State of New Jersey

JON S. CORZINE
Governor

DEPARTMENT OF ENVIRONMENTAL PROTECTION

MARK N. MAURIELLO
Acting Commissioner

Division of Water Quality
P.O. Box 029 Trenton, NJ 08625-0029
Phone: (609) 292-4860
Fax: (609) 984-7938

CERTIFIED MAIL
RETURN RECEIPT REQUESTED
January 7, 2010

Michael Massaro
Site Vice President
Exelon Generation Company
P.O. Box 388
Oyster Creek Generating Station
Forked River, NJ 08731-0388

Re: **Draft** Surface Water Renewal Permit Action
Category: B -Industrial Wastewater
NJPDES Permit No. NJ0005550
Oyster Creek Generating Station, Lacey Twp, Ocean County

Dear Mr. Massaro:

Enclosed is a **draft** New Jersey Pollutant Discharge Elimination System (NJPDES) permit action identified above which has been issued in accordance with N.J.A.C. 7:14A. This draft permit supersedes the New Jersey Department of Environmental Protection's (the Department's) previous draft permit which was issued on July 19, 2005.

Notice of this draft permit action will appear in the *Ocean County Observer* and in the 2010 *DEP Bulletin*. The *DEP Bulletin* is available on the internet at http://www.state.nj.us/dep/bulletin or by contacting the DEP Document Distribution Center at (609) 777-4398. Pursuant to N.J.A.C. 7:14A-15.10(c)1i, at least a thirty day public comment period has been established. The Department has set a public comment period deadline of March 15, 2010.

Issuance of this draft permit begins an extensive public process that will ultimately inform a final permit decision on this application. Two public hearings will be held and it is anticipated that there will be significant technical information provided to the Department for consideration. Issues that are expected to be raised include the costs and benefits of cooling towers, site logistics for construction of cooling towers, permitting requirements (other than NJPDES) associated with construction of cooling towers, timing required for the design, permitting and construction of cooling towers, fish and other species impacts resulting from continuing operation of the Oyster Creek Generating Station (OCGS), and other impacts to the ecology of Barnegat Bay unrelated to OCGS. The Department recognizes the broad range and technical complexity of issues associated with this permit and is committed to ensuring that the public process allows adequate time and attention to address all issues raised in a thorough and comprehensive manner. The final permit decision will reflect all input and comments provided as part of this process.

A non-adversarial public hearing has been scheduled on February 24, 2010 at the Lacey Township Municipal Building on Lacey Road from 1 to 4 PM and 7 to 9 PM (or end of testimony) to provide an opportunity for interested persons to present and submit information on the proposed action. A second public hearing will be held in the Department's Public Hearing Room at 401 East State Street in Trenton, NJ on March 3, 2010 from 1 PM to 4 PM (or end of testimony).

As detailed in the *DEP Bulletin* and aforementioned newspaper, written comments must be submitted in writing to Pilar Patterson, Chief, Bureau of Surface Water Permitting, P.O. Box 029, Trenton, NJ 08625 by March 15, 2010. All persons, including the applicant, who believe that any condition of this draft document is inappropriate or that the Department's tentative decision to issue this draft document is inappropriate, must raise all reasonable arguments and factual grounds supporting their position, including all supporting materials, during the public comment period.

The NJDEP will respond to all significant and timely comments upon issuance of the final document. The permittee and each person who has submitted written comments will receive notice of the NJDEP's final decision to issue, revoke, or redraft the document.

If you have questions or comments regarding the draft action, please contact Susan Rosenwinkel of my staff at (609) 292-4860.

Sincerely,

Original Signed By

Pilar Patterson, Chief
Bureau of Surface Water Permitting

Enclosures
c: Permit Distribution List
Masterfile #: 15856; PI #: 46400

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This permit package contains the items checked below:

New Jersey Department of Environmental Protection
Division of Water Quality
Bureau of Surface Water Permitting

PUBLIC NOTICE

Notice is hereby given that the New Jersey Department of Environmental Protection (NJDEP) proposes to renew the New Jersey Pollutant Discharge Elimination System (NJPDES) Discharge to Surface Water (DSW) Permit NJ0005550 in accordance with N.J.A.C. 7:14A-1 et seq., and by authority of the Water Pollution Control Act at N.J.S.A. 58:10A-1 et seq., for the following discharge:

Applicant or Permittee	Facility
Exelon Generation Company P.O. Box 388 – Oyster Creek Generating Station Forked River, NJ 08731-0388	Oyster Creek Generating Station Route 9 South Forked River, Ocean County, NJ

The Oyster Creek Generating Station (OCGS or the Station) is an existing nuclear fueled electric generating station. The Station is located between the South Branch of the Forked River and Oyster Creek, two tributaries of Barnegat Bay. This draft permit renewal proposes to authorize the intake of waters from Forked River as well as the discharge of wastewater through seven outfalls to both Forked River and Oyster Creek. The Station withdraws up to 662.4 million gallons per day (MGD) of water from an intake canal that leads from the Forked River, uses this water as non-contact cooling water, then discharges these waters into a discharge canal which leads to Oyster Creek, classified as SE-1 waters. The plant also withdraws approximately 732 MGD of water from the intake canal and discharges it directly into the discharge canal (without added heat) for the purpose of diluting the thermal discharge from the non-contact cooling water. This permit also serves to authorize the discharge of miscellaneous non-contact cooling water, process wastewater, intake screen washwater and stormwater in minimal amounts through five other outfalls.

This draft permit renewal supersedes the NJDEP's July 19, 2005 draft NJPDES permit. This proposed action incorporates NJDEP's determination with respect to the permittee's request for a thermal variance from surface water quality standards for heat and temperature pursuant to Section 316(a) of the Federal Clean Water Act. Further, this draft renewal permit incorporates NJDEP's determination pursuant to Section 316(b) of the Clean Water Act regarding the best technology available for the cooling water intake structure. Specifically, the Department has determined that closed-cycle cooling (i.e. cooling towers) constitutes best technology available for the OCGS in accordance with best professional judgment.

Issuance of this draft permit begins an extensive public process that will ultimately inform a final permit decision on this application. Two public hearings will be held and it is anticipated that there will be significant technical information provided to the Department for consideration. Issues that are expected to be raised include the costs and benefits of cooling towers, site logistics for construction of cooling towers, permitting requirements (other than NJPDES) associated with construction of cooling towers, timing required for the design, permitting and construction of cooling towers, fish and other species impacts resulting from continuing operation of the OCGS, and other impacts to the ecology of Barnegat Bay unrelated to OCGS. The Department recognizes the broad range and technical complexity of issues associated with this permit and is committed to ensuring that the public process allows adequate time and attention to address all issues raised in a thorough and comprehensive manner. The final permit decision will reflect all input and comments provided as part of this process.

Modification provisions as cited in the permit may be initiated in accordance with the provisions set forth in Part IV and upon written notification from the Department.

A draft NJPDES permit renewal has been prepared for this facility based on the administrative record filed at the NJDEP, 401 East State Street, Trenton, New Jersey 08625. Copies of the draft document can be obtained through the NJDEP's website at www.state.nj.us/dep/dwq. If you are interested in scheduling an appointment or

requesting specific information regarding the draft document, contact Susan Rosenwinkel of the Bureau of Surface Water Permitting at (609) 292-4860.

Written comments on the draft document must be submitted in writing to Pilar Patterson, Chief, or Attention: Comments on Public Notice NJ0005550, Bureau of Surface Water Permitting, P.O. Box 029, Trenton, NJ 08625 by March 15, 2010. All persons, including the applicant, who believe that any condition of this draft document is inappropriate or that the Department's decision to issue this draft document is inappropriate, must raise all reasonable arguments and factual grounds supporting their position, including all supporting materials, during the public comment period.

Notice is further given that, in accordance with N.J.A.C. 7:14A-15.12, two non-adversarial public hearings have been scheduled to afford the public an opportunity to be heard on this proposed action. This public hearing will be held on February 24, 2010 from 1 to 4 PM and again from 7 to 9 PM (or end of testimony) at:

Lacey Township Municipal Building
Lacey Road
Lacey Township, NJ

A second public hearing will be held on March 3, 2010 from 1 PM to 4 PM (or end of testimony) at:

New Jersey Department of Environmental Protection
Public Hearing Room – First Floor
401 East State Street
Trenton, NJ 08625

The hearing shall be held before a Hearing Officer designated by the NJDEP. The applicant and other interested persons will have the opportunity to present and submit information on the proposed action.

The NJDEP will respond to all significant and timely comments upon issuance of the final document. The permittee and each person who has submitted written comments will receive notice of the Department’s final permit decision.

Public Notice of Proposed Permit Actions (Division of Water Quality)

Permit: • ***Name*** • ***NJPDES No.*** • ***Type***	***Facility Location:*** • ***Address*** • ***County***	***NJDEP:*** • ***Case manager*** • ***Bureau*** • ***Phone No.***	***Receiving Discharge:*** • ***Stream or Formation or POTW*** • ***Stream Classification*** • ***Watershed***	***Executive Summary***
Oyster Creek Generating Station NJ0005550 DSW Major	Route 9 South Forked River, NJ Ocean County 08731-0388 Ocean	Susan Rosenwinkel Bureau of Surface Water Permitting (609) 292-4860	Oyster Creek and Forked River SE1 Forked River/Oyster Creek	The Oyster Creek Generating Station (Station) is an electric generating station located between the South Branch of the Forked River and Oyster Creek. This draft permit renewal proposes to authorize the intake of waters from Forked River as well as the discharge of wastewater through seven outfalls to both Forked River and Oyster Creek. The Station withdraws up to 662.4 million gallons per day (MGD) of water from an intake canal that leads from the Forked River, uses this water as non-contact cooling water, then discharges these waters into a discharge canal which leads to Oyster Creek. The plant also withdraws approximately 732 MGD of water from the intake canal and discharges it directly into the discharge canal (without added heat) for the purpose of diluting the thermal discharge from the non-contact cooling water. This permit also serves to authorize the discharge of miscellaneous non-contact cooling water, process wastewater, intake screen washwater and stormwater in minimal amounts through five other outfalls. This draft permit renewal incorporates NJDEP's determination with respect to the permittee's request for a thermal variance from surface water quality standards (SWQS) for heat and temperature pursuant to Section 316(a) of the Federal Clean Water Act. Further, this draft renewal permit incorporates NJDEP's determination pursuant to Section 316(b) of the Clean Water Act regarding the best technology available for the cooling water intake structure. Specifically, the Department has determined that closed-cycle cooling (i.e. cooling towers) constitutes best technology available for the Oyster Creek Generating Station.

New Jersey Department of Environmental Protection
Division of Water Quality
Bureau of Surface Water Permitting

FACT SHEET

Masterfile #: 15856 **PI #:** 46400

This fact sheet sets forth the principle facts and the significant factual, legal, and policy considerations examined during preparation of the draft permit. This action has been prepared in accordance with the New Jersey Water Pollution Control Act and its implementing regulations at N.J.A.C. 7:14A-1 et seq. - The New Jersey Pollutant Discharge Elimination System.

PERMIT ACTION: Surface Water Renewal Permit Action - **Draft**

This fact sheet contains information organized into the following sections:

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1 Overview of Draft Renewal Permit:

The permittee has applied for a New Jersey Pollutant Discharge Elimination System (NJPDES) Surface Water Renewal Permit Action through an application dated May 28, 1999. Until such time as this renewal permit is finalized, the existing permit remains in full force and effect pursuant to N.J.A.C. 7:14A-2.8.

The New Jersey Department of Environmental Protection (the Department) issued a draft renewal permit on July 19, 2005. This permit incorporated conditions consistent with the final regulations issued by the United States Environmental Protection Agency (EPA) for Phase II facilities for which this facility meets the eligibility criteria. These regulations served to guide implementation of the 316(b) statute and became effective on September 7, 2004. However, EPA has since "suspended" the Phase II regulations. This is articulated in the July 9, 2007 Federal Register notice and is a result of the fact that the Second U.S. Circuit Court of Appeals issued its decision in the litigation over the Phase II regulation. See Riverkeeper, Inc., v. EPA, No. 04-6692, (2d Cir. January 25, 2007). The court's decision remanded several provisions of the Rule on various grounds. Given that the Phase II rule is suspended, EPA has directed States and permitting authorities to issue permits in accordance with Best Professional Judgment (BPJ) pursuant to 40 CFR 401.14. Given the reliance of the July 19, 2005 draft permit on these now suspended regulations,

the Department is required to redraft the NJPDES permit for those conditions consistent with N.J.A.C. 7:14A-15.14(a)1.

Subsequent to the issuance of the July 19, 2005 draft NJPDES permit, the permit was open to public comment. The thirty (30) day public comment period began on July 19, 2005 when the Public Notice was published in the *Ocean County Observer*. The Department held two public hearings (an afternoon and an evening session) at the Lacey Township Municipal Building on August 29, 2005. At that hearing, the Department made notice of its intention to extend the public comment period to November 7, 2005. Due in part to requests made by many commentors, the Department also provided another public hearing on October 24, 2005 (evening session only), which took place at the Ocean County Administrative Building in Toms River, NJ. Notice of this additional public hearing, as well as the public comment period extension, was published in the *Ocean County Observer* on September 23, 2005. Finally, the Department extended the public comment period for an additional two weeks to November 21, 2005 in a letter dated November 4, 2005.

Issuance of this draft permit begins an extensive public process that will ultimately inform a final permit decision on this application. Two public hearings will be held and it is anticipated that there will be significant technical information provided to the Department for consideration. Issues that are expected to be raised include the costs and benefits of cooling towers, site logistics for construction of cooling towers, permitting requirements (other than NJPDES) associated with construction of cooling towers, timing required for the design, permitting and construction of cooling towers, fish and other species impacts resulting from continuing operation of the Oyster Creek Generating Station (OCGS), and other impacts to the ecology of Barnegat Bay unrelated to OCGS. The Department recognizes the broad range and technical complexity of issues associated with this permit and is committed to ensuring that the public process allows adequate time and attention to address all issues raised in a thorough and comprehensive manner. The final permit decision will reflect all input and comments provided as part of this process.

This action supercedes the July 19, 2005 permit. As detailed in the public notice accompanying this document, the Department will hold public hearings to solicit comments on this draft permit renewal. The public comment period will expire on March 15, 2010.

The NJPDES permit proposes to authorize the intake of waters from Forked River as well as the discharge of wastewater to both Forked River and Oyster Creek. As noted previously, this draft permit renewal serves to provide the Department's determination pursuant to Section 316(b) of the Clean Water Act in accordance with Best Professional Judgment. **Specifically, the Department has determined that closed-cycle cooling (i.e. cooling towers) constitutes best technology available for the Oyster Creek Generating Station in accordance with best professional judgment.**

2 Name and Address of the Applicant:

Exelon Generation Company
Oyster Creek Generating Station
Route 9 South, P.O. Box 388
Forked River, NJ 08731

3 Name and Address of the Facility/Site:

Exelon Generation Company
Oyster Creek Generating Station
Route 9 South
Lacey Township, Ocean County, NJ

4 Discharge Location Information:

Description of Outfalls of Most Significant Flow (DSN 001A and 005A)

Outfall 001A: Non-Contact Cooling Water (up to 662.4 million gallons per day or MGD)			Outfall 005A: Dilution Water (up to 748.8 MGD)	
Receiving Water:	Oyster Creek		Receiving Water:	Oyster Creek
Via :	Discharge Canal		Via :	Discharge Canal
Outfall Configuration:	Submerged pipe		Outfall Configuration:	Submerged pipe
Classification:	SE1		Classification:	SE1
Latitude:	39° 48’ 40”		Latitude:	39° 48’ 48.9”
Longitude:	74° 12’ 00”		Longitude:	74° 12’ 28.2”
County:	Ocean		County:	Ocean
Municipality:	Forked River		Municipality:	Forked River
Downstream Confluences:	Barnegat Bay		Downstream Confluences:	Barnegat Bay
Receiving River Basin:	Barnegat Bay		Receiving River Basin:	Barnegat Bay
WMA (a):	13		WMA (a):	13
Watershed:	Forked River/Oyster Creek		Watershed:	Forked River/Oyster Creek
Subwatershed:	Oyster Creek (below Rt 532)		Subwatershed:	Oyster Creek (below Rt 532)
HUC 14 (b):	02040301110050		HUC 14 (b):	02040301110050

Description of Other Outfalls (DSN 002A, 004A, 007A, 008A, 009A)

Outfall 002A: Non-Contact Cooling Water (3.5 MGD)			Outfall 004A: Non-Contact Cooling Water, Stormwater, Floor Drains (0.06 MGD)	
Receiving Water:	Forked River		Receiving Water:	Oyster Creek
Via :	Intake Canal		Via :	Discharge Canal
Outfall Configuration:	Submerged pipe		Outfall Configuration:	Submerged pipe
Classification:	SE1		Classification:	SE1
Latitude:	39° 48’ 52.9”		Latitude:	39° 48’ 47.6”
Longitude:	74° 12’ 28.2”		Longitude:	74° 12’ 24.9”
County:	Ocean		County:	Ocean
Municipality:	Forked River		Municipality:	Forked River
Downstream Confluences:	Barnegat Bay		Downstream Confluences:	Barnegat Bay
Receiving River Basin:	Barnegat Bay		Receiving River Basin:	Barnegat Bay
WMA (a):	13		WMA (a):	13
Watershed:	Forked River/Oyster Creek		Watershed:	Forked River/Oyster Creek
Subwatershed:	Forked River (below NB including Mid/South Branch)		Subwatershed:	Oyster Creek (below Rt 532)
HUC 14 (b):	02040301110030		HUC 14 (b):	02040301110050

Outfall 007A: Process Wastewater (30 GPD)	
Receiving Water:	Forked River
Via :	Intake Canal
Outfall Configuration:	Submerged pipe
Classification:	SE1
Latitude:	39° 48’ 50.9”
Longitude:	74° 12’ 55.1”
County:	Ocean
Municipality:	Forked River
Downstream Confluences:	Barnegat Bay
Receiving River Basin:	Barnegat Bay
WMA (a):	13
Watershed:	Forked River/Oyster Creek
Subwatershed:	Forked River (below NB including Mid/South Branch)
HUC 14 (b):	02040301110030

Outfall 008A: Intake Screen Washwater (2.4 MGD)	
Receiving Water:	Oyster Creek
Via :	Discharge Canal
Outfall Configuration:	Submerged pipe
Classification:	SE1
Latitude:	39° 48’ 48.8”
Longitude:	74° 12’ 27.5”
County:	Ocean
Municipality:	Forked River
Downstream Confluences:	Barnegat Bay
Receiving River Basin:	Barnegat Bay
WMA (a):	13
Watershed:	Forked River/Oyster Creek
Subwatershed:	Oyster Creek (below Rt 532)
HUC 14 (b):	02040301110050

Outfall 009A: Fish Sampling Pool Wastewater	
Receiving Water:	Forked River
Via :	Intake Canal
Outfall Configuration:	Submerged pipe
Classification:	SE1
Latitude:	39° 48’ 48.6”
Longitude:	74° 12’ 27.9”
County:	Ocean
Municipality:	Forked River
Downstream Confluences:	Barnegat Bay
Receiving River Basin:	Barnegat Bay
WMA (a):	13
Watershed:	Forked River/Oyster Creek
Subwatershed:	Forked River (below NB including Mid/South Branch)
HUC 14 (b):	02040301110030

Footnotes:
(a) WMA = Watershed Management Area
(b) HUC 14 = 14 digit Hydrologic Unit Code

5 Description of Facility:

The Oyster Creek Generating Station (hereafter “Station”, “facility”, or “OCGS”) is a nuclear fueled electric generating station (SIC code 4911). The Station is located between the South Branch of the Forked River and Oyster Creek, two tributaries of Barnegat Bay. The Station consists of a single boiling water reactor rated to produce 670 Megawatts. The unit was constructed between December 1964 and September 1969 where operation commenced in December 1969. The Station operates under a license issued by the United States Nuclear Regulatory Commission (US NRC) where this license was renewed on April 1, 2009.

The facility is classified as a major discharger by the Department in accordance with the EPA rating criteria.

6 Description of Intake:

General

Construction of the Oyster Creek Generating Station resulted in the dredging and widening of the Forked River and Oyster Creek and the construction of man-made canals leading from Forked River to the Station (intake canal) and from the Station to Oyster Creek (discharge canal). The shapes of the intake and discharge canal could connect; however, there is a dike that separates the upstream ends of both canals. A map showing the location of both canals is included at the end of this Fact Sheet.

The Station utilizes intake water for two primary purposes. The circulating water and service water systems utilize up to 662.4 million gallons per day (MGD) for the purposes of cooling the main condenser. The dilution water system utilizes up to 748.8 MGD for the purposes of mitigating the thermal effects in the discharge canal. These two systems are described in detail below. While Forked River is the primary source of intake water, an additional source of water used for operations is fresh water from an on-site well.

Sanitary wastewater that is generated on site is conveyed to the Lacey Township Municipal Utilities Authority.

Circulating Water and Service Water System

Water is withdrawn from Forked River via the Station's Intake Canal. There are four intake pumps each with a capacity of 115,000 gallons per minute (gpm) (which is equivalent to 165.6 MGD). During normal operations, all four pumps operate continuously at an average flow rate of 662.4 MGD. This intake water is used to cool the main condenser and the turbine building heat exchangers. This cooling water is then discharged through **DSN 001A** into the discharge canal, which joins Oyster Creek and ultimately Barnegat Bay.

The Station's Intake Canal includes two surface water intake structures namely the Circulating Water Intake, which also services flow for the service water system, and the Dilution Water Intake. The Circulating Water Intake is divided into two sections or bays. Each bay contains three cells. Water enters the cells through trash racks where there is one trash rack per cell. The trash racks are constructed of steel, almost vertically positioned bars on 3 inch centers; so that the trash rack slot opening is about 2 ½ inches. After passing through the trash rack, water is drawn through conventional vertical traveling screens (3/8 inch mesh) modified with "Ristroph" type fish buckets fitted to the base of each screen panel. These fish buckets are intended to prevent aquatic organisms that become trapped on the screens from falling back into the screen well and being repeatedly trapped. They also allow organisms to remain in a water filled bucket when the screen panel is rotated above the water surface. The screen-wash system includes an external low pressure spray (10 to 15 pounds per square inch or psi) and an internal low pressure spray (10 to 20 psi) designed to gently wash marine life off the screens and into the fish return system. After the marine organisms have been removed, a high pressure spray (70 to 90 psi) is used to remove debris from the screens. Screens normally rotate continuously at 1.3 cm/sec (2.5 feet per minute) but speeds can increase via manual control. Water passing through the trash racks and traveling screens is withdrawn by circulating or service water system pumps for use as cooling water. The fish return system is routed to the discharge canal which thereby eliminates the possibility that fish can be immediately reimpinged.

Intake screen washwater is discharged via **DSN 008A** where this flow averages approximately 2.4 MGD. The intake screen washwater removes debris and other organic matter from the Station's traveling intake screens, including the screen washwater system strainers, and discharges to the discharge canal without any additives or treatment. The facility has the option of diverting fish and other organisms removed from the traveling screens to a fish sampling pool where the water from such is drained to the Forked River. The discharge from the fish sampling pool is authorized as **DSN 009A** and is utilized during impingement sampling events.

Dilution Water System

The permittee also pumps water from the Forked River via the intake canal and discharges it directly to the discharge canal via **DSN 005A** without any addition of heat or other pollutants and without treatment. Dilution pump water is withdrawn via one or two of the Station's three dilution pumps and discharged for the purposes of moderating the temperature of the Station's discharge to Oyster Creek and Barnegat Bay. The dilution water system intake structure is divided into three sections or bays where each section contains two cells. Although the permittee contends that the design of these pumps allow for some entrainment survivability, these pumps are not currently equipped with any entrainment controls. Flow varies according to the number of dilution pumps in operation but averages approximately 708 MGD.

