

DOCKET NO. D-1986-041-3

DELAWARE RIVER BASIN COMMISSION

**Monroe Energy, LLC
Trainer Refinery Industrial Wastewater Treatment Plant
Borough of Trainer, Delaware County, Pennsylvania**

PROCEEDINGS

This docket is issued in response to an Application submitted to the Delaware River Basin Commission (DRBC or Commission) on September 1, 2016 (Application) for renewal of the docket holder's existing industrial wastewater treatment plant (IWTP) and its discharge. National Pollutant Discharge Elimination System (NPDES) Permit No. PA0012637 for the facility discharge was issued by the Pennsylvania Department of Environmental Protection (PADEP) on November 13, 2018.

The Application was reviewed for approval under Section 3.8 of the *Delaware River Basin Compact*. The Delaware County Planning Commission has been notified of pending action. A public hearing on this project was held by the DRBC on May 15, 2019.

A. DESCRIPTION

1. Purpose. The purpose of this docket is to renew approval of the docket holder's existing 4.3 million gallons per day (mgd) Trainer Refinery IWTP and its discharge. The facility also discharges non-contact cooling water (NCCW) from its existing once-through cooling system, as well as steam condensate and backwash from the water softening system. The facility is currently undergoing a project to install three cooling towers and closed loop cooling system to replace the once-through cooling system. The installation of cooling towers is intended to mitigate thermal impacts associated with the discharges at the Trainer facility and, as water demands are less, reduced withdrawals are expected to reduce impingement and entrainment caused by the water withdrawal. This docket updates the DRBC approval to reflect this modification to the cooling system.

2. Location. The docket holder's Trainer Refinery and its IWTP are located on Post Road in the Boroughs of Trainer and Marcus Hook, Delaware County, Pennsylvania. The facility monitors treated industrial wastewater effluent from its IWTP at Monitoring Point No. 201 (IMP 201), as well as NCCW, steam condensate, and softener backwash at Monitoring Point No. 101 (IMP 101), prior to discharge via existing Outfall No. 001 to the tidal portion of Marcus Hook Creek in

Delaware River Water Quality Zone 4, at River Mile 80.2 - 0.5 (Delaware River – Marcus Hook Creek). Additionally, the facility discharges steam condensate and heat exchanger cooling water back wash via existing Outfall No. 002 to Stoney Creek, which is a tidal tributary to the Delaware River Water Quality Zone 4, at River Mile 80.4 – 0.2 (Delaware River – Stony Creek).

The project outfalls are located in the Delaware River Watershed as follows:

OUTFALL NO.	LATITUDE (N)	LONGITUDE (W)
001	39° 49' 13.94"	75° 24' 32.45"
002	39° 49' 30.61"	75° 24' 1.61"
MONITORING POINT	LATITUDE (N)	LONGITUDE (W)
IMP 101	39° 49' 16.57"	75° 24' 27.94"
IMP 201	39° 49' 16.61"	75° 24' 27.97"

3. Area Served. The docket holder's IWTP will continue to serve the Trainer Refinery, located in the Boroughs of Trainer and Marcus Hook, Delaware County, Pennsylvania. 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 docket holder's 4.3 mgd IWTP treats industrial process wastewater generated from its refinery operations utilizing oil-water separation, sand filtration, aeration, clarification, and dissolved air flotation (DAF) sludge thickening. The facility also discharges NCCW, steam condensate, and softener backwash. Effluent limits in the NPDES permit for the IWTP discharge (IMP 201) are based on a discharge rate of 3.5 mgd. Effluent limits in the NPDES permit for IMP 101, Outfall No. 001, and Outfall No. 002 are based on discharge rates of 65.77 mgd, 69.27 mgd, and 36.17 mgd, respectively.

