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SUBJECT: Forwards 1989 environ monitoring, thermal discharge fish surveillance & dissolved NSR programs & plans.

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BOSTON EDISON
800 Boylston Street
Boston, Massachusetts 02199

BECO 88-139
December 27, 1988

Director
Mass. Division of Water Pollution Control
Permits Section - 7th Floor
One Winter Street
Boston, MA 02108

1989 ENVIRONMENTAL MONITORING PROGRAMS AND PLANS

Gentlemen:

In accordance with NPDES Permit No. MA0003557 (Federal) and No. 359 (State), for Pilgrim Station, the attached 1989 Environmental Monitoring, Thermal Discharge Fish Surveillance, and Dissolved Nitrogen Saturation Reduction Programs and Plans are submitted by Boston Edison Company for your approval.

This submittal is specifically in response to Part 1 Paragraph 7d of the above referenced permit, which provides a deadline of December 31st of each year of the permit's duration to submit annual programs and plans. These programs and plans replace the 1988 environmental program, and have been recommended by the Pilgrim Administrative-Technical Committee.

If there are any questions concerning the attached programs and plans, please do not hesitate to call Mr. Robert Anderson (617)(849-8935) of Boston Edison Company.


E. J. Wagner
Director
Nuclear Engineering

RDA/pac/290

Attachment: Marine Ecology Monitoring Related to Operation of Pilgrim Station
Unit 1, NPDES Permit Programs

cc: U. S. Nuclear Regulatory Commission
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King of Prussia, PA 19406

Senior NRC Resident Inspector
Pilgrim Nuclear Power Station

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MARINE ECOLOGY MONITORING
RELATED TO OPERATION OF PILGRIM STATION UNIT 1
NPDES PERMIT PROGRAMS

In accordance with NPDES Permit requirements for Pilgrim Station Permit No. MA0003557 (Federal) and No. 359 (State), the following modified programs are presented for 1989. The 1978 through 1988 programs were submitted to the Regional Administrator, U.S. Environmental Protection Agency (EPA) and Director, Mass. Division of Water Pollution Control (MDWPC), in December 1977 through December 1987, respectively.

I. ENVIRONMENTAL MONITORING

The Environmental Monitoring Program represents a continuation of previous monitoring. Pre-operational studies for Pilgrim Unit I commenced in 1969, almost four years before initial operation in December 1972. In accordance with environmental monitoring and reporting requirements of the Unit 1 Operating License, DPR-35, issued by the U.S. Atomic Energy Commission (now the Nuclear Regulatory Commission) Boston Edison carried out a post-operational Marine Ecology Program. This program was designed to investigate the Cape Cod Bay ecosystem, with emphasis on the Rocky Point area, in order to determine whether the operation of Pilgrim Station resulted in measurable effects on the marine ecology and evaluate the significance of any such effects. The Marine Ecology Program For Unit 1 continued for five years from initial full power operation (that is, through December 1977) and was replaced by this NPDES Permit Program (with NRC concurrence). Amendment #67 (1983) to the PNPS Technical Specifications deleted Appendix B non-radiological water quality requirements since the NRC believed they were incorporated in the NPDES Permit. The post-operational monitoring for Pilgrim Unit 1 and the collected data are incorporated and analyzed in the Marine Ecology Semi-Annual Reports (#1-32), Marine Ecology Final Report (1978), and the Section 316 Demonstration Document (1975) and Supplement (1977) pursuant to the Federal Water Pollution Control Act Amendments of 1972.

The NPDES Program includes the following elements:

A. Pilgrim Administrative - Technical Committee

The Pilgrim Administrative - Technical Committee (PATC) is an advisory committee that was established to ensure the Pilgrim marine studies have the benefit of qualified outside scientific and technical advice and are responsive to regulatory agency concerns. The PATC recommends improvement to ongoing monitoring based on the latest results with the approval of the U.S. EPA and Mass. Div. of Water Pollution Control. It has held 70 meetings since July 16, 1969, and will continue to be involved in the future Pilgrim marine monitoring. The PATC is composed of representatives (technical and administrative) from each interested federal and state regulatory agency, Boston Edison Company and the University of Massachusetts.

