William J. Cahill, Jr.
Vice President

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Telephone (212) 460-3819

November 17, 1975

Director of Nuclear Reactor Regulation
ATTN: Mr. George W. Knighton, Chief
Environmental Projects Branch No. 1
Division of Reactor Licensing
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Re: Indian Point 2 - Docket No. 50-247

Dear Sir:

Enclosed for your information is a copy of a letter we have sent to the New York State Department of Environmental Conservation reporting river surface temperatures exceeding 90°F within the immediate vicinity of the Indian Point Plant discharge structure. The extent of the surface temperatures was less then 3/4 of an acre. Annexed to the letter is a technical discussion of these findings.

Sincerely yours,

William J. Cahill Jr.

Enc.

Carl L. Newman
Vice President

Consolidated Edison Company of New York, Inc.
4 Irving Place, New York, N. Y. 10003
Telephone (212) 460-5133

September 4, 1975

Mr. Russell Mt. Pleasant, P.E., Chief
Bureau of Monitoring and Surveillance
Division of Pure Water
New York State Department of
Environmental Conservation
50 Wolf Road
Albany, N.Y. 12201

RE: Indian Point Unit No. 2

Dear Mr. Mt. Pleasant:

Reference is made to Condition 15 of the certification dated September 24, 1973 under Section 401 of the Federal Water Pollution Control Act for the above plant. That condition required thermal monitoring to establish compliance with state regulations.

In accordance with this condition, Dames & Moore conducted an intensive thermal survey for Con Edison in the Indian Point reach of the Hudson River during August, 1974. The data from that survey, which are still being reduced from computer tapes to graphical and illustrative form, indicate instances wherein river surface temperatures exceeded 90°F within the immediate vicinity of the plant discharge structure.

Attached hereto is a discussion of the times and river conditions under which temperatures in excess of 90°F occurred. The discussion with accompanying illustrations indicates that the surface area encompassed by the 90°F isotherm was less than 3/4 of an acre and suggests that alternate discharge port configurations would have eliminated the area so encompassed. Further surveys are

September 4, 1975

scheduled to be undertaken in 1976 to provide additional data on the thermal response to the river and on the effects of varying port configurations.

Very truly yours,

Carl L. Newman

LCP/lb
Attachment

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Regulatory File Cy.

ATTACHMENT

Technical Discussion

Consolidated Edison
Emissions Control Section
September 4, 1975

Technical Discussion

The August 1974 intensive thermal monitoring program included four days during which the intensity and extent of the Indian Point thermal plume was measured over each of the four major phases of the tidal cycle (flood, HWS, ebb, LWS). During four out of these total of 16 surveys surface temperatures in excess of 90°F were recorded in the vicinity of the discharge structure. These surface measurements were obtained from the uppermost thermistor probe of a string of three probes towed by a boat in the vicinity of the outfall structure.

Table 1 presents the maximum surface temperature recorded during each of the sixteen tidal phases. Also presented in the ambient reference temperature, the average plant intake and discharge water temperature, and if applicable, the maximum surface width and surface area of the 90°F region.

The areas contained within the 90°F isotherm were less than 3/4 of an acre (for the four tidal phases during which surface temperatures over 90°F were observed) with an average area of about 1/3 of an acre. It should be noted that the 90°F region does not persist throughout the entire tidal cycle. Three of the four cases in which temperatures in excess of 90°F were obtained occurred during ebb. The maximum surface temperature recorded was 91.6°F, the other maxima obtained were 90.3, 90.2, and 90.4°F. Figures 2,3,4 and 5 present the surface temperature patterns during the tidal phases where surface temperatures equal to or in excess of 90°F were obtained. The tidal average maximum surface temperatures were for all four tidal cycles monitored equal to or less than 89.3°F.

Velocity measurements conducted on the effluent jet indicate that the discharge jet velocity is as predicted by both the analytical and physical models (2,3), 10 feet per second with a 1.75 foot head differential. However, the dilution ratios obtained were lower than what these models predicted.

Two different head differentials were explored during the August survey, 1.75 feet and 3 feet. There was an apparent increase in the dilution ratio with the higher head differential.

