

**DOCKET NO. D-1981-020 CP-3**

**DELAWARE RIVER BASIN COMMISSION**

**Calpine Mid-Atlantic Generation, LLC  
Edge Moor and Hay Road Energy Centers  
Non-contact Cooling Water & Process Water Discharge  
City of Wilmington and New Castle County, Delaware**

**PROCEEDINGS**

This docket is issued in response to an application submitted to the Delaware River Basin Commission (DRBC or Commission) on March 12, 2021 (Application), for renewal of the docket holder's existing discharge of non-contact cooling water (NCCW) and process water. National Pollutant Discharge Elimination System (NPDES) Permit No. DE0000558 for this discharge was issued by the Delaware Department of Natural Resources and Environmental Control (DNREC).

The application was reviewed for continuation of the project in the Comprehensive Plan and approval under Section 3.8 of the *Delaware River Basin Compact*. The New Castle County Department of Land Use has been notified of pending action. A public hearing on this project was held by the DRBC on November 10, 2021.

**A. DESCRIPTION**

1. **Purpose.** The purpose of this docket is to renew approval of the docket holder's existing discharge of up to 870.2 million gallons per day (mgd) of NCCW, boiler and cooling tower blowdown, and intake screen backwash water from three (3) existing outfalls associated with the Edge Moor Energy Center and Hay Road Energy Center (HREC) power generating units. No modifications to the facilities are proposed.
2. **Location.** The Edge Moor and Hay Road Energy Centers are located along the Delaware River north of the mouth of Shellpot Creek, in the City of Wilmington and in New Castle County, Delaware. The facility will continue to discharge untreated process water to Delaware River Water Quality Zone 5 at River Mile 72 via existing Outfalls Nos. 001, 006, and 007.

Specific location information has been withheld for security reasons.

3. **Area Served.** The Edge Moor and Hay Road Energy Centers provide electricity to the Pennsylvania-New Jersey-Maryland (PJM) Interconnection (the regional transmission organization). Wastewater streams consist of NCCW, cooling tower blowdown, intake screen backwash, and storm water runoff that are generated on-site by the docket holder's power generation facilities. For the purpose of defining the Area Served, Section B (Type of Discharge) and D (Service Area) of the docket holder's Application are incorporated herein by reference, to the extent consistent with all other conditions contained in the DECISION Section of this docket.

4. **Design Criteria.** The Edge Moor Energy Center consists of three (3) boiler/turbine power generating units (Units 3, 4 and 5). Units 1 and 2 ceased operation in 1983. The units are fueled by oil or natural gas and are load cycled, with maximum generation typically maintained during the day and lower loads at night. The three units have a generating capacity of 710 MW (nominal). The units utilize a once-through cooling system and discharge NCCW and boiler blowdown to an artificial canal (Edge Moor Discharge Canal) which discharges to Delaware River Water Quality Zone 5 just north of Shellpot Creek, via Outfall No. 001.

The Hay Road Energy Center, located adjacent to the Edge Moor Energy Center, is a combined cycle power plant comprised of six (6) simple-cycle combustion turbines and heat recovery steam generator units (Units 1, 2, 3, 5, 6 and 7) and two (2) steam turbine units (Units 4 and 8). The combined cycle process utilizes the waste heat generated from the combustion turbines to generate steam and power an additional steam turbine unit. This system allows for the production of supplemental electric capacity without the use of additional fuel combustion. The simple-cycle combustion units are fueled primarily by natural gas; however, low-sulfur liquid distillate (No. 2 fuel oil or kerosene) is used as a back-up source when natural gas is unavailable or uneconomical. The generating capacity of the Hay Road Energy Center is 1,100 MW (nominal). The Hay Road units withdraw water from the Edge Moor Discharge Canal.

5. **Facilities.** NCCW for the Edge Moor Energy Center's once-through cooling system is withdrawn from the Delaware River via circulating water pumps from two (2) shoreline pump houses, referred to as Pump house 2 and Pump house 3. Pump house 2 serves Units 3 and 4 and Pump house 3 serves Unit 5. Boiler blowdown from Unit 5 (via Outfall No. 003) and NCCW from the three units at the Edge Moor facility is discharged to the Edge Moor Discharge Canal. During operation, the intake screens for Pump houses 2 and 3 are continuously cleaned and cleared of debris by backwashing with river water which is discharged to Delaware River Water Quality Zone 5 at the intake location, via Outfall Nos. 006 and 007 respectively. The maximum instantaneous flows for Outfall Nos. 006 and 007 are 1.1 mgd and 3.5 mgd, respectively.

