JERSEY CENTRAL POWER & LIGHT COMPANY

RESPONSE TO THE

ATOMIC ENERGY COMMISSION

DRAFT ENVIRONMENTAL STATEMENT

RELATED TO THE

OYSTER CREEK NUCLEAR GENERATING STATION

DOCKET NUMBER 50-219

DECEMBER 1973

1. GENERAL

1.A Fish Mortalities

1.B Effects of Canal Construction and Operation

1.C Canal Erosion, Silting and Sedimentation

1.D The Effects of Released Heat

1.E Impingement on Intake Screens

1.F Entrainment of Plankton, Eggs and Larval Forms

1.G Land Use and Consumptive Water Use

1.H Chemical and Radiological Discharges

2. LICENSE CONDITIONS AND TECHNICAL SPECIFICATION REQUIREMENTS

3. PLANT MODIFICATIONS ASSOCIATED WITH MINIMIZING ENVIRONMENTAL IMPACT

3.A Intake and Discharge Canal Improvements

3.B Dilution Pump Modifications

3.C Cooling Water System Procedure Changes

3.D Canal Temperature Monitoring System

4. DETAIL COMMENTS ON THE AEC DRAFT ENVIRONMENTAL STATEMENT

1. GENERAL

The environmental problems identified and evaluated in the Oyster Creek Station Environmental Report, March 1972, and the AEC Draft Environmental Statement Relating to the Oyster Creek Nuclear Generating Station are considered by Jersey Central Power & Light Company to be of minor importance in comparison to the contribution of the plant to the human environment and the well being of the human community. However, in light of the company's commitment to conduct its activities in a manner consistent with the goals of environmental protection and to reasonably minimize the environmental impact of its operations and construction activities, Jersey Central has determined to undertake the improvements or modifications to plant systems and procedures discussed below. The environmental impacts and adverse effects will be discussed in the order that they appear in the Summary and Conclusions of the AEC Draft Environmental Statement (pages i through iii).

A. Fish Mortalities

The menhaden mortalities occurring in the discharge canal during the winter months are caused by:

(1) The attraction of the fish by the warm water in the canal and their tendency to stay there during winter instead of migrating to generally warmer water to the south, and

(2) The reduction of the temperature in the discharge canal and thermal plume when the plant ceases operation. The resulting water temperature (Bay winter ambient 30° to 40°F) and, perhaps, the rate of change of water temperature are lethal to menhaden.

Several steps are being taken to minimize these occurrences:

(1) To the extent that such action is consistent with safe plant operations, shutdowns will be avoided during the winter months when such mortalities may occur.

(2) In order to reduce the attractiveness of the thermal plume and canals as winter habitats for menhaden, the dilution pump system will be operated to reduce the plant Delta T and therefore the plume and discharge canal temperatures. The details of the alterations and procedures are discussed later in Section 3.B.

(3) In order to reduce the rate at which the discharge canal and plume return to ambient temperature after a plant shutdown or trip, alterations will be made so that the dilution pumps will be automatically stopped when the plant trips. As soon as possible after a trip, circulating water system pumps will be secured consistent with the need for cooling water for safe cooldown of the plant. During an orderly shutdown, dilution pumps and circulating

water pumps will be shutdown in a manner which will minimize the rate of temperature decrease in the discharge canal.

It is important to note that these measures will not necessarily eliminate the occurrence of fish mortalities but may reduce the number of fish mortality incidents. Also, the measures mentioned above will, we believe, reduce the number of fish mortalities in any incident. Several alternative solutions such as weirs to prevent fish migration up the canal, and deliberate shutdowns or load reductions during the migration season to discourage schooling in the discharge canal have been considered. The first alternative, whether tried on the existing canal or a separate canal on Jersey Central property, which avoids the present property owners along the discharge canal, would again not eliminate the problem but only minimize it. The present canal could not be fully blocked by a weir because of the use by boats proceeding to and from private property and marinas along the discharge canal. A weir could be placed upstream of the most westerly private property but regardless of the locations of the weir, a thermal plume would exist downstream, which would be an attraction for menhaden and which would cool down after plant shutdown resulting in fish mortalities. Furthermore, a good number of fish enter the discharge canal through the dilution system and from the circulating water intake screen system. These fish would be subject to the thermal stress during plant shutdown. Although these modifications probably would reduce the number of fish that die per incident, the number of fishkill incidents would not necessarily be reduced and Jersey Central does not believe the cost of these changes is warranted. We believe the changes that are being implemented will significantly reduce the impact of station operations on the finfish population.

