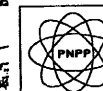




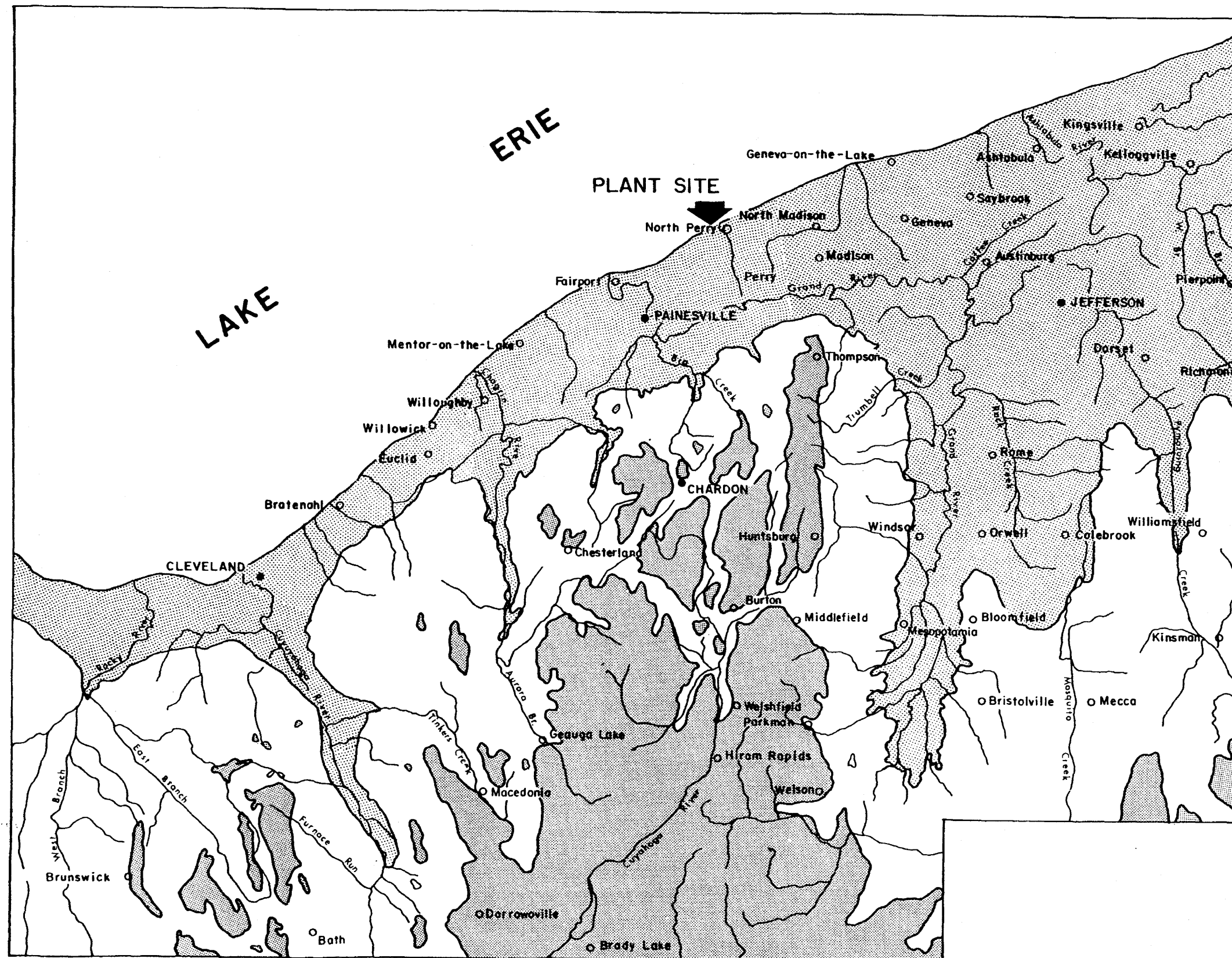
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PERRY NUCLEAR POWER PLANT

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

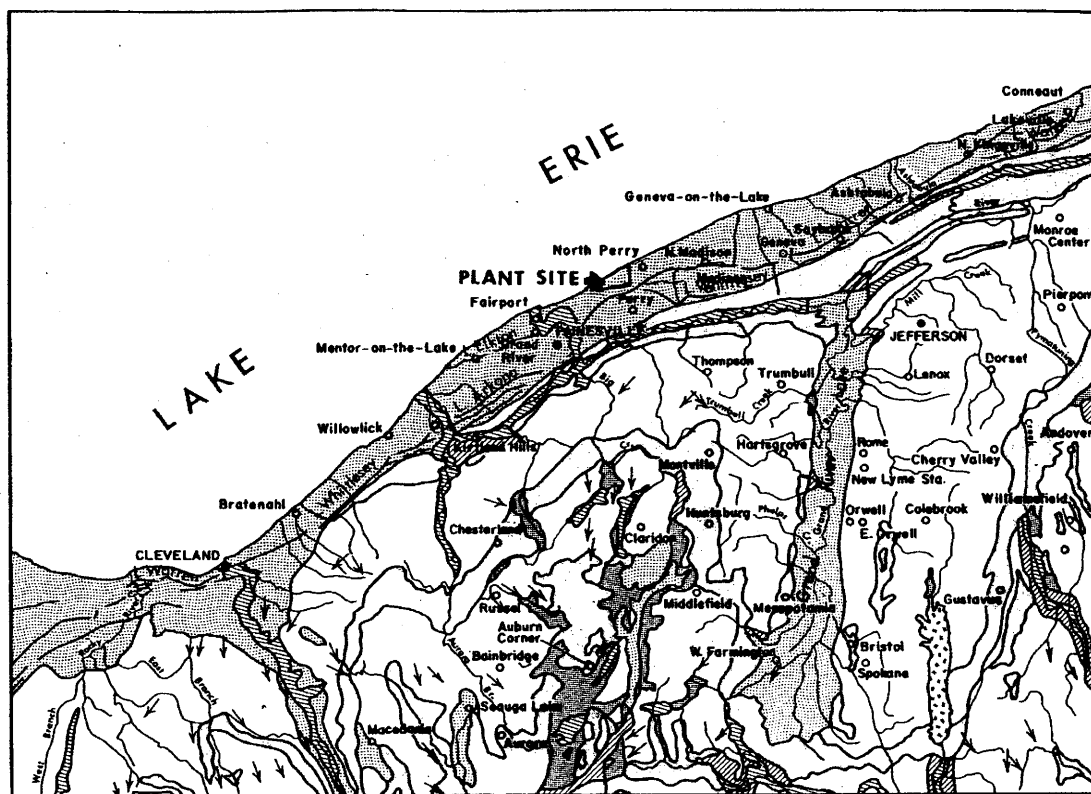
(Rev. 13 12/03)



PERRY NUCLEAR POWER PLANT

Bedrock Geologic Map of
Northeastern Ohio

Figure 2D-4



(AFTER REFERENCE 83)

LEGEND

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



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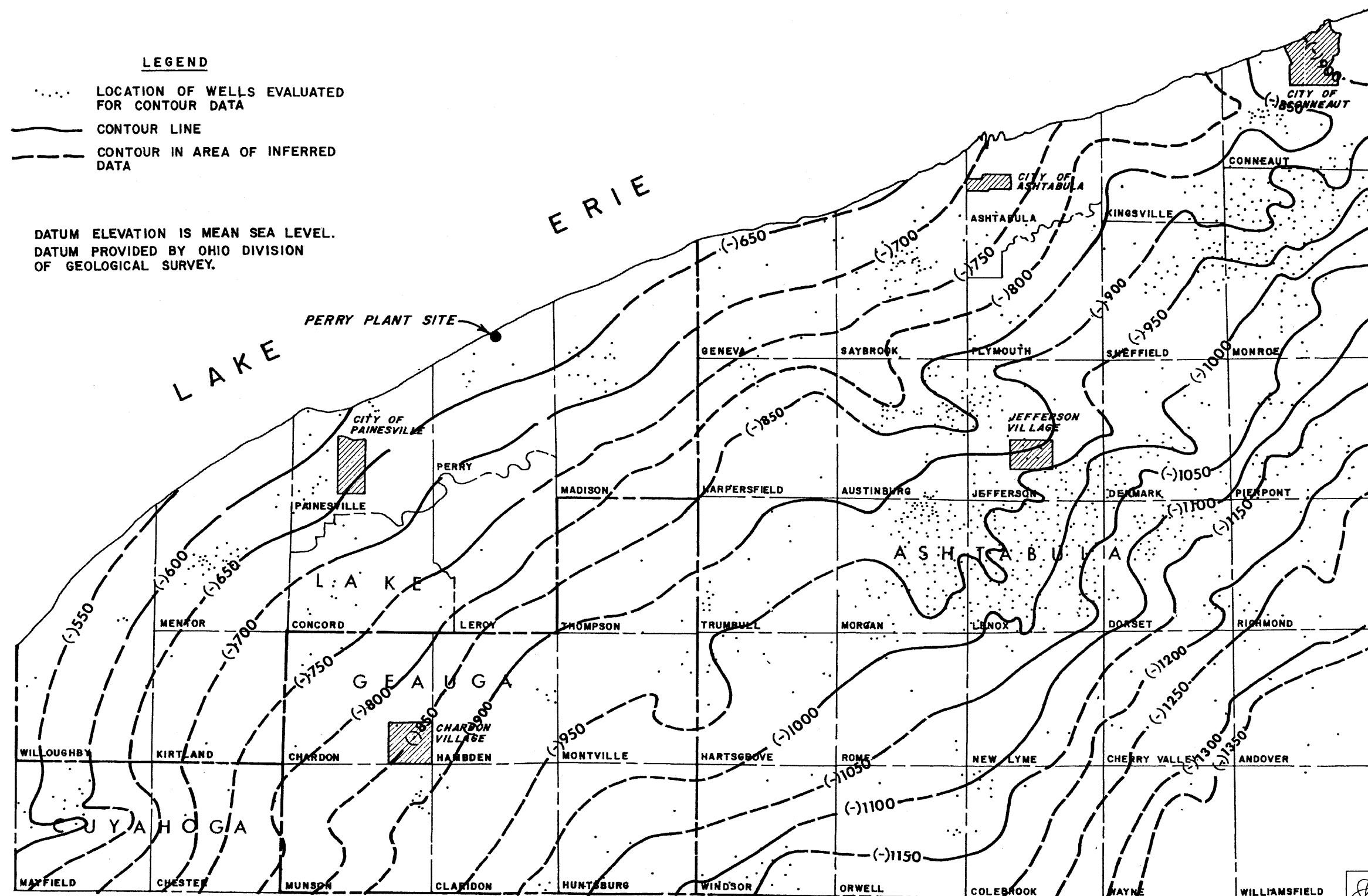
PERRY NUCLEAR POWER PLANT

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.



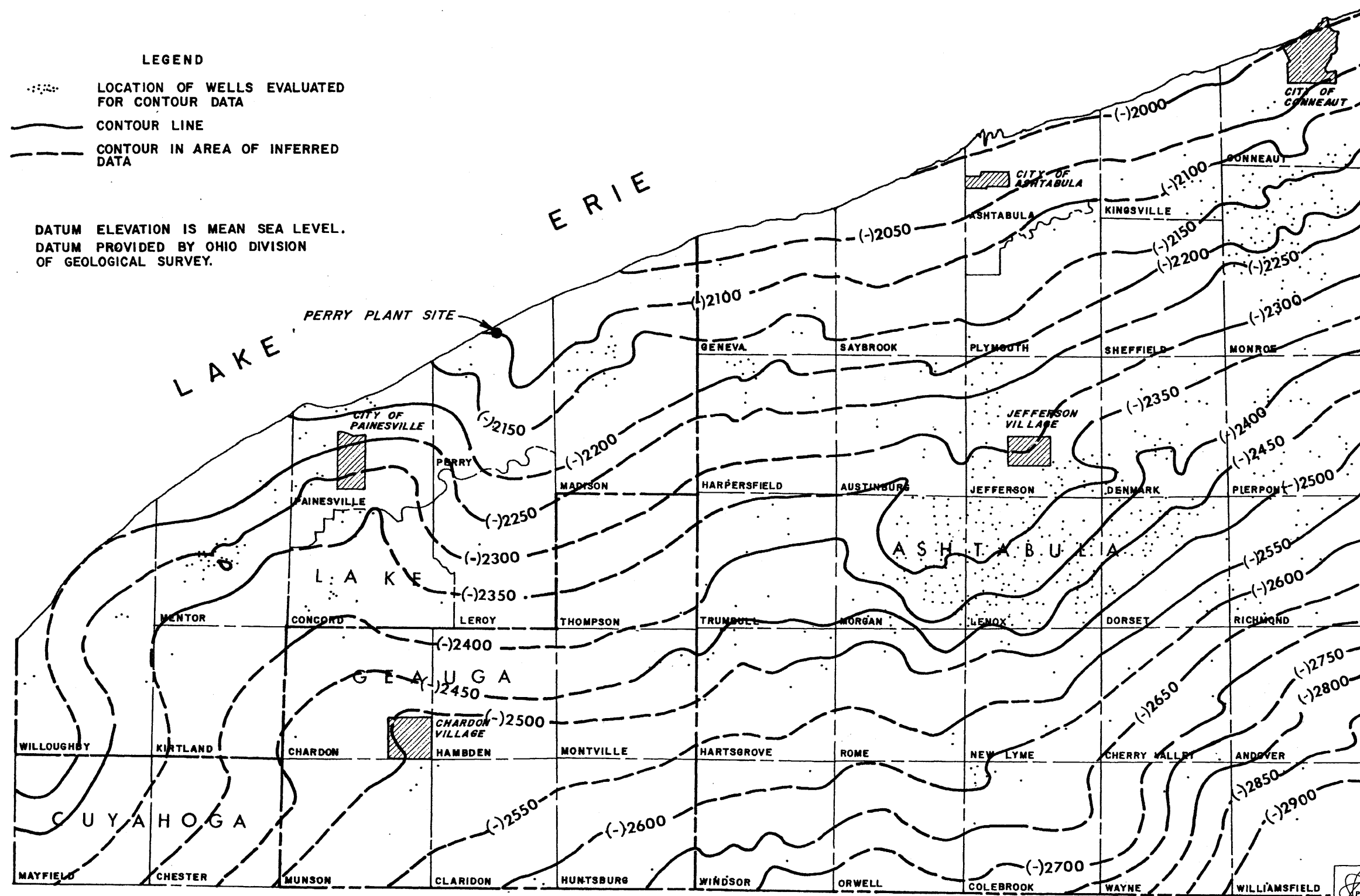
(Rev. 12 1/03)



PERRY NUCLEAR POWER PLANT

Structural Contour Map -
 Top of Big Lime

Figure 2D-6

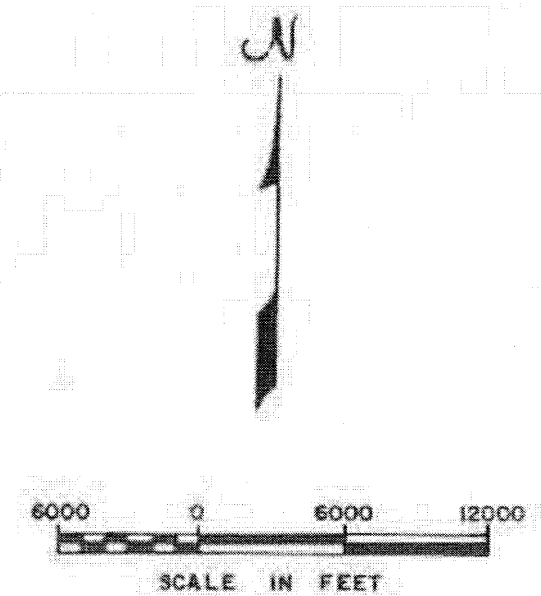


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PERRY NUCLEAR POWER PLANT

Structural Contour Map -
Top of Packer Shell

Figure 2D-7



LEGEND

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

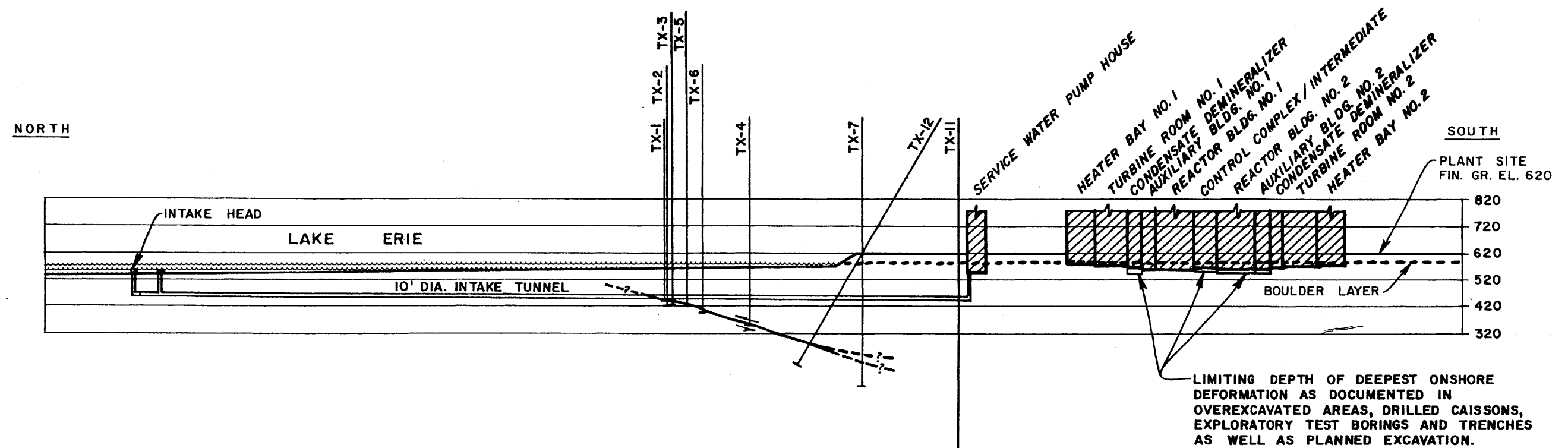
(Rev. 12 1/03)



PERRY NUCLEAR POWER PLANT

Fault and Outcrop
Location Map

Figure 2D-9



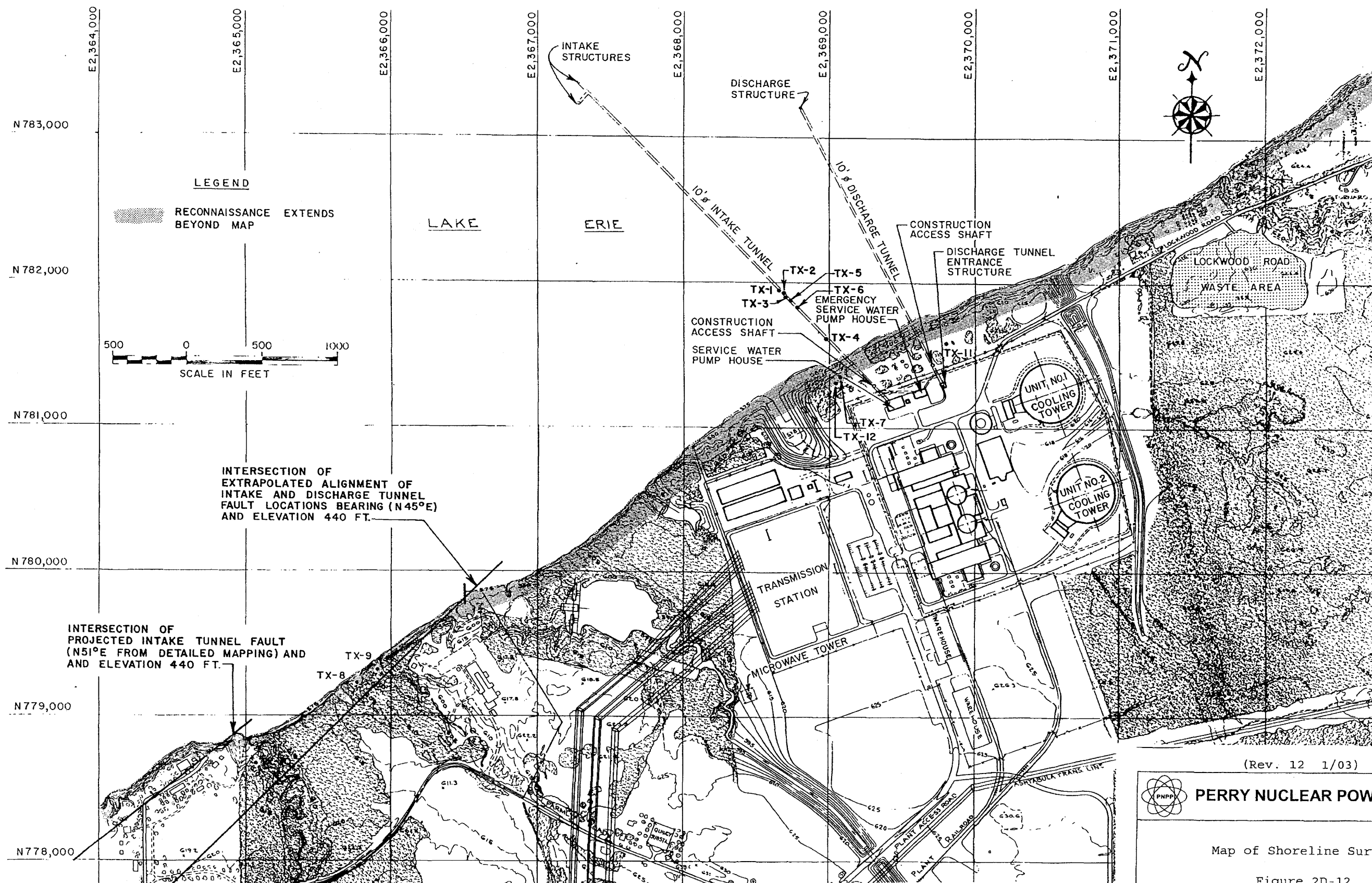
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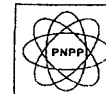
PERRY NUCLEAR POWER PLANT

Schematic Northwest-Southeast
 Cross Section,
 Perry Nuclear Power Plant

Figure 2D-10



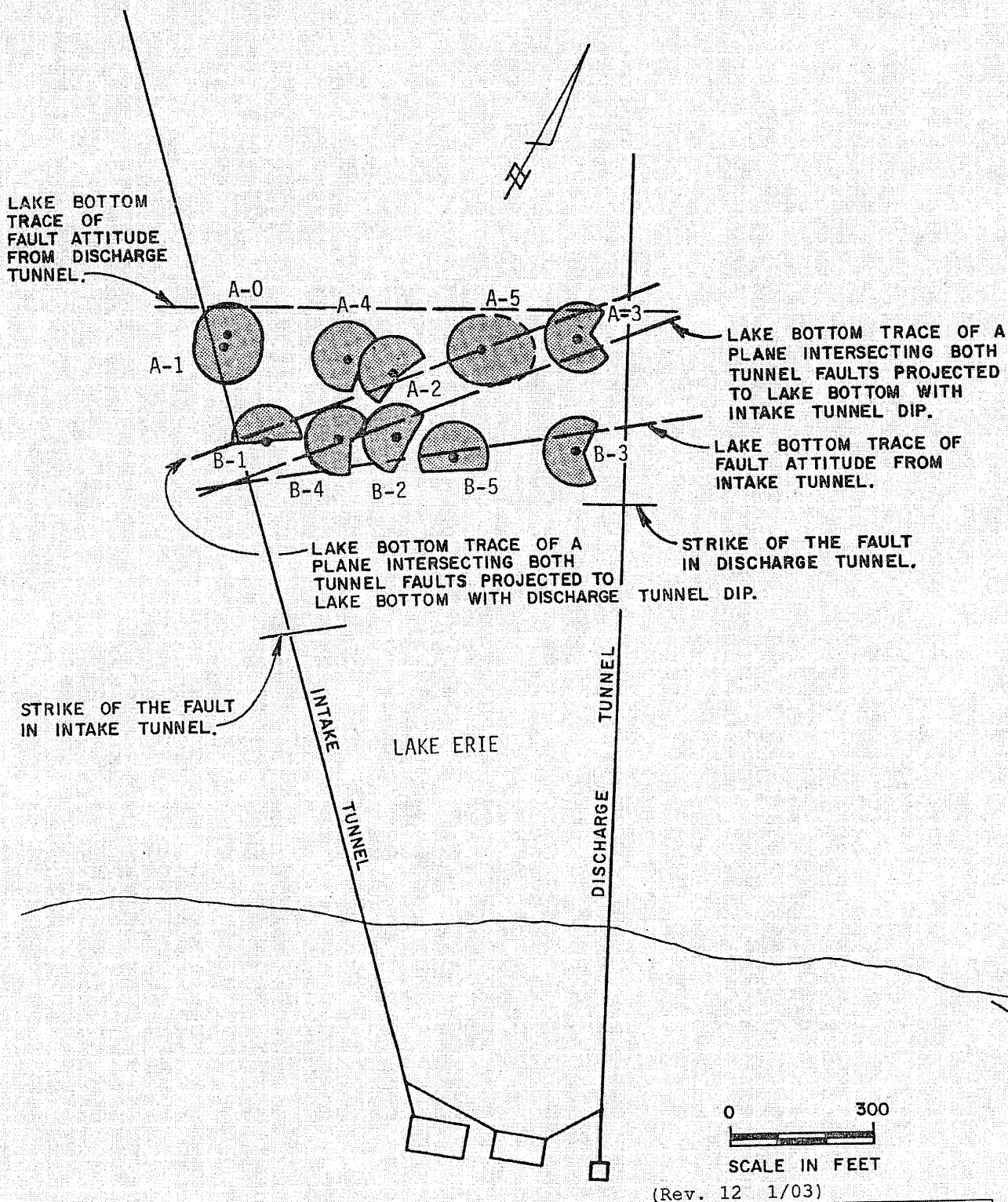
(Rev. 12 1/03)



