Shell Chemical Appalachia LLC
300 Frankfort Rd.
Monaca, PA 15061

August 25, 2025

Mr. Ryan Decker
Clean Water Program
PA Department of Environmental Protection
Southwest Regional Office
400 Waterfront Drive
Pittsburgh, PA 15222

RE: National Pollutant Discharge Elimination System Permit Application Renewal
Permit No. PA0002208
Shell Chemical Appalachia LLC
Beaver County, Pennsylvania

Dear Mr. Decker:

Shell Chemical Appalachia LLC ("Shell") has enclosed this permit application to renew Shell's National Pollution Discharge Elimination System (NPDES) permit PA0002208 which expires February 28, 2026. Shell is submitting its NPDES permit application as required at least 180-days prior to the expiration date.

If you have any questions or require additional information, please contact me at kimberly.kaal@shell.com.

Sincerely,

Kimberly Kaal
Environmental Manager, Attorney-in-Fact

Enclosure – NPDES Permit Application

SHELL CHEMICAL APPALACHIA LLC
SHELL POLYMERS MONACA SITE
POTTER AND CENTER TOWNSHIPS
BEAVER COUNTY, PENNSYLVANIA

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) RENEWAL APPLICATION
PERMIT PA0002208

August 26, 2025

Prepared for:
Shell Chemical Appalachia LLC

Prepared by:

AECOM

TABLE OF CONTENTS

Section

Section 1

General Information Form (GIF)

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
CENTER FOR ENVIRONMENTAL EXCELLENCE

GENERAL INFORMATION FORM – AUTHORIZATION APPLICATION

Before completing this General Information Form (GIF), read the step-by-step instructions provided in this application package. This form is used by the Department of Environmental Protection (DEP) to inform our programs regarding what other DEP permits or authorizations may be needed for the proposed project or activity. This version of the General Information Form (GIF) must be completed and returned with any program-specific application being submitted to the DEP.

Related ID#s (If Known)				DEP USE ONLY
Client ID#	311950	**APS ID#**		Date Received & General Notes
Site ID#	102360	**Auth ID#**		
Facility ID#	**775836**			

CLIENT INFORMATION

DEP Client ID#	Client Type/Code	Dun & Bradstreet ID#
311950	LLC	13148917

Legal Organization Name or Registered Fictitious Name	Employer ID# (EIN)	Is the EIN a SSN?
Shell Chemical Appalachia LLC	46-1624986	☐ Yes ☒ No

State of Incorporation or Registration of Fictious Name
Delaware Limited Liability Company

☐ **Corporation** ☒ **LLC** ☐ **Partnership** ☐ **LLP** ☐ **LP**
☐ **Sole Proprietorship** ☐ **Association/Organization**
☐ **Estate/Trust** ☐ **Other**

Individual Last Name	First Name	MI	Suffix

Additional Individual Last Name	First Name	MI	Suffix

Mailing Address Line 1	Mailing Address Line 2
300 Frankfort Rd	

Address Last Line – City	State	ZIP+4	Country
Monaca	PA	15061	Beaver

Client Contact Last Name	First Name	MI	Suffix
Kaal	Kimberly		

Client Contact Title	Phone	Ext	Cell Phone
Environmental Manager (Attorney-in-Fact)	724-709-2467		

Email Address	FAX
Kimberly.kaal@shell.com	

SITE INFORMATION

DEP Site ID#	Site Name
102360	Shell Polymers Monaca

EPA ID# 1506WSHLL3FRAN **Estimated Number of Employees to be Present at Site** 600

Description of Site
Ethylene manufacturing, polyethylene manufacturing, and cogeneration power plant

Tax Parcel ID(s):

County Name(s)	Municipality(ies)	City	Boro	Twp	State
Beaver	Potter	☐	☐	☒	PA
Beaver	**Center**	☐	☐	☒	PA
		☐	☐	☐	

☐	☐	☐	

Site Location Line 1	Site Location Line 2
300 Frankfort Rd	

Site Location Last Line – City	State	ZIP+4
Monaca	PA	15061

Detailed Written Directions to Site

From Pittsburgh International Airport - 376 North to Exit 39 (Monaca). Turn left onto Rt 18 South and proceed for 1.5 miles. Then turn right at light into plant.

Site Contact Last Name	First Name	MI	Suffix
Kaal	Kimberly		

Site Contact Title	Site Contact Firm
Environmental Manager (Attorney-in-Fact)	Shell

Mailing Address Line 1	Mailing Address Line 2
300 Frankfort Rd	

Mailing Address Last Line – City	State	ZIP+4
Monaca	PA	15061

Phone	Ext	FAX	Email Address
724-709-2467			Kimberly.kaal@shell.com

NAICS Codes (Two- & Three-Digit Codes – List All That Apply)	6-Digit Code (Optional)
325 and 221	325110, 325211, and 221112

Client to Site Relationship

Owner/Operator

FACILITY INFORMATION

Modification of Existing Facility	Yes	No
1. Will this project modify an existing facility, system, or activity?	☐	☒
2. Will this project involve an addition to an existing facility, system, or activity?	☐	☒

If "Yes", check all relevant facility types and provide DEP facility identification numbers below.

	Facility Type	DEP Fac ID#		Facility Type	DEP Fac ID#
☒	Air Emission Plant	775836	☐	Industrial Minerals Mining Operation	
☐	Beneficial Use (water)		☐	Laboratory Location	
☐	Blasting Operation		☐	Land Recycling Cleanup Location	
☐	Captive Hazardous Waste Operation		☐	Mine Drainage Treatment / Land Recycling Project Location	
☐	Coal Ash Beneficial Use Operation		☐	Municipal Waste Operation	
☐	Coal Mining Operation		☐	Oil & Gas Encroachment Location	
☐	Coal Pillar Location		☐	Oil & Gas Location	
☐	Commercial Hazardous Waste Operation		☐	Oil & Gas Water Poll Control Facility	
☐	Dam Location		☐	Public Water Supply System	
☐	Deep Mine Safety Operation -Anthracite		☐	Radiation Facility	
☐	Deep Mine Safety Operation -Bituminous		☐	Residual Waste Operation	
☐	Deep Mine Safety Operation -Ind Minerals		☐	Storage Tank Location	
☐	Encroachment Location (water, wetland)		☒	Water Pollution Control Facility	417201
☐	Erosion & Sediment Control Facility		☐	Water Resource	
☐	Explosive Storage Location		☐	Other:	

Latitude/Longitude Point of Origin	Latitude			Longitude		
	Degrees	Minutes	Seconds	Degrees	Minutes	Seconds
	40	40	17.724	80	20	**10**

Horizontal Accuracy Measure	Feet	18	*--or--*	Meters	
Horizontal Reference Datum Code	☐	North American Datum of 1927			
	☒	North American Datum of 1983			
	☐	World Geodetic System of 1984			
Horizontal Collection Method Code	GISDR				
Reference Point Code	CNTER				
Altitude	Feet	785.91	*--or--*	Meters	
Altitude Datum Name	☐	The National Geodetic Vertical Datum of 1929			
	☒	The North American Vertical Datum of 1988 (NAVD88)			
Altitude (Vertical) Location Datum Collection Method Code	SRVEY				
Geometric Type Code	POINT				
Data Collection Date	5/26/2012				
Source Map Scale Number	1	Inch(es)	=	Feet	
--or--		Centimeter(s)	=	Meters	

PROJECT INFORMATION

Project Name

Renewal of NPDES Permit PA 0002208

Project Description

Renewal of NPDES Permit PA-0002208

Project Consultant Last Name	First Name	MI	Suffix
Joseph	Jerry		

Project Consultant Title **Consulting Firm**

Mailing Address Line 1 **Mailing Address Line 2**

Address Last Line – City **State** **ZIP+4**

Phone **Ext** **FAX** **Email Address**

Time Schedules	Project Milestone (Optional)

1. Is the project located in or within a 0.5-**mile radius of an Environmental Justice community as defined by DEP?** ☒ Yes ☐ No

To determine if the project is located in or within a 0.5-mile radius of an environmental justice community, please use the online PennEnviroScreen tool. To see specific EJ areas, select the appropriate year of your submittal from the themes box on the right.

2. Have you informed the surrounding community prior to submitting the application to the Department? ☒ Yes ☐ No

Method of notification: Municipal Small Community Group meetings, Community Advisory Panel meetings, meetings with Elected Officials, and notification letters.

3. **Have you addressed community concerns that were identified?** ☒ Yes ☐ No ☐ N/A

If no, please briefly describe the community concerns that have been expressed and not addressed.

4. **Is your project funded by state or federal grants?** ☐ Yes ☒ No

Note: If "Yes", specify what aspect of the project is related to the grant and provide the grant source, contact person and grant expiration date.

Aspect of Project Related to Grant

Grant Source: _____

Grant Contact Person: _____

Grant Expiration Date: _____

5. **Is this application for an authorization on Appendix A of the Land Use Policy? (For referenced list, see Appendix A of the Land Use Policy attached to GIF instructions)** ☒ Yes ☐ No

Note: If "No" to Question 5, the application is not subject to the Land Use Policy.

If "Yes" to Question 5, the application is subject to this policy and the Applicant should answer the additional questions in the **Land Use Information** section.

LAND USE INFORMATION

Note: Applicants should submit copies of local land use approvals or other evidence of compliance with local comprehensive plans and zoning ordinances.

1. **Is there an adopted county or multi-county comprehensive plan?** ☒ Yes ☐ No

2. **Is there a county stormwater management plan?** ☒ Yes ☐ No

3. **Is there an adopted municipal or multi-municipal comprehensive plan?** ☒ Yes ☐ No

4. **Is there an adopted county-wide zoning ordinance, municipal zoning ordinance or joint municipal zoning ordinance?** ☒ Yes ☐ No

Note: If the Applicant answers "No" to either Questions 1, 3 or 4, the provisions of the PA MPC are not applicable and the Applicant does not need to respond to questions 5 and 6 below.

If the Applicant answers "Yes" to questions 1, 3 and 4, the Applicant should respond to questions 5 and 6 below.

5. **Does the proposed project meet the provisions of the zoning ordinance or does the proposed project have zoning approval?** If zoning approval has been received, attach documentation. ☒ Yes ☐ No

6. **Have you attached Municipal and County Land Use Letters for the project?** ☒ Yes ☐ No

COORDINATION INFORMATION

Note: The PA Historical and Museum Commission must be notified of proposed projects in accordance with DEP Technical Guidance Document 012-0700-001 at PHMC's online portal, PA-SHARE.

If the activity will be a mining project (i.e., mining of coal or industrial minerals, coal refuse disposal and/or the operation of a coal or industrial minerals preparation/processing facility), respond to questions 1.0 through 2.5 below.

If the activity will not be a mining project, skip questions 1.0 through 2.5 and begin with question 3.0.

1.0	**Is this a coal mining project?** If "Yes", respond to 1.1-1.6. If "No", skip to Question 2.0.	☐	Yes	☒	No
1.1	**Will this coal mining project involve coal preparation/ processing activities in which the total amount of coal prepared/processed will be equal to or greater than 200 tons/day?**	☐	Yes	☐	No
1.2	**Will this coal mining project involve coal preparation/ processing activities in which the total amount of coal prepared/processed will be greater than 50,000 tons/year?**	☐	Yes	☐	No
1.3	**Will this coal mining project involve coal preparation/ processing activities in which thermal coal dryers or pneumatic coal cleaners will be used?**	☐	Yes	☐	No
1.4	**For this coal mining project, will sewage treatment facilities be constructed and treated waste water discharged to surface waters?**	☐	Yes	☐	No
1.5	**Will this coal mining project involve the construction of a permanent impoundment meeting one or more of the following criteria: (1) a contributory drainage area exceeding 100 acres; (2) a depth of water measured by the upstream toe of the dam at maximum storage elevation exceeding 15 feet; (3) an impounding capacity at maximum storage elevation exceeding 50 acre-feet?**	☐	Yes	☐	No
1.6	**Will this coal mining project involve underground coal mining to be conducted within 500 feet of an oil or gas well?**	☐	Yes	☐	No
2.0	**Is this a non-coal (industrial minerals) mining project?** If "Yes", respond to 2.1-2.6. If "No", skip to Question 3.0.	☐	Yes	☒	No
2.1	**Will this non-coal (industrial minerals) mining project involve the crushing and screening of non-coal minerals other than sand and gravel?**	☐	Yes	☐	No
2.2	**Will this non-coal (industrial minerals) mining project involve the crushing and/or screening of sand and gravel with the exception of wet sand and gravel operations (screening only) and dry sand and gravel operations with a capacity of less than 150 tons/hour of unconsolidated materials?**	☐	Yes	☐	No
2.3	**Will this non-coal (industrial minerals) mining project involve the construction, operation and/or modification of a portable non-metallic (i.e., non-coal) minerals processing plant under the authority of the General Permit for Portable Non-metallic Mineral Processing Plants (i.e., BAQ-PGPA/GP-3)?**	☐	Yes	☐	No
2.4	**For this non-coal (industrial minerals) mining project, will sewage treatment facilities be constructed and treated waste water discharged to surface waters?**	☐	Yes	☐	No

2.5	**Will this non-coal (industrial minerals) mining project involve the construction of a permanent impoundment meeting one or more of the following criteria: (1) a contributory drainage area exceeding 100 acres; (2) a depth of water measured by the upstream toe of the dam at maximum storage elevation exceeding 15 feet; (3) an impounding capacity at maximum storage elevation exceeding 50 acre-feet?**	☐ Yes	☐ No
3.0	**Will your project, activity, or authorization have anything to do with a well related to oil or gas production, have construction within 200 feet of, affect an oil or gas well, involve the waste from such a well, or string power lines above an oil or gas well?** If "Yes", respond to 3.1-3.3. If "No", skip to Question 4.0.	☐ Yes	☒ No
3.1	**Does the oil- or gas-related project involve any of the following: placement of fill, excavation within or placement of a structure, located in, along, across or projecting into a watercourse, floodway or body of water (including wetlands)?**	☐ Yes	☐ No
3.2	**Will the oil- or gas-related project involve discharge of industrial wastewater or stormwater to a dry swale, surface water, ground water or an existing sanitary sewer system or storm water system?** If "Yes", discuss in *Project Description*.	☐ Yes	☐ No
3.3	**Will the oil- or gas-related project involve the construction and operation of industrial waste treatment facilities?**	☐ Yes	☐ No
4.0	**Will the project involve a construction activity that results in earth disturbance?** If "Yes", specify the total disturbed acreage.	☐ Yes	☒ No
	4.0.1 Total Disturbed Acreage		
	4.0.2 Will the project discharge or drain to a special protection water (EV or HQ) or an EV wetland?	☐ Yes	☒ No
	4.0.3 Will the project involve a construction activity that results in earth disturbance in the area of the earth disturbance that are contaminated at levels exceeding residential or non-residential medium-specific concentrations (MSCs) in 25 Pa. Code Chapter 250 at residential or non-residential construction sites, respectively?	☐ Yes	☒ No
5.0	**Does the project involve any of the following: water obstruction and/or encroachment, wetland impacts, or floodplain project by the Commonwealth/political subdivision or public utility?** If "Yes", respond to 5.1-5.7. If "No", skip to Question 6.0.	☐ Yes	☒ No
5.1	**Water Obstruction and Encroachment Projects – Does the project involve any of the following: placement of fill, excavation within or placement of a structure, located in, along, across or projecting into a watercourse, floodway or body of water?**	☐ Yes	☐ No
5.2	**Wetland Impacts – Does the project involve any of the following: placement of fill, excavation within or placement of a structure, located in, along, across or projecting into a wetland?**	☐ Yes	☐ No

5.3	**Floodplain Projects by the Commonwealth, a Political Subdivision of the Commonwealth or a Public Utility – Does the project involve any of the following: placement of fill, excavation within or placement of a structure, located in, along, across or projecting into a floodplain?**	☐ Yes	☐ No
5.4	**Is your project an interstate transmission natural gas pipeline?**	☐ Yes	☐ No
5.5	**Does your project consist of linear construction activities which result in earth disturbance in two or more DEP regions AND three or more counties?**	☐ Yes	☐ No
5.6	**Does your project utilize Floodplain Restoration as a best management practice for Post Construction Stormwater Management?**	☐ Yes	☐ No
5.7	**Does your project utilize Class V Gravity / Injection Wells as a best management practice for Post Construction Stormwater Management?**	☐ Yes	☐ No
6.0	**Will the project involve discharge of construction related stormwater to a dry swale, surface water, ground water or separate storm water system?**	☐ Yes	☒ No
6.1	**Will the project involve discharge of industrial waste stormwater or wastewater from an industrial activity or sewage to a dry swale, surface water, ground water or an existing sanitary sewer system or separate storm water system?**	☒ Yes	☐ No
7.0	**Will the project involve the construction and operation of industrial waste treatment facilities?**	☐ Yes	☒ No
8.0	**Will the project involve construction of sewage treatment facilities, sanitary sewers, or sewage pumping stations?** If "Yes", indicate estimated proposed flow (gal/day). Also, discuss the sanitary sewer pipe sizes and the number of pumping stations/treatment facilities/name of downstream sewage facilities in the *Project Description*, where applicable. **8.0.1 Estimated Proposed Flow (gal/day)**	☐ Yes	☒ No
9.0	**Will the project involve the subdivision of land, or the generation of 800 gpd or more of sewage on an existing parcel of land or the generation of an additional 400 gpd of sewage on an already-developed parcel, or the generation of 800 gpd or more of industrial wastewater that would be discharged to an existing sanitary sewer system?**	☐ Yes	☒ No
	9.0.1 Was Act 537 sewage facilities planning submitted and approved by DEP? If "Yes" attach the approval letter. Approval required prior to 105/NPDES approval.	☐ Yes	☐ No
10.0	**Is this project for the beneficial use of biosolids for land application within Pennsylvania?** If "Yes" indicate how much (i.e. gallons or dry tons per year). **10.0.1 Gallons Per Year (residential septage)** **10.0.2 Dry Tons Per Year (biosolids)**	☐ Yes	☒ No

11.0	**Does the project involve construction, modification or removal of a dam?** If "Yes", identify the dam.	☐ Yes	☒ No
	11.0.1 Dam Name		
12.0	**Will the project interfere with the flow from, or otherwise impact, a dam?** If "Yes", identify the dam.	☐ Yes	☒ No
	12.0.1 Dam Name		
13.0	**Will the project involve operations (excluding during the construction period) that produce air emissions (i.e., NOX, VOC, etc.)?**	☐ Yes	☒ No
	13.0.1 If "Yes", is the operation subject to the agricultural exemption in 35 P.S. § 4004.1?	☐ Yes	☐ No
	13.0.2 If the answer to 13.0.1 is "No", identify each type of emission followed by the estimated amount of that emission.		
	Enter all types & amounts of emissions; separate each set with semicolons.		
14.0	**Does the project include the construction or modification of a drinking water supply to serve 15 or more connections or 25 or more people, at least 60 days out of the year?** If "Yes," check all proposed sub-facilities.	☐ Yes	☒ No
	14.0.1 Number of Persons Served		
	14.0.2 Number of Employee/Guests		
	14.0.3 Number of Connections		
	14.0.4 Sub-Fac: Distribution System	☐ Yes	☐ No
	14.0.5 Sub-Fac: Water Treatment Plant	☐ Yes	☐ No
	14.0.6 Sub-Fac: Source	☐ Yes	☐ No
	14.0.7 Sub-Fac: Pump Station	☐ Yes	☐ No
	14.0.8 Sub-Fac: Transmission Main	☐ Yes	☐ No
	14.0.9 Sub-Fac: Storage Facility	☐ Yes	☐ No
15.0	**Will your project include infiltration of storm water or waste water to ground water within one-half mile of a public water supply well, spring or infiltration gallery?**	☐ Yes	☒ No
16.0	**Is your project to be served by an existing public water supply?** If "Yes", indicate name of supplier and attach letter from supplier stating that it will serve the project.	☒ Yes	☐ No
	16.0.1 Supplier's Name Center Township Water Authority (existing)		
	16.0.2 Letter of Approval from Supplier is Attached	☐ Yes	☒ No
17.0	**Will this project be served by on-lot drinking water wells?**	☐ Yes	☒ No
18.0	**Will this project involve a new or increased drinking water withdrawal from a river, stream, spring, lake, well or other water bod(ies)?** If "Yes," reference Safe Drinking Water Program.	☐ Yes	☒ No
	18.0.1 Source Name		

19.0	**Will the construction or operation of this project involve treatment, storage, reuse, or disposal of waste?** If "Yes," indicate what type (i.e., hazardous, municipal (including infectious & chemotherapeutic), residual) and the amount to be treated, stored, re-used or disposed. **19.0.1 Type & Amount**	☐ Yes	☒ No
20.0	**Will your project involve the removal of coal, minerals, contaminated media, or solid waste as part of any earth disturbance activities?**	☐ Yes	☒ No
21.0	**Does your project involve installation of a field constructed underground storage tank?** If "Yes," list each Substance & its Capacity. **Note:** Applicant may need a Storage Tank Site Specific Installation Permit. **21.0.1 Enter all substances & capacity of each; separate each set with semicolons.**	☐ Yes	☒ No
22.0	**Does your project involve installation of an aboveground storage tank greater than 21,000 gallons capacity at an existing facility?** If "Yes," list each Substance & its Capacity. **Note:** Applicant may need a Storage Tank Site Specific Installation Permit. **22.0.1 Enter all substances & capacity of each; separate each set with semicolons.**	☐ Yes	☒ No
23.0	**Does your project involve installation of a tank greater than 1,100 gallons which will contain a highly hazardous substance as defined in DEP's Regulated Substances List, 2570-BK-DEP2724?** If "Yes," list each Substance & its Capacity. **Note:** Applicant may need a Storage Tank Site Specific Installation Permit. **23.0.1 Enter all substances & capacity of each; separate each set with semicolons.**	☐ Yes	☒ No
24.0	**Does your project involve installation of a storage tank at a new facility with a total AST capacity greater than 21,000 gallons?** If "Yes", list each Substance & its Capacity. **Note:** Applicant may need a Storage Tank Site Specific Installation Permit. **24.0.1 Enter all substances & capacity of each; separate each set with semicolons.**	☐ Yes	☒ No
	NOTE: If the project includes the installation of a regulated storage tank system, including diesel emergency generator systems, the project may require the use of a Department Certified Tank Handler. For a full list of regulated storage tanks and substances, please go to www.dep.pa.gov search term storage tanks		
25.0	**Will the intended activity involve the use of a radiation source?**	☐ Yes	☒ No

CERTIFICATION

I certify that I have the authority to submit this application on behalf of the applicant named herein and that the information provided in this application is true and correct to the best of my knowledge and information.

For applicants supplying an EIN number: I am applying for a permit or authorization from the Pennsylvania Department of Environmental Protection (DEP). As part of this application, I will provide DEP with an accurate EIN number for the applicant entity. By filing this application with DEP, I hereby authorize DEP to confirm the accuracy of the EIN number provided with the Pennsylvania Department of Revenue. As applicant, I further consent to the Department of Revenue discussing the same with DEP prior to issuance of the Commonwealth permit or authorization.

Type or Print Name Nathan Levin

Signature	Title	Date
	Operations Manager	8-21-25

Section 2

Acts 14 Notifications and Receipts

Shell Chemical Appalachia LLC
300 Frankfort Road
Monaca, PA 15061

August 20, 2025

Daniel C. Camp III
Chairman, Beaver County Commissioners
Beaver County Courthouse
810 Third Street
Beaver, PA 15009

Dear Mr. Camp,

This notice is to inform you of Shell Chemical Appalachia LLC's intent to submit a renewal National Pollutant Discharge Elimination System (NPDES) application to the Pennsylvania Department of Environmental Protection (PADEP) with the Permitting and Technical Services Section, Bureau of Water Standards and Facility Regulations for the following project:

Project:	Application to renew NPDES Permit PA0002208
Applicant Name:	Shell Chemical Appalachia LLC
Project Location:	300 Frankfort Road, Monaca, PA 15061
Applicant Contact:	Kimberly Kaal Shell Chemical Appalachia LLC 300 Frankfort Road Monaca, Beaver County, Pennsylvania 15061
Municipality/County:	Center and Potter Townships, Beaver County, PA

This letter is intended to satisfy the requirements of Pennsylvania Act 14. Section 1905-A of the Commonwealth Administrative Code as amended by Act 14, requires that each applicant for a PADEP permit must give written notice to the municipality(ies) and the county(ies) in which the permitted activity is located. The written notices shall be received by the municipality(ies) and county(ies) at least 30 days before the PADEP may issue or deny the permit.

Please submit any comments concerning this project to the PADEP, Southwest Regional Office, Bureau of Water Standards and Facility Regulation, 400 Waterfront Drive, Pittsburgh, PA 15222-4745.

Sincerely,

Nathan Levin
Operations Manager

SENDER: *COMPLETE THIS SECTION*

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Daniel C. Camp III
Chair, Beaver County Commissioners
Beave County Courthouse
810 Third Street
Beaver, PA 15009

9590 9402 7850 2234 0079 96

2. Article Number *(Transfer from service label)*

7022 2410 0000 6187 6338

COMPLETE THIS SECTION ON DELIVERY

A. Signature

X

☐ Agent
☐ Addressee

B. Received by *(Printed Name)* H Gras

C. Date of Delivery 8.27.25

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type

- ☐ Adult Signature
- ☐ Adult Signature Restricted Delivery
- ☑ Certified Mail®
- ☐ Certified Mail Restricted Delivery
- ☐ Collect on Delivery
- ☐ Collect on Delivery Restricted Delivery
- ☐ Priority Mail Express®
- ☐ Registered Mail™
- ☐ Registered Mail Restricted Delivery
- ☐ Signature Confirmation™
- ☐ Signature Confirmation Restricted Delivery

Mail
Mail Restricted Delivery
00)

PS Form 3811, July 2020 PSN 7530-02-000-9053 Domestic Return Receipt

Shell Chemical Appalachia LLC
300 Frankfort Road
Monaca, PA 15061

August 20, 2025

Bill DiCioccio, Jr.
Chairman, Center Township Supervisors
Center Township Municipal Building
3468 Brodhead Road, Suite 7
Monaca, PA 15061

Dear Mr. DiCioccio,

This notice is to inform you of Shell Chemical Appalachia LLC's intent to submit a renewal National Pollutant Discharge Elimination System (NPDES) application to the Pennsylvania Department of Environmental Protection (PADEP) with the Permitting and Technical Services Section, Bureau of Water Standards and Facility Regulations for the following project:

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Municipality/County:	Center and Potter Townships, Beaver County, PA

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Please submit any comments concerning this project to the PADEP, Southwest Regional Office, Bureau of Water Standards and Facility Regulation, 400 Waterfront Drive, Pittsburgh, PA 15222-4745.