B. Effects of Canal Construction and Operation

Jersey Central does not feel that there are any bases for the conclusions drawn by the Commission concerning the impact of the loss of spawning and nursery areas or the introduction of boring marine organisms into the canal. These matters are discussed more fully in a later section. There are no alterations to the plant or changes in plant procedures which could have a beneficial effect on these two concerns and which are considered reasonable by Jersey Central.

C. Canal Erosion, Silting and Sedimentation

The concern expressed by Jersey Central's consultants, the Department of the Interior[1] and the AEC staff as well as the need for canal improvement to permit full diluting and circulating water system flow led to a study of alternative canal stabilization methods. Jersey Central will proceed with a program to stabilize the banks of the intake canal

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(1) U.S. Department of the Interior letter from W. W. Lyons, Deputy Assistant Secretary of the Interior, to D. R. Muller, Directorate of Licensing, USAEC, dated January 23, 1973.

between State Highway Route 9 and the plant and the discharge canal between the plant and State Highway Route 9 as soon as all regulatory approvals are obtained. These alterations will cost approximately $1.2 million and will take many months to complete. The modifications will include lined drainage ditches to collect and control run-off water from the canal banks and surrounding areas. During the reconstruction of the banks, the canals will be returned to their design condition to permit full operation of the dilution system as discussed in A above and D. below.

In a stipulation between Jersey Central and the New Jersey Department of Conservation and Economic Development[2] which was implemented by a New Jersey Public Utility Commission Order[3] Jersey Central agreed "that it will be responsible for dredging such shoals as may be due to cooling water flows. State representatives shall assist in determining the amount and location of dredging based among other things on Company's 1962 and 1966 surveys and the State agrees to cooperate in making available its records to aid the Company to carry out its dredging programs".

An up-to-date survey of the canals bottom contour is being made and will be compared to the referenced 1962 and 1966 data to determine the dredging that need be done. Jersey Central will consult with the State and after obtaining the appropriate regulatory authorizations will accomplish the necessary dredging.

D. The Effects of Released Heat

The conclusion that the heat released from the plant "makes a significant impact on the waters of the Bay" is not supported by the Staff's analyses, and is contradicted by the reports of Rutger's work in the waters used by the plant. However, in order to reduce even the potential for environmental effects due to elevated temperatures in the canal and the Bay, Jersey Central will agree to run up to two dilution pumps any time the canal temperature reaches or exceeds 87°F at the railroad bridge. Such a requirement has been made a part of the Environmental Technical Specifications. The rationale for running two pumps continuously when above 87°F instead of the three suggested by the AEC staff is presented in Section 3.C. In addition, a new temperature monitoring system is being installed at the railroad bridges across the intake and discharge canals, and intake temperature and the temperatures at the bridges will be continuously recorded. Temperature at the discharge canal bridge will be alarmed to alert the operators to the need for dilution pump operation.

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(2) State of New Jersey, Department of Public Utilities, Board of Public Utility Commissioners Stipulation - DCED, Docket No. 652-60, February 14, 1966.

(3) State of New Jersey, Department of Public Utilities, Board of Public Utility Commissioners Second Interim Order, Docket No. 652-60, April 22, 1966.

