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Oyster Creek
Nuclear Generating Station

Oyster Creek
Nuclear Generating Station

1982 Annual Environmental Operating Report
for the
Oyster Creek Environmental Technical Specifications
Appendix B to License No. DPR-16

Docket No. 50-219
March 1983

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1.0 Introduction

This document is the Oyster Creek Nuclear Generating Station (OCNGS) Annual Environmental Operating Report (AEOR) for 1982. It is submitted in accordance with Section 5.6.1 of the Oyster Creek Environmental Technical Specifications (OCETS).

OCNGS is a single cycle, forced circulation, boiling light water reactor of 620 MWe maximum (summer) dependable net capability, owned by Jersey Central Power & Light Company and operated by GPU Nuclear Corporation. The OCNGS is located in Lacey Township, Ocean County, New Jersey. The plant is subject to a Provisional Operating License No. DPR-16 pursuant to Docket No. 50-219. The date of initial reactor criticality was May 3, 1969 and the commercial generation of power began on December 23, 1969.

This AEOR covers the period from January 1, 1982 through December 31, 1982. The report is organized such that Sections 2.0, 3.0 and 4.0 correspond to those same sections in OCETS. However, due to differences in the required reporting dates of various studies conducted in accordance with OCETS, reports of those studies have been or will be submitted under separate cover and will not be duplicated in this report. In each of these instances, a confirmation of the filing of the required reports is provided in the appropriate sections of the AEOR. All data which is otherwise required to be presented in the AEOR are included in this report.

2.0 Limiting Conditions for Operation

This section of the AEOR, reports on the data gathered from the monitoring of each limiting condition for operation (LCO).

2.1 Maximum Δ T Between the Circulating Water Intake and Discharge

LCO 2.1.1 requires that the maximum difference in temperature (Δ T) between the circulating water intake and discharge not exceed 23°F during normal operation which, for the purposes of this LCO, means that all four circulating water intake pumps are operating (operation with less than four circulating water pumps is covered in Section 2.2). If this temperature is exceeded, corrective action must be taken unless an "emergency need for power" exists as defined by OCETS. At no time during the year, during normal operation, did the maximum Δ T exceed 23°F. The OCNGS complied with Specification 2.1.1.

For this LCO as well as the remaining ones in Section 2.0, the data recovery rate satisfied the requirements of OCETS.

2.2 Maximum Δ T Between the Circulating Water Intake and Discharge During Pump or Intake Component Failure

LCO 2.1.2 requires that the OCNGS operate within specified limits for ΔT when less than all four circulating water intake pumps are operating. Specification 2.1.2.1 requires that the ΔT not exceed 23°F for more than 48 consecutive hours due to preventive maintenance or inspection of the pumps. Specification 2.1.2.2 requires that the Δ T not exceed 23°F for more than 14 consecutive days due to pump failure, corrective maintenance or intake component failure. Specification 2.1.2.3 requires that at no time will the ΔT exceed 33°F. Finally, specification 2.1.2.4 directs that corrective action be taken if either of the first two specifications are exceeded, unless an emergency need for power exists.

At no time during the reporting period did the Δ T exceed 23°F due to preventive maintenance or inspections of the circulating water pumps, nor was the ΔT limit exceeded for more than 14 consecutive days for reasons of pump failure, corrective maintenance, or failure of intake components, nor did the ΔT ever exceed 33°F. Therefore the OCNGS complied with specifications 2.1.2.1, 2.1.2.2 and 2.1.2.3.

2.3 Maximum Discharge Temperature

LCO 2.1.3 places limits on the station's discharge temperature. Specification 2.1.3.1 limits the discharge temperature to 106°F when all four circulating water pumps are operating. Specification 2.1.3.2 allows the discharge limitation to increase to 110°F for up to 14 consecutive days if one or more circulating water pumps is inoperative for any reasons of pump or intake component failure. Specification 2.1.3.3 limits the absolute maximum discharge temperature to 110°F. Specification 2.1.3.4 requires that

corrective action be taken if any of these specifications is exceeded, unless an emergency need for power exists.

At no time during the reporting period did the discharge temperature exceed 106°F. Therefore LCO 2.1.3.1, 2.1.3.2 and 2.1.3.3 were complied with and LCO 2.1.3.4 was not applicable.

Table 2.1 Summary of Discharge Temperature Data presents the minimum, average, and maximum temperatures and maximum ΔT by day for each month of the 1982 reporting period.

2.4 Use of Dilution Pumps

LCO 2.1.4 regulates the minimum operation of the station's three dilution pumps. Specification 2.1.4.1 defines the requirements for minimum use of dilution pumps in warm weather. Specifically when the water temperature as measured at the U.S. Route 9 bridge crossing of the discharge canal exceeds 87°F, one dilution pump must be put into operation. If the temperature continues to exceed 87°F for at least two hours, a second dilution pump must be put into operation.

Specification 2.1.4.2 deals with the operation of the pumps in cooler weather. When the ambient water temperature falls below 60.0°F, two dilution pumps must be put into operation.

Specification 2.1.4.3 requires that the third dilution pump be put into operation within fifteen minutes of such times as an insufficient number of dilution pumps are operable to comply with Specification 2.1.4.1 or 2.1.4.2. Specification 2.1.4.4 allows the station to operate with fewer dilution pumps than required for up to 14 days if an insufficient number of pumps are available to meet any of the specifications above despite operation of the third pump.

The dilution pump LCOs were complied with except for the following: LCO 2.1.4.2 non-compliance occurred on April 17, 1982, LCO 2.1.4.3 non-compliances occurred on April 29, April 30, November 16, November 22, November 30, December 1, and December 5, 1982. These events were reported in Non-routine Environmental Operating Reports Nos. 50-219/82-1, 50-219/82-2, 50-219/82-3, 50-219/82-4, 50-219/82-5, 50-219/82-6, 50-219/82-7, 50-219/82-8-2. More information on these non-compliances can be found in Section 5.1 of this AEOR.

2.5 Rate of Change in Discharge Canal Temperature During Winter Shutdowns

LCO 2.1.5 requires that, in the event of a controlled reactor shutdown with the intake canal temperature below 50°F, the two operating dilution pumps be turned off when the first circulating water intake pump is turned off or upon reaching 70% of full rated power, whichever comes first. The remaining circulating water pumps will be removed from service when safe to do so.

On May 24, August 16 and December 10, 1982 the OCNGS began controlled reactor shutdowns. The shutdowns were done in a manner consistent with OCETS and no violation of LCO 2.1.5 occurred.

Table 2-1

Summary of Discharge Temperature Data

Oyster Creek Environmental Technical Specifications
1982 Annual Environmental Operating Report

Month: January

Day	Maximum Temperature °F	Average Temperature °F	Minimum Temperature °F	Maximum ΔT °F
1	37.6	36.3	34.7	0 [1]
2	38.0	37.2	36.6	0 [1]
3	36.6	35.7	34.9	0 [1]
4	41.0	38.4	36.0	0.1[1]
5	40.9	39.9	39.1	0 [1]
6	39.2	38.5	37.6	0 [1]
7	39.8	39.2	38.8	0 [1]
8	39.0	37.5	36.7	0 [1]
9	36.7	35.4	34.6	0 [1]
10	34.5	31.9	29.7	0 [1]
11	30.5	30.3	29.7	0 [1]
12	31.0	30.8	30.5	0 [1]
13	31.3	31.1	30.7	0.3[1]
14	31.5	31.2	31.0	0.3[1]
15	32.0	31.8	31.5	0.2[1]
16	32.0	31.9	31.7	0.5[1]
17	32.0	31.9	31.5	0.5[1]
18	32.0	31.7	31.5	0.3[1]
19	32.0	31.6	31.2	0.5[1]
20	32.6	32.0	30.0	0.4[1]
21	32.5	32.2	31.8	0.8[1]
22	32.0	31.6	31.5	1.0[1]
23	32.5	31.7	31.4	0.5[1]
24	32.0	31.6	31.5	0.5[1]
25	32.3	31.6	31.0	0.5[1]
26	33.5	32.9	32.0	0.3[1]
27	34.5	33.7	33.0	0 [1]
28	35.0	34.6	33.5	0.1[1]
29	34.9	33.7	32.8	0.3[1]
30	35.5	34.2	33.0	0.3[1]
31	34.5	34.1	33.5	0.5[1]

[1]Station out of service

Table 2-1

Summary of Discharge Temperature Data

Oyster Creek Environmental Technical Specifications
1982 Annual Environmental Operating Report

Month: February

Day	Maximum Temperature °F	Average Temperature °F	Minimum Temperature °F	Maximum ΔT °F
1	36.0	35.1	34.6	0.3[1]
2	35.0	34.6	34.0	0[1]
3	36.5	35.5	34.6	0.4[1]
4	36.5	35.9	35.1	0.5[1]
5	35.7	35.1	34.5	0.3[1]
6	36.3	35.4	34.0	0.4[1]
7	36.6	35.3	34.0	0.3[1]
8	37.0	35.3	33.8	0.3[1]
9	36.0	35.5	35.2	0.2[1]
10	36.5	36.1	35.5	0.7[1]
11	35.0	34.6	34.0	0.7[1]
12	37.5	35.2	33.9	0.5[1]
13	35.5	34.8	34.1	0.1[1]
14	36.0	34.4	32.3	0.5[1]
15	37.5	35.4	33.5	0.3[1]
16	39.5	38.6	37.5	0.3[1]
17	39.6	37.4	31.2	1.0[1]
18	33.9	32.6	31.6	1.0[1]
19	34.6	33.4	32.9	1.3[1]
20	36.7	35.6	34.7	0.6[1]
21	40.0	37.3	36.5	2.9[1]
22	38.4	37.5	37.4	1.3[1]
23	39.0	38.0	37.5	0[1]
24	38.6	38.3	38.1	0[1]
25	39.1	38.8	38.6	0[1]
26	40.7	39.7	39.1	0.7[1]
27	43.3	37.6	35.3	6.0[1]
28	39.4	37.7	36.7	1.0[1]

[1]Station out of service

Table 2-1

Summary of Discharge Temperature Data

Oyster Creek Environmental Technical Specifications
1982 Annual Environmental Operating Report

Month: March

Day	Maximum Temperature °F	Average Temperature °F	Minimum Temperature °F	Maximum ΔT °F
1	38.6	36.5	34.9	0.3[1]
2	39.2	38.2	37.8	0.5[1]
3	40.7	38.8	38.0	0.1[1]
4	41.7	39.8	39.1	1.2[1]
5	40.8	40.1	39.7	0.9[1]
6	44.8	40.7	39.4	4.8[1]
7	42.4	40.7	40.2	1.1[1]
8	40.5	39.7	37.9	0[1]
9	38.6	37.4	36.6	0.2[1]
10	38.9	37.4	35.9	0.1[1]
11	43.2	40.2	38.2	0[1]
12	45.4	43.7	42.2	0[1]
13	45.1	43.9	42.9	0[1]
14	46.4	44.8	43.3	0[1]
15	45.3	44.3	43.6	0.1[1]
16	45.3	44.5	43.6	0.2[1]
17	45.6	44.5	43.9	1.6[1]
18	46.2	44.8	44.3	1.6[1]
19	45.1	44.5	44.0	0[1]
20	47.0	45.1	44.6	0[1]
21	45.6	45.2	44.9	0[1]
22	46.2	45.6	45.0	0[1]
23	53.0	47.5	45.9	2.5[1]
24	48.4	47.9	47.3	0[1]
25	48.6	48.4	48.2	0[1]
26	49.2	48.3	46.5	0[1]
27	48.3	47.0	46.3	0[1]
28	49.7	48.0	46.9	1.7[1]
29	55.2	50.8	49.1	3.3[1]
30	49.1	47.9	47.0	0[1]
31	48.9	48.1	47.6	0[1]

[1]Station out of service

Table 2-1

Summary of Discharge Temperature Data

Oyster Creek Environmental Technical Specifications
1982 Annual Environmental Operating Report

Month: April

Day	Maximum Temperature °F	Average Temperature °F	Minimum Temperature °F	Maximum ΔT °F
1	50.0	47.6	46.4	0 [1]
2	55.7	50.8	49.1	4.9[1]
3	53.8	51.3	49.5	3.1[1,3]
4	----	----	----	---[1,2,3]
5	----	----	----	---[1,2,3]
6	----	----	----	---[1,2,3]
7	----	----	----	---[1,2,3]
8	----	----	----	---[1,2,3]
9	----	----	----	---[1,2,3]
10	----	----	----	---[1,2,3]
11	----	----	----	---[1,2,3]
12	----	----	----	--[1,2,3]
13	52.0	46.3	43.1	1.5[1],
14	50.0	47.7	45.5	0.2[1]
15	56.9	47.7	38.0	5.8
16	71.2	64.2	57.4	15.2
17	70.9	63.6	58.2	13.0
18	69.5	64.7	60.7	10.2
19	74.5	70.8	65.2	13.5
20	78.3	76.1	72.9	14.0
21	77.6	75.4	73.0	17.6
22	75.5	73.1	71.4	17.0
23	74.3	71.8	69.9	17.3
24	75.0	72.2	69.5	16.3
25	80.0	75.9	73.0	17.5
26	80.0	78.5	77.0	16.8
27	80.4	78.0	76.0	17.0
28	78.5	74.7	72.5	17.7
29	75.0	72.4	70.2	17.0
30	78.0	75.1	72.0	17.2

[1]Station out of service

[2]Environmental recorder out of service

[3]Circulating pumps not operating

Table 2-1

Summary of Discharge Temperature Data

Oyster Creek Environmental Technical Specifications
1982 Annual Environmental Operating Report

Month: May

Day	Maximum Temperature °F	Average Temperature °F	Minimum Temperature °F	Maximum ΔT °F
1	76.1	74.9	72.8	17.0
2	79.2	76.8	74.0	17.0
3	79.8	77.8	76.0	17.3
4	81.9	79.8	77.0	17.5
5	82.3	80.8	78.7	18.0
6	81.8	80.2	78.5	18.0
7	84.0	81.8	80.0	18.0
8	85.0	83.1	81.1	17.5
9	83.4	81.5	79.5	17.2
10	81.0	78.5	76.3	17.5
11	78.8	76.7	74.5	13.4
12	81.9	79.4	77.7	13.5
13	86.3	82.2	80.0	16.6
14	89.7	83.8	80.7	16.7
15	84.3	81.7	77.5	16.7
16	89.1	84.2	80.8	16.9
17	88.7	86.3	84.5	16.7
18	90.0	85.9	83.5	16.8
19	92.0	89.7	87.5	16.9
20	91.7	89.4	87.3	16.7
21	89.7	87.8	84.9	16.8
22	85.6	82.9	80.3	16.8
23	80.5	77.9	71.9	16.7
24	71.7	61.6	59.1	11.5
25	60.9	59.5	58.8	0.2[1]
26	65.9	62.3	59.6	0.3[1]
27	75.8	67.7	60.6	19.1
28	74.2	72.1	70.2	8.4
29	80.4	76.7	71.2	13.2
30	82.7	80.5	79.0	13.3
31	83.0	81.7	80.1	13.5

[1]Station out in service

Table 2-1

Summary of Discharge Temperature Data

Oyster Creek Environmental Technical Specification
1982 Annual Environmental Operating Report

Month: June

Day	Maximum Temperature °F	Average Temperature °F	Minimum Temperature °F	Maximum ΔT °F
1	85.0	82.3	79.9	17.4
2	86.5	84.4	82.3	17.3
3	84.8	82.6	80.5	13.6
4	85.0	71.7	67.1	13.9
5	76.9	68.7	66.0	10.7
6	81.8	79.4	76.9	15.9
7	81.7	80.9	80.4	17.5
8	81.8	80.1	79.0	17.8
9	87.8	84.6	80.6	21.8
10	86.9	84.6	83.6	17.5
11	86.1	85.4	84.6	17.1
12	84.6	83.2	82.1	17.1
13	84.2	81.8	79.2	17.0
14	82.3	80.7	79.0	16.8
15	86.8	82.7	80.1	16.7
16	93.6	89.2	83.8	16.7
17	93.6	91.0	88.5	16.8
18	92.1	89.8	88.1	16.4
19	92.3	90.4	89.0	16.5
20	90.1	88.5	86.8	16.6
21	91.2	88.9	86.8	16.2
22	91.6	90.2	89.4	16.3
23	90.7	89.2	87.6	16.3
24	91.4	88.6	86.9	16.0
25	91.8	89.2	87.7	16.3
26	95.9	92.1	89.8	16.6
27	95.0	92.0	90.6	17.0
28	91.8	90.8	89.5	16.4
29	94.4	92.3	90.8	16.4
30	92.1	91.0	89.6	16.1

Table 2-1

Summary of Discharge Temperature Data

Oyster Creek Environmental Technical Specifications
1982 Annual Environmental Operating Report

Month: July

Day	Maximum Temperature °F	Average Temperature °F	Minimum Temperature °F	Maximum ΔT °F
1	91.6	89.6	87.6	16.3
2	94.8	90.5	87.4	16.3
3	93.4	89.8	87.0	16.3
4	89.5	87.2	85.1	16.2
5	92.9	90.0	87.4	16.0
6	93.8	91.4	88.7	16.1
7	96.8	93.5	90.8	16.2
8	97.0	94.9	92.9	16.0
9	97.0	95.5	93.8	15.7
10	99.3	96.6	94.5	15.8
11	100.1	98.1	96.5	15.8
12	98.6	97.5	96.1	15.5
13	98.6	96.6	94.7	15.7
14	97.8	96.1	94.7	15.5
15	99.5	97.3	95.6	15.5
16	100.7	97.9	95.5	15.3
17	102.0	99.0	96.3	15.2
18	101.6	99.6	97.3	15.0
19	101.6	99.9	98.7	15.2
20	101.5	99.1	96.9	15.4
21	97.0	95.0	93.2	15.2
22	95.0	93.7	92.4	15.0
23	93.1	92.4	91.8	15.2
24	93.9	92.4	91.2	15.0
25	97.3	93.7	91.0	15.0
26	98.0	95.5	93.6	14.9
27	97.5	95.8	94.2	15.1
28	98.4	97.7	96.7	14.9
29	97.7	94.5	92.4	14.7
30	94.6	92.9	92.0	15.2
31	94.5	92.6	90.6	14.8

Table 2-1

Summary of Discharge Temperature Data

Oyster Creek Environmental Technical Specifications
1982 Annual Environmental Operating Report

Month: August

Day	Maximum Temperature °F	Average Temperature °F	Minimum Temperature °F	Maximum ΔT °F
1	94.5	92.7	91.2	14.7
2	95.5	93.2	91.1	14.4
3	95.8	93.6	92.0	14.7
4	95.8	93.8	92.0	14.6
5	97.2	95.5	93.0	14.5
6	97.4	93.4	89.8	14.6
7	93.8	91.2	89.2	14.9
8	95.1	92.8	90.7	15.8
9	95.8	94.9	93.8	14.6
10	96.6	95.0	93.6	14.8
11	94.7	93.3	91.3	14.3
12	91.3	89.8	88.8	14.2
13	91.3	89.1	87.7	14.0
14	91.7	89.3	87.1	14.2
15	90.9	78.2	74.1	13.3
16	77.8	75.9	74.3	0.2[1]
17	77.3	76.0	74.6	0.1[1]
18	77.6	75.9	74.5	0.1[1]
19	78.1	76.4	75.0	0.1[1]
20	77.7	76.1	74.8	0.1[1]
21	75.9	75.3	74.4	0.1[1]
22	74.4	73.1	71.8	0.1[1]
23	73.2	72.5	72.1	0.1[1]
24	76.8	73.9	72.2	0.2[1]
25	75.9	74.6	73.4	0.1[1]
26	75.3	73.3	71.2	0.1[1]
27	74.3	72.8	71.9	0[1]
28	74.3	72.5	71.2	0.1[1]
29	76.8	71.9	68.7	6.4
30	85.7	79.9	75.8	15.3
31	87.4	84.8	83.0	14.7

[1]Station out of service

Table 2-1

Summary of Discharge Temperature Data

Oyster Creek Environmental Technical Specifications
1982 Annual Environmental Operating Report

Month: September

Day	Maximum Temperature °F	Average Temperature °F	Minimum Temperature °F	Maximum ΔT °F
1	89.1	86.6	84.5	13.5
2	90,7	88.5	86.1	13.7
3	90.9	87.7	85.2	13.7
4	86.3	85.0	83.5	13.7
5	85.9	84.4	83.6	13.7
6	86.7	85.1	84.2	13.6
7	85.3	83.9	82.7	13.4
8	83.7	82.3	81.0	13.6
9	85.6	83.0	81.0	13.5
10	86.2	84.0	81.7	13.4
11	88.6	86.0	84.2	13.5
12	89.3	87.4	85.4	13.4
13	89.8	84.0	76.3	13.4
14	88.8	87.8	86.6	13.0
15	89.4	87.4	85.8	13.2
16	88.9	87.0	86.2	13.0
17	86.9	85.2	83.9	13.2
18	87.2	84.3	82.3	12.6
19	86.7	84.1	82.8	12.6
20	84.4	83.0	80.2	12.4
21	80.4	79.4	78.1	12.4
22	77.9	77.0	76.7	12.8
23	78.8	77.4	76.6	12.4
24	80.7	78.0	75.8	12.6
25	80.7	79.3	77.9	12.2
26	79.0	78.0	77.2	12.6
27	82.3	79.3	77.6	11.9
28	81.9	80.2	78.8	12.1
29	81.8	80.5	79.2	12.0
30	78.9	77.7	77.0	11.9

Table 2-1

Summary of Discharge Temperature Data

Oyster Creek Environmental Technical Specifications
1982 Annual Environmental Operating Report

Month: October

Day	Maximum Temperature °F	Average Temperature °F	Minimum Temperature °F	Maximum ΔT °F
1	80.9	78.4	76.8	11.9
2	80.4	78.4	76.7	12.0
3	80.3	77.9	76.1	11.9
4	80.6	78.9	76.9	11.9
5	80.4	79.1	77.9	11.9
6	81.5	80.1	79.1	11.8
7	82.9	81.0	79.7	11.6
8	90.2	86.7	82.7	16.2
9	88.5	84.6	79.8	14.8
10	79.8	75.9	73.6	11.9
11	74.1	72.6	71.4	11.6
12	72.8	72.1	71.5	11.4
13	73.9	72.4	71.7	11.8
14	75.2	74.2	73.2	11.9
15	77.2	75.7	73.3	15.4
16	76.1	72.1	69.8	14.6
17	70.1	68.3	67.0	11.9
18	68.5	66.7	65.2	11.6
19	69.4	67.0	65.3	11.6
20	71.9	69.3	67.8	11.7
21	72.6	70.8	69.2	11.7
22	69.6	68.4	67.0	11.5
23	68.0	66.7	65.4	11.5
24	66.9	64.4	62.8	12.7
25	62.8	61.9	61.2	12.0
26	64.0	62.8	61.0	11.7
27	64.6	63.7	62.3	12.2
28	71.1	65.8	63.5	16.4
29	69.4	66.5	63.7	12.1
30	69.6	68.3	66.4	11.7
31	71.7	69.9	68.7	12.0

Table 2-1

Summary of Discharge Temperature Data

Oyster Creek Environmental Technical Specification
1982 Annual Environmental Operating Report

Month: November

Day	Maximum Temperature °F	Average Temperature °F	Minimum Temperature °F	Maximum ΔT °F
1	73.7	71.8	70.7	11.7
2	78.2	75.0	71.7	14.8
3	79.6	78.3	77.0	14.7
4	81.5	79.6	77.5	14.8
5	82.0	77.7	73.1	14.6
6	73.1	71.1	69.8	14.7
7	70.1	69.0	67.9	15.4
8	69.1	67.2	66.0	15.2
9	68.1	67.4	66.6	15.2
10	68.8	65.3	63.2	16.2
11	65.9	63.1	60.8	11.8
12	71.5	67.6	64.8	11.8
13	72.8	67.2	62.7	11.8
14	62.9	62.0	60.9	11.5
15	62.7	61.2	59.1	11.5
16	60.1	58.7	57.2	11.4
17	60.4	58.3	56.9	11.6
18	58.2	57.4	56.5	11.4
19	59.0	58.5	57.8	11.1
20	61.0	59.5	58.5	11.3
21	62.0	60.6	59.8	11.2
22	62.8	62.0	61.4	10.7
23	63.7	62.9	62.3	10.6
24	63.9	62.9	60.6	10.6
25	60.6	59.3	58.3	11.3
26	61.1	59.0	57.1	11.1
27	60.6	57.4	55.2	11.2
28	56.9	55.5	52.0	10.8
29	60.5	58.7	55.9	10.8
30	58.8	57.7	56.5	10.4

Table 2-1

Summary of Discharge Temperature Data

Oyster Creek Environmental Technical Specification
1982 Annual Environmental Operating Report

Month: December

Day	Maximum Temperature °F	Average Temperature °F	Minimum Temperature °F	Maximum ΔT °F
1	59.0	57.3	56.0	10.2
2	62.1	60.9	57.5	13.3
3	63.6	62.6	61.5	13.4
4	68.8	66.1	62.9	13.4
5	70.6	67.8	65.5	13.3
6	73.4	71.3	69.9	13.2
7	69.8	66.5	60.6	13.2
8	66.3	63.6	61.5	13.3
9	62.5	61.0	53.3	11.6
10	52.8	44.5	42.9	6.0[1]
11	43.7	41.6	42.9	0.4[1]
12	42.9	39.9	37.4	0.9[1]
13	38.5	37.4	36.1	0.9[1]
14	38.9	36.8	35.5	0.1[1]
15	36.8	36.2	35.4	0.1[1]
16	40.9	39.1	36.7	0.0[1]
17	39.2	38.6	37.8	0.0[1]
18	38.8	37.5	36.8	1.5[1]
19	45.6	38.1	36.4	7.9[1]
20	49.4	47.3	43.2	11.4
21	49.7	48.3	44.6	10.6
22	50.4	46.9	43.9	12.9
23	51.8	50.0	49.4	13.4
24	53.9	51.2	49.7	13.1
25	57.7	54.1	51.5	13.1
26	66.5	59.5	57.6	13.1
27	56.9	56.2	55.3	13.1
28	61.5	58.0	56.2	13.0
29	62.9	61.3	59.6	12.7
30	59.5	57.5	56.0	12.5
31	56.2	54.8	54.2	12.4

[1]Station out of Service

3.0 Environmental Monitoring

This section of the AEOR outlines the various environmental monitoring programs to be conducted by Section 3.0 of the OCETS, and provides the status of submission of the reports on these various programs. The reporting requirements of the studies that are currently required by the nonradiological monitoring program of the OCETS do not coincide with the required submission date of the AEOR.

3.1 Abiotic-Aquatic

All aquatic abiotic measurements specified in the environmental monitoring programs (Section 3.0 of the OCETS) and special monitoring and study activities (Section 4.0 of the OCETS) are required to be reported as part of each particular study and therefore are not included in this section of the AEOR.

3.2 Biotic-Aquatic

Section 3.1.2 of the OCETS specifies the following studies:

A. General Ecological Survey

1. Commerical Landings of Fin and Shellfish

B. Impingement of Organisms

1. Conventional Travelling Screens

2. Fish Return System

C. Fish Kill Monitoring Program

The OCETS require that these studies be reported annually. These studies were submitted on February 25, 1983. Since these reports were submitted under separate cover, they are not duplicated here.

4.0 Special Monitoring and Study Activities

This section of the AEOR presents the results of the several special monitoring and study activities required by the OCETS. There are currently five different activities that are performed.

4.1 Woodborer Monitoring Program

This program has reporting requirements which are different from the other OCETS programs. During the reporting period the following reports were submitted.

a. The 27th Quarter Report covering the period from November 21, 1981 to February 20, 1982 was submitted on March 18, 1982.

b. The 28th Quarter Report covering the period from February 21 to May 20, 1982 was submitted on June 10, 1982.

c. The 29th Quarter Report covering the period from May 21 to August 20, 1982 was submitted on September 13, 1982.

d. The 30th Quarter Report covering the period from August 21 to November 20, 1982 was submitted on December 10, 1982.

In addition as per the OCETS, the annual report for the woodborer monitoring program will be submitted by the end of May 1983. Therefore, no results of this program are presented herein.

4.2 Thermal Plume Measurement Program

4.2.1 Introduction

The OCETS Thermal Plume Measurement Program requires a monthly plume measurement when OCNGS is operating. The thermal plume of the cooling water discharged by OCNGS is measured in Barnegat Bay.

In 1982, nine plume surveys were performed by GPUN Environmental Controls personnel and are the subject of analysis as contained in this report. No plumes were measured in January, February and March since OCNGS did not operate in those months (Table 4-1). Plumes surveyed from 1974 to 1976 are contained in separate reports (JCP&L, 1978), and plumes surveyed in 1979, 1980, and 1981 are contained in the 1979, 1980 and 1981 Oyster Creek Annual Environmental Operating Reports, respectively.

The text contains operating data and plume descriptions. The attachments for each plume (Section 4.2.7) contain: 1) table of plume data, 2) plot of temperature versus distance from OCNGS; 3) boat track in Barnegat Bay; 4) longitudinal cross-section of temperature in Oyster Creek and in an easterly

direction across Barnegat Bay; 5) maps of isotherms (temperature deltas above ambient) in Barnegat Bay at different depths.

Thermal plume maps were analyzed to determine if the area of Barnegat Bay affected by the operation of OCNGS is consistent with the New Jersey Surface Water Quality Criteria (N.J. Department of Environmental Protection, 1979). Barnegat Bay, Oyster Creek, and the South Branch of Forked River are classified Tidal Water 1 (TW1). The criteria for temperature for TW1 are as follows:

1) General--Shall not be raised above ambient by more than 4 degrees F during September through May, nor more than 1.5 degrees F during June through August, nor shall temperatures exceed 85 degrees F in these waters. Temperature shall be measured outside of designated heat dissipation areas.

2) Heat Dissipation Areas--The limitations specified above may be exceeded in designated heat dissipation areas by specific permission on a case-by-case basis.

3) Heat Dissipation Area Determinations--The determination of designated heat dissipation areas in estuarine waters, including bays, shall take into consideration the extent and nature of such waters. In order to meet the intent and purpose of the criteria and standards, provisions for the passage of free-swimming and drifting organisms are to be included so that negligible or no effects are produced on their populations. As a guideline, heat dissipation areas shall be limited to no more than 1/4 of the cross-sectional area and/or volume of flow of the body of water, leaving at least 3/4 free as a zone of passage which is to include a minimum of 1/3 of the surface measured from shore to shore at any stage of the tide.

4) Rate of Temperature Change--The rate of temperature change in designated heat dissipation areas shall not cause mortality of fish or shellfish.

4.2.2 Materials and Methods

Basic Instrumentation:

Mon/Ark 19 ft. Utility Work Boat
A/O Refractometer
YSI Model 46 Tele-thermometer
Esterline-Augus Model PD206 Data Logger
Mini-Ranger III Microwave Range Location System
Thermocouple probe and depressor assembly

The Mini-Ranger system employs two land based reference transponders and an on-board receiver/transmitter and console display unit. The system operates in the microwave frequency band and requires direct line of sight between each reference station and the survey vessel. At previously determined intervals, the on-board receiver/transmitter queries the transponders which respond with a microwave signal. Based on the time elapsed between the sending of the initial signal and the detection of the response signal, the console display unit determines the distance in real units between its current location and each of the land-based transponders. It is then possible to determine the location of a given point relative to the two transponders by triangulation.

A 40 lb. depressor (brass weight, taperd to facilitate flow through water), secured to the boat with a steel cable, is towed at a speed such that the steel cable is at a 45 degree angle from the vertical. Four thermocouples are attached to the cable so that in waters 7 ft. deep or deeper, the thermocouples are 1, 2.5, 5 and 7 ft. deep. Shallower waters will cause the depressor to ride along the bottom of the bay and affect the depth of each thermocouple. Figure 4-2b shows the 3 ft. and 6 ft. depth contour lines in the area of Barnegat Bay surrounding Oyster Creek.

This arrangement allows the plume survey to be conducted without stopping the boat at individual stations. The boat travels along at a constant speed, with the data logger automatically recording temperature at the four levels as well as location (via Mini-Ranger III Microwave Range Location System), date, and time of day. The data logger records measurements every 30 seconds.

Vertical temperature profiles are measured in this fashion beginning at a point where the Rt. 9 Bridge intersects Oyster Creek and traversing the length of Oyster Creek to the Barnegat Bay. Once out in the bay, transects sufficient in number and extent are made so as to determine the limits of the heated water area. Salinity is measured each time the boat changes direction and begins a new transect. The limits of the heated water area are defined when successive measurements are the same and correspond to known Rt. 9 Bridge temperature minus the OCNGS mixed delta temperature (with the appropriate circulation and dilution pumps in operation). This gives a good approximation of the ambient temperature of the bay for that particular day and time. Later, the ambient temperature is verified by taking an average of the range of the lowest temperatures encountered on that day.

The data is keypunched and loaded onto an IBM 370/3081 computer. The data is then transferred to a basic processor, analyzed, tabulated, and graphically presented using a Tektronix 4054 CRT terminal and 4956 graphics tablet.

4.2.3 Thermal Plume Results

April 26, 1982

Figures and tables which pertain to this plume survey appears on pp. 36 to 48 .

Time:	1200-1410	ΔT:	16.3°F
Wind Direction:	SE	MWe:	413
Wind Speed:	15 mph	Circ. flow:	345,000 gpm
Tide:	High Slack	Dil. flow:	520,000 gpm

The 4 degree F delta T isotherm did not exceed the maximum heat dissipation area guidelines, as defined in Section 4.2.1. At the 1 ft. level, the plume extended to the north along the western shore of Barnegat Bay (plume type 2, see Figure 4-2a). Surface area extent of the 4 degree F delta T isotherm was 0.25 square miles. The plume was nearly identical at all levels, a result of the shallow (5 ft. or less, Figure 4-2b) conditions in this area which restrict vertical dilution. Recirculation of the 4 degree F delta T isotherm occurred at all levels.

May 4, 1982

Figures and tables which pertain to this plume survey appear on pp. 49 to 61 .

Time:	1130-1400	ΔT:	17.1°F
Wind Direction:	E	MWe:	410
Wind Speed:	7-10 mph	Circ. flow:	345,000 gpm
Tide:	Ebb	Dil. flow:	520,000 gpm

The 4 degree F delta T isotherm did not exceed the maximum heat dissipation area guidelines, as defined in Section 4.2.1. The surface plume extended due east out into the bay (plume shape 1, see Figure 4-2a) about 0.9 miles. Surface area extent of the 4 degree F delta T isotherm was 0.72 square miles. The plume was only slightly smaller at the 2.5 ft. depth level, but was substantially smaller at the 5 ft. and bottom levels. Plumes which extend into the deeper (greater than 5 ft.) area of the bay (Figure 4-2b) usually are less extensive at the 5 ft and bottom levels than they are at the upper levels, because of enhanced vertical mixing. Recirculation of the plume did not occur.

June 8, 1982

Figures and tables which pertain to this plume survey appear on pp. 62 to 75.

Time:	1130-1350	ΔT:	17.2°F
Wind Direction:	N	MWe:	567
Wind Speed:	4-6 mph	Circ. flow:	460,000 gpm
Tide:	High Slack	Dil. flow:	260,000 gpm

The 1.5 degree F delta T isotherm did not exceed the maximum heat dissipation area guidelines, as defined in Section 4.2.1. The surface plume extended out into the bay (plume shape 1, Figure 4-2a) about 0.8 miles, showing a slight bias towards the northeast. Surface area extent of the 1.5 degree F delta T isotherm was 0.49 square miles. The plume was nearly identical at the 2.5 ft. level, substantially smaller at the 5 ft. level, and very small at the bottom level. Recirculation of the plume did not occur.

July 19, 1982

Figures and tables which pertain to this plume survey appear on pp. 76 to 87.

Time:	1150-1340	ΔT:	15.0°F
Wind Direction:	WSW	MWe:	450
Wind Speed:	7 mph	Circ. flow:	460,000 gpm
Tide:	Max. Ebb	Dil. flow:	520,000 gpm

The 1.5 degree F delta T isotherm approached the maximum heat dissipation area guidelines, as defined in Section 4.2.1. Section 4.2.4 contains a discussion of this under "Surface and Cross Sectional Extent." The surface plume extended due east out into the bay (plume shape 7, Figure 4-2a) about 1.1 miles. Surface area extent of the 1.5 degree F delta T isotherm was 0.94 square miles. The plume was similar at th 2.5 ft. level, but was substantially smaller at the 5 ft. level and insignificant at the bottom level. Recirculation of the plume did not occur.

August 31, 1982

Figures and tables which pertain to this plume survey appear on pp. 88 to 98.

Time:	1230-1420	ΔT:	14.0°F
Wind Direction:	S	MWe:	440
Wind Speed:	9 mph	Circ. flow:	460,000 gpm
Tide:	Ebb	Dil. flow:	260,000 gpm

The 1.5 degree F delta T isotherm did not exceed the maximum heat dissipation area guidelines, as defined in Section 4.2.1. The surface plume extended north along the western shore of Barnegat Bay (plume shape 6, Figure 4-2a), extending out into the bay about 0.7 miles from the shore. Surface area extent of the 1.5 degree F delta T isotherm was 0.47 square miles. The plume was similar at the 2.5 ft. level, but noticeably smaller at the 5 ft. and bottom levels. Since the bay is generally shallow in this area (5 ft. deep or less, Figure 4-2b) and vertical dilution was limited, a well-developed plume was observed at all levels. Recirculation of the 1.5 degree F isotherm was observed at all levels.

September 27, 1982

Figures and tables which pertain to this plume survey appear on pp. 99 to 111.

Time:	1200-1400	ΔT:	11.8°F
Wind Direction:	SW	MWe:	380
Wind Speed:	9 mph	Circ. flow:	460,000 gpm
Tide:	Low Slack	Dil. flow:	260,000 gpm

The 4 degree F delta T isotherm did not exceed the maximum heat dissipation area guidelines, as defined in Section 4.2.1. The surface plume extended north along the western shore of Barnegat Bay (plume shape 2, Figure 4-2a), extending out into the bay about 0.7 miles from the shore. Surface area extent of the 4 degree F delta T isotherm was 0.07 square miles. At the 1 and 2.5 ft. levels, a 3 degree F delta T isotherm was observed around the mouth of the Forked River, detached from the plume centerline. The 5 ft. and bottom level plumes were insignificant. Recirculation of the 2 degree F delta T isotherm was observed at the 1 and 2.5 ft. level.

October 12, 1982

Figures and tables which pertain to this plume survey appear on pp. 112 to 123.

Time:	1130-1330	ΔT:	11.1°F
Wind Direction:	S	MWe:	362
Wind Speed:	4-5 mph	Circ. flow:	460,000 gpm
Tide:	Low Slack	Dil. flow:	520,000 gpm

The 4 degree F delta T isotherm did not exceed the maximum heat dissipation area guidelines, as defined in Section 4.2.1 The surface plume was compressed against the western shore of the bay (plume type 5, Figure 4-2a), extending further to the south than the north. Extension out into the bay was about 0.7 miles. Surface area extent of the 4 degree F delta T isotherm was 0.18 square miles. The plume was similar at the 2.5 ft. level, but became progressively smaller and more compressed against the shore at the 5 ft. and bottom levels. Recirculation of the plume did not occur.

November 2, 1982

Figures and tables which pertain to this plume survey appear on pp. 124 to 134 .

Time:	1100-1230	ΔT:	14.7°F
Wind Direction:	SW	MWe:	331
Wind Speed:	10 mph	Circ. flow:	345,000 gpm
Tide:	Ebb	Dil. flow:	520,000 gpm

The 4 degree delta T isotherm did not exceed the maximum heat dissipation area guidelines, as defined in Section 4.2.1. The surface plume extended to the north along the western shore to Forked River (plume shape 2, Figure 4-2a). Extension out into the bay was about 0.5 miles from the shore. Surface area extent of the 4 degree F delta T isotherm was 0.16 square miles. The plume was similar in shape but became progressively smaller and more compressed against the shore at the deeper levels. Recirculation of the 1.5 and 3 degree F delta T isotherms was observed at the 1 and 2.5 ft. levels, but recirculation of only the 1.5 degree F isotherm was observed at the 5 ft. and bottom levels.

December 6, 1982

Figures and tables which pertain to this plume survey appear on pp. 135 to 145 .

Time:	1200-1330	ΔT:	13.1°F
Wind Direction:	SW	MWe:	280
Wind Speed:	9 mph	Circ. flow:	345,000 gpm
Tide:	Flood	Dil. flow:	520,000 gpm

The 4 degree F delta T isotherm did not exceed the maximum heat dissipation area guidelines, as defined in Section 4.2.1. The surface plume extended to the north along the western shore to Forked River (plume shape 2, Figure 4-2a). Extension out into the bay was about 0.5 miles from the shore. Surface area extent of the 4 degree F delta T isotherm was 0.12 square miles. The plume was similar in shape but became progressively

smaller and more compressed against the shore at the deeper levels. Recirculation of the 1.5 and 2 degree F delta T isotherms was observed at the 1 ft. levels, but recirculation at only the 1.5 degree F isotherm was observed at the deeper levels.

4.2.4 Discussion

Shape Codes

The plume's shape and extent are determined by the prevailing meteorological and tidal forces, and the station operating conditions. The station operating conditions determine the total content and concentration of heat (above ambient) in the Oyster Creek flow and the velocity of the discharge waters as they intersect the bay. The Oyster Creek flow is vertically well-mixed in the water column which varies from 8-13 feet deep. After the Oyster Creek flow intersects the bay and the initial momentum of the waters is expended, ambient conditions dominate the dispersion of the plume. The prevailing wind exerts primary influence on the plume's dispersion, while tidal forces and the bathymetry of the bay itself also help determine the shape, extent, and vertical stratification characteristics of the plume.

The object of this program is to develop the ability to predict the basic plume shape and extent under any given set of ambient and station operating conditions. Recurrent plume shapes have been established based on previously measured plumes (JCP&L, 1980 & 1981) and are portrayed in Figure 4-2a. The eight plume shapes are distinguished by the direction and location of the plume centerline. For the thermal plumes measured in 1982, Table 4-4 classifies the surface plumes according to the shape shown in Figure 4-2a and provides information on the wind and tide extant at the beginning of plume measurements. Meteorological, tidal, and station operating conditions during the thermal plumes are summarized in Tables 4-2 and 4-3.

Recirculation of Heated Water

Recirculation of OCNGS's discharge was observed on April 16, August 31, September 27, November 2, and December 6. This is a higher proportion of recirculation plumes than has been previously observed (JCP&L-1980, 1981;). Generally, southerly winds of at least moderate speeds are necessary to induce a recirculating plume. Southeasterly winds in combination with flood tide conditions can induce relatively strong recirculation. April 26 shows the strongest recirculation, with recirculation of the 4 degree F delta T isotherm at all levels. The wind was from the SE at 15 mph under high slack conditions, at the end of flood tide. November 2 also showed

substantial recirulation; recirculation of the 3 degree F isotherm was observed around the mouth of Forked River at the 1 and 2.5 ft. levels, as well as recirculation of the 2 degree F isotherm. This plume was performed between 1200-1400 under SW winds; but between 0400-0900 on September 27, SE winds at 11-17 mph prevailed. Stronger recirculation probably occurred earlier in the day, and the measured plume was in the process of shifting away from Forked River. The detached 3 degree F isotherm was captured by the intake flow of Forked River and left behind.

August 31 and December 6 showed relatively weak recirculation of the 1.5 and/or 2 degree F delta T isotherms at all levels. Winds were S at 9 mph on August 31 and SW at 9 mph on December 6.

Surface and Cross Sectional Extent

In Table 4-5, the approximate surface area of the 1.5 degree F or 4 degree F delta T isotherms in Barnegat Bay is presented. No plumes were found to violate the two-thirds surface heat dissipation area criteria (Section 4.2.1) in Barnegat Bay. Since Oyster Creek has a low natural flow (average 25 cfs) and tidal effects are minimal, Oyster Creek downstream of OCNGS was thermally affected for its entire length and cross sectional extent of each plume.

Estimating the percent of the cross-sectional area of Barnegat Bay which any given thermal plume occupies was performed as follows: from navigational chart 12324 (NOAA, 1982), the cross sectional extent of Barnegat Bay at Oyster Creek along an east-west transect is calculated as 12,900 square yards. For screening purposes only, the cross-sectional area occupied by the thermal plume is estimated as the product of the east-west surface extent of the plume at the mouth of Oyster Creek and 5 ft., where the plume is assumed to be limited to the top 5 ft. of the water column. Should this screening procedure identify a possibility that a given plume may have exceeded the one-fourth cross-sectional area criteria, more specific and refined assumptions may have to be applied.

Applying the above screening procedures to each of the seven thermal plumes surveyed in 1982, no plume except the July 19 plume was found to approach the one-fourth cross sectional extent criteria. The screening procedure produced a cross sectional extent of 3380 square yards for the July 19, 1.5 degree F isotherm, 26 percent of the total cross-sectional area of Barnegat Bay. Although the 2.5 ft. level plume is nearly identical to the 1 ft. plume, the 5 ft. plume is substantially smaller and the bottom (7 ft.) plume is negligible. Assuming the 1 and 2.5 ft. level plume extends down to a depth of 3.75 ft., and assuming the 5 ft. level plume is representative of conditions between 3.75 and 5 ft. deep, a more refined plume

cross-sectional area of 3180 square yards is calculated. This is 25 percent of the total cross-sectional area of Barnegat Bay here.

Previously, it had been though that, because of the buoyancy of the plume, the four mile distance across the bay, and the greater depth (10-13 ft.) of the Intracoastal Waterway Channel relative to the rest of the bay, it would be unlikely for the plume to occupy more than one-fourth of the bay's cross-sectional area (JCP&L-1980, 1981;). It should be noted that the July 19 plume was performed when the OCNGS MWe output was 450 MWe, about 180 MWe below full output. Although there is not a one-to-one relationship between MWe and plume area extent, it is likely that the July 19 plume would have been more extensive in some dimension (North-South, East-West, or vertical) under full output conditons.

4.2.5 Summary

Plume shapes vary with wind and tide, with wind having primary influence. Excess temperature maps indicate that the plume is limited to the western side of Barnegat Bay. No plume violated the two-third lateral surface extent criteria. The 1.5 degree F delta T isotherm of the July 19, 1982, plume covered 25 percent or one-fourth of the cross sectional extent of Barnegat Bay here. Recirculation of the plume was observed on April 16, August 31, September 27, November 2, and December 6.

4.2.6 References

GPU Nuclear Corporation (GPUN) Parsippany, NJ 1982. 1981 Oyster Creek NGS Annual Environmental Operating Report.

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Pickard, Lowe & Garick (PL&G). 1982. Oyster Creek Nuclear Generating Station Meteorological Data.

Starosta, et al. 1982. "Hydrographic Study of Barnegat Bay, New Jersey 1979." GPU Nuclear Corporation, Parsippany, New Jersey.

United States Geological Survey (USGS). 1972 Forked River Quadrangle 7.5 minute (topographic).

4.2.7 Attachments

This section contains the following data for each plume:

a. Table of plume data
b. Plot of temperature vs. distance for Oyster Creek
c. Boat track in Barnegat Bay
d. Plot of temperature in a longitudinal cross-section (East-West across Barnegat Bay).
e. Maps of delta T isotherms in Barnegat Bay at different depths.

Figure 4-1a Oyster Creek Nuclear Generating Station and Vicinity

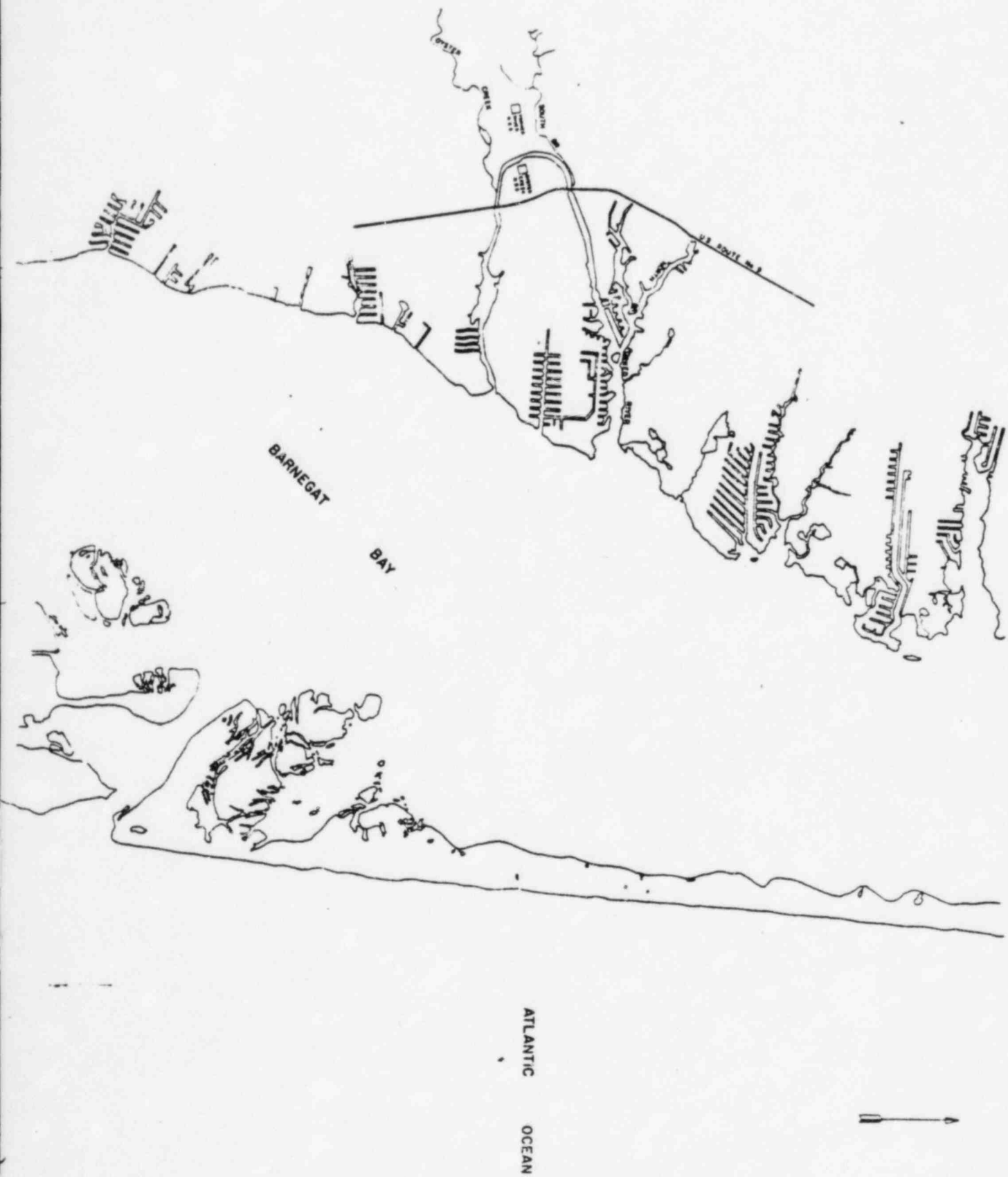


Figure 4-2a

OYSTER CREEK PLUME SHAPES

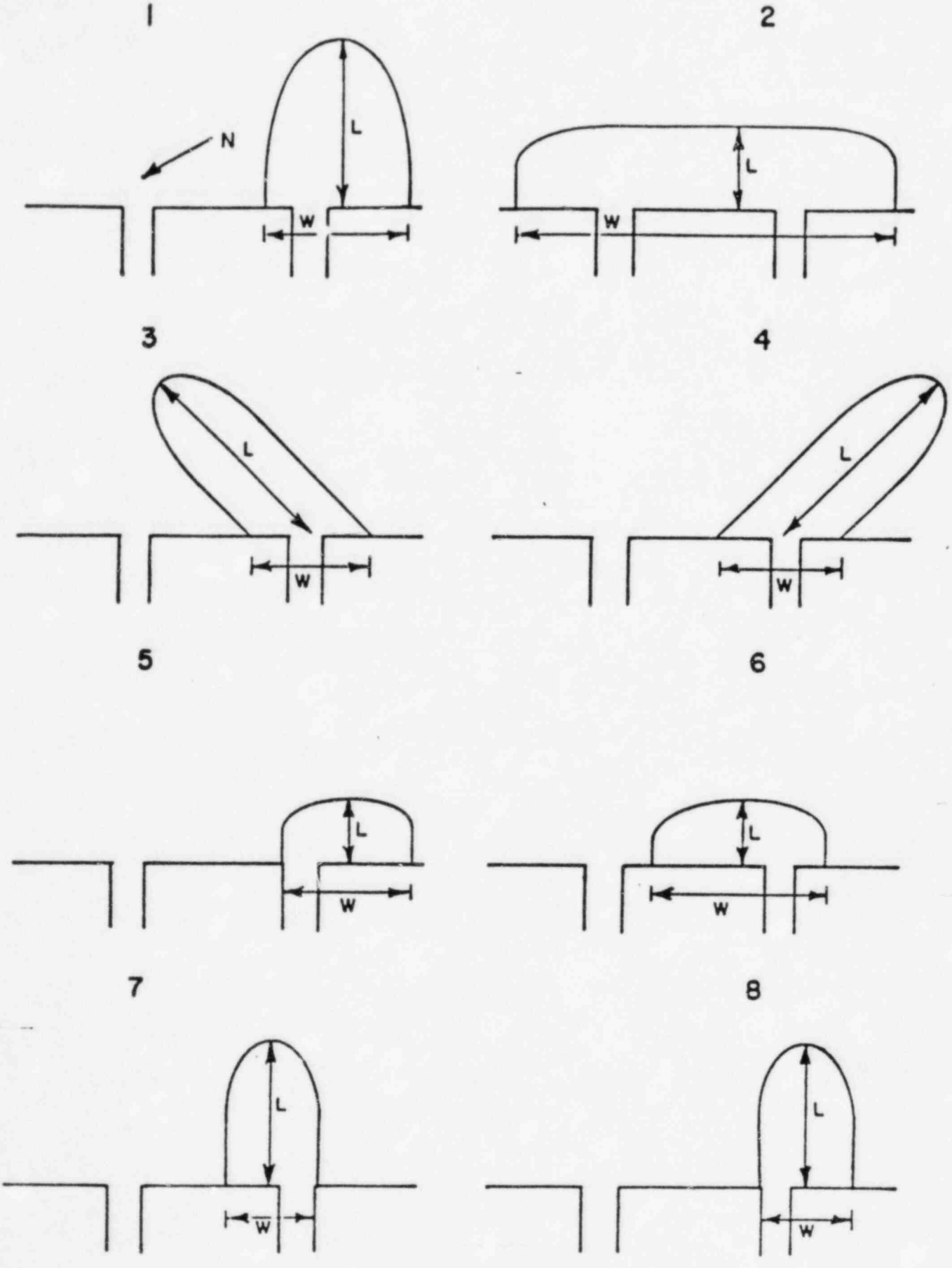


FIGURE 4-2b

BATHYMETRIC MAP OF BARNEGAT BAY

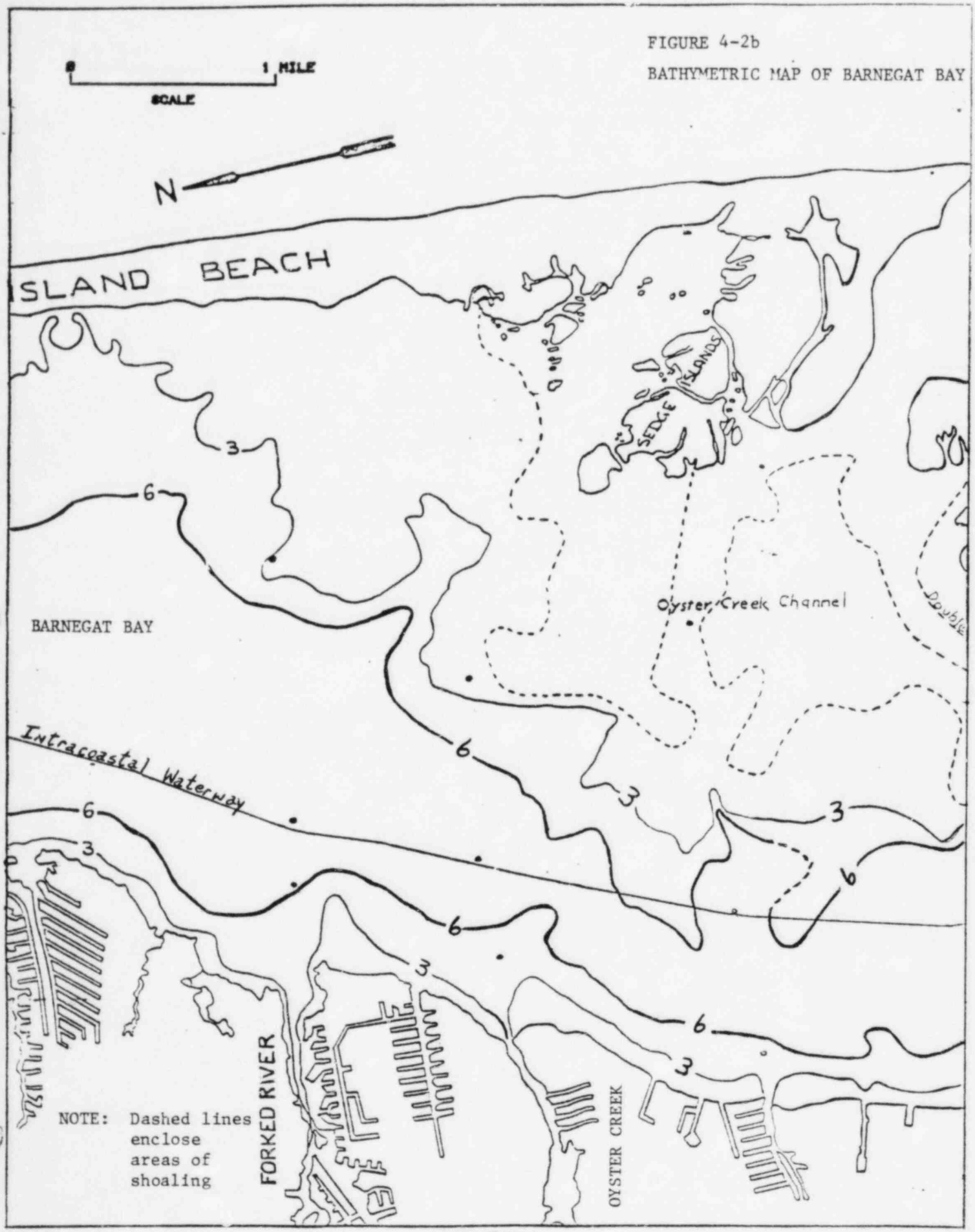


Table 4-1

Dates of Thermal Plume Measurements and OCNGS Outages in 1982

Dates of Plumes	Outage Dates
April 26	January 1 - April 16
May 4	May 24 - 27
June 8	
July 19	
August 31	August 15 - 29
September 27	
October 12	
November 2	
December 6	December 11 - 14 December 16 - 19

Table 4-2

Meteorological Conditions, Tide, and Crew During Thermal Plume Measurements in 1982

Date and Time	Wind Speed (mph)	Wind Direction	Tide	Crew
April 26 1200-1410	15	SE	High Slack	DWB, WH
May 4 1130-1400	7-10	E	Ebb	DWB, TS, WH
June 8 1130-1350	4-6	N	High Slack	DWB, TS
July 19 1150-1340	7	WSW	Max. Ebb	DWB, TS
August 31 1230-1420	9	S	Ebb	TS, WH
September 27 1200-1400	9	SW	Low Slack	DWB, TS
October 12 1130-1330	4-5	S	Low Slack	DWB, TS
November 2 1100-1230	10	SW	Ebb	DWB, TS
December 6 1200-1330	9	SW	Flood	DWB, TS

Sources: a) Meteorological Information and Dose Assessment System (MIDAS), Pickard, Lowe, & Garrick, Washington, D.C.

b) NOAA, Tide Tables for 1982 Sandy Hook, N. J. + 2h 45m EST or 3h 45m EDS

c) DWB - David W. Ballengee
TS - Thomas Starosta
WH - Werner Heck

Table 4-3

Station Operating Conditions During Thermal Plume Measurements in 1982

Date and Time		Ambient Temperatures			ΔT	MWe	MBTU/hr	No. Pumps	
		Intake	Ambient	Discharge				Circ.	Dil.
04/26/82	1200-1410	62.2	57.5	78.5	16.3	413	2810	3	2
05/04/82	1130-1400	62.7	61.5	79.8	17.1	410	2950	3	2
06/08/82	1130-1350	62.9	62.5	80.1	17.2	567	3960	4	1
07/19/82	1150-1340	84.9	85.5	99.9	15.0	450	3450	4	2
08/31/82	1230-1420	70.8	69.5	84.8	14.0	440	3220	4	1
09/27/82	1200-1400	67.5	66.5	79.3	11.8	380	2720	4	1
10/12/82	1130-1330	61.0	59	72.1	11.1	362	2560	4	2
11/02/82	1100-1230	62.7	58.5	77.4	14.7	331	2540	3	2
12/06/82	1200-1330	58.4	54.5	71.5	13.1	280	2260	3	2

Source: a) Intake and Discharge: Oyster Creek Daily Environmental Log, 1982

b) Ambient temperatures determined from field data.

Table 4-4

Shape Code, Wind and Tide Conditions for the 1982 Thermal Plumes

Shape Code	Date of Plume	Wind Direction-Speed (MPH)		Tide
2	April 26	SE	15	High Slack
1	May 4	E	7-10	Ebb
1	June 8	N	4-6	High Slack
7	July 19	WSW	7	Max. Ebb
6	August 31	S	9	Ebb
2	September 27	SW	9	Low Slack
5	October 12	S	4-5	Low Slack
2	November 2	SW	10	Ebb
2	December 6	SW	9	Flood

Table 4-5

Surface Area Extent of the 1982 Thermal Plumes in Barnegat Bay

Date of Plume	Surface Area (sq. mi.)	Surface Extent (mi.)	
		Length	Width
April 26 a	0.25	1.02	0.21
May 4 a	0.72	0.86	0.87
June 8 b	0.49	0.79	0.83
July 19 b	0.94	1.13	1.19
August 31 b	0.47	0.83	1.05
September 27 a	0.07	0.29	0.32
October 12 a	0.18	0.57	0.45
November 2 a	0.16	0.59	0.59
December 6 a	0.12	0.51	0.26

a) Measurements are based on the 4 degree F isotherm

b) Measurements are based on the 1.5 degree F isotherm

THERMAL PLUME OF April 26, 1982

INDEX	POSITION COORDINATES		TIME HHMMSS	TEMPERATURE DEG F			
				1 FT	2.5 FT	5 FT	BOTTOM
1	24405	9231	121817	65.8	65.9	65.5	65.8
2	24360	9484	121846	65.7	66.1	65.5	65.9
3	24335	9589	121916	65.7	66.1	65.3	65.8
4	24301	9764	121944	66.0	66.1	65.4	65.5
5	24269	9936	122012	65.8	66.1	65.4	65.8
6	24234	10090	122040	66.0	66.1	65.7	65.9
7	24185	10266	122108	65.9	66.2	65.7	65.8
8	24145	10427	122136	65.8	66.1	65.6	66.1
9	24122	10595	122204	66.0	65.9	65.7	66.2
10	24041	10743	122232	66.0	66.2	66.0	66.1
11	23986	10903	122301	66.1	65.9	65.7	66.4
12	23888	11041	122330	65.9	66.3	65.5	66.0
13	23708	11184	122400	66.0	66.3	65.8	65.9
14	23729	11330	122428	66.0	66.1	65.8	65.8
15	23650	11480	122456	66.2	66.2	65.9	65.8
16	23558	11655	122525	65.9	66.2	65.7	66.0
17	23503	11814	122553	66.0	66.2	65.5	65.8
18	23462	11985	122621	65.9	66.0	65.7	66.1
19	0	12216	122654	66.0	66.2	65.9	65.8
20	23383	12481	122732	65.9	66.1	65.5	65.1
21	23357	12685	122804	65.1	64.7	62.9	61.8
22	23321	12842	122832	65.0	64.5	63.1	62.5
23	23302	12994	122900	64.6	64.2	63.1	60.8
24	23271	13137	122928	63.8	63.8	60.5	58.0
25	23260	13272	122956	63.6	62.6	59.7	57.1
26	23248	13417	123024	62.4	61.9	60.2	57.5
27	23253	13536	123052	61.8	61.8	60.6	58.2
28	23251	13657	123120	61.8	61.3	60.2	58.7
29	23230	13785	123148	61.1	61.4	60.4	59.0
30	23238	13917	123216	61.5	61.6	60.4	58.6
31	23228	14054	123244	61.0	61.7	59.2	58.8
32	23231	14191	123312	59.7	60.3	59.0	59.2
33	23242	14332	123340	59.2	59.5	58.9	58.9
34	23242	14473	123408	57.5	58.3	57.5	58.1
35	23245	14597	123436	58.3	58.7	58.1	58.3
36	23249	14732	123504	58.6	58.9	58.1	58.4
37	23240	14873	123533	57.0	57.2	57.0	57.3
38	23255	15014	123602	56.2	56.4	56.3	56.3
39	23261	15149	123630	56.0	56.3	55.9	56.1
40	23218	15288	123658	56.0	55.9	55.8	56.1
41	23261	15429	123726	56.0	56.3	55.7	56.1
42	0	15564	123755	55.6	56.3	55.6	56.1
43	23246	15749	123833	56.0	56.3	55.8	56.0
44	23150	15800	123903	55.9	56.1	56.0	56.1
45	23011	15702	123932	55.9	56.0	55.7	56.4
46	22917	15587	124000	56.1	56.3	55.9	56.0
47	0	15458	124032	56.0	56.6	55.9	56.2
48	22597	15329	124106	56.2	56.4	56.1	56.2
49	22456	15211	124135	58.1	58.2	57.7	58.3

THERMAL PLUME OF April 26, 1982

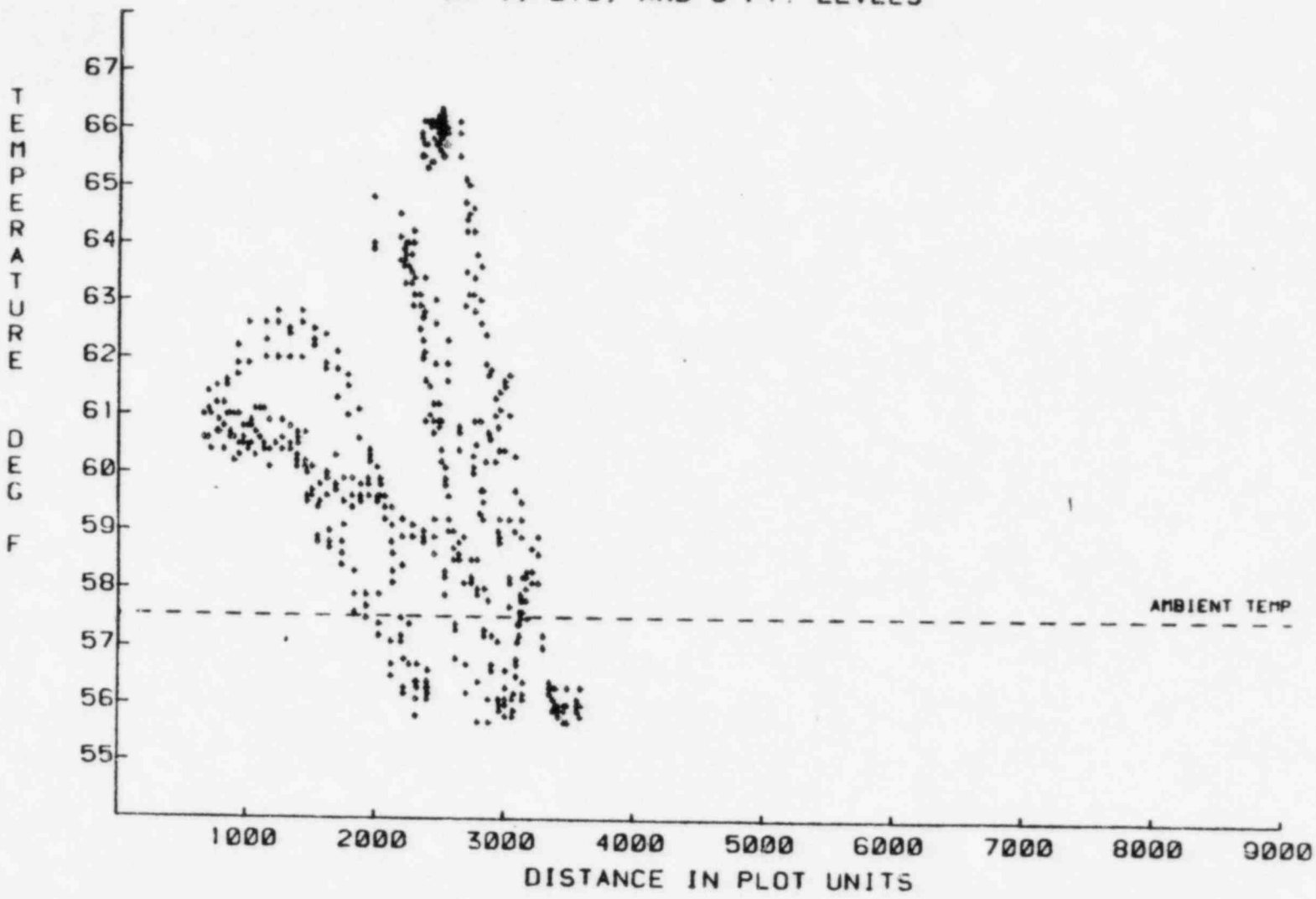
INDEX	POSITION COORDINATES		TIME HHMMSS	TEMPERATURE DEG F			
				1 FT	2.5 FT	5 FT	BOTTOM
50	22371	15102	124203	59.2	58.9	58.8	58.9
51	22201	14957	124236	59.5	59.7	60.2	59.5
52	22115	14842	124304	60.1	60.3	60.0	60.1
53	21963	14731	124333	60.[illegible]	60.8	60.4	60.1
54	21846	14624	124401	62.[illegible]	61.9	61.6	61.2
55	21734	14506	124429	62.6	63.0	61.0	61.1
56	21633	14386	124457	62.8	63.4	62.1	61.3
57	21528	14277	124525	64.0	64.2	62.9	62.2
58	0	14145	124554	63.9	64.3	63.4	63.1
59	0	13978	124632	64.1	64.5	64.0	64.2
60	0	13882	124710	64.6	65.0	64.3	64.4
61	21285	13703	124748	64.0	64.8	63.9	62.8
62	0	13709	124821	64.1	64.6	63.8	62.6
63	0	13932	124859	64.4	64.8	64.0	64.1
64	0	14006	124937	64.3	64.4	64.1	64.3
65	21361	14208	125015	64.1	64.5	63.7	64.3
66	21330	14339	125045	63.6	63.9	63.7	63.8
67	21260	14468	125114	63.8	64.0	63.3	63.6
68	21228	14588	125142	63.6	64.0	63.6	63.6
69	21184	14716	125210	63.5	63.8	63.3	63.3
70	21137	14851	125239	63.4	63.4	63.1	62.4
71	21134	14985	125308	62.9	63.1	62.5	62.4
72	21082	15119	125338	62.3	62.7	62.0	61.7
73	21040	15245	125408	60.9	61.6	60.9	61.3
74	21010	15372	125436	61.0	61.5	61.0	61.1
75	20986	15495	125504	60.9	61.2	60.7	61.2
76	20966	15634	125534	60.8	61.2	60.9	61.1
77	20910	15764	125603	60.4	60.9	60.2	60.6
78	20881	15887	125631	59.9	60.1	59.8	59.9
79	20832	16021	125701	59.2	59.6	59.0	59.4
80	20818	16149	125730	58.7	59.0	58.5	58.5
81	20805	16279	125759	58.5	58.8	58.6	58.5
82	20791	16405	125827	58.1	58.9	58.1	58.4
83	20806	16543	125855	58.1	58.5	58.2	58.2
84	20809	16676	125924	57.9	58.5	58.0	58.3
85	20804	16824	125954	57.2	58.0	57.3	57.6
86	20838	16939	130022	56.6	57.2	56.7	57.1
87	20858	17072	130051	56.1	56.1	56.1	56.1
88	20862	17201	130120	56.1	56.1	55.8	56.0
89	20717	17253	130149	56.0	56.1	55.9	55.9
90	20590	17175	130217	55.7	56.1	55.7	56.1
91	20459	17109	130245	55.7	56.4	55.7	56.0
92	20321	17025	130313	56.2	56.7	56.2	56.5
93	20207	16938	130341	57.3	57.4	56.8	57.1
94	20099	16842	130409	58.3	58.2	57.9	58.1
95	19997	16744	130437	58.0	59.2	58.6	59.1
96	19889	16646	130505	58.9	59.0	58.8	59.1
97	19767	16570	130533	58.9	59.1	58.9	58.8
98	19665	16475	130601	58.9	59.2	58.4	58.9

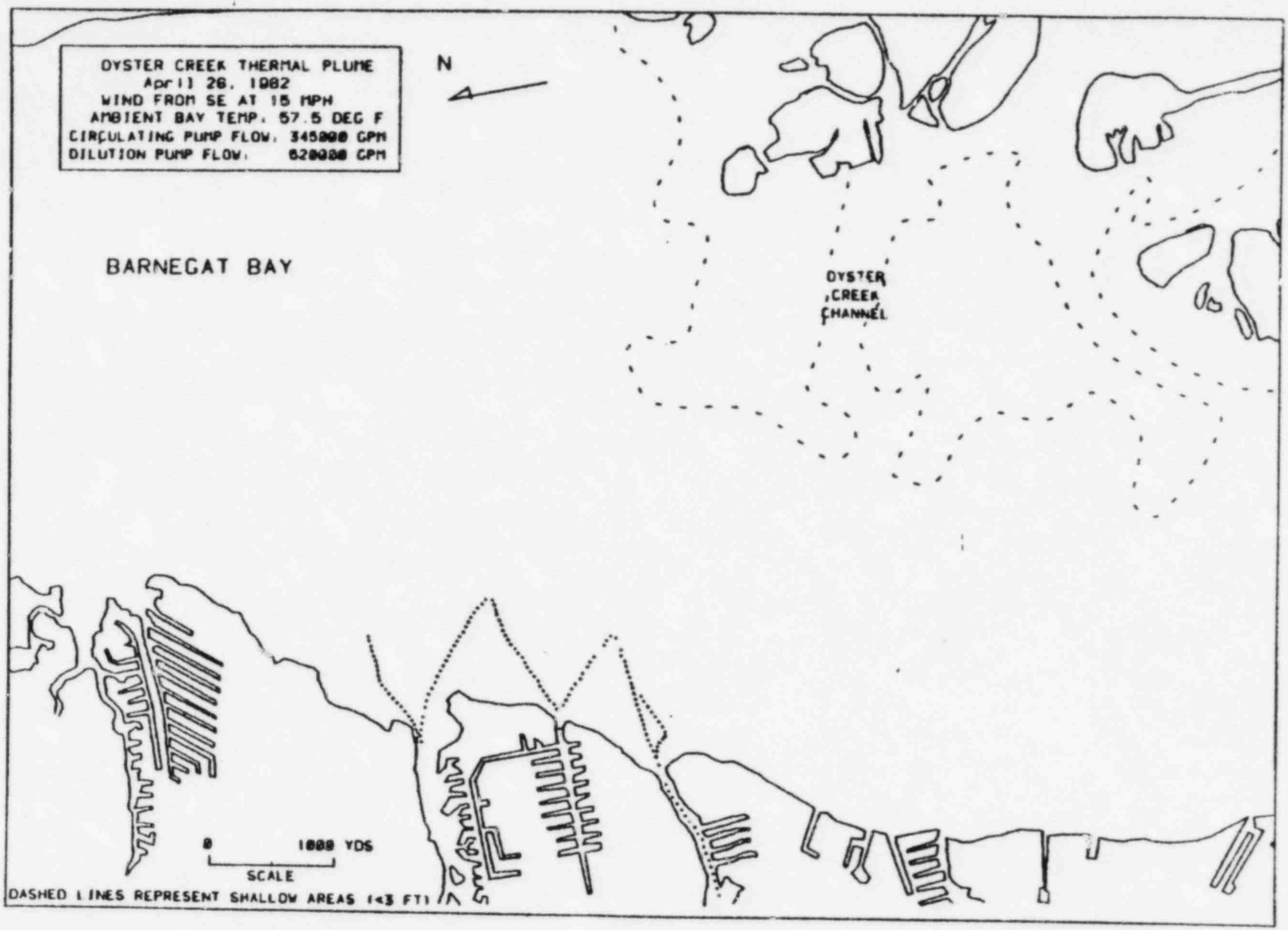
THERMAL PLUME OF April 26, 1982

INDEX	POSITION COORDINATES		TIME HHMMSS	TEMPERATURE DEG F			
				1 FT	2.5 FT	5 FT	BOTTOM
99	10555	16308	130620	59.1	59.4	58.8	59.2
100	10441	16201	130657	59.8	59.9	59.6	59.5
101	10330	16104	130725	60.3	60.4	60.2	60.3
102	10220	16006	130753	60.6	61.1	60.6	60.7
103	10110	16006	130821	61.5	61.7	61.0	61.4
104	10005	15914	130849	61.8	62.1	61.3	61.7
105	18806	15809	130917	61.9	62.4	61.8	61.9
106	18787	15601	130945	62.3	62.5	62.2	62.4
107	18660	15585	131013	62.6	62.8	62.0	61.2
108	18537	15487	131041	62.4	62.5	62.0	62.1
109	18438	15359	131109	62.6	62.8	62.0	62.3
110	18346	15225	131137	62.3	62.6	62.0	62.4
111	18216	15022	131210	61.9	62.6	61.9	62.3
112	18144	14879	131247	61.9	62.2	61.7	61.6
113	18060	14739	131315	61.5	61.6	61.0	61.3
114	18012	14592	131343	61.2	61.5	60.7	61.0
115	17991	14446	131411	61.1	61.4	60.6	60.9
116	17875	14404	131442	60.6	61.0	60.5	60.5
117	17915	14502	131510	60.4	61.0	60.4	60.7
118	17970	14602	131538	60.7	60.9	60.7	60.5
119	17964	14708	131606	60.8	61.2	60.4	60.6
120	17965	14822	131634	60.7	61.0	60.6	60.6
121	17941	15043	131702	60.6	61.0	60.2	60.7
122	17907	15180	131730	60.5	61.0	60.3	60.7
123	17856	15325	131758	60.6	60.8	60.5	60.8
124	17808	15471	131826	60.4	60.8	60.5	60.4
125	17748	15618	131854	60.8	60.9	60.5	60.7
126	17700	15748	131922	60.7	61.1	60.3	60.7
127	17654	15891	131950	60.6	61.1	60.6	60.6
128	17607	16024	132018	60.4	61.1	60.5	60.8
129	17575	16168	132046	60.1	60.9	60.4	60.7
130	17563	16288	132114	60.5	60.5	60.5	60.4
131	17578	16408	132142	60.6	60.9	60.4	60.8
132	17619	16524	132210	60.5	60.8	60.4	60.7
133	17645	16640	132238	60.6	60.7	60.5	60.6
134	17667	16764	132306	60.2	60.7	60.1	60.3
135	17672	16880	132334	59.6	60.1	59.7	60.0
136	17[illegible]8	17010	132402	59.5	59.8	59.5	59.8
137	17716	17136	132430	59.6	60.0	59.9	59.8
138	17735	17275	132458	59.8	60.3	59.7	59.8
139	17774	17393	132526	59.1	59.9	59.5	59.6
140	17814	17513	132554	59.6	59.9	59.4	59.8
141	17835	17644	132622	59.5	59.8	59.6	59.8
142	17855	17776	132650	59.6	59.9	59.8	59.7
143	17896	17896	132718	59.6	60.1	59.5	59.8
144	17912	18020	132746	59.2	59.6	59.4	59.8
145	17933	18158	132814	58.3	58.6	58.1	58.2
146	17968	18275	132842	57.1	57.5	57.2	56.9
147	18007	18392	132910	56.7	57.4	56.7	57.0

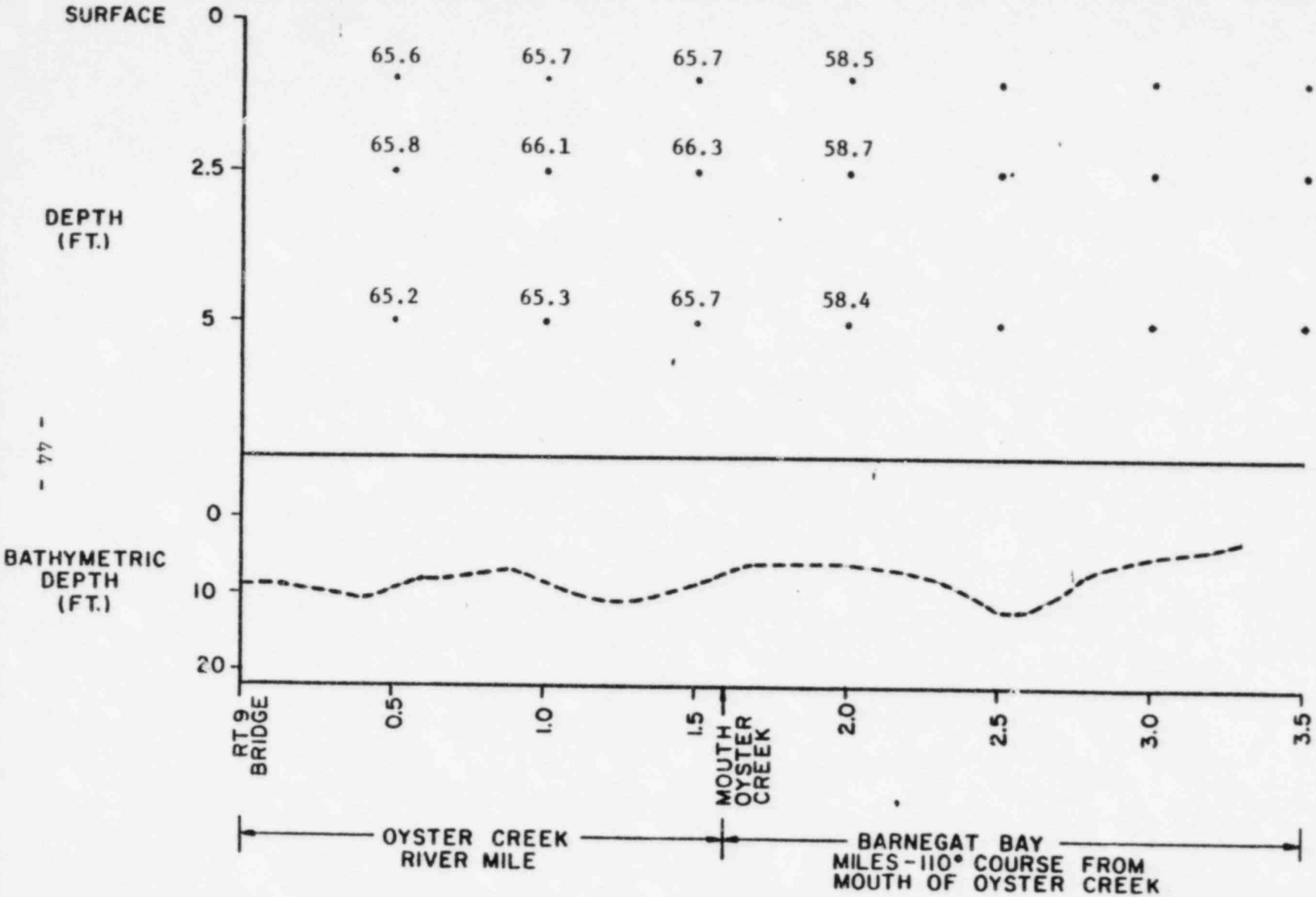
THERMAL PLUME OF April 26, 1982

INDEX	POSITION COORDINATES		TIME HHMMSS	TEMPERATURE DEG F			
				1 FT	2.5 FT	6 FT	BOTTOM
148	18115	18435	132938	56.3	56.7	56.4	56.3
149	18105	18532	133006	56.1	56.4	56.3	56.2
150	18113	18636	133034	56.3	56.6	56.2	56.2
151	17955	18566	133102	55.8	56.4	56.1	56.2
152	17811	18481	133130	56.3	56.8	56.2	56.5
153	17673	18385	133158	56.5	57.1	56.7	56.8
154	17536	18287	133226	57.4	57.9	57.2	57.9
155	17400	18187	133254	57.7	57.9	57.5	57.8
156	17273	18086	133322	57.9	58.3	57.6	57.8
157	17148	17977	133350	58.6	58.8	58.4	58.4
158	17017	17873	133418	58.8	59.0	58.7	59.1
159	16868	17798	133446	58.9	59.4	58.8	59.1
160	16725	17740	133514	59.5	60.0	59.6	59.8
161	16561	17707	133542	60.1	60.3	60.2	60.1
162	0	12343	140050	64.0	64.5	64.9	65.9
163	0	12530	140128	64.8	64.8	65.0	65.3
164	23362	12705	140206	64.4	64.2	63.5	62.9
165	23408	12839	140234	63.4	62.8	60.9	59.9
166	23438	12957	140302	63.0	60.9	59.3	57.2
167	23500	13052	140330	61.7	60.7	57.8	56.5
168	23606	13141	140358	60.8	59.0	57.1	56.5
169	23680	13200	140426	56.3	56.6	56.0	56.4
170	23723	13326	140454	55.8	56.1	55.8	56.4
171	23677	13455	140522	56.2	56.2	55.9	56.7
172	23630	13580	140550	56.7	56.8	56.5	57.2
173	23568	13714	140619	57.1	57.4	57.1	57.5
174	23524	13839	140647	57.2	57.6	57.4	57.6
175	23457	13984	140716	57.5	57.8	57.9	58.0
176	23403	14121	140744	57.8	58.2	57.6	58.0
177	23371	14251	140812	57.8	58.2	58.0	58.3