Sincerely,

Nathan Levin
Operations Manager

Hand Delivered
RECEIVED BY BERNADETTE L. VESTA
DATE 8/29/25
SIGNATURE

Shell Chemical Appalachia LLC
300 Frankfort Road
Monaca, PA 15061

August 20, 2025

Rebecca Matsco
Chairwoman, Potter Township Supervisors
206 Mowry Road
Monaca, PA 15061

Dear Ms. Matsco,

This notice is to inform you of Shell Chemical Appalachia LLC's intent to submit a renewal National Pollutant Discharge Elimination System (NPDES) permit application to the Pennsylvania Department of Environmental Protection (PADEP) with the Permitting and Technical Services Section, Bureau of Water Standards and Facility Regulations for the following project:

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Applicant Contact:	Kimberly Kaal Shell Chemical Appalachia LLC 300 Frankfort Road Monaca, Beaver County, Pennsylvania 15061
Municipality/County:	Center and Potter Townships, Beaver County, PA

This letter is intended to satisfy the requirements of Pennsylvania Act 14. Section 1905-A of the Commonwealth Administrative Code as amended by Act 14, requires that each applicant for a PADEP permit must give written notice to the municipality(ies) and the county(ies) in which the permitted activity is located. The written notices shall be received by the municipality(ies) and county(ies) at least 30 days before the PADEP may issue or deny the permit.

Please submit any comments concerning this project to the PADEP, Southwest Regional Office, Bureau of Water Standards and Facility Regulation, 400 Waterfront Drive, Pittsburgh, PA 15222-4745.

Sincerely,

Nathan Levin
Operations Manager

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Rebecca Matsco
Chairwoman, Potter Township
Supervisors
Street and Apt. No., or PO Box No.
206 Mowry Road
City, State, ZIP+4®
Monaca, PA 15061

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

7022 2410 0000 6187 6314

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Section 3

PADEP NPDES Application Forms:

- Checklist 3800-PM-BCW 0008c
- Form 3800-PM-BCW 0008b (Main Form)
- Compliance History Attachment
- Module 1 (3800-PM-BCW 0008d) – Stormwater
- Module 5 (3800-PM-BCW 0008h) – Cooling Water Intake Structures

Pennsylvania Department of Environmental Protection

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF CLEAN WATER

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) APPLICATION FOR INDIVIDUAL PERMIT TO DISCHARGE INDUSTRIAL WASTEWATER

APPLICANT'S ✓ CHECKLIST

Applicant Name	Shell Chemical Appalachia LLC

Check the following list to make sure you have included all the required information. Place a checkmark in the box provided for all items completed and/or provided.

ENCLOSE THIS CHECKLIST WITH YOUR COMPLETED APPLICATION. FAILURE TO SUBMIT ALL REQUIRED INFORMATION MAY RESULT IN DENIAL OF THE APPLICATION.

	REQUIREMENTS	Check ✓ If Included	DEP Use Only
1.	Application Fee (new applications only). Amount Enclosed $ _____	☐	☐
2.	One signed original and two copies of the *completed* application with all applicable Analytical Results Tables (One copy if submitted electronically through the Public Upload tool).	☒	☐
3.	One additional copy of application for ECHD (if located in Erie County).	☐	☐
4.	One copy of application mailed to Delaware River Basin Commission (if discharge is in the Delaware River Basin)	☐	☐
5.	One copy of the General Information Form (4700-PM-CEE0001).	☒	☐
6.	Proper evidence of Act 14 municipal and county notifications.	☒	☐
7.	Evidence of newspaper publication for four consecutive weeks (new and modified discharges only)	☐	☐
8.	Copy of topographic map identifying treatment facilities, intake structures, and outfalls.	☒	☐
9.	Site plan identifying significant site features.	☒	☐
10.	Line drawing / process flow diagram illustrating the flow of water and wastewater through the facility(ies), with a water balance.	☒	☐
11.	Chemical Additives Notification Form(s) (if applicable).	☐	☐
12.	Whole Effluent Toxicity Test Reports / WET Analysis Spreadsheet (if applicable).	☐	☐
13.	Documentation supporting variance requests (if applicable)	☐	☐
14.	Preparedness, Prevention and Contingency (PPC) Plan (optional)	☐	☐
15.	Module 1 – Stormwater, and attachments (if applicable).	☒	☐
16.	Module 2 – Groundwater Remediation, and attachments (if applicable).	☐	☐
17.	Module 3 – Aquatic Animal Production Facilities, and attachments (if applicable)	☐	☐
18.	Module 4 – Anti-Degradation, and attachments (if applicable)	☐	☐
19.	Module 5 – Cooling Water Intake Structures, and attachments (if applicable)	☒	☐
20.	Optional site-specific data: _____	☐	☐

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF CLEAN WATER

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)
APPLICATION FOR INDIVIDUAL PERMIT TO DISCHARGE
INDUSTRIAL WASTEWATER

Before completing this form, please read the instructions (3800-PM-BCW0008a). FAILURE TO FOLLOW THE INSTRUCTIONS MAY RESULT IN DENIAL OF THE APPLICATION.

Related ID#s (If Known)				DEP USE ONLY
Client ID#	311950	**APS ID#**		Date Received:
Site ID#	102360	**Facility ID#**	775836	Permit No.:
				Auth ID: PDG?

GENERAL INFORMATION

Applicant/Operator Name	**Shell Chemical Appalachia LLC**	**25 Pa. Code § 92a.26 Fee Category** *(See instructions for fees)*

☐ New Permit (Anticipated Discharge Date: _____)
☒ Permit Renewal: NPDES No. PA **PA0002208**
Permit Expiration Date: February 28, 2026
Permit Renewal Application Due Date: September 1, 2025
WQM Permit No(s).: 0417201
WQM Permit Issuance Date(s): _____
Currently Using eDMR System? ☒ Yes ☐ No Start Date: _____

☐ Minor facility without ELG
☐ Minor facility with ELG
☒ Major facility < 250 MGD
☐ Major facility ≥ 250 MGD
☐ CAAP

Is applicant a "small business"?
☐ Yes ☒ No

Will the applicant accept the draft and final permit electronically? ☒ Yes ☐ No Email: _____

Is there on-site sewage treatment facility? ☐ Yes ☒ No
If Yes, is the facility operated by operator(s) certified in compliance with the Operators Certification Act? ☐ Yes ☐ No

Describe the nature of the business or operations resulting in discharge(s): **The plant will convert ethane feedstock into ethylene for manufacturing on site into various grades of linear low density and high density polyethylene as the facility's final product.**

SIC Code	Primary?	Description	NAICS Code	Primary?	Description
2869	YES	Industrial Organic Chemicals, Not Elsewhere Classified (Ethylene)	325110	YES	Petrochemical Manufacturing
2821	YES	Plastics Materials, Synthetic Resins, and Nonvulcanizable Elastomers (Polyethylene)	325211	YES	Plastics Material and Resin Manufacturing

OTHER ENVIRONMENTAL PERMITS

Type of Permit	Agency That Issued Permit	Date Issued
NPDES Individual Permit PA0002208	PADEP	2/24/21
WQM Part II 0417201 A-2 & A-3	PADEP	6/27/25
Air Plan Approval PA-04-00740A, B, & C	PADEP	3/19/25
Waste ID PAD004372363	PADEP/EPA	4/10/19
Individual Permit LRP-1997-1769	Army Corp of Engineers	6/15/15
Joint Permit E04-250-A3	PADEP	10/26/21

DISCHARGE INFORMATION
1. Attach a site plan, a line drawing with a water balance, and topographic map(s) that present the information requested in the instructions. Attached: ☒ Yes ☐ No
2. Total Hardness Upstream of Process Wastewater Outfall (mg/L): 95.27 avg/140 max Basis: long term sampling

3. List all discharge points (outfalls) and internal monitoring points (IMPs). If numbers were previously assigned in a permit, use those numbers. Order sequentially and use additional pages as necessary.

Outfall / IMP No.	LATITUDE			LONGITUDE			RECEIVING WATERS			
	Deg	Min	Sec	Deg	Min	Sec	Name of Receiving Waters	Ch. 93 Class.	Impaired?	TMDL?
001	40	40	22.996	-80	20	18.489	Ohio River (WWTP)	WWF	☒	☒
002	40	40	36.32	-80	19	43.83	Ohio River (East RR Pond)	WWF	☒	☒
003	40	40	36.32	-80	19	43.51	Ohio River (East RR Pond Overflow)	WWF	☒	☒
004	40	39	57.4943	-80	20	40.5531	Poorhouse Run (AC Pond Overflow)	WWF	☐	☐
005	40	40	50.29	-80	19	11.14	Ohio River (Mall Lot 2)	WWF	☒	☒
006	40	39	57.17	-80	20	09.11	Poorhouse Run (South Ponds)	WWF	☐	☐
007	40	39	57.0622	-80	20	9.1604	Poorhouse Run (South Pond Overflow)	WWF	☐	☐
008	40	39	56.27	-80	20	32.18	Poorhouse Run (CR Pond)	WWF	☐	☐
009	40	39	56.2702	-80	20	32.187	Poorhouse Run (CR Pond Overflow)	WWF	☐	☐
010	40	39	54.71	-80	20	22.16	Poorhouse Run (West RR Basin)	WWF	☐	☐
011	40	40	4.0	-80	20	48.0	Ohio River (Screen Backwash)	WWF	☒	☒
012	40	39	54.3288	-80	20	21.869	Poorhouse Run (West Basin Overflow)	WWF	☐	☐
013	40	40	33	-80	20	03	Ohio River (North Pond)	WWF	☒	☒
014	40	40	29.23	-80	19	58.05	Ohio River (North Pond Overflow)	WWF	☒	☒
015	40	40	47.53	-80	19	19.32	Ohio River (Groundwater Seep)	WWF	☒	☒
016	40	40	37.223	-80	19	50.142	Unamed tributary to Ohio River	WWF	☒	☒
017	40	39	22.355	-80	20	56.304	Racoon Creek (Parking Area Pond A West)	WWF	☒	☒
018	40	39	26.757	-80	20	50.466	Racoon Creek (Parking Area Pond A West Overflow)	WWF	☒	☒
019	40	39	32.633	-80	20	41.880	Racoon Creek (Parking Area Pond B East)	WWF	☒	☒
020	40	39	32.274	-80	20	43.058	Racoon Creek (Parking Area Pond B East Overflow)	WWF	☒	☒
021	40	39	40.28	-80	20	33.68	Poorhouse run (Storm water runoff Electric Tower Rd)	WWF	☐	☐
022	40	39	38.651	-80	20	35.918	Raccoon Creek (Training Center former PGT)	WWF	☒	☒
101			As needed				Ohio River (IMP for ELG Compliance)	WWF	☒	☒
108							Poorhouse Run through Outfall 008 or the Ohio River through Outfall 001 or 013 (Hydrotest)	WWF	☐	☐
201							Ohio River through Outfall 001 (Cooling Tower	WWF	☒	☒

							Blowdown)				

4. List all outfalls and IMPs in the same order as in question 2, above, and provide the requested information. Attach additional pages as necessary. See instructions.

Outfall / IMP No.	DISCHARGE CHARACTERIZATION							Design Flow (MGD)	Average Flow During Production / Operation (MGD)	Maximum Flow During Production / Operation (MGD)
	Process	Non-Process	Stormwater	Sewage	Groundwater	AAPF	Combined			
001	☒	☒	☒	☐	☐	☐	☒	~3.75	~3.25	~3.75
002	☐	☐	☒	☐	☐	☐	☐			
003	☐	☐	☒	☐	☐	☐	☐			
004	☒	☐	☒	☐	☐	☐	☐			
005	☐	☐	☐	☐	☒	☐	☐			
006	☐	☐	☒	☐	☐	☐	☐			
007	☐	☐	☒	☐	☐	☐	☐			
008	☐	☒	☒	☐	☐	☐	☐			
009	☐	☐	☒	☐	☐	☐	☐			
010	☐	☐	☒	☐	☐	☐	☐			
011	☐	☐	☒	☐	☐	☐	☐			
012	☐	☐	☒	☐	☐	☐	☐			
013	☐	☒	☒	☐	☐	☐	☐			
014	☐	☐	☒	☐	☐	☐	☐			
015	☐	☐	☐	☐	☒	☐	☐			
016	☐	☐	☒	☐	☐	☐	☐			
017	☐	☐	☒	☐	☐	☐	☐			
018	☐	☐	☒	☐	☐	☐	☐			
019	☐	☐	☒	☐	☐	☐	☐			
020	☐	☐	☒	☐	☐	☐	☐			
021	☐	☐	☒	☐	☐	☐	☐			
022	☐	☐	☒	☐	☐	☐	☐			
101	☒	☐	☒	☐	☐	☐	☐	~1.28	~0.80	~1.28
108	☐	☒	☐	☐	☐	☐	☐			
201	☐	☒	☐	☐	☐	☐	☐	~2.57	~2.57	~2.57

5. List all outfalls and IMPs in the same order as in questions 2 and 3, above, and provide the requested information. Attach additional pages as necessary. See instructions.

Outfall / IMP No.	Wastewater or Stormwater Description	Discharge Type	Frequency		Batch Discharges		
			Hours / Day	Days / Week	No. Discharge Cycles/Day	Length of Discharge Cycle (Hrs)	Batch Discharge Rate (MGD)
001	Effluent from the industrial waste treatment plant, cooling tower blowdowns and treated stormwater from the accidentally contaminated stormwater pond.	Continuous	24	7	NA	NA	NA
002	East RR Pond.	Stormwater	NA	NA	NA	NA	NA
003	East Pond Overflow	Stormwater	NA	NA	NA	NA	NA
004	AC Pond Overflow	Stormwater	NA	NA	NA	NA	NA
005	Mall Lot 2 Ground Water	Groundwater	NA	NA	NA	NA	NA
006	South Pond	Stormwater	NA	NA	NA	NA	NA
007	South Pond Overflow	Stormwater	NA	NA	NA	NA	NA
008	CR Pond – steam condensate; and sources monitored at Internal Monitoring Point 108	Stormwater	NA	NA	NA	NA	NA
009	CR Pond Overflow	Stormwater	NA	NA	NA	NA	NA
010	West RR Basin - – See Site plan for drainage area	Stormwater	NA	NA	NA	NA	NA
011	Intake back wash water	Stormwater	NA	NA	NA	NA	NA
012	West RR Basin Overflow	Stormwater	NA	NA	NA	NA	NA
013	North Pond – steam condensate; and sources monitored at Internal Monitoring Point 108	Stormwater	NA	NA	NA	NA	NA
014	North Pond Overflow	Stormwater	NA	NA	NA	NA	NA
015	Groundwater Seep	Groundwater	NA	NA	NA	NA	NA
016	Storm water from plant yard areas and Duquesne and PennDOT rights-of-way	Stormwater	NA	NA	NA	NA	NA
017	Parking Area Pond A West	Stormwater	NA	NA	NA	NA	NA
018	Parking Area Pond A West Overflow	Stormwater	NA	NA	NA	NA	NA
019	Parking Area Pond B East	Stormwater	NA	NA	NA	NA	NA
020	Parking Area Pond B East Overflow	Stormwater	NA	NA	NA	NA	NA
021	Storm water runoff from Electric Tower Rd	Stormwater	NA	NA	NA	NA	NA
022	Training Center former PGT	Stormwater	NA	NA	NA	NA	NA
101	IMP for ELG Compliance	Continuous	24	7	NA	NA	NA

108	Hydro Test Waters	Batch - Intermittent			Varies - As needed during plant startup		
201	Cooling Tower Blowdown	Continuous	24	7	NA	NA	NA

TREATMENT FACILITY INFORMATION

Complete this sheet for each existing and proposed industrial waste, sewage and/or stormwater treatment facility (one sheet per facility).

Treatment Facility Name: Wastewater Treatment Plant	Effluent Discharged To Outfall / IMP No.: 101 and 001

1. Provide a narrative description of the wastewater treatment process. Attach a line drawing or process flow diagram to the application.

   The primary function of the Wastewater Treatment Plant (WWTP) is to ensure that all wastewater streams generated from the process units and utilities as well as the process paved area runoff generated from rainstorms are sufficiently treated for discharging to the Ohio River. The existing WWTP consists of primary flow equalization and oil removal, followed by secondary activated sludge bioreactor (including clarifier), and tertiary sand filter.

   Enhancement to the system have been proposed and include segregating ECU wastewater for oil and sludge removal. Two dissolved nitrogen flotation units to further enhance oil removal and steam stripper for VOC and odor removal.

2. List each treatment unit at the facility in sequential order of treatment.

Treatment Unit Description	Method for Handling and Disposal of Solid or Liquid Residue Resulting from Treatment
Settlement Drum (Proposed)	Sludge and recovered oil sent offsite
Dissolved Nitrogen Flotation (DNF 1 and 2 – Proposed)	Sludge and recovered oil sent offsite
Steam Stripper (Proposed)	Sludge and recovered oil sent offsite
Bioreactor Aeration	
Secondary Clarifier	Biosludge Cake to offsite disposal
Tertiary Sand Filter	
Oil Removal	Recovered Oil sent offsite

3. Describe any proposed upgrades to this treatment facility within the next five years.

   NONE planned after implementing proposed modifications addressed in June 27, 2025 amendment to WQM permit

4. Identify all chemicals that have been used for wastewater treatment over the past two years.

Chemical Name	Purpose	Max Usage Rate	Units	Acrylamide?
8140 DAF	WWT Coagulant	1635	Gal/yr	☐
8187 FEOR A	Coagulant	1113	Gal/yr	☐
8187 FEOR B	Coagulant	1841	Gal/yr	☐
8452 Plus	Odor Neutralizer	890	Gal/yr	☐
				☐

5. List any additional proposed wastewater treatment chemicals anticipated in the next five years.

Chemical Name	Purpose	Max Usage Rate	Units	Acrylamide?
Nalco 7768	Flocculent	4,745	Gal/yr	☐
				☐
				☐

CHEMICAL ADDITIVES

1. Identify all chemical additives that have been introduced to any waste stream over the past two years.

Chemical Additive Name	Outfall / IMP No.	Purpose	Usage Frequency	Max Usage Rate	Units
7473	201	Antifoam	As needed	1,454	lb/yr
73550	201	Biodetergent	As needed	2,155	lb/yr
3DT098	201	Yellow Metal CI	As needed	52,083	lb/yr
3DT184	201	Corrosion Inhibitor	As needed	47,497	lb/yr
3DT396	201	Dispersant	As needed	169,991	lb/yr
H-550	201	Non-Ox Biocide	As needed	16,943	lb/yr
7473	101	Antifoam	As needed	9,428	lb/yr
71306 Cent	101	Cationic Flocculant	As needed	1,710	lb/yr
71306 DAF	101	Cationic Flocculant	As needed	5,346	lb/yr
71306 WWT	101	Cationic Flocculant	As needed	2,942	lb/yr

2. List all chemical additives that the applicant is requesting approval to use upon issuance of the permit by DEP. Identify the point of introduction on a line or process diagram.

Chemical Additive Name	Outfall / IMP No.	Purpose	Proposed Usage Frequency	Proposed Max Usage Rate	Units
Nalco 3DT396	001	Scale inhibitor	Continuous	17,142	lb/day
3D Trasar 3DT184	001	Corrosion inhibitor	Continuous	125,955	lb/day
3DT098	001	Corrosion inhibitor	Continuous	1,152	lb/day
Nalco 7408	001	Chlorine scavenger	Continuous	3,608	lb/day
Nalco 7473	001	Anti foam	Intermittent	3,541	lb/day
NALCO 73550	001	Non-ionic bio detergent.	Continuous	411	lb/day
Sodium Hypochlorite (12%)	001	Prevent biological growth in different streams	Continuous	47	lb/day
NALCO H-550	001	Non-oxidant biocide	Intermittent	Concentration of Glutaraldehyde 900 ug/L at discharge 001.	
Citric Acid	011/013	Hydrotest	Intermittent	5,061	lb/day
Nalco 71306	001/011/013	Biotreaters/Hydrotest	Intermittent	32	lb/day
Sodium Nitrite	011/013	Hydrotest	Intermittent	197	lb/day

Max usage rate from PENNTOX output criteria. Actual expected usage will be much less.

3. List all chemical additives in the same order as question 2, above, and provide the requested information. For chemical additives that are not on DEP's Approved List, submit New Chemical Additive Request Form(s) to DEP's Central Office. For chemical additives that are on DEP's Approved List but a Chemical Additives Notification Form was not previously submitted, attach a Chemical Additives Notification Form to the application.

Chemical Additive Name	On Approved List?	Notification Form Attached?	Notification Form Previously Submitted?	Notification Form Submission Date	Analytical Method
Nalco 3DT396	☒	☐	☒	9/2019	
3D Trasar 3DT184	☒	☐	☒	9/2019	
3DT098	☒	☐	☒	11/2021	
Nalco 7408	☒	☐	☒	11/2015	
Nalco 7473	☒	☐	☒	11/2015	
NALCO 73550	☒	☐	☒	11/2015	
Sodium Hypochlorite (12%)	☒	☐	☒	11/2015	
NALCO H-550	☒	☐	☒	11/2015	
Citric Acid	☒	☐	☒	6/2019	
Nalco 71306	☒	☐	☒	6/2019	
Sodium Nitrite	☒	☐	☒	6/2019	

PRODUCTION DATA FOR EFFLUENT LIMITATION GUIDELINES (ELGs)

Complete this section for each production line with an applicable ELG. See instructions and use additional sheets as necessary.

1. Production line and process description: **Ethane Cracking Unit (ECU)**
2. Applicable ELG: 40 CFR: **414** Subpart: **91**
3. Is this production considered a new source? ☒ Yes ☐ No
4. Outfall / IMP No. receiving wastewater: **101**
5. Units of production measurement for ELG: **Million tons per year**
6. Design production capacity: **1.65 million tons per year**
7. Complete the table below for the five last years of production. Report production data using the same units of measurement as reported in question 5.

Parameter	Production Years				
	2020	2021	2022	2023	2024
Total Annual Production	0	0	0.134	0.457	1.324
Max Monthly Production	0	0	0.060	0.083	0.143
Month of Max Production	0	0	November	June	December
Avg Annual Production	0	0	0.100	0.485	1.269
Avg Production Hours/Day	0	0	5.23	13.69	24.0
Avg Production Days/Month	0	0	6.63	17.35	30.5
Avg Annual Water Usage (MGD)	0	0.5259	0.9266	1.7941	3.8445
Avg Annual Wastewater Flow (MGD)	0	0	0.1006	0.1152	0.2088

8. Average annual production over the past five years: 0.638 Units: Million tons/yr
9. Anticipated average annual production for the next five years: 1.6 Units: Million tons/yr
10. Explain the basis for the anticipated average annual production for the next five years:

    Average production is based on supply modeling using maximum capabilities, planned & unplanned downtime, and all other plant constraints that can impact production rates

11. Attach any pertinent information from the applicable ELG in 40 CFR that would allow DEP to appropriately determine technology-based effluent limitations.

PRODUCTION DATA FOR EFFLUENT LIMITATION GUIDELINES (ELGs)

Complete this section for each production line with an applicable ELG. See instructions and use additional sheets as necessary.

1. Production line and process description: **Polyethylene (PE) Units 1 and 2**
2. Applicable ELG: 40 CFR: **414** Subpart: **91**
3. Is this production considered a new source? ☒ Yes ☐ No
4. Outfall / IMP No. receiving wastewater: **101**
5. Units of production measurement for ELG: **Million tons per year**
6. Design production capacity: **0.606 million tons per year – EACH unit**
7. Complete the table below for the five last years of production. Report production data using the same units of measurement as reported in question 5.

Parameter	Production Years				
	2020	2021	2022	2023	2024
Total Annual Production	0	0	0.112	0.480	1.066
Max Monthly Production	0	0	0.041	0.077	0.111
Month of Max Production	0	0	December	June	December
Avg Annual Production	0	0	0.096	0.474	1.054
Avg Production Hours/Day	0	0	3.7	11.57	20.95
Avg Production Days/Month	0	0	4.62	14.47	26.19
Avg Annual Water Usage (MGD)	0	0	0.0462	0.0729	0.2039
Avg Annual Wastewater Flow (MGD)	0	0	0.0370	0.0583	0.1631

8. Average annual production over the past five years: 0.553 Units: Million tons/yr
9. Anticipated average annual production for the next five years: 1.17 Units: Million tons/yr
10. Explain the basis for the anticipated average annual production for the next five years:

    Average production is based on supply modeling using maximum capabilities, planned & unplanned downtime, and all other plant constraints that can impact production rates

11. Attach any pertinent information from the applicable ELG in 40 CFR that would allow DEP to appropriately determine technology-based effluent limitations.

PRODUCTION DATA FOR EFFLUENT LIMITATION GUIDELINES (ELGs)

Complete this section for each production line with an applicable ELG. See instructions and use additional sheets as necessary.

1. Production line and process description: **Polyethylene (PE) Unit 3**
2. Applicable ELG: 40 CFR: **414** Subpart: **91**
3. Is this production considered a new source? ☒ Yes ☐ No
4. Outfall / IMP No. receiving wastewater: **101**
5. Units of production measurement for ELG: **Million ton per year**
6. Design production capacity: **0.551 million ton per year**
7. Complete the table below for the five last years of production. Report production data using the same units of measurement as reported in question 5.