PERRY NUCLEAR POWER PLANT

Map of Shoreline Survey

Figure 2D-12



• = STATION LOCATION

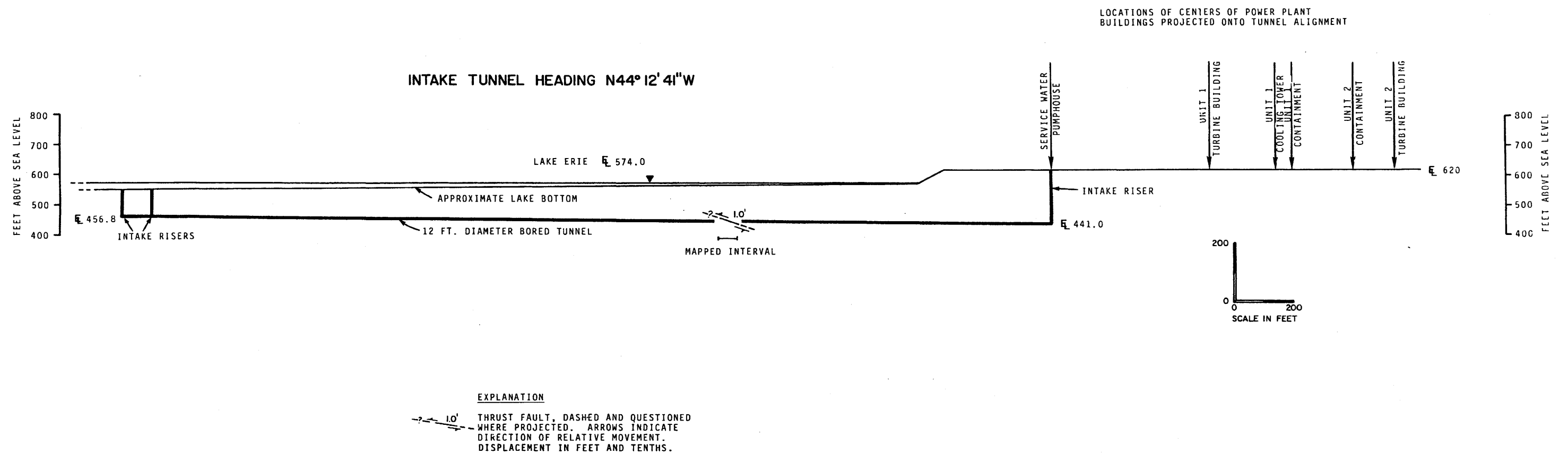
 = AREA OF COVERAGE ABOUT EACH STATION



PERRY NUCLEAR POWER PLANT

Location Map, Video
Survey Lake Erie Bottom

Figure 2D-13



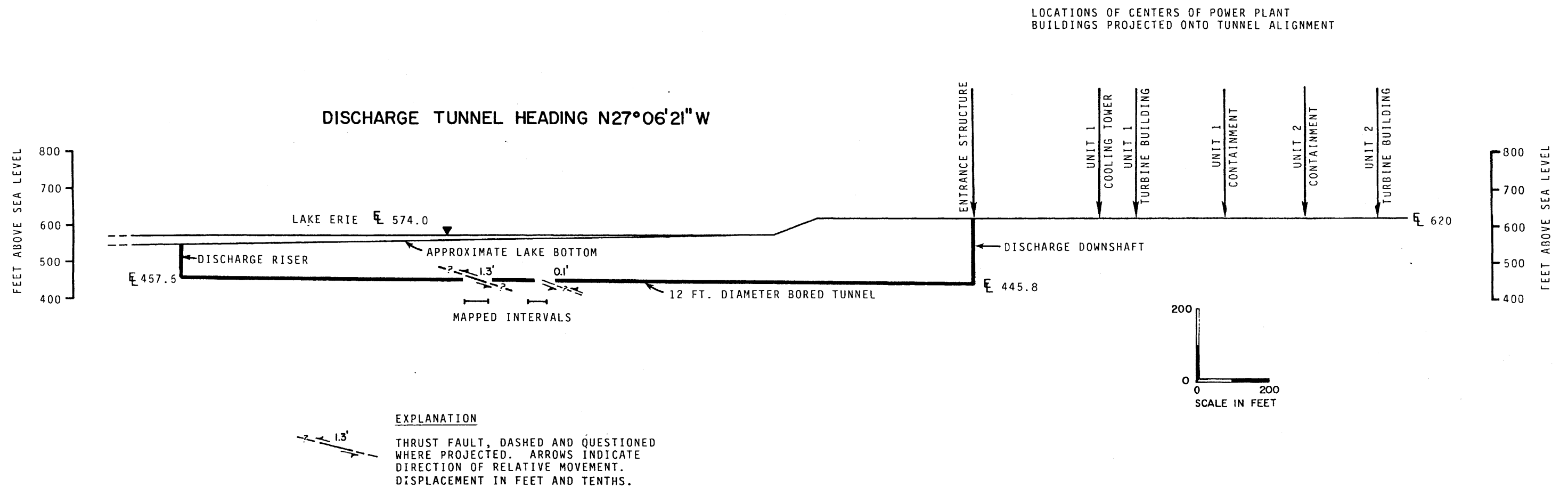
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PERRY NUCLEAR POWER PLANT

Longitudinal Section,
Intake Tunnel

Figure 2D-14



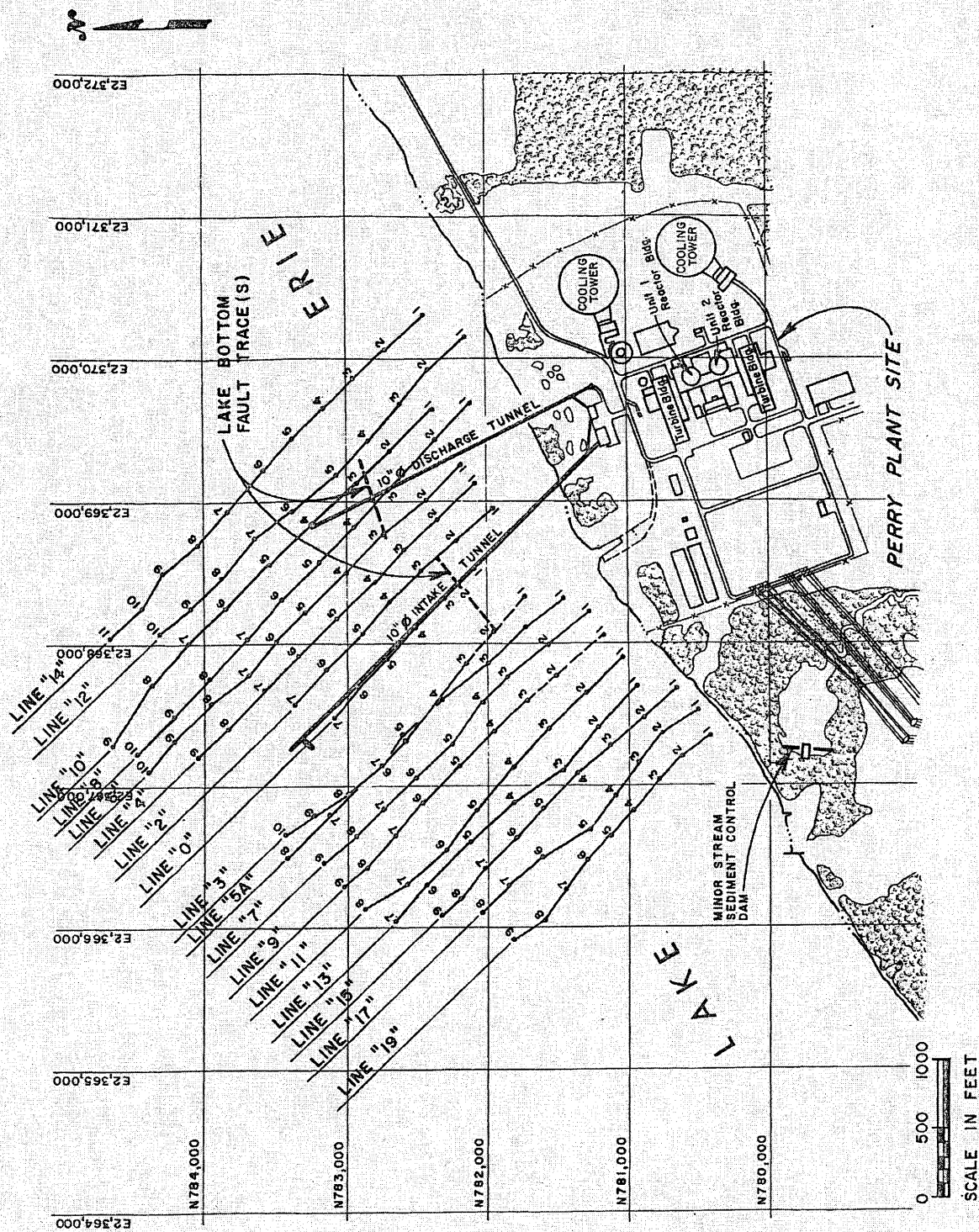
(Rev. 12 1/03)



PERRY NUCLEAR POWER PLANT

Longitudinal Section,
Discharge Tunnel

Figure 2D-15



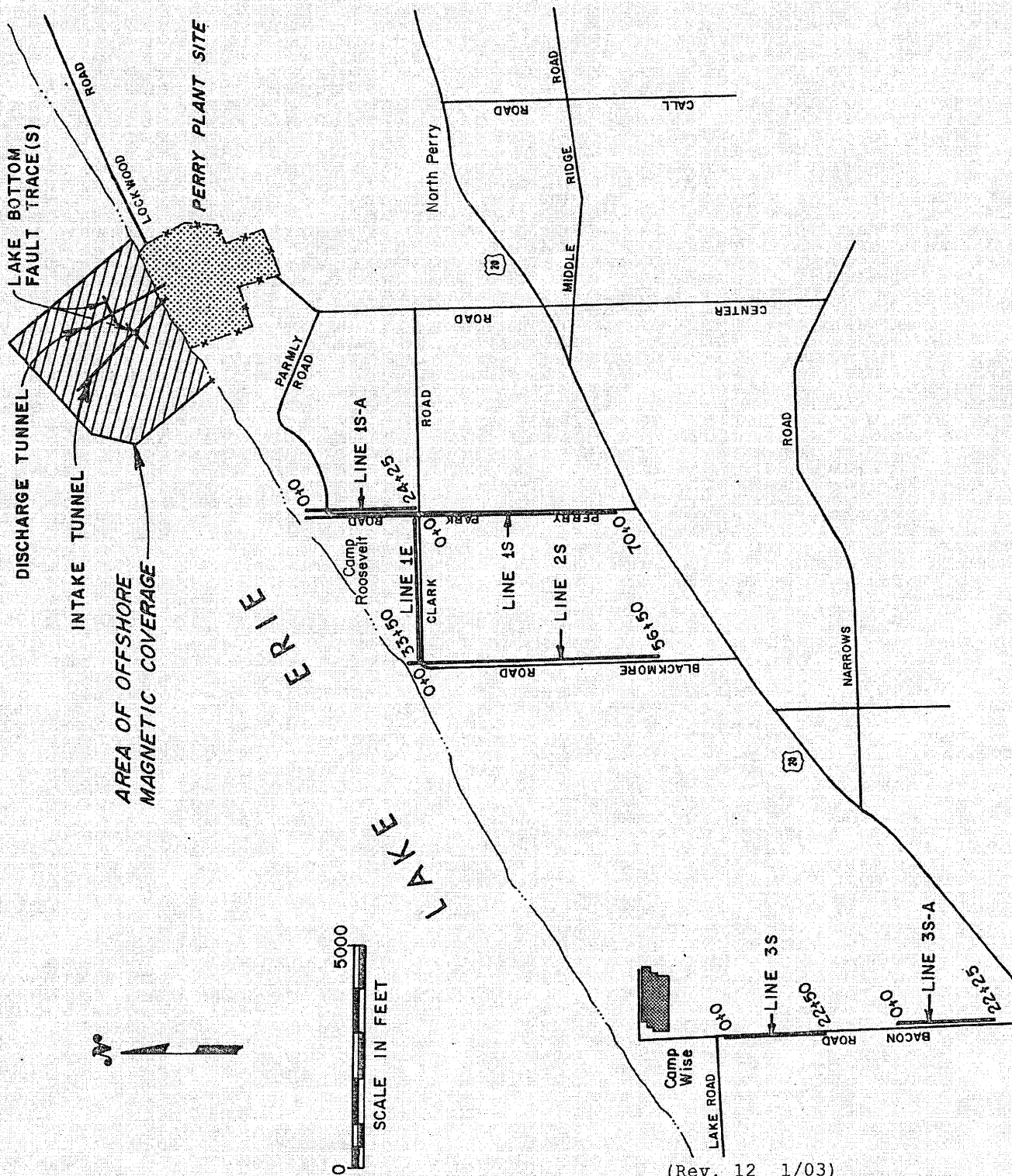
(Rev. 12 1/03)



PERRY NUCLEAR POWER PLANT

Location Map,
Offshore Magnetic Survey

Figure 2D-16



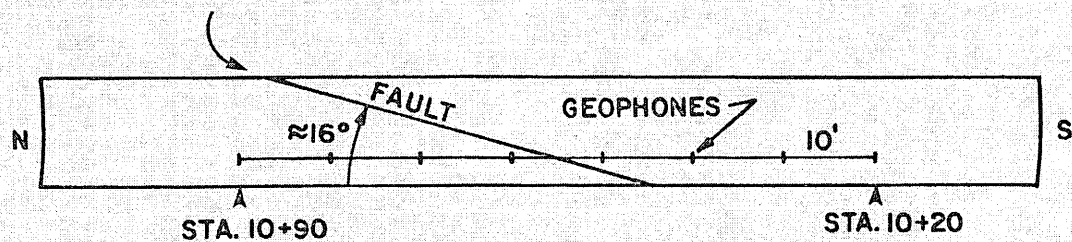
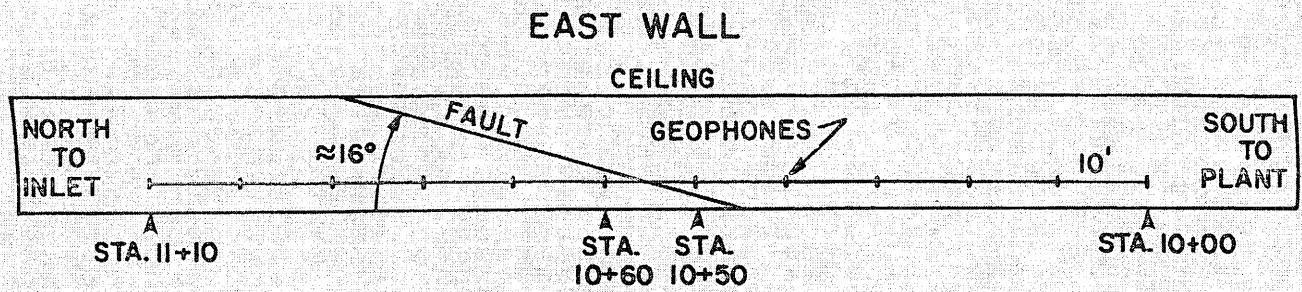
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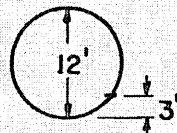
PERRY NUCLEAR POWER PLANT

Location Map,
Onshore Magnetic Survey

Figure 2D-17



3 ELEMENT GEOPHONE
AT EACH STATION



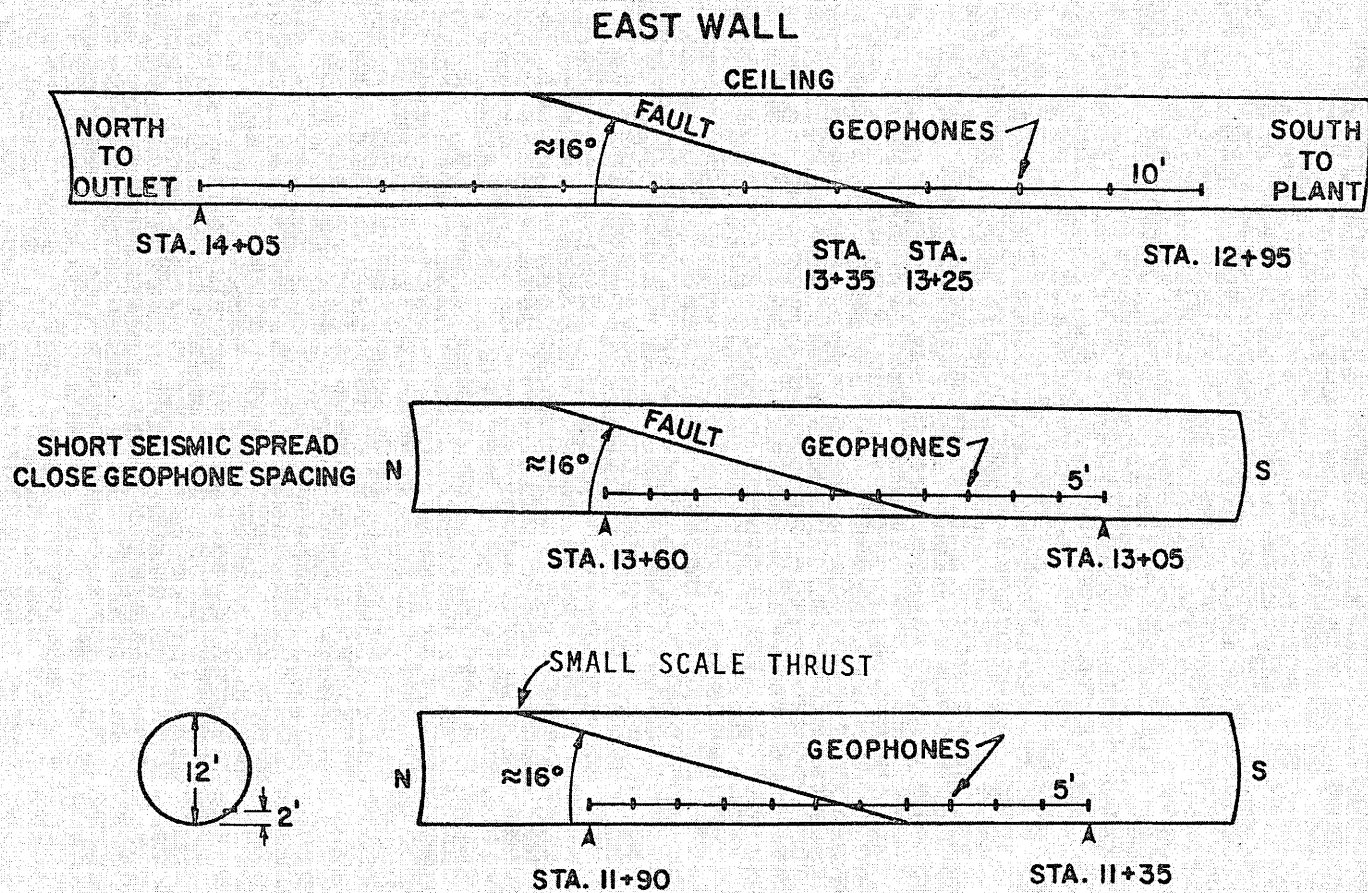
(Rev. 12 1/03)



PERRY NUCLEAR POWER PLANT

Location Map,
Seismic Spreads, Intake Tunnel

Figure 2D-18



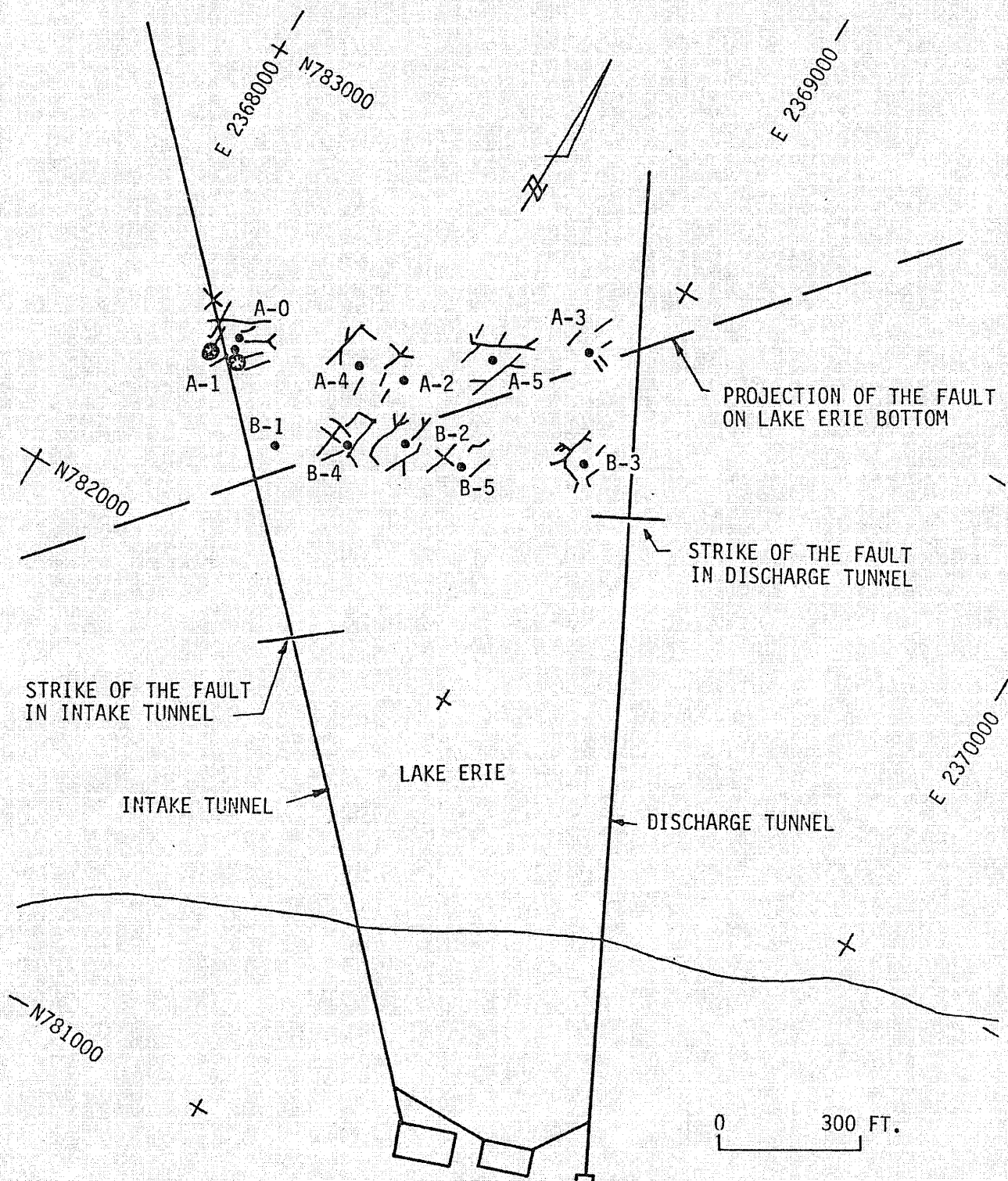
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PERRY NUCLEAR POWER PLANT

Location Map,
Seismic Spreads, Discharge Tunnel

Figure 2D-19



• = STATION LOCATION

— = FRACTURE

⊙ = SHALLOW DEPRESSION
IN BEDROCK SURFACE

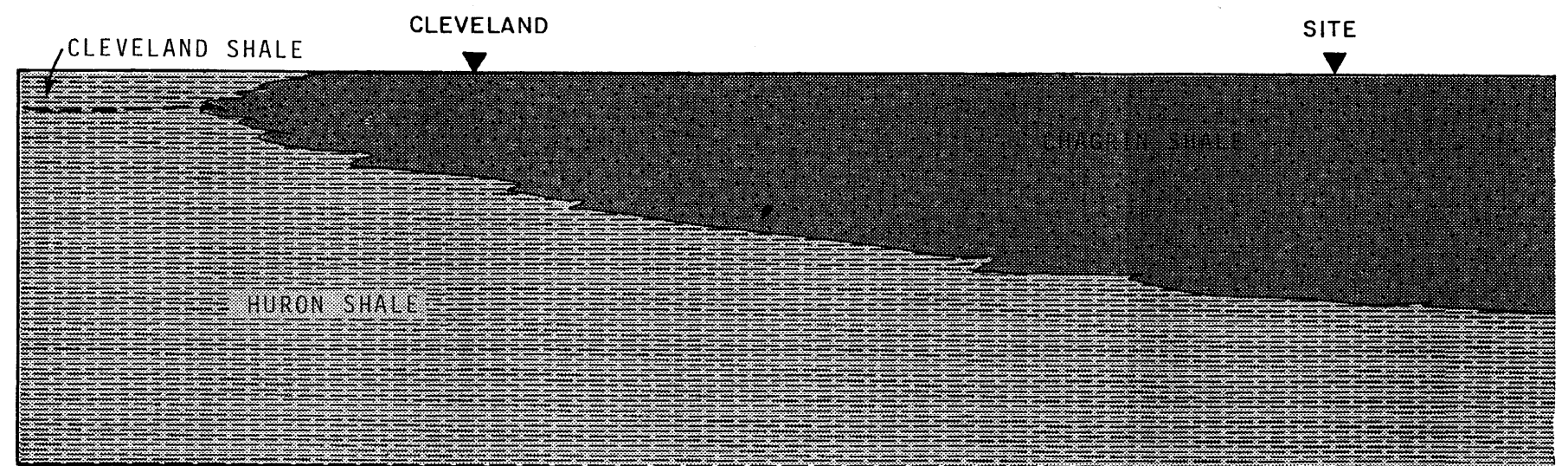
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PERRY NUCLEAR POWER PLANT

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

1. FINE, MEDIUM, COARSE, FINE, GRAY, PLASTIC CLAY, SAND, MATRIX WITH AGGREGATE OF SILTSTONE AND SHALE FRAGMENTS, PLAIN, SLOPED WHERE DISCERNABLE IN CONTACT AREAS.