TEMPERATURE MEASUREMENTS OF April 26, 1982
AT 1, 2.5, AND 5 FT. LEVELS
TEMPERATURE DEG F
67
66
65
64
63
62
61
60
59
58
57
56
55
AMBIENT TEMP
1000
2000
3000
4000
5000
6000
7000
8000
9000
DISTANCE IN PLOT UNITS


OYSTER CREEK THERMAL PLUME
April 28, 1982
WIND FROM SE AT 15 MPH
AMBIENT BAY TEMP. 57.5 DEG F
CIRCULATING PUMP FLOW. 345000 GPM
DILUTION PUMP FLOW. 620000 GPM
N
BARNEGAT BAY
OYSTER CREEK CHANNEL
0 1000 YDS
SCALE
DASHED LINES REPRESENT SHALLOW AREAS (<3 FT)

LONGITUDINAL SECTIONS OF OYSTER CREEK AND BARNEGAT BAY



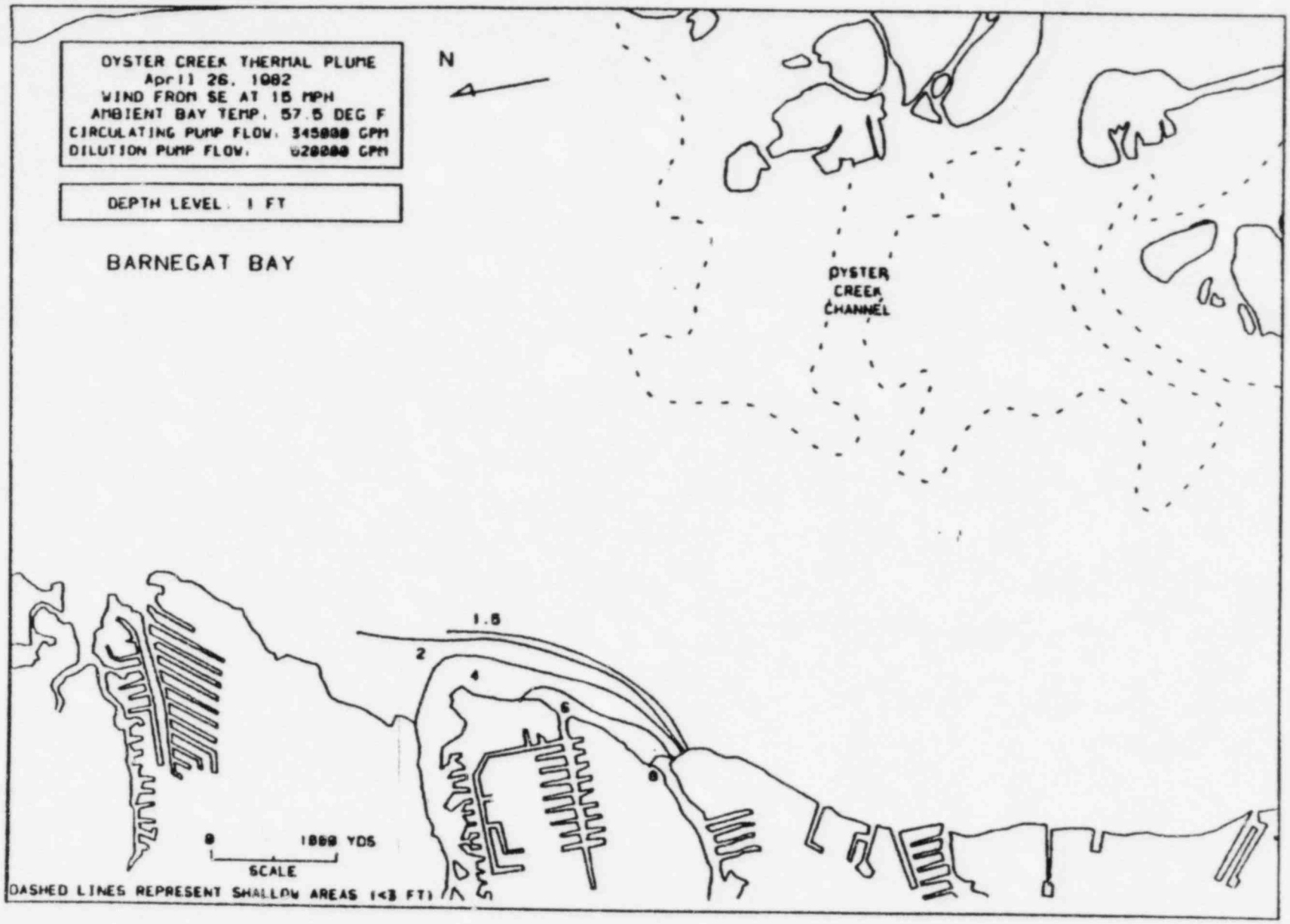
DATE April 26, 1982

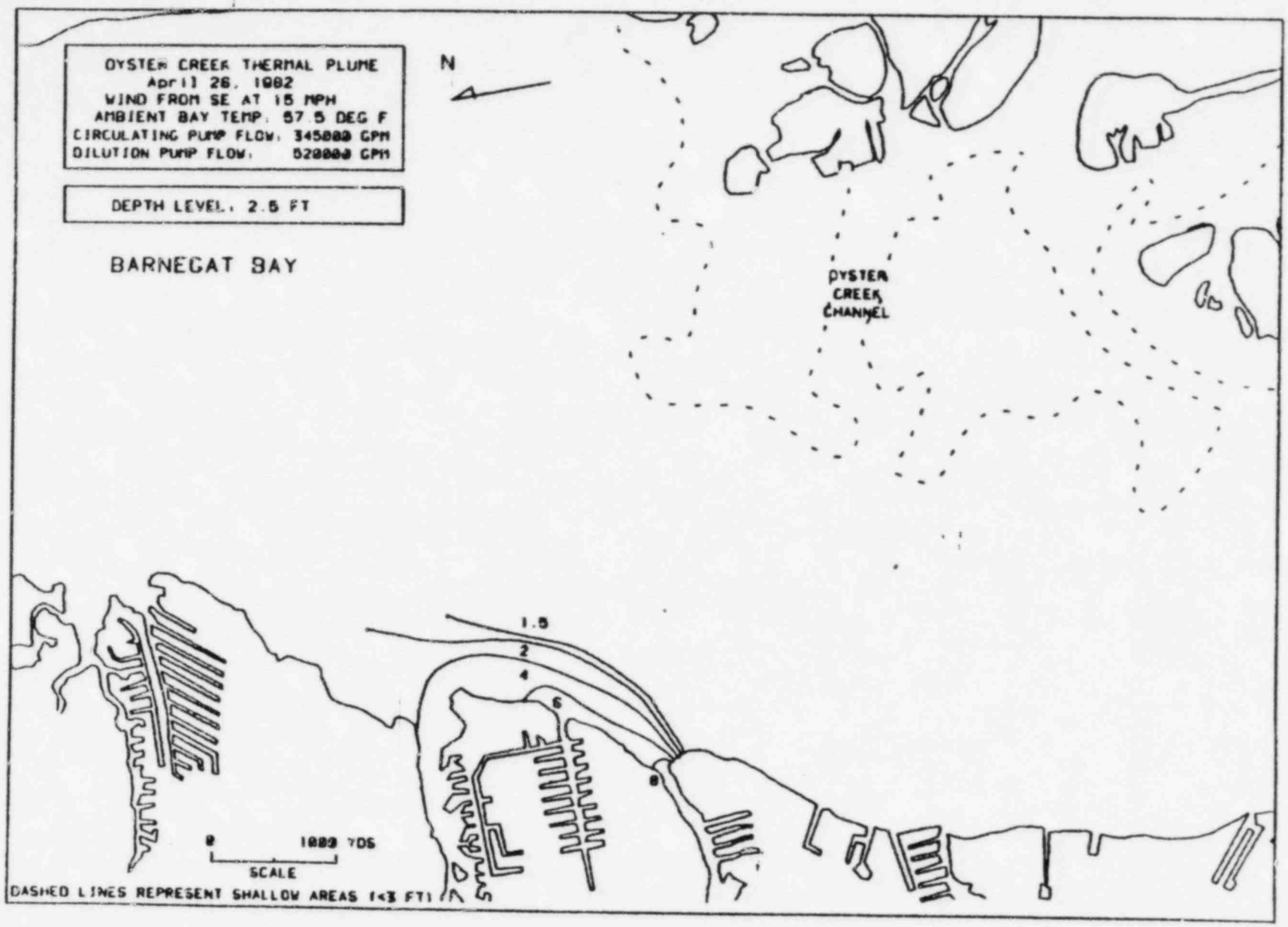
TIME 1200-1410

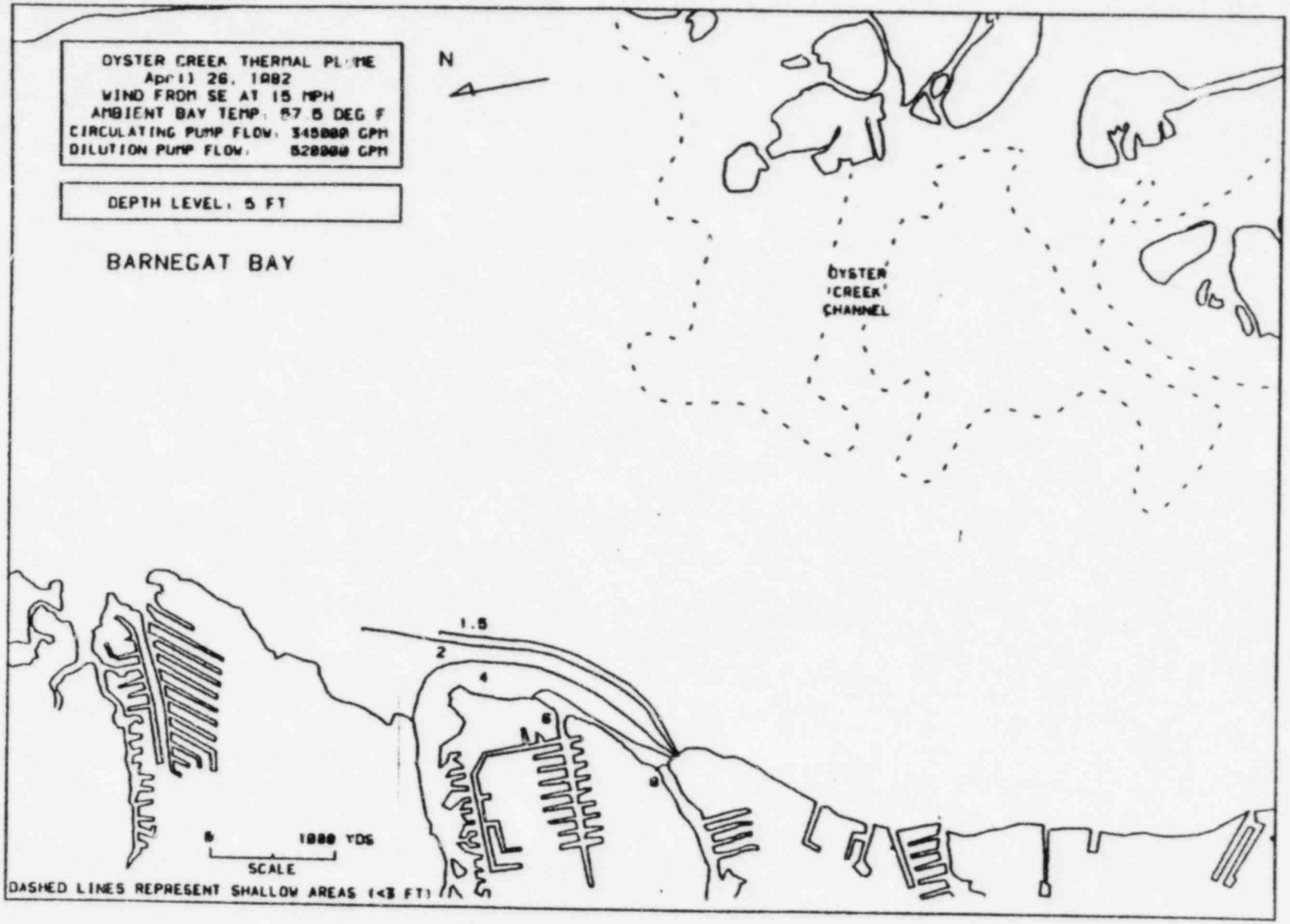
WIND SE at 15 mph

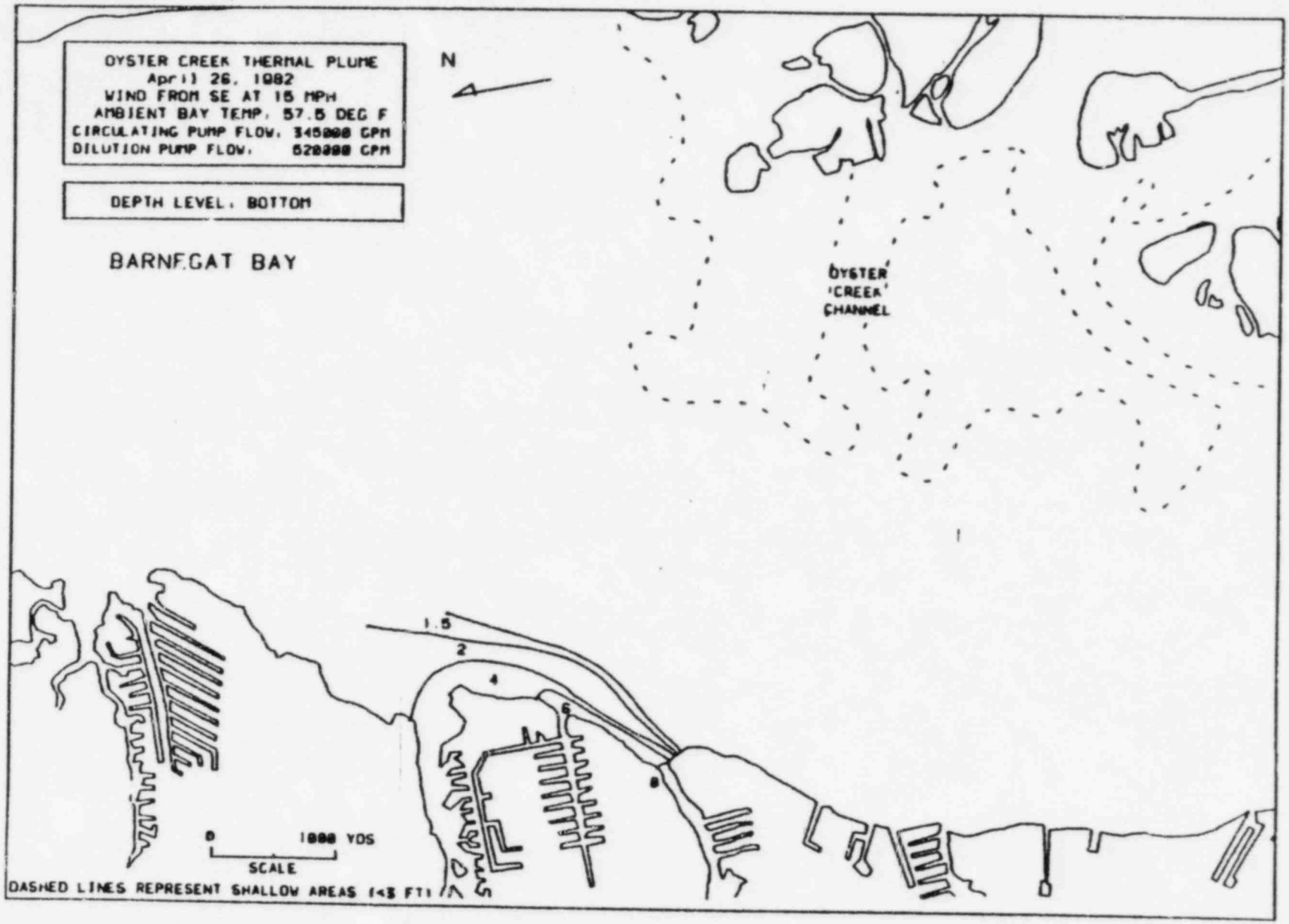
STATION PARAMETERS

ΔT	15.3 degrees F
CIRC. FLOW	345,000 gpm
DIL. FLOW	520,000 gpm


OYSTER CREEK THERMAL PLUME
April 26, 1982
WIND FROM SE AT 15 MPH
AMBIENT BAY TEMP. 57.5 DEG F
CIRCULATING PUMP FLOW: 345000 GPM
DILUTION PUMP FLOW: 020000 GPM
DEPTH LEVEL: 1 FT
N
BARNEGAT BAY
OYSTER CREEK CHANNEL
1.5
2
4
6
8
0
1000 YDS
SCALE
DASHED LINES REPRESENT SHALLOW AREAS (<3 FT)


OYSTER CREEK THERMAL PLUME
April 26, 1982
WIND FROM SE AT 15 MPH
AMBIENT BAY TEMP: 57.5 DEG F
CIRCULATING PUMP FLOW: 345000 GPM
DILUTION PUMP FLOW: 520000 GPM
DEPTH LEVEL: 2.5 FT
N
BARNEGAT BAY
OYSTER CREEK CHANNEL
1.5
2
4
6
8
0 1000 YDS
SCALE
DASHED LINES REPRESENT SHALLOW AREAS (<3 FT)


OYSTER CREEK THERMAL PLUME
April 26, 1982
WIND FROM SE AT 15 MPH
AMBIENT BAY TEMP: 87.5 DEG F
CIRCULATING PUMP FLOW: 345000 GPM
DILUTION PUMP FLOW: 520000 GPM
DEPTH LEVEL: 5 FT
N
BARNEGAT BAY
OYSTER CREEK CHANNEL
1.5
2
4
6
8
0 1000 YDS
SCALE
DASHED LINES REPRESENT SHALLOW AREAS (<3 FT)


OYSTER CREEK THERMAL PLUME
April 26, 1982
WIND FROM SE AT 15 MPH
AMBIENT BAY TEMP. 57.5 DEG F
CIRCULATING PUMP FLOW. 345000 GPM
DILUTION PUMP FLOW. 520000 GPM
DEPTH LEVEL: BOTTOM
N
BARNEGAT BAY
OYSTER CREEK CHANNEL
1.5
2
4
6
8
0 1000 YDS
SCALE
DASHED LINES REPRESENT SHALLOW AREAS (<3 FT)

THERMAL PLUME OF May 4, 1982

INDEX	POSITION COORDINATES		TIME HHMMSS	TEMPERATURE DEG F			
				1 FT	2.5 FT	5 FT	BOTTOM
1	24407	9087	114200	67.0	67.3	67.1	66.7
2	24370	9320	114232	67.1	67.2	66.7	66.7
3	24327	9529	114300	67.3	67.2	66.9	67.2
4	24286	9737	114329	67.0	67.4	66.9	66.7
5	24226	9936	114357	67.6	67.3	66.6	67.0
6	24105	10143	114425	67.2	67.3	66.8	67.0
7	24178	10342	114453	67.3	67.2	66.6	66.7
8	24145	10542	114521	67.1	66.8	66.7	66.7
9	24088	10735	114549	67.1	67.1	66.6	66.9
10	23908	10908	114617	67.3	67.2	66.7	67.0
11	23802	11072	114646	67.1	66.9	66.5	66.7
12	23785	11232	114715	66.9	66.9	66.6	66.7
13	23734	11416	114743	67.1	66.9	66.7	66.9
14	23645	11601	114811	67.1	67.1	66.6	66.9
15	23586	11784	114839	67.2	67.4	66.7	67.2
16	23514	11974	114907	67.2	67.3	66.7	67.0
17	0	12162	114935	67.3	67.5	66.8	67.3
18	0	12442	115013	67.1	67.3	66.8	67.0
19	23489	12671	115046	67.4	67.4	66.7	67.5
20	23520	12853	115114	67.7	67.5	66.9	67.4
21	23556	13040	115143	67.4	67.2	67.0	67.2
22	23500	13231	115211	67.2	67.1	67.0	67.2
23	23649	13456	115239	67.2	67.1	66.9	67.1
24	23704	13666	115307	67.3	67.1	66.6	66.6
25	23754	13863	115335	67.0	66.5	65.2	63.9
26	23820	14055	115403	66.9	66.1	65.1	62.7
27	23870	14260	115431	66.9	66.4	64.6	62.3
28	23932	14442	115459	66.7	65.3	62.1	61.9
29	23900	14630	115527	66.8	65.2	61.8	62.4
30	24063	14816	115555	66.7	65.5	61.7	62.2
31	24154	15000	115624	66.3	64.6	62.0	62.8
32	24162	15177	115652	66.6	65.7	63.7	61.9
33	24218	15363	115721	66.8	65.7	63.5	61.6
34	24317	15536	115749	66.8	66.2	63.4	61.9
35	24360	15705	115817	66.1	65.0	63.6	61.4
36	24390	15885	115847	66.3	65.2	61.8	61.2
37	24431	16053	115916	66.8	64.0	61.1	60.4
38	24480	16217	115944	65.9	64.8	61.8	60.2
39	24529	16376	120012	65.8	63.9	60.6	60.1
40	24569	16538	120040	65.5	63.6	60.3	59.9
41	24626	16701	120108	65.6	63.1	60.0	59.6
42	24682	16886	120136	65.1	63.3	60.1	59.8
43	24721	17020	120204	64.5	63.5	59.8	57.9
44	24769	17182	120232	64.3	63.5	59.7	57.3
45	24820	17344	120300	63.9	63.5	59.6	57.3
46	24884	17511	120328	63.6	63.2	59.5	57.5
47	24945	17678	120357	63.5	63.4	59.2	57.9
48	25014	17841	120425	63.5	63.0	59.0	58.4
49	25071	18000	120454	62.9	62.5	59.0	58.8

THERMAL PLUME OF May 4, 1982

INDEX	POSITION COORDINATES		TIME HHMMSS	TEMPERATURE DEG F			
				1 FT	2.5 FT	5 FT	BOTTOM
50	25130	18174	120522	63.0	62.7	58.8	59.2
51	25100	18337	120550	62.7	62.6	59.6	59.5
52	25257	18500	120618	62.5	62.5	61.5	59.5
53	25321	18674	120648	62.6	62.6	62.0	59.9
54	25374	18838	120714	62.5	62.6	62.0	59.8
55	25438	19005	120742	62.5	62.6	62.1	59.7
56	25490	19171	120810	62.1	62.2	61.9	60.0
57	25562	19336	120838	61.6	61.8	61.4	60.1
58	25642	19501	120906	61.0	61.0	61.3	60.3
59	25710	19673	120934	61.4	61.4	61.1	61.0
60	25780	19840	121002	61.3	61.3	61.1	61.3
61	25846	20008	121030	61.5	61.4	61.0	61.2
62	25929	20176	121058	61.0	61.0	61.0	61.1
63	26004	20341	121126	61.0	61.0	60.8	61.2
64	26081	20505	121154	60.9	61.0	61.0	60.9
65	26145	20669	121222	60.9	61.2	60.9	60.6
66	26215	20834	121250	60.9	61.0	60.7	60.3
67	26290	20993	121318	60.0	60.9	61.0	59.7
68	26170	20957	121346	60.9	60.9	60.5	58.2
69	26037	20777	121414	60.0	60.0	60.7	59.6
70	25902	20593	121442	60.0	61.2	60.5	60.3
71	25762	20407	121510	61.0	60.9	60.5	60.7
72	25648	20214	121538	60.9	61.0	60.5	60.0
73	25504	20025	121608	60.0	60.9	60.4	60.9
74	25369	19841	121636	60.9	61.2	60.4	60.6
75	25259	19661	121704	60.9	60.9	60.7	60.0
76	25123	19490	121732	61.0	61.3	60.3	60.4
77	24986	19319	121800	61.0	61.1	60.4	60.3
78	24844	19151	121828	61.3	61.4	60.7	60.1
79	24730	18978	121856	61.4	61.4	60.7	59.5
80	24610	18813	121924	61.4	61.4	60.8	59.5
81	24490	18638	121952	61.0	62.0	60.0	59.1
82	24398	18463	122020	62.1	62.2	59.8	59.2
83	24242	18286	122040	62.0	61.0	60.2	59.2
84	24127	18094	122117	62.3	62.5	60.5	59.1
85	24024	17904	122145	62.3	62.4	60.8	59.2
86	23911	17721	122213	62.4	62.3	60.9	59.3
87	23791	17532	122241	62.7	62.4	61.0	59.6
88	23700	17348	122309	62.5	62.5	61.1	59.5
89	23569	17149	122337	62.7	62.4	61.1	60.1
90	23462	16957	122405	63.0	62.8	60.7	59.7
91	23335	16784	122433	63.1	63.1	60.7	59.2
92	23253	16609	122501	63.4	63.0	60.6	59.5
93	23116	16426	122532	63.4	63.0	60.3	59.9
94	22970	16252	122601	63.3	63.0	61.0	60.7
95	22839	16055	122634	63.6	63.3	61.3	60.7
96	22700	15868	122705	63.5	63.6	62.4	60.0
97	0	15663	122739	63.0	64.0	63.4	61.0
98	22383	15430	122817	63.0	64.2	63.5	61.3

THERMAL PLUME OF May 4, 1982

INDEX	POSITION COORDINATES		TIME HHMMSS	TEMPERATURE DEG F			
				1 FT	2.5 FT	5 FT	BOTTOM
99	22291	15259	122846	64.2	64.4	63.9	61.7
100	22171	15089	122914	64.5	64.5	63.8	61.6
101	21987	14907	122943	64.3	64.3	63.8	62.1
102	21867	14744	123011	64.5	64.7	63.8	62.4
103	21751	14578	123039	63.7	64.0	63.4	63.1
104	21635	14415	123107	63.6	63.9	63.1	63.1
105	21540	14278	123135	63.4	63.6	63.2	63.6
106	21395	14209	123208	63.6	63.6	63.4	63.6
107	21240	14506	123251	63.2	63.4	63.0	63.4
108	21160	14640	123319	62.8	63.1	62.5	62.7
109	21094	14787	123347	62.9	62.9	62.4	62.4
110	21085	14913	123415	62.5	62.8	62.6	62.7
111	20993	15052	123444	62.2	62.4	62.2	62.3
112	20813	15182	123512	62.1	62.1	61.8	62.0
113	20739	15324	123540	61.9	62.3	61.8	61.8
114	20655	15463	123608	61.6	61.8	61.6	61.6
115	20575	15598	123636	61.4	61.7	61.3	61.8
116	20491	15725	123704	61.1	61.5	61.1	61.4
117	20416	15863	123732	61.2	61.5	60.9	61.4
118	20339	15999	123800	61.4	61.6	60.9	61.3
119	20265	16141	123828	61.3	61.5	61.2	61.8
120	20187	16274	123856	61.8	61.9	61.8	61.6
121	20111	16401	123924	61.9	61.9	61.5	61.6
122	20043	16540	123952	61.7	61.9	61.6	62.0
123	19988	16678	124020	61.8	62.2	61.6	61.7
124	19912	16809	124048	61.7	61.9	61.6	61.9
125	19858	16951	124116	61.2	61.4	61.3	61.7
126	19831	17088	124144	61.3	61.5	61.2	61.4
127	19825	17246	124212	61.7	61.7	61.3	61.4
128	19839	17395	124240	61.4	61.6	61.6	61.5
129	19825	17548	124308	61.3	61.3	61.3	61.4
130	19767	17683	124336	61.1	61.4	61.1	61.1
131	19711	17832	124404	61.3	61.6	61.1	60.9
132	19630	17953	124432	61.2	61.3	61.0	61.1
133	19464	17913	124500	61.4	61.6	61.1	61.0
134	19363	17760	124528	61.2	61.3	60.9	61.1
135	19267	17602	124556	61.1	61.1	61.0	61.1
136	19142	17467	124624	61.0	61.3	60.9	61.1
137	19047	17308	124652	61.1	61.2	60.7	60.8
138	18970	17133	124720	61.3	61.6	61.2	60.9
139	18902	16958	124748	61.1	61.2	60.7	60.9
140	18817	16780	124816	61.2	61.3	60.9	60.9
141	18763	16611	124844	61	61.0	60.0	61.0
142	18680	16435	124912	60.	61.1	60.0	61.1
143	18610	16259	124940	60.9	61.2	60.8	61.0
144	18555	16081	125008	61.2	61.3	60.8	60.9
145	18490	15910	125036	61.6	61.5	61.0	61.1
146	18613	15834	125104	61.1	61.2	61.1	61.3
147	18785	15801	125132	61.0	61.1	61.0	61.3

THERMAL PLUME OF May 4, 1982

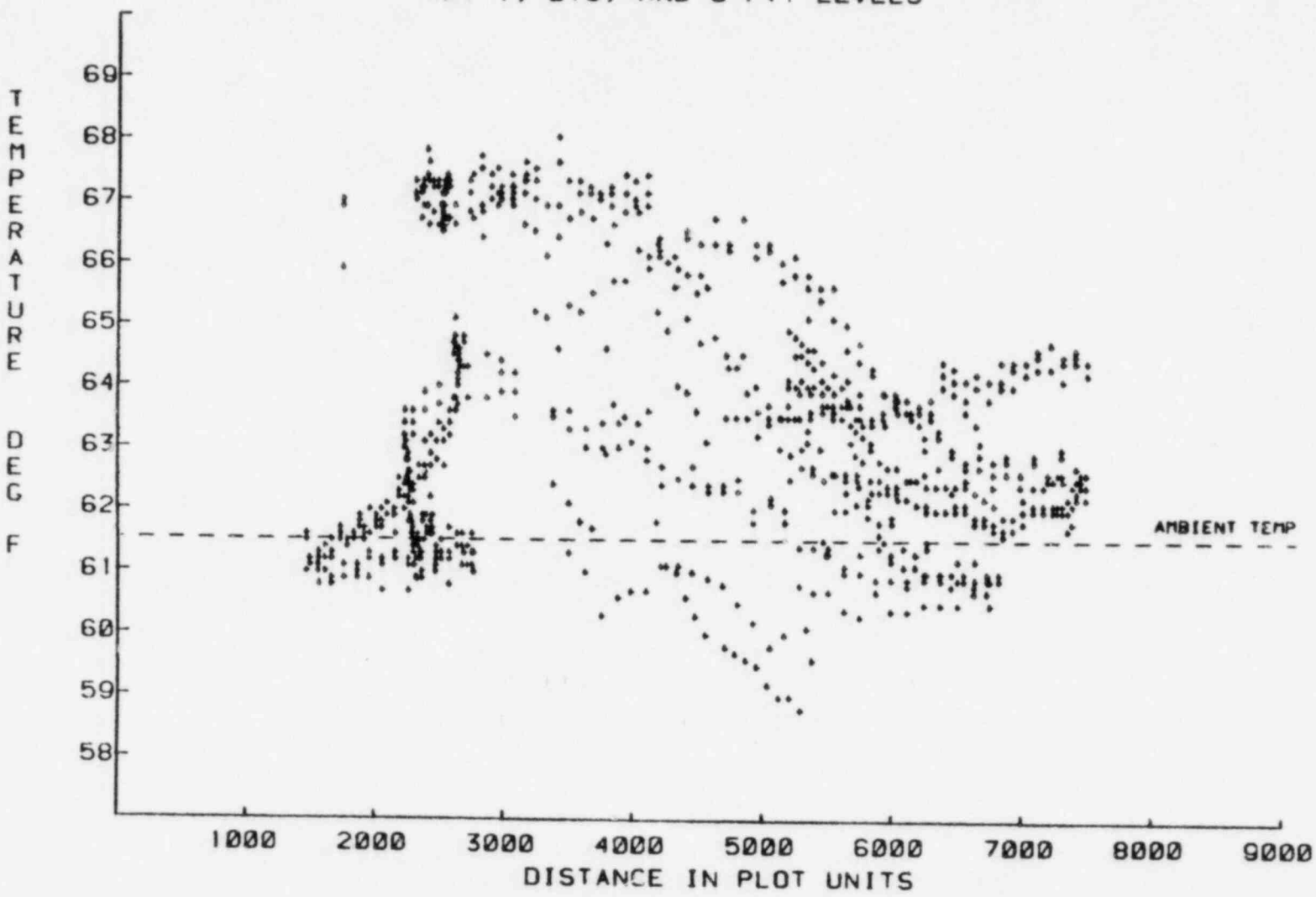
INDEX	POSITION COORDINATES		TIME HHMMSS	TEMPERATURE DEG F			
				1 FT	2.5 FT	5 FT	BOTTOM
148	18942	15760	125200	61.2	61.4	61.0	61.3
149	19007	15714	125228	61.3	61.5	61.2	61.3
150	19265	15690	125256	61.5	61.6	61.7	61.8
151	19425	15647	125324	61.4	61.4	61.5	61.8
152	19583	15585	125352	61.6	61.6	61.5	61.8
153	19740	15513	125420	61.7	61.9	61.8	61.7
154	19800	15427	125448	61.5	61.7	61.8	61.3
155	20047	15348	125516	61.6	62.0	61.6	61.6
156	20209	15283	125544	61.7	61.9	61.8	62.2
157	20348	15202	125612	61.8	62.0	61.7	62.1
158	20518	15118	125640	61.9	62.1	62.1	62.1
159	20684	15042	125708	61.9	62.0	61.9	62.3
160	20820	14961	125736	62.2	62.5	62.3	62.4
161	20966	14882	125805	62.2	62.4	62.0	62.3
162	21114	14812	125833	62.4	62.6	62.3	62.6
163	21240	14715	125901	62.3	62.4	62.1	62.5
164	21393	14624	125929	62.7	62.7	62.5	62.6
165	21545	14538	125957	62.6	62.7	62.5	62.8
166	21702	14454	130025	62.9	63.2	62.7	62.7
167	21868	14372	130053	62.8	63.1	62.8	63.1
168	22019	14300	130121	63.1	63.3	62.7	62.9
169	22171	14215	130149	63.4	63.6	63.2	63.3
170	22328	14121	130217	63.6	63.8	63.6	64.1
171	22447	13989	130245	64.0	64.2	63.7	64.2
172	22543	13848	130313	64.5	64.5	64.1	64.3
173	22638	13706	130341	64.6	64.5	64.4	64.8
174	22763	13546	130409	64.4	64.6	64.3	64.5
175	22796	13502	130437	64.7	64.8	64.3	64.2
176	22882	13237	130505	64.8	65.1	64.6	64.6
177	22972	13094	130533	64.8	65.1	64.6	64.6
178	23050	12948	130601	66.9	66.6	64.7	64.5
179	21368	12868	130629	66.9	67.0	65.9	65.1
180	23207	12917	130657	67.1	67.3	66.8	65.9
181	23415	13055	130725	66.8	66.8	66.4	66.7
182	23580	13160	130753	67.1	67.5	66.9	67.0
183	23754	13250	130821	67.0	67.4	67.2	67.5
184	23930	13305	130849	67.3	67.6	67.4	67.5
185	24114	13264	130917	67.3	67.5	67.3	67.4
186	24520	13172	131027	0.5	68.0	67.6	67.5
187	24681	13171	131055	0.5	67.3	67.3	67.7
188	24783	13285	131123	67.1	67.3	67.3	67.6
189	24877	13411	131151	67.1	67.2	67.1	67.5
190	24960	13527	131219	67.0	67.1	67.1	67.5
191	25066	13641	131247	67.1	67.2	66.9	67.1
192	25178	13837	131315	67.1	67.4	67.1	67.1
193	25201	13803	131343	66.9	67.3	67.0	67.5
194	25400	14020	131411	67.1	67.4	66.9	67.0
195	25508	14166	131439	66.1	66.4	66.2	65.4
196	25650	14307	131507	66.1	66.1	65.5	64.7

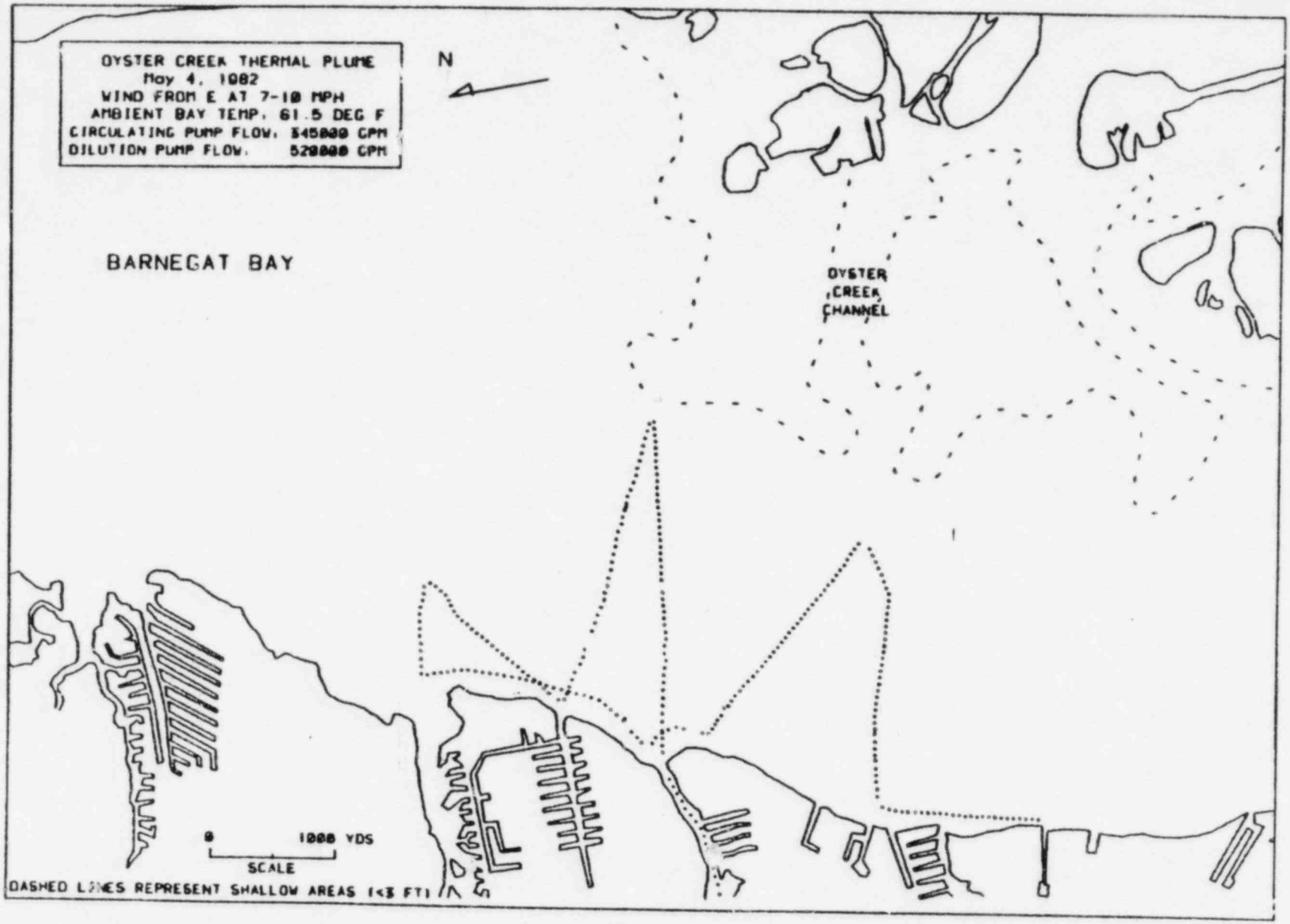
THERMAL PLUME OF May 4, 1982

INDEX	POSITION COORDINATES		TIME HHMMSS	TEMPERATURE DEG F			
				1 FT	2.5 FT	5 FT	BOTTOM
197	25771	14436	131535	66.5	66.4	65.1	64.1
198	25906	14563	131603	66.3	65.8	64.7	63.5
199	26053	14697	131631	66.7	66.3	64.8	62.8
200	26186	14839	131650	66.3	66.2	64.3	62.7
201	26321	14974	131727	66.7	66.7	64.5	62.5
202	26447	15108	131755	66.3	66.1	64.0	61.9
203	26572	15244	131823	66.3	66.2	63.7	60.6
204	26690	15373	131851	66.0	65.7	63.5	60.3
205	26810	15505	131919	66.1	65.8	63.5	59.8
206	26941	15636	131947	65.8	65.6	63.1	59.6
207	27068	15768	132015	65.6	65.4	63.0	59.8
208	27182	15904	132043	65.6	65.1	62.6	59.5
209	27312	16035	132111	65.0	64.6	62.3	59.2
210	27434	16169	132139	64.7	64.4	62.4	59.1
211	27557	16297	132207	64.3	64.2	62.3	58.9
212	27672	16432	132235	63.9	63.4	61.5	58.9
213	27797	16566	132303	63.8	63.6	62.2	58.5
214	27920	16703	132331	63.6	63.5	62.5	58.3
215	28046	16842	132359	63.8	63.2	62.6	58.9
216	28183	16971	132427	63.2	63.3	62.7	59.2
217	28311	17114	132455	62.9	63.0	62.3	59.9
218	28438	17257	132523	62.8	62.7	62.5	61.1
219	28569	17391	132551	62.9	63.1	62.7	62.0
220	28694	17535	132619	62.4	62.8	62.6	62.4
221	28817	17676	132647	62.8	62.9	62.6	62.4
222	28947	17822	132715	62.6	62.6	62.4	62.4
223	29068	17973	132743	62.8	62.9	62.8	62.6
224	29194	18121	132811	62.6	62.6	62.5	62.4
225	29320	18266	132839	62.9	63.0	62.6	62.0
226	29453	18418	132907	62.7	62.7	62.5	62.6
227	29660	18340	133011	62.2	62.6	62.4	62.4
228	29668	18207	133039	62.4	62.6	62.5	62.5
229	29683	18076	133107	62.3	62.5	62.2	62.1
230	29699	17945	133135	61.8	62.4	62.1	62.1
231	29717	17808	133203	62.0	62.2	61.7	61.5
232	29724	17667	133231	62.1	62.5	62.0	61.1
233	29731	17526	133259	62.1	62.6	62.0	61.5
234	29739	17394	133327	62.1	62.5	62.0	61.3
235	29686	17232	133355	62.1	62.4	62.0	61.0
236	29624	17072	133423	62.0	62.4	62.1	60.3
237	29561	16912	133451	61.8	62.2	62.0	60.1
238	29498	16752	133519	61.7	61.9	61.9	60.0
239	29444	16591	133547	61.7	61.9	61.6	60.5
240	29392	16432	133615	61.8	62.1	61.7	61.3
241	29334	16278	133643	61.9	62.2	61.8	60.5
242	29277	16122	133711	61.9	62.3	61.8	60.6
243	29214	15965	133739	62.1	62.4	62.0	60.3
244	29157	15809	133807	62.1	62.4	62.0	61.3
245	29099	15655	133835	62.0	62.4	62.0	60.9

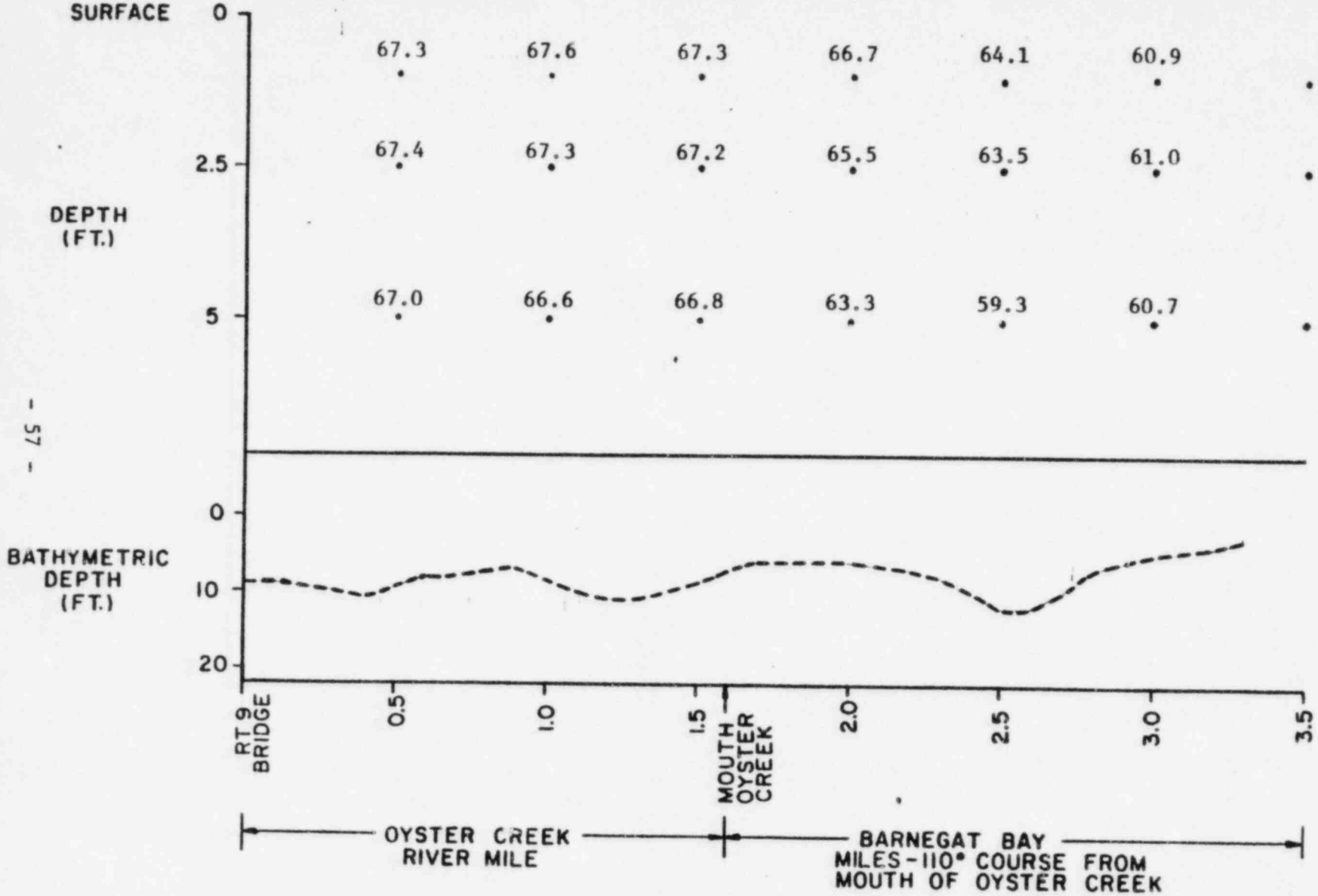
THERMAL PLUME OF May 4, 1982

INDEX	POSITION COORDINATES		TIME HHMMSS	TEMPERATURE DEG F			
				1 FT	2.5 FT	5 FT	BOTTOM
246	29038	15407	133903	62.0	62.4	62.0	61.9
247	28980	15333	133931	62.0	62.4	62.1	62.2
248	28921	15160	133959	62.1	62.5	62.1	62.4
249	28861	15005	134027	62.2	62.5	62.2	62.4
250	28800	14848	134055	62.4	62.7	62.3	62.6
251	28746	14679	134123	62.4	62.7	62.3	62.6
252	28704	14523	134151	62.5	62.8	62.3	62.7
253	28656	14363	134219	63.0	63.1	62.5	62.8
254	28620	14204	134247	63.2	63.4	62.8	63.1
255	28593	14056	134315	63.3	63.5	62.9	63.1
256	28568	13947	134343	63.4	63.7	63.1	63.3
257	28537	13747	134411	63.7	64.0	63.5	63.5
258	28504	13584	134439	63.9	64.2	63.6	63.6
259	28486	13429	134507	64.0	61.3	63.7	63.8
260	28465	13299	134535	64.1	64.4	63.9	63.8
261	28442	13105	134603	64.3	64.6	64.0	63.8
262	28427	12943	134631	64.4	64.6	64.0	63.8
263	28407	12705	134659	64.5	64.7	64.1	63.8
264	28483	12625	134727	64.5	64.8	64.0	63.9
265	28385	12453	134756	64.9	64.9	64.1	64.0
266	28467	12259	134850	63.5	64.0	63.7	63.9
267	28629	12272	134918	63.5	63.9	63.5	63.6
268	28777	12312	134946	63.6	63.9	63.5	63.6
269	28931	12354	135014	63.6	63.9	63.7	63.8
270	29071	12409	135042	63.5	63.7	63.6	64.2
271	29244	12488	135112	63.8	64.1	63.7	63.9
272	29402	12546	135145	63.5	63.9	63.7	64.2
273	29548	12618	135213	63.4	63.5	63.5	64.1
274	29688	12672	135241	63.5	63.9	63.6	64.1
275	29835	12741	135309	63.8	63.9	63.7	63.8
276	29978	12794	135337	63.6	63.8	63.8	64.2
277	30138	12855	135405	63.4	63.7	63.6	63.7
278	30279	12918	135433	63.6	63.8	63.5	63.6
279	30430	12979	135501	64.0	64.4	64.2	64.2
280	30558	13049	135529	63.9	64.3	64.1	64.5
281	30703	13118	135557	63.6	64.1	63.8	64.3
282	30831	13185	135626	64.0	63.4	64.2	64.4
283	30978	13263	135654	63.8	64.1	64.1	64.6
284	31125	13339	135722	64.0	64.4	64.1	64.5
285	31278	13411	135750	64.0	64.3	64.4	64.8
286	31423	13488	135818	64.2	64.4	64.2	64.5
287	31561	13569	135846	64.3	64.6	64.5	64.8
288	31716	13656	135914	64.3	64.7	64.3	64.6
289	31863	13741	135942	64.1	64.5	64.4	65.0
290	32000	13823	140010	64.5	64.6	64.4	64.7
291	32153	13902	140038	64.2	64.4	64.4	64.8


TEMPERATURE MEASUREMENTS OF May 4, 1982
AT 1, 2.5, AND 5 FT. LEVELS
TEMPERATURE DEG F
69
68
67
66
65
64
63
62
61
60
59
58
AMBIENT TEMP
1000
2000
3000
4000
5000
6000
7000
8000
9000
DISTANCE IN PLOT UNITS


OYSTER CREEK THERMAL PLUME
May 4, 1982
WIND FROM E AT 7-10 MPH
AMBIENT BAY TEMP. 61.5 DEG F
CIRCULATING PUMP FLOW. 545000 GPM
DILUTION PUMP FLOW. 520000 GPM
N
BARNEGAT BAY
OYSTER CREEK CHANNEL
0 1000 YDS
SCALE
DASHED LINES REPRESENT SHALLOW AREAS (<3 FT)

LONGITUDINAL SECTIONS OF OYSTER CREEK AND BARNEGAT BAY



DATE May 4, 1982

TIME 1130-1400

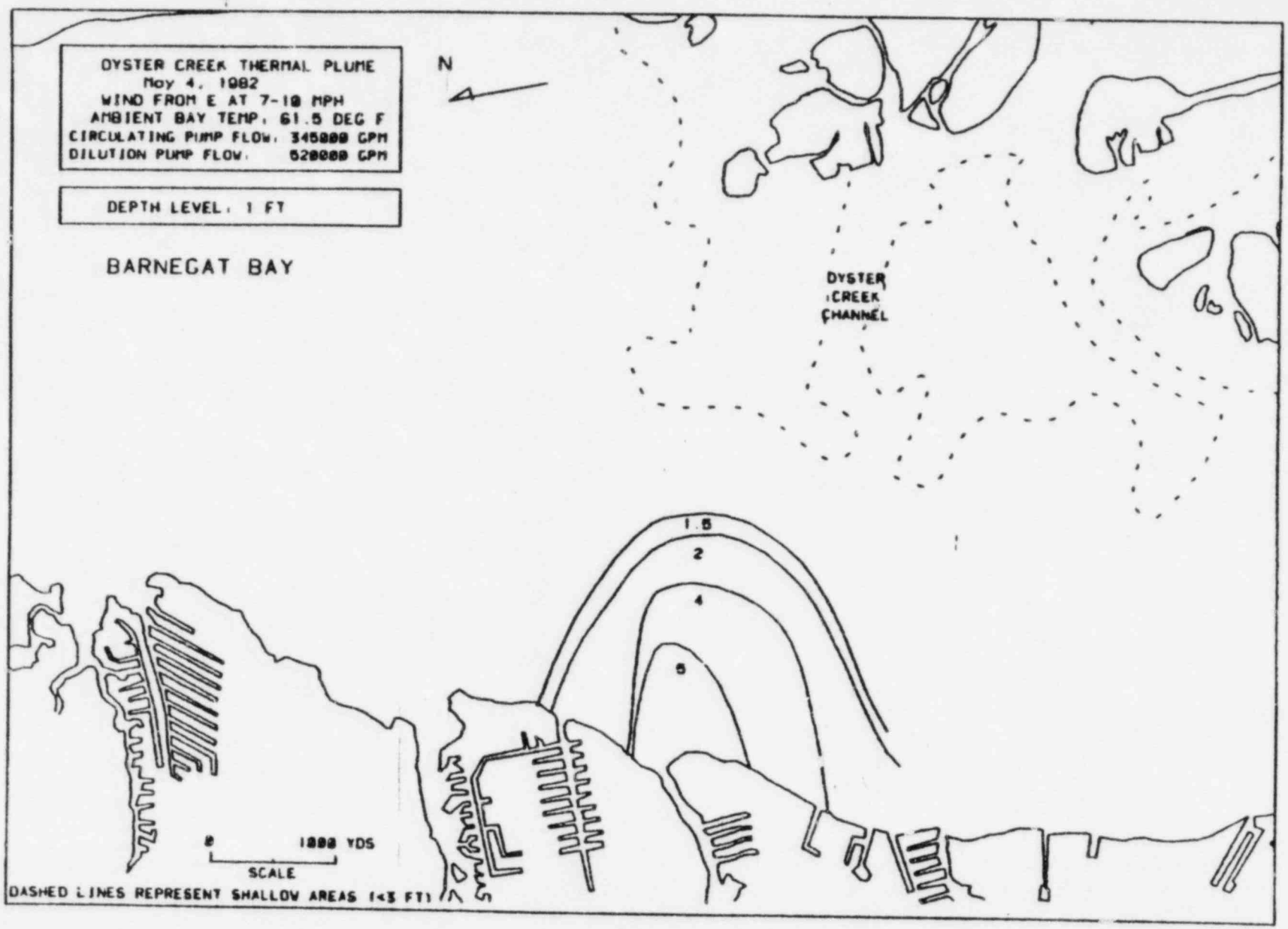
WIND E at 7-10 mph

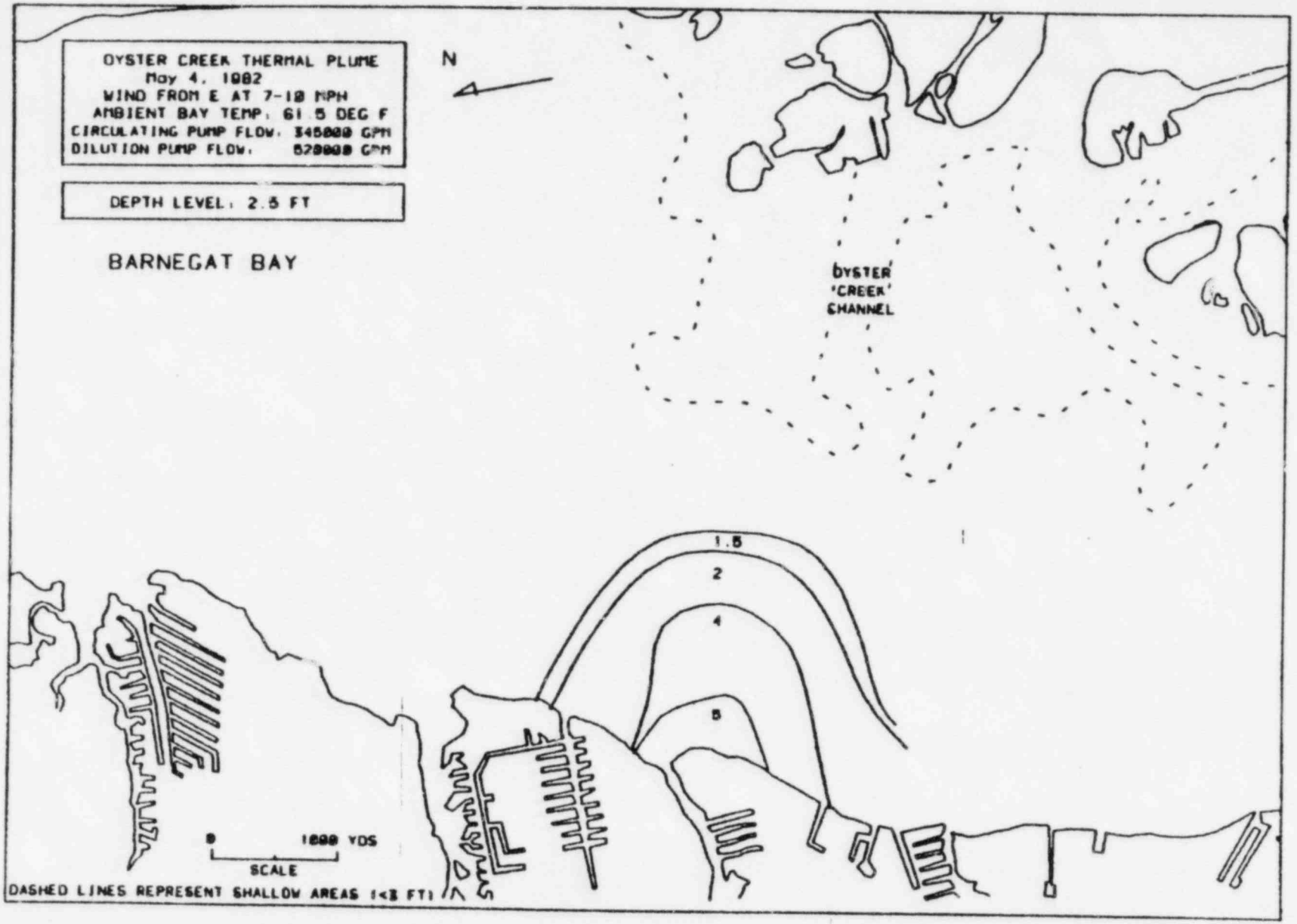
STATION PARAMETERS

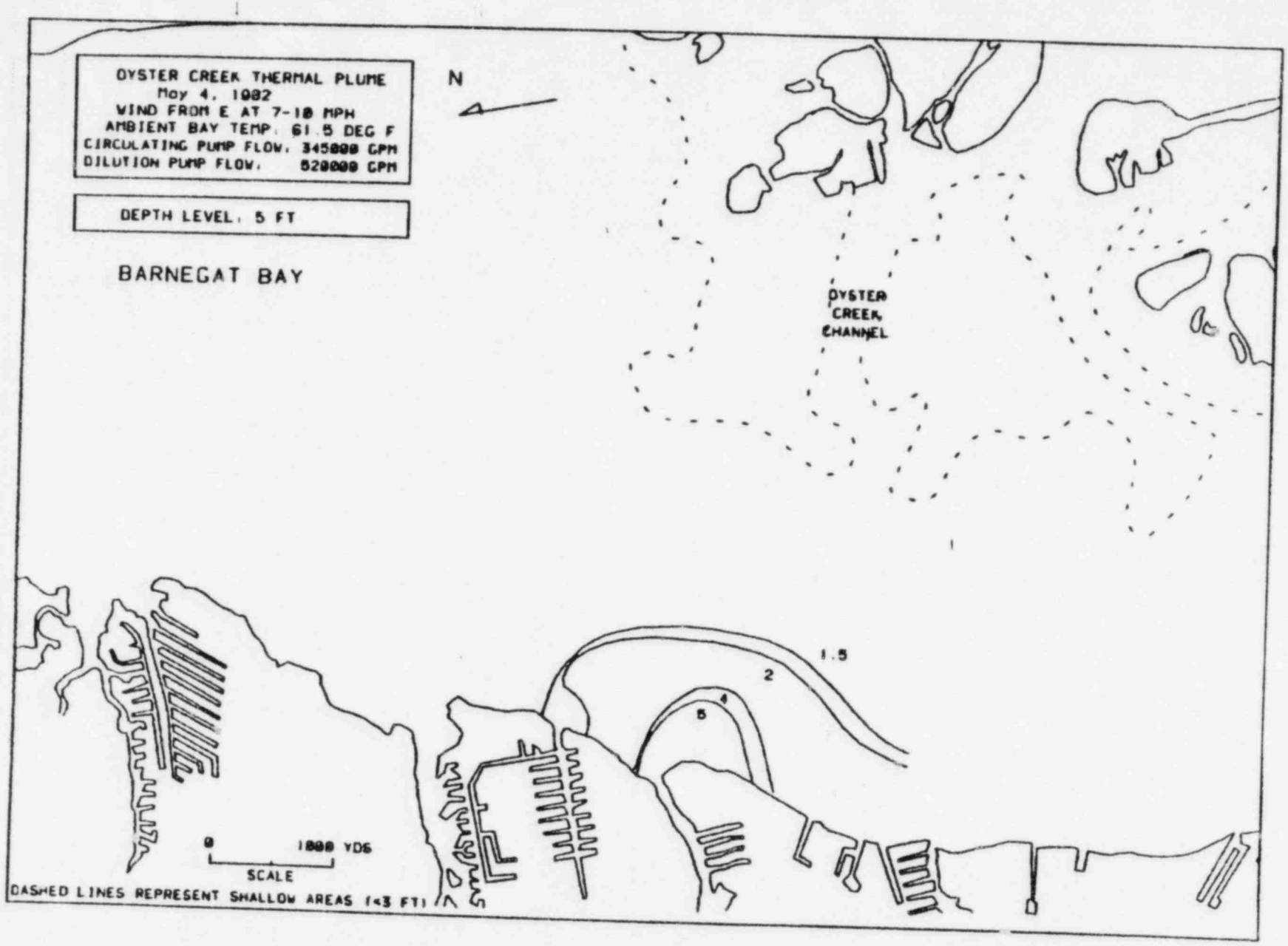
ΔT 17.1 degrees F

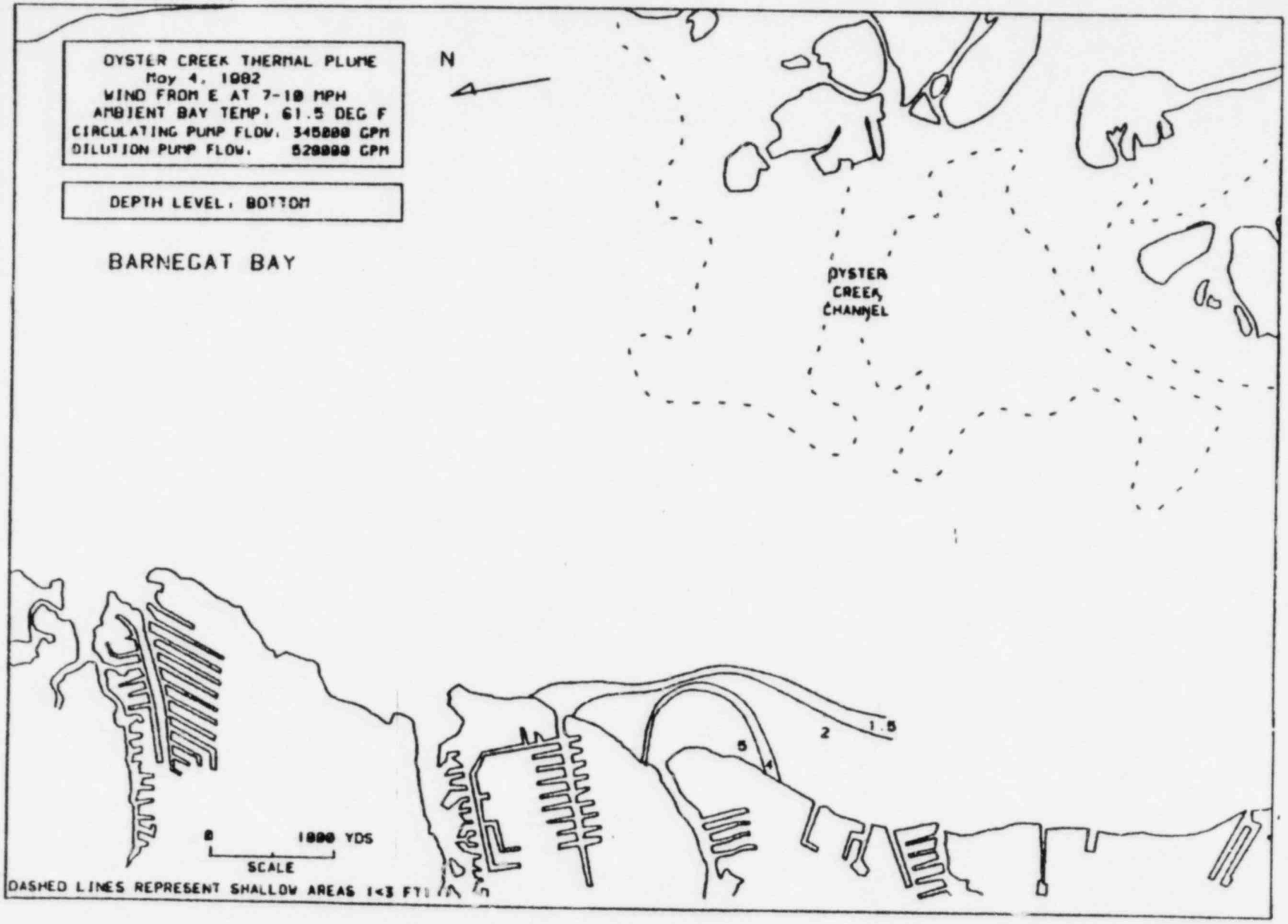
CIRC. FLOW 345,000 gpm

DIL. FLOW 520,000 gpm


OYSTER CREEK THERMAL PLUME
May 4, 1982
WIND FROM E AT 7-10 MPH
AMBIENT BAY TEMP. 61.5 DEG F
CIRCULATING PUMP FLOW: 345000 GPM
DILUTION PUMP FLOW: 520000 GPM
DEPTH LEVEL: 1 FT
N
BARNEGAT BAY
OYSTER CREEK CHANNEL
1.5
2
4
5
0
1000 YDS
SCALE
DASHED LINES REPRESENT SHALLOW AREAS (<3 FT)


OYSTER CREEK THERMAL PLUME
May 4, 1982
WIND FROM E AT 7-10 MPH
AMBIENT BAY TEMP: 61.5 DEG F
CIRCULATING PUMP FLOW: 345000 GPM
DILUTION PUMP FLOW: 520000 GPM
DEPTH LEVEL: 2.5 FT
N
BARNEGAT BAY
OYSTER CREEK CHANNEL
1.5
2
4
8
0
1000 YDS
SCALE
DASHED LINES REPRESENT SHALLOW AREAS (<3 FT)


OYSTER CREEK THERMAL PLUME
May 4, 1982
WIND FROM E AT 7-10 MPH
AMBIENT BAY TEMP. 61.5 DEG F
CIRCULATING PUMP FLOW. 345000 GPM
DILUTION PUMP FLOW. 520000 GPM
DEPTH LEVEL: 5 FT
N
BARNEGAT BAY
OYSTER CREEK CHANNEL
1.5
2
4
5
0
1000 YDS
SCALE
DASHED LINES REPRESENT SHALLOW AREAS (<3 FT)


OYSTER CREEK THERMAL PLUME
May 4, 1982
WIND FROM E AT 7-10 MPH
AMBIENT BAY TEMP. 61.5 DEG F
CIRCULATING PUMP FLOW. 345000 GPM
DILUTION PUMP FLOW. 529000 GPM
DEPTH LEVEL: BOTTOM
N
BARNEGAT BAY
OYSTER CREEK CHANNEL
2
1.5
1
0
1000 YDS
SCALE
DASHED LINES REPRESENT SHALLOW AREAS 1<3 FT

THERMAL PLUME OF June 8, 1982

INDEX	POSITION COORDINATES		TIME HHMMSS	TEMPERATURE DEG F			
				1 FT	2.5 FT	5 FT	BOTTOM
1	24408	9168	114457	71.3	71.4	71.1	72.1
2	24385	9329	114521	71.1	71.3	70.8	72.1
3	24351	9502	114543	71.2	71.2	71.0	72.0
4	24333	9662	114605	71.2	71.6	71.1	72.4
5	24284	9824	114627	71.4	71.6	71.0	72.5
6	24251	9985	114649	71.7	71.5	71.2	72.0
7	24225	10148	114711	71.4	71.7	71.1	72.2
8	24202	10319	114733	71.6	71.6	71.2	72.3
9	24177	10482	114755	71.5	71.4	71.6	72.1
10	24114	10633	114817	71.3	71.6	71.2	72.2
11	24048	10797	114840	71.3	71.5	71.2	72.2
12	23979	10968	114905	71.6	71.1	71.3	71.7
13	23884	11114	114928	71.2	71.5	70.9	72.2
14	23791	11262	114952	71.1	71.5	70.9	72.2
15	23709	11394	115014	71.1	71.5	71.0	72.1
16	23625	11542	115036	71.2	71.2	71.0	72.0
17	23557	11689	115058	71.3	71.3	71.1	72.0
18	23530	11848	115120	71.1	71.3	71.0	71.9
19	23482	12006	115142	71.3	71.2	71.2	71.9
20	0	12170	115204	71.3	71.3	71.1	72.0
21	0	12385	115231	71.2	71.5	71.0	72.1
22	23460	12585	115258	71.2	71.2	70.5	70.5
23	23487	12748	115320	71.2	70.9	70.2	70.2
24	23516	12912	115342	71.2	70.3	70.1	69.2
25	23553	13081	115404	70.6	70.2	69.9	65.9
26	23597	13265	115426	70.4	69.8	69.1	64.6
27	23643	13434	115448	70.4	69.6	69.4	64.1
28	23691	13603	115510	69.9	69.8	69.2	64.6
29	23775	13767	115532	69.7	69.6	69.3	64.3
30	23788	13932	115554	69.6	69.5	69.2	64.3
31	23835	14095	115616	69.5	69.4	68.9	63.7
32	23858	14254	115638	69.2	69.3	68.8	64.2
33	23891	14408	115700	69.8	69.1	68.6	63.4
34	23933	14567	115722	68.7	68.9	68.4	63.3
35	23969	14721	115744	68.5	68.9	68.1	62.6
36	24021	14878	115806	68.8	69.0	68.1	62.2
37	24061	15037	115829	69.0	68.8	68.1	62.5
38	24090	15195	115851	68.1	68.2	67.3	62.8
39	24129	15345	115913	67.9	67.8	66.6	62.6
40	24221	15497	115935	67.8	66.9	66.0	62.4
41	24222	15648	115957	67.0	66.4	65.2	61.9
42	24271	15796	120019	66.0	65.6	64.4	62.2
43	24302	15946	120041	65.0	64.8	63.9	62.5
44	24322	16092	120103	64.0	63.9	63.0	62.8
45	24361	16240	120125	63.0	63.0	62.1	62.3
46	24417	16385	120147	62.5	62.4	61.8	62.1
47	24456	16535	120209	62.0	61.9	61.6	61.7
48	24503	16681	120231	61.8	61.7	61.6	62.3
49	24550	16827	120253	61.4	61.6	61.3	61.8

THERMAL PLUME OF June 8, 1982

INDEX	POSITION COORDINATES		TIME HHMMSS	TEMPERATURE DEG F			
				1 FT	2.5 FT	5 FT	BOTTOM
50	24608	16964	120315	61.2	61.5	61.1	62.2
51	24658	17114	120337	61.3	61.4	61.1	62.3
52	23258	12021	121256	70.2	69.9	68.4	65.1
53	23157	13012	121318	70.8	70.4	69.1	63.8
54	23053	13102	121340	70.9	70.4	69.3	62.9
55	22963	13203	121402	70.7	70.7	68.9	63.0
56	22882	13320	121424	70.9	70.3	67.8	62.5
57	22798	13444	121446	70.8	69.9	67.9	62.5
58	22711	13562	121508	70.8	69.7	66.0	62.7
59	22632	13675	121530	70.3	68.5	64.7	62.5
60	22537	13764	121552	69.6	68.3	64.1	62.2
61	22451	13859	121614	69.3	68.5	64.1	62.5
62	22345	13947	121636	68.5	67.7	64.3	62.7
63	22262	14047	121658	67.0	65.7	63.6	62.7
64	22168	14150	121720	65.5	64.1	63.4	63.0
65	22077	14239	121742	63.9	63.8	63.2	62.8
66	21990	14328	121804	64.4	63.9	63.0	62.9
67	21903	14417	121826	64.2	63.6	63.1	62.7
68	21823	14515	121848	63.5	63.3	62.7	62.4
69	21727	14599	121910	63.1	62.8	62.4	62.3
70	21637	14685	121932	62.4	62.7	62.3	61.9
71	21556	14782	121954	62.5	62.6	62.2	62.2
72	21486	14884	122016	62.5	62.5	62.2	62.0
73	21403	14945	122038	62.5	62.7	62.3	62.1
74	21377	14804	122105	62.1	62.5	62.2	61.8
75	21460	14717	122127	62.5	62.6	62.2	66.3
76	21518	14586	122149	62.4	62.3	62.2	63.5
77	21570	14450	122211	62.3	62.6	62.1	63.2
78	21630	14317	122233	62.6	62.8	62.3	63.4
79	21704	14190	122255	62.8	63.0	62.6	63.4
80	21785	14068	122317	63.0	63.1	62.4	63.5
81	21924	14024	122339	63.5	63.5	62.9	63.8
82	22055	13998	122401	63.5	63.9	63.2	63.8
83	22190	13957	122423	64.0	64.1	63.6	64.0
84	22333	13912	122445	65.7	64.3	63.5	63.9
85	22471	13832	122507	67.0	65.8	63.8	64.1
86	22544	13729	122529	68.4	68.1	64.1	64.3
87	22670	13675	122551	68.9	68.1	63.8	64.1
88	22822	13664	122615	70.2	68.4	64.0	63.4
89	22964	13664	122635	70.6	69.4	65.9	63.4
90	23108	13725	122657	70.9	68.9	66.6	63.7
91	23249	13788	122719	70.4	69.5	67.3	63.7
92	23396	13745	122741	70.0	69.8	67.3	63.9
93	23543	13753	122803	70.0	70.1	68.3	63.9
94	23686	13757	122825	69.8	69.0	68.9	64.7
95	23832	13776	122847	69.8	69.7	68.7	64.8
96	23971	13838	122909	69.3	69.4	68.6	64.7
97	24101	13903	122931	69.2	69.2	68.3	64.5
98	24241	13951	122953	69.1	69.4	68.4	65.2

THERMAL PLUME OF June 8, 1982

INDEX	POSITION COORDINATES		TIME HHMMSS	TEMPERATURE DEG F			
				1 FT	2.5 FT	5 FT	BOTTOM
99	24380	14014	123015	60.0	60.1	67.0	65.6
100	24523	14060	123037	68.0	60.1	67.1	66.2
101	24650	14162	123050	68.1	67.6	65.7	66.2
102	24781	14263	123121	66.0	65.9	65.1	64.5
103	24879	14353	123143	6 .3	65.5	65.1	64.6
104	25016	14418	123205	65.0	65.0	64.6	64.1
105	25142	14497	123227	65.0	65.1	63.8	63.9
106	25265	14572	123249	65.0	65.2	64.0	63.5
107	25398	14654	123311	64.6	64.8	63.5	63.2
108	25531	14720	123333	64.7	64.7	63.5	62.6
109	25674	14779	123355	64.4	64.5	63.6	62.2
110	25813	14848	123417	64.0	64.0	63.4	62.1
111	25952	14920	123439	63.6	63.9	63.4	62.9
112	26097	14999	123501	63.5	63.9	63.5	63.9
113	26238	15072	123523	63.4	63.8	63.5	64.0
114	26380	15151	123545	63.7	63.9	63.5	63.9
115	26513	15239	123607	63.7	63.8	63.3	63.0
116	26643	15343	123629	64.0	63.9	63.4	63.1
117	26782	15435	123651	64.1	64.1	63.6	63.7
118	26911	15534	123713	64.0	64.0	63.4	63.8
119	27042	15635	123735	64.1	63.9	63.4	64.3
120	27175	15735	123757	63.9	63.8	63.2	64.2
121	27312	15822	123819	63.8	63.7	63.2	64.1
122	27450	15913	123841	63.8	63.8	63.4	64.1
123	27579	16011	123903	63.7	63.8	63.4	63.4
124	27719	16119	123925	63.6	63.9	63.5	62.9
125	27851	16219	123947	63.7	63.8	63.4	62.5
126	27977	16333	124009	63.4	63.6	63.2	61.9
127	28102	16431	124031	63.3	63.5	62.6	61.2
128	28219	16536	124053	63.3	63.4	62.3	61.2
129	28348	16633	124115	63.3	63.6	61.3	61.1
130	28467	16748	124137	63.2	62.5	60.2	60.5
131	28578	16858	124159	63.1	63.0	60.9	60.5
132	28700	16958	124221	63.0	62.7	61.1	60.3
133	28821	17006	124243	63.1	63.3	61.8	60.4
134	28843	16905	124305	62.9	62.7	61.9	60.0
135	28829	16769	124327	63.0	63.1	61.9	60.1
136	28841	16646	124349	63.0	62.8	61.6	60.1
137	28836	16517	124411	63.1	62.9	61.6	60.0
138	28816	16382	124433	63.2	63.0	60.9	60.3
139	28832	16259	124455	63.3	63.1	61.0	60.4
140	28867	16154	124517	63.4	63.4	61.0	60.6
141	28882	16035	124539	63.6	63.5	61.1	60.4
142	28874	15902	124601	63.5	63.6	62.0	61.0
143	28850	15763	124623	63.7	63.6	62.5	61.2
144	28836	15626	124645	63.9	63.9	63.4	61.9
145	28799	15484	124707	63.8	63.6	63.6	62.0
146	28719	15331	124729	64.1	64.0	63.7	62.5
147	28620	15180	124751	63.9	64.1	63.9	63.0

THERMAL PLUME OF June 8, 1982

INDEX	POSITION COORDINATES		TIME HHMMSS	TEMPERATURE DEG F			
				1 FT	2.5 FT	5 FT	BOTTOM
148	28587	15037	124813	63.9	64.2	64.1	63.8
149	28574	14902	124835	63.7	64.1	63.9	64.5
150	28559	14760	124857	63.8	64.1	63.9	64.6
151	28554	14629	124919	64.0	64.1	63.9	64.7
152	28553	14497	124941	64.0	64.1	63.8	63.8
153	28541	14361	125003	64.0	64.1	63.6	63.0
154	28540	14224	125025	64.1	64.3	63.7	63.1
155	28548	14094	125047	64.1	64.3	63.8	63.2
156	28551	13978	125109	64.1	64.4	63.9	63.9
157	28538	13864	125131	63.9	64.1	63.8	63.9
158	28519	13666	125153	63.8	64.0	63.7	63.8
159	28501	13514	125215	63.6	63.7	63.4	64.0
160	28485	13390	125237	63.5	63.6	63.3	64.0
161	28448	13216	125259	63.8	63.7	63.3	64.0
162	28418	13050	125321	63.6	63.6	63.0	63.9
163	28359	12901	125343	63.5	63.4	62.9	63.8
164	28321	12742	125405	63.4	63.3	62.9	63.7
165	28315	12587	125427	63.4	63.4	62.8	63.7
166	28273	12430	125449	63.5	63.4	62.9	63.8
167	28203	12291	125511	63.6	63.5	63.0	63.8
168	28275	12131	125535	63.7	63.8	63.5	64.2
169	28270	11981	125558	63.7	63.5	63.4	64.3
170	28242	11831	125620	63.6	63.4	63.1	63.2
171	0	11697	125643	63.3	63.6	63.2	63.1
172	0	11781	125710	63.3	63.8	63.4	64.2
173	28612	11917	125737	63.5	63.8	63.7	63.3
174	28755	12027	125803	63.4	63.5	62.9	63.1
175	28886	12103	125827	63.3	63.1	62.9	64.3
176	28975	12146	125849	63.3	63.4	63.1	63.9
177	28988	12153	125912	63.2	63.3	63.0	63.7
178	0	12317	130104	62.8	63.4	63.2	63.8
179	29333	12478	130131	63.4	63.5	63.0	63.8
180	29442	12598	130153	63.1	63.1	63.1	64.0
181	29514	12704	130216	63.1	63.2	63.0	63.8
182	29583	12818	130238	62.6	63.0	62.8	64.0
183	29611	12840	130300	62.8	63.0	62.6	63.3
184	29631	12849	130322	62.8	63.0	62.8	63.2
185	29707	12905	130344	62.8	62.9	62.5	63.5
186	29846	13020	130406	63.0	63.1	62.7	63.6
187	29969	13072	130428	62.8	62.8	62.7	63.6
188	30075	13042	130450	62.9	62.9	62.7	63.8
189	30185	13020	130512	62.5	62.9	62.	63.7
190	30306	13005	130534	62.9	63.0	62.7	63.7
191	30446	12972	130556	62.9	63.2	62.9	63.9
192	30518	12933	130619	63.3	63.4	63.2	64.1
193	0	12927	130645	63.4	63.6	63.2	64.0
194	0	12793	130712	63.6	63.5	63.3	63.6
195	0	12785	130730	63.8	63.7	63.3	63.7
196	0	12644	130806	63.7	63.8	63.4	63.4

THERMAL PLUME OF June 8, 1982

INDEX	POSITION COORDINATES		TIME HHMMSS	TEMPERATURE DEG F			
				1 FT	2.5 FT	5 FT	BOTTOM
197	0	12538	130833	63.5	63.4	62.9	62.8
198	28732	13554	131420	63.5	62.8	62.7	62.7
199	28629	13488	131451	63.2	63.1	62.9	63.0
200	28493	13400	131513	62.9	63.3	63.0	62.8
201	28368	13294	131535	63.0	63.1	62.7	62.7
202	28241	13200	131557	63.0	63.2	62.0	62.7
203	28123	13115	131619	63.1	63.4	63.1	62.7
204	28012	13051	131641	63.5	63.5	63.2	63.1
205	27889	13012	131703	63.3	63.6	63.4	62.8
206	27772	12963	131725	63.3	63.6	63.1	65.7
207	27660	12934	131747	63.3	63.5	63.2	65.5
208	27548	12897	131809	63.4	63.7	63.5	64.3
209	27448	12878	131831	63.7	63.8	63.6	64.5
210	27339	12851	131853	63.5	63.8	63.5	64.0
211	27237	12820	131915	63.4	63.7	63.1	63.9
212	27122	12786	131937	63.6	63.8	63.6	63.8
213	27003	12754	131959	63.7	64.0	63.6	64.1
214	26892	12720	132021	63.7	63.8	63.3	64.2
215	26780	12697	132043	63.2	63.5	63.2	63.8
216	26676	12673	132105	63.1	63.4	63.0	64.2
217	26566	12651	132127	63.2	63.1	63.3	64.7
218	26459	12629	132149	63.4	63.7	63.5	64.0
219	26345	12589	132211	63.6	63.8	63.5	64.3
220	26234	12577	132233	63.8	64.0	63.8	64.2
221	26131	12552	132255	63.9	64.1	63.9	64.9
222	26028	12543	132317	64.1	64.2	63.9	64.9
223	25930	12539	132339	64.1	64.3	64.2	65.0
224	25843	12531	132401	64.5	64.7	64.5	65.2
225	25752	12523	132423	64.6	64.8	64.4	65.5
226	25655	12507	132445	64.6	64.6	64.5	65.5
227	23042	12506	132507	64.7	65.0	64.9	66.4
228	0	12545	132530	64.9	65.2	65.0	65.9
229	25426	12603	132557	65.0	65.2	65.0	65.9
230	25416	12683	132619	65.0	65.3	65.1	66.4
231	25421	12764	132641	65.5	65.5	65.1	66.1
232	25432	12848	132703	65.0	65.0	65.0	66.1
233	25429	12955	132725	65.2	65.4	65.3	65.8
234	25431	13032	132747	65.2	65.4	65.1	65.3
235	25426	13121	132809	65.4	65.7	65.5	66.1
236	25430	13228	132831	65.9	65.8	65.2	65.2
237	25430	13305	132853	65.0	64.9	64.7	65.2
238	25435	13380	132915	64.4	64.7	64.5	65.1
239	25423	13467	132937	64.3	64.5	64.2	64.8
240	25420	13539	132959	64.4	64.6	64.4	64.8
241	25403	13612	133021	64.5	64.6	64.5	64.7
242	25385	13688	133043	64.5	64.5	64.4	64.6
243	25372	13780	133105	64.1	64.5	64.4	64.5
244	25350	13835	133127	64.5	64.9	64.6	64.2
245	25328	13906	133149	64.5	64.6	64.2	63.9