E. Impingement on Intake Screens

We question the AEC estimates of loss of crabs and winter flounder on the intake screens since the short duration of the survey and the small number of sampling dates prohibits accurate extrapolation of these data to yearly impingement rates. Jersey Central has included a surveillance program in the proposed Environmental Technical Specifications which will determine the number and condition of organisms impinged on the intake screens and transferred to the heated effluent canal. The results of this program will be used as the basis for a Limiting Condition for Operation, a Reporting Level, system alterations, or no action at all, depending on the severity of the impact.

F. Entrainment of Plankton, Eggs and Larval Forms

As discussed in the statement, insufficient data are available to assess the impact of entrainment. Therefore, the proposed Environmental Technical Specifications include an entrainment surveillance program which is designed to determine the kinds and quantities of phytoplankton and zooplankton (including invertebrate and fish eggs and larvae) taken into the condenser cooling system and the mortality among organisms passing through the system and being exposed to elevated temperatures. The results of this surveillance program will be used as discussed above under Impingement.

G. Land Use and Consumptive Water Use

These impacts were and are necessitated by the project, and are not considered by Jersey Central as significant in light of the projects benefits to the human environment.

H. Chemical and Radiological Discharges

All chemical and radiological effluents are at such low levels as to be an insignificant impact on the environment. Due to the concern over possible copper buildup in shellfish, Jersey Central will conduct a special study to determine if copper content in shellfish in Barnegat Bay is correlated with their location with respect to the station discharge. The results will be reported to the Commission.

The radiological environmental monitoring program contained in the Oyster Creek Station Technical Specifications is currently being revised and will be submitted as a requested change to that document.

2. LICENSE CONDITIONS AND TECHNICAL SPECIFICATION REQUIREMENTS

Jersey Central concurs in the need for canal bank improvement to reduce the transport of silt and sedimentation. The details of these improvements are discussed in Section 3.A.

Jersey Central also agrees to the use of the dilution pumps to reduce the temperature of the discharge canal and therefore the temperature of the thermal plume in Barnegat Bay. However, instead of using all three pumps as suggested by the staff, Jersey Central proposes to use two continuously, maintaining one in standby to be turned on if one of the operating pumps should fail and to permit normal maintenance of the pumps. This proposal is discussed in more detail in Section 3.B.

Jersey Central agrees to utilize existing systems to the greatest extent practical to minimize the probability and extent of fish mortalities resulting from plant shutdown during the winter. These system and operating procedure changes are outlined in Section 1A above and detailed in Section 3.C.

While there is no reason to believe that fish impingement on the intake screens at Oyster Creek is a significant impact, Jersey Central will conduct a surveillance program to better evaluate this concern. This program is included in the proposed Oyster Creek Environmental Technical Specifications (OCETS).

The Environmental Technical Specifications include requirements for evaluating and reporting any problems associated with plant operations that have a harmful effect on the environment. Action necessary to correct or minimize the problem will be determined on a case basis.

3. PLANT MODIFICATIONS ASSOCIATED WITH MINIMIZING ENVIRONMENTAL IMPACT

A. Intake and Discharge Canal Improvements

The intake and discharge canals at the Oyster Creek Station were designed to accomodate full flow of the dilution and circulating water systems (1,250,000 GPM). Due to erosion from surface run-off and canal flow and transport of silt, shoaling has taken place at various locations in the canals and a generally unsightly condition has resulted along the banks. Jersey Central intends to correct this situation by restoring the design flow capacity and by ensuring the long-term stability of the banks. Several bank treatments (crushed stone, wood bulkheading, fabriform, etc.) are being considered. The improvements will include a drainage system to prevent future surface runoff from effecting the banks once stabilized.

Soundings are currently being taken in the discharge canal to determine the amount of shoaling, if any, that has occurred as a result of plant operations. As discussed in Section 1.C dredging will be performed in accordance with the existing Jersey Central - State of New Jersey agreements.

The design and engineering work for the canal improvement and dredging work is being done this winter and as soon as regulatory approvals can be obtained, these activities will proceed.

