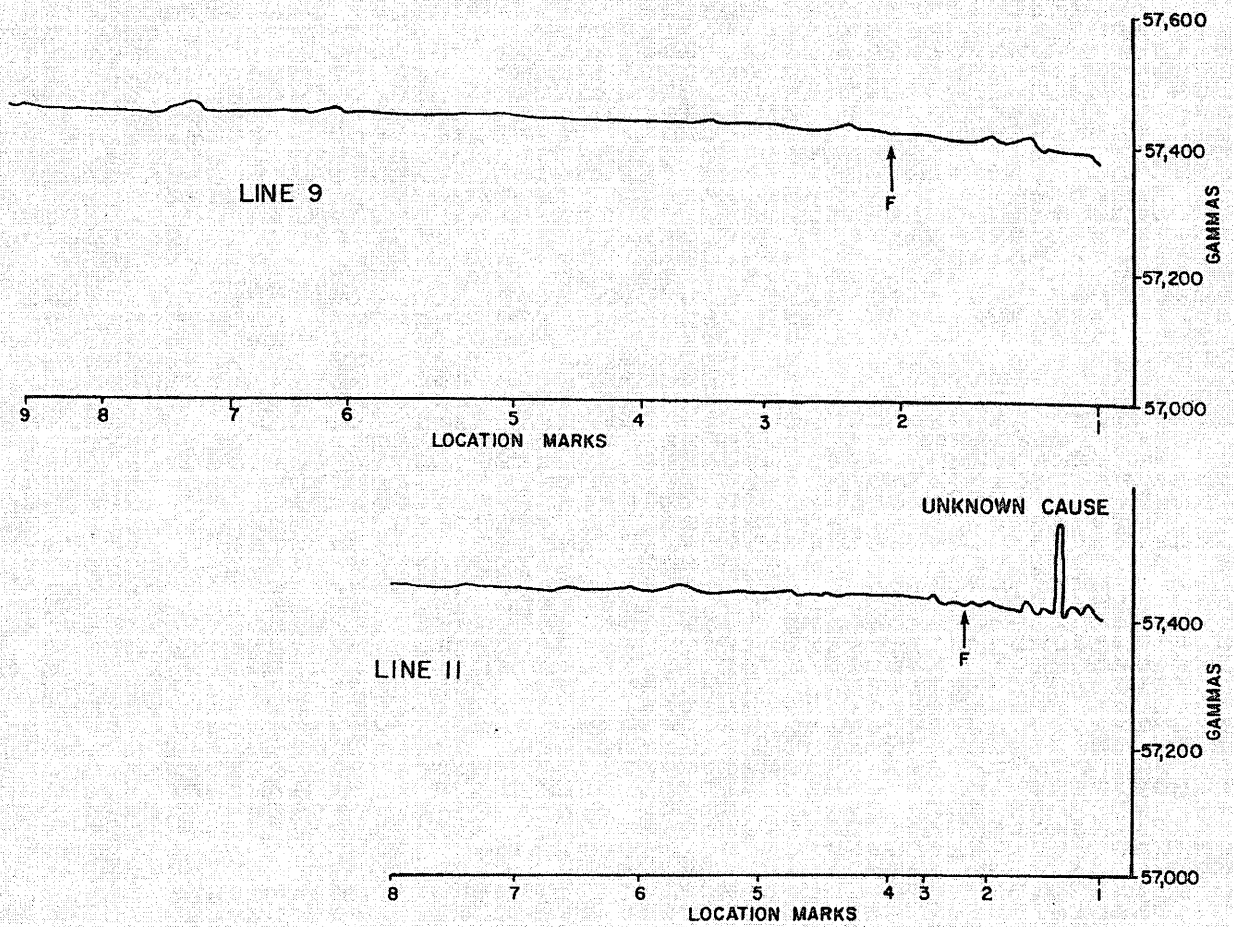


**PERRY NUCLEAR POWER PLANT**

Offshore for Shipborne  
Magnetic Profiles 5A and 7

Figure 2D-39

NOTE: MARK SEPARATION APPROXIMATELY 1000'



EXPLANATION

↑ PROJECTED FAULT LOCATION ON LAKE BOTTOM.

(Rev. 12 1/03)

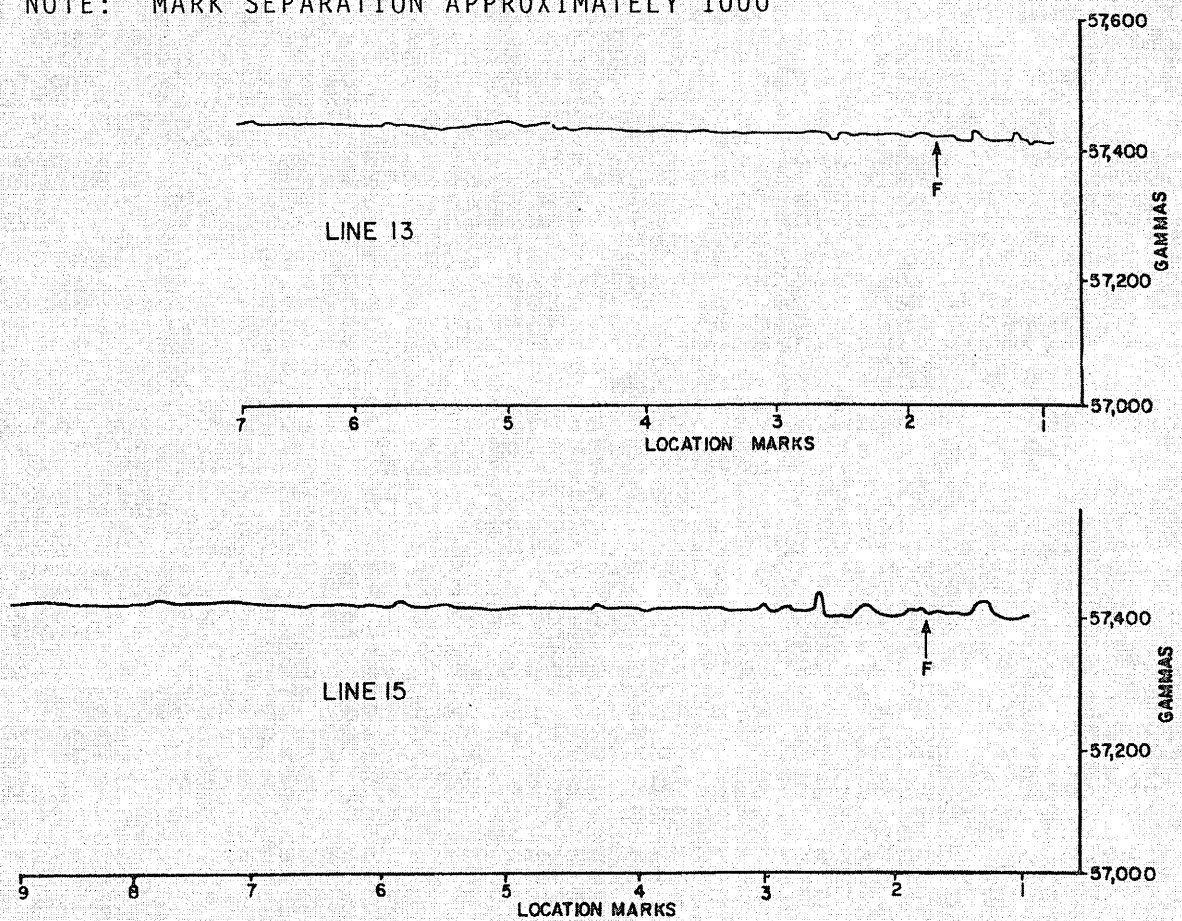


**PERRY NUCLEAR POWER PLANT**

Offshore for Shipborne  
Magnetic Profiles 9 and 11

Figure 2D-40

NOTE: MARK SEPARATION APPROXIMATELY 1000'



EXPLANATION

↑ PROJECTED FAULT LOCATION ON LAKE BOTTOM. (Rev. 12 1/03)

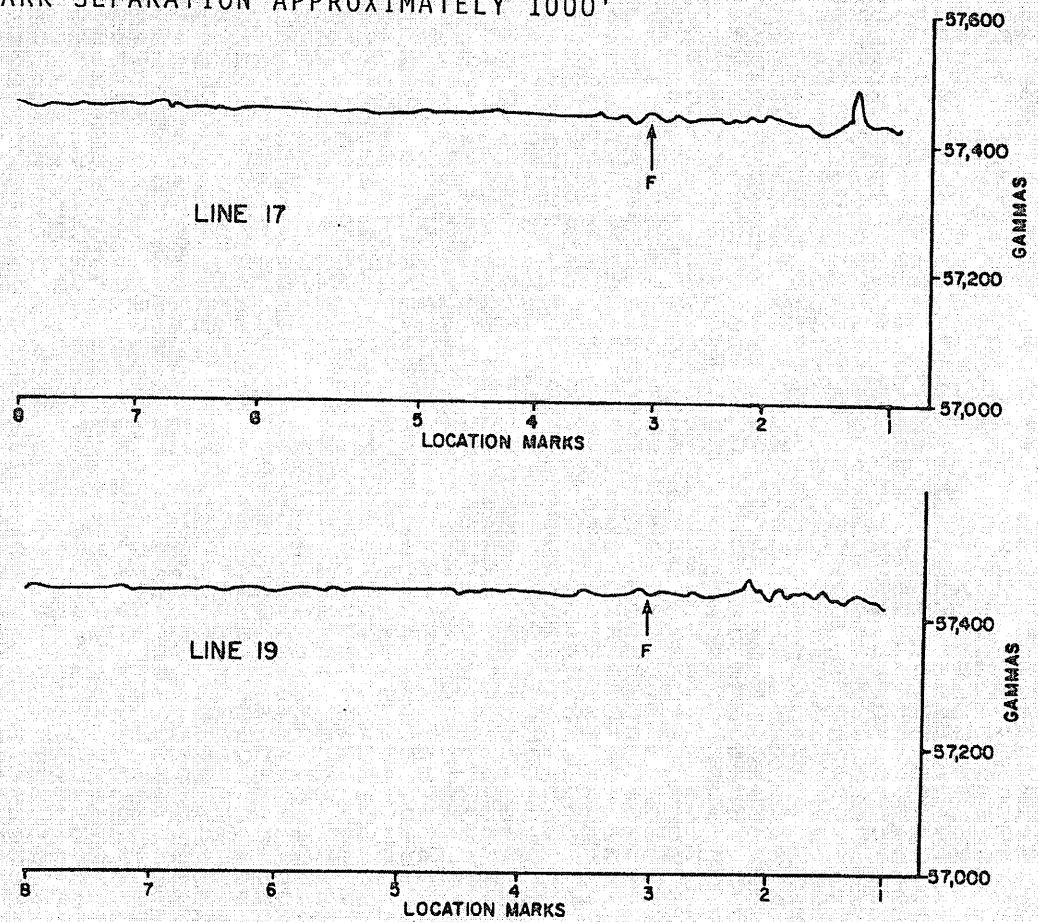


**PERRY NUCLEAR POWER PLANT**

Offshore for Shipborne  
Magnetic Profiles 13 and 15

Figure 2D-41

NOTE: MARK SEPARATION APPROXIMATELY 1000'



EXPLANATION

↑ PROJECTED FAULT LOCATION ON LAKE BOTTOM. (Rev. 12 1/03)