2. FINE, COARSE, STRONG, SANDSTONE, 10-15 FT. THICK.

3. SANDSTONE, 10-15 FT. THICK, 10-15 FT. THICK.

4. SANDSTONE, 10-15 FT. THICK, 10-15 FT. THICK.

5. SANDSTONE, 10-15 FT. THICK, 10-15 FT. THICK.

6. SANDSTONE, 10-15 FT. THICK, 10-15 FT. THICK.

7. SANDSTONE, 10-15 FT. THICK, 10-15 FT. THICK.

8. SANDSTONE, 10-15 FT. THICK, 10-15 FT. THICK.

9. SANDSTONE, 10-15 FT. THICK, 10-15 FT. THICK.

10. SANDSTONE, 10-15 FT. THICK, 10-15 FT. THICK.

[illegible]

1. MAP TAKEN DIRECTLY FROM PHOTOGRAPHIC IMAGE
FIXING PLANS ARE WAPPED, NOT INDENTED
MULTIPLE SETS OR STRATIFICATION UNITS
2. LINES INDICATED BY STATIONING AND ELEVATION TICKS
VARIATION DUE TO PHOTOGRAPHIC DISTORTION

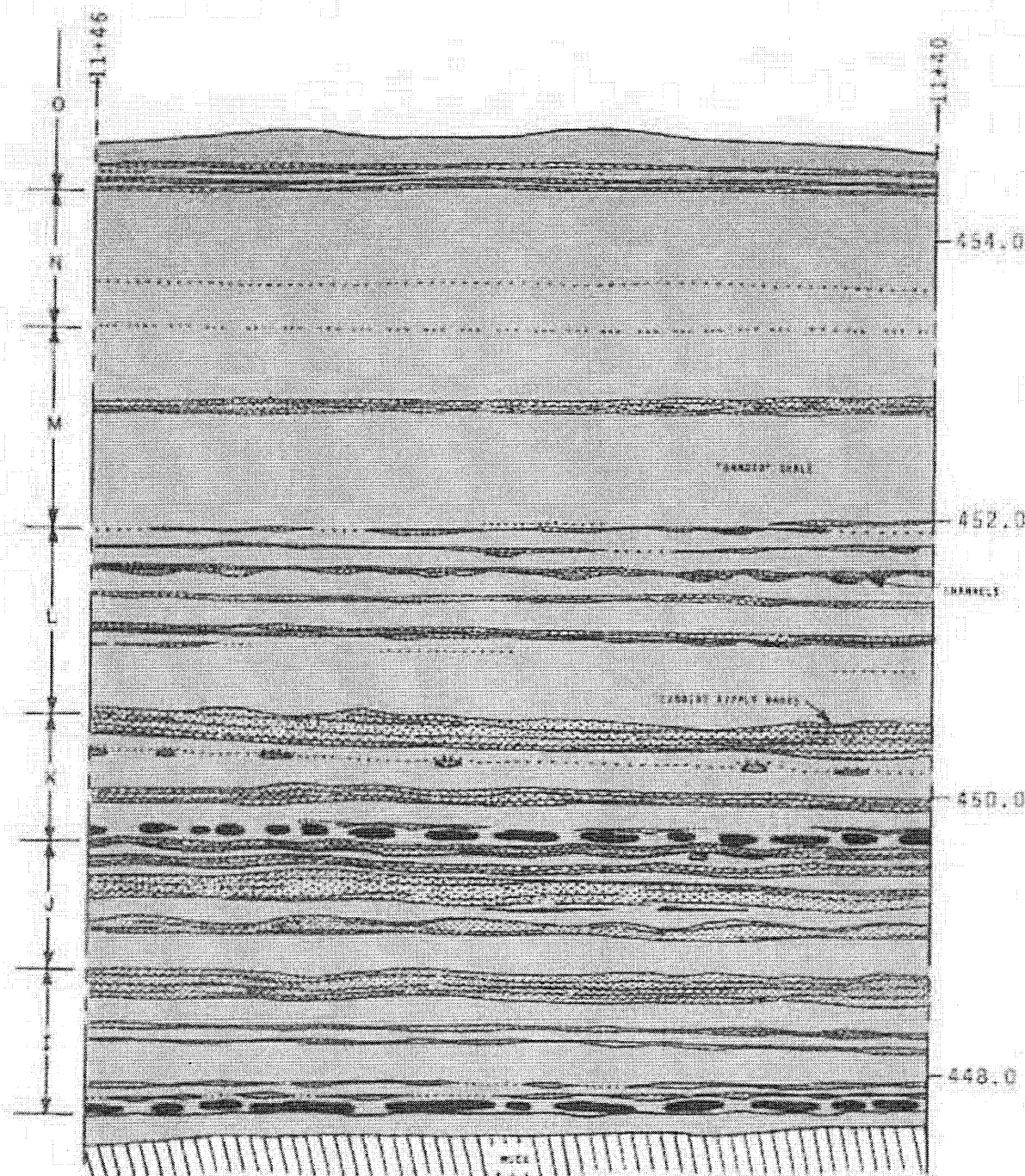


PERRY NUCLEAR POWER PLANT

Detailed Map,
Intake Pinnal Fault

Figure 2D-22

DISCHARGE TUNNEL EAST WALL



- UNIT O: CLAY SHALE: DARK GRAY, WITH BLOCKY FRACTURE, LAMINATED BY REDDISH-BLACK (CARBONACEOUS) SILTSTONE. TOP OF UNIT IS 4 IN THICK ZONE OF INTERLAMINATED SILTSTONE AND SILTY SHALE. BASEL 8 IN IS GRAYISH-WHITE, INTERLAMINATED DARK-BLACK CLAY SHALE, LIGHT GRAY SILTSTONE, AND DISCONTINUOUS DARK GRAY SHALE. SILTSTONE IN LOWER PART THICK AND SWELL, SINCE LAMINAE 2 TO 3 MM IN THICKNESS. UPPER PART SILTSTONE OF THIS BEDDING BECOMES MUCH THICKER NORTH OF STATION 11+40.
- UNIT N: CLAY SHALE: DARK GRAY, WITH BLOCKY TO CONCHOIDAL FRACTURE, WITH DISCONTINUOUS MEDIAL SILTSTONE LAMINAE, ABOUT 1 CM THICK. DISCONTINUOUS PARALLEL LAMINAE, 1 TO 2 MM THICK, OF LIGHT GRAY SILTSTONE AND BROWNISH-GRAY (PERMANENTLY) CLAY SHALE WITH COMMON FINE MEDIAL SILTSTONE. SINGLE DISCONTINUOUS SILTSTONE LAMINAE NEAR BASE OF UNIT. UNIT N-JAY M. FUNDAMENTAL IS A STANDING SURFACE AT THIS STATION. NORTHWARD FROM STATION 11+40, A PERMANENT SILTSTONE SEPARATES UNIT N AND M.
- UNIT M: CLAY SHALE AND SILTSTONE: DARK GRAY, MASSIVE, WITH BLOCKY TO CONCHOIDAL FRACTURE. PERIODIC ZONE OF SILTSTONE CONSISTS OF BROWNISH-WHITE LAMINAE, 1 TO 2 MM THICK, OF LIGHT GRAY SILTSTONE AND BROWNISH-GRAY SILTY SHALE, OVERLAIN BY A SINGLE DISCONTINUOUS (Lenticular) BED OF LIGHT GRAY SILTSTONE. (CARBONACEOUS) CLAY SHALE AS VERY THIN DISCONTINUOUS PARALLEL LAMINAE ABOVE MEDIAL SILTSTONE, AND AS PLANE CONTINUOUS PARALLEL LAMINAE IN LOWER PART OF UNIT. BASAL ONE HALF HAS "BANDER" ASPECT.
- UNIT L: CLAY SHALE AND SILTSTONE: LOWER ONE-HALF IS CLAY SHALE, DARK GRAY, WITH NUMEROUS DARK BROWNISH-GRAY, FINGERING (??), BROWNISH-WHITE LAMINAE, WITH "BANDER" ASPECT. BLOCKY FRACTURE. UPPER ONE-HALF IS GRAY CLAY SHALE WITH SEVERAL BROADLY WAVE SILTSTONE BEDS UP TO 2 CM IN THICKNESS. UPPER PART DISCONTINUOUS. LOWER BEDS 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 WAVE THIN LAMINAE OF BROWNISH-WHITE FINGERING (??) CLAY SHALE. SPREADING 2 CM IS GRAY MEDIAL ZONE OF FLAUNT, THINLY INTERLAMINATED SILTSTONE AND ONLY SILTSTONE WITH PARALLEL OF DARK GRAY SHALE. (NORTHWARD) THE TOP OF THIS SILTSTONE IS RIPPLE MARKED. MEDIAL SILTSTONE, UP TO 2 CM THICK, HAS STRAIGHT-TOOTHED CURRENT RIPPLES AT TOP. BASE OF UNIT CONTAINS BED OF CLUSTER SHALED (FINGERING) 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 FINGERING (??) CLAY SHALE. (NORTHWARD) 10 CM IS GRAY BEDDED ZONE OF FLAUNT, THINLY INTERLAMINATED LIGHT-GRAY SILTSTONE AND DARK, DARK-GRAY SHALE. (NORTHWARD) ONLY BED OF DARK SILTSTONE LAMINAE. (NORTHWARD) SILTSTONE LAMINAE. (NORTHWARD) UNIT J CONTAINS A MEDIAL PINCHING AND SKALING BED OF SILTSTONE.
- UNIT I: CLAY SHALE, SILTSTONE, AND IRONSTONE: SAME TENDENCY AS UNIT K, EXCEPT AS INDICATED GRAPHICALLY.
- NOTE: UNITS J AND K WERE RECORDED AND DESCRIBED BY STATION 11+40, UNITS L THROUGH V 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.

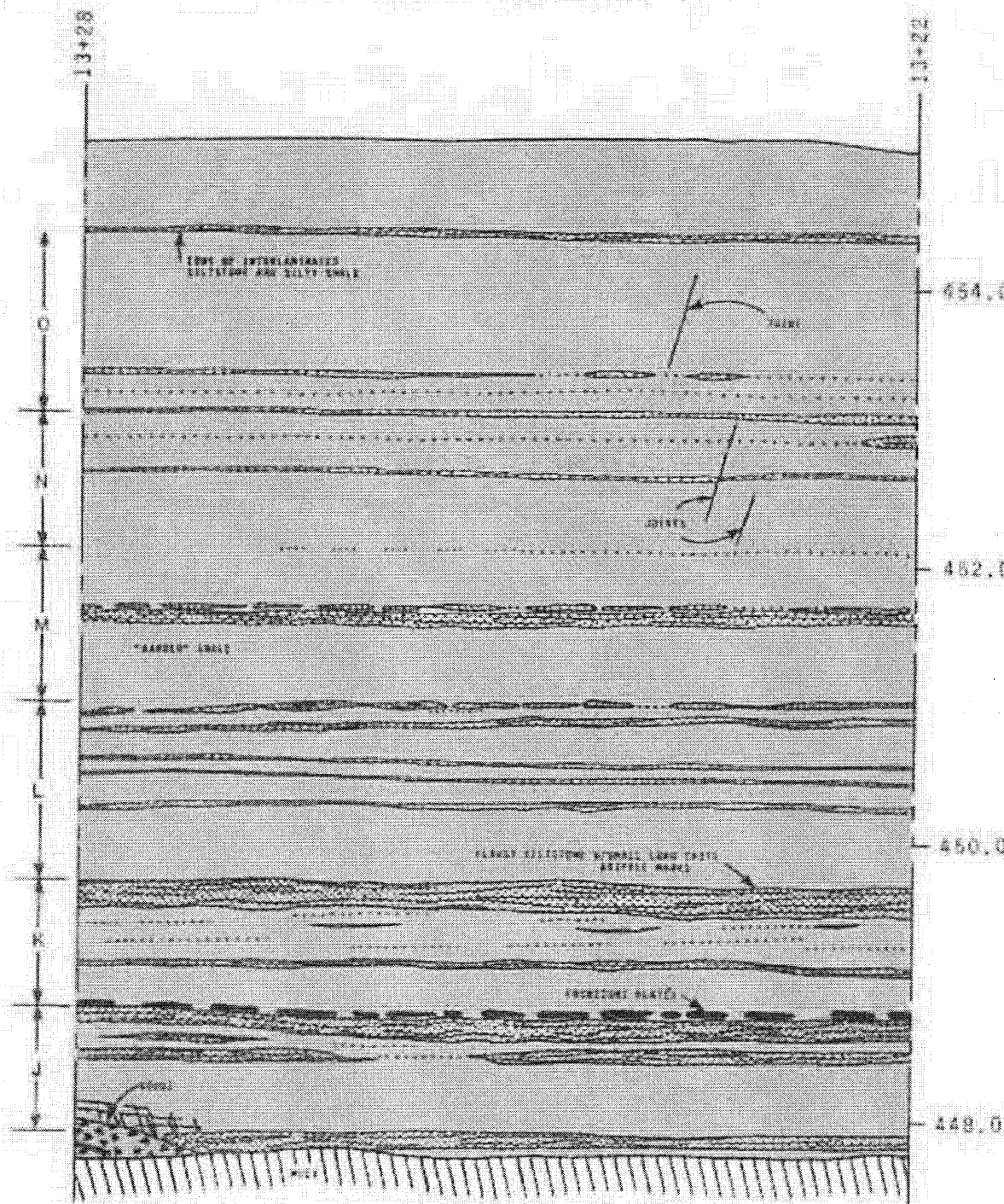
(Rev. 12 1/03)

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 SLIGHT FRACTURE, WITH SEVERAL PLACED PARALLEL LAMINAE OF BROWNISH-BLACK SILTSTONE. CLAY SHALE TOP OF UNIT IS 8 CM THICK ZONE OF INTERLAMINATED SILTSTONE AND SILTY SHALE. BASAL 8 CM IS BROWNISH-BLACK, UNLAMINATED BROWNISH-BLACK SILTY SHALE, LIGHT-GRAY SILTSTONE, AND SUBORDINATE GRAY CLAY SHALE. SILTSTONE IS LOWER PART OF UNIT AND DARK GRAY, FROM 2 TO 8 CM IN THICKNESS. UPPER MOST SILTSTONE AT THIS SECTION IS MORE THICKER NORTH OF STATION 13+22.
- UNIT N: CLAY SHALE. DARK GRAY, WITH BLOCKY TO CONGLOMERATE FRACTURE, WITH ONE PROMINENT MEDIAL SILTSTONE ZONE, ABOUT 2 CM THICK DISCONTINUOUS PARALLEL LAMINAE 1 TO 2 CM THICK, OF BROWNISH-BLACK SILTSTONE AND BROWNISH-BLACK (FLOCCULOUS?) CLAY SHALE. VERY COMMON ABOVE MEDIAL SILTSTONE, SINGLE DISCONTINUOUS SILTSTONE LAMINAE NEAR BASE OF UNIT. UNIT N-UNIT M BOUNDARY IS A RIDGING 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, WAGY, WITH BLOCKY TO CONGLOMERATE FRACTURE. MEDIAL ZONE OF SILTSTONE CONSISTS OF BROWNISH-BLACK INTERLAMINATIONS OF LIGHT-GRAY SILTSTONE AND BROWNISH-GRAY SILTY SHALE, OVERLAIN BY A SINGLE DISCONTINUOUS (Lenticular) BED OF LIGHT-GRAY SILTSTONE. FLOCCULOUS(?) CLAY SHALE AS VERY THIN DISCONTINUOUS PARALLEL LAMINAE ABOVE MEDIAL SILTSTONE, AND AS PLAIN CONTINUOUS PARALLEL LAMINAE IN LOWER PART OF UNIT. BASAL ONE-HALF HAS "BANDING" ASPECT.
- UNIT L: CLAY SHALE AND SILTSTONE. LOWER ONE-HALF IS CLAY SHALE, DARK GRAY, WITH NUMEROUS DARK BROWNISH-GRAY, FLOCCULOUS(?) BROWNISH-BLACK LAMINAE, WITH "BANDING" ASPECT, BLOCKY FRACTURE. UPPER ONE-HALF IS GRAY CLAY SHALE WITH SEVERAL BROWNISH-BLACK SILTSTONE BEDS UP TO 1 CM IN THICKNESS. UPPER BEDS DISCONTINUOUS, LOWER BEDS CONTINUOUS, SMALL CHANNELS OCCUR AT TOP.
- UNIT K: CLAY SHALE, SILTSTONE, AND IRONSTONE. BROWNISH-GRAY, TO BROWNISH-SILTY CLAY SHALE WITH CONGLOMERATE FRACTURE, WITH NUMEROUS UNCLAYED WAGY THIN LAMINAE OF BROWNISH-BLACK FLOCCULOUS(?) CLAY SHALE. UPPERMOST 6 CM IS WAGY MEDIAL ZONE OF FLACID, SMALLLY INTERLAMINATED SILTSTONE AND SHALE SILTSTONE WITH PATTERNS OF DARK GRAY SHALE. DOWNWARD TO THE TOP OF THIS SILTSTONE IS BROWNISH-BLACK MEDIAL SILTSTONE, UP TO 2 CM THICK, HAS BROWNISH-BLACK (BROWN) RUPPES AT TOP. BASE OF UNIT CONSISTS OF 2 CM OF CLAY SHALE. IRONSTONE CONCRETIONS ABOUT 2 CM IN THICK.
- UNIT J: CLAY SHALE AND SILTSTONE. DARK GRAY CLAY SHALE, WITH NUMEROUS THIN LAMINAE, 1 TO 2 CM THICK, OF DARK BROWNISH-GRAY FLOCCULOUS(?) CLAY SHALE. UPPERMOST 15 CM IS WAGY FLOCCULOUS(?) CLAY SHALE, THINLY INTERLAMINATED LIGHT-GRAY SILTSTONE AND SILTY, DARK GRAY SHALE. DARK LENS LIES OVER EDGE OF WAGY SILTSTONE LAMINAE, WITH BROWNISH-BLACK LAMINAE LOCALLY ON TOP OF SILTSTONE LAMINAE. SOUTHWARD UNIT J CONTAINS A MEDIAL BROWNISH-GRAY AND SWELLING BED OF SILTSTONE.
- UNIT I: CLAY SHALE, SILTSTONE, AND IRONSTONE. DARK GRAY, WITH CONGLOMERATE FRACTURE, WITH NUMEROUS UNCLAYED WAGY THIN LAMINAE OF BROWNISH-BLACK FLOCCULOUS(?) CLAY SHALE. UPPERMOST 6 CM IS WAGY MEDIAL ZONE OF FLACID, SMALLLY INTERLAMINATED SILTSTONE AND SHALE SILTSTONE WITH PATTERNS OF DARK GRAY SHALE. DOWNWARD TO THE TOP OF THIS SILTSTONE IS BROWNISH-BLACK MEDIAL SILTSTONE, UP TO 2 CM THICK, HAS BROWNISH-BLACK (BROWN) RUPPES AT TOP. BASE OF UNIT CONSISTS OF 2 CM OF CLAY SHALE. IRONSTONE CONCRETIONS ABOUT 2 CM IN THICK.
- UNIT H: CLAY SHALE AND SILTSTONE. DARK GRAY CLAY SHALE, WITH NUMEROUS THIN LAMINAE, 1 TO 2 CM THICK, OF DARK BROWNISH-GRAY FLOCCULOUS(?) CLAY SHALE. UPPERMOST 15 CM IS WAGY FLOCCULOUS(?) CLAY SHALE, THINLY INTERLAMINATED LIGHT-GRAY SILTSTONE AND SILTY, DARK GRAY SHALE. DARK LENS LIES OVER EDGE OF WAGY SILTSTONE LAMINAE, WITH BROWNISH-BLACK LAMINAE LOCALLY ON TOP OF SILTSTONE LAMINAE. SOUTHWARD UNIT H CONTAINS A MEDIAL BROWNISH-GRAY AND SWELLING BED OF SILTSTONE.
- UNIT G: CLAY SHALE, SILTSTONE, AND IRONSTONE. DARK GRAY, WITH CONGLOMERATE FRACTURE, WITH NUMEROUS UNCLAYED WAGY THIN LAMINAE OF BROWNISH-BLACK FLOCCULOUS(?) CLAY SHALE. UPPERMOST 6 CM IS WAGY MEDIAL ZONE OF FLACID, SMALLLY INTERLAMINATED SILTSTONE AND SHALE SILTSTONE WITH PATTERNS OF DARK GRAY SHALE. DOWNWARD TO THE TOP OF THIS SILTSTONE IS BROWNISH-BLACK MEDIAL SILTSTONE, UP TO 2 CM THICK, HAS BROWNISH-BLACK (BROWN) RUPPES AT TOP. BASE OF UNIT CONSISTS OF 2 CM OF CLAY SHALE. IRONSTONE CONCRETIONS ABOUT 2 CM IN THICK.
- UNIT F: CLAY SHALE AND SILTSTONE. DARK GRAY CLAY SHALE, WITH NUMEROUS THIN LAMINAE, 1 TO 2 CM THICK, OF DARK BROWNISH-GRAY FLOCCULOUS(?) CLAY SHALE. UPPERMOST 15 CM IS WAGY FLOCCULOUS(?) CLAY SHALE, THINLY INTERLAMINATED LIGHT-GRAY SILTSTONE AND SILTY, DARK GRAY SHALE. DARK LENS LIES OVER EDGE OF WAGY SILTSTONE LAMINAE, WITH BROWNISH-BLACK LAMINAE LOCALLY ON TOP OF SILTSTONE LAMINAE. SOUTHWARD UNIT F CONTAINS A MEDIAL BROWNISH-GRAY AND SWELLING BED OF SILTSTONE.
- UNIT E: CLAY SHALE AND SILTSTONE. DARK GRAY CLAY SHALE, WITH NUMEROUS THIN LAMINAE, 1 TO 2 CM THICK, OF DARK BROWNISH-GRAY FLOCCULOUS(?) CLAY SHALE. UPPERMOST 15 CM IS WAGY FLOCCULOUS(?) CLAY SHALE, THINLY INTERLAMINATED LIGHT-GRAY SILTSTONE AND SILTY, DARK GRAY SHALE. DARK LENS LIES OVER EDGE OF WAGY SILTSTONE LAMINAE, WITH BROWNISH-BLACK LAMINAE LOCALLY ON TOP OF SILTSTONE LAMINAE. SOUTHWARD UNIT E CONTAINS A MEDIAL BROWNISH-GRAY AND SWELLING BED OF SILTSTONE.
- UNIT D: CLAY SHALE AND SILTSTONE. DARK GRAY CLAY SHALE, WITH NUMEROUS THIN LAMINAE, 1 TO 2 CM THICK, OF DARK BROWNISH-GRAY FLOCCULOUS(?) CLAY SHALE. UPPERMOST 15 CM IS WAGY FLOCCULOUS(?) CLAY SHALE, THINLY INTERLAMINATED LIGHT-GRAY SILTSTONE AND SILTY, DARK GRAY SHALE. DARK LENS LIES OVER EDGE OF WAGY SILTSTONE LAMINAE, WITH BROWNISH-BLACK LAMINAE LOCALLY ON TOP OF SILTSTONE LAMINAE. SOUTHWARD UNIT D CONTAINS A MEDIAL BROWNISH-GRAY AND SWELLING BED OF SILTSTONE.
- UNIT C: CLAY SHALE AND SILTSTONE. DARK GRAY CLAY SHALE, WITH NUMEROUS THIN LAMINAE, 1 TO 2 CM THICK, OF DARK BROWNISH-GRAY FLOCCULOUS(?) CLAY SHALE. UPPERMOST 15 CM IS WAGY FLOCCULOUS(?) CLAY SHALE, THINLY INTERLAMINATED LIGHT-GRAY SILTSTONE AND SILTY, DARK GRAY SHALE. DARK LENS LIES OVER EDGE OF WAGY SILTSTONE LAMINAE, WITH BROWNISH-BLACK LAMINAE LOCALLY ON TOP OF SILTSTONE LAMINAE. SOUTHWARD UNIT C CONTAINS A MEDIAL BROWNISH-GRAY AND SWELLING BED OF SILTSTONE.
- UNIT B: CLAY SHALE AND SILTSTONE. DARK GRAY CLAY SHALE, WITH NUMEROUS THIN LAMINAE, 1 TO 2 CM THICK, OF DARK BROWNISH-GRAY FLOCCULOUS(?) CLAY SHALE. UPPERMOST 15 CM IS WAGY FLOCCULOUS(?) CLAY SHALE, THINLY INTERLAMINATED LIGHT-GRAY SILTSTONE AND SILTY, DARK GRAY SHALE. DARK LENS LIES OVER EDGE OF WAGY SILTSTONE LAMINAE, WITH BROWNISH-BLACK LAMINAE LOCALLY ON TOP OF SILTSTONE LAMINAE. SOUTHWARD UNIT B CONTAINS A MEDIAL BROWNISH-GRAY AND SWELLING BED OF SILTSTONE.
- UNIT A: CLAY SHALE AND SILTSTONE. DARK GRAY CLAY SHALE, WITH NUMEROUS THIN LAMINAE, 1 TO 2 CM THICK, OF DARK BROWNISH-GRAY FLOCCULOUS(?) CLAY SHALE. UPPERMOST 15 CM IS WAGY FLOCCULOUS(?) CLAY SHALE, THINLY INTERLAMINATED LIGHT-GRAY SILTSTONE AND SILTY, DARK GRAY SHALE. DARK LENS LIES OVER EDGE OF WAGY SILTSTONE LAMINAE, WITH BROWNISH-BLACK LAMINAE LOCALLY ON TOP OF SILTSTONE LAMINAE. SOUTHWARD UNIT A CONTAINS A MEDIAL BROWNISH-GRAY AND SWELLING BED OF SILTSTONE.

EXPLANATION

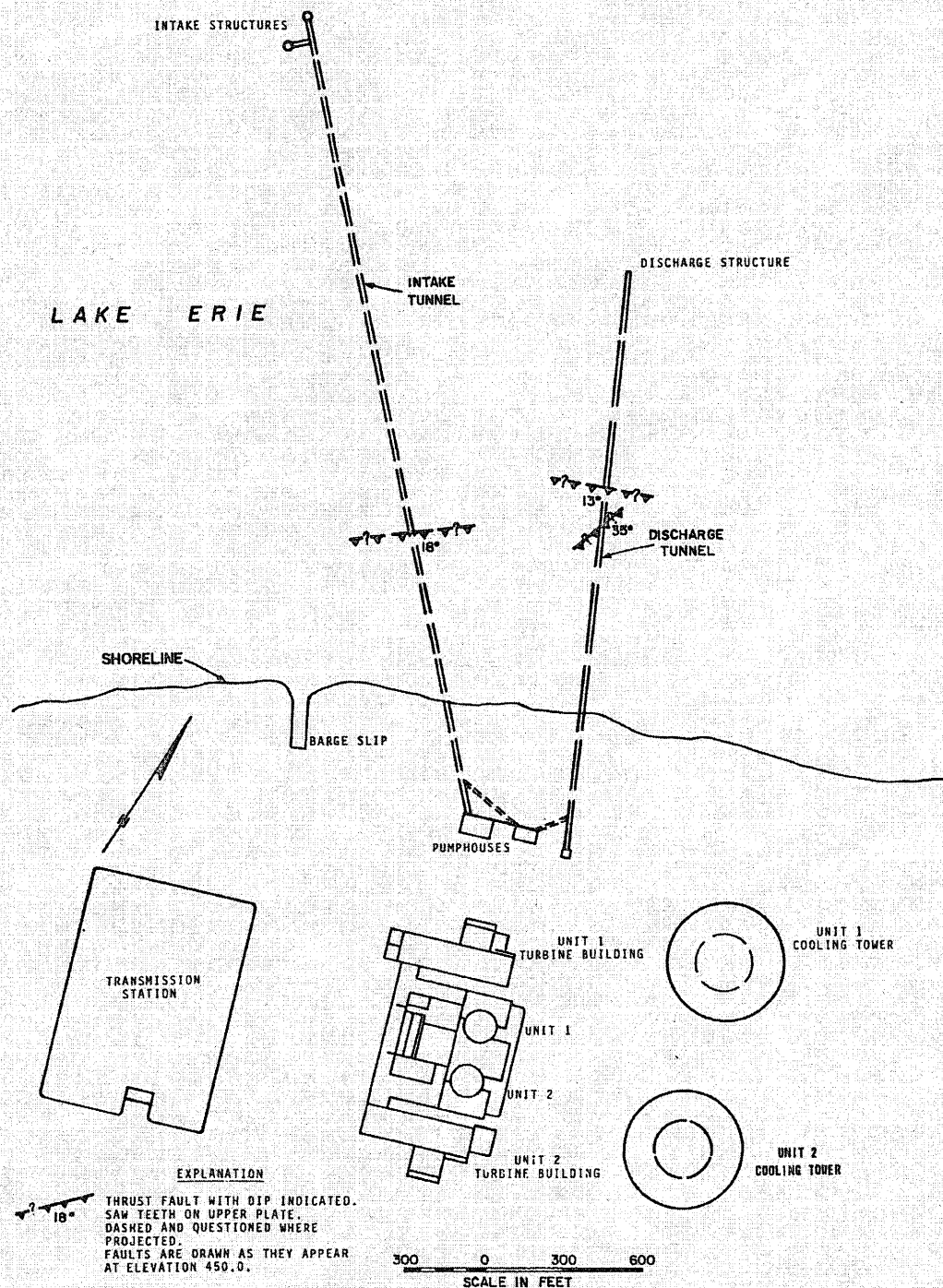
- FAULT GOUGE ZONE. GRAY, PLASTIC CLAY GOUGE MATRIX WITH AGGREGATE OF RANDOMLY ORIENTED SILTSTONE AND SHALE FRAGMENTS.
- SILTSTONE.
- SILTSTONE LAMINA, DASHED WHERE BEDDING PLANE CONTINUOUSLY MAPPED BUT SILTSTONE LITHOLOGY PINCHED OUT.
- SHALE.
- IRONSTONE CONCRETIONS.