B. Dilution Pump Modifications

The Dilution Water System was not designed for winter operation and, in the past, has only been used during the summer months. In order to upgrade the pumps to enable winter operation as discussed in Section 3.C, an automatically controlled seal and lubricating water heating system, automatically controlled gear oil heaters, and a heated building enclosing the pumps and auxiliary systems will be added. Jersey Central is proceeding on the design and engineering work for the modifications and it is expected that the modifications will be completed before the 1974-1975 winter season. During the 1973-1974 winter, heat tracing of necessary systems is being utilized on an interim basis to permit operation.

An automatic trip feature will also be installed on the dilution pumps. This trip will result in an immediate cessation of dilution system flow after a plant trip (turbine trip) to minimize the cooldown rate of the discharge canal.

C. Cooling Water System Procedure Changes

The operations of the cooling water systems, including dilution pumps and circulating water pumps will be altered to produce the minimum thermal impact and to minimize the probability and extent of winter fish mortalities.

In all cases where dilution pump operation is called for, Jersey Central proposes to operate a maximum of two dilution pumps instead of all three. This mode of operation is suggested:

(1) To provide some degree of flexibility to permit normal and corrective maintenance,

(2) To provide a backup pump should one trip during operation, thus enabling the system to better maintain the existing conditions, and

(3) Because the third pump is of marginal benefit in reducing canal temperature but involves more than a 26% increase in flow.

The need for maintenance time is self explanatory. The nominal Delta T across the Oyster Creek condenser for full load conditions and various combinations of dilution and circulating water pumps is given in Table 3.C.1. It is our belief that maintenance of stable conditions of temperature and flow in the canal is better than a cyclic regime. Table 3.C.1 shows that the third pump results in only a 1.7°F decrease in the Delta T (and therefore, in the discharge canal temperature) while increasing the flow by more than 26% (i.e. 260,000 GPM added to 980,000 GPM). The second pump, on the other hand, decreases discharge canal temperature by 3.1°F or by more than one seventh of the total Delta T. It is our judgement that the third pump, because of its minor contribution to temperature decrease is better kept in standby to function as the second pump, should one of the others fail. Pump operation will be implemented as follows:

(1) During those times of the year when Barnegat Bay water temperature (as measured at the intake structure) is below 60°F, two dilution pumps will be run continuously.
(NOTE: Prior to canal improvements, only one pump will be used.)

(2) In the summer, when discharge temperatures at the Route 9 railroad bridge crossing the canal reaches 87°F, one dilution pump will be placed into operation. When this temperature exceeds 87°F with one dilution pump operating, a second pump will be put into operation.

TABLE 3.C.1*

No. of Circulating Water Pumps	No. of Dilution Pumps	Condenser Delta T (°F)
4	0	20
4	1	12.2
4	2	9.1
4	3	7.4

*Assumes Full Power (620 MWe Net).

The control circuitry for the dilution pumps will be altered to include an automatic trip of these pumps when a turbine trip occurs (i.e. when heat input to the canal ceases). This will reduce the flow of ambient temperature water (relatively cold) into the discharge canal and therefore will reduce the rate of change of temperature. This reduction in the cooldown rate of the canal will help to minimize the shock to menhaden. Once the heat input to the main condenser ceases (because of a plant trip or reactor isolation) the temperature of the circulating water leaving the condenser drops to the same temperature as the intake (or to within a few degrees of intake temperature). This water also contributes to the rapid cooldown of the discharge canal. However, due to the need for some or all of this water for safe plant shutdown and cooldown, these pumps cannot be automatically tripped. Operating procedures will be modified, however, to direct the plant operators to secure these pumps as soon as possible consistent with safe shutdown and cooldown of the station.

D. Canal Temperature Monitoring System

A study to evaluate the discharge canal requirements at the bridge and to determine the most representative locations and depths for monitoring of the discharge waters has been performed. Thermal and current velocity surveys were carried out on several days in March and April 1973 using fixed point recording instruments and mobile field equipment.