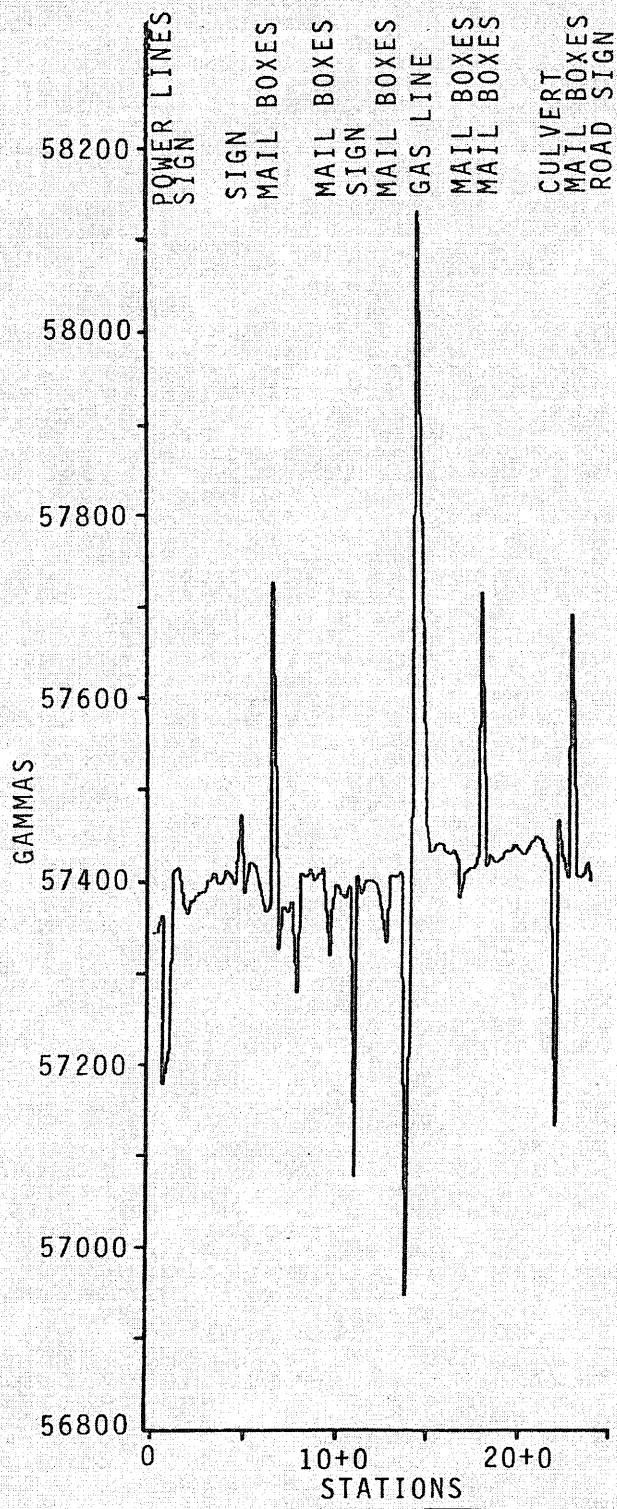


**PERRY NUCLEAR POWER PLANT**


Offshore for Shipborne  
Magnetic Profiles 17 and 19

Figure 2D-42





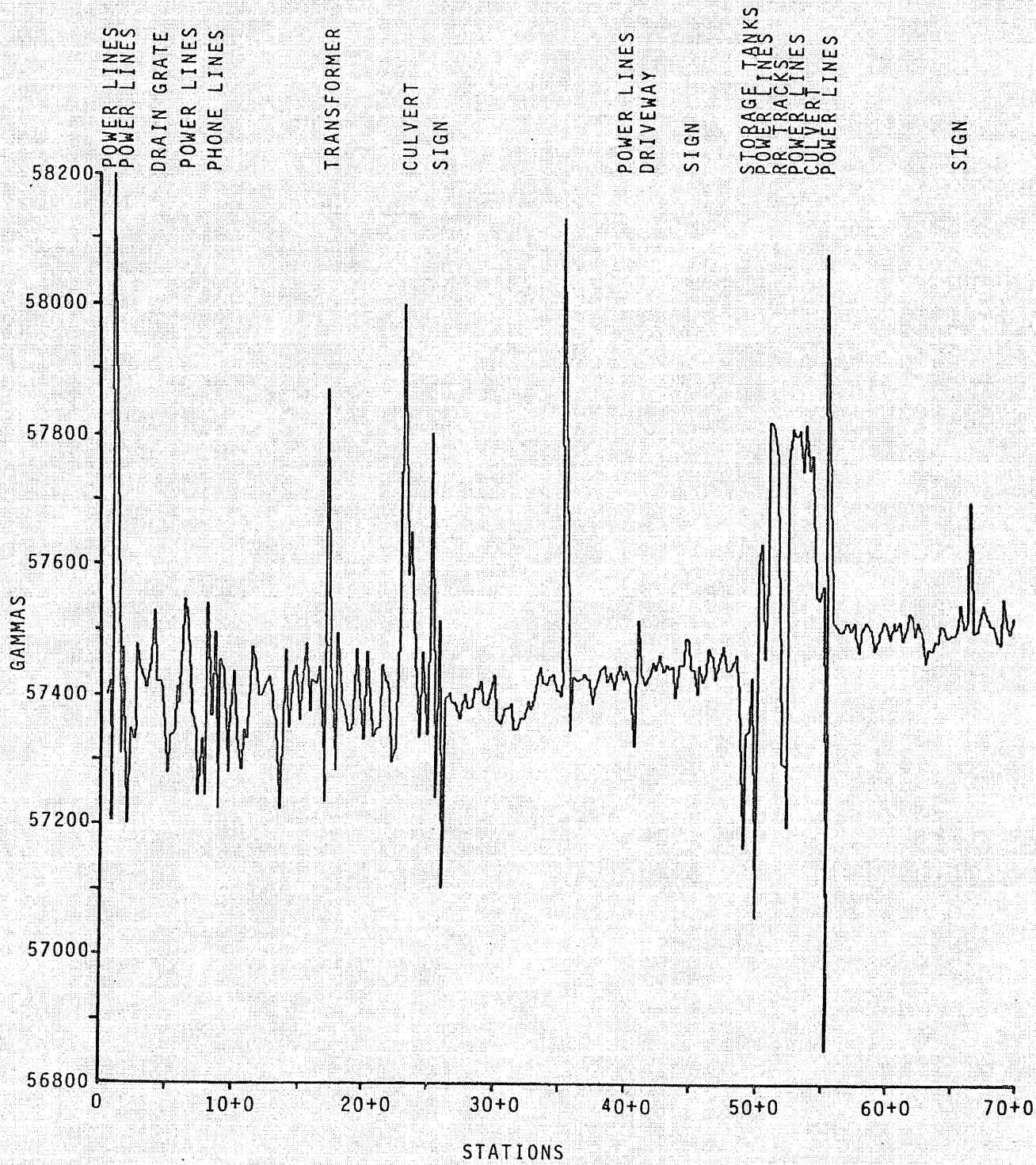
(Rev. 12 1/03)


**PERRY NUCLEAR POWER PLANT**

Onshore for Land  
Magnetic Profile 1S-A


Figure 2D-43

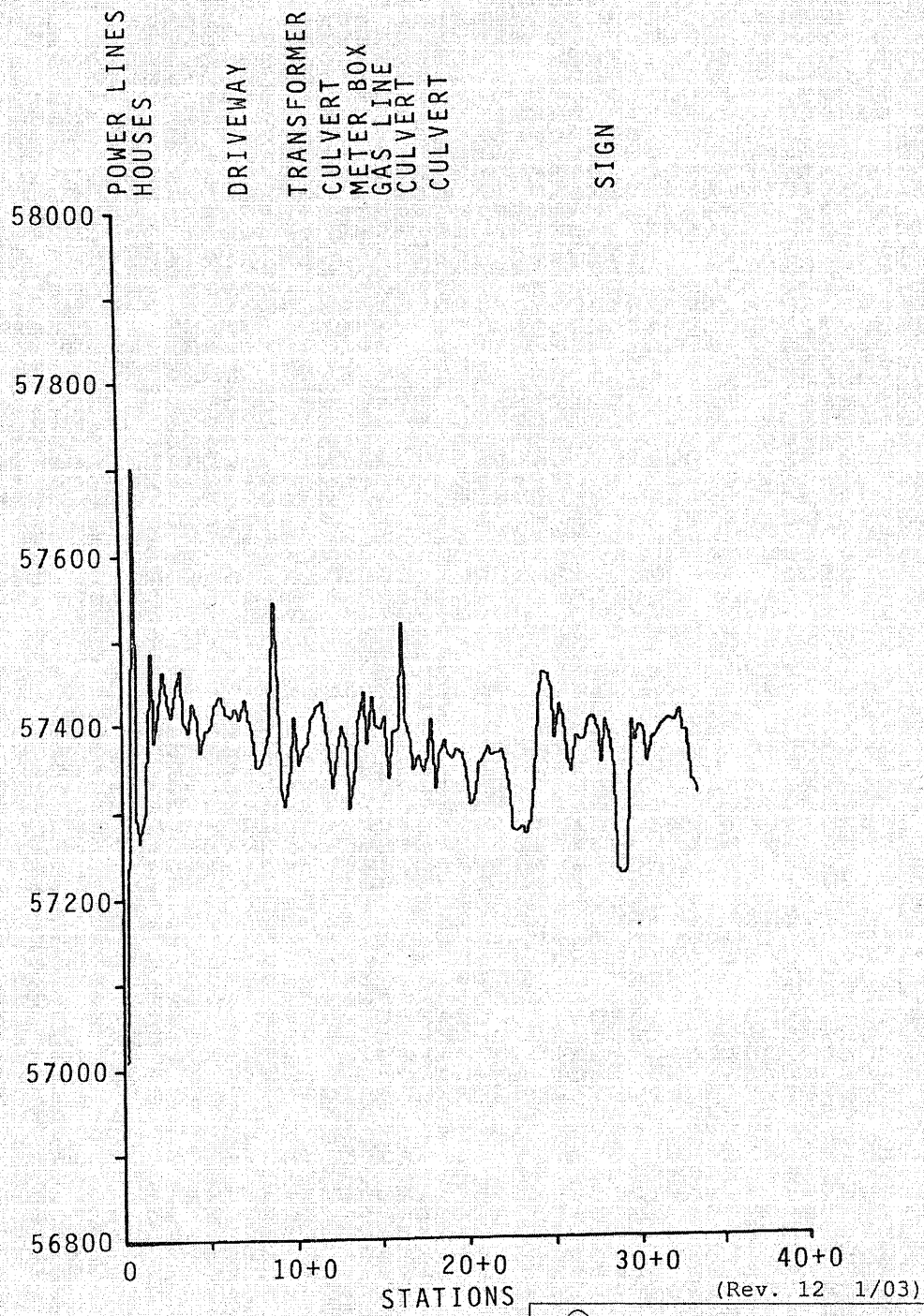
1"=1000'