The dilution water system intake is located on the west bank of the Intake Canal, across from the cooling water intake. Three low speed (180 revolutions per minute) axial flow pumps with 7 foot impellers with a design capacity of 260,000 gallons per minute (gpm) each provide water for the dilution water system. Normally two dilution pumps are used during "winter" and "summer" water conditions (as defined in a 1978 stipulation). The dilution water system intake has two trash racks for each of these three pumps.

Fresh water is drawn from the Station fire protection water system and is used for dilution pump lube oil cooling and pump seal water. This water is discharged through DSN 005A at a rate of 0 to 100 gpm, depending upon the number of dilution pumps in operation. A small, intermittent component of the fire protection water system flow is the discharge from the emergency diesel fire pump heat exchangers. The two emergency diesel fire pumps are required for emergency purposes, such as fire protection and emergency core cooling. Their operation is limited to 163 hours per year. When the pumps are operated, cooling water from the heat exchangers is discharged through 1.5 inch pipes at a rate of approximately 35 gpm. The increase in temperature is about 11 degrees Fahrenheit and no chemicals are added to the discharge. Most of the cooling water flow is drawn into the flow for the fire protection water system and does not flow back to Oyster Creek. Additionally, on an infrequent basis, small quantities of stormwater that may accumulate in a cable vault in the Dilution Pump intake structure are introduced into the dilution water flow.

7 Description of Discharges:

Discharges to the Intake Canal

Approximately 3.53 MGD of wastewater and other washwater is discharged by the Station to the intake canal via outfalls DSN 002A, DSN 007A and DSN 009A. **DSN 002A** consists of approximately 3.5 MGD of chlorinated non-contact cooling water from the Station's radioactive waste treatment system's heat exchanger and augmented off-gas heat exchanger. **DSN 007A** consists of approximately 30 GPD of dilution pump seal wastewater, which is treated by an oil/water separator prior to discharge. As described previously, **DSN 009A** is the discharge from the fish sampling pool and is operated on an as needed basis.

Discharges to the Discharge Canal

Approximately 1326 MGD of non-contact cooling water and other waters are discharged to the discharge canal. **DSN 001A** typically consists of 592 MGD of once through non-contact cooling water from the previously described circulating water and service water system. This water is used to cool the main condenser prior to discharge through the discharge canal. This non-contact cooling water is chlorinated to protect the heat exchanger tubes from marine and organic fouling. The main condenser consists of six sections among which the flow is equally divided. The chlorination injection system (sodium hypochlorite) is designed so that each condenser section is separately chlorinated. Only one section is chlorinated at a time so that the sections are consecutively chlorinated for 20 minutes each during the daily cycle for a maximum of two hours per day of chlorination. The water then passes through the steam condensers and is discharged through DSN 001A.

The Station discharges other wastewater via outfalls DSN 004A, DSN 005A, and DSN 008A to the discharge canal. **DSN 004A** consists of approximately 60,000 GPD of low volume wastewater that includes stormwater, non-contact cooling water from reactor building and emergency service water heat exchangers, laboratory and sampling streams, and various floor drains which emanate from sumps. As described previously, **DSN 005A** is the discharge of approximately 732 MGD (on average) of dilution pump water and **DSN 008A** is the discharge of approximately 2.4 MGD of intake screen washwater.

Stormwater Discharges

The existing permit contains requirements for outfalls DSN 012A, DSN 013A, and DSN 014A which discharge stormwater from sedimentation basins to the South Branch of the Forked River. These discharges are located on a portion of the site that was retained by First Energy when the Station was sold to AmerGen Energy Company, LLC (the permittee at that time) after the existing permit became effective. These outfalls are currently regulated under a general stormwater permit issued to First Energy and therefore are being removed from this permit action.

8 Determinations under Sections 316(a) and (b) of the Clean Water Act:

A. Section 316(b) Determination

1. Regulatory Background - Clean Water Act Section 316(b)

Section 316(b) "require[s] that the location, design, construction, and capacity of cooling water intake structures reflect the best technology available for minimizing adverse environmental impact." The majority of environmental impacts associated with intake structures are caused by water withdrawals that ultimately result in aquatic organism losses. In that regard, cooling water intakes can have two types of effects. The first effect, referred to as *impingement*, occurs when organisms are caught on the intake screens or associated trash racks. The second effect, referred to as *entrainment*, occurs when organisms pass through the facility's intake screens and the cooling system itself.

Impingement takes place when organisms are trapped against intake screens by the force of the water passing through the cooling water intake structure. Impingement can result in starvation and exhaustion (organisms are trapped against an intake screen or other barrier at the entrance to the cooling water intake structure), asphyxiation (organisms are pressed against an intake screen or other barrier at the entrance to the cooling water intake structure by velocity forces that prevent proper gill movement, or organisms are removed from the water for prolonged periods of time), and descaling (fish lose scales when removed from an intake screen by a wash system) as well as other physical harms.

Entrainment occurs when organisms are drawn through the cooling water intake structure into the cooling system. Organisms that become entrained are normally relatively small benthic, planktonic, and nektonic organisms, including early life stages of fish and shellfish. Many of these small organisms serve as prey for larger organisms that are found higher on the food chain. As entrained organisms pass through a plant's cooling system they are subject to mechanical, thermal, and/or toxic stress. Sources of such stress include physical impacts in the pumps and condenser tubing, pressure changes caused by diversion of the cooling water into the plant or by the hydraulic effects of the condensers, shear stress, thermal shock in the condenser and discharge canal, and chemical toxemia induced by antifouling agents such as chlorine.

As noted previously, EPA issued final regulations effective September 7, 2004 which served to guide implementation of the 316(b) statute. Phase II existing facilities, as defined by EPA in their Phase II regulations, are facilities that commenced construction before January 17, 2002 that have design flows over 50 MGD. This facility is eligible under Phase II of the regulations. The term "cooling water intake structure" is defined as the total physical structure and any associated constructed waterways used to withdraw cooling water from waters of the U.S. The cooling water intake structure extends from the point at which water is withdrawn from the surface water source up to, and including, the intake pumps. As noted in other parts of this document, the Phase II regulations have since been suspended.

On April 1, 2009, the Supreme Court issued a decision regarding the validity of cost/benefit determinations for Phase II facilities. The Supreme Court determined that the EPA permissibly relied on cost-benefit analysis in providing for cost-benefit variances from those standards as part of the Phase II regulations. This decision will have a direct bearing on any redrafted Phase II regulations prepared by EPA. In the meantime, states are required to issue Section 316(b) determinations in accordance with best professional judgment.

2. Historical Section 316(b) Technical Information

a. Contractor Review

In 1987, the Department engaged Versar, Inc. as an independent contractor to assist in reviewing the permittee's Section 316(a) and (b) Demonstration. The Section 316 Demonstration was originally submitted in 1974 with supplements in 1978 and July 1986. The 1986 supplement included an analysis of entrainment and impingement studies conducted from November 1984 through December 1985.

Versar was tasked to review and evaluate the Section 316 documents, to evaluate the impact of the facility on the aquatic environment, and to recommend the limitations which should be placed on the intakes and discharges so as to meet the intent of Section 316 and other applicable State and Federal requirements. The Department released Versar's 1988 Advanced Final Report for comment in 1988. In reviewing the permittee's 1988 comments, the Department learned that Versar had not been aware of critical data collected by the permittee at that time, namely GPU Nuclear. Upon review of this additional information, Versar submitted a report entitled "Technical Review and Evaluation of Thermal Effects Studies and Cooling Water Intake Structure Demonstration of Impact for the Oyster Creek Nuclear Generating Station, Revised Final Report", dated May 1989 (hereafter "1989 Versar Report"). A summary of this data and Versar's findings are noted below.

b. Summary of Historic Impingement/Entrainment Losses in a Population Context

While dated, historical impingement and entrainment data as contained in the above referenced documents is still appropriate for consideration as it gives a measure of the impingement and entrainment impacts as well as the Representative Important Species (RIS) used to evaluate the effects. The historical data should also be considered because there have been no substantial changes to the operation of the plant. The Section 316 demonstration relied on the following Representative Important Species (RIS) to assess intake impacts at the Station:

Winter Flounder	Bay Anchovy
Sand Shrimp	Hard Clam
Blue Crab	Eelgrass
Opossum Shrimp	Atlantic Ridley turtle
Teredo spp.	Bankia gouldi

The RIS impact assessment approach is based on the concept that it is not feasible or cost effective to measure power plant effects on all species inhabiting aquatic environments. In most aquatic ecosystems it is, however, generally possible to identify biota which because of their abundance, distribution, ecological, or economic importance are essential to and/or representative of the maintenance of balanced, indigenous populations of shellfish, fish, and wildlife. These RIS species are used to focus impact assessment efforts, making the assumption that if populations of these surrogate species are protected, then other populations, and the ecosystem as a whole, will also be protected. Because many RIS are near the top of the estuarine food webs or are key links in food webs, changes in the abundance or distribution are indicators of system wide alterations. In order for RIS to be reliable indicators of impact, they should include biota that are sensitive to power plant impacts as well as biota that are representative of all major trophic levels.

As noted in the 1989 Versar Report, the following three models were used to evaluate impingement and entrainment losses in the context of population size or biological productivity to understand the potential consequences of losses to Barnegat Bay RIS populations. The models used were:

1. Equivalent Adult Model (EAM) which examines changes in survivorship to sexual maturity or recruitment into a fishery.
2. Production Foregone Model (PFM) which examines fractional reductions in annual net population (weight) production.
3. Spawning/Nursery Area of Consequence Model (SNAC) which estimates fractional (or percent) reduction in RIS populations which are directly attributable to the Oyster Creek facility.

The EAM evaluated the number of RIS which would have survived to adulthood if impingement and entrainment losses had not occurred. The EAM was used since many of the aquatic organisms lost are at early life stages or are juveniles. Results of the EAM in the 1989 Versar Report are presented below*:*

Species	Estimated Adult Loss (Thousands per year)
Bay Anchovy	137,000
Hard Clam	59
Blue Crab	10.4
Winter Flounder	56.4
Opossum Shrimp	1,720,000
Sand Shrimp	164,000

Versar noted that the projected equivalent adult losses for bay anchovy, opossum shrimp, and sand shrimp are high but the production foregone model provided a better means to evaluate the significance of these losses to ecological functions in the Barnegat Bay. Versar also noted that these calculated equivalent adult losses are highly variable due to large uncertainties associated with entrainment losses.

The PFM estimated percentage declines in annual net production due to entrainment and impingement for those RIS which serve a forage function. Results of Versar's PFM are presented below:

RIS species	**Percent loss**	**Forage Production Lost**
Bay Anchovy	12.4%	354,000 pounds
Opossum Shrimp	8.7 %	67,000 pounds
RIS species	**Percent loss**	**Forage Production Lost**
Sand Shrimp	16.5%	1,650,000 pounds

The SNAC model estimated percentage declines in populations due to entrainment and impingement at the Oyster Creek Generating Station. Results of Versar's SNAC model in the 1989 Versar Report are presented below:

RIS species	**Percent of Population Decline**
Winter Flounder	2.1%
Bay Anchovy	3.2%
Hard Clam	1.5%
Blue Crab	0.4%
Sand Shrimp	16.6%
Opossum Shrimp	2.0%

As summarized above, the 1989 Versar Report provided information regarding losses to RIS and also provided loss information in the context of populations. Loss data is helpful in assessing what technologies may be available to reduce losses. However, the Department maintains that it is unnecessary to have to prove that an impact to a population must be demonstrated in order to trigger Section 316(b). While the Section 316(b) regulations are now suspended, this rationale is consistent with the Phase II regulations where adverse environmental impact was not defined. Available data shows that impingement and entrainment losses are documented and must be minimized consistent with the goal of the Section 316(b) statute.

c. Alternative Intake Protection Technologies from Historical Studies

As described in the 1994 NJPDES permit and summarized in the July 19, 2005 draft NJPDES permit, the Department evaluated available information on various technologies, including their technical feasibility, biological effectiveness, and associated costs in reviewing Versar's 1989 findings. The alternative technologies identified by the Department's contractor, Versar, to have the greatest potential for application to reduce impingement and entrainment at the Station were:

1. Replacing the existing 3/8" mesh traveling screens with fine mesh screen panels.
2. Traveling screens with conventional 3/8" mesh or fine mesh retrofitted in front of the dilution pumps and/or fine-mesh centerflow screens retrofitted in front of the dilution pump.
3. Replacement of intakes with fine-mesh wedgewire screens.
4. Closed cycle cooling (cooling towers).
5. Optimization of dilution pump operations.

As discussed in the 1989 Versar Report, the first two alternatives would increase impingement losses while reducing entrainment. The net ecological benefit of these retrofits would depend on the degree to which the reduction in entrainment losses exceeds the gain in impingement losses. Versar looked primarily at the first three physical barrier alternatives as they could be applied without complete replacement of the intake structure so as to avoid the high cost of an entirely new intake structure. Versar was concerned with limited data on the engineering feasibility of some of these alternatives and was not able to recommend that the cost of these technologies could be appropriate in view of the limited benefits of these technologies. In sum, Versar found that none of the screening options would reduce losses at the facility by even 50%.

Versar dismissed the wedgewire screen alternative because its costs far exceeded its benefits. Biofouling and detrital clogging would also be an operational concern in the application of wedgewire screens at the Station.

Versar also considered the alternative of recirculating cooling towers which are a demonstrated, effective technology for reducing entrainment and impingement, as well as reducing thermal discharge impacts. Cooling towers are the most expensive alternative but would provide the highest degree of protection of any single currently available technology as a proportionate reduction in impact would result from the withdrawal (flow) reduction. Cooling towers were expected to be more costly then the physical barrier alternatives and Versar did not recommend cooling towers to be designated the best technology available due to concerns about economic cost. Additionally, Versar concluded that there are ecological costs associated with cooling towers. Natural draft cooling towers are typically several hundred feet high and add considerable visual impact. Mechanical draft towers may be lesser in size thereby imposing less visual impact but would impose noise from tower fans as well as the potential for local salt drift, fogging and icing.

Versar also looked into optimization of dilution pump operations as an alternative for reducing total plant impingement-entrainment losses. Optimization studies would compare the benefits of an altered thermal mortality rate (from the cooling provided by dilution pump flows) with the environmental cost of exposure by entrainment of a greater number of organisms due to dilution pump flows. Versar found that the Section 316 Demonstration did not contain sufficient information to optimize dilution pump operations. Versar found that November through February (potential cold shock) and July and August (potential heat shock) are periods of high risk of increasing total mortality associated with the facility.

3. Section 316(b) Determination in Previous Permits

a. 1994 NJPDES Permit

Based on the above noted review of available intake protection technologies and available Section 316(b) guidance at that time, the Department determined in its 1994 NJPDES permit that the existing cooling water intake structure, in conjunction with the pursuit of Dilution Pump Optimization Studies, was designated Best Technology Available under Section 316(b).

b. 2005 NJPDES Draft Permit (never finalized)

The July 19, 2005 draft NJPDES permit was issued based upon the Section 316(b) regulations for Phase II facilities which were in effect at that time. These regulations have since been repealed. In the 2005 draft NJPDES permit, the Department expressed concern about both impingement and entrainment losses, but particular concern about entrainment losses. Species of particular concern include hard clam, blue crab, bay anchovy and sand shrimp. Nonetheless, the Department stated that it understood that there are limited design and construction technologies available to reduce entrainment. Specifically, the Department recognized that closed cycle cooling is the only cooling water intake structure technology available to the facility to reduce entrainment. Closed cycle cooling serves to significantly limit the amount of intake flow and thereby reduces both impingement and entrainment. Restoration could be used as a means to offset entrainment where there would also be benefits to larger life stages that are typically susceptible to impingement.

Based upon a review of site-specific factors at the facility, past Department policies and practices in implementing Section 316(b), and given the fact that the facility withdraws water from a tidal river or estuary, the Department determined that two compliance alternatives were available as specified in the then effective Section 316(b) regulations. As specified in the July 19, 2005 draft NJPDES permit, these alternatives are as follows:

1) Alternative 1: Reduce intake capacity to a level commensurate with the use of a closed-cycle, recirculating cooling system. This is the Department's preferred alternative. If Alternative 1 is chosen, the permittee would not be required to submit the Comprehensive Demonstration Study (CDS) as referenced in the Phase II Section 316(b) regulations.

2) **Alternative 2:** If the permittee demonstrates that Alternative 1 is unavailable to this facility, the Department would allow the permittee to select, install, properly operate and maintain a combination of design and construction technologies, operational measures, and/or restoration measures that will, in combination with any existing design and construction technologies, operational measures, and/or restoration measures, meet the following national performance standards:

Impingement Mortality Performance Standard – Reduce impingement mortality for all life stages of fish and shellfish by 80 to 95 percent from the calculation baseline[1].

Entrainment Performance Standard – Reduce entrainment for all life stages of fish and shellfish by 60 to 90 percent from the calculation baseline[1].

In addition to compliance with the national performance standards, the permittee shall initiate a wetlands restoration and enhancement program of a minimum of 350 acres within the Barnegat Bay estuary to offset any residual impingement and entrainment losses at the facility to realize benefits as soon as possible.

It is the Department's practice and policy to set forth a Best Technology Available (BTA) determination in its NJPDES permits with respect to Section 316(b). Consistent with past practice, the Department set forth a BTA determination in the July 19, 2005 draft NJPDES permit based on the site-specific factors at Oyster Creek and available information. Therefore, based on the above findings, the Department determined that BTA for this facility is as follows:

- **Option 1** - the implementation of closed-cycle cooling is best technology available.
- **Option 2** - BTA consists of the permittee's existing once-through cooling system coupled with a limit on the intake velocity, pursuit of the studies required under the Section 316(b) Phase II Regulations, and the initial restoration requirement.

[1] The calculation baseline means an estimate of impingement mortality and entrainment that would occur on-site assuming a shoreline cooling water intake structure with an intake capacity commensurate with a once-through cooling water system and no impingement and/or entrainment controls.

In addition to the above, the Department reiterated the specific requirements of the CDS within the permit, as specified in the then effective Section 316(b) Phase II regulations, along with set deadlines.

4. Summary of Recent Impingement and Entrainment Data

a. Proposal for Information Collection (PIC)

In direct response to the now suspended Section 316(b) Phase II regulations, OCGS submitted a PIC which is a component of the CDS as outlined in the regulations. The PIC is dated June 29, 2005 and includes the information contained in the Rule at 40 CFR 125.95(b)(1). Specifically, the PIC is the proposed work plan for collecting information to be used to support the CDS and specifically outlined additional analyses, including new field studies, to be performed.

The PIC describes the sampling programs for the new field studies as follows:

> The sampling programs at the circulating water intake structure address impingement, impingement mortality, entrainment and entrainment survival. At the dilution/bypass water intake structure, studies will examine the magnitude of entrainment of impingeable-size organisms and their ability to survive passage through the dilution/bypass pumps and entrainment survival. Additionally, OCGS will conduct an optimization study of the dilution/bypass pumps to assess the feasibility of reducing the operation time of these pumps.

Collection efficiency tests and delayed mortality studies were also proposed for the traveling screens at the circulating water intake structure.

With respect to dilution pump survivability, the objective of this program was to (1) produce accurate density estimates of impingeable-size fish and shellfish passed through the dilution/bypass pumps, and (2) to produce accurate estimates of initial survival. The seven target species for this program are: Atlantic silverside, bay anchovy, northern pipefish, winter flounder, sand shrimp, grass shrimp, and blue crab. Weekly sample collection was proposed including nighttime sampling which is consistent with sampling in the most recent historical studies.

The Department conducted a comprehensive review of the PIC as detailed in a letter dated September 9, 2005. In this response letter on the PIC, the Department included a comparison of the historical and proposed impingement sampling programs at the circulating water intake as follows:

Species Targeted in PIC – Impingement	**Historical Impingement Sampling**	**>70% of the Finfish Catch through the Circulating Water Intake during the September 1975 through October 1985 period**	**96% of the Total Number of Organisms Passing through the Dilution/Bypass pumps During the December 1984 to December 1985 Study Period**
Sand shrimp	Sand shrimp		Sand Shrimp (42%)
Blue Crab	Blue crab		Blue Crab (4%)
Atlantic Silverside	Atlantic Silverside	Atlantic Silverside	Atlantic Silverside (3%)
Northern Pipefish	Northern Pipefish	Northern Pipefish	
Winter Flounder	Winter Flounder	Winter Flounder	
Bay Anchovy	Bay Anchovy	Bay Anchovy	Bay Anchovy (30%)
	Weakfish	Weakfish	
	Blueback Herring	Blueback Herring	
	Atlantic Menhaden	Atlantic Menhaden	
	Bluefish		
	Summer Flounder		
	Northern Puffer	Northern Puffer	
	Northern Kingfish		
Grass Shrimp			Grass Shrimp (17%)

Based on the above comparison, the Department provided approval of the species selected for impingement sampling provided that weakfish, blueback herring, atlantic menhaden and summer flounder were added making a total of eleven target species. The permittee agreed to the inclusion of these additional target species in a letter dated September 21, 2005. The permittee formally responded to the Department's comments on the PIC in a letter dated November 7, 2005.

Also, in its September 9, 2005 letter, the Department found the entrainment sampling design acceptable so long as the details of such were consistent with the sampling design for the 1975 through 1981 data.

Due in part to fulfill its requirements under the Coastal Zone Management Process, as described below, the permittee decided to extend impingement and entrainment sampling to a second year (i.e. Year 2).

b. Summary of Results of "Oyster Creek Generating Station Fishery Data Report"

To provide the impingement and entrainment results that were collected as outlined in the PIC and to support the permittee's application under the Coastal Zone Management Act, AmerGen (the permittee at that time) submitted the OCGS Fishery Data Report dated November 20, 2007 (hereafter "2007 Fishery Report"). This report transmits all Year 1 and Year 2 data. This report also compares Year 1 and Year 2 impingement and entrainment data with the results of historical impingement and entrainment studies conducted at OCGS in the 1970s and 1980s as well as with the conclusions of the 1989 Versar Report. The purpose of these comparisons is to (1) determine if major differences in species composition and abundance that cannot be attributed to normal fluctuations in biological systems are apparent between the historical data and the recent data, and (2) evaluate whether recently observed data are consistent with trends as documented in Versar 1989.

The results were then used to reach conclusions about impacts of OCGS on the natural functioning of marine fish in Barnegat Bay, as required by the CZMA. Application under the CZMA was made since the permittee applied for an extension to a federal agency for a relicense of an existing facility within New Jersey's Coastal Zone. In this case, the permittee requested that the United States Nuclear Regulatory Commission (NRC) relicense the facility for a period of 20 years, or until 2029. This license renewal was granted on April 1, 2009.

- **Impingement Sampling**

<u>Recent Impingement Sampling – 2007 Fishery Report Results</u>

Impingement sampling at the Circulating Water Intake was performed for one 24 hour sampling event per week. Each sampling event was subdivided into 12-hour predominantly day/night periods to allow for a determination of day/night differences. At least 12 collections were made during each 24-hour event, with a ratio of approximately twice as many collections made during the night period since historical sampling data suggest that greater numbers of organisms are impinged after sunset.