(Rev. 12 1/83)

PERRY NUCLEAR POWER PLANT

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

Figure 20-26



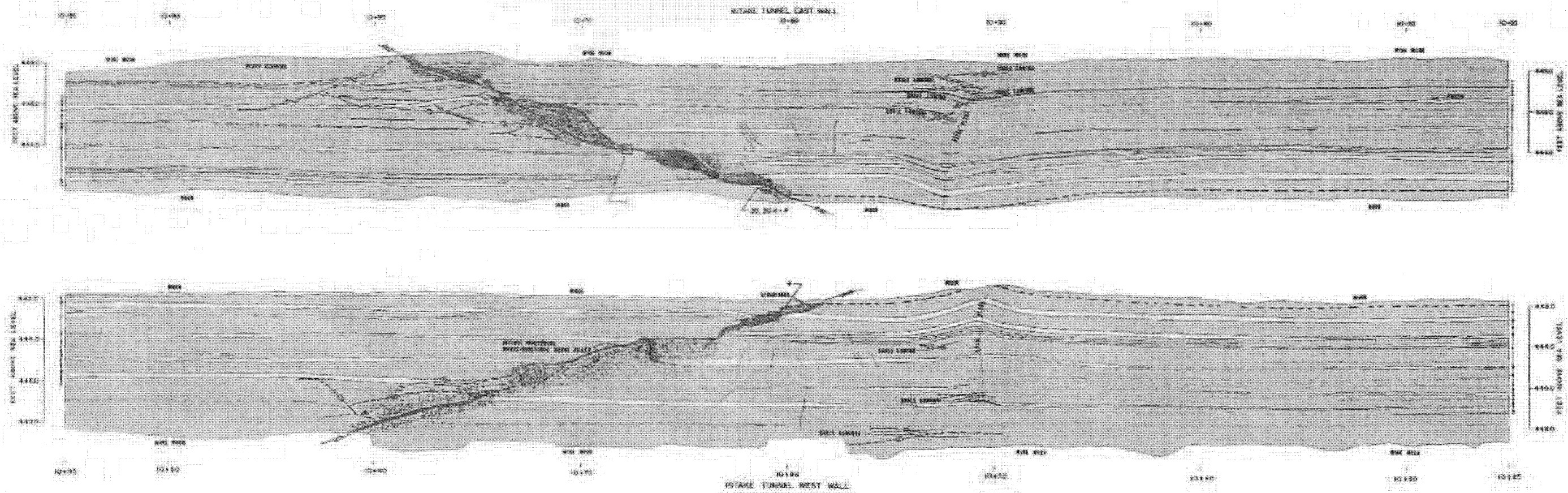
(Rev. 12 1/03)



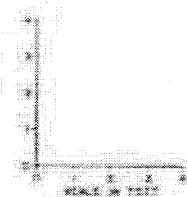
PERRY NUCLEAR POWER PLANT

Geologic Structure Map,
Intake & Discharge Tunnel Faults

Figure 2D-27



- EXPLANATION**
- FAULT ZONE WITH STRIKE-SLIP MOVEMENT
 - FAULT ZONE WITH NORMAL MOVEMENT
 - FAULT ZONE WITH THRUST MOVEMENT
 - JOINT/FRACTURE PATTERN
 - SILTSTONE
 - SILTSTONE LAYER, BEDDING PLANE CONTINUOUSLY MAPPED BY SILTSTONE LITHOLOGY (KINEMATIC GUL)
 - SHALE
 - SHALE LAYER, AS LABELED
 - IRONSTONE CONCRETIONS
 - MICRO-CRACK SAMPLE LOCATION NUMBER GIVEN



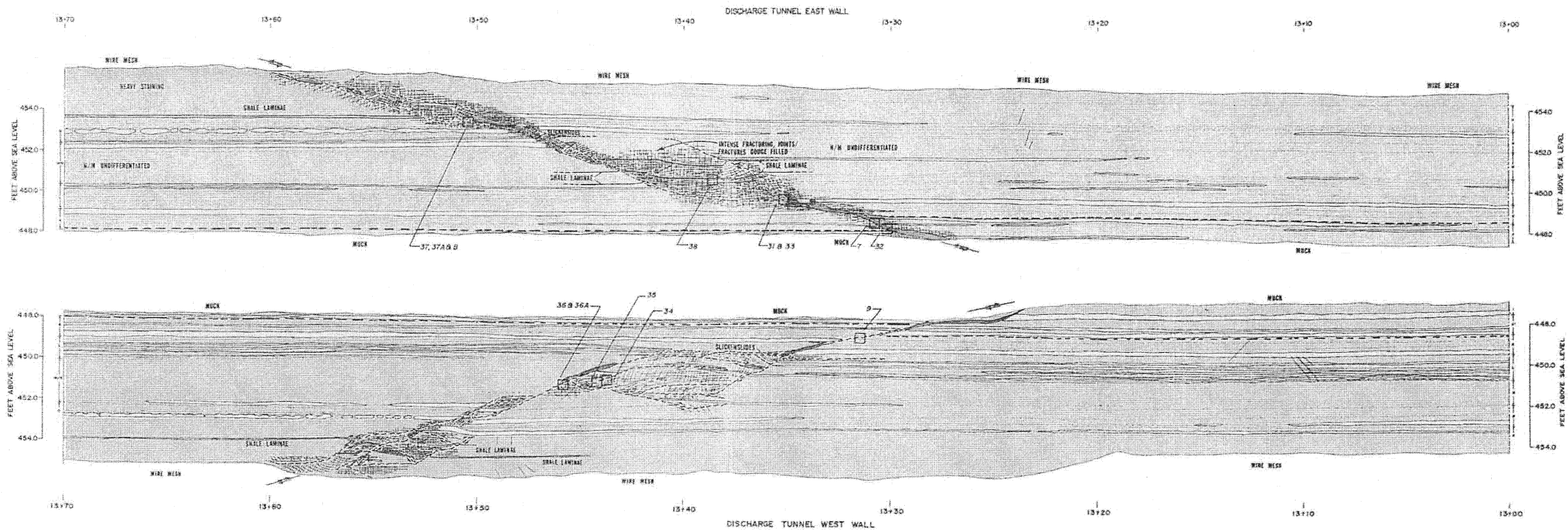
(Rev. 12 1/03)



PERRY NUCLEAR POWER PLANT

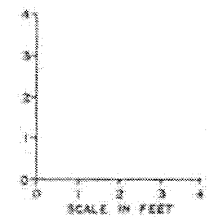
Intake Tunnel Wall Maps,
Stations 10+25-10+35

Figure 2B-18

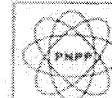


EXPLANATION

- 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)

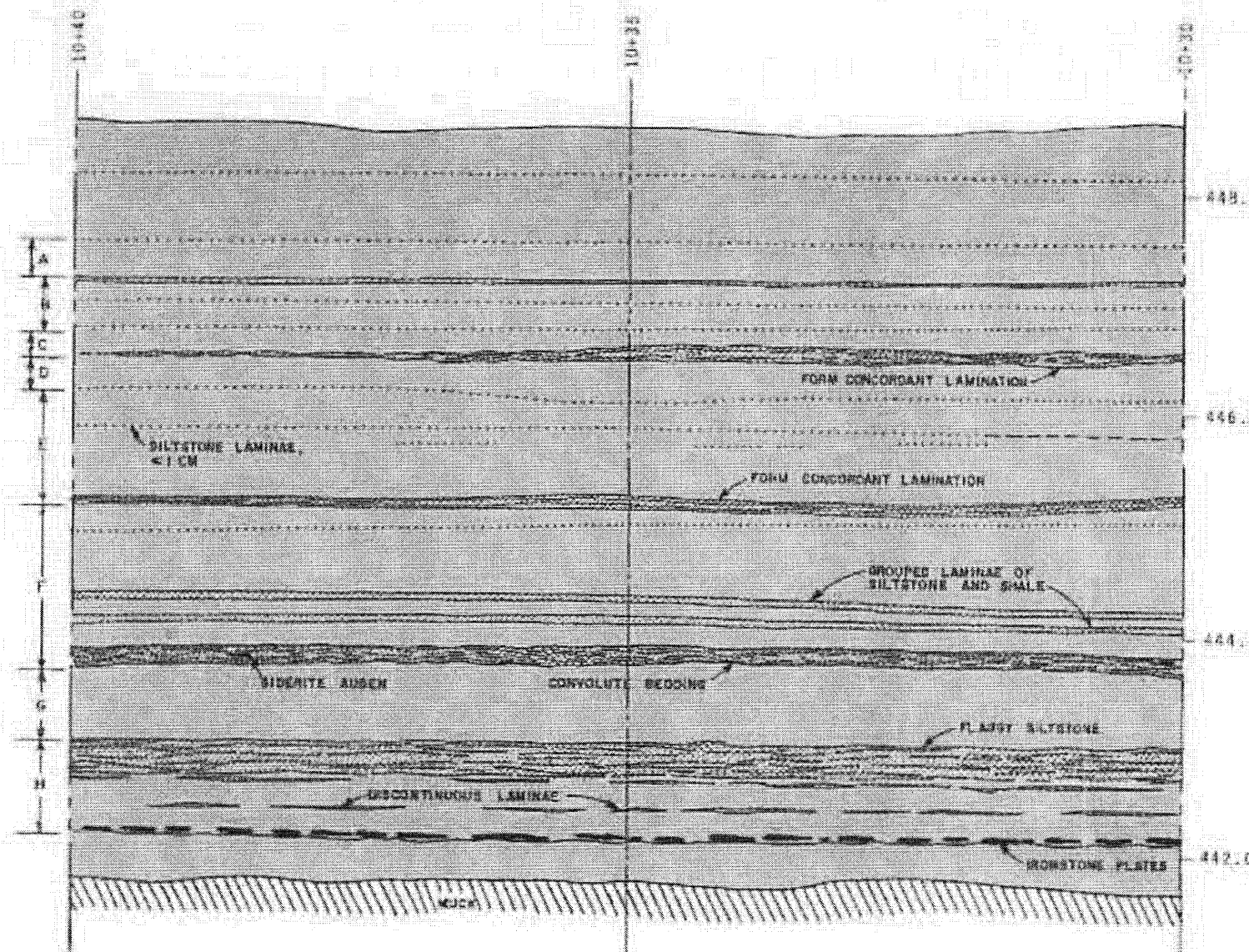


PERRY NUCLEAR POWER PLANT

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

Figure 2D-29

INTAKE TUNNEL EAST WALL



EXPLANATION

SILTSTONE.

SILTSTONE LAMINA, DASHED WHERE BEDDING PLANE CONTINUOUSLY MAPPED BUT SILTSTONE LITHOLOGY PINCHED OUT.

SHALE.

IRONSTONE CONCRETIONS.

- UNIT A: SILT SHALE: DARK GRAY, WITH MEDIUM TO COARSE BEDDING, WITH LIGHT GRAY SHALES OF LATERAL POSITION. CLAY, SAND, AND SILTSTONE OF 10-15 IN. THICKNESS.
- UNIT B: SILT SHALE: DARK GRAY, WITH MEDIUM TO COARSE BEDDING, WITH LIGHT GRAY SHALES OF LATERAL POSITION. CLAY, SAND, AND SILTSTONE OF 10-15 IN. THICKNESS.
- UNIT C: SILT SHALE AND SILTSTONE: DARK GRAY, WITH MEDIUM TO COARSE BEDDING, WITH LIGHT GRAY SHALES OF LATERAL POSITION. CLAY, SAND, AND SILTSTONE OF 10-15 IN. THICKNESS.
- UNIT D: SILT SHALE: DARK GRAY, WITH MEDIUM TO COARSE BEDDING, WITH LIGHT GRAY SHALES OF LATERAL POSITION. CLAY, SAND, AND SILTSTONE OF 10-15 IN. THICKNESS.
- UNIT E: SILT SHALE AND SILTSTONE: DARK GRAY, WITH MEDIUM TO COARSE BEDDING, WITH LIGHT GRAY SHALES OF LATERAL POSITION. CLAY, SAND, AND SILTSTONE OF 10-15 IN. THICKNESS.
- UNIT F: SILT SHALE AND SILTSTONE: DARK GRAY, WITH MEDIUM TO COARSE BEDDING, WITH LIGHT GRAY SHALES OF LATERAL POSITION. CLAY, SAND, AND SILTSTONE OF 10-15 IN. THICKNESS.
- UNIT G: SILT SHALE: DARK GRAY, WITH MEDIUM TO COARSE BEDDING, WITH LIGHT GRAY SHALES OF LATERAL POSITION. CLAY, SAND, AND SILTSTONE OF 10-15 IN. THICKNESS.
- UNIT H: SILT SHALE: DARK GRAY, WITH MEDIUM TO COARSE BEDDING, WITH LIGHT GRAY SHALES OF LATERAL POSITION. CLAY, SAND, AND SILTSTONE OF 10-15 IN. THICKNESS.

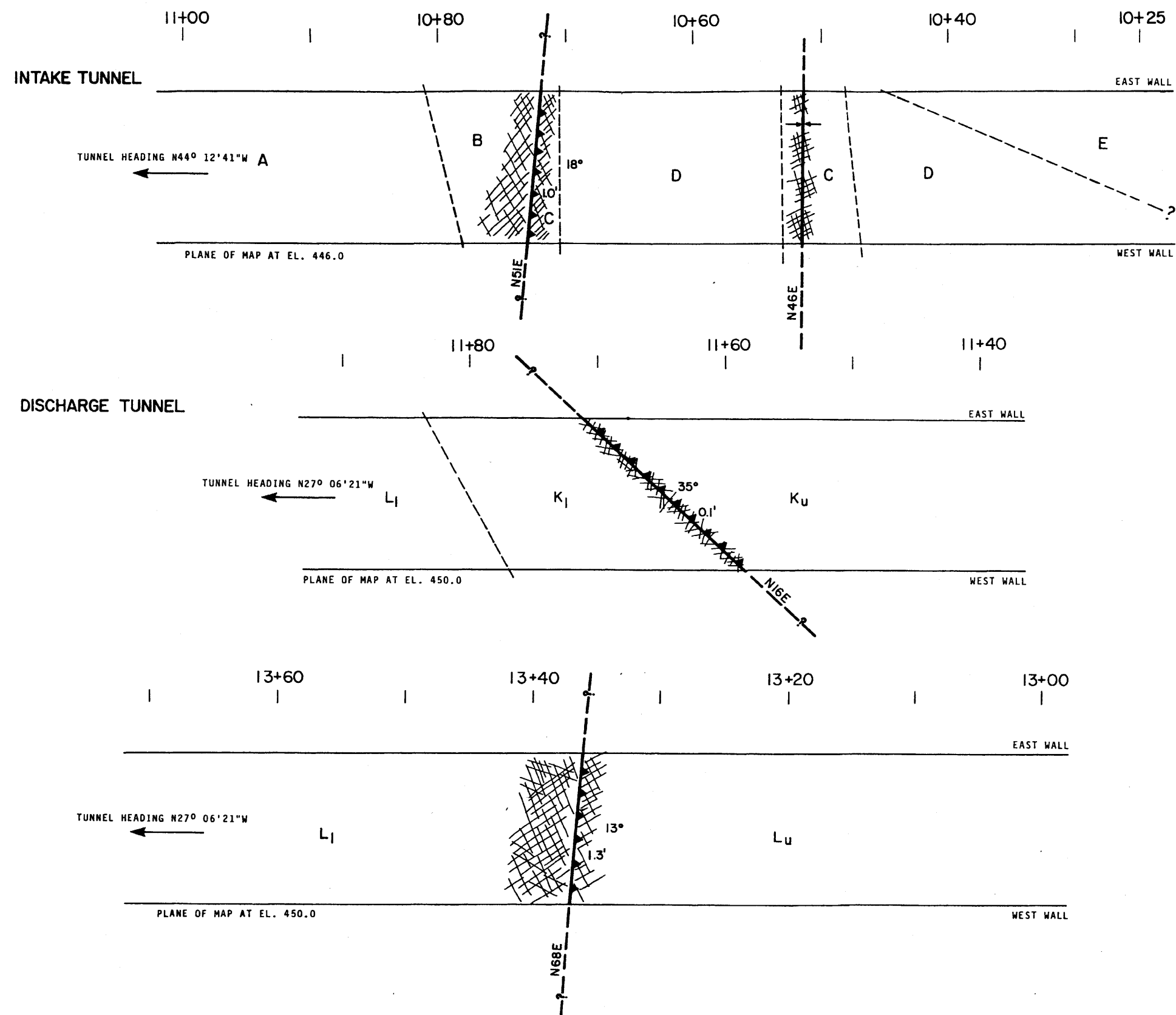
(Rev. 12 1/03)



PERRY NUCLEAR POWER PLANT

Discharge Tunnel Wall Maps,
Station 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

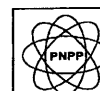
THRUST FAULT SHOWING DISPLACEMENT AND DIP
STRATIGRAPHIC UNIT CONTACT.

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.

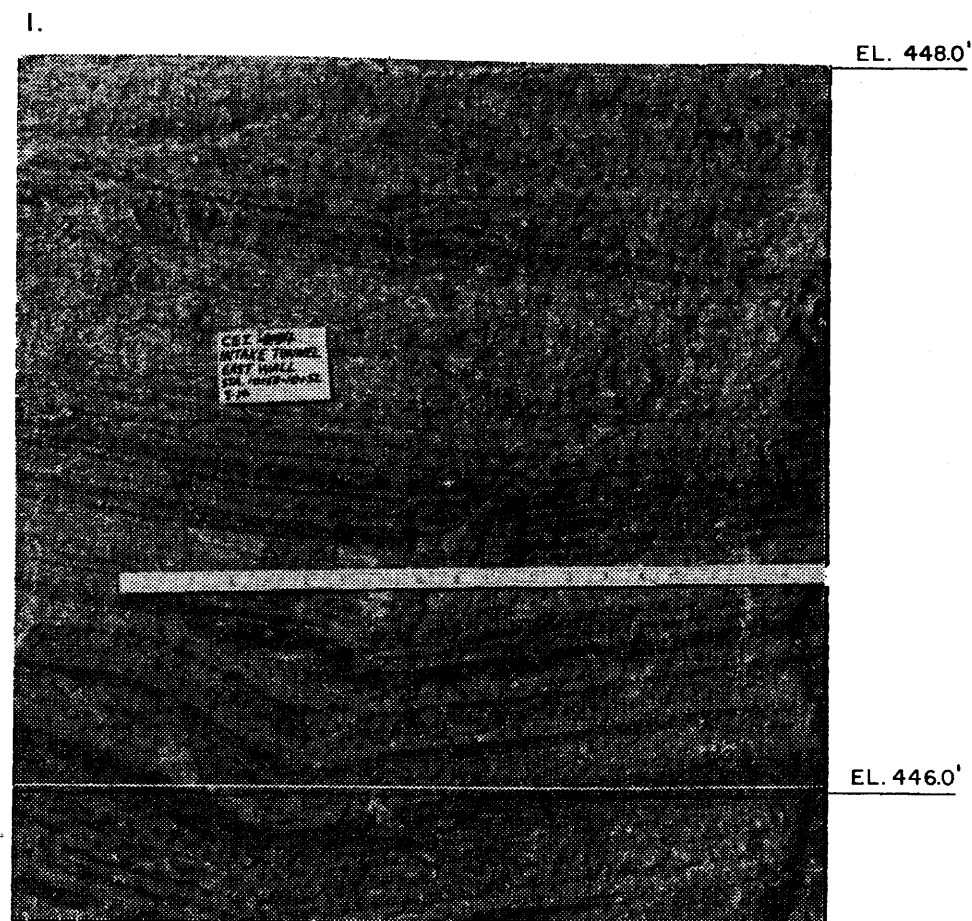
(Rev. 12 1/03)



PERRY NUCLEAR POWER PLANT

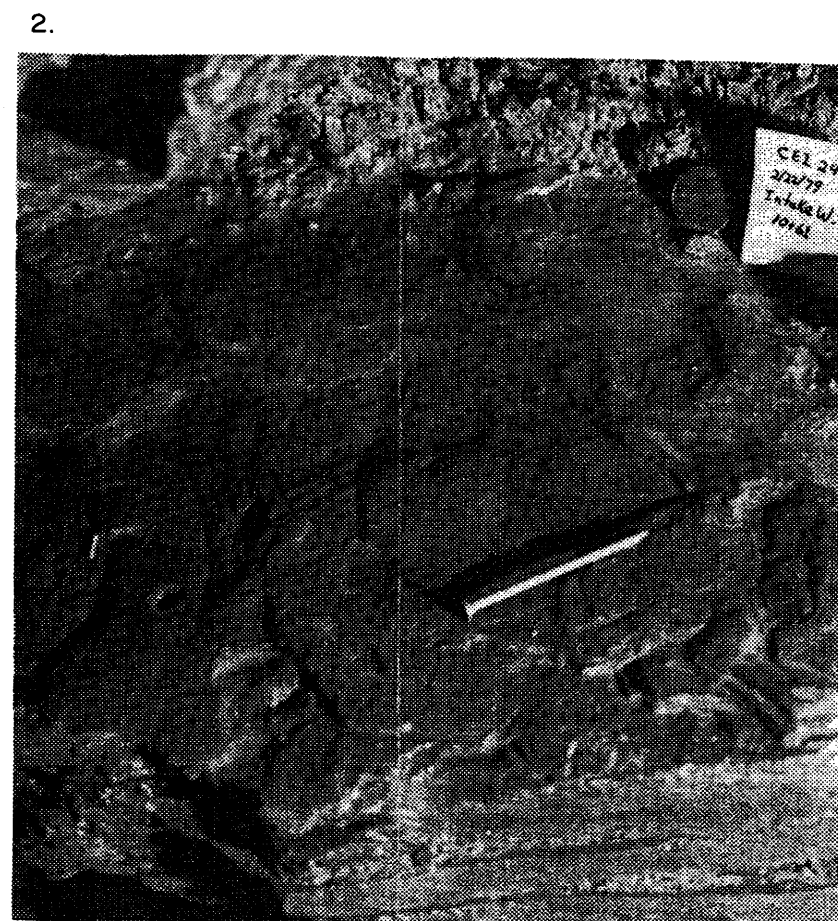
Geologic Maps,
Intake & Discharge Tunnels

Figure 2D-31



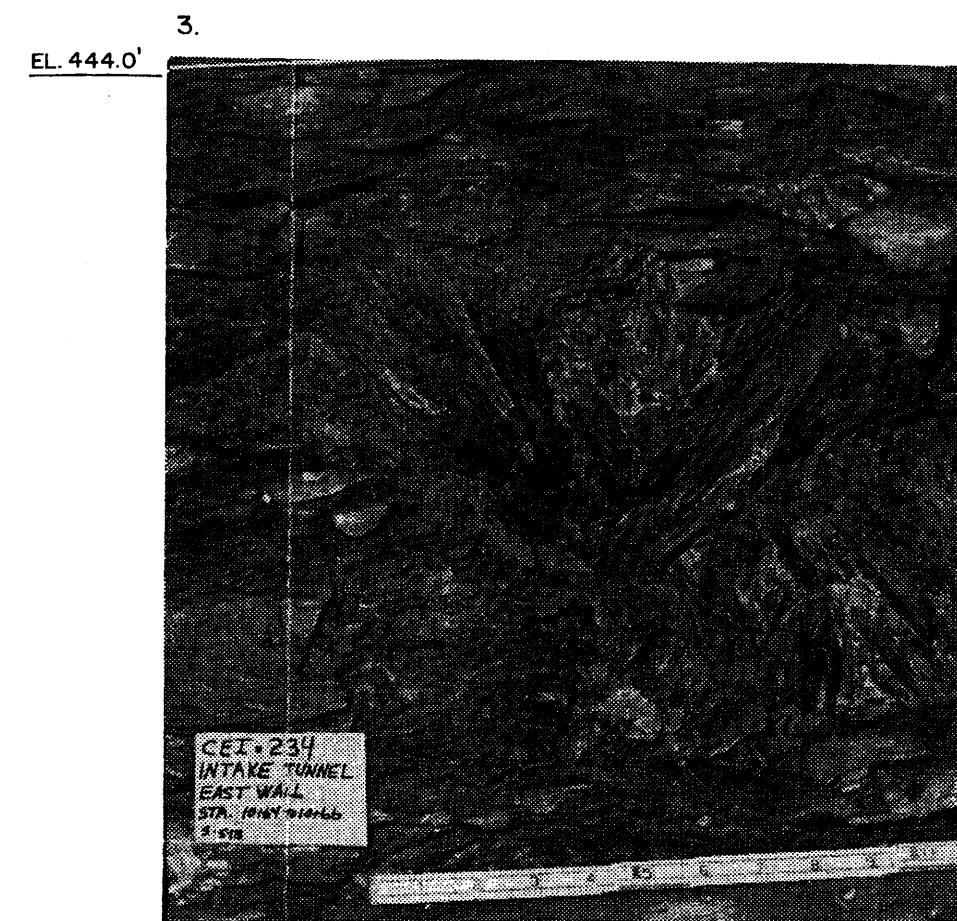
↑
10+51

ASYMMETRIC 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.

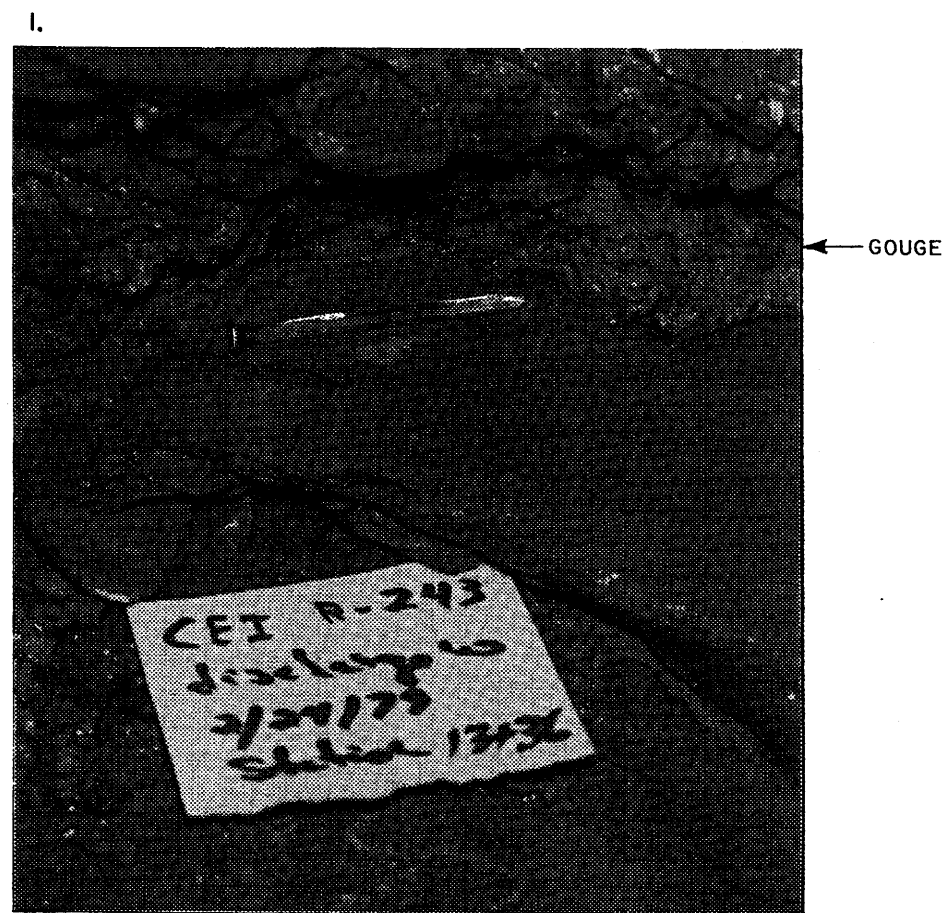
(Rev. 12 1/03)



PERRY NUCLEAR POWER PLANT

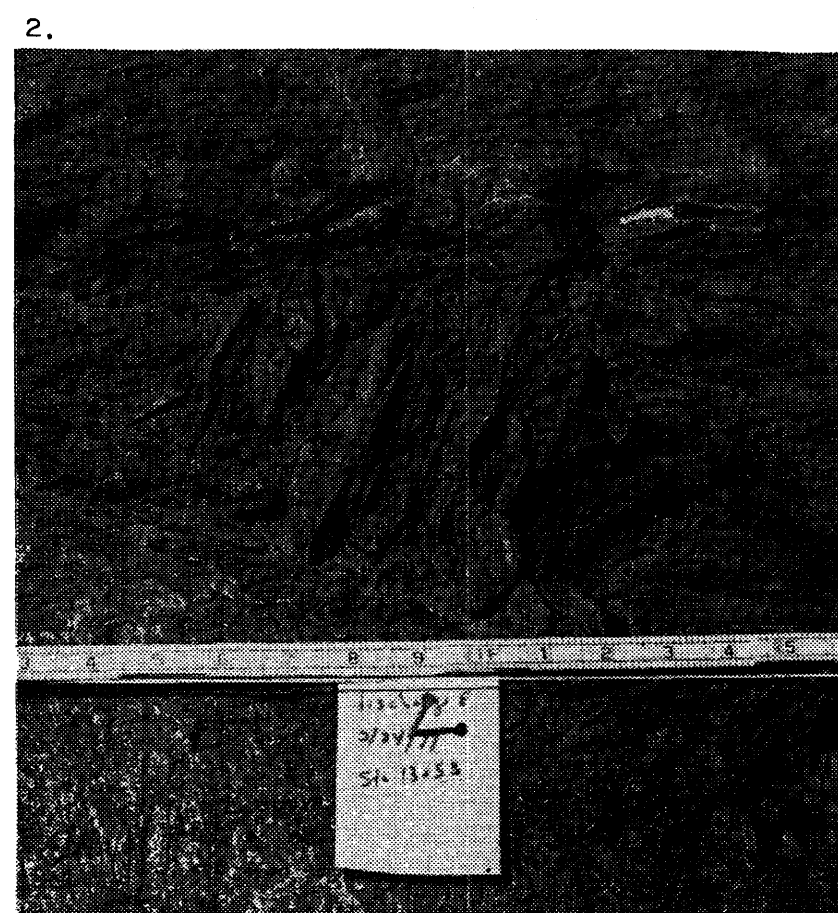
Photographs, Structural
Details, Intake Tunnel

Figure 2D-32



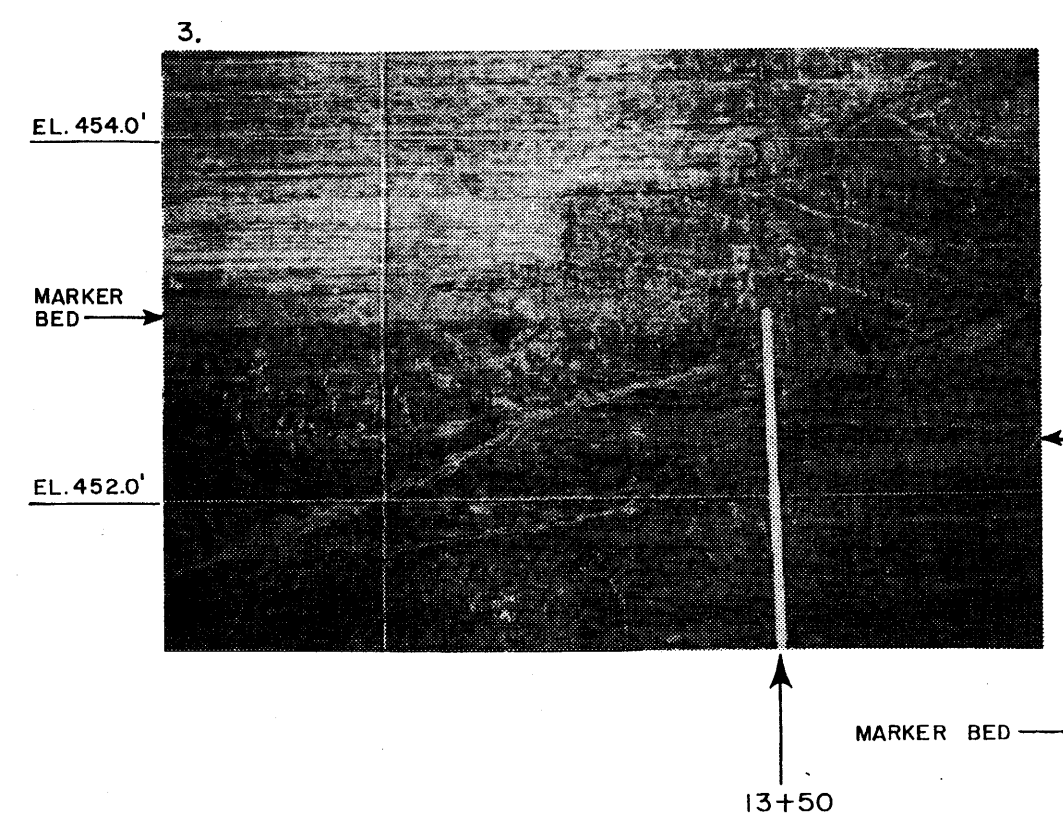
↑
13+36

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.