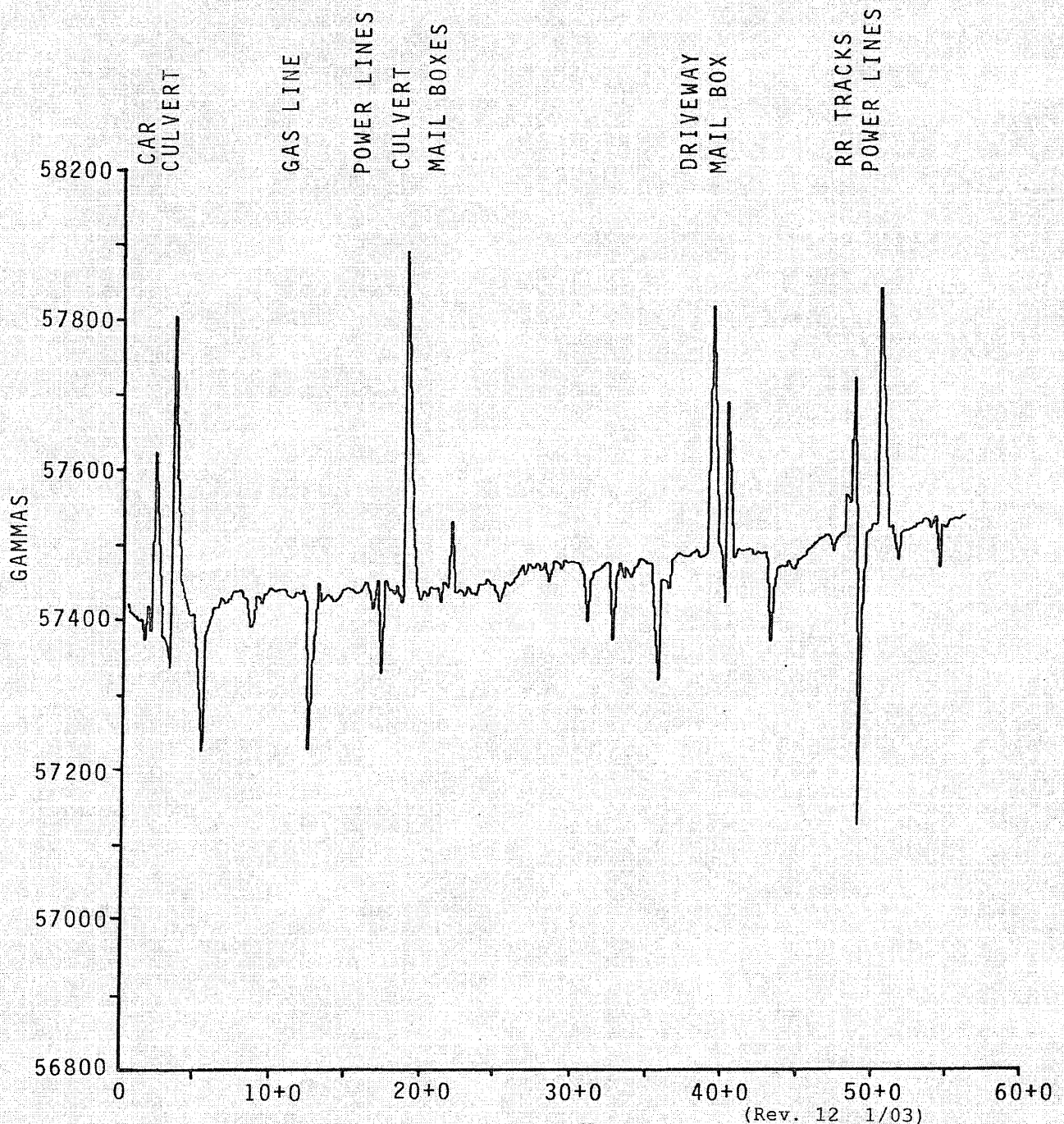
1"=1000'

(Rev. 12 1/03)

	<p><b>PERRY NUCLEAR POWER PLANT</b></p>
<p>Onshore for Land Magnetic Profile 1S</p>	
<p>Figure 2D-44</p>	

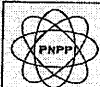


	<b>PERRY NUCLEAR POWER PLANT</b>
	Onshore for Land Magnetic Profile 1E
	Figure 2D-45



(Rev. 12 1/03)

STATIONS

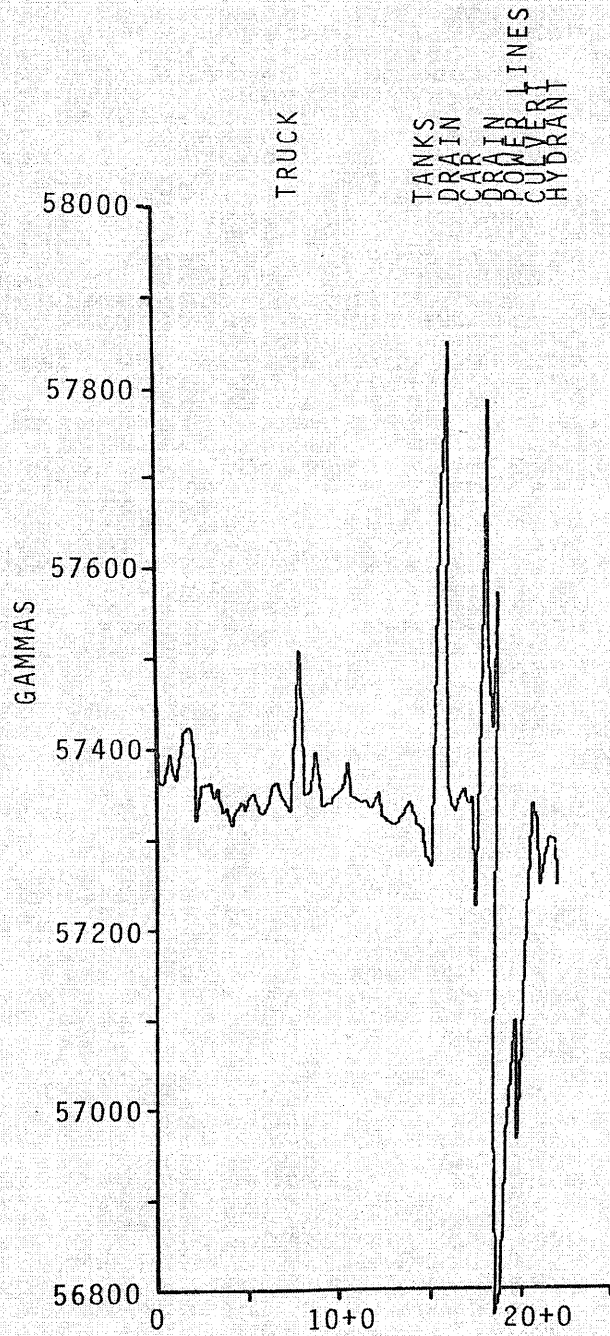


**PERRY NUCLEAR POWER PLANT**

1"=1000'

Onshore for Land  
Magnetic Profile 2S

Figure 2D-46



(Rev. 12 1/03)

STATIONS

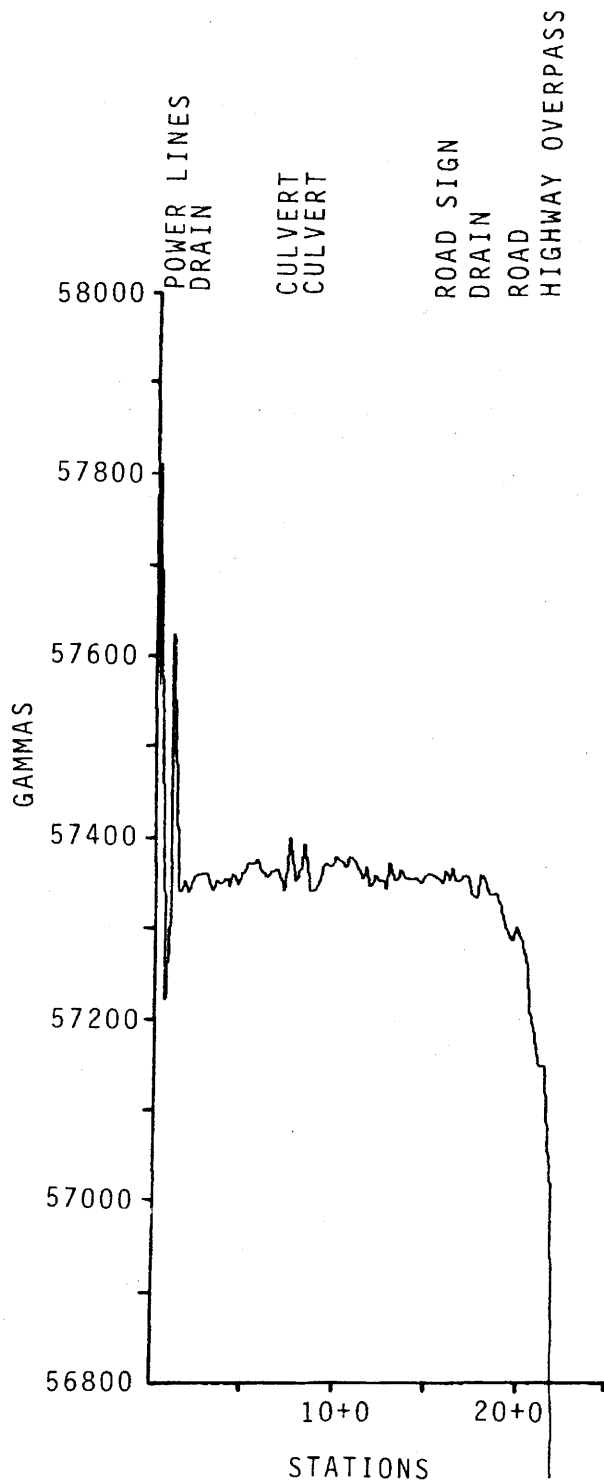


**PERRY NUCLEAR POWER PLANT**

1"=1000'

Onshore for Land  
Magnetic Profile 3S

Figure 2D-47



1" = 1000'

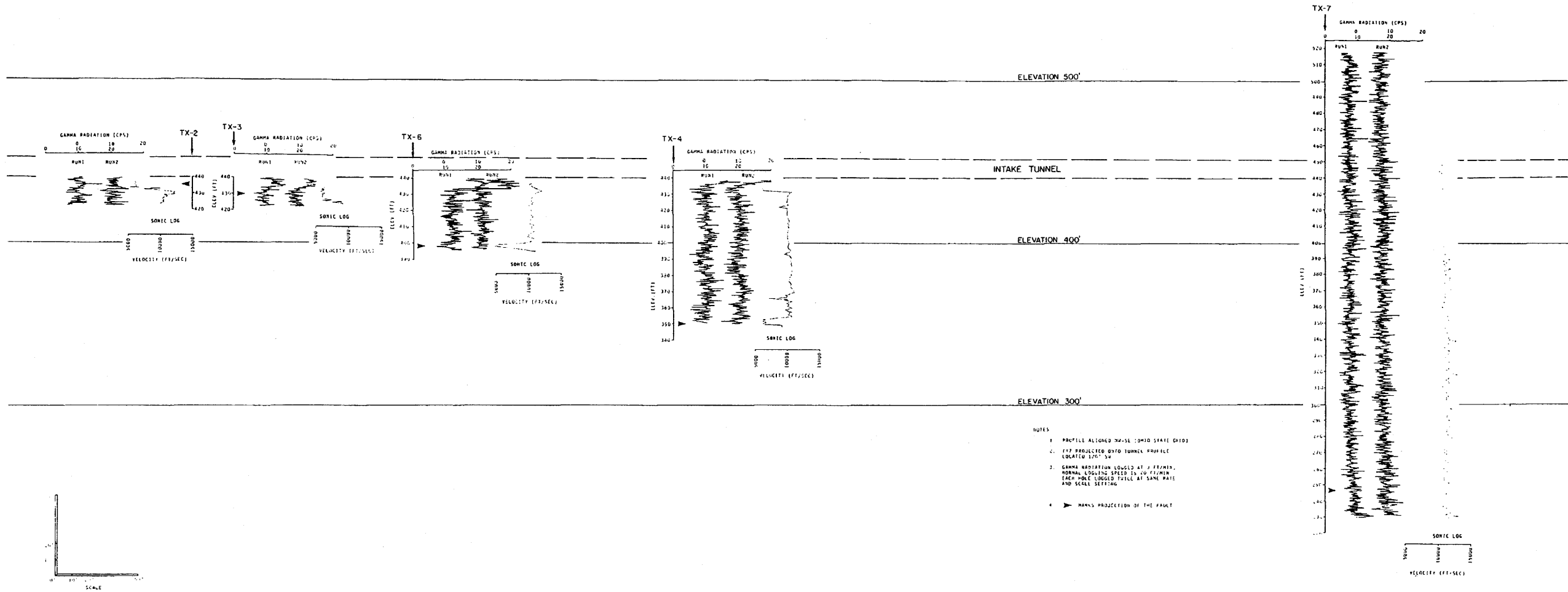
(Rev. 12 1/03)