Dilution ratios obtained during the october intensive survey (1.75) with a head differential of 1.75 feet were significantly higher than the dilution ratio obtained during the August survey (1.45), at the same head differential. This could be attributable to higher surface temperatures (compared to intake temperatures) due to surface heating occurring in August.

It should be noted that low water at Peekskill in August was as follows: (4)

Date	Low Water Elevation (datum MLW) (ft.)
August 20	-.6, -.2
21	-.3, +.2
23	.1, .5
24	.9, 1.1

While in Ocotober low water was: (4)

October 22	1.3, 1.1
23	1.5, 1.1
24	1.4, 0.9
25	1.2, 0.8

the two numbers correspond to the first and second low tides for the particular day

It can be seen that there was about a foot more of river water available for dilution in October, which may account for the higher dilution ratios.

The above suggests that altering discharge port configuration would be a viable approach to increasing dilution ratios. The ports themselves are illustrated in Figure 1. The ports are 4 feet high by 15 feet wide, with the centerline at -12 feet (MLW). During the survey alternate ports were used, with those ports essentially fully opened. The upper edge of the port was then 10 feet below mean low water. An alternate procedure would be to have all the ports partly open. This could put the upper edge of the port at 12 feet below mean low water, providing an additional two feet of dilution water. An investigation of this nature will be conducted during the August, 1976 intensive survey, whereby the performance of the outfall structure under various port configuration and head differentials will be investigated.

