

MONTHLY REPORT NO. 66 FOR DECEMBER 1978
THERMAL AND BIOLOGICAL MONITORING PROGRAMS
PEACH BOTTOM ATOMIC POWER STATION
UNITS NO. 2 AND 3

Due to severe icing conditions, thermograph servicing could not be performed for the December, 1978 reporting period. The analysis for this period will be submitted shortly after conditions permit retrieval of the thermal data.

The daily river flows as measured at Holtwood Hydroelectric Station and the daily generation at PBAPS in thermal megawatts for the reporting period are presented in Table 1. Figure 1 shows the instrument and survey locations.

Figures 2, 3, 4, and 5 are isotherm plots, which include three (3) horizontal sections of boat surveys made during the December recording period. Boat survey information is tabulated in Table 2. Surveys for this period were started at the north end of Conowingo Pond. The delta T at the state line indicated on the isotherms is calculated by subtracting the Holtwood Dam temperature and the hourly Confidence Limit (applicable to the mid-survey time) from the state line temperature. This delta T can be interpreted as being caused by PBAPS since ambient hourly variations at the state line have been considered.

Although the isotherm plots do not cover the entire reporting period on a daily, hour by hour basis and cannot be used as a continuous indication of temperature variation, they do represent a fair treatment of typical plume characteristics. In addition, they may also be used as an empirical tool in estimating probable plume patterns in advance of certain natural and plant operating conditions.