Parameter	Production Years				
	2020	2021	2022	2023	2024
Total Annual Production	0	0	0.0048	0.0011	0.3085
Max Monthly Production	0	0	0.0048	0.0011	0.0455
Month of Max Production	0	0	November	March	September
Avg Annual Production	0	0	0.004	0.001	0.297
Avg Production Hours/Day	0	0	0.35	0.07	14.4
Avg Production Days/Month	0	0	0.45	0.09	18.3
Avg Annual Water Usage (MGD)	0	0	0.0148	0.0085	0.0513
Avg Annual Wastewater Flow (MGD)	0	0	0.0118	0.0068	0.0411

8. Average annual production over the past five years: 0.105 Units: Million tons/yr
9. Anticipated average annual production for the next five years: 0.48 Units: Million tons/yr
10. Explain the basis for the anticipated average annual production for the next five years:

    Average production is based on supply modeling using maximum capabilities, planned & unplanned downtime, and all other plant constraints that can impact production rates.

11. Attach any pertinent information from the applicable ELG in 40 CFR that would allow DEP to appropriately determine technology-based effluent limitations.

Note: Annual production matches max monthly production for 2022 and 2023 as unit only ran for a single month (November 2022 and March 2023). PE3 was completely down for every other month in 2022 and 2023.

ANTI-DEGRADATION

If the applicant is proposing a new or increased discharge to High Quality (HQ) or Exceptional Value (EV) waters, Module 4 (Anti Degradation Module) must be attached to the application. In addition, for HQ waters only, if the analysis concludes that the new or increased discharge will produce a measurable change in water quality, a social or economic justification (SEJ) must be attached if the applicant desires approval for the discharge.

1. Is the Anti-Degradation Module (Module 4) attached to the application? ☐ Yes ☒ No
2. Is a social or economic justification (SEJ) (HQ waters only) attached to the application? ☐ Yes ☒ No

VARIANCES

If the applicant is requesting a variance authorized under federal regulations at 40 CFR 122.21(m), complete the section below and attach to this application documentation necessary under federal regulations to support the variance request.

1. Description of variance requested: **Not Applicable**
2. Federal regulation authorizing the variance: _____
3. Supporting documentation attached to the application? ☐ Yes ☐ No

LABORATORY INFORMATION

Did an off-site laboratory perform any of the analyses required by this application? ☐ Yes ☐ No
If Yes, provide the information below.

Name	**Eurofins Pittsburgh**	Analyses Performed:
Address	**301 Alpha Dr. RIDC Park Pittsburgh, PA 15238**	**All analysis reported in this application**
Phone	(**412) 963-2444**	
Name		Analyses Performed:
Address		
Phone	( )	

COMPLIANCE HISTORY REVIEW

Is the facility owner or operator in violation of any DEP regulation, permit, order or schedule of compliance at this or any other facility?
☒ Yes ☐ No

See Attached List for information requested below

If Yes, list each permit, order or schedule of compliance and provide compliance status. Use additional sheets as necessary.

Permit Program:		Permit No.:	
Permit Program:		Permit No.:	
Permit Program:		Permit No.:	

Brief Description of Non-Compliance:

Steps Taken to Achieve Compliance	Date(s) Compliance Achieved

Current Compliance Status: ☐ In Compliance ☐ In Non-Compliance

POLLUTANT IDENTIFICATION AND ANALYSIS

1. Summary of Required Analyses (see instructions):

Outfall / IMP No.	Pollutant Groups which must be sampled for and analyzed							Other Pollutants Analyzed
	Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	
001	☒	☒	☒	☒	☒	☒	☐	
101	☒	☒	☒	☒	☒	☒	☐	
108	☐	☐	☐	☐	☐	☐	☐	**Hydrotest - per permit limits**
201	☐	☐	☐	☐	☐	☐	☐	**Included in 001**
	☐	☐	☐	☐	☐	☐	☐	
	☐	☐	☐	☐	☐	☐	☐	
	☐	☐	☐	☐	☐	☐	☐	
	☐	☐	☐	☐	☐	☐	☐	
	☐	☐	☐	☐	☐	☐	☐	
	☐	☐	☐	☐	☐	☐	☐	
	☐	☐	☐	☐	☐	☐	☐	
	☐	☐	☐	☐	☐	☐	☐	
	☐	☐	☐	☐	☐	☐	☐	
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	☐	☐	☐	☐	☐	☐	☐	
	☐	☐	☐	☐	☐	☐	☐	
	☐	☐	☐	☐	☐	☐	☐	

2. Is screening for 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD) required? ☐ Yes ☒ No

Method used: **NA**	Describe results: **NA**

3. Other Potentially Toxic Pollutants Known or Expected to be Present in the Discharge.

a. GC/MS "Five Peaks" Pollutants (see instructions).

Outfall / IMP No.	Group Number (3 - 6)	Chemical or Compound Name	Quantitation Limit (µg/L)	Avg Effluent Concentration (µg/L)	Max Effluent Concentration (µg/L)	No. Samples Positive / No. Analyzed
						/
						/
						/
						/
						/

b. Other Potential Pollutants.

Outfall / IMP No.	Chemical Substance or Compound Name	Reason/Suspected Reason for Presence in Discharge	Avg Concentration (µg/L)	Indicate if Presence is Known (K) or Suspected (S)

☐ If additional peaks were not available for one or more groups with the method used check here and attach an explanation of why the method was selected.

4. Additional Analysis Results Tables may be attached to provide any of the optional site-specific information discussed in Appendix A of the instructions.
Optional site-specific data is attached to this application? ☐ Yes ☐ No

WHOLE EFFLUENT TOXICITY

1. Summarize the results of all Whole Effluent Toxicity (WET) tests completed in the last five years (or attach a separate sheet with these results). If required by the NPDES permit, attach a copy of DEP's WET Analysis Spreadsheet to the application (electronic transmission to DEP is acceptable) that provides replicate data for all species tested and for the most recent four consecutive tests.

   Outfall No. Tested:

   Type of tests completed: ☐ Chronic ☐ Acute

   Dilution series used: %, %, %, %, and % effluent

   Target Instream Waste Concentration (TIWC): % effluent

Test Date	Ceriodaphnia Results (% Effluent)			Pimephales Results (% Effluent)			Pass or Fail
	Survival NOEC	Reproduction NOEC	LC50	Survival NOEC	Growth NOEC	LC50	

2. Describe the status of any Phase I or II Toxicity Reduction Evaluation (if applicable):

PREPAREDNESS, PREVENTION AND CONTINGENCY (PPC) PLAN

The applicant may optionally attach its PPC Plan or related plan to the application. This information may be useful to DEP in completing its review of the application. If the PPC Plan is not attached to the application, DEP may request submission of the Plan during the review. Electronic transmission of large PPC Plans is encouraged.

Type or Description of Plan (e.g., PPC, SPCC, etc.)	Attached?	Date of Latest Plan Update
SPCC Plan	☐	**5/9/2024**
PPC Plan	☐	**October 2024**
	☐	

COOLING WATER INTAKE STRUCTURES

1. Does the facility use cooling water? ☒ Yes ☐ No If no, the rest of this section may remain blank

2. Identify the source(s) of cooling water: ☒ Surface water ☐ Groundwater ☐ Treated effluent
☐ Public water system (Potable): PWS ID: _____ ☐ Public water system (Raw): PWS ID: _____
☐ Independent supplier: _____ ☐ Other: _____

3. Facility Type: ☐ New Facility ☐ New Offshore O&G Facility ☒ Existing Facility ☐ below 2 MGD or 25% cooling

4. Is Module 5 is attached to this application? ☒ Yes ☐ No

5. Number of CWISs at facility: ONE

6. CWIS Flow Data:

CWIS ID No.	DIF (MGD)	AIF (MGD)	Max Screen Velocity (fps)	% Used for Cooling	% Mean Annual Flow
1	21.21	4.4	0.19 to 0.28 AIF	78%	0.02 annual avg

7. Type of CWIS Location:

CWIS ID No.	Type (check box):				
1	☐ Intake Canal	☐ Embayment, Bank or Cove	☐ Submerged Offshore Intake	☐ Near-shore Submerged Intake	☒ Shoreline Submerged Intake
	☐ Intake Canal	☐ Embayment, Bank or Cove	☐ Submerged Offshore Intake	☐ Near-shore Submerged Intake	☐ Shoreline Submerged Intake
	☐ Intake Canal	☐ Embayment, Bank or Cove	☐ Submerged Offshore Intake	☐ Near-shore Submerged Intake	☐ Shoreline Submerged Intake

8. Describe all Impingement Control Technologies employed:
Modified Traveling Screens

9. Describe all Entrainment Control Technologies employed:
Closed-Cycle Recirculating System

10. Has the facility conducted any impingement or entrainment studies in the last 10 years? ☒ Yes ☐ No If yes, attach the results

11. Attach any information required by your current permit to the application (existing facilities only)

ANALYSIS RESULTS TABLE

POLLUTANT GROUP 1 (PAGE 1 OF 2)

Please read instructions carefully before completing this form.

APPLICANT NAME **Shell Chemical Appalachia LLC**

Outfall / IMP Number 001 (Show location of sampling point on Line Drawing)

Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing)

Intake Sampling Results (Specify Source: ___)

Background (Upstream) Sampling Results (Specify Location: ___)

New Discharge (Basis for Information: ___)

POLLUTANT	CONCENTRATION / MASS PRESENT						No. Analyses	No. "Non-Detect" Results	QL Used	Method Used
GROUP 1	Min/Max Daily		Max Avg Monthly		Long-Term Avg					
PARAMETERS	Value		Value		Value					
	Conc	Mass (lbs/day)	Conc	Mass (lbs/day)	Conc	Mass (lbs/day)				
BOD_5 (mg/L)	5.7	142.4	5.7	142.4	3.5	75.9	4	1	2	SM 5210B
COD (mg/L)	75	1561.5	75	1561.5	41.3	836.7	4	1	10.1	EPA 410.4
TOC (mg/L)	18	375	18	375	15	314	4	0	0.51	5310 C-2014
TSS (mg/L)	5.7	119	5.7	119	3.5	71	4	0	0.5	SM 2540D
Ammonia-Nitrogen (mg/L)	0.088	2.2	0.088	2.2	0.088	1.8	4	4	0.088	EPA 350.1
Temperature (Winter) (°F)	82	XXX	77.57	XXX	75.62	XXX	123	XXX	XXX	4500 H+ B-2000
Temperature (Summer) (°F)	97.1	XXX	92.82	XXX	92.09	XXX	122	XXX	XXX	4500 H+ B-2000
pH – Minimum (S.U.)	6.65	XXX	XXX	XXX	7.53	XXX	492	XXX	XXX	4500 H+ B-2000
pH – Maximum (S.U.)	8.33	XXX	XXX	XXX	7.53	XXX	492	XXX	XXX	4500 H+ B-2000
Fecal Coliform (No./100 mL)	2	XXX	2	XXX	1.3	XXX	3	1	XXX	Colilert
Oil and Grease (mg/L)	22.8	557.1	10.4	221.2	4.72	80.67	492	405	4.17	EPA 1664B
TRC (mg/L)	0.28	XXX	0.17	XXX	0.08	XXX	71	0	0.35	CL17 DPD Colorimetri
Total Phosphorus (mg/L)	2	50	2	50	1.7	36	4	0	0.04	TKN_Tphos
TKN (mg/L)	1.8	42.5	1.8	42.5	1.5	31.9	4	0	0.12	TKN_Tphos
Nitrite + Nitrate-Nitrogen (mg/L)	7.7	145	7.7	145	6.7	134	4	0	0.13	EPA 353.2
Total Dissolved Solids (mg/L)	4400	77449	3200	67406	2682	47030	74	0	11.1	SM 2540C
Color (Pt-Co Units)	50	XXX	50	XXX	23.8	XXX	4	0	5	SM2120B
Bromide (mg/L)	6.7	133.91	1.43	28.57	0.299	5.69	74	65	0.118	EPA 300.0 Rev 2
Chloride (mg/L)	720	14390.6	277.4	5336.4	129.7	2411.2	74	0	0.76	EPA 300.0 Rev 2
Sulfate (mg/L)	2700	46636	2060	43138	1591	27634	74	2	13	EPA 300.0 Rev 2
Sulfide (mg/L)	2.2	55	2.2	55	1.8	37.5	4	3	1.7	4500 S2 F-2011
Surfactants (mg/L)	0.16	3.33	0.16	3.33	0.11	2.28	4	0	0.049	5540C - 2011
Fluoride (mg/L)	0.52	12	0.52	12	0.4	8.5	4	0	0.059	EPA 300.0 Rev 2
Total Hardness (mg/L)	420	8744	420	8744	343	6701	3	0	2.44	SM2340B

ANALYSIS RESULTS TABLE

POLLUTANT GROUP 1 (PAGE 2 OF 2)

Please read instructions carefully before completing this form.

APPLICANT NAME **Shell Chemical Appalachia LLC**

Outfall / IMP Number **001** (Show location of sampling point on Line Drawing)

Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing)

Intake Sampling Results (Specify Source: ___)

Background (Upstream) Sampling Results (Specify Location: ___)

New Discharge (Basis for Information: ___)

POLLUTANT GROUP 1 PARAMETERS	CONCENTRATION / MASS PRESENT						No. Analyses	No. "Non-Detect" Results	QL Used	Method Used
	Min/Max Daily Value		Max Avg Monthly Value		Long-Term Avg Value					
	Conc	Mass (lbs/day)	Conc	Mass (lbs/day)	Conc	Mass (lbs/day)				
Perfluorooctanoic acid (PFOA) (ng/L)	3.7	0.000077	3.7	0.000077	3.7	0.000077	1	0	0.9	EPA 1633
Perfluorooctanesulfonic acid (PFOS) (ng/L)	2.1	0.000044	2.1	0.000044	2.1	0.000044	1	0	1.3	EPA 1633
Perfluorobutanesulfonic acid (PFBS) (ng/L)	5.3	0.00011	5.3	0.00011	5.3	0.00011	1	0	0.5	EPA 1633
Hexafluoropropylene oxide dimer acid (HFPO-DA) (ng/L)	1.4	0.000029	1.4	0.000029	1.4	0.000029	1	1	1.4	EPA 1633

ANALYSIS RESULTS TABLE

POLLUTANT GROUP 2

Please read instructions carefully before completing this form.

APPLICANT NAME **Shell Chemical Appalachia LLC**

Outfall / IMP Number **001** (Show location of sampling point on Line Drawing)

Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing)

Intake Sampling Results (Specify Source: ___)

Background (Upstream) Sampling Results (Specify Location: ___)

New Discharge (Basis for Information: ___)

POLLUTANT GROUP 2 PARAMETERS	CONCENTRATION / MASS PRESENT						No. Analyses	No. "Non-Detect" Results	QL Used	Method Used
	Min/Max Daily Value		Max Avg Monthly Value		Long-Term Avg Value					
	Conc	Mass (lbs/day)	Conc	Mass (lbs/day)	Conc	Mass (lbs/day)				
Aluminum, Total (µg/L)	2300	57.46	742	17.08	401	8.02	74	11	99	EPA 200.8 Rev 5
Antimony, Total (µg/L)	1.8	0.037	1.8	0.037	1	0.022	4	2	0.79	EPA 200.8 Rev 5
Arsenic, Total (µg/L)	2.2	0.055	2.2	0.055	1.5	0.033	4	1	0.62	EPA 200.8 Rev 5
Barium, Total (µg/L)	160	3.5	160	3.5	134	2.8	4	0	1	EPA 200.8 Rev 5
Beryllium, Total (µg/L)	0.27	0.0067	0.27	0.0067	0.23	0.0046	4	4	0.23	EPA 200.8 Rev 5
Boron, Total (µg/L)	230	5.75	230	5.75	148	3.22	4	0	26.8	EPA 200.8 Rev 5
Cadmium, Total (µg/L)	0.34	0.0071	0.34	0.0071	0.2	0.0042	4	3	0.2	EPA 200.8 Rev 5
Chromium, Total (µg/L)	1.8	0.04	1.8	0.04	1.4	0.029	4	1	1	EPA 200.8 Rev 5
Chromium, Hexavalent (µg/L)	6	0.15	6	0.14	6	0.1	74	70	6	3500-Cr B-2011
Cobalt, Total (µg/L)	1.4	0.029	1.4	0.029	0.58	0.012	4	0	0.11	EPA 200.8 Rev 5
Copper, Total (µg/L)	23	0.52	12	0.24	7.8	0.15	74	25	4.7	EPA 200.8 Rev 5
Cyanide, Total (µg/L)	11	0.23	11	0.23	11	0.23	1	0	8	SM 4500 CN
Iron, Total (µg/L)	1200	25	1200	25	364	7.53	4	0	39	EPA 200.8 Rev 5
Iron, Dissolved (µg/L)	0.11	0.0023	0.11	0.0023	0.11	0.0023	1	0	0.02	EPA 6020B
Lead, Total (µg/L)	0.89	0.019	0.89	0.019	0.51	0.011	4	1	0.41	EPA 200.8 Rev 5
Manganese, Total (µg/L)	470	9.79	470	9.79	166	3.45	3	0	3	EPA 200.8 Rev 5
Mercury, Total (µg/L)	0.29	0.006	0.29	0.006	0.061	0.0012	12	3	0.12	EPA 245.1 Rev 3
Molybdenum, Total (µg/L)	20	0.5	20	0.5	9.4	0.21	4	0	1.2	EPA 200.8 Rev 5
Nickel, Total (µg/L)	15	0.31	15	0.31	8.8	0.18	4	0	0.95	EPA 200.8 Rev 5
Phenols, Total (µg/L)	30	0.62	30	0.62	13	0.29	5	3	8.7	EPA 628.1
Selenium, Total (µg/L)	2.5	0.062	2.5	0.062	2.2	0.046	4	0	0.61	EPA 200.8 Rev 5
Silver, Total (µg/L)	0.79	0.016	0.79	0.016	0.25	0.0052	4	4	0.25	EPA 200.8 Rev 5
Thallium, Total (µg/L)	0.69	0.014	0.69	0.014	0.47	0.0096	4	3	0.46	EPA 200.8 Rev 5
Zinc, Total (µg/L)	110	2.3	110	2.3	40	0.83	4	0	11	EPA 200.8 Rev 5

ANALYSIS RESULTS TABLE

POLLUTANT GROUP 3 (PAGE 1 OF 2)

Please read instructions carefully before completing this form.

APPLICANT NAME **Shell Chemical Appalachia LLC**

Outfall / IMP Number **001** (Show location of sampling point on Line Drawing)

Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing)

Intake Sampling Results (Specify Source: ___)

Background (Upstream) Sampling Results (Specify Location: ___)

New Discharge (Basis for Information: ___)

POLLUTANT GROUP 3 PARAMETERS	CONCENTRATION / MASS PRESENT						No. Analyses	No. "Non-Detect" Results	QL Used	Method Used
	Min/Max Daily Value		Max Avg Monthly Value		Long-Term Avg Value					
	Conc	Mass (lbs/day)	Conc	Mass (lbs/day)	Conc	Mass (lbs/day)				
Acrolein (µg/L)	60	1.25	60	1.25	27	0.56	4	4	27	EPA 624.1
Acrylonitrile (µg/L)	17	0.42	17	0.42	14	0.29	4	4	14	EPA 624.1
Benzene (µg/L)	3	0.062	3	0.062	0.63	0.011	74	72	0.63	EPA 624.1
Bromoform (µg/L)	10	0.21	10	0.21	3.2	0.067	4	4	3.2	EPA 624.1
Carbon Tetrachloride (µg/L)	3	0.062	3	0.062	1.4	0.029	4	4	1.4	EPA 624.1
Chlorobenzene (µg/L)	3	0.062	3	0.062	1.1	0.023	4	4	1.1	EPA 624.1
Chlorodibromo-methane (µg/L)	2	0.042	2	0.042	1.1	0.023	4	4	1.1	EPA 624.1
Chloroethane (µg/L)	3	0.062	3	0.062	1.4	0.029	4	4	1.4	EPA 624.1
2-Chloroethylvinyl Ether (µg/L)	3	0.062	3	0.062	2	0.041	4	4	2	EPA 624.1
Chloroform (µg/L)	6.6	0.14	6.6	0.14	3.6	0.075	4	1	1.2	EPA 624.1
Dichlorobromo-methane (µg/L)	2	0.042	2	0.042	1.1	0.022	4	3	0.98	EPA 624.1
1,1-Dichloro-ethane (µg/L)	3	0.062	3	0.062	1.2	0.024	4	4	1.2	EPA 624.1
1,2-Dichloro-ethane (µg/L)	3	0.062	3	0.062	1.2	0.024	4	4	1.2	EPA 624.1
1,1-Dichloro-ethylene (µg/L)	3	0.062	3	0.062	1.4	0.028	4	4	1.4	EPA 624.1
1,2 Dichloropropane (µg/L)	3	0.062	3	0.062	1.2	0.026	4	4	1.2	EPA 624.1
1,3-Dichloro-propylene (µg/L)	2	0.042	2	0.042	0.94	0.019	4	4	0.94	EPA 624.1
1,4-Dioxane (µg/L)	43	1.074	43	1.074	34	0.687	4	4	34	EPA 624.1
Ethylbenzene (µg/L)	4	0.083	4	0.083	1.4	0.029	4	4	1.4	EPA 624.1
Methyl Bromide (µg/L)	3	0.62	3	0.62	1.4	0.029	4	4	1.4	EPA 624.1
Methyl Chloride (µg/L)	5.5	0.11	5.5	0.11	2.1	0.042	4	4	2.1	EPA 624.1
Methylene Chloride (µg/L)	3	0.062	3	0.062	1.4	0.029	4	4	1.4	EPA 624.1
1,1,2,2-Tetrachloroethane (µg/L)	3	0.062	3	0.062	1.2	0.025	4	4	1.2	EPA 624.1
Tetrachloro-ethylene (µg/L)	3	0.062	3	0.062	1.1	0.023	4	4	1.1	EPA 624.1

ANALYSIS RESULTS TABLE

POLLUTANT GROUP 3 (PAGE 2 OF 2)

Please read instructions carefully before completing this form.

APPLICANT NAME **Shell Chemical Appalachia LLC**

Outfall / IMP Number **001** (Show location of sampling point on Line Drawing)

Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing)

Intake Sampling Results (Specify Source: ___)

Background (Upstream) Sampling Results (Specify Location: ___)

New Discharge (Basis for Information: ___)

POLLUTANT GROUP 3 PARAMETERS	CONCENTRATION / MASS PRESENT						No. Analyses	No. "Non-Detect" Results	QL Used	Method Used
	Min/Max Daily Value		Max Avg Monthly Value		Long-Term Avg Value					
	Conc	Mass (lbs/day)	Conc	Mass (lbs/day)	Conc	Mass (lbs/day)				
Toluene (µg/L)	3	0.062	3	0.062	1.1	0.023	4	4	1.1	EPA 624.1
1,2-Trans-Dichloroethylene (µg/L)	7	0.15	7	0.15	2.3	0.047	4	4	2.3	EPA 624.1
1,1,1-Trichloro-ethane (µg/L)	3	0.062	3	0.062	1.2	0.025	4	4	1.2	EPA 624.1
1,1,2-Trichloro-ethane (µg/L)	3	0.062	3	0.062	1.1	0.022	4	4	1.1	EPA 624.1
Trichloro-ethylene (µg/L)	3	0.062	3	0.062	1.3	0.026	4	4	1.3	EPA 624.1
Vinyl Chloride (µg/L)	3	0.062	3	0.062	1.1	0.022	4	4	1.1	EPA 624.1

ANALYSIS RESULTS TABLE

POLLUTANT GROUP 4

Please read instructions carefully before completing this form.

APPLICANT NAME **Shell Chemical Appalachia LLC**

Outfall / IMP Number **001** (Show location of sampling point on Line Drawing)

Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing)

Intake Sampling Results (Specify Source: ___)

Background (Upstream) Sampling Results (Specify Location: ___)

New Discharge (Basis for Information: ___)

POLLUTANT GROUP 4 PARAMETERS	CONCENTRATION / MASS PRESENT						No. Analyses	No. "Non-Detect" Results	QL Used	Method Used
	Min/Max Daily Value		Max Avg Monthly Value		Long-Term Avg Value					
	Conc	Mass (lbs/day)	Conc	Mass (lbs/day)	Conc	Mass (lbs/day)				
2-Chlorophenol (µg/L)	2.3	0.048	2.3	0.048	0.74	0.015	4	4	0.74	EPA 625.1
2,4-Dichloro-phenol (µg/L)	0.53	0.011	0.53	0.011	0.17	0.0035	4	4	0.17	EPA 625.1
2,4-Dimethyl-phenol (µg/L)	6.1	0.13	6.1	0.13	2	0.04	4	4	2	EPA 625.1
4,6-Dinitro-o-Cresol (µg/L)	15	0.31	15	0.31	4.8	0.1	4	4	4.8	EPA 625.1
2,4-Dinitro-phenol (µg/L)	34	0.71	34	0.71	11	0.23	4	4	11	EPA 625.1
2-Nitrophenol (µg/L)	2	0.042	2	0.042	0.64	0.013	4	4	0.64	EPA 625.1
4-Nitrophenol (µg/L)	9.8	0.204	9.8	0.204	3.1	0.065	4	4	3.1	EPA 625.1
P-Chloro-m-Cresol (µg/L)	4.5	0.094	4.5	0.094	1.4	0.03	4	4	1.4	EPA 625.1
Pentachloro-phenol (µg/L)	8.8	0.18	8.8	0.18	2.8	0.058	4	4	2.8	EPA 625.1
Phenol (µg/L)	5.1	0.11	5.1	0.11	1.6	0.034	4	4	1.6	EPA 625.1
2,4,6-Trichloro-phenol (µg/L)	2.3	0.048	2.3	0.048	0.74	0.015	4	4	0.74	EPA 625.1

ANALYSIS RESULTS TABLE

POLLUTANT GROUP 5 (PAGE 1 OF 3)

Please read instructions carefully before completing this form.