The present membership is as follows:

Agency

National Marine Fisheries Services - (1 member)

Mass. Division of Water Pollution Control - (2 members)

U. S. Environmental Protection Agency - (2 members)

Mass. Division of Marine Fisheries - (2 members)

U. S. Fish and Wildlife Service - (1 member)

University of Massachusetts (2 members)

Boston Edison Company (1 member)

Each meeting was chaired by a representative of the Mass. Div. of Water Pollution Control in 1988. Minutes of PATC meetings appear in the semi-annual Pilgrim Station marine ecology reports.

B. Marine Fisheries Monitoring (Mass. Division of Marine Fisheries)

The Division of Marine Fisheries (DMF), an agency of the Commonwealth of Massachusetts, conducts field monitoring (modified in 1981) pertinent to Pilgrim Station. The monitoring efforts listed below will be continued in 1989.

Fish

The DMF monitors the occurrence and distribution of fish around Rocky Point and at sites in the area of discharge temperature increase. Groundfish will be collected using a 32-foot Shrimp trawl (1/2 inch mesh liner) bi-weekly from April-December and monthly from January-March. Four stations will be sampled (including replicates), at 2 reference and 2 surveillance locations which include the PNPS intake embayment and discharge thermal effluent. Figure 1 shows sampling station locations.

A finfish observational dive survey (Figure 1) will continue in 1989 for the Pilgrim Station thermal plume area. This monitoring will involve bi-weekly diving from April through October to document fish behavior and condition at six stations. During mid-August to mid-September, weekly diving will be done to document potential thermal plume-related mortalities.

In June-November 1989, a 150-foot and 20-foot beach seine (3/16 inch mesh bag) survey (Figure 2) will be performed weekly at five stations, including two in the Pilgrim Station intake embayment. This monitoring will record fishes which are most susceptible to large impingement mortalities that have occurred in previous years.

Lobster

An experimental lobster pot study, initiated in 1986, will be continued during June-September in reference and surveillance areas to better define Pilgrim Station's thermal influence on lobster catch rate (Figure 3).

The DMF has collected lobster catch statistics bi-weekly through each fishing season (April-October) by sampling commercial lobstermen's pot hauls. This effort will continue with one lobsterman as a measure of the Pilgrim Station effect on the local lobster population (Figure 4 shows the sampling grid).

Gas Saturation

In 1989, saturated gas analyses will be conducted only during periods of potential discharge-related mortalities (as occurred in August 1985). A Weiss saturometer will be used in situ to measure total partial pressure of dissolved gases, and percent saturation of total gas, nitrogen, and oxygen.

C. Impingement Monitoring (Marine Research, Inc./BECO)

The main objective of the impingement study is to calculate impingement rates of marine organisms by gathering and analyzing data on numbers and species carried onto the four travelling water screens at Pilgrim Station. In 1989 the weekly collection time will be twenty-four hours (three 8-hour periods). Supplemental fish survival data will also be recorded. BECO will analyze the data and prepare the reports.

D. Benthic monitoring (Battelle New England Marine Research Lab)

The benthic flora and fauna will be monitored at three sampling stations at depths of approximately 10 feet (MLW) (Figure 1). The dominant flora and fauna in each plot are recorded, and quantitative samples are collected from rock surfaces. Sampling will continue two times a year (March and September) to determine power plant-related effects.

In addition, transect monitoring to map the extent of stunted and denuded areas immediately off the discharge canal will be continued 4 times a year (March, June, September and December) in 1989.

E. Entrainment Monitoring (Marine Research, Inc./BECO)

Entrainment monitoring in 1988 emphasized consideration of ichthyoplankton, as it will in 1989.