**PERRY NUCLEAR POWER PLANT**

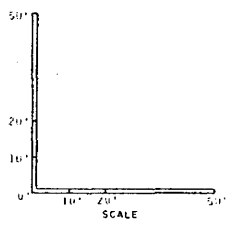
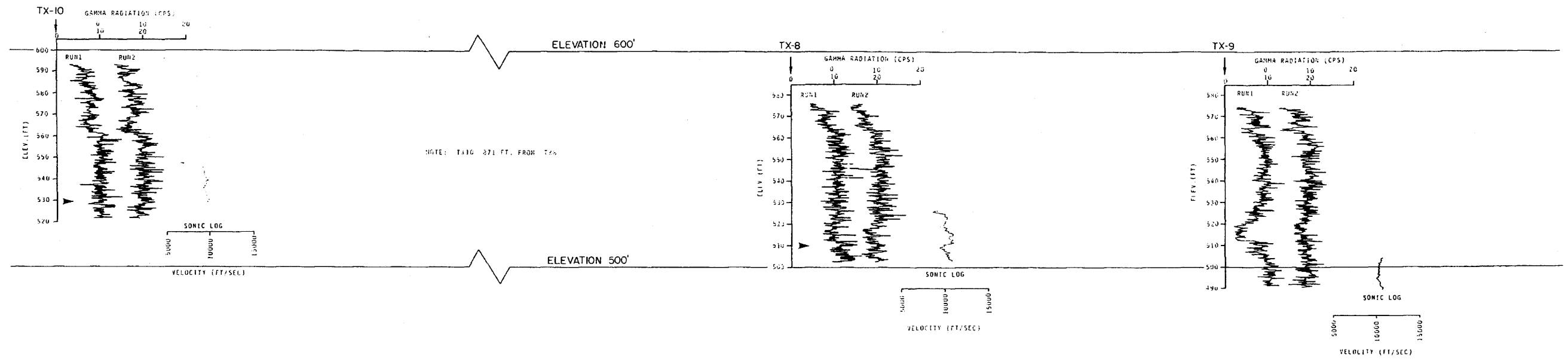
Onshore for Land  
Magnetic Profile 3S-A

Figure 2D-48



(Rev. 12 1/03)


**PERRY NUCLEAR POWER PLANT**  
 Borehole Logs - Gamma/Sonic,  
 TX Borings 2, 3, 4, 5, 6, 7  
 Figure 2D-49



- NOTES:
1. PROFILE ALIGNED APPROXIMATELY SW-NE (OHIO STATE GRID)
  2. GAMMA RADIATION LOGGED AT 3 FT/MIN; NORMAL LOGGING SPEED IS 20 FT/MIN; EACH HOLE LOGGED TWICE AT SAME RATE AND SCALE SETTING
  3. ▲ MARKS PROJECTION OF THE FAULT

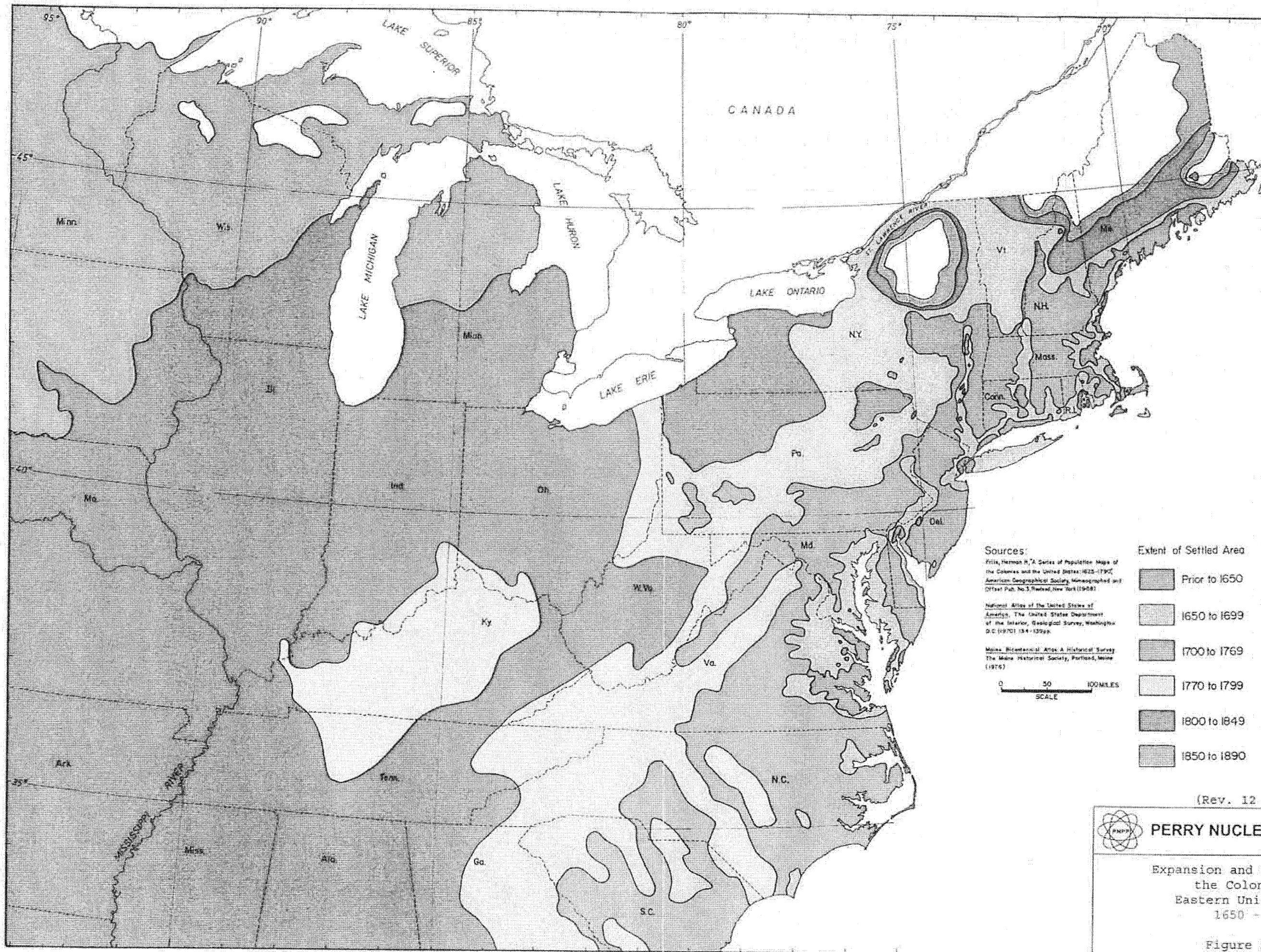
(Rev. 12 1/03)

**PERRY NUCLEAR POWER PLANT**

Borehole Logs - Gamma/Sonic,  
TX Borings 8, 9, 10

Figure 2D-50




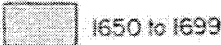






Sources:  
 Fiske, Herman R., "A Series of Population Maps of the Colonies and the United States: 1625-1790," American Geographical Society, Monograph and Official Publ. No. 3, Revised, New York (1908)

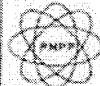
National Atlas of the United States of America, The United States Department of the Interior, Geological Survey, Washington, D.C. (1970) 134-139pp.

Maine Bicentennial Atlas: A Historical Survey, The Maine Historical Society, Portland, Maine (1976)

0 50 100 MILES  
 SCALE

- Extent of Settled Area
-  Prior to 1650
  -  1650 to 1699
  -  1700 to 1769
  -  1770 to 1799
  -  1800 to 1849
  -  1850 to 1890

(Rev. 12 1/03)



**PERRY NUCLEAR POWER PLANT**

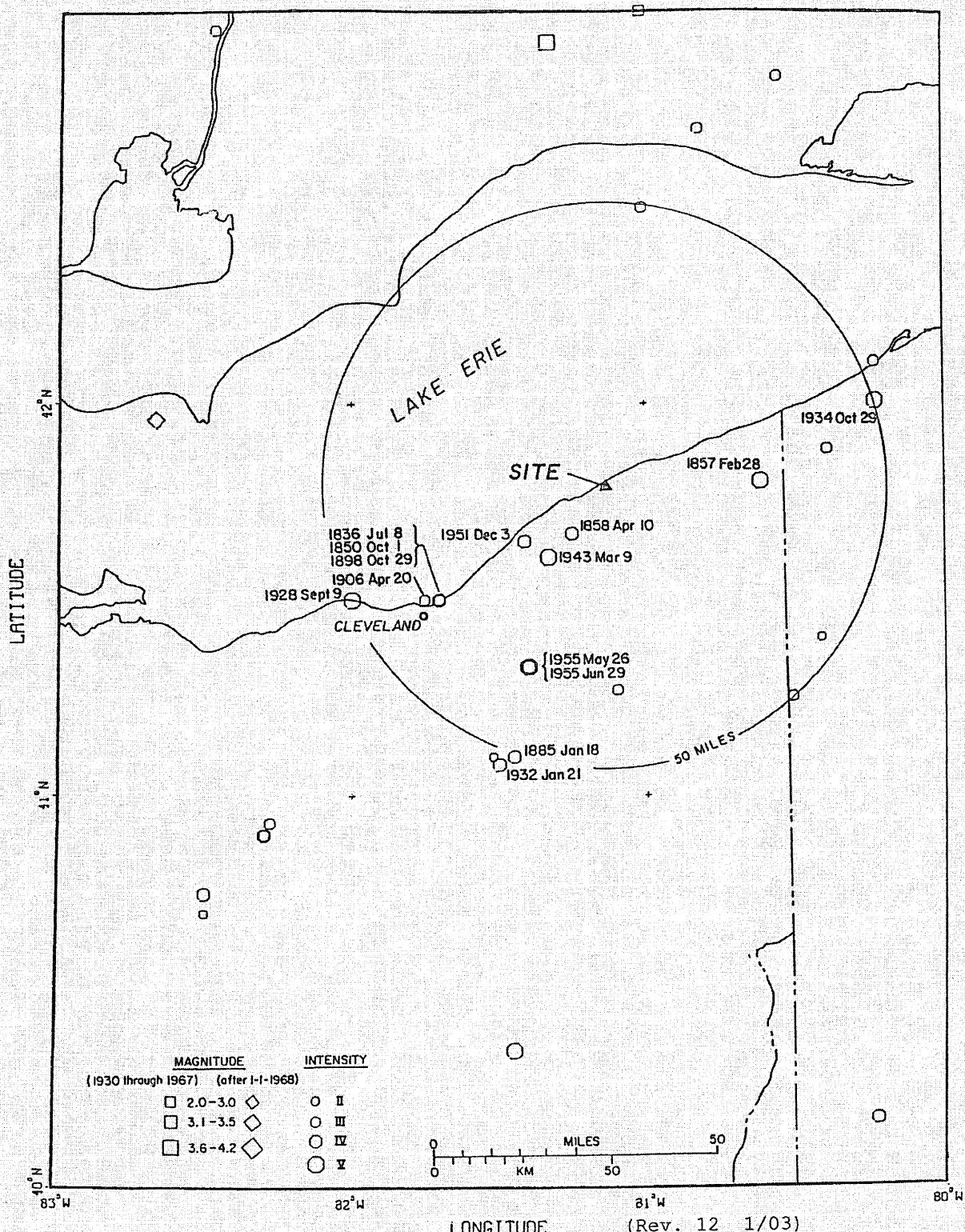
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Expansion and Settlement in  
 the Colonies and  
 Eastern United States  
 1650 - 1890