APPLICANT NAME **Shell Chemical Appalachia LLC**

Outfall / IMP Number **001** (Show location of sampling point on Line Drawing)

Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing)

Intake Sampling Results (Specify Source: ___)

Background (Upstream) Sampling Results (Specify Location: ___)

New Discharge (Basis for Information: ___)

POLLUTANT GROUP 5 PARAMETERS	CONCENTRATION / MASS PRESENT						No. Analyses	No. "Non-Detect" Results	QL Used	Method Used
	Min/Max Daily Value		Max Avg Monthly Value		Long-Term Avg Value					
	Conc	Mass (lbs/day)	Conc	Mass (lbs/day)	Conc	Mass (lbs/day)				
Acenaphthene (µg/L)	0.68	0.014	0.68	0.014	0.22	0.0045	4	4	0.22	EPA 625.1
Acenaphthylene (µg/L)	0.68	0.014	0.68	0.014	0.23	0.0048	4	3	0.22	EPA 625.1
Acrylamide (µg/L)	210	4.37	210	4.37	68	1.4	4	4	68	EPA 625.1
Anthracene (µg/L)	0.51	0.011	0.51	0.011	0.16	0.0034	4	4	0.16	EPA 625.1
Benzidine (µg/L)	95	1.98	95	1.98	30	0.63	4	4	30	EPA 625.1
Benzo(*a*)Anthracene (µg/L)	0.78	0.016	0.78	0.016	0.25	0.0052	4	4	0.25	EPA 625.1
Benzo(*a*)Pyrene (µg/L)	0.55	0.011	0.55	0.011	0.18	0.0037	4	4	0.18	EPA 625.1
3,4-Benzo-fluoranthene (µg/L)	1	0.021	1	0.021	0.32	0.0066	4	4	0.32	EPA 625.1
Benzo(*ghi*)Perylene (µg/L)	0.72	0.015	0.72	0.015	0.23	0.0048	4	4	0.23	EPA 625.1
Benzo(*k*)Fluoranthene (µg/L)	0.92	0.019	0.92	0.019	0.29	0.0061	4	4	0.29	EPA 625.1
Bis(2-*Chloro-ethoxy*)Methane (µg/L)	1.6	0.033	1.6	0.033	0.51	0.011	4	4	0.51	EPA 625.1
Bis(*2-Chloro-ethyl)* Ether (µg/L)	0.42	0.0087	0.42	0.0087	0.13	0.0028	4	4	0.13	EPA 625.1
Bis(*2-Chloro-isopropyl)* Ether (µg/L)	0.058	0.0014	0.058	0.0014	0.057	0.0012	3	3	0.057	EPA 625.1
Bis(*2-Ethyl-hexyl*)Phthalate (µg/L)	65	1.35	65	1.35	21	0.43	4	4	21	EPA 625.1
4-Bromophenyl Phenyl Ether (µg/L)	3.3	0.069	3.3	0.069	1.1	0.022	4	4	1.1	EPA 625.1
Butyl Benzyl Phthalate (µg/L)	10	0.21	10	0.21	3.2	0.055	4	4	3.2	EPA 625.1
2-Chloronaphthalene (µg/L)	0.61	0.013	0.61	0.013	0.2	0.004	4	4	0.2	EPA 625.1
4-Chlorophenyl Phenyl Ether (µg/L)	2.3	0.048	2.3	0.048	0.74	0.015	4	4	0.74	EPA 625.1
Chrysene (µg/L)	0.84	0.017	0.84	0.017	0.27	0.0056	4	4	0.27	EPA 625.1

ANALYSIS RESULTS TABLE

POLLUTANT GROUP 5 (PAGE 2 OF 3)

Please read instructions carefully before completing this form.

APPLICANT NAME **Shell Chemical Appalachia LLC**

Outfall / IMP Number **001** (Show location of sampling point on Line Drawing)

Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing)

Intake Sampling Results (Specify Source: ___)

Background (Upstream) Sampling Results (Specify Location: ___)

New Discharge (Basis for Information: ___)

POLLUTANT GROUP 5 PARAMETERS	CONCENTRATION / MASS PRESENT						No. Analyses	No. "Non-Detect" Results	QL Used	Method Used
	Min/Max Daily Value		Max Avg Monthly Value		Long-Term Avg Value					
	Conc	Mass (lbs/day)	Conc	Mass (lbs/day)	Conc	Mass (lbs/day)				
Dibenzo(*a,h*)Anthracene (µg/L)	0.75	0.016	0.75	0.016	0.24	0.005	4	4	0.24	EPA 625.1
1,2-Dichlorobenzene (µg/L)	2.2	0.046	2.2	0.046	0.7	0.015	4	4	0.7	EPA 625.1
1,3- Dichlorobenzene (µg/L)	2.2	0.046	2.2	0.046	2.2	0.046	1	1	2.2	EPA 8270E
1,4- Dichlorobenzene (µg/L)	2.5	0.052	2.5	0.052	0.8	0.017	4	4	0.8	EPA 625.1
3,3'-Dichlorobenzidine (µg/L)	6.1	0.13	6.1	0.13	2	0.04	4	4	2	EPA 625.1
Diethyl Phthalate (µg/L)	5.9	0.12	5.9	0.12	1.9	0.039	4	4	1.9	EPA 625.1
Dimethyl Phthalate (µg/L)	3.4	0.071	3.4	0.071	1	0.021	4	3	0.67	EPA 625.1
Di-n-Butyl Phthalate (µg/L)	51	1.06	51	1.06	16	0.34	4	4	16	EPA 625.1
2,4-Dinitrotoluene (µg/L)	3.7	0.077	3.7	0.077	1.2	0.024	4	4	1.2	EPA 625.1
2,6-Dinitrotoluene (µg/L)	1.8	0.037	1.8	0.037	0.58	0.012	4	4	0.58	EPA 625.1
Di-n-Octyl Phthalate (µg/L)	7.1	0.15	7.1	0.15	2.3	0.047	4	4	2.3	EPA 625.1
1,2-Diphenylhydrazine (as *Azobenzene)* (µg/L)	2	0.042	2	0.042	0.65	0.013	4	4	0.65	EPA 625.1
Fluoranthene (µg/L)	0.63	0.013	0.63	0.013	0.2	0.0042	4	4	0.2	EPA 625.1
Fluorene (µg/L)	0.72	0.015	0.72	0.015	0.23	0.0048	4	4	0.23	EPA 625.1
Hexachlorobenzene (µg/L)	0.58	0.012	0.58	0.012	0.17	0.0031	12	12	0.17	EPA 625.1
Hexechlorobutadiene (µg/L)	1.1	0.015	1.1	0.015	0.44	0.0079	12	12	0.44	EPA 625.1
Hexachlorocyclopentadiene (µg/L)	5.2	0.11	5.2	0.11	1.7	0.034	4	4	1.7	EPA 625.1
Hexachloroethane (µg/L)	1.4	0.029	1.4	0.029	0.45	0.0093	4	4	0.45	EPA 625.1

ANALYSIS RESULTS TABLE

POLLUTANT GROUP 5 (PAGE 3 OF 3)

Please read instructions carefully before completing this form.

APPLICANT NAME **Shell Chemical Appalachia LLC**

Outfall / IMP Number **001** (Show location of sampling point on Line Drawing)

Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing)

Intake Sampling Results (Specify Source: ___)

Background (Upstream) Sampling Results (Specify Location: ___)

New Discharge (Basis for Information: ___)

POLLUTANT GROUP 5 PARAMETERS	CONCENTRATION / MASS PRESENT						No. Analyses	No. "Non-Detect" Results	QL Used	Method Used
	Min/Max Daily Value		Max Avg Monthly Value		Long-Term Avg Value					
	Conc	Mass (lbs/day)	Conc	Mass (lbs/day)	Conc	Mass (lbs/day)				
Indeno(*1,2,3-cd)* Pyrene (µg/L)	0.89	0.019	0.89	0.019	0.28	0.0059	4	4	0.28	EPA 625.1
Isophorone (µg/L)	2	0.42	2	0.42	0.64	0.013	4	4	0.64	EPA 625.1
Naphthalene (µg/L)	0.61	0.013	0.61	0.013	0.24	0.0047	4	3	0.2	EPA 625.1
Nitrobenzene (µg/L)	5.2	0.11	5.2	0.11	1.7	0.034	4	4	1.7	EPA 625.1
N-Nitroso-di-methylamine (µg/L)	2.7	0.056	2.7	0.056	0.87	0.018	4	4	0.87	EPA 625.1
N-Nitroso-di-n-p-propylamine (µg/L)	0.74	0.015	0.74	0.015	0.24	0.0049	4	4	0.24	EPA 625.1
N-Nitroso-di-n-phenylamine (µg/L)	1.2	0.025	1.2	0.025	0.39	0.008	4	4	0.39	EPA 625.1
Phenanthrene (µg/L)	1.6	0.033	1.6	0.033	0.52	0.011	4	4	0.52	EPA 625.1
Pyrene (µg/L)	0.56	0.012	0.56	0.012	0.18	0.0038	4	4	0.18	EPA 625.1
1,2,4-Trichlorobenzene (µg/L)	3	0.062	3	0.062	0.93	0.019	4	4	0.93	EPA 625.1

ANALYSIS RESULTS TABLE

POLLUTANT GROUP 6 (PAGE 1 OF 2)

Please read instructions carefully before completing this form.

APPLICANT NAME **Shell Chemical Appalachia LLC**

Outfall / IMP Number **001** (Show location of sampling point on Line Drawing)

Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing)

Intake Sampling Results (Specify Source: ___)

Background (Upstream) Sampling Results (Specify Location: ___)

New Discharge (Basis for Information: ___)

POLLUTANT GROUP 6 PARAMETERS	CONCENTRATION / MASS PRESENT						No. Analyses	No. "Non-Detect" Results	QL Used	Method Used
	Min/Max Daily Value		Max Avg Monthly Value		Long-Term Avg Value					
	Conc	Mass (lbs/day)	Conc	Mass (lbs/day)	Conc	Mass (lbs/day)				
Aldrin (µg/L)	0.014	0.00029	0.014	0.00029	0.0038	0.000078	4	4	0.0038	EPA 608.3
Alpha BHC (µg/L)	0.0095	0.0002	0.0095	0.0002	0.0026	0.000053	4	4	0.0026	EPA 608.3
Beta BHC (µg/L)	0.015	0.00031	0.015	0.00031	0.004	0.000084	4	4	0.004	EPA 608.3
Gamma BHC (µg/L)	0.012	0.00025	0.012	0.00025	0.0032	0.000067	4	4	0.0032	EPA 608.3
Delta BHC (µg/L)	0.026	0.00054	0.026	0.00054	0.007	0.00014	4	4	0.007	EPA 608.3
Chlordane (µg/L)	0.29	0.006	0.29	0.006	0.078	0.0016	4	4	0.078	EPA 608.3
4,4'-DDT (µg/L)	0.028	0.00058	0.028	0.00058	0.0075	0.00016	4	4	0.0075	EPA 608.3
4,4'-DDE (µg/L)	0.029	0.0006	0.029	0.0006	0.0075	0.00016	4	4	0.0075	EPA 608.3
4,4'-DDD (µg/L)	0.021	0.00044	0.021	0.00044	0.0056	0.00012	4	4	0.0056	EPA 608.3
Dieldrin (µg/L)	0.011	0.00023	0.011	0.00023	0.003	0.00006	4	4	0.003	EPA 608.3
Alpha- Endosulfan (µg/L)	0.6	0.012	0.6	0.012	0.13	0.0026	4	4	0.13	EPA 608.3
Beta-Endosulfan (µg/L)	0.038	0.00079	0.038	0.00079	0.0097	0.0002	4	4	0.0097	EPA 608.3
Endosulfan Sulfate (µg/L)	0.026	0.00054	0.026	0.00054	0.007	0.00014	4	4	0.007	EPA 608.3
Endrin (µg/L)	0.0091	0.00019	0.0091	0.00019	0.0024	0.000051	4	4	0.0024	EPA 608.3
Endrin Aldehyde (µg/L)	0.021	0.00044	0.021	0.00044	0.0056	0.00012	4	4	0.0056	EPA 608.3
Heptachlor (µg/L)	0.018	0.00037	0.018	0.00037	0.0048	0.0001	4	4	0.0048	EPA 608.3
Heptachlor Epoxide (µg/L)	0.014	0.00029	0.014	0.00029	0.0038	0.000078	4	4	0.0038	EPA 608.3
PCB -1242 (µg/L)	0.14	0.0029	0.14	0.0029	0.042	0.00086	4	4	0.042	EPA 608.3
PCB -1254 (µg/L)	0.18	0.0037	0.18	0.0037	0.052	0.0011	4	4	0.052	EPA 608.3

ANALYSIS RESULTS TABLE

POLLUTANT GROUP 6 (PAGE 2 OF 2)

Please read instructions carefully before completing this form.

APPLICANT NAME **Shell Chemical Appalachia LLC**

Outfall / IMP Number **001** (Show location of sampling point on Line Drawing)

Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing)

Intake Sampling Results (Specify Source: ___)

Background (Upstream) Sampling Results (Specify Location: ___)

New Discharge (Basis for Information: ___)

POLLUTANT GROUP 6 PARAMETERS	CONCENTRATION / MASS PRESENT						No. Analyses	No. "Non-Detect" Results	QL Used	Method Used
	Min/Max Daily Value		Max Avg Monthly Value		Long-Term Avg Value					
	Conc	Mass (lbs/day)	Conc	Mass (lbs/day)	Conc	Mass (lbs/day)				
PCB-1221 (µg/L)	0.23	0.0048	0.23	0.0048	0.062	0.0013	4	4	0.062	EPA 608.3
PCB-1232 (µg/L)	0.21	0.0044	0.21	0.0044	0.056	0.0012	4	4	0.056	EPA 608.3
PCB-1248 (µg/L)	0.32	0.0067	0.32	0.0067	0.082	0.0017	4	4	0.082	EPA 608.3
PCB-1260 (µg/L)	0.16	0.0033	0.16	0.0033	0.043	0.00089	4	4	0.043	EPA 608.3
PCB-1016 (µg/L)	0.19	0.004	0.19	0.004	0.051	0.0011	4	4	0.051	EPA 608.3
Toxaphene (µg/L)	2	0.042	2	0.042	0.54	0.011	4	4	0.54	EPA 608.3

ANALYSIS RESULTS TABLE

POLLUTANT GROUP 1 (PAGE 1 OF 2)

Please read instructions carefully before completing this form.

APPLICANT NAME **Shell Chemical Appalachia LLC**

Outfall / IMP Number 101 (Show location of sampling point on Line Drawing)

Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing)

Intake Sampling Results (Specify Source: ___)

Background (Upstream) Sampling Results (Specify Location: ___)

New Discharge (Basis for Information: ___)

POLLUTANT GROUP 1 PARAMETERS	CONCENTRATION / MASS PRESENT						No. Analyses	No. "Non-Detect" Results	QL Used	Method Used
	Min/Max Daily Value		Max Avg Monthly Value		Long-Term Avg Value					
	Conc	Mass (lbs/day)	Conc	Mass (lbs/day)	Conc	Mass (lbs/day)				
BOD_5 (mg/L)	40	433	11	125.9	3.2	39.3	56	49	2.8	SM 5210B
COD (mg/L)	44	623	44	623	26	308	4	1	10.1	EPA 410.4
TOC (mg/L)	13	184	13	184	8.3	99.1	4	0	0.51	5310 C-2014
TSS (mg/L)	4.5	59.96	2.1	27.48	1.4	17.98	56	0	0.5	SM 2540D
Ammonia-Nitrogen (mg/L)	0.088	1.246	0.088	1.246	0.088	1.03	4	4	0.088	EPA 350.1
Temperature (Winter) (°F)	Monitored at 001	XXX	NA	XXX	NA	XXX	NA	XXX	XXX	
Temperature (Summer) (°F)	Monitored at 001	XXX	NA	XXX	NA	XXX	NA	XXX	XXX	
pH – Minimum (S.U.)	7.08	XXX	XXX	XXX	7.59	XXX	56	XXX	XXX	4500 H+ B-2000
pH – Maximum (S.U.)	8.1	XXX	XXX	XXX	7.59	XXX	56	XXX	XXX	4501 H+ B-2000
Fecal Coliform (No./100 mL)	4.1	XXX	4.1	XXX	2	XXX	3	1	XXX	Colilert
Oil and Grease (mg/L)	26.2	370.9	10.2	146.2	5.12	64.99	56	48	4.22	EPA 1664B
TRC (mg/L)	0.03	XXX	0.03	XXX	0.025	XXX	2	2	0.025	SM 4500 CL G
Total Phosphorus (mg/L)	0.76	7.36	0.76	7.36	0.52	5.97	4	0	0.04	TKN_Tphos
TKN (mg/L)	0.57	7.22	0.57	7.22	0.45	4.18	4	0	0.12	TKN_Tphos
Nitrite + Nitrate-Nitrogen (mg/L)	7.7	91.2	7.7	91.2	7	81.6	4	0	0.13	EPA 353.2
Total Dissolved Solids (mg/L)	4900	53049	4900	53049	3975	45474	4	0	40	SM 2540C
Color (Pt-Co Units)	50	XXX	50	XXX	28	XXX	4	0	5	SM 2120B
Bromide (mg/L)	0.13	1.66	0.13	1.66	0.11	1.28	4	4	0.11	EPA 300.0 Rev 2.1
Chloride (mg/L)	105	1312	105	1312	70.5	795.7	4	0	1.42	EPA 300.0 Rev 2.1
Sulfate (mg/L)	3550	38433	3550	38433	2693	30851	4	0	17	EPA 300.0 Rev 2.2
Sulfide (mg/L)	2.2	26.9	2.2	26.9	1.7	20.26	4	3	1.5	4500 S2 F-2011
Surfactants (mg/L)	0.14	1.62	0.14	1.62	0.12	1.37	4	0	0.049	5540C - 2011
Fluoride (mg/L)	0.24	2.29	0.24	2.29	0.16	1.76	4	0	0.052	EPA 300.0 Rev 2.1
Total Hardness (mg/L)	220	2070	220	2070	133	1475	3	0	2.44	SM 2340B

ANALYSIS RESULTS TABLE

POLLUTANT GROUP 1 (PAGE 2 OF 2)

Please read instructions carefully before completing this form.

APPLICANT NAME **Shell Chemical Appalachia LLC**

Outfall / IMP Number **101** (Show location of sampling point on Line Drawing)

Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing)

Intake Sampling Results (Specify Source: ___)

Background (Upstream) Sampling Results (Specify Location: ___)

New Discharge (Basis for Information: ___)

POLLUTANT GROUP 1 PARAMETERS	CONCENTRATION / MASS PRESENT						No. Analyses	No. "Non-Detect" Results	QL Used	Method Used
	Min/Max Daily Value		Max Avg Monthly Value		Long-Term Avg Value					
	Conc	Mass (lbs/day)	Conc	Mass (lbs/day)	Conc	Mass (lbs/day)				
Perfluorooctanoic acid (PFOA) (ng/L)	3.1	0.000029	3.1	0.000029	3.1	0.000029	1	0	0.9	EPA 1633
Perfluorooctanesulfonic acid (PFOS) (ng/L)	1.3	0.000012	1.3	0.000012	1.3	0.000012	1	1	1.3	EPA 1633
Perfluorobutanesulfonic acid (PFBS) (ng/L)	0.5	0.0000047	0.5	0.0000047	0.5	0.0000047	1	1	0.5	EPA 1633
Hexafluoropropylene oxide dimer acid (HFPO-DA) (ng/L)	1.4	0.000013	1.4	0.000013	1.4	0.000013	1	1	1.4	EPA 1633

ANALYSIS RESULTS TABLE

POLLUTANT GROUP 2

Please read instructions carefully before completing this form.

APPLICANT NAME **Shell Chemical Appalachia LLC**

Outfall / IMP Number **101** (Show location of sampling point on Line Drawing)

Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing)

Intake Sampling Results (Specify Source: ___)

Background (Upstream) Sampling Results (Specify Location: ___)

New Discharge (Basis for Information: ___)

POLLUTANT	CONCENTRATION / MASS PRESENT						No. Analyses	No. "Non-Detect" Results	QL Used	Method Used
GROUP 2	Min/Max Daily		Max Avg Monthly		Long-Term Avg					
PARAMETERS	Value		Value		Value					
	Conc	Mass (lbs/day)	Conc	Mass (lbs/day)	Conc	Mass (lbs/day)				
Aluminum, Total (µg/L)	190	1.79	190	1.79	104	1.16	4	0	14	EPA 200.8 Rev 5
Antimony, Total (µg/L)	1.8	0.025	1.8	0.025	0.84	0.011	4	3	0.79	EPA 200.8 Rev 5
Arsenic, Total (µg/L)	1.2	0.011	1.2	0.011	0.77	0.0086	4	2	0.62	EPA 200.8 Rev 5
Barium, Total (µg/L)	76	0.72	76	0.72	51	0.57	4	0	1	EPA 200.8 Rev 5
Beryllium, Total (µg/L)	0.27	0.0035	0.27	0.0035	0.23	0.0027	4	4	0.23	EPA 200.8 Rev 5
Boron, Total (µg/L)	110	1.19	110	1.19	77	0.87	4	1	27	EPA 200.8 Rev 5
Cadmium, Total (µg/L)	0.34	0.0048	0.34	0.0048	0.17	0.0021	4	3	0.16	EPA 200.8 Rev 5
Chromium, Total (µg/L)	2.3	0.033	2.3	0.033	1.5	0.018	4	0	0.79	EPA 200.8 Rev 5
Chromium, Hexavalent (µg/L)	6	0.085	6	0.085	6	0.07	4	4	6	3500-Cr B-2011
Cobalt, Total (µg/L)	0.33	0.0038	0.33	0.0038	0.28	0.0032	4	0	0.11	EPA 200.8 Rev 5
Copper, Total (µg/L)	8.5	0.08	8.5	0.08	4.4	0.047	4	0	1.5	EPA 200.8 Rev 5
Cyanide, Total (µg/L)	15	0.14	15	0.14	15	0.14	1	0	8	SM 4500 CN
Iron, Total (µg/L)	110	1.56	110	1.56	83	0.98	4	1	39	EPA 200.8 Rev 5
Iron, Dissolved (µg/L)	91	0.86	91	0.86	91	0.86	1	0	20	EPA 6020B
Lead, Total (µg/L)	0.61	0.0086	0.61	0.0086	0.41	0.0051	4	3	0.41	EPA 200.8 Rev 5
Manganese, Total (µg/L)	180	2.55	180	2.55	111	1.47	3	0	3.1	EPA 200.8 Rev 5
Mercury, Total (µg/L)	0.23	0.0033	0.23	0.0033	0.14	0.0018	4	3	0.12	EPA 245.1
Molybdenum, Total (µg/L)	32	0.35	32	0.35	12	0.13	4	0	1.2	EPA 200.8 Rev 5
Nickel, Total (µg/L)	9.2	0.11	9.2	0.11	7.7	0.09	4	0	0.95	EPA 200.8 Rev 5
Phenols, Total (µg/L)	14	0.13	14	0.13	9.8	0.11	4	3	8.6	EPA 625.1
Selenium, Total (µg/L)	2.6	0.028	2.6	0.028	2	0.022	4	1	0.82	EPA 200.8 Rev 5
Silver, Total (µg/L)	0.79	0.011	0.79	0.011	0.25	0.0033	4	4	0.25	EPA 200.8 Rev 5
Thallium, Total (µg/L)	0.69	0.0098	0.69	0.0098	0.46	0.0057	4	4	0.46	EPA 200.8 Rev 5
Zinc, Total (µg/L)	42	0.59	42	0.59	25	0.31	4	0	11	EPA 200.8 Rev 5

ANALYSIS RESULTS TABLE

POLLUTANT GROUP 3 (PAGE 1 OF 2)

Please read instructions carefully before completing this form.

APPLICANT NAME **Shell Chemical Appalachia LLC**

Outfall / IMP Number **101** (Show location of sampling point on Line Drawing)

Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing)

Intake Sampling Results (Specify Source: ___)

Background (Upstream) Sampling Results (Specify Location: ___)

New Discharge (Basis for Information: ___)

POLLUTANT	CONCENTRATION / MASS PRESENT						No. Analyses	No. "Non-Detect" Results	QL Used	Method Used
GROUP 3	Min/Max Daily		Max Avg Monthly		Long-Term Avg					
PARAMETERS	Value		Value		Value					
	Conc	Mass (lbs/day)	Conc	Mass (lbs/day)	Conc	Mass (lbs/day)				
Acrolein (µg/L)	16	0.23	16	0.23	14	0.16	4	4	14	EPA 624.1
Acrylonitrile (µg/L)	17	0.25	17	0.25	11	0.14	212	212	11	EPA 624.1
Benzene (µg/L)	2.1	0.026	0.7	0.009	0.61	0.0078	212	211	0.6	EPA 624.1
Bromoform (µg/L)	1	0.014	1	0.014	0.99	0.012	4	4	0.99	EPA 624.1
Carbon Tetrachloride (µg/L)	0.88	0.0132	0.88	0.0132	0.88	0.0113	212	212	0.88	EPA 624.1
Chlorobenzene (µg/L)	3.5	0.044	1.1	0.014	0.55	0.007	212	208	0.5	EPA 624.1
Chlorodibromo-methane (µg/L)	0.84	0.012	0.84	0.012	0.68	0.0083	4	4	0.68	EPA 624.1
Chloroethane (µg/L)	0.9	0.013	0.9	0.013	0.9	0.012	212	212	0.9	EPA 624.1
2-Chloroethylvinyl Ether (µg/L)	1.7	0.024	1.7	0.024	1.4	0.017	4	4	1.4	EPA 624.1
Chloroform (µg/L)	2.5	0.037	1.6	0.022	0.99	0.013	212	39	0.6	EPA 624.1
Dichlorobromo-methane (µg/L)	0.64	0.0091	0.64	0.0091	0.53	0.0065	4	4	0.53	EPA 624.1
1,1-Dichloro-ethane (µg/L)	0.63	0.0094	0.63	0.0094	0.61	0.0078	212	212	0.61	EPA 624.1
1,2-Dichloro-ethane (µg/L)	0.57	0.0085	0.57	0.0085	0.57	0.0073	212	212	0.57	EPA 624.1
1,1-Dichloro-ethylene (µg/L)	0.95	0.014	0.95	0.014	0.68	0.087	212	212	0.68	EPA 624.1
1,2 Dichloropropane (µg/L)	0.66	0.01	0.66	0.01	0.66	0.0084	212	212	0.66	EPA 624.1
1,3-Dichloro-propylene (µg/L)	1.1	0.016	1.1	0.016	1.1	0.014	212	212	1.1	EPA 624.1
1,4-Dioxane (µg/L)	43	0.61	43	0.61	34	0.42	4	4	34	EPA 624.1
Ethylbenzene (µg/L)	0.51	0.0076	0.51	0.0076	0.51	0.0065	212	212	0.51	EPA 624.1
Methyl Bromide (µg/L)	0.89	0.013	0.89	0.013	0.74	0.009	4	4	0.74	EPA 624.1
Methyl Chloride (µg/L)	0.9	0.013	0.9	0.013	0.9	0.012	212	212	0.9	EPA 624.1
Methylene Chloride (µg/L)	4.9	0.053	1.1	0.013	0.91	0.0116	212	211	0.89	EPA 624.1
1,1,2,2-Tetrachloroethane (µg/L)	0.6	0.0085	0.6	0.0085	0.53	0.0063	4	4	0.53	EPA 624.1
Tetrachloro-ethylene (µg/L)	0.73	0.0091	0.51	0.007	0.47	0.0061	212	209	0.47	EPA 624.1

ANALYSIS RESULTS TABLE

POLLUTANT GROUP 3 (PAGE 2 OF 2)

Please read instructions carefully before completing this form.