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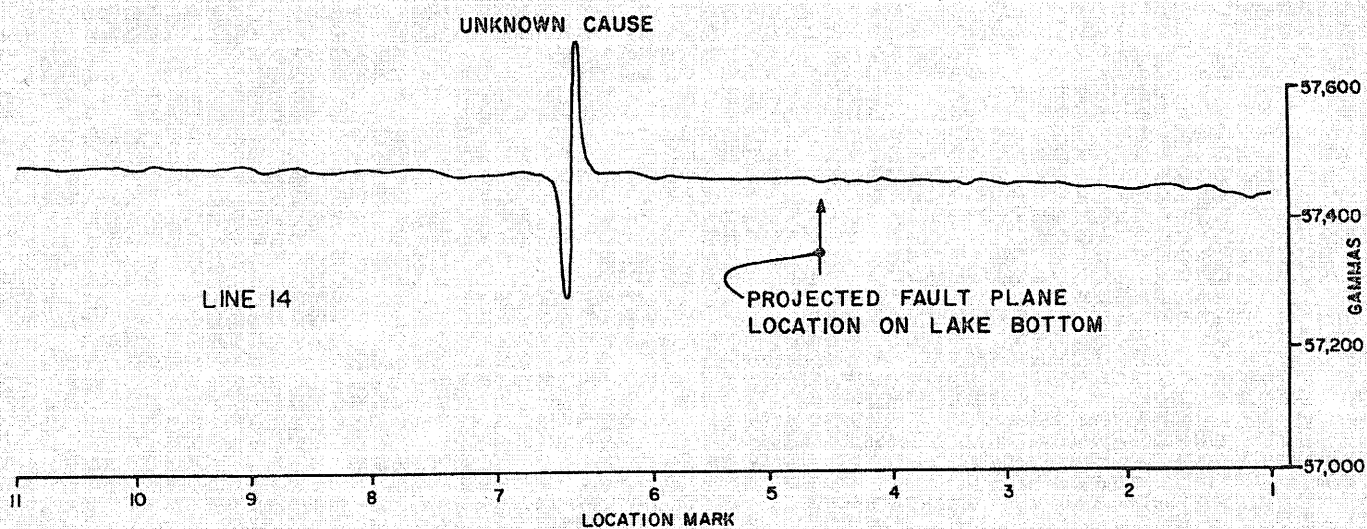


PERRY NUCLEAR POWER PLANT

Photographs, Structural
Details, Discharge Tunnel

Figure 2D-33

NOTE: MARK SEPARATION APPROXIMATELY 1000'



(Rev. 12 1/03)

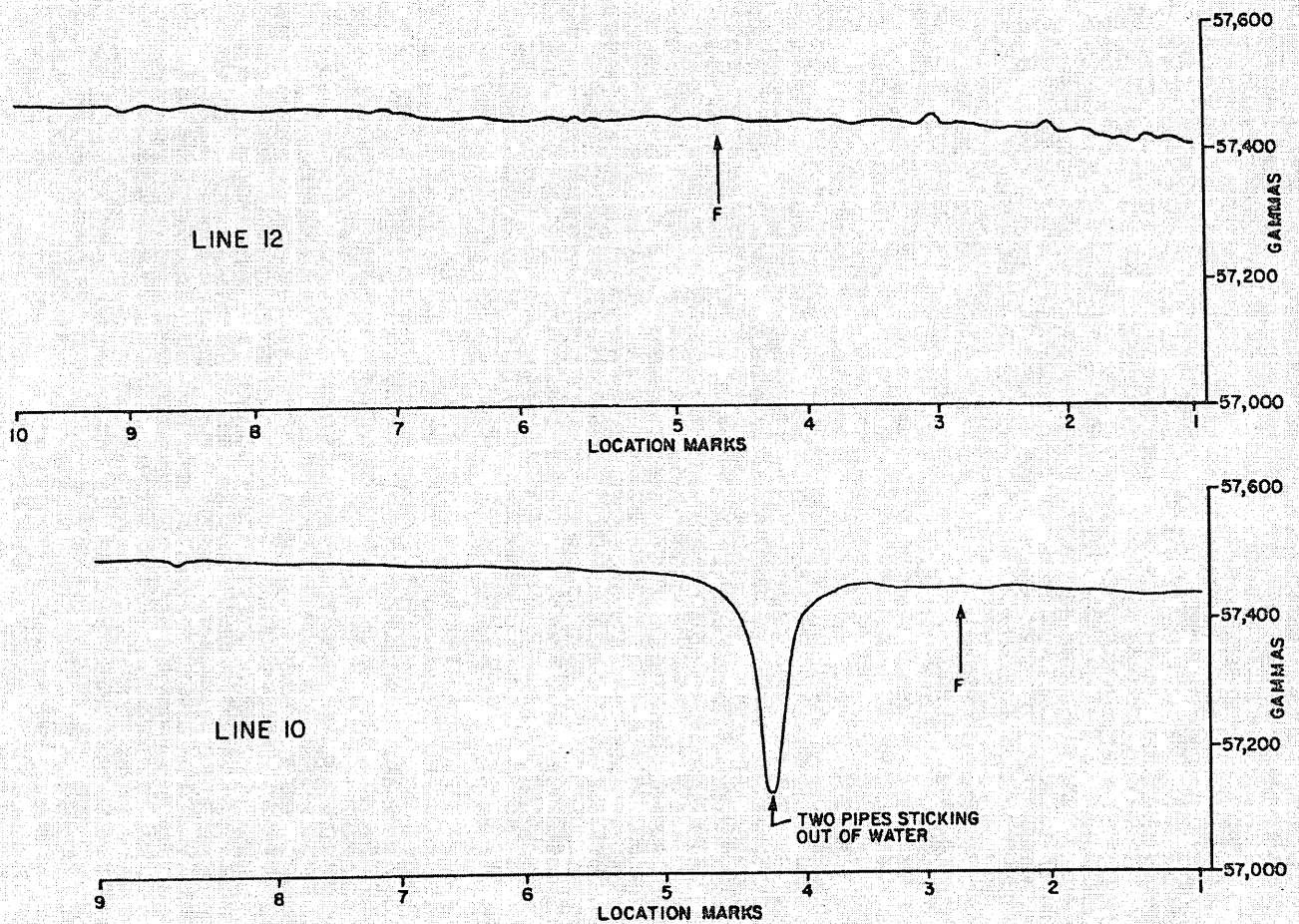


PERRY NUCLEAR POWER PLANT

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)

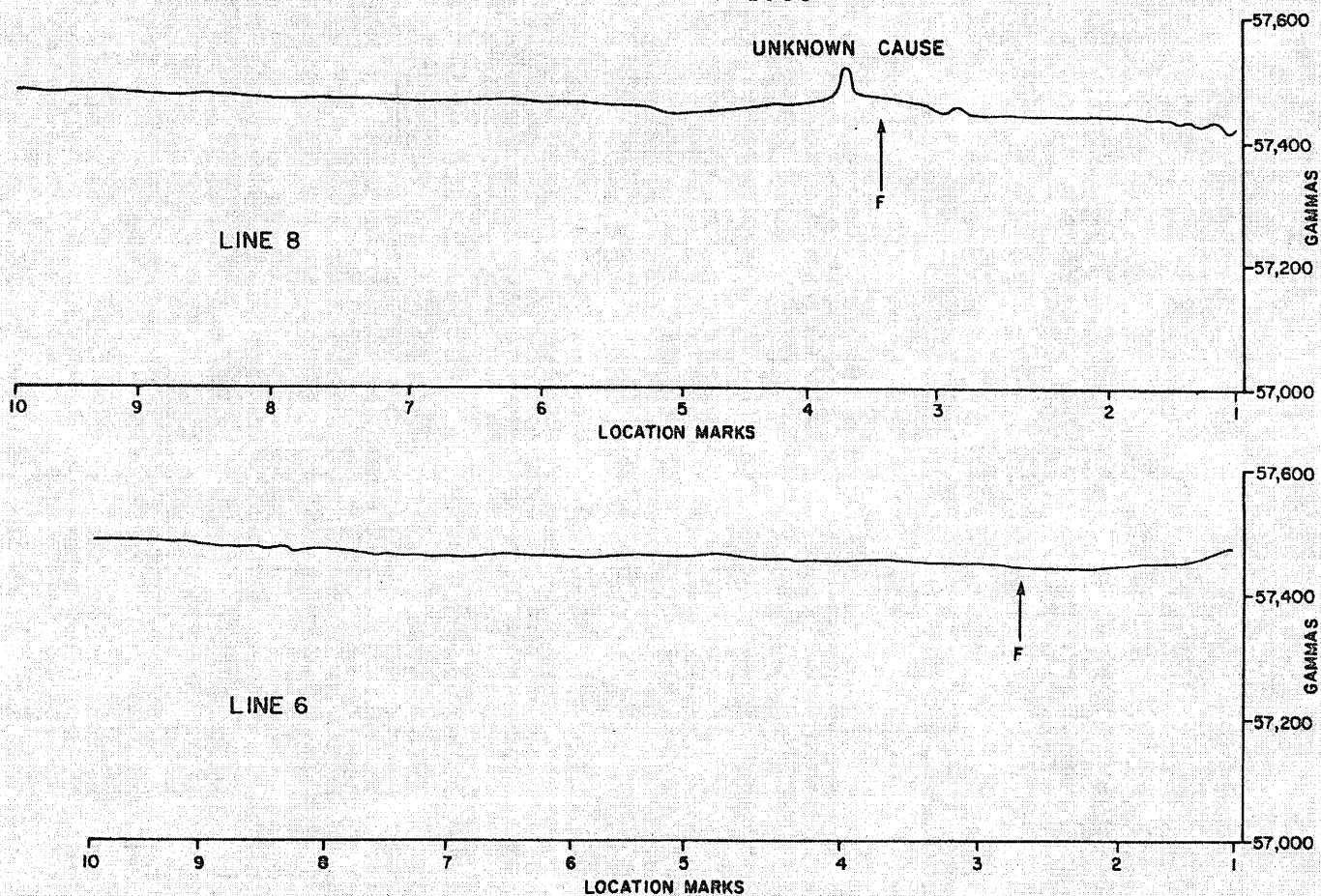


PERRY NUCLEAR POWER PLANT

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)

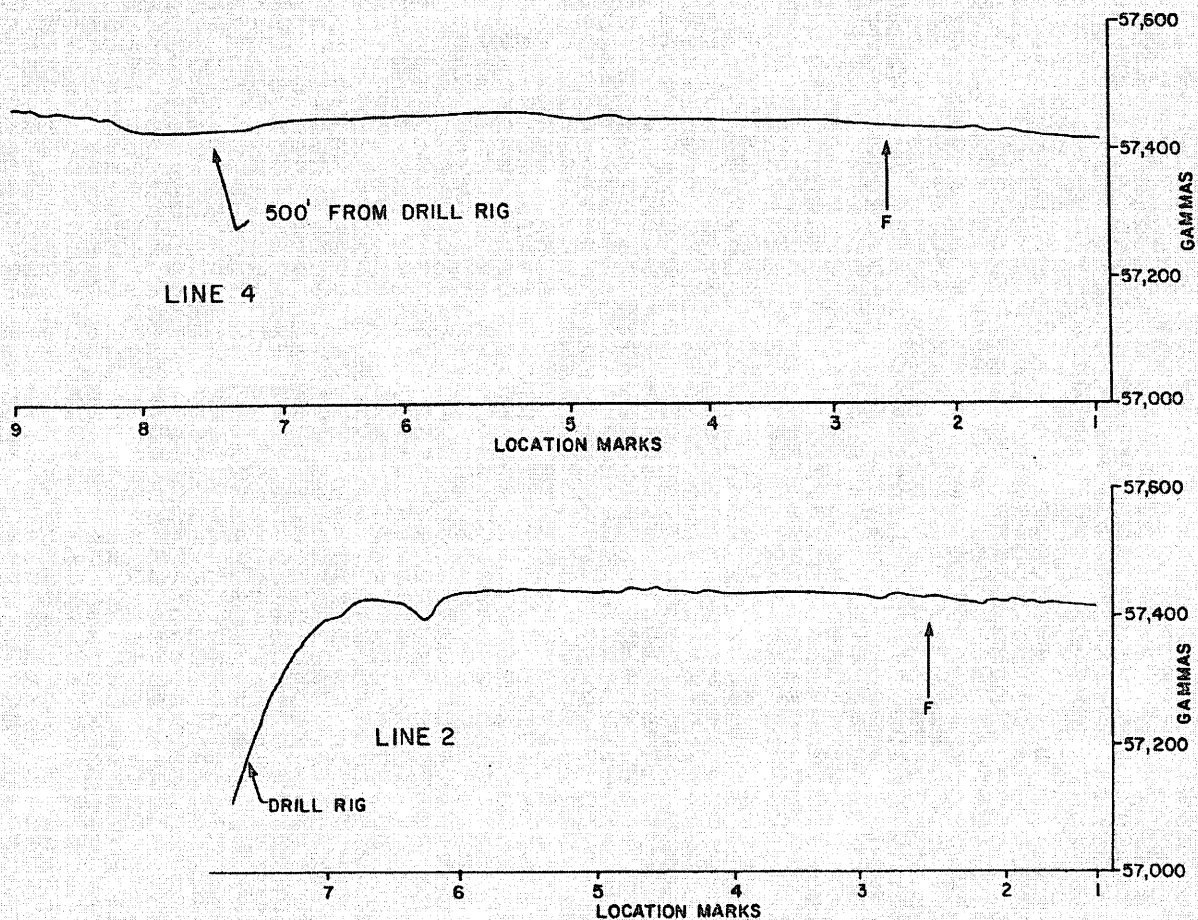


PERRY NUCLEAR POWER PLANT

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)

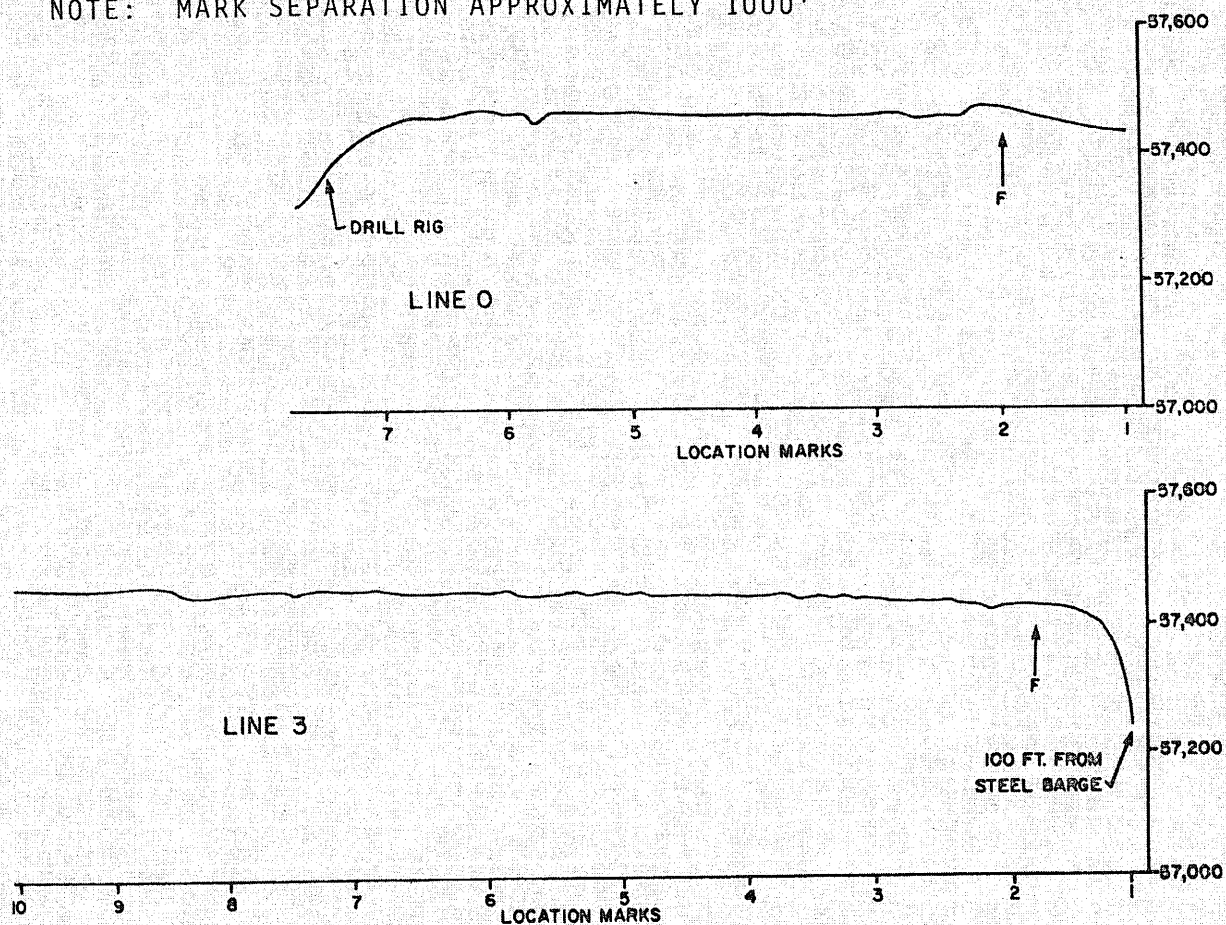


PERRY NUCLEAR POWER PLANT

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)

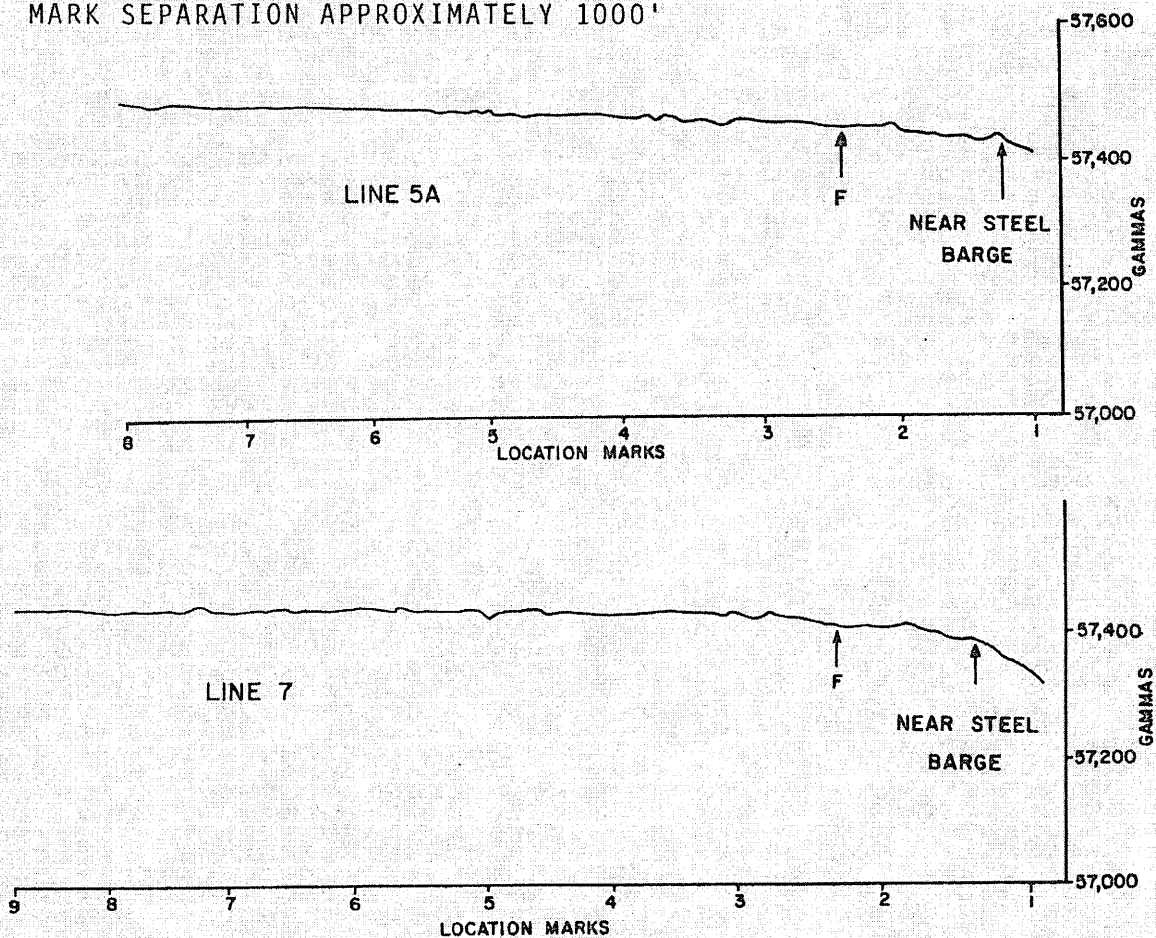


PERRY NUCLEAR POWER PLANT

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)

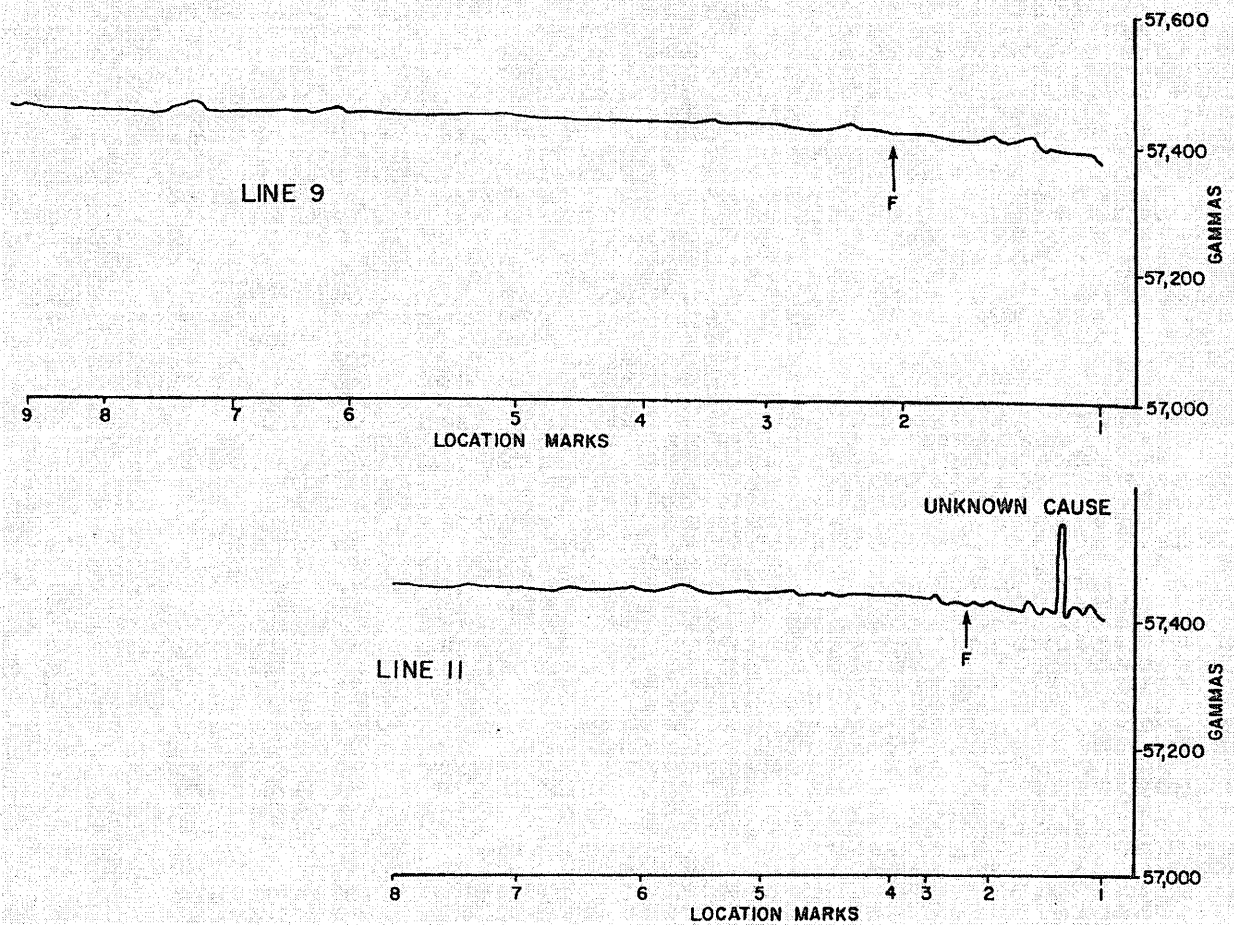


PERRY NUCLEAR POWER PLANT

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)