The Hay Road Energy Center utilizes a closed loop NCCW system with two (2) wet, mechanical drift cooling towers for condenser cooling of the steam turbines (Hay Road Units 4 and 8). Up to 7.8 mgd of makeup water for the cooling system is obtained by means of an intake (the Hay Road Intake) located at the head of the Edge Moor Discharge Canal. At times when the Edge Moor units are not operating and thus not producing discharge flows, a condenser pump at Edge Moor Energy Center is operated to transfer water to the Hay Road intake via the Discharge Canal. Boiler water necessary for the operation of the six (6) simple-cycle combustion units at the Hay Road Energy Center is supplied by United Water of Delaware. Cooling tower blowdown and intake screen backwash water from the Hay Road facility is discharged back to the Edge

Moor Discharge Canal via internal Outfalls No. 016. The combined discharge from the Edge Moor and Hay Road Energy Centers to Outfall No. 001 via the Edge Moor Discharge Canal is a maximum instantaneous flow up to 865.6 mgd (860.8 when Hay Road Energy Center is not operating).

The facilities do not have a wastewater treatment plant. For operational purposes, the boiler water at both facilities and cooling water for the Hay Road Energy Center HREC are treated to maintain appropriate pH levels in the system. Additionally, the HREC cooling tower water may receive a variety of DNREC-approved additives to prevent scaling, corrosion, and biofouling of the cooling water system and for system cleaning. Boiler blowdown for EM Units 3 and 4 is discharged to the City of Wilmington wastewater treatment plant system and is pH adjusted prior to discharge to meet municipal permit limits. Discharge from the oil water separators which treat water from sumps within the facility, as well as the sanitary wastewater and non-process wastewater also discharges to municipal treatment system. The City of Wilmington wastewater treatment plant was most recently approved by DRBC Docket No. D-1998-026 CP-1 on November 15, 2000. No modifications to the existing facilities are proposed.

**6. Water Withdrawals.** The docket holder's surface water withdrawal is described in detail in DRBC Docket No. D-2000-012 CP-2, approved on September 14, 2016.

**7. NPDES Permit / DRBC Effluent Requirements.** NPDES Permit No. DE0000558, issued by the DNREC, includes effluent limitations for the existing discharge to surface waters classified as Delaware River Water Quality Zone 5 via Outfall No. 001 and for the internal discharge to the Edge Moor Discharge Canal via Outfall No. 016. EFFLUENT TABLES C-1, C-2, C-3 & C-4 included in Section C. DECISION Condition C.1. of this docket, contain effluent requirements for DRBC parameters that must be met as a condition of this approval.

**8. Relationship to the Comprehensive Plan.** The Edge Moor and Hay Road Energy Centers' power generating units, surface water withdrawals, and discharges were originally added to the Comprehensive Plan via Docket No. D-1990-045 CP-1 on September 26, 1990 and modified via Docket No. D-2000-012 CP-1 on September 28, 2000. The project withdrawal and discharge were separately approved and continued in the Comprehensive Plan in Dockets Nos. D-2000-012 CP-2 and D-1981-020 CP-2, respectively. Issuance of this docket will renew and continue the project discharge in the Comprehensive Plan.

## **B. FINDINGS**

The docket holder submitted an application to renew approval to discharge NCCW, boiler and cooling tower blowdown, and intake screen backwash water from three (3) existing outfalls associated with the Edge Moor Energy Center and Hay Road Energy Center power generating units to the Delaware River.

### **1. Total Dissolved Solids – Estuary Zone 5.**

Zone 5 stream quality objectives do not explicitly include Total Dissolved Solids (TDS). As a consequence, the Commission finds that basin-wide TDS requirements are not always applied in Zone 5. The Commission reserves the right, in accordance with the *WQR* and the *Rules of Practice and Procedure (RPP)*, to apply the basin-wide TDS requirements in Zone 5 when and where it determines that the requirements are necessary to protect water uses in Zone 5.

### **2. Thermal Mixing Zone.**

Zone 5 stream quality objectives for temperatures require that the ambient river temperature shall not be raised by more than 4°F (2.2°C) from September to May and 1.5°F (0.8°C) from June to August, nor shall such discharge result in stream temperatures exceeding 86°F (30.0°C). The Commission's Interpretive Guideline No. 1 also requires an effluent limitation of 110°F (43.3°C) where the discharge is readily accessible to human contact for the protection of Public Safety. DRBC performed a heat dissipation area determination for the discharge associated with the Edge Moor generating units and granted the docket holder a thermal mixing zone for Outfall No. 001 via Docket No. D-1970-225-1, approved on May 31, 1973, consisting of 700 feet upstream, 600 feet downstream, and 300 feet channel ward, as measured from the mouth of the Edge Moor Discharge Canal. Docket No. D-1990-045 CP-1 and Docket No. D-2000-012 CP-1, approved on September 26, 1990, and September 28, 2000, respectively, determined that the change in the thermal plume being produced in the Delaware River by the total discharge from the Edge Moor Discharge Canal as a result of the addition of the Hay Road Generating Units would be insignificant. Accordingly, this thermal mixing zone was continued in docket D-1981-020 CP-2 and will be continued in this docket. To demonstrate compliance with DRBC's thermal requirements, the docket holder is required to meet the effluent limits for temperature contained in EFFLUENT TABLES C-1, C-2, C-3 and C-4 included in Section C. DECISION Condition C.1. of this docket.