5. Facilities. The existing IWTP facilities are divided into the following treatment sections:

- The primary treatment section provides physical and chemical processes, consisting of an American Petroleum Institute (API) oil-water separator and five primary sand filters, as well as pH adjustment.
- The secondary treatment section provides equalization, biological treatment, and solids thickening, and consists of an equalization tank, an aeration tank, three secondary clarifiers.
- The tertiary treatment section provides filtration through six tertiary sand filters,
- The oily sludge treatment and disposal section provides thickening and dewatering of sludge and solids from the API separator and primary sand filters and consists of a DAF thickening system and a filter press.
- The biological sludge treatment and disposal section provides thickening and dewatering of biological sludge from the secondary treatment section, and consists of a DAF thickening system, a biological sludge conditioning system, and a filter press.

The facility is currently undergoing a project to install three cooling towers, the Area 3 Cooling Tower, FCC Cooling Tower, and Alky Cooling Tower, to replace the existing once-through cooling system. The Area 3 cooling tower and its closed loop cooling system was installed and placed into operation in 2018, and as a result, the facility no longer discharges NCCW to Stoney Creek via Outfall No. 002. The FCC Cooling Tower and Alky Cooling Tower are expected to be installed and put into operation by December 31, 2026. After these cooling towers are constructed and go into operation, the majority of the facility will operate a closed loop cooling system and substantially reduce the amount of water withdrawn for cooling and the amount of NCCW discharged to Marcus Hook Creek via Outfall No. 001. The existing IWTP will receive blowdown from the three cooling towers. The installation of cooling towers will significantly reduce the thermal loading to Marcus Hook, eliminate the thermal discharge to Stoney Creek, and is expected to minimize impingement and entrainment at the facility cooling water intake structure on the Delaware River.

Sanitary wastewater generated at the Trainer Refinery is directed for treatment to the Delaware County Regional Water Quality Control Authority (DELCORA) Western Regional Wastewater Treatment Plant (WWTP). The DELCORA WWTP was most recently approved by the DRBC via Docket No. D-1992-018 CP-4 on March 13, 2019.

Wasted sludge will continue to be hauled off-site by a licensed hauler for disposal at a state approved facility.

6. Water withdrawals. Potable water for the facility is provided by the Chester Water Authority, as described in detail in DRBC Docket No. D-1969-060 CP-1, approved on May 28, 1969. Process water for the facility is withdrawn from the Delaware River at the docket holder's surface water intake, as described in detail in Docket No. D-1996-052-2, which was approved on May 10, 2012.

7. NPDES Permit / DRBC Effluent Requirements. NPDES Permit No. PA0012637 was issued by the PADEP on November 13, 2018 and includes final effluent limitations for the project discharge to surface waters classified by the PADEP as supporting warm water fishes / migratory fishes (WWF/MF). EFFLUENT TABLES C-1 & C-2 included in the DECISION section of this docket, contain effluent requirements for DRBC parameters that must be met as a condition of this approval (See DECISION Condition C.1.). Effluent requirements for Outfall No. 001 (IWTP discharge) and Outfall No. 002 (NCCW discharge) are based on discharge rates of 69.27 mgd and 36.17 mgd, respectively. Effluent requirements for IMP 101 (NCCW discharge) and IMP 201 (IWTP discharge) are based on discharge rates of 65.77 mgd and 3.5 mgd, respectively.

B. FINDINGS

This docket holder submitted an Application to renew approval of their existing 4.3 mgd Trainer Refinery IWTP and its discharge, along with the discharge of NCCW, steam condensate and backwash from the water softening system. This docket also reflects modifications to the facility operations resulting from the installation of three cooling towers and closed loop cooling system to replace the existing once through cooling system. This docket renews the approval of the IWTP and the facility discharges, and updates conditions of the DRBC approval to reflect this modification to the cooling system.

1. Cooling Water Intake

PADEP's previous iteration of NPDES Permit No. PA0012637, approved by the PADEP on February 14, 2012, and effective March 1, 2012 required the docket holder to evaluate the cooling water intake for the once-through cooling loop at the Trainer facility. Part C Section VI "Cooling Water Intake Structures" states the following:

"Section 316(b) of the Clean Water Act (CWA) requires establishing the best technology available (BTA) for minimizing adverse environmental impacts associated with the use of cooling water intake structures".