A summary of impingement data for those species that accounted for more than one percent of the total number in either year is included below. These data were collected between September 2005 through September 2007 with the exception of those weeks in which the plant was not operating or there was construction interference with the sampling pool. These numbers are scaled up for full flow assuming all four circulating pumps are operating. The estimated total number is a sum of the individual collections where data is as follows:

Impingement						
	Year One			Year Two		
Taxon	**Estimated Total Number**	**Percent**	**Rank**	**Estimated Total Number**	**Percent**	**Rank**
Grass Shrimp	802,323	28.0	1	570,887	19.5	3
Sand Shrimp	764,000	26.7	2	1,020,499	34.9	1
Blue Crab	714,790	24.9	3	738,777	25.3	2
Atlantic Croaker	138,847	4.8	4	11,438	0.4	8
Unmeasurable	108,384	3.8	5	0	--	
Atlantic Silverside	76,107	2.7	6	0	--	
Atlantic Menhaden	43,732	1.5	7	242,585	8.3	4
Bay Anchovy	37,081	1.3	8	33,330	1.1	7
Weakfish	3.841	0.1	9	59,949	2.1	6
Atherinidae	0	--		123,165	4.2	5

Collection efficiency tests were performed as part of the Year One and Year Two data. However, the data presented in the 2007 Fishery Report were not adjusted for collection efficiency due to time limitations. No effort was made in the analysis of Year One and Year Two data to adjust for organisms catchability or gear efficiency since the historical analysis did not make such adjustments. Other differences between historic and current collection methods include changes in sample location (due to security changes at OCGS) and improvements in sampling gear.

Impingement – AmerGen's Comparison of Year One and Year Two Data

In the AmerGen 2007 Fishery Report, the permittee concludes that the OCGS impingement data show a high degree of consistency between Year One and Year Two data, both in terms of actual numbers impinged and species/groups most often impinged. With similar pumping periods during the sample years, it is reasonable to compare total numbers of impinged organisms. In Year One (September 2005 through September 2006), 2,866,000 aquatic organisms were estimated impinged; in Year Two (October 2006 through September 2007) 2,922,000 aquatic organisms were estimated impinged. In both years, impingement collections were dominated by three invertebrate species: grass shrimp, sand shrimp and blue crab.

Together these three invertebrate species comprise approximately 80 percent of all organisms impinged in Year One and 80 percent of all organisms impinged in Year Two. This is generally consistent with historic data – invertebrates make up the bulk of impinged organisms. Given the abundance of young shrimp and blue crabs at certain times of the year, it is not surprising to see their relatively high rates of impingement. Moreover, both shrimp and crabs, regardless of age, are generally more vulnerable to impingement than finfish. Both shrimp species are highly vulnerable to impingement as juveniles and somewhat less vulnerable as adults. With regard to finfish, impingement collections in both years were dominated by small, schooling species, most notably Atlantic menhaden, Atherinidae (several species of silverside), and bay anchovy.

Impingement – AmerGen's Comparison of Recent (Year One and Year Two) Data with Historic Data

Historical impingement studies were conducted annually at OCGS from September 1975 through December 1985. Both similarities and differences exist among the various years of these studies. Similarities include the location of impingement sampling, the sampling gear used, and the techniques used for processing impingement samples.

Major differences among years include the type of traveling screens, the mode of screen wash operation, the length of impingement sampling time, the frequency for sampling, and the time of day at which samples were collected. Until 1980, OCGS utilized conventional vertical traveling screens then these conventional screens were replaced with Ristroph screens. Both types of screens have a 9.5 mm mesh screen. The screen rotation and wash operation varied from 1975 to 1985 depending upon the magnitude of debris and organisms impinged on the screens. The frequency of sampling and the time of day in which samples were taken changed appreciably over the years. The sampling period encompassed all times of day, and except for the period September 1977 to March 1979, samples were taken both during the day and night. None of the sampling data was corrected for collection efficiency as noted in the 1989 Versar Report.

In its 2007 Fishery Report, the permittee compared the Year One and Year Two recent data with the historical data. Only those historic data with comparable sampling methods and sufficient information on sample volume/ sample time to yield comparable estimates of entrained/impinged organisms were compared for this report. Specifically, impingement data sets from 1976 to 1979 and 1985 were compared to the Year One and Year Two data sets.

To ensure a clear understanding of this comparison, the Department has included a summary of historical data from these years, as represented in the 1986 EA report, which is as follows:

Annual Impingement of Selected Species by Study Year Adjusted for Differences in Sampling Effort (EA 1986)

Species	Sep 1975 – Aug 1976	Sep 1976 – Aug 1977	Sep 1977 – Aug 1978	Sep 1978 – Aug 1979	Sep 1979 – Aug 1980	Nov 1984 – Oct 1985
Blueback herring	28,120	27,496	42,279	103,498	35,034	52,190
Atlantic Menhaden	17,788	94,960	54,460	9,388	3,427	4,654
Bay Anchovy	1,811,550	147,202	155,858	146,531	85,611	195,867
Atlantic Silverside	61,272	35,051	86,687	196,164	153,912	276,943
Northern Pipefish	36,066	11,220	21,881	53,700	29,822	107,875
Bluefish	14,086	3,935	3,661	9,658	2,392	4,937
Weakfish	11,790	27,297	20,839	5,272	46,186	11,083
Northern Kingfish	16	105	23	20	342	0
Summer Flounder	4,266	2,380	1,881	1,308	6,440	3,437
Winter Flounder	8,908	18,618	27,600	148,442	16,122	18,205
Northern Puffer	3,313	1,516	50,414	272	420	981
Sand Shrimp	3,342,143	600,278	3,793,355	4,818,977	3,365,975	17,090,788
Blue Crab	5,627,253	230,691	1,167,289	310,873	77,727	1,333,894

1 Night samples only were collected from the period of September 1977 through May 1979.

While the Department recognizes that there are limitations to these data sets, to enable an overall comparison of historical data against average Year One and Year Two data , the Department has prepared the following summary. Please note that the Department has only included recent data for those species that comprise more than one percent of the recent impingement losses:

Species	Average Annual Impingement Over Years 1975 – 1980; 1984-1985	Average Annual Impingement Over Years 2005-2006; 2006-2007	Percent Change (rounded)
Sand Shrimp	5501919	892250	- 84
Blue Crab	1491288	726784	- 51
Grass Shrimp	---	686605	--
Bay Anchovy	423770	35206	- 92
Atlantic Silverside	134930	38054	- 72
Bluefish	64445	2212	- 97
Blueback herring	48103	6645	-86
Northern Pipefish	43427	28800	-34
Winter Flounder	39649	8901	-78
Atlantic Menhaden	30780	1432	-95
Weakfish	20411	31895	+56
Northern Puffer	9486	4294	-55
Summer Flounder	3285	2686	-18
Northern Kingfish	84	435	+ 417

As noted by the permittee, when recent data (i.e. Year One and Year Two) is compared with historic data, the relative impingement rank is a more appropriate comparison because historic data do not account for times of pump operation or total volume of water. Of the 10 most commonly impinged species in Year 2, seven were among the top ten in Year One; six appeared in the top 10 in 1978; five in the top ten in 1976 and 1985 (not the same five species each year); and four in 1977. Three species have been among the ten most commonly collected species every year. As with any fish community, the numbers of individuals collected at OCGS of a given species vary widely between years. However, five of the ten most common species in Year Two were also among the ten most common species in 1976, the earliest collection year.

Grass shrimp, which is one of the top three species impinged in both Year One and Year Two, was not included in the historic data set as it was not selected as a historic RIS species.

- **Entrainment Sampling**

Recent Entrainment Sampling – 2007 Fishery Report Results

Entrainment sampling was performed at the Circulating Water Intake once per week. Samples were obtained every six hours during each weekly 24-hour sampling event during two separate 12-hour periods which approximated day and night. Entrainment sampling coincided with weekly impingement sampling. The samples were collected immediately in front of the intake screens. **Note that sampling was not conducted at the dilution/bypass water intake to quantify entrainment at this location.**

A summary of entrainment data for those species that accounted for more than one percent of the total number in either year is included below. These data were collected from September 28, 2005 to September 29, 2006 for Year 1 (53 weeks) and from October 3, 2006 to October 24, 2007 for Year 2 (49 weeks). The estimated total number (x 10^6) of each fish species entrained at OCGS are as follows:

Circulating Water Intake – Entrainment				
	Year One		Year Two	
Taxon	**Estimated Total Number (x 10^6)**	**Percent**	**Estimated Total Number (x 10^6)**	**Percent**
Bay Anchovy	819.47	59.76	249.41	36.39
Gobiidae	152.14	11.10	80.05	11.68
Cunner	112.84	8.23	4.44	0.65
Atlantic Croaker	84.30	6.15	51.97	7.58
Windowpane	80.82	5.90	50.83	7.42
Northern Pipefish	19.48	1.42	13.28	1.94
Tautog	18.32	1.34	0.81	0.12
Scianediae	14.89	1.10	0	--
Four-beard Rockling	13.61	1.00	1.66	0.24
Winter Flounder	11.39	0.83	118.82	17.34
Feather Blenny	10.10	0.73	7.30	1.60
Atlantic Menhaden	4.65	0.34	25.14	3.37
Weakfish	3.60	0.26	31.41	4.58
Prinotus sp.	1.77	0.13	7.90	1.12
Hogchoker	1.64	0.12	10.95	1.60

The estimates assume four (460,000 gallons per minute) pumps running continuously. In other words, these data are scaled up for full flow but do not include entrainment losses via the dilution/bypass water and therefore **do not represent all entrainment losses at OCGS**. The dilution pumps account for more than half of the total intake flow at the facility. In addition, this data was not corrected for gear efficiency or organism catchability, which is consistent with the historical sampling analysis.

Entrainment – AmerGen's Comparison of Year One and Year Two Data

The estimated total number of ichthyoplankton (all species combined) entrained during Year 2 (685 million) was almost exactly half of the number entrained during Year 1 (1371 million). The difference between years was due primarily to entrained bay anchovy and cunner. An estimated 819 million bay anchovy were entrained in Year One compared to 249 million in Year Two. The number of entrained cunner fell from approximately 113 million to approximately 4 million.

Other species showing substantial inter-annual variability include Atlantic menhaden (4.65 million in Year One and 25.14 million in Year Two), hogchoker (1.64 million and 10.95 million), and tautog (18.32 million and 0.81 million). The family Sciaenidae went from 14.89 million (Year One) to zero (Year Two), but this change resulted from an increased resolution in classifying Sciaenids (e.g., spotted seatrout and weakfish) to the species level.

With respect to recreationally important species, higher numbers of weakfish and winter flounder were entrained in Year Two. A total of 3.6 million weakfish were entrained in Year One, while 31.41 million weakfish were entrained in Year Two. Similarly, the number of winter flounder entrained increased from 11.39 million in Year One to 118.82 million in Year Two. Winter flounder was the second most common species entrained in Year Two; only bay anchovies were entrained more often.

Because OCGS operating procedures were the same during Year One and Year Two, it is reasonable to conclude that the higher entrainment rates for some species in Year Two are not the result of OCGS operations. Many factors, such as changes in weather or water quality in the Bay, a change in the distribution of spawning females or a "pulse" of larvae drifting into the intake area could have affected species-specific entrainment rates. The entrainment data for Atlantic Menhaden (5 times higher in Year Two), weakfish (9 times higher in Year Two), winter flounder (10 times higher in Year Two), and Clupeidae (165 times higher in Year Two) are likely indicative of more favorable

environmental conditions for these species during 2006 – 2007 than during 2005 – 2006. On the other hand, fewer bay anchovy and cunner were entrained in Year Two, suggesting less favorable conditions for these species.

Entrainment - Comparison of Recent (Year One and Year Two) Data with Historic Data

The report compared the two most recent years of entrainment data to historic data. Only those historic data with comparable sampling methods and sufficient information on sample volume/ sample time to yield comparable estimates of entrained organisms were retained for this report. Specifically, entrainment data sets from 1976 to 1981 were compared to the recent data sets (i.e. Year One and Year Two).

To ensure a clear understanding of this comparison, the Department has included a summary of the historical data from these years, as represented in the 1986 EA report, which is as follows:

Estimated Number (x 10^6 of Selected Ichthyoplankton Passed through the Condenser and Dilution/Bypass Pumps at Oyster Creek from September 1975 through August 1981 (EA 1986)

Species	**Lifestage**	**1975-1976**		**1976-1977**		**1977-1978**	
		Condenser	Dilution	Condenser	Dilution	Condenser	Dilution
Silverside	Larvae	15.81	12.15	5.72	3.68	38.28	31.27
Bay anchovy	Larvae	1,152.09	1,158.82	457.41	297.71	497.35	533.39
Bay anchovy	Eggs	14,135.76	13,535.1	196.71	179.04	1,994.76	2,158.24
Winter flounder	Larvae	116.25	140.86	850.84	865.00	597.58	635.09
Sand lance	Larvae	27.57	36.92	109.77	109.35	142.28	151.69
Goby	Larvae	614.02	591.79	101.19	84.19	160.19	162.60
Naked goby	Juveniles	6.71	7.77	0.41	0.21	0.77	0.84
Blenny	Larvae	11.56	10.54	18.19	12.24	17.38	14.35
Northern pipefish	Juveniles	54.38	48.42	7.16	5.39	36.53	38.29
Species	**Lifestage**	**1978-1979**		**1979-1980**		**1980-1981**	
		Condenser	Dilution	Condenser	Dilution	Condenser	Dilution
Silverside	Larvae	66.50	55.52	5.14	1.71	105.56	98.94
Bay anchovy	Larvae	1,270.35	1,412.46	144.12	135.26	314.06	318.98
Bay anchovy	Eggs	3,029.43	3,241.40	475.44	322.38	3,818.59	3,914.51
Winter flounder	Larvae	1,077.08	808.80			126.05	128.36
Sand lance	Larvae	1,294.87	1,389.67			133.67	147.90
Goby	Larvae	85.64	97.21	188.49	144.17	187.79	202.61
Naked goby	Juveniles	0.27	0.31	1.82	1.81	1.93	2.91
Blenny	Larvae	4.01	4.40	8.43	6.26	4.12	4.37
Northern pipefish	Juveniles	30.69	33.29	17.37	14.48	42.06	39.03

Species	Lifestage	Average Annual	
		Condenser	Dilution
Silverside	Larvae	33.86	29.04
Bay anchovy	Larvae	547.91	554.80
Bay anchovy	Eggs	3,378.67	3,335.81
Winter flounder	Larvae	461.30	429.69
Sand lance	Larvae	284.69	305.92
Goby	Larvae	191.05	183.22
Naked goby	Juveniles	1.70	1.98
Blenny	Larvae	9.10	7.45
Northern pipefish	Juveniles	26.88	25.56

While the Department recognizes that there are limitations to these data sets, to enable an overall comparison of historical data (condenser side only) against average Year One and Year Two data , the Department has prepared the following summary. Please note that the Department has only included recent data for those species that comprise more than one percent of the recent entrainment losses:

	Average Annual Entrainment (x 10^6) Over Years – Condenser Side Only (broken down by life stage)	**Average Annual Entrainment (x 10^6) Over Years – Condenser Side Only (all life stages)**	**Percent Change (rounded)**
Species	**1975 – 1980; 1984-1985**	**2005-2006; 2006-2007**	
Bay Anchovy	547.91 – larvae 3,378.67 - eggs	534.44	- 86
Gobiidae	192.75	116.95	- 39
Cunner	--	58.64	--
Atlantic Croaker	--	68.135	--
Windowpane	--	65.825	--
Tautog	--	9.565	--
Scianediae	--	7.445	--
Four-beard Rockling	--	7.635	--
Atlantic Menhaden	--	14.895	--
Weakfish	--	17.505	--
Prinotus sp.	--	4.835	--
Hogchoker	--	6.295	--
Blue Crab	--	0.925	--
Atlantic Silverside	33.86 – larvae	2.88	- 91
Bluefish	--	--	
Blueback herring	--	--	
Northern Pipefish	26.88 – juveniles	16.38	- 39
Winter Flounder	461.30 – larvae	65.105	- 86
Northern Puffer		1.46	--
Summer Flounder	--	4.035	--
Northern Kingfish	--	0.125	--
Sand lance	284.69 - larvae	--	--
Blenny	9.10 - larvae	--	--

While the data for some of these species is not summarized above, the permittee compared recent and historic entrainment data for winter flounder, summer flounder, American eel, bay anchovy, weakfish, northern pipefish,

northern puffer, Atlantic silverside, Atlantic menhaden, tautog, hogchoker, croaker, American sand lance and Gobiidae. Entrainment data for most species shows a high degree of variability over the last 30 years. Atlantic menhaden and bay anchovy, in particular, show marked fluctuations in total entrainment and entrainment rates that presumably correspond with cycles of adult abundance. American eel shows a relatively constant (and precipitous) decline in entrainment rate over the 1976 – 2007 timeframe.

- **Survivability via Traveling Screens and Dilution Pumps**

Impingement – Ristroph Traveling Screens Survivability

As described in the 2007 Fishery Report, preliminary survival estimates (Proportion surviving) at OCGS for impinged RIS were determined from the condition indices (alive, dead, damaged, unmeasurable) recorded during collection. Data for each of the 11 RIS were pooled by week and survival estimated as:

$$\text{Survival} = \frac{\Sigma \text{ Number Alive}}{\Sigma \text{ (Number Dead + Number Damaged + Number Unmeasurable + Number Alive)}}$$

A survival score of one for a species during a sampling week means that all impinged individuals of that species were alive during that week's collection. A score of zero means that all individiuals were dead, damaged, or unmeasurable. The data for median and mean weekly survival for each of the RIS is as follows:

Median and Mean Initial Survival for Impinged RIS at OCGS, September 2005 through September 2007

Species	Median Survival	Mean Survival
Blueback Herring	1.00	0.72
Atlantic Menhaden	0.88	0.76
Bay Anchovy	0.23	0.31
Atlantic Silverside	1.00	0.92
Northern Pipefish	0.89	0.81
Weakfish	1.00	0.86
Summer Flounder	1.00	0.98
Winter Flounder	1.00	0.93
Sand Shrimp	0.95	0.90
Blue Crab	0.97	0.92
Grass Shrimp	0.96	0.93

As noted by the permittee, because the distribution is skewed toward high survival, median is a more appropriate measure of the central tendency than is the mean. Survival was generally high for most species – even for Atlantic silverside, a species sensitive to handling. Bay anchovy, another species known to exhibit high handling mortality, had the lowest survival in the study. Significantly, factors such as temperature and dissolved oxygen affect survival. Fish exposed to low dissolved oxygen and high temperatures will likely have significantly lower survival rates than those not exposed to such conditions. The analysis presented makes no adjustments for any such factors and presents a first-order examination of the data.

Entrainment - Dilution Pump Survivability

As described in the 2007 Fishery Report, dilution/bypass water sampling was performed most recently from December 1984 to December 1985 to measure the abundance of impingeable-sized fish and macroinvertebrates passing through the dilution/bypass pumps and to determine their initial condition after pump passage (EA 1986). Because there are no traveling screens at the dilution pumps, all species are entrained. Five species comprised 96% of the total number of organisms passing through the dilution/bypass pumps during the study period: sand shrimp (42% of the total), bay anchovy (30%), grass shrimp (17%), blue crab (4%), and Atlantic silverside (3%). EA (1986) reported the large majority of most species survived at least 30 minutes after collection. Species reported as having high survival (over 80%) included sand shrimp, blue crab, winter flounder, summer flounder, northern pipefish, and Atlantic silverside. Bay anchovy and blueback herring, known to be fragile species, had survival rates of 54% and 42%, respectively.

c. Department's Conclusions Regarding Impingement and Entrainment Data

It is the Department's long standing position that the best starting point to evaluate Section 316(b) of the Clean Water Act is to refer to impingement and entrainment data sets. This data reflects the direct effects of the Station. An assessment of these effects is integral to defining alternatives to minimizing these losses.

As noted at length above, the Department reviewed both historic and recent data in evaluating the impingement and entrainment effects of this facility. Based on this review, the Department concludes the following:

- There is a significant data gap encompassing over two decades for both impingement and entrainment. While recent data is useful and includes a count of all species impinged and entrained, it is difficult to draw any long range conclusions given these interruptions in data.

- The top three organisms impinged in both Year One and Year Two are grass shrimp, sand shrimp and blue crab. These three species comprise approximately 80% of the total species impinged. However, grass shrimp losses were not ennumerated in the historical data set; therefore, a comparison of historical and recent data can not be made.

- While there are only two years of recent data available, a comparison of the recent data to the historical data shows that the magnitude of the number of species impinged is dramatically less for most species. During this same time span plant operations have not substantially changed with respect to intake and effluent flows. This indicates that the decline in these species may be due to other causes which may include environmental impacts such as the overall health of Barnegat Bay.

- Recent entrainment data was insufficient at the dilution pumps to estimate annual passage at this location. As a result, data collected at the circulating water intake was used to estimate entrainment at the dilution pumps. Since the dilution pumps represent over half the intake flow of OCGS, they account for a significant portion of all Station entrainment losses.

- As noted by AmerGen in the 2007 Fishery Report, there were differences among years for the sampling gear used, techniques used for processing samples and even sampling locations. Again, this results in limitations to any comparative data analysis.

5. Available Intake Protection Technologies

a. Summary of "Determination of Cooling Tower Availability" Study

As noted previously, the Department issued a draft NJPDES permit on July 19, 2005 which required one of two alternatives. The Department specified that its preferred alternative was to reduce the intake capacity to a level

commensurate with the use of a closed-cycle, recirculating cooling system. If the permittee demonstrated that this alternative was unavailable to the facility, a second alternative could be pursued.

To address the issue of cooling tower availability, URS, on behalf of the permittee, submitted a report entitled "Determination of Cooling Tower Availability" (hereafter "report") dated March 4, 2006. In this report, various cooling tower alternatives for OCGS were evaluated. This evaluation relied upon previous cooling tower studies, drawings, and design data to develop a conceptual model for the construction and operation of cooling towers at OCGS. The conceptual model was updated to account for new technologies, site conditions, environmental impacts and regulatory requirements.

As noted in this report, URS chose a conceptual model of a recirculating closed-cycle cooling system that consists of two multi-cell mechanical draft hybrid cooling towers. A hybrid cooling system, which is a combination of wet evaporative cooling and dry cooling, was chosen because of the need for both consumptive water use reduction and plume abatement at this particular site. Additionally, the newly implemented security systems at OCGS can not be hindered by either an elevated plume or ground fog. A hybrid system can effectively eliminate a visible plume and ground fog at a lower cost and using less land area than air-cooled condensers. The reduction or elimination of a visible plume is, by necessity, the driving factor in the design of any cooling system at OCGS.

Since the primary purpose of installing a closed-cycle cooling system is to minimize intake and effluent flow volume, comparing the water balance as part of a closed-cycle cooling system to the current once-through cooling system is critical. An excerpt of the section from this report which outlines the water balance associated with the conceptual cooling tower design is as follows:

> OCGS' current open-cycle cooling system has virtually no consumptive water use. With the addition of a closed cooling system, the water flow through the intake/discharge system is reduced. However, there is consumptive use of water. As water is evaporated in the cooling tower, the amount of dissolved and suspended solids and minerals in the water become concentrated. If left uncontrolled, these chemicals will inhibit the operation and efficiency of the cooling tower with a buildup of slime and scale.
>
> To control scale and slime build-up, a certain percentage of water is discharged (as "blowdown") from the cooling tower basin into the discharge canal. Makeup water that is pumped to the cooling tower replenishes the water evaporated and the blowdown water. The ratio of total dissolved solids (TDS) in the recirculating water to the TDS in the makeup water is termed "the cycles of concentration". Cooling towers using makeup water with low dissolved impurities typically operate with a cycle of concentration factor between seven and ten. The industry standard for cooling towers using salt water or brackish water, such as at the OCGS site, is two or less cycles of concentration….
>
> Two 10,000 gpm pumps would be used to supply the makeup water to the cooling tower. The makeup water would be supplied from the intake canal and sent to a filter skid to remove silt and other foreign substances.
>
> During the summer, when the hybrid cooling tower would be operating in full evaporative cooling mode, the average makeup water supply would be approximately 14,000 gpm. Using a cycle of concentration factor of two means that half the makeup water flow (7000 gpm) is returned to the discharge system as blowdown with the other half evaporated. Thus, the average consumptive use of intake water during the summer is approximately 7000 gpm.
>
> In the event that there are no circulating water pumps available, such as during the maintenance of the pump, intake tunnel, or main condenser, at least one of the three dilution pumps must be available to meet OCGS' procedural requirements. The available pump will also allow water from the intake canal to be available to supply other emergency needs.
>
> In addition to having operational dilution pumps available, a single dilution pump must remain in operation to:
> - prevent the stagnation of water and accumulation of silt in the intake and discharge canals
> - provide thermal dilution of warm blowdown water (from the cooling tower circulating water outlet line) at the discharge canal
> - provide dilution of concentrated and trace elements in the blowdown water within the discharge canal
>
> One dilution pump (260,000 gpm), with a makeup design requirement of 20,000 gpm, would create a total flow through the intake canal of approximately 280,000 gpm. The flow through the discharge canal would be approximately 270,000 gpm, or about 30 percent of the flow of the current open-cycle system.

