pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Southeast Regional Office
CLEAN WATER PROGRAM

Application Type	Renewal	**NPDES PERMIT FACT SHEET INDIVIDUAL INDUSTRIAL WASTE (IW) AND IW STORMWATER**	Application No.	PA0244449
Facility Type	Industrial		APS ID	999951
Major / Minor	Major		Authorization ID	1284833

Applicant and Facility Information

Applicant Name	Marcus Hook Energy LP	Facility Name	Marcus Hook Generating Station
Applicant Address	100 Green Street Marcus Hook, PA 19061	Facility Address	100 Green Street Marcus Hook, PA 19061-0426
Applicant Contact	Kevin Collins	Facility Contact	Jennifer Eisenmann
Applicant Phone	(609) 364-2470	Facility Phone	(610) 364-2470
Client ID	221135	Site ID	525172
SIC Code	4911,4931	Municipality	Marcus Hook Borough
SIC Description	Trans. & Utilities - Electric and Other Services Combined, Trans. & Utilities - Electric Services	County	Delaware
Date Application Received	August 2, 2019	EPA Waived?	No
Date Application Accepted		If No, Reason	Major Facility
Purpose of Application	Permit Renewal.		

Summary of Review

The applicant requests renewal of an NPDES permit to discharge industrial wastewater from Marcus Hook Generating Station.

This 750-megawatt combined cycle cogeneration facility is located on a 20-acre parcel leased from Sunoco Inc, at the Marcus Hook Industrial Complex. The facility provides power to the regional PJM power pool and up to 1,000,000 pounds per hour of steam to the Sunoco Marcus Hook Industrial Complex. The facility includes three General Electric 7FA dry low-NOx combustion turbines and three supplementary fired heat recovery system generators (HRSGs), and a steam turbine. Selective Catalytic Reduction (SCR) systems are used to reduce emission of NOx from the turbines/HRSGs. Natural gas is used as the primary fuel for the Facility, however, the HRSGs are dual fuel capable, and can fire natural gas and refinery gas.

The facility is currently authorized to withdraw up to 330 million gallons of water over any 30-day period (11 million gallons per day) from the Delaware River through Sunoco's surface water intake located in Delaware. The pretreatment units for the facility's makeup water, including clarifier, multimedia filter, and demineralization system are located in the state of Delaware.

The facility's principal process waste streams include cooling tower blowdown, HRSG blowdown, demineralization reject water, clarifier blowdown (clarifier underflow), multimedia filter backwash and off-line compressor wash water. To minimize process makeup requirements and wastewater discharge flows, internal recycle and reuse is also employed. All process waste streams that are not suitable for internal recycle and reuse are collected in a master sump and will be discharged through outfall 001.

According to the operation section and based on the review of the DMRs the facility is operating well and in compliance with the permit requirements.

Approve	Deny	Signatures	Date
X		*Sara Abraham* Sara Reji Abraham, E.I.T. / Project Manager	12/17/2020
X		*Pravin Patel* Pravin C. Patel, P.E. / Environmental Engineer Manager	12/17/2020

Summary of Review

A WQM permit, 2309201 was issued on January 12, 2010 for the installation of a de-chlorination system at the facility.

Sanitary wastewater from the facility will continue to be directed to DELCORA for disposal. There is no stormwater discharge from the site. The stormwater from the site is collected in the stormwater collection basin and is directed into Sunoco's oil water treatment system.

The following chemical additives are used at the facility: Better Clear, Captifloc AEF30, Captifloc CEF305B, Chemtron 4864, Chemtron 4895, Chemtron 3808, Chemtron 5015, RD9025, Foambloc 10, Chlorine Dioxide (CDG 3000). Permittee submitted revised chemical additive notification forms for all these chemicals in August 2019.

Sulfuric acid and Sodium hypochlorite are used to control the pH of the effluent.

On December 15, 2003 US EPA adopted TMDLs for PCBs for Zones 2, 3, 4 and 5 of the Delaware River Estuary. These TMDLs are established using a multi-step procedure where the DRBC water quality standards are used as the basis for the Stage 1 TMDLs. Based on the PCB annual reports the only source of PCBs at the site is the Delaware River. The current annual monitoring of PCBs (dry weather) is recommended to continue for the new permit. Requirement to continue the implementation of PMP is also in Part C of the permit.