Program measurements revealed that the flow under the railroad trestle exhibits varying degrees of density stratification. Generally there is a lens of freshwater from Oyster Creek and periodic freshwater runoff riding atop the denser brackish Barnegat Bay water which has been heated and discharged by the Oyster Creek Nuclear Generating Station. During the measurement periods the surface waters (1 to 2 feet in depth) were consistently cooler than the rest of the vertical profile, particularly on the south side of the canal receiving the freshwater discharge from Oyster Creek. A similar result noted on the north side of the canal was apparently due to some Oyster Creek freshwater crossing the canal and remaining in an area of generally low velocities.

The surface waters of the discharge canal upstream of the trestle are normally cooler than the main stream brackish waters because of the freshwater inflow and surface cooling effects. The residence time of waters upstream of the trestle, determined by the plant shutdown measurements conducted in April, is less than one hour. Solar and atmospheric heating of the surface layers--a slow process--would be insignificant within this time frame. Therefore, temperature measurements in the mainstream of the brackish zone represent conservative (high temperature) values at the trestle.

Based on the above reasoning, the monitoring point temperature sensors will be placed near mid-channel at a water depth of four feet, one foot below the previously used sensor location. Two independent sensors will be used to insure that adequate redundancy is provided to allow for routine equipment failure, accidental damage, or vandalism, and to allow for maintenance downtime.

In order to have a valid measurement of intake temperature, a similar installation of redundant temperature sensors will be placed near mid-channel of the intake canal at the railroad trestle approximately four feet below the surface.

The two intake temperature readings, the two discharge temperature readings and the condenser discharge temperature will be recorded in the station control room. The discharge temperature will be alarmed to alert operators to the need for dilution pump operation as discussed above.

4. DETAIL COMMENTS ON THE AEC DRAFT ENVIRONMENTAL STATEMENT

Jersey Central Power & Light Company has reviewed the Draft Environmental Statement (DES) related to the Oyster Creek Station and submits the following comments for your consideration in preparing the Final Environmental Statement:

Summary and Conclusion

Statement 1. "Periodic kills of fish ..."

One reported fish mortality incident is presented on page 5-28, paragraph 2 of the DES. The last sentence of this paragraph and the first paragraph on page 5-23 state that other large kills have occurred, but no information is given regarding who reported them, magnitude, species involved, etc. Factual information should be supplied to support the summary statement.

Statement 2. Effects of Canal Construction and Operation.

Jersey Central agrees that to some extent the current, salinity and temperature regimes of Oyster Creek have been changed by the construction and operation of the station cooling system canals. The work done by Dr. Ruth Turner and others show the presence of shipworms (Teredo navalis and Bankia Gouldii) in great abundance in the discharge canal. However, the conclusion that the canal construction and operation has caused the introduction of these marine boring organisms into the canal is totally incorrect. 1965 surveys by Jersey Central's Consulting Biologist, Dr. C. B. Wurtz, reported in December 1971, indicate that native shipworms existed in the streams tributary to Barnegat Bay as a natural community element prior to canal construction. The salinity regime of Oyster Creek before canal construction is also questionable. Dr. Wurtz's 1965 survey clearly showed that fresh water bottom fauna was lost from the community at the head of Sands Point Marina which is the marina closest to the plant. Downstream from this point the bottom was anaerobic during June 1965. During September 1965 the sample stations near the mouth of the Oyster Creek complex had a typical estuarine bottom fauna, but the middle stretch (up to Sands Point Marina) was still anaerobic. No doubt fresh water extended downstream for some distance beyond the point where fresh water bottom organisms were found, but this would simply be a surface extension. The fresh water would override the more dense saline water of the bottom.

The conclusion that canal construction and operation "has eliminated spawning and nursery areas throught the canal" is also questionable. It presumes that these areas were productive spawning and nursery areas prior to construction and operation. In fact, the 1965 survey by Dr. Wurtz demonstrated that these streams were not important in this respect and that Oyster Creek in particular could not have served such a function because the bottom was largely anaerobic.