Amongst other requirements, Part C Section IV.B. of the permit required the docket holder to submit the following within two years of permit issuance:

"A plan to minimize impingement mortality which includes an evaluation of technologies and operational measures expected to minimize adverse environmental impact due to impingement at the cooling water intake structures."; and:

"A plan to minimize entrainment mortality which includes an evaluation of technologies and operational measures expected to minimize adverse environmental impact due to entrainment at the cooling water intake structures."

In response to this requirement, the docket holder proposed the project to install three cooling towers (Area 3 Cooling Tower, FCC Cooling Tower, and Alky Cooling Tower) to replace the existing once-through cooling system. The cooling tower system features a closed cooling loop and is considered best technology available (BTA). The new cooling towers will reduce the amount of water withdrawn for cooling needs at the Trainer facility from approximately 95 MGD (the once through cooling demand) to 6 MGD after the cooling towers are installed and go into operation. The project is currently underway at the Trainer facility with one cooling tower (the Area 3 Cooling Tower) constructed and in operation, and the remaining two cooling towers (FCC Cooling Tower and Alky Cooling Tower) anticipated to be completed by the end of 2026.

2. Thermal Impacts

After the Area 3 Cooling Tower went into operation in 2018, the facility discontinued discharge of NCCW to Stoney Creek, and therefore no thermal impacts are expected at Outfall No. 002.

Regarding the thermal impacts to Marcus Hook Creek and the Delaware River, Outfall No. 001 will continue to receive NCCW through IMP 101, and IWTP effluent through IMP 201, and discharge into Marcus Hook Creek 2,608 feet upstream of its confluence with the Delaware River. After the FCC Cooling Tower and Alky Cooling Tower are installed and go into operation, the discharge rate from Outfall No. 001 will be reduced from 75.79 cfs to 10.65 cfs. The docket holder performed a HEC-RAS river analysis and CORMIX water quality model to evaluate the thermal impacts of the Trainer facility discharges to Marcus Hook Creek and the Delaware River prior to the installation of any cooling towers (once through cooling loop system) and after the installation of the three cooling towers. Evaluations were performed for three seasons: summer, winter, and spring; and for two operating conditions: existing (75.79 cfs) and future (10.65 cfs) through Outfall No. 001. Since Outfall No. 001 is located near the head of tide, all evaluations were performed during the ebbing tidal condition.

The results of the evaluation indicated that the overall thermal load from Outfall No. 001 will be greatly reduced because of the reduction of the discharge rate after the three cooling towers are installed. As summarized in the Table B-1, heat load reductions of approximately 9,255, 11,854, and 10,389 10,500 MBtu/day for the summer, winter, and spring seasons, respectively, are expected with the implementation of three cooling towers. The model results also predict that temperature increases at the mouth of Marcus Hook Creek due to the facility discharge are up to 16 °C lower under the three cooling towers system than under the once through cooling loop system.

Table B-1: Thermal loads for three seasons under once through and cooling towers into MHC

Season	Once Through Cooling (MBtu/day)	Cooling Towers (MBtu/day)	Reduction (MBtu/day)
Summer	11,346	2,091	9,255
Winter	14,280	2,426	11,854
Spring	12,618	2,229	10,389

The results of the model simulations indicated that at a length of 795 meters (2,608 feet) (distance from Outfall No. 001 to Marcus Hook Creek's confluence) plus 168 meters (551 feet) into the mainstem Delaware River, a delta temperature (ΔT) in-stream increase of 2.8 °C (5°F) can be achieved for the entire tidal cycle for all three seasons evaluated. The total distance from Outfall No. 001 at which 5°F ΔT is met is 963 meters (3,160 feet) from Outfall No. 001, which is less than DRBC's guideline maximum length dimension for heat dissipation areas (HDAs) of 3,500 feet. The evaluation did not determine the exact numeric values of the width dimension and cross-sectional area of the HDA within the Delaware River; however, DRBC staff determined that due to the large size of the Delaware River at this location, the guideline maximum width dimension

(two-thirds the surface width of the receiving water body) and guideline maximum cross-sectional area (one-quarter of the cross-sectional area of the receiving water body) will be met within the Delaware River.