DRBC Docket No. D-2008-021 CP-3 was approved on December 11, 2019 for this facility.

The DRBC docket continues the approval of TDS determination (Average Monthly limit of 5000 mg/l) for this discharge. The docket also renews the approval of a heat dissipation area consisting of a radius of 200 feet around Outfall 001 and limits the maximum instantaneous discharge temperature to 95°F. Temperature requirements for Delaware River Basin discharges are incorporated in part C of the permit in accordance with the docket.

Clean Water Act § 316(b) – Cooling Water Intake Structures:

On August 15, 2014, EPA promulgated Clean Water Act Section 316(b) regulations applicable to cooling water intake structures. The regulations established best technology available (BTA) standards to reduce impingement mortality and entrainment of all life stages of fish and shellfish at existing power generating and manufacturing facilities. The Final Rule took effect on October 14, 2014. Regulations implementing the 2014 Final Rule (and the previously promulgated Phase I Rule) are provided in 40 CFR Part 125, Subparts I and J for new facilities and existing facilities, respectively. Associated NPDES permit application requirements for facilities with cooling water intake structures are provided in 40 CFR Part 122, Subpart B – Permit Application and Special NPDES Program Requirements (§ 122.21(r)).

Applicability Criteria for Existing Facilities

As an existing facility, Marcus Hook Energy, LP falls under 40 CFR part 125, Subpart J – Requirements Applicable to Cooling Water Intake Structures for Existing Facilities Under Section 316(b) of the Clean Water Act (§§ 125.90 – 125.99). Pursuant to the applicability criteria given by § 125.91(a), Marcus Hook Energy, LP would be subject to the requirements of §§ 125.94 – 125.99 if:

(1) The facility is a point source;

(2) The facility uses or proposes to use one or more cooling water intake structures with a cumulative design intake flow (DIF) of greater than 2 million gallons per day (mgd) to withdraw water from waters of the United States; and

(3) Twenty-five percent or more of the water the facility withdraws on an actual intake flow basis is used exclusively for cooling purposes.

Marcus Hook Energy, LP operates an electric generating station with a closed-circuit cooling system that utilizes water from a cooling water intake structure (CWIS) located on the Delaware River Estuary. The CWIS is owned by an independent supplier, Sunoco Partners Marketing & Terminals (SPMT). Both facilities are located at the Marcus Hook Industrial Complex (MHIC). The CWIS is subject to BTA requirements under the existing facilities rule.

The CWIS (known as RW-7) draws water from the Delaware River through two 48-inch diameter downward facing pipes located approximately 550 feet from the shoreline at the end of a receiving dock. A six-sided polyethylene barrier net with

Summary of Review

0.45-inch mesh is installed around the intake pipes and surrounding pilings. River water flows to the RW-7 building where it enters an intake basin with four coarse mesh traveling screens. Debris washed off the screen is removed and discarded. Water then flows into the pumping basin with four circulating water pumps (two owned and operated by the applicant and two by SPMT). The intake has a 34.97 MGD DIF with an AIF of 4.94 MGD from 2013 through 2015.

The facility operates a closed-cycle recirculating cooling system with a 12-cell mechanical draft cooling tower which operates 24 hours per day, seven days a week. Approximately 1.98 MGD, or 40% of the total AIF withdrawn by the CWIS, was used exclusively for cooling purposes from 2013 to 2015.

To meet BTA requirements to minimize adverse impacts from impingement mortality and entrainment the permittee will continue to operate a closed-cycle recirculating system. This meets the required alternatives for impingement mortality and satisfies the site-specific entrainment standards based on required considerations discussed below.

In addition, the facility will annually inspect the barrier net with a design through-screen velocity of <0.5 fps and make repairs as needed.

1.) Numbers and types of organisms entrained

The facility conducted entrainment sampling between March and July in 2019 and 2020. During that time samples were collected at RW-7 CWIS biweekly during 24-hour events, with four collections at approximately equal intervals encompassing two tidal cycles during day and night. Samples were withdrawn from the screen #3 pumping basin in the RW-7 building with typical sample filtering 100-101 cubic meters of intake water. Below is a table showing numbers and types of organisms collected during sampling.