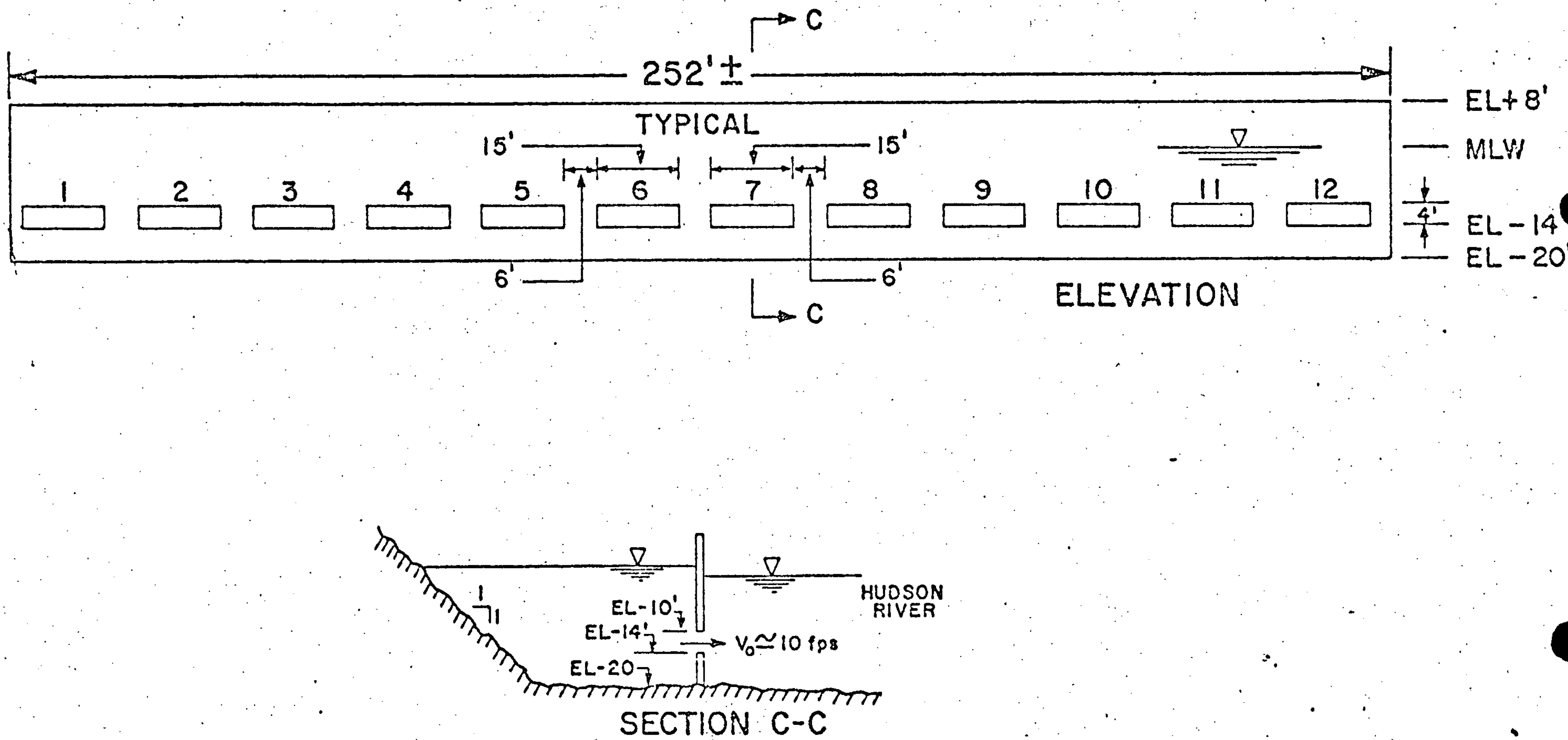
References

1. "Indian Point No. 2 Routine Monthly Thermal Monitoring, Report No. 3, Supplement", July 1974 Consolidated Edison Company of New York Inc.
2. "Indian Point Unit No. 2 Environmental Report," Appendices M and O, Consolidated Edison Company.
3. Final Environmental Statement, Indian Point Unit No. 2, p. III-37; USAEC.
4. "Tide Tables, High and Low Water Predictions", 1974 East Coast of North and South America, NOAA.