### **3. Other Findings**

The Delaware River is tidal at the point of discharge. There are no surface water intakes of record for public water supply downstream of the facilities' discharges. The nearest upstream surface water intake of record for public water is operated by the City of Philadelphia and is located on the Delaware River 38 river miles upstream of the project discharge.

The project does not conflict with the Comprehensive Plan and is designed to prevent substantial adverse impact on the water resources related environment, while sustaining the current and future water uses and development of the water resources of the Basin.

The effluent limits in the NPDES Permit conform with Commission effluent quality requirements, where applicable.

The project is designed to produce a discharge that meets the effluent requirements as set forth in the Commission's *Water Quality Regulations (WQR)*.

### C. DECISION

Effective on the approval date for Docket No. D-1981-020 CP-3 below, the project described in Docket No. D-1981-020 CP-2 is removed from the Comprehensive Plan to the extent that it is not included in Docket No. D-1981-020 CP-3; Docket No. D-1981-020 CP-2 is terminated and replaced by Docket No. D-1981-020 CP-3; and the project and the appurtenant facilities described in Section A "DESCRIPTION" of this docket shall be continued in the Comprehensive Plan. The project and appurtenant facilities as described in Section A of this docket are approved pursuant to Section 3.8 of the *Compact*, subject to the following conditions:

#### Monitoring and Reporting

1. The docket holder shall comply with the requirements contained in the EFFLUENT TABLES below. The docket holder shall submit the required monitoring results electronically to the DRBC Project Review Section via email [aemr@drbc.gov](mailto:aemr@drbc.gov) on the **Annual Effluent Monitoring Report Form** located at this web address: <https://www.nj.gov/drbc/programs/project/docket-app-info.html#3>. The monitoring results shall be submitted annually, absent any observed limit violations, by January 31. If a DRBC effluent limit is violated, the docket holder shall submit the result(s) to the DRBC within 30 days of the violation(s) and provide a written explanation that states the action(s) the docket holder has taken to correct the violation(s) and protect against any future violations.

The following average monthly effluent limits are among those listed in the NPDES Permit and meet or are more stringent than the effluent requirements of the DRBC.

**EFFLUENT TABLE C-1: DRBC Parameters Included in NPDES Permit**

| OUTFALL No. 001 (Water Quality Zone 5) |                                 |                             |
|----------------------------------------|---------------------------------|-----------------------------|
| PARAMETER                              | LIMIT                           | MONITORING                  |
| pH (Standard Units)                    | 6 to 9 at all times             | As required by NPDES Permit |
| Temperature*                           |                                 | As required by NPDES Permit |
| 9/16 – 6/30                            | 96 ° F (instantaneous maximum)  |                             |
| 7/1 – 9/15                             | 103 ° F (instantaneous maximum) |                             |

\*See Findings section and Condition C.2. in the Decision Section

The following monitoring requirements and average monthly effluent limits are for DRBC parameters not listed in the NPDES Permit.

**EFFLUENT TABLE C-2: DRBC Parameters Not Included in NPDES Permit**

| <b>OUTFALL No. 001 (Water Quality Zone 5)</b> |                    |                                     |
|-----------------------------------------------|--------------------|-------------------------------------|
| <b>PARAMETER</b>                              | <b>LIMIT</b>       | <b>MONITORING</b>                   |
| Total Suspended Solids                        | Monitor and report | Bi-Monthly (once every other month) |
| Total Dissolved Solids*                       | Monitor and report | Bi-Monthly (once every other month) |

\* See Findings section and DECISION Condition C.4

The following average monthly effluent limits are among those listed in the NPDES Permit and meet or are more stringent than the effluent requirements of the DRBC.

**EFFLUENT TABLE C-3: DRBC Parameters Included in NPDES Permit**

| <b>OUTFALL No. 016 (Internal)</b> |                     |                             |
|-----------------------------------|---------------------|-----------------------------|
| <b>PARAMETER</b>                  | <b>LIMIT</b>        | <b>MONITORING</b>           |
| pH (Standard Units)               | 6 to 9 at all times | As required by NPDES Permit |

The following monitoring requirements and average monthly effluent limits are for DRBC parameters not listed in the NPDES Permit.