		Life Stage						
Common Name	**Scientific Name**	**Unknown Life Stage**	**Egg**	**Yolk-sac larvae**	**Post yolk-sac larvae**	**Young of Year**	**Total**	**Percent Composition**
Alewife	*Alosa pseudoharengus*			14	15		29	3.5
American Eel	*Anguilla rostrata*	3			3	1	7	0.8
American Shad	*Alosa rostrata*				5		5	0.6
Atlantic Menhaden	*Brevoortia tyrannus*				1	1	2	0.2
Bay Anchovy	*Anchoa mitchilli*				2	2	4	0.5
Gizzard Shad	*Dorosoma cepedianum*			23	7		30	3.6
Margined madtom	*Noturus insignis*					1	1	0.1
Unidentifiable Morone	*Morone*	2			6		8	1.0
Striped bass	*Morone saxatilis*		1	1	261	1	264	32.0
Summer flounder	*Paralichthys dentatus*					1	1	0.1
Naked goby	*Gobiosoma bosc*				4		4	0.5
Tessellated darter	*Etheostoma olmstedi*			10	37	1	48	5.8
Unidentifiable clupeidae	*Clupeidae*	52			143		195	23.6
Unidentifiable cyprinidae	*Cyprinidae*			4	22		26	3.2
White perch	*Morone americana*		2	3	10	1	16	1.9
Yellow perch	*Perca flavescens*	1		3			4	0.5
Unidentifiable fish		174	5		2		181	21.9

Species, life stage, and percent composition of organisms identified from entrainment sampling conducted for SPMT by Cardno.

No federally listed threatened and endangered species were identified during the sampling effort. The most abundant taxa entrained during the study were Stripped Bass and Unidentifiable Clupeidae making up about 56% of the abundance. Other common taxa include Alewife, Gizzard Shad, Tessellated Darter, Unidentifiable Cyprinidae, and White Perch making up an additional 18% combined. Important commercial and recreational species found during the study include American eel (*Anguilla rostrate*) striped bass (*Morone saxatilis*), white perch (*Morone Americana*), and yellow perch (*Perca flavescens*).

2.) Impact of changes in particulate emission or other pollutants

Summary of Review

The BTA of closed-cycle recirculating system is already installed at the facility. A change in particulate emissions or other pollutants is not expected to occur based on the BTA decision.

3.) Land Availability

The BTA of closed-cycle recirculating system is already installed at the facility and land availability should not be considered an issue.

4.) Remaining useful plant life

Permit application materials do not include an estimation of the remaining useful plant life and because BTA is already installed, it is not considered a factor in the BTA decision.

5.) Social Benefits and Cost of Technologies

R(10) report was not submitted. Because BTA is already installed, the facility is not expected to incur additional cost due to the BTA decision.

Services Comments

The US Fish and Wildlife Service and the National Marine Fisheries Service, in a joint letter to DEP dated 1/23/2018, recommend that the facility conduct impingement and entrainment studies to document impacts to migratory species. They also recommend that the facility consider installing wedge-wire screens with appropriately sized mesh, which will minimize the possibility of passive entrainment.

Conclusion

The reductions in entrainment already provided by the closed cycle recirculating cooling system and entrainment BTA. The types of organisms observed during the entrainment study include representatives from the expected fish community at seemingly minimal numbers. As stated, no federally listed threatened and endangered species were identified during the sampling effort.

Public Participation

DEP will publish notice of the receipt of the NPDES permit application and a tentative decision to issue the individual NPDES permit in the *Pennsylvania Bulletin* in accordance with 25 Pa. Code § 92a.82. Upon publication in the *Pennsylvania Bulletin*, DEP will accept written comments from interested persons for a 30-day period (which may be extended for one additional 15-day period at DEP's discretion), which will be considered in making a final decision on the application. Any person may request or petition for a public hearing with respect to the application. A public hearing may be held if DEP determines that there is significant public interest in holding a hearing. If a hearing is held, notice of the hearing will be published in the *Pennsylvania Bulletin* at least 30 days prior to the hearing and in at least one newspaper of general circulation within the geographical area of the discharge.