This docket approves a HDA after the three cooling towers go into operation, consisting of a length of 963 meters (3,160 feet) from Outfall No. 001 into Marcus Hook Creek and the Delaware River (See DECISION Condition C.4).

BOD and CBOD₂₀ Wasteload Allocation

The Commission's WQR provide for the allocation of the stream assimilative capacity where waste discharges would otherwise result in exceeding such capacity. It was determined in the 1960's that discharges to the Delaware Estuary be limited to a total of 322,000 lbs/day of carbonaceous biochemical (first stage) oxygen demand (CBOD₂₀). In accordance with the WQR, the assimilative capacity of each Delaware Estuary zone minus a reserve was originally allocated in 1968 among the individual dischargers based upon the concept of uniform reduction of raw waste in a zone (Zones 2, 3, 4 and 5). The totals and percent reduction for each zone are given in Table 1 of the Commission's *Status of CBOD₂₀ Wasteload Allocations* (Revised October 1, 2000). The Trainer Refinery and its IWTP discharge are located in Water Quality Zone 4 at River Mile 80.2 – 0.45 (Delaware River – Marcus Hook Creek). Zone 4 is allocated at 91,000 lbs/day of CBOD₂₀ and has a minimum percent removal requirement of CBOD₂₀ of 89.25%.

The Commission approved a CBOD₂₀ allocation for the Trainer facility of 1,800 lbs/day from Outfall No. 201 on November 25, 1986. DRBC reduced the CBOD₂₀ allocation for the Trainer facility to 1,500 lbs/day by issuance of Docket No. D-1986-041-2 on May 10, 2012. The CBOD₂₀ allocation of 1,500 lbs/day from Outfall No. 201 is continued in this docket.

CBOD Allocation Compliance and Monitoring

Compliance with the CBOD₂₀ allocation of 1,500 lbs/day can be demonstrated by meeting the BOD₅ effluent load limit of 1,000 lbs/day contained in EFFLUENT TABLE C-1 in the DECISION section of this docket. The BOD₅ effluent load limit is calculated as the CBOD₂₀ allocation divided by the CBOD₂₀/BOD₅ ratio of 1.5:1, as determined in Docket No. D-1986-041-2.

Section 4.30.3 B.3. of the Commission's WQR states "For dilute industrial process wastewater, the percent BOD reduction may be modified, upon application, provided it has been demonstrated that the best management practices and the highest degree of waste treatment determined to be practicable will be applied." Docket No. D-1986-041-2 included a determination that the facility met this condition based on 2009 BOD monitoring data that demonstrated low strength influent BOD and low effluent BOD and alleviated the docket holder from meeting the Zone 4 BOD minimum removal requirement of 89.25%. This docket (D-1986-041-3) continues that determination and requires the docket holder to monitor BOD₅ influent and effluent to demonstrate that influent remains dilute and to demonstrate compliance with the wasteload allocation (See EFFLUENT TABLE C-5 in the DECISION section).

There are no public water supply intakes downstream 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 are in compliance with Commission effluent quality requirements, where applicable.

The project is designed to produce a discharge meeting 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-1986-041-4 below, Docket No. D-1986-041-3 is terminated and replaced by Docket No. D-1986-041-4; and the project and the appurtenant facilities described in Section A. DESCRIPTION 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.state.nj.us on the **Annual Effluent Monitoring Report Form** located at this web address: <http://www.state.nj.us/drbc/programs/project/pr/info.html>. 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 for Internal Monitoring Point (IMP) 201

IMP 201 (IWTP Effluent)		
Parameter	Limit	MONITORING
pH (Standard Units)	6 to 9 at all times	As required by NPDES Permit
Total Suspended Solids	30 mg/l	As required by NPDES Permit
BOD ₅	34 mg/l 1,000 lbs/day	As required by NPDES Permit
Total Dissolved Solids*	1,000 mg/l	As required by NPDES Permit
Ammonia Nitrogen	35 mg/l	As required by NPDES Permit
PCBs	Monitor & Report	As required by NPDES Permit

* See Condition C.6.