The 1989 entrainment studies will consist of routine monitoring of the Pilgrim discharge. This monitoring will be on a weekly basis during the period March-September and bi-weekly during the periods January-February and October-December. Samples will be collected in triplicate. If exceptionally high egg or larvae concentrations are found in the discharge when compared with previous years, steps

will be taken to implement contingency ichthyoplankton sampling plans to assess the reason for the high concentrations. The first plan will consist of single tows and sample analysis from the discharge canal. If ichthyoplankton numbers remain exceptionally high, the second plan consisting of single tows at each of 13 Bay stations off the plant will be initiated, and the samples analyzed immediately (Figure 5). MRI will analyze the data and prepare the reports.

F. Reporting of Environmental Monitoring

Semi-annual and annual reports covering each of the above (Items A-E) will be submitted to the EPA and MDWPC on October 31, 1989 and April 30, 1990 covering the periods January-June and January-December 1989, respectively.

II. THERMAL DISCHARGE FISH SURVEILLANCE

The Thermal Discharge Fish Surveillance Program for Pilgrim Station has the following primary parts:

A. Overflights

Periodic aerial overflights of western Cape Cod Bay and the Pilgrim vicinity will be conducted to alert Boston Edison to the presence of large schools of fish in the area. These overflights will be conducted weekly from March-November 1989 and results summarized by BECo in each annual monitoring report.

B. Observation of the Discharge Canal

Boston Edison personnel will make frequent visual observations of the Pilgrim discharge canal during periods of fish migration.

C. Dive Surveys

Dive inspections of the discharge canal and fish barrier net will determine fish presence and condition, and barrier net performance. BECo will report dive survey findings in each annual monitoring report. Also, fish sampling and diver observation in the plume area will be conducted bi-weekly from April through October by Massachusetts Division of Marine Fisheries personnel as part of the Environmental Monitoring Program.

The dive and observation elements of the Surveillance Program monitor compliance with the NPDES Permit barrier net condition, by providing a check on the adequacy of the net in preventing fish passage into the discharge canal. If these elements indicate that the barrier net is not functioning adequately and the Permit's 115% surface nitrogen limitation is triggered by the EPA, the overflights, as well as the canal observations and dive surveys, will indicate when fish susceptible to gas bubble disease mortality are sufficiently near Pilgrim Station to warrant action

to reduce surface nitrogen saturation level to less than 115%. Boston Edison will notify the EPA Regional Administrator and Massachusetts DWPC Director of the presence of large schools of fish within 1/2 mile of the discharge canal concurrent with water quality conditions potentially harmful to the fish.

III. DISSOLVED NITROGEN SATURATION REDUCTION

The plan for reducing dissolved nitrogen surface saturation levels to less than 115% in the discharge canal will involve a power reduction or outage should a school of fish susceptible to gas bubble disease mortality be in the immediate vicinity of Pilgrim Station. The procedure for determining the need, feasibility and request for a power reduction or outage is as follows:

1. Responsible regulatory/agency personnel familiar with fishery statistics (e.g. Mass. Division of Marine Fisheries) will estimate the magnitude of the fish school and, based on measured water quality and other pertinent environmental data, make a determination as to the likelihood and effect of a gas bubble disease mortality. They will also determine the potential necessity for a nitrogen saturation reduction, and notify Boston Edison of this initial judgment.
2. Boston Edison will notify the Rhode Island, Eastern Massachusetts, and Vermont Energy Control (REMVEC) of the possibility of a power reduction and obtain projections through at least the upcoming weekend. Boston Edison will transmit load information to the agencies/persons taking the actions identified in No. 1 above.
3. On the basis of this information, agency personnel will formulate specific recommendations to the EPA Regional Administrator and/or the MDWPC Director on the timing and duration of a power reduction that is, in their judgment, appropriate and in the overall public interest.
4. Responsible regulatory personnel will request a power reduction through a telephone call to the Boston Edison, Pilgrim Nuclear Power Station Director.
5. Boston Edison personnel will record results of periodic surveillance of the condition and location of the fish prior to and subsequent to any plant changes.