Act 14 Notifications:

Marcus Hook Borough	-	July 30, 2019
Delaware County	-	July 30, 2019

Permit Conditions:

A. Acquire Necessary Property Rights
B. Proper Sludge Disposal
C. WQM Permit Condition
D. BAT/ELG Reopener
E. Chlorine Optimization
F. Thermal Impact

Summary of Review

G. Thermal Mixing Zone
H. Annual Inspection of Stormwater
I. WET Requirement
J. Chemical Additives Requirement
K. PCB/PMP Requirement
L. Cooling Water Requirement

Discharge, Receiving Waters and Water Supply Information

Outfall No.	001	Design Flow (MGD)	4.32
Latitude	39 ° 48' 15.05"	Longitude	-75 ° 25' 6.04"
Quad Name	Marcus Hook	Quad Code	2042
Wastewater Description:	IW Process Effluent with ELG (Cooling water blowdown, boiler blowdown, RO reject water and internal plant drains		
Receiving Waters	Delaware River Estuary – Zone 4 (WWF, MF)	Stream Code	00002
NHD Com ID	25602819	RMI	78.4
Q_{7-10} Flow (cfs)	Delaware River flow at Trenton = 2500 cfs		
Watershed No.	3-G	Chapter 93 Class.	WWF, MF
Assessment Status	Not Assessed		
TMDL Status	Final, 12/30/2006	Name	Delaware River Estuary PCB TMDLs

There are no public water supply intakes downstream of the discharge.

Compliance History

DMR Data for Outfall 001 (from September 1, 2019 to August 31, 2020)

Parameter	AUG-20	JUL-20	JUN-20	MAY-20	APR-20	MAR-20	FEB-20	JAN-20	DEC-19	NOV-19	OCT-19	SEP-19
Flow (MGD) Average Monthly	0.631	0.746	0.601	0.269	0.636	0.342	0.471	0.482	0.478	0.664	2.218	1.837
Flow (MGD) Daily Maximum	1.147	1.391	1.142	0.612	0.985	0.540	0.882	0.689	0.993	1.490	2.990	2.691
pH (S.U.) Instantaneous Minimum	6.36	6.18	6.69	6.36	6.42	6.21	6.27	6.93	6.22	6.57	6.53	7.06
pH (S.U.) Instantaneous Maximum	7.63	7.68	7.71	7.82	7.47	7.76	7.73	7.74	7.75	7.80	7.96	8.84
DO (mg/L) Instantaneous Minimum	8.78	7.11	7.29	4.58	6.36	8.18	7.95	6.15	6.77	7.61	7.25	9.20
TRC (mg/L) Average Monthly	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
TRC (mg/L) Instantaneous Maximum	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Temperature (ºF) Instantaneous Maximum	92.5	92.6	92.8	89.0	82.5	83.8	86.1	81.6	82.3	83.9	89.8	87.5
CBOD5 (lbs/day) Average Monthly			1.60			1.69			8.67			3.85
CBOD5 (lbs/day) Daily Maximum			1.60			1.69			8.67			3.85
CBOD5 (mg/L) Average Monthly			1.00			1.00			1.00			1.00
CBOD5 (mg/L) Daily Maximum			1.00			1.00			1.00			1.00
CBOD20 (lbs/day) Average Monthly			15.99			21.34			123.18			38.87
TSS (lbs/day) Average Monthly	42.15	66.76	17.25	5.31	15.35	9.65	23.58	40.20	36.14	84.61	223.96	118.70
TSS (lbs/day) Daily Maximum	75.98	102.49	33.84	7.53	18.86	11.58	28.38	65.13	62.73	119.12	506.57	183.06
TSS (mg/L) Average Monthly	11.08	12.38	4.20	2.50	3.64	6.68	7.50	11.65	10.52	16.38	13.92	7.70