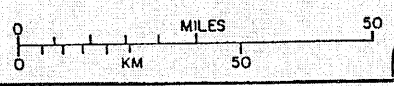
Figure 2D D-1







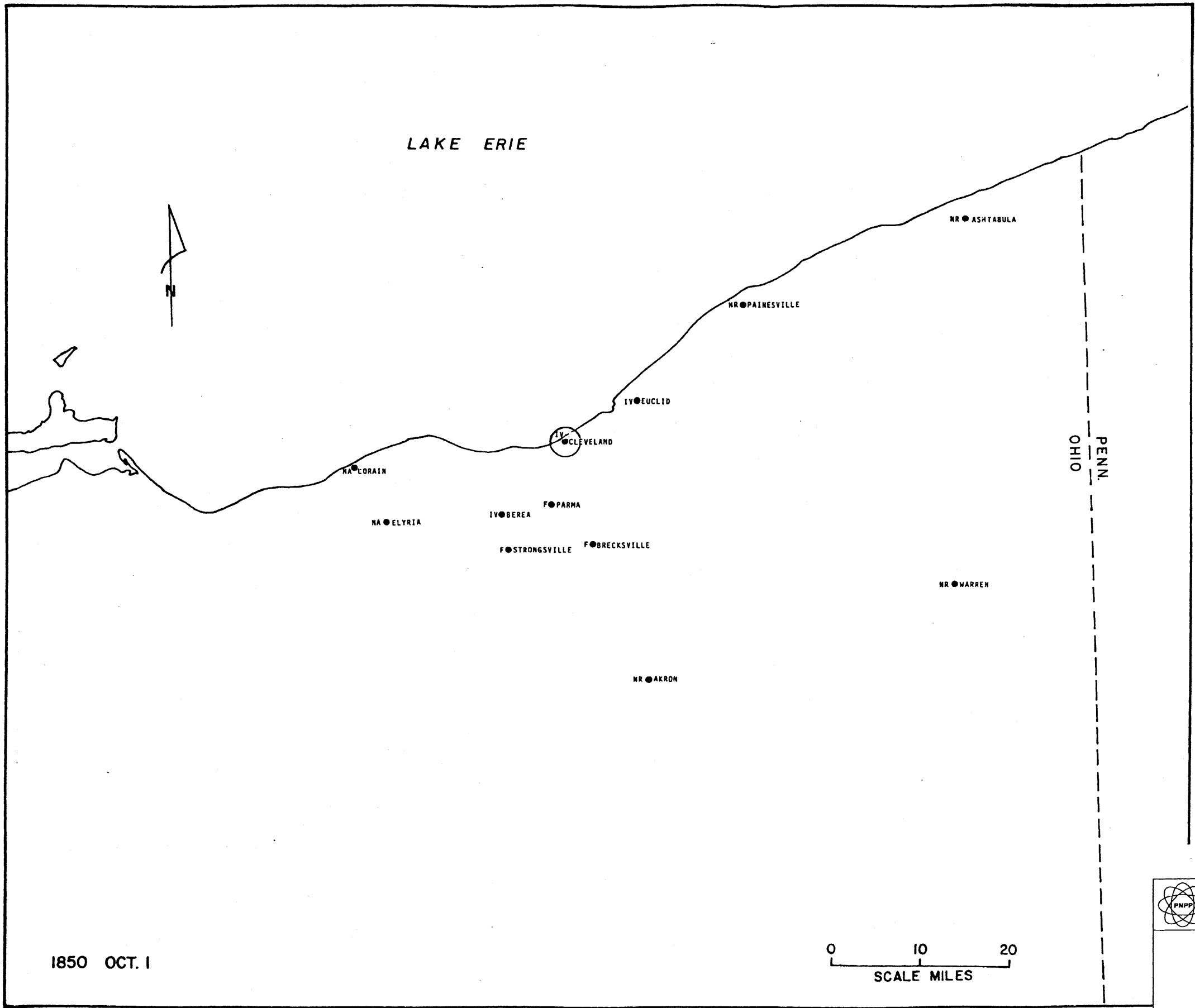
MAGNITUDE		INTENSITY
(1930 through 1967)	(after 1-1-1968)	
□ 2.0-3.0	◇ 3.1-3.5	○ II
□ 3.1-3.5	◇ 3.6-4.2	○ III
□ 3.6-4.2		○ IV
		○ V



LONGITUDE. (Rev. 12 1/03)

### PERRY NUCLEAR POWER PLANT

Seismicity Map  
Figure 2D D-4



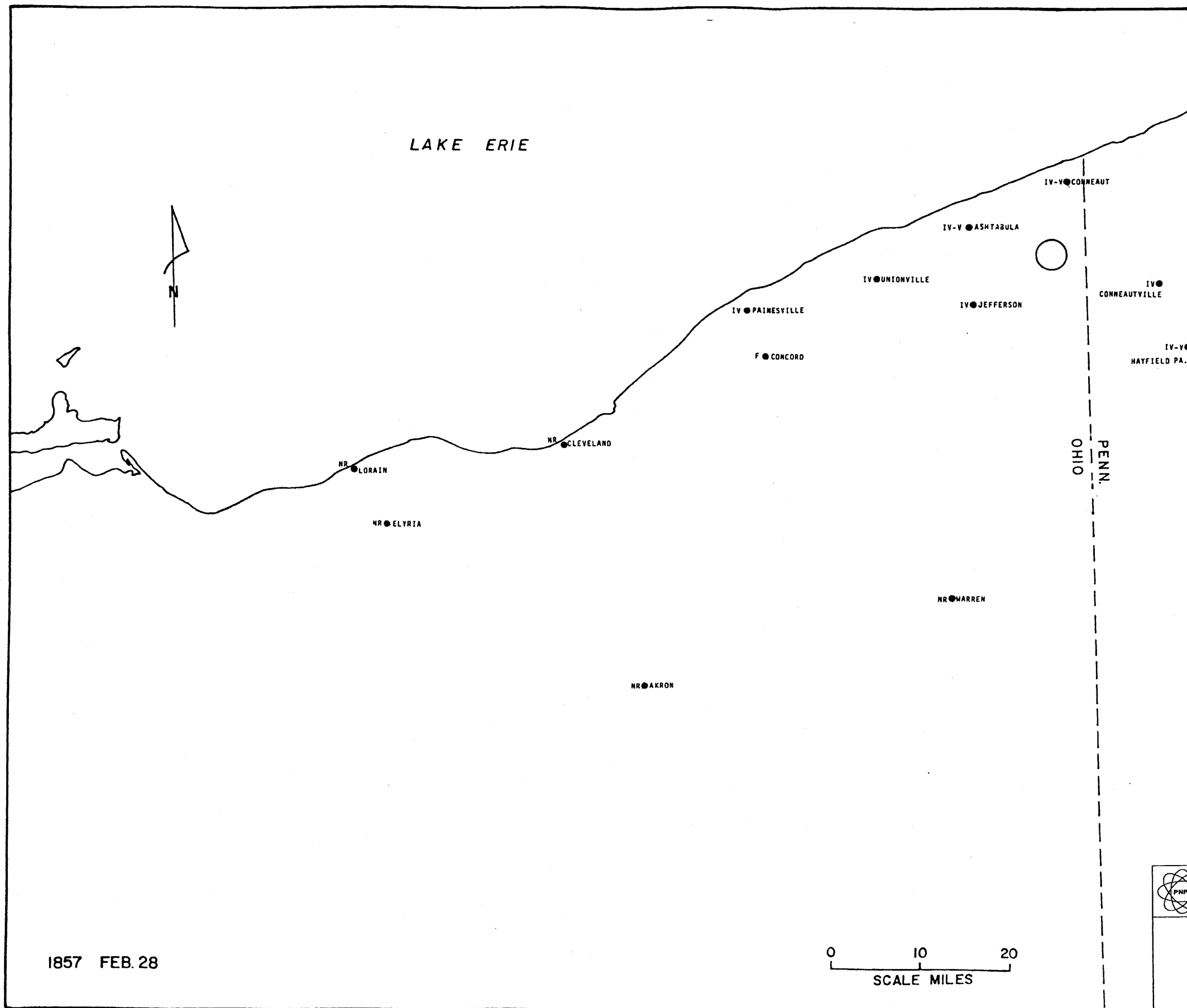
(Rev. 12 1/03)



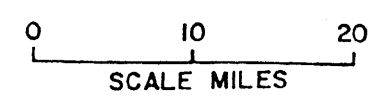
**PERRY NUCLEAR POWER PLANT**

Felt Report Map:  
1850 Oct. 1


Figure 2D D-5

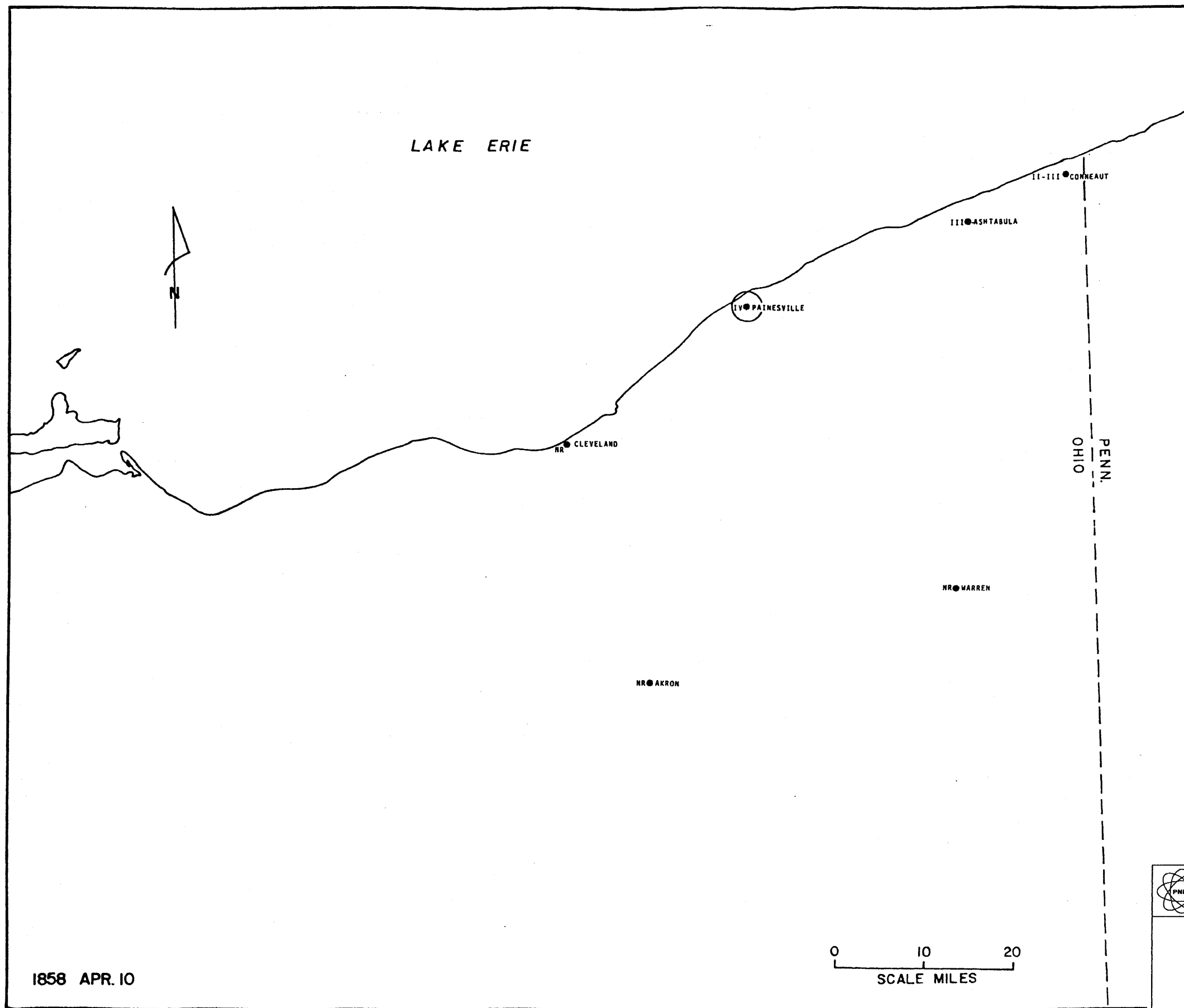


1857 FEB. 28



(Rev. 12 1/03)