As noted in this report, it is estimated that the cost of a hybrid dry cooling tower is between 705 million dollars and 801 million dollars over a ten year period. Costs include (in descending order): 1) construction (material and labor); 2) lost energy revenue; 3) lost energy during outage; 4) risk factor; 5) added real estate taxes; 6) maintenance/chemicals; 7) added security personnel; 8) added operators; 9) lost capacity revenue; 10) lost capacity during outage; 11) environmental/public relations; 12) dislocation of master plan; 13) added insurance. It is therefore concluded in this report that based on the technical and engineering difficulty of retrofitting the existing OCGS station with this alternative as well as the associated costs, cooling towers are unavailable under Section 316(b) of the Clean Water Act.

The calculated average annual net power loss with a hybrid cooling tower system would be 32.5 MW. Specifically, OCGS currently operates at 641 MW whereas a closed-cycle cooling system would result in the plant operating at 609 MW.

b. Department's Conclusions Regarding Available Intake Protection Technologies Considering Impingement and Entrainment Data

The Department recognizes that Ristroph traveling screens at OCGS are a proven and effective technology to minimize impingement mortality. Constant screen rotation and low pressure washes serve to reduce impingement mortality by assisting organisms into the fish return system. The fish return system is designed in a manner that minimizes stresses as it was constructed with a gentle slope with various quiet pools to allow the fish to orient themselves in the current. The fish return system does not divert these organisms to the heated discharge but rather to the dilution pump discharge which is not heated nor chlorinated. In sum, the Department agrees that impingement mortality is minimized at the circulating water intake.

However, the circulating water intake represents less than half the total intake flow at the facility. There is no technology employed at the dilution pumps therefore all species are entrained. While the dilution pumps may be designed with some fish friendly attributes such as few and widely spaced impellers and low rotation speed, the intake flow is significant and therefore so are losses even with some survivability.

Beyond Ristroph traveling screens, there are limited intake protection technologies to effectively reduce impingement mortality. In addition, there are even fewer intake protection technologies to reduce entrainment. While the EPA Phase II Rule is suspended, its findings regarding intake protection technology are still valid. Specifically, on page 41601 of the Phase II regulation the following is stated:

> …EPA believes the record contains ample evidence to support the proposition that entrainment is related to flow…..while impingement is related to a combination of flow, intake velocity and fish swim speed….Larger withdrawals of water may result in commensurate greater levels of entrainment. Entrainment impacts of cooling water intake structures are closely linked to the amount of water passing through the intake structure because the eggs and larvae of some aquatic species are free-floating and may be drawn with the flow of cooling water into an intake structure. Swim speeds of affected species as well as intake velocity must be taken into account to predict rates of impingement in relation to flow in order to account for the ability of juvenile and adult life stages of species to avoid impingement. Due to this relationship, EPA agrees that reducing intake by installing flow reduction technologies will result in a similarly high reduction of impinged and entrained organisms.

The Department has completed its review of the March 4, 2006 "Determination of Cooling Tower Availability". To summarize the findings of this report, the difference in flows between the closed-cycle cooling system and current once through system is as follows:

	Current Once-Through Cooling	Conceptual Closed-Cycle Cooling	Percent Change from Current System
Intake Flow			
Circulating Water System Dilution Pumps Cooling Tower Make-up	662 748 N/A	N/A 374* 29	
Total Intake Flow	1410	403	-71%
Effluent Flow			
Circulating Water System Dilution Pump Cooling Tower Blowdown	662 748 N/A	N/A 374* 14	
Total Effluent Flow	1410	388	-72%

* It is contended in this report that operation of a dilution pump is necessary. This summary of flow reductions assumes that this contention is accurate.

Based on its review of this report, the Department does not agree that the permittee has substantiated that cooling towers are "unavailable" to OCGS at this time. **As a result, based on the information available at this time, the Department has determined that closed-cycle cooling is an available technology to OCGS.**

6. Court Decisions and Implications on Section 316(b) Determination

Subsequent to the issuance of the July 19, 2005 draft permit, the Second U.S. Circuit Court of Appeals issued its decision in the litigation over the Phase II regulation. See Riverkeeper, Inc., v. EPA, No. 04-6692, (2d Cir. January 25, 2007). The court's decision remanded several provisions of the Rule on various grounds including, but not limited to the following:

- EPA's determination of the Best Technology Available under section 316(b);
- The Rule's performance standard ranges;
- The Cost-cost and cost-benefit compliance alternatives;
- The Technology Installation and Operation Plan provision and;
- The restoration provisions.

EPA then suspended the Phase II Section 316(b) regulations as articulated in the July 9, 2007 Federal Register. EPA directed States and permitting authorities to issue permits in accordance with Best Professional Judgment (BPJ) pursuant to 40 CFR 401.14. All of the above referenced rule provisions were included as components of permit conditions in the July 19, 2005 draft NJPDES permit. As a result of this suspension, the July 19, 2005 draft NJPDES permit have been reevaluated under Best Professional Judgment. EPA has yet to release draft Section 316(b) regulations for Phase II facilities and has not announced any schedule for doing such.

Cost-benefit analysis was one element of the Second Circuit Court decision. The issue of cost-benefit analysis was brought before the Supreme Court. Specifically, the question presented was "Whether 316(b) of the Clean Water Act, 33 U.S.C. 1326(b), authorizes the Environmental Protection Agency to compare costs with benefits when determining the "best technology available for minimizing adverse environmental impacts" at cooling water intake structures?"

On April 1, 2009, the Supreme Court issued a decision regarding the validity of cost/benefit determinations for Phase II facilities. The Supreme Court determined that the EPA permissibly relied on cost-benefit analysis in providing for cost-benefit variances from those standards as part of the Phase II regulations. This decision will have a direct bearing on any redrafted Phase II regulations prepared by EPA. In the meantime, states are required to issue Section 316(b) determinations in accordance with best professional judgment.

7. Section 316(b) Determination in this Renewal Permit

The Department is hereby making a determination that closed-cycle cooling constitutes best technology available for this facility in accordance with Best Professional Judgment. This determination is based upon the following factors:

- Significant impingement and entrainment losses are documented in both historic and current data. The magnitude of these losses is due primarily to the location of OCGS in a marine environment. Closed-cycle cooling will reduce water intake usage significantly thereby decreasing impingement and entrainment effects. It is particularly noteworthy that closed-cycle cooling is one of the few technologies available to target entrainment effects.

- Based on its review of the permittee's Cooling Tower Availability study, the Department remains unconvinced that closed-cycle cooling is unavailable for this site.

- The permittee has received a 20 year renewal of its operating license for OCGS from the United States Nuclear Regulatory Commission. As a result, any costs incurred from closed-cycle cooling can be ammortized over a longer time frame thereby contributing to cost-effectiveness.

The **compliance schedule** for implementation of a closed-cycle cooling system is as follows:

- Apply for all necessary permits and approvals by the effective date of the permit (EDP) + 12 months.
- Finalize design and award construction contracts by EDP + 48 months.
- Operate closed-cycle cooling system within three years of finalizing design and awarding construction contracts specified above.

While the Department relies directly on plant-related impingement and entrainment effects in implementing the Section 316(b) statute, the Department considered the overall health of Barnegat Bay in this determination. While there is a lack of long term biological monitoring data throughout Barnegat Bay, the significantly decreased numbers of certain species collected in impingement and entrainment samples as compared to historical data, is indicative of a decline in the biological health of Barnegat Bay. This decline is likely attributable to a variety of reasons including, but not limited to: non-point source pollution loading, nitrogen loading, motorized boat and jet-ski usage, eutrophication, the loss of wetland and other estuarine habitat, overall development and changes in tidal regime within the estuary. Nonetheless, OCGS is also contributing impacts through impingement and entrainment effects. These plant related impacts can be minimized to the fullest extent through closed-cycle cooling.

B. Section 316(a) Determination

1. Regulatory Background - Thermal Surface Water Quality Standards (SWQS) and Section 316(a)

Surface Water Quality Standards (SWQS) for SE1 waters are established in N.J.A.C. 7:9B-1.1 et seq. and are applicable to the Barnegat Bay, Forked River, and Oyster Creek. These standards require that ambient water temperatures in the receiving waters shall not be raised by more than 2.2^{o} C (4^{o} F), from September through May, nor more than 0.8^{o} C (1.5^{o} F) from June through August, nor cause temperatures to exceed 29.4^{o} C (85^{o} F), except in designated heat dissipation areas. SWQS provide that "heat dissipation areas" in "streams" (including SE waters) shall not exceed one-quarter (1/4) of the cross section and/or volume of the water body at any time; nor more than two-thirds (2/3) of the surface from shore to shore at any time. SWQS further provide that these "heat dissipation areas" limits:

> "…may be exceeded by special permission, on a case-by-case basis, when a discharger can demonstrate that a larger heat dissipation area meets the tests for a waiver under Section 316 of the Federal Clean Water Act."

SWQS provide that for bays, "heat dissipation areas" will be developed on a case by case basis at N.J.A.C. 7:9B-1.14 (c)(11)(ii)(2).

Section 316(a) of the Federal Clean Water Act regulates the thermal component of surface water discharges. Specifically, Section 316(a) authorizes variances from thermal surface water quality standards where it is shown that the alternative limit proposed will "assure the protection and propagation of a balanced, indigenous population of shellfish, fish, and wildlife" in the receiving water.

2. Historical Technical Information

As noted previously, in 1987 the Department engaged Versar, Inc. as an independent contractor to assist in reviewing the permittee's Section 316(a) and (b) Demonstration. As described in the 1989 Versar Report, Versar reviewed the extent of the thermal plume from the Station based on dye plume mapping, thermal plume mapping, recirculation studies and hydrothermal modeling submitted by the permittee and other agencies.

The 1989 Versar Report indicated that operation of the Station did not appear to produce unacceptable, substantial long-term population and ecosystem level impacts and such operation assures the protection and propagation of a balanced, indigenous population of fish, shellfish, and wildlife in and on the receiving waters. The 1989 Versar Report recommends, among other things, that the Department grant a thermal variance pursuant to Section 316(a) and that the Department require the permittee to conduct and submit Dilution Pump Optimization Studies. The goal of this study was to develop a decision framework to predictively evaluate the seasonal operation of the dilution pumps in order to minimize the potential for the Oyster Creek cooling system to affect the biota of Barnegat Bay. In other words, the goal of any study would be to predict a schedule for operation of the dilution pumps to ensure that pumps were operated to mitigate thermal effects, but yet minimize operations to minimize entrainment effects. A workplan for this study was completed and submitted in May 1995.

3. Section 316(a) Determination in Previous Permits

In the June 30, 1994 draft renewal permit, the Department made a determination that the existing thermal limitations and operating requirements met the 316(a) criteria based on the findings of the permittee's 1987 316(a) study. However, the existing permit requires a number of operating and monitoring conditions to ensure that thermal effects were minimized during critical periods. These conditions have been continued in this draft renewal permit and can be summarized and justified as follows:

- Planned Winter Shutdown Conditions – The permittee shall not schedule routine shutdowns during the months of December, January, February, and/or March to reduce the possibility of a fish-kill resulting from cold shock. The permittee shall also not schedule routine maintenance that may cause violation of thermal limitations or intake velocity limitations during the months of June, July, August, and/or September. The Department acknowledges that the NJPDES Regulations require the permittee to maintain its plant in good working order and efficient operation and, therefore, some maintenance may be required. This condition is included in Part IV of the permit.

  Basis and Background to Planned Winter Shutdown Condition - Many fish species initiate their autumn migration from temperate estuarine areas such as Barnegat Bay to southern areas or deeper oceanic waters in response to temperature cues. Fish commonly thermoregulate by seeking water having temperature closer to their thermal preference. As a consequence, during the autumn, winter, and spring, fish are attracted to areas such as the Oyster Creek Discharge Canal, which acts to confine heated water from condenser cooling. Upon winter shutdowns of the Station, the thermal discharge from condenser cooling ceases and the temperature of this area quickly reverts towards ambient.

  Provisions in the 1987 NJPDES permit regarding planned winter shutdowns of the Station required the permittee to avoid scheduling shutdowns during the months of December, January, February, and March. These provisions were, for the most part, based on a permit issued by USEPA. The restriction on planned winter shutdowns was included in the 1987 and 1994 NJPDES permits to lessen the probability of winter shutdown fish kills associated with cold shock. This condition has been retained once again in this renewal permit.

- Temperature Monitoring at Route 9 Bridge – The permittee is required to continuously monitor temperature at a point four feet below the surface of Oyster Creek at the Route 9 bridge. A maximum temperature action level of 97 ^{o}F (36.1 ^{o}C) shall be continued in this permit action. Upon exceedance of this action level, the permittee may be required to conduct and submit an Effluent Temperature Evaluation Study (ETES) as detailed in Part IV of the permit. Temperature results from this location shall also determine when dilution pumps become operational. This condition is included in Part IV of the permit.

  Basis and Background to Temperature Monitoring at Route 9 Bridge - In order to ensure that the temperature of the water at the point it enters Barnegat Bay remains approximately at the temperature that was used in the Section 316(a) determination, the Department is requiring the Station to continue to monitor water temperature at the Route 9 Bridge. If the temperature is monitored above 97^{o}F, the Station is required to submit a written report to the Department stating the reason for such. If the temperature increase is due to (a) unusually high influent temperature, i.e., any influent temperature in excess of 85^{o} F; (b) operation of the Dilution Pumps in accordance with Part IV; or (c) implementation of the alternate effluent limitations in accordance with a Maximum Emergency Generation event as defined in this permit, the Station is required to do no more. If the temperature increases is not attributable to any of the above, the Station is required to conduct an Effluent Temperature Evaluation Study ("ETES") as detailed in Part IV to identify the cause of the temperature increases and to implement measures to prevent the temperature increases from occurring again.

  The Station's exceedance of the temperature monitoring action level of 97 degrees Fahrenheit is not a violation of the permit for which an enforcement action could be taken. The Station's failure to report an exceedance, to provide the Department with a written report providing reasons for the exceedance or to conduct the ETES in the time frames and manner established in the permit would, however, constitute violations of the permit for which enforcement action could be instituted.

- Maximum Emergency Generation – The permittee is permitted to increase its heat load, effluent temperature and delta T limitations for outfall DSN 001A during a Maximum Emergency Generation event as ordered by the PJM Interconnection Office of Information Dispatcher in accordance with Section 2 (Capacity Conditions) of the PJM Interconnection Emergency Operations Manual M-13, dated October 10, 1998 and any subsequent revisions thereto. Within 8 hours of the permittee being advised that Maximum Emergency Generation has been ordered, the permittee must notify the Department by telephone declaring that the Station has invoked the use of the alternate thermal limits of the permit. The Station must follow-up the telephone notification within five working days with a written report setting forth the following: the time and date of the telephone notification to the Department, the time and date the Station actually invoked relief under this permit condition, and the time and date it terminated such relief. A similar condition was contained in the 1994 permit issued to this facility; however, the term Emergency Need for Power has been replaced with Maximum Emergency Generation to reflect revisions to the PJM Interconnection Emergency Operations Manual.

In sum, the Department proposed to continue those thermal limitations and operating requirements in the July 19, 2005 draft permit action and thereby grant a thermal variance in accordance with Section 316(a) of the Clean Water Act. In addition to the above, the variance contained in the July 19, 2005 draft permit is based on the fact that the facility's operations have not changed appreciably since the time that the existing permit was issued and based on the fact that cooling water intake flow rates have remained relatively constant.

4. Section 316(a) Determination in this Renewal Permit

As noted previously, closed-cycle cooling is being required in accordance with best professional judgment in accordance with Section 316(b) of the Clean Water Act. As described in the July 19, 2005 draft NJPDES permit, the Department proposed to grant a thermal variance for the existing once-through cooling system. Unlike Section 316(b), the operative regulations for Section 316(a), namely 40 CFR 125.70 – 125.73, have not been remanded and are the same as when the July 19, 2005 draft permit was issued. Similarly, the NJSWQS have also not appreciably changed for heat and temperature since the July 19, 2005 draft NJPDES permit renewal was issued. As a result, the Department's analysis under Section 316(a) remains the same as in the July 19, 2005 draft NJPDES permit renewal. **In sum, the Department continues to propose a Section 316(a) variance for the once-through cooling system.**

While implementation of closed-cycle cooling is not being required under Section 316(a), the Department would be remiss if it did not recognize the benefits of closed-cycle cooling on thermal impacts. According to the information presented in the report entitled "Determination of Cooling Tower Availability" dated March 4, 2006, closed-cycle cooling will result in a reduction of flow volume for DSN 001A from 460,000 gallons per minute (gpm) of once-through cooling water to 10,000 gpm of cooling tower blowdown. This is a 98% reduction in the flow volume for the heated discharge from DSN 001A.

However, the installation of a closed loop system would not eliminate the thermal discharge. Specifically, a thermal discharge would occur via cooling tower blowdown although the volume would be less given the site-specifics of OCGS. It is also expected that a thermal variance would still be necessary for any cooling tower blowdown discharge. **As a result, the Department is retaining the daily maximum temperature limitation of 41.4 degrees Celsius for the cooling tower blowdown.** However, the Department is requiring thermal modeling for any closed-cycle cooling discharge flow once this discharge commences. The purpose of this modeling is to appropriately define any heat dissipation area and determine if a Section 316(a) determination is necessary. This condition has been included in Part IV.

The Department acknowledges that there have been documented fish kills associated with cold shock for the once-through cooling system. These instances were typically the result of winter shutdown conditions and, given compliance with permit conditions, it is expected that fish kills will not occur with the once-through cooling system. Nonetheless, given the significant reduction in any thermal discharge flow associated with a closed-cycle cooling system, it is expected that fish kills will be eliminated or greatly reduced.

9 Impacts:

A. Federal Consistency Determination

Impingement and entrainment and the thermal discharge results in impacts to aquatic life. In addition, the issue of impacts has relevance within the context of the Federal Consistency Determination pursuant to Section 307 of the federal Coastal Zone Management Act of 1972 (P.L. 92-573), as amended. The Department's assessment with respect to impacts is relevant. While a component of the Federal Consistency Determination concerns impacts, Section 316(b) is the statute that regulates impingement and entrainment impacts and Section 316(a) addresses thermal impacts. To ensure that the issue is fully addressed, the Department has included a summary of the Federal Consistency Determination administrative history, technical submittals and conclusions.

The Federal Consistency Determination (FCD) was required pursuant to the federal Coastal Zone Management Act as a result of AmerGen (the permittee at that time) applying to a federal agency for a license renewal of an existing facility within New Jersey's Coastal Zone. In this case, the permittee requested that the United States Nuclear Regulatory Commission (USNRC) relicense the facility for a period of 20 years, or until 2029. The Department's Coastal Zone Management rules at N.J.A.C. 7:7E represent the standards for reviewing the Federal Consistency Determination request. The Federal Consistency Determination was issued by the Department's Land Use Regulation Program on December 28, 2007. The USNRC license extension was granted on April 1, 2009.

To provide the administrative history, AmerGen submitted an application for a Federal Consistency Determination Request for License renewal of AmerGen's Oyster Creek Generating Station on January 21, 2005. By letter of March 31, 2005, the Division of Land Use Regulation advised AmerGen that the State agency's review had begun and a decision was due on or before July 21, 2005. In addition, the March 31, 2005 Division of Land Use Regulation letter requested information to address application deficiencies. The Division of Land Use Regulation requested that the applicant submit the information and an analysis of that information to support the following assertions made by the permittee:

- The impacts of entrainment and impingement during current operations are being monitored on a continual basis;

- The Ristroph traveling screens currently being used reduce the number of fish impinged and impingement mortality;
- The water quality of Barnegat Bay, which had been in decline, is recovering and now supports a healthy fish population; and
- The impacts of heat shock during current operations are also being monitored on a continual basis.

As described previously, impingement and entrainment data was already being collected, consistent with the Proposal for Information Collection. The collection of this data was a direct result of the requirement for a Comprehensive Demonstration Study in the now suspended Phase II EPA Regulations for Section 316(b). Impingement and entrainment data was collected for two years (i.e. Year 1 and Year 2) and was submitted in the 2007 Fishery Data Report. This information was utilized in for two regulatory purposes, namely Section 316(b) and the FCD request.

A summary of the December 28, 2007 FCD issued by the Department Land Use Regulation program to Oyster Creek Nuclear Generating Station (OCNGS) is as follows:

> …The continued operation of the OCNGS, which is the subject of this FCD request, is subject to review pursuant to the CZM rules. The scope of this review is focused on the continued operation of the facility on the coastal environment.
>
> The operation of the OCNGS is causing an impact on the estuarine environment specifically to marine fish and fisheries, through the once-through cooling process. Specifically, fish and shellfish are impinged on the cooling water intake screens, entrained through the circulating water system and the dilution pumps, and subjected to thermal impacts from discharge water. While the applicant has provided two years of recent monitoring data (encompassing a period from 2005 through 2007) to supplement previous data collected and to quantify the impacts from impingement and entrainment, the long-term effects on the coastal ecosystem are difficult to quantify. The difficulty in making this assessment is due to a number of factors listed below, some of which are not well-understood by the scientific community:
>
> - Lack of long-term biological monitoring data throughout Barnegat Bay;
> - Non-point source pollution loading into the Bay;
> - Nitrogen loading into the Bay from various sources (air deposition, groundwater discharge, non-point source pollution);
> - Extensive motorized boat and jet-ski usage throughout the Bay;
> - Eutrophication within the Bay;
> - Loss of wetland and other estuarine habitat;
> - Changes in tidal regime within the estuary resulting from reconstruction of the Barnegat Inlet south jetty; and
> - Development on the Bay and within the Barnegat Bay Watershed, including docks, piers, bulkheads and other waterfront structures.
>
> Given the fact that the facility was built in 1968, and the difficulty in drawing a clear nexus between the continued operations of OCNGS and the Bay impairments, the applicant has proposed various mitigation activities intended to offset any impacts of continued operation. All of these activities are proposed to be funded by AmerGen and conducted under the direction supervision of the Department's Division of Fish and Wildlife. Environmental enhancement/mitigation activities proposed by the applicant, as outlined in letters from AmerGen dated September 13, 2007 and November 30, 2007 include:
>
> - Tidal wetland restoration
> - Hard Clam Bed restoration
> - Oyster Bed Restoration
> - Enhance public access to and use of the Barnegat Bay waterfront

As noted previously, there are limited intake protection technologies to address entrainment. Restoration is an alternative that could be used at OCGS as a means to offset losses. Therefore, the Department hereby acknowledges any benefits that may come of the above referenced projects via the CZMA process.