**EFFLUENT TABLE C-4: DRBC Parameters Not Included in NPDES Permit**

| <b>OUTFALL No. 016 (Internal)</b> |                    |                                     |
|-----------------------------------|--------------------|-------------------------------------|
| <b>PARAMETER</b>                  | <b>LIMIT</b>       | <b>MONITORING</b>                   |
| Total Suspended Solids            | Monitor and report | Bi-Monthly (once every other month) |
| Total Dissolved Solids*           | Monitor and report | Bi-Monthly (once every other month) |

\* See Findings section and DECISION Condition C.4

### **Other Conditions**

2. The discharge of wastewater shall not increase the ambient temperatures of the receiving waters by more than 4°F (2.2°C) from September to May and 1.5°F (0.8°C) from June to August, nor shall such discharge result in stream temperatures exceeding 86°F, except within the heat dissipation area described in the FINDINGS section of this docket. In order to demonstrate compliance with DRBC's thermal requirements, the docket holder is required to meet the effluent limits for temperature contained in EFFLUENT TABLE C-1 in Section C. DECISION Condition C.1. of this docket.

3. Except as otherwise authorized by this docket, if the docket holder seeks relief from any limitation based upon a DRBC water quality standard or minimum treatment requirement, the docket holder shall apply for approval from the Executive Director or for a docket revision in accordance with Section 3.8 of the *Compact* and the *Rules of Practice and Procedure*.

4. The docket holder may request of the Executive Director in writing the substitution of specific conductance for TDS. The request should include information that supports the effluent specific correlation between TDS and specific conductance. Upon review, the Executive Director may modify the docket to allow the substitution of specific conductance for TDS monitoring.

5. The docket holder is responsible for timely submittal to the DRBC of a docket renewal application on the appropriate application form including the appropriate docket application filing fee (see 18 CFR 401.43) at least 6 months in advance of the docket expiration date set forth below. The docket holder will be subject to late filed renewal surcharges in the event of untimely submittal of its renewal application, whether or not DRBC issues a reminder notice in advance of the deadline or the docket holder receives such notice. In the event that a timely and complete application for renewal has been submitted and the DRBC is unable, through no fault of the docket holder, to reissue the docket before the expiration date below, the terms and conditions of the current docket will remain fully effective and enforceable against the docket holder pending the grant or denial of the application for docket approval.
6. The docket holder is permitted to treat and discharge wastewater as set forth in the Area Served Section of this docket, which incorporates by reference Sections B (Type of Discharge) and D (Service Area) of the docket holder's Application to the extent consistent with all other conditions of this DECISION Section.
7. The facility and operational records shall be available at all times for inspection by the DRBC.
8. The facility shall be operated at all times to comply with the requirements of the Commission's WQR.
9. If at any time the receiving treatment plant proves unable to produce an effluent that is consistent with the requirements of this docket approval, no further connections shall be permitted until the deficiency is remedied.
10. Nothing herein shall be construed to exempt the docket holder from obtaining all necessary permits and/or approvals from other State, Federal or local government agencies having jurisdiction over this project.
11. The docket holder shall discharge wastewater in such a manner as to avoid injury or damage to fish or wildlife and shall avoid any injury to public or private property.
12. No sewer service connections shall be made to newly constructed premises with plumbing fixtures and fittings that do not comply with water conservation performance standards contained in Resolution No. 88-2 (Revision 2).
13. The issuance of this docket approval shall not create any private or proprietary rights in the waters of the Basin, and the Commission reserves the right to amend, suspend or rescind the docket for cause, in order to ensure proper control, use and management of the water resources of the Basin.
14. The docket holder shall be subject to applicable DRBC regulatory program fees, in accordance with duly adopted DRBC resolutions and/or regulations (see 18 CFR 401.43). This approval is transferable by request to the DRBC Executive Director provided that the project purpose and area served approved by the Commission in this docket will not be materially altered because of the change in project ownership. The request shall be submitted on the appropriate form and be accompanied by the appropriate fee (see 18 CFR 401.43).

**15.** The docket holder shall request a name change of the entity to which this approval is issued if the name of the entity to which this approval is issued changes its name. The request for name change shall be submitted on the appropriate form and be accompanied by the appropriate fee (see 18 CFR 401.43).

**16.** The Executive Director may modify or suspend this approval or any condition thereof, or require mitigating measures pending additional review, if in the Executive Director's judgment such modification or suspension is required to protect the water resources of the Basin.

**17.** Any person who objects to a docket decision by the Commission may request a hearing in accordance with Article 6 of the Rules of Practice and Procedure. In accordance with Section 15.1(p) of the *Delaware River Basin Compact*, cases and controversies arising under the *Compact* are reviewable in the United States district courts.

**BY THE COMMISSION**

**APPROVAL DATE: December 8, 2021**

**EXPIRATION DATE: August 1, 2028**