The question of damages done to the local marinas as a result of shipworms and the degree to which Jersey Central is responsible for the damage is presently the subject of litigation in the State Courts of New Jersey. The matter is still pending. In this respect, evaluations and statements based solely upon opinions and/or statements by marina owners must be carefully verified

before being presented as fact. Jersey Central feels that the question of environmental impact and the balancing of environmental costs of the plant versus the benefits derived must not only consider the impact on these local individuals but must cover the costs and benefits as applicable to all members of the human environment.

The correct references for this statement should be 5.5.2, 5.5.2.1, and 5.2.2.2.

Statement 3. Canal bank erosion and silting.

The conclusion that the silting is excessive is not supported by documented evidence in the statement. The marina operators are engaged in litigation over the subject and should not be considered as the sole source of information upon which to base this conclusion.

Statement 4. Thermal discharge and effects.

The actual thermal limitation, which is the subject of a New Jersey Public Utility Commission Interim Order #2 (Docket 652-60) requires that temperatures be limited to 95°F not at the U.S. Route 9 bridge but at a buoy located in Barnegat Bay between Oyster Creek and Forked River.

The second sentence of the statement says that "heat may reduce the production of fish by about 5050 lbs. annually". It should be made clear that this is only an estimate, extrapolated from an estimate given for yearly reduction of phytoplankton. The discussion in 5.5.2.4 does not fully explain how the conversion biomass of phytoplankton to biomass of fish was made. The latter part of the second sentence ("this heat may ... cause a significant loss of winter flounder and zooplankton") is unfounded. It is stated in 5.5.2.4 and in the Oyster Creek Environmental Report page 5.1-13 that winter flounder avoid the heated discharge area. The loss of flounder as well as zooplankton are apparently caused by entrapment on the intake screens and not by temperature per se.

Statement 5. Impingement on intake screens.

The 32,000 blue crabs and 24,000 winter flounder lost annually by impingement should be placed in perspective to the aquatic ecosystem in order to justify this as a "significant loss". The area around the plant is a haven for sports fishermen during winter with both crabs and winter flounder caught in large numbers. The number of flounders loss is greatly overestimated because the assumption is made that they are present year round, which is not true. The proper reference section is 8.4 not 8.3.

Statement 6. Loss of zooplankton, fish larvae and eggs.

The figures for zooplankton, fish larvae and fish eggs lost need to be placed in perspective with regard to the ecosystem. The calculations were based on a conglomerate of data (5.5.2.3)

which may not be truly representative of the aquatic ecosystem in question. In light of this, the final sentence in the fifth paragraph on page 5-22 is too definitive. It should not be stated that "the station is killing approximately 150 million eggs per year and 100 million fish larvae". The reference section should be 8.4 not 8.3.

Statement 7. Loss of 80 acres of freshwater marsh and 45 acres of saltwater marsh.

The reference sections should include 8.4. not 8.3.

Statement 9. References should also include section 8.4.

Item 7B(1) page iv.

We propose changes in the statements that indicate the programs that will be instituted at the site. These are discussed more fully in Section 3 of this "Response".

a. JCP&L intends to use a maximum of two dilution pumps and a temperature measuring depth of 4 feet below mean tide level to reduce the effects of the cooler Oyster Creek water as discussed in Section 3.D above.

b. The wording here should be revised to read "The applicant will install appropriate controls, and employ operating procedures and measures that will mitigate the extent of fish mortalities."

Detailed comments on the balance of the Draft Environmental Impact Statement follow:

Page 2-10, Paragraphs 3 & 4.

In paragraph 3, the extent to which salt water tidal action affected Oyster Creek prior to the canal dredging is not substantiated. The reference and sources that formed the basis for the conclusion that "the quality of Oyster Creek water was relatively unaffected by salt water intrusion to a point 2500 feet East of the highway" should be presented. The paragraph also fails to discuss how this conclusion is drawn with respect to surface water quality or salt water intrusion along the entire length of the creek.