B. Biological Monitoring Program

While the Department does not render a Section 316(b) determination based on long-term population effects, there is precedence within the NJPDES program for facilities to conduct an on-going biological monitoring program. Since OCGS uses the natural resources of the North Branch of the Forked River and Oyster Creek to operate their process, it

is reasonable to require an assessment of the overall health of the ecosystem as a steward of that resource. As noted at length above, there is a paucity of data available in Barnegat Bay and a biological monitoring program could serve to fill that gap.

In order to better assess the impacts that Oyster Creek Generating Station is having on Barnegat Bay and to monitor any effects from the implementation of closed-cycle cooling technology, the permittee is hereby required to implement a Biological Monitoring Program pursuant to N.J.A.C. 7:14A-6.2(a)14. This Biological Monitoring Program shall include the following components:

1. Shallow Water Survey of Estuarine Organisms

There is currently a large data gap in assessing population trends of organisms in Barnegat Bay. As such, a Barnegat Bay-wide beach seining survey needs to be conducted year round to identify and assess all estuarine organisms that inhabit shallow water environments. This survey shall be designed to accomplish the following:

- Identify and quantify any forage finfish species, young-of-year, yearlings, early life stages of predator finfish species, macroinvertebrates, and other life forms encountered within the shallow water habitats of Barnegat Bay.

- Develop relative abundance indices (number of organisms caught per sampling effort) for the major forage species identified in recent plant-related impingement and entrainment samples.

- Once sufficient data becomes available, perform a trends analysis of those species impacted by the impingement and entrainment operations at OCGS to be used as indicator organisms to conduct a statistically robust trend analysis of their relative abundance indices over an extended time period.

- The shallow water surveys should be conducted at a minimum frequency of once per month or at a frequency set forth in any biological monitoring program work plan approved by the Department.

2. Biological Monitoring Program Work Plan

- The permittee shall submit to the Department for approval an improved Biological Monitoring Work Plan, which addresses the study components described above. **This Work Plan shall be submitted within EDP + 6 months as indicated in Part IV.**

- **Not later than sixty days after receipt of the Department's written approval of the Work Plan, the permittee shall implement the Work Plan as indicated in Part IV.**

- The Department reserves the right to designate a third party to oversee any biological monitoring.

C. Plant Related Impingement and Entrainment Monitoring During Operation of Once-Through Cooling System

In order to ensure that recent impingement and entrainment monitoring is continued thereby allowing a long term assessment of plant related intake effects, continued impingement and entrainment monitoring shall be conducted as follows:

- The permittee shall conduct ongoing entrainment sampling at the circulating water intake during normal Station operations at a minimum frequency of **twice per month from May through October** and **once per month from November through April**, weather and operational conditions permitting. Sampling shall be conducted in

accordance with the procedures set forth in the June 29, 2005 Proposal for Information Collection or as specified in a Department approved workplan.

- The permittee shall conduct ongoing impingement sampling at the circulating water intake during normal Station operations at a minimum frequency of **twice per month on a year round basis**. Sampling shall be conducted in accordance with the procedures set forth in the June 29, 2005 Proposal for Information Collection or as specified in a Department approved workplan.

10 Type and Quantity of the Wastes or Pollutants:

The Permit Summary Table near the end of this fact sheet contains a summary of the quantity and quality of pollutants treated and discharged from the facility and the proposed effluent limitations. Effluent data was obtained from the facility's Monitoring Report Forms for the time period specified in the table.

11 Summary of Chemical-Specific Permit Conditions:

The existing and proposed effluent limitations and other pertinent information regarding the draft permit are described below:

A. Basis for Effluent Limitations and Permit Conditions - General:

The effluent limitations and permit conditions in this permit have been developed to ensure compliance with the following:

1. NJPDES Regulations (N.J.A.C. 7:14A),
2. New Jersey Surface Water Quality Standards (N.J.A.C. 7:9B),
3. New Jersey's 2006 Integrated Water Quality Monitoring and Assessment Report (include 305(b) Report and 303(d) List),
4. Existing permit limitations in accordance with N.J.A.C. 7:14A-13.19 and 40 CFR 122.44 (antibacksliding requirements),
5. Permit limitations in accordance with N.J.A.C. 7:9B-1.5(d) (antidegradation requirements),
6. Statewide Water Quality Management Planning Rules (N.J.A.C. 7:15),
7. Technology Based Treatment Requirements or Effluent Limitation Guideline Requirements (N.J.A.C. 7:14A-13.2 to 13.4),
8. 40 CFR Part 423 – Steam Electric Power Generating Point Source Category
9. 40 CFR Part 125, Subpart H

Technology based limitations are authorized by Section 301 of the Clean Water Act, 40 CFR 122, N.J.S.A. 58:10A-4, and N.J.A.C. 7:14A-13.2(a)1.ii., 13.3(b), and 13.4. In general, effluent limitations are based on Effluent Limitation Guidelines (ELGs), developed by the United States Environmental Protection Agency (USEPA), or on case-by-case limitations developed through a Best Professional Judgment (BPJ) analysis in cases where ELGs are not available or appropriate. ELGs are minimum technology based requirements applicable on a nation-wide basis and are published in 40 CFR Subchapter N. ELGs consider the category of industry that produce common pollutants taking into account the specific factors unique to a particular type of industry (manufacturing process, type and quantity of pollutants generated, types of treatment facilities available to treat the pollutants, etc.). In cases where ELGs are applicable for surface water dischargers, ELG loading limitations are calculated using the specified concentration value and the production information provided by the permittee. BPJ determinations are authorized by Section 402 (a)(1) of the Clean Water Act.

Effluent Limitation Guidelines (ELGs) are applicable to this facility in accordance with 40 CFR 423, the Steam Electric Power Generating Point Source Category. Where applicable, these guidelines were used to develop effluent limitations for the discharges from this facility unless a more stringent federal, state, or local effluent limitation was applicable.

In accordance with N.J.A.C. 7:14A-13.5, Water Quality Based Effluent Limitations (WQBELs) are imposed when it has been determined that the discharge of a pollutant causes an excursion of criteria specified in the New Jersey Surface Water Quality Standards (SWQS), N.J.A.C. 7:9B-1.1 et seq., and the Federal Water Quality Standards, 40 CFR Part 131. WQBELs are authorized by Section 301 of the Clean Water Act, 40 CFR 122, N.J.S.A. 58:10A-4, and N.J.A.C. 7:14A-13.2 and 13.3. The policies used to develop WQBELs are contained in the State and Federal Standards. Specific procedures, methodologies, and equations are contained in the current USEPA "Technical Support Document for Water Quality-based Toxics Control" (TSD) (EPA- 505/2-90-001) and are referenced in N.J.A.C. 7:14A-13.5 and 13.6.

Expression of all effluent limitations are in accordance with N.J.A.C. 7:14A-13.14 and 13.15.

Whole effluent toxicity limitations are expressed as a minimum as a percent.

B. Basis and Derivation for Effluent Limitations and Monitoring Requirements- Specific:

All permit limitations and conditions in this permit action, are equal to or more stringent than those contained in the existing permit action. As a result, this permit action satisfies the federal and state anti-degradation regulations 40 CFR 131.12 and N.J.A.C. 7:9B-1.5(d), and no further anti-degradation analysis is necessary.

DSN 001A: Non-Contact Cooling Water (approximately 592 MGD)

1. Flow: This permit does not include a numerical limitation for flow. Monitoring conditions for effluent and influent are applied pursuant to N.J.A.C. 7:14A-13.13. Monitoring is required on a **continuous** basis with a **calculated** sample type.

2. pH: The effluent limitations of 6.5 standard units as a monthly minimum and 8.5 standard units as a monthly maximum are consistent with the existing permit and are imposed in accordance with N.J.A.C 7:14A-13.19. A condition for monitoring intake pH has been included since a narrative condition regarding pH compliance has been included in Part IV A.1.h.

   Monitoring for pH shall be conducted **twice/week** with a **grab** sample type.

3. Effluent Temperature, Intake Temperature, Temperature Difference Between Intake and Discharge, Net Rate of Addition of Heat: The effluent limitations and/or monitoring requirements are originally based on the findings of the permittee's 1987 316(a) study and are retained from the existing permit in accordance with N.J.A.C 7:14A-13.19. Additional information regarding temperature and heat limitations is included in the Section 316(a) determination discussed previously in this Fact Sheet.

   Temperature shall be monitored on a **continuous** basis with a **grab** sample type.

   Consistent with the existing permit, the Department has continued effluent limitations for effluent temperature, temperature difference between intake and discharge, and net rate of addition of heat under two scenarios that are identified in this permit as Option 1 and Option 2 limits. Option 1 limits are applicable when four circulating water pumps are operating for condenser cooling. Option 2 limits shall be applicable during periods of condenser backwash, intake component maintenance or during a Maximum Emergency Generating Event. An explanation of these conditions is also specified as items G.2.g. and G.2.i. of Part IV.

4. Intake Velocity: The daily maximum limitation for intake velocity of 2.2 feet per second is imposed consistent with the existing permit pursuant to N.J.A.C 7:14A-13.19. This limitation was imposed in the existing permit to reduce impingement and entrainment at the cooling water intake. Additional information regarding intake velocity is included in the Section 316(b) determination discussed previously in this Fact Sheet. The intake velocity limit is also indicated as item G.4.i. of Part IV.

   Intake velocity shall be measured **monthly**.

5. Chlorine Produced Oxidants (CPO): In accordance with the Surface Water Quality Standards N.J.A.C. 7:9B-1 et seq. Total Residual Chlorine (TRC) is now referred to as CPO. The term CPO is simply a more appropriate name for the compounds which the TRC test measures. The TRC test measures not only residual chlorine, but the sum of free and combined chlorine and bromine as well.

   The daily maximum limitation of 0.2 mg/L is based on 40 CFR 423.13(b)(1), N.J.A.C. 7:9B-1.6(c), and is retained from the existing permit consistent with the provisions of N.J.A.C 7:14A-13.19. Monthly average monitoring and reporting is also required.

   A narrative condition has been included as item A.1.j. of Part IV to ensure that chlorination only occurs for two hours per day consistent with 40 CFR Part 423. An additional CPO limit on a concentration basis applies to the turbine building closed cooling water heat exchanger. Data for this wastestream shall be tracked on monitoring report forms.

   CPO shall be monitored **daily** with a **grab** sample.

6. Whole Effluent Toxicity (WET): Section 101(a) of the Clean Water Act (CWA) establishes a national policy of restoring and maintaining the chemical, physical and biological integrity of the Nation's waters. In addition, section 101(a)(3) of the CWA and the State's Surface Water Quality Standards (SWQS) at N.J.A.C. 7:9B-1.5(a)3 state that the discharge of toxic pollutants in toxic amounts is prohibited. Further, 40 CFR 122.44(d) and N.J.A.C. 7:14A-13.6(a) require that where the Department determines using site-specific WET data that a discharge causes, shows a reasonable potential to cause, or contributes to an excursion above the SWQS, the permitting authority must establish effluent limits for WET.

   Acute WET sampling was imposed in the existing permit at a quarterly monitoring frequency. The Department issued a modification on November 26, 1996 that reduced the monitoring frequency to annual. Since January 1995, the permittee has consistently reported an acute result of LC50>100% for this discharge. However, given the significant volume of this discharge, the Department has retained **annual** sampling. A **composite** sample type shall be used.

   The test species method to be used for acute testing shall be the *Mysidopsis bahia* 96 hour definitive test. Such selection is based on the saline characteristics of the receiving stream, the existing permit, N.J.A.C. 7:9B-1.5 and N.J.A.C. 7:18, the Regulations Governing the Certification of Laboratories and Environmental Measurements (N.J.A.C. 7:18).

DSN 002A - Non-Contact Cooling Water (3.5 MGD)

1. Flow: This permit does not include a numerical limitation for flow. Monitoring conditions are applied pursuant to N.J.A.C. 7:14A-13.13.

   Monitoring is required **twice per month** with a **calculated** sample type.

2. pH: The effluent limitations of 6.5 standard units as a monthly minimum and 8.5 standard units as a monthly maximum are consistent with the existing permit and are imposed in accordance with N.J.A.C 7:14A-13.19. A

condition for monitoring intake pH has been included since a narrative condition regarding pH compliance has been included in Part IV A.1.h.

Monitoring for pH shall be conducted **twice/week** with a **grab** sample type.

3. Effluent Temperature, Intake Temperature, Temperature Difference Between Intake and Discharge, Net Rate of Addition of Heat: The effluent limitations and/or monitoring requirements are originally based on the findings of the permittee's 1987 316(a) study and are retained from the existing permit in accordance with N.J.A.C 7:14A-13.19. Additional information regarding temperature and heat limitations is included in the Section 316(a) determination discussed previously in this Fact Sheet.

   Temperature shall be monitored on a **twice/month** basis with a **grab** sample type.

4. Chlorine Produced Oxidants (CPO): In accordance with the Surface Water Quality Standards N.J.A.C. 7:9B-1 et seq. Total Residual Chlorine (TRC) is now referred to as CPO. The daily maximum limitation of 0.2 mg/L is based on 40 CFR 423.13(b)(1) and is retained from the existing permit in accordance with N.J.A.C 7:14A-13.19. Monthly average monitoring and reporting is also required.

   Monitoring for CPO shall be conducted on a **twice/month** basis with a **grab** sample type.

5. Whole Effluent Toxicity (WET): Section 101(a) of the Clean Water Act (CWA) establishes a national policy of restoring and maintaining the chemical, physical and biological integrity of the Nation's waters. In addition, section 101(a)(3) of the CWA and the State's Surface Water Quality Standards (SWQS) at N.J.A.C. 7:9B-1.5(a)3 state that the discharge of toxic pollutants in toxic amounts is prohibited. Further, 40 CFR 122.44(d) and N.J.A.C. 7:14A-13.6(a) require that where the Department determines using site-specific WET data that a discharge causes, shows a reasonable potential to cause, or contributes to an excursion above the SWQS, the permitting authority must establish effluent limits for WET.

   Acute WET sampling was imposed in the existing permit at a quarterly monitoring frequency. The Department issued a modification on November 26, 1996 that reduced the monitoring frequency to annual. Since January 1995, the permittee has consistently reported an acute result of LC50>100% for this discharge. However, given the volume of this discharge, the Department has retained **annual** sampling. A **composite** sample type shall be used.

   The test species method to be used for acute testing shall be the *Mysidopsis bahia* 96 hour definitive test. Such selection is based on the saline characteristics of the receiving stream, the existing permit, N.J.A.C. 7:9B-1.5 and N.J.A.C. 7:18, the Regulations Governing the Certification of Laboratories and Environmental Measurements (N.J.A.C. 7:18).

DSN 004A - Non-Contact Cooling Water, Stormwater, Floor Drains (0.06 MGD)

1. Flow: This permit does not include a numerical limitation for flow. Monitoring conditions are applied pursuant to N.J.A.C. 7:14A-13.13. Consistent with the existing permit, the permittee is required to monitor and report net flow and heat exchanger flow where net flow shall be used for the purposes of calculating loading values.

   Effluent flow monitoring and heat exchanger flow monitoring (internal monitoring) shall be performed **monthly**. Net flow shall be **calculated** on a monthly basis.

2. Total Suspended Solids (TSS), Net: The concentration limitations are based on 40 CFR 423.12(b)(3), are consistent with the existing permit, and are imposed in accordance with N.J.A.C 7:14A-13.19. The loading limitations are based on the long- term average flow of 0.06 MGD. As the source water for this discharge is the receiving stream, the permittee was allowed under the previous permit to meet these limitations on a 'net'

basis. This condition has been retained as it is allowable under N.J.A.C. 7:14A-13.4(k). Because net limits are applied, monitoring and reporting for intake and effluent TSS is also required as a monthly average and daily maximum.

Monitoring for TSS shall be conducted on a **monthly** basis with a **grab** sample type.

3. pH: The effluent limitations of 6.0 standard units as a monthly minimum and 9.0 standard units as a monthly maximum are consistent with the existing permit and are imposed in accordance with N.J.A.C 7:14A-13.19. A condition for monitoring intake pH has been included since a narrative condition regarding pH compliance has been included in Part IV A.1.h.

   Monitoring for pH shall be conducted **once/week** with a **grab** sample type.

4. Effluent Temperature: The effluent limitation of 37.2 degrees Celsius as a daily maximum is based on the anti-backsliding provisions as cited in N.J.A.C 7:14A-13.19. Monthly average monitoring and reporting is also required.

   Monitoring for effluent temperature shall be conducted on a **monthly** basis with a **grab** sample type.

5. Petroleum Hydrocarbons: The effluent limitations are based on N.J.A.C. 7:14A-12.8(c). The loading limitations are based on the long term average flow of 0.06 MGD. As the source water for this discharge is the receiving stream, the permittee was allowed under the previous permit to meet these limitations on a 'net' basis. This condition has been retained as it is allowable under N.J.A.C. 7:14A-13.4(k). Because net limits are applied, monitoring and reporting for intake and effluent petroleum hydrocarbons is also required as a monthly average and daily maximum.

   Monitoring for petroleum hydrocarbons shall be conducted on a **monthly** basis with a **grab** sample type.

6. Total Organic Carbon: The daily maximum effluent limitation of 50 mg/L is imposed consistent with the existing permit pursuant to N.J.A.C 7:14A-13.19. Monthly average monitoring and reporting is also required.

   Monitoring for total organic carbon shall be conducted on a **monthly** basis with a **grab** sample type.

7. Chlorine Produced Oxidants (CPO): In accordance with the Surface Water Quality Standards N.J.A.C. 7:9B-1 et seq. Total Residual Chlorine (TRC) is now referred to as CPO. The daily maximum limitation of 0.2 mg/L is based on 40 CFR 423.13(b)(1) and is retained from the existing permit in accordance with N.J.A.C 7:14A-13.19. Monthly average monitoring and reporting is also required.

   Monitoring for CPO shall be conducted on a **monthly** basis with a **grab** sample type.

8. Whole Effluent Toxicity (WET): Section 101(a) of the Clean Water Act (CWA) establishes a national policy of restoring and maintaining the chemical, physical and biological integrity of the Nation's waters. In addition, section 101(a)(3) of the CWA and the State's Surface Water Quality Standards (SWQS) at N.J.A.C. 7:9B-1.5(a)3 state that the discharge of toxic pollutants in toxic amounts is prohibited. Further, 40 CFR 122.44(d) and N.J.A.C. 7:14A-13.6(a) require that where the Department determines using site-specific WET data that a discharge causes, shows a reasonable potential to cause, or contributes to an excursion above the SWQS, the permitting authority must establish effluent limits for WET.

   Acute WET sampling was imposed in the existing permit at a quarterly monitoring frequency. The Department issued a modification on November 26, 1996 that reduced the monitoring frequency to annual. Since January 1995, the permittee has consistently reported an acute result of LC50>100% for this discharge. However, given the volume of this discharge, the Department has retained **annual** sampling. A **composite** sample type shall be used.

The test species method to be used for acute testing shall be the *Mysidopsis bahia* 96 hour definitive test. Such selection is based on the saline characteristics of the receiving stream, the existing permit, N.J.A.C. 7:9B-1.5 and N.J.A.C. 7:18, the Regulations Governing the Certification of Laboratories and Environmental Measurements (N.J.A.C. 7:18).

DSN 005A – Dilution Water (732 MGD)

1. Flow: This permit does not include a numerical limitation for flow. Monitoring conditions are applied pursuant to N.J.A.C. 7:14A-13.13. Part IV contains dilution pump operation requirements that are in accordance with the existing permit.

   Monitoring is required on a **continuous** basis with a **calculated** sample type.

DSN 007A – Miscellaneous Wastewater (30 MGD)

1. Flow: This permit does not include a numerical limitation for flow. Monitoring conditions are applied pursuant to N.J.A.C. 7:14A-13.13.

   Monitoring is required on a **monthly** basis with a **calculated** sample type.

2. pH: The pH of the effluent shall not be less than 6.0 S.U. nor greater than 9.0 S.U.; or, during periods when the pH of the intake water is less than 6.0, the pH of the effluent shall not be less than that of the intake; or, during periods when the pH of the intake water is greater than 9.0, the pH shall not be greater than that of the intake. However, no monitoring or reporting for pH is required at this time at this outfall. This requirement is included as a narrative condition in Part IV.

   This condition is included as item A.1.h. of Part IV.

3. Petroleum Hydrocarbons: The monthly average effluent limitation of 10 mg/L and the daily maximum effluent limitation of 15 mg/L are imposed consistent with the existing permit pursuant to N.J.A.C 7:14A-13.19. These limitations are also consistent with N.J.A.C. 7:14A-12.8(c).

DSN 008A – Intake Screen Washwater (2.4 MGD)

1. Flow: Monitoring conditions for flow are applied pursuant to N.J.A.C. 7:14A-13.13 and to allow for a measure of intake screen washwater. A flow limit is not imposed at this outfall. No pollutants are added to this discharge as the discharge consists of canal water used for screen washwater.

   Monitoring is required on a **monthly** basis with a **calculated** sample type.

DSN 009A – Discharge from Fish Sampling Pool (0 MGD)

1. Flow: Monitoring conditions for flow are applied pursuant to N.J.A.C. 7:14A-13.13 and to ensure that any operations at this discharge point are tracked. A flow limit is not imposed at this outfall. No pollutants are added to this discharge as the discharge consists of canal water used for the purposes of providing water in the fish sampling pool. Monitoring is required on a **monthly** basis with a **calculated** sample type.

C. Effluent Monitoring Frequencies and Sample Types:

Monitoring frequencies and sample types are in accordance with N.J.A.C. 7:14A-14, unless specified otherwise in the permit. In accordance with N.J.A.C. 7:14A-14.2, the permittee may submit a written request for a modification

of the permit to decrease monitoring frequencies for non-limited parameters listed in Part III if site specific conditions indicate the applicability of such a modification.

D. Recommended Quantitation Levels Policy (RQLs):

The Department developed the RQLs to insure that useful data is provided to the Department in order to characterize the discharger's effluent. The Department recommends that the permittee achieve detection levels that are at least as sensitive as the RQLs found in Part III. The Department has determined that the quantitation levels listed therein can be reliably and consistently achieved by most state certified laboratories for most of the listed pollutants using the appropriate procedures specified in 40 CFR Part 136. FAILURE TO ATTAIN A QUANTITATION LEVEL AS SENSITIVE AS A LISTED RQL IS NOT A VIOLATION OF THE PERMIT, BUT DOES TRIGGER SOME ADDITIONAL REPORTING REQUIREMENTS FOR THE PERMITTEE AS SPECIFIED IN PART IV A.1.c. OF THE PERMIT.

E. Reporting Requirements:

All data requested to be submitted by this permit shall be reported on the Discharge Monitoring Reports (DMRs), Waste Characterization Reports (WCR), and Residual Transfer Reports (RTR) as appropriate and submitted to the Department as required by N.J.A.C. 7:14A-6.8(a).

F. General conditions:

In accordance with N.J.A.C. 7:14A-2.3 and 6.1(b), specific rules from the New Jersey Administrative Code have been incorporated either expressly or by reference in Part I and Part II.

G. Operator Classification Number:

The operator classification requirement is no longer included in the permit. To obtain or determine the appropriate licensed operator classification for the treatment works specified, the permittee shall contact the Bureau of Engineering South at (609) 984-6840.

H. Residuals/Sludge Conditions:

All treatment works with a discharge regulated under N.J.A.C. 7:14A must have permits that implement applicable technical standards for residuals management. Generally, the permit issued to the treatment works generating the residual will include applicable residual quality monitoring as well as other general conditions required by N.J.A.C. 7:14A-6. In addition, the permit may include conditions related to any aspect of residual management developed on a case-by-case basis where the Department determines that such conditions are necessary to protect public health and the environment.

The permit may also include conditions establishing requirements for treatment works that send residual to other facilities for final use or disposal. Thus, **ALL** residual preparers (that is, generators as well as persons who manage the residual) are required to submit basic information concerning their residual use and disposal practices. This basic information is submitted by compliance with the Sludge Quality Assurance Regulations (N.J.A.C. 7:14C).