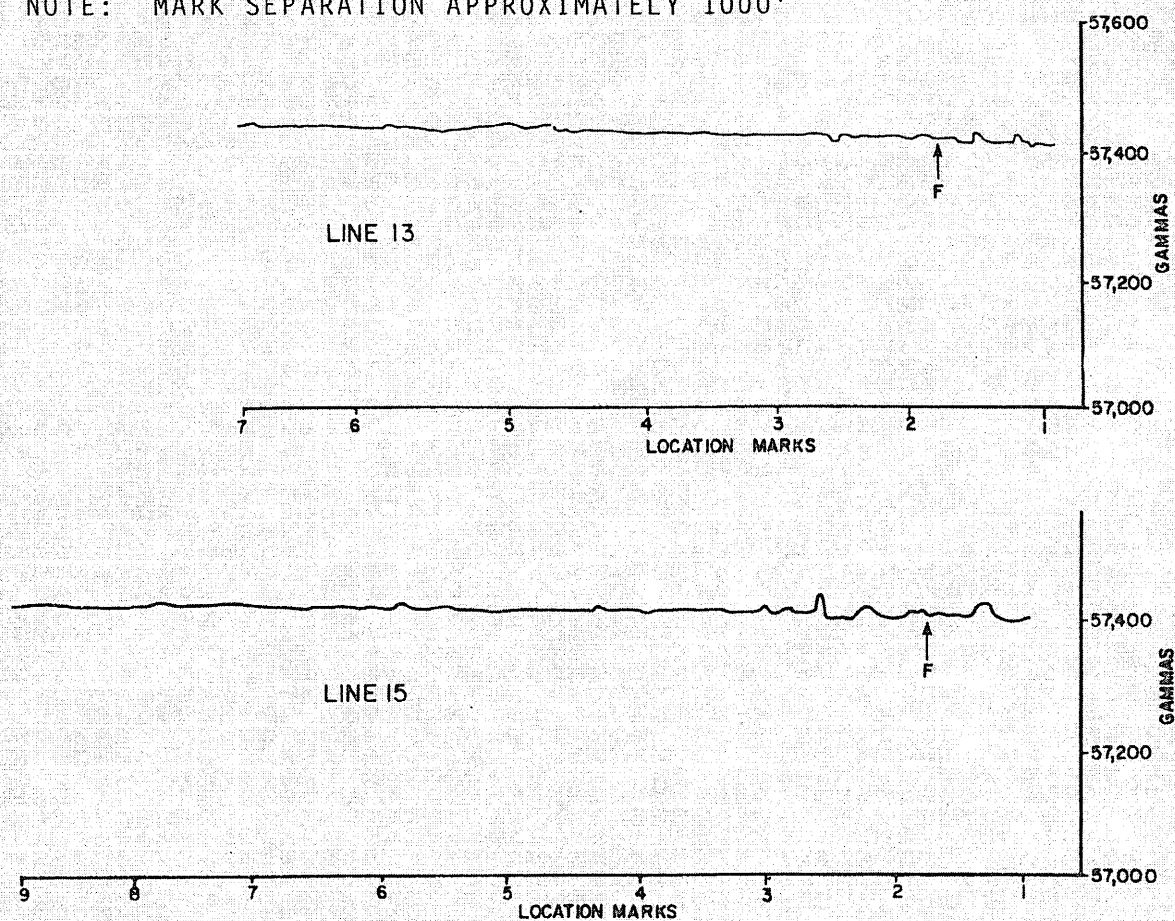


PERRY NUCLEAR POWER PLANT

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)

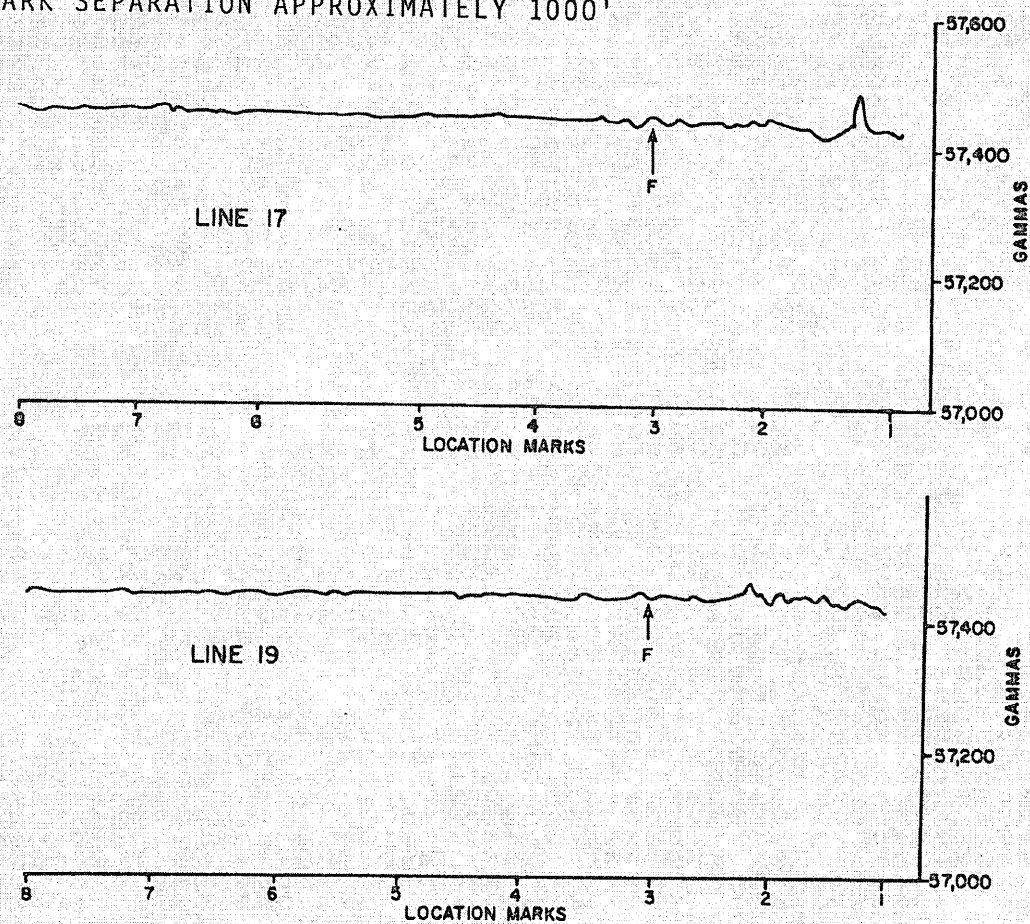


PERRY NUCLEAR POWER PLANT

Offshore for Shipborne
Magnetic Profiles 13 and 15

Figure 2D-41

NOTE: MARK SEPARATION APPROXIMATELY 1000'



EXPLANATION

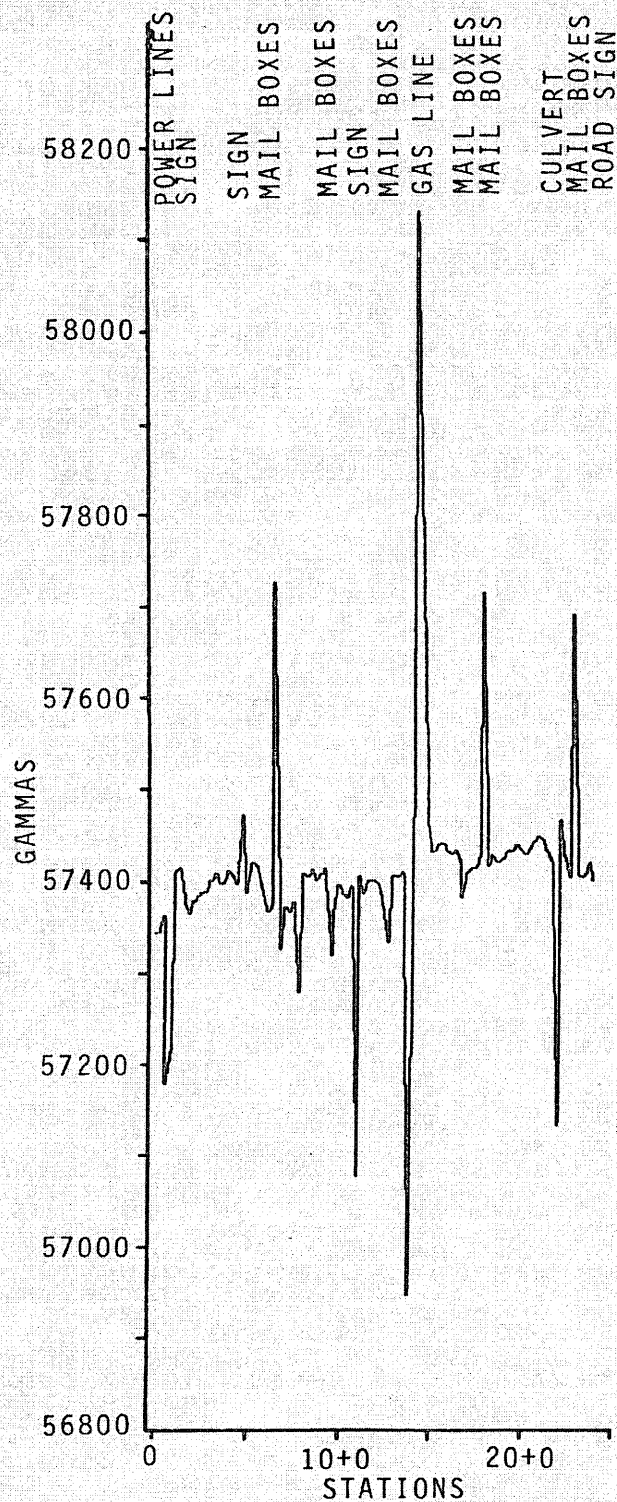
↑ PROJECTED FAULT LOCATION ON LAKE BOTTOM. (Rev. 12 1/03)



PERRY NUCLEAR POWER PLANT

Offshore for Shipborne
Magnetic Profiles 17 and 19

Figure 2D-42



(Rev. 12 1/03)

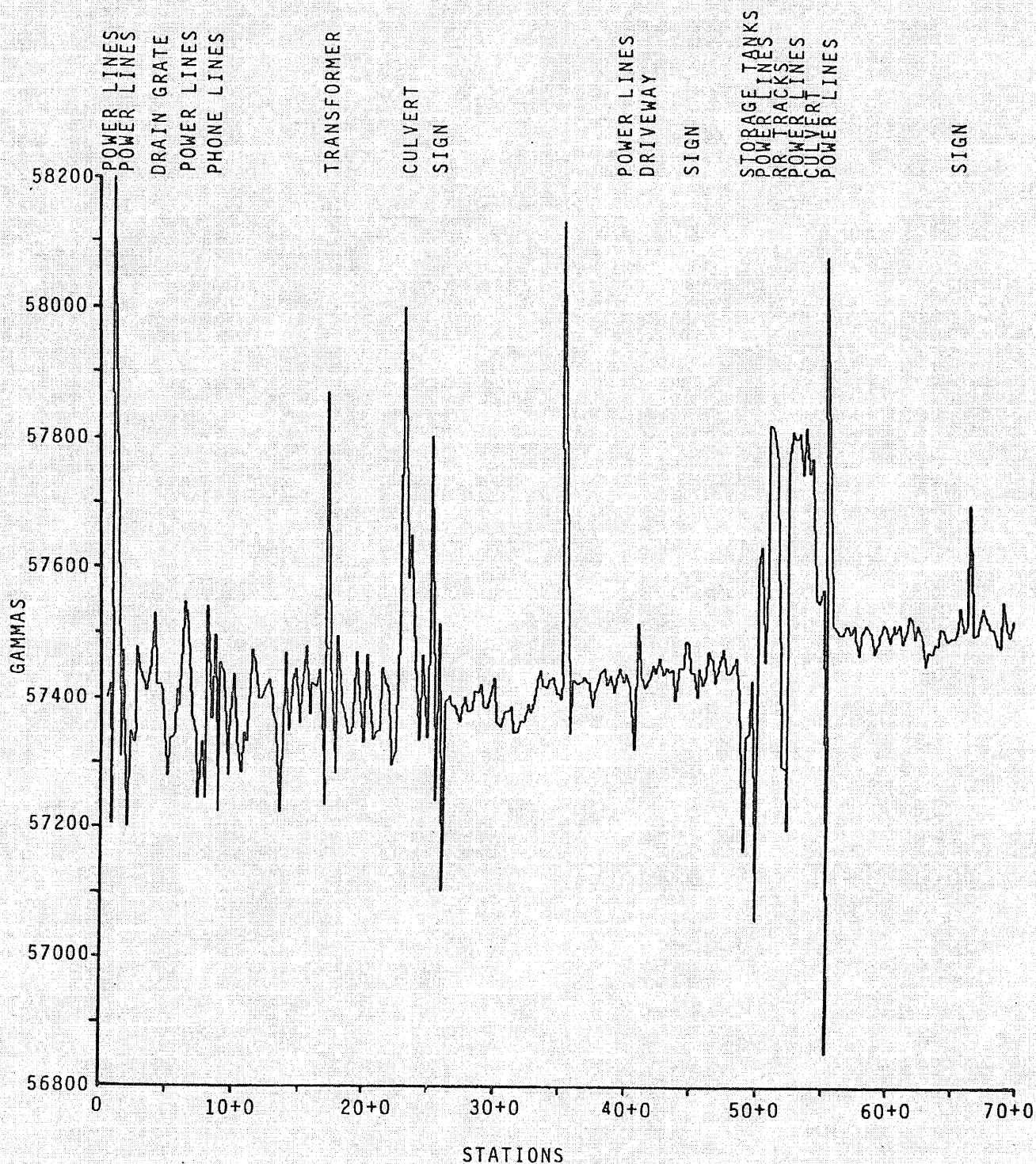


PERRY NUCLEAR POWER PLANT

1"=1000'

Onshore for Land
Magnetic Profile 1S-A

Figure 2D-43



1"=1000'

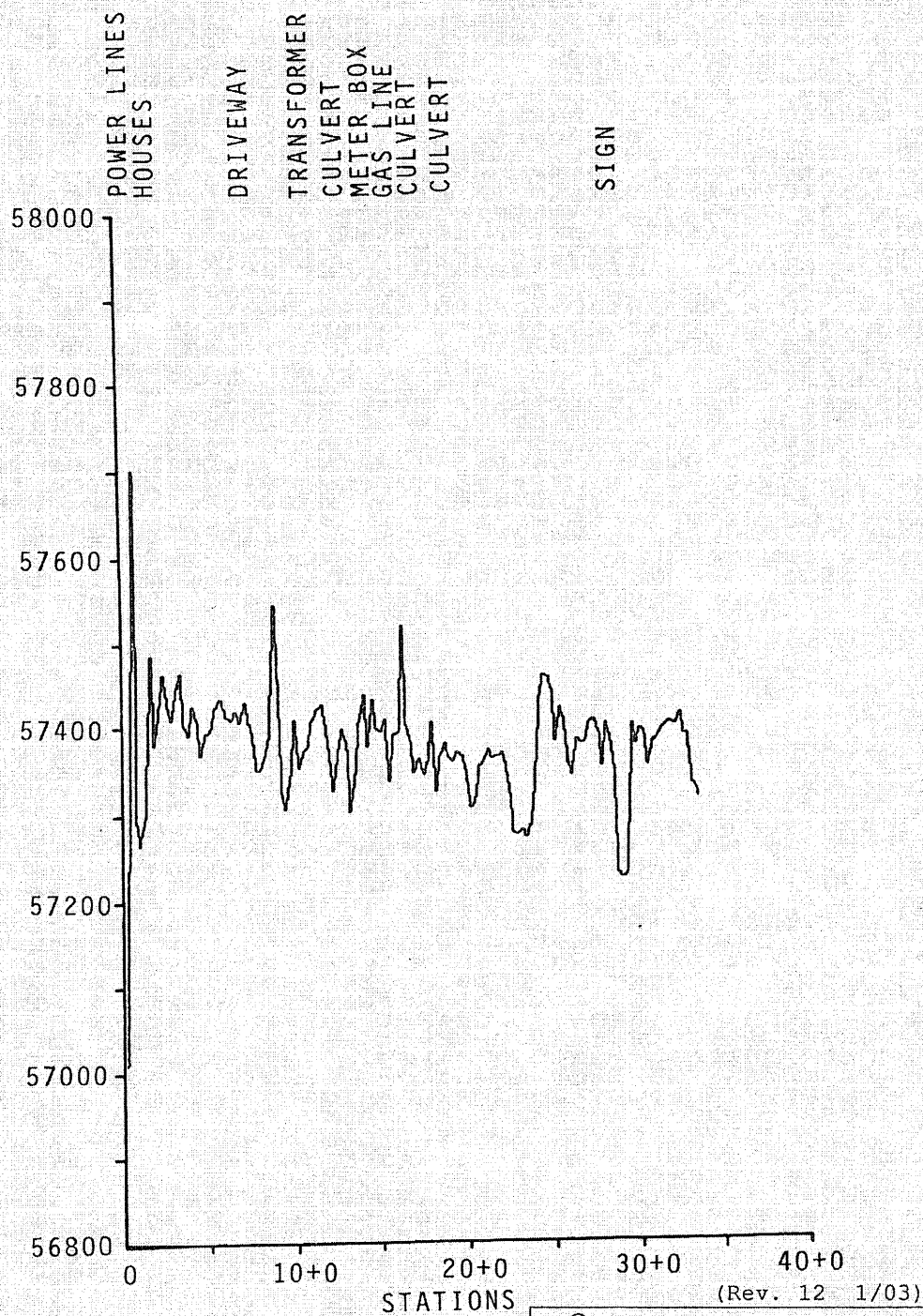
(Rev. 12 1/03)



PERRY NUCLEAR POWER PLANT

Onshore for Land
Magnetic Profile 1S

Figure 2D-44



STATIONS

(Rev. 12 1/03)

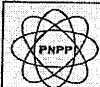
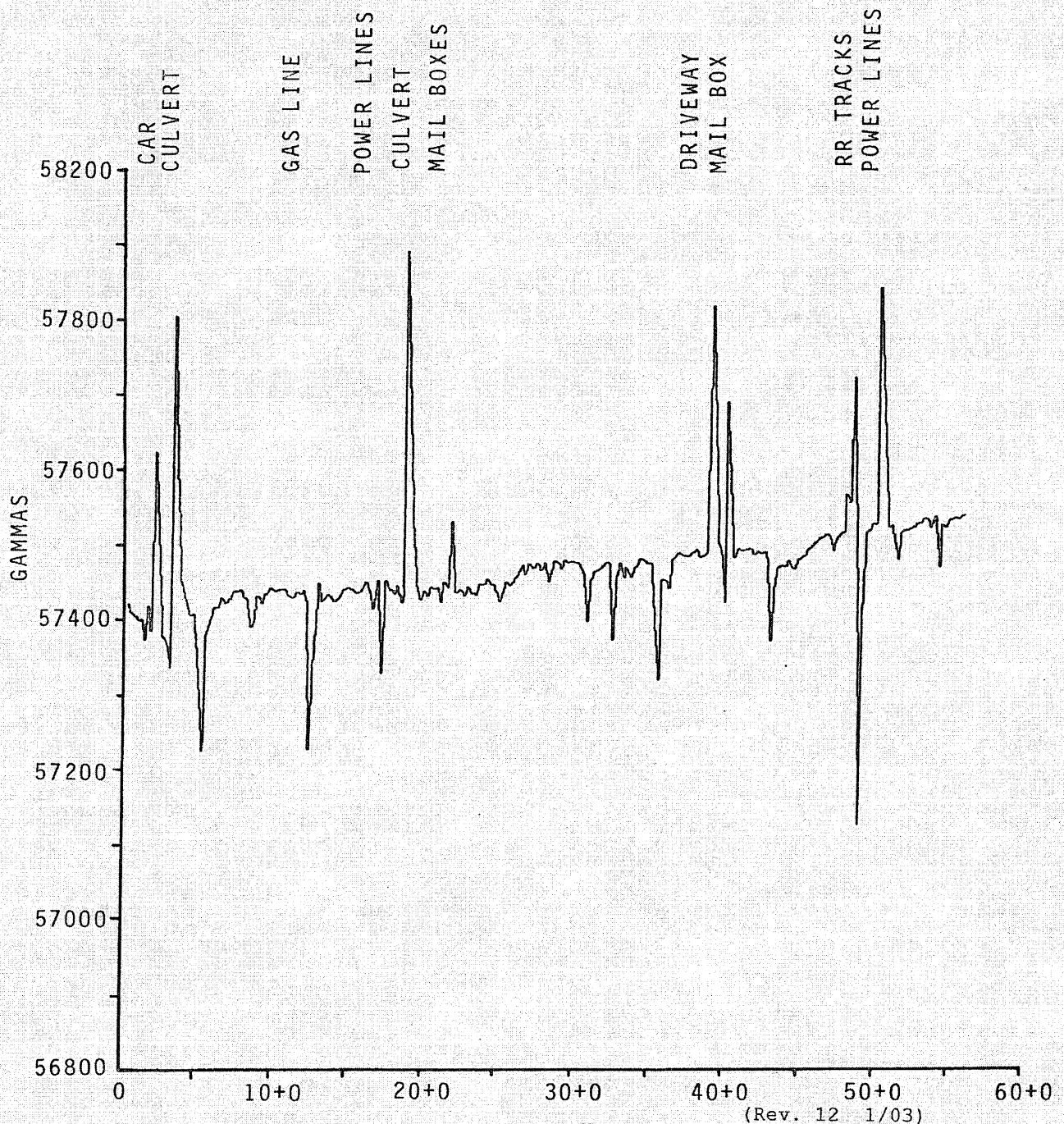
1"=1000'



PERRY NUCLEAR POWER PLANT

Onshore for Land
Magnetic Profile 1E

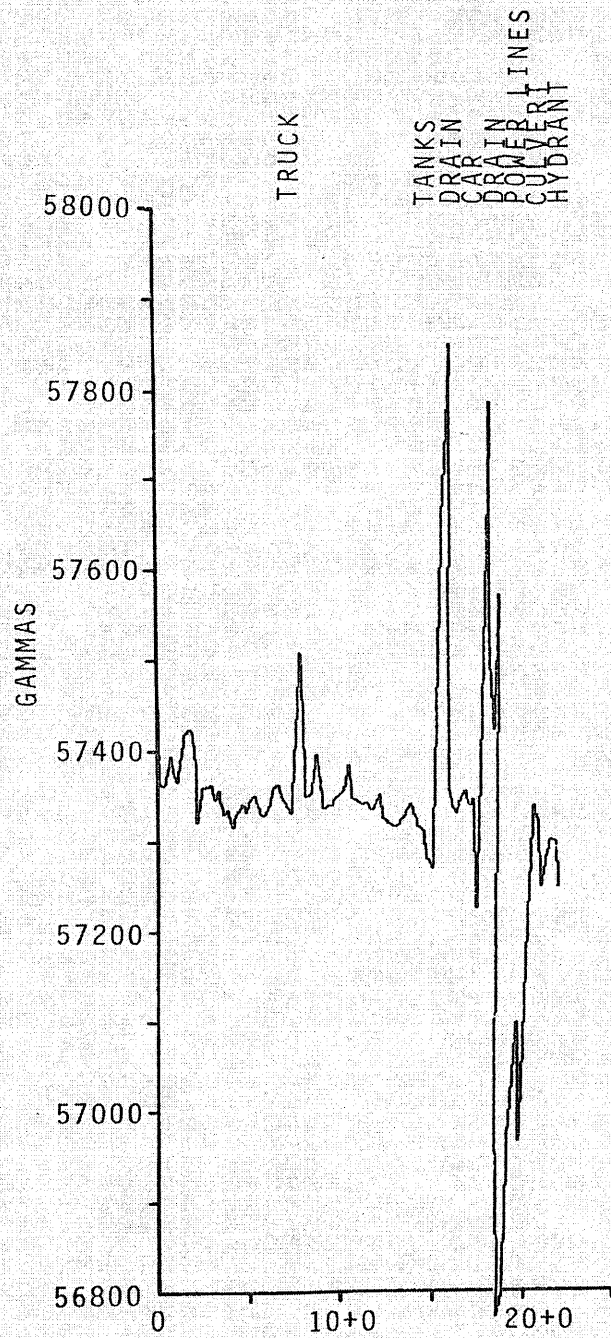
Figure 2D-45



PERRY NUCLEAR POWER PLANT

Onshore for Land
Magnetic Profile 2S

Figure 2D-46



(Rev. 12 1/03)

STATIONS

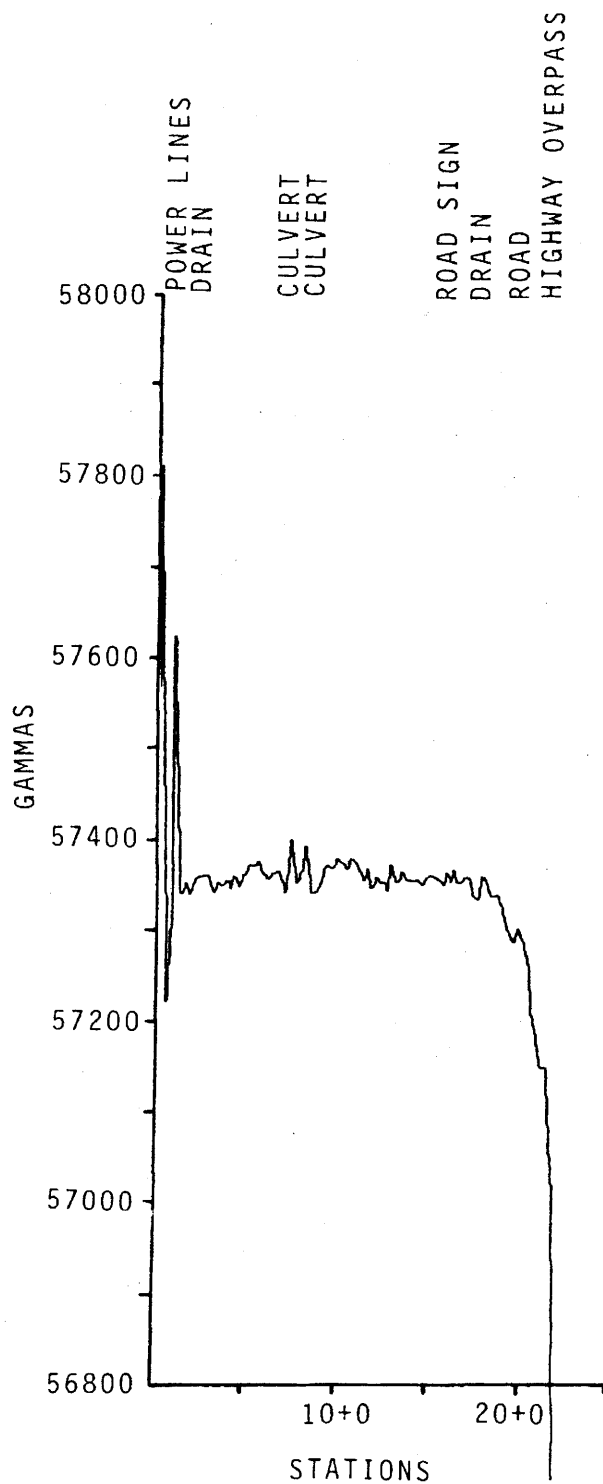


PERRY NUCLEAR POWER PLANT

1"=1000'