APPLICANT NAME **Shell Chemical Appalachia LLC**

Outfall / IMP Number **101** (Show location of sampling point on Line Drawing)

Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing)

Intake Sampling Results (Specify Source: ___)

Background (Upstream) Sampling Results (Specify Location: ___)

New Discharge (Basis for Information: ___)

POLLUTANT	CONCENTRATION / MASS PRESENT						No. Analyses	No. "Non-Detect" Results	QL Used	Method Used
GROUP 3	Min/Max Daily		Max Avg Monthly		Long-Term Avg					
PARAMETERS	Value		Value		Value					
	Conc	Mass (lbs/day)	Conc	Mass (lbs/day)	Conc	Mass (lbs/day)				
Toluene (µg/L)	3.5	0.044	0.65	0.0082	0.48	0.0061	212	209	0.46	EPA 624.1
1,2-Trans-Dichloroethylene (µg/L)	0.67	0.01	0.67	0.01	0.67	0.0086	212	212	0.67	EPA 624.1
1,1,1-Trichloro-ethane (µg/L)	0.6	0.012	0.6	0.009	0.6	0.008	212	212	0.6	EPA 624.1
1,1,2-Trichloro-ethane (µg/L)	0.45	0.0067	0.45	0.0067	0.45	0.0058	212	212	0.45	EPA 624.1
Trichloro-ethylene (µg/L)	0.69	0.0103	0.69	0.0103	0.69	0.0088	212	212	0.69	EPA 624.1
Vinyl Chloride (µg/L)	0.41	0.0061	0.41	0.0061	0.41	0.0053	212	212	0.41	EPA 624.1

ANALYSIS RESULTS TABLE

POLLUTANT GROUP 4

Please read instructions carefully before completing this form.

APPLICANT NAME **Shell Chemical Appalachia LLC**

Outfall / IMP Number **101** (Show location of sampling point on Line Drawing)

Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing)

Intake Sampling Results (Specify Source: ___)

Background (Upstream) Sampling Results (Specify Location: ___)

New Discharge (Basis for Information: ___)

POLLUTANT	CONCENTRATION / MASS PRESENT						No. Analyses	No. "Non-Detect" Results	QL Used	Method Used
GROUP 4	Min/Max Daily		Max Avg Monthly		Long-Term Avg					
PARAMETERS	Value		Value		Value					
	Conc	Mass (lbs/day)	Conc	Mass (lbs/day)	Conc	Mass (lbs/day)				
2-Chlorophenol (µg/L)	2.3	0.034	2.3	0.028	0.75	0.0094	56	56	0.75	EPA 625.1
2,4-Dichloro-phenol (µg/L)	0.67	0.0084	0.57	0.0064	0.23	0.0029	56	56	0.23	EPA 625.1
2,4-Dimethyl-phenol (µg/L)	6.1	0.091	5.9	0.074	1.9	0.024	56	56	1.9	EPA 625.1
4,6-Dinitro-o-Cresol (µg/L)	19	0.24	16	0.18	6.1	0.075	56	56	6.1	EPA 625.1
2,4-Dinitro-phenol (µg/L)	38	0.51	33	0.4	11	0.14	56	56	11	EPA 625.1
2-Nitrophenol (µg/L)	9.4	0.11	3.1	0.04	1	0.012	56	56	1	EPA 625.1
4-Nitrophenol (µg/L)	12	0.15	10	0.12	4	0.049	56	56	4	EPA 625.1
P-Chloro-m-Cresol (µg/L)	4.4	0.041	4.4	0.041	1.4	0.014	4	4	1.4	EPA 625.1
Pentachloro-phenol (µg/L)	8.5	0.08	8.5	0.08	2.7	0.028	4	4	2.7	EPA 625.1
Phenol (µg/L)	8.5	0.12	5.5	0.07	2.2	0.027	56	55	2.1	EPA 625.1
2,4,6-Trichloro-phenol (µg/L)	2.2	0.021	2.2	0.021	0.72	0.0072	4	4	0.72	EPA 625.1

ANALYSIS RESULTS TABLE

POLLUTANT GROUP 5 (PAGE 1 OF 3)

Please read instructions carefully before completing this form.

APPLICANT NAME **Shell Chemical Appalachia LLC**

Outfall / IMP Number **101** (Show location of sampling point on Line Drawing)

Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing)

Intake Sampling Results (Specify Source: ___)

Background (Upstream) Sampling Results (Specify Location: ___)

New Discharge (Basis for Information: ___)

POLLUTANT	CONCENTRATION / MASS PRESENT						No. Analyses	No. "Non-Detect" Results	QL Used	Method Used
GROUP 5	Min/Max Daily		Max Avg Monthly		Long-Term Avg					
PARAMETERS	Value		Value		Value					
	Conc	Mass (lbs/day)	Conc	Mass (lbs/day)	Conc	Mass (lbs/day)				
Acenaphthene (µg/L)	0.86	0.011	0.73	0.008	0.3	0.0038	56	55	0.3	EPA 625.1
Acenaphthylene (µg/L)	0.86	0.011	0.73	0.008	0.3	0.0038	56	46	0.3	EPA 625.1
Acrylamide (µg/L)	210	1.98	210	1.98	68	0.68	4	4	68	EPA 625.1
Anthracene (µg/L)	0.64	0.008	0.54	0.0061	0.22	0.0027	56	56	0.22	EPA 625.1
Benzidine (µg/L)	91	0.86	91	0.86	29	0.3	4	4	29	EPA 625.1
Benzo(*a*)Anthracene (µg/L)	0.99	0.012	0.84	0.009	0.31	0.0038	56	56	0.31	EPA 625.1
Benzo(*a*)Pyrene (µg/L)	0.7	0.0087	0.6	0.0066	0.23	0.0028	56	56	0.23	EPA 625.1
3,4-Benzo-fluoranthene (µg/L)	1.3	0.016	1.1	0.012	0.42	0.0052	56	56	0.42	EPA 625.1
Benzo(*ghi*)Perylene (µg/L)	0.69	0.0065	0.69	0.0065	0.22	0.0022	4	4	0.22	EPA 625.1
Benzo(*k*)Fluoranthene (µg/L)	1.2	0.015	1	0.011	0.38	0.0047	56	56	0.38	EPA 625.1
Bis(2-*Chloro-ethoxy*)Methane (µg/L)	1.5	0.014	1.5	0.014	0.49	0.0049	4	4	0.49	EPA 625.1
Bis(*2-Chloro-ethyl)* Ether (µg/L)	0.4	0.0038	0.4	0.0038	0.13	0.0013	4	4	0.13	EPA 625.1
Bis(*2-Chloro-isopropyl)* Ether (µg/L)	0.056	0.0008	0.056	0.0008	0.056	0.0007	3	3	0.056	EPA 625.1
Bis(*2-Ethyl-hexyl*)Phthalate (µg/L)	82	1.02	70	0.78	27	0.34	56	55	27	EPA 625.1
4-Bromophenyl Phenyl Ether (µg/L)	3.2	0.03	3.2	0.03	1	0.01	4	4	1	EPA 625.1
Butyl Benzyl Phthalate (µg/L)	9.6	0.09	9.6	0.09	3.1	0.031	4	4	3.1	EPA 625.1
2-Chloronaphthalene (µg/L)	0.59	0.0056	0.59	0.0056	0.19	0.0019	4	4	0.19	EPA 625.1
4-Chlorophenyl Phenyl Ether (µg/L)	2.2	0.021	2.2	0.021	0.71	0.0071	4	4	0.71	EPA 625.1
Chrysene (µg/L)	1.1	0.014	0.92	0.01	0.35	0.0043	56	56	0.35	EPA 625.1

ANALYSIS RESULTS TABLE

POLLUTANT GROUP 5 (PAGE 2 OF 3)

Please read instructions carefully before completing this form.

APPLICANT NAME **Shell Chemical Appalachia LLC**

Outfall / IMP Number **101** (Show location of sampling point on Line Drawing)

Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing)

Intake Sampling Results (Specify Source: ___)

Background (Upstream) Sampling Results (Specify Location: ___)

New Discharge (Basis for Information: ___)

POLLUTANT	CONCENTRATION / MASS PRESENT						No. Analyses	No. "Non-Detect" Results	QL Used	Method Used
GROUP 5	Min/Max Daily		Max Avg Monthly		Long-Term Avg					
PARAMETERS	Value		Value		Value					
	Conc	Mass (lbs/day)	Conc	Mass (lbs/day)	Conc	Mass (lbs/day)				
Dibenzo(*a,h*)Anthracene (µg/L)	0.72	0.0068	0.72	0.0068	0.23	0.0023	4	4	0.23	EPA 625.1
1,2-Dichlorobenzene (µg/L)	2.2	0.033	2.1	0.026	0.63	0.008	56	56	0.63	EPA 625.1
1,3- Dichlorobenzene (µg/L)	2.2	0.033	2.2	0.032	0.68	0.0086	53	53	0.68	EPA 625.1
1,4- Dichlorobenzene (µg/L)	2.5	0.037	2.4	0.03	0.61	0.0078	56	56	0.61	EPA 625.1
3,3'-Dichlorobenzidine (µg/L)	5.8	0.055	5.8	0.055	1.9	0.019	4	4	1.9	EPA 625.1
Diethyl Phthalate (µg/L)	7.5	0.094	6.4	0.07	2.1	0.026	56	55	2.1	EPA 625.1
Dimethyl Phthalate (µg/L)	2.9	0.041	2.2	0.025	1	0.013	56	50	1	EPA 625.1
Di-n-Butyl Phthalate (µg/L)	49	0.46	49	0.46	7	0.086	56	47	6.8	EPA 625.1
2,4-Dinitrotoluene (µg/L)	4.6	0.057	4	0.045	1.8	0.022	56	56	1.8	EPA 625.1
2,6-Dinitrotoluene (µg/L)	2.3	0.029	2	0.022	0.82	0.01	56	56	0.82	EPA 625.1
Di-n-Octyl Phthalate (µg/L)	6.9	0.065	6.9	0.065	2.2	0.022	4	4	2.2	EPA 625.1
1,2-Diphenylhydrazine (as *Azobenzene)* (µg/L)	2	0.019	2	0.019	0.64	0.0065	4	4	0.64	EPA 625.1
Fluoranthene (µg/L)	0.79	0.0099	0.67	0.0075	0.26	0.0032	56	55	0.26	EPA 625.1
Fluorene (µg/L)	0.91	0.011	0.78	0.0086	0.31	0.0039	56	56	0.31	EPA 625.1
Hexachlorobenzene (µg/L)	0.74	0.0092	0.62	0.007	0.24	0.003	56	56	0.24	EPA 625.1
Hexechlorobutadiene (µg/L)	0.91	0.011	0.78	0.009	0.3	0.0037	56	56	0.3	EPA 625.1
Hexachlorocyclopentadiene (µg/L)	5	0.047	5	0.047	1.6	0.016	4	4	1.6	EPA 625.1
Hexachloroethane (µg/L)	1.8	0.022	1.5	0.016	0.57	0.0071	56	56	0.57	EPA 625.1

ANALYSIS RESULTS TABLE

POLLUTANT GROUP 5 (PAGE 3 OF 3)

Please read instructions carefully before completing this form.

APPLICANT NAME **Shell Chemical Appalachia LLC**

Outfall / IMP Number **101** (Show location of sampling point on Line Drawing)

Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing)

Intake Sampling Results (Specify Source: ___)

Background (Upstream) Sampling Results (Specify Location: ___)

New Discharge (Basis for Information: ___)

POLLUTANT	CONCENTRATION / MASS PRESENT						No. Analyses	No. "Non-Detect" Results	QL Used	Method Used
GROUP 5	Min/Max Daily		Max Avg Monthly		Long-Term Avg					
PARAMETERS	Value		Value		Value					
	Conc	Mass (lbs/day)	Conc	Mass (lbs/day)	Conc	Mass (lbs/day)				
Indeno(*1,2,3-cd)* Pyrene (µg/L)	0.85	0.009	0.85	0.009	0.27	0.0028	4	4	0.27	EPA 625.1
Isophorone (µg/L)	1.9	0.018	1.9	0.018	0.61	0.0062	4	4	0.61	EPA 625.1
Naphthalene (µg/L)	1.2	0.018	0.66	0.0079	0.34	0.0043	56	39	0.31	EPA 625.1
Nitrobenzene (µg/L)	6.6	0.082	5.6	0.063	2.2	0.027	56	56	2.2	EPA 625.1
N-Nitroso-di-methylamine (µg/L)	2.6	0.024	2.6	0.024	0.84	0.0085	4	4	0.84	EPA 625.1
N-Nitroso-di-n-p-propylamine (µg/L)	0.71	0.0067	0.71	0.0067	0.23	0.0023	4	4	0.23	EPA 625.1
N-Nitroso-di-n-phenylamine (µg/L)	1.2	0.012	1.2	0.012	0.38	0.0039	4	4	0.38	EPA 625.1
Phenanthrene (µg/L)	1.6	0.024	1.6	0.019	0.43	0.0055	56	56	0.43	EPA 625.1
Pyrene (µg/L)	0.71	0.0089	0.61	0.0068	0.23	0.0029	56	54	0.24	EPA 625.1
1,2,4-Trichlorobenzene (µg/L)	2.5	0.037	2	0.03	0.74	0.0094	56	56	0.74	EPA 625.1

ANALYSIS RESULTS TABLE

POLLUTANT GROUP 6 (PAGE 1 OF 2)

Please read instructions carefully before completing this form.

APPLICANT NAME **Shell Chemical Appalachia LLC**

Outfall / IMP Number **101** (Show location of sampling point on Line Drawing)

Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing)

Intake Sampling Results (Specify Source: ___)

Background (Upstream) Sampling Results (Specify Location: ___)

New Discharge (Basis for Information: ___)

POLLUTANT	CONCENTRATION / MASS PRESENT						No. Analyses	No. "Non-Detect" Results	QL Used	Method Used
GROUP 6	Min/Max Daily		Max Avg Monthly		Long-Term Avg					
PARAMETERS	Value		Value		Value					
	Conc	Mass (lbs/day)	Conc	Mass (lbs/day)	Conc	Mass (lbs/day)				
Aldrin (µg/L)	0.014	0.00013	0.014	0.00013	0.0038	0.000036	4	4	0.0038	EPA 608.3
Alpha BHC (µg/L)	0.0092	0.000087	0.0092	0.000087	0.0025	0.000024	4	4	0.0025	EPA 608.3
Beta BHC (µg/L)	0.014	0.00013	0.014	0.00013	0.0038	0.000036	4	4	0.0038	EPA 608.3
Gamma BHC (µg/L)	0.011	0.0001	0.011	0.0001	0.003	0.000029	4	4	0.003	EPA 608.3
Delta BHC (µg/L)	0.025	0.00024	0.025	0.00024	0.0067	0.000065	4	4	0.0067	EPA 608.3
Chlordane (µg/L)	0.28	0.0026	0.28	0.0026	0.075	0.00072	4	4	0.075	EPA 608.3
4,4'-DDT (µg/L)	0.027	0.00025	0.027	0.00025	0.0073	0.00007	4	4	0.0073	EPA 608.3
4,4'-DDE (µg/L)	0.028	0.00026	0.028	0.00026	0.0072	0.000069	4	4	0.0072	EPA 608.3
4,4'-DDD (µg/L)	0.021	0.0002	0.021	0.0002	0.0056	0.000054	4	4	0.0056	EPA 608.3
Dieldrin (µg/L)	0.011	0.0001	0.011	0.0001	0.003	0.000028	4	4	0.003	EPA 608.3
Alpha- Endosulfan (µg/L)	0.58	0.0055	0.58	0.0055	0.12	0.0011	4	4	0.12	EPA 608.3
Beta-Endosulfan (µg/L)	0.036	0.00034	0.036	0.00034	0.0092	0.000088	4	4	0.0092	EPA 608.3
Endosulfan Sulfate (µg/L)	0.025	0.00024	0.025	0.00024	0.0067	0.000065	4	4	0.0067	EPA 608.3
Endrin (µg/L)	0.0088	0.000083	0.0088	0.000083	0.0024	0.000023	4	4	0.0024	EPA 608.3
Endrin Aldehyde (µg/L)	0.02	0.00019	0.02	0.00019	0.0054	0.000052	4	4	0.0054	EPA 608.3
Heptachlor (µg/L)	0.017	0.00016	0.017	0.00016	0.0046	0.000044	4	4	0.0046	EPA 608.3
Heptachlor Epoxide (µg/L)	0.013	0.00012	0.013	0.00012	0.0035	0.000034	4	4	0.0035	EPA 608.3
PCB -1242 (µg/L)	0.14	0.0013	0.14	0.0013	0.042	0.00041	4	4	0.042	EPA 608.3
PCB -1254 (µg/L)	0.18	0.0017	0.18	0.0017	0.052	0.00051	4	4	0.052	EPA 608.3

ANALYSIS RESULTS TABLE

POLLUTANT GROUP 6 (PAGE 2 OF 2)

Please read instructions carefully before completing this form.

APPLICANT NAME **Shell Chemical Appalachia LLC**

Outfall / IMP Number **101** (Show location of sampling point on Line Drawing)

Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing)

Intake Sampling Results (Specify Source: ___)

Background (Upstream) Sampling Results (Specify Location: ___)

New Discharge (Basis for Information: ___)

POLLUTANT	CONCENTRATION / MASS PRESENT						No. Analyses	No. "Non-Detect" Results	QL Used	Method Used
GROUP 6	Min/Max Daily		Max Avg Monthly		Long-Term Avg					
PARAMETERS	Value		Value		Value					
	Conc	Mass (lbs/day)	Conc	Mass (lbs/day)	Conc	Mass (lbs/day)				
PCB-1221 (µg/L)	0.22	0.0021	0.22	0.0021	0.059	0.00057	4	4	0.059	EPA 608.3
PCB-1232 (µg/L)	0.2	0.0019	0.2	0.0019	0.054	0.00052	4	4	0.054	EPA 608.3
PCB-1248 (µg/L)	0.31	0.0029	0.31	0.0029	0.08	0.00076	4	4	0.08	EPA 608.3
PCB-1260 (µg/L)	0.15	0.0014	0.15	0.0014	0.04	0.00039	4	4	0.04	EPA 608.3
PCB-1016 (µg/L)	0.18	0.0017	0.18	0.0017	0.048	0.00047	4	4	0.048	EPA 608.3
Toxaphene (µg/L)	1.9	0.018	1.9	0.018	0.51	0.0049	4	4	0.51	EPA 608.3

ANALYSIS RESULTS TABLE

POLLUTANT GROUP 1 (PAGE 1 OF 2)

Please read instructions carefully before completing this form.

APPLICANT NAME **Shell Chemical Appalachia LLC**

Outfall / IMP Number 201 (Show location of sampling point on Line Drawing)

Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing)

Intake Sampling Results (Specify Source: ___)

Background (Upstream) Sampling Results (Specify Location: ___)

New Discharge (Basis for Information: ___)

POLLUTANT	CONCENTRATION / MASS PRESENT						No. Analyses	No. "Non-Detect" Results	QL Used	Method Used
GROUP 1	Min/Max Daily		Max Avg Monthly		Long-Term Avg					
PARAMETERS	Value		Value		Value					
	Conc	Mass (lbs/day)	Conc	Mass (lbs/day)	Conc	Mass (lbs/day)				
BOD_5 (mg/L)	3.9	35.38	3.9	35.38	3.5	19.91	4	0	2	SM 5210B
COD (mg/L)	76	628.9	76	628.9	49.3	303.3	4	1	10.1	EPA 410.4
TOC (mg/L)	28	226	28	226	22	128	4	0	0.51	5310 C-2014
TSS (mg/L)	20	110	20	110	7.3	36.8	4	0	0.75	SM 2540D
Ammonia-Nitrogen (mg/L)	0.088	0.86	0.088	0.86	0.088	0.49	4	4	0.088	EPA 350.1
Temperature (Winter) (°F)	Monitored at 001	XXX	NA	XXX	NA	XXX	NA	XXX	XXX	
Temperature (Summer) (°F)	Monitored at 001	XXX	NA	XXX	NA	XXX	NA	XXX	XXX	
pH – Minimum (S.U.)	7.3	XXX	XXX	XXX	7.7	XXX	4	XXX	XXX	4500 H+ B-2000
pH – Maximum (S.U.)	8	XXX	XXX	XXX	7.7	XXX	4	XXX	XXX	4500 H+ B-2000
Fecal Coliform (No./100 mL)	2	XXX	2	XXX	1.3	XXX	3	2	XXX	Colilert
Oil and Grease (mg/L)	4.2	23.1	4.2	23.1	3.5	16.5	4	4	3.5	EPA 1664B
TRC (mg/L)	0.38	XXX	0.38	XXX	0.2	XXX	2	1	0.025	SM 4500 CL G
Total Phosphorus (mg/L)	3.7	33.4	3.7	33.4	3.5	19.3	4	0	0.04	TKN_Tphos
TKN (mg/L)	3	18.7	3	18.7	2.2	12.1	4	0	0.12	TKN_Tphos
Nitrite + Nitrate-Nitrogen (mg/L)	7.9	58	7.9	58	6.4	34.44	4	0	0.11	EPA 353.2
Total Dissolved Solids (mg/L)	1700	16706	1700	16706	1575	8998	4	0	12.5	SM 2540C
Color (Pt-Co Units)	50	XXX	50	XXX	21	XXX	4	0	5	SM 2120B
Bromide (mg/L)	0.053	0.521	0.053	0.521	0.053	0.295	4	4	0.053	EPA 300.0 Rev 2.1
Chloride (mg/L)	330	3242.9	330	3242.9	302	1717.9	4	0	7.12	EPA 300.0 Rev 2.1
Sulfate (mg/L)	792	7636	792	7636	698	4095	4	0	7.56	EPA 300.0 Rev 2.1
Sulfide (mg/L)	1.7	8.79	1.7	8.79	1.4	6.86	4	3	1.4	4500 S2 F-2011
Surfactants (mg/L)	0.24	1.87	0.24	1.87	0.17	0.92	4	0	0.049	5540C - 2011
Fluoride (mg/L)	0.82	8.06	0.82	8.06	0.66	4.02	4	0	0.026	EPA 300.0 Rev 2.1
Total Hardness (mg/L)	790	7174	790	7174	693	4336	4	0	2.44	SM 2340B

ANALYSIS RESULTS TABLE

POLLUTANT GROUP 1 (PAGE 2 OF 2)

Please read instructions carefully before completing this form.

APPLICANT NAME **Shell Chemical Appalachia LLC**

Outfall / IMP Number 201 (Show location of sampling point on Line Drawing)

Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing)

Intake Sampling Results (Specify Source: ___)

Background (Upstream) Sampling Results (Specify Location: ___)

New Discharge (Basis for Information: ___)

POLLUTANT GROUP 1 PARAMETERS	CONCENTRATION / MASS PRESENT						No. Analyses	No. "Non-Detect" Results	QL Used	Method Used
	Min/Max Daily Value		Max Avg Monthly Value		Long-Term Avg Value					
	Conc	Mass (lbs/day)	Conc	Mass (lbs/day)	Conc	Mass (lbs/day)				
Perfluorooctanoic acid (PFOA) (ng/L)	8.2	0.000081	8.2	0.000081	8.2	0.000081	1	0	0.9	EPA 1633
Perfluorooctanesulfonic acid (PFOS) (ng/L)	7.3	0.000072	7.3	0.000072	7.3	0.000072	1	0	1.3	EPA 1633
Perfluorobutanesulfonic acid (PFBS) (ng/L)	9.9	0.000097	9.9	0.000097	9.9	0.000097	1	0	0.5	EPA 1633
Hexafluoropropylene oxide dimer acid (HFPO-DA) (ng/L)	1.4	0.000014	1.4	0.000014	1.4	0.000014	1	1	1.4	EPA 1633

ANALYSIS RESULTS TABLE

POLLUTANT GROUP 2

Please read instructions carefully before completing this form.