The documents listed below have been used to establish the residual conditions of the Draft Permit:

a. United States Environmental Protection Agency “Standards for the use or disposal of sewage sludge” (40 CFR Part 503),
b. "New Jersey Pollutant Discharge Elimination System” (N.J.A.C. 7:14A),
c. Technical Manual for Residuals Management, May 1998,
d. USEPA Part 503 Implementation Guidance, EPA 833-R-95-001, October 1995. This document is a compilation of federal requirements, management practices and EPA recommended permit conditions for sewage sludge use and management practices,

e. USEPA A Plain English Guide to the EPA Part 503 Biosolids Rule, EPA/832/R-93/003, September 1994,
f. New Jersey "Statewide Sludge Management Plan", November 1987 and
g. New Jersey "Sludge Quality Assurance Regulations" (SQAR), N.J.A.C. 7:14C.

I. Biocides or Other Cooling Water Additives:

The Department has approved the permittee's request to chlorinate its non-contact cooling water. In accordance with 40 CFR 423.13(b)(2), chlorine produced oxidants may not be discharged from any single generating unit for more than two hours per day. Simultaneous multi-unit chlorination is permitted.

If the permittee decides to begin using any additional additives in the future, the permittee must notify the Bureau of Surface Water Permitting at least 180 days prior to use so that the permit may be reopened to incorporate any additional limitations deemed necessary.

12 Description of Procedures for Reaching a Final Decision on the Draft Action:

Please refer to the procedures described in the public notice that is part of the draft permit. The public notice for this action is published in the *Ocean County Observer* and in the DEP Bulletin.

13 Contact Information

If you have any questions regarding this permit action, please contact Susan Rosenwinkel, Bureau of Surface Water Permitting at (609) 292-4860.

14 Permit Summary Tables

Unless otherwise noted all effluent limitations are expressed as maximums. Dashes (--) indicate there is no effluent data, no limitations, or no monitoring for this parameter depending on the column in which it appears.

DSN 001A

PARAMETER (1)	UNITS	AVERAGING PERIOD	WASTEWATER DATA (2)	EXISTING LIMITS	FINAL LIMITS
Effluent Flow	MGD	Monthly Avg. Daily Max.	326 662	MR MR	MR MR
Intake Flow	MGD	Monthly Avg. Daily Max.	-- --	-- --	MR MR
Temperature Difference Between Intake and Discharge (Option 1)	°C	Monthly Avg. Instant Max.	10.63 12.8	MR 12.8	MR 12.8
Temperature Difference Between Intake and Discharge (Option 2)	°C	Monthly Avg. Instant Max.	8.5 13.9	MR 18.3	MR 18.3
Effluent Temperature (Option 1)	°C	Monthly Avg. Instant Max.	26.47 41.1	MR 41.1	MR 41.1
Effluent Temperature (Option 2)	°C	Monthly Avg. Instant Max.	17.89 41.1	MR 43.3	MR 43.3
Intake Temperature	°C	Monthly Avg. Instant Max.	-- 31.7	MR MR	MR MR
Effluent pH	Su	Instant Min. Instant Max.	6.9 8.2	6.5 (3) 8.5 (3)	6.5 (3) 8.5 (3)
Intake pH	Su	Instant Min. Instant Max.	6.7 8.3	MR MR	MR MR
Chlorine Produced Oxidants – Normal Operations (Option 1)	kg/d	Monthly Avg. Daily Max.	9.50 39.7	MR 41.7	MR 41.7
Chlorine Produced Oxidants – Normal Operations (Option 1)	mg/L	Monthly Avg. Daily Max. # Det. / # N.D.	0.1 0.2 2/21	MR 0.2	MR 0.2
Chlorine Produced Oxidants – During operation of the turbine building closed cooling water heat exchanger (Option 2)	mg/L	Monthly Avg. Daily Max. # Det. / # N.D.	0.1 0.2 3/21	MR 0.2	MR 0.2
Intake Velocity	Ft/sec	Monthly Avg. Daily Max.	0.68 1.57	MR 2.2	MR 2.2
Net Rate of Heat (Option 1)	MBTU/hr	Monthly Avg. Daily Max.	4202 4537	MR 5420	MR 5420
Net Rate of Heat (Option 2)	MBTU/hr	Monthly Avg. Daily Max.	3005 4457	MR 5700	MR 5700
Acute Toxicity, LC50	%	Minimum	>100	MR	MR

Footnotes and Abbreviations:

MR Monitor and report only

(1) Consistent with the existing permit, the Department has continued effluent limitations for effluent temperature, temperature difference between intake and discharge, net rate of addition of heat, and CPO under two scenarios that are identified in this permit as Option 1 and Option 2 limits. Option 1 heat and temperature limits are applicable when four circulating water pumps are operating for condenser cooling. Option 2 heat and temperature limits shall be applicable during periods of condenser backwash, intake component maintenance or during a Maximum Emergency Generating Event. Option 1 CPO limits are applicable to DSN 001A. Option 2 CPO limits are applicable during periods of chlorination of the turbine building closed CW heat exchanger. An explanation of these conditions is also reiterated as items A.2.j.(CPO), G.2.g. , G.2.j and G.2.i.. of Part IV.

(2) Wastewater data originates from the information submitted on the monitoring report forms from 7/06 to 6/08

(3) During periods when the pH of the intake water is less than 6.5, the pH of the effluent shall not be less than that of the intake; or, during periods when the pH of the intake water is greater than 8.5, the pH of the effluent shall not be greater than that of the intake.

(4) Monitoring of the parameters listed above for DSN 001A is not required when there is no flow and/or heat load across the Station's main condensers.

DSN 002A

PARAMETER	UNITS	AVERAGING PERIOD	WASTEWATER DATA (1)	EXISTING LIMITS	FINAL LIMITS
Flow	MGD	Monthly Avg. Daily Max.	3.63 5.4	MR MR	MR MR
Temperature Difference Between Intake and Discharge	°C	Monthly Avg. Instant Max.	2.61 14.5	MR 18.3	MR 18.3
Effluent Temperature	°C	Monthly Avg. Instant Max.	18.5 39.8	MR 45	MR 45
Intake Temperature	°C	Monthly Avg. Instant Max.	-- 29	MR MR	MR MR
Effluent pH	Su	Instant Min. Instant Max.	6.6 8.2	6.5 (2) 8.5 (2)	6.5 (2) 8.5 (2)
Intake pH	Su	Instant Min. Instant Max.	6.7 8.3	MR MR	MR MR
Chlorine Produced Oxidants	mg/L	Monthly Avg. Daily Max. # Det. / # N.D.	0.1 0.2 9/16	MR 0.2	MR 0.2
Net Rate of Addition of Heat	MBTU/Hour	Monthly Avg. Daily Max.	6 33	MR 790	MR 790
Acute Toxicity, LC50	%	Minimum	>100	MR	MR

Footnotes and Abbreviations:

MR Monitor and report only

(1) Wastewater data originates from the information submitted on the monitoring report forms from 7/06 to 6/08.

(2) During periods when the pH of the intake water is less than 6.5, the pH of the effluent shall not be less than that of the intake; or, during periods when the pH of the intake water is greater than 8.5, the pH of the effluent shall not be greater than that of the intake.

DSN 004A

PARAMETER	UNITS	AVERAGING PERIOD	WASTEWATER DATA (1)	FINAL LIMITS
Net Flow (2)	MGD	Monthly Avg. Daily Max.	0.06 0.06	MR MR
Effluent Flow	MGD	Monthly Avg. Daily Max.	8.66 8.66	MR MR
Heat Exchanger Flow	MGD	Monthly Avg. Daily Max.	8.6 8.6	MR MR
Effluent Temperature	°C	Monthly Avg. Instant Max.	21.44 31.4	MR 37.2
Effluent pH	S.U.	Instant Min. Instant Max.	6.9 8.1	6.0 (3) 9.0 (3)
Intake pH	S.U.	Instant Min. Instant Max.	6.7 8.3	MR MR
Chlorine Produced Oxidants	Mg/L	Monthly Avg. Daily Max. # Det. / # N.D.	0.1 0.2 7/17	MR 0.2
Total Organic Carbon	Mg/L	Monthly Avg. Daily Max.	6.8 11.6	MR 50
Net Petroleum Hydrocarbons	Mg/L	Monthly Avg. Daily Max.	0.71 10	10 15
Net Petroleum Hydrocarbons	Kg/day	Monthly Avg. Daily Max.	0.23 2.27	MR 4.54
Effluent Petroleum Hydrocarbons	Mg/L	Monthly Avg. Daily Max # Det. / # N.D.	4.55 12.5 6/18	MR MR
Intake Petroleum Hydrocarbons	Mg/L	Monthly Avg. Daily Max. # Det. / # N.D.	2.12 7.8 5/19	MR MR
Net Total Suspended Solids	Mg/L	Monthly Avg. Daily Max.	0.20 9.4	30 100
Net Total Suspended Solids	Kg/day	Monthly Avg. Daily Max.	0.05 2.14	MR 22.7
Effluent Total Suspended Solids	Mg/L	Monthly Avg. Daily Max.	14.42 34.2	MR MR
Intake Total Suspended Solids	Mg/L	Monthly Avg. Daily Max.	14.23 32	MR MR
Acute Toxicity, LC50	%	Minimum	>100	MR

Footnotes and Abbreviations:

MR Monitor and report only

(1) Wastewater data originates from the information submitted on the monitoring report forms from 7/06 to 6/08.

(2) Net flow shall be used for calculating loading values only for this outfall. The equation Qnet = Qeffluent – Qheat exchanger.

(3) During periods when the pH of the intake water is less than 6.0, the pH of the effluent shall not be less than that of the intake; or, during periods when the pH of the intake water is greater than 9.0, the pH of the effluent shall not be greater than that of the intake.

DSN 005A

PARAMETER	UNITS	AVERAGING PERIOD	WASTEWATER DATA (1)	FINAL LIMITS
Flow	MGD	Monthly Avg. Daily Max.	715 765	MR MR

Footnotes and Abbreviations:

MR Monitor and report only

(1) Wastewater data originates from the information submitted on the monitoring report forms from 7/06 to 6/08.

DSN 007A

PARAMETER	UNITS	AVERAGING PERIOD	WASTEWATER DATA (1)	FINAL LIMITS
Flow	GPD	Monthly Avg. Daily Max.	91 91	MR MR
Petroleum Hydrocarbons	mg/L	Monthly Avg. Instant Max.	-- --	10 15

Footnotes and Abbreviations:

MR Monitor and report only

(1) Wastewater data originates from the information submitted on the monitoring report forms from 7/06 to 6/08. A discharge only occurred during the month of 2/08

DSN 008A

PARAMETER	UNITS	AVERAGING PERIOD	WASTEWATER DATA (1)	FINAL LIMITS
Flow	MGD	Monthly Avg. Daily Max.	2.4 4.4	MR MR

Footnotes and Abbreviations:

MR Monitor and report only

(1) Wastewater data originates from the information submitted on the monitoring report forms from 7/06 to 6/08.

DSN 009A

PARAMETER	UNITS	AVERAGING PERIOD	WASTEWATER DATA (1)	FINAL LIMITS
Flow	MGD	Monthly Avg. Daily Max.	0.03 0.23	MR MR

Footnotes and Abbreviations:

MR Monitor and report only

(1) Wastewater data originates from the information submitted on the monitoring report forms from 7/06 to 6/08.

15 Contents of the Administrative Record

The following items are used to establish the basis of the Draft Permit:

Rules and Regulations:

1. 33 U.S.C. 1251 et seq., Federal Water Pollution Control Act. [C]
2. 40 CFR Part 131, Federal Water Quality Standards. [A] [C]
3. 40 CFR Part 122, National Pollutant Discharge Elimination System. [C]
4. N.J.S.A. 58:10A-1 et seq., New Jersey Water Pollution Control Act. [A] [B]
5. N.J.A.C. 7:14A-1 et seq., New Jersey Pollutant Discharge Elimination System Regulations. [A] [B]
6. N.J.A.C. 7:9B-1 et seq., New Jersey Surface Water Quality Standards. [A] [B]
7. N.J.A.C. 7:9-5.1 et seq., Wastewater Discharge Requirements. [A] [B]
8. N.J.A.C. 7:15, Statewide Water Quality Management Planning Rules. [A] [B]
9. N.J.A.C. 7:14C, Sludge Quality Assurance Regulations. [B]
10. 40 CFR Part 125, Criteria and Standards for the National Pollutant Discharge Elimination System, Subpart H, Criteria for Determining Effluent Limitations Under Section 316(a) of the Act.
11. 40 CFR Part 423, Steam Electric Power Generating Point Source Category.
12. 40 CFR Part 401.2

Guidance Documents / Reports:

1. "Field Sampling Procedures Manual", published by the NJDEP. [A]
2. "Discharge Monitoring Report (DMR) Instructional Manual", published by the NJDEP. [A]
3. "EPA Technical Support Document for Water Quality-based Toxics Control", EPA/505/2-90-001, March 1991. [A]
4. New Jersey's 2006 Integrated Water Quality Monitoring and Assessment Report (include 305(b) Report and 303(d) List). [A] [B]

Permits / Applications:

1. NJPDES/DSW Permit Application dated 6/3/99. [A]
2. Minor Modification to NJPDES/DSW Permit NJ0005550, issued 1/14/09 and effective 1/5/09. [A]
3. Draft NJPDES/DSW Permit NJ0005550, issued July 19, 2005. [A]
4. Existing NJPDES/DSW Permit NJ0005550, issued 10/21/94 and effective 12/1/94. [A]
5. Major Modification to NJPDES/DSW Permit NJ0005550, issued 4/17/96 and effective on 6/1/96.[A]
6. Major Modification to NJPDES/DSW Permit NJ0005550, issued 11/27/96 and effective on 12/1/96.[A]

Correspondence / Reports / Other:

1. Report dated October 29, 2008 to characterize the aquatic resources and impingement and entrainment at Oyster Creek Nuclear Generating Station.
2. Monitoring Report form data, July 2006 through June 2008.
3. Correspondence dated December 28, 2007 addressed to Timothy Rausch, AmeGen Energy Company from Assistant Commissioner Mark Mauriello, NJDEP finding consistency with the federal Coastal Zone Management Act for federal relicensing.
4. Correspondence dated November 30, 2007 addressed to Commissioner Lisa Jackson from Joseph Dominguez of Exelon Generation Company committing to environmental projects related to the Federal Consistency Request for License Renewal of OCNGS.
5. Oyster Creek Generating Station Fishery Data Report dated November 20, 2007.
6. Second Circuit Court decision regarding Section 316(b) Phase II regulations. Riverkeeper, Inc., v. EPA, No. 04-6692, (2d Cir. January 25, 2007).
7. Determination of Cooling Tower Availability" (hereafter "report") dated March 4, 2006.
8. Correspondence dated November 7, 2005 formally responding to the Department's comments on the PIC.
9. Correspondence dated September 21, 2005 agreeing to the inclusion of four additional target species for impingement sampling.

10. Correspondence dated September 9, 2005 granting conditional approval of the PIC addressed to Malcolm Browne of AmerGen from Howard Tompkins of the Department's Bureau of Point Source Permitting – Region 1.
11. Proposal for Information Collection dated June 29, 2005
12. Plan of Study for Analysis of Alternatives for Dilution Pump Operation at the Oyster Creek Nuclear Generating Station, May 1995 (EA Engineering, Science, and Technology).
13. Technical Review and Evaluation of Thermal Effects Studies and Cooling Water Intake Structure Demonstration of Impact for the Oyster Creek Nuclear Generating Station, Revised Final Report, Versar, Inc., May 1989.
14. Technical Review and Evaluation of Thermal Effects Studies and Cooling Water Intake Structure Demonstration of Impact for the Oyster Creek Nuclear Generating Station, Advanced Final Report, Versar, Inc., 1988 and comments received thereon.
15. EA 1986 (EA Engineering, Science and Technology, Inc. 1986) Entrainment and impingement studies at Oyster Creek Nuclear Generating Station, 1984-1985. Prepared for GPU Nuclear Corporation.
16. Jersey Central Power & Light Company Section 316 Demonstration for Oyster Creek and Forked River Nuclear Generating Stations, May 1978.
17. 1966 Stipulation of the State of NJ, Department of Public Utilities, Board of Public Utility Commissioners.

Footnotes:

[A] Denotes items that may be found in the NJPDES/DSW Administrative Record Library located in the NJDEP Central File Room, 401 East State Street, Trenton, New Jersey.

[B] Denotes items that may be found on the New Jersey Department of Environmental Protection (NJDEP) website located at "http://www.state.nj.us/dep/".

[C] Denotes items that may be found on the United States Environmental Protection Agency (USEPA) website at "http://www.epa.gov/".

NEW JERSEY POLLUTANT DISCHARGE ELIMINATION SYSTEM

The New Jersey Department of Environmental Protection hereby grants you a NJPDES permit for the facility/activity named in this document. This permit is the regulatory mechanism used by the Department to help ensure your discharge will not harm the environment. By complying with the terms and conditions specified, you are assuming an important role in protecting New Jersey's valuable water resources. Your acceptance of this permit is an agreement to conform with all of its provisions when constructing, installing, modifying, or operating any facility for the collection, treatment, or discharge of pollutants to waters of the state. If you have any questions about this document, please feel free to contact the Department representative listed in the permit cover letter. Your cooperation in helping us protect and safeguard our state's environment is appreciated.

Permit Number: NJ0005550

Draft: Surface Water Renewal Permit Action

Permittee:
Exelon Generation Co.
PO Box 388 - Oyster Creek Generating Station
Forked River, NJ 08731-0388

Co-Permittee:

Property Owner:
Exelon Generation Co.
PO Box 388 - Oyster Creek Generating Station
Forked River, NJ 08731-0388

Location Of Activity:
Oyster Creek Generating Station
Route 9 South
Forked River, NJ 08731-0388

Authorization(s) Covered Under This Approval	Issuance Date	Effective Date	Expiration Date
B -Industrial Wastewater			

By Authority of:
Commissioner's Office

DEP AUTHORIZATION
Pilar Patterson, Chief
Bureau of Surface Water Permitting
Division of Water Quality

(Terms, conditions and provisions attached hereto)

PART I
GENERAL REQUIREMENTS:
NJPDES

A. General Requirements of all NJPDES Permits

1. Requirements Incorporated by Reference

a. The permittee shall comply with all conditions set forth in this permit and with all the applicable requirements incorporated into this permit by reference. The permittee is required to comply with the regulations, including those cited in paragraphs b. through e. following, which are in effect as of the effective date of the final permit.

b. General Conditions

Penalties for Violations	N.J.A.C. 7:14-8.1 et seq.
Incorporation by Reference	N.J.A.C. 7:14A-2.3
Toxic Pollutants	N.J.A.C. 7:14A-6.2(a)4i
Duty to Comply	N.J.A.C. 7:14A-6.2(a)1 & 4
Duty to Mitigate	N.J.A.C. 7:14A-6.2(a)5 & 11
Inspection and Entry	N.J.A.C. 7:14A-2.11(e)
Enforcement Action	N.J.A.C. 7:14A-2.9
Duty to Reapply	N.J.A.C. 7:14A-4.2(e)3
Signatory Requirements for Applications and Reports	N.J.A.C. 7:14A-4.9
Effect of Permit/Other Laws	N.J.A.C. 7:14A-6.2(a)6 & 7 & 2.9(c)
Severability	N.J.A.C. 7:14A-2.2
Administrative Continuation of Permits	N.J.A.C. 7:14A-2.8
Permit Actions	N.J.A.C. 7:14A-2.7(c)
Reopener Clause	N.J.A.C. 7:14A-6.2(a)10
Permit Duration and Renewal	N.J.A.C. 7:14A-2.7(a) & (b)
Consolidation of Permit Process	N.J.A.C. 7:14A-15.5
Confidentiality	N.J.A.C. 7:14A-18.2 & 2.11(g)
Fee Schedule	N.J.A.C. 7:14A-3.1
Treatment Works Approval	N.J.A.C. 7:14A-22 & 23

c. Operation And Maintenance

Need to Halt or Reduce not a Defense	N.J.A.C. 7:14A-2.9(b)
Proper Operation and Maintenance	N.J.A.C. 7:14A-6.12

d. Monitoring And Records

Monitoring	N.J.A.C. 7:14A-6.5
Recordkeeping	N.J.A.C. 7:14A-6.6
Signatory Requirements for Monitoring Reports	N.J.A.C. 7:14A-6.9

e. Reporting Requirements

Planned Changes	N.J.A.C. 7:14A-6.7
Reporting of Monitoring Results	N.J.A.C. 7:14A-6.8
Noncompliance Reporting	N.J.A.C. 7:14A-6.10 & 6.8(h)
Hotline/Two Hour & Twenty-four Hour Reporting	N.J.A.C. 7:14A-6.10(c) & (d)
Written Reporting	N.J.A.C. 7:14A-6.10(e) &(f) & 6.8(h)
Duty to Provide Information	N.J.A.C. 7:14A-2.11, 6.2(a)14 & 18.1
Schedules of Compliance	N.J.A.C. 7:14A-6.4
Transfer	N.J.A.C. 7:14A-6.2(a)8 & 16.2

PART II

GENERAL REQUIREMENTS: DISCHARGE CATEGORIES

A. Additional Requirements Incorporated By Reference

1. Requirements for Discharges to Surface Waters

a. In addition to conditions in Part I of this permit, the conditions in this section are applicable to activities at the permitted location and are incorporated by reference. The permittee is required to comply with the regulations which are in effect as of the effective date of the final permit.

i. Surface Water Quality Standards N.J.A.C. 7:9B-1

ii. Water Quality Management Planning Regulations N.J.A.C. 7:15

B. General Conditions

1. Scope

a. The issuance of this permit shall not be considered as a waiver of any applicable federal, state, and local rules, regulations and ordinances.

2. Permit Renewal Requirement

a. Permit conditions remain in effect and enforceable until and unless the permit is modified, renewed or revoked by the Department.

b. Submit a complete permit renewal application: 180 days before the Expiration Date.

3. Notification of Non-Compliance

a. The permittee shall notify the Department of all non-compliance when required in accordance with N.J.A.C. 7:14A-6.10 by contacting the DEP HOTLINE at 1-877-WARNDEP (1-877-927-6337).

b. The permittee shall submit a written report as required by N.J.A.C. 7:14A-6.10 within five days.

4. Notification of Changes

a. The permittee shall give written notification to the Department of any planned physical or operational alterations or additions to the permitted facility when the alteration is expected to result in a significant change in the permittee's discharge and/or residuals use or disposal practices including the cessation of discharge in accordance with N.J.A.C. 7:14A-6.7.

b. Prior to any change in ownership, the current permittee shall comply with the requirements of N.J.A.C. 7:14A-16.2, pertaining to the notification of change in ownership.

5. Access to Information

a. The permittee shall allow an authorized representative of the Department, upon the presentation of credentials, to enter upon a person's premises, for purposes of inspection, and to access / copy any records that must be kept under the conditions of this permit.

6. Operator Certification

a. Pursuant to N.J.A.C. 7:10A-1.1 et seq. every wastewater system not exempt pursuant to N.J.A.C. 7:10A-1.1(b) requires a licensed operator. The operator of a system shall meet the Department's requirements pursuant to N.J.A.C. 7:10A-1.1 and any amendments. The name of the proposed operator, where required shall be submitted to the Department at the address below, in order that his/her qualifications may be determined prior to initiating operation of the treatment works.

i. Notifcations shall be submitted to:
NJDEP
Examination and Licensing Unit
P.O. Box 417
Trenton, New Jersey 08625
(609)777-1012

b. The permittee shall notify the Department of any changes in licensed operator within two weeks of the change.