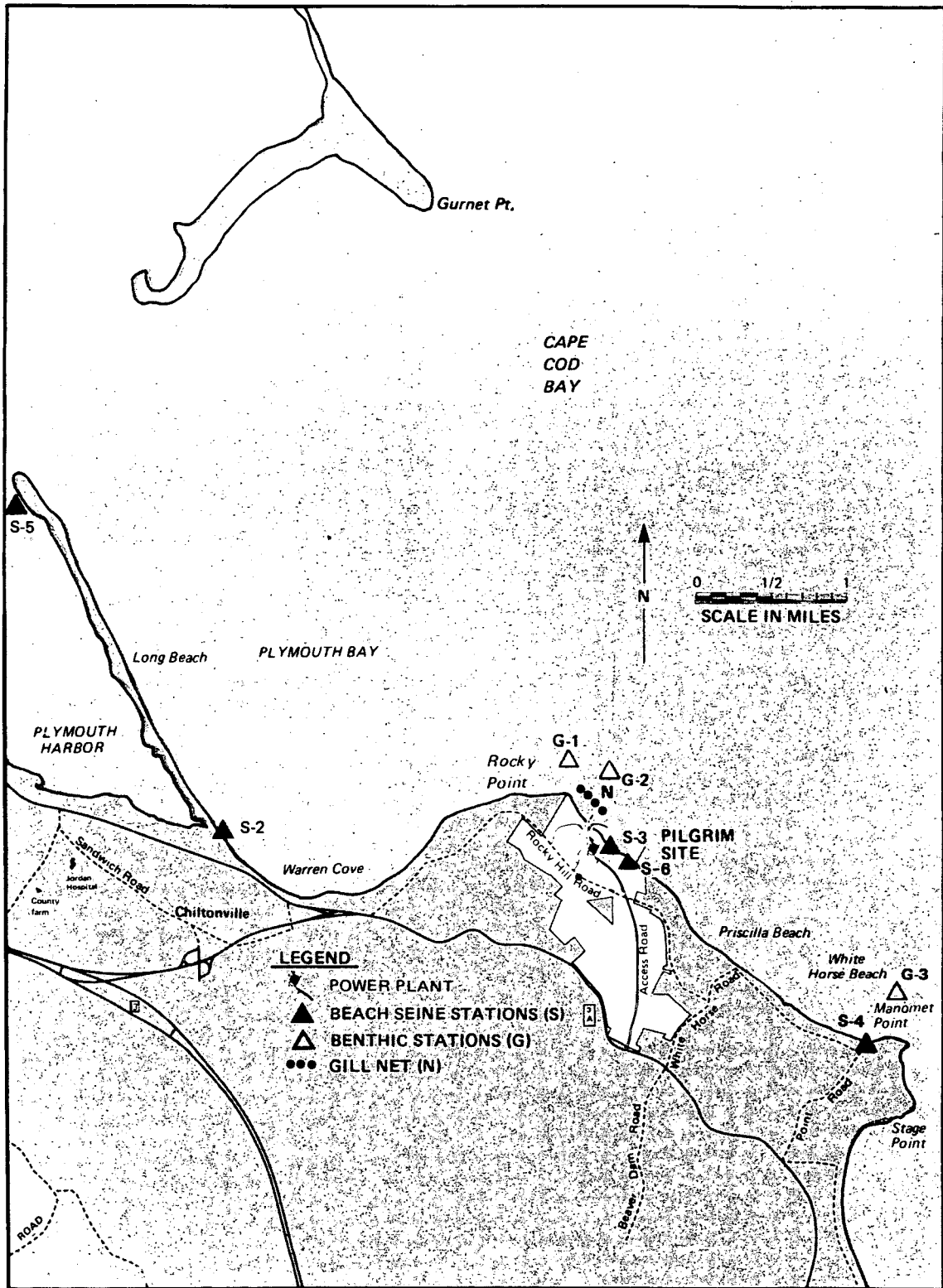


Figure 1. Location of Beach Seine and Gill Net Sampling Stations for Marine Fisheries Studies, and Benthic Studies Sampling Stations