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TABLE 1

MULTWOOD DAILY FLOWS(CFS) AND DAILY THERMAL MEGAWATTS- DEC 1978

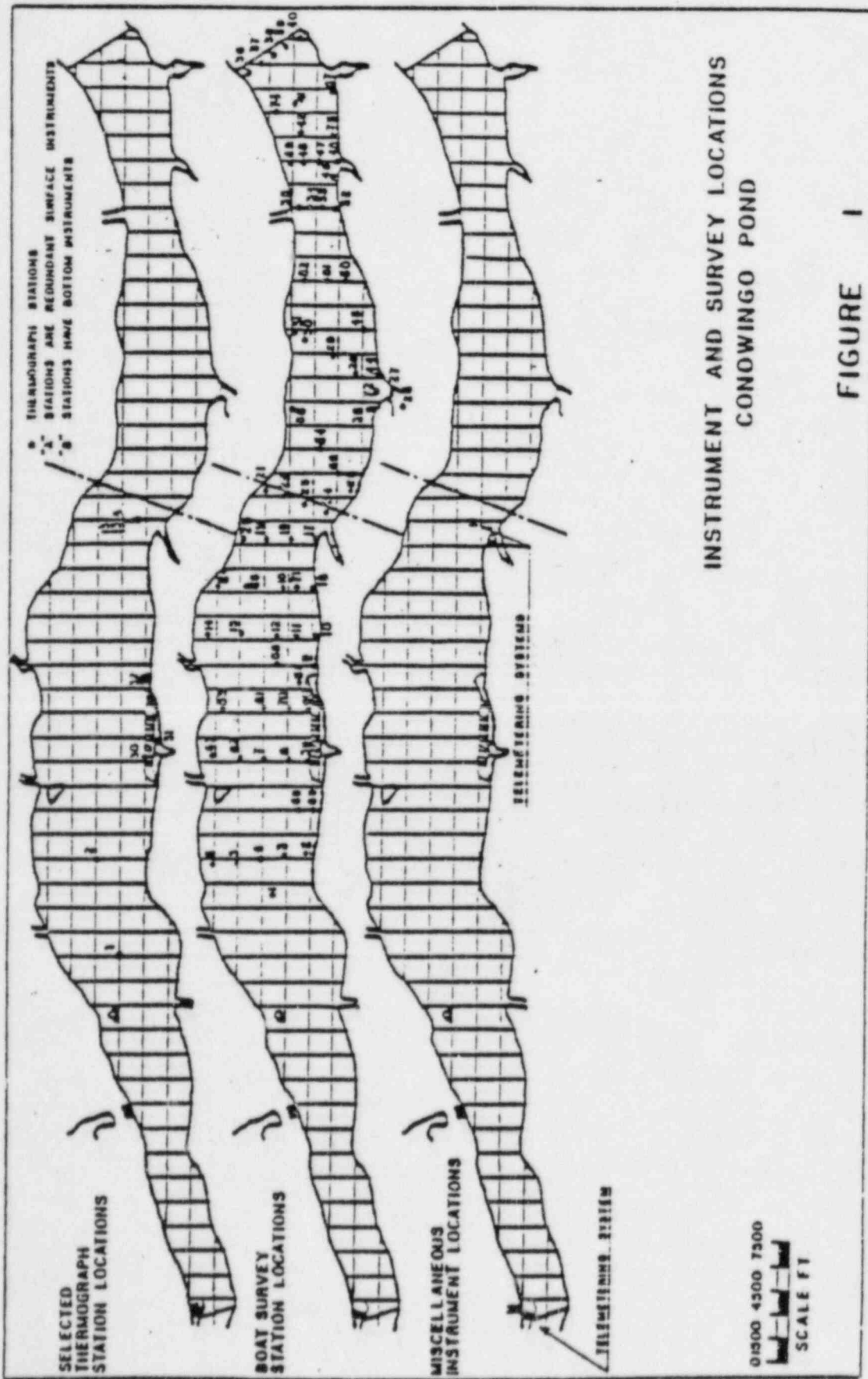
| DBS | YEAR | MONTH | DAY | HW_FLOW | MW_THERM |
|-----|------|-------|-----|---------|----------|
| 1 | 78 | 12 | 1 | 18100 | 6444 |
| 2 | 78 | 12 | 2 | 17500 | 5679 |
| 3 | 78 | 12 | 3 | 16500 | 6294 |
| 4 | 78 | 12 | 4 | 18000 | 6574 |
| 5 | 78 | 12 | 5 | 18500 | 6576 |
| 6 | 78 | 12 | 6 | 21700 | 6576 |
| 7 | 78 | 12 | 7 | 22700 | 6577 |
| 8 | 78 | 12 | 8 | 25100 | 4505 |
| 9 | 78 | 12 | 9 | 32400 | 4982 |
| 10 | 78 | 12 | 10 | 44500 | 5757 |
| 11 | 78 | 12 | 11 | 56500 | 6476 |
| 12 | 78 | 12 | 12 | 61300 | 6557 |
| 13 | 78 | 12 | 13 | 55800 | 6573 |
| 14 | 78 | 12 | 14 | 42000 | 6582 |
| 15 | 78 | 12 | 15 | 40000 | 6576 |
| 16 | 78 | 12 | 16 | 35000 | 6503 |
| 17 | 78 | 12 | 17 | 32300 | 6517 |
| 18 | 78 | 12 | 18 | 28000 | 6572 |
| 19 | 78 | 12 | 19 | 25900 | 6566 |
| 20 | 78 | 12 | 20 | 24900 | 6573 |
| 21 | 78 | 12 | 21 | 23000 | 6573 |
| 22 | 78 | 12 | 22 | 20500 | 6570 |
| 23 | 78 | 12 | 23 | 22000 | 6567 |
| 24 | 78 | 12 | 24 | 26700 | 6553 |
| 25 | 78 | 12 | 25 | 40300 | 6533 |
| 26 | 78 | 12 | 26 | 46800 | 6391 |
| 27 | 78 | 12 | 27 | 41300 | 6450 |
| 28 | 78 | 12 | 28 | 32800 | 6404 |
| 29 | 78 | 12 | 29 | 25700 | 6465 |
| 30 | 78 | 12 | 30 | 22200 | 6475 |
| 31 | 78 | 12 | 31 | 23100 | 6456 |