7. Operation Restrictions

a. The operation of a waste treatment or disposal facility shall at no time create: (a) a discharge, except as authorized by the Department in the manner and location specified in Part III of this permit; (b) any discharge to the waters of the state or any standing or ponded condtion for water or waste, except as specifically authorized by a valid NJPDES permit.

8. Residuals Management

a. The permittee shall comply with land-based sludge management criteria and shall conform with the requirements for the management of residuals and grit and screenings under N.J.A.C. 7:14A-6.15(a), which includes:

i. Standards for the Use or Disposal of Residual, N.J.A.C. 7:14A-20;

ii. Section 405 of the Federal Act governing the disposal of sludge from treatment works treating domestic sewage;

iii. The Solid Waste Management Act, N.J.S.A. 13:1E-1 et seq., and the Solid Waste Management Rules, N.J.A.C. 7:26;

iv. The Sludge Quality Assurance Regulations, N.J.A.C. 7:14C;

v. The Statewide Sludge Management Plan promulgated pursuant to the Water Quality Planning Act, N.J.S.A. 58:11A-1 et seq., and the Solid Waste Management Act, N.J.S.A. 13:1E-1 et seq.; and

vi. The provisions concerning disposal of sewage sludge and septage in sanitary landfills set forth at N.J.S.A. 13:1E-42 and the Statewide Sludge Management Plan.

vii. Residual that is disposed in a municipal solid waste landfill unit shall meet the requirements in 40 CFR Part 258 and/or N.J.A.C. 7:26 concerning the quality of residual disposed in a municipal solid waste landfill unit. (That is, passes the Toxicity Characteristic Leaching Procedure and does not contain "free liquids" as defined at N.J.A.C. 7:14A-1.2.)

b. If any applicable standard for residual use or disposal is promulgated under section 405(d)of the Federal Act and Sections 4 and 6 of the State Act and that standard is more stringent than any limitation on the pollutant or practice in the permit, the Department may modify or revoke and reissue the permit to conform to the standard for residual use or disposal.

c. The permittee shall make provisions for storage, or some other approved alternative management strategy, for anticipated downtimes at a primary residual management alternative. The permittee shall not be permitted to store residual beyond the capacity of the structural treatment and storage components of the treatment works. N.J.A.C. 7:14A-20.8(a) and N.J.A.C. 7:26 provide for the temporary storage of residuals for periods not exceeding six months, provided such storage does not cause pollutants to enter surface or ground waters of the State. The storage of residual for more than six months is not authorized under this permit. However, this prohibition does not apply to residual that remains on the land for longer than six months when the person who prepares the residual demonstrates that the land on which the residual remains is not a surface disposal site or landfill. The demonstration shall explain why residual must remain on the land for longer than six months prior to final use or disposal, discuss the approximate time period during which the residual shall be used or disposed and provide documentation of ultimate residual management arrangements. Said demonstration shall be in writing, be kept on file by the person who prepares residual, and submitted to the Department upon request.

d. The permittee shall comply with the appropriate adopted District Solid Waste or Sludge Management Plan (which by definition in N.J.A.C. 7:14A-1.2 includes Generator Sludge Management Plans), unless otherwise specifically exempted by the Department.

e. The preparer must notify and provide information necessary to comply with the N.J.A.C. 7:14A-20 land application requirements to the person who applies bulk residual to the land. This shall include, but not be limited to, the applicable recordkeeping requirements and certification statements of 40 CFR 503.17 as referenced at N.J.A.C 7:14A-20.7(j).

f. The preparer who provides biosolids to another person who further prepares the biosolids for application to the land must provide this person with notification and information necessary to comply with the N.J.A.C. 7:14A-20 land application requirements.

g. Any person who prepares bulk residual in New Jersey that is applied to land in a State other than New Jersey shall comply with the requirement at N.J.A.C. 7:14A-20.7(b)1.ix and/or 20.7(b)1.x, as applicable, to provide written notice to the Department and to the permitting authority for the State in which the bulk residual is proposed to be applied.

PART III
LIMITS AND MONITORING REQUIREMENTS

MONITORED LOCATION:	RECEIVING STREAM:	STREAM CLASSIFICATION:	DISCHARGE CATEGORY(IES):
001A NCCW Main Condenser	Oyster Creek Discharge Canal	SE1(C2)	B - Industrial Wastewater

Location Description

Sampling for all parameters shall be taken at the discharge into the discharge canal or at the discharge tunnel east of the chlorine monitoring shed. Discharge occurs at lat. 39d 48' 40.2" and long. 74d 12' 00.0". Please refer to items A1j and E2f of Part IV for additional information on pH and CPO limits. Please refer to items G2g, G2h and G2i for additional info. on heat and temperature limits.

Contributing Waste Types

Non-contact Cooling Water

Surface Water DMR Reporting Requirements:

Submit a Monthly DMR: within twenty-five days after the end of every month beginning from the effective date of the permit (EDP).

Comments:

Monitoring for all parameters is not required when there is no flow and/or heat load across the Station's main condenser (i.e. plant is not generating power).

Table III - A - 1: Surface Water DMR Limits and Monitoring Requirements

PHASE: Final **PHASE Start Date:** **PHASE End Date:**

Parameter	Sample Point	Limit	Limit	Units	Limit	Limit	Limit	Units	Frequency	Sample Type
Flow, In Conduit or Thru Treatment Plant	Intake	REPORT Monthly Average	REPORT Daily Maximum	MGD	*****	*****	*****	*****	Continuous	Calculated
January thru December	QL	***	***		***	***	***			
Flow, In Conduit or Thru Treatment Plant	Effluent Gross Value	REPORT Monthly Average	REPORT Daily Maximum	MGD	*****	*****	*****	*****	Continuous	Calculated
January thru December	QL	***	***		***	***	***			
pH	Effluent Gross Value	*****	*****	*****	6.5 Monthly Minimum	*****	8.5 Monthly Maximum	SU	2/Week	Grab
January thru December	QL	***	***		***	***	***			
pH	Intake From Stream	*****	*****	*****	REPORT Monthly Minimum	*****	REPORT Monthly Maximum	SU	2/Week	Grab
January thru December	QL	***	***		***	***	***			

Surface Water DMR Reporting Requirements:

Submit a Monthly DMR: within twenty-five days after the end of every month beginning from the effective date of the permit (EDP).

Comments:

Monitoring for all parameters is not required when there is no flow and/or heat load across the Station's main condenser (i.e. plant is not generating power).

Table III - A - 1: Surface Water DMR Limits and Monitoring Requirements

PHASE: Final **PHASE Start Date:** **PHASE End Date:**

Parameter	Sample Point	Limit	Limit	Units	Limit	Limit	Limit	Units	Frequency	Sample Type
LC50 Statre 96hr Acu Mysid Bahia	Effluent Gross Value	*****	*****	*****	REPORT Report Per Minimum	*****	*****	PERCENT	1/Year	Composite
January thru December	QL	***	***		***	***	***			
Chlorine Produced Oxidants Option 1	Effluent Gross Value	REPORT Monthly Average	41.7 Daily Maximum	KG/DAY	*****	REPORT Monthly Average	0.2 Daily Maximum	MG/L	1/Day	Grab
January thru December	RQL	***	***		***	***	0.1			
Chlorine Produced Oxidants Option 2	Effluent Gross Value	*****	*****	*****	*****	REPORT Monthly Average	0.2 Daily Maximum	MG/L	1/Day	Grab
January thru December	RQL	***	***		***	***	0.1			
Temperature, oC Option 1	Effluent Gross Value	*****	*****	*****	*****	REPORT Monthly Average	41.1 Daily Maximum	DEG.C	Continuous	Grab
January thru December	QL	***	***		***	***	***			
Temperature, oC Option 2	Effluent Gross Value	*****	*****	*****	*****	REPORT Monthly Average	43.3 Daily Maximum	DEG.C	Continuous	Grab
January thru December	QL	***	***		***	***	***			
Temperature, oC	Intake From Stream	*****	*****	*****	*****	REPORT Monthly Average	REPORT Daily Maximum	DEG.C	Continuous	Grab
January thru December	QL	***	***		***	***	***			
Net Rate of Addition of Heat Option 1	Effluent Gross Value	*****	*****	*****	*****	REPORT Monthly Average	5420 Daily Maximum	MBTU/HR	1/Day	Calculated
January thru December	QL	***	***		***	***	***			

Surface Water DMR Reporting Requirements:

Submit a Monthly DMR: within twenty-five days after the end of every month beginning from the effective date of the permit (EDP).

Comments:

Monitoring for all parameters is not required when there is no flow and/or heat load across the Station's main condenser (i.e. plant is not generating power).

Table III - A - 1: Surface Water DMR Limits and Monitoring Requirements

PHASE: Final **PHASE Start Date:** **PHASE End Date:**

Parameter	Sample Point	Limit	Limit	Units	Limit	Limit	Limit	Units	Frequency	Sample Type
Net Rate of Addition of Heat Option 2	Effluent Gross Value	*****	*****	*****	*****	REPORT Monthly Average	5700 Daily Maximum	MBTU/HR	1/Day	Calculated
January thru December	QL	***	***		***	***	***			
Temp. Diff. between Intake and Discharge Option 1	Effluent Net Value	*****	*****	*****	*****	REPORT Monthly Average	12.8 Daily Maximum	DEG.C	1/Day	Calculated
January thru December	QL	***	***		***	***	***			
Temp. Diff. between Intake and Discharge Option 2	Effluent Net Value	*****	*****	*****	*****	REPORT Monthly Average	18.3 Daily Maximum	DEG.C	1/Day	Calculated
January thru December	QL	***	***		***	***	***			
Velocity of Intake	Effluent Gross Value	*****	*****	*****	*****	REPORT Monthly Average	2.2 Daily Maximum	FPS	1/Month	Measured
January thru December	QL	***	***		***	***	***			

MONITORED LOCATION:	RECEIVING STREAM:	STREAM CLASSIFICATION:	DISCHARGE CATEGORY(IES):
002A NCCW from Rad. System	Forked River Intake Canal	SE1(C2)	B - Industrial Wastewater

Location Description

Sampling shall take place at the discharge to the intake canal or alternatively at the Radwaste Heat Exchanger Room. Discharge is to the intake canal at Latitude 39d 48' 52.9" and Longitude 74d 12' 28.2". Please refer to item A.1.h. of Part IV for additional information on pH. Please refer to item G.1.h. for additional information on temperature limits.

Contributing Waste Types

Non-contact Cooling Water

Surface Water DMR Reporting Requirements:

Submit a Monthly DMR: Within twenty-five days after the end of every month beginning from the effective date of the permit (EDP)..

Table III - B - 1: Surface Water DMR Limits and Monitoring Requirements

PHASE: Final **PHASE Start Date:** **PHASE End Date:**

Parameter	Sample Point	Limit	Limit	Units	Limit	Limit	Limit	Units	Frequency	Sample Type
Flow, In Conduit or Thru Treatment Plant	Effluent Gross Value	REPORT Monthly Average	REPORT Daily Maximum	MGD	*****	*****	*****	*****	2/Month	Calculated
January thru December	QL	***	***		***	***	***			
pH	Effluent Gross Value	*****	*****	*****	6.5 Report Per Minimum	*****	8.5 Report Per Maximum	SU	2/Week	Grab
January thru December	QL	***	***		***	***	***			
pH	Intake From Stream	*****	*****	*****	REPORT Daily Minimum	*****	REPORT Daily Maximum	SU	2/Week	Grab
January thru December	QL	***	***		***	***	***			
LC50 Statre 96hr Acu Mysid Bahia	Effluent Gross Value	*****	*****	*****	REPORT Daily Minimum	*****	*****	PERCENT	1/Year	Composite
January thru December	QL	***	***		***	***	***			

Surface Water DMR Reporting Requirements:

Submit a Monthly DMR: Within twenty-five days after the end of every month beginning from the effective date of the permit (EDP)..

Table III - B - 1: Surface Water DMR Limits and Monitoring Requirements

PHASE: Final **PHASE Start Date:** **PHASE End Date:**

Parameter	Sample Point	Limit	Limit	Units	Limit	Limit	Limit	Units	Frequency	Sample Type
Chlorine Produced Oxidants	Effluent Gross Value	*****	*****	*****	*****	REPORT Monthly Average	0.2 Daily Maximum	MG/L	2/Month	Grab
January thru December	MDL	***	***		***	0.1	0.1			
Temperature, oC	Effluent Gross Value	*****	*****	*****	*****	REPORT Monthly Average	45 Daily Maximum	DEG.C	2/Month	Grab
January thru December	QL	***	***		***	***	***			
Temperature, oC	Intake From Stream	*****	*****	*****	*****	REPORT Monthly Average	REPORT Daily Maximum	DEG.C	2/Month	Grab
January thru December	QL	***	***		***	***	***			
Net Rate of Addition of Heat	Effluent Gross Value	*****	*****	*****	*****	REPORT Monthly Average	790 Daily Maximum	MBTU/HR	2/Month	Calculated
January thru December	QL	***	***		***	***	***			
Temp. Diff. between Intake and Discharge	Effluent Net Value	*****	*****	*****	*****	REPORT Monthly Average	18.3 Daily Maximum	DEG.C	2/Month	Calculated
January thru December	QL	***	***		***	***	***			

MONITORED LOCATION:	RECEIVING STREAM:	STREAM CLASSIFICATION:	DISCHARGE CATEGORY(IES):
004A Combined Wastewater	Oyster Creek Discharge Canal	SE1(C2)	B - Industrial Wastewater

Location Description

Sampling shall take place at the sample pipe located inside the fence near the terminus of the 30 inch header or at the outfall of DSN 004A depending upon on-site conditions. Effluent net flow values shall be used for calculating loading values. Net flow is equal to effluent flow - heat exchanger flow. Heat exchanger flow shall be reported as "internal monitoring". Please refer to item A.1.h. and G.1.h. for addtional information on pH and temperature, respectively.

Contributing Waste Types

Process Water

Surface Water DMR Reporting Requirements:

Submit a Monthly DMR: Within twenty-five days after the end of every month beginning from the effective date of the permit (EDP)..

Table III - C - 1: Surface Water DMR Limits and Monitoring Requirements

PHASE: Final **PHASE Start Date:** **PHASE End Date:**

Parameter	Sample Point	Limit	Limit	Units	Limit	Limit	Limit	Units	Frequency	Sample Type
Flow, In Conduit or Thru Treatment Plant	Internal Monitoring	REPORT Monthly Average	REPORT Daily Maximum	MGD	*****	*****	*****	*****	1/Month	Calculated
January thru December	QL	***	***		***	***	***			
Flow, In Conduit or Thru Treatment Plant	Effluent Gross Value	REPORT Monthly Average	REPORT Daily Maximum	MGD	*****	*****	*****	*****	1/Month	Calculated
January thru December	QL	***	***		***	***	***			
Flow, In Conduit or Thru Treatment Plant	Effluent Net Value	REPORT Monthly Average	REPORT Daily Maximum	MGD	*****	*****	*****	*****	1/Month	Calculated
January thru December	QL	***	***		***	***	***			
pH	Effluent Gross Value	*****	*****	*****	6.0 Daily Minimum	*****	9.0 Daily Maximum	SU	1/Week	Grab
January thru December	QL	***	***		***	***	***			

Surface Water DMR Reporting Requirements:

Submit a Monthly DMR: Within twenty-five days after the end of every month beginning from the effective date of the permit (EDP)..

Table III - C - 1: Surface Water DMR Limits and Monitoring Requirements

PHASE: Final **PHASE Start Date:** **PHASE End Date:**

Parameter	Sample Point	Limit	Limit	Units	Limit	Limit	Limit	Units	Frequency	Sample Type
pH	Intake From Stream	*****	*****	*****	REPORT Daily Minimum	*****	REPORT Daily Maximum	SU	1/Week	Grab
January thru December	QL	***	***		***	***	***			
Solids, Total Suspended	Effluent Gross Value	*****	*****	*****	*****	REPORT Monthly Average	REPORT Daily Maximum	MG/L	1/Month	Grab
January thru December	QL	***	***		***	***	***			
Solids, Total Suspended	Effluent Net Value	REPORT Monthly Average	22.7 Daily Maximum	KG/DAY	*****	30 Monthly Average	100 Daily Maximum	MG/L	1/Month	Calculated
January thru December	QL	***	***		***	***	***			
Solids, Total Suspended	Intake From Stream	REPORT	*****	*****	*****	REPORT Monthly Average	REPORT Daily Maximum	MG/L	1/Month	Grab
January thru December	QL	***	***		***	***	***			
LC50 Statre 96hr Acu Mysid Bahia	Effluent Gross Value	*****	*****	*****	REPORT Daily Minimum	*****	*****	PERCENT	1/Year	Composite
January thru December	QL	***	***		***	***	***			
Chlorine Produced Oxidants	Effluent Gross Value	*****	*****	*****	*****	REPORT Monthly Average	0.2 Daily Maximum	MG/L	1/Month	Grab
January thru December	MDL	***	***		***	0.1	0.1			
Temperature, oC	Effluent Gross Value	*****	*****	*****	*****	REPORT Monthly Average	37.2 Daily Maximum	DEG.C	1/Month	Grab
January thru December	QL	***	***		***	***	***			

Surface Water DMR Reporting Requirements:

Submit a Monthly DMR: Within twenty-five days after the end of every month beginning from the effective date of the permit (EDP)..

Table III - C - 1: Surface Water DMR Limits and Monitoring Requirements

PHASE: Final **PHASE Start Date:** **PHASE End Date:**

Parameter	Sample Point	Limit	Limit	Units	Limit	Limit	Limit	Units	Frequency	Sample Type
Petroleum Hydrocarbons	Effluent Gross Value	*****	*****	*****	*****	REPORT Monthly Average	REPORT Daily Maximum	MG/L	1/Month	Grab
January thru December	QL	***	***		***	***	***			
Petroleum Hydrocarbons	Effluent Net Value	REPORT Monthly Average	4.54 Daily Maximum	KG/DAY	*****	10 Monthly Average	15 Daily Maximum	MG/L	1/Month	Calculated
January thru December	QL	***	***		***	***	***			
Petroleum Hydrocarbons	Intake From Stream	*****	*****	*****	*****	REPORT Monthly Average	REPORT Daily Maximum	MG/L	1/Month	Grab
January thru December	QL	***	***		***	***	***			
Carbon, Tot Organic (TOC)	Effluent Gross Value	*****	*****	*****	*****	REPORT Monthly Average	50 Daily Maximum	MG/L	1/Month	Grab
January thru December	QL	***	***		***	***	***			

MONITORED LOCATION:	RECEIVING STREAM:	STREAM CLASSIFICATION:	DISCHARGE CATEGORY(IES):
005A Dilution Pump Discharge	Oyster Creek Discharge Canal	SE1(C2)	B - Industrial Wastewater

Location Description

Outfall discharges into the discharge canal at Latitude 39d 48' 48.9" and Longitude 74d 12' 28.2"

Contributing Waste Types

Process Water

Surface Water DMR Reporting Requirements:

Submit a Monthly DMR: Within twenty-five days after the end of every month beginning from the effective date of the permit (EDP)..

Table III - D - 1: Surface Water DMR Limits and Monitoring Requirements

PHASE: Final **PHASE Start Date:** **PHASE End Date:**

Parameter	Sample Point	Limit	Limit	Units	Limit	Limit	Limit	Units	Frequency	Sample Type
Flow, In Conduit or Thru Treatment Plant	Effluent Gross Value	REPORT Monthly Average	REPORT Daily Maximum	MGD	*****	*****	*****	*****	Continuous	Calculated
January thru December	QL	***	***		***	***	***			

MONITORED LOCATION:	RECEIVING STREAM:	STREAM CLASSIFICATION:	DISCHARGE CATEGORY(IES):
007A Dilution Pump Seal Water	Oyster Creek Intake Canal	SE1(C2)	B - Industrial Wastewater

Location Description

Sampling shall take place at the north side of the dilution pump structure at Latitude 39d 48' 50.9" and Longitude 74d 12' 55.1".

Contributing Waste Types

Process Water

Surface Water DMR Reporting Requirements:

Submit a Monthly DMR: Within twenty-five days after the end of every month beginning from the effective date of the permit (EDP)..

Table III - E - 1: Surface Water DMR Limits and Monitoring Requirements

PHASE: Final **PHASE Start Date:** **PHASE End Date:**

Parameter	Sample Point	Limit	Limit	Units	Limit	Limit	Limit	Units	Frequency	Sample Type
Flow, In Conduit or Thru Treatment Plant	Effluent Gross Value	REPORT Monthly Average	REPORT Daily Maximum	GPD	*****	*****	*****	*****	1/Month	Calculated
January thru December	QL	***	***		***	***	***			
Petroleum Hydrocarbons	Effluent Gross Value	*****	*****	*****	*****	10 Monthly Average	15 Daily Maximum	MG/L	1/Month	Grab
January thru December	QL	***	***		***	***	***			

MONITORED LOCATION:	RECEIVING STREAM:	STREAM CLASSIFICATION:	DISCHARGE CATEGORY(IES):
008A Screen Water Discharge	Oyster Creek Discharge Canal	SE1(C2)	B - Industrial Wastewater

Location Description

Sampling shall take place at the outfall of DSN 008A at Latitude 39d 48' 48.8" and Longitude 74d 12' 27.5".

Contributing Waste Types

Unprocessed water

Surface Water DMR Reporting Requirements:

Submit a Monthly DMR: Within twenty-five days after the end of every month beginning from the effective date of the permit (EDP)..

Table III - F - 1: Surface Water DMR Limits and Monitoring Requirements

PHASE: Final **PHASE Start Date:** **PHASE End Date:**

Parameter	Sample Point	Limit	Limit	Units	Limit	Limit	Limit	Units	Frequency	Sample Type
Flow, In Conduit or Thru Treatment Plant	Effluent Gross Value	REPORT Monthly Average	REPORT Daily Maximum	MGD	*****	*****	*****	*****	1/Month	Calculated
January thru December	QL	***	***		***	***	***			

MONITORED LOCATION:	RECEIVING STREAM:	STREAM CLASSIFICATION:	DISCHARGE CATEGORY(IES):
009A Fish Sampling Pool Disch.	Forked River Intake Canal	SE1(C2)	B - Industrial Wastewater

Location Description

Sampling shall take place at the outfall of DSN 009A at Latitude 39d 48' 48.6" and Longitude 74d 12' 27.9".

Contributing Waste Types

Unprocessed water

Surface Water DMR Reporting Requirements:

Submit a Monthly DMR: Within twenty-five days after the end of every month beginning from the effective date of the permit (EDP)..