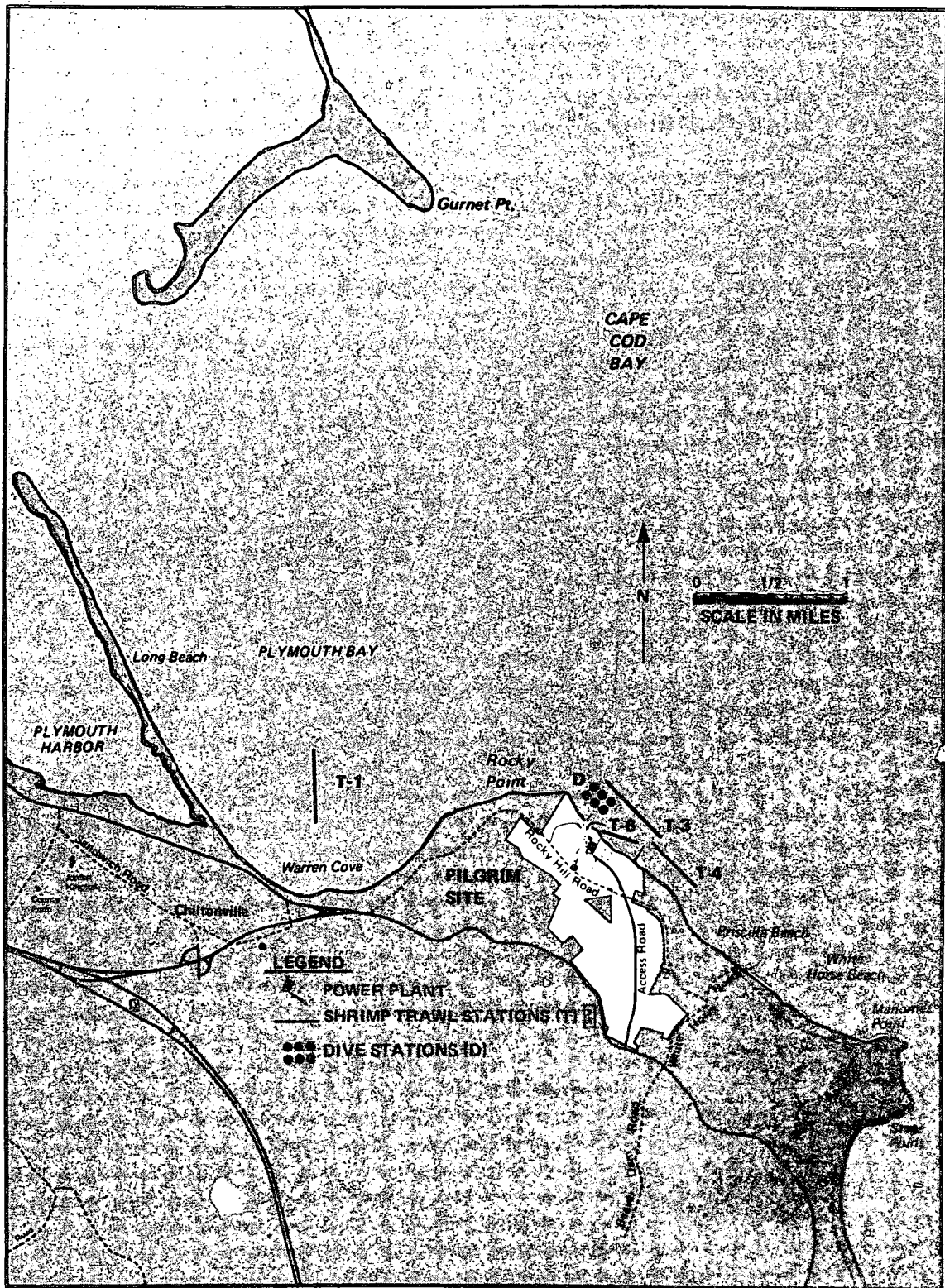


Figure 2. Location of Shrimp Trawl and Dive Sampling Stations for Marine Fisheries Studies