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TABLE 2

BOAT SURVEY INFORMATION

| SURVEY DATE | 12/4/78 | 12/13/78 | 12/18/78 | 12/29/78 | |
|--|----------|------------|------------|------------|------------|
| TIME: | | | | | |
| Survey Start (EST) | 1340 | 1000 | 0930 | 0915 | |
| State Line (EST) | 1445 | 1115 | 1045 | 1030 | |
| Survey Finish (EST) | 1600 | 1400 | 1145 | 1130 | |
| HYDRAULIC DATA: | | | | | |
| Pond Elevation Start (Ft.) | 107.50 | 108.55 | 108.12 | 107.04 | |
| Pond Elevation Finish (Ft.) | 107.98 | 108.31 | 107.79 | 106.38 | |
| Natural Flow (24 hour ave., CFS) | 16,400 | 53,900 | 26,600 | 23,600 | |
| Conowingo Inflow (24 hrs. ave., CFS) | 16,700 | 51,800 | 28,975 | 28,250 | |
| Conowingo Dam Draft (24 hr. ave., CFS) | 18,400 | 53,600 | 29,850 | 34,775 | |
| PBAPS Power Output: | | | | | |
| Unit 2: Thermal (MW) | 3286 | 3283 | 3289 | 3261 | |
| Electrical (MW) | 1064 | 1062 | 1063 | 1059 | |
| Unit 3: Thermal (MW) | 3288 | 3290 | 3283 | 3272 | |
| Electrical (MW) | 1044 | 1047 | 1044 | 1034 | |
| METEOROLOGICAL DATA: | | | | | |
| Time (EST) | 1330 | 1050 | 0920 | 0910 | |
| Air Temperature (°F) | 66 | 42 | 39 | 27 | |
| Relative Humidity (%) | 74 | 60 | 55 | 48 | |
| Precipitation (24 hour total, in) | .66 | None | None | None | |
| Wind Speed (mph) | 10 | 10 | 10-15 | 3-5 | |
| Cloud Over | Full | Sunny | Partly | Partly | |
| Location: | Sta #7 | Sta #7 | Sta #7 | Sta #7 | |
| Wind Direction | S | SW | NW | N | |
| WATER TEMPERATURE (SURVEY) | | | | | |
| PBAPS Discharge | °C, (°F) | 14.3(57.7) | 11.4(52.5) | 10.4(50.7) | 10.8(51.4) |
| Intake | °C, (°F) | 4.0(39.2) | 1.9(35.4) | 1.9(35.4) | 0.0(32) |
| T | °C, (°F) | 10.3(18.5) | 9.5(17.1) | 8.5(15.3) | 10.8(19.4) |
| Pond Surface Max. | °C, (°F) | 14.4(57.9) | 10.6(51.1) | 10.4(50.7) | 10.8(51.4) |
| Min. | °C, (°F) | 3.7(38.7) | 1.9(35.4) | 1.6(34.9) | 0.0(32) |
| Pond Bottom Max. | °C, (°F) | 14.4(57.9) | 11.5(52.7) | 10.8(51.4) | 10.8(51.4) |
| Min. | °C, (°F) | 3.6(38.5) | 1.9(35.4) | 1.6(34.9) | 0.0(32) |
| No. of C.W. Pumps Operating | | 6 | 6 | 6 | 5 |
| No. of Cooling Towers Operating | | 3 | 2 | 2 | 2 |