APPLICANT NAME **Shell Chemical Appalachia LLC**

Outfall / IMP Number **201** (Show location of sampling point on Line Drawing)

Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing)

Intake Sampling Results (Specify Source: ___)

Background (Upstream) Sampling Results (Specify Location: ___)

New Discharge (Basis for Information: ___)

POLLUTANT	CONCENTRATION / MASS PRESENT						No. Analyses	No. "Non-Detect" Results	QL Used	Method Used
GROUP 2	Min/Max Daily		Max Avg Monthly		Long-Term Avg					
PARAMETERS	Value		Value		Value					
	Conc	Mass (lbs/day)	Conc	Mass (lbs/day)	Conc	Mass (lbs/day)				
Aluminum, Total (µg/L)	4100	22.54	4100	22.54	1230	6.62	4	0	13.8	EPA 200.8 Rev 5
Antimony, Total (µg/L)	1.9	0.01	1.9	0.01	1.1	0.0067	4	0	0.79	EPA 200.8 Rev 5
Arsenic, Total (µg/L)	2.9	0.027	2.9	0.027	2.1	0.013	4	0	0.62	EPA 200.8 Rev 5
Barium, Total (µg/L)	410	2.46	410	2.46	265	1.52	4	0	1	EPA 200.8 Rev 5
Beryllium, Total (µg/L)	0.27	0.0014	0.27	0.0014	0.17	0.00094	4	4	0.17	EPA 200.8 Rev 5
Boron, Total (µg/L)	310	3.05	310	3.05	253	1.51	4	0	30.8	EPA 200.8 Rev 5
Cadmium, Total (µg/L)	0.34	0.0019	0.34	0.0019	0.19	0.0011	4	2	0.16	EPA 200.8 Rev 5
Chromium, Total (µg/L)	4.7	0.026	4.7	0.026	2.2	0.012	4	2	1	EPA 200.8 Rev 5
Chromium, Hexavalent (µg/L)	6	0.059	6	0.059	6	0.033	4	4	6	3500-Cr B-2011
Cobalt, Total (µg/L)	2.6	0.014	2.6	0.014	0.96	0.0053	4	0	0.11	EPA 200.8 Rev 5
Copper, Total (µg/L)	42	0.23	42	0.23	15	0.085	4	0	1.5	EPA 200.8 Rev 5
Cyanide, Total (µg/L)	9.1	0.089	9.1	0.089	9.1	0.089	1	0	8	SM 4500 CN
Iron, Total (µg/L)	4200	23.08	4200	23.08	1164	6.29	4	0	39	EPA 200.8 Rev 5
Iron, Dissolved (µg/L)	100	0.98	100	0.98	100	0.98	1	0	20	EPA 6020B
Lead, Total (µg/L)	3.9	0.021	3.9	0.021	1.2	0.0065	4	2	0.41	EPA 200.8 Rev 5
Manganese, Total (µg/L)	420	2.31	420	2.31	160	0.83	3	0	3.1	EPA 200.8 Rev 5
Mercury, Total (µg/L)	0.23	0.0013	0.23	0.0013	0.14	0.0008	4	3	0.12	EPA 245.1
Molybdenum, Total (µg/L)	10	0.098	10	0.098	8	0.049	4	0	1.2	EPA 200.8 Rev 5
Nickel, Total (µg/L)	29	0.16	29	0.16	13	0.068	4	0	0.95	EPA 200.8 Rev 5
Phenols, Total (µg/L)	9.3	0.091	9.3	0.091	8.7	0.049	4	4	8.7	EPA 625.1
Selenium, Total (µg/L)	2.9	0.027	2.9	0.027	2.3	0.014	4	0	0.82	EPA 200.8 Rev 5
Silver, Total (µg/L)	0.79	0.0043	0.79	0.0043	0.25	0.0014	4	4	0.25	EPA 200.8 Rev 5
Thallium, Total (µg/L)	0.69	0.0038	0.69	0.0038	0.35	0.0017	4	4	0.35	EPA 200.8 Rev 5
Zinc, Total (µg/L)	170	0.88	170	0.88	89	0.38	4	1	11	EPA 200.8 Rev 5

ANALYSIS RESULTS TABLE

POLLUTANT GROUP 3 (PAGE 1 OF 2)

Please read instructions carefully before completing this form.

APPLICANT NAME **Shell Chemical Appalachia LLC**

Outfall / IMP Number **201** (Show location of sampling point on Line Drawing)

Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing)

Intake Sampling Results (Specify Source: ___)

Background (Upstream) Sampling Results (Specify Location: ___)

New Discharge (Basis for Information: ___)

POLLUTANT	CONCENTRATION / MASS PRESENT						No. Analyses	No. "Non-Detect" Results	QL Used	Method Used
GROUP 3	Min/Max Daily		Max Avg Monthly		Long-Term Avg					
PARAMETERS	Value		Value		Value					
	Conc	Mass (lbs/day)	Conc	Mass (lbs/day)	Conc	Mass (lbs/day)				
Acrolein (µg/L)	16	0.088	16	0.088	13.5	0.064	4	4	13.5	EPA 624.1
Acrylonitrile (µg/L)	17	0.072	17	0.072	10.9	0.044	4	4	10.9	EPA 624.1
Benzene (µg/L)	0.6	0.0033	0.6	0.0033	0.53	0.0026	4	4	0.53	EPA 624.1
Bromoform (µg/L)	1	0.0098	1	0.0098	1	0.0055	4	4	1	EPA 624.1
Carbon Tetrachloride (µg/L)	0.88	0.0048	0.88	0.0048	0.74	0.0035	4	4	0.74	EPA 624.1
Chlorobenzene (µg/L)	0.5	0.0029	0.5	0.0029	0.45	0.0023	4	4	0.45	EPA 624.1
Chlorodibromo-methane (µg/L)	0.84	0.0046	0.84	0.0046	0.68	0.0031	4	4	0.68	EPA 624.1
Chloroethane (µg/L)	0.9	0.0049	0.9	0.0049	0.75	0.0035	4	4	0.75	EPA 624.1
2-Chloroethylvinyl Ether (µg/L)	1.7	0.009	1.7	0.009	1.4	0.006	4	4	1.4	EPA 624.1
Chloroform (µg/L)	11	0.083	11	0.083	7.9	0.045	4	0	0.53	EPA 624.1
Dichlorobromo-methane (µg/L)	1.4	0.012	1.4	0.0118	0.97	0.0057	4	2	0.53	EPA 624.1
1,1-Dichloro-ethane (µg/L)	0.63	0.0035	0.63	0.0035	0.51	0.0026	4	4	0.51	EPA 624.1
1,2-Dichloro-ethane (µg/L)	0.57	0.0031	0.57	0.0031	0.5	0.0025	4	4	0.5	EPA 624.1
1,1-Dichloro-ethylene (µg/L)	0.95	0.004	0.95	0.004	0.69	0.0031	4	4	0.69	EPA 624.1
1,2 Dichloropropane (µg/L)	0.66	0.0036	0.66	0.0036	0.57	0.0028	4	4	0.57	EPA 624.1
1,3-Dichloro-propylene (µg/L)	0.59	0.0032	0.59	0.0032	0.49	0.0023	4	4	0.49	EPA 624.1
1,4-Dioxane (µg/L)	43	0.24	43	0.24	34	0.15	4	4	34	EPA 624.1
Ethylbenzene (µg/L)	0.51	0.0039	0.51	0.0039	0.48	0.0026	4	4	0.48	EPA 624.1
Methyl Bromide (µg/L)	0.89	0.0049	0.89	0.0049	0.74	0.0035	4	4	0.74	EPA 624.1
Methyl Chloride (µg/L)	0.9	0.0054	0.9	0.0054	0.81	0.0041	4	4	0.81	EPA 624.1
Methylene Chloride (µg/L)	0.89	0.0049	0.89	0.0049	0.74	0.0035	4	4	0.74	EPA 624.1
1,1,2,2-Tetrachloroethane (µg/L)	0.6	0.0033	0.6	0.0033	0.5	0.0026	4	4	0.5	EPA 624.1
Tetrachloro-ethylene (µg/L)	0.47	0.0029	0.47	0.0029	0.43	0.0022	4	4	0.43	EPA 624.1

ANALYSIS RESULTS TABLE

POLLUTANT GROUP 3 (PAGE 2 OF 2)

Please read instructions carefully before completing this form.

APPLICANT NAME **Shell Chemical Appalachia LLC**

Outfall / IMP Number **201** (Show location of sampling point on Line Drawing)

Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing)

Intake Sampling Results (Specify Source: ___)

Background (Upstream) Sampling Results (Specify Location: ___)

New Discharge (Basis for Information: ___)

POLLUTANT	CONCENTRATION / MASS PRESENT						No. Analyses	No. "Non-Detect" Results	QL Used	Method Used
GROUP 3	Min/Max Daily		Max Avg Monthly		Long-Term Avg					
PARAMETERS	Value		Value		Value					
	Conc	Mass (lbs/day)	Conc	Mass (lbs/day)	Conc	Mass (lbs/day)				
Toluene (µg/L)	0.46	0.0029	0.46	0.0029	0.42	0.0022	4	4	0.42	EPA 624.1
1,2-Trans-Dichloroethylene (µg/L)	0.7	0.0069	0.7	0.0069	0.68	0.0038	4	4	0.68	EPA 624.1
1,1,1-Trichloro-ethane (µg/L)	0.6	0.0033	0.6	0.0033	0.5	0.0026	4	4	0.5	EPA 624.1
1,1,2-Trichloro-ethane (µg/L)	0.45	0.0029	0.45	0.0029	0.41	0.0021	4	4	0.41	EPA 624.1
Trichloro-ethylene (µg/L)	0.69	0.0038	0.69	0.0038	0.59	0.0029	4	4	0.59	EPA 624.1
Vinyl Chloride (µg/L)	0.41	0.0029	0.41	0.0029	0.38	0.002	4	4	0.38	EPA 624.1

ANALYSIS RESULTS TABLE

POLLUTANT GROUP 4

Please read instructions carefully before completing this form.

APPLICANT NAME **Shell Chemical Appalachia LLC**

Outfall / IMP Number **201** (Show location of sampling point on Line Drawing)

Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing)

Intake Sampling Results (Specify Source: ___)

Background (Upstream) Sampling Results (Specify Location: ___)

New Discharge (Basis for Information: ___)

POLLUTANT	CONCENTRATION / MASS PRESENT						No. Analyses	No. "Non-Detect" Results	QL Used	Method Used
GROUP 4	Min/Max Daily		Max Avg Monthly		Long-Term Avg					
PARAMETERS	Value		Value		Value					
	Conc	Mass (lbs/day)	Conc	Mass (lbs/day)	Conc	Mass (lbs/day)				
2-Chlorophenol (µg/L)	2.4	0.024	2.4	0.024	0.77	0.0066	4	4	0.77	EPA 625.1
2,4-Dichloro-phenol (µg/L)	0.55	0.0054	0.55	0.0054	0.17	0.0015	4	4	0.17	EPA 625.1
2,4-Dimethyl-phenol (µg/L)	6.4	0.063	6.4	0.063	2	0.017	4	4	2	EPA 625.1
4,6-Dinitro-o-Cresol (µg/L)	16	0.16	16	0.16	5.1	0.044	4	4	5.1	EPA 625.1
2,4-Dinitro-phenol (µg/L)	35	0.34	35	0.34	11	0.096	4	4	11	EPA 625.1
2-Nitrophenol (µg/L)	2.1	0.021	2.1	0.021	0.67	0.0057	4	4	0.67	EPA 625.1
4-Nitrophenol (µg/L)	10	0.098	10	0.098	3.2	0.027	4	4	3.2	EPA 625.1
P-Chloro-m-Cresol (µg/L)	4.7	0.046	4.7	0.046	1.5	0.013	4	4	1.5	EPA 625.1
Pentachloro-phenol (µg/L)	9.2	0.09	9.2	0.09	2.9	0.025	4	4	2.9	EPA 625.1
Phenol (µg/L)	5.3	0.052	5.3	0.052	1.7	0.014	4	4	1.7	EPA 625.1
2,4,6-Trichloro-phenol (µg/L)	2.4	0.024	2.4	0.024	0.77	0.0066	4	4	0.77	EPA 625.1

ANALYSIS RESULTS TABLE

POLLUTANT GROUP 5 (PAGE 1 OF 3)

Please read instructions carefully before completing this form.

APPLICANT NAME **Shell Chemical Appalachia LLC**

Outfall / IMP Number **201** (Show location of sampling point on Line Drawing)

Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing)

Intake Sampling Results (Specify Source: ___)

Background (Upstream) Sampling Results (Specify Location: ___)

New Discharge (Basis for Information: ___)

POLLUTANT	CONCENTRATION / MASS PRESENT						No. Analyses	No. "Non-Detect" Results	QL Used	Method Used
GROUP 5	Min/Max Daily		Max Avg Monthly		Long-Term Avg					
PARAMETERS	Value		Value		Value					
	Conc	Mass (lbs/day)	Conc	Mass (lbs/day)	Conc	Mass (lbs/day)				
Acenaphthene (µg/L)	0.71	0.007	0.71	0.007	0.23	0.0019	4	4	0.23	EPA 625.1
Acenaphthylene (µg/L)	0.71	0.007	0.71	0.007	0.23	0.0019	4	4	0.23	EPA 625.1
Acrylamide (µg/L)	220	2.16	220	2.16	70.3	0.603	4	4	70.3	EPA 625.1
Anthracene (µg/L)	0.53	0.0052	0.53	0.0052	0.17	0.0014	4	4	0.17	EPA 625.1
Benzidine (µg/L)	99	0.97	99	0.97	31	0.27	4	4	31	EPA 625.1
Benzo(*a*)Anthracene (µg/L)	0.82	0.0081	0.82	0.0081	0.26	0.0022	4	4	0.26	EPA 625.1
Benzo(*a*)Pyrene (µg/L)	0.58	0.0057	0.58	0.0057	0.18	0.0016	4	4	0.18	EPA 625.1
3,4-Benzo-fluoranthene (µg/L)	1.1	0.011	1.1	0.011	0.35	0.003	4	4	0.35	EPA 625.1
Benzo(*ghi*)Perylene (µg/L)	0.75	0.0074	0.75	0.0074	0.24	0.002	4	4	0.24	EPA 625.1
Benzo(*k*)Fluoranthene (µg/L)	0.96	0.0094	0.96	0.0094	0.3	0.0026	4	4	0.3	EPA 625.1
Bis(2-*Chloro-ethoxy*)Methane (µg/L)	1.7	0.017	1.7	0.017	0.54	0.0046	4	4	0.54	EPA 625.1
Bis(*2-Chloro-ethyl)* Ether (µg/L)	0.43	0.0042	0.43	0.0042	0.14	0.0012	4	4	0.14	EPA 625.1
Bis(*2-Chloro-isopropyl)* Ether (µg/L)	0.058	0.00031	0.058	0.00031	0.057	0.00023	3	3	0.057	EPA 625.1
Bis(*2-Ethyl-hexyl*)Phthalate (µg/L)	68	0.67	68	0.67	22	0.19	4	4	22	EPA 625.1
4-Bromophenyl Phenyl Ether (µg/L)	3.5	0.034	3.5	0.034	1.1	0.0096	4	4	1.1	EPA 625.1
Butyl Benzyl Phthalate (µg/L)	10	0.098	10	0.098	3.2	0.027	4	4	3.2	EPA 625.1
2-Chloronaphthalene (µg/L)	0.64	0.0063	0.64	0.0063	0.2	0.0018	4	4	0.2	EPA 625.1
4-Chlorophenyl Phenyl Ether (µg/L)	2.4	0.024	2.4	0.024	0.76	0.0066	4	4	0.76	EPA 625.1
Chrysene (µg/L)	0.88	0.0086	0.88	0.0086	0.28	0.0024	4	4	0.28	EPA 625.1

ANALYSIS RESULTS TABLE

POLLUTANT GROUP 5 (PAGE 2 OF 3)

Please read instructions carefully before completing this form.

APPLICANT NAME **Shell Chemical Appalachia LLC**

Outfall / IMP Number **201** (Show location of sampling point on Line Drawing)

Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing)

Intake Sampling Results (Specify Source: ___)

Background (Upstream) Sampling Results (Specify Location: ___)

New Discharge (Basis for Information: ___)

POLLUTANT	CONCENTRATION / MASS PRESENT						No. Analyses	No. "Non-Detect" Results	QL Used	Method Used
GROUP 5	Min/Max Daily		Max Avg Monthly		Long-Term Avg					
PARAMETERS	Value		Value		Value					
	Conc	Mass (lbs/day)	Conc	Mass (lbs/day)	Conc	Mass (lbs/day)				
Dibenzo(*a,h*)Anthracene (µg/L)	0.78	0.0077	0.78	0.0077	0.25	0.0021	4	4	0.25	EPA 625.1
1,2-Dichlorobenzene (µg/L)	2.3	0.023	2.3	0.023	0.73	0.0062	4	4	0.73	EPA 625.1
1,3- Dichlorobenzene (µg/L)	2.3	0.023	2.3	0.023	2.3	0.023	1	1	2.3	EPA 8270E
1,4- Dichlorobenzene (µg/L)	2.6	0.026	2.6	0.026	0.83	0.0071	4	4	0.83	EPA 625.1
3,3'-Dichlorobenzidine (µg/L)	6.3	0.062	6.3	0.062	2	0.017	4	4	2	EPA 625.1
Diethyl Phthalate (µg/L)	6.2	0.061	6.2	0.061	2	0.017	4	4	2	EPA 625.1
Dimethyl Phthalate (µg/L)	2.2	0.022	2.2	0.022	0.7	0.006	4	4	0.7	EPA 625.1
Di-n-Butyl Phthalate (µg/L)	53	0.52	53	0.52	17	0.15	4	4	17	EPA 625.1
2,4-Dinitrotoluene (µg/L)	3.8	0.037	3.8	0.037	1.2	0.01	4	4	1.2	EPA 625.1
2,6-Dinitrotoluene (µg/L)	1.9	0.019	1.9	0.019	0.6	0.0052	4	4	0.6	EPA 625.1
Di-n-Octyl Phthalate (µg/L)	7.4	0.073	7.4	0.073	2.4	0.02	4	4	2.4	EPA 625.1
1,2-Diphenylhydrazine (as *Azobenzene)* (µg/L)	2.1	0.021	2.1	0.021	0.67	0.0058	4	4	0.67	EPA 625.1
Fluoranthene (µg/L)	0.65	0.0064	0.65	0.0064	0.21	0.0018	4	4	0.21	EPA 625.1
Fluorene (µg/L)	0.75	0.0074	0.75	0.0074	0.24	0.002	4	4	0.24	EPA 625.1
Hexachlorobenzene (µg/L)	0.61	0.006	0.61	0.006	0.19	0.0017	4	4	0.19	EPA 625.1
Hexechlorobutadiene (µg/L)	0.75	0.0074	0.75	0.0074	0.24	0.002	4	4	0.24	EPA 625.1
Hexachlorocyclopentadiene (µg/L)	5.4	0.053	5.4	0.053	1.7	0.015	4	4	1.7	EPA 625.1
Hexachloroethane (µg/L)	1.4	0.014	1.4	0.014	0.45	0.0038	4	4	0.45	EPA 625.1

ANALYSIS RESULTS TABLE

POLLUTANT GROUP 5 (PAGE 3 OF 3)

Please read instructions carefully before completing this form.

APPLICANT NAME **Shell Chemical Appalachia LLC**

Outfall / IMP Number **201** (Show location of sampling point on Line Drawing)

Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing)

Intake Sampling Results (Specify Source: ___)

Background (Upstream) Sampling Results (Specify Location: ___)

New Discharge (Basis for Information: ___)

POLLUTANT	CONCENTRATION / MASS PRESENT						No. Analyses	No. "Non-Detect" Results	QL Used	Method Used
GROUP 5	Min/Max Daily		Max Avg Monthly		Long-Term Avg					
PARAMETERS	Value		Value		Value					
	Conc	Mass (lbs/day)	Conc	Mass (lbs/day)	Conc	Mass (lbs/day)				
Indeno(*1,2,3-cd)* Pyrene (µg/L)	0.92	0.009	0.92	0.009	0.29	0.0025	4	4	0.29	EPA 625.1
Isophorone (µg/L)	2	0.02	2	0.02	0.64	0.0055	4	4	0.64	EPA 625.1
Naphthalene (µg/L)	0.64	0.0063	0.64	0.0063	0.26	0.002	4	2	0.2	EPA 625.1
Nitrobenzene (µg/L)	5.4	0.053	5.4	0.053	1.7	0.015	4	4	1.7	EPA 625.1
N-Nitroso-di-methylamine (µg/L)	2.8	0.028	2.8	0.028	0.89	0.0077	4	4	0.89	EPA 625.1
N-Nitroso-di-n-p-propylamine (µg/L)	0.77	0.0076	0.77	0.0076	0.24	0.0021	4	4	0.24	EPA 625.1
N-Nitroso-di-n-phenylamine (µg/L)	1.3	0.013	1.3	0.013	0.41	0.0035	4	4	0.41	EPA 625.1
Phenanthrene (µg/L)	1.7	0.017	1.7	0.017	0.54	0.0046	4	4	0.54	EPA 625.1
Pyrene (µg/L)	0.59	0.0058	0.59	0.0058	0.19	0.0016	4	4	0.19	EPA 625.1
1,2,4-Trichlorobenzene (µg/L)	0.3	0.0029	0.3	0.0029	0.25	0.0015	4	4	0.25	EPA 625.1

ANALYSIS RESULTS TABLE

POLLUTANT GROUP 6 (PAGE 1 OF 2)

Please read instructions carefully before completing this form.

APPLICANT NAME **Shell Chemical Appalachia LLC**

Outfall / IMP Number **201** (Show location of sampling point on Line Drawing)

Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing)

Intake Sampling Results (Specify Source: ___)

Background (Upstream) Sampling Results (Specify Location: ___)

New Discharge (Basis for Information: ___)

POLLUTANT	CONCENTRATION / MASS PRESENT						No. Analyses	No. "Non-Detect" Results	QL Used	Method Used
GROUP 6	Min/Max Daily		Max Avg Monthly		Long-Term Avg					
PARAMETERS	Value		Value		Value					
	Conc	Mass (lbs/day)	Conc	Mass (lbs/day)	Conc	Mass (lbs/day)				
Aldrin (µg/L)	0.015	0.00015	0.015	0.00015	0.004	0.000038	4	4	0.004	EPA 608.3
Alpha BHC (µg/L)	0.01	0.000098	0.01	0.000098	0.0027	0.000025	4	4	0.0027	EPA 608.3
Beta BHC (µg/L)	0.016	0.00016	0.016	0.00016	0.0043	0.00004	4	4	0.0043	EPA 608.3
Gamma BHC (µg/L)	0.013	0.00013	0.013	0.00013	0.0035	0.000033	4	4	0.0035	EPA 608.3
Delta BHC (µg/L)	0.028	0.00028	0.028	0.00028	0.0075	0.000071	4	4	0.0075	EPA 608.3
Chlordane (µg/L)	0.32	0.0031	0.32	0.0032	0.085	0.00081	4	4	0.085	EPA 608.3
4,4'-DDT (µg/L)	0.03	0.00029	0.03	0.00029	0.008	0.000076	4	4	0.008	EPA 608.3
4,4'-DDE (µg/L)	0.031	0.0003	0.031	0.0003	0.008	0.000077	4	4	0.008	EPA 608.3
4,4'-DDD (µg/L)	0.023	0.00023	0.023	0.00023	0.0061	0.000058	4	4	0.0061	EPA 608.3
Dieldrin (µg/L)	0.012	0.00012	0.012	0.00012	0.0032	0.00003	4	4	0.0032	EPA 608.3
Alpha- Endosulfan (µg/L)	0.03	0.00029	0.03	0.00029	0.008	0.000076	4	4	0.008	EPA 608.3
Beta-Endosulfan (µg/L)	0.041	0.0004	0.041	0.0004	0.01	0.0001	4	4	0.01	EPA 608.3
Endosulfan Sulfate (µg/L)	0.028	0.00028	0.028	0.00028	0.0075	0.000071	4	4	0.0075	EPA 608.3
Endrin (µg/L)	0.0099	0.000097	0.0099	0.000097	0.0026	0.000025	4	4	0.0026	EPA 608.3
Endrin Aldehyde (µg/L)	0.023	0.00023	0.023	0.00023	0.0061	0.000058	4	4	0.0061	EPA 608.3
Heptachlor (µg/L)	0.02	0.0002	0.02	0.0002	0.0053	0.00004	4	4	0.0053	EPA 608.3
Heptachlor Epoxide (µg/L)	0.015	0.00015	0.015	0.00015	0.004	0.000038	4	4	0.004	EPA 608.3
PCB -1242 (µg/L)	0.15	0.0015	0.15	0.0015	0.044	0.0004	4	4	0.044	EPA 608.3
PCB -1254 (µg/L)	0.2	0.002	0.2	0.002	0.057	0.00052	4	4	0.057	EPA 608.3

ANALYSIS RESULTS TABLE

POLLUTANT GROUP 6 (PAGE 2 OF 2)

Please read instructions carefully before completing this form.

APPLICANT NAME **Shell Chemical Appalachia LLC**

Outfall / IMP Number **201** (Show location of sampling point on Line Drawing)

Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing)

Intake Sampling Results (Specify Source: ___)

Background (Upstream) Sampling Results (Specify Location: ___)

New Discharge (Basis for Information: ___)

POLLUTANT	CONCENTRATION / MASS PRESENT						No. Analyses	No. "Non-Detect" Results	QL Used	Method Used
GROUP 6	Min/Max Daily		Max Avg Monthly		Long-Term Avg					
PARAMETERS	Value		Value		Value					
	Conc	Mass (lbs/day)	Conc	Mass (lbs/day)	Conc	Mass (lbs/day)				
PCB-1221 (µg/L)	0.25	0.0025	0.25	0.0025	0.067	0.00063	4	4	0.067	EPA 608.3
PCB-1232 (µg/L)	0.23	0.0023	0.23	0.0023	0.061	0.00058	4	4	0.061	EPA 608.3
PCB-1248 (µg/L)	0.35	0.0034	0.35	0.0034	0.09	0.00087	4	4	0.09	EPA 608.3
PCB-1260 (µg/L)	0.17	0.0017	0.17	0.0017	0.052	0.00045	4	3	0.045	EPA 608.3
PCB-1016 (µg/L)	0.71	0.0021	0.71	0.0021	0.23	0.001	4	3	0.056	EPA 608.3
Toxaphene (µg/L)	2.1	0.021	2.1	0.021	0.56	0.0053	4	4	0.56	EPA 608.3

ANALYSIS RESULTS TABLE

POLLUTANT GROUP 1 (PAGE 1 OF 2)

Please read instructions carefully before completing this form.