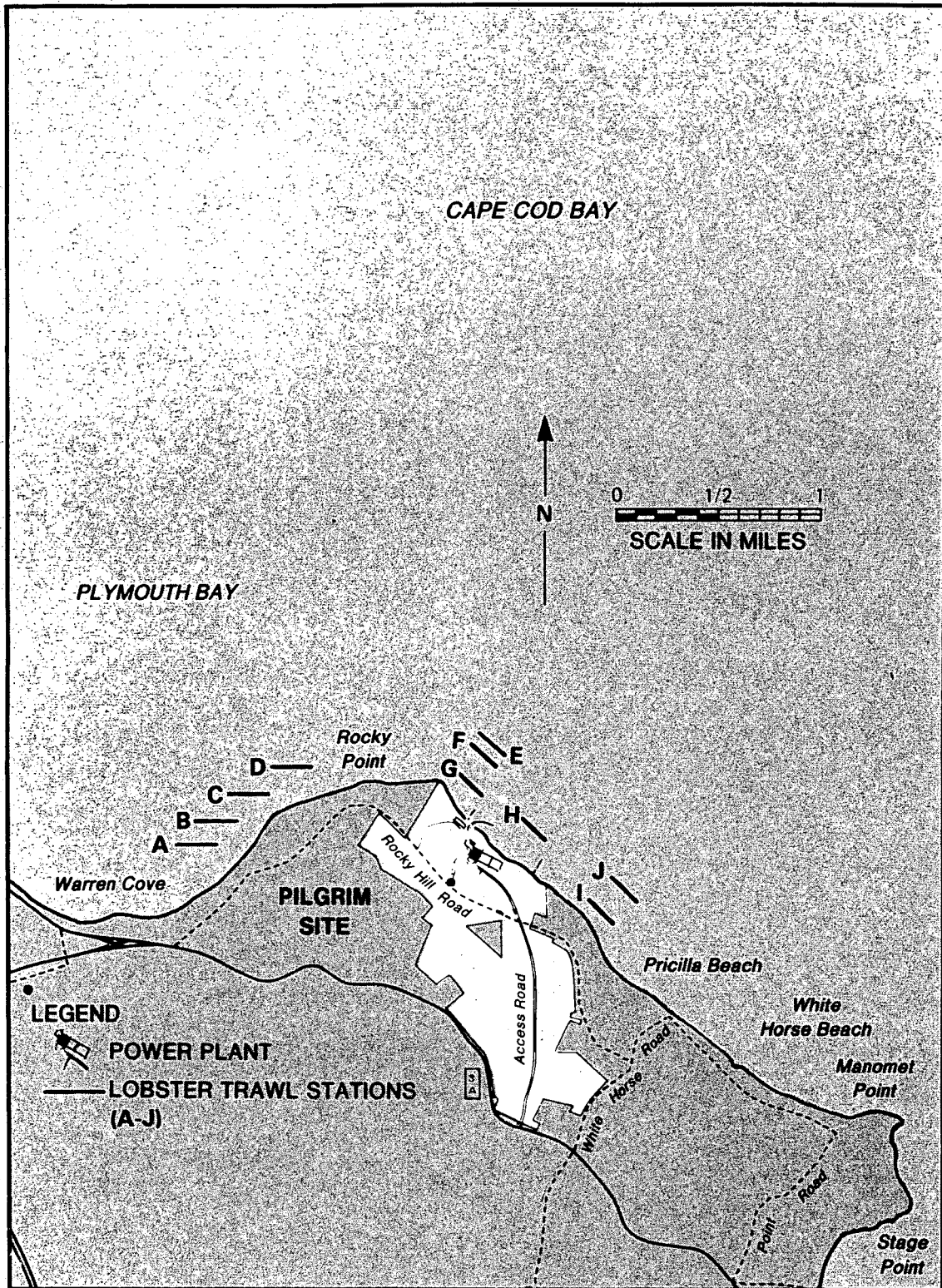


Figure 3. Location of experimental lobster gear (5-pot trawls) for Marine Fisheries Studies.