	<b>PERRY NUCLEAR POWER PLANT</b>
	Felt Report Map: 1857 Feb. 28
	Figure 2D D-6



1858 APR. 10

0 10 20  
SCALE MILES

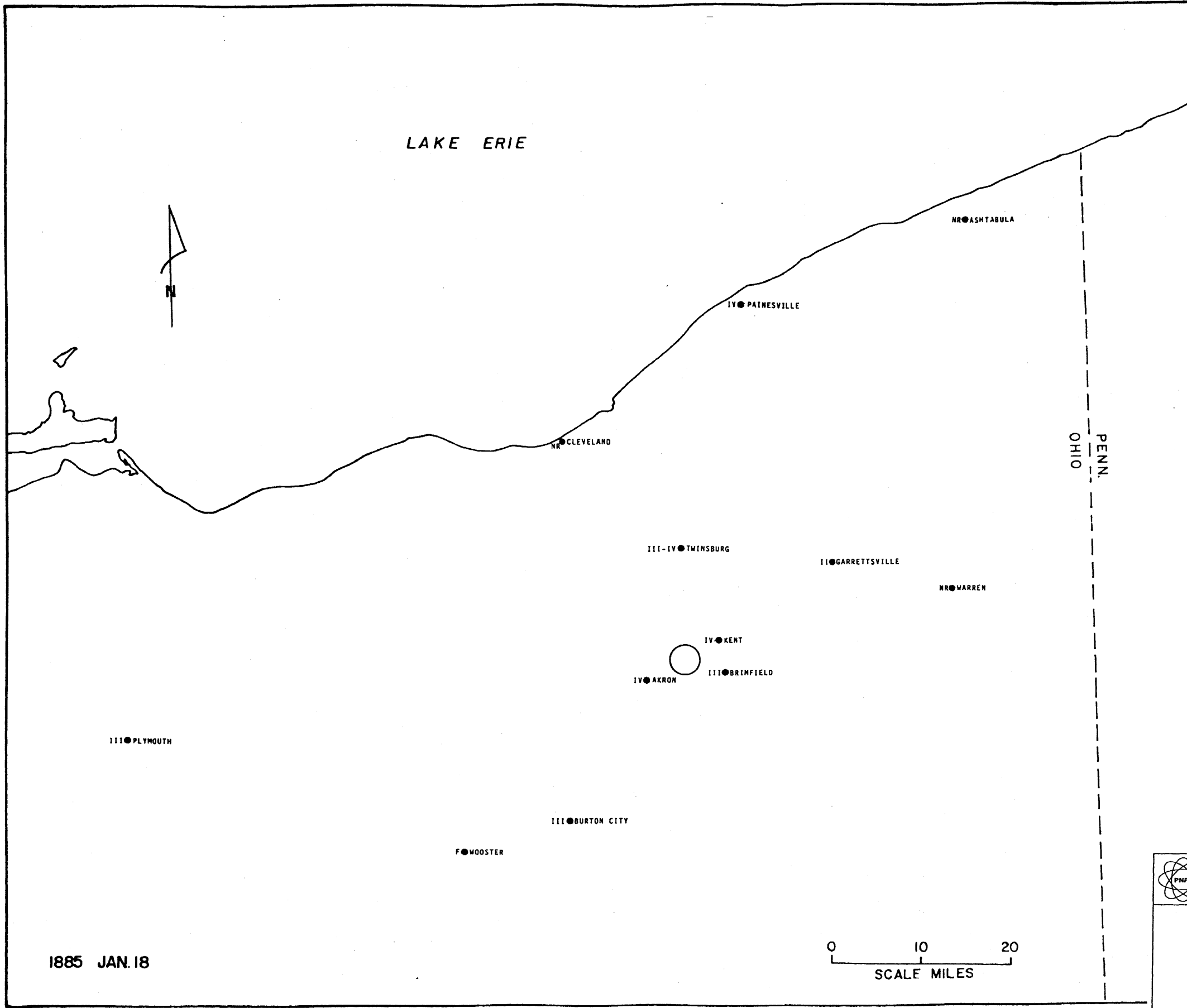
(Rev. 12 1/03)



**PERRY NUCLEAR POWER PLANT**

Felt Report Map:  
1858 Apr. 10

Figure 2D D-7



(Rev. 12 1/03)

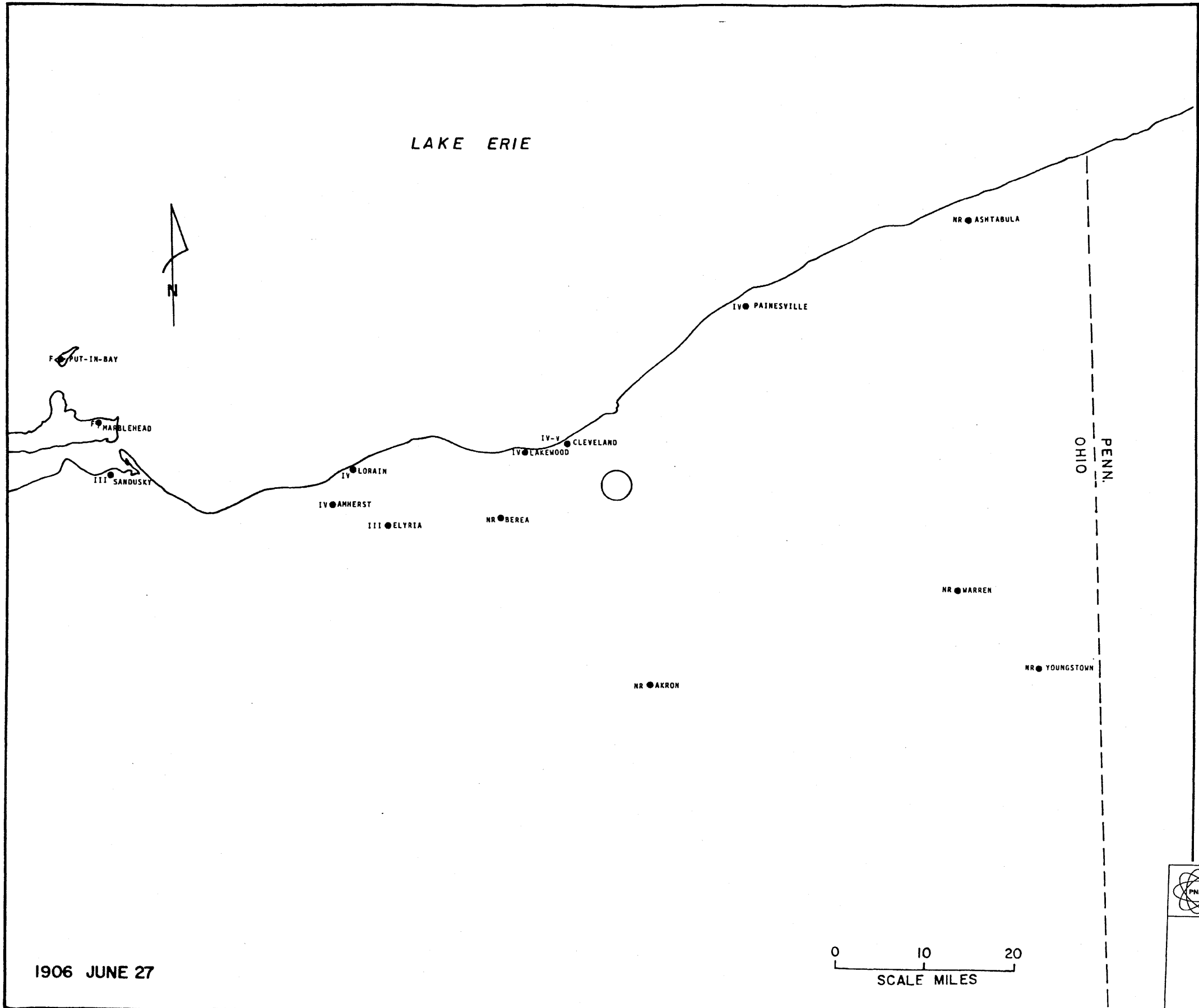


**PERRY NUCLEAR POWER PLANT**

Felt Report Map:  
1885 Jan. 18

Figure 2D D-8




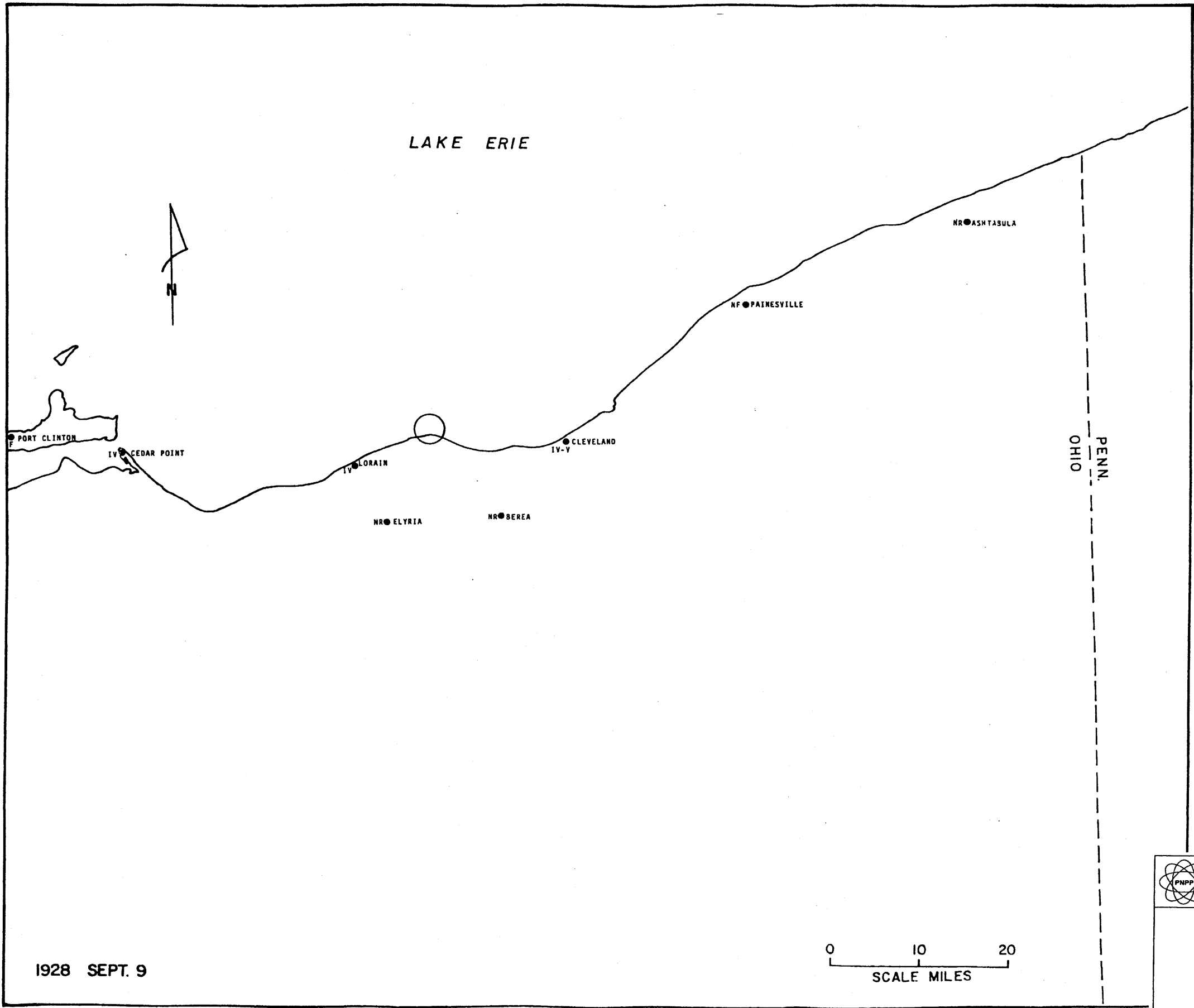


1906 JUNE 27

0 10 20  
SCALE MILES

(Rev. 12 1/03)

	<b>PERRY NUCLEAR POWER PLANT</b>
Felt Report Map: 1906 June 27	
Figure 2D D-9	



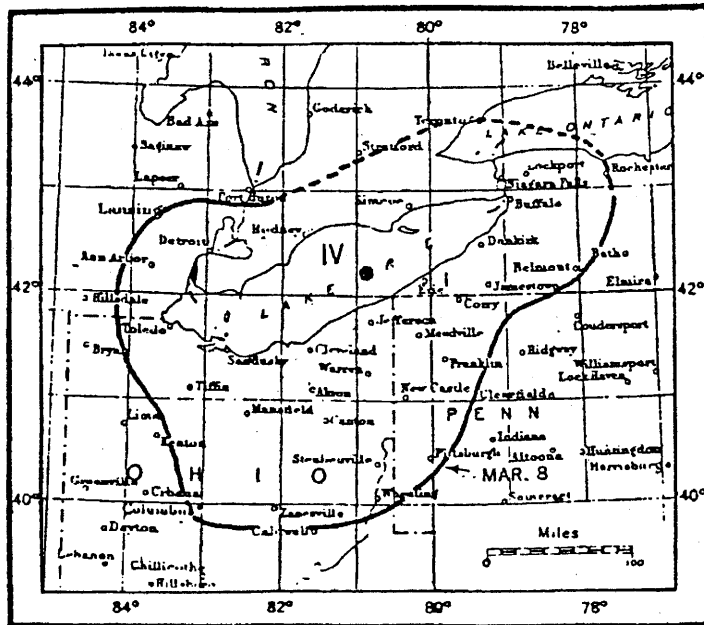
1928 SEPT. 9

(Rev. 12 1/03)

 **PERRY NUCLEAR POWER PLANT**

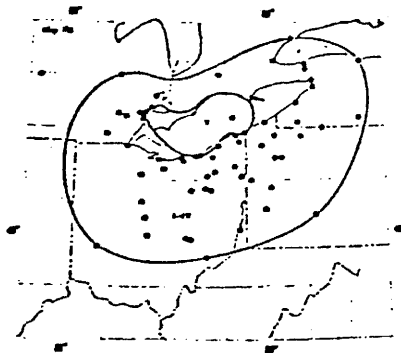
Felt Report Map:  
1928 Sept. 09

Figure 2D D-10



Area affected by the Lake Erie earthquake of March 8, 1943.