APPLICANT NAME **Shell Chemical Appalachia LLC**

Outfall / IMP Number **Influent** (Show location of sampling point on Line Drawing)

Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing)

Intake Sampling Results (Specify Source: ___)

Background (Upstream) Sampling Results (Specify Location: ___)

New Discharge (Basis for Information: ___)

POLLUTANT	CONCENTRATION / MASS PRESENT						No. Analyses	No. "Non-Detect" Results	QL Used	Method Used
GROUP 1	Min/Max Daily		Max Avg Monthly		Long-Term Avg					
PARAMETERS	Value		Value		Value					
	Conc	Mass (lbs/day)	Conc	Mass (lbs/day)	Conc	Mass (lbs/day)				
BOD_5 (mg/L)	13	68.2	13	68.2	13	68.2	1	0	6	EPA 5210B
COD (mg/L)	65	341	65	341	65	341	1	0	13	EPA 410
TOC (mg/L)	20	104.9	20	104.9	20	104.9	1	0	0.51	EPA 5310C
TSS (mg/L)	4.2	22	4.2	22	4.2	22	1	0	5	EPA 2540D
Ammonia-Nitrogen (mg/L)	3.4	17.84	3.4	17.84	3.4	17.84	1	0	0.88	EPA 350.1
Temperature (Winter) (°F)	NA	XXX	NA	XXX	NA	XXX	NA	XXX	XXX	NA
Temperature (Summer) (°F)	NA	XXX	NA	XXX	NA	XXX	NA	XXX	XXX	NA
pH – Minimum (S.U.)	8.5	XXX	XXX	XXX	8.5	XXX	1	XXX	XXX	SM 2120B
pH – Maximum (S.U.)	8.5	XXX	XXX	XXX	8.5	XXX	1	XXX	XXX	SM 2120B
Fecal Coliform (No./100 mL)	7.5	XXX	7.5	XXX	7.5	XXX	1	0	XXX	Collilert 18
Oil and Grease (mg/L)	1.9	9.97	1.9	9.97	1.9	9.97	1	0	1.3	EPA 1664B
TRC (mg/L)	0.03	0.157	0.03	0.157	0.03	0.157	1	1	0.3	SM 4500 CLG
Total Phosphorus (mg/L)	0.29	1.52	0.29	1.52	0.29	1.52	1	0	0.04	CALC
TKN (mg/L)	6.6	34.6	6.6	34.6	6.6	34.6	1	0	0.12	CALC
Nitrite + Nitrate-Nitrogen (mg/L)	0.073	0.383	0.073	0.383	0.073	0.383	1	0	0.065	EPA 353 PR
Total Dissolved Solids (mg/L)	4500	23610	4500	23610	4500	23610	1	0	40	EPA 2540C
Color (Pt-Co Units)	40	XXX	40	XXX	40	XXX	1	0	5	SM 2120B
Bromide (mg/L)	0.133	0.498	0.133	0.498	0.133	0.498	1	1	0.133	EPA 300
Chloride (mg/L)	50.2	263.4	50.2	263.4	50.2	263.4	1	0	1.78	EPA 300
Sulfate (mg/L)	3070	16107	3070	16107	3070	16107	1	0	18.9	EPA 300
Sulfide (mg/L)	6.3	33.1	6.3	33.1	6.3	33.1	1	0	1.3	SM 4500 S2
Surfactants (mg/L)	0.48	2.52	0.48	2.52	0.48	2.52	1	0	0.24	SM 5540C
Fluoride (mg/L)	0.204	1.07	0.204	1.07	0.204	1.07	1	0	0.065	EPA 300
Total Hardness (mg/L)	140	734.5	140	734.5	140	734.5	1	0	0.19	SM 2340B

ANALYSIS RESULTS TABLE

POLLUTANT GROUP 1 (PAGE 2 OF 2)

Please read instructions carefully before completing this form.

APPLICANT NAME **Shell Chemical Appalachia LLC**

Outfall / IMP Number **Influent** (Show location of sampling point on Line Drawing)

Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing)

Intake Sampling Results (Specify Source: ___)

Background (Upstream) Sampling Results (Specify Location: ___)

New Discharge (Basis for Information: ___)

POLLUTANT GROUP 1 PARAMETERS	CONCENTRATION / MASS PRESENT						No. Analyses	No. "Non-Detect" Results	QL Used	Method Used
	Min/Max Daily Value		Max Avg Monthly Value		Long-Term Avg Value					
	Conc	Mass (lbs/day)	Conc	Mass (lbs/day)	Conc	Mass (lbs/day)				
Perfluorooctanoic acid (PFOA) (ng/L)	1.5	0.0000079	1.5	0.0000079	1.5	0.0000079	1	0	0.9	EPA 1633
Perfluorooctanesulfonic acid (PFOS) (ng/L)	1.3	0.0000068	1.3	0.0000068	1.3	0.0000068	1	1	1.3	EPA 1633
Perfluorobutanesulfonic acid (PFBS) (ng/L)	0.89	0.0000047	0.89	0.0000047	0.89	0.0000047	1	0	0.5	EPA 1633
Hexafluoropropylene oxide dimer acid (HFPO-DA) (ng/L)	1.4	0.0000073	1.4	0.0000073	1.4	0.0000073	1	1	1.4	EPA 1633

ANALYSIS RESULTS TABLE

POLLUTANT GROUP 2

Please read instructions carefully before completing this form.

APPLICANT NAME **Shell Chemical Appalachia LLC**

Outfall / IMP Number **Influent** (Show location of sampling point on Line Drawing)

Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing)

Intake Sampling Results (Specify Source: ___)

Background (Upstream) Sampling Results (Specify Location: ___)

New Discharge (Basis for Information: ___)

POLLUTANT	CONCENTRATION / MASS PRESENT						No. Analyses	No. "Non-Detect" Results	QL Used	Method Used
GROUP 2	Min/Max Daily		Max Avg Monthly		Long-Term Avg					
PARAMETERS	Value		Value		Value					
	Conc	Mass (lbs/day)	Conc	Mass (lbs/day)	Conc	Mass (lbs/day)				
Aluminum, Total (µg/L)	110	0.58	110	0.58	110	0.58	1	0	12	EPA 6020B
Antimony, Total (µg/L)	0.21	0.0011	0.21	0.0011	0.21	0.0011	1	0	2	EPA 6020B
Arsenic, Total (µg/L)	0.9	0.0047	0.9	0.0047	0.9	0.0047	1	0	0.68	EPA 6020B
Barium, Total (µg/L)	54	0.28	54	0.28	54	0.28	1	0	0.75	EPA 6020B
Beryllium, Total (µg/L)	0.12	0.00063	0.12	0.00063	0.12	0.00063	1	1	0.12	EPA 6020B
Boron, Total (µg/L)	62	0.33	62	0.33	62	0.33	1	0	12	EPA 6010D
Cadmium, Total (µg/L)	0.15	0.00079	0.15	0.00079	0.15	0.00079	1	1	0.15	EPA 6020B
Chromium, Total (µg/L)	5.8	0.03	5.8	0.03	5.8	0.03	1	0	0.55	EPA 6020B
Chromium, Hexavalent (µg/L)	6	0.031	6	0.031	6	0.031	1	1	6	SM 3500 CR
Cobalt, Total (µg/L)	0.21	0.0011	0.21	0.0011	0.21	0.0011	1	0	0.16	EPA 6020B
Copper, Total (µg/L)	9.5	0.05	9.5	0.05	9.5	0.05	1	0	0.85	EPA 6020B
Cyanide, Total (µg/L)	160	0.84	160	0.84	160	0.84	1	0	8	SM 4500 CN
Iron, Total (µg/L)	230	1.21	230	1.21	230	1.21	1	0	20	EPA 6020B
Iron, Dissolved (µg/L)	260	1.36	260	1.36	260	1.36	1	0	20	EPA 6020B
Lead, Total (µg/L)	0.12	0.00063	0.12	0.00063	0.12	0.00063	1	1	0.12	EPA 6020B
Manganese, Total (µg/L)	10,000	52.5	10,000	52.5	10,000	52.5	1	0	16	EPA_6020B
Mercury, Total (µg/L)	0.087	0.00046	0.087	0.00046	0.087	0.00046	1	1	0.087	EPA 7470A
Molybdenum, Total (µg/L)	5.1	0.027	5.1	0.027	5.1	0.027	1	0	2	EPA 6010D
Nickel, Total (µg/L)	8.5	0.045	8.5	0.045	8.5	0.045	1	0	0.4	EPA 6020B
Phenols, Total (µg/L)	110	0.058	110	0.058	110	0.058	1	0	9.3	EPA 420.1
Selenium, Total (µg/L)	0.97	0.0051	0.97	0.0051	0.97	0.0051	1	0	0.28	EPA 6020B
Silver, Total (µg/L)	0.1	0.00052	0.1	0.00052	0.1	0.00052	1	1	0.1	EPA 6020B
Thallium, Total (µg/L)	0.13	0.00068	0.13	0.00068	0.13	0.00068	1	1	0.13	EPA 6020B
Zinc, Total (µg/L)	30	0.16	30	0.16	30	0.16	1	0	4	EPA 6020B

ANALYSIS RESULTS TABLE

POLLUTANT GROUP 3 (PAGE 1 OF 2)

Please read instructions carefully before completing this form.

APPLICANT NAME **Shell Chemical Appalachia LLC**

Outfall / IMP Number **Influent** (Show location of sampling point on Line Drawing)

Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing)

Intake Sampling Results (Specify Source: ___)

Background (Upstream) Sampling Results (Specify Location: ___)

New Discharge (Basis for Information: ___)

POLLUTANT	CONCENTRATION / MASS PRESENT						No. Analyses	No. "Non-Detect" Results	QL Used	Method Used
GROUP 3	Min/Max Daily		Max Avg Monthly		Long-Term Avg					
PARAMETERS	Value		Value		Value					
	Conc	Mass (lbs/day)	Conc	Mass (lbs/day)	Conc	Mass (lbs/day)				
Acrolein (µg/L)	60	**0.315**	60	**0.315**	60	**0.315**	1	1	60	EPA 8260D
Acrylonitrile (µg/L)	16	0.084	16	0.084	16	0.084	1	1	16	EPA 8260D
Benzene (µg/L)	180	0.944	180	0.944	180	0.944	1	0	3	EPA 8260D
Bromoform (µg/L)	10	0.052	10	0.052	10	0.052	1	1	10	EPA 8260D
Carbon Tetrachloride (µg/L)	3	0.016	3	0.016	3	0.016	1	1	3	EPA 8260D
Chlorobenzene (µg/L)	3	0.016	3	0.016	3	0.016	1	1	3	EPA 8260D
Chlorodibromo-methane (µg/L)	2	0.01	2	0.01	2	0.01	1	1	2	EPA 8260D
Chloroethane (µg/L)	3	0.016	3	0.016	3	0.016	1	1	3	EPA 8260D
2-Chloroethylvinyl Ether (µg/L)	3	0.016	3	0.016	3	0.016	1	1	3	EPA 8260D
Chloroform (µg/L)	3	0.016	3	0.016	3	0.016	1	1	3	EPA 8260D
Dichlorobromo-methane (µg/L)	2	0.01	2	0.01	2	0.01	1	1	2	EPA 8260D
1,1-Dichloro-ethane (µg/L)	3	0.016	3	0.016	3	0.016	1	1	3	EPA 8260D
1,2-Dichloro-ethane (µg/L)	3	0.016	3	0.016	3	0.016	1	1	3	EPA 8260D
1,1-Dichloro-ethylene (µg/L)	3	0.015	3	0.015	3	0.015	1	1	3	EPA 8260D
1,2 Dichloropropane (µg/L)	3	0.016	3	0.016	3	0.016	1	1	3	EPA 8260D
1,3-Dichloro-propylene (µg/L)	2	0.01	2	0.01	2	0.01	1	1	2	EPA 8260D
1,4-Dioxane (µg/L)	6	0.031	6	0.031	6	0.031	1	1	6	EPA 8270E
Ethylbenzene (µg/L)	10	0.052	10	0.052	10	0.052	1	0	4	EPA 8260D
Methyl Bromide (µg/L)	3	0.016	3	0.016	3	0.016	1	1	3	EPA 8260D
Methyl Chloride (µg/L)	5.5	0.029	5.5	0.029	5.5	0.029	1	1	5.5	EPA 8260D
Methylene Chloride (µg/L)	3	0.016	3	0.016	3	0.016	1	1	3	EPA 8260D
1,1,2,2-Tetrachloroethane (µg/L)	3	0.016	3	0.016	3	0.016	1	1	3	EPA 8260D
Tetrachloro-ethylene (µg/L)	3	0.016	3	0.016	3	0.016	1	1	3	EPA 8260D

ANALYSIS RESULTS TABLE

POLLUTANT GROUP 3 (PAGE 2 OF 2)

Please read instructions carefully before completing this form.

APPLICANT NAME **Shell Chemical Appalachia LLC**

Outfall / IMP Number **Influent** (Show location of sampling point on Line Drawing)

Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing)

Intake Sampling Results (Specify Source: ___)

Background (Upstream) Sampling Results (Specify Location: ___)

New Discharge (Basis for Information: ___)

POLLUTANT	CONCENTRATION / MASS PRESENT						No. Analyses	No. "Non-Detect" Results	QL Used	Method Used
GROUP 3	Min/Max Daily		Max Avg Monthly		Long-Term Avg					
PARAMETERS	Value		Value		Value					
	Conc	Mass (lbs/day)	Conc	Mass (lbs/day)	Conc	Mass (lbs/day)				
Toluene (µg/L)	240	1.26	240	1.26	240	1.26	1	0	3	EPA 8260D
1,2-Trans-Dichloroethylene (µg/L)	7	0.037	7	0.037	7	0.037	1	1	7	EPA 8260D
1,1,1-Trichloro-ethane (µg/L)	3	0.016	3	0.016	3	0.016	1	1	3	EPA 8260D
1,1,2-Trichloro-ethane (µg/L)	3	0.016	3	0.016	3	0.016	1	1	3	EPA 8260D
Trichloro-ethylene (µg/L)	3	0.016	3	0.016	3	0.016	1	1	3	EPA 8260D
Vinyl Chloride (µg/L)	3	0.016	3	0.016	3	0.016	1	1	3	EPA 8260D

ANALYSIS RESULTS TABLE

POLLUTANT GROUP 4

Please read instructions carefully before completing this form.

APPLICANT NAME **Shell Chemical Appalachia LLC**

Outfall / IMP Number **Influent** (Show location of sampling point on Line Drawing)

Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing)

Intake Sampling Results (Specify Source: ___)

Background (Upstream) Sampling Results (Specify Location: ___)

New Discharge (Basis for Information: ___)

POLLUTANT	CONCENTRATION / MASS PRESENT						No. Analyses	No. "Non-Detect" Results	QL Used	Method Used
GROUP 4	Min/Max Daily		Max Avg Monthly		Long-Term Avg					
PARAMETERS	Value		Value		Value					
	Conc	Mass (lbs/day)	Conc	Mass (lbs/day)	Conc	Mass (lbs/day)				
2-Chlorophenol (µg/L)	2.2	0.012	2.2	0.012	2.2	0.012	1	1	2.2	EPA 8270E
2,4-Dichloro-phenol (µg/L)	0.49	0.0026	0.49	0.0026	0.49	0.0026	1	1	0.49	EPA 8270E
2,4-Dimethyl-phenol (µg/L)	5.6	0.029	5.6	0.029	5.6	0.029	1	1	5.6	EPA 8270E
4,6-Dinitro-o-Cresol (µg/L)	14	0.073	14	0.073	14	0.073	1	1	14	EPA 8270E
2,4-Dinitro-phenol (µg/L)	31	0.16	31	0.16	31	0.16	1	1	31	EPA 8270E
2-Nitrophenol (µg/L)	1.9	0.01	1.9	0.01	1.9	0.01	1	1	1.9	EPA 8270E
4-Nitrophenol (µg/L)	9	0.047	9	0.047	9	0.047	1	1	9	EPA 8270E
P-Chloro-m-Cresol (µg/L)	4.2	0.022	4.2	0.022	4.2	0.022	1	1	4.2	EPA 8270E
Pentachloro-phenol (µg/L)	8.1	0.042	8.1	0.042	8.1	0.042	1	1	8.1	EPA 8270E
Phenol (µg/L)	4.7	0.025	4.7	0.025	4.7	0.025	1	1	4.7	EPA 8270E
2,4,6-Trichloro-phenol (µg/L)	2.2	0.012	2.2	0.012	2.2	0.012	1	1	2.2	EPA 8270E

ANALYSIS RESULTS TABLE

POLLUTANT GROUP 5 (PAGE 1 OF 3)

Please read instructions carefully before completing this form.

APPLICANT NAME **Shell Chemical Appalachia LLC**

Outfall / IMP Number **Influent** (Show location of sampling point on Line Drawing)

Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing)

Intake Sampling Results (Specify Source: ___)

Background (Upstream) Sampling Results (Specify Location: ___)

New Discharge (Basis for Information: ___)

POLLUTANT	CONCENTRATION / MASS PRESENT						No. Analyses	No. "Non-Detect" Results	QL Used	Method Used
GROUP 5	Min/Max Daily		Max Avg Monthly		Long-Term Avg					
PARAMETERS	Value		Value		Value					
	Conc	Mass (lbs/day)	Conc	Mass (lbs/day)	Conc	Mass (lbs/day)				
Acenaphthene (µg/L)	5.5	0.029	5.5	0.029	5.5	0.029	1	0	0.63	EPA 8270E
Acenaphthylene (µg/L)	13	0.068	13	0.068	13	0.068	1	0	0.63	EPA 8270E
Acrylamide (µg/L)	200	1.05	200	1.05	200	1.05	1	1	200	EPA 8270E
Anthracene (µg/L)	1.9	0.01	1.9	0.01	1.9	0.01	1	0	0.47	EPA 8270E
Benzidine (µg/L)	88	0.46	88	0.46	88	0.46	1	1	88	EPA 8270E
Benzo(*a*)Anthracene (µg/L)	0.72	0.0038	0.72	0.0038	0.72	0.0038	1	1	0.72	EPA 8270E
Benzo(*a*)Pyrene (µg/L)	0.51	0.0027	0.51	0.0027	0.51	0.0027	1	1	0.51	EPA 8270E
3,4-Benzo-fluoranthene (µg/L)	0.93	0.0049	0.93	0.0049	0.93	0.0049	1	1	0.93	EPA 8270E
Benzo(*ghi*)Perylene (µg/L)	0.66	0.0035	0.66	0.0035	0.66	0.0035	1	1	0.66	EPA 8270E
Benzo(*k*)Fluoranthene (µg/L)	0.85	0.0045	0.85	0.0045	0.85	0.0045	1	1	0.85	EPA 8270E
Bis(2-*Chloro-ethoxy*)Methane (µg/L)	1.5	0.0079	1.5	0.0079	1.5	0.0079	1	1	1.5	EPA 8270E
Bis(*2-Chloro-ethyl)* Ether (µg/L)	0.38	0.002	0.38	0.002	0.38	0.002	1	1	0.38	EPA 8270E
Bis(*2-Chloro-isopropyl)* Ether (µg/L)	1.8	0.0095	1.8	0.0095	1.8	0.0095	1	0	0.56	EPA_8270E
Bis(*2-Ethyl-hexyl*)Phthalate (µg/L)	60	0.31	60	0.31	60	0.31	1	1	60	EPA 8270E
4-Bromophenyl Phenyl Ether (µg/L)	3.1	0.016	3.1	0.016	3.1	0.016	1	1	3.1	EPA 8270E
Butyl Benzyl Phthalate (µg/L)	9.3	0.049	9.3	0.049	9.3	0.049	1	1	9.3	EPA 8270E
2-Chloronaphthalene (µg/L)	0.57	0.003	0.57	0.003	0.57	0.003	1	1	0.57	EPA 8270E
4-Chlorophenyl Phenyl Ether (µg/L)	2.1	0.011	2.1	0.011	2.1	0.011	1	1	2.1	EPA 8270E
Chrysene (µg/L)	0.78	0.0041	0.78	0.0041	0.78	0.0041	1	1	0.78	EPA 8270E

ANALYSIS RESULTS TABLE

POLLUTANT GROUP 5 (PAGE 2 OF 3)

Please read instructions carefully before completing this form.

APPLICANT NAME **Shell Chemical Appalachia LLC**

Outfall / IMP Number **Influent** (Show location of sampling point on Line Drawing)

Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing)

Intake Sampling Results (Specify Source: ___)

Background (Upstream) Sampling Results (Specify Location: ___)

New Discharge (Basis for Information: ___)

POLLUTANT	CONCENTRATION / MASS PRESENT						No. Analyses	No. "Non-Detect" Results	QL Used	Method Used
GROUP 5	Min/Max Daily		Max Avg Monthly		Long-Term Avg					
PARAMETERS	Value		Value		Value					
	Conc	Mass (lbs/day)	Conc	Mass (lbs/day)	Conc	Mass (lbs/day)				
Dibenzo(*a,h*)Anthracene (µg/L)	0.69	0.0036	0.69	0.0036	0.69	0.0036	1	1	0.69	EPA 8270E
1,2-Dichlorobenzene (µg/L)	2	0.01	2	0.01	2	0.01	1	1	2	EPA 8270E
1,3- Dichlorobenzene (µg/L)	2.1	0.011	2.1	0.011	2.1	0.011	1	1	2.1	EPA 8270E
1,4- Dichlorobenzene (µg/L)	2.3	0.012	2.3	0.012	2.3	0.012	1	1	2.3	EPA 8270E
3,3'-Dichlorobenzidine (µg/L)	5.6	0.029	5.6	0.029	5.6	0.029	1	1	5.6	EPA 8270E
Diethyl Phthalate (µg/L)	5.5	0.029	5.5	0.029	5.5	0.029	1	1	5.5	EPA 8270E
Dimethyl Phthalate (µg/L)	1.9	0.01	1.9	0.01	1.9	0.01	1	1	1.9	EPA 8270E
Di-n-Butyl Phthalate (µg/L)	47	0.25	47	0.25	47	0.25	1	1	47	EPA 8270E
2,4-Dinitrotoluene (µg/L)	3.4	0.018	3.4	0.018	3.4	0.018	1	1	3.4	EPA 8270E
2,6-Dinitrotoluene (µg/L)	1.7	0.0089	1.7	0.0089	1.7	0.0089	1	1	1.7	EPA 8270E
Di-n-Octyl Phthalate (µg/L)	6.6	0.035	6.6	0.035	6.6	0.035	1	1	6.6	EPA 8270E
1,2-Diphenylhydrazine (as *Azobenzene)* (µg/L)	1.9	0.01	1.9	0.01	1.9	0.01	1	1	1.9	EPA 8270E
Fluoranthene (µg/L)	2.2	0.012	2.2	0.012	2.2	0.012	1	0	0.58	EPA 8270E
Fluorene (µg/L)	5.6	0.029	5.6	0.029	5.6	0.029	1	0	0.66	EPA 8270E
Hexachlorobenzene (µg/L)	0.54	0.0028	0.54	0.0028	0.54	0.0028	1	1	0.54	EPA 8270E
Hexechlorobutadiene (µg/L)	0.66	0.0035	0.66	0.0035	0.66	0.0035	1	1	0.66	EPA 8270E
Hexachlorocyclopentadiene (µg/L)	4.8	0.025	4.8	0.025	4.8	0.025	1	1	4.8	EPA 8270E
Hexachloroethane (µg/L)	1.3	0.0068	1.3	0.0068	1.3	0.0068	1	1	1.3	EPA 8270E

ANALYSIS RESULTS TABLE

POLLUTANT GROUP 5 (PAGE 3 OF 3)

Please read instructions carefully before completing this form.

APPLICANT NAME **Shell Chemical Appalachia LLC**

Outfall / IMP Number **Influent** (Show location of sampling point on Line Drawing)

Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing)

Intake Sampling Results (Specify Source: ___)

Background (Upstream) Sampling Results (Specify Location: ___)

New Discharge (Basis for Information: ___)

POLLUTANT	CONCENTRATION / MASS PRESENT						No. Analyses	No. "Non-Detect" Results	QL Used	Method Used
GROUP 5	Min/Max Daily		Max Avg Monthly		Long-Term Avg					
PARAMETERS	Value		Value		Value					
	Conc	Mass (lbs/day)	Conc	Mass (lbs/day)	Conc	Mass (lbs/day)				
Indeno(*1,2,3-cd)* Pyrene (µg/L)	0.82	0.0043	0.82	0.0043	0.82	0.0043	1	1	0.82	EPA 8270E
Isophorone (µg/L)	1.8	0.0094	1.8	0.0094	1.8	0.0094	1	1	1.8	EPA 8270E
Naphthalene (µg/L)	140	0.73	140	0.73	140	0.73	1	0	0.57	EPA 8270E
Nitrobenzene (µg/L)	4.8	0.025	4.8	0.025	4.8	0.025	1	1	4.8	EPA 8270E
N-Nitroso-di-methylamine (µg/L)	2.5	0.013	2.5	0.013	2.5	0.013	1	1	2.5	EPA 8270E
N-Nitroso-di-n-p-propylamine (µg/L)	0.68	0.0036	0.68	0.0036	0.68	0.0036	1	1	0.68	EPA 8270E
N-Nitroso-di-n-phenylamine (µg/L)	1.1	0.0058	1.1	0.0058	1.1	0.0058	1	1	1.1	EPA 8270E
Phenanthrene (µg/L)	8.3	0.044	8.3	0.044	8.3	0.044	1	0	1.5	EPA 8270E
Pyrene (µg/L)	4	0.021	4	0.021	4	0.021	1	0	0.52	EPA 8270E
1,2,4-Trichlorobenzene (µg/L)	3	0.016	3	0.016	3	0.016	1	1	3	EPA 8260D

ANALYSIS RESULTS TABLE

POLLUTANT GROUP 6 (PAGE 1 OF 2)

Please read instructions carefully before completing this form.