Onshore for Land
Magnetic Profile 3S

Figure 2D-47



1"=1000'

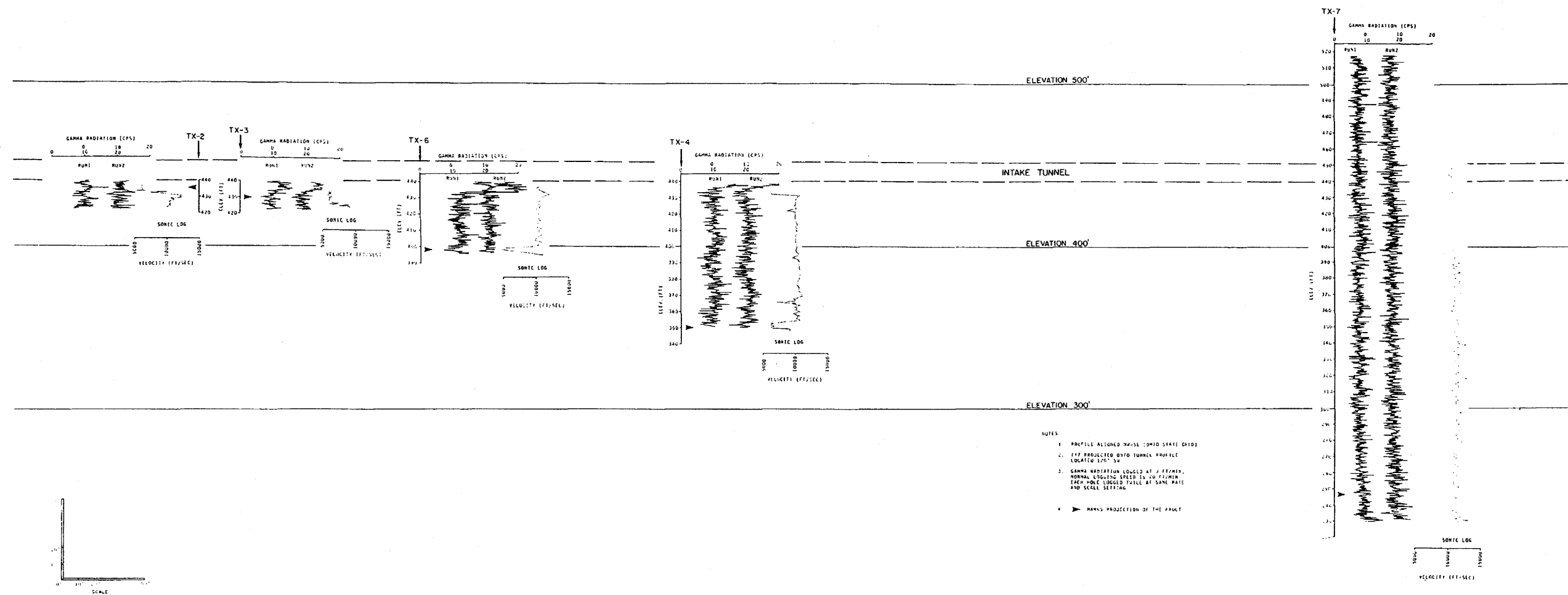
(Rev. 12 1/03)



PERRY NUCLEAR POWER PLANT

Onshore for Land
Magnetic Profile 3S-A

Figure 2D-48



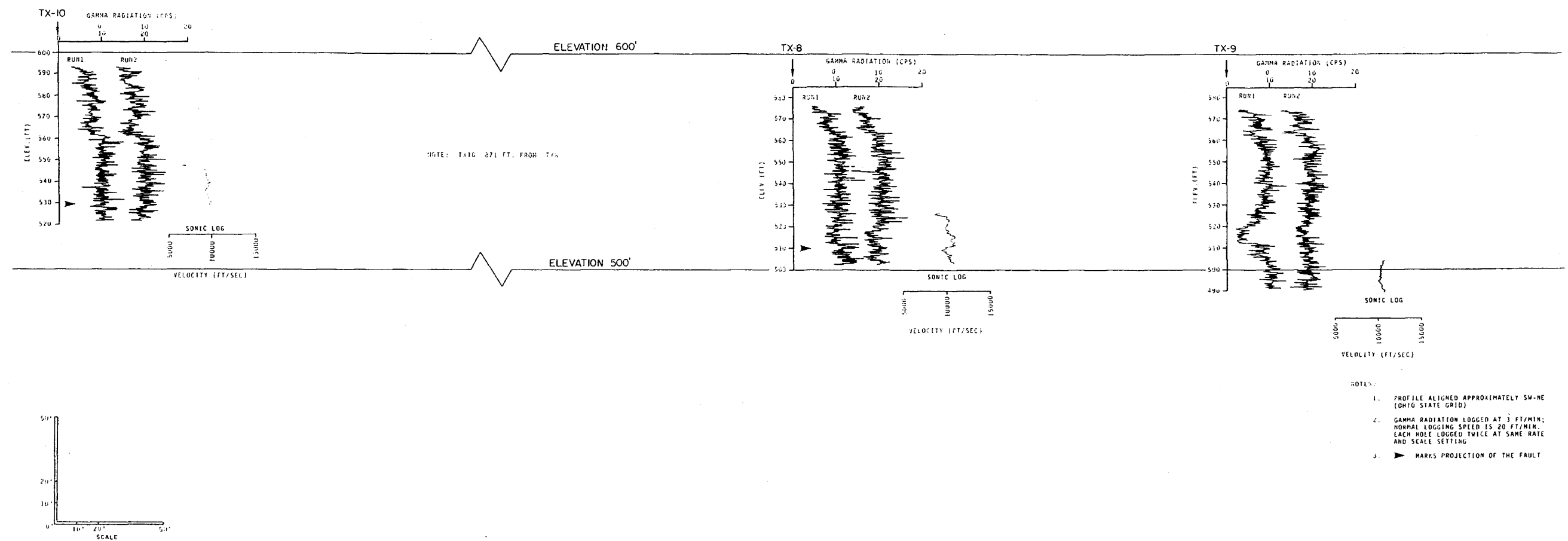
(Rev. 12 1/03)



PERRY NUCLEAR POWER PLANT

Borehole Logs - Gamma/Sonic,
TX Borings 2, 3, 4, 5, 6, 7

Figure 2D-49



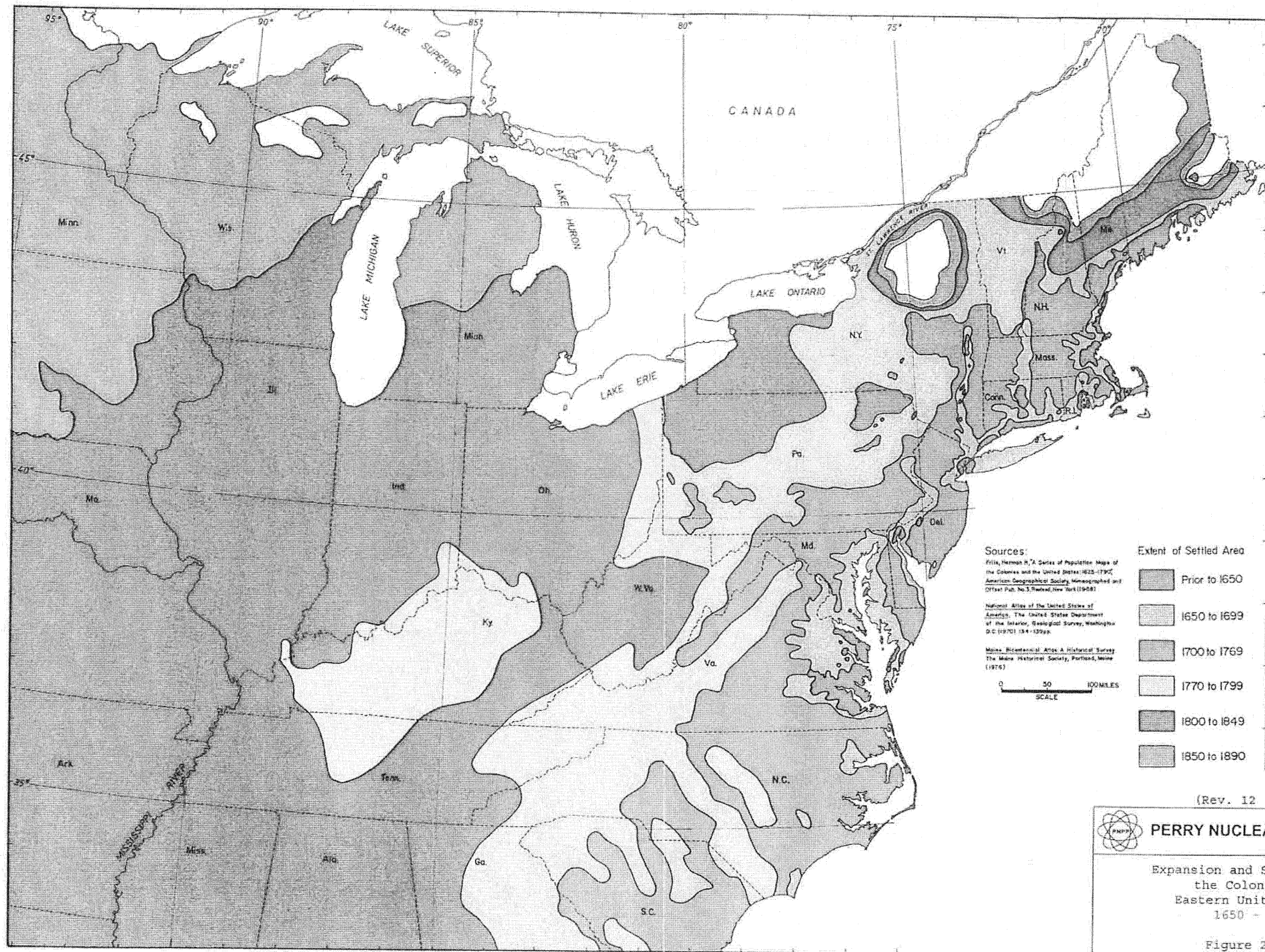
(Rev. 12 1/03)



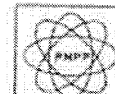
PERRY NUCLEAR POWER PLANT

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

Figure 2D-50



(Rev. 12 1/03)



PERRY NUCLEAR POWER PLANT

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

Figure 2D D-1

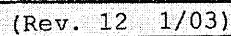


Figure 2D D-2

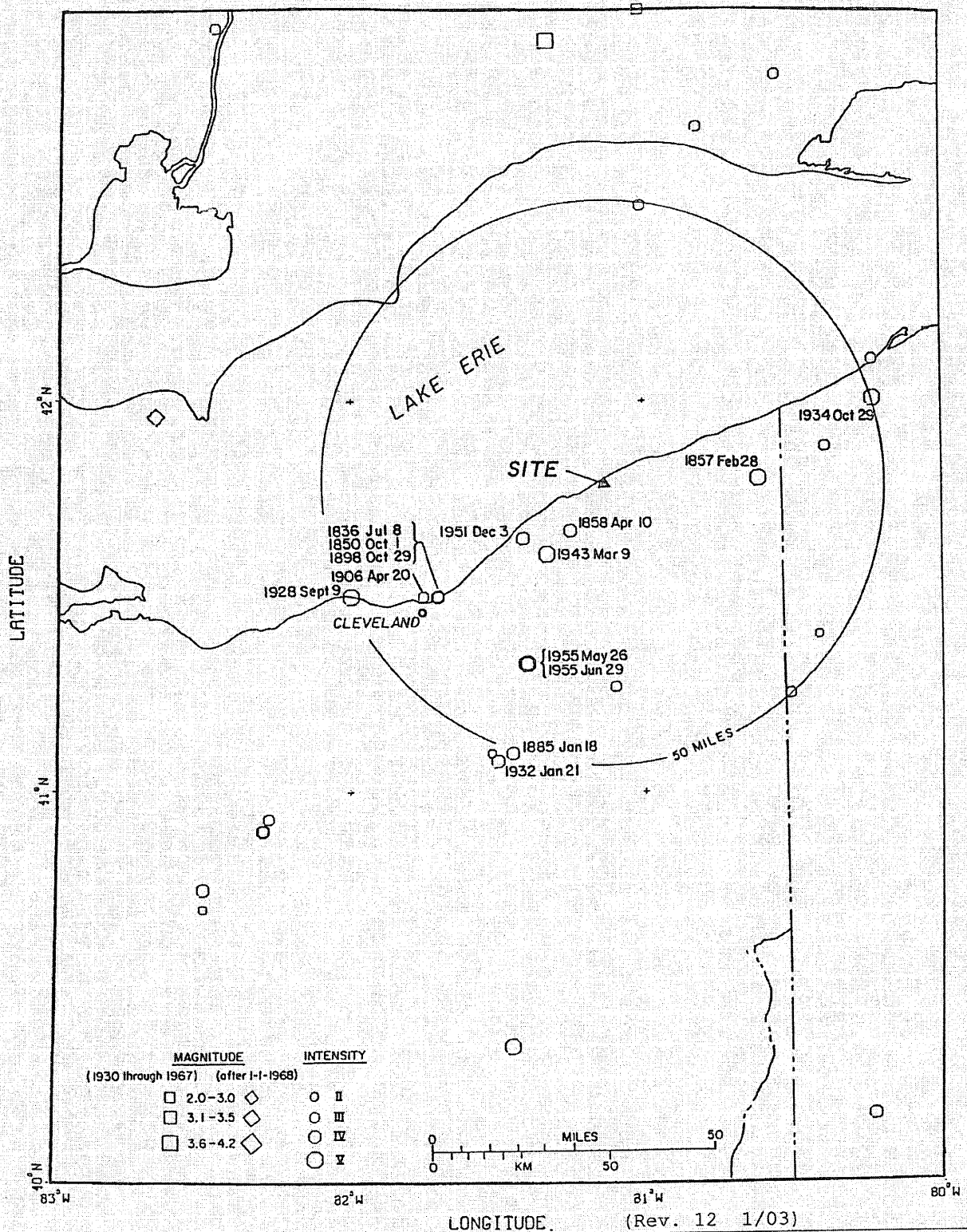
(Rev. 12 1/03)



PERRY NUCLEAR POWER PLANT

Newspaper Research Matrix

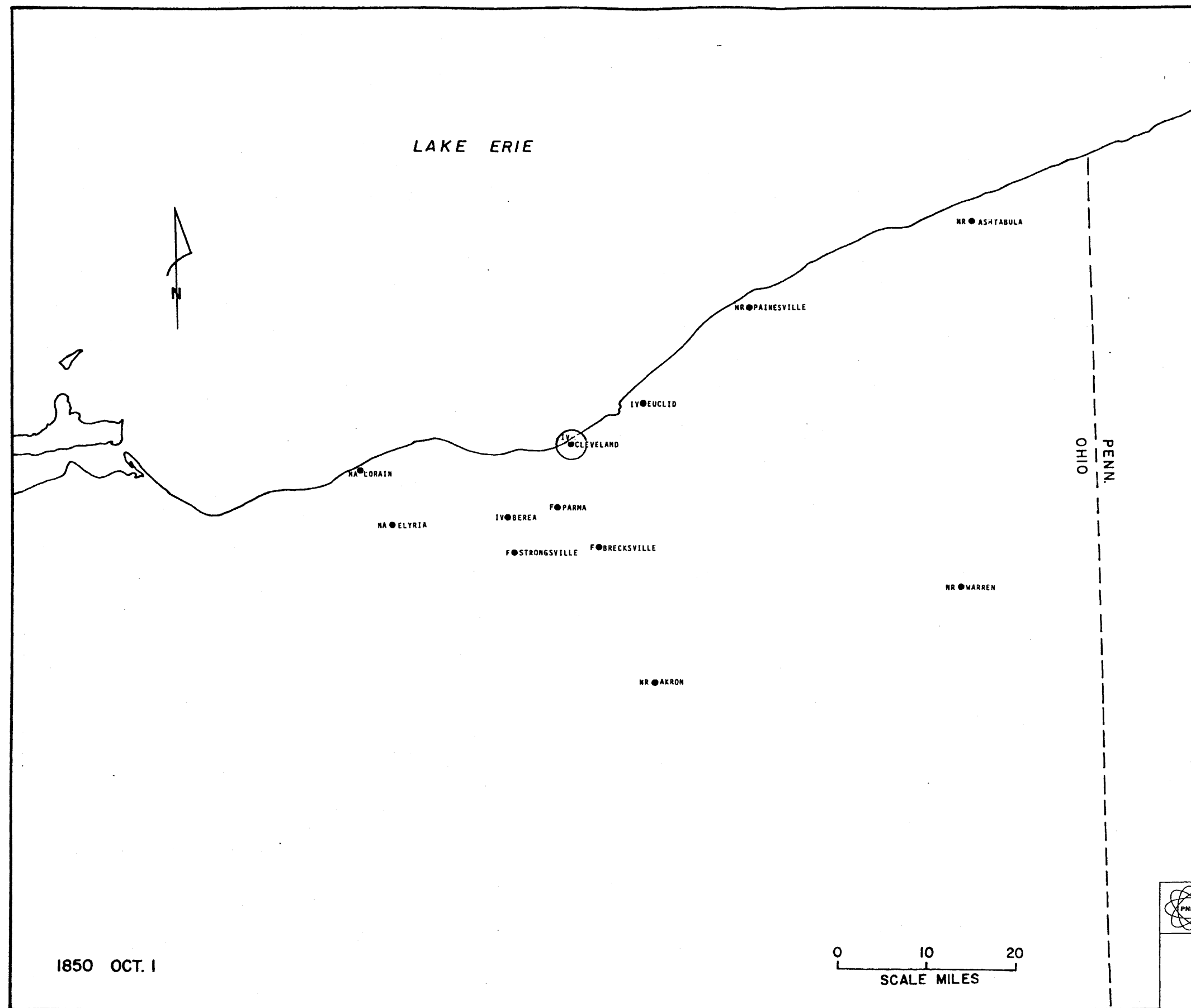
Figure 2D D-3



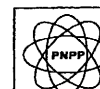
PERRY NUCLEAR POWER PLANT

Seismicity Map

Figure 2D D-4



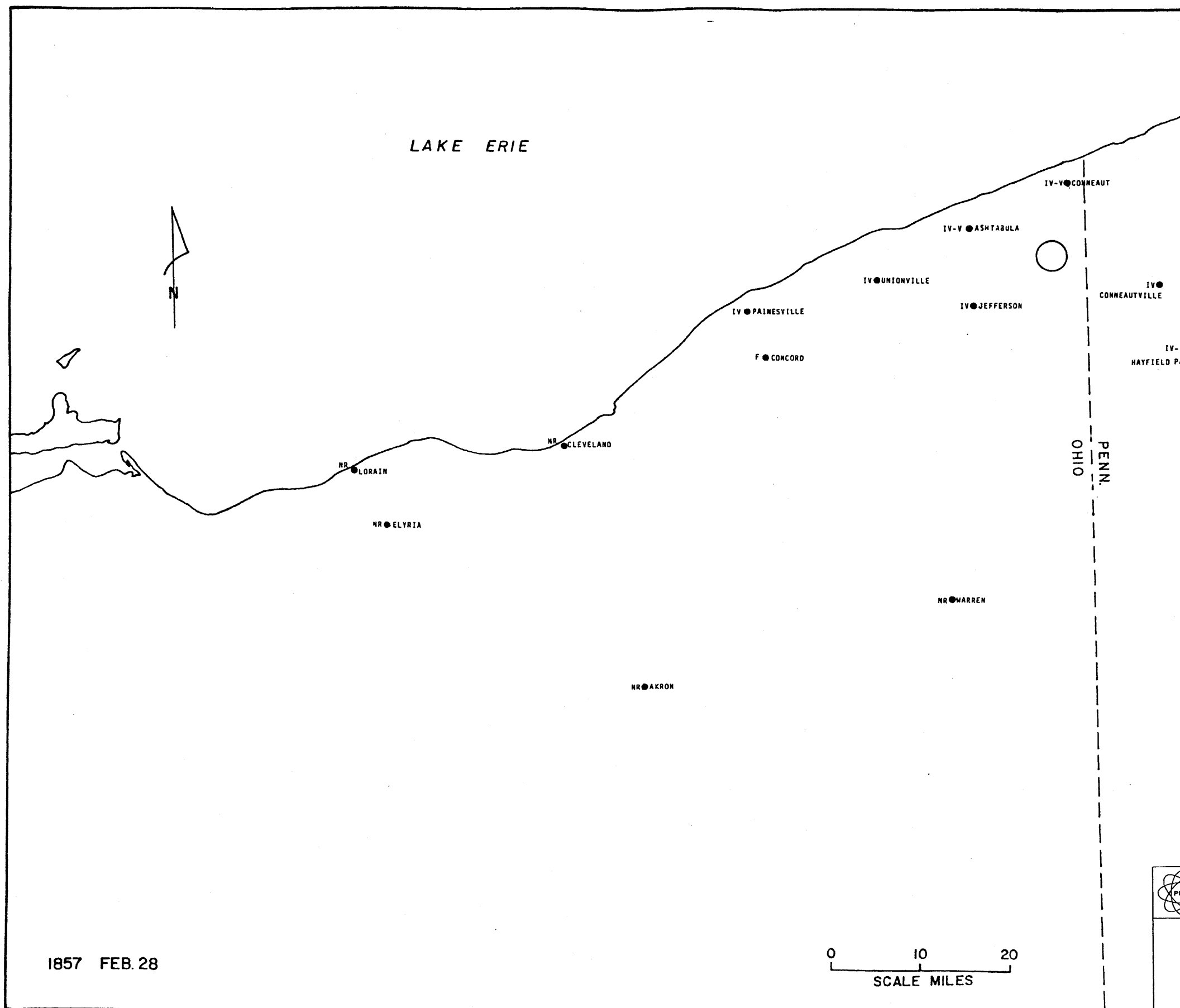
(Rev. 12 1/03)



PERRY NUCLEAR POWER PLANT

Felt Report Map:
1850 Oct. 1

Figure 2D D-5



1857 FEB. 28

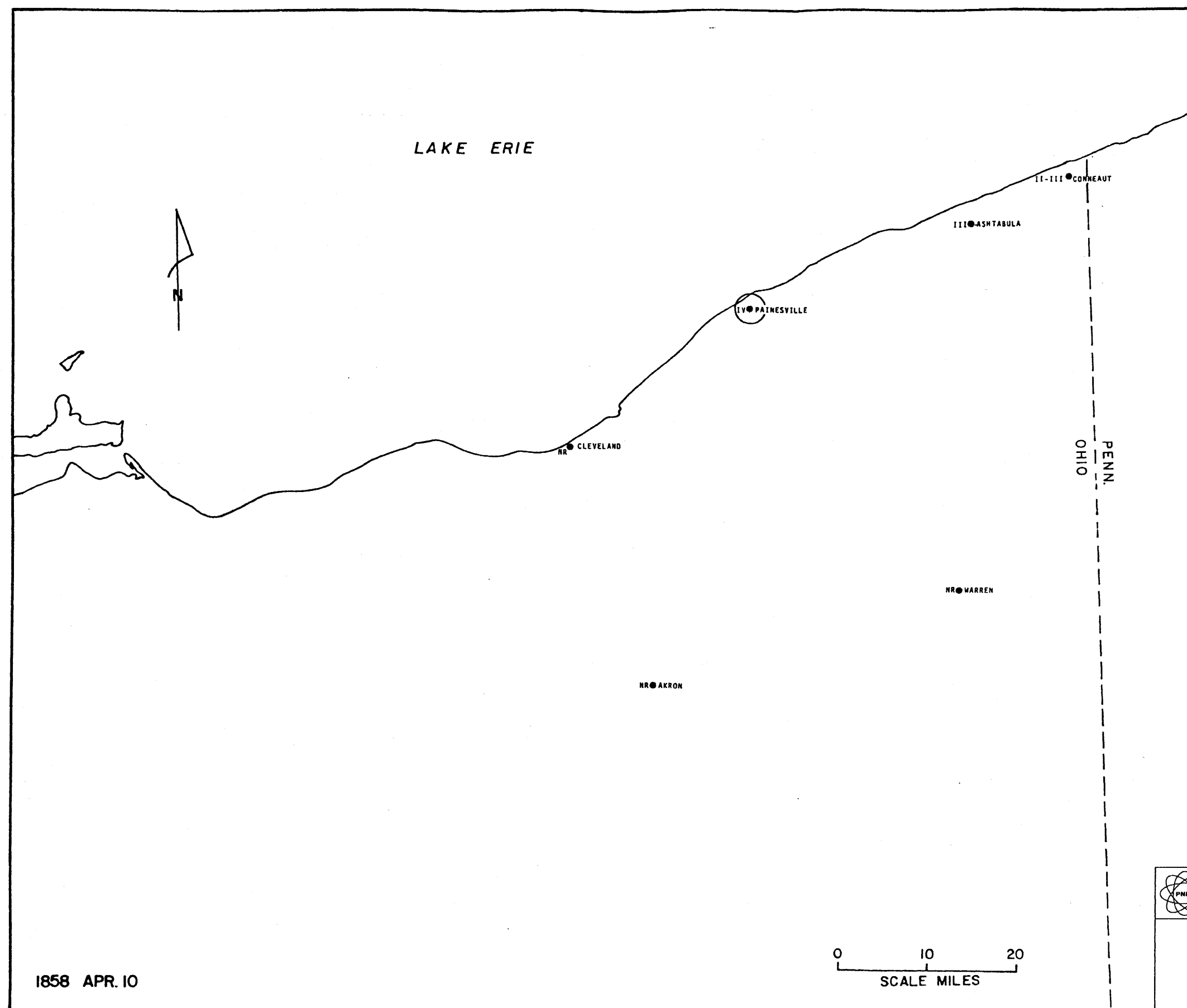
0 10 20
SCALE MILES

(Rev. 12 1/03)