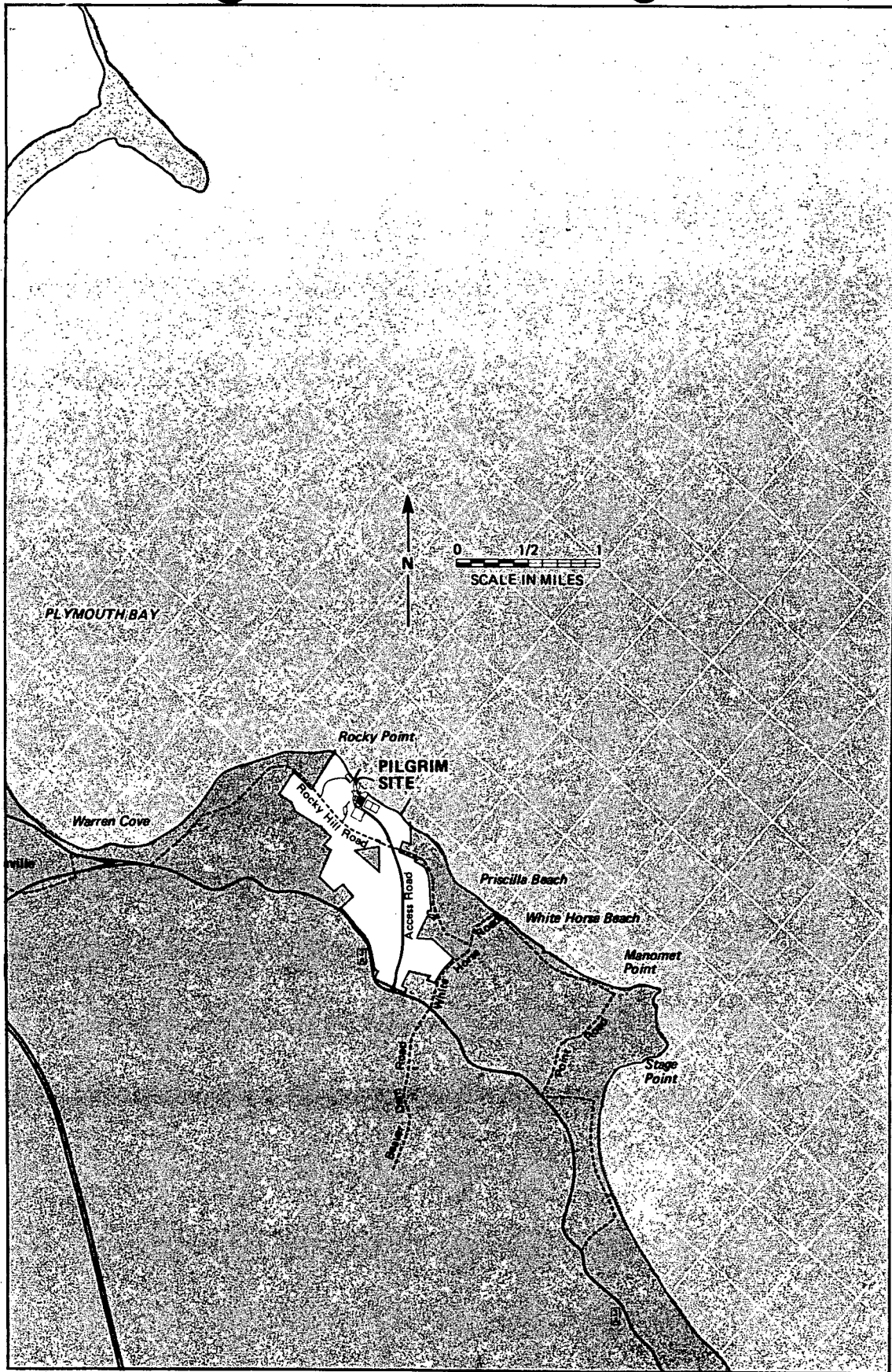


Figure 4 Lobster Pot Sampling Grid for Marine Fisheries Studies.