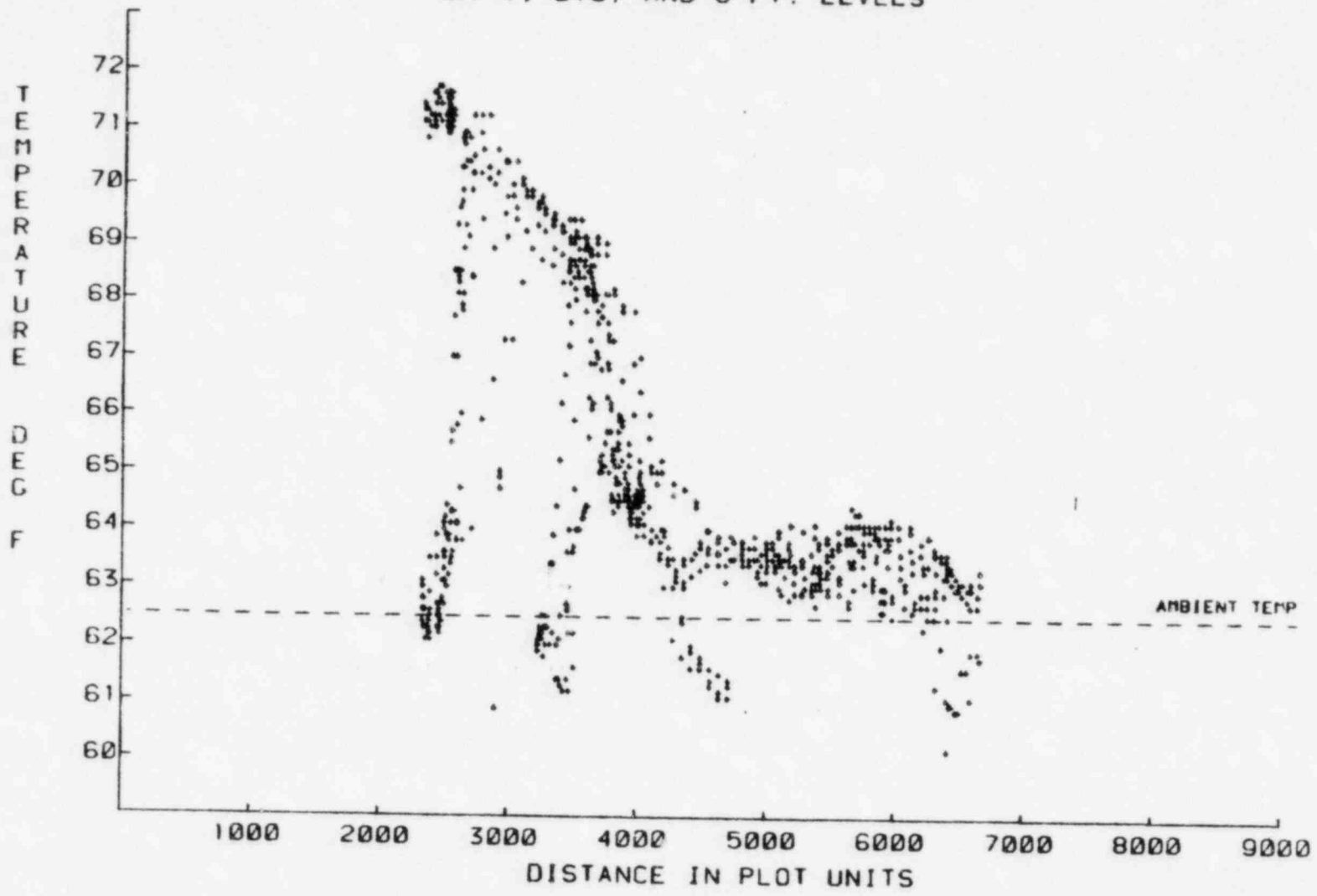
THERMAL PLUME OF June 8, 1982

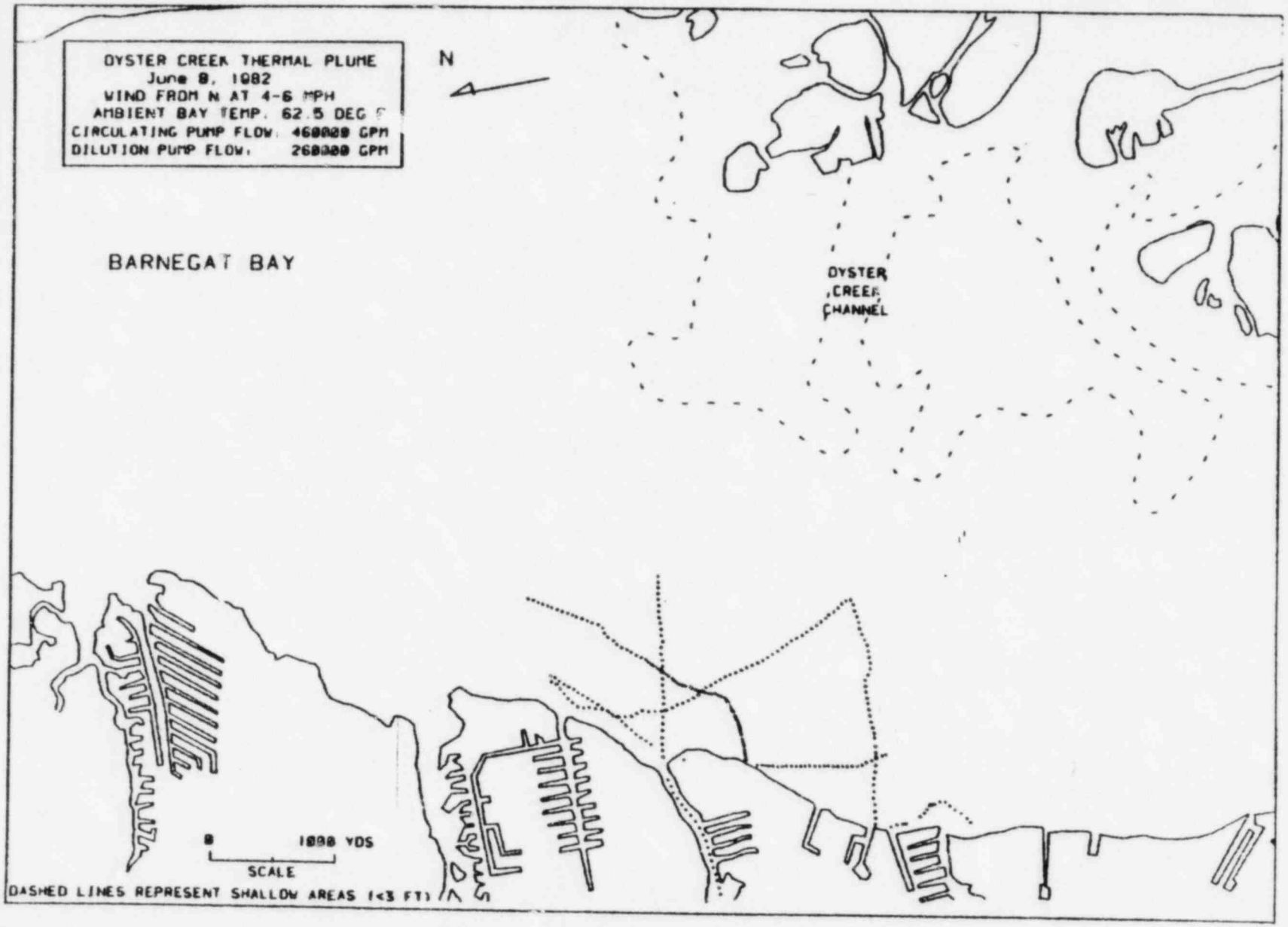
INDEX	POSITION COORDINATES		TIME HHMMSS	TEMPERATURE DEG F			
				1 FT	2.5 FT	5 FT	BOTTOM
246	25384	13995	133211	64.6	64.7	64.7	64.1
247	25281	14054	133233	64.6	64.7	64.6	63.7
248	25252	14112	133255	64.3	64.6	64.5	63.7
249	25183	14143	133317	64.5	64.8	64.5	64.0
250	25117	14161	133339	64.6	64.7	64.5	64.6
251	25055	14211	133401	64.5	64.5	64.5	64.1
252	24967	14191	133423	64.6	64.8	64.8	64.2
253	24897	14209	133445	64.6	64.7	64.5	63.9
254	24822	14227	133507	64.5	64.8	64.5	64.3
255	24747	14243	133529	64.9	64.8	64.5	64.2
256	24696	14266	133551	64.5	64.3	64.3	64.1
257	24627	14288	133613	66.1	66.2	65.7	64.5
258	24555	14321	133635	66.9	66.9	66.3	65.2
259	24533	14372	133657	67.3	67.4	66.8	65.7
260	24422	14381	133719	67.9	67.7	66.8	65.5
261	24358	14396	133741	67.8	67.6	67.0	65.2
262	24283	14425	133803	68.1	68.0	66.9	65.0
263	24234	14473	133825	68.1	68.0	66.2	65.0
264	24184	14518	133847	68.2	68.1	66.1	65.1
265	24166	14569	133909	68.6	68.2	66.2	65.0
266	24091	14625	133932	68.8	68.4	66.9	64.9
267	24049	14681	133954	68.9	68.8	67.3	65.3
268	24081	14740	134016	68.8	68.6	66.3	64.7
269	23973	14778	134038	68.8	68.5	65.6	64.6
270	23924	14821	134100	68.9	68.2	64.4	63.9
271	23880	14854	134122	68.9	68.2	64.4	64.0
272	23821	14900	134145	68.9	68.2	64.3	63.5
273	23783	14947	134207	68.7	68.2	64.2	63.6
274	23732	15002	134229	69.1	68.6	64.2	63.3
275	23685	15068	134251	68.9	68.4	64.2	63.5
276	23601	15125	134313	69.4	68.7	64.0	63.3
277	23510	15193	134335	69.1	68.5	64.0	63.3
278	23414	15274	134357	69.2	68.6	63.7	63.2
279	23342	15343	134419	69.0	68.7	63.6	63.2
280	23233	15412	134441	69.1	68.7	63.0	63.0
281	23155	15493	134503	69.4	68.7	62.7	63.2
282	23100	15588	134526	69.4	68.5	62.6	63.0
283	23011	15689	134548	68.5	67.9	62.7	63.2
284	22963	15798	134610	68.3	67.2	62.2	62.8
285	22953	15928	134632	68.2	65.9	62.2	62.8
286	22894	16019	134655	68.0	64.7	61.6	62.5
287	22769	16086	134718	67.6	64.0	61.2	62.7
288	22687	16155	134743	67.2	63.6	61.4	62.4
289	22576	16221	134807	66.7	63.0	61.2	62.2
290	22475	16285	134831	66.2	62.5	61.3	62.5
291	22406	16348	134853	65.2	62.1	61.4	62.5
292	22317	16406	134915	64.4	62.0	61.4	62.4
293	22206	16469	134938	63.9	63.4	62.2	62.4
294	22116	16535	135000	63.4	63.3	62.0	62.4

THERMAL PLUME OF June 8, 1982

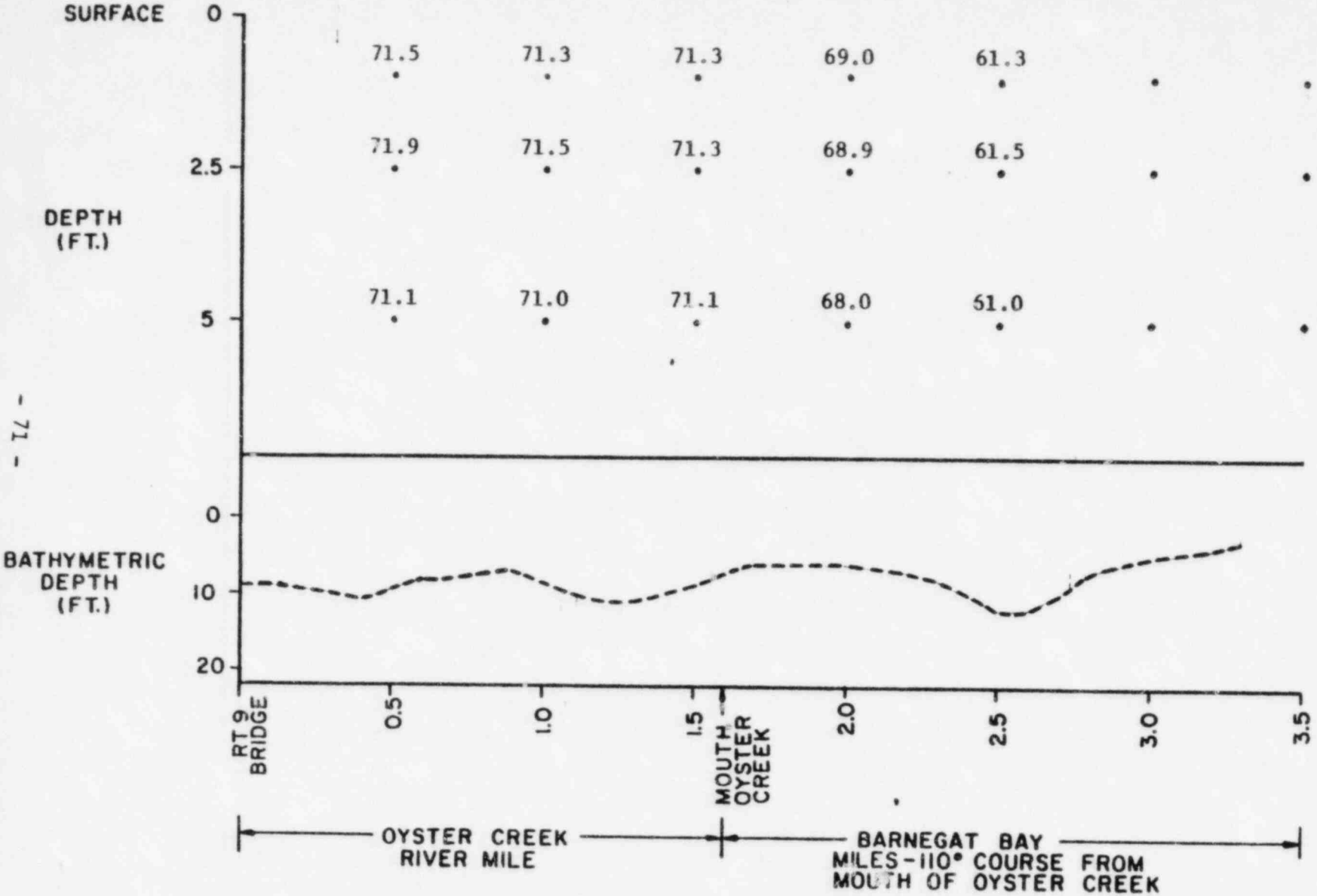
INDEX	POSITION COORDINATES		TIME HHMMSS	TEMPERATURE DEG F			
				1 FT	2 5 FT	5 FT	BOTTOM
295	22017	16601	135023	63.0	63.2	62.3	62.4
296	21935	16663	135045	62.3	62.5	62.0	62.4
297	21846	16729	135107	62.3	62.3	61.8	62.4
298	21768	16791	135129	62.2	62.5	62.1	62.6
299	21674	16865	135151	62.1	62.3	62.2	62.8
300	21590	16927	135213	62.1	61.9	62.0	62.6

TEMPERATURE MEASUREMENTS OF June 8, 1982
AT 1, 2.5, AND 5 FT. LEVELS




OYSTER CREEK THERMAL PLUME
June 8, 1982
WIND FROM N AT 4-6 MPH
AMBIENT BAY TEMP. 62.5 DEG F
CIRCULATING PUMP FLOW: 460000 GPM
DILUTION PUMP FLOW: 260000 GPM
N
BARNEGAT BAY
OYSTER CREEK CHANNEL
0 1000 YDS
SCALE
DASHED LINES REPRESENT SHALLOW AREAS (<3 FT)

LONGITUDINAL SECTIONS OF OYSTER CREEK AND BARNEGAT BAY



DATE June 8, 1982

TIME 1130-1350

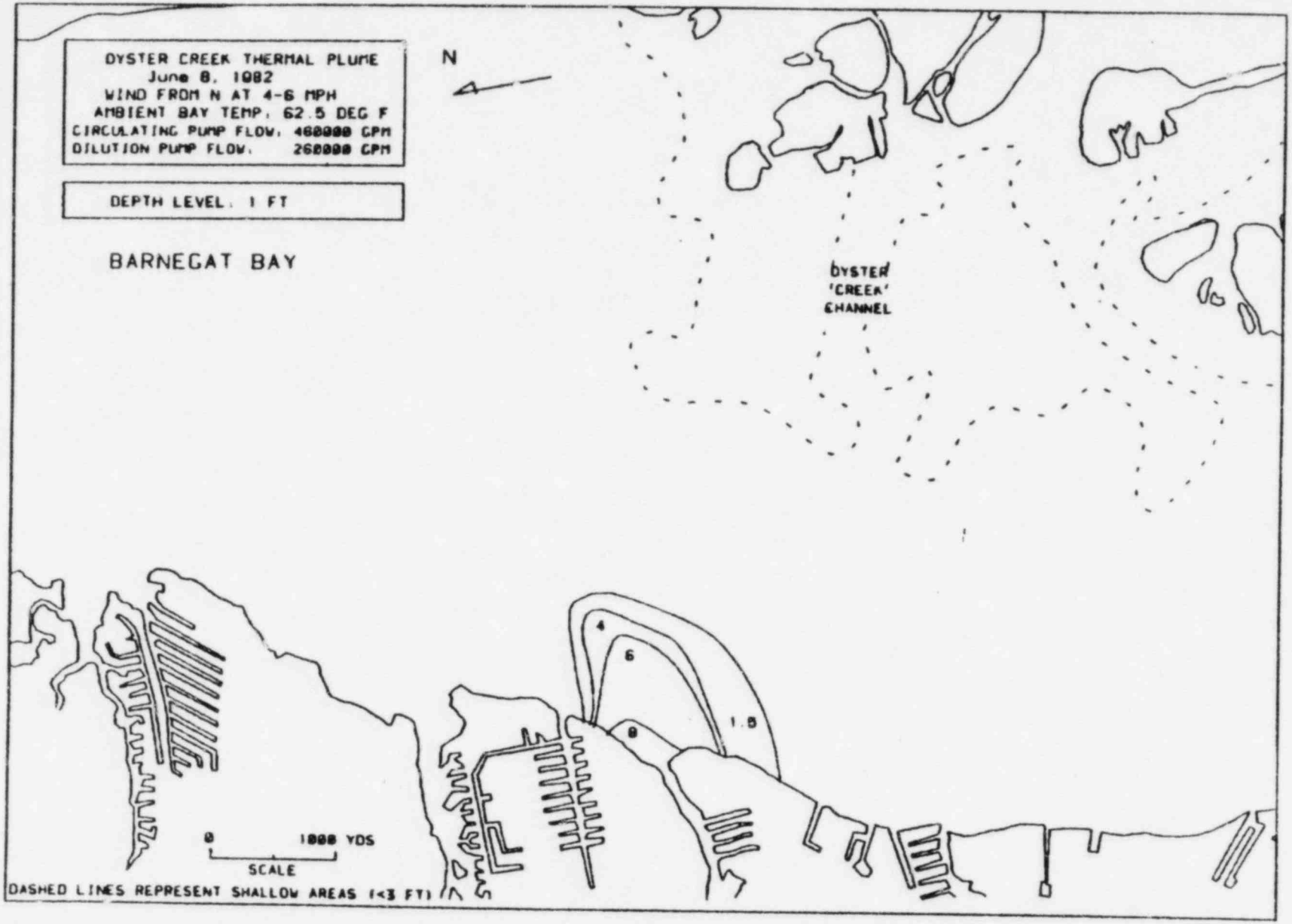
WIND N at 4-6 mph

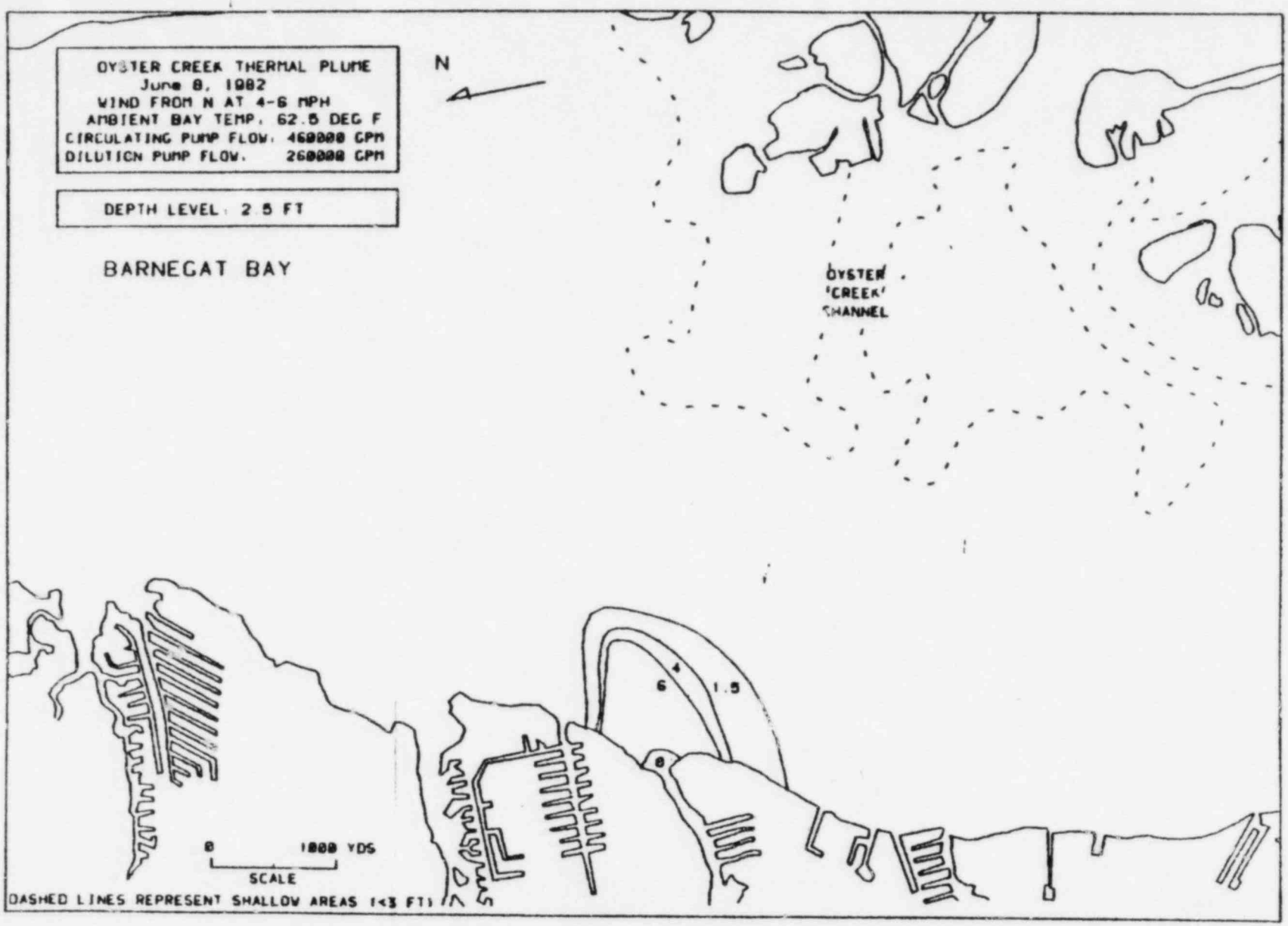
STATION PARAMETERS

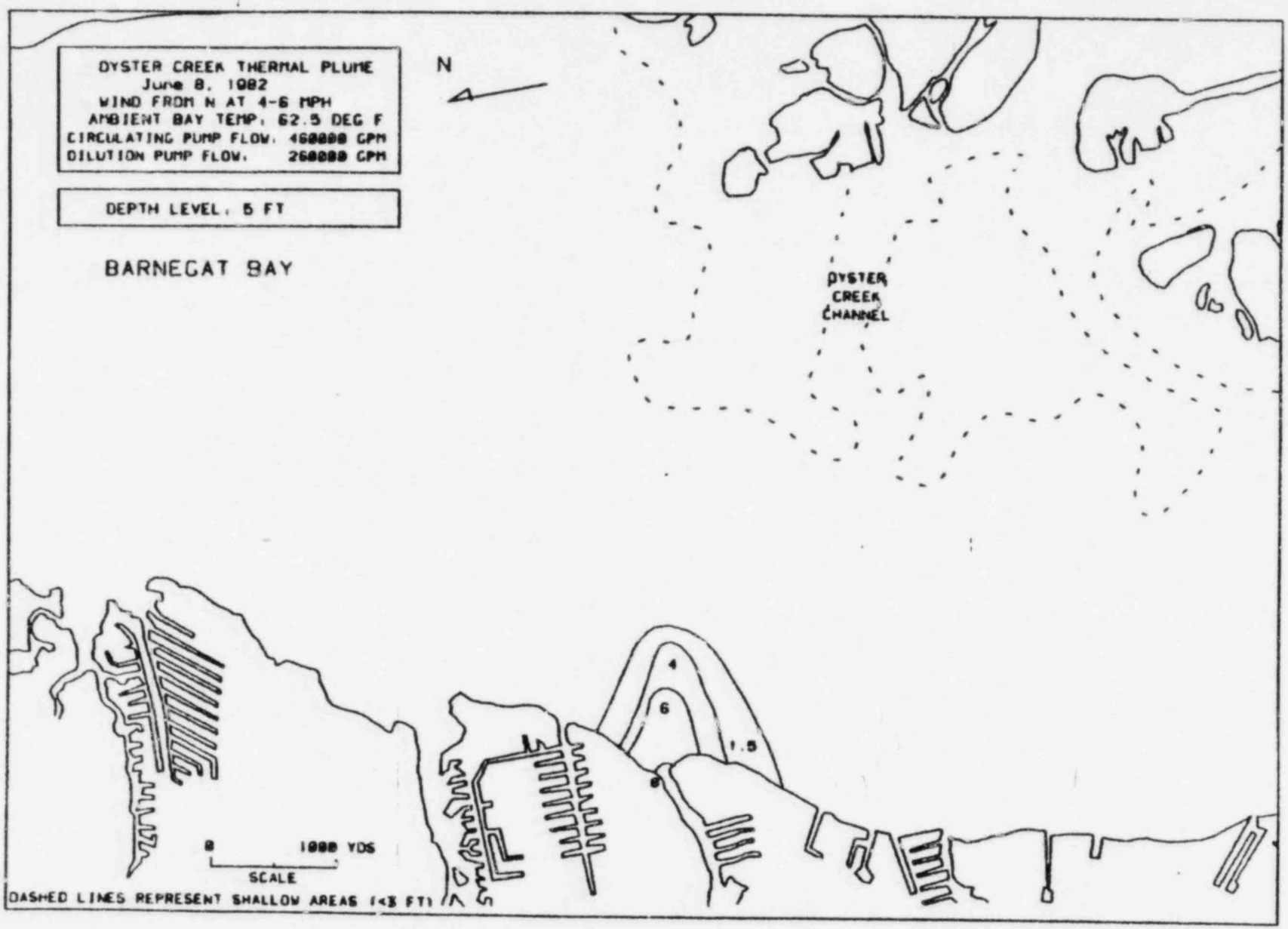
ΔT 17.2 degrees F

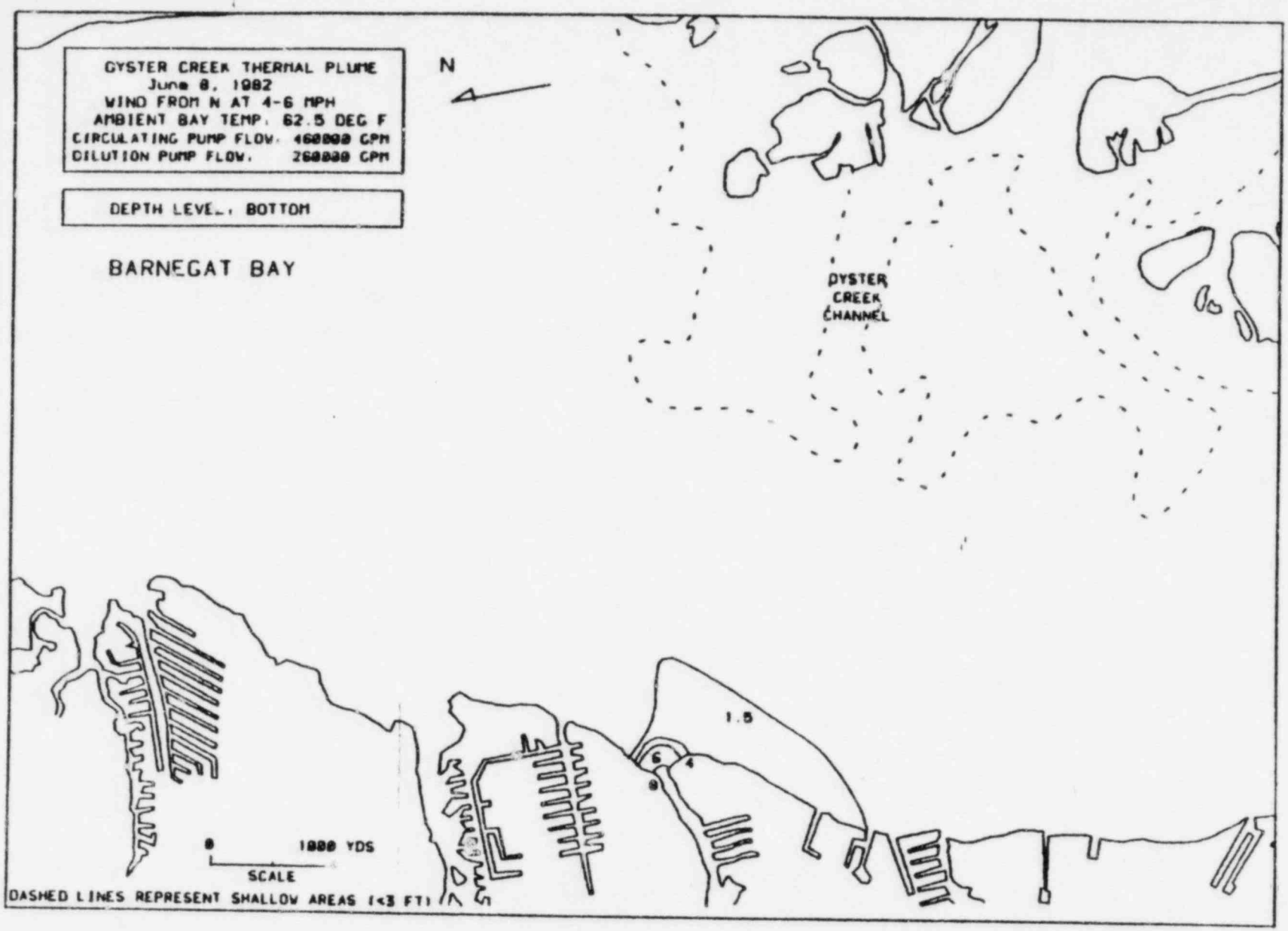
CIRC. FLOW 460,000 gpm

DIL. FLOW 260,000 gpm


OYSTER CREEK THERMAL PLUME
June 8, 1982
WIND FROM N AT 4-6 MPH
AMBIENT BAY TEMP: 62.5 DEG F
CIRCULATING PUMP FLOW: 460000 GPM
DILUTION PUMP FLOW: 260000 GPM
DEPTH LEVEL: 1 FT
N
BARNEGAT BAY
OYSTER 'CREEK' CHANNEL
4
6
8
1.8
0
1000 YDS
SCALE
DASHED LINES REPRESENT SHALLOW AREAS (<3 FT)


OYSTER CREEK THERMAL PLUME
June 8, 1982
WIND FROM N AT 4-6 MPH
AMBIENT BAY TEMP. 62.5 DEG F
CIRCULATING PUMP FLOW. 460000 GPM
DILUTION PUMP FLOW. 260000 GPM
DEPTH LEVEL: 2.5 FT
N
BARNEGAT BAY
OYSTER CREEK CHANNEL
6
4
1.5
0
1000 YDS
SCALE
DASHED LINES REPRESENT SHALLOW AREAS (<3 FT)


OYSTER CREEK THERMAL PLUME
June 8, 1982
WIND FROM N AT 4-6 MPH
AMBIENT BAY TEMP: 62.5 DEG F
CIRCULATING PUMP FLOW: 460000 GPM
DILUTION PUMP FLOW: 260000 GPM
DEPTH LEVEL: 5 FT
N
BARNEGAT BAY
OYSTER CREEK CHANNEL
4
6
1.5
0 1000 YDS
SCALE
DASHED LINES REPRESENT SHALLOW AREAS (<3 FT)


OYSTER CREEK THERMAL PLUME
June 8, 1982
WIND FROM N AT 4-6 MPH
AMBIENT BAY TEMP. 62.5 DEG F
CIRCULATING PUMP FLOW. 460000 GPM
DILUTION PUMP FLOW. 260000 GPM
DEPTH LEVEL, BOTTOM
N
BARNEGAT BAY
OYSTER CREEK CHANNEL
1.5
6
4
0 1000 YDS
SCALE
DASHED LINES REPRESENT SHALLOW AREAS (<3 FT)

THERMAL PLUME OF July 19, 1982

INDEX	POSITION COORDINATES		TIME HHMMSS	TEMPERATURE DEG F			
				1 FT	2.5 FT	5 FT	BOTTOM
1	24388	9445	120822	91.5	91.4	91.7	91.6
2	0	9573	120839	91.3	91.4	91.7	91.6
3	24322	9742	120100	91.4	91.5	91.5	91.5
4	0	9873	120117	91.5	91.6	91.6	91.5
5	0	10034	120138	91.4	91.5	91.7	91.3
6	24217	10279	120204	91.5	91.7	91.7	91.5
7	24166	10476	120230	91.3	91.8	91.6	91.5
8	0	10645	120254	91.4	91.7	91.7	91.6
9	0	10831	120321	91.3	91.4	91.6	91.7
10	0	11016	120348	91.3	91.4	91.7	91.5
11	0	11188	120415	91.3	91.3	91.5	91.5
12	23748	11371	120442	91.3	91.4	91.7	91.3
13	23675	11526	120504	91.3	91.5	91.8	91.6
14	0	11698	120529	91.2	91.5	91.7	91.5
15	23537	11896	120556	91.3	91.5	91.7	91.6
16	0	12073	120619	91.3	91.6	92.0	91.7
17	0	12294	120646	91.5	91.8	91.8	91.8
18	0	11859	120713	91.4	91.5	91.5	91.7
19	23377	12738	120740	91.5	91.5	91.0	89.9
20	23403	12980	120802	90.8	90.8	90.0	88.2
21	23427	13008	120824	90.5	89.9	89.1	85.7
22	23443	13257	120846	89.8	89.2	88.1	86.2
23	23456	13422	120908	89.5	89.2	88.6	86.7
24	23482	13592	120930	89.6	89.4	88.9	84.5
25	23512	13707	120952	89.7	89.6	88.7	82.6
26	23526	14001	121014	89.3	89.1	87.2	82.8
27	23570	14123	121036	89.2	88.5	86.7	81.8
28	23600	14294	121058	89.3	88.5	86.8	81.5
29	23648	14467	121120	89.1	88.1	87.1	81.6
30	23654	14640	121143	88.6	88.0	87.1	82.1
31	23710	14818	121205	88.6	88.0	87.0	82.7
32	23740	15003	121229	88.5	88.0	87.1	82.2
33	23750	15179	121252	88.5	88.0	87.3	82.3
34	23700	15347	121314	88.0	87.5	87.1	83.2
35	23855	15500	121336	87.7	87.8	87.4	83.7
36	14722	12528	121359	87.9	87.6	87.1	84.2
37	1247.	10730	121634	87.8	88.0	87.4	85.2
38	20452	14082	121656	87.7	87.9	87.1	83.3
39	24225	17172	121718	87.9	87.6	87.2	85.1
40	24284	17341	121741	87.7	87.8	87.5	85.5
41	24303	17504	121803	87.7	87.3	86.5	83.1
42	24407	17669	121825	86.9	86.9	86.4	85.0
43	24418	17858	121849	86.9	87.0	86.8	85.2
44	24468	18012	121911	86.9	86.9	86.6	85.3
45	24525	18176	121933	87.2	87.1	86.9	85.5
46	24569	18341	121955	87.1	87.3	86.8	85.3
47	24614	18505	122017	87.2	87.4	86.8	85.4
48	24647	18668	122039	87.2	87.3	86.9	85.6
49	24690	18836	122101	86.9	86.7	86.6	85.3

THERMAL PLUME OF July 19, 1982

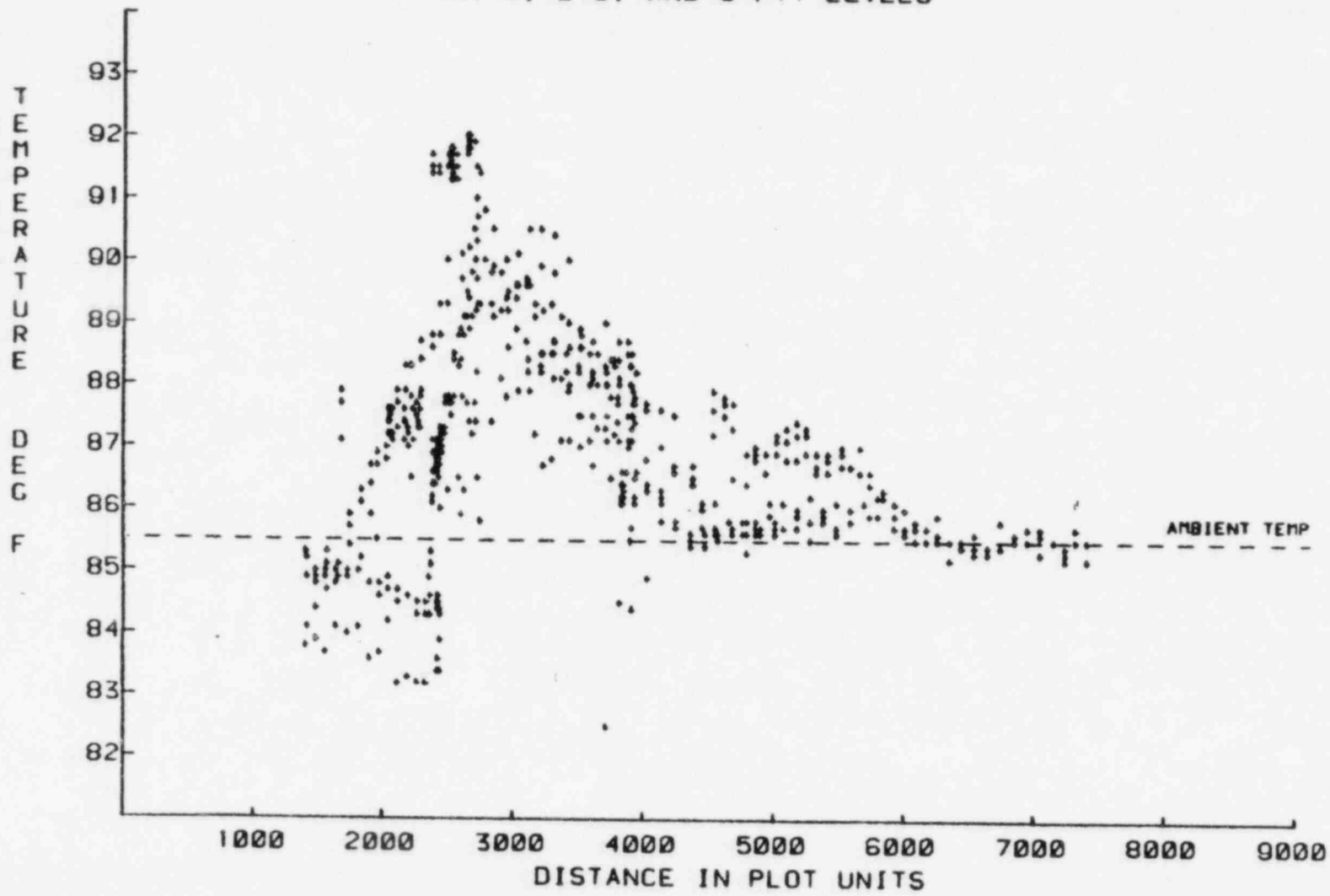
INDEX	POSITION COORDINATES		TIME HHMMSS	TEMPERATURE DEG F			
				1 FT	2.5 FT	5 FT	BOTTOM
50	24747	19812	122123	86.9	86.8	86.8	85.7
51	24856	19181	122145	86.9	87.0	86.7	85.7
52	24877	19346	122207	86.7	86.7	86.7	85.1
53	24900	19513	122229	87.0	87.0	86.6	85.1
54	24942	19677	122251	86.6	86.4	85.9	84.4
55	25039	19844	122313	86.3	86.3	86.2	84.3
56	25083	20032	122337	86.1	85.9	85.7	84.4
57	25117	20199	122400	85.7	86.0	85.6	84.3
58	25159	20373	122422	85.8	85.5	85.7	84.3
59	25219	20544	122444	85.7	85.7	85.5	84.1
60	25267	20710	122506	85.6	85.9	85.5	84.2
61	25331	20870	122528	85.5	85.5	85.2	84.1
62	25398	21057	122550	85.4	85.5	85.4	84.1
63	25462	21222	122612	85.4	85.6	85.3	84.2
64	25536	21400	122634	85.4	85.3	85.4	84.6
65	25601	21597	122656	85.4	85.8	85.1	84.7
66	25685	21780	122718	85.6	85.5	85.3	85.3
67	25761	21976	122740	85.5	85.7	85.5	84.9
68	25821	22156	122802	85.6	85.3	85.7	84.5
69	25905	22348	122824	85.5	85.5	85.5	84.1
70	25966	22506	122846	85.2	85.3	85.4	83.9
71	26020	22657	122908	85.5	85.7	85.7	84.2
72	26085	22816	122931	85.5	85.5	85.2	83.9
73	23017	13134	124430	92.0	91.8	91.9	91.9
74	22924	13249	124501	91.7	91.8	92.0	91.8
75	22848	13395	124523	92.0	92.0	92.0	91.6
76	22783	13537	124545	92.0	91.8	90.2	85.8
77	22727	13748	124607	91.9	90.5	87.7	83.3
78	22715	13904	124629	91.4	89.3	85.8	82.7
79	22594	14026	124651	90.7	89.3	86.5	82.8
80	22477	14169	124713	90.0	89.2	87.4	82.6
81	22346	14271	124735	89.8	89.1	87.2	82.6
82	22212	14401	124757	89.4	88.9	87.4	82.5
83	22093	14530	124819	89.5	89.1	87.7	82.7
84	21958	14648	124841	89.1	88.8	86.3	82.7
85	21825	14767	124903	88.9	88.4	85.9	82.9
86	21714	14866	124925	88.8	88.3	86.5	82.8
87	21559	14983	124948	88.5	88.4	87.8	83.4
88	21410	15116	125010	87.7	87.7	87.5	82.8
89	21288	15241	125032	87.7	87.7	87.8	83.0
90	21148	15355	125054	87.8	87.7	87.7	82.8
91	21039	15479	125116	87.3	87.3	87.2	82.7
92	20899	15594	125138	86.9	87.0	87.0	82.6
93	20787	15726	125200	86.9	87.1	87.2	82.7
94	20665	15861	125222	87.2	87.3	87.3	82.6
95	20547	15995	125244	87.1	87.1	86.7	82.3
96	20427	16132	125306	87.1	87.1	86.5	82.4
97	20311	16266	125328	87.0	87.0	86.8	83.0
98	20189	16398	125350	86.9	86.9	87.0	84.2

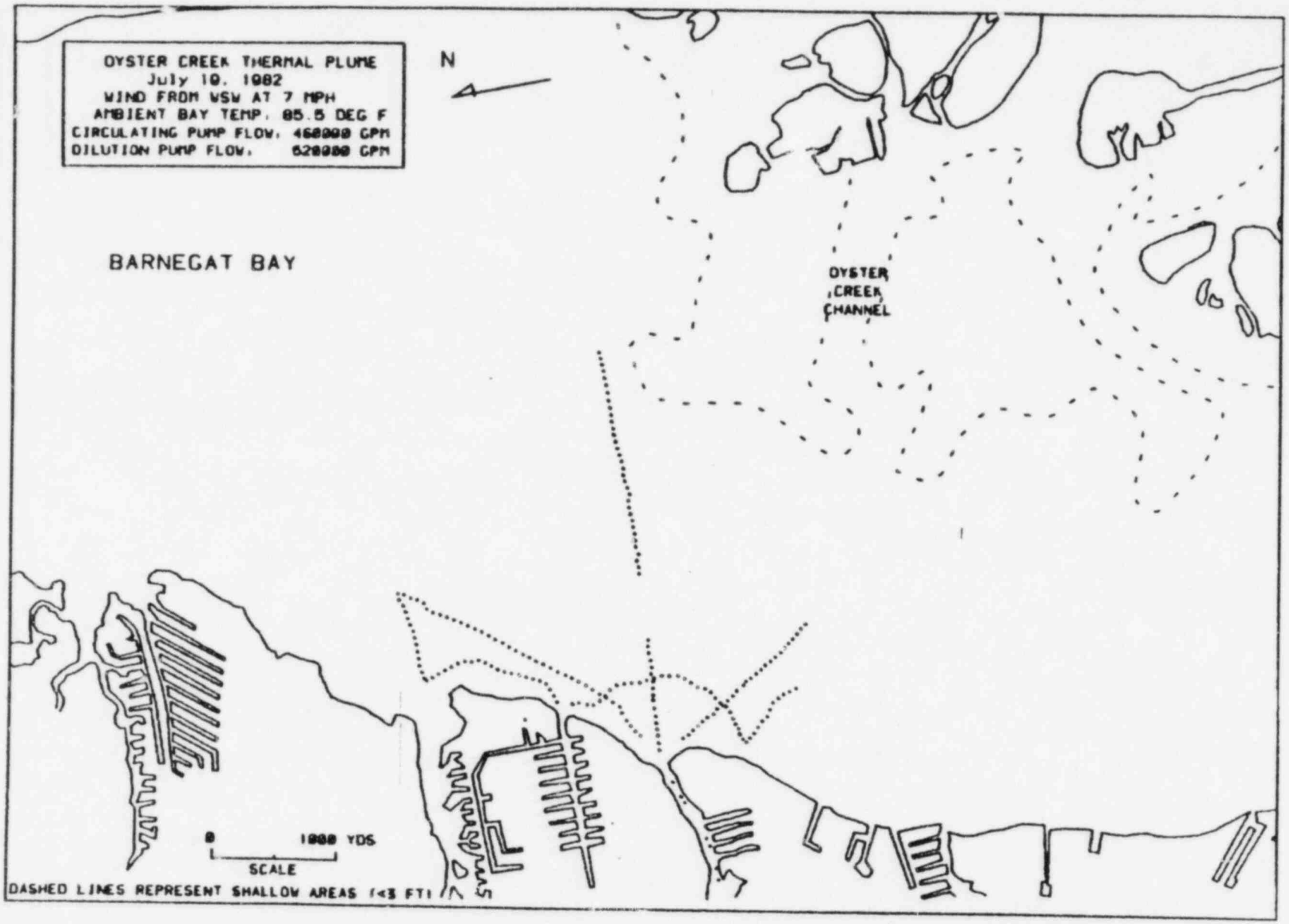
THERMAL PLUME OF July 19, 1982

INDEX	POSITION COORDINATES		TIME HHMMSS	TEMPERATURE DEG F			
				1 FT	2.5 FT	5 FT	BOTTOM
148	21809	14128	131307	88.8	88.6	87.1	84.1
149	21988	14046	131320	89.3	88.8	86.8	83.9
150	22127	14014	131352	90.0	89.3	86.3	83.8
151	22309	14088	131414	90.1	89.7	87.8	83.5
152	22459	14211	131436	90.3	89.7	88.2	83.1
153	22611	14341	131458	89.8	89.3	87.4	82.9
154	22705	14436	131520	90.0	89.4	87.8	82.6
155	22966	14454	131542	90.1	89.6	87.9	82.8
156	23147	14455	131604	90.5	89.6	87.9	82.1
157	23331	14452	131626	90.5	89.9	88.5	81.8
158	23517	14503	131648	90.4	89.8	88.7	81.5
159	23703	14548	131710	90.0	89.0	87.9	81.7
160	23886	14589	131732	88.8	88.6	87.5	81.7
161	24068	14583	131754	88.7	88.7	87.5	81.2
162	24267	14587	131816	89.0	88.3	87.3	80.9
163	24307	14516	131838	88.4	87.8	86.5	81.2
164	24510	14408	131900	88.4	88.3	87.2	81.8
165	24651	14314	131922	88.7	88.4	87.1	82.9
166	24812	14201	131944	88.7	88.5	87.5	85.3
167	24923	14188	132006	87.1	88.5	88.3	86.2
168	24987	14055	132028	85.5	88.3	88.0	85.9
169	25073	13934	132050	84.4	88.0	88.3	86.3
170	25102	13857	132112	86.6	88.2	88.2	86.0
171	25240	13722	132134	87.4	87.7	87.8	86.3
172	25286	13568	132156	87.3	87.5	85.7	86.4
173	25314	13435	132218	87.1	87.0	87.0	86.7
174	25352	13324	132240	86.6	86.6	86.6	85.6
175	25362	13102	132302	86.1	86.1	86.6	86.1
176	25409	13073	132324	86.4	86.1	86.2	84.5
177	25481	13004	132346	86.2	86.3	86.4	83.6
178	25579	13118	132408	86.1	86.2	86.5	84.6
179	25701	13259	132430	84.0	86.3	86.4	84.1
180	25824	13421	132452	85.8	86.1	86.2	84.6
181	25951	13579	132514	85.7	85.8	85.7	82.8
182	26103	13723	132536	85.6	85.5	85.4	8[illegible].4
183	26205	13888	132600	85.6	85.6	85.4	81.6
184	26318	14079	132622	85.6	85.6	85.5	81.5
185	26457	14211	132644	85.7	85.7	85.6	81.6
186	26603	14333	132706	85.8	85.6	85.3	81.3
187	26763	14432	132728	85.7	85.7	85.6	81.3
188	26929	14533	132750	85.7	85.8	85.6	81.8
189	27568	16154	133225	86.2	85.9	86.2	83.8
190	27438	16017	133247	86.1	86.1	86.1	84.3
191	27311	15878	133309	85.8	86.0	86.0	84.0
192	27175	15738	133331	85.7	85.6	86.1	84.8
193	27049	15600	133353	85.9	86.0	85.8	84.6
194	26921	15477	133416	85.5	85.8	86.2	83.9
195	26793	15350	133437	86.0	85.9	85.7	83.4
196	26651	15221	133459	85.7	85.7	86.1	83.6

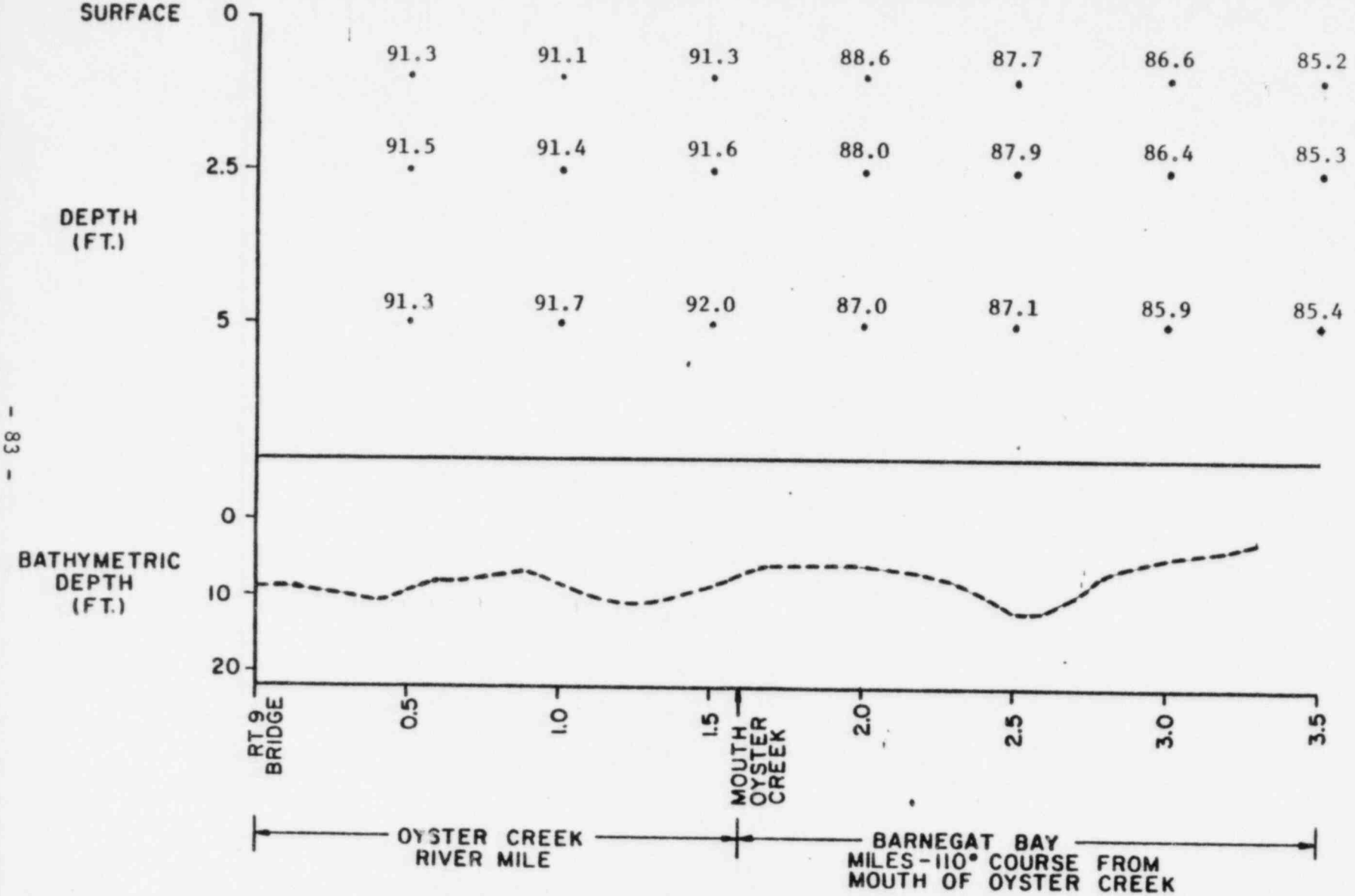
THERMAL PLUME OF July 19, 1982

INDEX	POSITION COORDINATES		TIME HHMMSS	TEMPERATURE DEG F			
				1 FT	2.5 FT	5 FT	BOTTOM
197	26514	15183	133521	85.9	86.1	85.9	83.8
198	26365	14986	133543	85.8	85.6	85.7	82.9
199	26233	14864	133605	85.6	85.8	85.8	82.5
200	26004	14739	133627	85.8	85.8	85.8	82.6
201	25950	14617	133649	85.6	85.7	86.1	82.3
202	25806	14531	133711	85.7	86.1	86.8	82.3
203	25720	14428	133733	86.7	86.5	86.4	82.6
204	25533	14272	133756	87.5	86.7	86.6	83.9
205	25410	14137	133818	87.6	87.0	86.3	85.1
206	25259	14003	133840	87.6	87.7	86.8	85.5
207	25122	13888	133902	87.5	87.9	87.7	86.0
208	24971	13794	133924	84.5	88.1	88.0	85.4
209	24852	13640	133946	62.5	88.0	88.2	86.0
210	24691	13561	134008	86.7	88.1	88.2	86.0
211	24546	13448	134030	87.5	88.2	88.3	86.4
212	24415	13330	134052	88.2	88.5	88.5	86.1
213	24285	13223	134114	88.1	88.5	88.7	86.2
214	24153	13110	134136	88.2	88.3	88.3	86.0
215	24006	13010	134158	88.4	88.4	88.2	85.6


TEMPERATURE MEASUREMENTS OF July 19, 1982
AT 1, 2.5, AND 5 FT. LEVELS
TEMPERATURE DEG F
93
92
91
90
89
88
87
86
85
84
83
82
AMBIENT TEMP
1000
2000
3000
4000
5000
6000
7000
8000
9000
DISTANCE IN PLOT UNITS


OYSTER CREEK THERMAL PLUME
July 10, 1982
WIND FROM WSW AT 7 MPH
AMBIENT BAY TEMP. 85.5 DEG F
CIRCULATING PUMP FLOW. 460000 GPM
DILUTION PUMP FLOW. 520000 GPM
N
BARNEGAT BAY
OYSTER CREEK CHANNEL
0
1000 YDS
SCALE
DASHED LINES REPRESENT SHALLOW AREAS (<3 FT)

LONGITUDINAL SECTIONS OF OYSTER CREEK AND BARNEGAT BAY



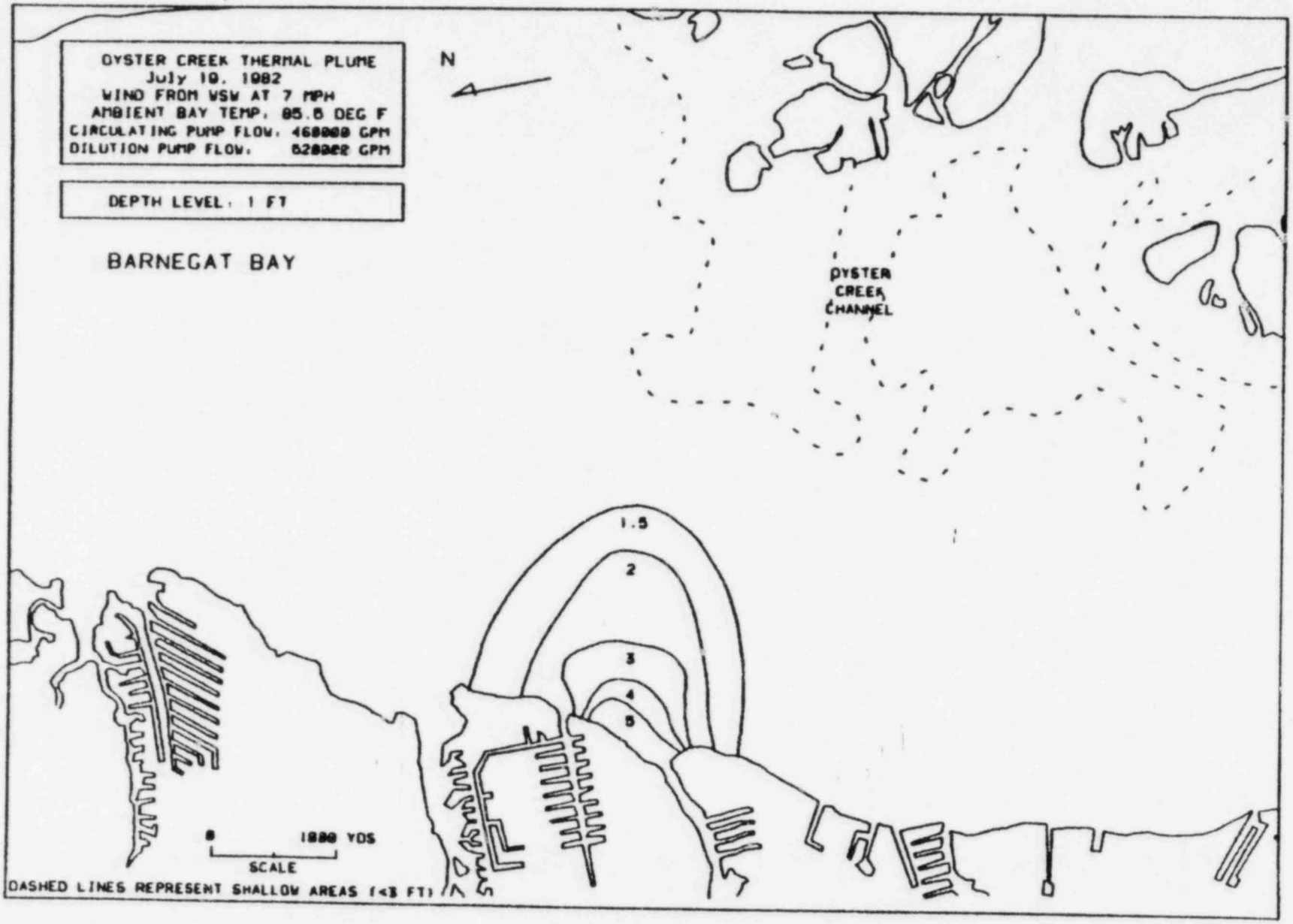
DATE July 19, 1982

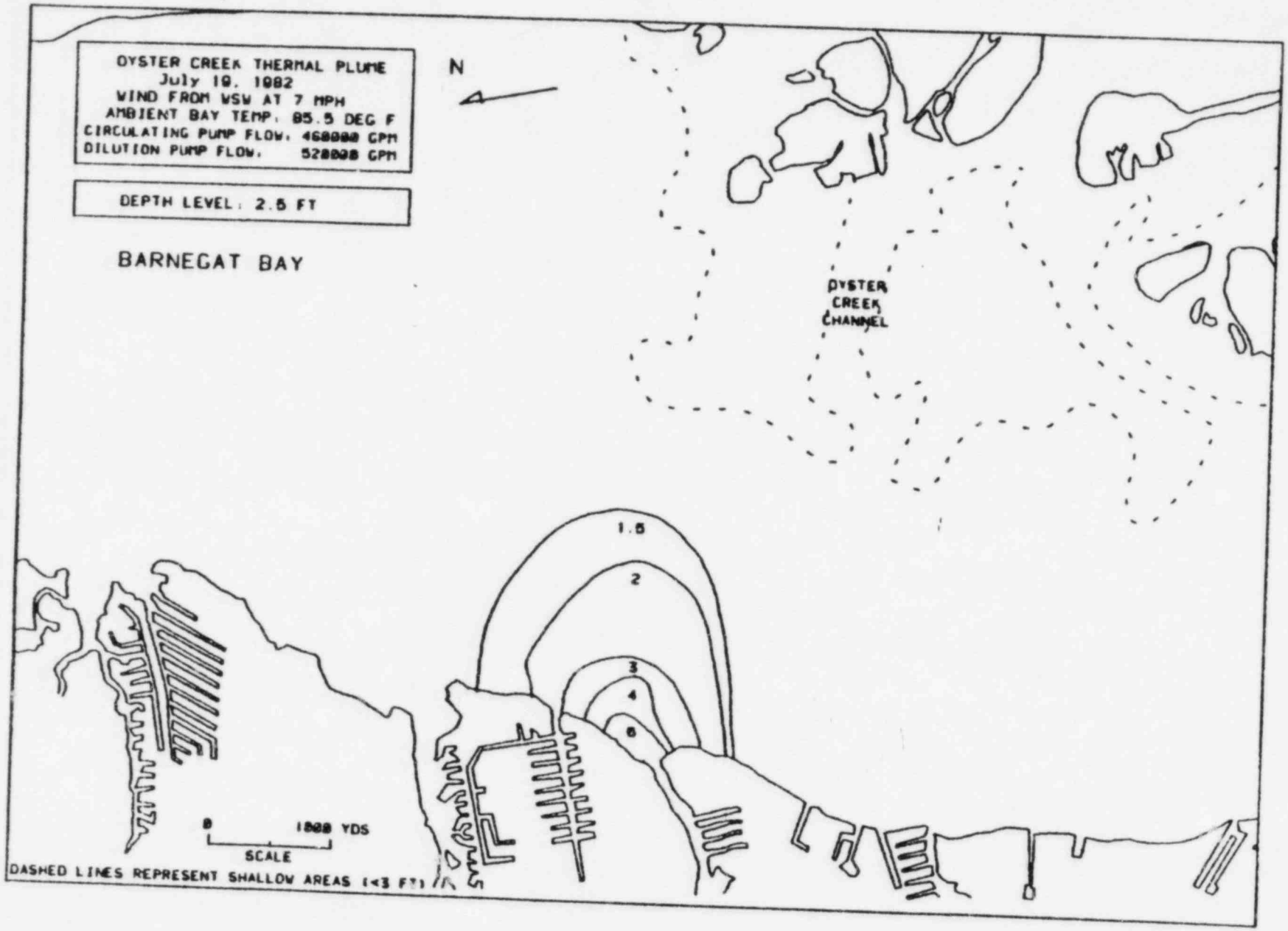
TIME 1150-1340

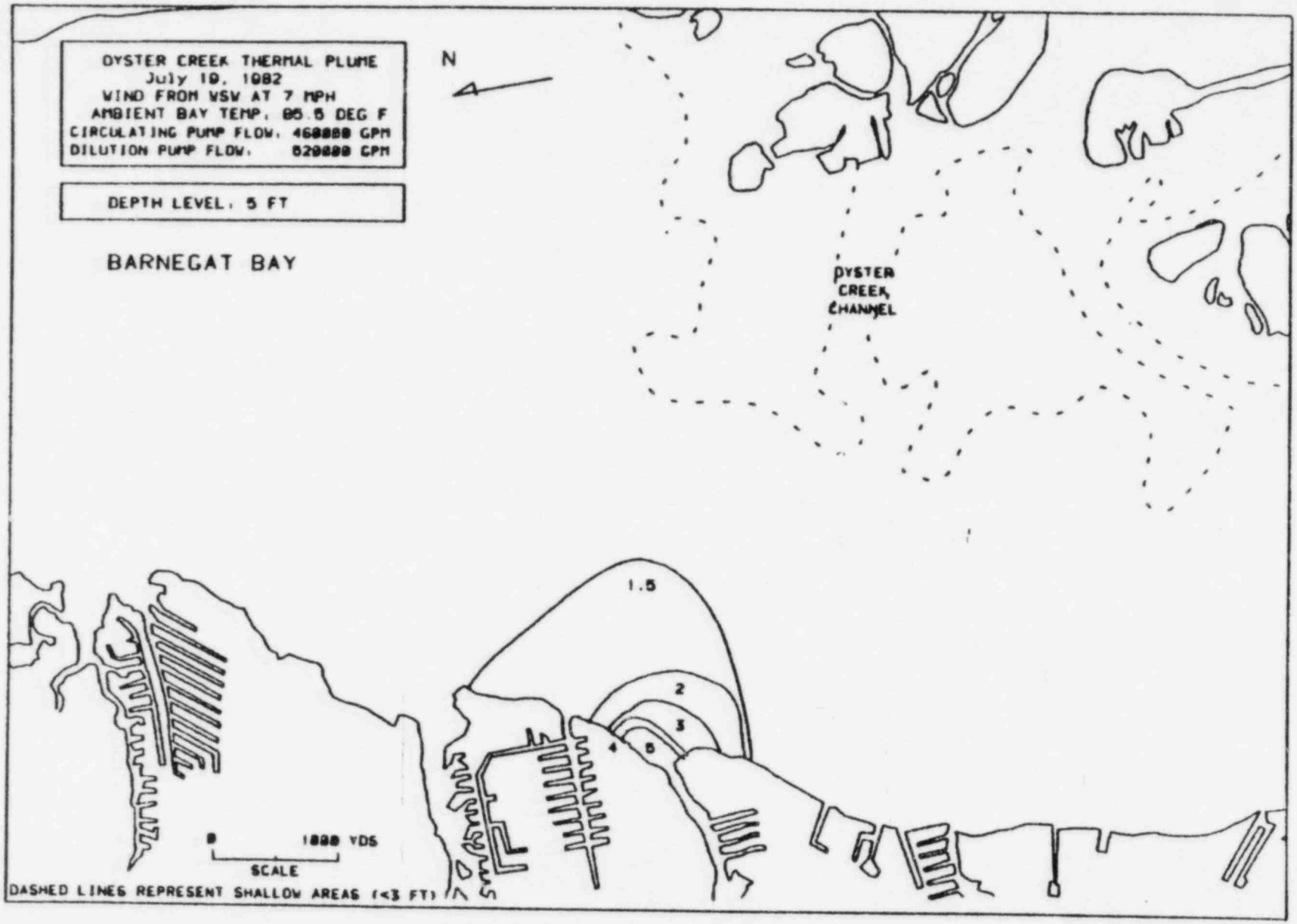
WIND WSW at 7 mph

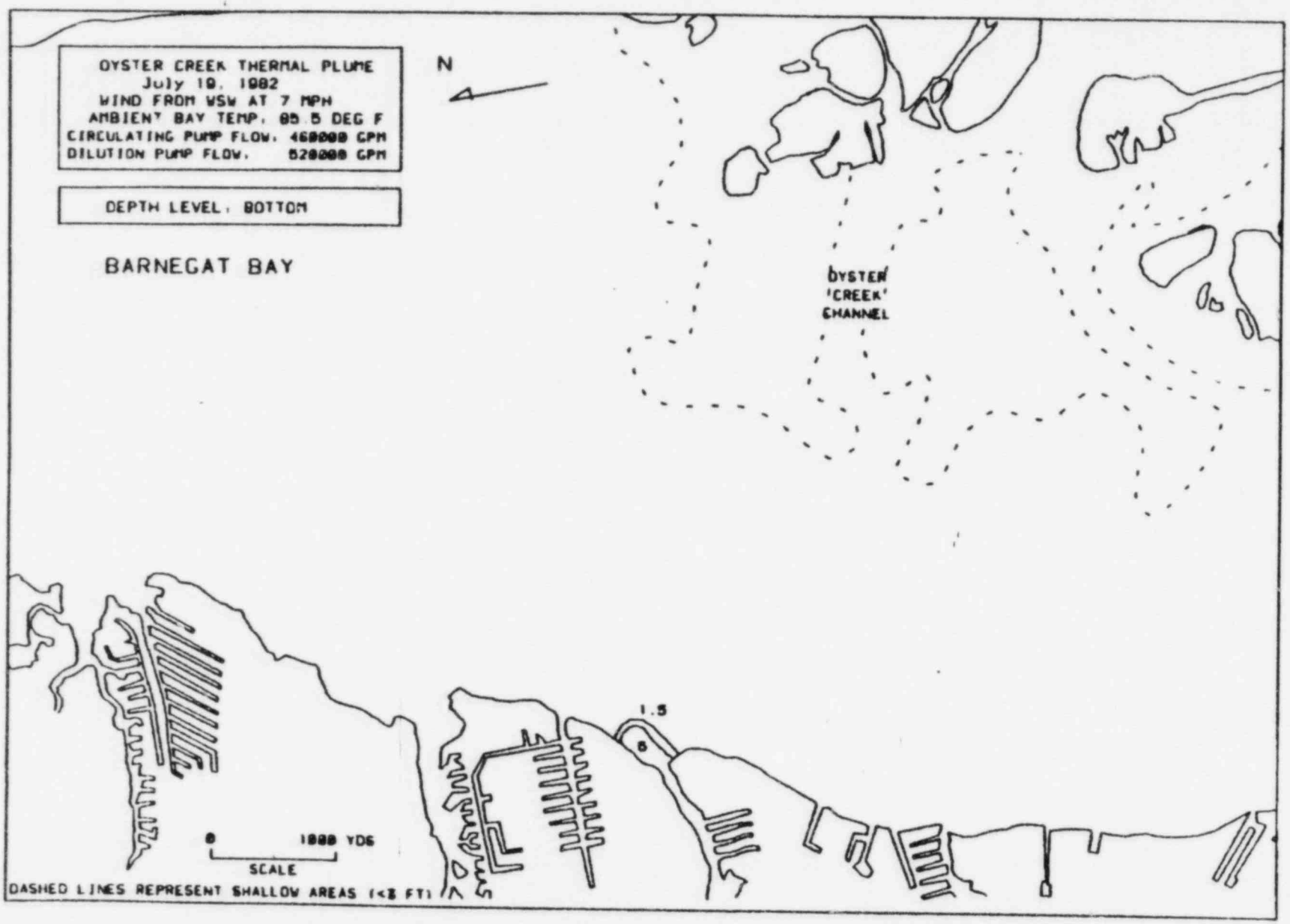
STATION PARAMETERS

ΔT	15.0 degrees F
CIRC. FLOW	460,000 gpm
DIL. FLOW	520,000 gpm


OYSTER CREEK THERMAL PLUME
July 10, 1982
WIND FROM WSW AT 7 MPH
AMBIENT BAY TEMP. 85.8 DEG F
CIRCULATING PUMP FLOW: 468000 GPM
DILUTION PUMP FLOW: 528000 GPM
DEPTH LEVEL: 1 FT
N
BARNEGAT BAY
OYSTER CREEK CHANNEL
1.5
2
3
4
5
0
1000 YDS
SCALE
DASHED LINES REPRESENT SHALLOW AREAS (<3 FT)


OYSTER CREEK THERMAL PLUME
July 19, 1982
WIND FROM WSW AT 7 MPH
AMBIENT BAY TEMP: 85.5 DEG F
CIRCULATING PUMP FLOW: 468000 GPM
DILUTION PUMP FLOW: 528000 GPM
DEPTH LEVEL: 2.5 FT
BARNEGAT BAY
N
OYSTER CREEK CHANNEL
1.5
2
3
4
6
0
1000 YDS
SCALE
DASHED LINES REPRESENT SHALLOW AREAS (<3 FT)


OYSTER CREEK THERMAL PLUME
July 10, 1982
WIND FROM WSW AT 7 MPH
AMBIENT BAY TEMP. 85.5 DEG F
CIRCULATING PUMP FLOW: 460000 GPM
DILUTION PUMP FLOW: 520000 GPM
DEPTH LEVEL: 5 FT
N
BARNEGAT BAY
OYSTER CREEK CHANNEL
1.5
2
3
4
5
0 1000 YDS
SCALE
DASHED LINES REPRESENT SHALLOW AREAS (<3 FT)


OYSTER CREEK THERMAL PLUME
July 19, 1982
WIND FROM WSW AT 7 MPH
AMBIENT BAY TEMP. 85.5 DEG F
CIRCULATING PUMP FLOW. 460000 GPM
DILUTION PUMP FLOW. 520000 GPM
DEPTH LEVEL: BOTTOM
N
BARNEGAT BAY
OYSTER CREEK CHANNEL
1.5
0 1000 YDS
SCALE
DASHED LINES REPRESENT SHALLOW AREAS (<8 FT)

THERMAL PLUME OF August 31, 1982

INDEX	POSITION COORDINATES		TIME HHMMSS	TEMPERATURE DEG F			
				1 FT	2.5 FT	5 FT	BOTTOM
1	24336	0468	124007	78.1	78.0	77.8	77.6
2	0	0665	124029	78.1	78.1	77.7	77.6
3	0	0851	124056	78.0	78.2	77.9	77.6
4	24266	10005	124123	77.9	77.7	77.8	77.7
5	24230	10166	124145	77.9	77.7	77.6	77.7
6	24198	10328	124208	78.1	78.0	77.8	77.5
7	24163	10487	124232	78.0	78.0	77.8	77.7
8	0	10663	124255	78.1	78.4	77.9	77.7
9	0	10833	124322	78.1	78.0	77.8	77.8
10	0	10992	124340	77.9	78.2	77.8	77.7
11	0	11156	124416	78.0	78.2	78.0	77.8
12	0	11325	124443	78.4	78.3	77.8	77.7
13	0	11491	124510	78.1	78.2	77.8	77.6
14	0	11665	124537	78.1	77.8	77.8	77.9
15	0	11830	124604	78.0	78.2	77.9	77.8
16	0	12011	124631	78.1	78.2	77.9	77.7
17	0	12207	124658	78.3	78.2	77.8	77.7
18	0	12410	124725	78.1	78.2	77.9	77.6
19	0	12603	124752	78.0	77.8	77.3	76.8
20	23391	12747	124819	77.7	77.7	76.5	74.0
21	23391	12908	124841	77.4	76.7	74.7	71.7
22	23391	13070	124903	77.0	76.0	73.9	70.8
23	23390	13231	124925	76.3	75.5	73.3	69.5
24	23387	13376	124947	76.0	75.4	73.2	68.7
25	23383	13522	125009	76.0	75.3	72.2	68.0
26	23383	13691	125031	75.5	74.7	72.4	67.5
27	23380	13840	125053	75.1	74.7	73.3	68.1
28	23387	13995	125115	74.9	74.6	73.5	68.7
29	23373	14154	125137	74.5	74.4	72.0	67.8
30	23370	14313	125159	74.3	74.3	71.0	67.5
31	23380	14470	125221	74.5	74.5	71.3	67.3
32	23396	14630	125243	74.6	74.5	71.6	67.3
33	23397	14784	125305	73.8	73.7	69.7	67.1
34	23437	14945	125327	73.4	73.5	69.8	67.2
35	23415	15104	125349	73.3	73.2	69.9	67.0
36	23437	15259	125411	73.2	72.7	68.4	66.9
37	23442	15407	125433	72.9	72.5	68.0	66.8
38	23493	15558	125455	72.7	72.3	67.7	66.5
39	23497	15735	125517	72.5	72.0	67.2	66.2
40	23467	15885	125544	72.4	71.9	67.4	66.4
41	23477	16028	125606	72.2	71.6	67.9	66.3
42	23492	16182	125629	71.4	70.6	67.5	66.3
43	23508	16327	125652	71.1	70.7	68.3	66.3
44	23524	16467	125714	71.0	70.6	68.9	66.4
45	23535	16610	125736	70.7	70.4	68.6	66.3
46	23544	16746	125758	70.4	70.2	68.9	66.3
47	23605	16903	125820	70.2	70.0	69.0	66.4
48	23640	17039	125842	70.0	69.7	68.8	66.4
49	23623	17181	125905	69.4	69.4	68.4	66.3

THERMAL PLUME OF August 31, 1982

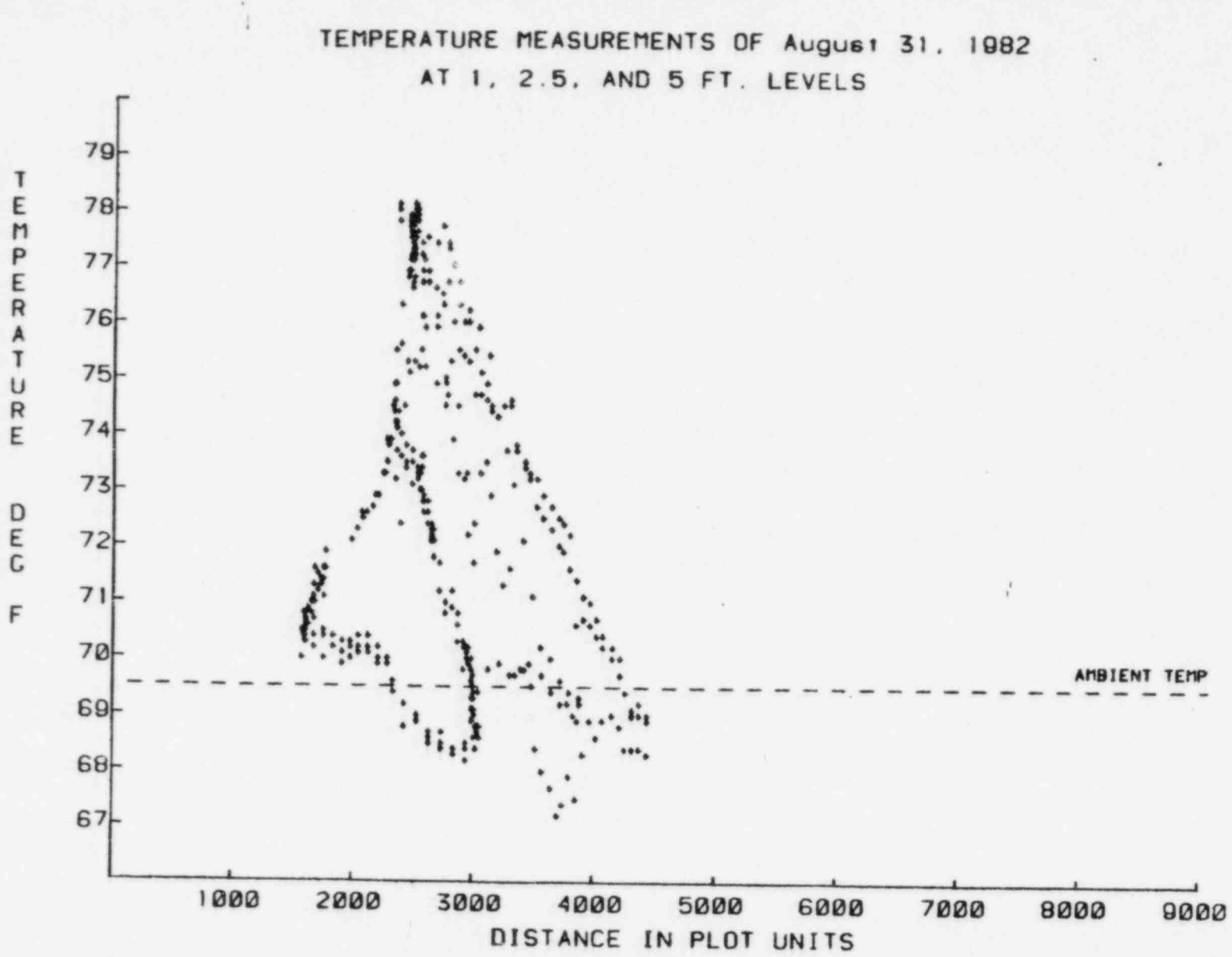
INDEX	POSITION COORDINATES		TIME HHMMSS	TEMPERATURE DEG F			
				1 FT	2.5 FT	5 FT	BOTTOM
50	23630	17327	125927	69.1	69.0	68.4	66.3
51	23650	17467	125949	69.2	69.0	68.4	66.3
52	23602	17600	130011	69.0	68.9	68.3	66.4
53	23403	12833	131312	74.9	75.0	74.5	73.2
54	23253	12836	131334	76.1	75.9	74.9	73.6
55	23100	12843	131356	76.7	76.9	76.7	76.3
56	22962	12885	131418	0.5	77.4	77.2	77.1
57	22832	12970	131440	0.5	77.9	77.6	77.5
58	22704	13071	131502	0.5	77.7	77.3	77.5
59	22641	13213	131524	76.8	77.8	77.5	77.3
60	22574	13278	131546	76.6	77.5	77.4	76.4
61	22501	13342	131608	77.6	77.5	77.2	76.7
62	22475	13401	131630	77.2	77.5	77.3	76.9
63	22365	13617	131652	77.1	77.3	76.7	71.5
64	22256	13717	131714	76.9	77.1	75.1	69.3
65	22161	13818	131736	76.8	76.9	75.3	69.9
66	22005	13883	131758	76.3	75.6	72.4	68.5
67	21881	13944	131820	75.5	74.9	73.2	70.8
68	21801	14040	131842	74.9	74.9	74.2	72.2
69	21704	14172	131904	74.6	74.9	74.4	72.9
70	21633	14320	131928	74.1	74.2	73.7	72.2
71	21607	14475	131950	74.8	74.8	73.6	72.1
72	21583	14633	132012	73.5	73.8	73.4	71.9
73	21580	14797	132034	73.5	73.7	73.1	72.0
74	21558	14950	132056	73.3	73.4	73.2	72.1
75	21490	15105	132119	73.0	73.3	73.0	71.7
76	21410	15243	132141	73.4	73.6	73.0	72.0
77	21350	15365	132203	73.6	73.6	72.8	71.8
78	21260	15494	132225	72.8	72.9	72.6	71.6
79	21222	15661	132248	72.6	72.8	72.4	71.2
80	21166	15814	132312	72.2	72.3	72.1	71.3
81	21070	15941	132334	72.3	72.4	72.1	71.1
82	21014	16075	132356	72.1	72.3	71.8	70.9
83	20902	16220	132418	71.7	71.7	71.2	70.6
84	20875	16394	132440	71.0	71.0	70.8	70.3
85	20866	16561	132502	70.9	71.2	70.9	70.3
86	20936	16726	132524	70.6	70.8	70.3	69.6
87	20910	16887	132546	70.2	70.3	69.8	69.4
88	20840	17044	132608	70.1	70.2	70.0	69.6
89	20759	17189	132630	70.2	70.2	69.9	69.1
90	20687	17338	132652	69.8	70.0	69.6	68.6
91	20595	17474	132714	69.5	69.7	69.3	68.5
92	20480	17605	132736	69.3	69.5	69.3	68.1
93	20389	17730	132758	69.4	69.5	69.3	68.0
94	20267	17834	132820	69.1	69.3	68.9	67.9
95	20188	17967	132842	69.0	69.1	68.6	68.3
96	20120	18108	132904	68.7	68.8	68.7	68.5
97	20035	18247	132926	0.5	68.8	68.6	68.4
98	19905	18328	132948	68.4	68.8	68.4	68.0