Paragraph 4 tends to indicate that a salt water wedge did exist on the bottom of Oyster Creek perhaps to a point much further West than that indicated in the above quote.

Figure 2.8, page 2-18.

The following revisions are needed:

1. The dashed line needs to be explained. In the Oyster Creek Environmental Report (ER) Figure 2.7-2, which is the basis for the subject Figure, the dashed line indicates the boundaries of the pine barren area.

2. Areas designated "deciduous swamps" and "cedar swamps" in ER Figure 2.7-2 are combined in the statement Figure 2.8 and indicated as "lowland forest". Because the cedar swamps are considered as rare and endangered habitats, and the death of these swamps is considered an important impact, it seems imperative to distinctly designate cedar swamps in this figure.

3. The ER Figure 2.7-2 distinguishes between salt and freshwater marshes whereas the statement describes the same areas as "saltwater marsh". The ER designation is more exact and, therefore, preferable.

Page 2-19, paragraph 2, line 8.

Should be revised to read "Wildlife of economic and recreational importance found within a 5-mile radius of the site include red and southern flying squirrel, gray and red fox, beaver and deer.

Table 2.6 and 2.7.

These tables are taken from ER tables 2.7-4 and 2.7-5 respectively, but include only "representative" species from the ER table. It appears there is no rationale for the selection of these species since some of them seemingly are of no greater import than species that were deleted. Either a definition of the "representative" species should be given or the entire species list included.

In Table 2.7 the designation "Birds and Waterfowl" implies that waterfowl are not birds which is not correct.

Page 2-21, third line from bottom.

The comment on the nesting of the Osprey, an endangered species is in contradiction to the ER statement that according to a state conservation officer six pair nested in the Ocean County area during the 1971 breeding season.

Table 2.8 has several mistakes.

The following changes should be made in order to concur with the official 1970 American Fisheries Society List of Common and Scientific names of Fishes from the U.S. and Canada:

a. The accurate name of the redfin pickerel is Esox americanus americanus.

b. The species name of the yellow bullhead is misspelled. It should be natalis.

c. Chubsucker is one word.

d. "Eastern" should be deleted before the common names "creek chubsucker" and "pirate perch".

e. The "fusiform darter" is now officially called the "swamp darter". Its scientific name is Etheostoma fusiforme.

Page 2-23.

Paragraph 2 states that 119 benthic algal species were identified. However, in the ER page 2.7-1, 137 species of benthic flora are reported. Were the 18 species not accounted for in the statement algal species or higher plants?

Paragraph 3 and Table 2-9 on page 2-23 list two different spellings of the algal species "Gracillaria" and "Gracilaria". The correct spelling should be verified.

Page 2-24, paragraph 3, line 5.

"synchasta" should be "synchaeta".

Table 2.13.

This Table should include the scientific names of finfish. Common names are too ambiguous. The 1970 American Fisheries Society list should be consulted.

Page 2-30, paragraph 1, line 4.

The word "tautog" should not be capitalized.

Page 4-3, paragraph 3, line 8.

"regarding" should be "regrading".

Page 5-3, first full paragraph.

The second from the last statement states that "the ability of the bay to disperse the waste energy either by transport to the ocean or by heat transfer from the surface, does not nearly match the station heat discharge". If this were true, Barnegat Bay temperatures would continue to rise as long as the plant operates. In fact, this is not the case and the next sentence in that paragraph concludes that the Bay is able to disperse the heat in a mixing zone which is a limited area existing at a constant, slightly higher temperature.

The conclusion about the ability of the Bay to disperse heat should be deleted or corrected.

Pages 5-3, 5-4, Section 5.2.2.1.

The statement that temperatures up to 104°F were recorded in July 1972 should be substantiated before they are adopted and published in an AEC document.

The statement on page 5-4, paragraph 2, regarding fogging is in direct conflict with the statement on page 5-2, paragraph 2.

The occurrence of severe fogging and increased accidents on Route 9 due to fogging have not been substantiated in the Statement.