INSTRUMENT AND SURVEY LOCATIONS
CONOWINGO POND

FIGURE I

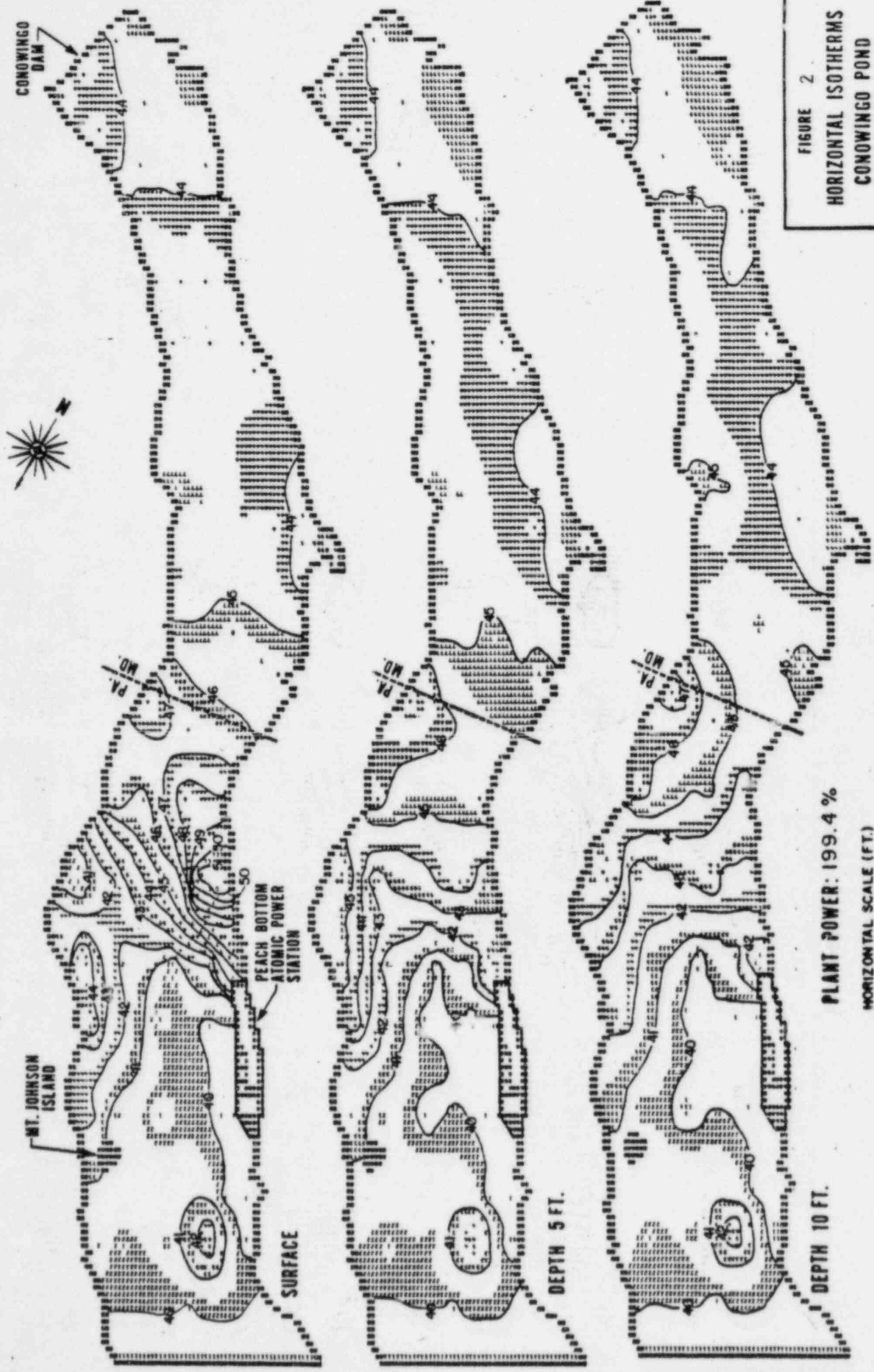


FIGURE 2
 HORIZONTAL ISOOTHERMS
 CONOWINGO POND
 DATE 12/04/78
 TIME 1340/1600

PLANT POWER: 199.4%

HORIZONTAL SCALE (FT.)