Table III - G - 1: Surface Water DMR Limits and Monitoring Requirements

PHASE: Final **PHASE Start Date:** **PHASE End Date:**

Parameter	Sample Point	Limit	Limit	Units	Limit	Limit	Limit	Units	Frequency	Sample Type
Flow, In Conduit or Thru Treatment Plant	Effluent Gross Value	REPORT Monthly Average	REPORT Daily Maximum	MGD	*****	*****	*****	*****	1/Month	Calculated
January thru December	QL	***	***		***	***	***			

PART IV

SPECIFIC REQUIREMENTS: NARRATIVE

Industrial Wastewater

A. MONITORING REQUIREMENTS

1. Standard Monitoring Requirements

a. Each analysis required by this permit shall be performed by a New Jersey Certified Laboratory that is certified to perform that analysis.

b. The Permittee shall perform all water/wastewater analyses in accordance with the analytical test procedures specified in 40 CFR 136 unless other test procedures have been approved by the Department in writing or as otherwise specified in the permit.

c. The permittee shall utilize analytical methods that will ensure compliance with the Quantification Levels (QLs) listed in PART III. QLs include, but are not limited to, Recommended Quantification Levels (RQLs) and Method Detection Levels (MDLs). If the permittee and/or contract laboratory determines that the QLs achieved for any pollutant(s) generally will not be as sensitive as the QLs specified in PART III, the permittee must submit a justification of such to the Bureau of Surface Water Permitting. For limited parameters with no QL specified, the sample analysis shall use a detection level at least as sensitive as the effluent limit.

d. All sampling shall be conducted in accordance with the Department's Field Sampling Procedures Manual, or an alternate method approved by the Department in writing.

e. All monitoring shall be conducted as specified in Part III.

f. All sample frequencies expressed in Part III are minimum requirements. Any additional samples taken consistent with the monitoring and reporting requirements contained herein shall be reported on the Monitoring Report Forms.

g. Annual and semi-annual wastewater testing shall be conducted in a different quarter of each year so that tests are conducted in each of the four permit quarters of the permit cycle. Testing may be conducted during any month of the permit quarters.

h. The permittee shall perform all residual analyses in accordance with the analytical test procedures specified in 40 CFR 503.8 and the Sludge Quality Assurance Regulations (N.J.A.C. 7:14C) unless other test procedures have been approved by the Department in writing or as otherwise specified in the permit.

i. Flow shall be measured using a calculated sample type for all outfalls.

j. pH: For DSN 001A and 002A - the effluent pH shall be in the range of 6.5 standard units (S.U.) to 8.5 S.U. However, if the intake pH is less than 6.5 S.U., the pH of the effluent shall not be considered a violation of the permit if it is less than the intake pH. Likewise, if the intake pH is greater than 8.5 S.U., the pH of the effluent shall not be considered a violation of the permit if it is greater than 8.5 S.U.

For DSN 004A - the effluent pH shall be in the range of 6.0 to 9.0 S.U. However, if the intake pH is less than 6.0 S.U., the pH of the effluent shall not be considered a violation of the permit if it is less than the intake pH. Likewise, if the intake pH is greater than 9.0 S.U., the pH of the effluent shall not be considered a violation of the permit if it is greater than 9.0 S.U.

When reporting of the intake water pH is required, it shall be reported as the intake pH on the Monitoring Report Form.

For DSN 007A - the pH of the effluent shall not be less than 6.0 S.U. nor greater than 9.0 S.U.; or, during periods when the pH of the intake water is less than 6.0, the pH of the effluent shall not be less than that of the intake; or, during periods when the pH of the intake water is greater than 9.0, the pH shall not be greater than that of the intake. However, no monitoring or reporting for pH is required at this time.

k. The net amount of heat per unit time shall be calculated by multiplying heat capacity, discharge flow, and discharge-intake temperature difference.

l. Net values shall be calculated by using the following formula: [(gross effluent concentration)*(gross effluent flow) - (intake concentration)*(intake flow)] / [gross effluent flow].

m. Monitoring for temperature shall only be conducted when cooling water is discharged during the monitoring period (i.e. the facility is generating power).

B. RECORDKEEPING

1. Standard Recordkeeping Requirements

a. The permittee shall retain records of all monitoring information, including 1) all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation (if applicable), 2) copies of all reports required by this NJPDES permit, 3) all data used to complete the application for a NJPDES permit, and 4) monitoring information required by the permit related to the permittee's residual use and/or disposal practices, for a period of at least 5 years, or longer as required by N.J.A.C. 7:14A-20, from the date of the sample, measurement, report, application or record.

b. Records of monitoring information shall include 1) the date, locations, and time of sampling or measurements, 2) the individual(s) who performed the sampling or measurements, 3) the date(s) the analyses were performed, 4) the individual(s) who performed the analyses, 5) the analytical techniques or methods used, and 6) the results of such analyses.

C. REPORTING

1. Standard Reporting Requirements

a. The permittee shall submit all required monitoring results to the Department on the forms provided to them. The Monitoring Report Forms (MRFs) may be provided to the permittee in either a paper format or in an electronic file format. Unless otherwise noted, all requirements below pertain to both paper and electronic formats.

b. Any MRFs in paper format shall be submitted to the following addresses:

i. NJDEP
Division of Water Quality
Bureau of Permit Management
P.O. Box 029
Trenton, New Jersey 08625-0029

ii. (if requested by the Water Compliance and Enforcement Bureau)
NJDEP: Central Bureau of Water Compliance and Enforcement
P.O. Box 407
Trenton, New Jersey 08625-0407

c. Any electronic data submission shall be in accordance with the guidelines and provisions outlined in the Department's Electronic Data Interchange (EDI) agreement with the permittee. Paper copies must be available for on-site inspection by DEP personnel or provided to the DEP upon written request.

d. All monitoring report forms shall be certified by the highest ranking official having day-to-day managerial and operational responsibilities for the discharging facility.

e. The highest ranking official may delegate responsibility to certify the monitoring report forms in his or her absence. Authorizations for other individuals to sign shall be made in accordance with N.J.A.C. 7:14A-4.9(b).

f. Monitoring results shall be submitted in accordance with the current Discharge Monitoring Report Manual and any updates thereof.

g. If monitoring for a parameter is not required in a monitoring period, the permittee must report "CODE=N" for that parameter.

h. For intermittent discharges, the permittee shall obtain a sample during at least one of the discharge events occurring during a monitoring period.

i. If there are no discharge events during an entire monitoring period, the permittee must notify the Department when submitting the monitoring results. This is accomplished by placing a check mark in the "No Discharge this monitoring period" box on the paper or electronic version of the monitoring report submittal form.

D. SUBMITTALS

1. Standard Submittal Requirements

a. The permittee shall amend the Operation & Maintenance Manual whenever there is a change in the treatment works design, construction, operations or maintenance which substantially changes the treatment works operations and maintenance procedures.

E. FACILITY MANAGEMENT

1. Discharge Requirements

a. The permittee shall discharge at the location(s) specified in PART III of this permit.

b. The permittee shall not discharge foam or cause foaming of the receiving water that: 1) Forms objectionable deposits on the receiving water, 2) Forms floating masses producing a nuisance, or 3) Interferes with a designated use of the waterbody.

c. The permittee's discharge shall not produce objectionable color or odor in the receiving stream.

d. The discharge shall not exhibit a visible sheen.

e. When quantification levels (QL) and effluent limits are both specified for a given parameter in Part III, and the QL is less stringent than the effluent limit, effluent compliance will be determined by comparing the reported value against the QL.

f. The Permittee is authorized to use the following corrosion inhibitors, biocides, or other cooling water additives: DSN 001A - Sodium hypochlorite; DSN 002A - Chlorine gas; DSN 004A Sodium hypochlorite, Bioguard Tabguard Pucks (trichloro-s-triazinetrione).

Chlorine Produced Oxidants (CPO) shall not be discharged from any single generating unit for more than two hours per day. Samples for CPO shall be taken once during each two hour period of chlorination. Option 1 CPO limits apply to DSN 001A during normal operations. Option 2 CPO limits apply to DSN 001A during periods of chlorination of the turbine building closed CW heat exchanger.

2. Applicability of Discharge Limitations and Effective Dates

a. Surface Water Discharge Monitoring Report (DMR) Form Requirements

i. The final effluent limitations and monitoring conditions contained in PART III apply for the full term of this permit action.

3. Operation, Maintenance and Emergency conditions

a. The permittee shall operate and maintain treatment works and facilities which are installed or used by the permittee to achieve compliance with the terms and conditions of this permit as specified in the Operation & Maintenance Manual.

b. The permittee shall develop emergency procedures to ensure effective operation of the treatment works under emergency conditions in accordance with NJAC 7:14A-6.12(d).

4. Toxicity Testing Requirements - Acute Whole Effluent Toxicity (DSNs 001A, 002A and 004A)

a. The permittee shall conduct toxicity tests on its wastewater discharge in accordance with the provisions in this section. Such testing will determine if appropriately selected effluent concentrations adversely affect the test species.

b. Acute toxicity tests shall be conducted using the test species and method identified in Part III of this permit.

c. Any test that does not meet the specifications of N.J.A.C. 7:18, laboratory certification regulations, must be repeated within 30 days of the completion of the initial test. The repeat test shall not replace subsequent testing required in Part III.

d. The permittee shall resubmit an Acute Methodology Questionnaire within 60 days of any change in laboratory.

e. Submit an acute whole effluent toxicity test report: within twenty-five days after the end of every 12 month monitoring period beginning from the effective date of the permit (EDP). The permittee shall submit toxicity test results on appropriate forms.

f. Test reports shall be submitted to:

i. New Jersey Department of Environmental Protection
Division of Water Quality
Bureau of Surface Water Permitting
P.O. Box 029
Trenton, New Jersey 08625.

F. CONDITIONS FOR MODIFICATION

1. Notification requirements

a. The permittee may request a minor modification for a reduction in monitoring frequency for a non-limited parameter when four consecutive test results of "not detected" have occurred using the specified QL.

2. Causes for modification

a. The Department may modify or revoke and reissue any permit to incorporate 1) any applicable effluent standard or any effluent limitation, including any effluent standards or effluent limitations to control the discharge of toxic pollutants or pollutant parameters such as acute or chronic whole effluent toxicity and chemical specific toxic parameters, 2) toxicity reduction requirements, or 3) the implementation of a TMDL or watershed management plan adopted in accordance with N.J.A.C. 7:15-7.

b. The permittee may request a minor modification to eliminate the monitoring requirements associated with a discharge authorized by this permit when the discharge ceases due to changes at the facility.

G. Custom Requirement

1. Section 316(a) Determination

a. The Department is hereby granting a Section 316(a) variance for the existing once-through cooling system. This determination is based on the fact that the facility's operations have not changed appreciably since the time that the 1994 NJPDES permit was issued and based on the fact that cooling water intake flow rates have remained relatively constant.

b. While the implementation of closed-cycle cooling is not being required under Section 316(a), the Department would be remiss if it did not recognize the benefits of closed-cycle cooling on thermal impacts. According to the information presented in the report entitled "Determination of Cooling Tower Availability" dated March 4, 2006, closed-cycle cooling will result in a reduction of flow volume at DSN 001A from 460,000 gallons per minute (gpm) of once-through cooling water to 10,000 gpm of cooling tower blowdown. This is a 98% reduction in the flow volume for the heated discharge from DSN 001A.

c. Once a closed loop system is installed, the permittee shall comply with a daily maximum temperature limitation of 41.4 degrees Celsius for the cooling tower blowdown. In order for the Department to consider an alternate limit, the permittee shall conduct thermal modeling for the cooling tower blowdown. The purpose of this modeling is to appropriately define any heat dissipation area for consideration as part of any Section 316(a) determination.

2. Requirements to Monitor and/or Minimize Thermal Effects while the Once-Through Cooling System is Operational

a. Temperature Monitoring in Oyster Creek - The permittee shall continuously measure the temperature four (4) feet below the surface of Oyster Creek at the Route 9 bridge. Any results have a bearing on whether or not the permittee has to perform an Effluent Temperature Evaluation Study (ETES) as described in b. below.

b. Criteria for Having to Conduct an Effluent Temperature Evaluation Study (ETES).

i. Except as provided in ii below, the permittee shall conduct an ETES if any maximum daily temperature readings at the Route 9 bridge monitoring location exceed the temperature action level of 97 degrees Fahrenheit. The ETES is intended to determine what caused the exceedances and to identify mitigation measures for meeting the action level for effluent water temperature within Oyster Creek at the Route 9 bridge.

ii. When an exceedance occurs, the permittee shall:

a) Evaluate whether the exceedance of the temperature action level occured solely as a result of any, or a combination of, the following factors: unusually high intake temperature (i.e. any intake temperature in excess of 85 degrees Fahrenheit); operation of the dilution pumps in accordance with item d. below; implementation of the alternate effluent limitations in accordance with a Maximum Emergency Generation event as defined in G.2.g.; during condenser backwashing; during intake components maintenance; or when fewer than four circulating water pumps are operating.

b) If the evaluation shows that any of the above factors caused the exceedance, the permittee is not required to conduct an ETES. However, the permittee shall submit a report to the Department within ten business days of the exceedance, which specifies the relationship of the exceedance to items noted in a) above. The report shall be submitted to the following address:

NJDEP Division of Water Quality
Bureau of Surface Water Permitting
401 East State Street, P.O. Box 029
Trenton, NJ 08625

c) When the temperature monitoring action level exceedance occurs and the cause cannot be attributed to the factors described in a) above, then the permittee shall conduct an ETES where the conditions are defined in c. below.

c. Effluent Temperature Evaluation Study (ETES).

i. The permittee shall evaluate the relationship of the following factors to the exceedance of the temperature action level of 97 degrees Fahrenheit: circulating water pump operation, dilution pump operation, plant power levels, heat rejection, effluent temperature at DSN 001A, temperature at the Route 9 bridge, and the temperature differential across the main condenser for the date of the exceedance of the temperature action level as well as relevant periods prior to and following the exceedance.

ii. A written report shall be prepared documenting the evaluation conducted in accordance with Part IV G.2.c.i. The report shall include tabular and graphical presentation of daily maximum and average intake temperatures, effluent temperatures at DSN 001A, Route 9 bridge monitoring location temperatures, and the temperature differential across the main condenser. The report shall include an analysis and discussion of the cause of the exceedance and shall include recommended mitigation measures.

iii. If mitigation measures are identified that can be implemented while maintaining compliance with all other permit conditions, then the permittee is not required to obtain Department approval prior to implementation. Otherwise, Department approval will be required prior to implementation of mitigation measures or modification of the permit.

iv. Two copies of all written submissions required above shall be sent to:

NJDEP
Division of Water Quality
Bureau of Surface Water Permitting
401 East State Street, P.O. Box 029
Trenton, NJ 08625-029
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d. Dilution Pump Operations.

i. When the intake water temperature is at or above 60 degrees Fahrenheit and the temperature as measured four feet below the surface at the Route 9 bridge over Oyster Creek is at or less than 87 degrees Fahrenheit, no dilution pump operation is required.

ii. When the temperature in Oyster Creek exceeds 87 degrees Fahrenheit, as measured four feet below the surface at the Route 9 bridge over Oyster Creek, one dilution pump will be put into operation. If, after one dilution pump has been in operation for at least two hours, the temperature measured at such point continues to exceed 87 degrees Fahrenheit, a second dilution pump will be put into operation.

iii. When the intake water temperature is less than 60 degrees Fahrenheit, two dilution pumps will be put into operation.

iv. A third dilution pump shall be held in reserve at the Station and must be put into operation within 40 minutes after one of the other two dilution pumps becomes inoperable and the operation of two dilution pumps is required by ii. or iii. above.

v. During periods of dilution pump and/or dilution pump component maintenance, a sufficient number of dilution pumps may not be available to meet the requirements of ii., iii., and iv. above. In that event, the Station may be operated for a period not to exceed fourteen (14) days in order to make necessary repairs, provided at least one dilution pump is available for operation. As soon as a second dilution pump is available for operation, it shall be placed into service as required under ii., iii., and iv. When the Station has operated under this paragraph for 14 days and continues to lack sufficient pumps to comply with ii., iii., and iv., the Station shall become subject to vi. below instead of this paragraph.

vi. If dilution pump operation is required under ii., iii., and iv., and if one pump operation under v. above continues for 14 days, remedial action will be taken within 24 hours to bring the plant into compliance with ii., iii., and iv. If the remedial action taken involves reduction of Station power output, power will be reduced as necessary to achieve the same effects as operating the proper number of dilution pumps as required by paragraphs ii., iii., and iv.

vii. Paragraphs ii. through vi. above do not apply during Station shutdowns. Any dilution pump(s) will be operated, however, in a manner that will minimize the adverse impact of Station shutdown on marine and estuarine life in Oyster Creek and Barnegat Bay.

viii. Paragraphs ii. through vi. do not apply in the event of a hazardous substance spill into the intake or discharge canals. In such cases, the dilution pumps will be operated in a manner which will minimize the environmental impact of the spill, while taking into consideration the need to minimize the possibility of thermal shock mortality of organisms residing in the discharge canal.

e. Thermal Discharge.

i. The rate of temperature change from the Station shall not cause mortality to fish or shellfish.

f. Plant Shutdowns During Operation of Once-through Cooling System.

i. The permittee shall not schedule routine shutdowns during the months of December, January, February, and/or March.

ii. The permittee shall not schedule routine intake component (e.g. circulating water pumps and appurtenant equipment, traveling screens and appurtenant equipment, intake ports, etc.) maintenance which may cause violation of thermal limitations or intake velocity limitations during the months of June, July, August, and/or September. The Department acknowledges that the NJPDES Regulations require the permittee to maintain its plant in good working order and efficient operation and, therefore, some intake component maintenance may be required.

iii. In the event that shutdown or power reduction is required in December, January, February and/or March (i.e. in the event of an emergency), it is suggested that the permittee institute the following measures: lower reactor power slowly so the rate of change in the discharge canal water temperature is approximately 1 degree Fahrenheit per hour; provide a thermal refuge for the fish in the discharge canal by providing temporary portable boilers; and ensure that the temperture maintained in the discharge canal is at a level biologically appropriate for those fish present to prevent cold shock. It is not the Department's intent to jeopardize the safe operation of the plant; however, if these measures can be deployed and the safe operation of the plant can be maintained, it is recommended that the permittee do so in order to ensure compliance with item G.2.e.i.

g. Maximum Emergency Generation Event.

i. The permittee is permitted to increase its net rate of heat addition, effluent temperature and temperature difference between intake and discharge limitations for outfall DSN 001A during a Maximum Emergency Generation Event as ordered by the PJM Interconnection Office of Information Dispatcher in accordance with Section 2 (Capacity Conditions) of the PJM Interconnection Emergency Operations Manual M-13, dated October 10, 1998 and any subsequent revisions thereto. If a Maximum Emergency Generation Event occurs, the permittee shall comply with "Option 2" limits for these parameters. Within eight hours of the permittee being advised that Maximum Emergency Generation has been ordered, the permittee must notify the Department's Central Bureau of Water Compliance and Enforcement by telephone declaring that the Station has invoked the use of the alternate thermal limits of the permit. During non-business hours and weekends, the permittee shall notify the NJDEP Hotline at 1-877-WARNDEP. The Station must follow-up the telephone notification within five working days with a written report setting forth the following: the time and date of the telephone notification to the Department, the time and date the Station actually invoked relief under this permit condition, and the time and date it terminated such relief.

h. Temperature Limits - For the purposes of the Administrative Record, the Department recognizes that the following temperature limits apply to the facility in units of both Celsius and Fahrenheit:.

i. DSN 001A
Temperature Difference between Intake and Discharge (Option 1) - 12.8 degrees Celsius (23 degrees Fahrenheit)
Temperature Difference between Intake and Discharge (Option 2) - 18.3 degrees Celsius (33 degrees Fahrenheit)
Effluent Temperature (Option 1) - 41.1 degrees Celsius (106 degrees Fahrenheit)
Effluent Temperature (Option 2) - 43.3 degrees Celsius (110 degrees Fahrenheit).

ii. DSN 002A
Temperature Difference between Intake and Discharge - 18.3 degrees Celsius (33 degrees Fahrenheit)
Effluent Temperature - 45 degrees Celsius (113 degrees Fahrenheit).

iii. DSN 004A
Effluent Temperature - 37.2 degrees Celsius (99 degrees Fahrenheit).

i. Option 1 and Option 2 Heat and Temperature Limits - The Department has specified effluent limitations for effluent temperature, temperature difference between intake and discharge, and net rate of addition of heat under two scenarios that are identified in this permit as Option 1 and Option 2 limits. These limits are applicable as follows:.

i. Option 1 limits are applicable when four circulating water pumps are operating for condenser cooling.

ii. Option 2 limits shall be applicable when fewer than four circulating water pumps are operating, during periods of condenser backwash, during intake component maintenance, or during a Maximum Emergency Generation Event as defined in item G.2.g.

3. Section 316(b) Determination

a. The Department is hereby making a determination that closed-cycle cooling constitutes best technology available for this facility in accordance with Best Professional Judgment. This determination is based upon the following factors:.

i. Significant impingement and entrainment losses are documented in both historic and current data. The magnitude of these losses is due primarily to the location of the facility in a marine environment. Closed-cycle cooling will reduce water intake usage significantly thereby decreasing impingement and entrainment effects. Closed-cycle cooling is one of the few technologies available to target entrainment effects.

ii. Based on the Department's review of the report entitled "Determination of Cooling Tower Availability" dated March 4, 2006, the Department remains unconvinced that closed-cycle cooling is unavailable for this site.

iii. The permittee has received from the United States Nuclear Regulatory Commission a renewal of its operating license at the facility for twenty years. As a result, any costs incurred from closed-cycle cooling can be ammortized over a longer time frame thereby contributing to cost-effectiveness.

b. The compliance schedule for implementation of a closed-cycle cooling system is as follows:.

i. Apply for all necessary permits and approvals by the effective date of the permit (EDP) + 12 months.

ii. Finalize design and award construction contracts by EDP + 48 months.

iii. Operate closed-cycle cooling system within three years of finalizing design and awarding construction contracts as specified above.

4. Requirements to Minimize Impingement and Entrainment Effects While the Once-Through Cooling System is Operational

a. Intake Velocity.

i. When one circulating water pump is in operation, or when one circulating water pump is in operation in each half of the intake structure, or when there is no flow through the main condenser, the permittee is not required to measure intake velocity.

ii. The intake velocity shall not exceed 2.2 feet per second (fps) averaged over one minute at any point at the midplane of each port and the average of the average readings taken at 5 foot intervals from the top to the bottom of the water column of the individual port shall not exceed 1 fps during 6 port, 6 screen operation. In the event that any screen must be removed from service due to intake component maintenance, then the 1 fps limitation shall apply as an average over the effective intake face.

5. Biological Monitoring Program

a. Shallow Water Survey of Estuarine Organisms - A Barnegat Bay-wide beach seining survey shall be conducted year round to identify and assess all estuarine organisms that inhabit shallow water environments. This survey will serve to better assess the impacts that the facility is having on Barnegat Bay and to monitor any effects from the implementation of any closed-cycle cooling technology. This survey shall be designed to include the following components:.

i. Identify and quantify any forage finfish species, young-of-year, yearlings, early life stages of predator finfish species, macroinvertebrates, and other life forms encountered within the shallow water habitats of Barnegat Bay.

ii. Develop relative abundance indices (number of organisms caught per sampling effort) for the major forage species identified in recent plant-related impingement and entrainment samples.

iii. Perform a trends analysis of those species impacted by the impingement and entrainment operations at the facility to be used as indicator organisms to conduct a statistically robust trend analysis of their relative abundance indices over an extended time period once sufficient data becomes available.

iv. The shallow water surveys should be conducted at a minimum frequency of once per month or at a frequency set forth in any Biological Monitoring Program Work Plan approved by the Department.

b. The permittee shall submit to the Department for approval a Biological Monitoring Program Work Plan, which addresses the study components described above. The Work Plan shall be submitted by EDP + 6 months.

c. Not later than sixty days after receipt of the Department's written approval of the Work Plan, the permittee shall implement the Work Plan.

6. Plant Related Impingement and Entrainment Monitoring During Operation of Once-Through Cooling System

a. In order to ensure that recent impingement and entrainment monitoring is conducted thereby allowing a long term assessment of plant related intake effects, continued impingement and entrainment monitoring shall be conducted as follows:.

i. The permittee shall conduct ongoing impingement sampling at the circulating water intake during normal Station operations at a minimum frequency of twice per month on a year round basis. Sampling shall be conducted in accordance with the procedures set forth in the June 29, 2005 Proposal for Information Collection or as specified in a Department approved work plan.

ii. The permittee shall conduct ongoing entrainment sampling at the circulating water intake during normal Station operations at a minimum frequency of twice per month from May through October and once per month from November through April, weather and operational conditions permitting. Sampling shall be conducted in accordance with the procedures set forth in the June 29, 2005 Proposal for Information Collection or as specified in a Department approved work plan.