The only reference available to support this conclusion consists of interviews with marina operators by representatives of Regulatory Operations. Local traffic officials should be consulted to determine if such dangers exist.

Page 5-4, line 4.

"weater" should be "weather".

Page 5-4, Section 5.2.2.2.

The conclusion that operation of Oyster Creek has allowed invasion of the shipworms into the canal is unsupported since surveys in 1965 demonstrated the existence of these organisms as a natural constituent of the estuarine community.

Page 5-5, paragraph 1.

Higher silting may very well be a problem in the operation of the marinas. It is not clear that all silting in and around marinas is as a result of the operation of the Oyster Creek station. However, as discussed in Section 1.C Jersey Central already has an agreement with the State of New Jersey to correct any shoaling condition caused by plant operations and this work is presently being planned.

Page 5-5, last paragraph and page 5-3, paragraph 2.

The temperature at which dilution pumps are put into operation (67°F) has, apparently, been determined by the AEC Staff on the basis of laboratory studies conducted by Gift and Westman of Rutgers University. This level is the mean temperature at which various fish and shellfish exhibited avoidance behavior. This may not be a meaningful temperature.

The failing of these studies in terms of the applicability of their results to the field situation is related to the following facts:

a. The results are derived from experiments which were conducted with one acclimation temperature (68°F); the resultant upper avoidance temperatures are thus applicable only to those times of the year when the organisms in the field are acclimated to this general temperature.

b. Acclimation times in the laboratory were very short (about 24 hours).

c. Physiological state, salinity, day length, and various other factors may affect the response of organisms to temperature changes.

Acclimation of a species to different seasonal temperatures (lower in winter, higher in summer, for instance) may yield different upper avoidance temperatures--lower in winter and higher in summer.

In one of their experiments Gift and Westman demonstrated this fact. Ambient temperature acclimation studies with the Atlantic silversides showed that "highly significant differences (greater than 99% probability) between the mean responses at different ambient water temperatures" exist.

Page 5-12, paragraph 1.

This paragraph contains several typographical errors including the repeat of 7 lines near the end of the paragraph; i.e., lines 17 to 23 should be deleted as they are the same as lines. 10 to 16.

Page 5-17, paragraph 1.

The statement about fresh water in Oyster Creek to a point 2500 feet East of U.S. Route 9 should include a discussion of the salt water wedge which may have had a significant effect on the population of shipworms in the Oyster Creek canal prior to operation of the station.

Page 5-18.

Estimates of the numbers of winter flounder and crabs killed by impingement may be in error due to the short duration of the sampling (April 11 - July 1, 1971) used to produce the estimated impingement rates. The mean of the number of organisms impinged per hour may decrease if impingement data were available for other time periods. In many estuarine situations, the composition of the animal community changes significantly seasonally. Furthermore, the assessment of the significance of these mortality rates is meaningless without considering:

a. The size ranges of the organisms impinged.

b. The population levels and production of these organisms in the bay.

Page 5-23.

The assessment of the significance of the effect of the loss of phytoplankton production in terms of pounds of fish lost per year to commercial fisherman assumes:

a. The 5000 pounds of fish would have been caught by commercial fishermen.

b. All phytoplankton are converted to fish.

c. It also assumes the method of conversion from phytoplankton to fish biomass is correct. Since the method of conversion is not presented, no assessment of errors is possible.

On the other side of the matter, the potential production of offspring of these fish is not considered.

Assuming that the conversion factors from phytoplankton to biomass of commercial species is correct, then commercial shellfish species which also feed on plankton should be included in the estimates for commercial production from the Bay. According to Table 2.12 of the Draft Statement, at least 2,791,400 pounds of shellfish were caught in Barnegat Bay in 1969. When this figure is added to the 76,400 pounds of commercial fish catch, the loss is less than 0.2%.

Page 5-30, Section 5.7.2., paragraph 2.

The third sentence should read "About 14 truckloads ...".

Table 9.8.

"Manhaden" should be "Menhaden".