TABLE 1

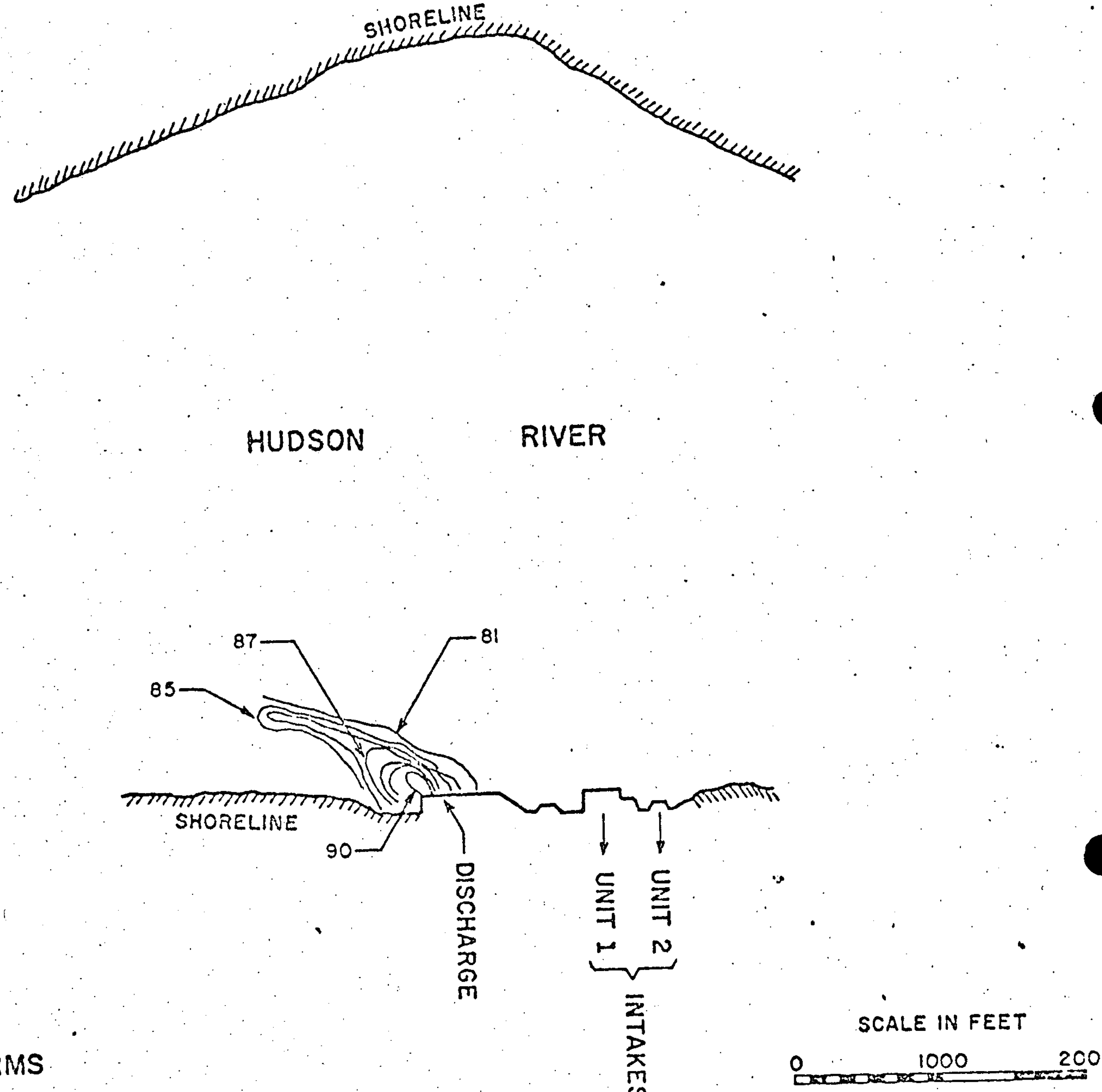
DATE	TIDAL PHASE	TIME	UNIT 2 INTAKE TEMPERATURE (°F)	DISCHARGE TEMPERATURE (°F)	SURFACE REFERENCE TEMPERATURE AT LOCATION (°F)	LOCATION[1]	MAXIMUM SURFACE TEMPERATURE (°F)	LATERAL EXTENT 90°F ISOTHERM (ft)	AREA 90°F ISOTHERM (acres)	DILUTION RATIO	HEAD DIFFERENTIAL (ft)
August 20	LWS	1005	77.8	91.8	77.7	BM	88.8	NA	NA	1.27	1.75
	Flood	1254	79.5	84.1	78.9	CP	89.9	NA	NA	1.41	1.75
	HWS	1550	79.3	93.2	80.4	CP	88.0	NA	NA	1.61	1.75
	Ebb	1919	79.7	93.8	79.1	BM	90.3	200	.36	1.33	1.75
August 21	LWS	1054	78.3	92.4	78.2	BM	87.2	NA	NA	1.59	1.75
	Flood	1348	79.8	94.3	81.2	CP	89.6	NA	NA	1.47	1.75
	HWS	1643	79.7	93.7	79.6	CP	88.1	NA	NA	1.67	1.75
	Ebb	2008	80.0	94.1	79.1	BM	91.6	100	.73	1.22	1.75
August 23	Ebb	0917	79.4	93.5	78.4	BM	90.2	100	.14	1.32	3.00
	LWS	1242	78.9	92.9	78.7	BM	86.2	NA	NA	1.96	3.00
	Flood	1538	80.3	94.2	80.6	CP	87.3	NA	NA	2.00	3.00
	HWS	1830	80.4	94.4	79.3	CP	90.4	150	.20	1.41	3.00
August 24	Ebb	1013	79.7	90.3	78.6	BM	87.9	NA	NA	1.27	3.00
	LWS	1340	79.8	90.4	78.9	BM	87.0	NA	NA	1.43	3.00
	Flood	1634	80.8	91.9	81.7	CP	84.5	NA	NA	1.45	3.00
	HWS	1926	80.2	91.0	80.2	CP	88.4	NA	NA	1.32	3.00