AT STATE LINE = 2.8°F

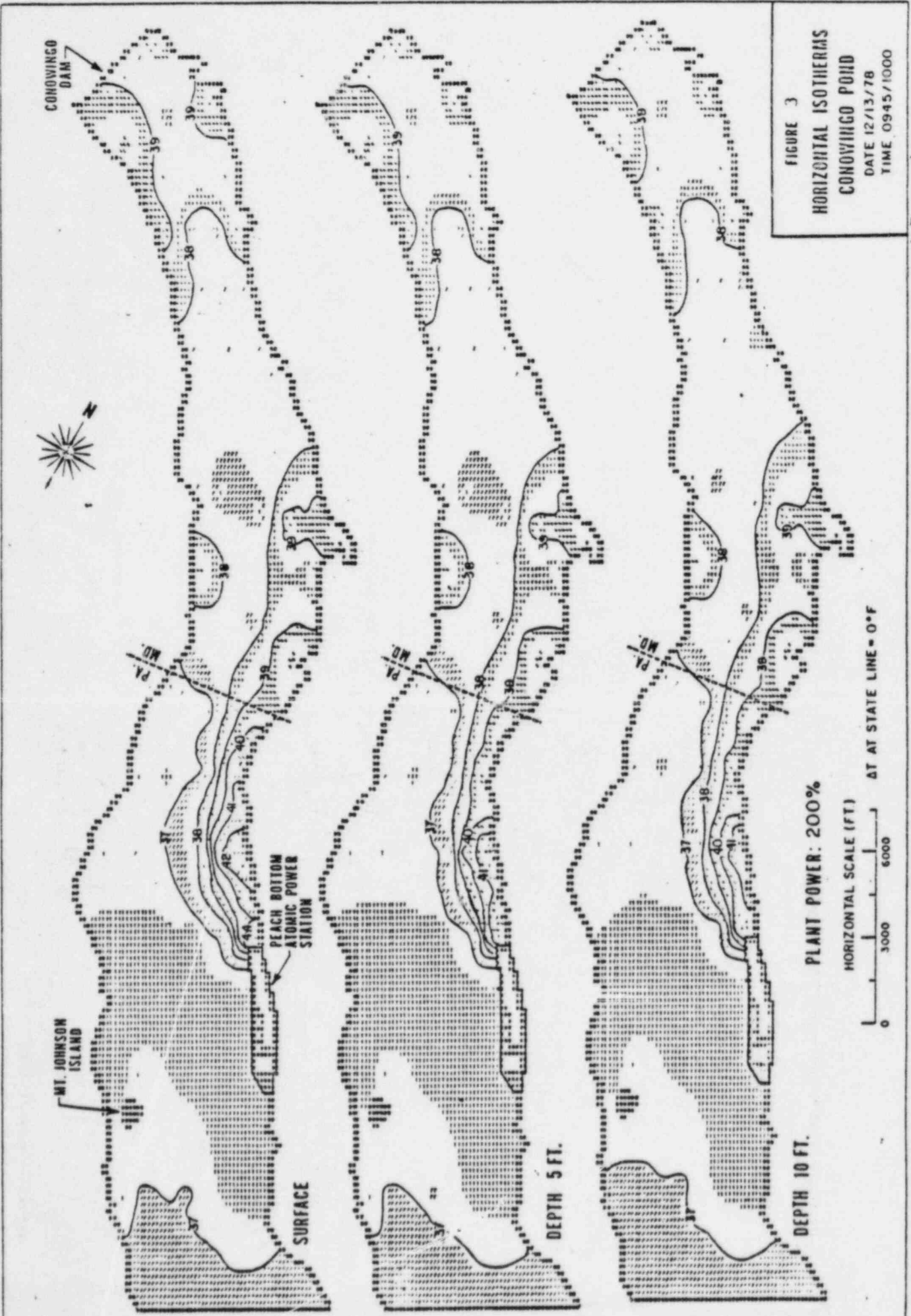
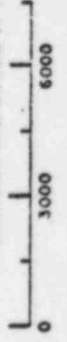


FIGURE 3
 HORIZONTAL ISOTHERMS
 CONOWINGO POND
 DATE 12/13/78
 TIME 0945/1000

PLANT POWER: 200%
 HORIZONTAL SCALE (FT)



ΔT AT STATE LINE = 0°F



MT. JOHNSON ISLAND

PA MD

CONOWINGO DAM

PEACH BOTTOM
ATOMIC
STATION

SURFACE

DEPTH 5 FT.

DEPTH 10 FT.

CONOWINGO DAM



MT. JOHNSON ISLAND

PEACH BOTTOM ATOMIC POWER STATION

SURFACE

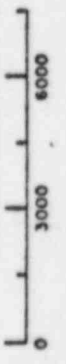
DEPTH 5 FT.

DEPTH 10 FT.