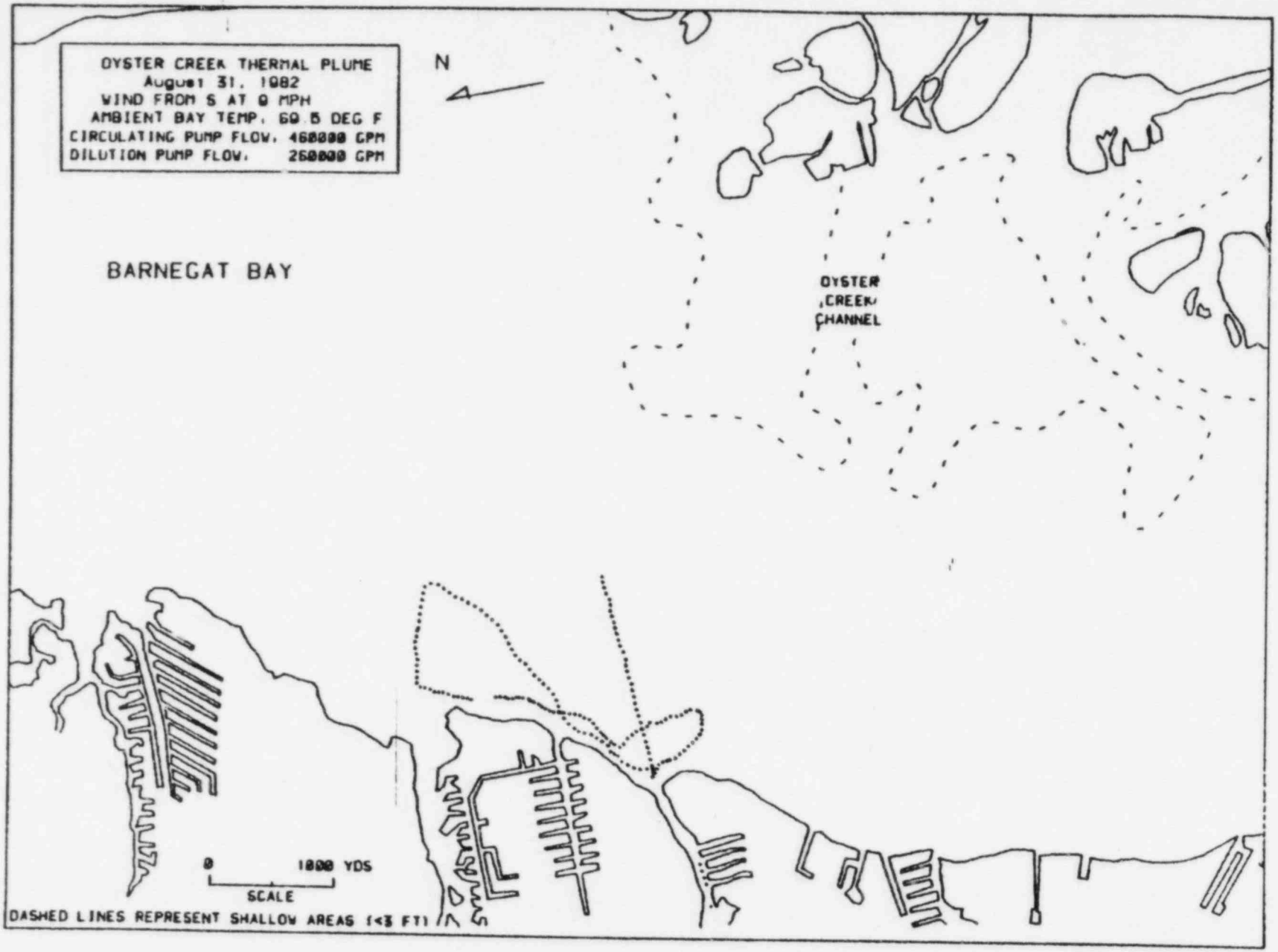
THERMAL PLUME OF August 31, 1982

INDEX	POSITION COORDINATES		TIME HHMMSS	TEMPERATURE DEG F			
				1 FT	2.5 FT	5 FT	BOTTOM
00	19724	18298	133010	68.4	68.5	68.2	67.9
100	19613	18163	133032	68.3	68.4	68.3	68.0
101	19506	18019	133054	68.4	68.7	68.5	68.2
102	19404	17865	133116	68.6	68.7	68.5	68.5
103	19305	17713	133138	68.9	68.9	69.0	68.9
104	19206	17557	133200	68.8	69.2	69.2	69.0
105	19120	17418	133222	69.4	69.6	69.4	69.4
106	19062	17350	133244	70.0	70.0	69.9	69.4
107	18992	17241	133306	69.9	70.2	70.0	69.3
108	18903	17128	133328	70.1	70.4	70.2	69.3
109	18843	16989	133350	70.1	70.4	70.2	69.6
110	18817	16850	133412	70.0	70.3	70.2	69.6
111	18781	16711	133434	69.9	70.3	70.1	69.6
112	18714	16588	133456	70.2	70.4	70.4	69.9
113	18658	16449	133518	70.0	70.5	70.4	70.1
114	18594	16312	133540	70.2	70.7	70.4	70.0
115	18541	16181	133602	70.3	70.5	70.4	70.1
116	18582	16067	133624	70.0	70.5	70.5	70.2
117	18684	16000	133646	70.5	70.8	70.4	70.4
118	18783	15917	133708	70.6	70.5	70.6	70.5
119	18868	15823	133730	70.3	70.8	70.7	70.2
120	18953	15770	133752	70.6	70.9	70.6	70.5
121	19049	15731	133814	70.8	71.0	70.8	71.0
122	19150	15644	133836	71.0	71.3	71.1	69.8
123	19253	15566	133858	71.3	71.6	71.0	70.3
124	19353	15511	133920	71.5	71.5	71.2	71.1
125	19456	15446	133942	71.3	71.4	71.3	71.2
126	19557	15385	134004	71.1	71.6	71.4	71.3
127	19633	15338	134026	71.6	71.9	71.6	71.6
128	20200	15206	135848	72.1	0.0	0.0	0.0
129	20314	15103	135910	72.3	0.0	0.0	0.0
130	20432	15141	135932	72.6	0.0	0.0	0.0
131	20406	15086	135954	72.5	0.0	0.0	0.0
132	20585	15068	140016	72.6	0.0	0.0	0.0
133	20683	15070	140038	72.7	0.0	0.0	0.0
134	20747	15040	140100	72.9	0.0	0.0	0.0
135	20831	15000	140122	72.9	0.0	0.0	0.0
136	20952	14956	140144	73.3	0.0	0.0	0.0
137	20988	14985	140208	73.3	0.0	0.0	0.0
138	21058	14853	140230	73.3	0.0	0.0	0.0
139	21144	14785	140252	73.5	0.0	0.0	0.0
140	21196	14706	140314	73.9	0.0	0.0	0.0
141	21271	14641	140336	73.8	0.0	0.0	0.0
142	21352	14581	140358	73.9	0.0	0.0	0.0
143	21430	14528	140420	74.6	0.0	0.0	0.0
144	21550	14493	140442	74.4	0.0	0.0	0.0
145	21673	14454	140504	74.5	0.0	0.0	0.0
146	21780	14414	140526	75.1	0.0	0.0	0.0
147	21906	14378	140548	75.3	0.0	0.0	0.0

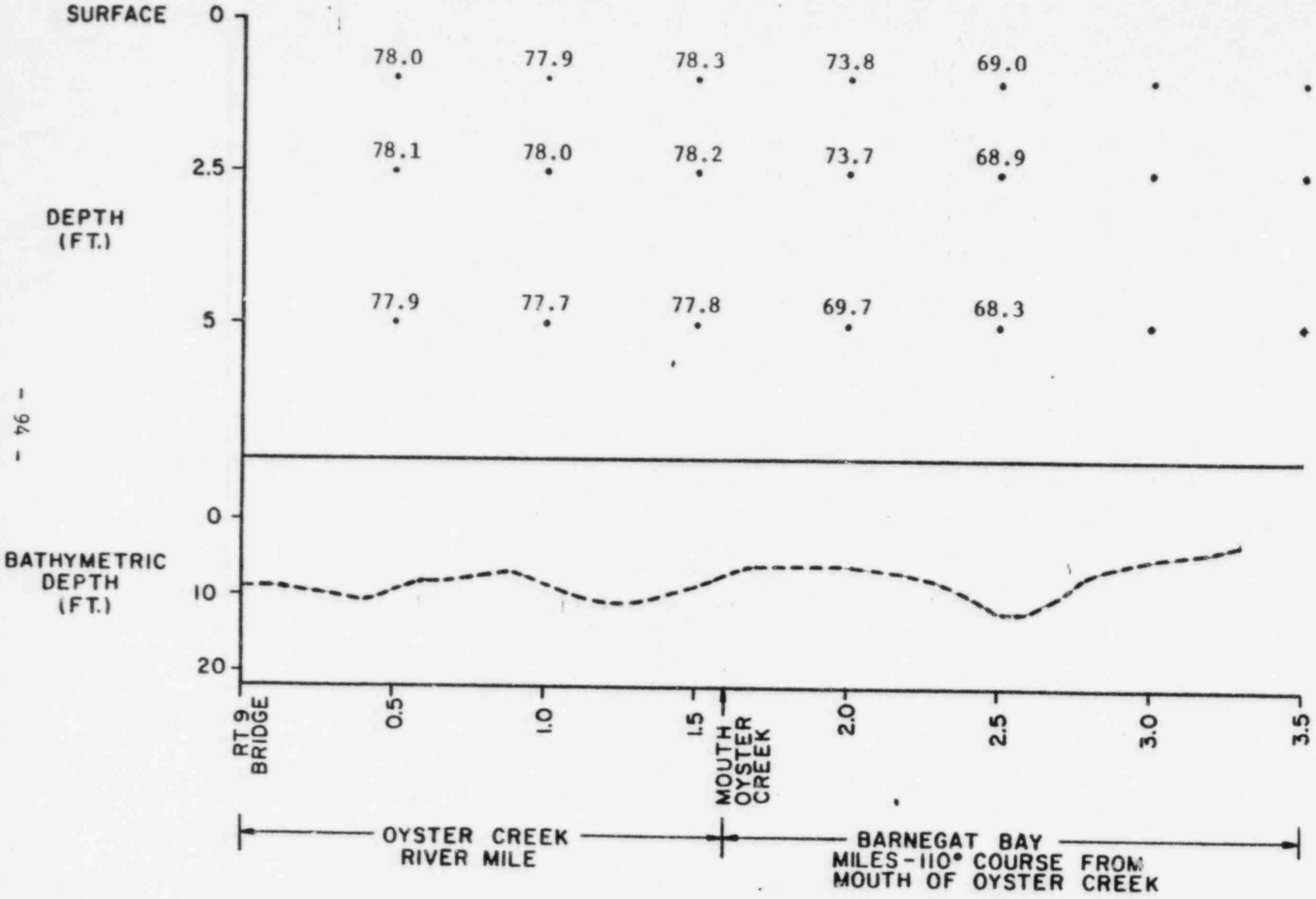
THERMAL PLUME OF August 31, 1982

INDEX	POSITION COORDINATES		TIME HHMMSS	TEMPERATURE DEG F			
				1 FT	2.5 FT	5 FT	BOTTOM
148	22014	14326	140610	75.2	0.0	0.0	0.0
149	22098	14246	140632	75.5	0.0	0.0	0.0
150	22206	14101	140654	75.2	0.0	0.0	0.0
151	22278	14005	140716	75.9	0.0	0.0	0.0
152	22321	13953	140738	76.1	0.0	0.0	0.0
153	22379	13844	140800	76.1	0.0	0.0	0.0
154	22430	13756	140822	76.7	0.0	0.0	0.0
155	22488	13670	140844	76.9	0.0	0.0	0.0
156	22558	13578	140906	76.7	0.0	0.0	0.0
157	22632	13497	140928	77.1	0.0	0.0	0.0
158	22730	13421	140950	77.5	0.0	0.0	0.0
159	22852	13406	141012	77.4	0.0	0.0	0.0
160	22972	13620	141034	77.3	0.0	0.0	0.0
161	23101	13705	141056	76.7	0.0	0.0	0.0
162	23219	13776	141118	76.2	0.0	0.0	0.0
163	23359	13823	141140	75.9	0.0	0.0	0.0
164	23501	13891	141202	75.4	0.0	0.0	0.0
165	23594	13988	141224	74.3	0.0	0.0	0.0
166	23755	13952	141246	73.7	0.0	0.0	0.0
167	23867	13985	141308	73.1	0.0	0.0	0.0
168	23988	14052	141330	72.1	0.0	0.0	0.0
169	24110	14113	141352	71.1	0.0	0.0	0.0
170	24252	14115	141414	70.2	0.0	0.0	0.0
171	24390	14161	141436	70.0	0.0	0.0	0.0
172	24511	14236	141458	69.6	0.0	0.0	0.0
173	24627	14274	141520	69.4	0.0	0.0	0.0
174	24776	14266	141542	68.9	0.0	0.0	0.0
175	24828	14241	141604	69.2	0.0	0.0	0.0
176	24870	14167	141626	69.3	0.0	0.0	0.0
177	24840	14059	141648	69.0	0.0	0.0	0.0
178	24807	13936	141710	69.2	0.0	0.0	0.0
179	24775	13803	141732	69.2	0.0	0.0	0.0
180	24694	13686	141754	69.4	0.0	0.0	0.0
181	24594	13583	141816	69.7	0.0	0.0	0.0
182	24483	13484	141838	69.5	0.0	0.0	0.0
183	24362	13379	141900	69.8	0.0	0.0	0.0
184	24241	13278	141922	69.7	0.0	0.0	0.0
185	24120	13184	141944	69.9	0.0	0.0	0.0
186	23986	13083	142006	69.8	0.0	0.0	0.0
187	23847	13038	142028	69.4	0.0	0.0	0.0
188	23782	13020	142050	71.7	0.0	0.0	0.0
189	23669	12986	142112	73.3	0.0	0.0	0.0
190	23558	12924	142134	74.5	0.0	0.0	0.0
191	23483	12837	142156	75.3	0.0	0.0	0.0
192	23413	12732	142218	76.3	0.0	0.0	0.0
193	23350	12629	142240	76.6	0.0	0.0	0.0
194	0	12549	142305	77.0	0.0	0.0	0.0
195	0	12525	142332	77.6	0.0	0.0	0.0
196	0	12484	142350	77.5	0.0	0.0	0.0


TEMPERATURE MEASUREMENTS OF August 31, 1982
AT 1, 2.5, AND 5 FT. LEVELS
TEMPERATURE DEG F
79
78
77
76
75
74
73
72
71
70
69
68
67
AMBIENT TEMP
1000
2000
3000
4000
5000
6000
7000
8000
9000
DISTANCE IN PLOT UNITS


OYSTER CREEK THERMAL PLUME
August 31, 1982
WIND FROM S AT 0 MPH
AMBIENT BAY TEMP. 69.5 DEG F
CIRCULATING PUMP FLOW. 460000 GPM
DILUTION PUMP FLOW. 260000 GPM
N
BARNEGAT BAY
OYSTER CREEK CHANNEL
0 1000 YDS
SCALE
DASHED LINES REPRESENT SHALLOW AREAS (<3 FT)

LONGITUDINAL SECTIONS OF OYSTER CREEK AND BARNEGAT BAY



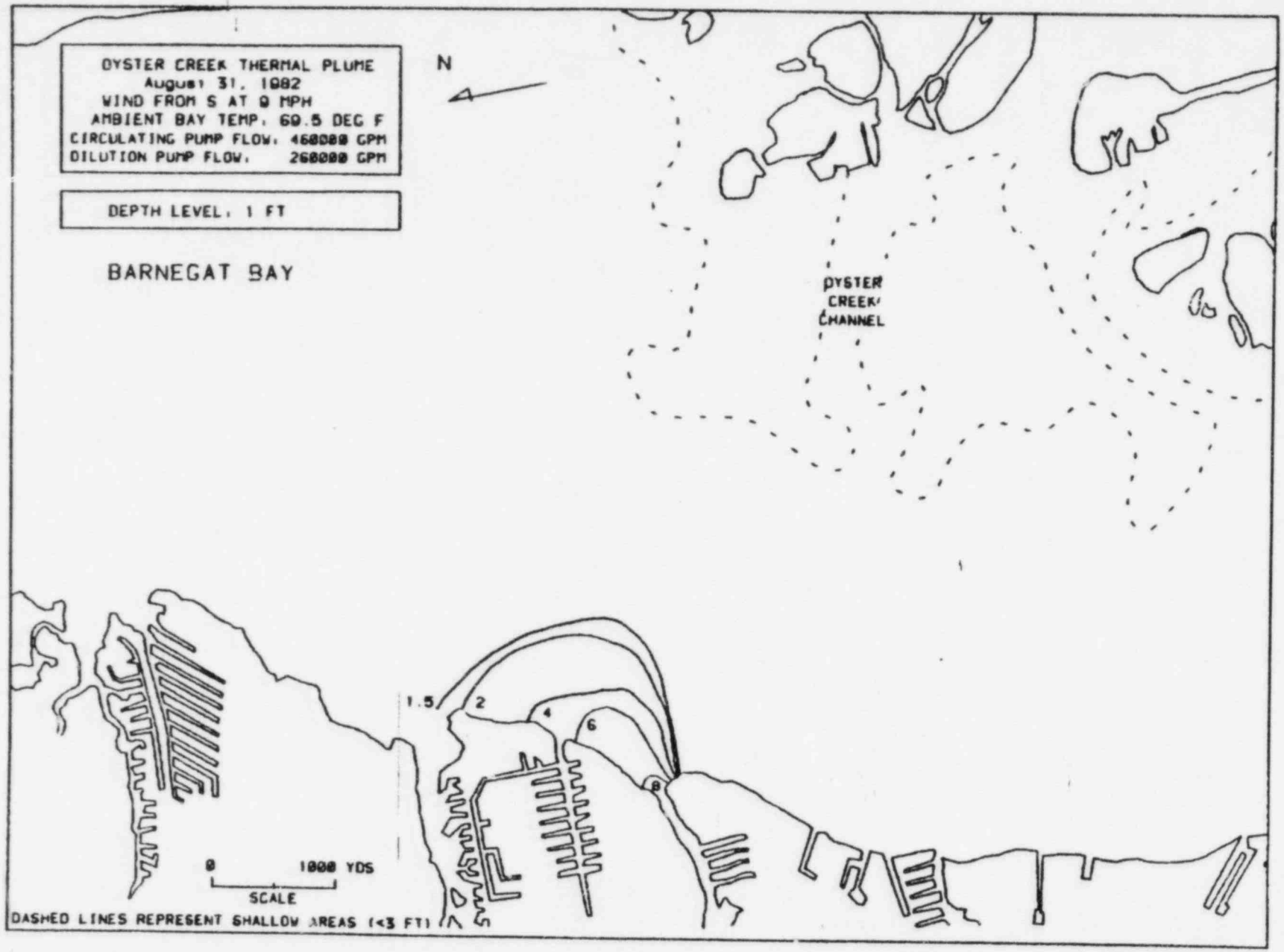
DATE August 31, 1982

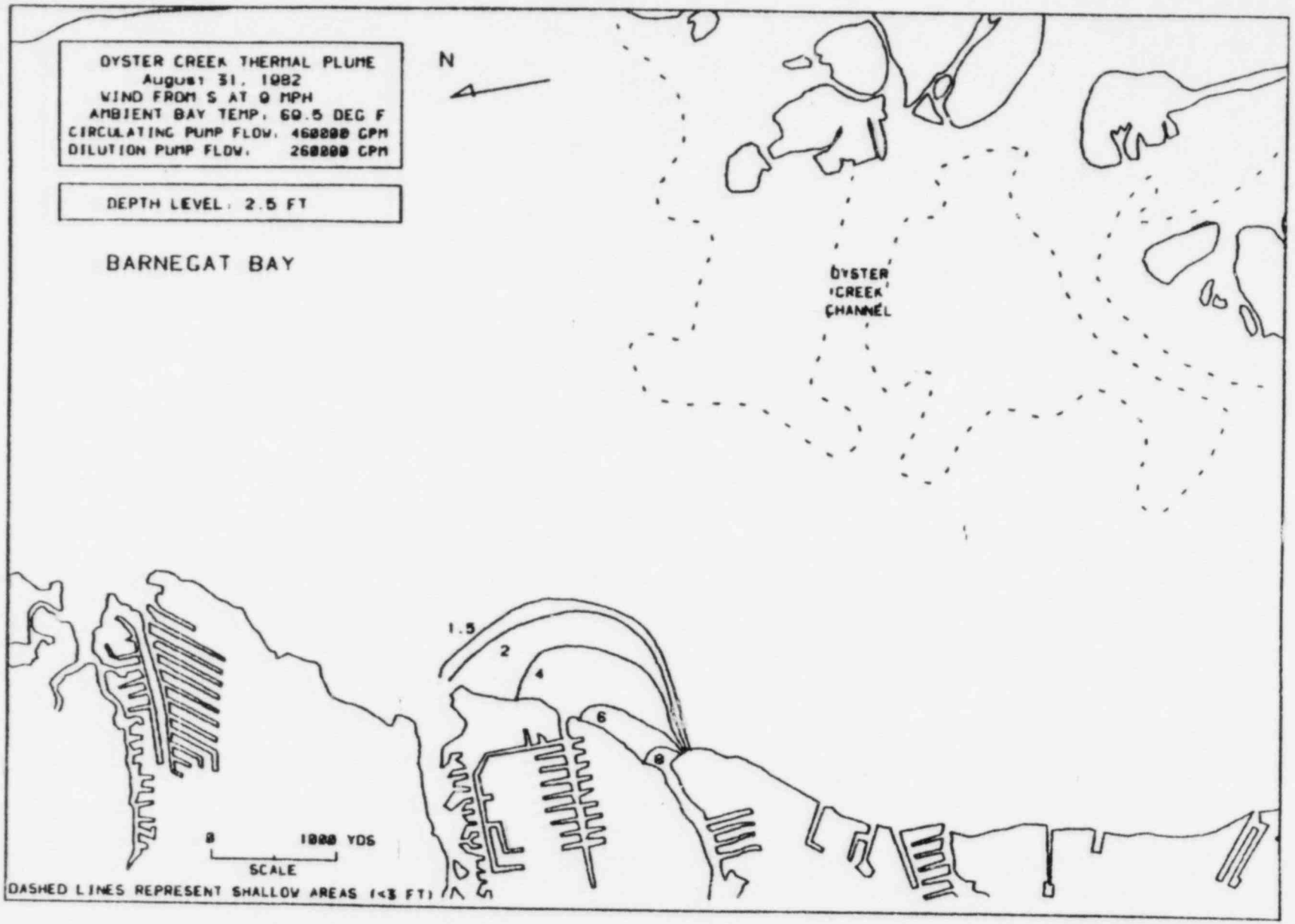
TIME 1230-1420

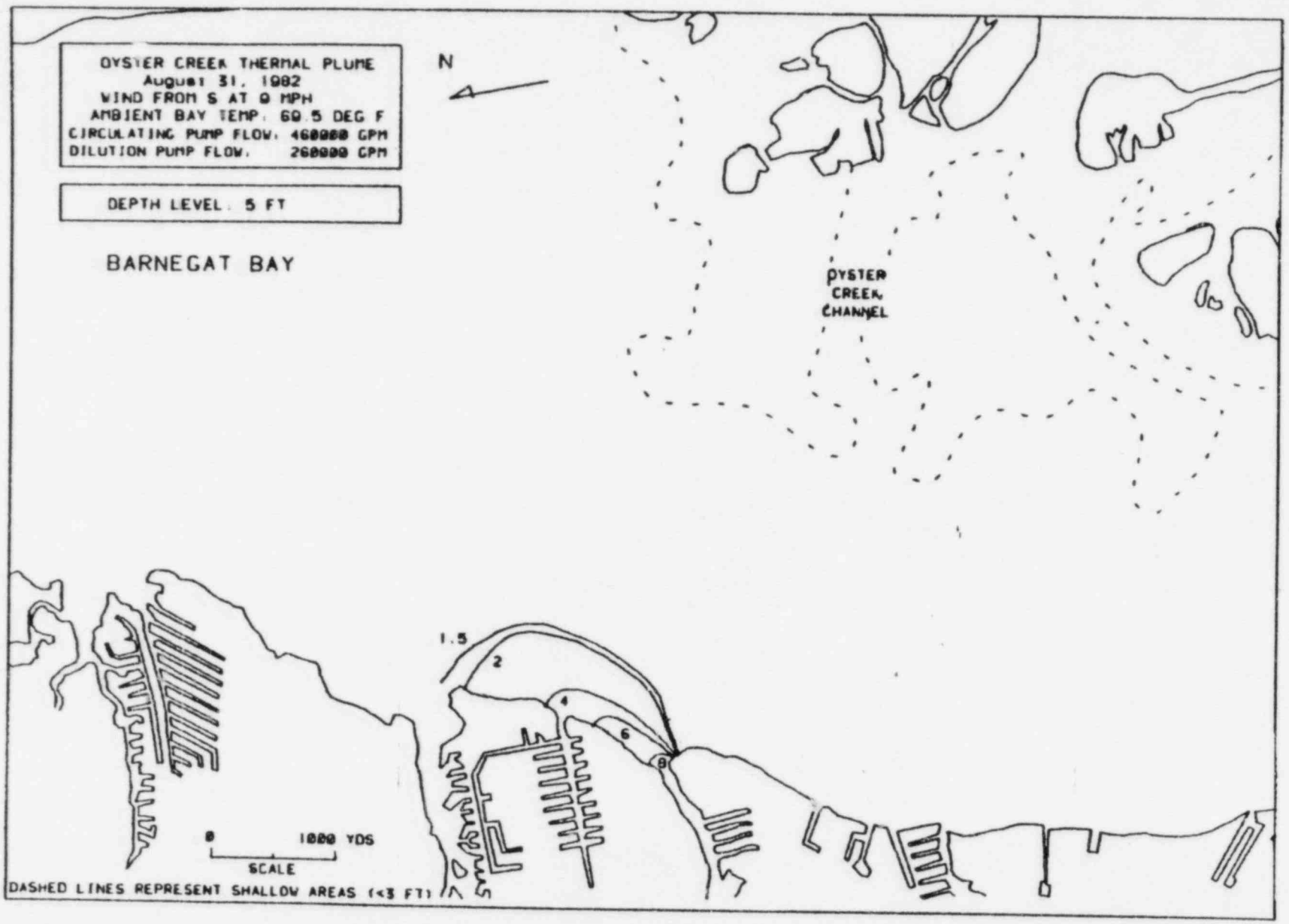
WIND S at 9 mph

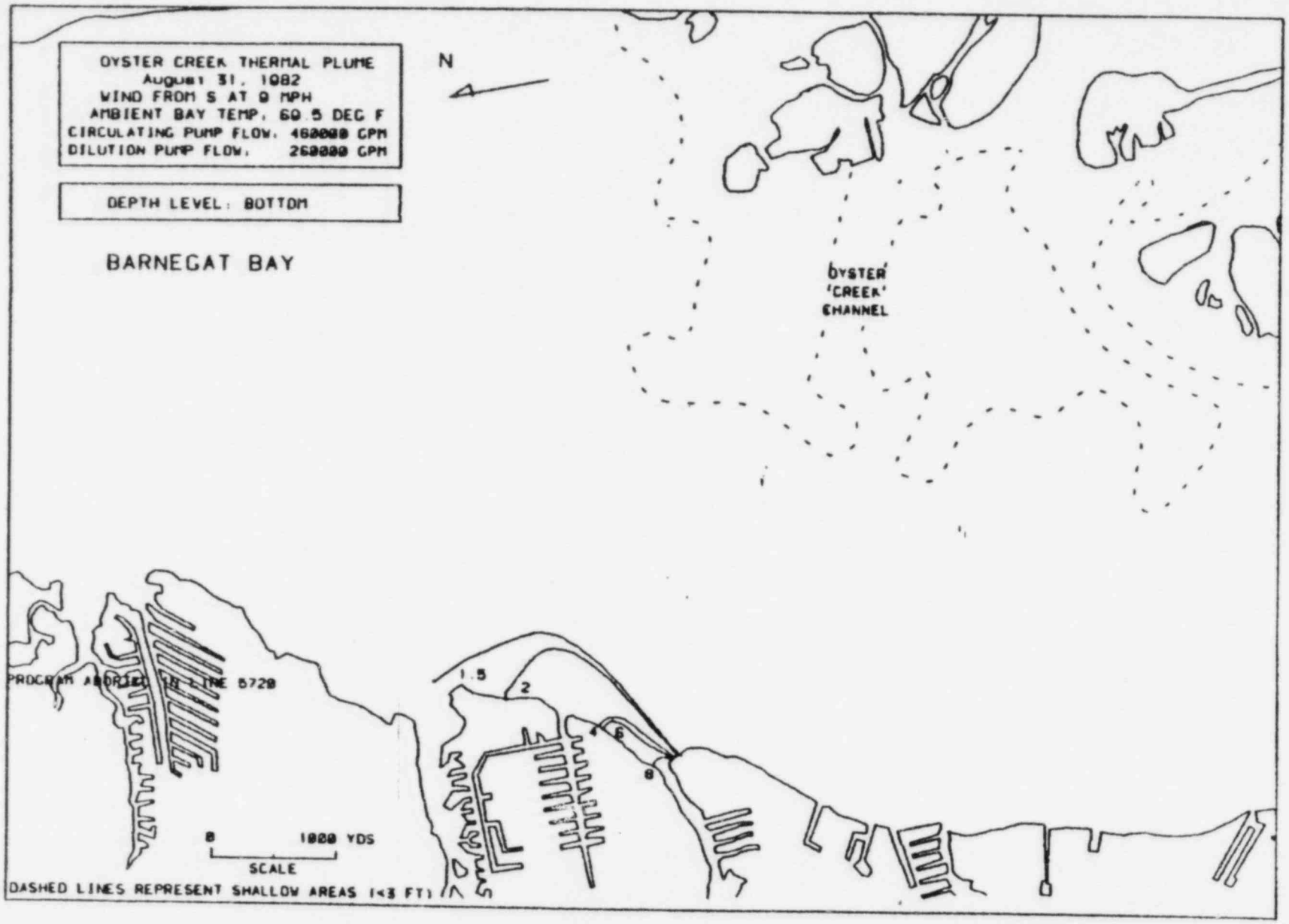
STATION PARAMETERS

ΔT	14.0 degrees F
CIRC. FLOW	460,000 gpm
DIL. FLOW	260,000 gpm


OYSTER CREEK THERMAL PLUME
August 31, 1982
WIND FROM S AT 0 MPH
AMBIENT BAY TEMP. 69.5 DEG F
CIRCULATING PUMP FLOW. 468000 GPM
DILUTION PUMP FLOW. 268000 GPM
DEPTH LEVEL. 1 FT
N
BARNEGAT BAY
OYSTER CREEK CHANNEL
1.5
2
4
6
8
0
1000 YDS
SCALE
DASHED LINES REPRESENT SHALLOW AREAS (<3 FT)


OYSTER CREEK THERMAL PLUME
August 31, 1982
WIND FROM S AT 0 MPH
AMBIENT BAY TEMP. 69.5 DEG F
CIRCULATING PUMP FLOW. 460000 GPM
DILUTION PUMP FLOW. 260000 GPM
DEPTH LEVEL: 2.5 FT
N
BARNEGAT BAY
OYSTER CREEK CHANNEL
1.5
2
4
6
8
0
1000 YDS
SCALE
DASHED LINES REPRESENT SHALLOW AREAS (<3 FT)


OYSTER CREEK THERMAL PLUME
August 31, 1982
WIND FROM S AT 0 MPH
AMBIENT BAY TEMP. 69.5 DEG F
CIRCULATING PUMP FLOW. 460000 GPM
DILUTION PUMP FLOW. 260000 GPM
DEPTH LEVEL. 5 FT
BARNEGAT BAY
N
OYSTER CREEK CHANNEL
1.5
2
4
6
8
0 1000 YDS
SCALE
DASHED LINES REPRESENT SHALLOW AREAS (<3 FT)


OYSTER CREEK THERMAL PLUME
August 31, 1982
WIND FROM S AT 9 MPH
AMBIENT BAY TEMP. 69.5 DEG F
CIRCULATING PUMP FLOW. 460000 GPM
DILUTION PUMP FLOW. 260000 GPM
DEPTH LEVEL: BOTTOM
N
BARNEGAT BAY
OYSTER CREEK CHANNEL
1.5
2
4
5
8
0 1000 YDS
SCALE
DASHED LINES REPRESENT SHALLOW AREAS (<3 FT)

THERMAL PLUME OF September 27, 1982

INDEX	POSITION COORDINATES		TIME HHMMSS	TEMPERATURE DEG F			
				1 FT	2.5 FT	5 FT	BOTTOM
1	24364	0316	120343	73.5	73.1	73.2	73.0
2	24340	0464	120407	73.3	73.1	73.3	73.2
3	0	0615	120430	73.4	73.2	73.3	73.1
4	24293	0791	120457	73.2	73.2	73.0	73.1
5	24265	0962	120524	73.4	73.2	73.1	73.1
6	24243	10111	120547	73.2	73.0	73.1	72.9
7	24212	10256	120609	73.0	72.9	72.8	72.9
8	24169	10386	120631	72.8	73.1	72.8	73.2
9	24124	10525	120654	73.0	73.0	72.9	72.9
10	0	10683	120720	72.8	72.9	72.6	72.8
11	0	10853	120747	73.0	72.8	73.1	72.8
12	0	11002	120814	72.9	73.0	72.5	72.9
13	0	11153	120841	73.0	72.7	73.0	72.7
14	0	11311	120908	72.8	72.9	72.5	72.8
15	0	11473	120935	72.8	72.7	72.8	72.9
16	0	11634	121002	72.9	72.8	72.8	72.7
17	23526	11806	121029	72.6	72.8	72.6	72.8
18	0	11973	121055	72.8	72.9	72.7	72.7
19	0	12159	121122	72.9	72.9	72.9	72.6
20	0	12348	121149	73.1	72.6	71.4	70.2
21	23489	12529	121216	71.4	70.6	68.4	66.6
22	23482	12682	121239	70.6	70.0	67.2	65.8
23	23481	12839	121301	70.2	68.5	65.8	65.7
24	23417	12997	121323	70.6	67.7	65.7	65.1
25	23446	13164	121345	70.2	65.9	65.3	65.6
26	23466	13321	121407	69.4	66.5	65.6	65.4
27	23488	13500	121429	69.9	66.8	65.6	65.7
28	23521	13509	121451	70.0	69.0	65.6	65.5
29	23529	13701	121513	70.1	69.2	65.8	65.7
30	23549	13935	121535	70.0	69.5	66.1	65.7
31	23567	14101	121557	70.4	69.3	65.7	65.8
32	23587	14268	121619	70.2	69.5	66.1	65.3
33	23604	14418	121641	70.3	69.0	65.6	65.7
34	23617	14563	121703	70.3	68.7	65.6	65.7
35	23643	14715	121725	69.9	68.0	65.7	65.5
36	23658	14866	121747	70.0	67.8	65.6	65.4
37	23700	15019	121809	69.9	67.6	65.6	65.6
38	23711	15166	121831	69.9	67.3	65.6	65.7
39	23784	15319	121853	69.2	66.3	65.6	65.4
40	23780	15468	121916	69.0	66.4	65.7	65.7
41	23837	15611	121938	68.6	66.0	65.8	65.9
42	23866	15763	122001	68.9	66.1	65.9	65.9
43	23878	15919	122026	68.7	66.1	65.8	66.0
44	23919	16063	122047	68.6	66.5	66.1	65.8
45	23928	16200	122109	68.3	66.2	66.0	66.2
46	23958	16339	122131	68.4	66.5	66.1	66.0
47	23994	16480	122153	68.1	66.2	66.0	66.1
48	24025	16621	122215	67.5	66.3	66.1	66.2
49	24082	16767	122237	67.8	66.4	66.1	66.0

THERMAL PLUME OF September 27, 1982

INDEX	POSITION COORDINATES		TIME HHMMSS	TEMPERATURE DEG F			
				1 FT	2.5 FT	5 FT	BOTTOM
50	24184	16986	122250	67.7	66.4	65.9	66.1
51	24149	17051	122321	67.5	66.3	65.9	66.2
52	24100	17103	122343	67.7	66.6	66.2	66.2
53	24221	17337	122405	67.7	66.6	65.9	65.8
54	24255	17477	122427	67.7	66.7	66.4	66.4
55	24311	17623	122449	67.7	66.7	66.1	66.1
56	24350	17764	122511	67.5	67.0	66.7	66.2
57	24393	17907	122533	67.5	66.5	66.7	66.4
58	24435	18050	122555	67.4	67.1	67.2	66.0
59	24478	18196	122617	68.2	67.5	67.1	66.6
60	24515	18336	122639	67.9	67.7	67.2	66.6
61	24561	18479	122701	67.9	67.7	66.9	66.4
62	24606	18622	122723	67.7	67.2	66.6	66.2
63	23291	13076	124052	71.6	70.7	67.0	65.7
64	23361	13206	124114	71.2	69.1	65.6	65.3
65	23445	13330	124136	71.3	69.7	66.1	65.6
66	23540	13447	124158	70.3	68.1	65.5	65.7
67	23647	13598	124220	69.9	67.8	65.7	65.8
68	23754	13640	124242	70.4	68.7	65.5	65.6
69	23860	13715	124304	70.5	69.1	65.1	65.5
70	23990	13763	124326	70.7	68.8	65.4	65.6
71	24106	13761	124348	71.6	68.5	65.5	65.7
72	24215	13771	124410	71.3	67.3	65.6	65.7
73	24324	13790	124432	70.7	68.1	65.7	65.9
74	24432	13741	124454	70.1	69.6	65.8	65.7
75	24545	13733	124516	70.0	69.5	65.7	65.7
76	24661	13739	124538	69.9	70.1	66.9	65.7
77	24779	13727	124600	70.4	70.2	66.7	65.6
78	24889	13705	124622	70.7	70.7	69.0	65.7
79	24989	13716	124644	70.8	70.7	67.4	65.8
80	25094	13673	124706	70.6	70.5	69.9	65.8
81	25196	13649	124728	70.3	70.4	70.0	65.9
82	25301	13636	124750	70.3	70.1	69.9	65.9
83	25414	13636	124812	70.0	69.9	69.5	65.7
84	25520	13626	124834	69.9	69.8	69.6	66.0
85	25630	13584	124856	69.8	69.7	69.4	66.0
86	25746	13589	124918	69.5	69.4	68.3	66.0
87	25859	13589	124940	69.3	69.3	66.7	66.2
88	25975	13605	125002	69.4	69.2	66.0	66.1
89	26089	13609	125024	69.2	68.8	65.8	65.9
90	26203	13626	125046	69.3	69.1	66.0	66.0
91	26306	13622	125108	69.4	69.1	65.8	65.8
92	26418	13622	125130	69.2	69.0	65.7	65.5
93	26528	13634	125152	69.2	69.0	65.7	65.7
94	26633	13642	125214	69.2	68.9	65.8	65.7
95	26734	13682	125236	68.9	68.7	65.6	65.6
96	26800	13592	125258	68.7	68.6	65.7	65.7
97	26806	13548	125320	68.8	68.8	65.9	65.8
98	26988	13528	125342	68.7	68.6	65.7	65.7

THERMAL PLUME OF September 27, 1982

INDEX	POSITION COORDINATES		TIME HHMMSS	TEMPERATURE DEG F			
				1 FT	2.5 FT	5 FT	BOTTOM
99	27181	13540	125404	68.4	68.5	65.7	65.8
100	27211	13514	125426	68.5	68.5	65.6	65.9
101	27326	13520	125448	68.3	68.2	65.6	65.7
102	27439	13523	125510	68.3	67.9	65.3	65.5
103	27558	13526	125532	68.5	68.1	65.5	65.6
104	27676	13518	125554	68.6	68.0	65.7	65.7
105	27759	13484	125616	68.4	67.6	65.6	65.7
106	27856	13479	125638	68.0	66.8	65.7	65.8
107	27952	13443	125700	68.1	67.0	65.9	65.7
108	28050	13418	125722	68.1	67.0	65.5	65.5
109	28140	13390	125744	68.2	66.9	65.7	65.6
110	28253	13376	125806	68.2	66.6	65.5	65.4
111	28361	13376	125828	67.9	66.0	65.4	65.6
112	28476	13394	125850	68.0	66.2	65.7	65.6
113	28581	13374	125912	67.9	66.4	65.3	65.6
114	28674	13351	125934	68.1	67.0	65.6	65.6
115	23105	12901	131151	71.2	69.6	61.8	66.6
116	23137	13040	131213	70.6	69.8	69.4	67.1
117	23090	13105	131235	70.3	69.6	68.4	65.8
118	23041	13325	131257	69.6	68.6	66.4	65.8
119	22989	13455	131319	68.8	68.1	65.6	65.8
120	22945	13601	131341	68.9	68.7	66.0	66.1
121	22883	13720	131403	69.4	68.6	65.9	65.9
122	22825	13858	131425	69.6	69.0	66.3	65.7
123	22763	13988	131447	69.7	68.9	65.7	65.9
124	22698	14140	131509	70.0	68.4	65.8	65.7
125	22636	14220	131531	69.6	68.4	65.8	65.5
126	22584	14339	131553	69.4	68.5	65.6	65.9
127	22514	14453	131615	69.5	68.1	65.8	65.9
128	22460	14576	131637	69.4	68.5	65.9	65.8
129	22414	14705	131659	69.2	68.9	65.8	65.8
130	22362	14823	131721	69.4	69.1	66.0	66.0
131	22356	14937	131743	69.2	68.8	65.7	65.6
132	22235	15048	131805	69.3	68.7	65.9	66.0
133	22219	15174	131829	69.2	68.4	65.7	65.8
134	22145	15285	131851	69.1	67.2	66.0	66.2
135	22008	15406	131914	69.3	67.5	66.0	66.1
136	21903	15515	131937	69.1	68.4	66.1	66.1
137	21828	15770	132028	69.1	68.2	66.2	66.0
138	21662	16049	132121	69.6	68.2	66.1	66.1
139	21571	16175	132145	69.6	67.7	66.1	66.0
140	21481	16296	132209	69.4	67.7	66.1	66.2
141	21398	16409	132231	69.3	67.8	66.0	66.1
142	21344	16530	132253	69.8	67.8	66.1	66.1
143	21251	16650	132316	69.2	68.0	66.0	66.1
144	21190	16777	132338	69.2	67.8	65.6	65.7
145	21167	16909	132400	69.3	67.8	65.9	66.1
146	21172	17047	132422	69.1	67.4	65.8	65.8
147	21111	17187	132444	69.4	67.4	65.9	65.6

THERMAL PLUME OF September 27, 1982

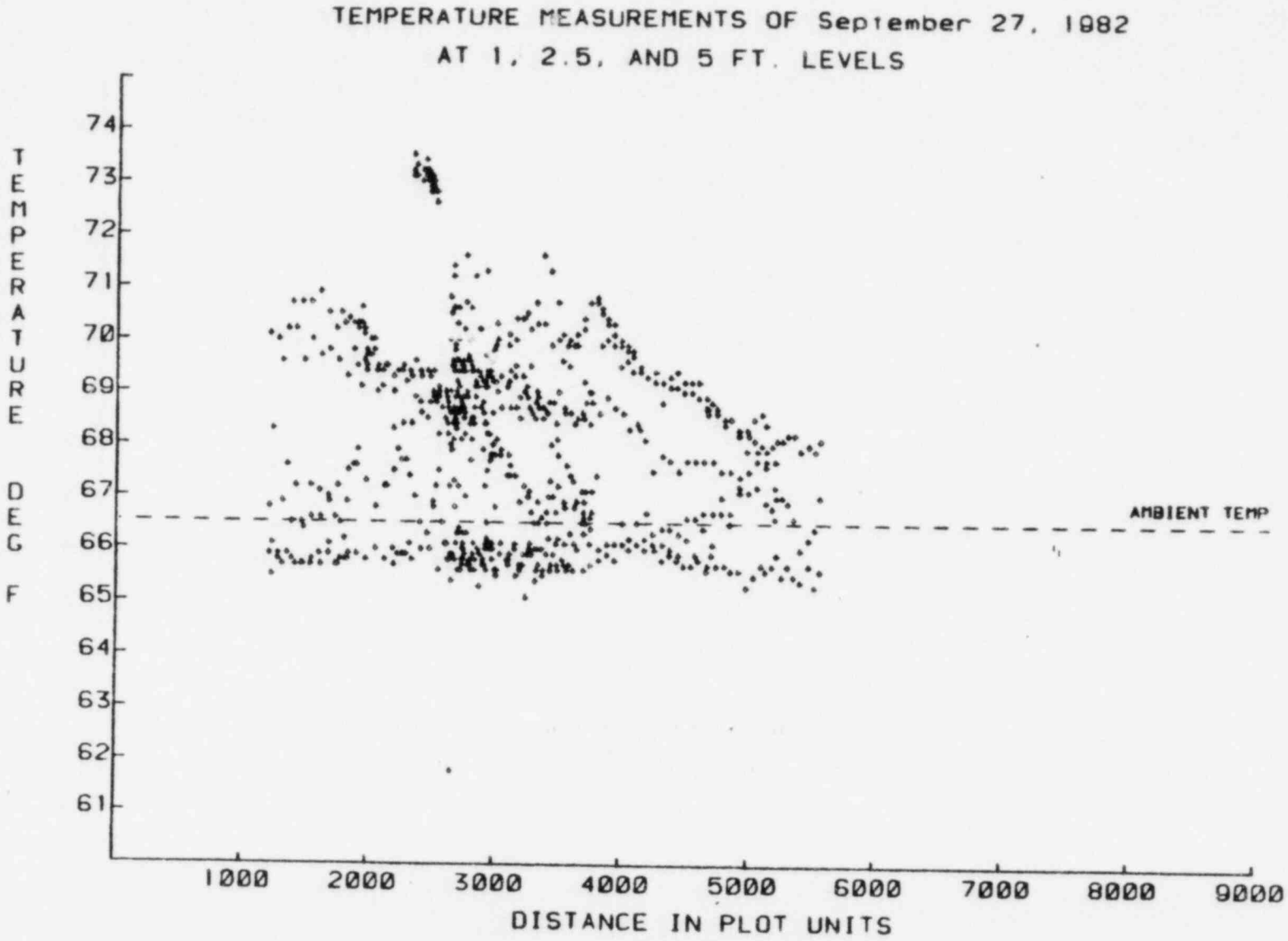
INDEX	POSITION COORDINATES		TIME HHMMSS	TEMPERATURE DEG F			
				1 FT	2.5 FT	5 FT	BOTTOM
148	21086	17326	132506	69.3	67.4	66.0	66.0
149	21051	17467	132528	68.9	66.9	65.6	65.8
150	21017	17609	132550	69.0	67.2	65.9	65.9
151	20975	17726	132612	68.9	67.0	65.9	66.0
152	20930	17850	132634	68.6	66.7	65.9	65.9
153	20885	17988	132656	68.5	66.5	66.0	66.0
154	20835	18119	132718	68.7	66.5	65.7	65.6
155	20789	18246	132740	68.7	66.6	66.0	66.0
156	20760	18367	132802	68.6	66.5	65.9	65.8
157	20694	18491	132824	68.8	67.0	66.2	66.2
158	20650	18618	132846	68.8	67.0	65.9	65.8
159	20636	18745	132908	69.0	67.2	66.2	66.0
160	20614	18891	132932	68.7	66.9	65.7	65.8
161	20595	19034	132954	68.6	67.4	66.3	66.1
162	20603	19168	133016	68.5	66.9	66.0	65.9
163	20569	19297	133038	68.6	67.1	66.5	66.0
164	20527	19420	133100	68.8	67.1	66.5	66.3
165	20485	19535	133122	68.4	66.6	66.1	66.0
166	20428	19644	133144	68.8	67.1	66.7	66.2
167	20387	19612	133206	68.5	66.9	66.6	66.3
168	20223	19505	133228	68.4	66.8	66.1	66.0
169	20150	19396	133250	68.6	66.8	66.1	66.0
170	20086	19287	133312	68.4	66.7	66.1	66.1
171	20019	19172	133334	68.6	66.7	65.9	66.0
172	19954	19065	133356	68.9	66.9	66.0	66.0
173	19880	18953	133418	68.7	67.1	66.0	66.0
174	19826	18834	133440	68.5	66.9	65.7	65.9
175	19755	18718	133502	68.7	67.3	65.9	65.9
176	19696	18598	133524	68.7	67.0	66.1	66.3
177	19648	18476	133546	68.6	68.0	65.8	65.9
178	19582	18362	133608	68.6	67.9	65.8	65.8
179	19529	18258	133630	68.7	68.4	66.1	66.0
180	19464	18135	133652	68.6	68.2	65.9	66.0
181	19419	18014	133714	69.0	68.3	66.1	65.9
182	19378	17897	133736	68.8	68.4	66.1	66.0
183	19314	17774	133758	69.1	68.2	65.6	65.8
184	19263	17658	133820	69.3	68.8	66.0	65.9
185	19204	17544	133842	69.3	68.6	66.0	66.1
186	19141	17425	133904	69.3	68.4	65.8	65.8
187	19079	17317	133926	69.5	68.4	65.9	65.9
188	19020	17199	133948	69.0	67.5	65.7	65.9
189	18959	17084	134010	69.5	67.2	65.8	65.9
190	18899	16967	134032	69.4	66.8	66.0	66.2
191	18835	16844	134054	69.4	67.3	65.8	65.9
192	18766	16725	134116	69.5	67.6	65.9	65.9
193	18707	16602	134138	69.3	66.9	65.8	66.0
194	18652	16476	134200	69.6	67.2	65.7	65.8
195	18602	16351	134222	69.8	66.9	66.1	66.1
196	18559	16230	134244	69.7	66.6	65.7	65.8

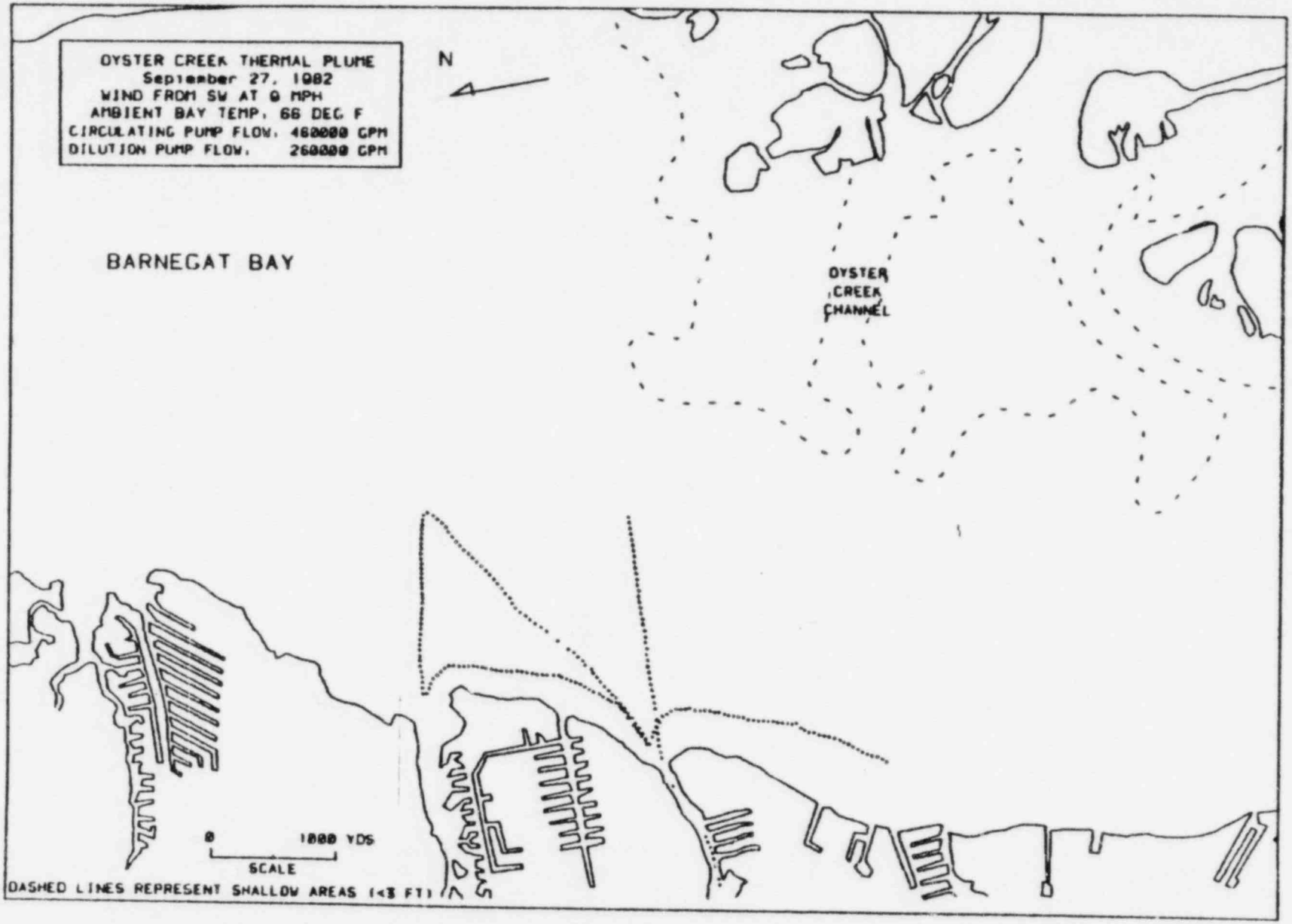
THERMAL PLUME OF September 27, 1982

INDEX	POSITION COORDINATES		TIME HHMMSS	TEMPERATURE DEG F			
				1 FT	2.5 FT	5 FT	BOTTOM
197	18511	16098	134306	70.0	66.6	65.8	65.9
198	18479	15966	134328	69.6	66.4	65.7	65.9
199	18456	15830	134350	70.2	67.2	65.7	65.8
200	18414	15701	134412	70.2	67.6	65.9	66.2
201	18361	15574	134434	70.0	65.9	65.8	65.8
202	18317	15440	134456	70.1	66.8	65.9	66.0
203	18398	15407	134518	68.3	66.1	65.5	65.7
204	18405	15504	134540	69.6	66.9	65.7	65.7
205	18573	15600	134602	70.7	66.5	65.8	65.9
206	18675	15600	134624	70.7	66.5	65.7	65.7
207	18706	15744	134646	70.7	67.2	65.7	65.8
208	18914	15704	134708	70.9	67.1	65.9	66.0
209	19029	15844	134730	70.5	67.0	65.9	66.0
210	19142	15863	134752	70.2	66.6	65.7	65.8
211	19258	15828	134814	70.5	66.5	65.8	65.9
212	19372	15772	134836	70.3	66.2	65.8	65.8
213	19484	15724	134858	70.4	67.5	65.9	65.8
214	19589	15693	134920	70.3	69.8	67.6	66.0
215	19694	15664	134942	70.3	70.2	67.9	65.9
216	19793	15619	135004	70.6	70.3	69.1	66.8
217	19884	15562	135026	70.1	70.2	69.6	66.6
218	19967	15510	135048	69.8	69.7	69.5	68.4
219	20091	15447	135110	70.0	70.0	69.7	68.6
220	20186	15390	135132	69.8	70.0	69.8	67.2
221	20288	15344	135154	69.5	69.4	69.0	66.4
222	20407	15301	135216	69.4	69.4	69.1	65.8
223	20520	15258	135238	69.5	69.5	67.2	66.1
224	20648	15235	135300	69.3	68.3	66.0	66.1
225	20754	15189	135322	69.4	67.9	65.9	65.8
226	20864	15138	135344	69.4	67.7	65.9	65.9
227	20979	15084	135406	69.2	67.7	65.9	66.0
228	21072	15036	135428	69.4	67.4	66.1	65.9
229	21193	14999	135450	69.6	68.9	67.0	66.0
230	21300	14965	135513	69.4	68.8	66.5	66.0
231	21444	14939	135535	69.4	68.5	66.3	65.6
232	21572	14897	135557	69.4	68.9	66.9	66.1
233	21611	14849	135620	69.0	68.9	66.8	66.1
234	21701	14783	135642	68.9	68.8	67.2	65.8
235	21793	14717	135704	69.0	68.9	67.5	65.8
236	21880	14654	135726	68.7	68.7	66.5	66.0
237	21984	14594	135748	69.0	68.5	66.1	65.8
238	22065	14511	135810	69.0	68.9	66.1	66.0
239	22147	14429	135832	68.7	68.2	65.8	66.0
240	22233	14352	135854	68.6	68.0	65.8	65.6
241	22341	14282	135916	68.7	68.6	67.3	66.0
242	22410	14202	135938	68.9	68.5	66.8	65.9
243	22497	14123	140000	69.2	68.7	66.3	65.8
244	22577	14060	140022	69.1	68.9	66.3	65.9
245	22670	14013	140044	69.7	68.5	66.1	65.9

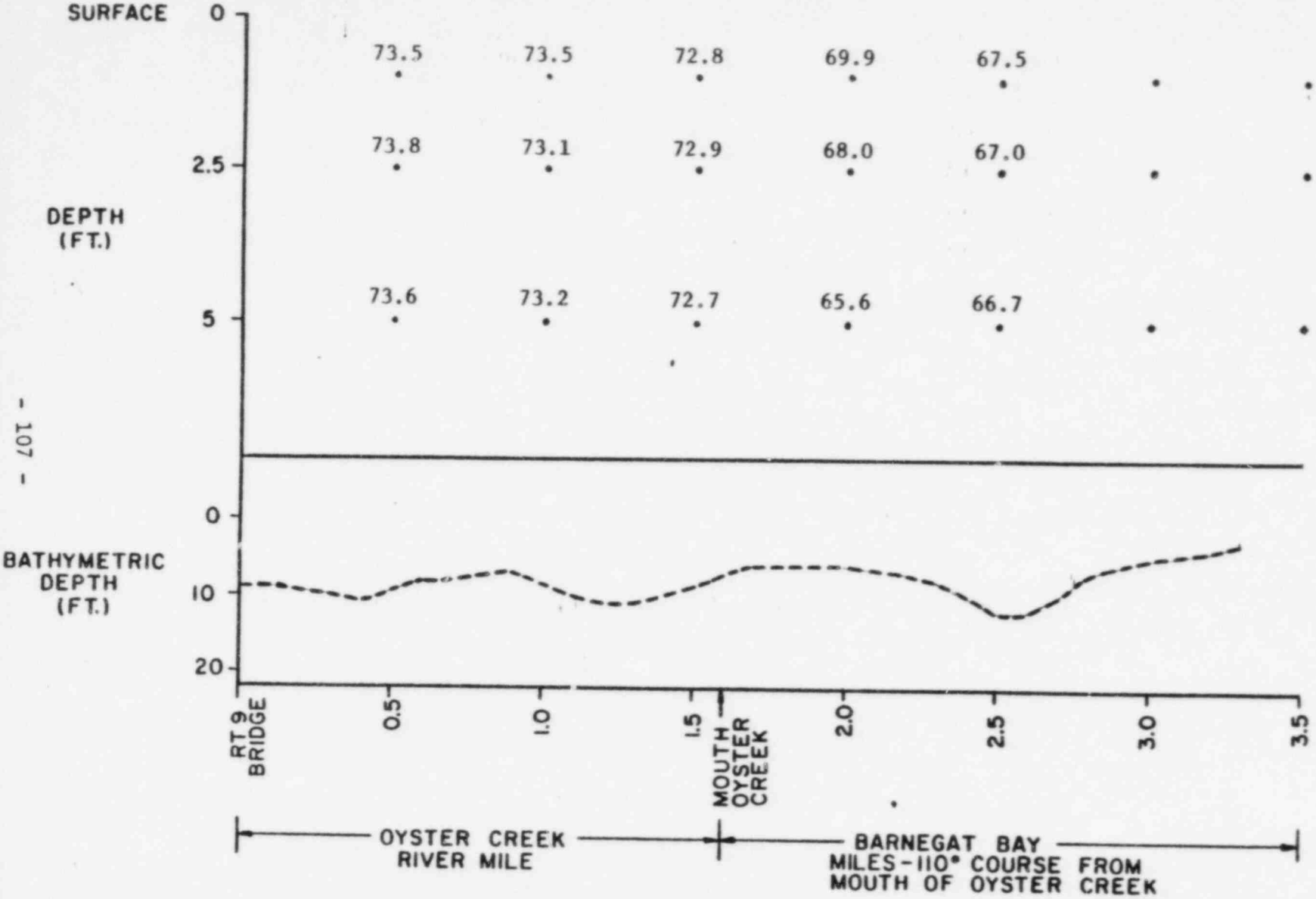
THERMAL PLUME OF September 27, 1982

INDEX	POSITION COORDINATES		TIME HHMMSS	TEMPERATURE DEG F			
				1 FT	2.5 FT	5 FT	BOTTOM
246	22732	13988	140106	69.6	68.9	66.3	65.8
247	22760	13839	140128	69.5	68.7	66.8	66.1
248	22818	13769	140150	69.4	68.7	65.7	65.8
249	22858	13603	140212	69.4	68.6	65.6	65.7
250	22803	13603	140234	69.5	68.7	65.8	65.9
251	22934	13492	140256	69.6	68.6	65.8	65.9
252	22976	13312	140318	69.9	68.4	65.8	65.9
253	23011	13211	140340	69.5	68.1	65.9	66.0
254	23058	13108	140402	69.5	67.9	65.4	65.7
255	23097	13007	140424	70.5	69.0	65.9	65.9
256	23141	12906	140446	70.8	70.0	67.2	66.0


TEMPERATURE MEASUREMENTS OF September 27, 1982
AT 1, 2.5, AND 5 FT. LEVELS
TEMPERATURE DEG F
74
73
72
71
70
69
68
67
66
65
64
63
62
61
AMBIENT TEMP
1000
2000
3000
4000
5000
6000
7000
8000
9000
DISTANCE IN PLOT UNITS


OYSTER CREEK THERMAL PLUME
September 27, 1982
WIND FROM SW AT 9 MPH
AMBIENT BAY TEMP. 66 DEG F
CIRCULATING PUMP FLOW. 460000 GPM
DILUTION PUMP FLOW. 260000 GPM
N
BARNEGAT BAY
OYSTER CREEK CHANNEL
0 1000 YDS
SCALE
DASHED LINES REPRESENT SHALLOW AREAS (<3 FT)

LONGITUDINAL SECTIONS OF OYSTER CREEK AND BARNEGAT BAY



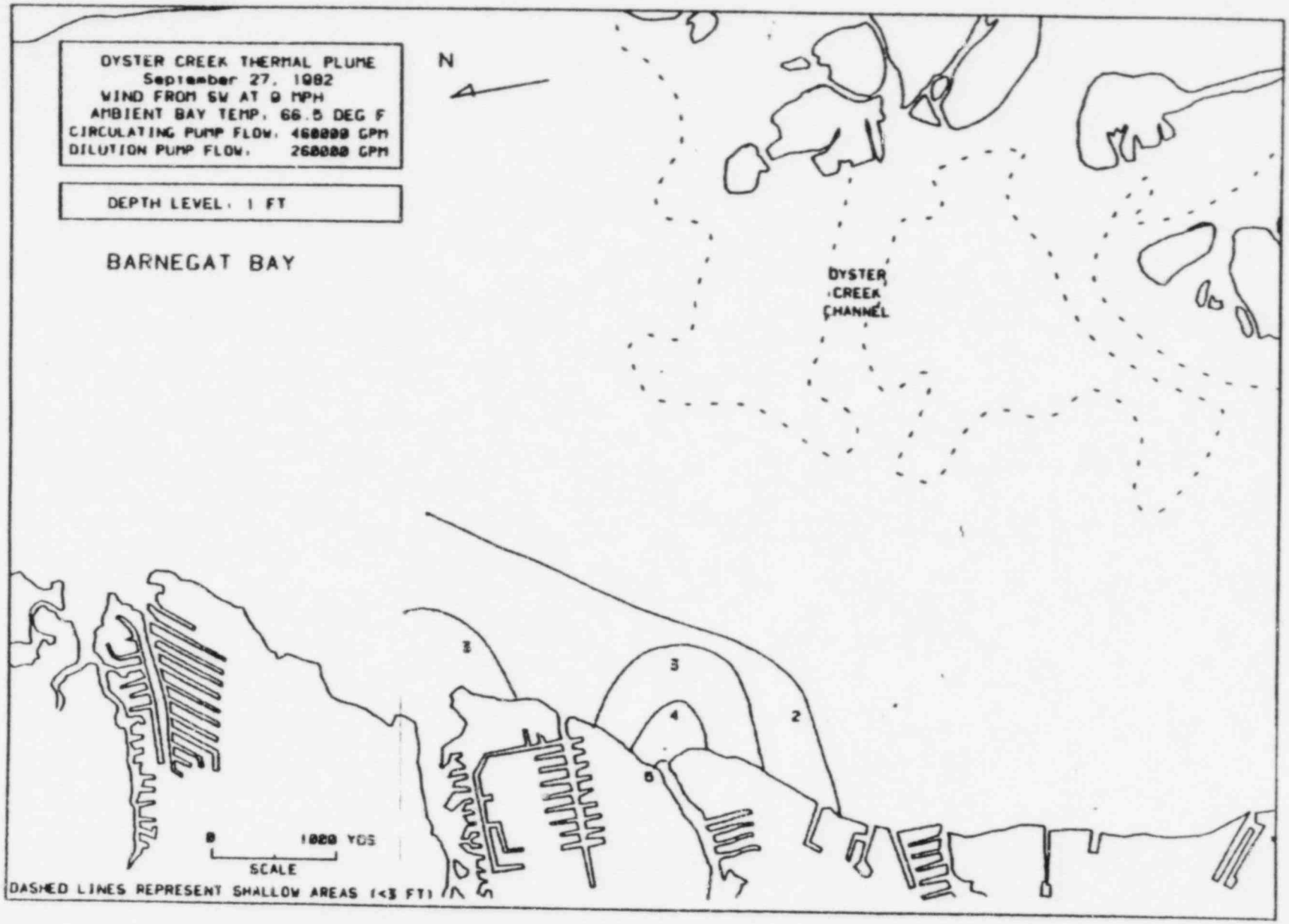
DATE September 27, 1982

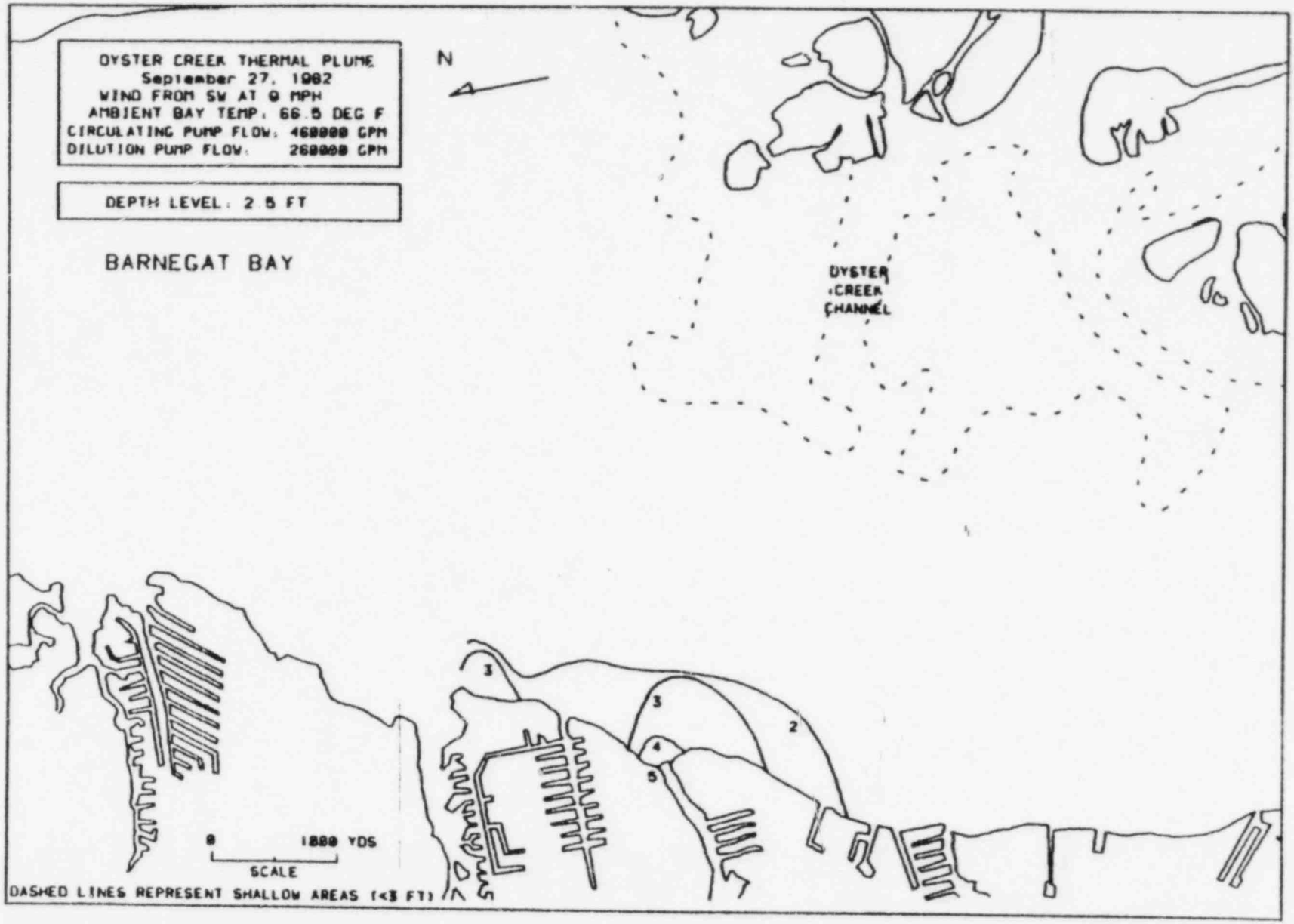
TIME 1200-1400

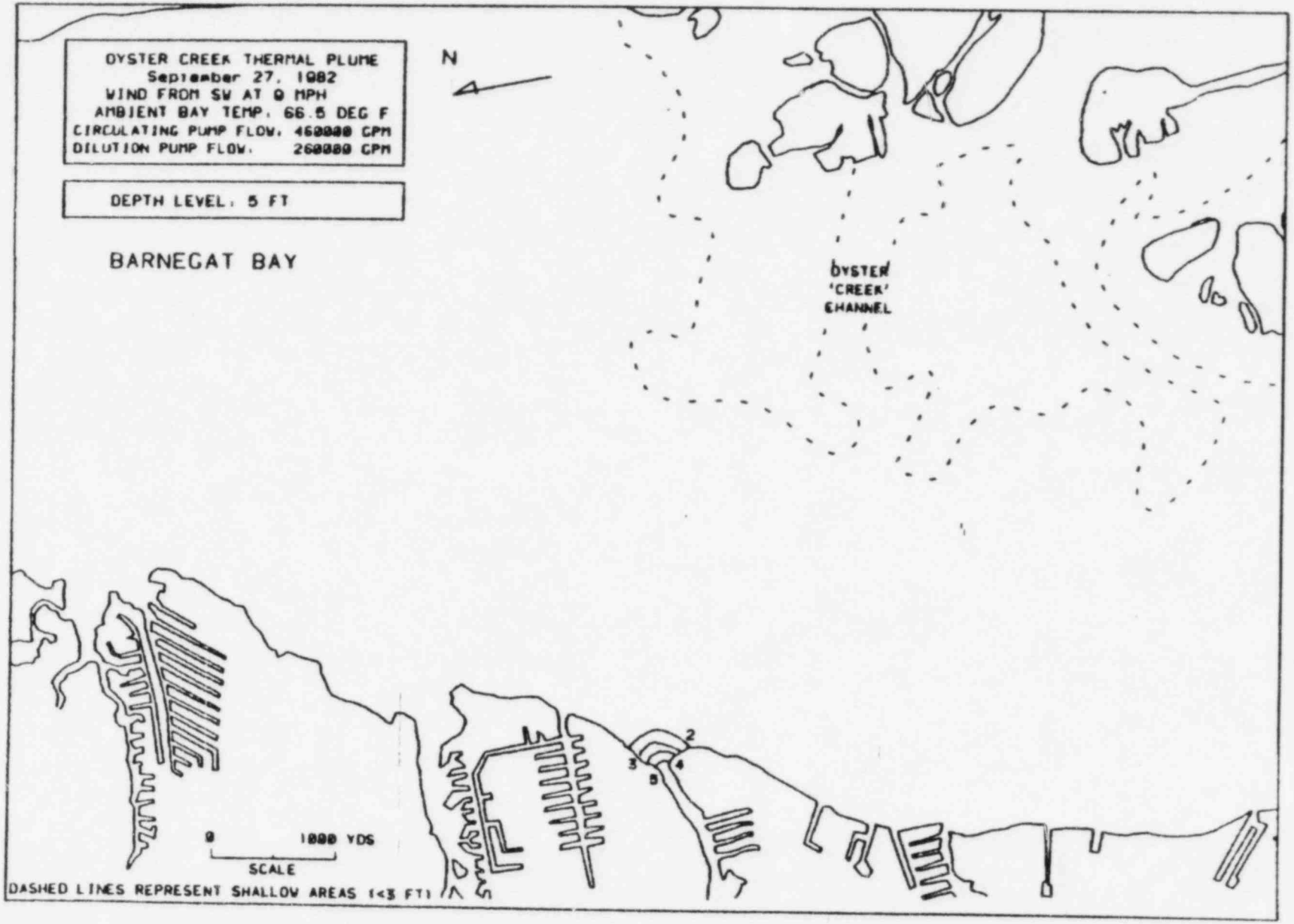
WIND SW at 9 mph

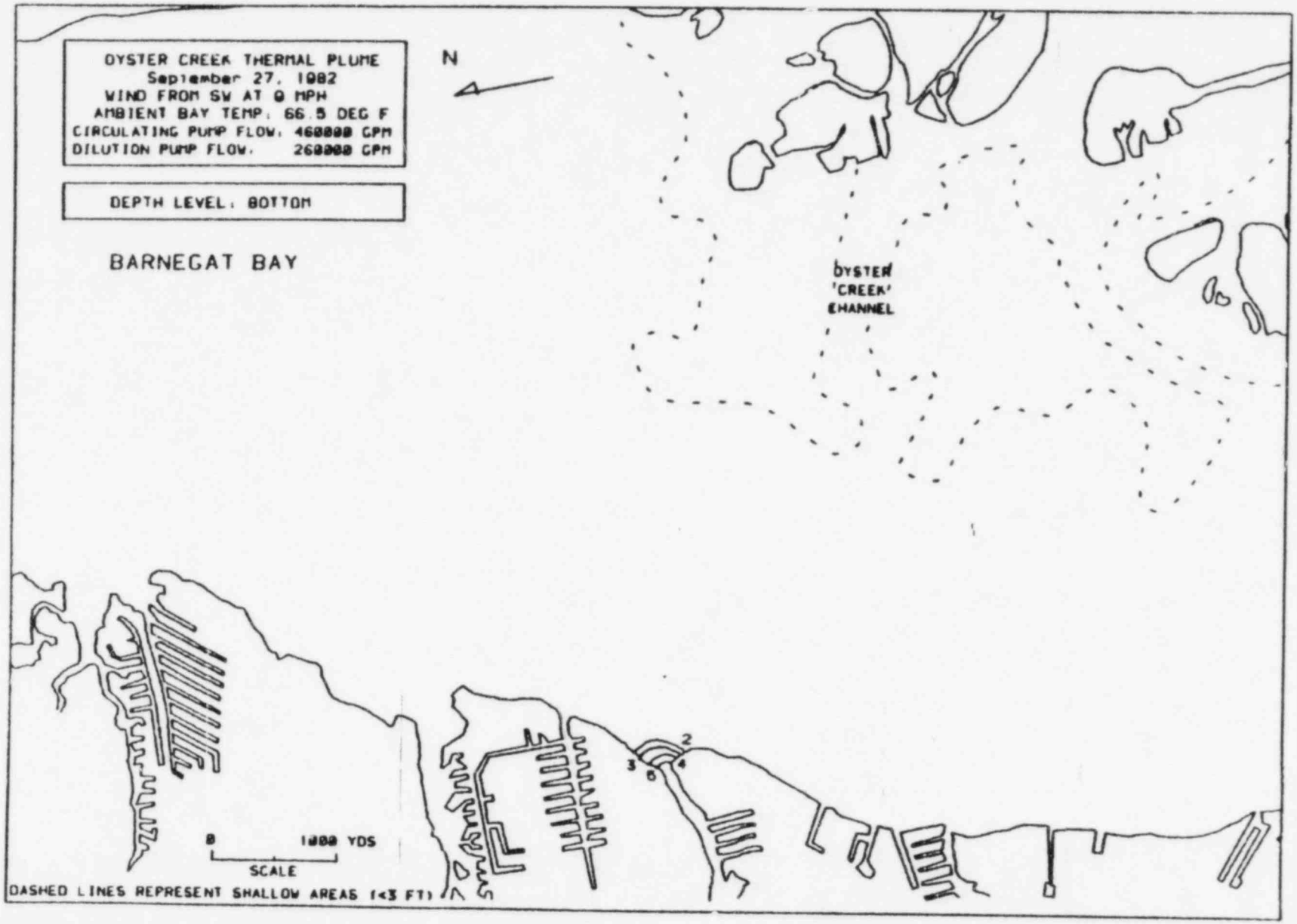
STATION PARAMETERS

ΔT	11.8 degrees F
CIRC. FLOW	460,000 gpm
DIL. FLOW	260,000 gpm


DYSTER CREEK THERMAL PLUME
September 27, 1982
WIND FROM SW AT 9 MPH
AMBIENT BAY TEMP. 66.5 DEG F
CIRCULATING PUMP FLOW. 460000 GPM
DILUTION PUMP FLOW. 260000 GPM
DEPTH LEVEL: 1 FT
N
BARNEGAT BAY
DYSTER CREEK CHANNEL
1
3
4
2
0
0 1000 YDS
SCALE
DASHED LINES REPRESENT SHALLOW AREAS (<3 FT)


OYSTER CREEK THERMAL PLUME
September 27, 1982
WIND FROM SW AT 9 MPH
AMBIENT BAY TEMP: 66.5 DEG F
CIRCULATING PUMP FLOW: 460000 GPM
DILUTION PUMP FLOW: 260000 GPM
DEPTH LEVEL: 2.5 FT
N
BARNEGAT BAY
OYSTER CREEK CHANNEL
3
3
2
4
5
0
1000 YDS
SCALE
DASHED LINES REPRESENT SHALLOW AREAS (<3 FT)


OYSTER CREEK THERMAL PLUME
September 27, 1982
WIND FROM SW AT 0 MPH
AMBIENT BAY TEMP. 66.5 DEG F
CIRCULATING PUMP FLOW. 460000 GPM
DILUTION PUMP FLOW. 260000 GPM
DEPTH LEVEL: 5 FT
N
BARNEGAT BAY
OYSTER CREEK CHANNEL
0 1000 YDS
SCALE
DASHED LINES REPRESENT SHALLOW AREAS (<3 FT)


OYSTER CREEK THERMAL PLUME
September 27, 1982
WIND FROM SW AT 0 MPH
AMBIENT BAY TEMP: 66.5 DEG F
CIRCULATING PUMP FLOW: 460000 GPM
DILUTION PUMP FLOW: 260000 GPM
DEPTH LEVEL: BOTTOM
N
BARNEGAT BAY
OYSTER CREEK CHANNEL
0 1000 YDS
SCALE
DASHED LINES REPRESENT SHALLOW AREAS (<3 FT)

THERMAL PLUME OF October 12, 1982

INDEX	POSITION COORDINATES		TIME HHMMSS	TEMPERATURE DEG F			
				1 FT	2.5 FT	5 FT	BOTTOM
1	24374	9080	113440	64.3	0.0	64.2	63.8
2	24360	9293	113515	64.2	0.0	64.0	64.0
3	24353	9432	113537	64.4	0.0	64.2	63.9
4	0	9622	113603	64.4	0.0	64.2	63.9
5	24304	9817	113630	64.3	0.0	64.0	64.0
6	24260	9976	113653	64.2	0.0	63.9	64.3
7	24215	10129	113715	64.1	0.0	63.7	64.0
8	24184	10282	113737	64.2	0.0	64.1	63.9
9	24142	10450	113801	64.3	0.0	63.9	64.1
10	0	10599	113823	64.1	64.5	64.0	64.2
11	0	10773	113850	64.0	64.5	63.9	64.1
12	23937	10949	113917	64.2	64.6	64.1	64.1
13	23831	11101	113940	64.2	64.6	63.9	64.1
14	23743	11260	114005	64.0	64.5	63.8	64.0
15	23649	11401	114027	64.2	64.6	64.1	64.1
16	23649	11572	114052	64.0	64.5	63.9	64.0
17	23523	11732	114117	64.3	64.5	63.9	64.0
18	23487	11908	114141	64.3	64.6	64.0	64.3
19	0	12058	114203	64.2	64.7	64.1	64.2
20	0	12267	114230	64.2	64.5	64.1	64.4
21	0	12475	114257	64.3	64.8	64.1	64.1
22	23408	12673	114324	64.3	64.5	63.5	63.3
23	23425	12845	114346	63.7	63.9	62.0	60.7
24	23428	13021	114409	63.1	62.4	60.[illegible]	59.7
25	23438	13187	114431	62.7	62.2	60.2	59.8
26	23452	13356	114453	62.6	62.0	61.2	60.4
27	23473	13520	114516	62.5	62.8	61.9	61.8
28	23480	13730	114537	62.7	63.1	62.3	60.8
29	23515	13858	114559	63.3	63.0	61.5	60.0
30	23545	14023	114621	63.5	62.6	61.4	60.0
31	23558	14184	114643	63.2	62.8	62.1	60.8
32	23573	14339	114705	63.2	63.2	62.5	59.9
33	23591	14493	114727	63.1	63.5	62.4	60.0
34	23600	14641	114749	63.3	63.5	62.2	59.8
35	23660	14791	114811	63.3	63.4	62.0	60.0
36	23687	14944	114834	63.0	63.6	61.9	59.8
37	23692	15095	114856	63.0	63.6	62.6	59.9
38	23718	15246	114918	63.4	63.7	62.1	59.7
39	23760	15396	114940	63.3	63.8	61.8	59.8
40	23768	15542	115002	63.4	63.9	60.5	59.7
41	23824	15691	115024	63.8	63.8	59.7	59.9
42	23845	15832	115046	63.9	60.3	60.4	59.6
43	23873	15979	115109	63.3	59.3	59.5	59.4
44	23878	16137	115133	60.2	60.5	59.5	59.4
45	23896	16283	115155	60.6	60.0	59.2	59.3
46	23902	16421	115217	60.0	59.7	59.6	59.3
47	23948	16559	115239	60.0	59.3	59.3	59.4
48	23961	16699	115301	59.9	59.7	59.4	59.6
49	23998	16836	115323	58.7	59.1	59.2	59.2

THERMAL PLUME OF October 12, 1982

INDEX	POSITION COORDINATES		TIME HHMMSS	TEMPERATURE DEG F			
				1 FT	2.5 FT	5 FT	BOTTOM
50	24010	16970	115345	59.1	59.3	59.5	59.2
51	24036	17102	115407	58.6	59.0	59.3	59.2
52	24061	17237	115429	59.0	59.5	59.7	59.6
53	24050	17361	115451	59.1	59.5	59.4	59.4
54	23962	17362	115513	58.9	59.4	59.2	59.3
55	23815	17284	115535	59.0	59.6	59.2	59.3
56	23680	17198	115557	58.8	59.5	59.3	59.3
57	23564	17105	115618	58.8	60.2	59.3	59.6
58	23433	17021	115641	58.9	60.4	59.4	59.4
59	23315	16922	115707	59.1	59.2	59.5	59.2
60	23158	16922	115732	58.8	60.1	59.4	59.5
61	23064	16747	115754	58.5	59.9	59.4	59.4
62	22985	16663	115818	58.6	60.2	59.3	59.4
63	0	16583	115841	58.6	59.8	59.6	59.5
64	0	16502	115908	58.3	59.6	59.5	59.7
65	0	16407	115935	58.4	58.9	60.0	59.8
66	22220	16310	120002	58.1	58.8	59.7	59.7
67	22076	16247	120024	58.3	58.9	59.4	59.8
68	0	16194	120046	58.4	58.9	58.9	59.8
69	21762	16126	120113	58.4	58.9	58.9	59.9
70	21615	16070	120135	58.4	58.5	58.9	60.0
71	0	16024	120157	58.6	58.8	58.5	59.8
72	21318	15959	120224	58.3	58.8	58.6	59.8
73	0	15907	120248	58.3	58.8	58.6	59.9
74	20967	15853	120315	58.2	58.7	58.8	60.2
75	20822	15816	120337	58.3	58.9	58.6	60.0
76	20675	15779	120359	58.1	58.9	58.6	60.1
77	20537	15751	120421	58.5	58.8	58.7	59.7
78	20393	15720	120443	58.3	58.7	58.8	60.0
79	20240	15688	120505	58.3	58.7	58.6	59.7
80	20100	15670	120527	58.5	58.9	58.7	59.8
81	19964	15724	120549	58.4	58.9	58.8	59.7
82	19826	15773	120611	58.7	59.3	59.2	59.8
83	19683	15797	120633	58.8	59.1	59.3	59.7
84	19539	15809	120655	58.6	59.3	59.3	59.3
85	19390	15798	120717	58.5	59.2	59.4	59.9
86	19253	15781	120739	58.8	59.6	59.3	59.6
87	19111	15754	120801	58.8	59.4	59.5	59.6
88	18969	15729	120823	58.6	59.3	59.4	59.7
89	18826	15707	120845	58.5	59.2	58.9	59.6
90	18683	15691	120907	58.8	59.2	58.9	59.6
91	18541	15542	120941	58.8	59.3	58.9	59.7
92	18830	15558	121009	58.8	59.0	58.6	59.7
93	19011	15593	121037	58.7	59.1	58.9	59.6
94	19193	15624	121105	58.9	59.2	59.3	59.7
95	19378	15624	121133	58.7	59.2	59.3	59.6
96	19546	15681	121201	58.6	59.2	59.2	59.6
97	16730	15696	121229	58.7	59.3	59.6	59.8
98	19916	15685	121257	58.8	59.0	59.0	59.7