EFFLUENT TABLE C-2: DRBC Parameters Included in NPDES Permit for Internal Monitoring Point (IMP) 101

IMP 101 (NCCW, Steam Condensate, and Softener Backwash)		
Parameter	Limit	MONITORING
pH (Standard Units)	6 to 9 at all times	As required by NPDES Permit
Total Suspended Solids	30 mg/l	As required by NPDES Permit
Total Dissolved Solids (TDS)*	Monitor & Report	As required by NPDES Permit
Temperature	110°F (Instantaneous Max)	As required by NPDES Permit

* See Condition C.6.

EFFLUENT TABLE C-3: DRBC Parameters Included in NPDES Permit for Outfall No. 002

OUTFALL 002 (Stoney Creek)		
Parameter	Limit	MONITORING
pH (Standard Units)	6 to 9 at all times	As required by NPDES Permit
Total Suspended Solids	30 mg/l	As required by NPDES Permit
Total Dissolved Solids (TDS)*	Monitor & Report	As required by NPDES Permit
Temperature	110°F (Instantaneous Max)	As required by NPDES Permit

* See Condition C.6.

EFFLUENT TABLE C-4: DRBC Parameters Included in NPDES Permit for Outfall No. 001

OUTFALL 001 (Marcus Hook Creek)		
Parameter	Limit	MONITORING
Chronic Toxicity	Monitor & Report	As required by NPDES Permit

The following monitoring requirements are for DRBC parameters not listed in the NPDES Permit.

EFFLUENT TABLE C-5: DRBC Parameters Not Included in NPDES Permit for Internal Monitoring Point (IMP) 201

IMP 201 (IWTP Effluent)		
PARAMETER	LIMIT	MONITORING
BOD ₅	Monitor & Report Influent*	Monthly, paired with BOD ₅ effluent monitoring sample

*See Condition C.3.

2. The docket holder shall continue to submit Polychlorinated Biphenyl (PCB) monitoring data and PMP Annual Reports to the Commission's Science & Water Quality Management Branch as required in the existing NPDES Permit.
3. The docket holder is required to perform monthly BOD₅ influent monitoring in accordance with EFFLUENT TABLE C-5 above. After completing 2 years of monthly tests (24 tests), the

docket holder may request in writing to the Executive Director that testing for this parameter be reduced or eliminated based on the test results.

Other Conditions

4. This docket approves a heat dissipation area (HDA) consisting of a length of 963 meters (3,160 feet) from Outfall No. 001 into Marcus Hook Creek and the Delaware River, to be in effect after the three cooling towers are installed and go into operation.

5. 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*.

6. 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.

7. 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.

8. 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.

9. The docket holder is prohibited from treating/pre-treating any hydraulic fracturing wastewater from sources in or out of the Basin at this time. Should the docket holder wish to treat/pre-treat hydraulic fracturing wastewater in the future, the docket holder will need to first apply to the Commission to renew this docket and be issued a revised docket allowing such treatment and an expanded service area. Failure to obtain this approval prior to treatment/pre-treatment will result in action by the Commission.

10. The facility and operational records shall be available at all times for inspection by the DRBC.

11. The facility shall be operated at all times to comply with the requirements of the Commission's WQR.

- 12.** 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.
- 13.** 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.
- 14.** 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.
- 15.** 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).
- 16.** 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.
- 17.** 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).
- 18.** 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).
- 19.** 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).
- 20.** 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.

21. 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

DATE APPROVED: June 12, 2019

EXPIRATION DATE: November 30, 2023