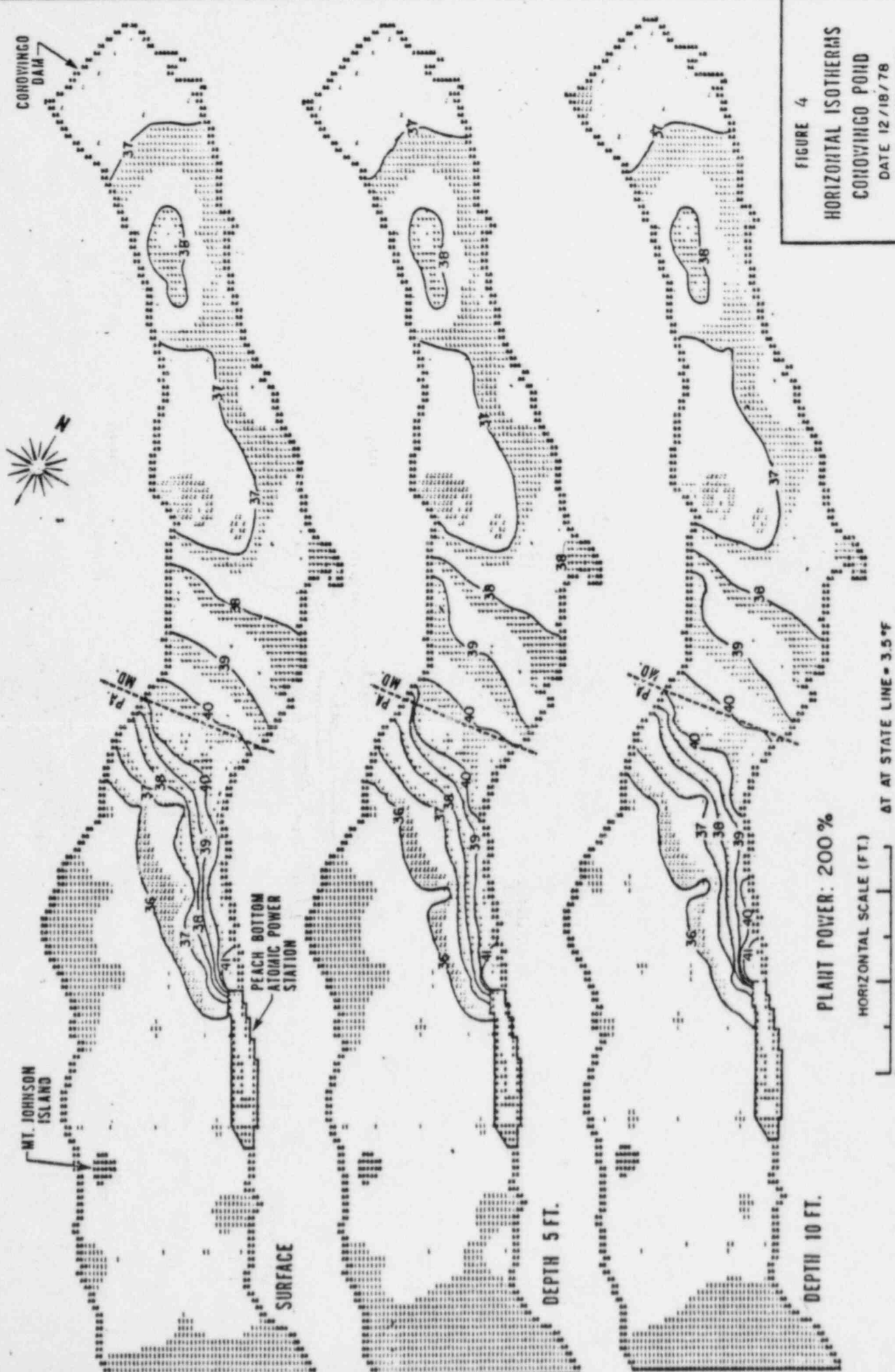
FIGURE 4
HORIZONTAL ISOTHERMS
CONOWINGO POND
DATE 12/18/78
TIME 0930/1145

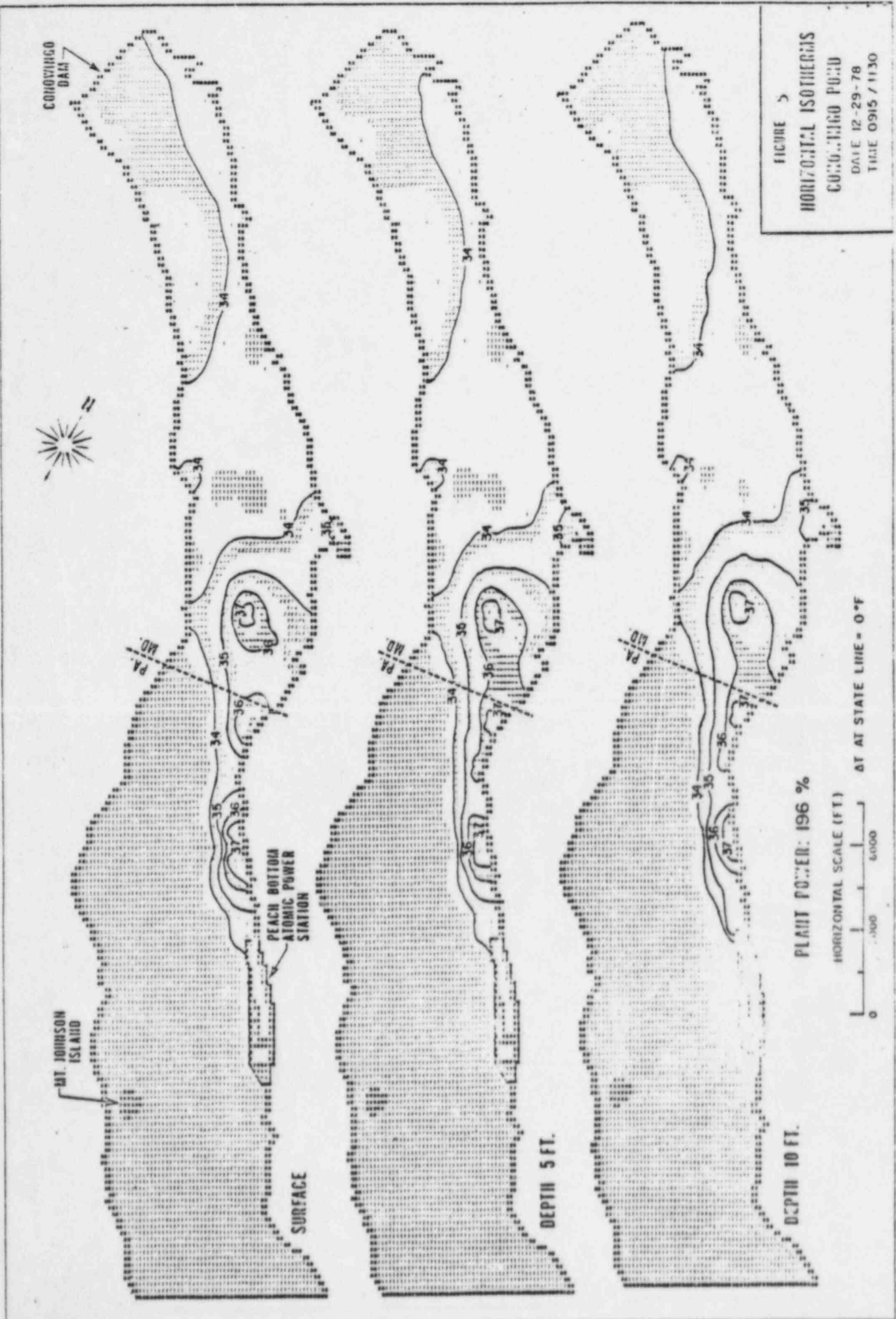
PLANT POWER: 200 %

HORIZONTAL SCALE (FT.)



ΔT AT STATE LINE = 3.5 °F





CONOWINGO DAM



MT. JOHNSON ISLAND

PEACH BOTTOM ATOMIC POWER STATION

SURFACE

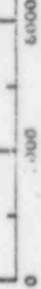
DEPTH 5 FT.

DEPTH 10 FT.

FIGURE 5
 HORIZONTAL ISOTHERMS
 CO:O..1160 P:0:0
 DATE 12-29-78
 TIME 0915 / 1130

PLANT POWER: 196 %

HORIZONTAL SCALE (FT)



AT STATE LINE = 0°