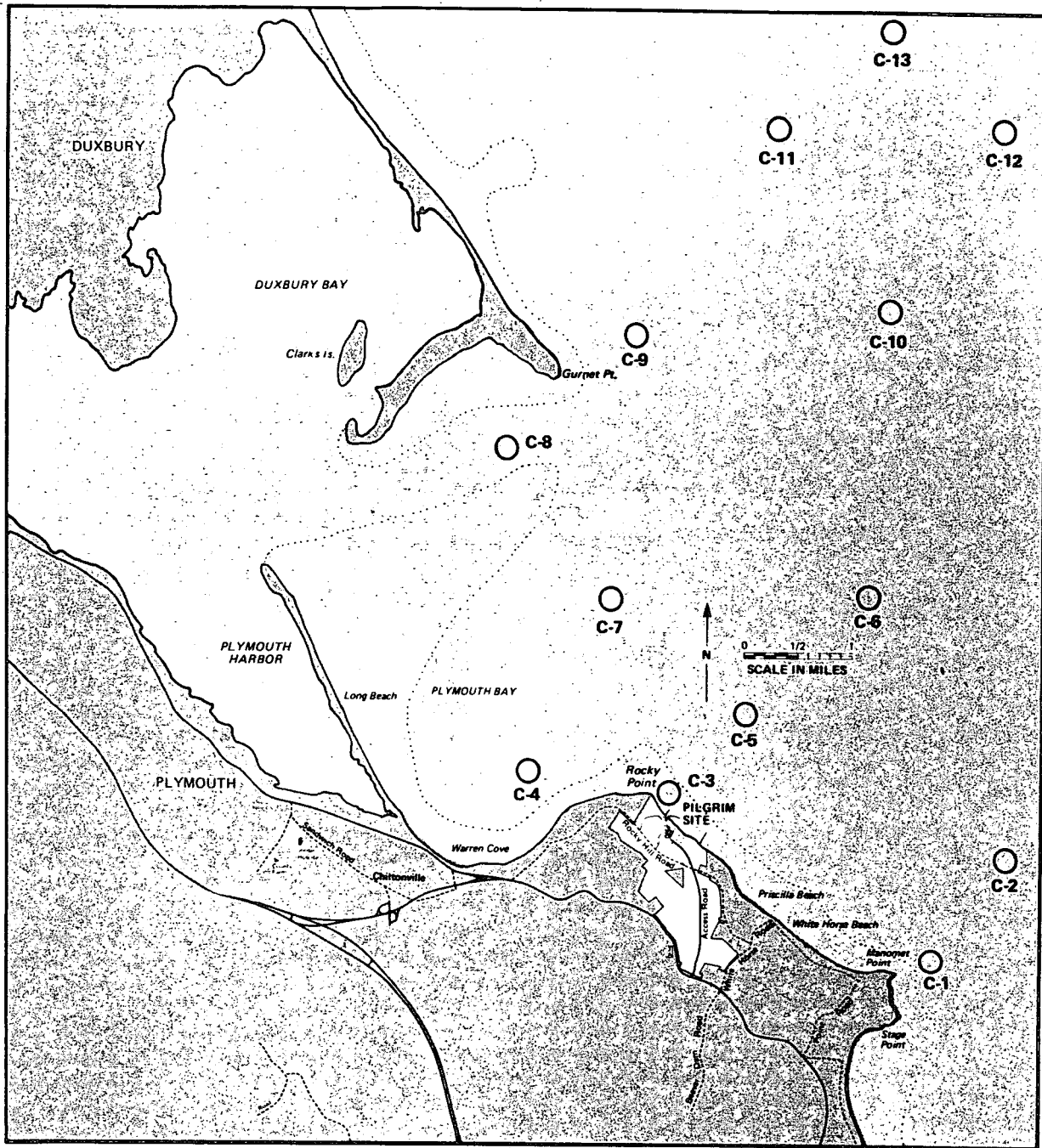


Figure 5 Location of Entrainment Contingency Plan Sampling Stations, C.