THERMAL PLUME OF October 12, 1982

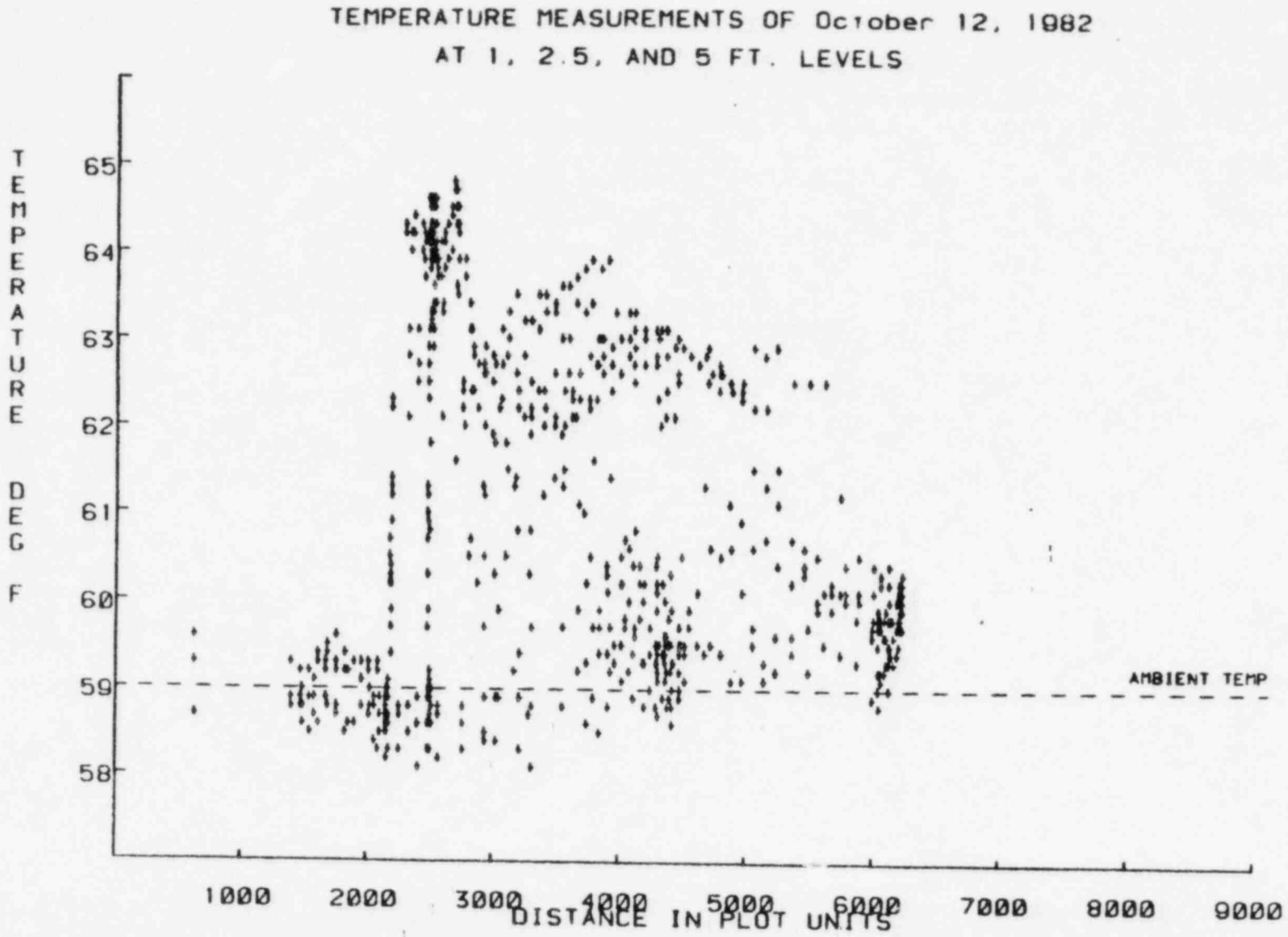
INDEX	POSITION COORDINATES		TIME HHMMSS	TEMPERATURE DEG F			
				1 FT	2.5 FT	5 FT	BOTTOM
99	20092	15639	121325	58.3	59.2	59.3	59.9
100	20270	15589	121353	58.5	58.9	58.8	59.0
101	20480	15465	121421	58.3	59.0	58.6	59.0
102	20496	15304	121449	58.6	58.8	58.7	59.5
103	20600	15157	121517	58.2	59.0	58.5	59.2
104	20754	15021	121545	58.7	58.9	59.1	59.2
105	20891	14889	121613	59.4	59.9	60.2	60.7
106	20984	14754	121641	59.7	60.4	60.3	60.9
107	21084	14605	121709	60.2	60.5	60.7	61.0
108	21282	14478	121737	60.9	61.2	61.3	61.6
109	21311	14316	121805	62.3	62.2	61.4	61.8
110	0	14126	121834	62.5	63.1	62.7	62.4
111	0	14053	121907	61.9	62.3	62.6	62.5
112	21609	14148	121940	62.1	63.1	62.8	62.8
113	21879	14109	122011	62.7	63.1	62.5	62.4
114	22025	14154	122040	62.7	62.9	62.5	62.3
115	22172	14265	122108	63.4	63.3	62.1	61.8
116	22313	14389	122136	63.6	63.6	61.6	61.4
117	22464	14513	122204	63.4	63.1	60.5	61.2
118	22631	14638	122232	62.9	60.5	59.7	61.3
119	22780	14760	122300	62.2	59.9	58.9	60.5
120	22946	14905	122328	61.3	59.2	59.2	60.3
121	23005	15036	122356	61.9	60.3	58.7	60.3
122	0	15181	122424	61.8	60.6	58.7	60.2
123	23442	15347	122457	61.3	59.7	58.8	60.0
124	23604	15491	122525	61.1	59.2	59.9	60.2
125	23750	15635	122553	61.6	58.9	59.7	59.8
126	23935	15770	122621	61.4	59.2	59.7	59.8
127	24092	15915	122650	60.7	59.8	59.7	59.7
128	24234	16067	122719	60.4	60.2	59.8	59.9
129	24393	16219	122747	60.4	60.4	59.5	59.7
130	24550	16341	122815	59.2	60.3	59.5	59.4
131	24646	16237	122843	58.8	59.9	59.5	59.7
132	24703	16085	122911	58.9	59.8	59.5	59.9
133	24751	15928	122939	59.4	60.0	59.4	59.8
134	24819	15766	123007	58.9	60.2	59.4	60.0
135	24827	15604	123035	60.2	60.1	59.3	59.9
136	24921	15461	123103	62.3	59.9	59.5	59.6
137	25000	15350	123131	63.0	60.5	59.4	59.7
138	25111	15237	123159	63.1	62.0	59.5	59.6
139	25243	15163	123227	63.1	62.1	59.6	59.6
140	25400	15121	123255	62.9	62.1	59.3	59.8
141	25568	15068	123323	62.9	60.5	59.5	59.9
142	25729	15012	123351	62.8	59.9	59.7	59.4
143	25890	14965	123419	62.7	60.1	59.5	59.3
144	26043	14902	123447	62.8	61.3	59.4	59.7
145	26189	14823	123515	62.6	60.6	59.5	59.5
146	26368	14799	123543	62.6	60.5	59.4	59.5
147	26544	14781	123611	62.4	60.6	59.1	59.8

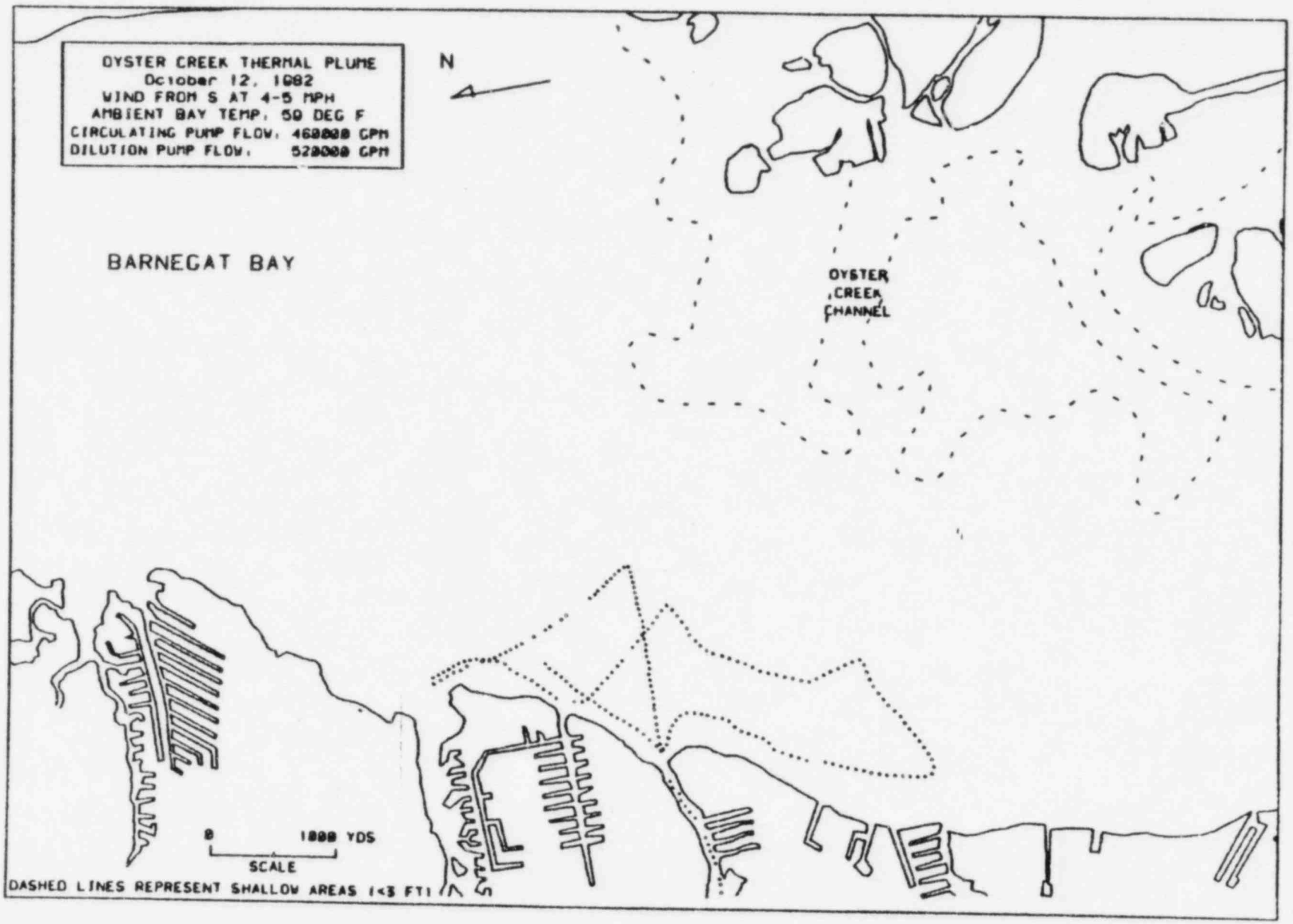
THERMAL PLUME OF October 12, 1982

INDEX	POSITION COORDINATES		TIME HHMMSS	TEMPERATURE DEG F			
				1 FT	2.5 FT	5 FT	BOTTOM
148	26724	14766	123639	62.5	60.1	59.1	59.3
149	26905	14762	123707	62.9	59.7	59.5	59.4
150	27086	14747	123735	62.8	59.3	59.1	59.0
151	27267	14756	123803	62.9	59.6	59.2	58.9
152	27456	14872	123831	62.5	59.6	59.4	59.3
153	27638	14998	123859	62.5	59.7	59.2	59.2
154	27820	15125	123927	62.5	60.1	59.5	59.1
155	28013	15241	123955	61.2	60.1	59.4	59.2
156	28196	15369	124023	59.8	59.8	59.3	59.4
157	28377	15497	124051	59.7	59.6	58.9	59.3
158	28566	15603	124119	59.5	59.5	59.0	59.6
159	28634	15501	124147	59.8	59.3	59.0	59.4
160	28656	15339	124215	59.8	59.6	59.2	59.5
161	28685	15181	124243	60.3	59.7	59.1	59.1
162	28724	15033	124311	59.5	59.8	59.0	59.2
163	28798	14900	124339	59.9	59.7	59.2	59.6
164	28875	14793	124407	59.9	59.7	58.8	59.7
165	28964	14685	124435	60.2	59.8	59.2	59.6
166	29086	14600	124503	59.9	59.6	59.3	59.4
167	29194	14519	124531	59.5	59.8	59.4	59.4
168	29267	14413	124559	59.4	59.8	59.4	59.6
169	29356	14314	124627	59.3	59.8	59.6	59.6
170	29457	14221	124655	59.7	60.0	59.4	59.5
171	29534	14122	124723	59.5	60.1	59.8	59.7
172	29617	14017	124751	59.7	60.0	59.9	59.7
173	29695	13918	124819	59.7	60.2	59.1	60.0
174	29753	13809	124847	59.9	60.3	60.0	59.8
175	29777	13672	124915	59.8	60.2	60.2	60.0
176	29703	13499	124943	60.0	60.4	60.2	60.3
177	29535	13358	125011	59.8	60.4	60.1	60.1
178	29352	13276	125039	60.0	60.5	60.1	60.1
179	29177	13200	125107	60.1	60.4	60.0	60.4
180	28994	13130	125135	59.9	60.2	60.1	60.5
181	28813	13080	125203	59.9	60.5	60.0	60.1
182	28631	13016	125231	60.6	60.4	60.3	60.5
183	28452	12975	125259	60.7	60.7	60.2	60.4
184	28272	12937	125327	61.5	61.1	60.4	60.5
185	28095	12922	125355	62.2	61.3	60.7	60.2
186	27916	12895	125423	62.2	61.5	60.6	60.3
187	27735	12875	125451	62.4	62.3	60.9	61.2
188	27568	12857	125519	62.5	62.5	61.1	61.2
189	27395	12858	125547	62.6	62.7	62.4	60.8
190	27223	12852	125615	62.5	62.9	62.5	60.9
191	26796	12779	125803	62.5	63.0	62.6	61.0
192	26613	12795	125831	62.4	63.1	62.8	61.1
193	26442	12810	125859	62.8	63.1	62.7	61.1
194	26251	12837	125927	62.7	63.0	63.1	62.5
195	26064	12883	125956	62.7	63.1	63.1	63.1
196	25900	13033	130025	62.6	63.3	62.9	63.2

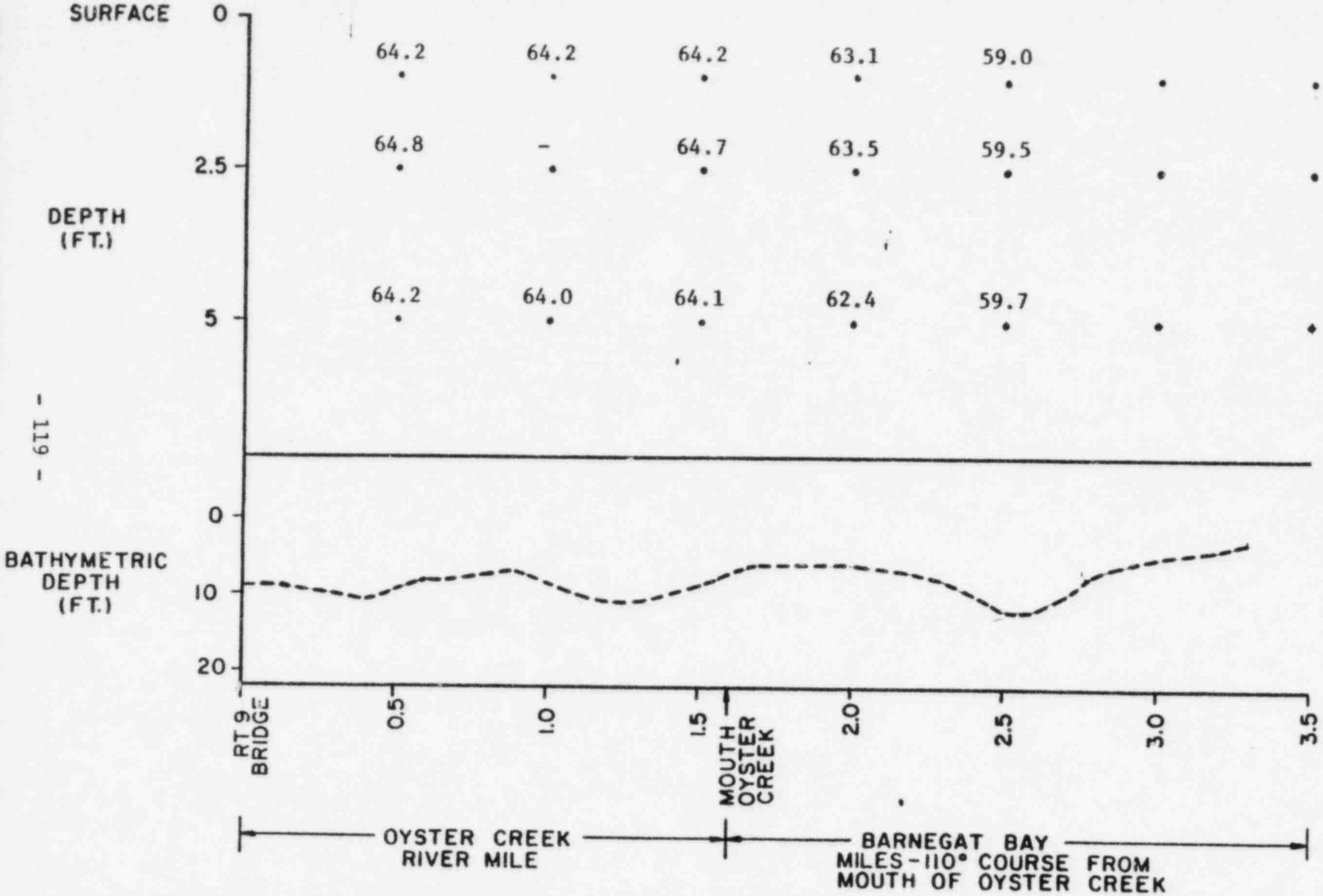
THERMAL PLUME OF October 12, 1982

INDEX	POSITION COORDINATES		TIME HHMMSS	TEMPERATURE DEG F			
				1 FT	2.5 FT	5 FT	BOTTOM
197	25857	13119	130053	62.8	63.3	63.0	63.1
198	25704	13158	130121	62.6	63.0	63.0	63.1
199	25542	13197	130149	62.4	62.9	62.7	60.8
200	25384	13235	130217	62.6	63.0	62.8	61.7
201	25254	13329	130245	62.7	63.0	63.0	62.3
202	25154	13461	130313	62.3	62.7	62.7	60.6
203	25010	13525	130341	62.2	62.8	62.3	60.4
204	24843	13533	130409	62.3	62.6	62.3	60.6
205	24704	13581	130437	62.3	62.4	62.1	61.0
206	24565	13607	130505	62.0	62.4	61.5	60.4
207	24403	13623	130533	62.1	62.6	61.4	60.5
208	24225	13610	130601	62.0	62.4	61.2	60.4
209	24056	13558	130629	62.2	62.1	60.8	60.3
210	23931	13446	130657	62.4	62.2	60.8	60.1
211	23821	13309	130725	62.8	61.8	60.5	60.3
212	23730	13160	130753	62.7	61.8	60.3	60.2
213	23647	12985	130821	62.6	62.7	61.3	60.5
214	23576	12825	130849	62.9	62.8	62.4	60.7
215	23474	12713	130917	62.5	62.4	62.2	62.2
216	23339	12807	130945	63.9	64.2	64.3	64.3
217	23211	12960	131013	64.3	64.5	64.7	65.0
218	23093	13113	131041	64.7	64.8	64.8	65.1
219	22966	13248	131109	64.4	64.5	64.0	63.3
220	22836	13365	131137	63.9	64.3	63.9	62.9
221	22707	13483	131205	64.1	64.2	63.8	63.3
222	22582	13583	131233	63.7	64.1	63.7	63.2
223	22460	13692	131301	63.9	63.7	63.8	63.3
224	22359	13815	131329	63.4	64.1	63.4	63.5
225	22247	13934	131357	63.6	63.6	63.1	62.6
226	22160	14059	131425	63.3	63.4	62.9	62.1
227	22042	14177	131453	63.2	63.3	61.8	62.0
228	21931	14299	131521	63.1	62.3	61.2	61.6
229	21832	14428	131549	62.7	61.3	60.7	60.9
230	21742	14562	131617	61.0	60.3	59.7	61.1
231	21661	14696	131645	60.9	59.9	59.0	60.9
232	21587	14827	131713	60.8	58.9	58.9	60.0
233	21498	14961	131742	58.3	58.7	58.9	59.7
234	21394	15099	131810	58.7	59.2	59.1	59.8
235	21329	15230	131838	58.6	59.0	58.8	59.9


TEMPERATURE MEASUREMENTS OF October 12, 1982
AT 1, 2.5, AND 5 FT. LEVELS
TEMPERATURE DEG F
65
64
63
62
61
60
59
58
AMBIENT TEMP
1000
2000
3000
4000
5000
6000
7000
8000
9000
DISTANCE IN PLOT UNITS


OYSTER CREEK THERMAL PLUME
October 12, 1982
WIND FROM S AT 4-5 MPH
AMBIENT BAY TEMP. 59 DEG F
CIRCULATING PUMP FLOW: 460000 GPM
DILUTION PUMP FLOW: 520000 GPM
N
BARNEGAT BAY
OYSTER CREEK CHANNEL
0 1000 YDS
SCALE
DASHED LINES REPRESENT SHALLOW AREAS (<3 FT)

LONGITUDINAL SECTIONS OF OYSTER CREEK AND BARNEGAT BAY



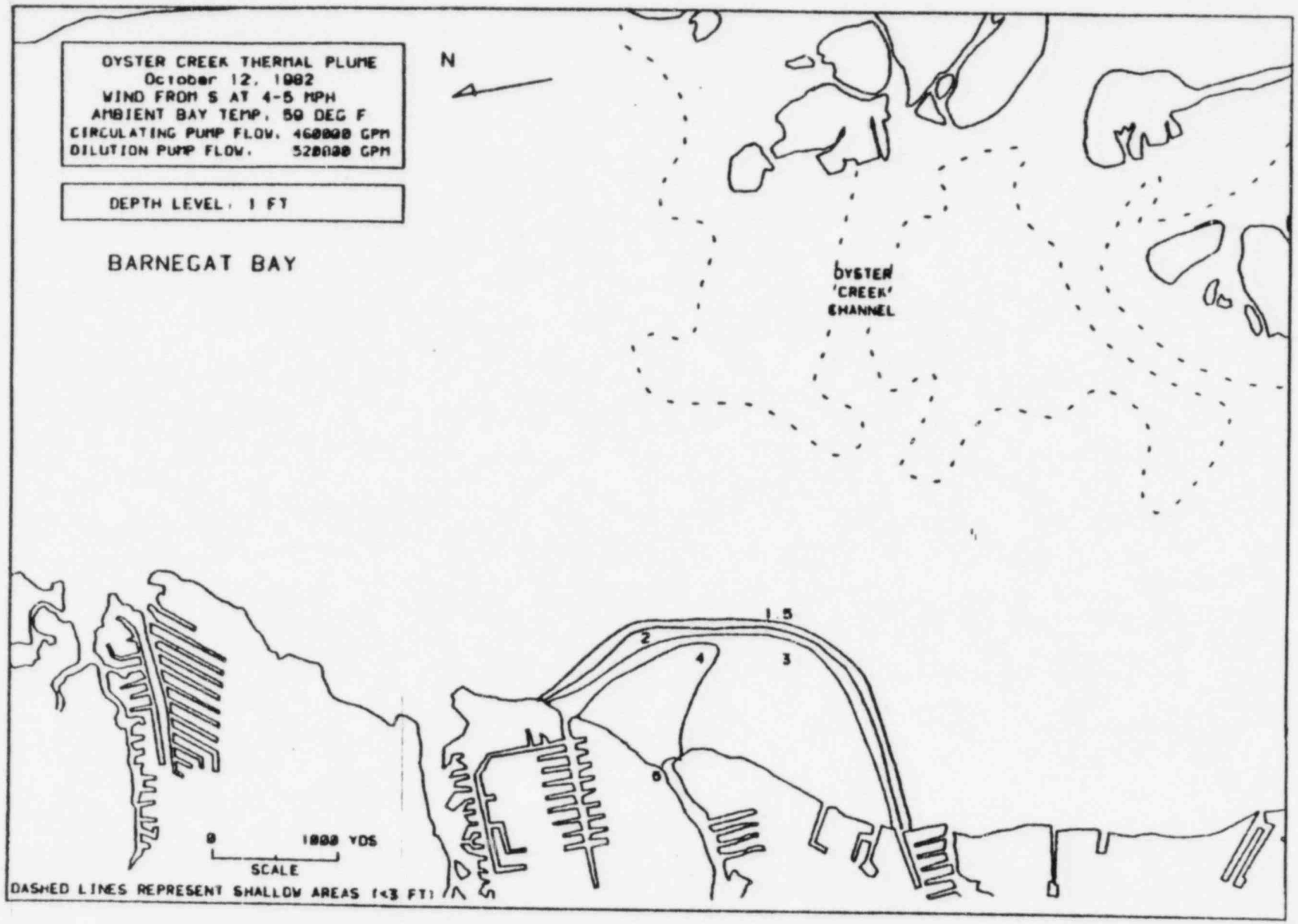
DATE October 12, 1982

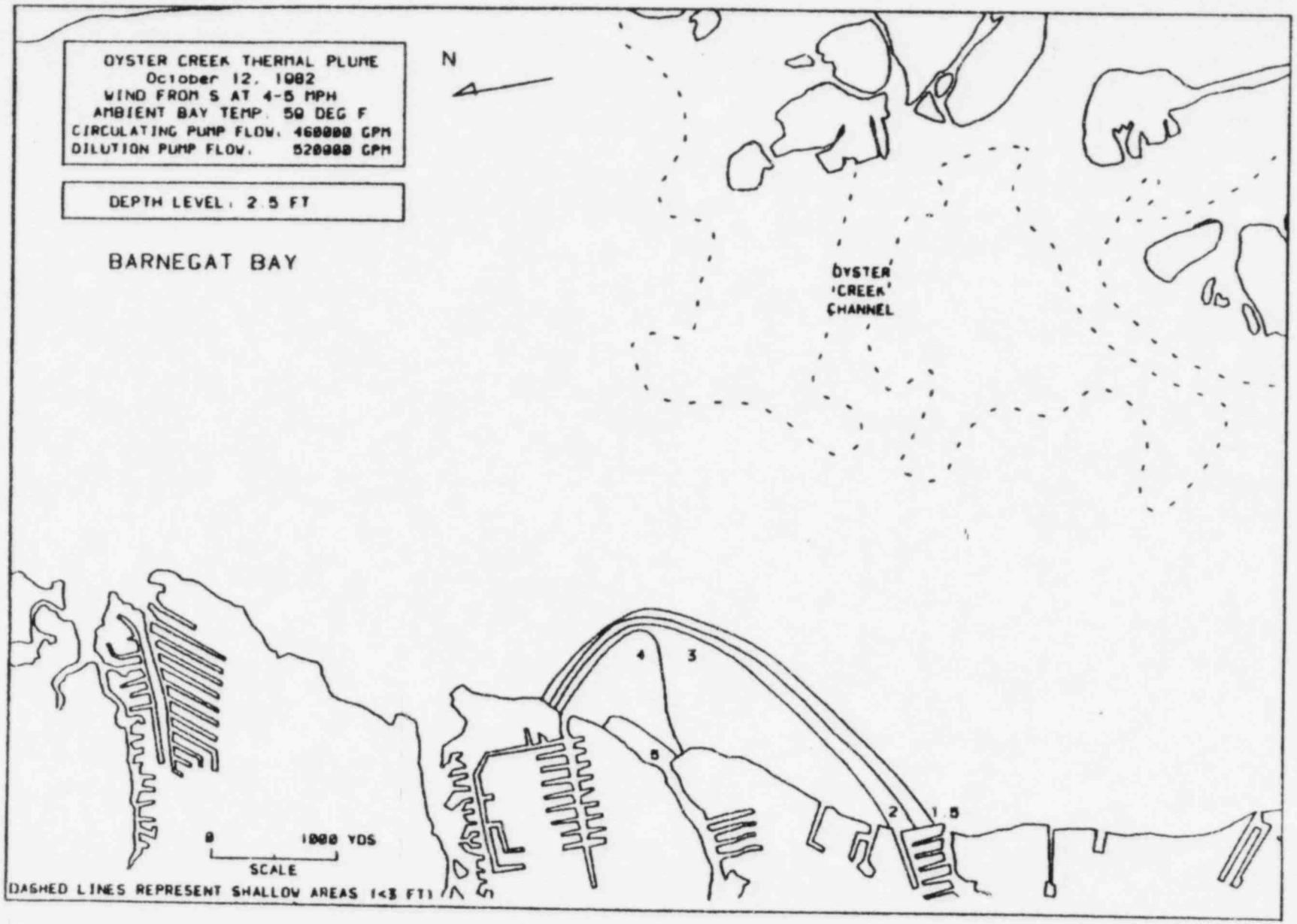
TIME 1130-1330

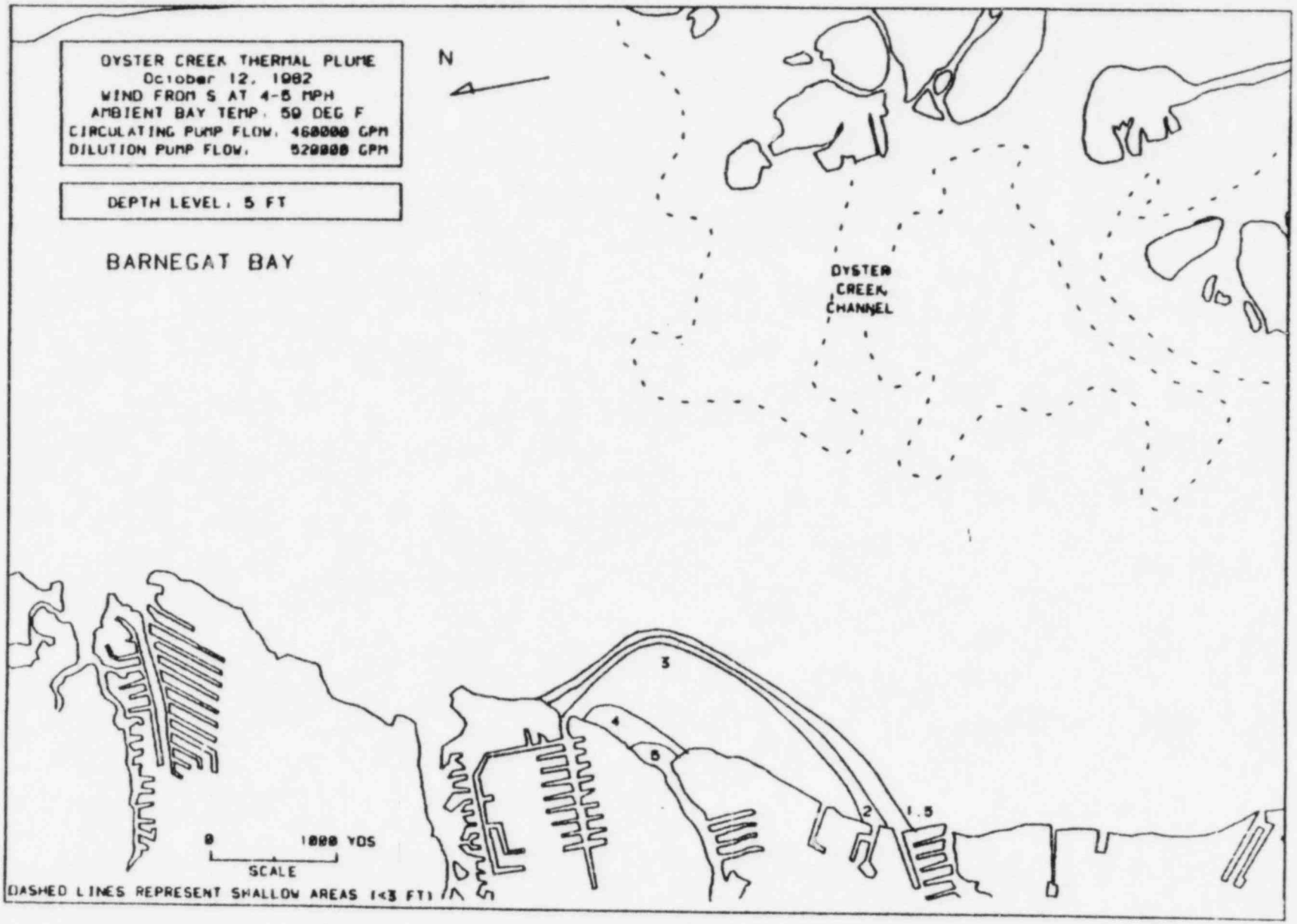
WIND S at 4-5 mph

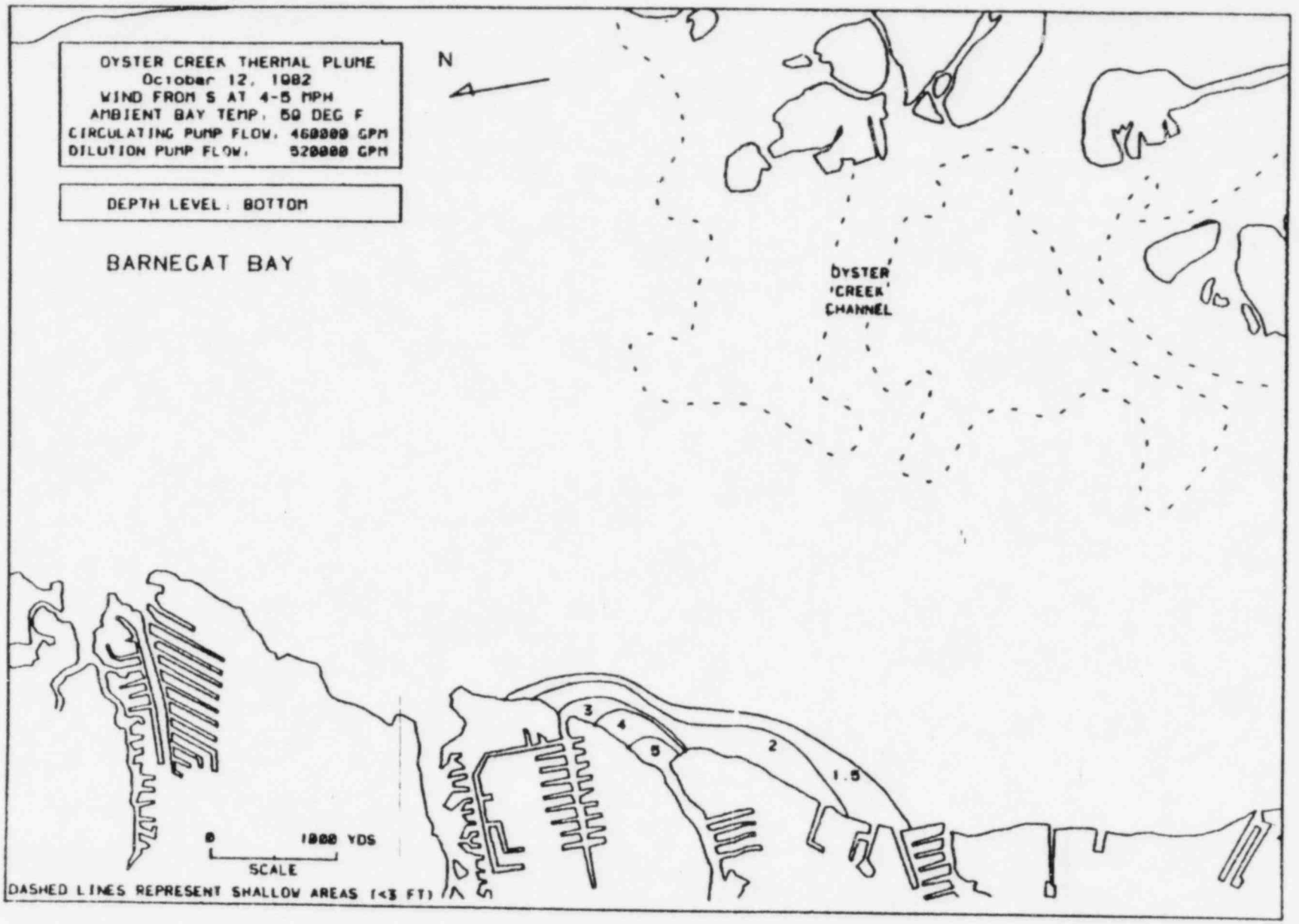
STATION PARAMETERS

ΔT	11.1 degrees F
CIRC. FLOW	460,000 gpm
DIL. FLOW	520,000 gpm


OYSTER CREEK THERMAL PLUME
October 12, 1982
WIND FROM S AT 4-5 MPH
AMBIENT BAY TEMP. 59 DEG F
CIRCULATING PUMP FLOW. 460000 GPM
DILUTION PUMP FLOW. 520000 GPM
DEPTH LEVEL: 1 FT
N
BARNEGAT BAY
OYSTER CREEK CHANNEL
1.5
2
4
3
0
0 1000 YDS
SCALE
DASHED LINES REPRESENT SHALLOW AREAS (<3 FT)


OYSTER CREEK THERMAL PLUME
October 12, 1982
WIND FROM S AT 4-5 MPH
AMBIENT BAY TEMP. 50 DEG F
CIRCULATING PUMP FLOW. 460000 GPM
DILUTION PUMP FLOW. 520000 GPM
DEPTH LEVEL: 2.5 FT
N
BARNEGAT BAY
OYSTER CREEK CHANNEL
4
3
2
1.5
0
1000 YDS
SCALE
DASHED LINES REPRESENT SHALLOW AREAS (<3 FT)


OYSTER CREEK THERMAL PLUME
October 12, 1982
WIND FROM S AT 4-5 MPH
AMBIENT BAY TEMP. 59 DEG F
CIRCULATING PUMP FLOW. 460000 GPM
DILUTION PUMP FLOW. 520000 GPM
DEPTH LEVEL: 5 FT
N
BARNEGAT BAY
OYSTER CREEK CHANNEL
3
4
5
2
1.5
0
1000 YDS
SCALE
DASHED LINES REPRESENT SHALLOW AREAS (<3 FT)


OYSTER CREEK THERMAL PLUME
October 12, 1982
WIND FROM S AT 4-5 MPH
AMBIENT BAY TEMP. 50 DEG F
CIRCULATING PUMP FLOW. 460000 GPM
DILUTION PUMP FLOW. 520000 GPM
DEPTH LEVEL: BOTTOM
N
BARNEGAT BAY
OYSTER CREEK CHANNEL
3
4
5
2
1.5
0 1000 YDS
SCALE
DASHED LINES REPRESENT SHALLOW AREAS (<3 FT)

THERMAL PLUME OF November 2, 1982

INDEX	POSITION COORDINATES		TIME HHMMSS	TEMPERATURE DEG F			
				1 FT	2.5 FT	5 FT	BOTTOM
1	24341	9401	111402	65.4	65.4	65.2	65.2
2	24321	9570	111425	65.5	65.2	65.2	65.0
3	24281	9729	111447	65.4	65.3	65.2	65.2
4	24262	9883	111509	65.0	65.0	65.4	65.4
5	24242	10044	111532	65.0	65.7	65.4	65.4
6	24101	10201	111554	65.5	65.6	65.2	65.6
7	24140	10353	111616	65.7	65.6	65.3	65.6
8	0	10499	111638	65.7	65.4	65.2	65.3
9	24058	10675	111705	65.7	65.3	65.2	65.2
10	0	10816	111728	65.7	65.5	65.4	65.2
11	23935	10974	111755	65.2	65.4	64.9	65.3
12	23868	11122	111818	65.4	65.7	65.2	65.4
13	23786	11266	111843	65.0	65.3	65.3	65.2
14	23695	11411	111905	65.5	65.3	65.2	65.3
15	23617	11546	111927	65.4	65.5	65.2	65.3
16	23560	11682	111949	65.5	65.6	64.9	65.3
17	23507	11826	112011	65.5	65.4	64.9	65.3
18	23484	11979	112033	65.6	65.4	65.1	65.2
19	0	12126	112055	65.9	65.4	65.3	65.1
20	0	12340	112122	65.6	65.7	65.3	65.4
21	23426	12531	122140	65.7	65.4	64.8	64.4
22	23422	12695	112213	65.3	64.9	64.6	64.3
23	23424	12842	112235	65.1	65.3	63.5	62.9
24	23416	12969	112257	64.6	63.9	63.0	62.4
25	23413	13132	112319	64.2	64.0	62.9	62.5
26	23410	13284	112341	64.2	63.9	62.9	62.1
27	23410	13415	112403	64.5	63.8	63.2	62.6
28	23413	13555	112425	64.2	63.9	63.2	62.7
29	23426	13699	122447	64.2	64.5	63.1	61.9
30	23442	13846	112509	63.5	63.2	62.2	61.4
31	23456	13988	112531	63.6	62.9	62.2	60.2
32	23464	14121	112553	63.5	63.4	61.5	60.0
33	23475	14270	112615	63.0	63.3	61.3	59.9
34	23484	14408	112637	64.1	63.1	61.3	60.1
35	23487	14529	112659	63.2	61.7	60.5	59.8
36	23495	14675	112721	61.1	61.1	59.7	59.6
37	23504	14818	112743	61.4	60.1	59.7	58.9
38	23514	14958	112805	61.0	59.9	59.3	58.8
39	23524	15088	112827	60.9	59.5	59.3	58.4
40	23532	15222	112849	60.6	59.7	59.1	58.6
41	23535	15352	112911	60.1	59.2	58.6	58.0
42	23534	15480	112933	59.7	59.5	58.0	58.0
43	23546	15608	112955	59.8	59.1	58.2	57.8
44	23563	15744	113017	59.3	58.9	57.9	58.4
45	23581	15872	113039	59.4	58.9	58.3	58.2
46	23485	15963	113101	59.2	58.7	58.0	58.4
47	23360	15957	113123	59.2	58.5	58.1	58.0
48	23247	15948	113145	59.0	58.2	57.8	58.3
49	23034	15928	113208	59.1	58.1	57.8	58.2

THERMAL PLUME OF November 2, 1982

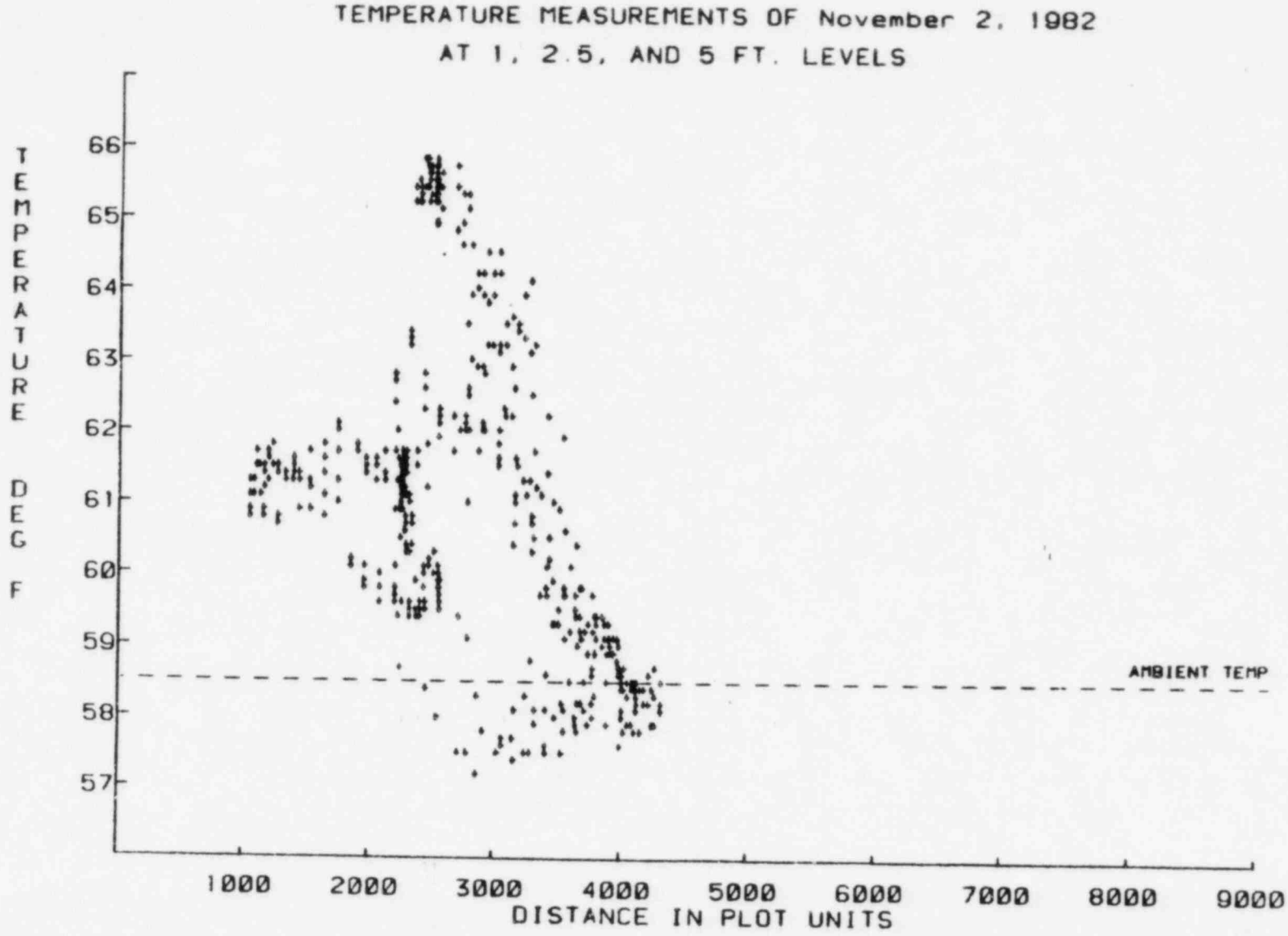
INDEX	POSITION COORDINATES		TIME HHMMSS	TEMPERATURE DEG F			
				1 FT	2.5 FT	5 FT	BOTTOM
50	22807	15901	113230	59.3	58.0	58.0	58.1
51	22761	15879	113252	59.8	58.1	57.6	57.9
52	22686	15857	113315	61.2	58.1	57.9	57.6
53	22448	15843	113338	61.1	58.3	57.5	57.8
54	22284	15818	113400	61.6	58.1	57.4	57.6
55	22093	15788	113424	62.3	57.7	57.6	57.6
56	0	15751	113440	62.4	57.7	57.5	57.3
57	21717	15713	113516	61.7	58.3	57.2	57.6
58	21561	15694	113538	62.0	59.1	57.5	57.4
59	21410	15691	113600	62.0	59.4	57.5	57.5
60	0	15699	113623	61.9	60.1	57.2	57.6
61	21036	15694	113650	61.9	60.1	58.0	57.5
62	20847	15695	113713	61.8	61.2	58.4	57.5
63	20669	15699	113736	61.7	61.5	59.4	57.5
64	20483	15701	113800	61.6	61.5	60.4	58.1
65	20294	15699	113822	61.7	60.9	60.1	58.2
66	20115	15699	113844	61.3	61.7	61.4	61.3
67	19952	15704	113906	61.6	61.3	61.5	60.7
68	19754	15733	113929	61.4	61.6	61.5	61.7
69	19574	15760	113951	61.8	61.7	61.8	61.5
70	19236	15757	114027	62.0	62.1	61.7	61.2
71	19022	15727	114055	61.8	61.6	61.4	59.8
72	18804	15666	114123	61.7	61.7	61.3	60.9
73	18606	15566	114151	61.6	61.5	61.4	61.8
74	18465	15423	114219	60.8	60.8	60.7	60.9
75	18322	15278	114247	60.8	60.8	60.9	60.9
76	18151	15104	114315	60.8	60.9	60.8	61.1
77	18017	15346	114343	61.1	61.1	61.3	61.4
78	17915	15552	114411	61.1	61.3	61.3	61.4
79	17793	15747	114439	61.7	61.5	61.5	61.6
80	17675	15947	114507	61.1	61.5	61.5	61.5
81	17561	16151	114535	61.4	61.5	61.2	61.6
82	17445	16354	114603	61.6	61.3	61.7	61.7
83	17337	16559	114631	61.5	61.8	61.5	61.6
84	17243	16760	114659	61.5	61.4	61.5	61.8
85	17156	16981	114727	61.3	61.3	61.4	61.3
86	17077	17197	114755	61.3	61.3	61.3	61.5
87	16992	17418	114823	61.3	60.9	61.4	61.5
88	16991	17617	114851	60.9	61.2	61.2	61.8
89	17063	17815	114919	61.1	61.1	60.8	61.4
90	17113	18022	114947	61.0	61.0	61.3	61.2
91	17158	18229	115015	60.1	60.2	60.1	60.2
92	17221	18428	115043	60.1	59.9	59.8	60.1
93	17309	18628	115111	59.8	59.6	60.0	59.9
94	17414	18815	115139	59.7	59.8	59.6	59.5
95	17518	18996	115207	59.6	59.5	59.4	59.6
96	17629	19178	115235	59.6	59.5	59.6	59.3
97	17761	19320	115303	59.7	59.9	59.5	59.3
98	17882	19214	115331	59.9	59.5	59.6	59.7

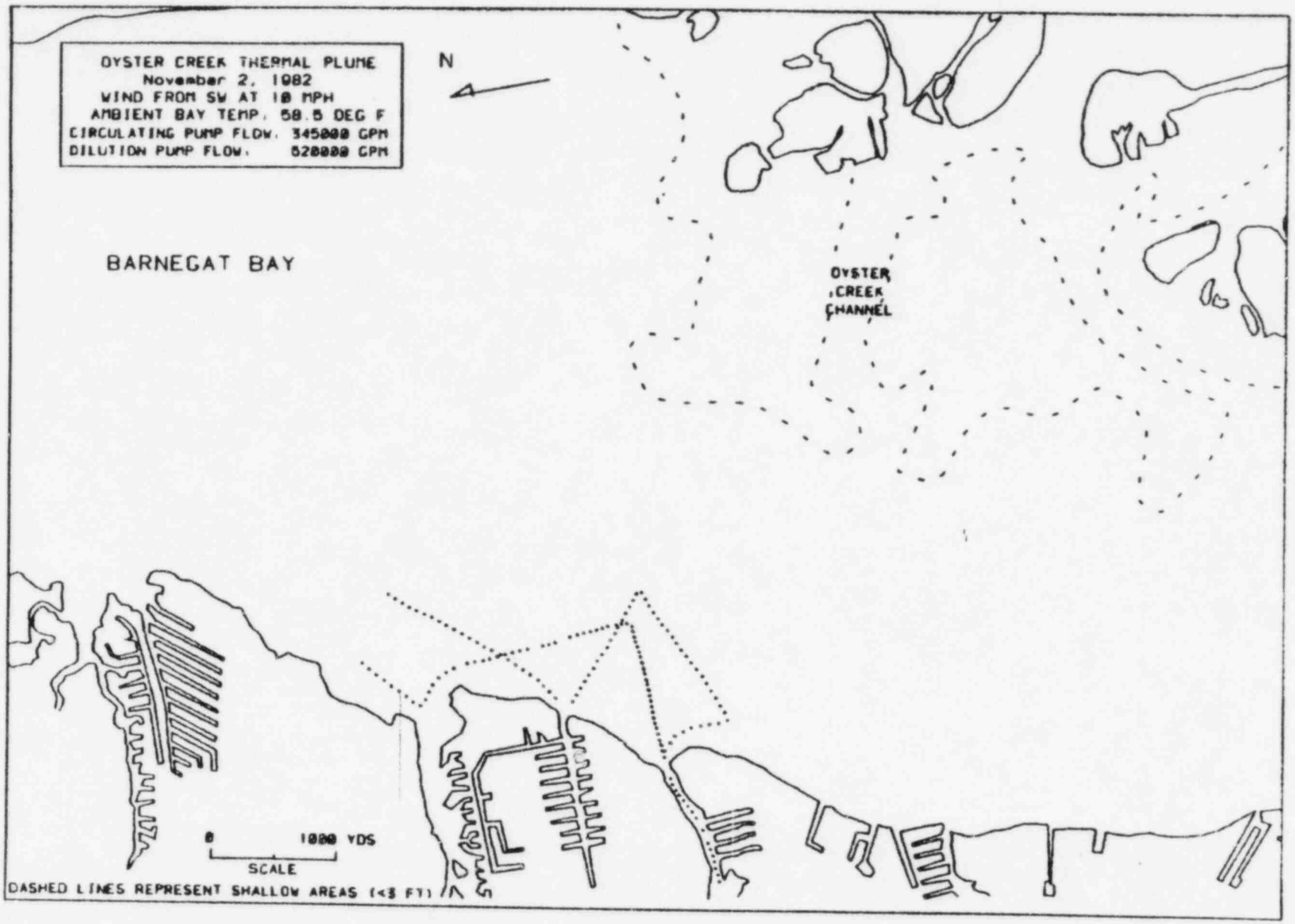
THERMAL PLUME OF November 2, 1982

INDEX	POSITION COORDINATES		TIME HHMMSS	TEMPERATURE DEG F			
				1 FT	2.5 FT	5 FT	BOTTOM
99	18011	19074	115359	59.8	59.9	60.0	59.1
100	18139	18943	115427	60.0	59.9	59.8	59.6
101	18225	18772	115455	60.3	60.0	60.0	59.7
102	18309	18597	115523	60.1	60.1	60.2	59.7
103	18387	18420	115551	60.0	60.1	59.8	59.4
104	18481	18248	115619	59.6	59.5	59.4	59.4
105	18576	18074	115647	59.9	59.5	59.5	59.3
106	18669	17905	115715	60.8	60.7	60.4	59.3
107	18774	17742	115743	61.1	61.0	60.3	59.1
108	18877	17578	115811	61.7	61.4	60.3	58.5
109	18993	17441	115839	61.4	61.1	60.7	58.0
110	19118	17287	115907	61.2	61.1	60.6	57.6
111	19255	17149	115935	61.1	61.5	60.8	57.1
112	19366	16994	120003	61.6	61.4	60.6	57.2
113	19479	16831	120031	61.7	61.6	60.9	57.3
114	19610	16675	120059	61.1	61.3	61.3	57.3
115	19739	16509	120127	61.1	61.4	61.1	59.6
116	19866	16348	120155	61.0	61.0	61.2	60.9
117	19989	16188	120223	61.2	61.2	61.5	60.7
118	20108	16025	120251	60.9	61.3	61.3	61.1
119	20240	15885	120319	61.2	61.1	60.5	58.8
120	20387	15727	120347	61.1	61.1	61.2	58.5
121	20506	15552	120418	61.1	61.0	58.7	57.7
122	20634	15385	120446	61.3	61.0	60.9	59.2
123	20758	15221	120514	61.2	61.3	61.0	57.9
124	20882	15061	120543	61.4	61.3	60.9	57.8
125	21020	14894	120612	61.5	61.2	59.6	57.9
126	21088	14723	120641	61.6	61.3	59.4	58.1
127	21189	14551	120709	62.0	62.0	61.3	58.5
128	21281	14360	120737	62.4	62.8	62.7	62.2
129	0	14139	120808	62.8	63.1	63.5	63.2
130	0	13912	120841	63.8	63.9	63.6	61.6
131	0	14023	120914	64.0	64.0	64.3	64.0
132	21640	14180	120947	63.2	63.4	63.3	63.3
133	21785	14343	121015	62.6	62.8	62.3	60.6
134	21924	14498	121043	62.3	62.2	62.1	59.6
135	22067	14641	121111	62.2	62.2	61.7	57.7
136	22211	14783	121139	62.5	62.6	61.0	57.3
137	22371	14935	121207	62.8	62.0	57.8	57.5
139	22513	15096	121236	63.2	62.0	57.5	57.4
139	22660	15243	121304	62.6	60.4	57.7	57.6
140	22844	15406	121333	62.5	58.8	57.5	57.6
141	22982	15576	121402	62.2	58.6	57.5	57.9
142	23139	15731	121430	61.9	58.2	57.5	58.3
143	23258	15891	121459	59.4	59.4	57.9	58.2
144	23419	16051	121528	59.7	58.6	58.2	58.2
145	23546	16218	121557	58.9	58.5	57.9	58.1
146	23693	16377	121625	58.6	58.5	58.1	58.5
147	23828	16534	121653	58.5	58.5	58.2	58.1

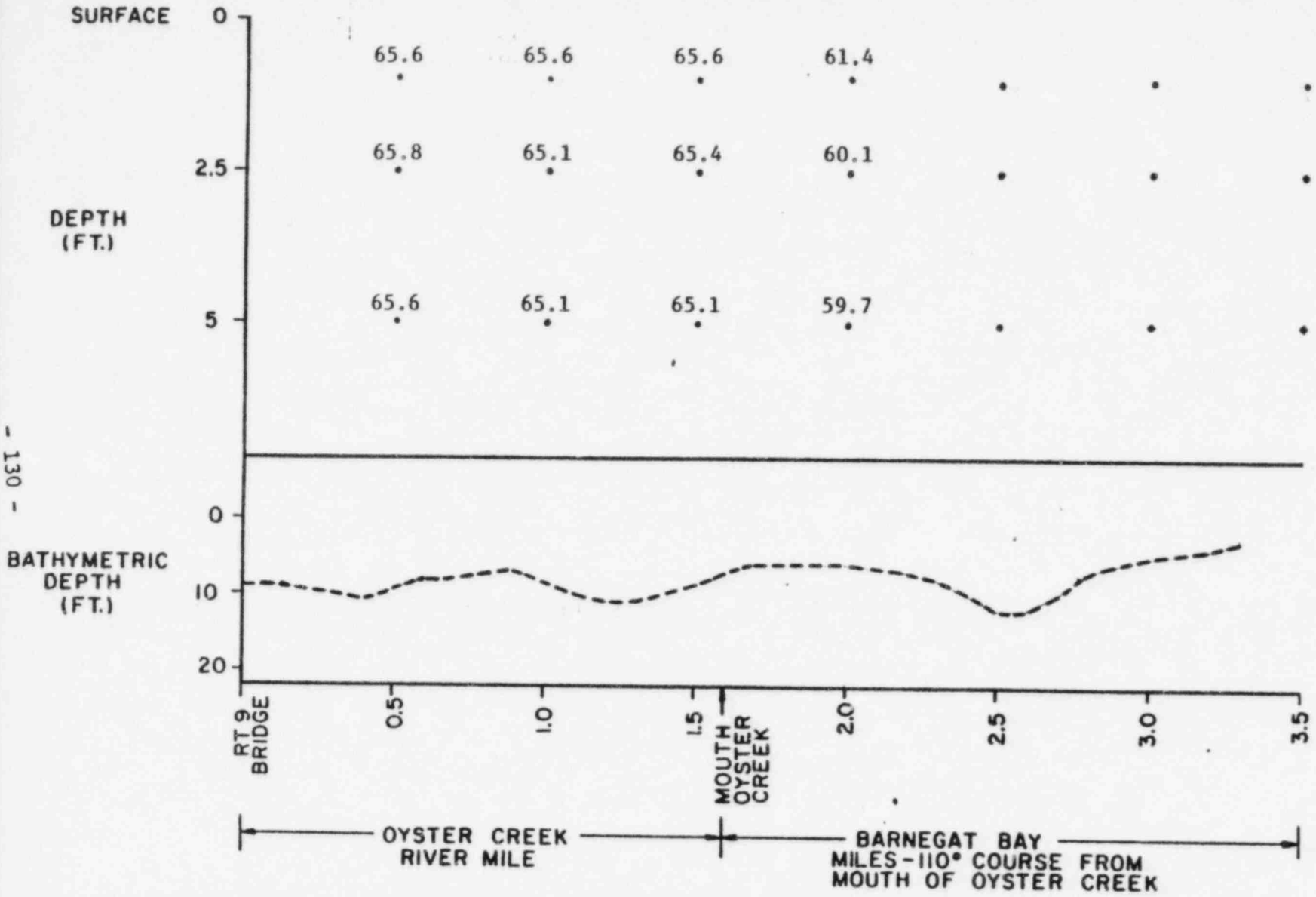
THERMAL PLUME OF November 2, 1982

INDEX	POSITION COORDINATES		TIME HHMMSS	TEMPERATURE DEG F			
				1 FT	2.5 FT	5 FT	BOTTOM
148	23970	16688	121721	58.4	58.4	57.9	58.4
149	24094	16722	121749	58.5	58.2	58.1	58.4
150	24115	16545	121817	58.3	58.7	57.9	58.4
151	24140	16373	121845	58.6	58.2	58.2	58.4
152	24181	16202	121913	58.2	58.4	58.2	58.8
153	24228	16040	121941	58.4	58.4	57.8	58.4
154	24273	15879	122009	58.3	58.4	58.1	58.2
155	24344	15728	122037	58.4	58.5	57.8	58.3
156	24407	15566	122105	58.5	58.4	57.9	58.3
157	24451	15403	122133	58.3	58.5	57.9	58.3
158	24504	15233	122201	58.7	58.4	57.8	58.3
159	24571	15077	122229	58.4	58.4	58.0	58.2
160	24645	14917	122257	58.6	58.7	57.6	58.1
161	24716	14756	122325	58.7	58.6	59.0	59.0
162	24790	14589	122353	58.8	59.1	59.1	59.1
163	24854	14418	122421	58.9	58.9	59.1	59.5
164	24906	14223	122449	58.9	59.0	59.1	59.1
165	24977	14061	122517	59.1	59.1	59.3	59.6
166	25031	13871	122545	59.1	59.1	59.3	59.4
167	25099	13702	122613	59.0	59.4	59.4	59.5
168	25180	13508	122641	59.4	59.1	59.3	59.7
169	24903	13417	122709	59.2	59.4	59.8	59.5
170	24676	13380	122737	59.7	59.8	59.8	60.2
171	24461	13327	122805	60.2	60.2	60.5	60.6
172	24228	13279	122833	60.3	60.7	60.8	60.8
173	24015	13169	122901	61.0	61.1	60.7	61.3
174	23799	13065	122929	61.6	61.5	61.8	61.8
175	23640	12891	122957	62.1	62.1	62.0	61.4
176	23483	12692	123025	62.2	62.1	62.0	62.1


TEMPERATURE MEASUREMENTS OF November 2, 1982
AT 1, 2.5, AND 5 FT. LEVELS
TEMPERATURE DEG F
66
65
64
63
62
61
60
59
58
57
AMBIENT TEMP
1000
2000
3000
4000
5000
6000
7000
8000
9000
DISTANCE IN PLOT UNITS


OYSTER CREEK THERMAL PLUME
November 2, 1982
WIND FROM SW AT 18 MPH
AMBIENT BAY TEMP. 58.5 DEG F
CIRCULATING PUMP FLOW. 345000 GPM
DILUTION PUMP FLOW. 520000 GPM
N
BARNEGAT BAY
OYSTER CREEK CHANNEL
0 1000 YDS
SCALE
DASHED LINES REPRESENT SHALLOW AREAS (<3 FT)

LONGITUDINAL SECTIONS OF OYSTER CREEK AND BARNEGAT BAY



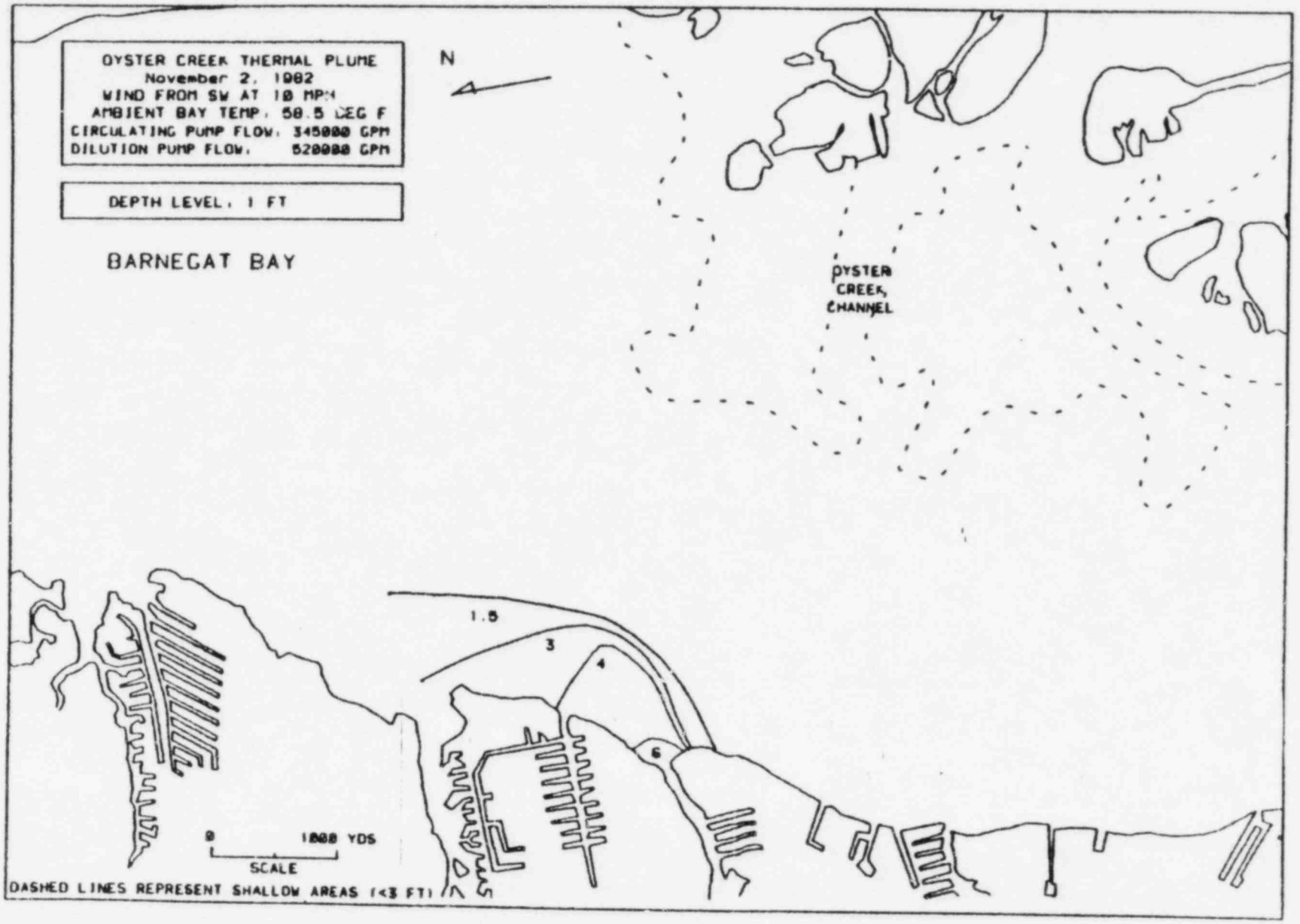
DATE November 2, 1982

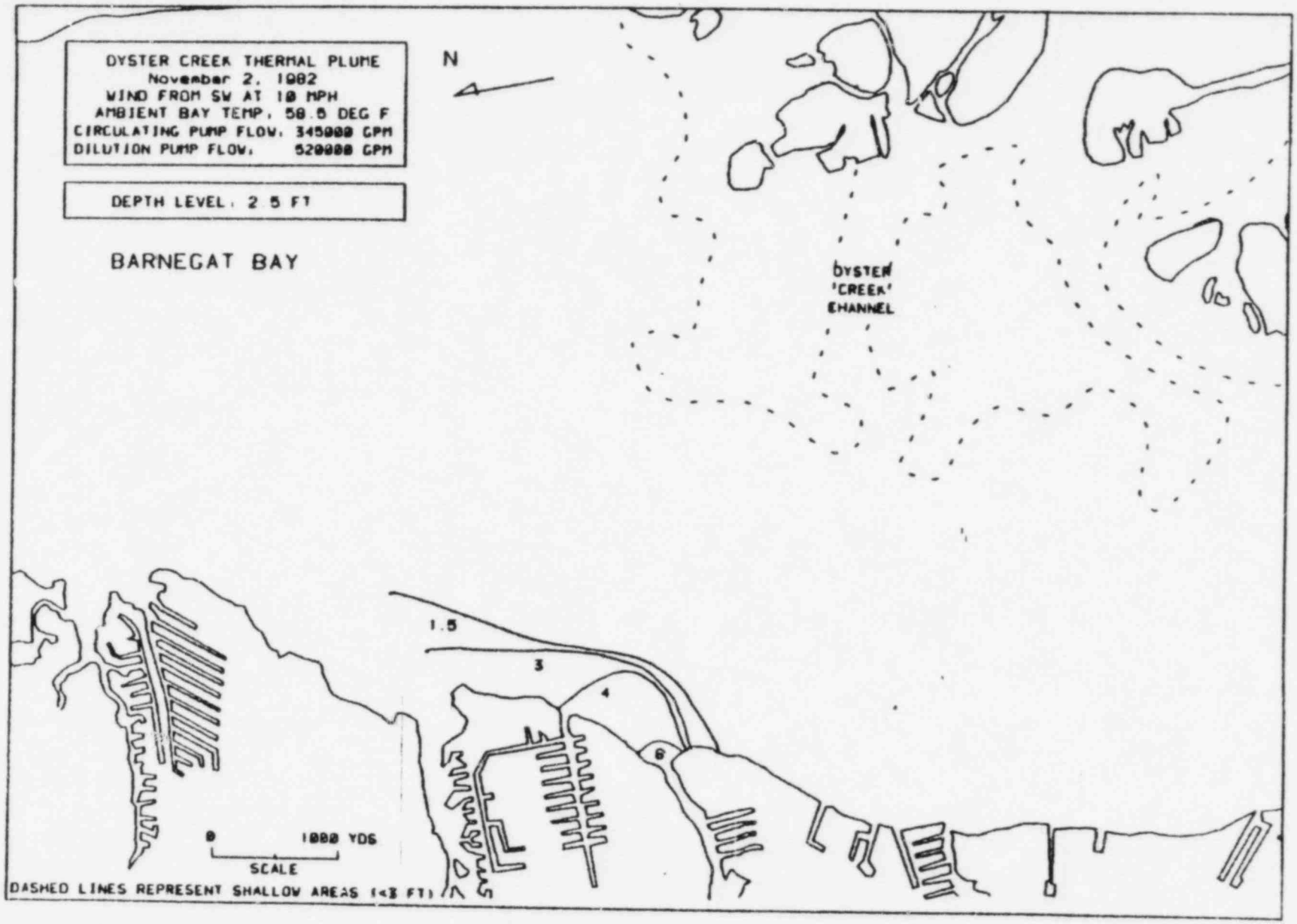
TIME 1100-1230

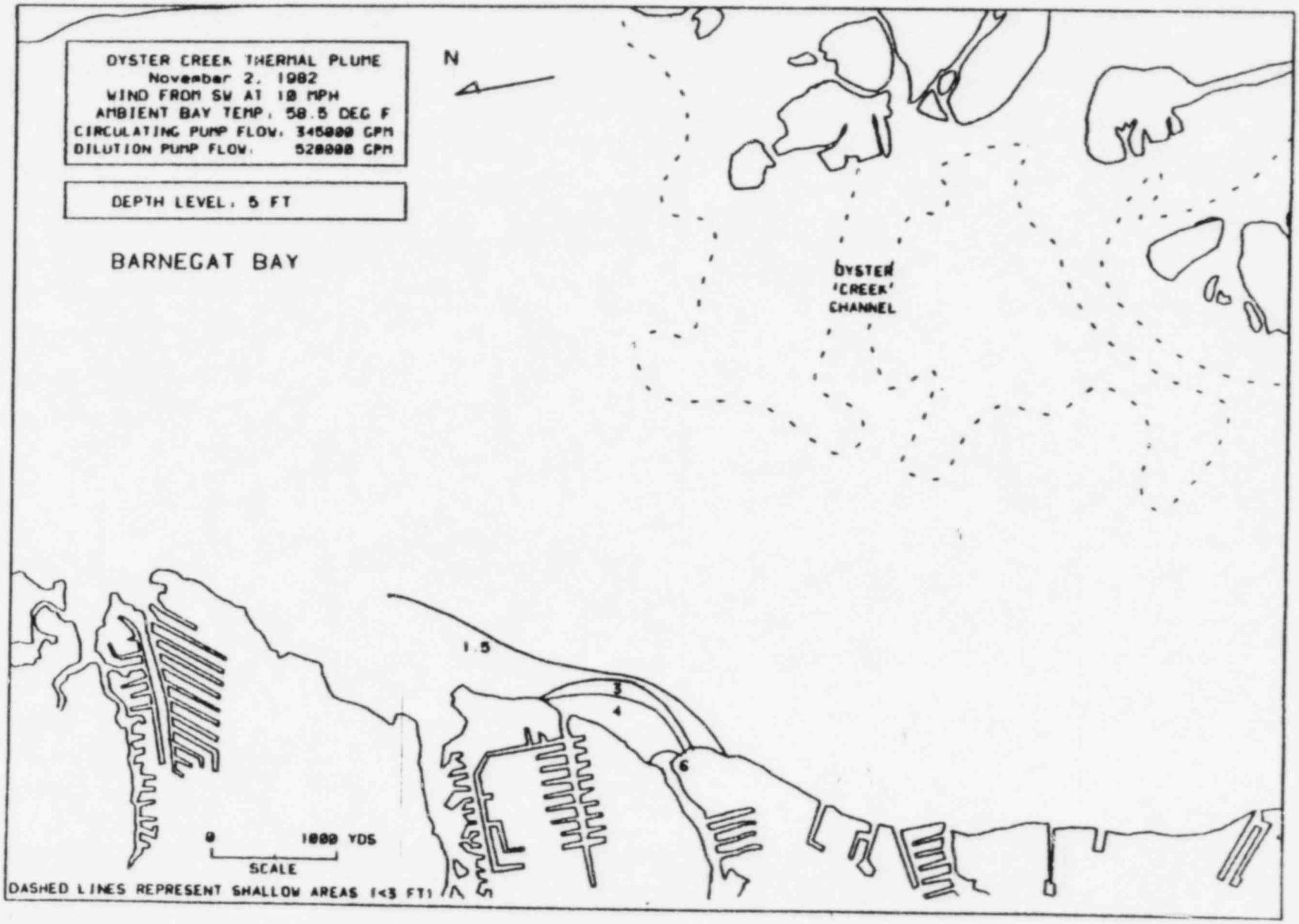
WIND SW at 10 mph

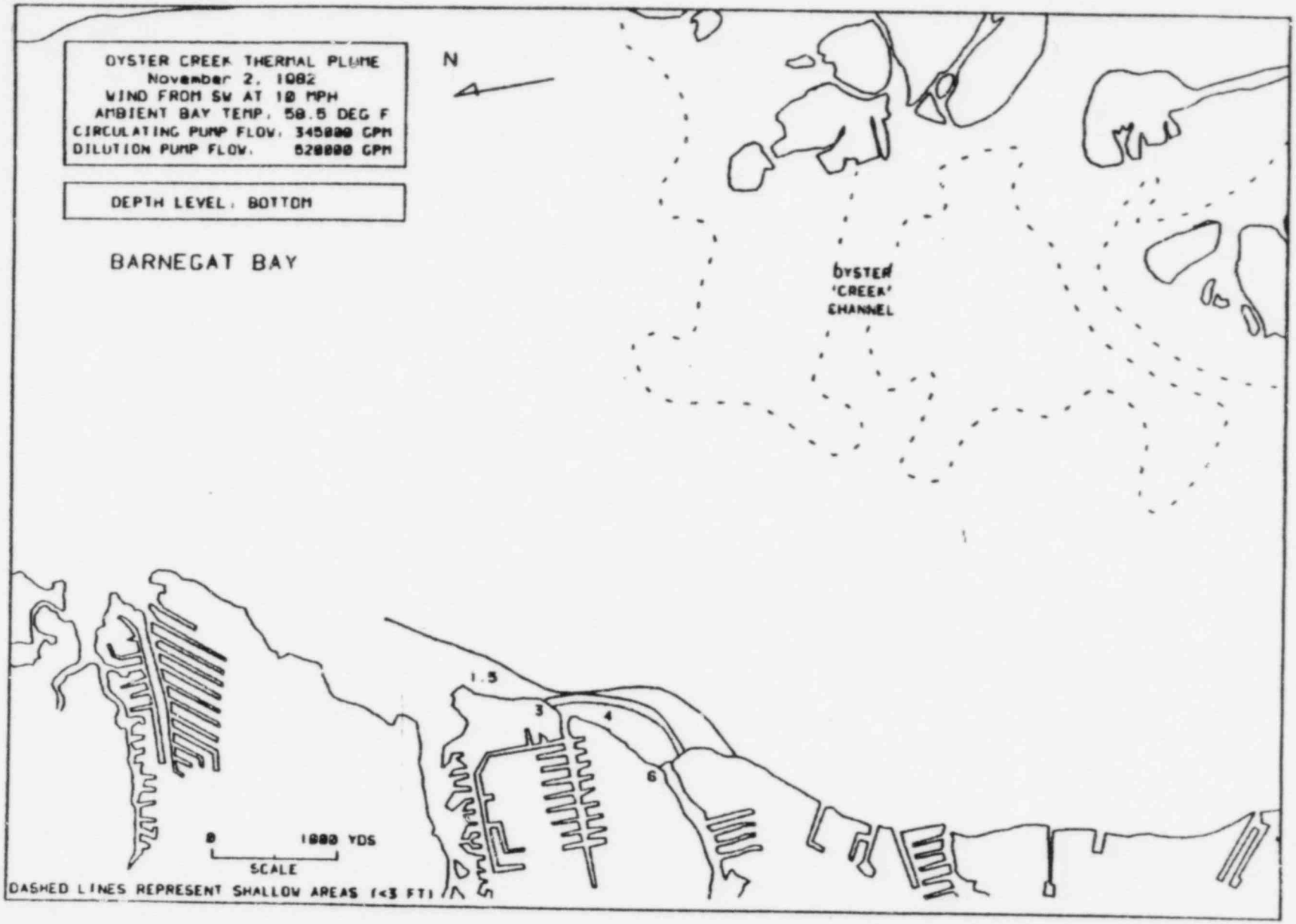
STATION PARAMETERS

ΔT	14.7 degrees F
CIRC. FLOW	345,000 gpm
DIL. FLOW	520,000 gpm


OYSTER CREEK THERMAL PLUME
November 2, 1982
WIND FROM SW AT 10 MPH
AMBIENT BAY TEMP. 58.5 DEG F
CIRCULATING PUMP FLOW: 345000 GPM
DILUTION PUMP FLOW: 520000 GPM
DEPTH LEVEL: 1 FT
N
BARNEGAT BAY
OYSTER CREEK CHANNEL
1.5
3
4
6
0
1000 YDS
SCALE
DASHED LINES REPRESENT SHALLOW AREAS (<3 FT)


OYSTER CREEK THERMAL PLUME
November 2, 1982
WIND FROM SW AT 10 MPH
AMBIENT BAY TEMP. 58.5 DEG F
CIRCULATING PUMP FLOW: 345000 GPM
DILUTION PUMP FLOW: 520000 GPM
DEPTH LEVEL: 2.5 FT
N
BARNEGAT BAY
OYSTER CREEK CHANNEL
1.5
3
4
6
0
1000 YDS
SCALE
DASHED LINES REPRESENT SHALLOW AREAS (<3 FT)


OYSTER CREEK THERMAL PLUME
November 2, 1982
WIND FROM SW AT 18 MPH
AMBIENT BAY TEMP. 58.5 DEG F
CIRCULATING PUMP FLOW: 345000 GPM
DILUTION PUMP FLOW: 528000 GPM
DEPTH LEVEL: 5 FT
N
BARNEGAT BAY
OYSTER CREEK CHANNEL
1.5
3
4
6
0 1000 YDS
SCALE
DASHED LINES REPRESENT SHALLOW AREAS (<3 FT)


OYSTER CREEK THERMAL PLUME
November 2, 1982
WIND FROM SW AT 10 MPH
AMBIENT BAY TEMP. 58.5 DEG F
CIRCULATING PUMP FLOW. 345000 GPM
DILUTION PUMP FLOW. 520000 GPM
DEPTH LEVEL: BOTTOM
N
BARNEGAT BAY
OYSTER CREEK CHANNEL
1.5
3
4
6
0
1000 YDS
SCALE
DASHED LINES REPRESENT SHALLOW AREAS (<3 FT)

THERMAL PLUME OF December 6, 1982

INDEX	POSITION COORDINATES		TIME HHMMSS	TEMPERATURE DEG F			
				1 FT	2.5 FT	5 FT	BOTTOM
1	24385	9418	120946	62.5	62.4	62.6	62.8
2	0	9549	121003	62.3	62.4	62.7	62.4
3	24332	9714	121024	62.5	62.1	62.3	62.4
4	0	9861	121043	62.3	62.2	62.2	62.4
5	0	10028	121104	62.2	61.8	62.4	62.4
6	24241	10183	121125	61.8	61.9	62.4	62.3
7	0	10305	121141	61.9	62.0	62.5	62.3
8	0	10467	121202	61.9	62.4	62.3	62.1
9	0	10621	121223	61.9	61.9	62.1	62.3
10	0	10772	121244	62.0	62.0	62.2	62.4
11	0	10920	121305	61.9	62.0	62.4	62.4
12	0	11064	121326	61.9	61.8	62.4	62.0
13	0	11201	121347	61.8	62.0	62.2	62.2
14	0	11472	121421	61.9	61.9	62.5	62.4
15	0	11665	121448	61.8	61.7	62.3	62.3
16	23521	11869	121515	61.7	61.7	62.2	62.3
17	0	12038	121537	61.7	61.7	62.1	62.0
18	0	12259	121604	61.4	61.7	62.2	62.1
19	0	12496	121631	61.8	62.1	62.2	62.0
20	23443	12694	121658	61.1	60.3	60.8	59.0
21	23483	12867	121720	60.0	59.6	58.9	57.3
22	23515	13096	121742	59.8	59.0	57.0	55.8
23	23544	13096	121804	59.5	57.7	55.4	55.1
24	23579	13389	121826	59.0	57.3	55.0	55.0
25	23613	13567	121848	58.7	57.6	55.3	54.9
26	23647	13756	121910	58.4	57.6	55.9	54.8
27	23685	13910	121932	58.1	57.5	55.6	54.8
28	23748	14200	122002	58.3	57.0	54.4	54.5
29	23777	14418	122030	57.6	56.4	54.0	54.1
30	23813	14632	122058	57.4	56.2	54.0	53.8
31	23875	14846	122126	56.7	55.1	53.9	54.0
32	23883	15049	122154	56.2	55.1	53.9	54.0
33	23908	15252	122222	56.1	54.7	53.9	53.6
34	23948	15451	122250	56.1	54.3	53.8	53.4
35	23965	15645	122318	56.1	54.5	53.8	53.2
36	23991	15847	122346	55.9	53.5	53.6	53.3
37	24017	16047	122414	56.0	53.6	53.6	53.4
38	24066	16237	122442	55.6	54.1	53.8	53.6
39	24125	16428	122510	53.2	53.1	53.3	54.1
40	24156	16615	122538	53.0	53.2	53.3	54.2
41	24188	16801	122606	52.7	53.1	53.5	54.2
42	24173	16974	122634	52.8	53.0	53.9	54.2
43	24000	16882	122702	53.0	53.0	54.0	54.2
44	23865	16734	122730	52.9	52.0	53.5	54.0
45	23721	16587	122758	53.0	52.7	53.5	53.7
46	23582	16445	122826	53.0	52.9	53.3	53.6
47	23428	16300	122854	54.3	53.1	52.9	53.5
48	23309	16164	122922	54.9	53.9	53.3	53.1
49	23186	16028	122951	55.1	54.3	53.4	53.2

THERMAL PLUME OF December 6, 1982

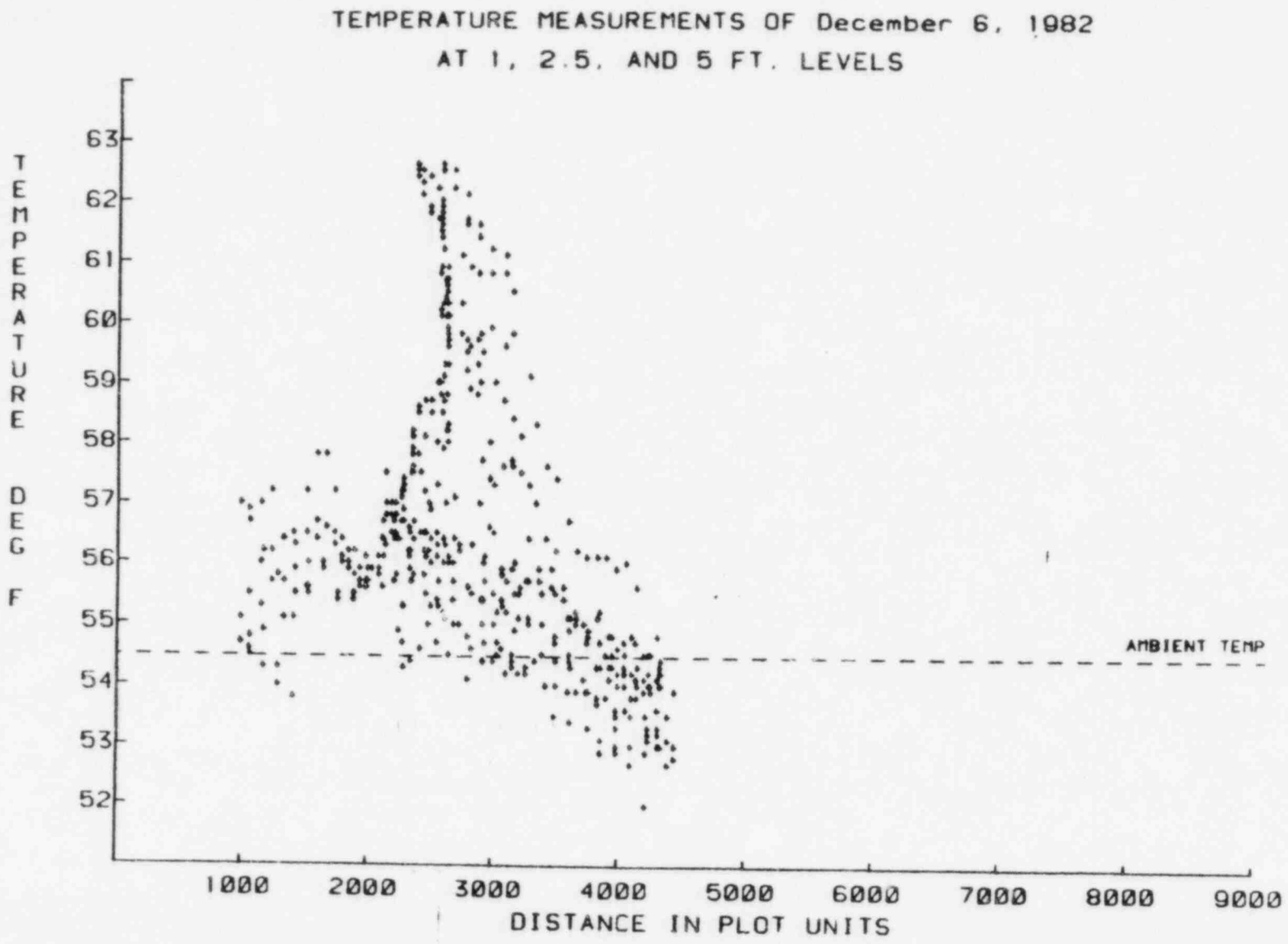
INDEX	POSITION COORDINATES		TIME HHMMSS	TEMPERATURE DEG F			
				1 FT	2.5 FT	5 FT	BOTTOM
50	22943	15886	123010	55.5	54.7	53.5	53.2
51	0	15733	123049	55.7	54.0	53.2	53.4
52	0	15563	123122	55.4	55.1	54.2	53.3
53	22302	15380	123155	55.0	55.4	54.6	53.8
54	22203	15250	123223	56.1	55.7	54.7	54.0
55	0	15001	123251	56.3	56.0	55.2	54.2
56	21918	14923	123332	57.1	56.4	55.0	54.4
57	21845	14825	123348	57.0	56.3	55.1	54.4
58	21770	14730	123404	57.3	56.3	54.7	54.6
59	21693	14638	123420	57.0	56.2	55.0	54.5
60	21614	14550	123436	57.5	56.5	54.6	54.5
61	21528	14453	123452	57.5	55.7	54.4	54.9
62	21450	14363	123508	57.2	55.3	54.7	54.7
63	0	14238	123528	57.1	55.7	54.5	54.8
64	0	14111	123549	56.3	56.0	55.3	55.4
65	21450	13956	123610	57.5	56.8	56.3	55.5
66	0	13877	123627	57.4	56.4	55.9	55.6
67	0	14115	123653	56.6	56.0	55.5	55.4
68	21303	14363	123726	56.7	56.4	55.7	55.5
69	21241	14570	123754	56.4	56.4	54.9	54.8
70	21186	14760	123822	56.7	55.3	54.3	54.7
71	21129	14963	123850	56.6	56.1	56.2	54.8
72	21044	15181	123919	56.7	56.4	55.8	54.8
73	0	15382	123948	56.7	56.3	55.2	54.8
74	20911	15636	124021	56.5	56.1	55.5	54.4
75	20833	15849	124050	56.4	56.0	55.3	54.5
76	20784	16049	124118	56.3	56.1	55.4	54.3
77	20732	16251	124146	56.4	56.0	55.2	54.0
78	20658	16459	124215	56.1	56.0	54.5	53.9
79	20676	16664	124243	56.3	56.2	55.0	54.0
80	20729	16869	124311	56.3	55.5	54.6	53.5
81	20773	17070	124339	56.0	55.4	54.4	55.7
82	20783	17277	124407	56.5	55.5	54.4	53.2
83	20841	17483	124435	55.7	55.2	54.2	53.6
84	20808	17677	124503	55.5	55.1	54.2	54.3
85	20875	17857	124531	55.7	54.3	54.2	54.3
86	20680	17708	124559	54.4	54.5	54.3	54.2
87	20554	17627	124627	55.2	54.7	54.5	54.0
88	20418	17470	124655	55.4	55.0	54.4	53.6
89	20290	17313	124723	55.6	54.8	54.1	53.6
90	20162	17149	124751	56.0	55.7	55.4	54.6
91	20035	16984	124819	55.7	55.7	55.3	54.3
92	19926	16808	124847	56.5	56.2	55.8	54.7
93	19827	16631	124915	56.5	56.2	55.9	54.9
94	19723	16460	124943	56.8	56.4	55.8	55.0
95	19618	16297	125011	56.4	55.6	55.6	55.3
96	19499	16129	125039	55.9	55.7	55.7	55.4
97	19349	15993	125107	55.4	55.5	55.4	55.2
98	19169	15880	125135	55.4	55.5	55.4	55.5