(1) BM= Bear Mountain; CP= Croton Point



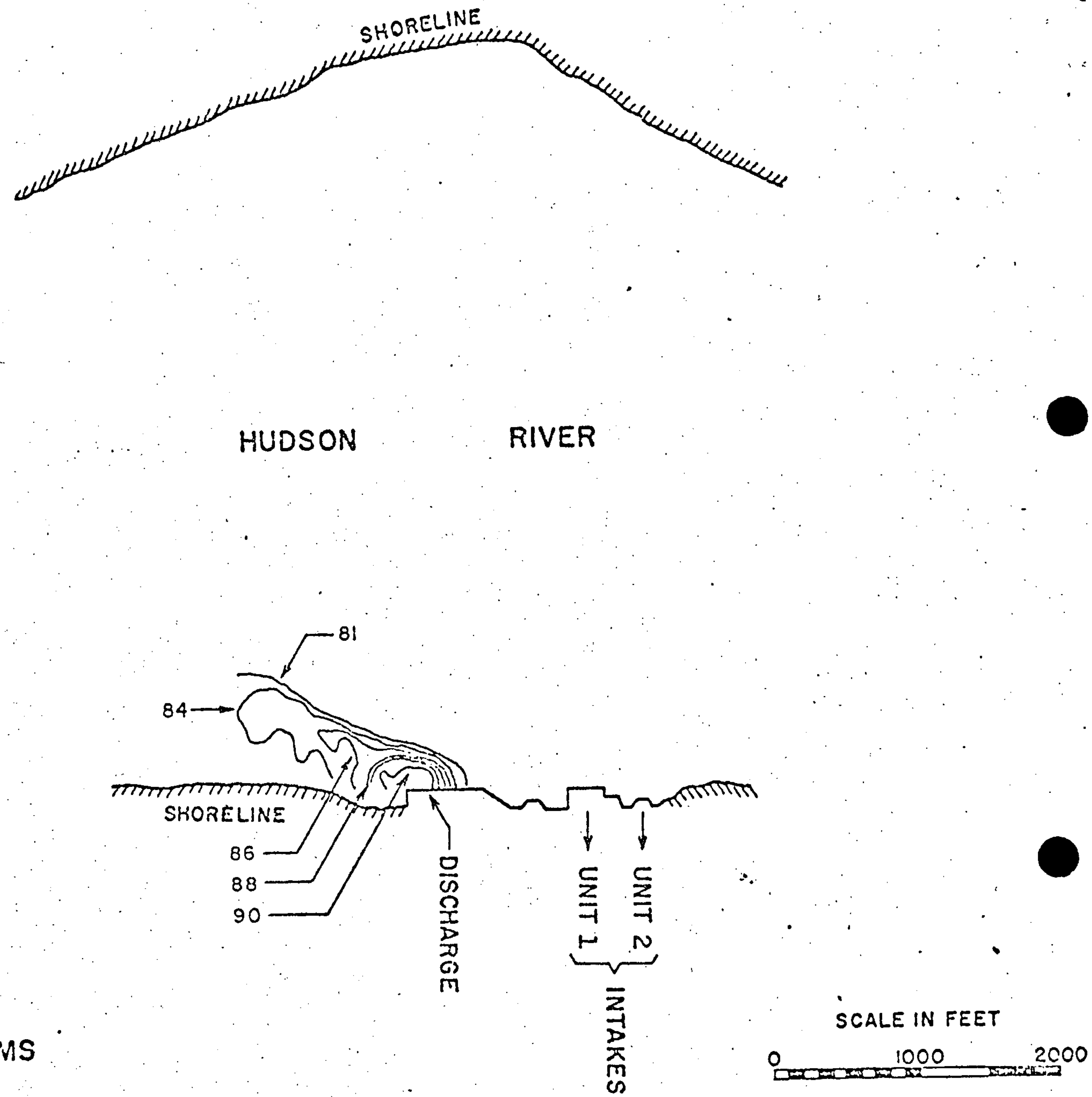
DETAILS OF DISCHARGE STRUCTURE