 **PERRY NUCLEAR POWER PLANT**

Felt Report Map:
1857 Feb. 28

Figure 2D D-6



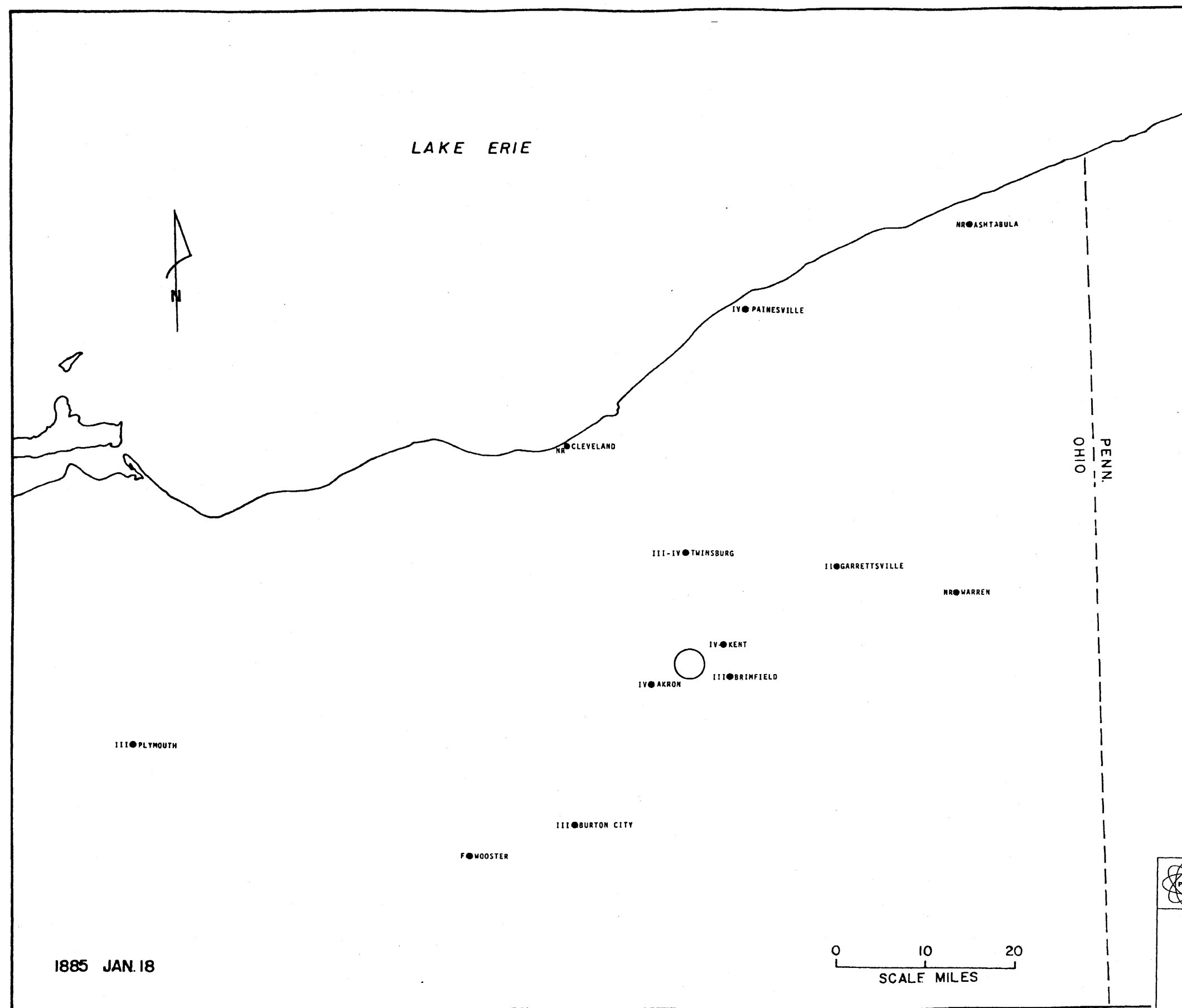
(Rev. 12 1/03)



PERRY NUCLEAR POWER PLANT

Felt Report Map:
1858 Apr. 10

Figure 2D D-7



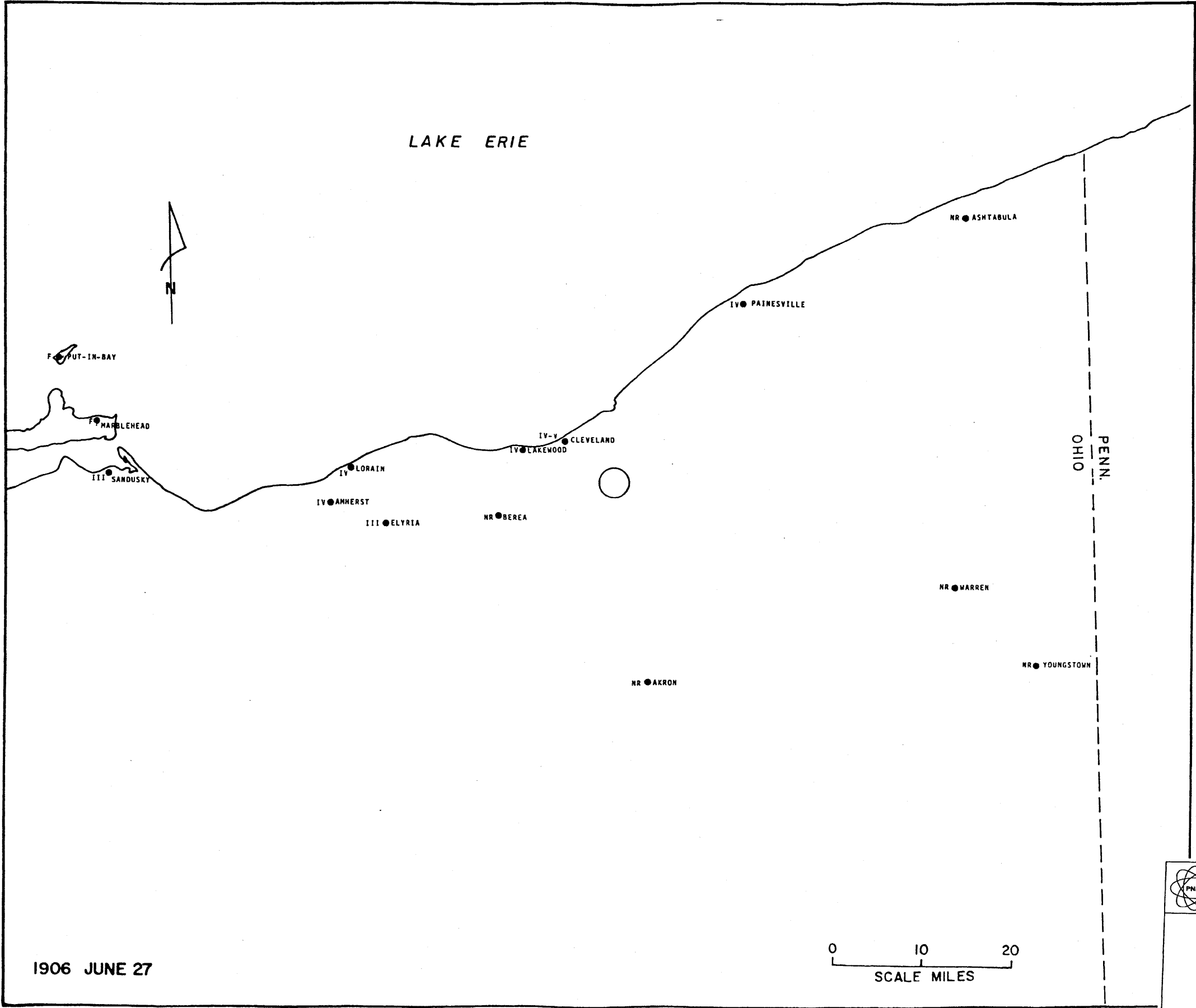
(Rev. 12 1/03)



PERRY NUCLEAR POWER PLANT

Felt Report Map:
1885 Jan. 18

Figure 2D D-8



1906 JUNE 27

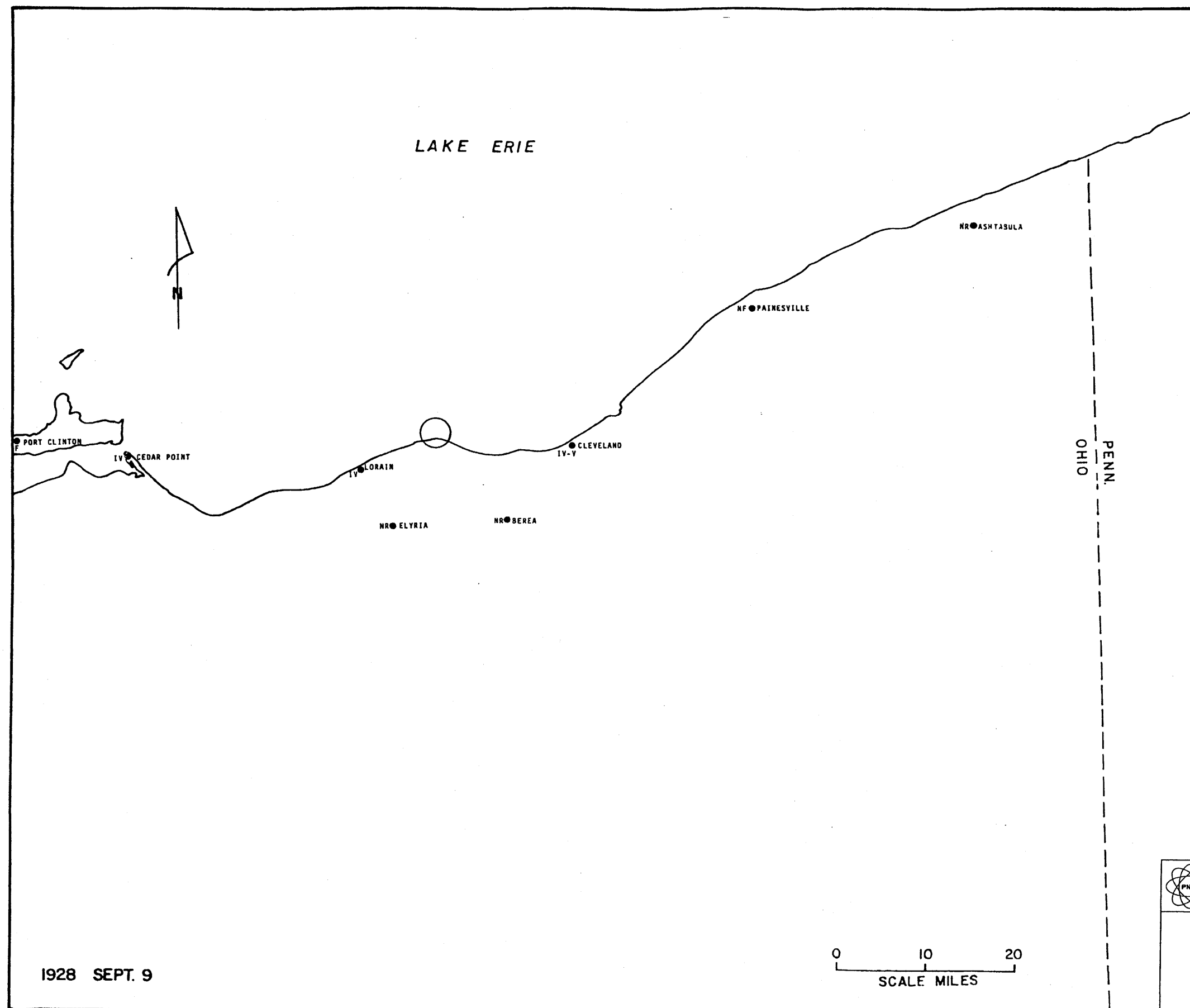
(Rev. 12 1/03)



PERRY NUCLEAR POWER PLANT

Felt Report Map:
1906 June 27

Figure 2D D-9



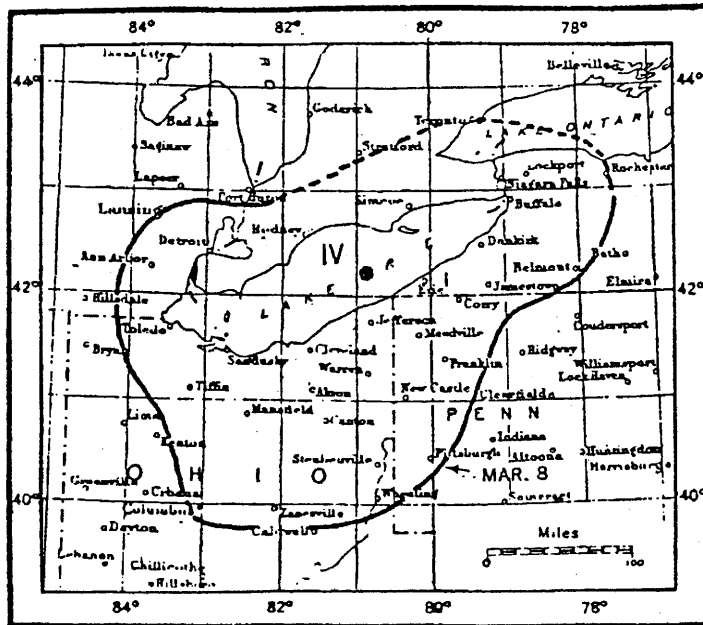
(Rev. 12 1/03)



PERRY NUCLEAR POWER PLANT

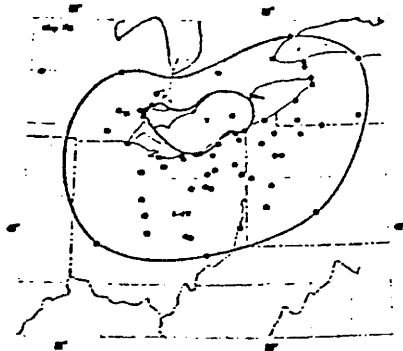
Felt Report Map:
1928 Sept. 09

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

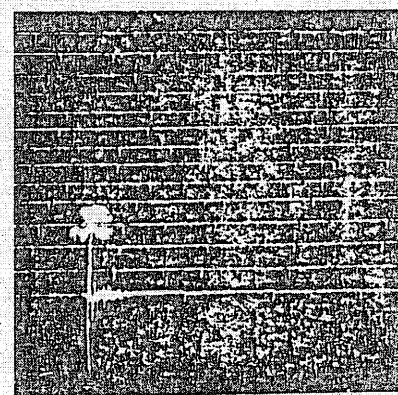
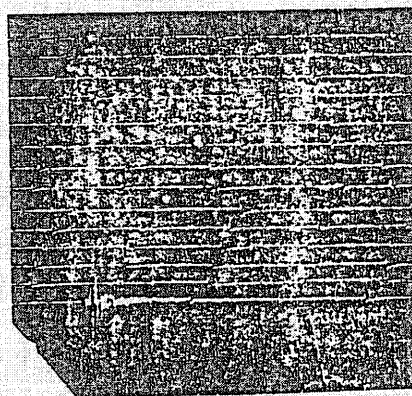


PERRY NUCLEAR POWER PLANT

Felt Report Map:
1943 Mar. 09

Figure 2D D-11

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



(Rev. 12 1/03)



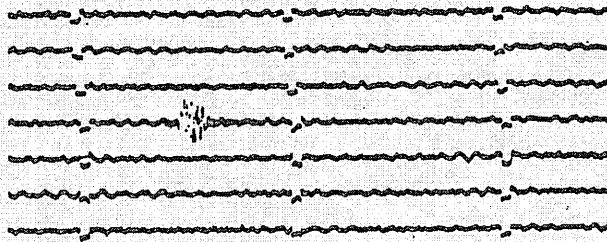
PERRY NUCLEAR POWER PLANT

John Carroll University
Seismogram: 1943 Mar. 09

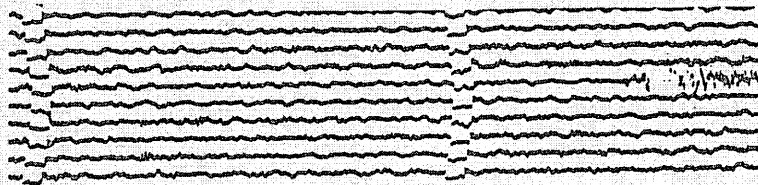
Figure 2D D-12

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

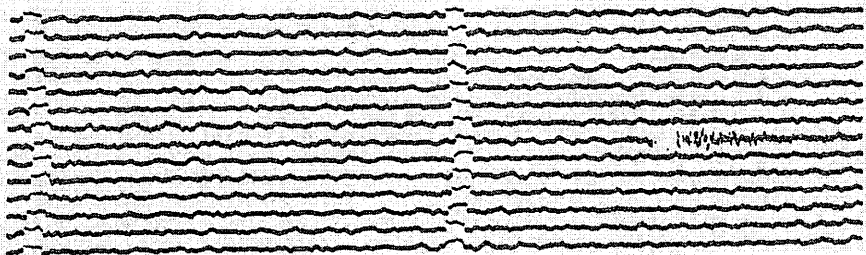
VERTICAL



NORTH-SOUTH



EAST-WEST



(Rev. 12 1/03)



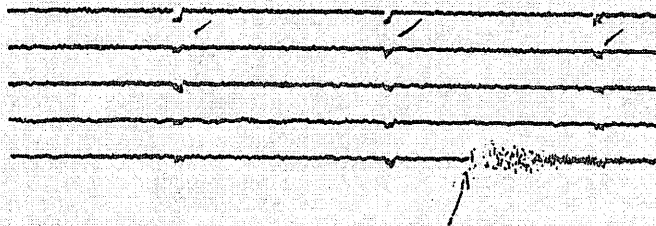
PERRY NUCLEAR POWER PLANT

John Carroll University
Seismograms: 1951 Dec. 03

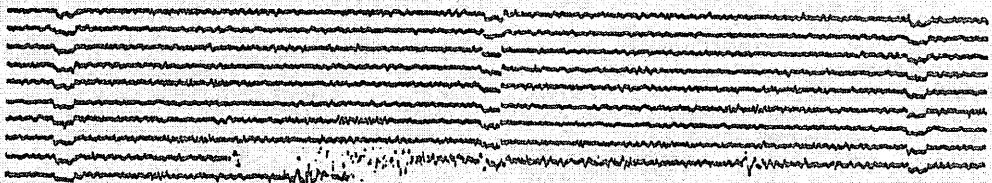
Figure 2D D-13

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

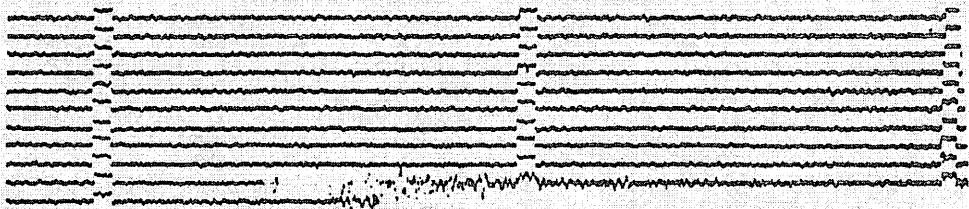
VERTICAL



NORTH-SOUTH



EAST-WEST



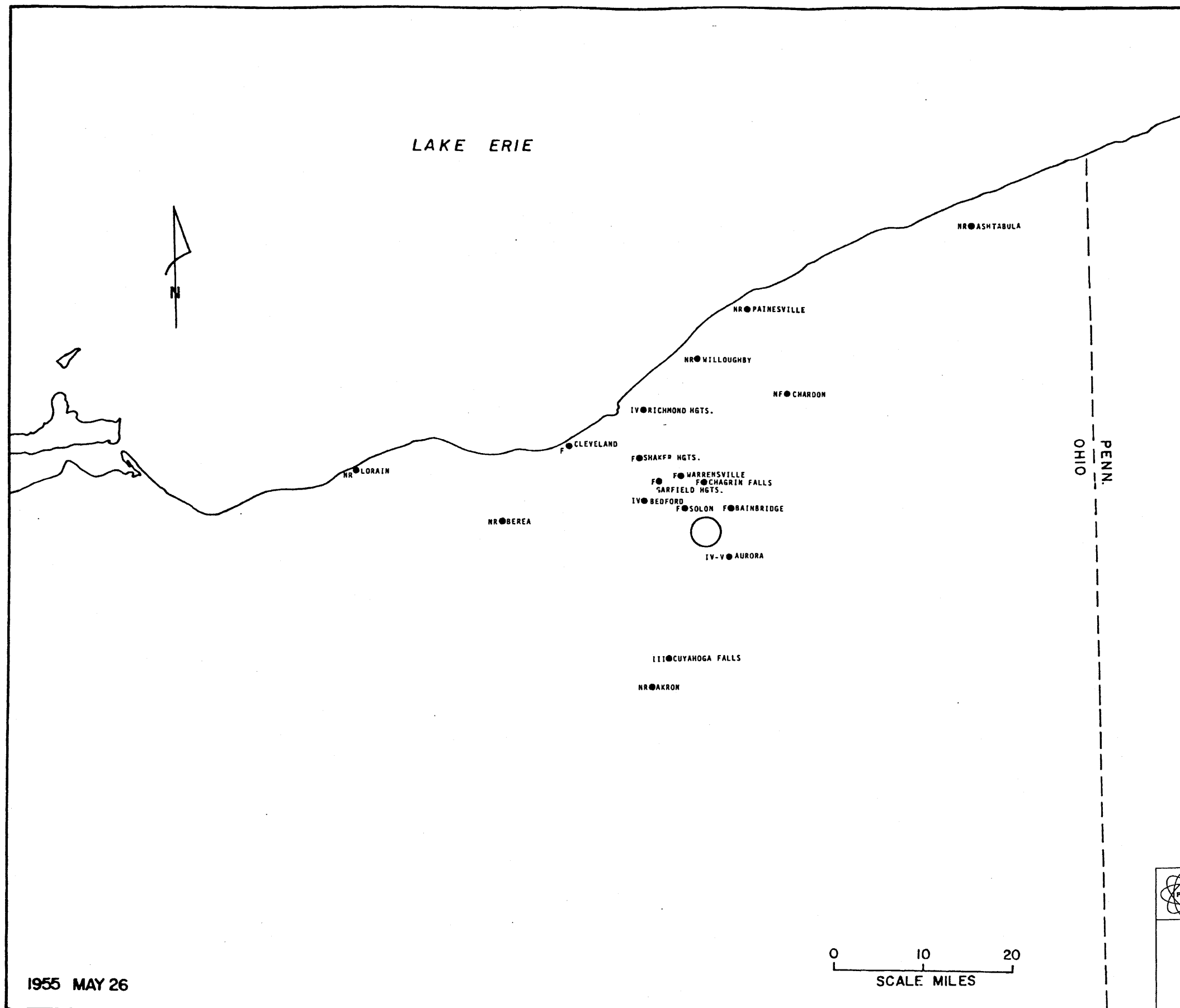
(Rev. 12 1/03)



PERRY NUCLEAR POWER PLANT

John Carroll University
Seismograms: 1955 May 26

Figure 2D D-14



1955 MAY 26

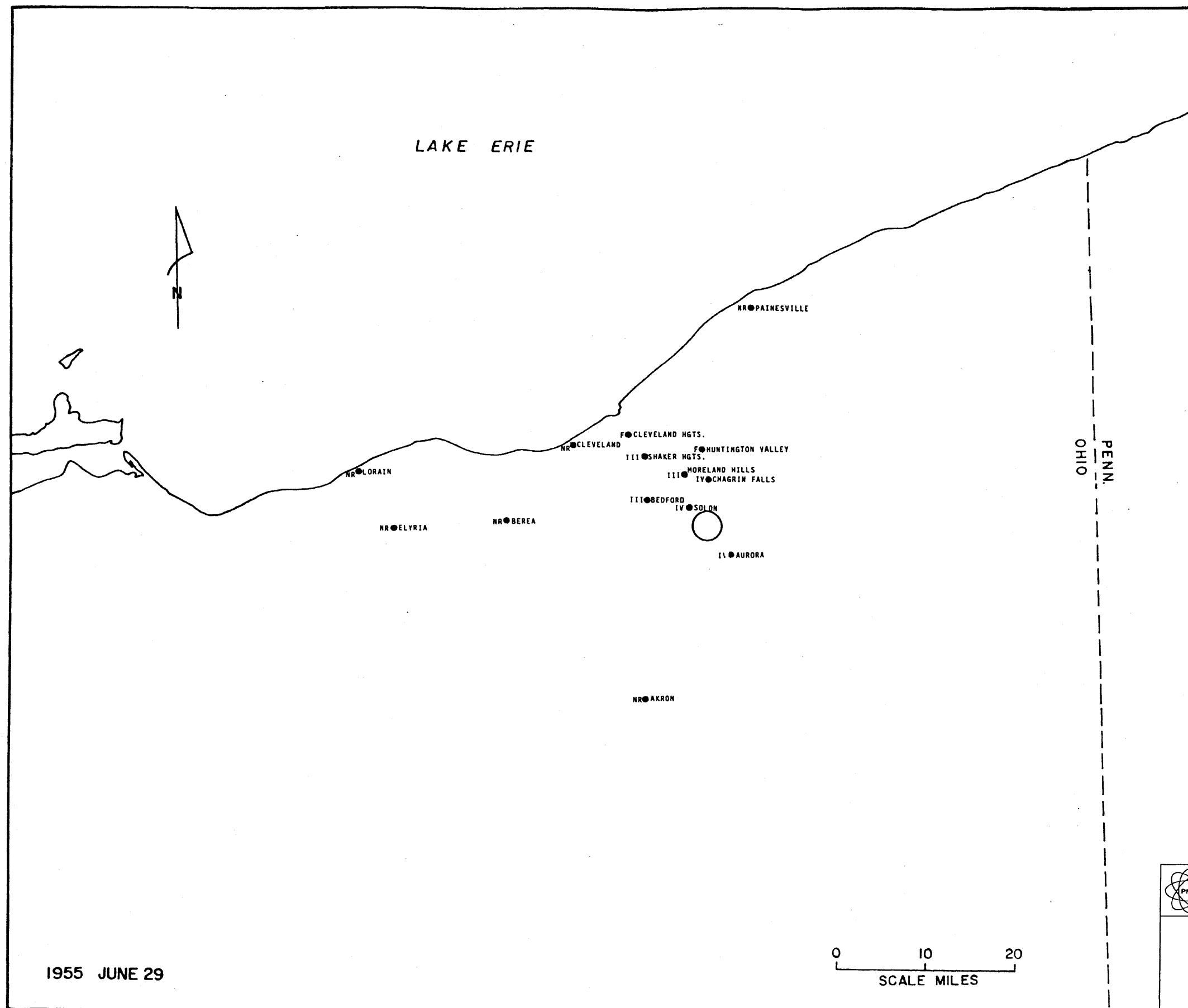
(Rev. 12 1/03)



PERRY NUCLEAR POWER PLANT

Felt Report Map:
1955 May 26

Figure 2D D-15



(Rev. 12 1/03)



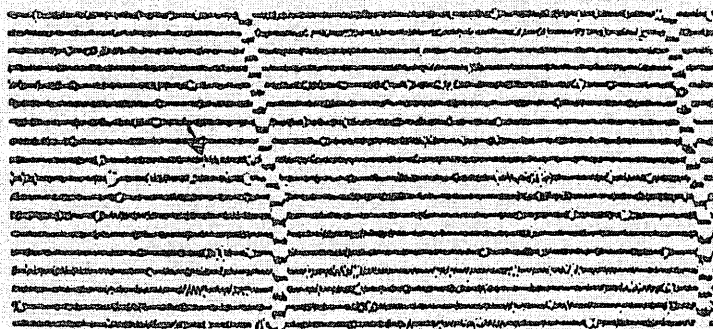
PERRY NUCLEAR POWER PLANT

Felt Report Map:
1955 June 29

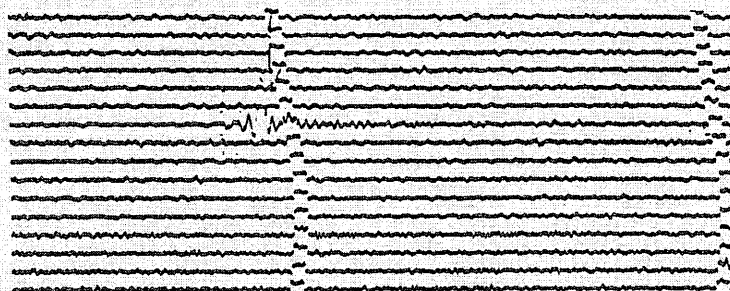
Figure 2D D-16

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

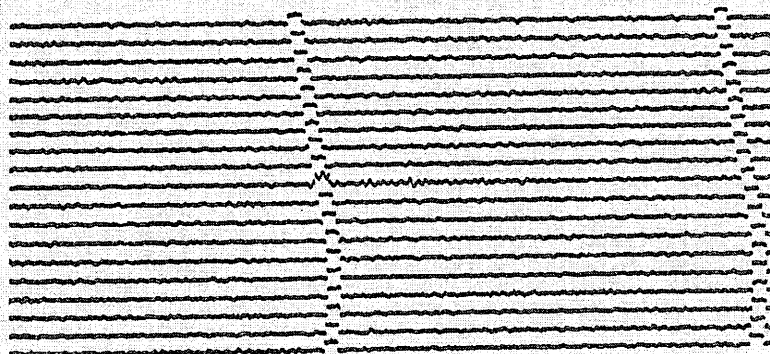
VERTICAL



NORTH-SOUTH



EAST-WEST



(Rev. 12 1/03)



PERRY NUCLEAR POWER PLANT

John Carroll University
Seismograms: 1958 May 1

Figure 2D D-17