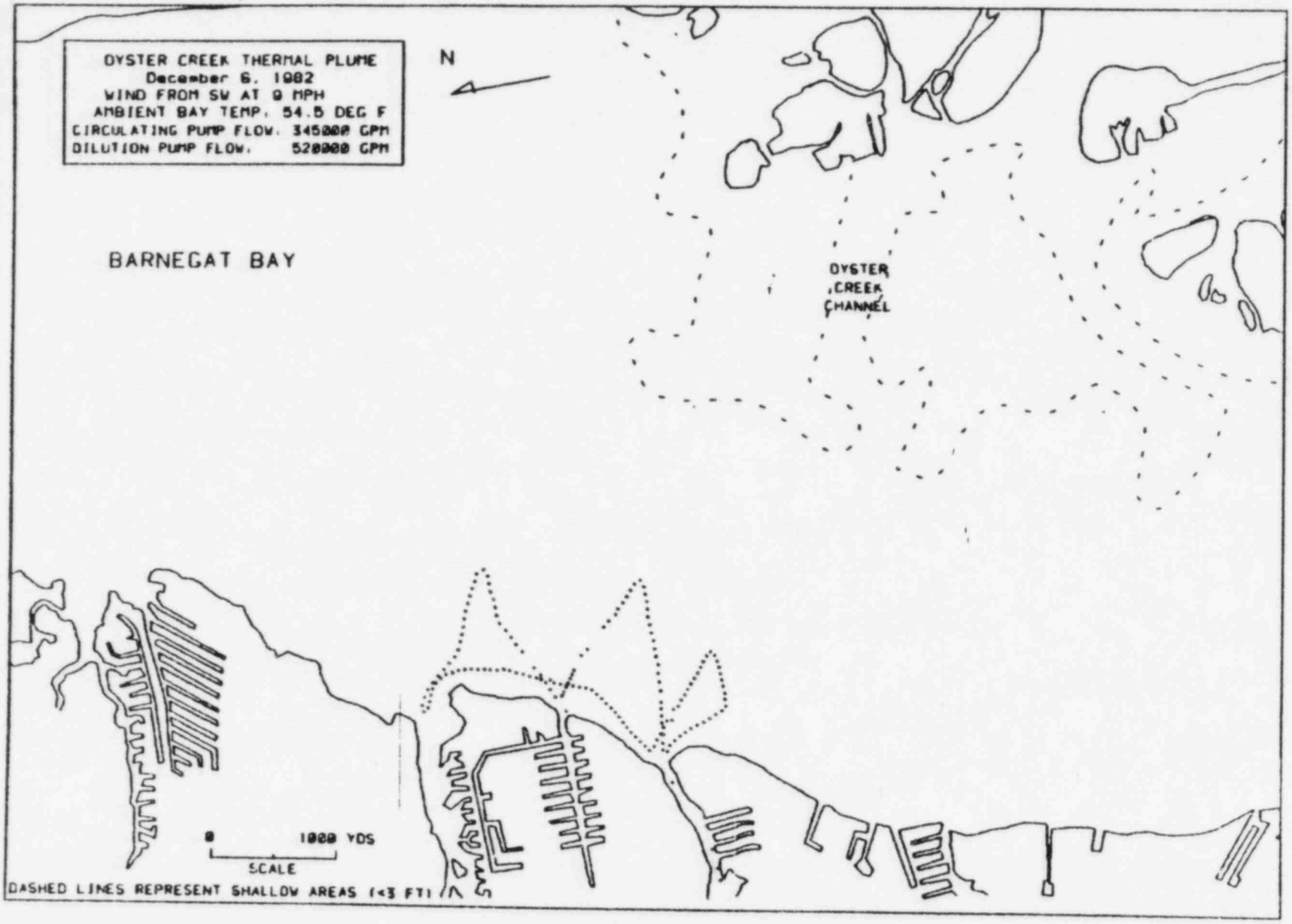
THERMAL PLUME OF December 6, 1982

INDEX	POSITION COORDINATES		TIME HHMMSS	TEMPERATURE DEG F			
				1 FT	2.5 FT	5 FT	BOTTOM
99	18087	15789	125203	55.9	56.0	55.9	55.9
100	18824	15689	125231	56.0	55.6	55.5	54.6
101	18627	15580	125259	56.5	55.1	53.0	54.2
102	18458	15472	125327	55.8	54.3	54.0	54.2
103	18316	15330	125355	56.2	54.9	54.3	54.4
104	18196	15166	125423	56.9	55.5	54.6	54.7
105	18187	14998	125451	57.0	55.1	54.7	54.9
106	18313	15049	125519	56.7	54.5	54.8	54.9
107	18401	15177	125547	57.0	56.0	55.3	54.9
108	18478	15317	125615	57.2	56.2	55.7	55.1
109	18567	15447	125643	56.4	55.7	55.1	54.5
110	18693	15543	125711	56.3	55.9	55.5	55.0
111	18843	15610	125739	57.2	56.5	55.6	55.4
112	18999	15646	125807	57.8	56.7	56.4	56.0
113	19150	15645	125835	57.8	56.6	56.3	56.5
114	19315	15640	125903	57.2	56.3	56.5	56.0
115	19466	15611	125931	56.0	56.1	56.4	56.3
116	19615	15571	125959	56.0	55.9	56.2	56.3
117	19762	15513	130027	55.5	55.8	56.2	56.1
118	19904	15458	130055	55.7	55.6	55.9	55.9
119	20049	15409	130123	55.6	55.7	56.1	56.0
120	20193	15356	130151	55.9	55.9	55.9	55.7
121	20339	15317	130219	55.8	55.9	56.1	56.1
122	20474	15254	130247	56.1	56.4	56.7	56.5
123	20594	15169	130315	56.8	57.0	56.8	56.4
124	20748	15087	130343	56.8	57.0	56.5	56.1
125	20871	14998	130412	57.0	56.8	56.5	55.8
126	21024	14921	130441	57.2	57.1	56.7	56.4
127	21113	14857	130509	57.4	57.3	56.9	56.4
128	21309	14793	130537	57.6	57.8	57.5	56.8
129	21374	14703	130606	58.1	58.2	57.9	56.9
130	21506	14645	130634	58.6	58.5	57.8	56.5
131	21650	14599	130702	58.7	58.1	57.2	56.3
132	21783	14550	130730	58.7	58.5	56.9	56.8
133	21921	14498	130758	59.0	58.0	56.5	55.5
134	22057	14446	130826	59.1	58.7	57.9	56.2
135	22184	14369	130854	59.7	59.3	58.3	56.5
136	22262	14256	130922	60.1	59.6	58.0	55.9
137	22339	14126	130950	60.3	59.8	58.2	56.2
138	22417	13993	131018	60.7	59.9	58.2	55.5
139	22499	13870	131046	60.9	60.5	58.8	56.3
140	22566	13743	131114	60.6	60.6	60.1	58.2
141	22621	13615	131142	60.7	60.4	59.3	57.0
142	22679	13469	131210	61.2	60.3	58.5	56.9
143	22737	13330	131238	60.9	60.1	58.8	56.9
144	22804	13195	131306	61.7	60.8	59.[illegible]	56.9
145	22884	13068	131334	61.7	61.5	60.[illegible]	57.9
146	22969	12943	131402	61.6	61.7	61.4	60.1
147	23047	12814	131430	62.0	61.8	61.9	61.6

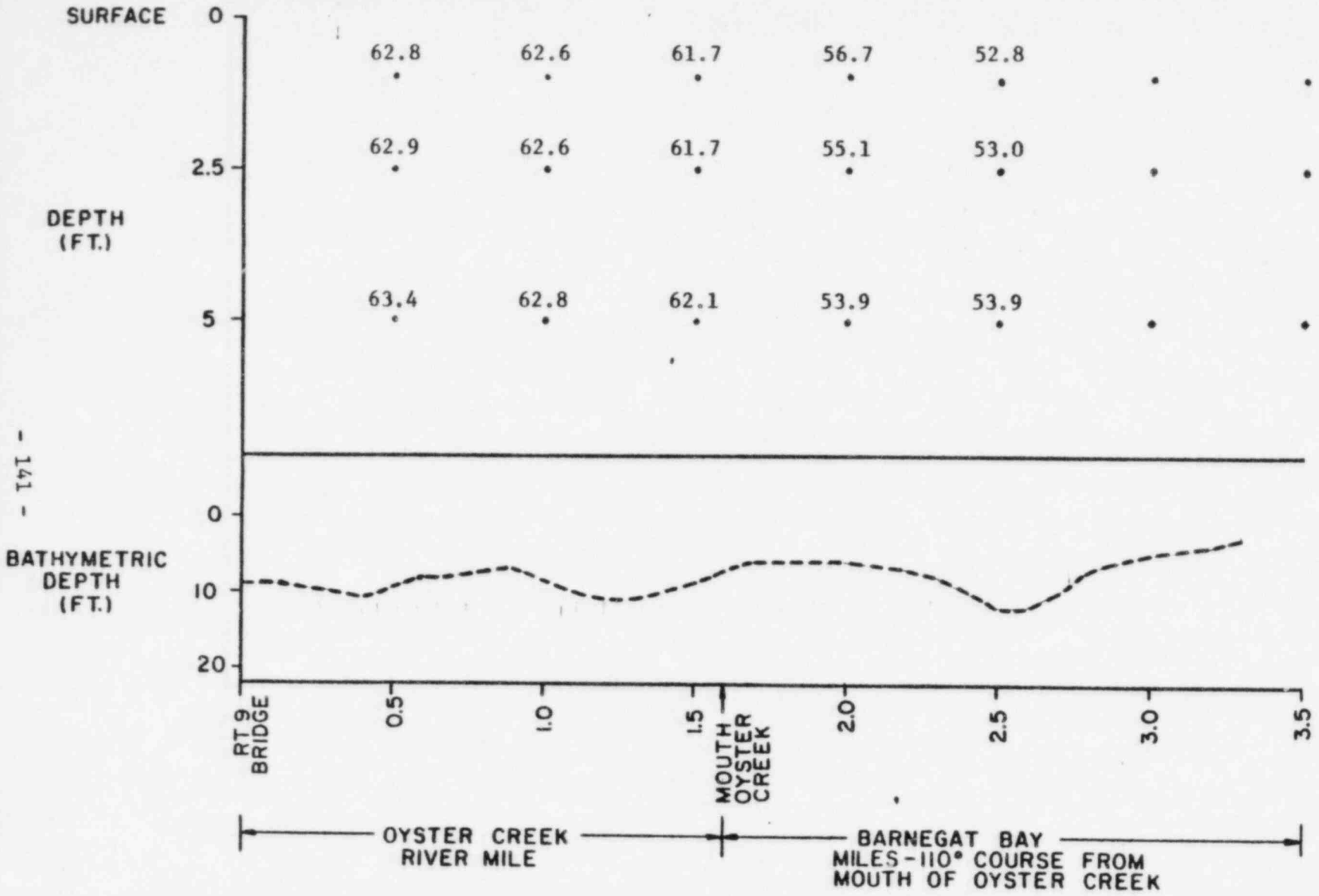
THERMAL PLUME OF December 6, 1982

INDEX	POSITION COORDINATES		TIME HHMMSS	TEMPERATURE DEG F			
				1 FT	2.5 FT	5 FT	BOTTOM
148	23131	12701	131458	62.5	62.5	62.6	62.8
149	23258	12700	131526	62.2	62.2	62.5	62.3
150	23360	12957	131554	62.1	61.7	61.6	61.6
151	23476	13107	131622	61.6	61.4	60.8	60.5
152	23587	13267	131650	61.2	60.8	60.0	59.0
153	23707	13443	131718	61.1	60.8	59.6	58.3
154	23825	13443	131746	60.5	59.8	57.7	56.9
155	23934	13720	131814	59.1	57.3	56.4	56.5
156	24056	13803	131842	55.9	55.7	55.9	56.3
157	24162	13953	131910	55.9	55.6	55.6	56.1
158	24276	14083	131938	55.4	55.4	55.6	55.7
159	24385	14225	132006	55.0	55.0	55.2	55.5
160	24500	14361	132034	54.9	54.8	54.9	55.5
161	24612	14497	132102	54.7	54.7	55.2	55.4
162	24729	14630	132130	54.5	54.3	54.8	55.2
163	24838	14776	132158	54.3	54.2	54.7	54.9
164	24929	14914	132226	54.1	54.1	54.7	54.9
165	25052	15051	132254	54.2	54.0	54.5	54.9
166	25161	15159	132322	54.3	54.0	54.2	54.7
167	25235	15088	132350	54.0	54.2	54.4	53.9
168	25259	14941	132418	53.6	54.1	54.8	54.5
169	25253	14788	132446	54.0	53.9	54.5	54.7
170	25245	14629	132514	53.9	54.1	54.5	54.7
171	25227	14482	132542	54.0	54.0	54.3	54.8
172	25227	14334	132610	53.8	54.2	54.8	54.7
173	25216	14158	132638	54.0	54.2	54.5	54.4
174	25192	14011	132706	54.0	54.2	54.6	54.6
175	25163	13841	132734	54.1	54.3	54.8	54.9
176	25046	13714	132802	53.7	54.3	55.1	55.1
177	24882	13617	132830	54.1	54.1	55.0	55.1
178	24718	13500	132858	54.4	54.5	54.9	55.3
179	24553	13403	132926	54.4	54.7	54.8	55.4
180	24386	13324	132954	54.5	55.0	55.5	55.6
181	24226	13237	133022	55.0	55.1	55.7	55.8
182	24068	13133	133050	54.9	55.5	56.0	56.1
183	23918	13032	133118	55.8	55.8	55.9	56.5
184	23778	12927	133146	56.6	58.0	57.4	56.7
185	23639	12798	133214	59.7	59.3	58.8	57.5
186	23552	12648	133242	59.7	59.5	59.2	58.3
187	0	12498	133310	60.2	59.5	59.5	59.2
188	0	12336	133343	61.8	62.0	62.5	62.7
189	0	12232	133416	61.9	62.4	62.8	62.9


TEMPERATURE MEASUREMENTS OF December 6, 1982
AT 1, 2.5, AND 5 FT. LEVELS
TEMPERATURE DEG F
63
62
61
60
59
58
57
56
55
54
53
52
AMBIENT TEMP
1000
2000
3000
4000
5000
6000
7000
8000
9000
DISTANCE IN PLOT UNITS


OYSTER CREEK THERMAL PLUME
December 6, 1982
WIND FROM SW AT 9 MPH
AMBIENT BAY TEMP. 54.5 DEG F
CIRCULATING PUMP FLOW. 345000 GPM
DILUTION PUMP FLOW. 520000 GPM
N
BARNEGAT BAY
OYSTER CREEK CHANNEL
0 1000 YDS
SCALE
DASHED LINES REPRESENT SHALLOW AREAS (<3 FT)

LONGITUDINAL SECTIONS OF OYSTER CREEK AND BARNEGAT BAY



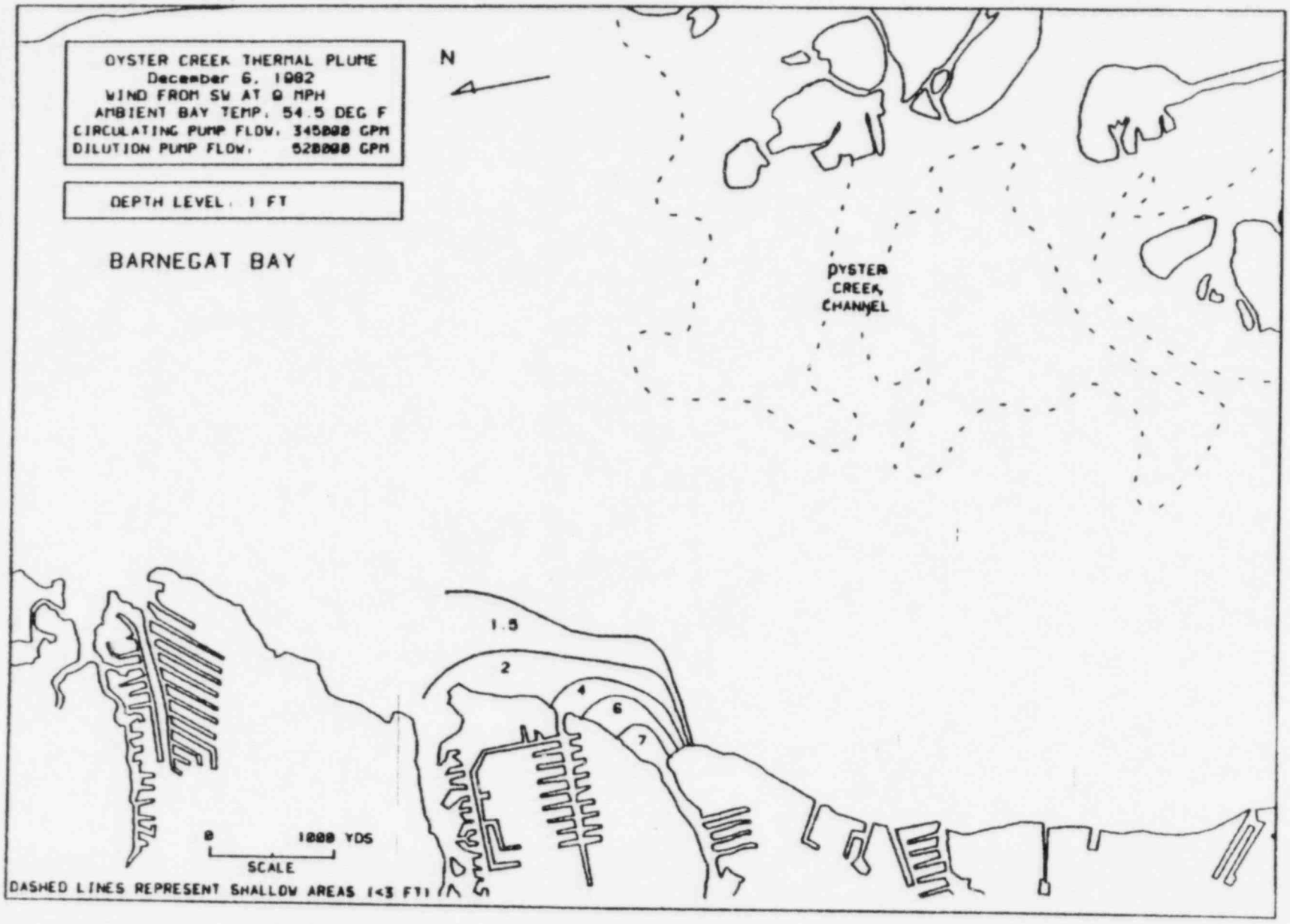
DATE December 6, 1982

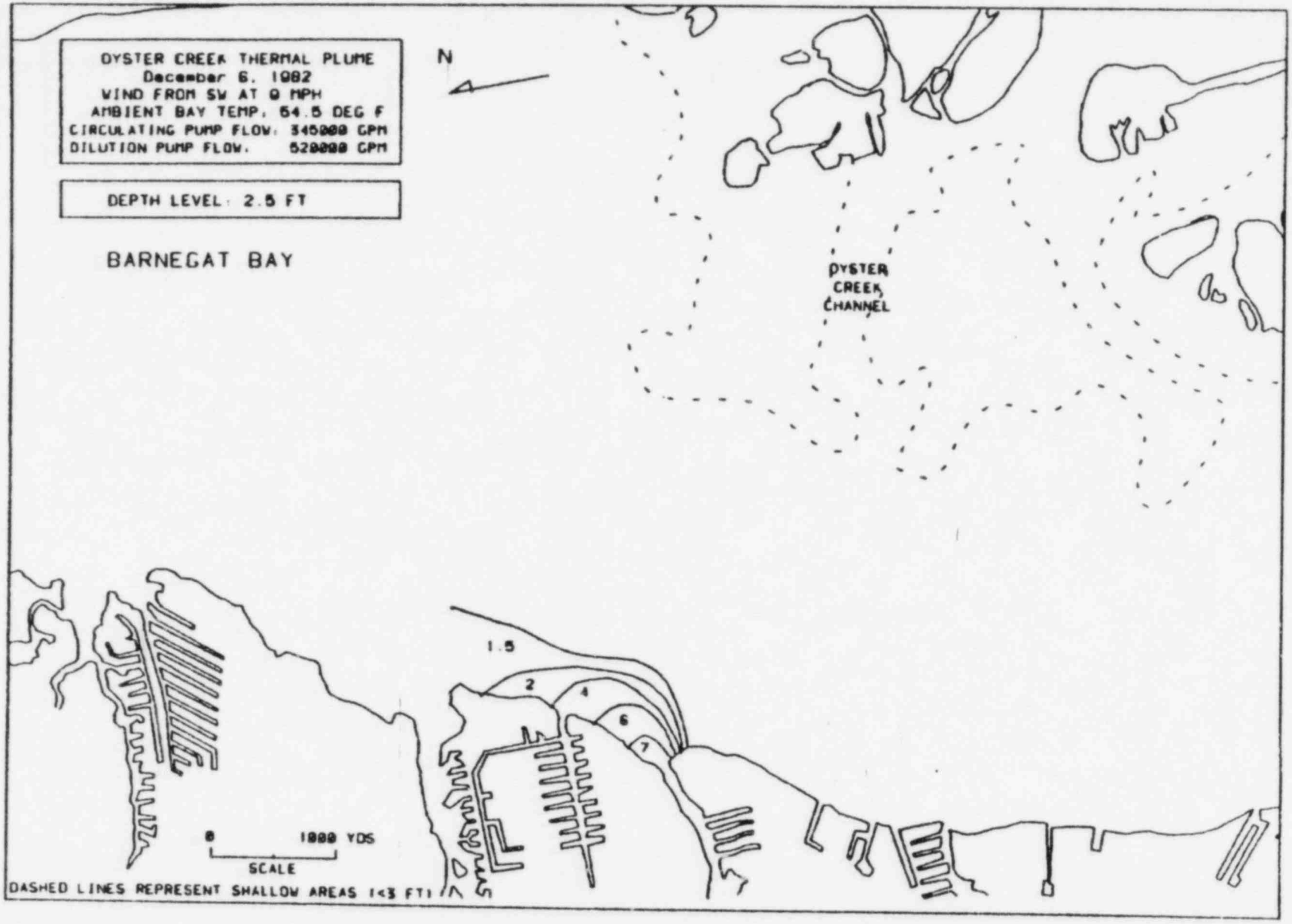
TIME 1200-1330

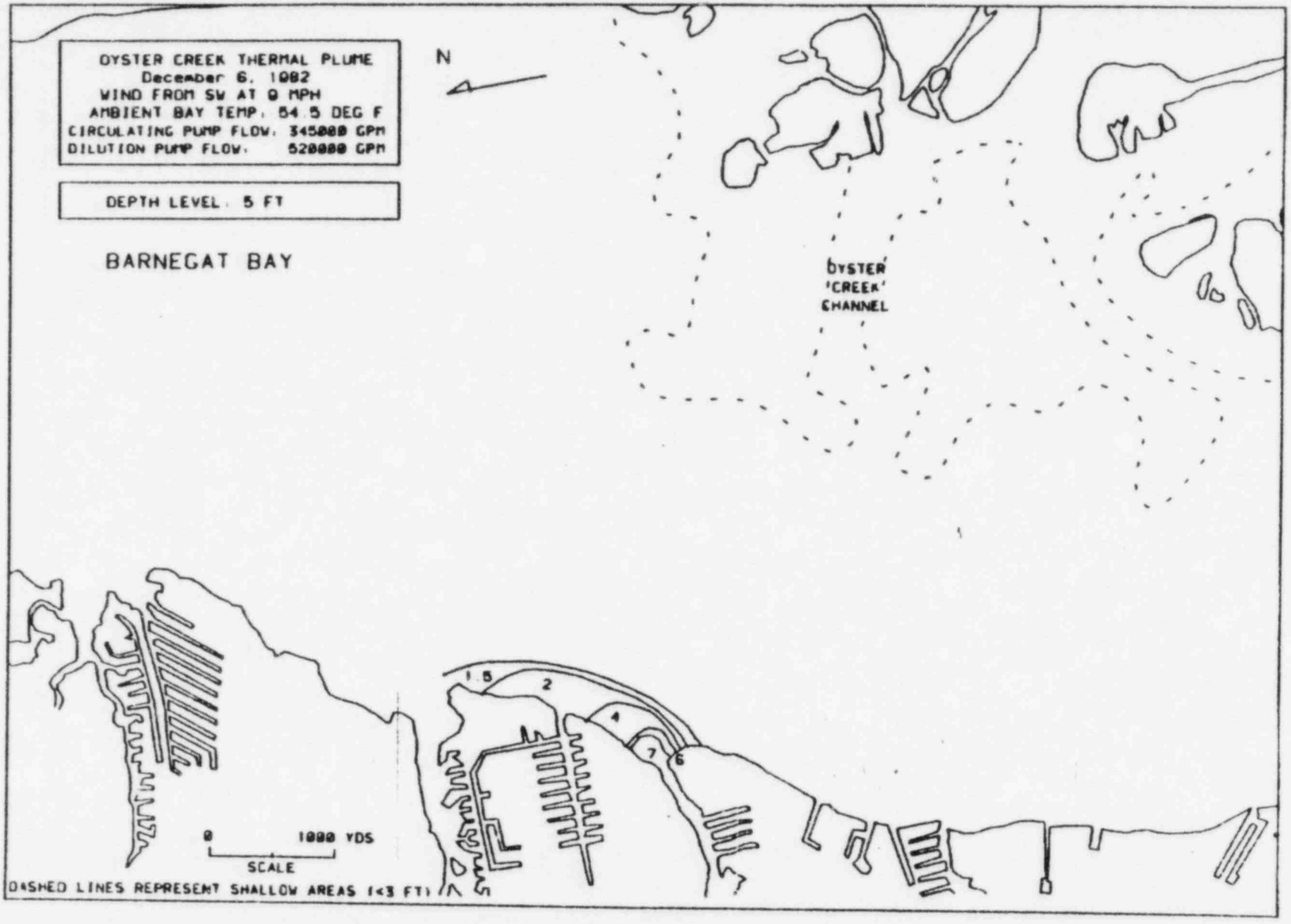
WIND SW at 9 mph

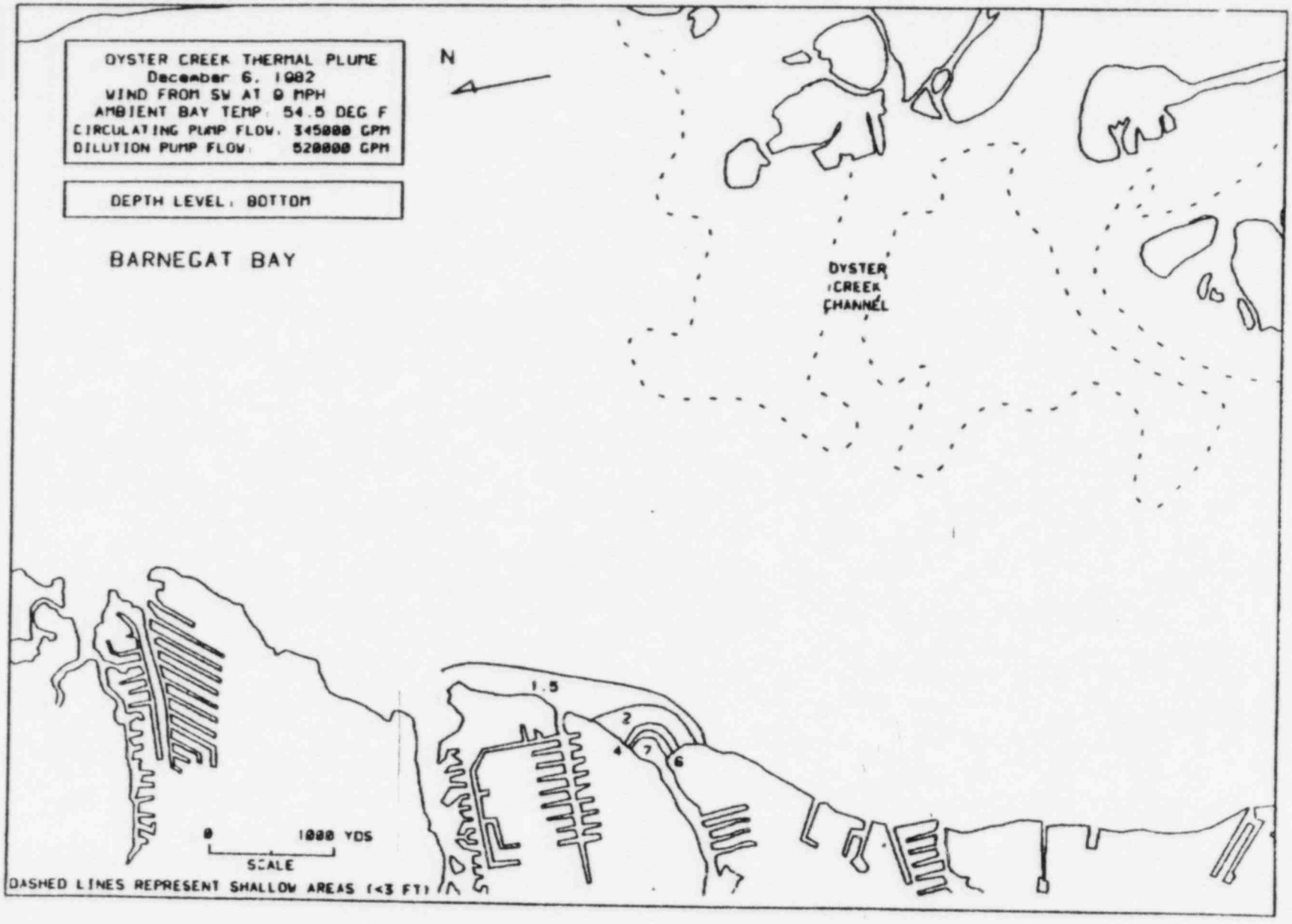
STATION PARAMETERS

ΔT	13.1 degrees F
CIRC. FLOW	345,000 gpm
DIL. FLOW	520,000 gpm


OYSTER CREEK THERMAL PLUME
December 6, 1982
WIND FROM SW AT 9 MPH
AMBIENT BAY TEMP. 54.5 DEG F
CIRCULATING PUMP FLOW: 345000 GPM
DILUTION PUMP FLOW: 520000 GPM
DEPTH LEVEL: 1 FT
N
BARNEGAT BAY
OYSTER CREEK CHANNEL
1.5
2
4
6
7
0
1000 YDS
SCALE
DASHED LINES REPRESENT SHALLOW AREAS (<3 FT)


OYSTER CREEK THERMAL PLUME
December 6, 1982
WIND FROM SW AT 0 MPH
AMBIENT BAY TEMP. 54.5 DEG F
CIRCULATING PUMP FLOW. 345000 GPM
DILUTION PUMP FLOW. 520000 GPM
DEPTH LEVEL 2.5 FT
N
BARNEGAT BAY
OYSTER CREEK CHANNEL
1.5
2
4
6
7
0 1000 YDS
SCALE
DASHED LINES REPRESENT SHALLOW AREAS (<3 FT)


OYSTER CREEK THERMAL PLUME
December 6, 1982
WIND FROM SW AT 0 MPH
AMBIENT BAY TEMP: 54.5 DEG F
CIRCULATING PUMP FLOW: 345000 GPM
DILUTION PUMP FLOW: 520000 GPM
DEPTH LEVEL: 5 FT
N
BARNEGAT BAY
OYSTER CREEK CHANNEL
1
2
4
7
6
0
1000 YDS
SCALE
DASHED LINES REPRESENT SHALLOW AREAS (<3 FT)


OYSTER CREEK THERMAL PLUME
December 6, 1982
WIND FROM SW AT 9 MPH
AMBIENT BAY TEMP: 54.5 DEG F
CIRCULATING PUMP FLOW: 345000 GPM
DILUTION PUMP FLOW: 520000 GPM
DEPTH LEVEL: BOTTOM
N
BARNEGAT BAY
OYSTER CREEK CHANNEL
1.5
2
4
7
6
0
1000 YDS
SCALE
DASHED LINES REPRESENT SHALLOW AREAS (<3 FT)

4.3 Hydrographic Study

4.3.1 Introduction

The Oyster Creek Environmental Technical Specification requires an annual bathymetric survey of Oyster Creek from 100 feet east of the Route 9 bridge and ending in Barnegat Bay about 300 feet west of the mouth of Oyster Creek, to identify scouring or sedimentation trends. The 1982 survey was completed in April; dredging of Oyster Creek was last performed in 1979. This section explains the data collection and analysis methods and presents the data in tabular and graphic format. The 1982 bathymetry is compared to the post-dredging December 1979 bathymetry, which serves as baseline data in this study.

4.3.2 Methods

Station Locations

In 1969, bathymetric survey stations were set up in Oyster Creek from U.S. Route 9 east to Barnegat Bay (Figures 4-1 through 4-3). The station numbers correspond to the distance, in hundreds of feet, east of the U.S. Route 9 bridge. All station survey markers are north of Oyster Creek and soundings are taken from north to south.

Field Instruments and Techniques

Small utility boat.
Raytheon Portable Echo Sounding Survey Recorder and probe.
Hewlett-Packard 3805-A Distance Measuring Device.
Calibrated Depth Rod.
Standard Surveying Equipment.

Field Procedure

After the instruments are calibrated, an accurate water elevation is measured by observing a known bench mark and then the water with a level. Two theodolites are situated on the base line, one at a monument in the actual cross section line and one on the base line several feet away.

The boat is aligned with the first instrument and a level rod is used to measure the depth at approximate 15 ft. intervals. At the precise instant that the rod is lowered the second theodolite which is tracking the boat locks onto the rod, measuring the angle from the first instrument to the rod. By triangulation an accurate distance from the base line to the rod is calculated. Two prism rods are set in the water, one on either side of the channel and the distance to each measured electronically.

As the transducer is driven past each of these rods, the fathometer mark switch is hit and the chart marked. This enables a scale factor to be made for the chart which is plotted and overlayed on the 15 ft. interval plotting. The manual 15 ft. ± observation are thereby checked and the intermediate bottom elevations plotted from the echo sounding recorder chart.

Two passes are made wih the fathometer and the water elevation is measured before and after each pass.

Elevations are based on N.G.V.D. 1929 tidal epoch.

The HP 3805-A is accurate to within 0.02 ft., and has a range of 2000 meters.

Data Reduction

Data analysis proceeds in three steps:

1) A draftsman plots the raw data for each survey station.
2) The plots are digitized by using a Tektronix Graphics System: Tektronix 4054, 4956 digitizing table.
3) The digitized data are analyzed for scouring and shoaling by comparison to 1979 baseline data.

The accuracy of the digitizing was obtained by inputting ten consecutive data points of the same spot. The following summarizes the results:

	x-direction (ft.)	y-direction (ft.)
Average	-.0246	-.316
Median	-.0246	-.301
Std. Deviation	.020	.1105

Figures 4-4 to 4-44 are the graphical and tabular summaries by section. On the upper graph of each figure, the 1982 cross-section is overlaid on the 1979 cross-section. Elevation is shown in feet with zero (N.G.V.D. 1929 tidal epoch) about 1 ft. below the mean low water.

The lower graph shows filling or scouring in feet. A tabular summary of filling or scouring trends is presented below the two graphs. Figures 4-45 through 4-46 show plan sections of the four residential lagoons located near the mouth of Oyster Creek in 1979 and 1982. Elevations are plotted next to the stations at which they were measured. Figure 4-47 shows the difference in elevation between 1982 and 1979 at each station.

4.3.3 Data Analysis and Discussion

The cross-sectional profiles that appear in Figures 4-4 to 4-44 show that, overall, very little change has occured since 1979; nearly all of the sections show a main channel depth of 9 to 14 feet except section 21, with a main channel depth of 8 feet. The design main channel depth for the 1979 dredging work was 10 feet, as a minimum. About 2 feet of fill has occurred at section 21, and about 1 foot of fill has occurred at sections 23, 24, 25, and 58; these transects now show a main channel depth of about 9 feet. Section 62 is now being surveyed further into Sanabelle lagoon than in 1979, and some scouring is evident near the mouth of the lagoon, away from the main channel. Section 94, the easternmost section about 1000 feet east of the mouth of Oyster Creek, shows about 1 foot of fill since 1979; this section was not dredged in 1979.

The shoaling observed at section 15 in the 1981 AEOR has disappeared. Main channel depth is now 9 feet as opposed to the 8 feet depth observed last year.

Sections 1 through 21 have an average bank-to-bank width of 300 feet and a uniform main channel bottom width of 130 feet. Submerged main channel banks are generally sloped 1:2.

Section 23 through 52 constitute the widest part of Oyster Creek and include many of the side channels, dredged in 1979 to facilitate safe recreational navigation through Oyster Creek. Side channels were dredged to 5 feet. Main channel bottom widths are 100-110 feet, and bank-to-bank width ranges from 300-1000 feet.

From section 53 out to Barnegat Bay the sections have average main channel widths of 110 feet. Bank-to-bank widths range from 150 to 500 feet.

Filling and scouring trends in the four lagoons taken from Figure 5-57 are tabulated below. Because of the extreme and presumably unrepresentative variabillity exhibited by some of the data collected at stations adjacent to the bulkheads, the mid-lagoon stations were used in compiling these statistics. All four lagoons show navigable depths of greater than 5 feet along their entire length.

	Lagoon Statistics		
Name (West to East)	Max. Scour	Max. Fill	Average
Venice	-2.8	+0.8	-1.0
Sanabelle	-2.7	+0.2	-1.5
Buccaneer	-2.1	+0.2	-0.9
Privateer	-1.5	-	-0.8

4.3.4 References

GPU Nuclear Corporation (GPUN), Parsippany, New Jersey, March 1982. Oyster Creek Annual Environmental Operating Report, 1981.

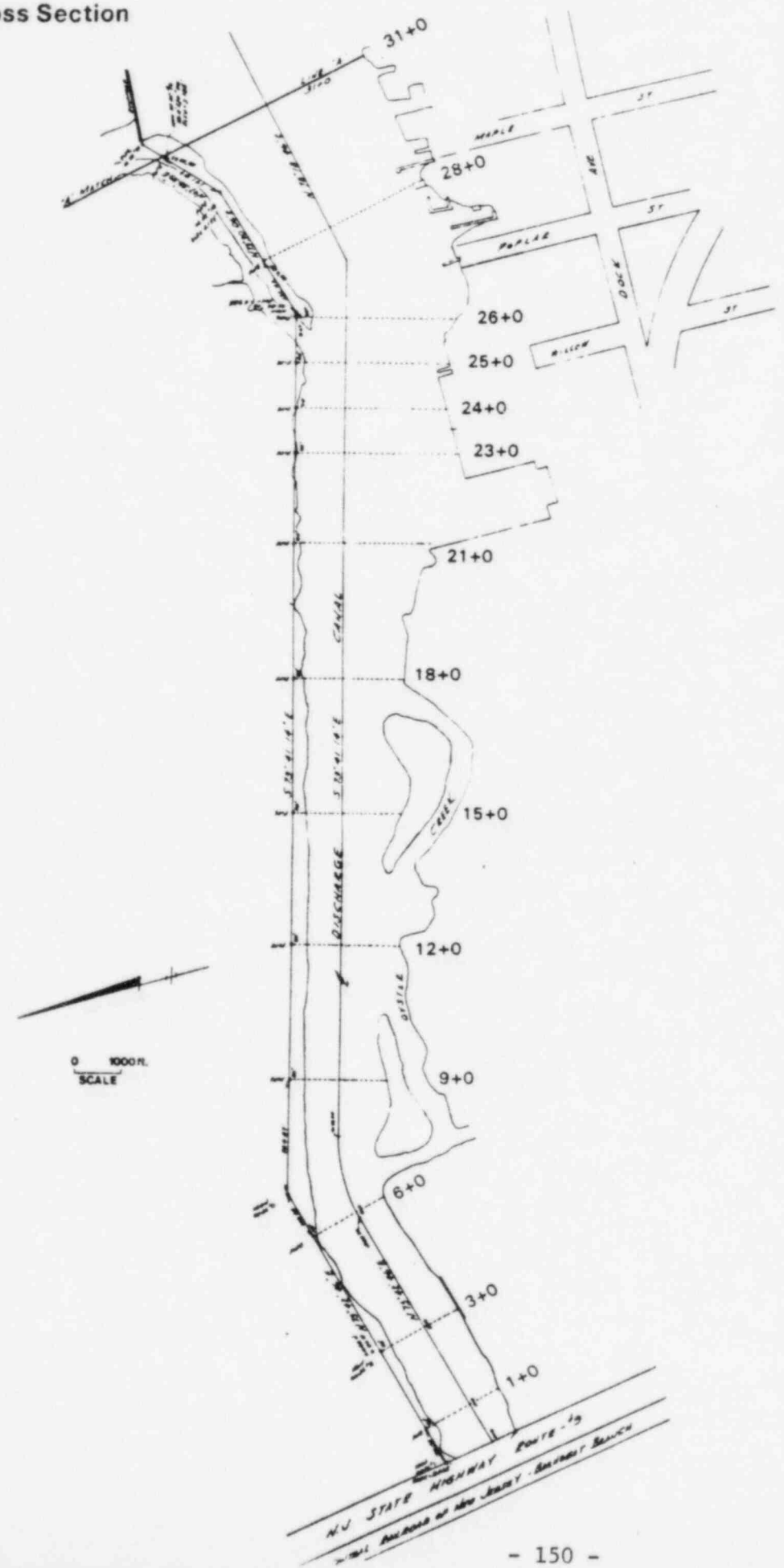
Jersey Central Power & Light Company, Morristown, New Jersey, 1980 and 1981. Oyster Creek Annual Environmental Operating Report, 1979 and 1980.

Jersey Central Power & Light Company, Morristown, New Jersey, April 1982. Engineering drawing D-66519 (8 Sheets).

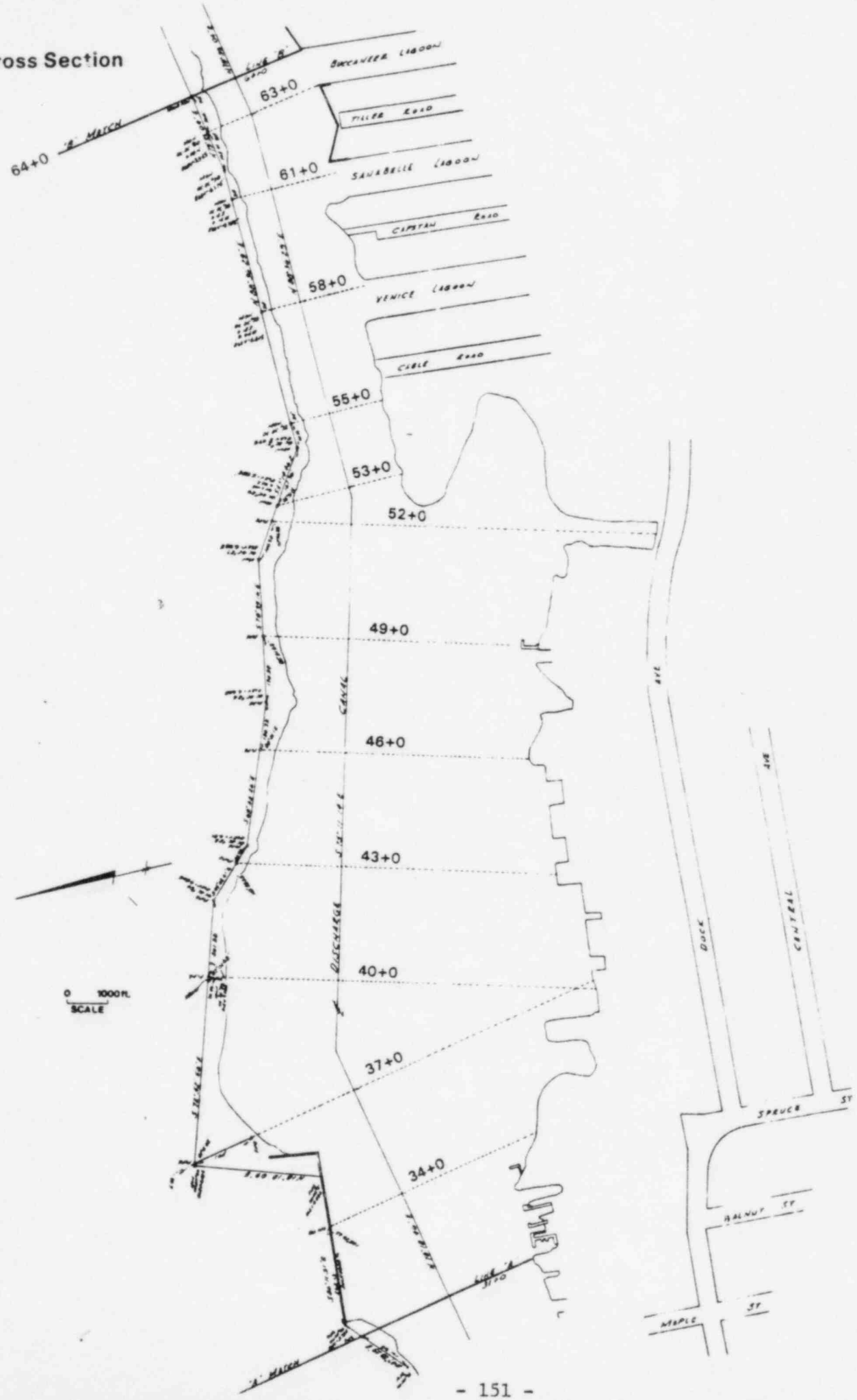
Lynch, Carmdy & Dombrowski, Pennsylvania (Consulting Engineers), June 1979. Engineering drawing D-66519 (8 Sheets) for JCP&L Co., Morristown, New Jersey.

Oyster Creek Cross Section Location Map

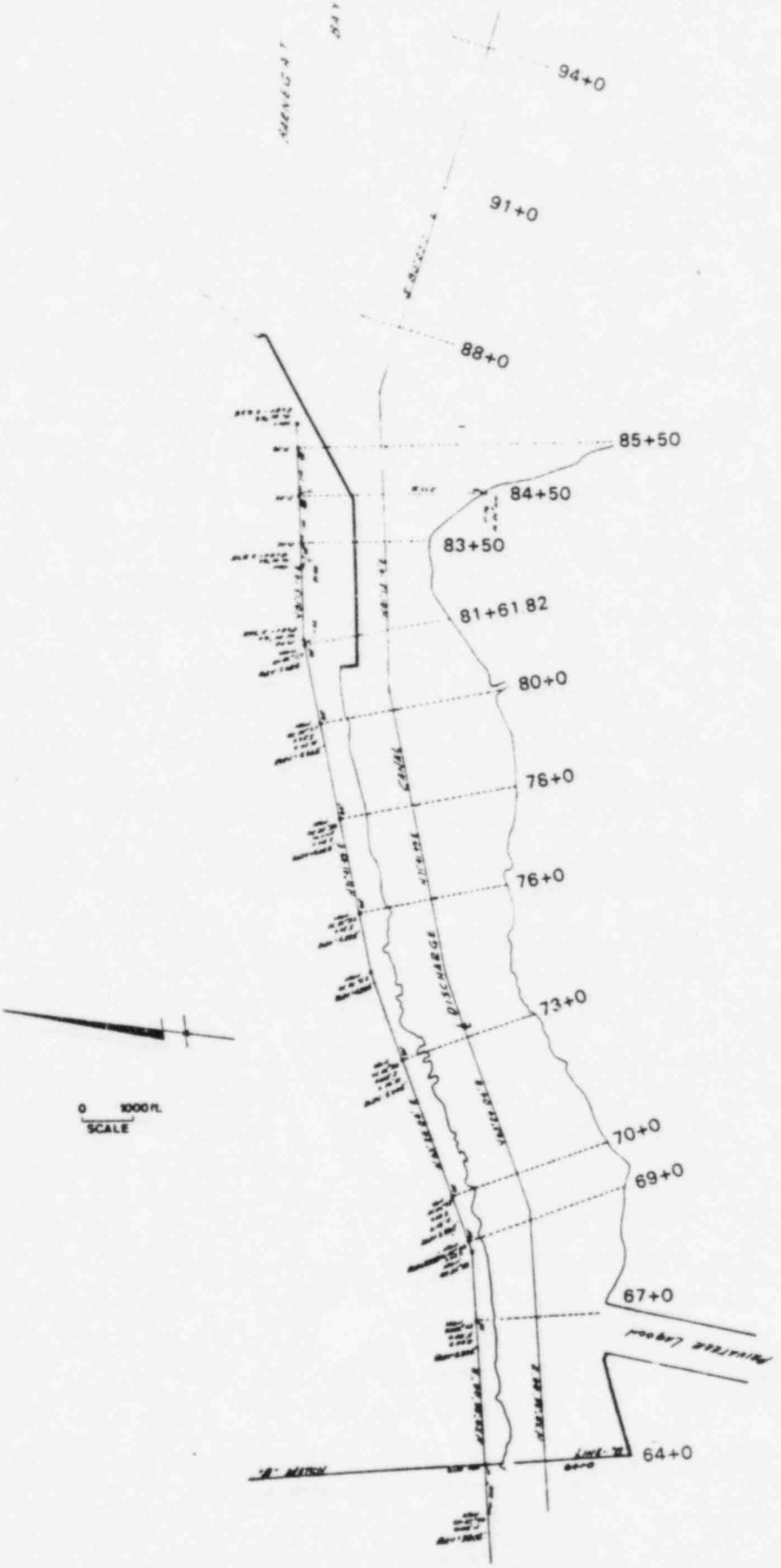
Figure 4-1

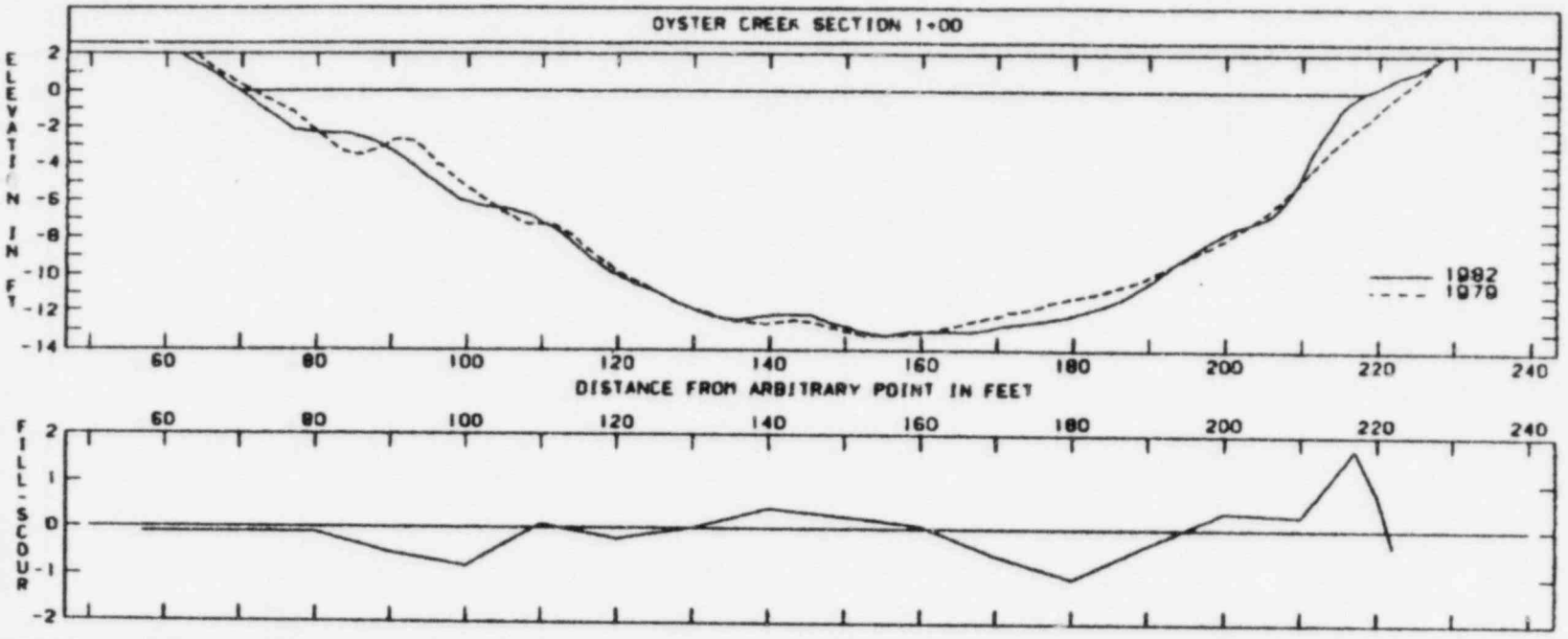


Oyster Creek Cross Section Location Map
Figure 4-2



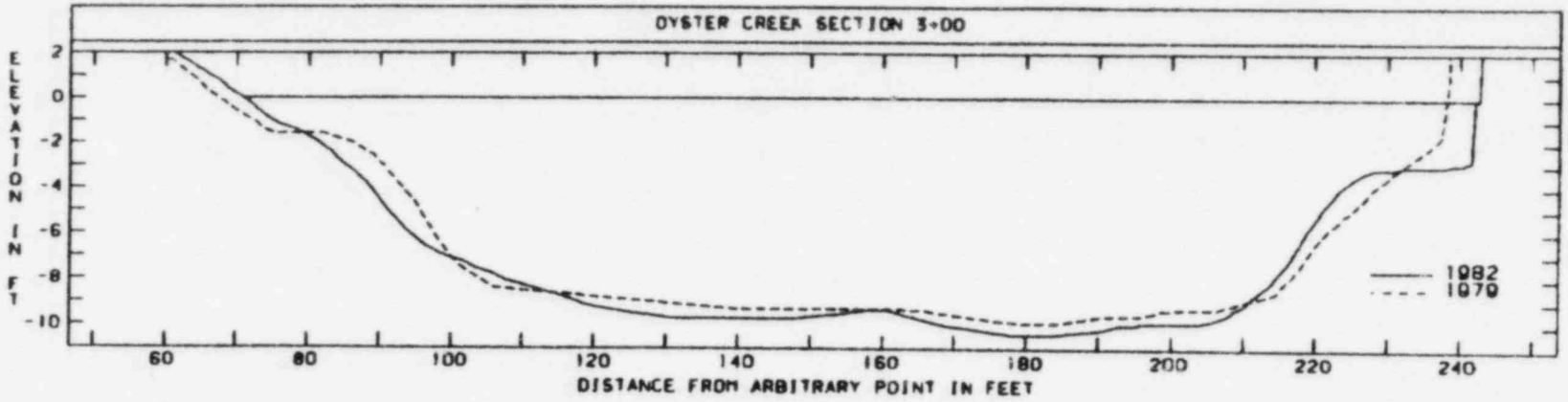
Oyster Creek Cross Section
Location Map
Figure 4-3

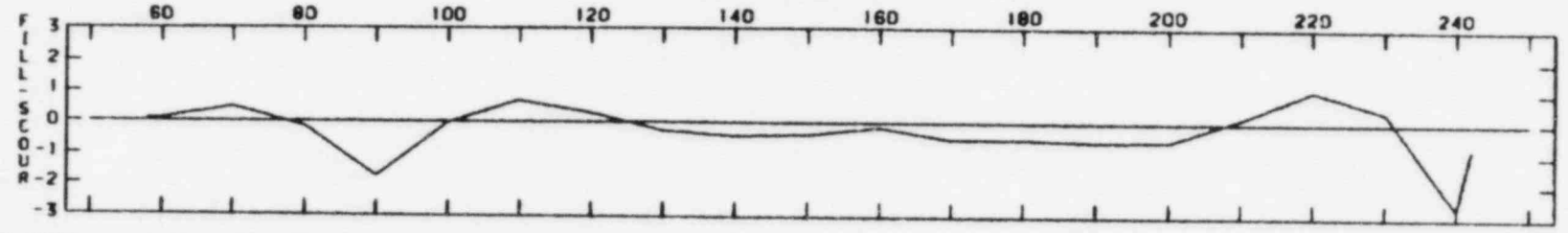




HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET	HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET	HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET
57	-.3	-.2	-.10	120	-10.8	-9.7	-.22	190	-10.3	-10.0	-.32
60	-.3	-.2	-.10	130	-11.8	-11.8	.02	200	-7.6	-8.0	.36
70	-.3	-.2	-.10	140	-12.1	-12.5	.44	210	-4.5	-4.8	.20
80	-2.3	-2.2	-.11	150	-12.7	-12.9	.26	217	-.3	-2.0	1.72
90	-3.3	-2.7	-.53	160	-13.0	-13.0	.06	220	-.3	-1.0	.76
100	-6.0	-5.2	-.80	170	-12.7	-12.1	-.56	222	-.6	-.3	-.36
110	-7.2	-7.3	.09	180	-12.1	-11.1	-1.03				

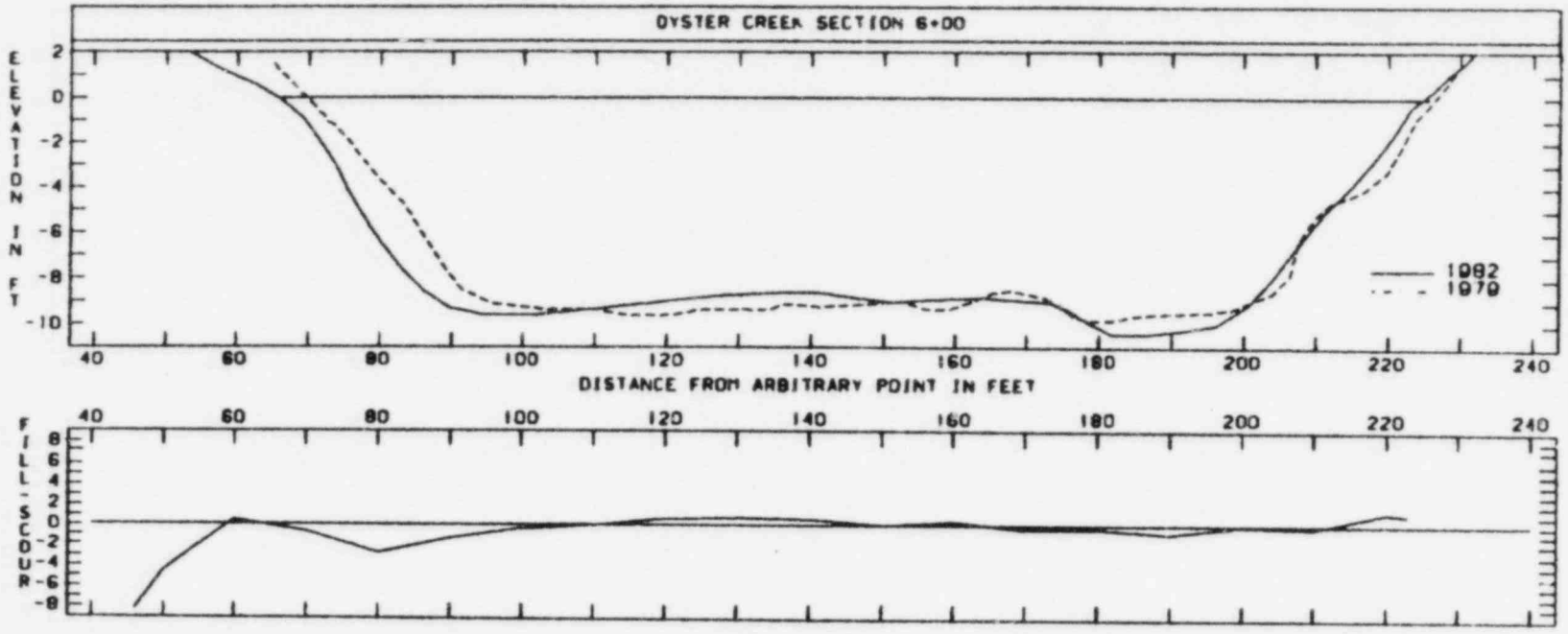
Figure 4-4





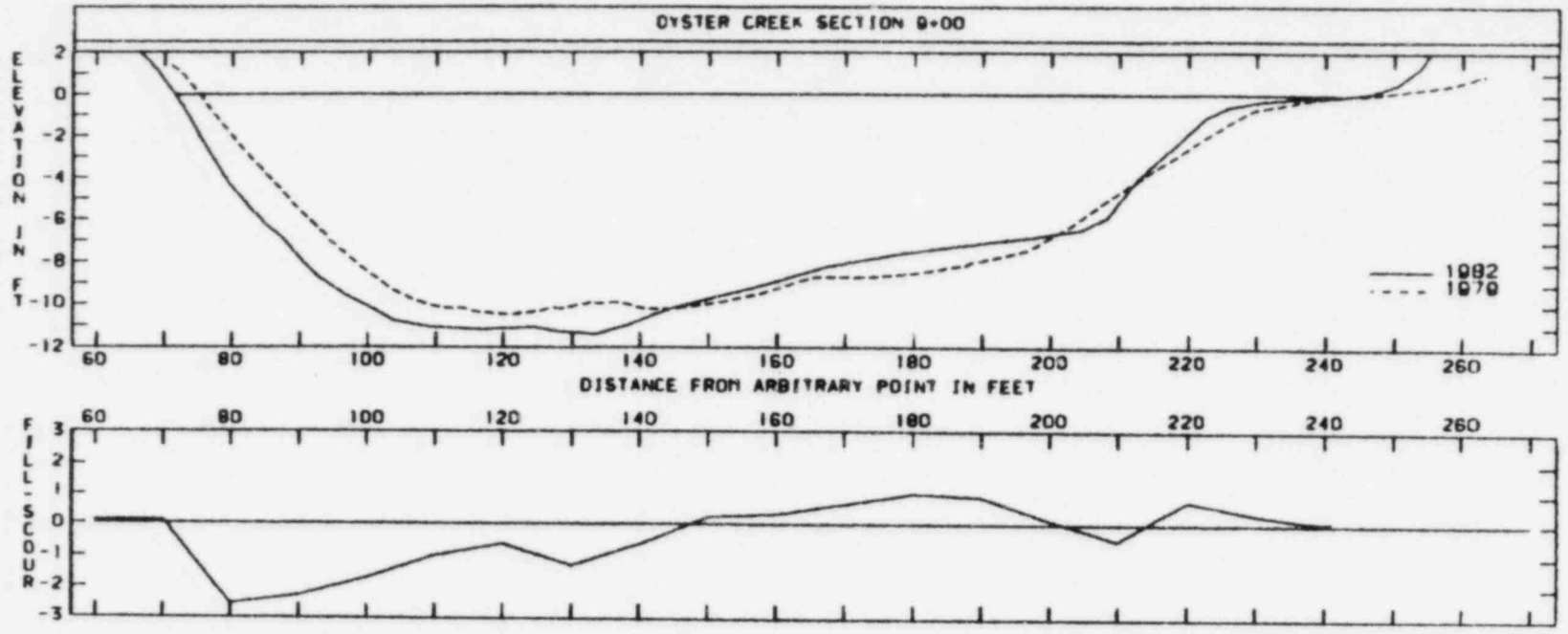
HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET	HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET	HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET
58	-.1	-.28	.18	130	-9.6	-9.42	-.25	200	-9.0	-9.33	-.57
60	-.1	-.28	.18	140	-9.7	-9.38	-.48	210	-9.1	-9.20	.16
70	-.1	-.55	.45	150	-9.6	-9.27	-.36	220	-5.3	-6.45	1.06
80	-1.7	-1.60	-.15	160	-9.3	-9.25	-.13	230	-3.1	-3.40	.30
90	-4.5	-2.82	-1.75	170	-10.0	-9.54	-.51	238	-2.9	-.86	-2.13
100	-7.1	-7.10	-.01	180	-10.4	-9.90	-.58	248	-2.9	-.20	-2.78
110	-8.2	-8.94	.67	190	-10.1	-9.62	-.57	242	-.9	-.20	-.73
120	-9.2	-9.52	.38								

Figure 4-5



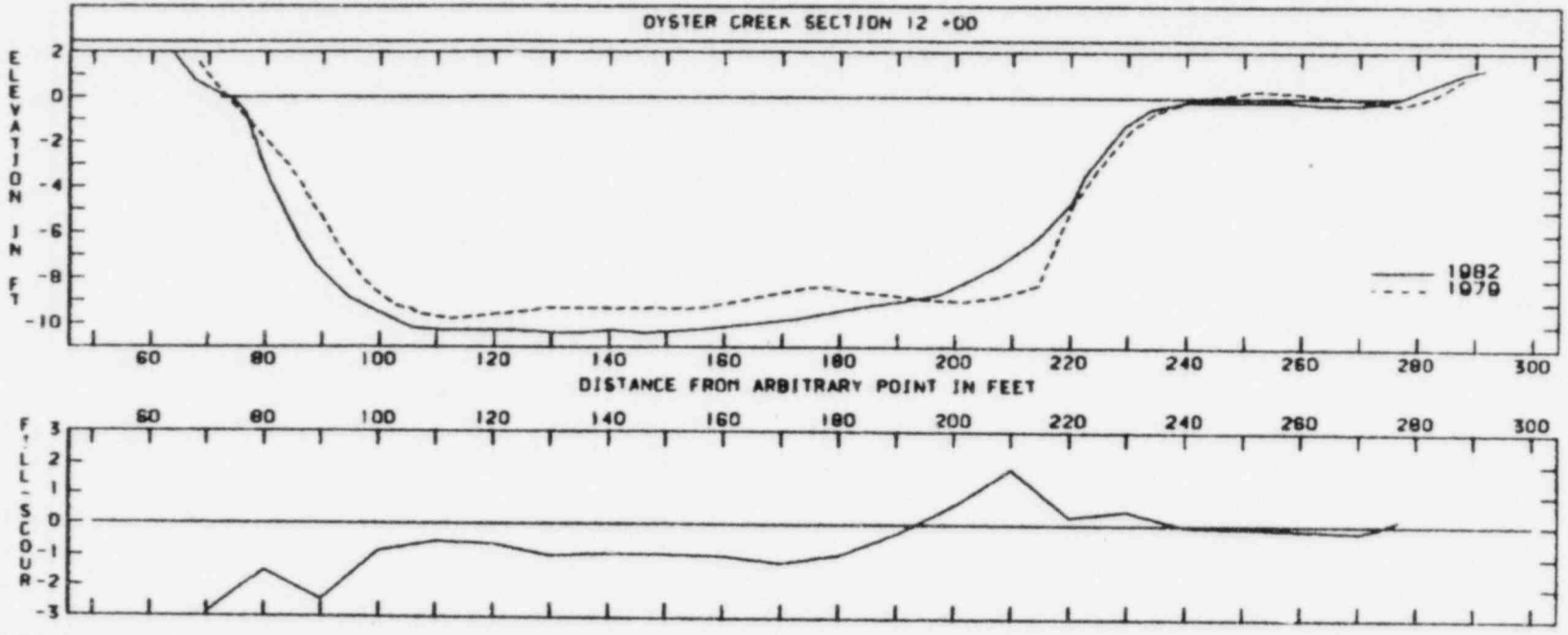
HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET	HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET	HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET
46	-8.8	-.60	-8.25	110	-9.3	-9.38	-.08	180	-10.1	-9.83	-.32
50	-5.1	-.60	-4.55	120	-9.9	-9.50	.61	190	-10.3	-9.49	-.81
60	-.1	-.60	.44	130	-8.6	-9.41	.73	200	-9.3	-9.22	-.07
70	-1.2	-.60	-.69	140	-8.5	-9.17	.58	210	-5.5	-5.29	-.23
80	-6.4	-3.70	-2.74	150	-8.9	-8.82	.83	220	-1.9	-3.21	1.28
90	-9.3	-7.98	-1.34	160	-8.8	-9.24	.41	223	-.4	-1.52	1.09
100	-9.6	-9.27	-.37	170	-8.8	-8.55	-.34				

Figure 4-6



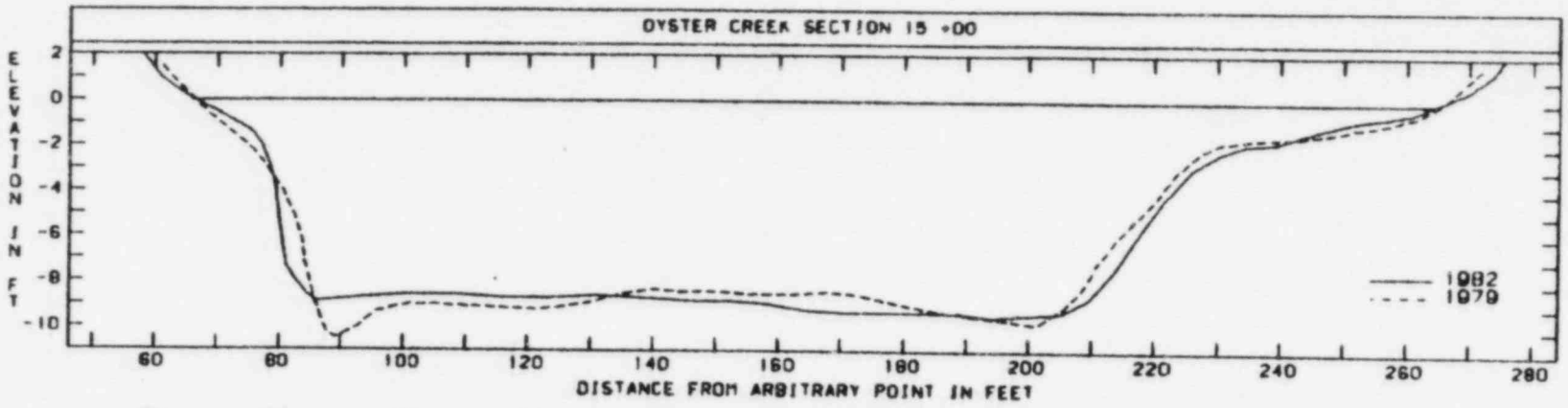
HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET	HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET	HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET
60	-.1	-.2	.10	130	-11.3	-10.0	-1.30	200	-6.7	-6.8	.14
70	-.1	-.2	.10	140	-10.7	-10.1	-.63	210	-5.1	-4.6	-.49
80	-4.5	-1.9	-2.55	150	-9.7	-9.9	.24	220	-1.8	-2.5	.75
90	-7.9	-5.6	-2.28	160	-8.8	-9.2	.33	230	-.3	-.6	.34
100	-10.1	-8.4	-1.71	170	-8.0	-8.6	.66	236	-.1	-.3	.15
110	-11.1	-10.1	-1.01	180	-7.5	-8.5	1.02	240	-.1	-.2	.08
120	-11.1	-10.5	-.63	190	-7.1	-7.9	.86	241	-.1	-.2	.09

Figure 4-7



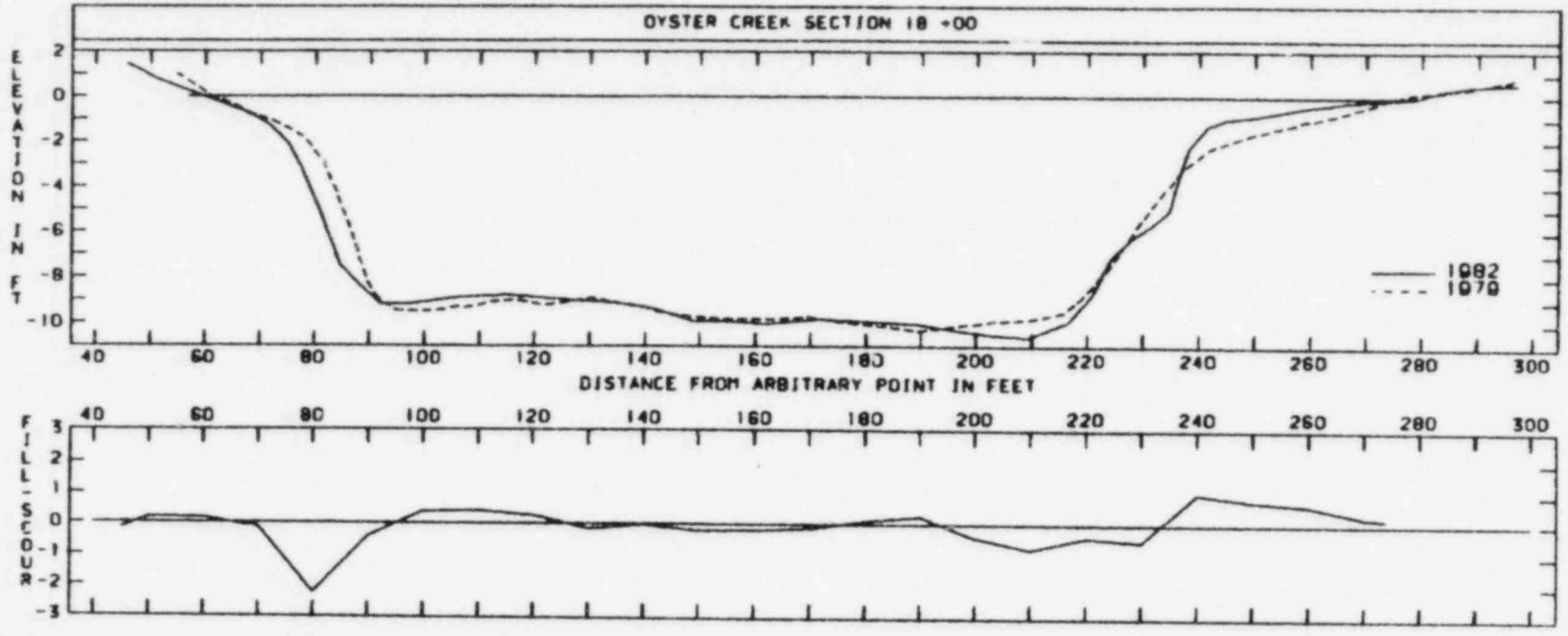
HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET	HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET	HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET
57	-44.5	-.10		140	-10.3	-9.35	-.95	220	-4.7	-5.03	.27
60	-38.5	-.10		150	-10.3	-9.40	-.95	230	-1.1	-1.59	.46
70	-2.9	-.10	-2.80	160	-10.1	-9.12	-1.01	240	-.1	-.10	-.02
80	-3.4	-1.92	-1.52	170	-9.8	-8.63	-1.22	250	-.1	-.10	-.07
90	-7.8	-5.38	-2.46	180	-9.4	-8.48	-.96	260	-.2	-.10	-.13
100	-9.5	-8.69	-.86	190	-9.0	-8.76	-.27	270	-.2	-.10	-.10
110	-10.2	-9.73	-.57	200	-8.3	-9.00	.63	273	-.2	-.14	-.06
120	-10.2	-9.62	-.68	210	-7.8	-8.85	1.00	277	-.1	-.20	.10
130	-10.4	-9.39	-1.01								

Figure 4-8



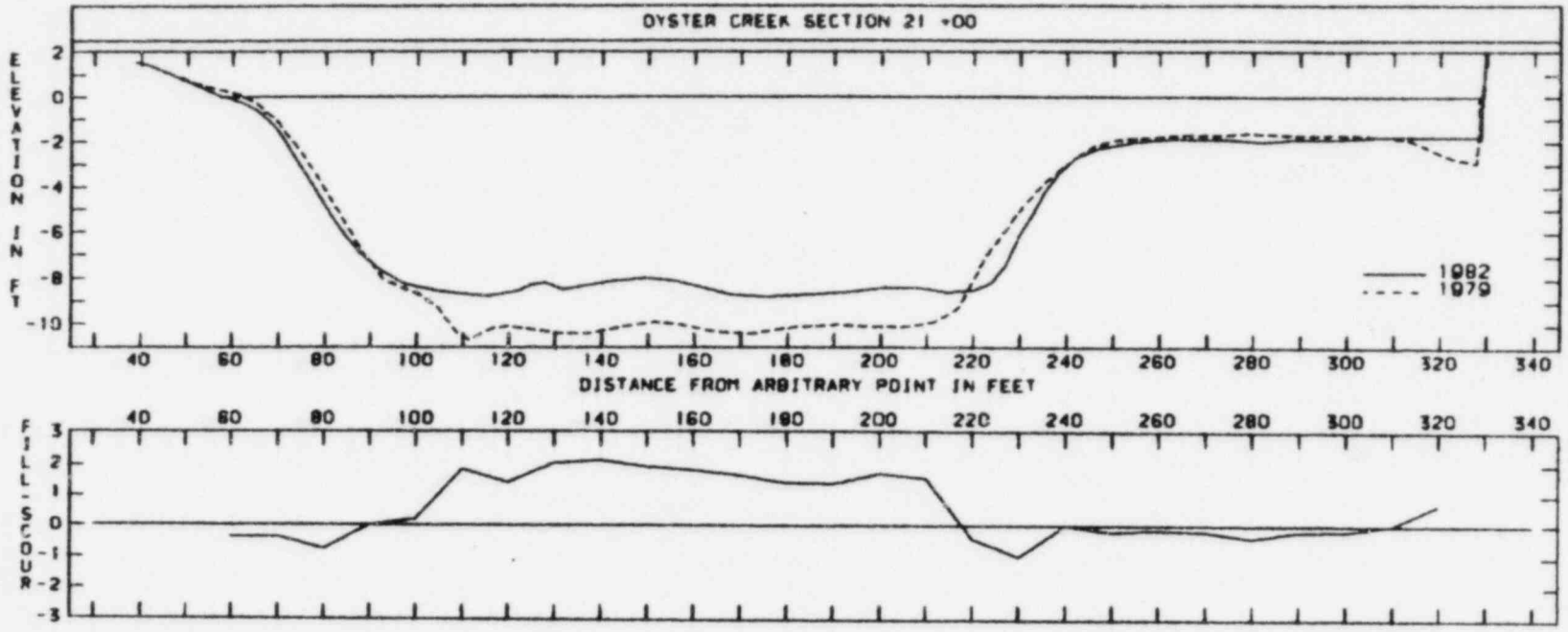
HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET	HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET	HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET
55	- 48	- 5	10	130	-8.61	-8.8	.27	210	-8.58	-7.6	- 97
60	- 48	- 5	10	140	-8.72	-8.3	- 41	220	-4.88	-4.4	- 44
70	- 65	- 8	33	150	-8.80	-8.3	- 49	230	-2.38	-1.8	- 46
80	-5.48	-3.7	-1.69	160	-8.90	-8.5	- 48	240	-1.74	-1.5	- 19
90	-9.97	-10.5	1.55	170	-0.20	-8.4	- 86	250	- .98	-1.2	32
100	-8.61	-0.8	.44	180	-9.30	-8.9	- 33	260	- .45	- .6	.28
110	-8.62	-9.0	.43	190	-9.43	-9.4	- 81	261	- .49	- .5	.18
120	-8.71	-9.2	.59	200	-9.55	-9.8	.38				

Figure 4-9



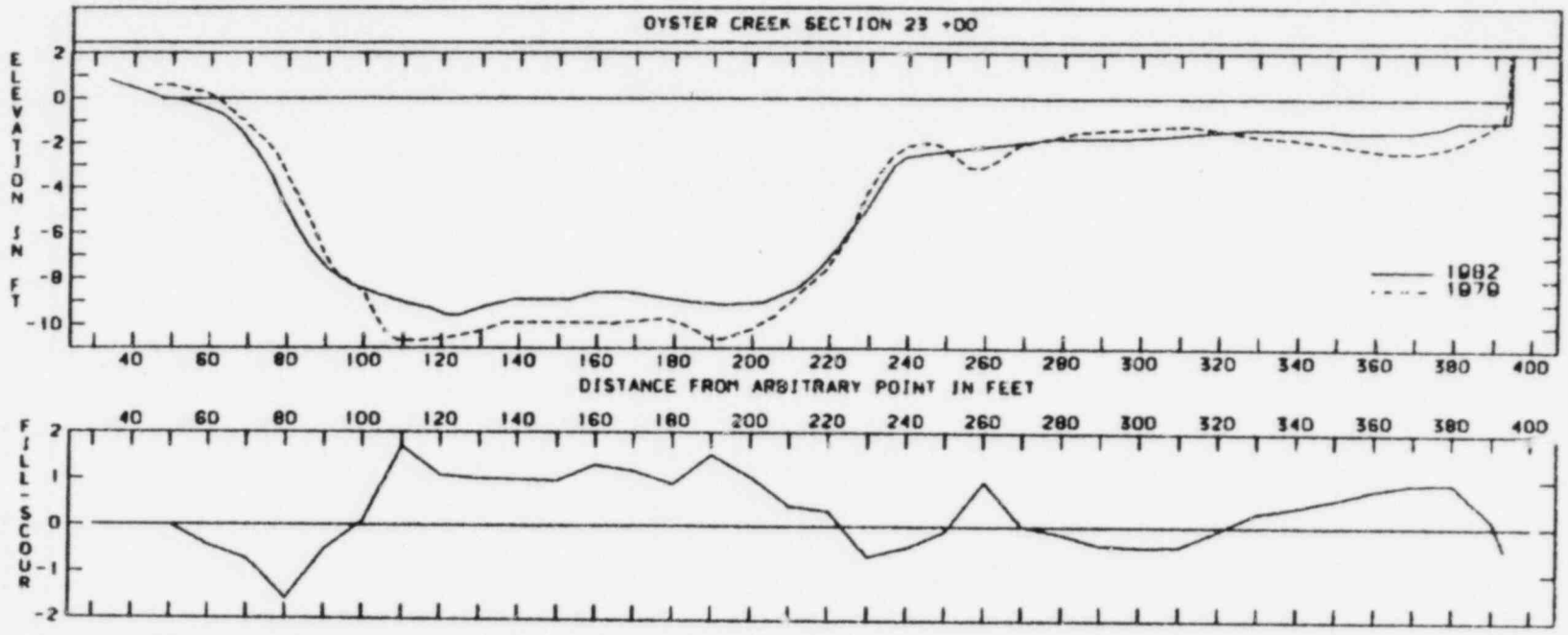
HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET	HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET	HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET
45	-.4	-.3	-.17	130	-9.8	-8.9	-.14	220	-9.8	-8.6	-.30
50	-.1	-.3	.17	140	-9.3	-9.3	-.01	230	-5.9	-5.4	-.54
60	-.1	-.3	.15	150	-9.9	-9.7	-.19	240	-1.5	-2.5	1.02
70	-1.8	-.9	-.14	160	-9.9	-9.8	-.17	250	-.8	-1.6	.77
80	-4.6	-2.3	-2.24	170	-9.8	-9.7	-.11	260	-.4	-1.8	.63
90	-8.8	-8.3	-.43	180	-9.9	-10.0	.12	269	-.1	-.4	.32
100	-9.1	-9.5	.38	190	-10.6	-10.3	.26	270	-.1	-.3	.25
110	-8.8	-9.2	.40	200	-10.4	-9.9	-.41	274	-.1	-.3	.20
120	-8.8	-9.1	.28	210	-10.5	-9.7	-.78				