FIGURE 1



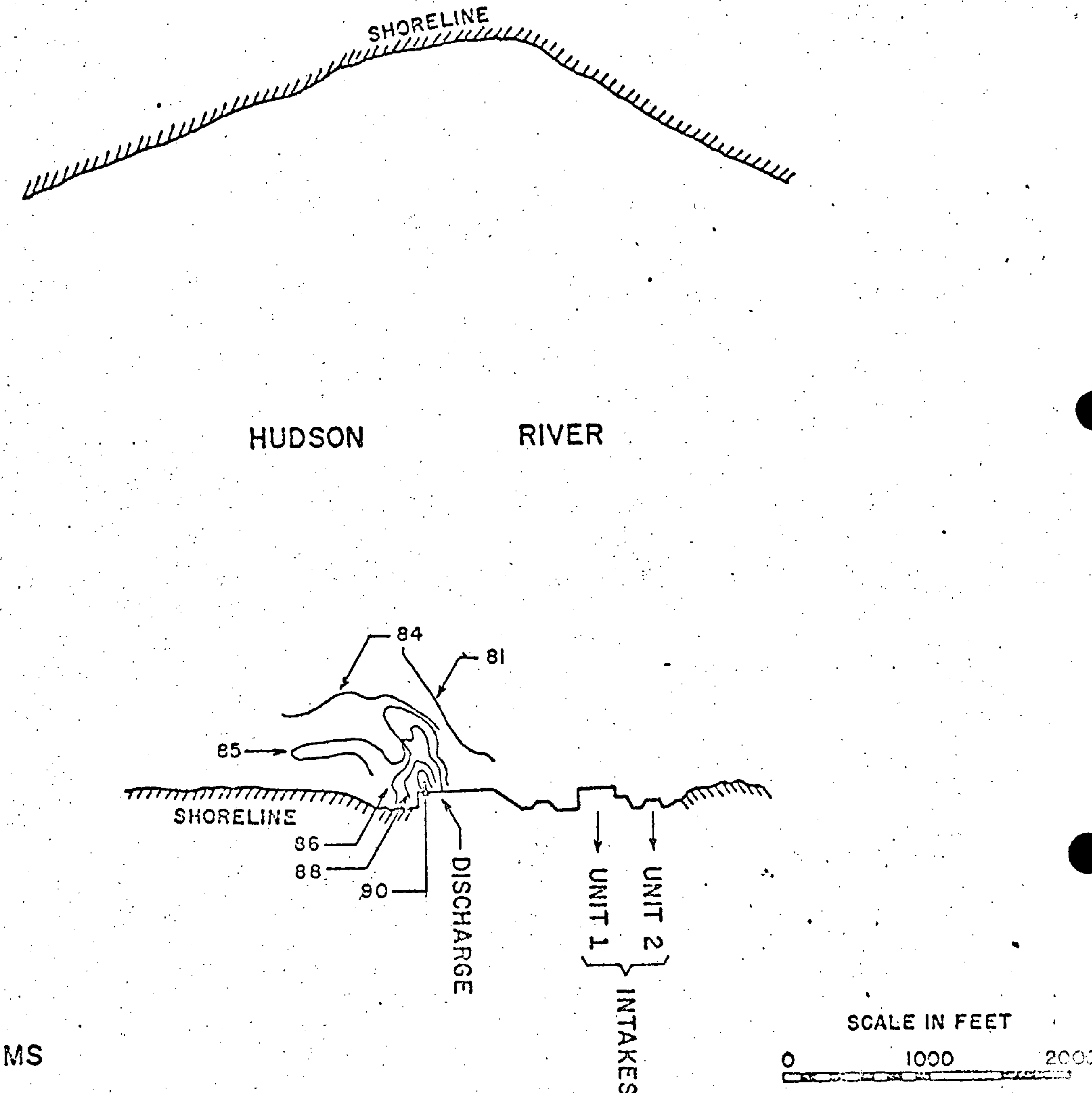
EBB
SURFACE ISOTHERMS
AUGUST 20, 1974
TIME: 1850 — 1940
TEMPERATURE (°F)