Bodle, R. R., 1945, United States Earthquakes, 1943, United States Department of Commerce, Coast and Geodetic Survey, Washington, D.C., p. 7.



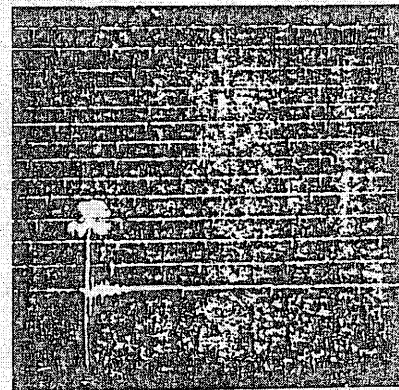
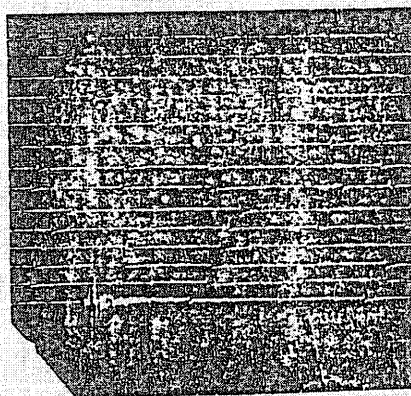
The Lake Erie Earthquake of March 8, 1943. A modification of Bodle (1947, fig. 4): 85,000 sq. mi.

(Rev. 12 1/03)

Docekal, J., 1971, Earthquakes of the Stable Interior with Emphasis on the Midcontinent, Ph.D. thesis, University of Nebraska

	<b>PERRY NUCLEAR POWER PLANT</b>
<p>Felt Report Map: 1943 Mar. 09</p> <p>Figure 2D D-11</p>	

EVENT: MARCH 9, 1943  
STATION: JOHN CARROLL UNIV., CLEVELAND  
HORIZONTAL COMPONENTS  
ESTIMATED DISTANCE: ≈ 20 MILES



(Rev. 12 1/03)



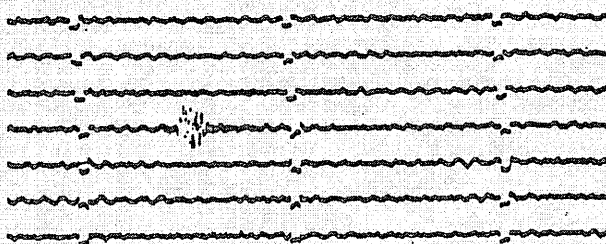
**PERRY NUCLEAR POWER PLANT**

John Carroll University  
Seismogram: 1943 Mar. 09

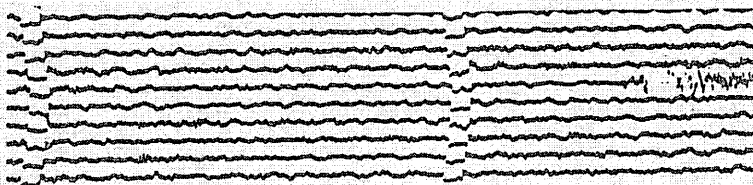
Figure 2D D-12

EVENT: DECEMBER 3, 1951  
STATION: JOHN CARROLL UNIV., CLEVELAND  
ESTIMATED DISTANCE: \* 20 MILES

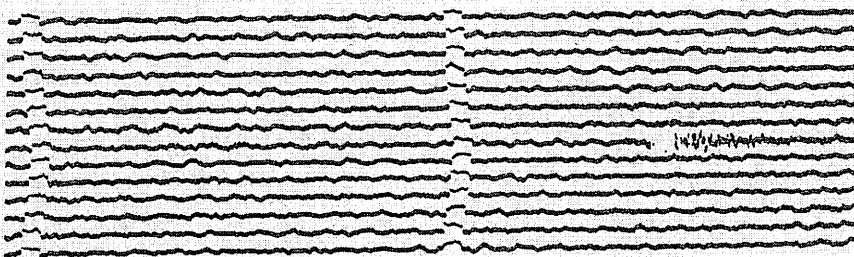
VERTICAL



NORTH-SOUTH



EAST-WEST



(Rev. 12 1/03)



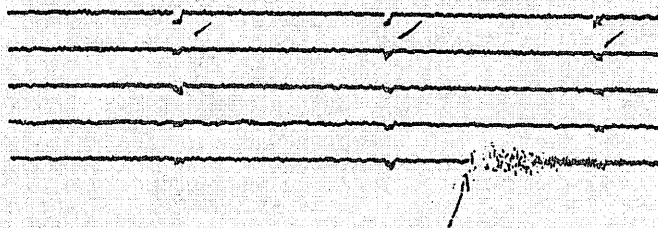
**PERRY NUCLEAR POWER PLANT**

John Carroll University  
Seismograms: 1951 Dec. 03

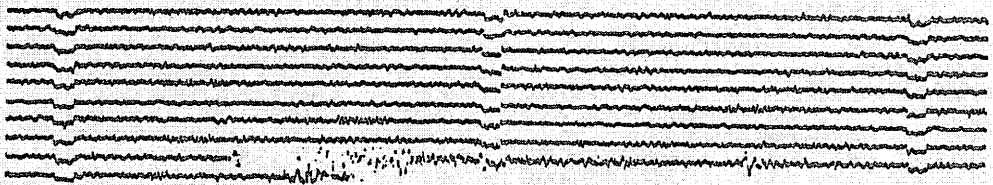
Figure 2D D-13

EVENT: MAY 26, 1955  
STATION: JOHN CARROLL UNIV., CLEVELAND  
ESTIMATED DISTANCE: ≈ 13 MILES (DR. E. WALTER)

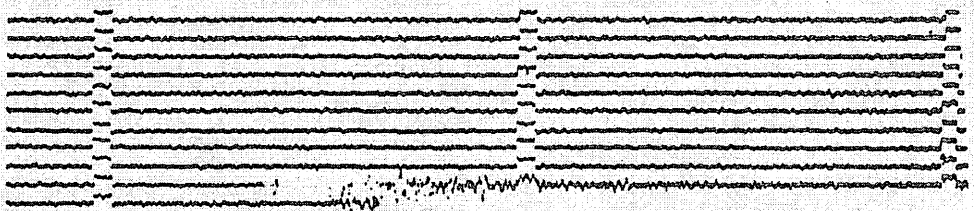
VERTICAL



NORTH-SOUTH



EAST-WEST



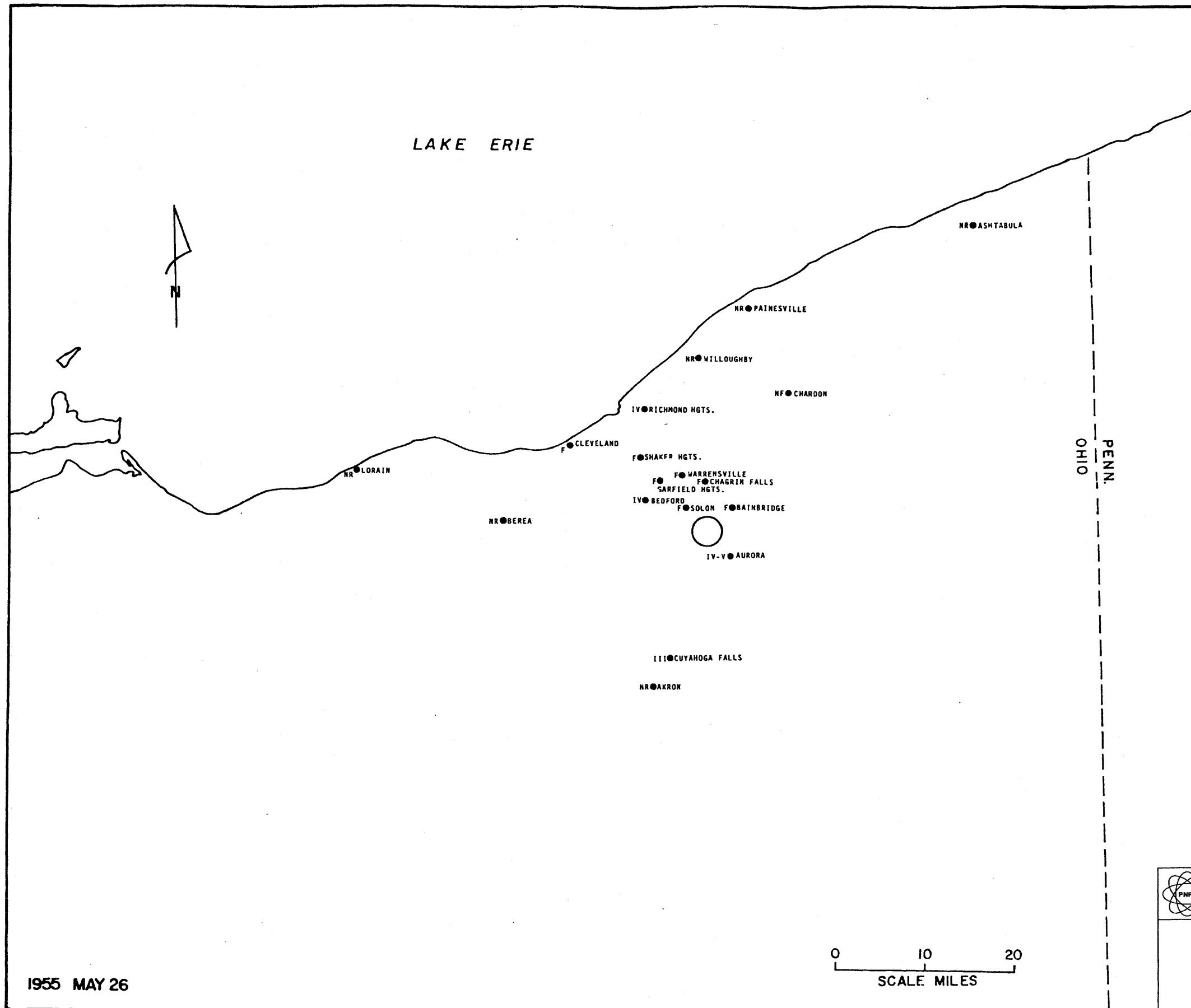
(Rev. 12 1/03)