TSS (mg/L) Daily Maximum	15.20	17.70	5.90	2.50	6.70	5.3	13.40	17.70	19.20	23.20	25.00	9.80
Total Dissolved Solids (lbs/day) Average Monthly	4318.90	20104.03	3521.10	1159.09	2973.32	4196.04	3706.81	3150.91	4179.23	6442.14	28018.99	13719.09
Total Dissolved Solids (lbs/day) Daily Maximum	4318.90	20104.03	3521.10	1159.09	2973.32	4196.04	3706.81	3150.91	4179.23	6442.14	28018.99	13719.09
Total Dissolved Solids (mg/L) Average Monthly	1940.00	2480.00	2230.00	1890.00	1860.00	1920.00	1750.00	1860.00	1760.00	1040.00	3230.00	2080.0
Total Dissolved Solids (mg/L) Daily Maximum	1940.00	2480.00	2230.00	1890.00	1860.00	1920.00	1750.00	1860.00	1760.00	1040.00	3230.00	2080.0
Oil and Grease (lbs/day) Average Monthly	5.46	7.27	5.77	2.97	7.26	3.75	5.60	4.66	4.78	7.37	23.41	20.10
Oil and Grease (lbs/day) Daily Maximum	7.25	11.35	8.03	4.22	10.56	4.70	10.30	5.92	6.06	8.67	32.50	28.48
Oil and Grease (mg/L) Average Monthly	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40
Oil and Grease (mg/L) Daily Maximum	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40
Ammonia (mg/L) Average Monthly	0.03	0.36	0.13	0.21	0.05	0.03	0.07	0.13	0.19	0.17	0.07	0.08
Ammonia (mg/L) Daily Maximum	0.03	0.36	0.13	0.21	0.05	0.03	0.07	0.13	0.19	0.17	0.07	0.08
Total Cadmium (mg/L) Average Monthly	0.0004	0.0004	0.009	0.0009	0.0009	0.0009	0.0009	0.0009	0.0009	0.0009	0.0009	0.0009
Total Cadmium (mg/L) Daily Maximum	0.0004	0.0004	0.009	0.0009	0.0009	0.0009	0.0009	0.0009	0.0009	0.0009	0.0009	0.0009
Total Copper (mg/L) Average Monthly	0.0076	0.0058	0.0079	0.0122	0.0091	0.0117	0.0115	0.0098	0.0101	0.0062	0.0047	0.0052
Total Copper (mg/L) Daily Maximum	0.0076	0.0058	0.0079	0.0122	0.0091	0.0117	0.0115	0.0098	0.0101	0.0062	0.0047	0.0052
Bromide (mg/L) Average Monthly			3.69			3.35			4.57			19.30
Bromide (mg/L) Daily Maximum			3.69			3.35			4.57			19.30
PCBs (Dry Weather) (pg/L) Daily Maximum									383			

Acute WET - Ceriodaphnia Survival (TUa) Daily Maximum			1.0						1.0			
Chronic WET - Ceriodaphnia Survival (TUc) Daily Maximum			2.5						1.4			
Chronic WET - Ceriodaphnia Reproduction (TUc) Daily Maximum			2.5						2.0			

Development of Effluent Limitations

Outfall No.	001	**Design Flow (MGD)**	4.32
Latitude	39º 48' 23.44"	**Longitude**	-75º 25' 9.72"

Wastewater Description: IW Process Effluent with ELG – Cooling tower blowdown, boiler blowdown, RO reject water and internal plant drains

Technology-Based Limitations

The following technology-based limitations apply, subject to water quality analysis and BPJ where applicable:

Parameter	Limit (mg/l)	SBC	Federal Regulation
Total Suspended Solids	30/100	Month. Ave. /Dly.Max	40 CFR: 423.12.(b) (3)
pH	6.0 – 9.0 S.U. at all times		40 CFR: 423.12.(b) (1)
Oil and Grease	15/20	Month. Ave./Dly. Max	40 CFR: 423. 12.(b) (3)
*Free Available Chlorine	0.2/0.5	Ave./Max.	40 CFR: 423.12. (b) (7)

* The existing TRC limit is recommended due to chemical addition.

Water Quality-Based Limitations

Parameter	Limit (mg/l)	SBC	Basis
pH	6.0 to 9.0 SU at all times		Chapter 93
TSS	30	Month. Ave.	DRBC
TDS	5000	Month. Ave.	DRBC
Temperature	95ºF	I. Max.	DRBC
Oil and Grease	15	Month. Ave.	DRBC
DO	5.0	I. Min.	Chapter 93
CBOD5	30	Average	DRBC
NH3-N	Monitor/Report	Average	Existing*

All the above requirements are carried over from the existing permit. DO limit is changed according to Chapter 93.