FIGURE



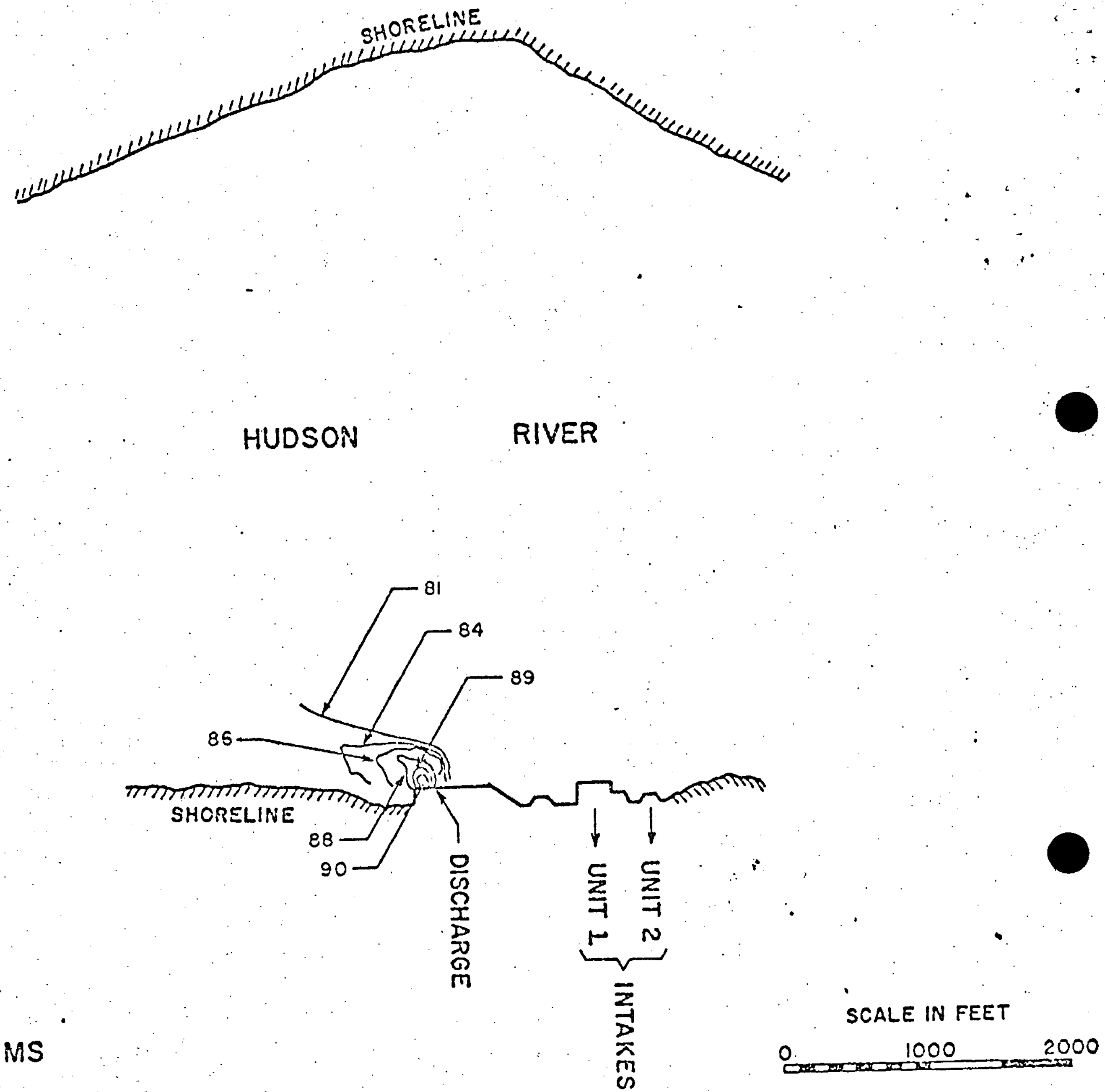
EBB
SURFACE ISOTHERMS
AUGUST 21, 1974
TIME: 1943 — 2023
TEMPERATURE (°F)

FIGURE 3



HWS
SURFACE ISOTHERMS
AUGUST 23, 1974
TIME: 1838 – 1919
TEMPERATURE (°F)

FIGURE



EBB
SURFACE ISOTHERMS
AUGUST 23, 1974
TIME: 0852 — 0932
TEMPERATURE (°F)

FIGURE