Figure 4-10



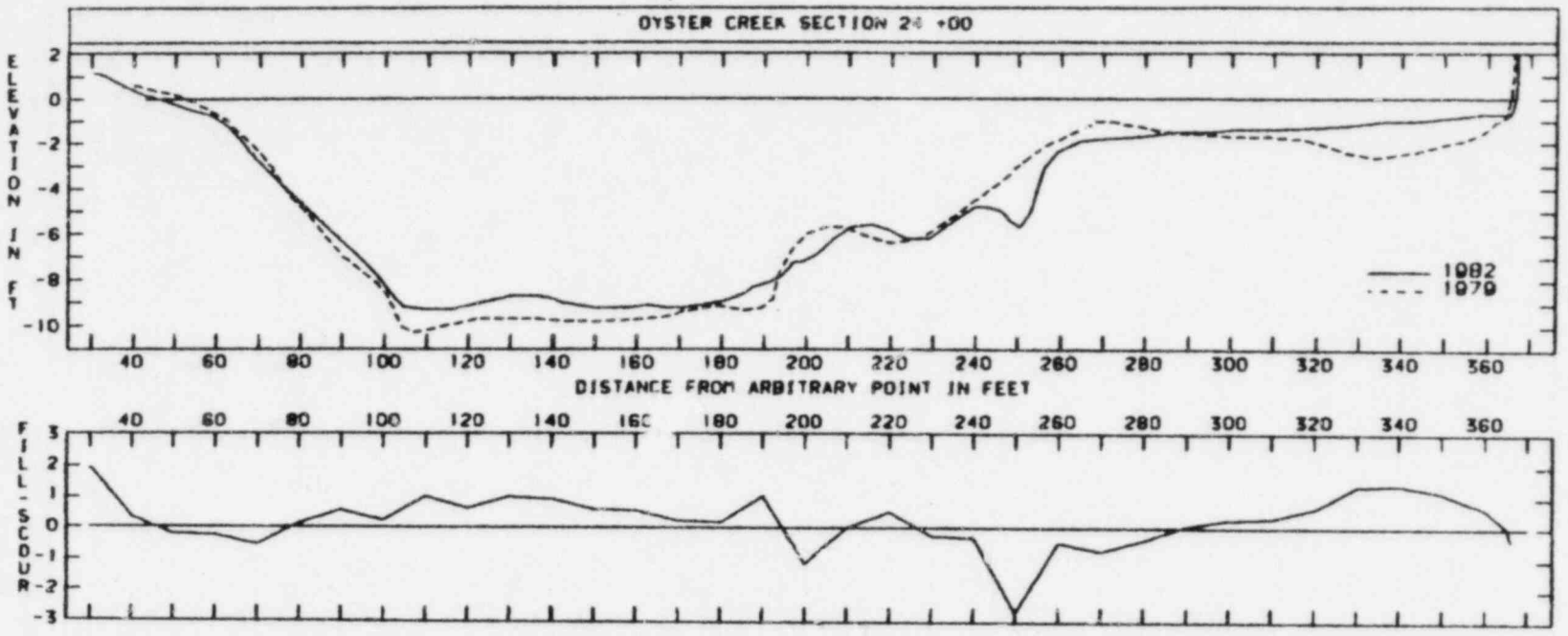
HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET	HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET	HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET
38	1.50	2.5		140	-8.19	-10.3	2.11	250	-2.15	-1.9	-.20
40	1.49	2.1		150	-8.00	-9.9	1.92	260	-1.92	-1.7	-.14
50	.66	.7		160	-8.31	-10.1	1.81	270	-1.89	-1.7	-.19
60	-.17	.2	-.38	170	-8.75	-10.4	1.64	280	-1.90	-1.6	-.30
70	-1.65	-1.2	-.37	180	-8.77	-10.1	1.39	290	-1.98	-1.7	-.28
80	-4.80	-4.1	-.77	190	-8.64	-10.0	1.36	300	-1.88	-1.6	-.19
90	-7.39	-7.3	.00	200	-9.41	-10.1	1.60	310	-1.80	-1.8	.01
100	-8.45	-8.8	.28	210	-8.45	-9.9	1.54	320	-1.80	-2.4	.68
110	-8.70	-10.5	1.82	220	-8.51	-9.0	-.42	330	4.13	1.6	
120	-8.70	-10.1	1.39	230	-6.04	-5.0	-.08	333	4.00	2.5	
130	-8.36	-10.3	2.02	240	-3.01	-3.0	.00				

Figure 4-11



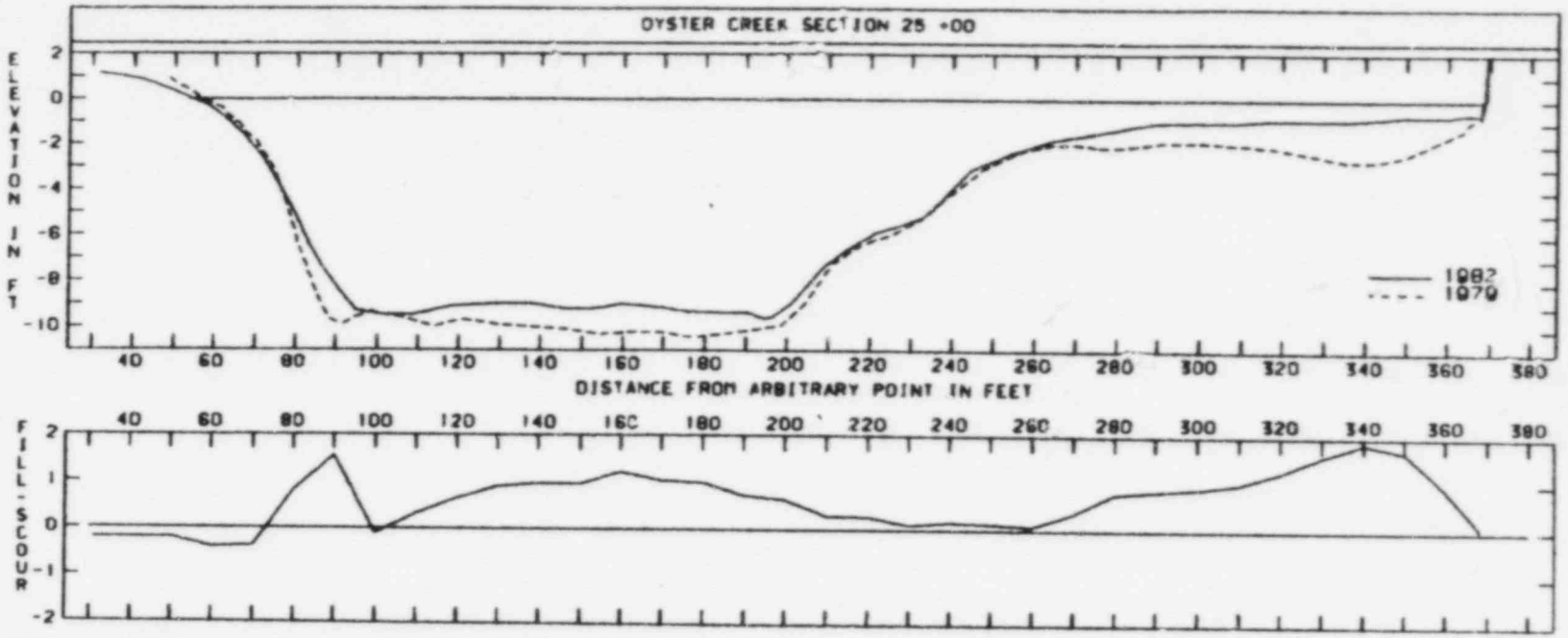
HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET	HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET	HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET
33	-.10	-.1	.00	160	-8.59	-9.9	1.32	290	-1.00	-1.4	-.38
40	-.10	-.1	.00	170	-8.63	-9.8	1.19	300	-1.77	-1.3	-.45
50	-.10	-.1	.00	180	-8.90	-9.8	.90	310	-1.63	-1.1	-.44
60	-.53	-.1	-.43	190	-9.00	-10.6	1.54	320	-1.47	-1.4	-.06
70	-1.06	-1.2	-.73	200	-9.00	-10.1	1.06	330	-1.30	-1.7	.31
80	-5.00	-3.4	-1.50	210	-8.55	-8.9	.44	340	-1.40	-1.8	.43
90	-7.57	-7.0	-.51	220	-7.05	-7.3	.34	350	-1.45	-2.0	.60
100	-8.52	-8.6	.09	230	-4.60	-4.0	-.63	360	-1.50	-2.3	.81
110	-9.04	-10.7	1.72	240	-2.55	-2.0	-.46	370	-1.48	-2.4	.93
120	-9.54	-10.6	1.08	250	-2.37	-2.2	-.08	380	-1.13	-2.0	.94
130	-9.27	-10.2	1.01	260	-2.16	-3.1	.96	390	-1.81	-1.1	.15
140	-8.89	-9.8	1.00	270	-1.97	-1.9	.02	397	-1.00	-.5	-.47
150	-8.92	-9.9	.98	280	-1.79	-1.6	-.18				

Figure 4-12



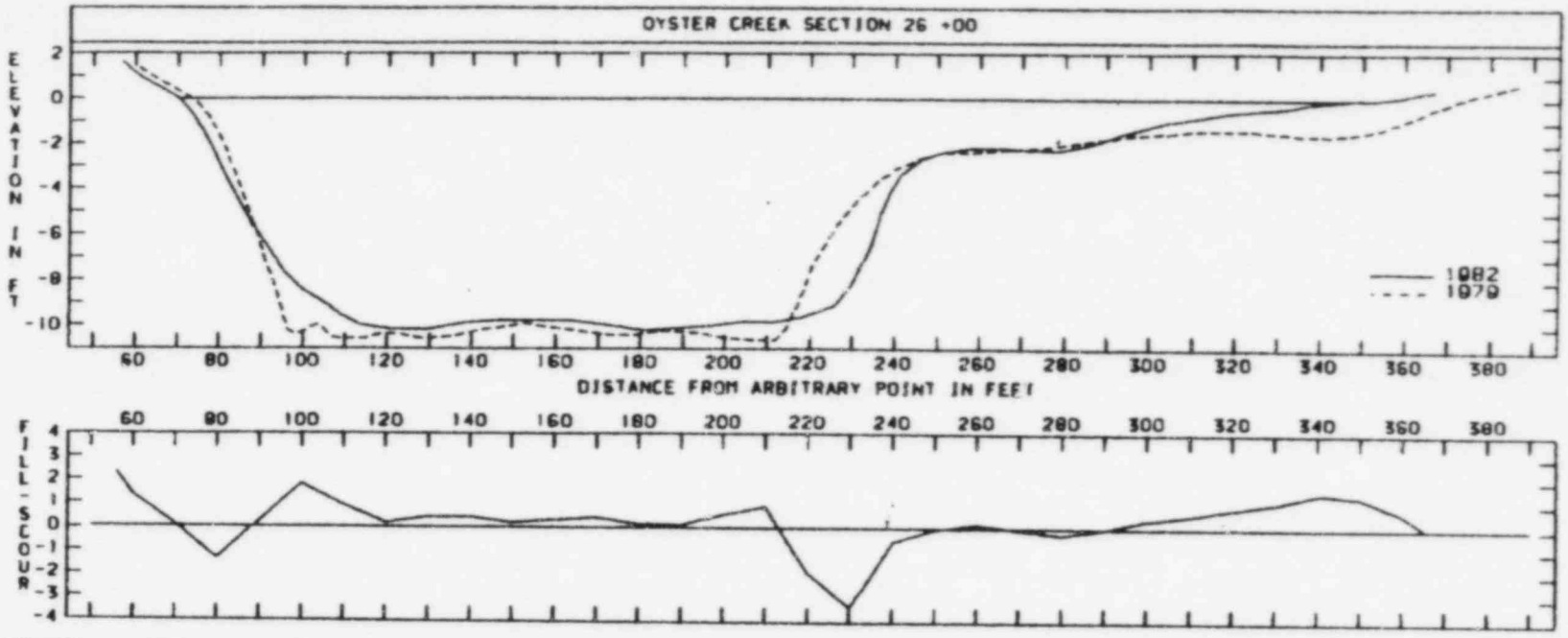
HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET	HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET	HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET
30	-.10	-2.0	1.91	150	-9.21	-9.8	.60	270	-1.81	-1.0	-.73
40	-.10	-.4	.33	160	-9.15	-9.7	.56	280	-1.60	-1.2	-.39
50	-.32	-.1	-.22	170	-9.20	-9.4	.23	290	-1.40	-1.5	.08
60	-.93	-.6	-.26	180	-8.93	-9.1	.18	300	-1.42	-1.6	.27
70	-2.93	-2.5	-.55	190	-8.15	-9.1	1.05	310	-1.40	-1.7	.31
80	-4.68	-4.8	.12	200	-7.13	-6.0	-1.12	320	-1.30	-1.9	.64
90	-6.41	-6.9	.55	210	-5.76	-5.7	.02	330	-1.18	-2.5	1.35
100	-8.24	-8.4	.22	220	-5.80	-6.4	.51	340	-1.10	-2.4	1.30
110	-9.30	-10.2	.90	230	-6.11	-5.8	-.25	350	-.90	-2.0	1.15
120	-9.15	-9.7	.62	240	-4.70	-4.4	-.30	360	-.70	-1.3	.63
130	-8.71	-9.7	.90	250	-5.71	-3.0	-2.69	365	-.70	-.7	.00
140	-8.81	-9.7	.93	260	-2.26	-1.7	-.47	366	-.60	-.1	-.40

Figure 4-13



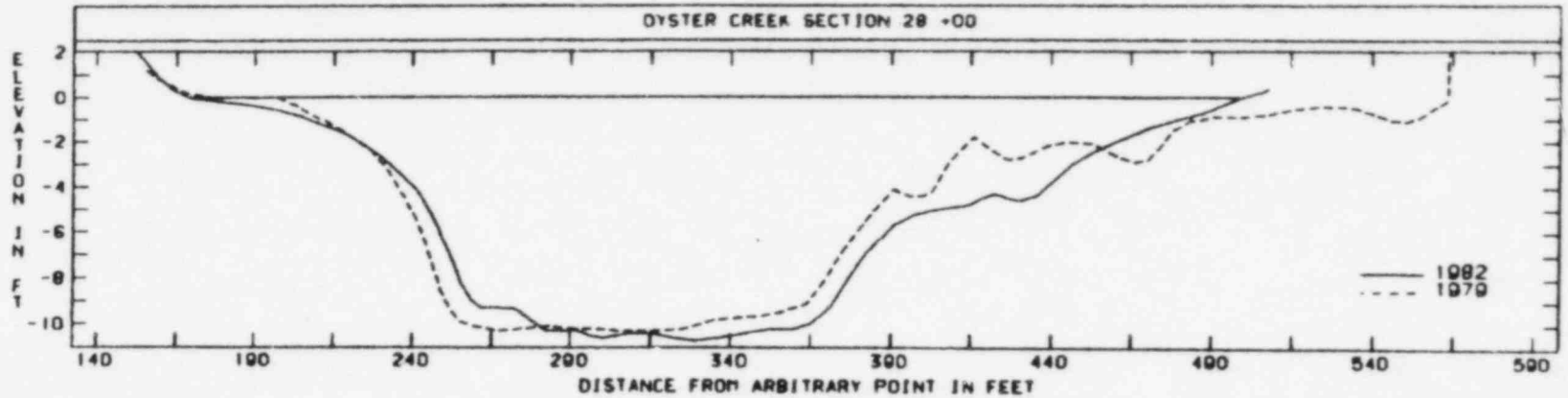
HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET	HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET	HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET
31	- .39	- .1	- .28	150	-0.22	-10.1	.97	270	-1.62	-1.9	.38
40	- .39	- .1	- .28	160	-0.60	-10.2	1.23	280	-1.33	-2.1	.78
50	- .39	- .1	- .28	170	-0.16	-10.2	1.85	290	-1.00	-1.9	.84
60	- .54	- .1	- .44	180	-0.36	-10.3	1.81	300	-1.88	-1.8	.89
70	-2.27	-1.8	- .38	190	-0.39	-10.1	.73	310	- .98	-1.9	1.81
80	-5.28	-6.8	.81	200	-0.89	-9.7	.65	320	- .80	-2.1	1.26
90	-8.32	-9.8	1.55	210	-7.20	-7.5	.39	330	- .90	-2.5	1.61
100	-9.49	-9.3	- .11	220	-5.97	-6.2	.29	340	- .85	-2.7	1.89
110	-9.47	-9.7	.32	230	-5.43	-5.5	.12	350	- .78	-2.4	1.71
120	-9.08	-9.7	.65	240	-3.94	-4.1	.18	359	- .78	-1.6	.90
130	-9.88	-9.8	.08	250	-2.66	-2.8	.15	367	- .68	- .8	.21
140	-9.05	-10.8	.97	260	-2.03	-2.1	.18	368	- .68	- .6	.85

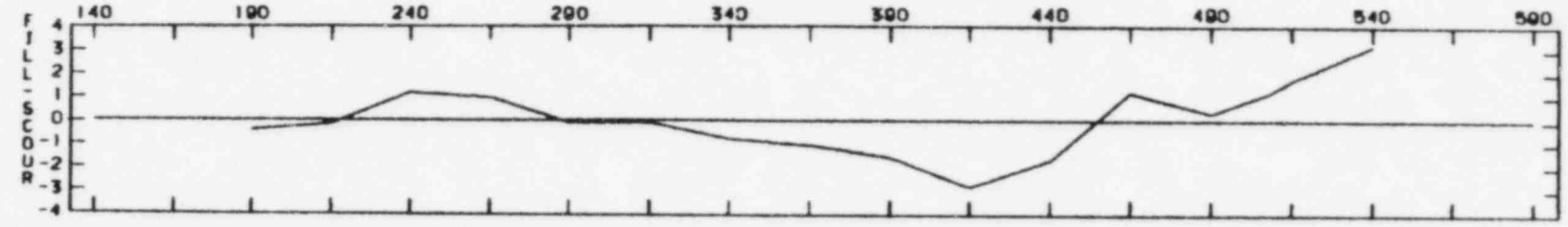
Figure 4-14



HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET	HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET	HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET
56	-.7	-3.0	2.28	170	-9.9	-10.3	.42	280	-2.2	-2.0	-.25
60	-.1	-1.4	1.32	180	-10.1	-10.3	.17	290	-1.7	-1.7	-.02
70	-.1	-.2	.10	190	-10.0	-10.2	.13	300	-1.1	-1.5	.35
80	-2.9	-1.6	-1.33	200	-9.9	-10.4	.50	310	-.8	-1.4	.56
90	-6.2	-6.4	.24	210	-9.8	-10.7	.90	320	-.5	-1.4	.83
100	-8.5	-10.3	1.81	220	-9.5	-7.6	-1.89	330	-.4	-1.4	1.06
110	-9.7	-10.6	.92	230	-8.1	-4.7	-3.36	340	-.1	-1.6	1.48
120	-10.1	-10.3	.19	240	-3.7	-3.1	-.56	341	-.1	-1.6	1.50
130	-10.1	-10.6	.42	250	-2.4	-2.4	-.02	350	-.1	-1.4	1.36
140	-9.8	-10.3	.42	260	-2.1	-2.3	.19	360	-.2	-.9	.68
150	-9.7	-9.9	.20	270	-2.2	-2.2	-.04	366	-.4	-.4	-.04
160	-9.7	-10.1	.32								

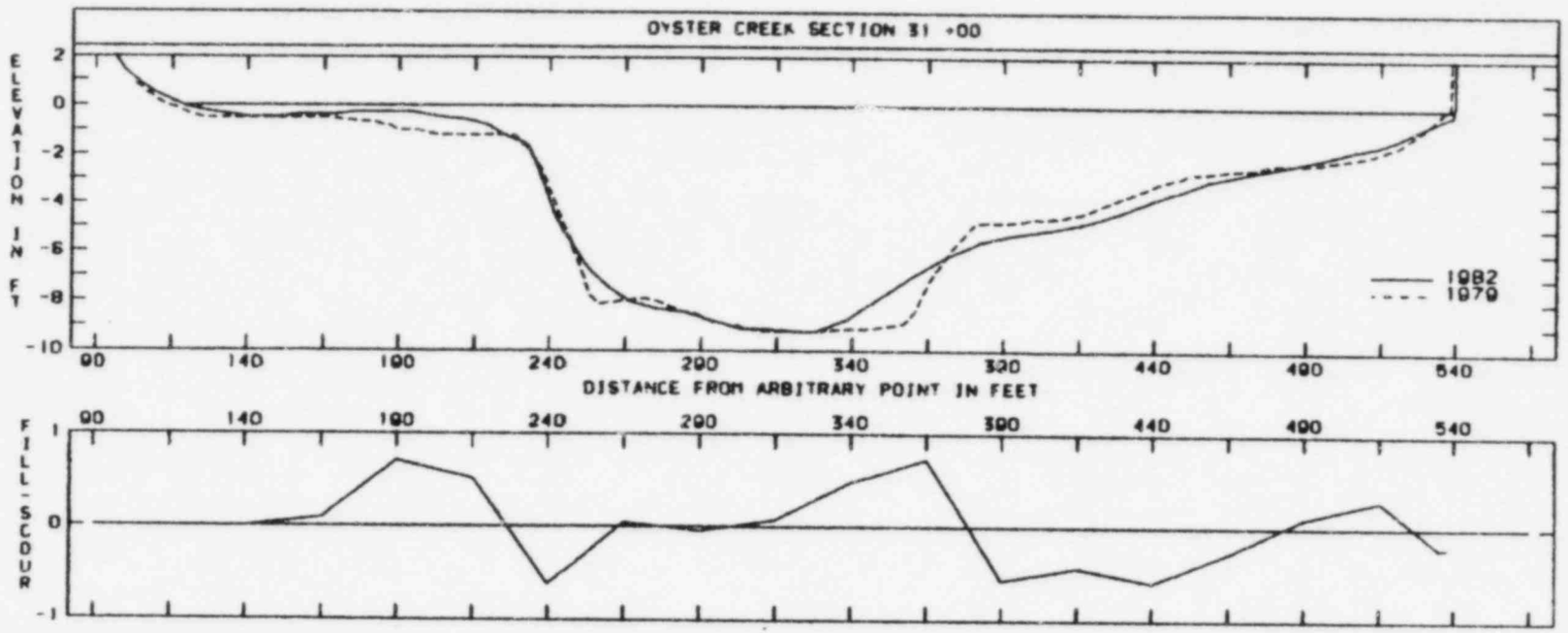
Figure 4-15





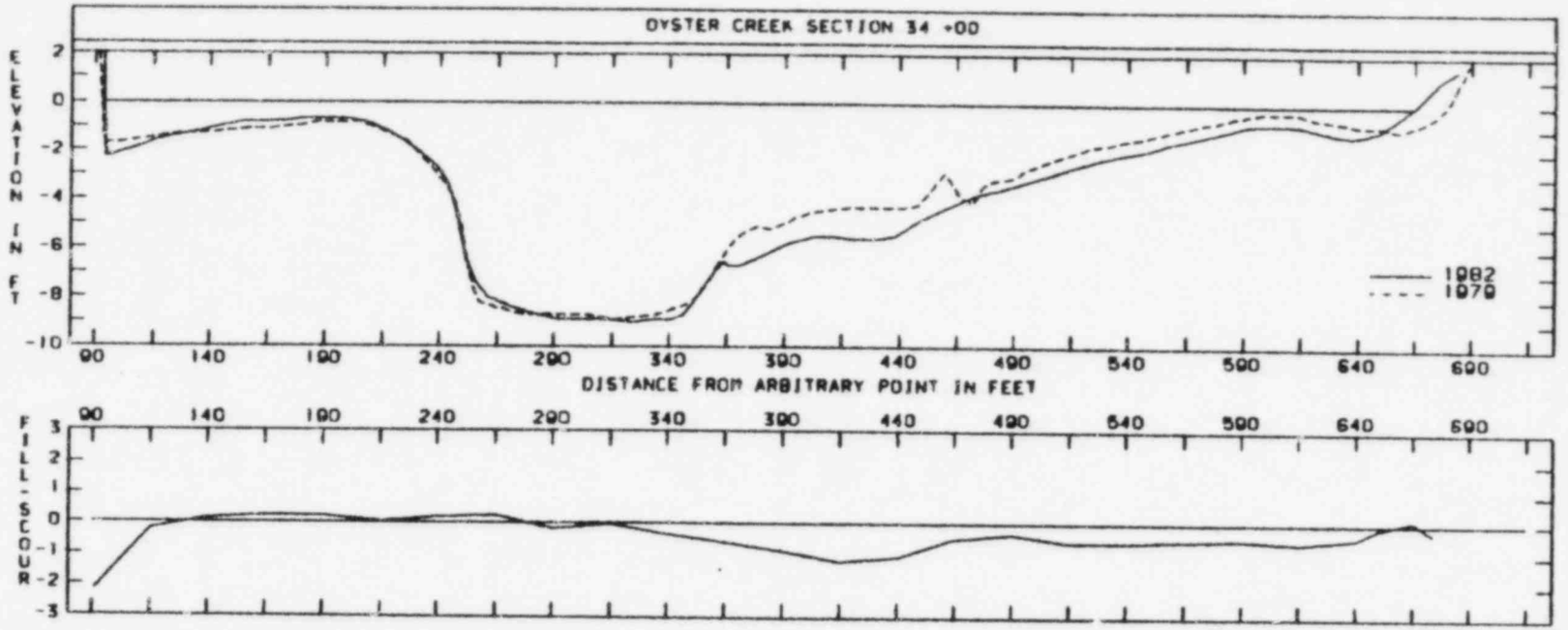
HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET	HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET	HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET
140	2.5	1.9		315	-10.3	-10.3	-.00	490	-.5	-.9	.32
165	.1	.4		340	-10.5	-9.7	-.77	500	.5	-.7	1.15
190	-.4	.0	-.43	365	-9.9	-8.9	-1.03	515	1.2	-.5	1.75
215	-1.4	-1.3	-.17	390	-5.7	-4.2	-1.55	540	2.5	-.6	3.10
240	-3.9	-5.1	1.18	415	-4.7	-1.9	-2.81	565	2.5	4.6	
265	-9.3	-10.2	.86	440	-3.8	-2.1	-1.69	566	2.5	4.6	
290	-10.2	-10.1	-.00	465	-1.7	-2.8	1.15				

Figure 4-16



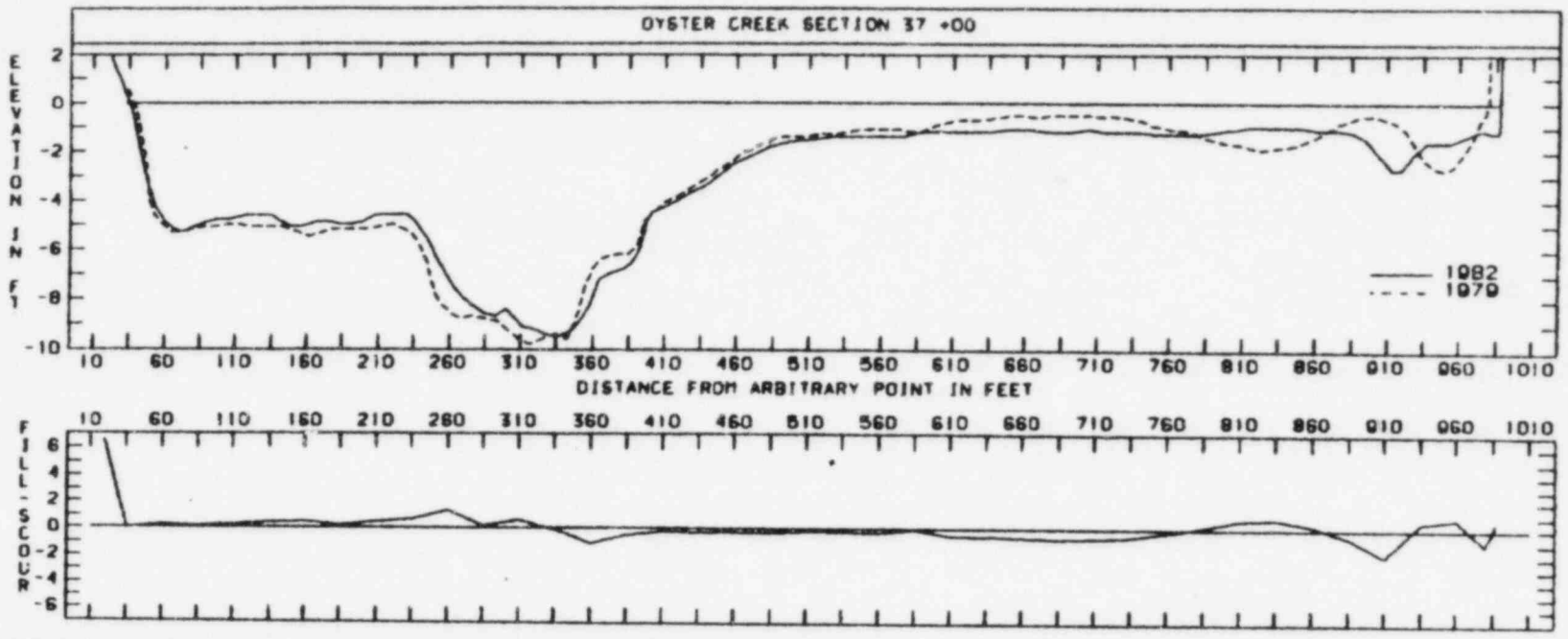
HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET	HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET	HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET
93	-.10	-.10	.00	265	-7.93	-7.96	.05	440	-3.80	-3.21	-.59
115	-.10	-.10	.00	290	-8.68	-8.64	-.04	465	-2.82	-2.55	-.27
140	-.50	-.50	.00	315	-9.14	-9.21	.08	490	-2.21	-2.31	.10
165	-.41	-.59	.09	340	-8.61	-9.10	.49	515	-1.48	-1.77	.29
190	-.29	-1.00	.71	365	-6.59	-7.32	.73	535	-.43	-.22	-.21
215	-.68	-1.20	.52	390	-5.37	-4.80	-.56	550	-.30	-.10	-.20
240	-3.07	-3.35	-.61	415	-4.87	-4.44	-.43				

Figure 4-17



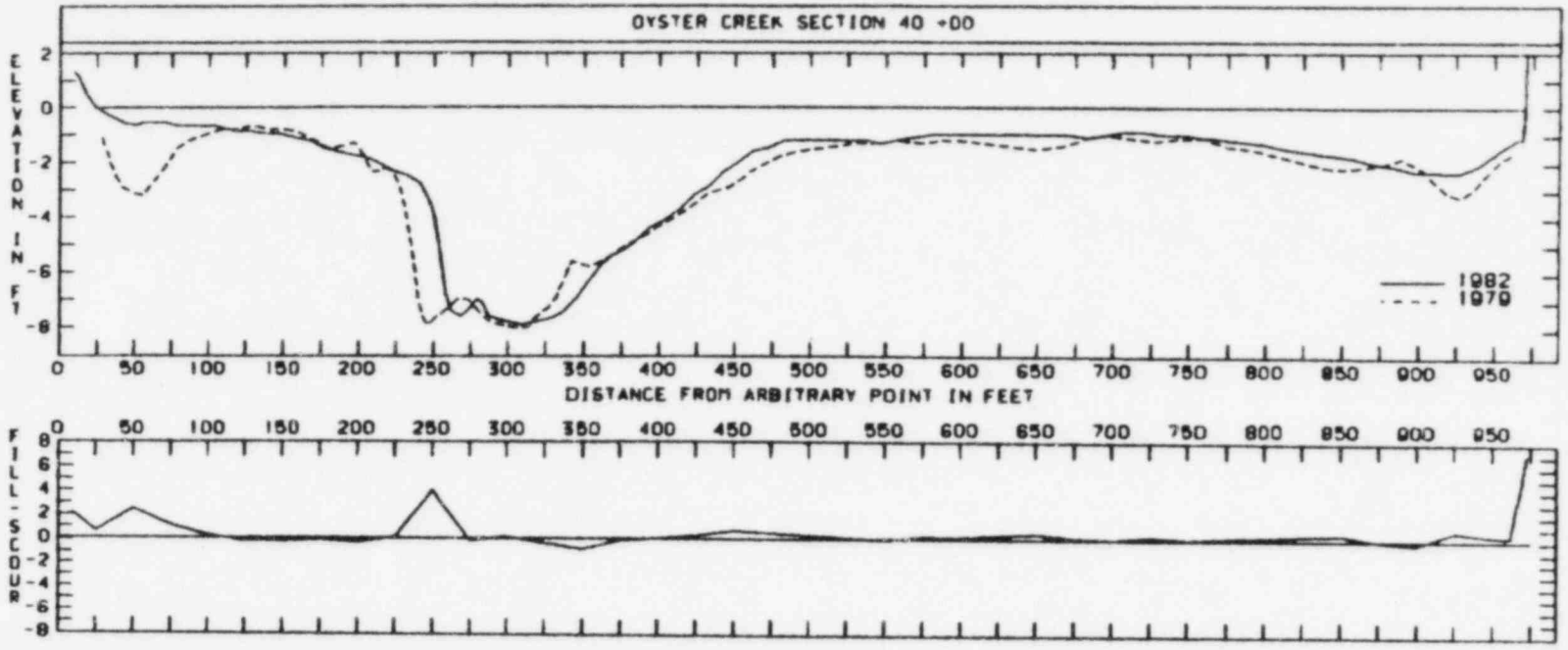
HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET	HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET	HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET
91	-2.30	-.10	-2.20	315	-8.92	-8.89	-.02	540	-2.08	-1.40	-.59
115	-1.68	-1.45	-.23	340	-8.91	-8.57	-.34	565	-1.49	-.95	-.54
140	-1.13	-1.26	.14	365	-6.68	-6.08	-.60	590	-.94	-.43	-.51
165	-.89	-1.10	.21	390	-5.85	-4.96	-.88	615	-.92	-.31	-.61
190	-.78	-.98	.20	415	-5.54	-4.32	-1.22	640	-1.26	-.81	-.45
215	-1.13	-1.17	.04	440	-5.39	-4.31	-1.08	650	-1.09	-.98	-.11
240	-2.92	-3.10	.18	465	-4.13	-3.65	-.48	665	-.78	-.85	.15
265	-8.24	-8.48	.24	490	-3.48	-3.07	-.32	674	-.78	-.41	-.29
290	-8.87	-8.70	-.17	515	-2.67	-2.07	-.60				

Figure 4-18



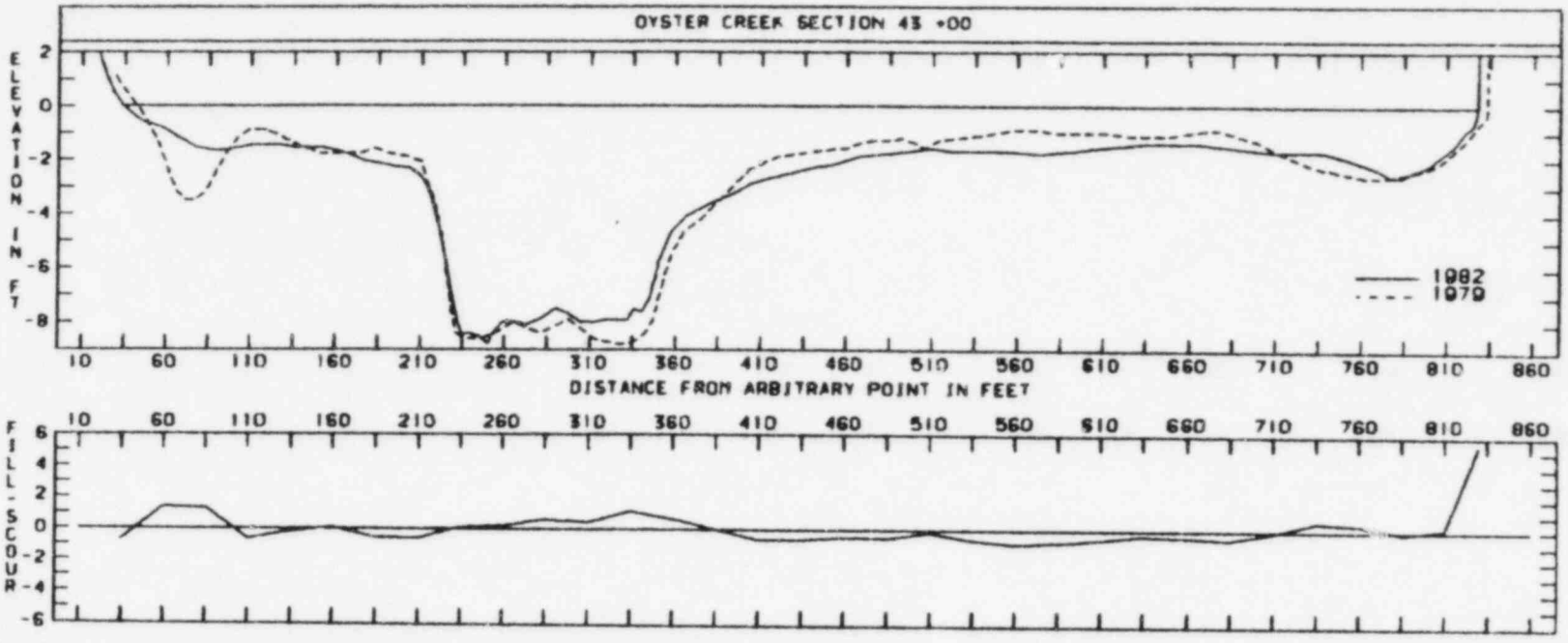
HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET	HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET	HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET
10	-.10	-6.67	6.57	360	-7.87	-6.79	-1.08	710	-1.15	-.50	-.65
35	-.10	-.10	.00	385	-6.65	-6.19	-.46	735	-1.19	-.66	-.54
60	-4.98	-5.11	.20	410	-4.26	-4.09	-.17	760	-1.38	-1.06	-.25
85	-5.00	-5.12	.12	435	-3.49	-3.26	-.24	785	-1.25	-1.44	.19
110	-4.77	-4.99	.22	460	-2.40	-2.18	-.22	810	-1.03	-1.72	.69
135	-4.71	-5.10	.39	485	-1.77	-1.50	-.27	835	-1.08	-1.88	.80
160	-5.04	-5.49	.45	510	-1.52	-1.36	-.15	860	-1.08	-1.39	.30
185	-5.01	-5.20	.19	535	-1.40	-1.22	-.18	885	-1.19	-.63	-.55
210	-4.66	-5.12	.46	560	-1.40	-1.10	-.30	910	-2.55	-.62	-1.93
235	-4.84	-5.47	.64	585	-1.24	-1.21	-.02	935	-1.65	-2.19	.54
260	-7.20	-8.60	1.38	610	-1.20	-.72	-.48	960	-1.45	-2.31	.86
285	-8.63	-8.79	.17	635	-1.20	-.68	-.52	970	-1.16	-.14	-1.02
310	-9.06	-9.66	.60	660	-1.00	-.50	-.50	985	-1.29	-1.29	.00
335	-9.51	-9.40	-.10	685	-1.21	-.50	-.71	986	-1.28	-1.86	.57

Figure 4-19



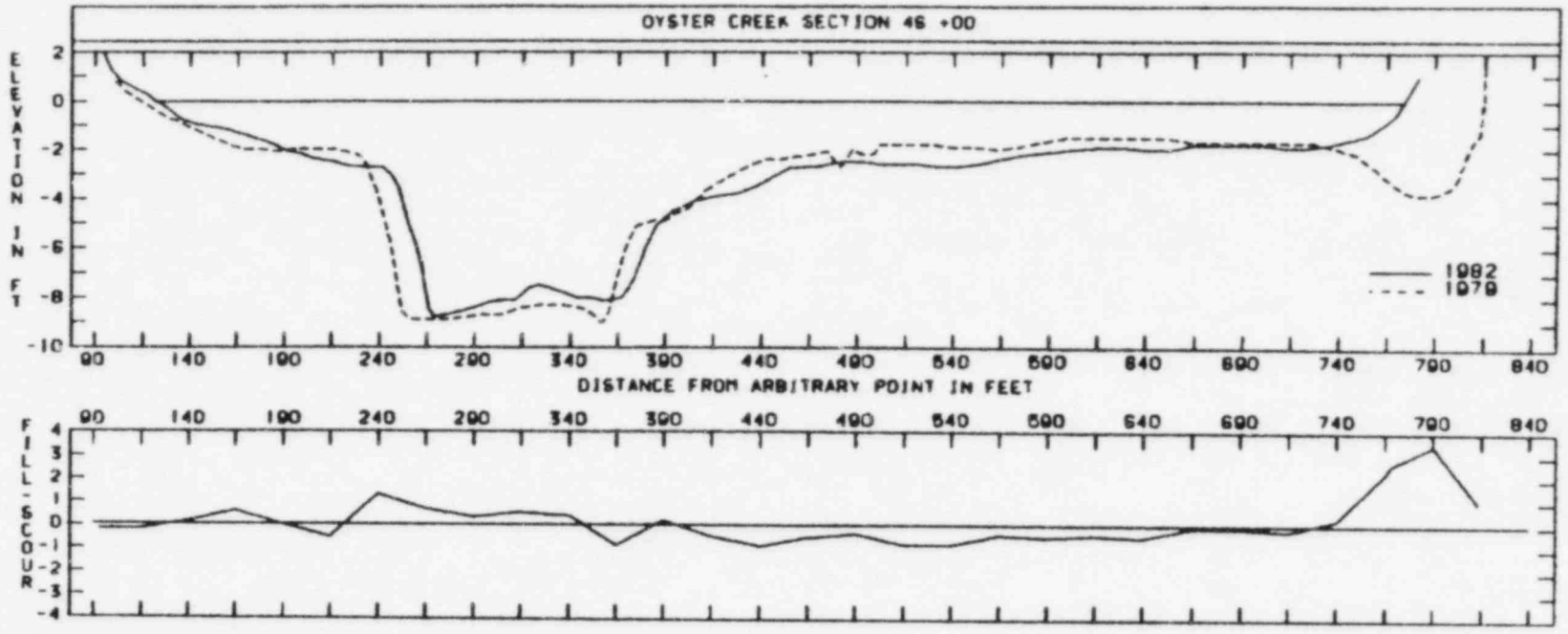
HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET	HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET	HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET
0	1.41	- .70	2.11	350	-6.56	-5.74	- .82	700	- .96	-1.01	.06
25	- .88	- .70	.62	375	-5.23	-5.14	- .09	725	- .94	-1.19	.25
50	- .70	-3.14	2.44	400	-4.21	-4.32	.11	750	-1.02	-1.00	.07
75	- .66	-1.74	1.08	425	-3.11	-3.45	.34	775	-1.19	-1.38	.19
100	- .69	- .93	.24	450	-2.07	-2.78	.71	800	-1.34	-1.60	.26
125	- .90	- .70	- .20	475	-1.39	-1.89	.51	825	-1.58	-1.96	.37
150	-1.04	- .80	- .24	500	-1.20	-1.53	.33	850	-1.75	-2.20	.45
175	-1.49	-1.38	- .11	525	-1.20	-1.33	.13	875	-2.04	-2.03	- .01
200	-1.82	-1.49	- .33	550	-1.28	-1.25	- .04	900	-2.31	-2.06	- .25
225	-2.43	-2.54	.11	575	-1.03	-1.29	.26	925	-2.42	-3.19	.77
250	-3.03	-7.01	3.98	600	-1.00	-1.20	.20	950	-1.66	-2.08	.42
275	-7.23	-7.08	- .15	625	-1.00	-1.38	.36	962	-1.23	-1.63	.40
300	-7.80	-7.96	.16	650	-1.00	-1.58	.58	972	6.40	- .96	7.36
325	-7.72	-7.38	- .34	675	-1.06	-1.22	.16				

Figure 4-20



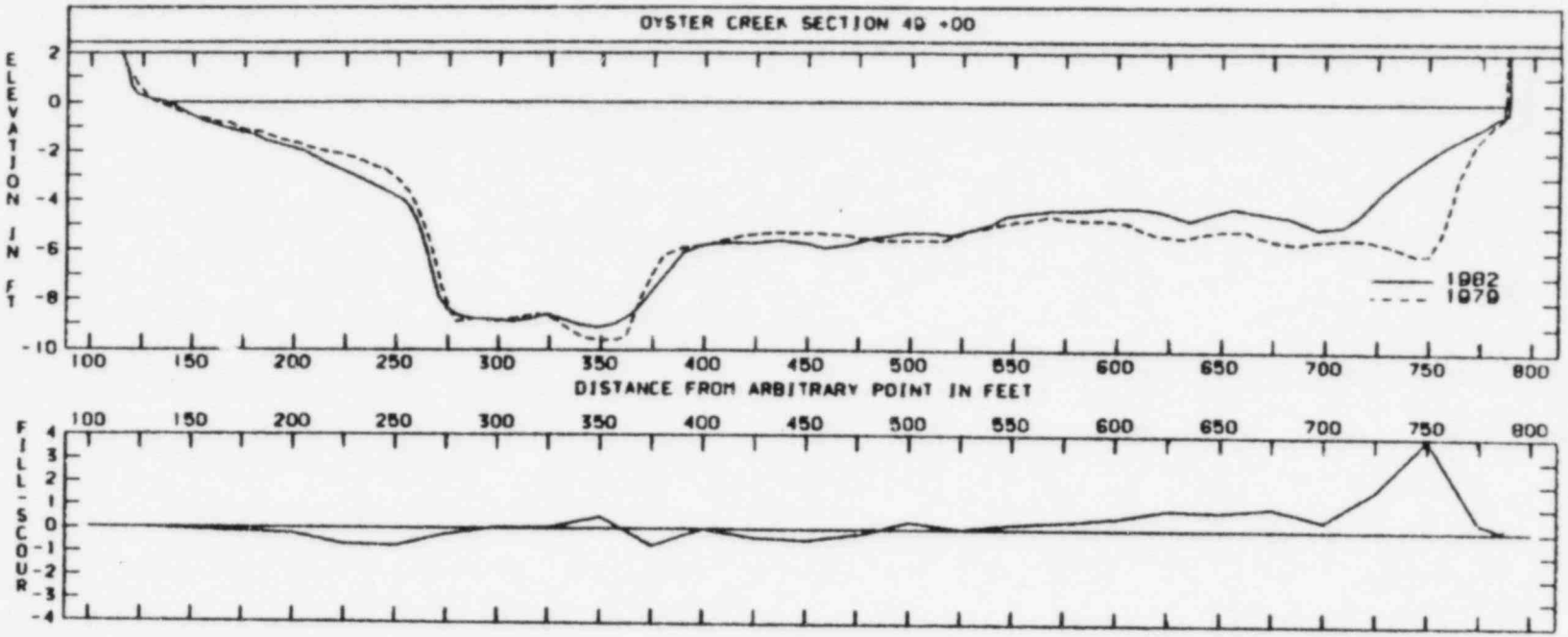
HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET	HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET	HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET
10	2.20	2.10		310	-8.01	-8.49	.48	610	-1.65	-1.00	-.56
35	-.11	.50	-.60	335	-7.57	-8.74	1.17	635	-1.40	-1.10	-.30
60	-.04	-2.32	1.30	360	-4.43	-5.14	.70	660	-1.30	-.90	-.40
85	-1.60	-3.00	1.31	385	-3.40	-3.54	.05	685	-1.55	-1.01	-.54
110	-1.51	-.88	-.63	410	-2.77	-2.15	-.61	710	-1.71	-1.65	-.06
135	-1.50	-1.40	-.10	435	-2.30	-1.76	-.62	735	-1.68	-2.27	.59
160	-1.70	-1.80	.10	460	-2.05	-1.60	-.45	760	-2.13	-2.57	.43
185	-2.10	-1.62	-.57	485	-1.70	-1.31	-.40	785	-2.57	-2.47	-.10
210	-2.65	-2.06	-.59	510	-1.60	-1.47	-.13	810	-1.65	-1.88	.23
235	-8.40	-8.62	.14	535	-1.70	-1.12	-.58	830	5.00	-.56	5.56
260	-7.98	-8.19	.22	560	-1.73	-.89	-.84	835	5.00	2.60	
285	-7.70	-8.33	.63	585	-1.74	-1.00	-.73	836	5.00	2.60	

Figure 4-21



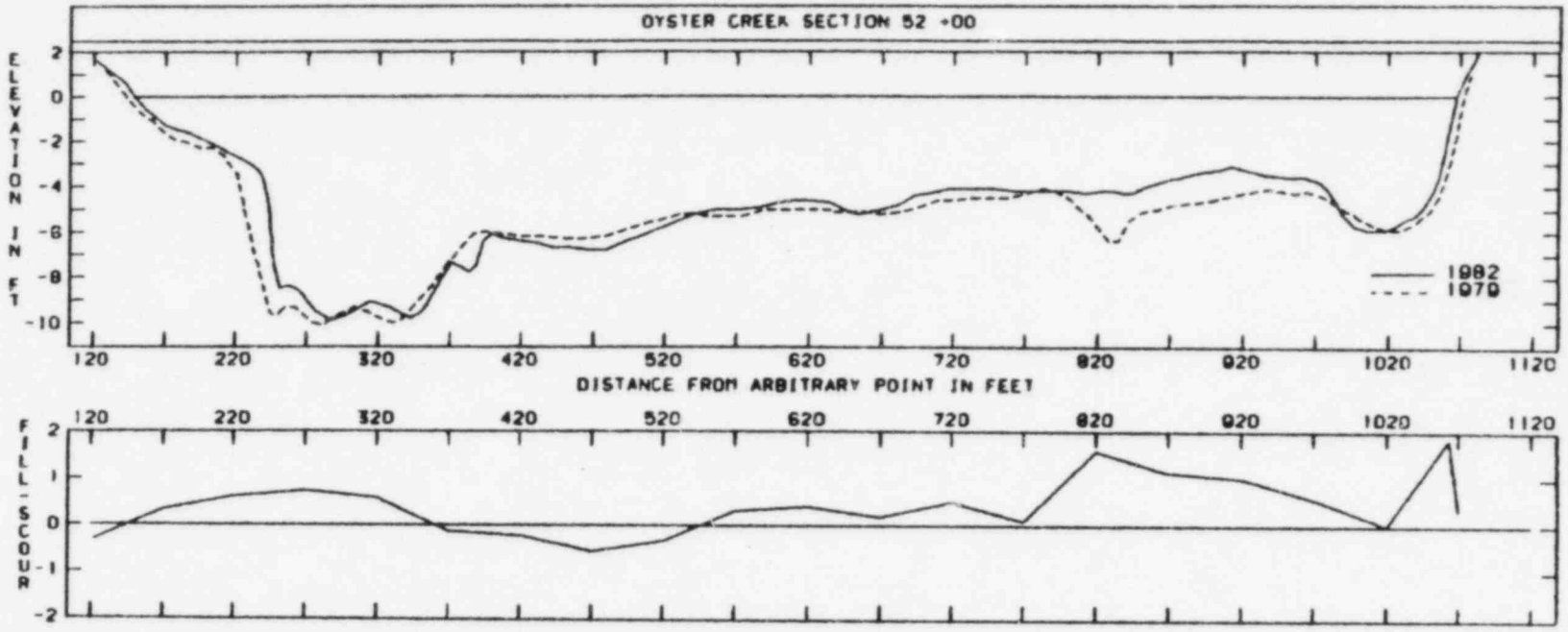
HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET	HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET	HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET
93	-.38	-.18	-.20	365	-8.11	-7.19	-.92	615	-1.00	-1.50	.48
115	-.38	-.18	-.20	390	-4.69	-4.90	.21	640	-2.00	-1.50	-.50
140	-.93	-1.07	.14	415	-3.92	-3.46	-.46	665	-1.80	-1.70	-.10
165	-1.34	-1.93	.59	440	-3.36	-2.43	-.93	690	-1.80	-1.70	-.10
190	-2.88	-2.87	-.01	465	-2.72	-2.22	-.50	715	-1.91	-1.70	-.21
215	-2.52	-1.90	-.55	490	-2.48	-2.14	-.35	740	-1.80	-1.92	.24
240	-2.77	-4.09	1.32	515	-2.60	-1.80	-.80	765	-.83	-3.12	2.30
265	-8.23	-8.91	.68	540	-2.70	-1.90	-.80	788	-.64	-3.30	2.66
290	-8.41	-8.74	.33	565	-2.37	-1.90	-.39	790	-.30	-3.78	3.48
315	-7.86	-8.40	.54	590	-2.11	-1.63	-.48	814	-.30	-1.30	1.00
340	-7.02	-8.33	.40								

Figure 4-22



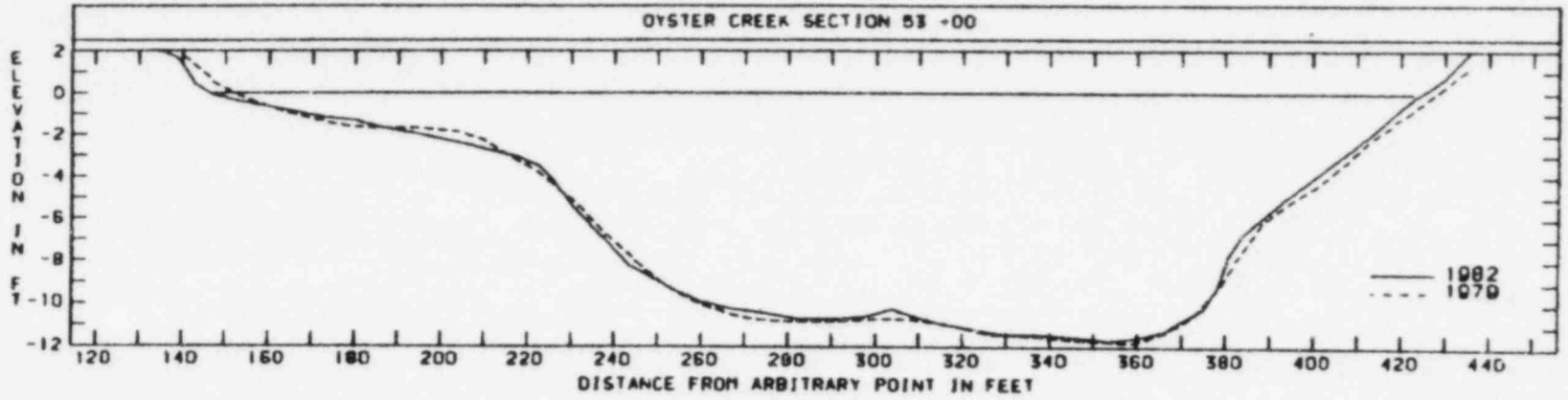
HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET	HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET	HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET
100	-.10	-.10	.00	350	-9.89	-9.61	.51	600	-4.29	-4.82	.53
125	-.10	-.10	.00	375	-7.62	-6.95	-.67	625	-4.59	-5.45	.86
150	-.50	-.52	-.07	400	-5.80	-5.80	-.00	650	-4.48	-5.28	.80
175	-1.25	-1.10	-.15	425	-5.69	-5.34	-.35	675	-4.58	-5.56	.98
200	-1.90	-1.66	-.24	450	-5.73	-5.30	-.43	700	-5.12	-5.54	.43
225	-2.86	-2.19	-.67	475	-5.66	-5.46	-.20	725	-3.81	-5.58	1.76
250	-3.83	-3.10	-.73	500	-5.29	-5.60	.31	750	-2.17	-6.13	3.97
275	-8.43	-8.18	-.24	525	-5.29	-5.33	.04	775	-.98	-1.38	.40
300	-8.84	-8.80	.05	550	-4.62	-4.86	.24	785	-.51	-.60	.09
325	-8.62	-8.68	.06	575	-4.30	-4.74	.35	787	-.48	-.60	.20

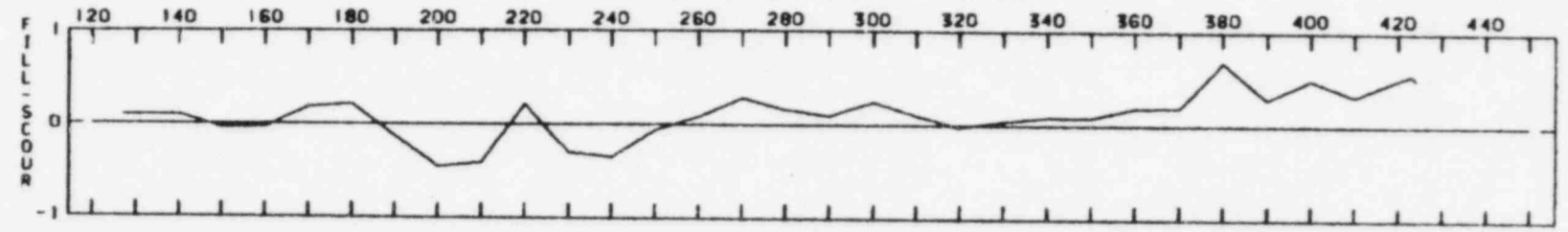
Figure 4-23



HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET	HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET	HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET
122	-.60	-.30	-.30	470	-6.82	-6.27	-.55	820	-4.22	-5.78	1.56
170	-1.32	-1.65	.33	520	-5.74	-5.42	-.33	870	-3.72	-4.85	1.13
220	-2.68	-3.28	.60	570	-5.00	-5.32	.32	920	-3.28	-4.20	1.01
270	-9.84	-9.77	.73	620	-4.68	-5.08	.40	970	-3.73	-4.28	.55
320	-9.17	-9.75	.58	670	-5.81	-5.28	.19	1020	-5.86	-5.88	.02
370	-7.48	-7.35	-.13	720	-4.89	-4.68	.51	1063	-1.23	-3.07	1.84
420	-6.41	-6.19	-.22	770	-4.20	-4.38	.18	1070	-.68	-.98	.30

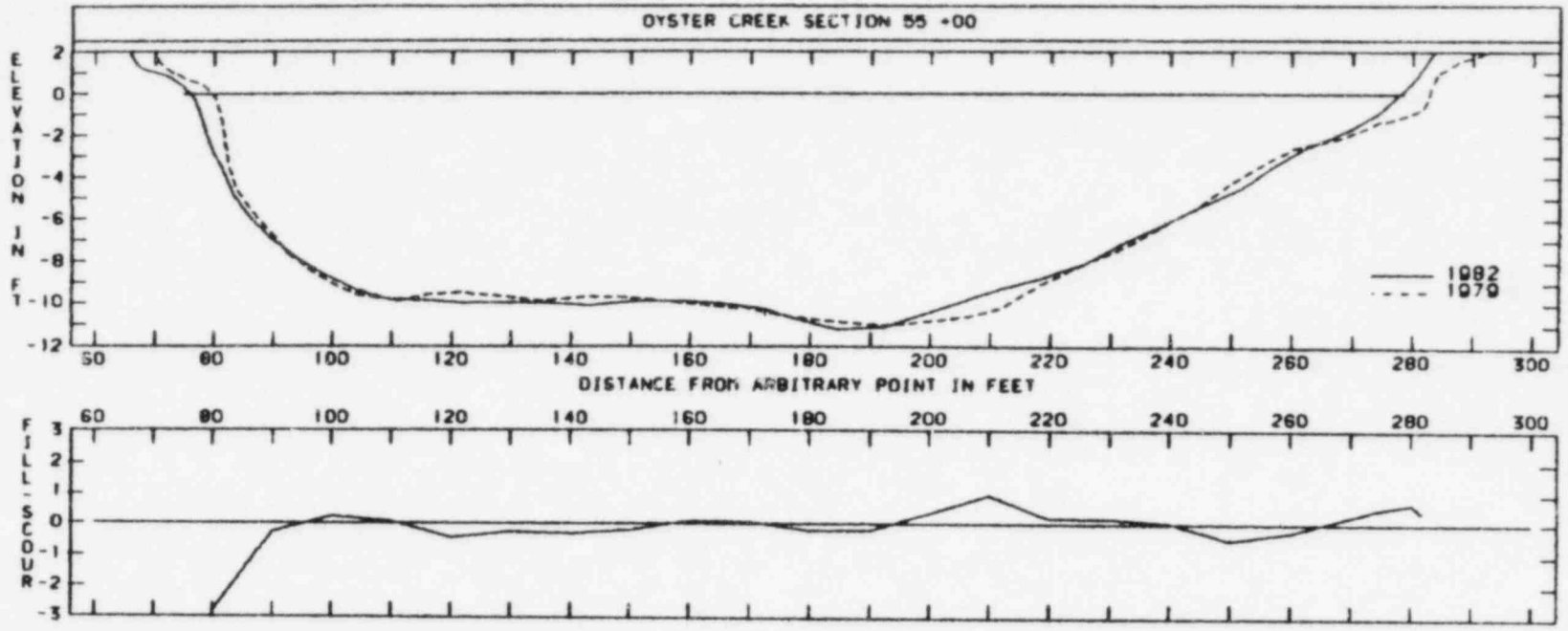
Figure 4-24





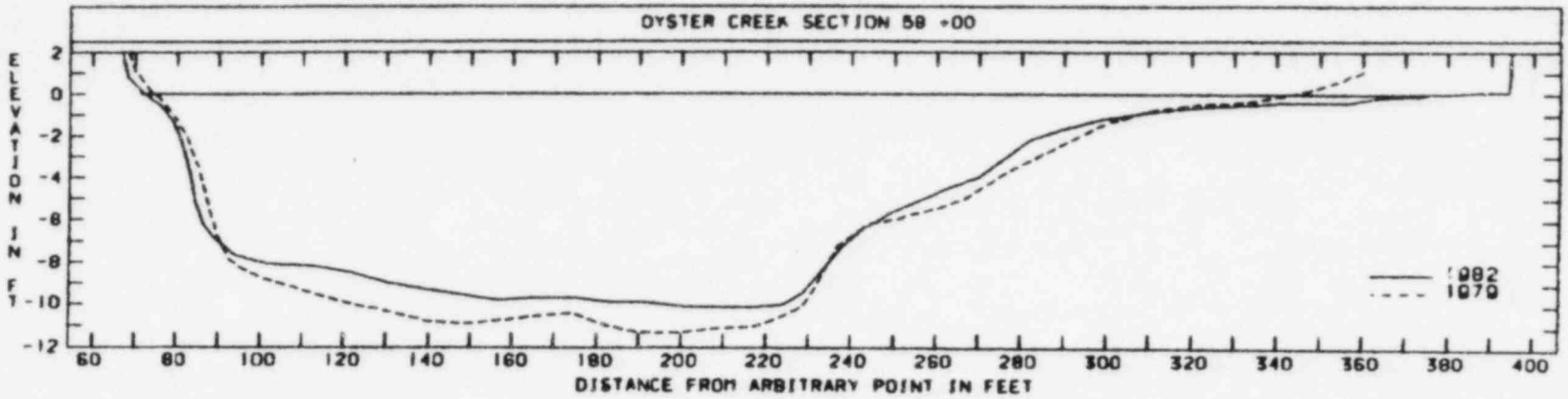
HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET	HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET	HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET
127	-.1	-.2	.10	230	-5.3	-5.0	-.30	340	-11.4	-11.5	.09
130	-.1	-.2	.10	240	-7.4	-7.1	-.35	350	-11.6	-11.7	.09
140	-.1	-.2	.10	250	-8.9	-8.8	-.06	360	-11.5	-11.7	.19
150	-.2	-.2	-.04	260	-9.9	-9.9	.00	370	-10.7	-10.9	.20
160	-.6	-.6	-.04	270	-10.3	-10.6	.28	380	-8.1	-8.8	.69
170	-1.0	-1.2	.19	280	-10.6	-10.8	.17	390	-5.5	-5.8	.30
180	-1.4	-1.6	.22	290	-10.7	-10.8	.10	400	-4.0	-4.5	.51
190	-1.8	-1.7	-.13	300	-10.4	-10.7	.26	410	-2.4	-2.8	.33
200	-2.2	-1.7	-.46	310	-10.6	-10.7	.11	420	-.7	-1.2	.52
210	-2.7	-2.2	-.42	320	-11.1	-11.0	-.01	423	-.2	-.7	.57
220	-3.2	-3.4	.21	330	-11.4	-11.4	.05	424	-.1	-.6	.51

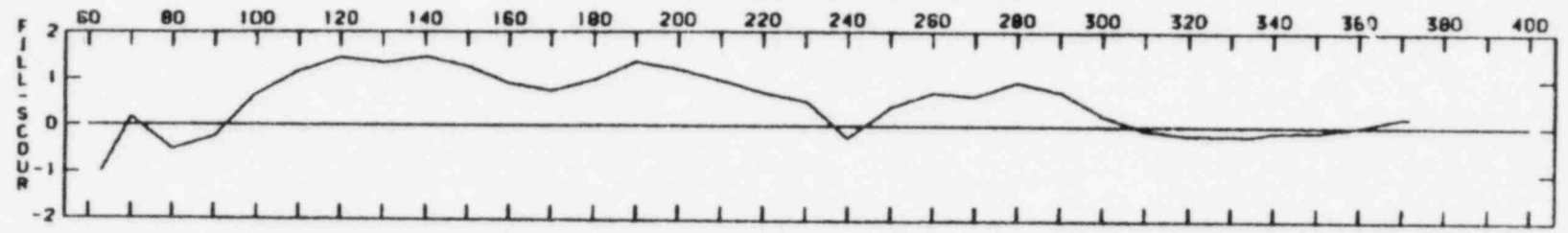
Figure 4-25



HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET	HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET	HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET
63	-3.2	-58.5		150	-9.9	-9.7	-.20	230	-7.4	-7.6	.18
70	-.3	-13.6		160	-9.9	-10.0	.10	240	-6.1	-6.1	.04
80	-2.9	-.1	-2.84	170	-10.2	-10.2	.07	250	-4.7	-4.2	-.51
90	-7.1	-6.8	-.28	180	-10.9	-10.7	-.21	260	-2.9	-2.6	-.26
100	-8.8	-9.0	.22	190	-11.1	-10.9	-.21	270	-1.6	-1.8	.26
110	-9.8	-9.9	.06	200	-10.4	-10.8	.36	274	-.9	-1.4	.48
120	-9.9	-9.5	-.48	210	-9.4	-10.3	.94	280	-.3	-.9	.67
130	-10.0	-9.7	-.28	220	-8.8	-8.8	.20	282	-.3	-.6	.35
140	-10.0	-9.7	-.31								

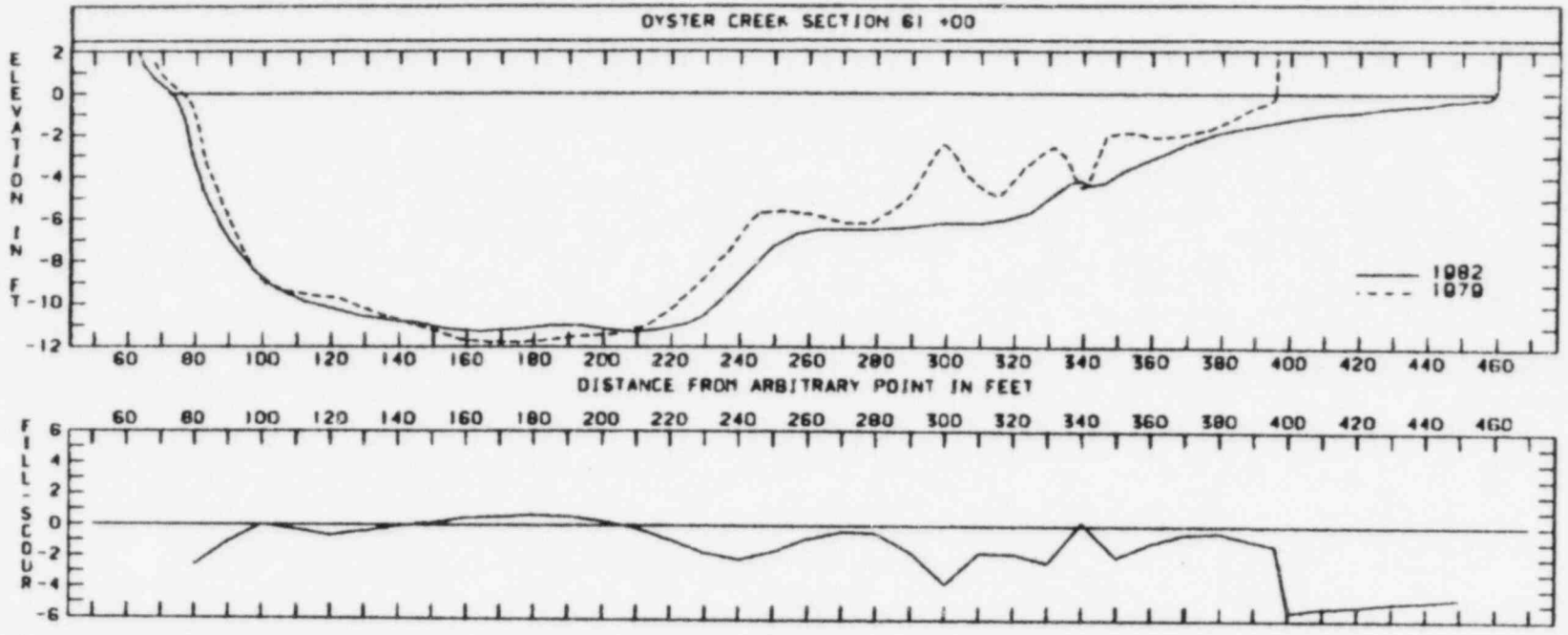
Figure 4-26





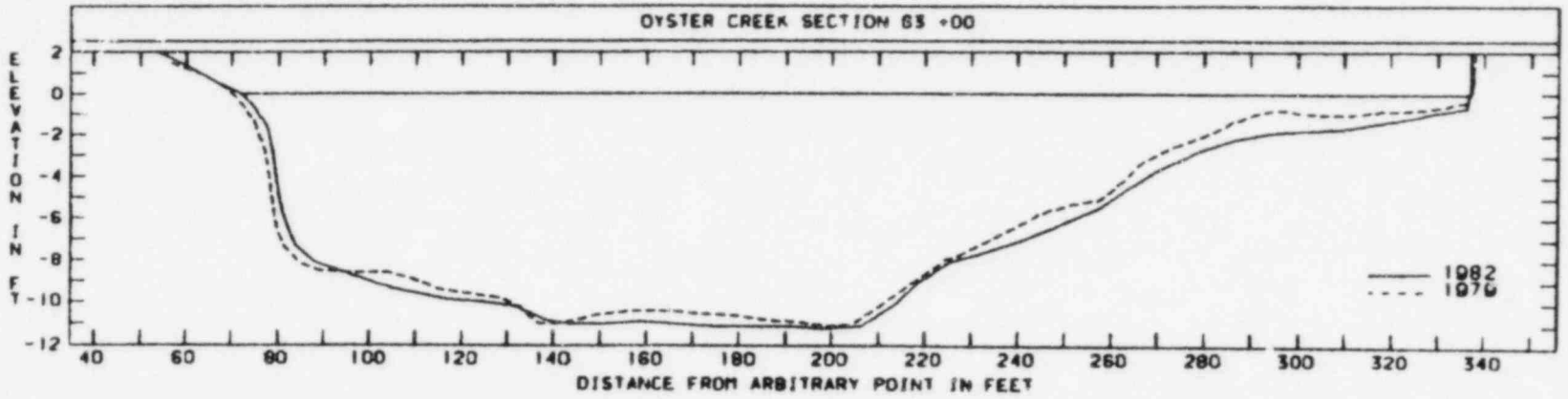
HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET	HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET	HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET
63	-1.2	-.3	-.90	188	-9.8	-10.8	.99	200	-1.6	-2.3	.74
70	-.1	-.3	.17	198	-9.8	-11.2	1.38	300	-1.1	-1.4	.23
80	-1.7	-1.2	-.51	200	-10.0	-11.3	1.22	310	-.8	-.8	-.07
90	-7.8	-6.8	-.25	210	-10.1	-11.0	.98	320	-.6	-.5	-.17
100	-8.0	-8.7	.68	220	-10.1	-10.8	.72	330	-.5	-.3	-.18
110	-8.1	-9.3	1.16	230	-9.1	-9.7	.54	335	-.4	-.3	-.19
120	-8.4	-9.0	1.46	240	-6.8	-6.6	-.24	340	-.4	-.3	-.11
130	-8.9	-10.3	1.35	250	-5.5	-5.9	.48	350	-.4	-.3	-.10
140	-9.3	-10.8	1.48	260	-4.7	-5.4	.72	360	-.2	-.3	.01
150	-9.6	-10.9	1.28	270	-3.9	-4.6	.65	370	-.1	-.3	.20
160	-9.7	-10.7	.91	280	-2.4	-3.3	.94	372	-.1	-.3	.20
170	-9.8	-10.4	.76								

Figure 4-27



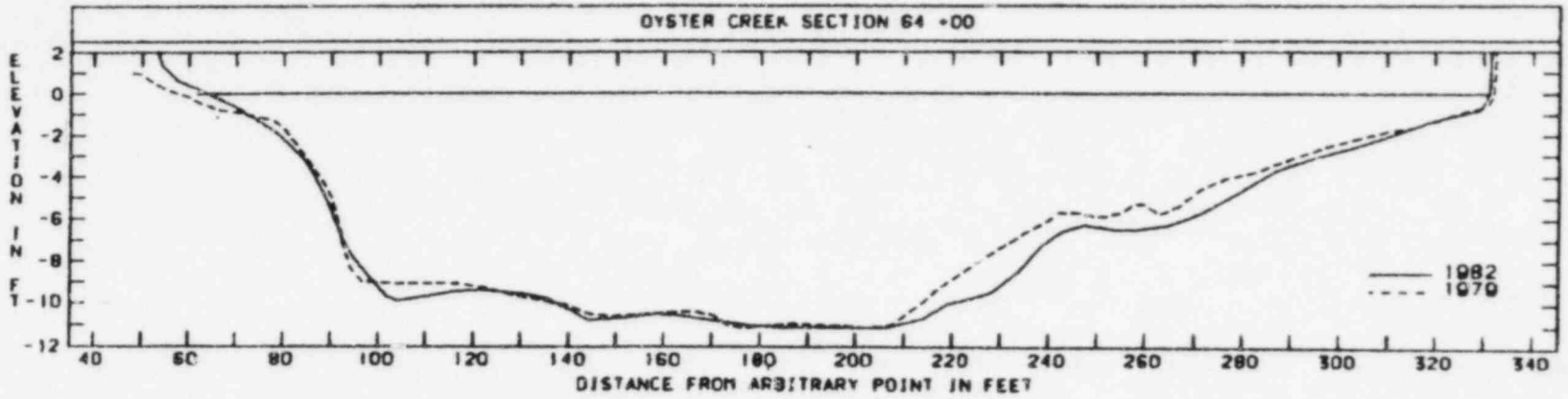
HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET	HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET	HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET
54	3.6	4.2		200	-11.1	-11.4	.28	350	-3.8	-1.9	-1.97
60	2.7	4.2		210	-11.2	-11.1	-.12	360	-3.1	-2.0	-1.09
70	.3	.9		220	-11.8	-10.2	-.87	370	-2.4	-1.9	-.46
80	-3.7	-1.1	-2.54	230	-10.4	-8.7	-1.72	380	-1.8	-1.4	-.39
90	-7.6	-5.9	-1.86	240	-8.8	-8.7	-2.13	390	-1.5	-.6	-.91
100	-8.8	-8.8	.83	250	-7.2	-5.5	-1.63	396	-1.3	-.1	-1.23
110	-9.7	-9.5	-.28	260	-6.5	-5.7	-.80	400	-1.2	4.2	-5.46
120	-10.2	-9.6	-.65	270	-6.5	-6.1	-.34	410	-1.8	4.2	-5.21
130	-10.6	-10.2	-.48	280	-6.5	-6.0	-.44	420	-.9	4.2	-5.10
140	-10.8	-10.7	-.87	290	-6.3	-4.7	-1.66	430	-.6	4.2	-4.89
150	-11.0	-11.2	.15	300	-6.1	-2.5	-3.67	440	-.5	4.2	-4.78
160	-11.2	-11.7	.45	310	-8.2	-4.5	-1.71	450	-.4	4.2	-4.68
170	-11.2	-11.8	.56	320	-5.0	-4.1	-1.77	460	3.8	4.2	
180	-11.0	-11.7	.67	330	-4.9	-2.8	-2.33	462	3.8	4.2	
190	-10.9	-11.5	.59	340	-4.2	-4.5	.24				

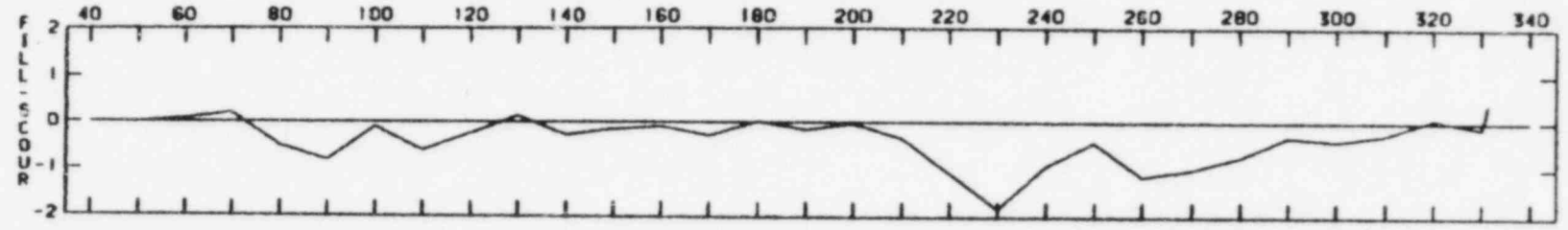
Figure 4-28



HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET	HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET	HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET
40	-110.	-.2		150	-11.	-10.5	-.44	250	-6.	-5.3	-.84
50	-102.	-.2		160	-10.	-10.3	-.53	260	-5.	-4.7	-.39
60	-37.	-.2		170	-11.	-10.4	-.57	270	-3.	-2.8	-.80
70	-4.	-.2	-4.62	180	-11.	-10.6	-.49	280	-2.	-2.0	-.64
80	-4.	-6.6	1.90	190	-11.	-10.8	-.24	290	-2.	-1.0	-1.00
90	-8.	-8.5	.25	200	-11.	-11.1	.12	300	-1.	-.9	-.94
100	-9.	-8.5	-.45	210	-10.	-10.2	-.44	310	-1.	-1.0	-.66
110	-9.	-8.9	-.68	220	-8.	-8.6	.12	320	-1.	-.7	-.61
120	-9.	-9.5	-.38	230	-7.	-7.4	-.38	330	-.	-.6	-.22
130	-10.	-9.9	-.17	240	-7.	-6.3	-.77	336	-.	-.4	-.38
140	-10.	-11.0	11								

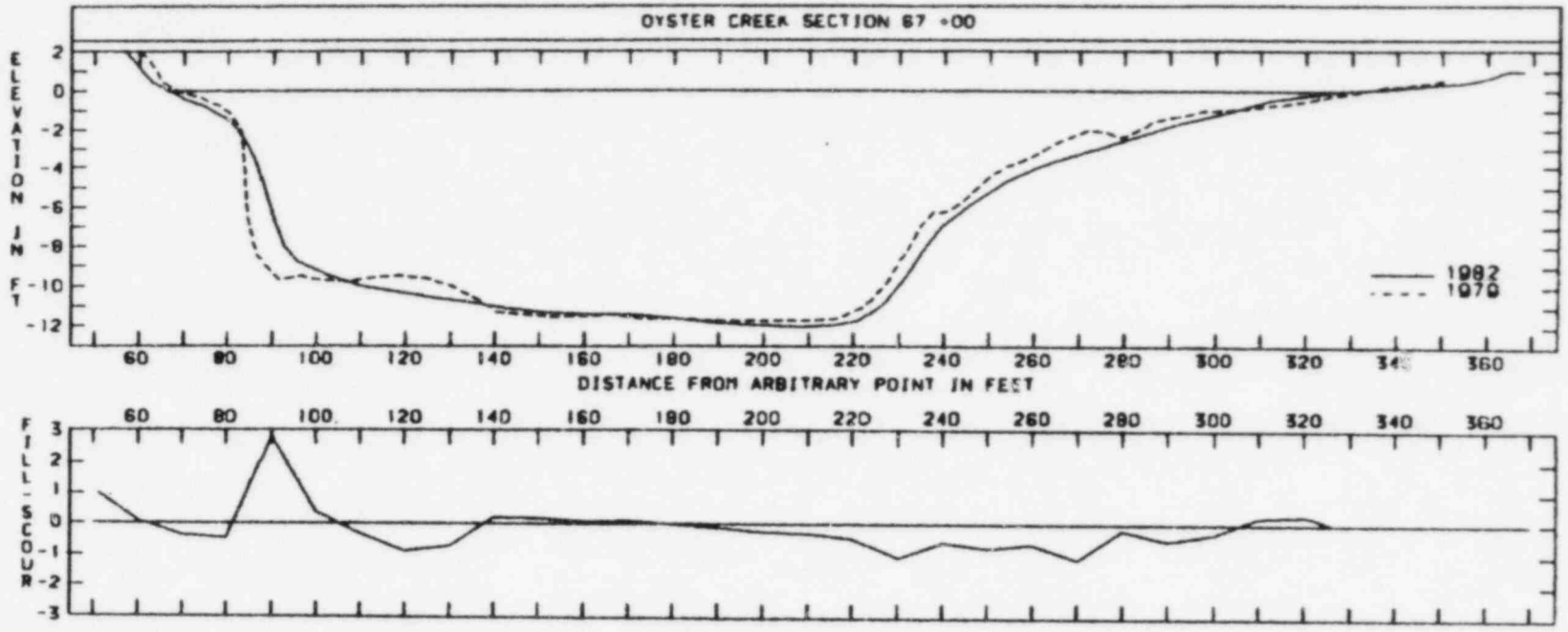
Figure 4-29





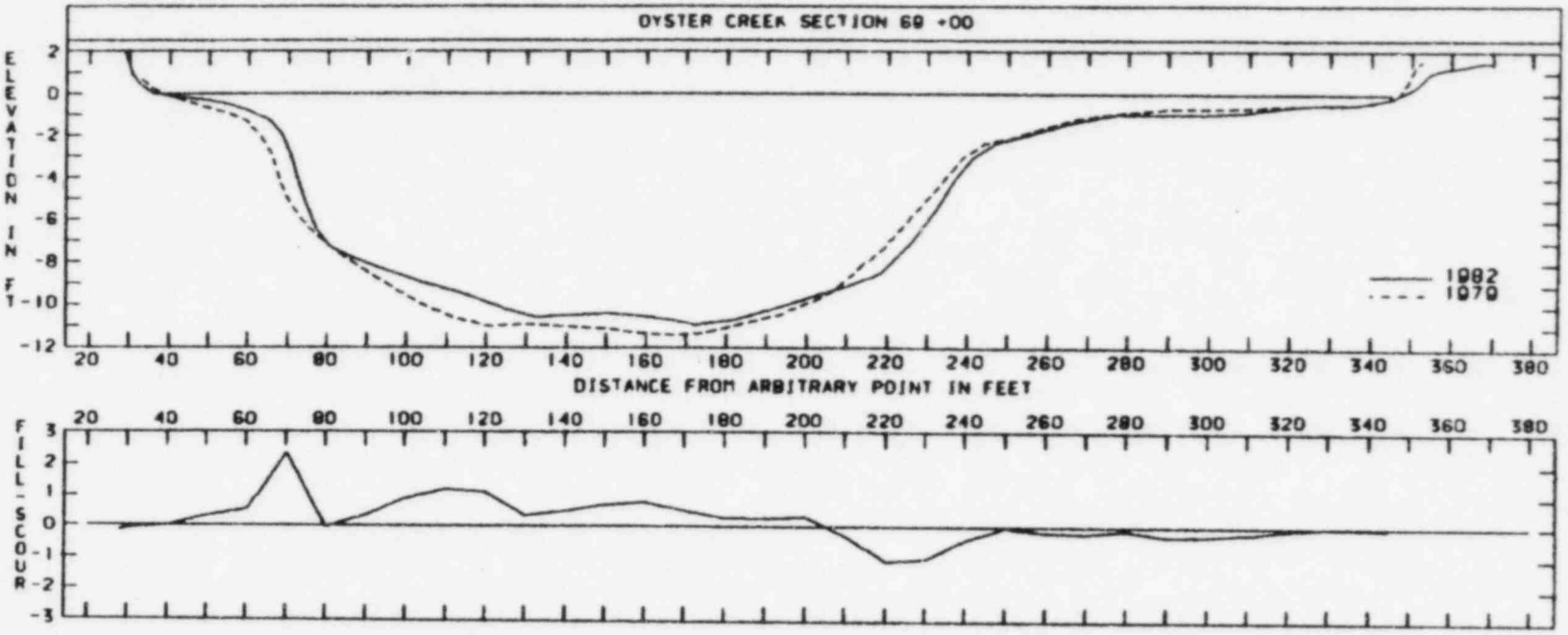
HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET	HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET	HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET
48	-.1	-.1	.00	150	-10.7	-10.6	-.14	250	-6.3	-5.8	-.46
50	-.1	-.1	.00	160	-10.5	-10.4	-.08	260	-6.4	-5.3	-1.16
60	-.1	-.1	.00	170	-10.7	-10.5	-.27	270	-5.8	-4.8	-1.01
70	-.7	-.8	.10	180	-11.0	-11.0	.03	280	-4.8	-3.9	-.74
80	-2.2	-1.6	-.51	190	-11.1	-10.9	-.15	290	-3.4	-3.1	-.31
90	-5.6	-4.8	-.82	200	-11.1	-11.0	-.05	300	-2.7	-2.3	-.39
100	-9.2	-9.1	-.10	210	-10.9	-10.6	-.33	310	-2.0	-1.6	-.26
110	-9.7	-9.1	-.61	220	-9.9	-8.8	-1.09	320	-1.2	-1.3	.08
120	-9.4	-9.1	-.24	230	-9.2	-7.3	-1.84	330	-.7	-.5	-.12
130	-9.5	-9.6	.13	240	-6.9	-6.8	-.03	331	-.1	-.6	.41
140	-10.3	-10.1	-.26								