*existing monitoring requirement is continued due to chemical addition
**CBOD20 limit is eliminated from the permit according to the recommendation from DRBC.
Reference: DRBC Docket No. D-2008-021 CP-3.

Anti-Backsliding

N/A

A "Reasonable Potential Analysis" was conducted and the following parameters were of concern:

Effluent parameter (1)	Reported in application (2)	Most stringent criterion (DEP/DRBC) (3)	Max. allowable concentration (3) *	Concerns/comments (4)
TDS	2240000	500000		Existing limit recommended
Chloride	474000	250000(HH)	$2.66*10^8$	No concern
Bromide	19300	N/A		Monitor (existing)
Sulfate	410000	250000	$2.66*10^8$	No concern
Total Aluminum	2980	750	7125	Monitor
Total Antimony	12.9	5.6 (HH)	5964	No concern
Total Cadmium	0.89	1.6	15.2	No concern (existing monitoring)
Acrylamide	<50	0.07 (CRL)	133.91	No concern
Hexavalent Chromium	19.1	16	152	Monitoring
Copper, total	10.4	10.5	99.75	Monitor (existing)
Chlorodibromomethane	<3.4	0.4 (CRL	765.2	No concern
Chloroform	88	5.7 (CRL)	10904.1	No concern
Dichlorobromomethane	18	0.55 (CRL)	1052.15	No concern

*Based on the CORMIX model run, a minimum acute dilution factor of 9.5 is expected. A chronic dilution factor of 1065 and 1913 are provided by DRBC and are preliminary results based on DRBC model under Q7-10 condition for the aquatic life and harmonic mean flow for the human health. (this information is from previous fact sheet dated 2014). These are appropriately used to calculate the maximum allowable concentration.

TDS limit is based on DRBC.

Chloride and Sulfate criteria are based on PWS and no public water supply intake downstream of the discharge. No concern due to the high dilution factor.

Bromide monitoring is recommended to continue because there is a concern of bromide compounds in power plant discharges.

For Aluminum, calculation is based on fresh water acute criterion of 750 ug/l. Reported concentration is between 10% and 50% of the maximum allowable concentration and based on our SOP, monitoring is recommended.

Reported concentration of Antimony is much less than the maximum allowable concentration so there is no concern.

For Cadmium reported concentration is much less than the maximum allowable concentration so there is no concern; existing monitoring is eliminated from the permit.

For Acrylamide, all three sampling results provided are non-detectable. There is no recommended TQL for Acrylamide. DEP suggest using the most sensitive test method in the future.

For Hexavalent Chromium calculation is based on the fresh water acute criterion of 16 ug/l and the reported concentration is between 10% and 50% of the maximum allowable concentration and based on our SOP, monitoring is recommended.

For copper, calculation is based on the fresh water acute criterion of 10.5 ug/l. Reported concentration is between 10% and 50% of the maximum allowable concentration and based on our SOP, existing monitoring is recommended to continue.

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For Chlorodibromomethane, Chloroform, and Dichlorobromomethane, calculations are based on the CRL criteria. The reported concentrations are much less than the maximum allowable concentrations. No concern for these parameters.

Whole Effluent Toxicity (WET)

For Outfall 001, [FORMCHECKBOX] **Acute** [FORMCHECKBOX] **Chronic** WET Testing was completed:

[FORMCHECKBOX] For the permit renewal application (4 tests).
[FORMCHECKBOX] Quarterly throughout the permit term.
[FORMCHECKBOX] Quarterly throughout the permit term and a TIE/TRE was conducted.
[FORMCHECKBOX] Other: semiannually

The dilution series used for the tests was: 100%, 50%, 25%, 12%, and 6.25%. The Target Instream Waste Concentration (TIWC) to be used for analysis of the results is: TIWCa = 35 % and TIWCc <1 %.

Summary of Four Most Recent Test Results

(NOTE – Enter results into one table, depending on which data analysis method was used).