PERRY NUCLEAR POWER PLANT

John Carroll University  
Seismograms: 1955 May 26

Figure 2D D-14



1955 MAY 26

0 10 20  
SCALE MILES

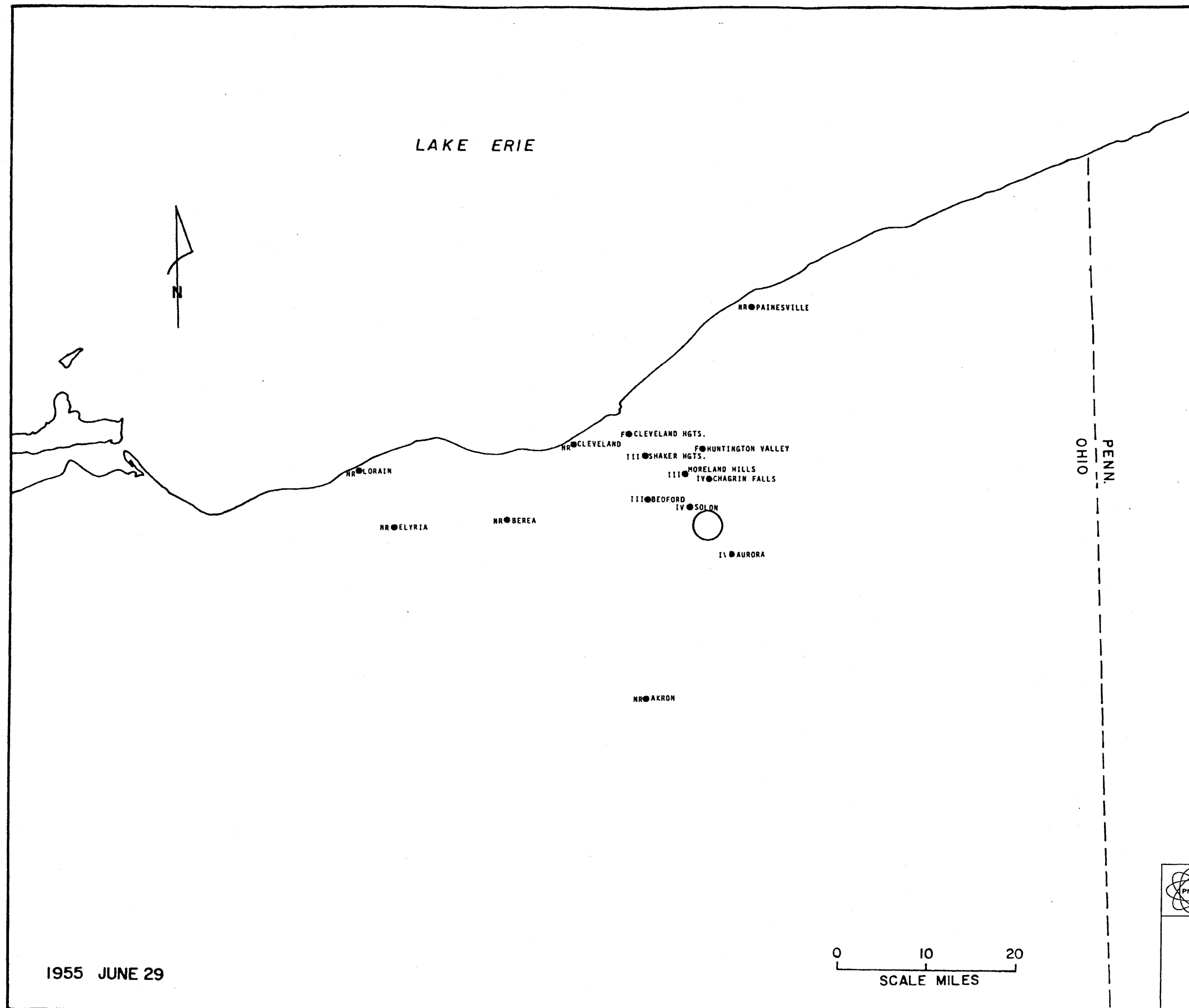
(Rev. 12 1/03)



**PERRY NUCLEAR POWER PLANT**

Felt Report Map:  
1955 May 26

Figure 2D D-15



(Rev. 12 1/03)



**PERRY NUCLEAR POWER PLANT**

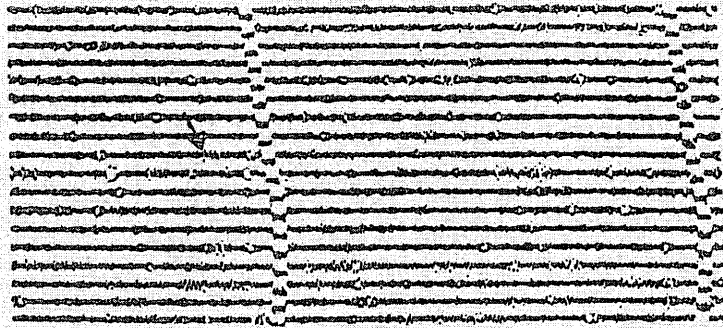
Felt Report Map:  
1955 June 29

Figure 2D D-16

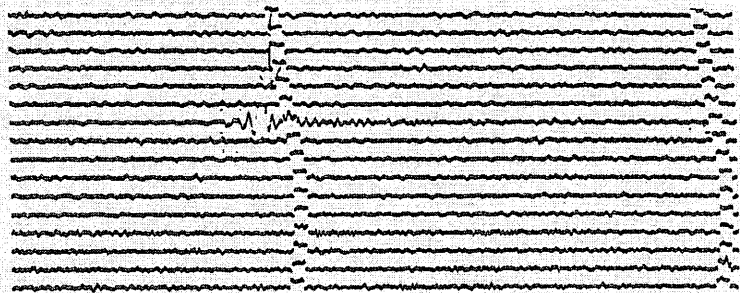


EVENT: MAY 1, 1958  
STATION: JOHN CARROLL UNIV., CLEVELAND  
ESTIMATED DISTANCE: 12 MILES (DR. E. WALTER)

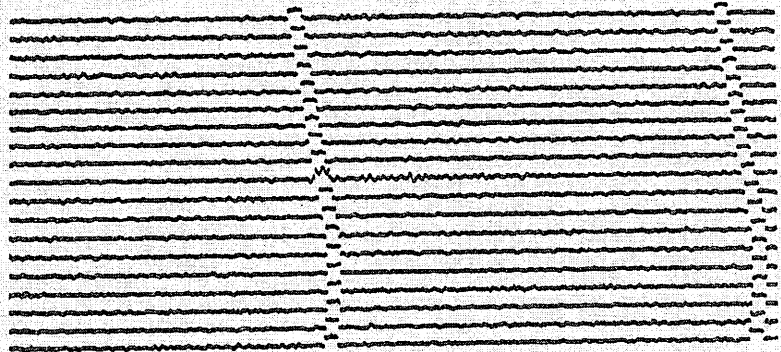
VERTICAL



NORTH-SOUTH



EAST-WEST



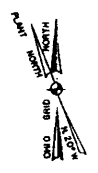
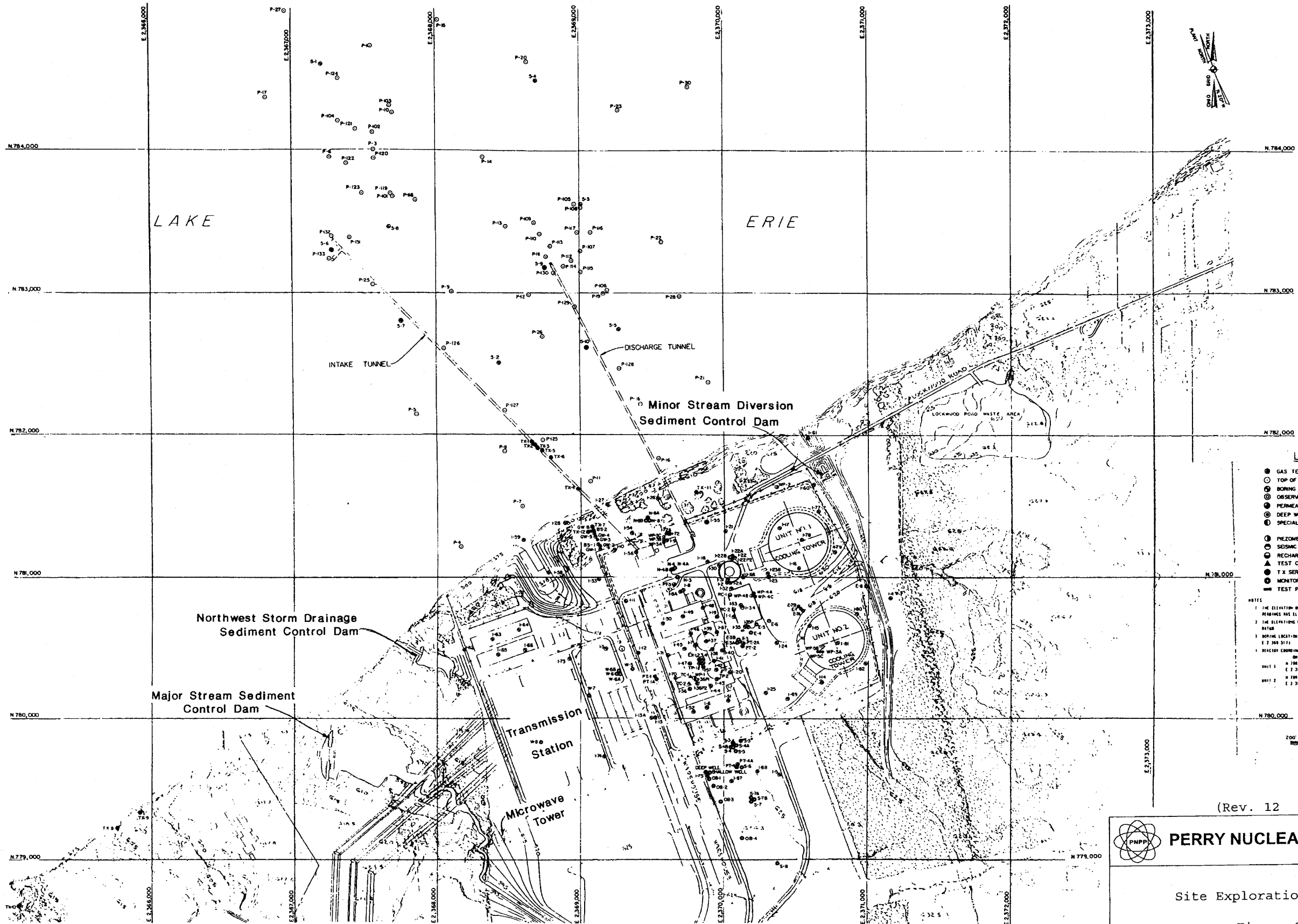
(Rev. 12 1/03)



PERRY NUCLEAR POWER PLANT

John Carroll University  
Seismograms: 1958 May 1

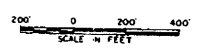
Figure 2D D-17



**LEGEND**

- GAS TESTING
- TOP OF BEDROCK PROBE LOCATIONS
- ⊙ BORING LOCATIONS
- ⊙ OBSERVATION WELLS
- ⊙ PERMEABILITY TEST BORINGS
- ⊙ DEEP WELL (PUMP WELL)
- ⊙ SPECIAL TESTING TEST BORINGS (PRESSUREMETER)
- ⊙ PIEZOMETER TEST BORINGS
- ⊙ SEISMIC SURVEY TEST BORINGS
- ⊙ RECHARGE TEST BORINGS
- ⊙ TEST CAISSONS
- ⊙ T-X SERIES-FAULT STUDY
- ⊙ MONITORING WELLS
- ⊙ TEST PITS

- NOTES**
1. THE ELEVATION OF THE SURFACE OF THE WATER DURING THE PROBE BORINGS WAS EL. 574.0 (U.S. DATUM)
  2. THE ELEVATIONS USED ON THIS DRAWING REFERENCED TO THE U.S.C. DATUM
  3. BORING LOCATION 1-78 NOT SHOWN - SEE DRAWING 1-77 785 (E 2 369 313)
  4. READING COORDINATES
- |        | GRID GRID       | PLANT GRID |
|--------|-----------------|------------|
| UNIT 1 | N 780 543       | N 48 483   |
|        | E 2 368 875     | E 8 578    |
| UNIT 2 | N 780 348 725   | N 48 255   |
|        | E 2 369 947 188 | E 9 378    |



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**PERRY NUCLEAR POWER PLANT**

Site Exploration Plot Plan

Figure 2E-1