Figure 4-30



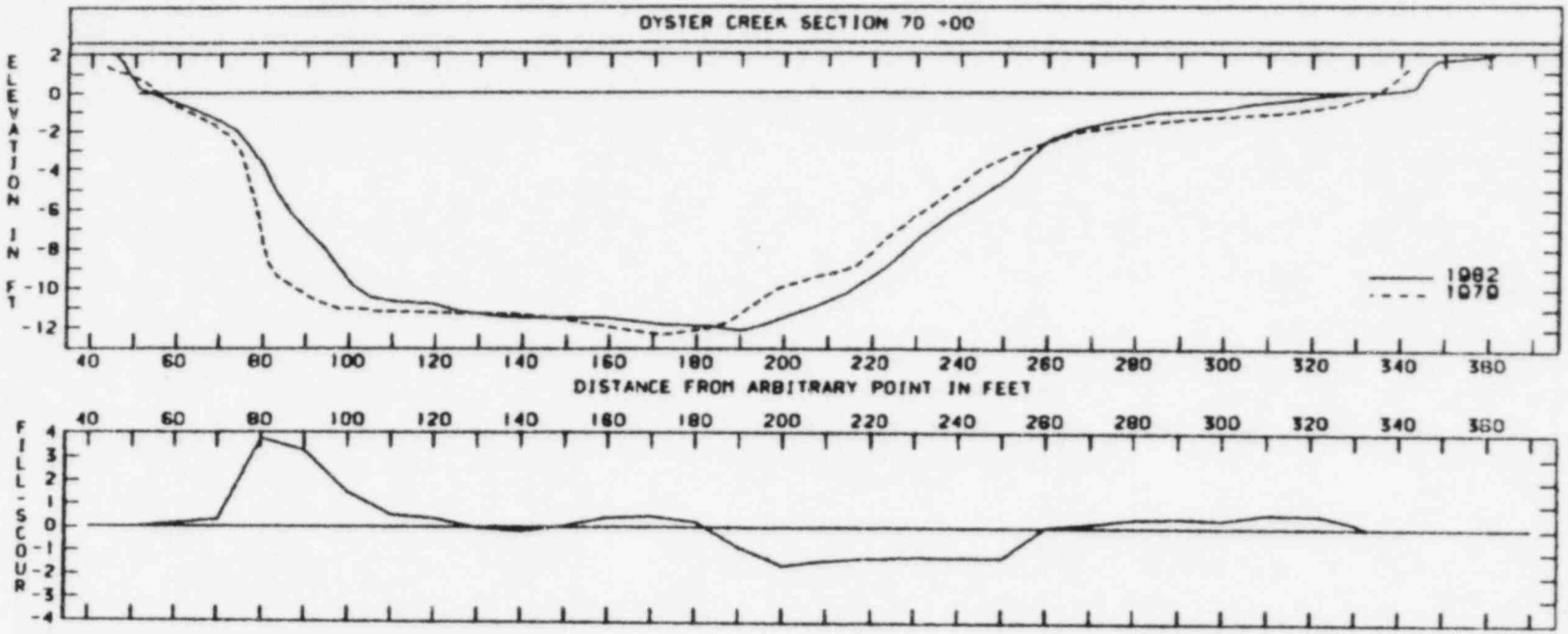
HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET	HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET	HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET
51	-1.8	-2.7	.97	150	-11.2	-11.4	.18	250	-5.1	-4.4	- 76
60	-.6	-.7	.10	160	-11.4	-11.4	.08	260	-3.9	-3.3	- 68
70	-.4	-.1	-.38	170	-11.4	-11.5	.11	270	-3.2	-2.1	-1.12
80	-1.4	-1.8	-.47	180	-11.5	-11.6	.00	280	-2.5	-2.3	- 18
90	-6.5	-9.3	2.81	190	-11.8	-11.7	- 11	290	-1.8	-1.3	- 52
100	-9.3	-9.7	.37	200	-11.9	-11.7	- 23	300	-1.2	- .9	- 30
110	-10.0	-9.7	-.33	210	-11.9	-11.7	- 20	310	- .6	- .8	23
120	-10.3	-9.5	-.88	220	-11.7	-11.3	- 44	320	- .2	- .5	28
130	-10.7	-9.9	-.72	230	-9.9	-8.8	-1 07	321	- .2	- .4	26
140	-11.0	-11.2	.21	240	-6.8	-6.2	- 58	326	- .2	- .2	04

Figure 4-31



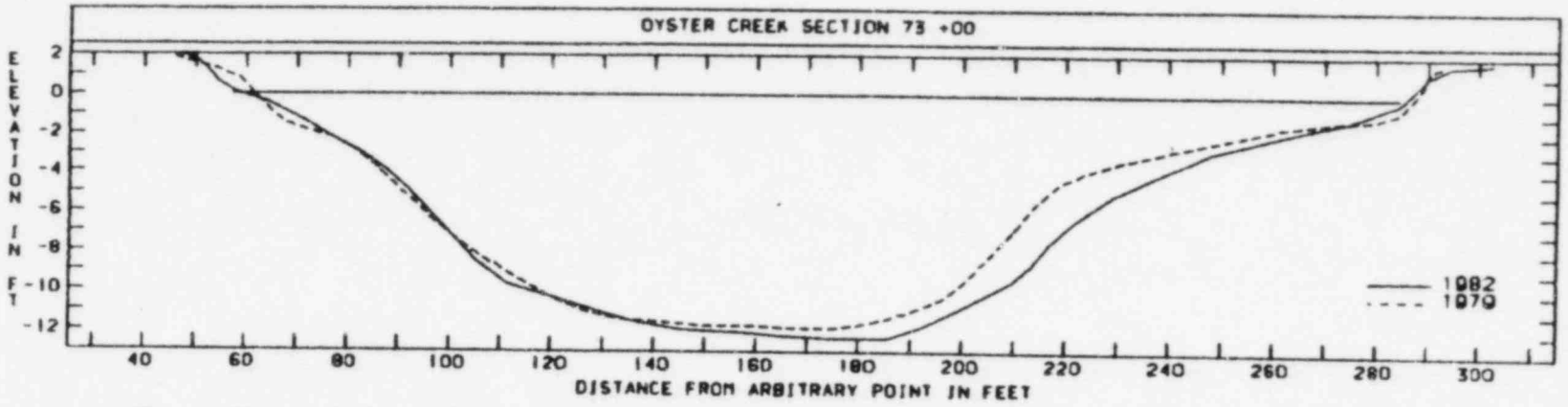
HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET	HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET	HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET
20	-.3	-.2	-.14	140	-10.5	-11.0	.50	260	-1.7	-1.5	-.16
30	-.2	-.2	-.00	150	-10.4	-11.1	.71	270	-1.2	-1.0	-.19
40	-.2	-.2	.00	160	-10.5	-11.3	.79	280	-.9	-.8	-.10
50	-.3	-.6	.32	170	-10.8	-11.3	.54	290	-1.0	-.7	-.29
60	-.8	-1.3	.52	180	-10.7	-11.0	.30	300	-.9	-.7	-.28
70	-2.7	-5.0	2.31	190	-10.3	-10.6	.28	310	-.8	-.6	-.21
80	-7.2	-7.1	-.04	200	-9.6	-10.0	.34	320	-.6	-.5	-.07
90	-8.1	-8.4	.35	210	-9.1	-8.8	-.27	330	-.5	-.5	.01
100	-8.7	-9.5	.84	220	-8.2	-7.1	-1.10	340	-.4	-.3	-.02
110	-9.2	-10.4	1.10	230	-6.8	-5.8	-1.03	344	-.2	-.2	-.04
120	-9.8	-10.9	1.11	240	-3.3	-2.8	-.42	345	-.2	-.2	-.01
130	-10.5	-10.9	.36	250	-2.1	-2.1	-.02				

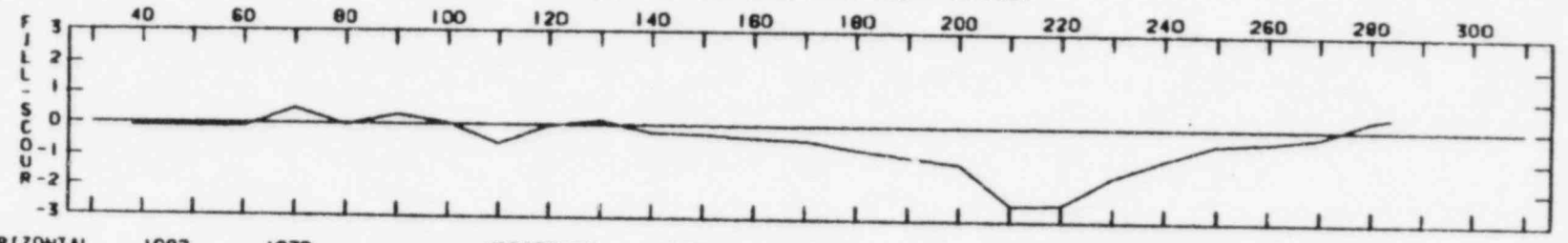
Figure 4-32



HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET	HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET	HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET
41	-.2	-.2	.00	150	-11.5	-11.5	.00	260	-2.5	-2.5	.05
50	-.2	-.2	.00	160	-11.5	-11.9	.43	270	-1.7	-1.9	.20
60	-.5	-.7	.15	170	-11.7	-12.2	.49	280	-1.2	-1.6	.40
70	-1.5	-1.8	.28	180	-11.8	-12.1	.26	290	-1.8	-1.4	.44
80	-3.9	-7.7	3.77	190	-12.1	-11.2	-.82	300	-.8	-1.2	.37
90	-7.0	-10.3	3.26	200	-11.4	-9.8	-1.58	310	-.5	-1.1	.62
100	-9.6	-11.1	1.51	210	-10.6	-9.2	-1.36	320	-.2	-.8	.60
110	-10.6	-11.2	.52	220	-9.4	-8.1	-1.27	322	-.2	-.8	.59
120	-10.8	-11.2	.37	230	-7.5	-6.3	-1.19	330	-.2	-.4	.23
130	-11.3	-11.3	-.03	240	-5.9	-4.7	-1.22	333	-.2	-.2	.01
140	-11.4	-11.3	-.17	250	-4.6	-3.3	-1.25				

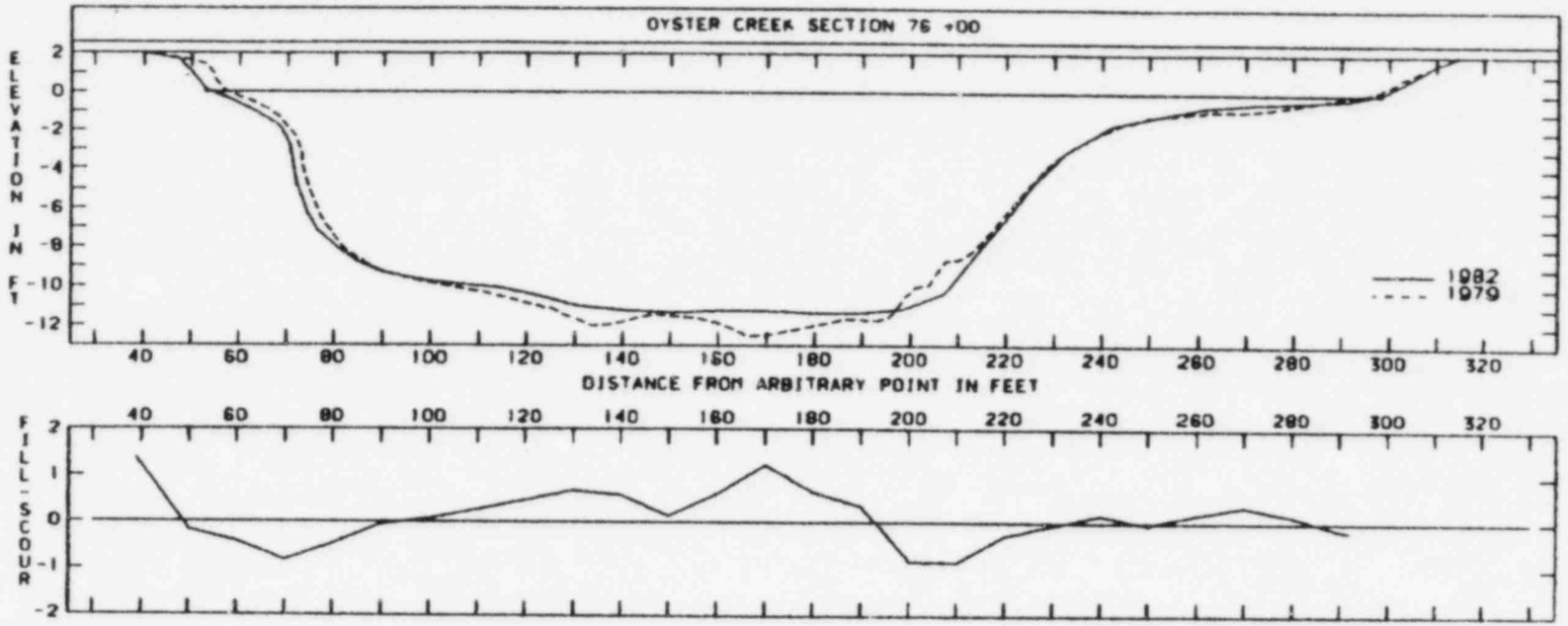
Figure 4-33





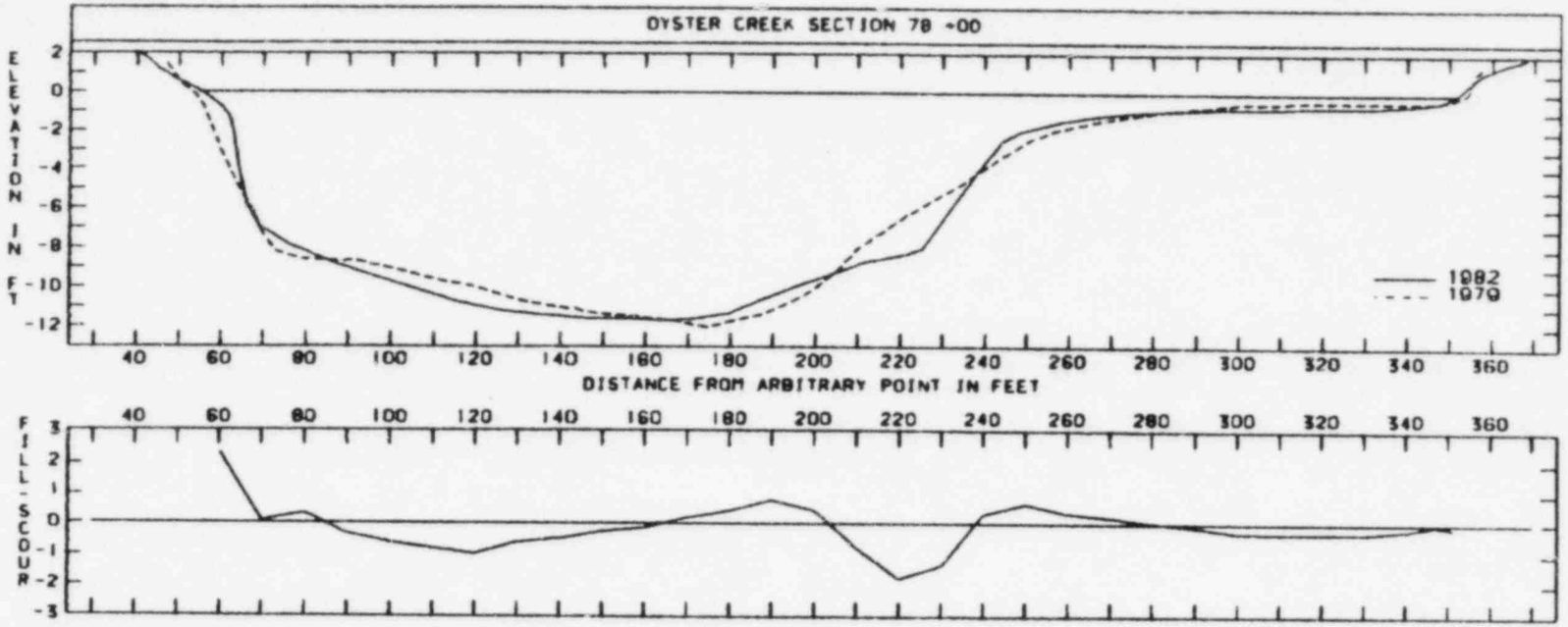
HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET	HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET	HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET
38	-.3	-.2	-.10	120	-10.3	-10.3	-.02	210	-9.4	-6.9	-2.50
40	-.3	-.2	-.10	130	-11.0	-11.2	.15	220	-6.8	-4.3	-2.47
50	-.3	-.2	-.10	140	-11.7	-11.4	-.22	230	-5.0	-3.4	-1.56
60	-.3	-.2	-.10	150	-11.9	-11.7	-.27	240	-3.8	-2.8	-.90
70	-1.2	-1.6	.48	160	-12.0	-11.7	-.37	250	-2.7	-2.2	-.48
80	-2.6	-2.6	-.03	170	-12.2	-11.8	-.44	260	-2.0	-1.7	-.39
90	-4.4	-4.7	.30	180	-12.3	-11.6	-.73	270	-1.4	-1.2	-.22
100	-7.0	-7.1	.04	190	-11.9	-10.9	-.95	280	-.7	-1.1	.35
110	-9.4	-8.8	-.60	200	-10.7	-9.6	-1.16	284	-.3	-.7	.44

Figure 4-34



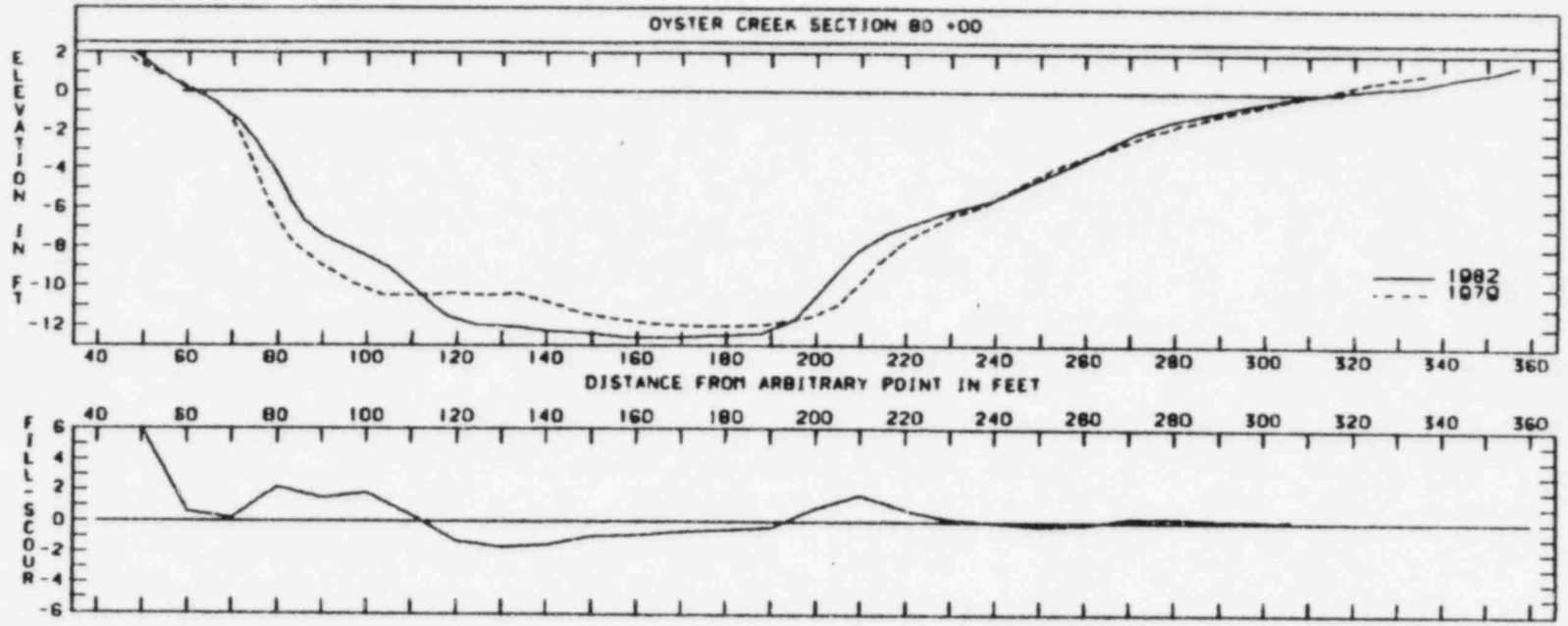
HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET	HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET	HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET
30	- 3	-1.7	1.37	130	-10.9	-11.6	.68	230	-3.5	-3.5	- .05
40	- .3	-1.5	1.22	140	-11.1	-11.7	.68	240	-1.9	-2.0	.16
50	- .3	- .1	- .17	150	-11.3	-11.4	.15	250	-1.2	-1.2	- .04
60	- .6	- .1	- .43	160	-11.2	-11.8	.62	260	- .7	- .9	.18
70	-2.4	-1.6	- .82	170	-11.2	-12.4	1.25	270	- .5	- .8	.35
80	-8.0	-7.5	- .48	180	-11.3	-11.9	.67	280	- .4	- .5	.15
90	-9.3	-9.2	- .05	190	-11.2	-11.6	.37	290	- .3	- .1	- .15
100	-9.7	-9.8	.07	200	-11.8	-10.1	- .83	291	- .3	- .1	- .16
110	-9.9	-10.2	.27	210	-9.4	-8.6	- .85	292	- .3	- .1	- .19
120	-10.3	-10.8	.48	220	-6.5	-6.2	- .28				

Figure 4-35



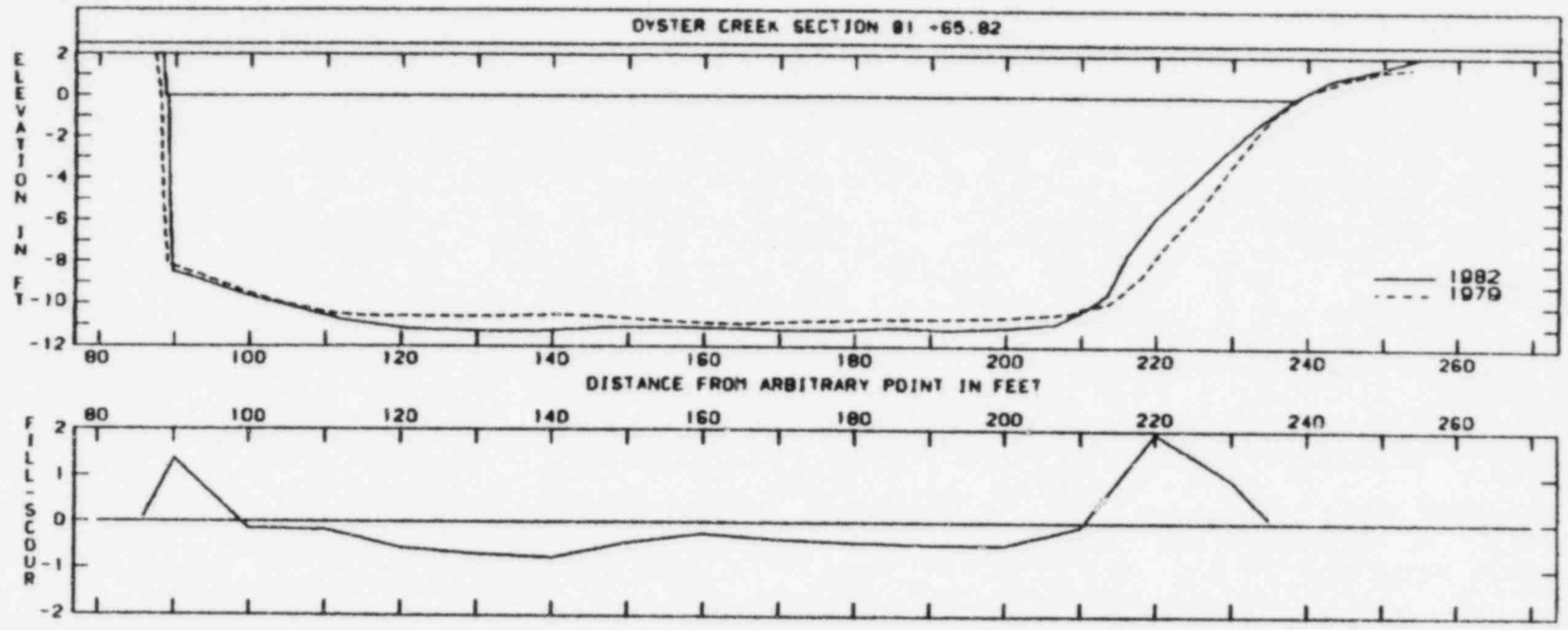
HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET	HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET	HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET
35	-103.	-10.0		150	-11.	-11.3	-.25	270	-1.	-1.3	.22
40	-68.	-4.4		160	-11.	-11.5	-.12	280	-.	-.9	.04
50	-17.	-.2		170	-11.	-11.0	.19	290	-.	-.7	-.18
60	-.	-3.1	2.30	180	-11.	-11.7	.43	300	-.	-.5	-.29
70	-7.	-7.3	.08	190	-10.	-11.1	.78	310	-.	-.4	-.30
80	-8.	-8.6	.53	200	-9.	-10.0	.44	320	-.	-.3	-.31
90	-9.	-8.7	-.34	210	-8.	-8.8	-.77	330	-.	-.4	-.31
100	-9.	-9.0	-.69	220	-8.	-8.0	-1.77	340	-.	-.4	-.28
110	-10.	-9.6	-.82	230	-6.	-5.2	-1.35	347	-.	-.3	-.04
120	-10.	-10.0	-.99	240	-3.	-3.0	.32	350	-.	-.3	-.08
130	-11.	-10.6	-.66	250	-1.	-2.5	.65	351	-.	-.2	-.16
140	-11.	-11.9	-.48	260	-1.	-1.7	.35				

Figure 4-36



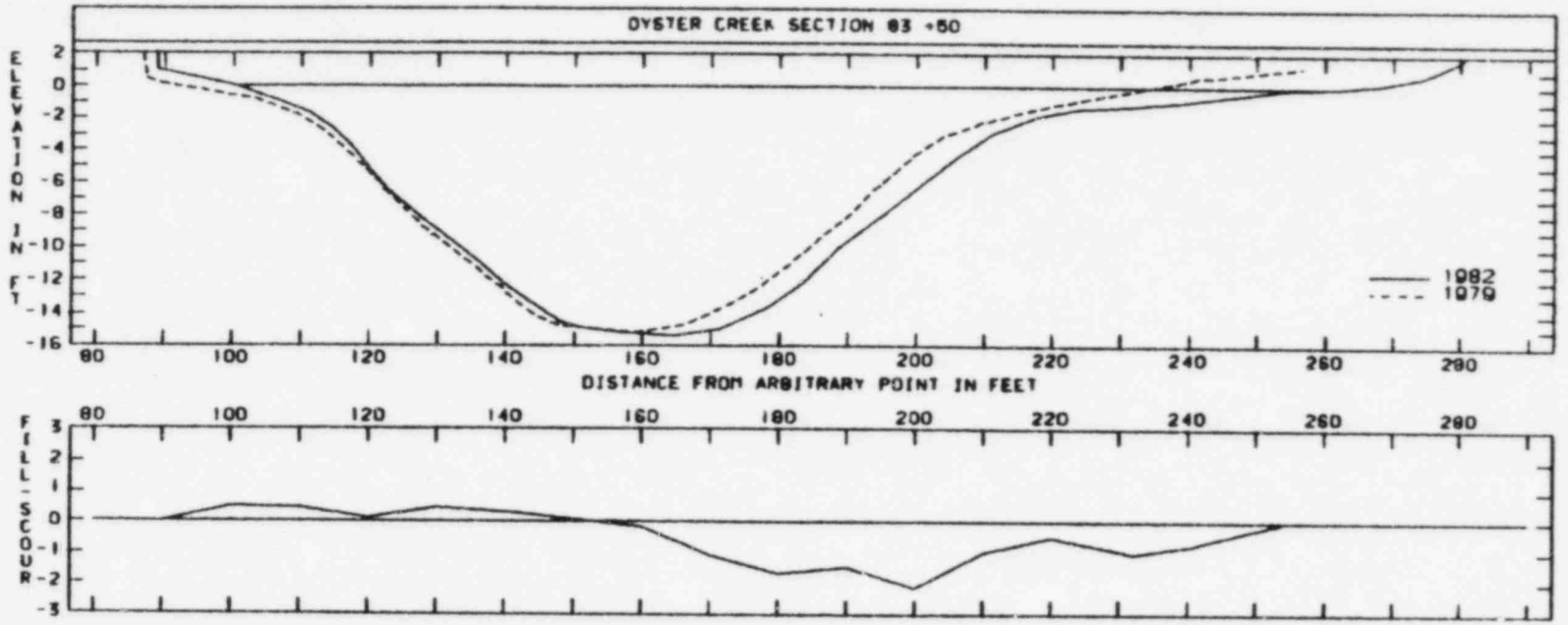
HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET	HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET	HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET
44	-1.2	-12.3		140	-12.2	-10.8	-1.40	240	-5.5	-5.5	-.00
50	-.2	-8.2	5.05	150	-12.4	-11.4	-.92	250	-4.4	-4.2	-.21
60	-.2	-.9	.63	160	-12.6	-11.8	-.82	260	-3.4	-3.3	-.10
70	-1.3	-1.5	.19	170	-12.5	-11.9	-.61	270	-2.2	-2.4	.26
80	-4.4	-6.6	2.18	180	-12.4	-12.0	-.48	280	-1.4	-1.7	.30
90	-7.4	-8.9	1.51	190	-12.2	-11.8	-.35	290	-.9	-1.1	.18
100	-8.5	-10.2	1.71	200	-10.5	-11.4	.92	300	-.4	-.5	.12
110	-10.0	-10.5	.41	210	-8.0	-9.8	1.74	303	-.3	-.4	.07
120	-11.7	-10.4	-1.36	220	-6.8	-7.6	.79	306	-.2	-.4	.18
130	-12.0	-10.4	-1.64	230	-6.2	-6.4	.20				

Figure 4-37



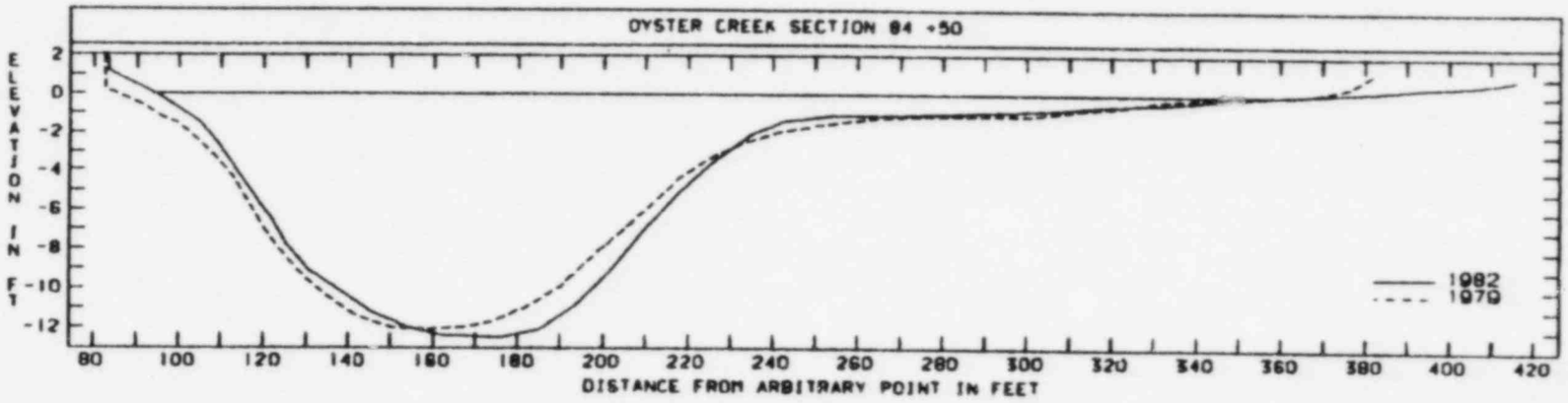
HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET	HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET	HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET
86	-.1	-.2	.10	140	-11.2	-10.5	-.76	200	-11.0	-10.6	-.48
90	-9.5	-10.8	1.36	150	-11.0	-10.6	-.43	210	-10.3	-10.3	-.00
100	-9.6	-9.5	-.15	160	-11.1	-10.8	-.23	220	-5.7	-7.7	1.04
110	-10.6	-10.4	-.17	170	-11.2	-10.8	-.36	230	-2.3	-3.3	.94
120	-11.1	-10.6	-.56	180	-11.1	-10.7	-.46	233	-1.4	-1.9	.42
130	-11.3	-10.6	-.69	190	-11.1	-10.7	-.47	235	-.9	-1.0	.09

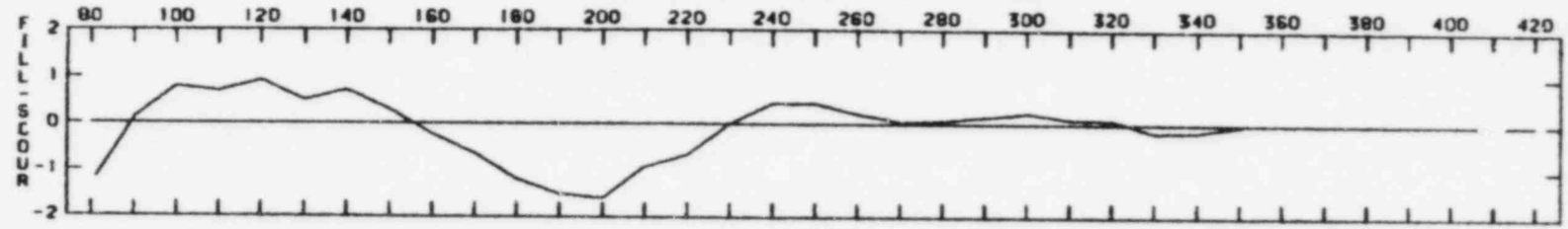
Figure 4-38



HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET	HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET	HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET
86	-.1	-.1	.00	150	-14.8	-14.9	.09	220	-1.6	-1.1	-.50
90	-.1	-.1	.00	160	-15.3	-15.1	-.15	230	-1.2	-.3	-.94
100	-.1	-.5	.40	170	-15.1	-14.0	-1.08	232	-1.2	-.1	-1.04
110	-1.4	-1.9	.44	180	-13.1	-11.5	-1.66	240	-.8	-.1	-.70
120	-5.2	-5.3	.11	190	-9.5	-8.1	-1.47	250	-.3	-.1	-.25
130	-9.0	-9.4	.44	200	-6.3	-4.2	-2.14	254	-.1	-.1	-.02
140	-12.3	-12.8	.31	210	-3.2	-2.2	-.99				

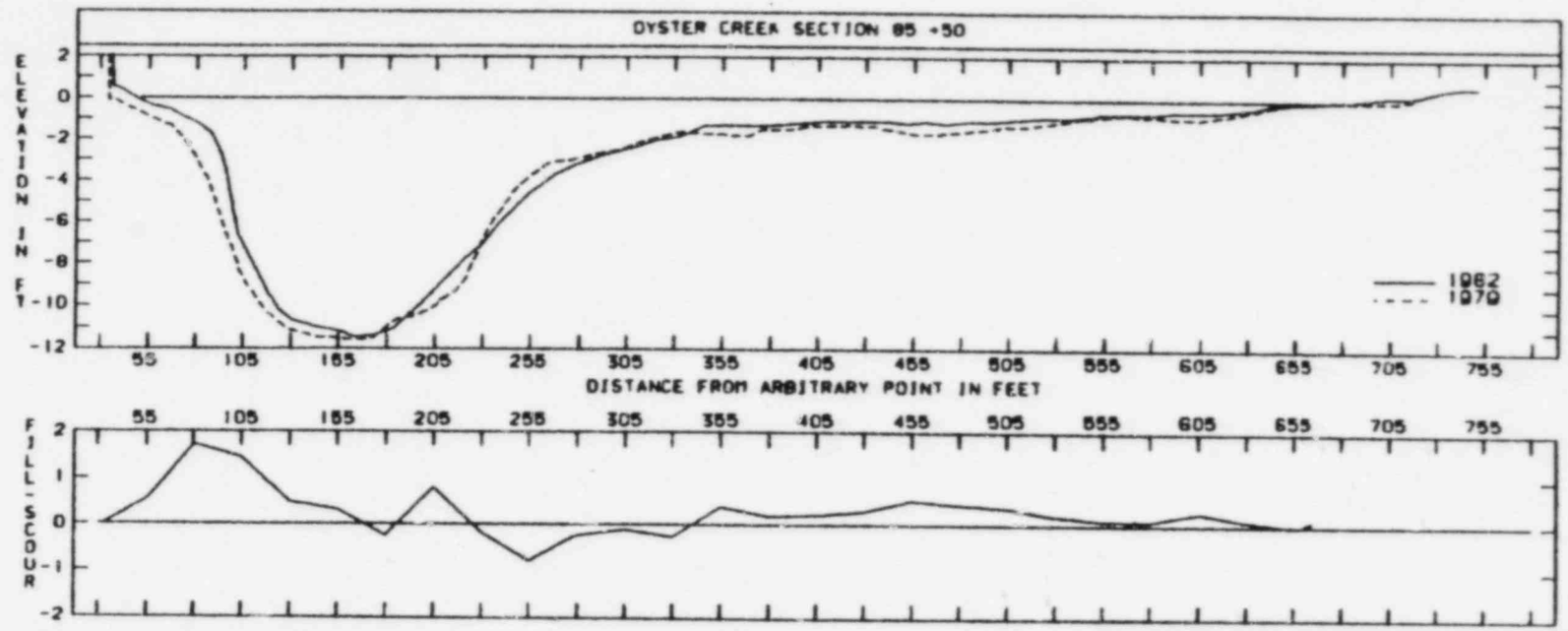
Figure 4-39





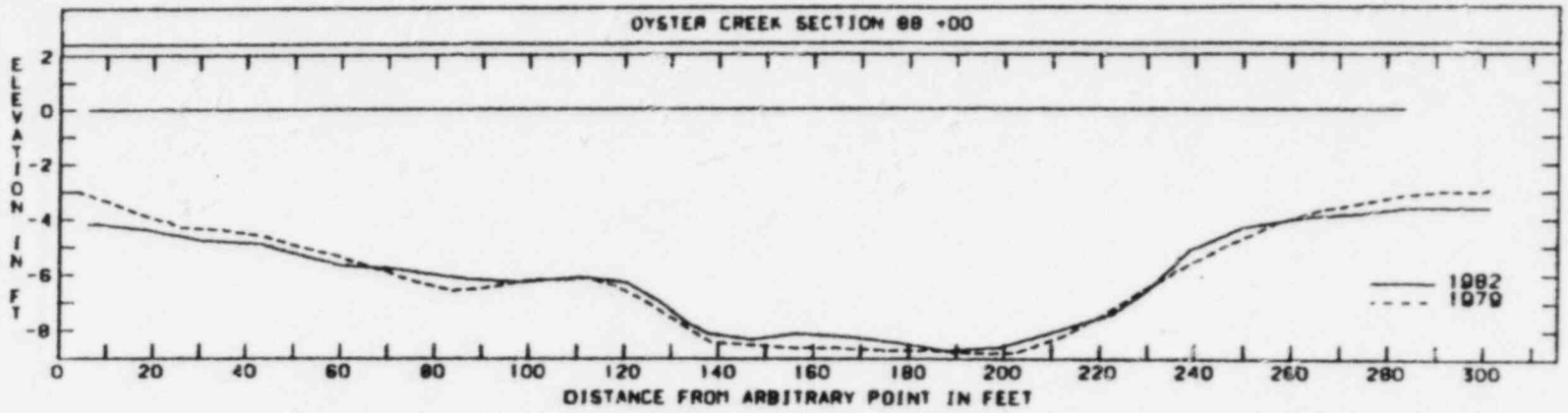
HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET	HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET	HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET
81	-1.2	-.1	-1.16	180	-12.4	-11.2	-1.19	280	-1.0	-1.0	.00
90	-.3	-.4	.12	190	-11.4	-9.9	-1.52	290	-.9	-1.1	.16
100	-.8	-1.5	.70	200	-9.4	-7.8	-1.60	300	-.8	-1.1	.25
110	-2.8	-3.5	.70	210	-6.9	-6.8	-.91	310	-.7	-.8	.11
120	-5.9	-6.9	.92	220	-4.6	-4.0	-.65	320	-.5	-.6	.00
130	-8.9	-9.4	.58	230	-2.7	-2.7	.02	330	-.4	-.3	-.16
140	-10.4	-11.1	.72	240	-1.5	-2.0	.44	340	-.3	-.2	-.14
150	-11.7	-11.9	.29	250	-1.1	-1.6	.45	350	-.1	-.1	-.02
160	-12.3	-12.1	-.22	260	-1.0	-1.3	.22	351	-.1	-.1	-.00
170	-12.0	-11.9	-.64	270	-1.0	-1.1	.06				

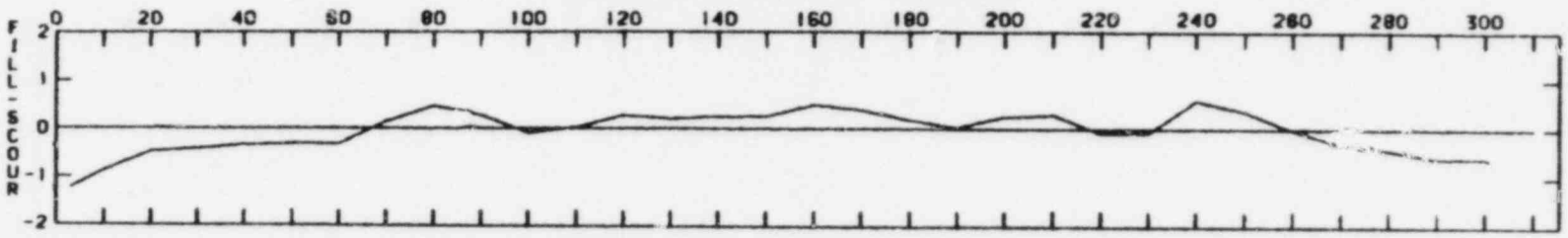
Figure 4-40



HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET	HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET	HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET
33	-.1	-.1	.02	280	-3.1	-2.9	-.23	505	-1.8	-1.4	.38
55	-.3	-.9	.53	305	-2.4	-2.8	-.18	530	-.9	-1.1	.21
80	-1.2	-2.9	1.72	330	-1.9	-1.6	-.25	555	-.7	-.8	.10
105	-7.2	-8.7	1.46	355	-1.3	-1.7	.49	580	-.7	-.8	.10
130	-10.6	-11.1	.49	380	-1.2	-1.4	.28	605	-.6	-.8	.20
155	-11.2	-11.5	.32	405	-1.1	-1.3	.22	630	-.4	-.5	.10
180	-11.2	-11.0	-.25	430	-1.1	-1.4	.31	655	-.1	-.1	-.01
205	-9.2	-10.0	.08	455	-1.1	-1.7	.54	680	-.1	-.1	.00
230	-7.0	-6.8	-.17	480	-1.1	-1.5	.46	665	-.1	-.2	.11
255	-4.5	-3.7	-.78								

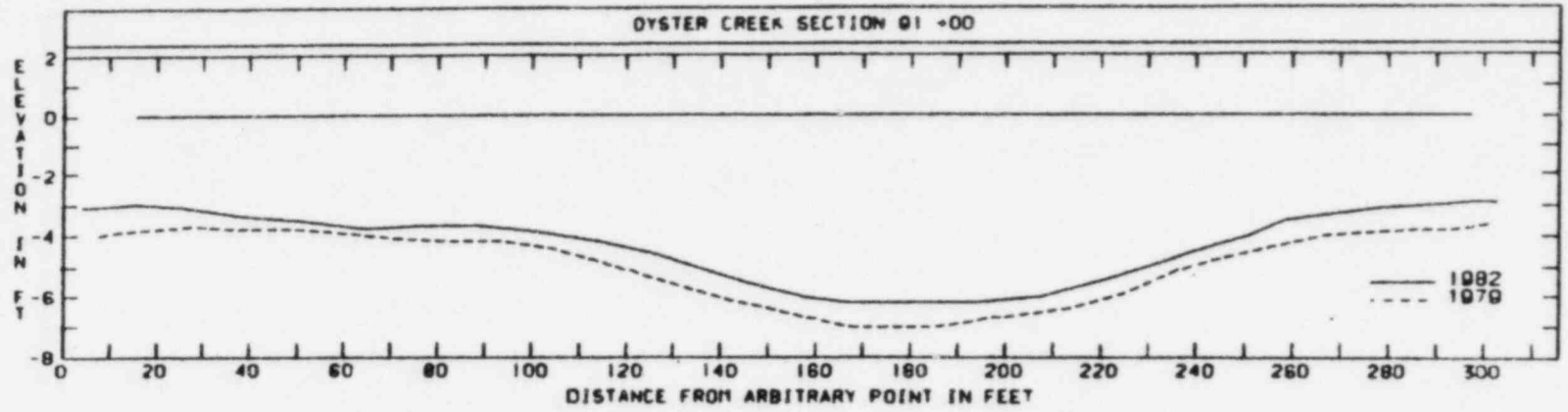
Figure 4-41





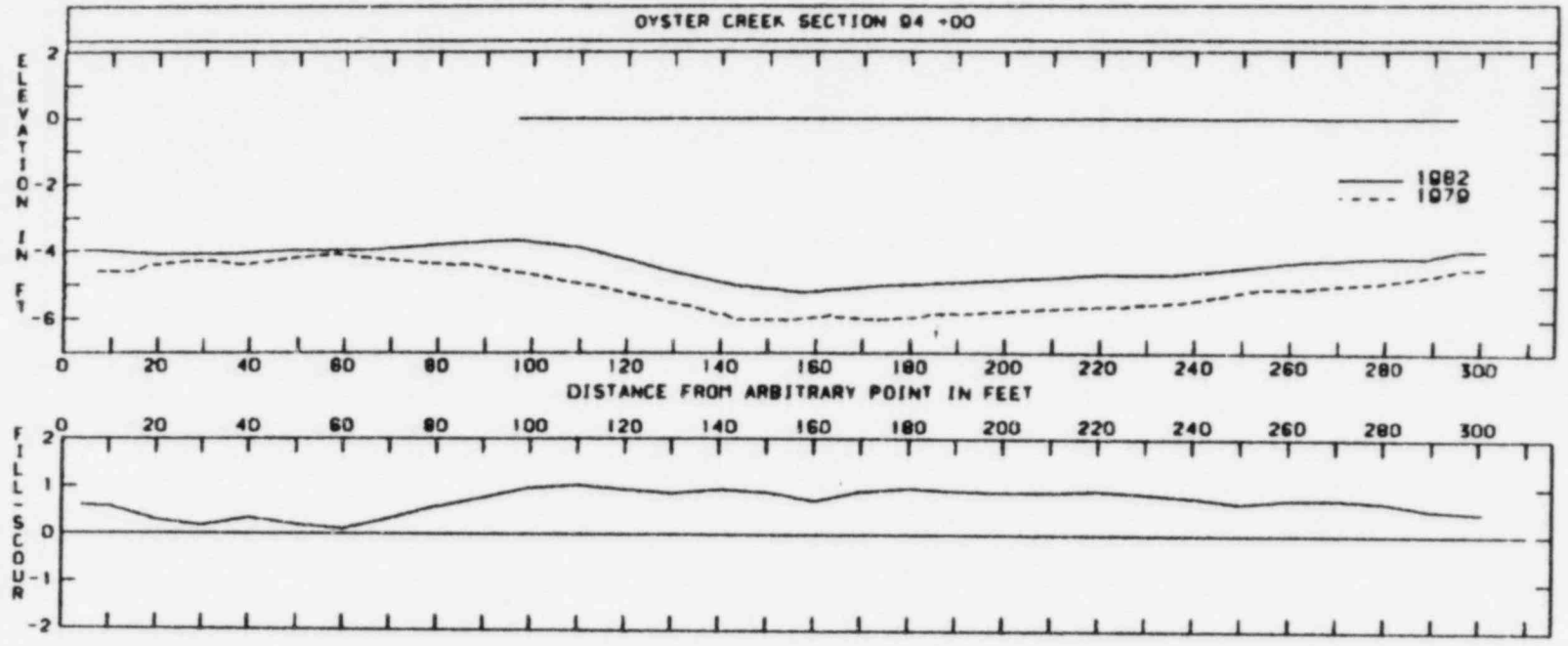
HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET	HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET	HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET
3	-4.22	-3.01	-1.22	110	-6.10	-6.13	.03	220	-7.80	-7.53	-.27
10	-4.22	-3.35	-.87	120	-6.27	-6.54	.28	230	-6.57	-6.49	-.08
20	-4.46	-3.99	-.47	130	-7.28	-7.51	.23	240	-4.99	-5.54	.55
30	-4.78	-4.36	-.42	140	-8.21	-8.47	.26	250	-4.30	-4.66	.36
40	-4.85	-4.51	-.34	150	-8.25	-8.52	.27	260	-3.97	-3.97	-.01
50	-5.26	-4.95	-.30	160	-8.10	-8.68	.58	270	-3.85	-3.54	-.30
60	-5.60	-5.30	-.31	170	-8.25	-8.64	.40	280	-3.68	-3.23	-.45
70	-5.70	-5.83	.14	180	-8.51	-8.70	.19	290	-3.60	-3.01	-.59
80	-6.02	-6.48	.46	190	-8.71	-8.75	.04	300	-3.60	-3.01	-.59
90	-6.24	-6.51	.27	200	-8.67	-8.93	.26	301	-3.60	-2.96	-.64
100	-6.29	-6.21	-.08	210	-8.07	-8.37	.30				

Figure 4-42



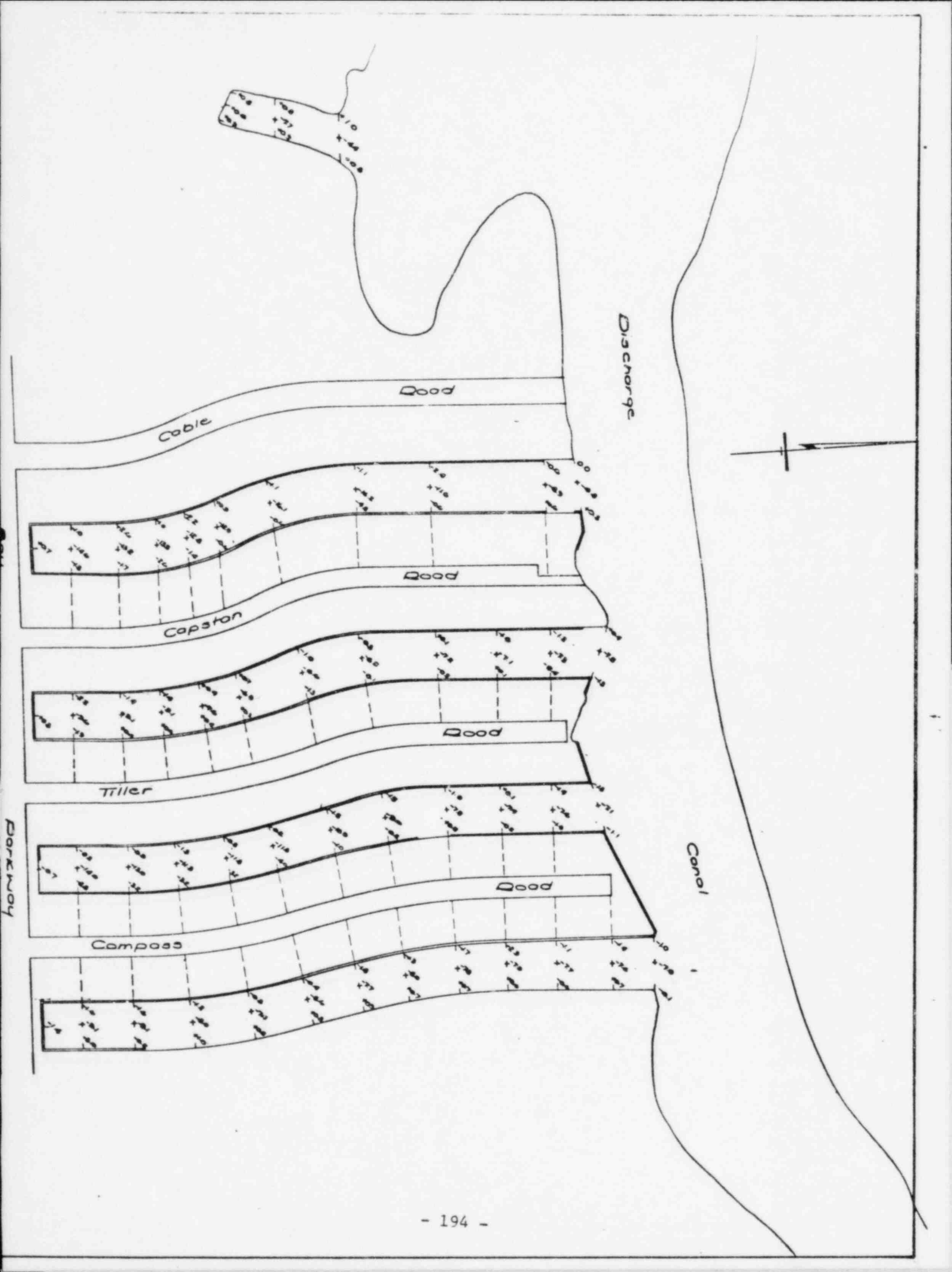
HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET	HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET	HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET
4	-3.10	-4.17	1.07	110	-4.00	-4.65	.56	220	-5.50	-6.16	.66
10	-3.06	-3.93	.87	120	-4.38	-5.10	.72	230	-5.01	-5.57	.55
20	-3.03	-3.78	.76	130	-4.79	-5.57	.78	240	-4.50	-4.97	.47
30	-3.19	-3.71	.52	140	-5.20	-8.03	.75	250	-4.05	-4.57	.52
40	-3.41	-3.80	.39	150	-5.74	-6.38	.64	260	-3.44	-4.21	.77
50	-3.58	-3.81	.23	160	-6.08	-6.75	.67	270	-3.27	-3.95	.68
60	-3.76	-3.92	.17	170	-6.22	-7.02	.80	280	-3.08	-3.85	.77
70	-3.77	-4.09	.32	180	-6.20	-7.08	.88	290	-2.99	-3.81	.82
80	-3.69	-4.10	.40	190	-6.21	-6.92	.71	300	-2.90	-3.62	.72
90	-3.71	-4.19	.48	200	-6.14	-6.68	.54	302	-2.90	-3.60	.70
100	-3.87	-4.30	.43	210	-5.93	-6.51	.58	303	-2.90	-3.60	.70

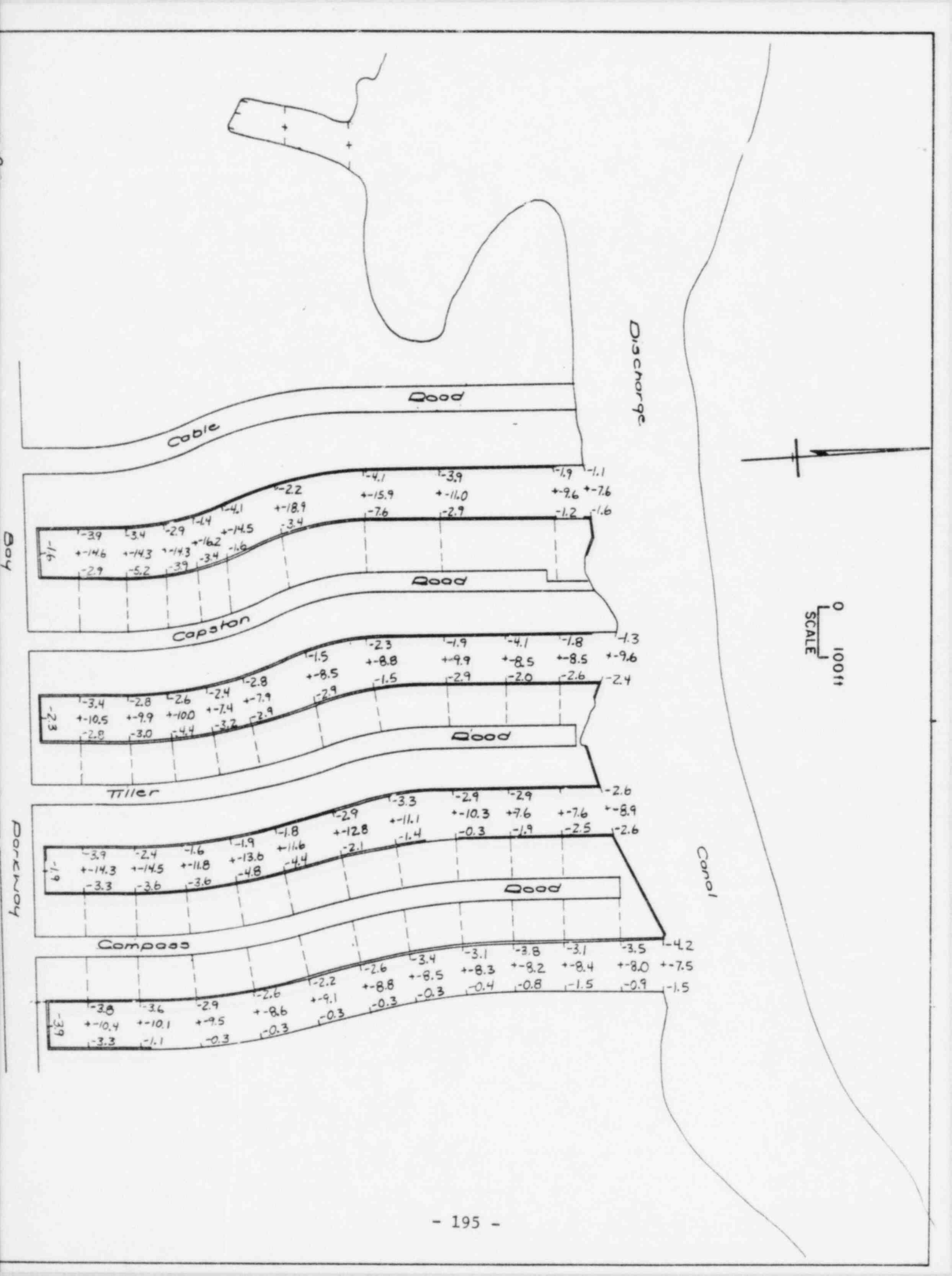
Figure 4-43

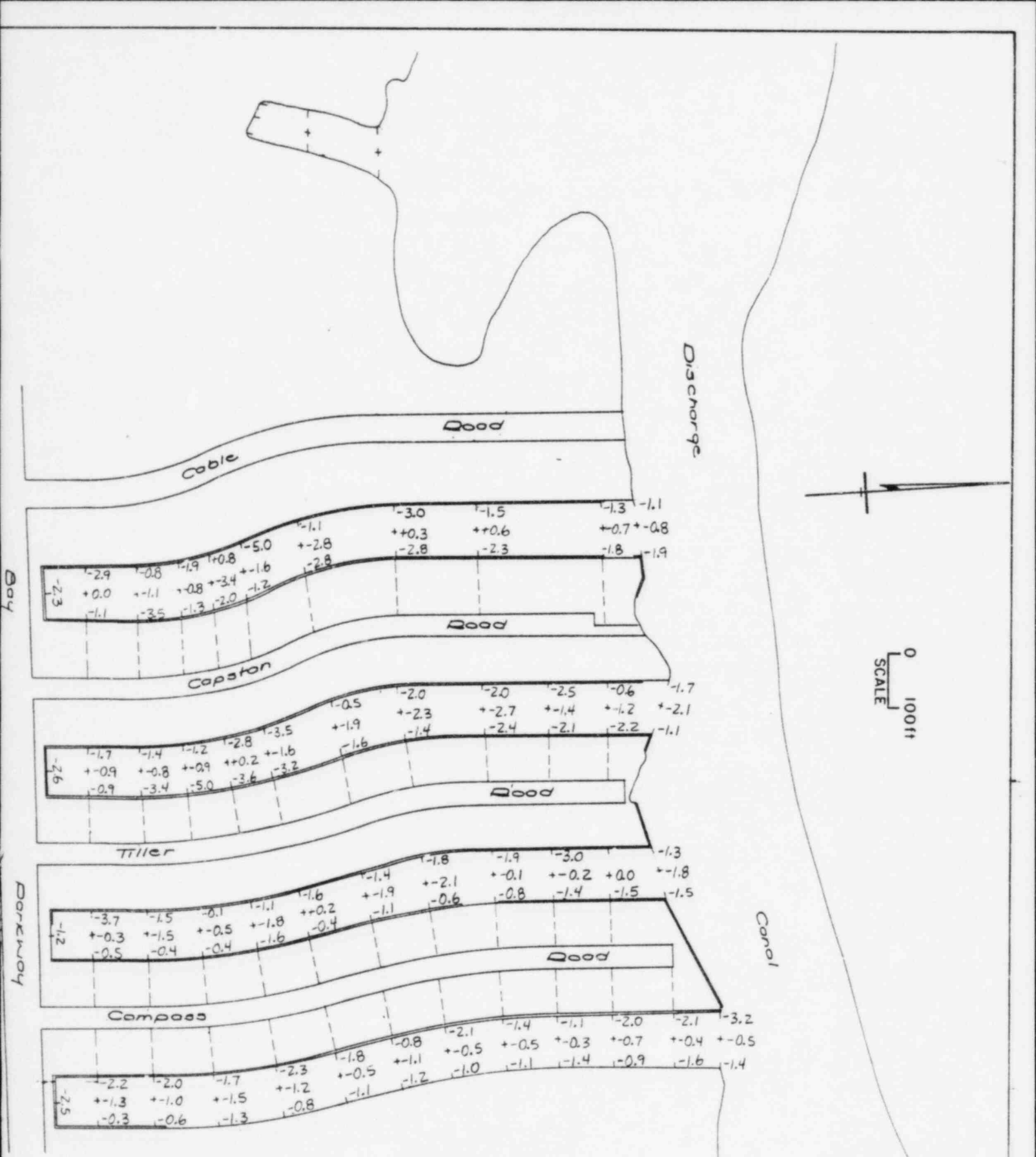


HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET	HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET	HORIZONTAL DISTANCE FEET	1982 ELEVATION FEET	1979 ELEVATION FEET	DIFFERENCE FEET
4	-4.00	-4.60	.60	110	-3.91	-4.95	1.04	220	-4.70	-5.63	.92
10	-4.02	-4.60	.58	120	-4.25	-5.21	.95	230	-4.71	-5.58	.87
20	-4.10	-4.40	.30	130	-4.63	-5.50	.87	240	-4.65	-5.44	.79
30	-4.11	-4.20	.10	140	-4.93	-5.88	.95	250	-4.50	-5.17	.67
40	-4.06	-4.40	.33	150	-5.13	-6.03	.89	260	-4.35	-5.10	.75
50	-4.00	-4.20	.20	160	-5.20	-5.92	.73	270	-4.25	-5.00	.75
60	-4.01	-4.12	.11	170	-5.06	-5.97	.91	280	-4.20	-4.90	.70
70	-3.95	-4.28	.33	180	-4.96	-5.05	.90	290	-4.15	-4.69	.54
80	-3.82	-4.38	.55	190	-4.92	-5.85	.93	300	-4.00	-4.49	.49
90	-3.72	-4.49	.77	200	-4.86	-5.78	.91	301	-4.00	-4.49	.49
100	-3.72	-4.70	.98	210	-4.78	-5.69	.90				

Figure 4-44


Discharge
Canal
Cable
Road
Road
Capston
Road
Tiller
Road
Compass
Parkway


Discharge
Canal
Cable
Qood
Capston
Qood
Tiller
Qood
Compass
Qood
Boy
Porkpy
SCALE
0
100ft



Comparison of
Dec. 1979 & April 1982 Soundings

4.4 Chemical Release Inventory

The following is a summary of those chemicals discharged by OCNGS to the aquatic environment during the reporting period. As per the OCETS, chemicals used in station laboratories are excluded.

Some chemicals are discharged in quantities and frequencies other than that reported in the OCNGS Final Environmental Statement (FES). In those cases where the reported quantities or frequencies are exceeded, or unlisted chemicals are discharged, no significant adverse environmental impacts have been noted or are expected.

In general, most of the chemicals will not be discharged in their original composition since chemical reactions will take place during their residence time in the various systems.

Chlorine

The average amount of chlorine used at the OCNGS on days of chlorination during the report period was approximately 623 lbs., with 820 lbs. per day being the maximum daily discharge allowed from the main condenser discharge by the NPDES Permit issued to the OCNGS by the U.S. Environmental Protection Agency and now administered by the New Jersey Department of Environmental Protection. Although most of this chlorine is used in the main condenser cooling system, some is injected into the turbine building closed cooling water (TBCCW) and reactor building closed cooling water (RBCCW) systems service water heat exchanger flows and the emergency service water system heat exchanger flow. Regarding the main condenser, each of the six condenser sections is sequentially chlorinated for 20 minutes every four hours when chlorination is necessary. Thus, chlorine can be released for 12 of every 24 hours with two hours of no discharge between releases. This chlorinated water is discharged to the station's discharge canal.

The Oyster Creek FES values for the quantity of chlorine injected (up to 2000 lbs per day) and duration of chlorine addition (3.5 hours of every 4) are higher than those in use during the reporting period (see FES, Section 3.6).

Chlorine may also be added to the cooling water flow of the liquid radwaste/augmented offgas treatment system for control of organismic growth on the heat exchanger piping. The chlorine dosage for 1982 was approximately 10.3 pounds per day. This water is discharged to the station's intake canal. Due to the low dosage, no adverse environmental impacts are expected from this chemical. The potential for the use of this chemical at this facility was not identified in the FES since this system was installed after the FES was issued.

Chlorine (Sodium Hypochlorite)

Sodium hypochlorite was added to the sewage treatment plant effluent continuously at the rate of approximately 50 lbs per month, or approximately 1.6 lbs per day. The sewage treatment plant effluent was discharged to the station's discharge canal via a 30-inch diameter discharge pipe. The sewage treatment plant was abandoned in August 1982.

The FES included an average value of 1.5 mg/l total residual chlorine for the discharge of this chemical from the station's sewage treatment plant. Since the purpose of this addition was to kill pathogenic organisms, and this addition was required by the treatment plant's license to operate (required range was 1.0-2.5 mg/l), and in view of its very low concentration in the 30-inch discharge water pipe, no adverse environmental impacts were noted or expected.

A small amount of this chemical is used to purify station domestic water. Some of this treated water will be discharged (mostly via sewage system), so a small amount of chlorides was added to the discharge in this way.

Sulfuric Acid

Sulfuric acid is used for the regenerations of the makeup water and condensate demineralizers and in the radwaste treatment system. However, only the wastewater from the makeup demineralizer regenerations is discharged to the environment. The wastes from the condensate demineralizer regenerations and the radwaste treatment system become part of the radwaste that is shipped in casks for offsite burial.

The quantity of sulfuric acid discharged to the environment is approximately 140 gallons per month, which is less than that discussed in the FES. The acid released by the regenerations is diluted by several hundred gallons of wastewater in a sump prior to its release to a 30-inch diameter discharge pipe. This pipe also receives several other flows, primarily the RBCCW heat exchanger flow, which is a constant flow of either 6,000 or 12,000 gpm of intake canal water depending on whether one or both pumps are operating. This RBCCW heat exchanger flow ensures sufficient dilution of the sulfuric acid so that it should have no significant influence on the discharge canal. In addition, chemical reactions take place while the dilution occurs, thus the discharge to the environment is not 140 gallons of pure acid. The products of these reactions should be various sulfate compounds that will be formed while mixing with the salt water from the RBCCW heat exchanger flow. The additional sulfates should not be detectable over the ambient concentration in the salt water.

Sodium Hydroxide (liquid)

Liquid sodium hydroxide is also used for the regenerations of the makeup water and condensate demineralizers and in the radwaste treatment system.

The wastes from the condensate demineralizer regenerations and the radwaste treatment system become part of the radwaste that is shipped in casks for offsite burial, so only the wastewater from the makeup demineralizer regeneration is discharged to the environment.

The quantity of caustic discharged to the environment is approximately 440 gallons per month which is less than that discussed in the FES. As with the sulfuric acid used in this process as described above, the caustic is further diluted first in a sump, then by the RBCCW heat exchanger flow, prior to its discharge to the environment. Similarly, it should have no significant impact on the discharge canal. Instead of additional sulfates, the caustic will add sodium to the environment. When compared to ambient concentrations in the salt water of the RBCCW heat exchanger flow, the addition should be undetectable.

Auxiliary Boiler Additives

Tri-sodium phosphate and sodium sulfite are added to the auxiliary (heating) boiler on a daily basis at the rate of about one-half pound per day per chemical. The boiler blowdown occurs only when requestd by the chemistry department. The total quantity of blowdown is approximately 2250 gallons per day, and is discharged to the station's discharge canal via the 30-inch diameter discharge pipe discussed above for sulfuric acid and liquid caustic.

The quantity of chemcial added is about two times that listed in the FES. However, the dilution obtaind in the 30-inch water line from the RBCCW heat exchanger flow and other flows should ensure that there is no significant environmental impact from the additional amount added to the auxiliary boiler.

Hydrazine (Amerzine)

Hydrazine (Amerzine) is used for corrosion control in the station's closed cooling water systems, such as the RBCCW and TBCCW, since the cooling water in each system is recycled. Each of the closed cooling water systems is, in turn, cooled by its own heat exchanger system, which uses intake water in a once-through cooling mode before discharging the flow to the discharge canal.

Although these closed cooling water systems are not designed to have a discharge, some minor system leakage does occur. Any leakage that may occur would be released into the associated heat exchanger cooling flow. The total leakage is small enough that the OCNGS needs to add only about 5-10 gallons of hydrazine per month in order to compensate for the quantity leaked. The release of this chemical was not discussed in the FES.

In the case of the TBCCW, the heat exchanger cooling flow is 10,000 gpm on a constant basis, and combines with the main condenser cooling flow of up to 450,000 gpm prior to discharge to the environment. The RBCCW heat exchanger flow is either 6,000 or 12,000 gpm on a constant basis, depending on how many pumps are operating.

Therefore, due to the dilution encountered, the hydrazine lost from the various closed cooling water systems should be undetectable in the station's discharges. There has been no evidence of an adverse environmental impact resulting from the releases of hydrazine.

Table 4-6
Chemical Usage

Chemical	System Released From	Amount Released*
Chlorine	Main Condenser	152,000 lbs.
Chlorine	Radwaste/AOG	3,750 lbs.
Chlorine (Sodium Hypochlorite)	Sewage Treatment	350 lbs.
Sulfuric Acid	Demineralizer	1,630 gal.
Sodium Hydroxide (liquid)	Demineralizer	5,240 gal.
Tri-Sodium Phosphate	Auxiliary Boiler (Heating)	150 lbs.
Sodium Sulfite	Auxiliary Boiler (Heating)	150 lbs.
Hydrazine (Amerzine)	Closed Cooling Water Systems	95 lbs.

* Amount released during reporting period (1/1/82-12/31/82)

Table 4-7
Chemical Discharge Frequency

Chemical	Frequency of Discharge	Duration of Each Discharge
Chlorine	6 per day[1]	2 hours
Chlorine (Sodium Hypochlorite)	Continuous[2]	Continuous
Chlorine (Radwaste)	4 per day	20 minutes
Sulfuric Acid	9 per month[3]	30 minutes
Sodium Hydroxide	9 per month[3]	1 hour
Tri-Sodium Phosphate	as required	5 minutes
Sodium Sulfite	as required	5 minutes
Hydrazine (Amerzine)	random	random

[1] Frequency during days of chlorination; however, station condenser is not chlorinated every day.

[2] Sodium Hypochlorite was only discharged from the sewer treatment plant (STP).

[3] Average

4.5 Unusual or Important Environmental Events

There was one incident at OCNGS this reporting period which can be considered an unusual or important environmental event, per section 4.5 of OCETS.

The event occurred on December 10, 1982 during a shutdown of the OCNGS for maintenance. As a result of this shutdown a fishkill of approximately 7800 organisms ocurred (this value was extrapolated from a total collected value of 387 organisms). Species included were crevalle jack, blue runner, bluefish, Atlantic needlefish, scup, ladyfish, and northern kingfish. This incident was reported as a Nonroutine Environmental Operating Report No. 50-219/82-10. More information on this incident can be found in section 5.1 of this AEOR.

5.0 Additional Information

This Section of the AEOR is included in order to report any additional information that is required.

Section 5.6.1 of the OCETS requires a summary of:

A. All OCETS non-compliances and the corrective action taken to remedy them.
B. Changes made to State and Federal permits and certificates which pertain to the requirements of OCETS.
C. Changes in station design which could involve an environmental impact.
D. Changes to OCETS

5.1 Summary of OCETS Non-compliances

During the reporting period there were ten (10) Nonroutine Environmental Operating Reports filed with NRC. Each one is summarized below.

A. Report No. 50-219/82-1

Date and time of occurrence: April 17, 1982 at 2145 hours to April 18, 1982 at 0825 hours.

Description: At 0656 hours on April 17, 1982 the reactor scrammed. Prior to the scram dilution pumps 1-2 and 1-3 were operating. Reactor start-up occurred at 2145 hours on April 17, 1982 with only dilution pump 1-2 operating. A second dilution pump, 1-3, was not put into service until 0825 hours on April 18, 1982.

Corrective Action: Immediate corrective action involved making dilution pump 1-3 operational. In addition plant procedure 201.1 has been revised so that it specifies that two dilution pumps shall be put into service prior to reactor start-up when water temperature at the U.S. Route 9 Bridge is greater than 87°F or ambient water temperature is less than 60°F.

B. Report No. 50-219/82-2

Date and time of occurrence: April 29, 1982 at 0315 hours.

Description: At 0315 hours on April 29, 1892 dilution pump 1-2 was tripped off due to low oil pressure, leaving only dilution pump 1-3 in service. At 0337 hours on April 29, 1982 dilution pump 1-2 was returned to service.

Corrective action: Immediate corrective action involved restarting dilution pump 1-2. Long term action involves a total dilution pump improvement program, as per a submittal to the Nuclear Regulatory Commission on July 1, 1981. The program is designed to improve pump reliability and operability and is in

progress. This includes upgrading of the dilution pump seal water and lubricatng oil cooling water systems, pipe line strainers, pipe and heat tracing and overhaul of dilution pumps.

C. Report No. 50-219/82-3

Date and time of occurrence: April 30, 1982, 0957 hours, 1243 hours, 1417 hours, 1545 hours, 1715 hours, and 2100 hours.

Description: At 0957 hours on April 30, 1982 dilution pump 1-2 tripped off, leaving only dilution pump 1-3 in service. Dilution pump 1-2 was returned to service at 1150 hours on April 30, 1982.

At 1243 hours on April 30, 1982 dilution pump 1-2 tripped off leaving only dilution pump 1-3 in service. Dilution pump 1-2 was returned to service at 1312 hours on April 30, 1982.

At 1417 hours on April 30, 1982 dilution pump 1-2 tripped off because of low oil flow, leaving only dilution pump 1-3 in service. Dilution pump 1-2 was returned to service at 1505 hours on April 30, 1982.

At 1545 hours on April 30, 1982, dilution pump 1-2 tripped off leaving only dilution pump 1-3 in operation. Dilution pump 1-2 was returned to service at 1715 hours on April 30, 1982.

At 1715 hours on April 30, 1982 dilution pump 1-3 was taken out of service to correct a seal water flow problem, leaving only dilution pump 1-2 in service. Dilution pump 1-3 was returned to service at 2100 hours on April 30, 1982.

At 2100 hours on April 30, 1982 dilution pump 1-2 was taken out of service to make an adjustment in the calibration flow switch, leaving only dilution pump 1-3 in service. Dilution pump 1-2 was returned to service at 2320 hours on April 30, 1982.

Corrective Action:

0957-1150 hours:	Pump 1-2 was restarted immediately after the lube oil system was flushed.
1243-1312 hours:	Immediate corrective action involved restarting dilution pump 1-2.
1417-1505 hours:	Pump 1-2 was restarted once the proper oil flow was restarted.
1595-1715 hours:	Immediate corrective action involved restarting dilution pump 1-2.
1715-2100 hours:	Corrective action involved cleaning the seal water strainer in order to restore proper seal water flow, then restarting pump 1-3.
2100-2320 hours:	Corrective action was to restart dilution pump 1-2 after a calibration flow switch was adjusted. Long term action involves a total diluton pump improvement program, as per a submittal to the Nuclear Regulatory Commission on July 1, 1981. The program is designed to

improve pump reliability and operabililty and is in progress. This includes upgrading of the dilution pump seal water and lubricating oil cooling water systems, pipe line strainers, pipe and heat tracing and overhaul of dilution pumps.

D. Report No. 50-219/82-4

Date and time of occurrence: November 16, 1982, 0336 hours

Description: At 0336 hours on November 16, 1982 dilution pump 1-3 tripped off leaving only dilution pump 1-2 in operation. The trip was caused by debris clogging the seal water strainer. At 0357 hours dilution pump 1-3 was returned to service.

Corrective Action: Immediate corrective action involved clearing the debris from the strainer and restarting dilution pump 1-3. Long term action involves a total dilution pump improvement program, as per a submittal to the Nuclear Regulatory Commission on July 1, 1981. The program is designed to improve pump reliability and operability and is in progress. This includes upgrading of the dilution pump seal water and lubricatng oil cooling water systems, pipe line strainers, pipe and heat tracing and overhaul of dilution pumps.

E. Report No. 50-219/82-5

Date and time of occurrennce: November 22, 1982, 1731 hours

Description: At 1731 hours on November 22, 1982, dilution pump 1-3 was removed from service due to an electrical problem, leaving only dilution pump 1-2 in operation. At 2121 hours on November 22, 1982 dilution pump 1-3 was returned to service.

Corrective Action: Immediate corrective action involved repairing the electrical problem and restarting dilution pump 1-3. Long term action involves a total dilution pump improvement program, as per a submittal to the Nuclear Regulatory Commission on July 1, 1981. The program is designed to improve pump reliability and operability and is in progress. This includes upgrading of the dilution pump seal water and lubricatng oil cooling water systems, pipe line strainers, pipe and heat tracing and overhaul of dilution pumps.

F. Report No. 50-219/82-6

Date and time of occurrence: November 30, 1982, 0739 hours

Description: At 0739 hours on November 30, 1982 dilution pump 1-2 was removed from service due to debris clogging the intake grates, leaving only dilution 1-3 in operation. Dilution pump 1-2 was returned to service at 0213 hours on December 1, 1982.

Corrective Action: Immediate corrective action involved removing

the debris from the grates and restarting dilution pump 1-2. Long term action involves a total dilution pump improvement program, as per a submittal to the Nuclear Regulatory Commission on July 1, 1981. The program is designed to improve pump reliability and operability and is in progress. This includes upgrading of the dilution pump seal water and lubricatng oil cooling water systems, pipe line strainers, pipe and heat tracing and overhaul of dilution pumps.

G. Report No. 50-219/82-7

Date and time of occurrence: December 1, 1982, 0722 hours

Description: At 0722 hours on December 1, 1982 dilution pump 1-3 was removed from service due to debris clogging the intake grates, leaving only dilution pump 1-2 in service. Dilution pump 1-3 was returned to service on December 1, 1982 at 1036 hours.

Corrective Action: Immediate corrective action involved removing the debris from the pump intake grates and restartng dilution pump 1-3. Long term action involves a total dilution pump improvement program, as per a submittal to the Nuclear Regulatory Commission on July 1, 1981. The program is designed to improve pump reliability and operability and is in progress. This includes upgrading of the dilution pump seal water and lubricatng oil cooling water systems, pipe line strainers, pipe and heat tracing and overhaul of dilution pumps.

H. Report No. 50-219/82-8-2

Date and time of occurrence: December 5, 1982, 0322 hours.

Description: At 0322 hours on Decmeber 5, 1982 dilution pump 1-3 tripped off leaving only dilution pump 1-2 in service. The trip may have been casued by low seal water flow. Dilution pump 1-3 was returned to service at 0433 hours on December 5, 1982.

Corrective Action: Immediate corrective action involved putting dilution pump 1-3 into service using the fire water system instead of the seal water system. Long term action involves a total dilution pump improvement program, as per a submittal to the Nuclear Regulatory Commission on July 1, 1981. The program is designed to improve pump reliability and operability and is in progress. This includes upgrading of the dilution pump seal water and lubricatng oil cooling water systems, pipe line strainers, pipe and heat tracing and overhaul of dilution pumps.

I. Report No. 50-219/82-9

Date of occurrence: December 8, 1982

Description: During the routine monthly calibration of the station's Route 9 temperature monitoring system, it was observed that the control room recorder was not printing the temperature within the ± 1°F specification. The actual temperature was 55.78°F; the recorder was reading 54.5°F. The cause of the low reading was due to a slight downward drift of temperature transmitter's zero and span adjustments. Immediately following this determination, the temperature monitoring system was recalibrated according to plant procedure 664.3.002.

Corrective Action: The corrective action involved recalibrating the temperature transmitter so that the recorder was printing the actual temperature within the ± 1°F specification.

J. Report No. 5:-219/82-10

Date and time of occurrence: December 10, 1982, at 0200 hours.

Description: The OCNGS began a controlled reactor shutdown at approximately 2200 hours on December 9, 1982, consistent with OCETS condition 2.1.5. At approximately 2220 hours both operating dilution pumps were taken out of service, while three circulating pumps continued to operate. By 0330 hours on December 10 no further heat was being rejected and water temperature was as follows:

Location	Temperature °F (°C)	
Intake	46.0	(7.8)
Discharge	45.9	(7.7)
U.S. Route 9 Bridge	48.9	(9.4)

Large numbers of bluefish were observed swimming in the eastern-most condenser discharge bay at 2300 hours on December 9. The water temperature in that area was 54°F, the warmest area in the discharge canal at that time. By 0200 hours on December 10, the water temperature at the condenser discharge had declined to 50°F and the bluefish were obviously stressed and moving closer to the surface. The bluefish began to disperse and move down the discharge canal at approximately 0235 hours when the condenser discharge temperature was 47°F. At 0330 hours, stressed and dying bluefish began to appear along the banks of Oyster Creek in the vicinity of the U.S. Route 9 bridge.

Stressed jacks (crevalle jack and blue runner) were first observed in the area between the condenser discharge and the 30" discharge pipe at 0030 hours on December 10 when the condenser discharge temperature was 52°F. The jacks began to die at approxiately 0220 hours at a temperature of 50°F. Dead and dying jacks were first observed at the U.S. Route 9 bridge at 0315.

Stressed and dead fish were dipnetted along the length of Oyster Creek from 0030 and 0600 hours on December 10. Additional surveys of the creek banks were conducted later in the day on December 10 and during the morning of December 11. This effort yielded 314 dead and stressed fish, 234 of which were jacks.

Bluefish (49 individuals) and Atlantic needlefish (24 individuals) were the only other species found in any abundance. An additional 27 bluefish, 3 Atlantic needlefish and 4 scup were captured in a stressed condition in a gill net set near the mouth of Oyster Creek. Diver surveys of the discharge canal bottom yeilded 12 jacks, 1 Atlantic needlefish, 2 American eel and 1 conger eel. The latter two species appeared to have been dead for some time and their death was probably not related to plant shutdown.

A total of approximately 7800 organisms died following this event. This value was extrapolated from the actual number of organisms collected during the post outage survey.

Corrective Action: Since no further mortality is expected on the affected species and no other species should become stressed or die, no immediate corrective action will be taken. GPUN is currently investigating the feasibiliy of instal'ling blocking devices in the discharge canal in order to divert fish that might be attracted to the heated discharge.

5.2 Summary of Changes Made to Federal and State Permits Which Pertain to the Requirements of OCETS

On March 6, 1982, State of New Jersey regulations concerning the New Jersey Pollutant Discharge Elimination System (NJPDES), N.J.A.C. 7:14A-1 et seq., became effective, and the New Jersey Department of Environmental Protection issued JCP&L, effective that same date, NJPDES permit No. 000 5550 for OCNGS. The NJPDES permit included the effluent limitations, monitoring requirements and other conditions of the NPDES permit previously issued by EPA.

On April 13, 1982, pursuant to Section 402 of the Federal Water Pollution Control Act of 1972, as further amended in 1977, EPA delegated to NJDEP principal responsibility for administration of the NPDES program, and the Department assumed delegation pursuant to the State Water Pollutant Control Act.

The NPDES permit issued by USEPA was scheduled to expire on January 31, 1980. The licensee filed timely application for reissuance of the permit and while a new permit has not been issued to date, the permit was extended by law and remains in full force and effect.

It should be noted that GPUN requested the following permit modifications:
1) Change the chemicals used to control corrosion and scaling in the boiler feedwater, 2) begin chlorination of the emergency service water system. Since the OCNGS is operating with an NPDES permit extended by law, neither the U.S. Environmental Protection Agency nor the New Jersey Department of Environmental Protection could modify our permit. However, GPUN was granted authorization from these agencies to allow the above mentioned discharges subject to the limits specified in the authorizations. Chlorination of the emergency service water system has been initiated. The new chemical have yet to be added to the boiler feedwater.

Additionally, two permit amendment requests were filed with the New Jersey Department of Environmental Protection. The first was a request to increase the velocity limits at the intake structure. The second was a request to increase the dilution pump restart time as it applies to LCO 2.4, from 15 minutes to 40 minutes. A copy of this request ws sent to the USNRC on December 15, 1982. As of the date of this report no decision has been made on either of the requests.

There were no changes made to Federal or State permits or certificates during this reporting period which pertain to the requirements of OCETS.

5.3 Summary of Changes in Station Which Could Involve an Environmental Impact

The following four changes in station design were completed during the reporting period and will involve a positive environmental impact:

1) Installation of a spill containment dike at the fire pond oil tanks.
2) Installation of a spill containment dike at the turbine dirty oil tank.
3) Installation of a spill containment dike at the hazardous waste storage area.
4) The onsite sewage treatment plant was abandoned. All sanitary waste is pumped to the Ocean County Utilities Authority regional sewage treatment plant.

5.4 Summary of Changes to OCETS

There were two amendments to OCETS during the reporting period. Amendment 59 which became effective January 1, 1982 and Amendment 65 which became effective November 5, 1982.

Amendment 59 approved the change in operator for the OCNGS from Jersey Central Power & Light Company to the GPU Nuclear Corporation along with the appropriate changes in section 5.0 of OCETS entitled Administrative Controls.

Amendment 65 approved the change in the organization for the implementation of the OCETS.