NOEC/LC50 Data Analysis

	***Ceriodaphnia* Results (% Effluent)**			***Pimephales* Results (% Effluent)**			
Test Date	**NOEC Survival**	**NOEC Reproduction**	**LC50**	**NOEC Survival**	**NOEC Growth**	**LC50**	**Pass? ***
06/26/18	100	2	>100	100	100	>100	pass
09/26/218	100	100	>100	100	100	>100	pass
01/22/19	100	100	>100	100	100	>100	pass
06/18/19	100	100	>100	100	100	>100	pass

** A "passing" result is that which is greater than or equal to the TIWC value.*

Is there reasonable potential for an excursion above water quality standards based on the results of these tests? (*NOTE – In general, reasonable potential is determined anytime there is at least one test failure in the previous four tests).*

[FORMCHECKBOX] **YES** [FORMCHECKBOX] **NO**

Comments: Currently the facility is conducting Chronic WET testing and Acute Toxicity results are derived from Chronic Tests.

Evaluation of Test Type, IWC and Dilution Series for Renewed Permit

IWC = Qd/ {(Q7-10) xPMF +Qd}

This discharge is into tidal Delaware River.

Acute dilution factor is 9.5 and Chronic dilution factor is 1065 based on CORMIX model from DRBC.

Therefore IWCa = 1/9.5 * 100 = 10.53 % and TIWCa = IWCa/0.3 = 35%

IWCc = 1/1065 = 0.0938% and TIWCc = IWCc/1 = 0.0938%

Chronic TIWCc is well below the lowest WET SOP minimum dilution of 1%. Considering the very high chronic dilution and assuming acute testing may be more protective, for the new permit Acute WET testing is recommended for both species, and the dilution series will be 9%, 18%, 35%, 68%, and 100% based on PADEP WET SOP.

WET Limits

Has reasonable potential been determined? [FORMCHECKBOX] YES [FORMCHECKBOX] NO

Will WET limits be established in the permit? [FORMCHECKBOX] YES [FORMCHECKBOX] NO

The standard condition from PADEP WET SOP is included in the part C of the permit.

Proposed Effluent Limitations and Monitoring Requirements

Outfall 001, Effective Period: Permit Effective Date through Permit Expiration Date.

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Daily Maximum	Minimum	Average Quarterly	Daily Maximum	Instant. Maximum		
Flow (MGD)	Report	Report	XXX	XXX	XXX	XXX	1/day	Metered
pH (S.U.)	XXX	XXX	6.0 Inst Min	XXX	XXX	9.0	1/week	Grab
DO	XXX	XXX	5.0 Inst Min	XXX	XXX	XXX	1/month	Grab
TRC	XXX	XXX	XXX	0.05 Avg Mo	XXX	0.1	1/week	Grab
Temperature (°F)	XXX	XXX	XXX	XXX	XXX	95.0	1/week	I-S
CBOD5	1080 Avg Qrtly	2161	XXX	30.0	60.0	75	1/quarter	24-Hr Composite
TSS	1080	3602	XXX	30.0 Avg Mo	100.0	XXX	1/week	24-Hr Composite
Total Dissolved Solids	180144	360288	XXX	5000.0 Avg Mo	10000.0	12500	1/month	24-Hr Composite
Oil and Grease	540	720	XXX	15.0 Avg Mo	20.0	XXX	1/week	Grab
Ammonia	XXX	XXX	XXX	Report Avg Mo	Report	XXX	1/month	24-Hr Composite
Total Copper	XXX	XXX	XXX	Report Avg Mo	Report	XXX	1/month	24-Hr Composite
Total Aluminum	XXX	XXX	XXX	Report Avg Mo	Report	XXX	1/month	24-Hr Composite
Chromium, Hexavalent	XXX	XXX	XXX	Report Avg Mo	Report	XXX	1/month	24-Hr Composite
Bromide	XXX	XXX	XXX	Report	Report	XXX	1/quarter	24-Hr Composite
PCBs (Dry Weather) (pg/L)	XXX	XXX	XXX	XXX	Report	XXX	1/year	24-Hr Composite

Outfall 001 , Continued (from Permit Effective Date through Permit Expiration Date)

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Daily Maximum	Minimum	Average Quarterly	Daily Maximum	Instant. Maximum		
Acute WET - Ceriodaphnia Survival (TUa)	XXX	XXX	XXX	XXX	Report	XXX	See Permit	24-Hr Composite
Acute WET – Pimephales Survival	XXX	XXX	XXX	XXX	Report	XXX	See Permit	24-Hr Composite