APPLICANT NAME **Shell Chemical Appalachia LLC**

Outfall / IMP Number **Influent** (Show location of sampling point on Line Drawing)

Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing)

Intake Sampling Results (Specify Source: ___)

Background (Upstream) Sampling Results (Specify Location: ___)

New Discharge (Basis for Information: ___)

POLLUTANT / GROUP 6 / PARAMETERS	CONCENTRATION / MASS PRESENT						No. Analyses	No. "Non-Detect" Results	QL Used	Method Used
	Min/Max Daily Value		Max Avg Monthly Value		Long-Term Avg Value					
	Conc	Mass (lbs/day)	Conc	Mass (lbs/day)	Conc	Mass (lbs/day)				
Aldrin (µg/L)	0.014	0.00007	0.014	0.00007	0.014	0.00007	1	1	0.014	EPA 8081B
Alpha BHC (µg/L)	0.0095	0.00005	0.0095	0.00005	0.0095	0.00005	1	1	0.0095	EPA 8081B
Beta BHC (µg/L)	0.015	0.000079	0.015	0.000079	0.015	0.000079	1	1	0.015	EPA 8081B
Gamma BHC (µg/L)	0.012	0.000063	0.012	0.000063	0.012	0.000063	1	1	0.012	EPA 8081B
Delta BHC (µg/L)	0.026	0.00014	0.026	0.00014	0.026	0.00014	1	1	0.026	EPA 8081B
Chlordane (µg/L)	0.29	0.0015	0.29	0.0015	0.29	0.0015	1	1	0.29	EPA 8081B
4,4'-DDT (µg/L)	0.062	0.00033	0.062	0.00033	0.062	0.00033	1	0	0.028	EPA 8081B
4,4'-DDE (µg/L)	0.029	0.00015	0.029	0.00015	0.029	0.00015	1	1	0.029	EPA 8081B
4,4'-DDD (µg/L)	0.021	0.00011	0.021	0.00011	0.021	0.00011	1	1	0.021	EPA 8081B
Dieldrin (µg/L)	0.011	0.000058	0.011	0.000058	0.011	0.000058	1	1	0.011	EPA 8081B
Alpha- Endosulfan (µg/L)	0.027	0.0001	0.027	0.0001	0.027	0.0001	1	1	0.027	EPA 8081B
Beta-Endosulfan (µg/L)	0.038	0.0002	0.038	0.0002	0.038	0.0002	1	1	0.038	EPA 8081B
Endosulfan I	0.027	0.00014	0.027	0.00014	0.027	0.00014	1	1	0.027	EPA_8081B
Endosulfan II	0.038	0.0002	0.038	0.0002	0.038	0.0002	1	1	0.038	EPA_8081B
Endosulfan Sulfate (µg/L)	0.026	0.00014	0.026	0.00014	0.026	0.00014	1	1	0.026	EPA_8081B
Endrin (µg/L)	0.0091	0.000048	0.0091	0.000048	0.0091	0.000048	1	1	0.0091	EPA 8081B
Endrin Aldehyde (µg/L)	0.021	0.00011	0.021	0.00011	0.021	0.00011	1	1	0.021	EPA 8081B
Heptachlor (µg/L)	0.018	0.000094	0.018	0.000094	0.018	0.000094	1	1	0.018	EPA 8081B
Heptachlor Epoxide (µg/L)	0.014	0.000073	0.014	0.000073	0.014	0.000073	1	1	0.014	EPA 8081B
PCB -1242 (µg/L)	0.14	0.00073	0.14	0.00073	0.14	0.00073	1	1	0.14	EPA 8082A
PCB -1254 (µg/L)	0.18	0.00094	0.18	0.00094	0.18	0.00094	1	1	0.18	EPA 8082A

ANALYSIS RESULTS TABLE

POLLUTANT GROUP 6 (PAGE 2 OF 2)

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APPLICANT NAME **Shell Chemical Appalachia LLC**

Outfall / IMP Number **Influent** (Show location of sampling point on Line Drawing)

Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing)

Intake Sampling Results (Specify Source: ___)

Background (Upstream) Sampling Results (Specify Location: ___)

New Discharge (Basis for Information: ___)

POLLUTANT	CONCENTRATION / MASS PRESENT						No. Analyses	No. "Non-Detect" Results	QL Used	Method Used
GROUP 6	Min/Max Daily		Max Avg Monthly		Long-Term Avg					
PARAMETERS	Value		Value		Value					
	Conc	Mass (lbs/day)	Conc	Mass (lbs/day)	Conc	Mass (lbs/day)				
PCB-1221 (µg/L)	0.23	0.0012	0.23	0.0012	0.23	0.0012	1	1	0.23	EPA 8082A
PCB-1232 (µg/L)	0.21	0.0011	0.21	0.0011	0.21	0.0011	1	1	0.21	EPA 8082A
PCB-1248 (µg/L)	0.32	0.0017	0.32	0.0017	0.32	0.0017	1	1	0.32	EPA 8082A
PCB-1260 (µg/L)	0.16	0.00084	0.16	0.00084	0.16	0.00084	1	1	0.16	EPA 8082A
PCB-1016 (µg/L)	0.19	0.001	0.19	0.001	0.19	0.001	1	1	0.19	EPA 8082A
Toxaphene (µg/L)	2	0.01	2	0.01	2	0.01	1	1	2	EPA 8081B

CERTIFICATION AND SIGNATURE OF APPLICANT

I certify under penalty of law that this document and all attachments and modules were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. See 18 Pa. C.S. § 4904 (relating to unsworn falsification).

Nathan Levin	**Operations Manager**
Name (Type or Print Legibly)	**Official Title**
Nathan Levin	8-26-25
Signature	**Date**

ATTACHMENT
COMPLIANCE HISTORY REVIEW SUMMARY

Date	Location	Plan Approval/ Operating Permit#	Nature of Deviation/ Documented Conduct	Type of Department Action	Status Litigation; Existing / Continuing; or corrected/Date	Dollar Amount Penalty
5/24/2023 to present	Shell Polymers Monaca	04-00740A/C	Site-wide NOx 12-month rolling limitation: The COA expired end of January 2024. Site remains non-compliant with NOx emission limitation.		Continuing deviation. Engineering improvements and permitting corrections to match facility design. Proposed to be resolved in plan approval modification application.	• $4,935,023 • $5,000,000: Projects to Benefit Community, Environment and Health • $521,549.62: Monthly emissions for May 2023 • $1,046,766.94: Monthly emissions for June 2023 • $844,373.39: Monthly emissions for July 2023 • $250,791.20: Monthly emissions for August 2023 • $0: Monthly emissions for September 2023 • $0: Monthly emissions for October and November 2023 · • $7,563.60: Monthly emissions for December 2023 · • $90,484.90: Monthly emissions for January 2024
9/11/2023	Shell Polymers Monaca	PA-04-00740A/B/C	NOV for Benzene Waste NESHAP (BWON)	Notice of Violation	Pending	TBD
12/4/2023	Shell Polymers Monaca	PA-04-00740A/B/C	Visible Emissions >5 min in consecutive 2 hrs. MPGF, Source C204B, and TEGF A C205A and HPEF C205C	Notice of Violation	Pending	TBD
3/6/2024	Shell Polymers Monaca	PA-04-00740A/B/C	Visible Emissions >5 min in consecutive 2 hrs. MPGF, Source TEGFA C205A	Notice of Violation	Pending	TBD
6/17/2024	Shell Polymers Monaca	PA-04-00740A/B/C	Visible Emissions >5 min in consecutive 2 hrs from the MPGF Source C204B.	Notice of Violation	Pending	TBD
8/19/2024	Shell Polymers Monaca	PA-04-00740A/B/C	Visible Emissions >5 min in consecutive 2 hrs from the MPGF 204B, TEGF A C205A and TEGF B C205B	Notice of Violation	Pending	TBD

ATTACHMENT
COMPLIANCE HISTORY REVIEW SUMMARY

Date	Location	Plan Approval/ Operating Permit#	Nature of Deviation/ Documented Conduct	Type of Department Action	Status Litigation; Existing / Continuing; or corrected/Date	Dollar Amount Penalty
9/5/2024 to present	Shell Polymers Monaca	PA-04-00740A/B/C	Exceedances of 12-Month Emission Limitations for NOx (ongoing)	Notice of Violation(s)	Pending	TBD
2/12/2025	Shell Polymers Monaca	PA-04-00740A/B/C	Cogen Units NOx Emission Limit Exceedances: - 2/23/2024 Cogen Unit 103 - 7/4/2024 Cogen Unit 102	Notice of Violation	Pending	TBD
2/12/2025	Shell Polymers Monaca	PA-04-00740A/B/C	Ethane Cracking Furnaces NOx Emission Limit Exceedances: - 1/20/2024: Furnace 1 (031) and Furnace 2 (032) - 3/18/2024 Furnace 3 (033) - 6/21-22/2024 Furnace 3 (033) - 9/30/2024 Furnace 6 (036)	Notice of Violation	Pending	TBD
2/12/2025	Shell Polymers Monaca	PA-04-00740A/B/C	Ethane Cracking Furnaces NOx Emission Limit Exceedances: - 11/8/2024 Furnace 1 (031), Furnace 3 (033), Furnace 4 (034), Furnace 5 (035); Furnace 6 (036) - 11/9/2024 Furnace 6 (036) Visible Emissions >5 min in consecutive 2 hrs from the TEGF A C205A, TEGF B C205B, and HPEF C205C on 11/8/2024	Notice of Violation	Pending	TBD
2/12/2025	Shell Polymers Monaca	PA-04-00740A/B/C	Visible Emissions >5 min in consecutive 2 hrs from the MPGF C204B on 9/16/2024 and 9/18/2024	Notice of Violation	Pending	TBD
2/12/2025	Shell Polymers Monaca	PA-04-00740A/B/C	Visible Emissions >5 min in consecutive 2 hrs from the MPGF C204B on 12/6/2024	Notice of Violation	Pending	TBD
4/21/2025	Shell Polymers Monaca	PA-04-00740A/B/C	Excess Nox Emissions Cogen Units 101 & 102 on 3/17/2025	Notice of Violation	Pending	TBD
4/21/2025	Shell Polymers Monaca	PA-04000740A/B/C	Visible Emissions >5 min in consecutive 2 hrs from TEGF A C205A and TEGF B C205B on 4/10/2025	Notice of Violation	Pending	TBD
4/28/2025	Shell Polymers Monaca	PA-04-00740A/B/C	Visible Emissions >5 min in consecutive 2 hrs from HP Elevated Flare Source C205C on 3/28/2025	Notice of Violation	Pending	TBD
6/11/2025	Shell Polymers Monaca	PA-04-00740A/B/C	Visible Emissions >5 min in consecutive 2 hrs from TEGF A C205A and TEGF B C205B 4/25/2025	Notice of Violation	Pending	TBD
6/18/2025	Shell Polymers Monaca	PA-04-00740A/B/C	Visible Emissions >5 min in consecutive 2 hrs from TEGF A C205A and TEGF B C205B on 5/12/2025	Notice of Violation	Pending	TBD

ATTACHMENT
COMPLIANCE HISTORY REVIEW SUMMARY

Date	Location	Plan Approval/ Operating Permit#	Nature of Deviation/ Documented Conduct	Type of Department Action	Status Litigation; Existing / Continuing; or corrected/Date	Dollar Amount Penalty
6/25/2025	Shell Polymers Monaca	PA-04-00740A/B/C	Non-compliant performance tests in Cogen 101, 102 & 103 in 2022 and LP Incinerators C204A and C206 in 2024	Notice of Violation	Pending	TBD
7/28/2025	Shell Polymers Monaca	PA-04-00740A/B/C	Visible Emissions from ECU Furnaces 2 & 3	Notice of Violation	Pending	TBD
7/28/2025	Shell Polymers Monaca	PA-04-00740A/B/C	Visible Emissions from ECU Furnaces 3, 4, 6, and 7	Notice of Violation	Pending	TBD

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF CLEAN WATER

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
APPLICATION FOR INDIVIDUAL PERMIT TO DISCHARGE INDUSTRIAL WASTEWATER
MODULE 1 – STORMWATER

1. **Applicant/Operator Name:**	**Shell Chemical Appalachia LLC**					
2. Total Area of Site (acres):	**598.9**	IA Area (acres):	**258.62**	% Pervious	**5.94**	% Impervious **94.16**
3. IA area treated by structural BMPs (acres):	**258.62**	IA area untreated (acres):	**0**			
4. List all outfalls receiving stormwater in whole or in part and provide the requested information.						

Outfall No.	Entirely Stormwater?	Ind. SW?	Drainage Area (ft^2)	% Impervious	Description of Materials/Activities in Drainage Area Exposed to Precipitation	No Exposure?
001	☐	☒	**504,821**	**77.90%**	Ohio River (WWTP)	☐
002	☒	☐	**1,051,520**	**97.42%**	Ohio River (East RR Pond)	☐
003	☒	☐	**NA**	**NA**	Ohio River (East RR Pond Overflow)	☐
004	☒	☐	**NA**	**NA**	Poorhouse Run (AC Pond Overflow)	☐
006	☒	☐	**3,221,610**	**78.08%**	Poorhouse Run (South Ponds)	☐
007	☒	☐	**NA**	**NA**	Poorhouse Run (South Pond Overflow)	☐
008	☒	☐	**4,686,388**	**83.35%**	Poorhouse Run (CR Pond)	☐
009	☒	☐	**NA**	**NA**	Poorhouse Run (CR Pond Overflow)	☐
010	☒	☐	**164,993**	**80.80%**	Poorhouse Run (West RR Basin)	☐
012	☒	☐	**NA**	**NA**	Poorhouse Run (West Basin Overflow)	☐
013	☒	☐	**4,935,212**	**94.96%**	Ohio River (North Pond)	☐
014	☒	☐	**NA**	**NA**	Ohio River (North Pond Overflow)	☐
016	☒	☐	**373,966**	**52.09%**	Ohio River (Storm water from plant and Duquesne and PennDOT rights-of-way)	☐
017	☒	☐	**612,323**	**60.49%**	Racoon Creek (Parking Area Pond A West)	☐
018	☒	☐	**NA**	**NA**	Racoon Creek (Parking Area Pond A West Overflow)	☐
019	☒	☐	**614,443**	**60.57%**	Racoon Creek (Parking Area Pond B East)	☐
020	☒	☐	**NA**	**NA**	Racoon Creek (Parking Area Pond B East Overflow)	☐
021	☒	☐	**340,525**	**0.58%**	Poorhouse run (Storm water runoff Electric Tower Rd)	☐
022	☒	☐	**1,128,045**	**40.82%**	Raccoon Creek (Training Center former PGT)	☐
	☐	☐				☐
	☐	☐				☐
	☐	☐				☐
	☐	☐				☐
	☐	☐				☐
	☐	☐				☐
	☐	☐				☐
	☐	☐				☐
	☐	☐				☐
	☐	☐				☐
	☐	☐				☐
	☐	☐				☐

5. List all outfalls receiving stormwater in the same order as question 2, above, and provide the requested information.

Outfall No.	Sampling Completed?	Representative Outfall No.	Treatment?	Description of BMPs in Drainage Area to Control Pollutants in Stormwater	PCSM?
001	☒		☒	Dry extended basin and segregation of AC areas	☒
002	☒		☐	Dry extended basin and segregation of AC areas	☒
003	☒		☐	Dry extended basin and segregation of AC areas	☒
004	☒		☐	Dry extended basin and segregation of AC areas	☒
006	☒		☐	Dry extended basin and segregation of AC areas	☒
007	☒		☐	Dry extended basin and segregation of AC areas	☒
008	☒		☐	Dry extended basin and segregation of AC areas	☒
009	☒		☐	Dry extended basin and segregation of AC areas	☒
010	☒		☐	Dry extended basin and segregation of AC areas	☒
012	☒		☐	Dry extended basin and segregation of AC areas	☒
013	☒		☐	Dry extended basin and segregation of AC areas	☒
014	☒		☐	Dry extended basin and segregation of AC areas	☒
016	☒		☐	Rock check dams and visual inspections	☒
017	☒		☐	Dry extended basin	☒
018	☒		☐	Dry extended basin	☒
019	☒		☐	Dry extended basin	☒
020	☒		☐	Dry extended basin	☒
021	☒		☐	Silt socks and visual inspections	☒
022	☒		☐	Visual inspections	☒
	☐		☐		☐
	☐		☐		☐
	☐		☐		☐
	☐		☐		☐
	☐		☐		☐
	☐		☐		☐
	☐		☐		☐
	☐		☐		☐
	☐		☐		☐
	☐		☐		☐
	☐		☐		☐
	☐		☐		☐
	☐		☐		☐

6. All non-stormwater discharges from these outfall(s) are identified in the Discharge Information section of the application?
☒ Yes ☐ No ☐ There are no non-stormwater discharges associated with these outfalls (If No, attach an explanation)

7. If there have been leaks or spills on-site within the past five years that have reached stormwater outfall(s), identify the outfall(s) receiving the leaks or spills, the substance(s) released, measures taken to remediate the incident(s) and preventative measure(s) taken to reduce the possibility of future incidents. Attach additional sheets as necessary.

NONE

8. Describe how often stormwater outfalls are inspected and routine maintenance performed, if not identified in question 3.

Outfalls are inspected after rain events of more than 0.1 inch. If it is noted that maintenance is needed, the maintenance is either preformed immediately or a work order is submitted if more extensive maintenance is required.

9. Is Aqueous Film-Forming Foam (AFFF) product containing PFAS used at the facility? ☐ Yes ☒ No

STORMWATER SAMPLING RESULTS

Complete the following tables for each stormwater outfalll sampled for analysis.

OUTFALL NO.:	**002**					
1. You must provide the results of at least one analysis for every pollutant identified in the table below						
Pollutant	Average Concentration		Maxium Concentration		No. Storm Events Sampled	Quantitation Limit
	Grab Sample	Flow-Weighted Composite Sample	Grab Sample	Flow-Weighted Composite Sample		
Oil and Grease (mg/L)	<4.4		<4.4		2	4.4
BOD5 (mg/L)	<2		<2		2	2
COD (mg/L)	<9.1		<9.1		2	9.1
TSS (mg/L)	10.10		15.00		2	0.5
Total Nitrogen (mg/L)	<0.54		<0.79		2	0.545
Total Phosphorus (mg/L)	0.04		0.04		1	0.04
pH (S.U.)	8.10		8.10		2	0.1

2. List all pollutants contained within an Effluent Limitation Guideline (ELF) that is applicable to the facility's production. Also list all pollutants listed in the facility's existing NPDES permit for the outfall identified above; process wastewater discharges; and any other pollutants that are considered the cause of impairment to waters receiving stormwater discharges from the outfall. Provide the results of at least one analysis for every pollutant listed. Specify the units with your results (e.g., mg/L)

Pollutant	Average Concentration		Maxium Concentration		No. Storm Events Sampled	Quantitation Limit
	Grab Sample	Flow-Weighted Composite Sample	Grab Sample	Flow-Weighted Composite Sample		
1,1,1-Trichloroethane	<0.0006 mg/L		<0.0006 mg/L		2	0.0006 mg/L
1,1,2,2-Tetrachloroethane	<0.0006 mg/L		<0.0006 mg/L		2	0.0006 mg/L
1,1,2-Trichloroethane	<0.00045 mg/L		<0.00045 mg/L		2	0.00045 mg/L
1,1-Dichloroethane	<0.00047 mg/L		<0.00063 mg/L		2	0.00047 mg/L
1,1-Dichloroethene	<0.00055 mg/L		<0.00055 mg/L		2	0.00055 mg/L
1,2,4-Trichlorobenzene	<0.00025 mg/L		<0.00021 mg/L		2	0.00021 mg/L
1,2-Dichlorobenzene	<0.00022 mg/L		<0.00017 mg/L		2	0.00017 mg/L
1,2-Dichloroethane	<0.00057 mg/L		<0.00057 mg/L		2	0.00057 mg/L
1,2-Dichloroethane-d4	0.01 mg/L		0.011 mg/L		2	
1,2-Dichloropropane	<0.00066 mg/L		<0.00066 mg/L		2	0.00066 mg/L
Diphenylhydrazine (as Azobenz	<0.00025 mg/L		<0.00023 mg/L		2	0.00023 mg/L
1,3-Dinitrobenzene	<0.00057 mg/L		<0.00053 mg/L		2	0.00053 mg/L
1,4-Dichlorobenzene	<0.00025 mg/L		<0.00016 mg/L		2	0.00016 mg/L
1,4-Dioxane	<0.043 mg/L		<0.043 mg/L		2	0.043 mg/L
2,2'oxybis[1-chloropropane]	<0.000067 mg/L		<0.000073 mg/L		2	0.000067 mg/L
2,4,6-Tribromophenol	0.0038 mg/L		0.004 mg/L		2	
2,4,6-Trichlorophenol	<0.00026 mg/L		<0.00028 mg/L		2	0.00026 mg/L
2,4-Dichlorophenol	<0.000059 mg/L		<0.000064 mg/L		2	0.000059 mg/L
2,4-Dimethylphenol	<0.00041 mg/L		<0.00061 mg/L		2	0.00041 mg/L
2,4-Dinitrophenol	<0.00265 mg/L		<0.0034 mg/L		2	0.0027 mg/L
2,4-Dinitrotoluene	<0.00041 mg/L		<0.00044 mg/L		2	0.00041 mg/L
2,6-Dinitrotoluene	<0.0002 mg/L		<0.00022 mg/L		2	0.0002 mg/L
2-Chlorethyl vinyl ether	<0.0017 mg/L		<0.0017 mg/L		2	0.0017 mg/L
2-Chloronaphthalene	<0.000068 mg/L		<0.000074 mg/L		2	0.000068 mg/L
2-Chlorophenol	<0.00020 mg/L		<0.00023 mg/L		2	0.0002 mg/L
2-Fluorobiphenyl	0.00385 mg/L		0.0041 mg/L		2	
2-Fluorophenol	0.0035 mg/L		0.0036 mg/L		2	
2-Nitrophenol	<0.00022 mg/L		<0.00024 mg/L		2	0.00022 mg/L

Pollutant	Average Concentration		Maxium Concentration		No. Storm Events Sampled	Quantitation Limit
	Grab Sample	Flow-Weighted Composite Sample	Grab Sample	Flow-Weighted Composite Sample		
3,3'-Dichlorobenzidine	<0.00067 mg/L		<0.00073 mg/L		2	0.00067 mg/L
4,4'-DDD	<0.00000068 mg/L		0.00000084 mg/L		2	0.00000052 mg/L
4,4'-DDE	<0.00000029 mg/L		<0.00000029 mg/L		2	0.00000029 mg/L
4,4'-DDT	<0.00000067 mg/L		<0.00000068 mg/L		2	0.00000067 mg/L
4,6-Dinitro-2-methylphenol	<0.00165 mg/L		<0.0018 mg/L		2	0.0017 mg/L
4-Bromofluorobenzene	0.0088 mg/L		0.0096 mg/L		2	
4-Bromophenyl phenyl ether	<0.00037 mg/L		<0.0004 mg/L		2	0.00037 mg/L
4-Chloro-3-methylphenol	<0.0004 mg/L		<0.00045 mg/L		2	0.0004 mg/L
4-Chlorophenyl phenyl ether	<0.00026 mg/L		<0.00028 mg/L		2	0.00026 mg/L
4-Nitrophenol	<0.00109 mg/L		<0.0012 mg/L		2	0.0011 mg/L
Acenaphthene	<0.000075 mg/L		<0.000081 mg/L		2	0.000075 mg/L
Acenaphthylene	<0.000075 mg/L		<0.000081 mg/L		2	0.000075 mg/L
Acrolein	<0.016 mg/L		<0.016 mg/L		2	0.016 mg/L
Acrylamide	<0.0175 mg/L		<0.021 mg/L		2	0.018 mg/L
Acrylonitrile	<0.0078 mg/L		<0.0078 mg/L		2	0.0078 mg/L
Aldrin	<0.00000035 mg/L		<0.00000035 mg/L		2	0.00000035 mg/L
alpha-BHC	<0.00000023 mg/L		<0.00000023 mg/L		2	0.00000023 mg/L
Aluminum	0.54 mg/L		0.91 mg/L		2	0.024 mg/L
Ammonia	<0.088 mg/L		<0.088 mg/L		2	0.088 mg/L
Anthracene	<0.000056 mg/L		<0.000061 mg/L		2	0.000056 mg/L
Antimony	0.00085 mg/L		0.0011 mg/L		2	0.00063 mg/L
Arsenic	0.00088 mg/L		0.0013 mg/L		2	0.00053 mg/L
Barium	0.0805 mg/L		0.1 mg/L		2	0.0017 mg/L
Benzene	<0.0006 mg/L		<0.0006 mg/L		2	0.0006 mg/L
Benzidine	<0.010 mg/L		<0.011 mg/L		2	0.010 mg/L
Benzo[a]anthracene	<0.000086 mg/L		<0.000094 mg/L		2	0.000086 mg/L
Benzo[a]pyrene	<0.000061 mg/L		<0.000066 mg/L		2	0.000061 mg/L
Benzo[b]fluoranthene	<0.00011 mg/L		<0.00012 mg/L		2	0.00011 mg/L
Benzo[g,h,i]perylene	<0.000079 mg/L		<0.000086 mg/L		2	0.000079 mg/L
Benzo[k]fluoranthene	<0.00010 mg/L		<0.00011 mg/L		2	0.00010 mg/L
Beryllium	<0.00044 mg/L		<0.00062 mg/L		2	0.00044 mg/L
beta-BHC	<0.00000036 mg/L		<0.000000036 mg/L		2	0.00000036 mg/L
Bis(2-chloroethoxy)methane	<0.00018 mg/L		<0.00019 mg/L		2	0.00018 mg/L
Bis(2-chloroethyl)ether	<0.000046 mg/L		<0.00005 mg/L		2	0.000046 mg/L
Bis(2-ethylhexyl) phthalate	<0.0072 mg/L		<0.0078 mg/L		2	0.0072 mg/L
Boron	<0.040 mg/L		<0.063 mg/L		2	0.04 mg/L
Bromide	<0.413 mg/L		0.773 mg/L		2	0.053 mg/L
Bromoform	<0.00098 mg/L		<0.00098 mg/L		2	0.00098 mg/L
Bromomethane	<0.00089 mg/L		<0.00089 mg/L		2	0.00089 mg/L
Butyl benzyl phthalate	<0.00078 mg/L		<0.00098 mg/L		2	0.00078 mg/L
Cadmium	0.00027 mg/L		0.00027 mg/L		2	0.00021 mg/L
Calcium	51 mg/L		72 mg/L		2	0.22 mg/L
Carbon tetrachloride	<0.00088 mg/L		<0.00088 mg/L		2	0.00088 mg/L
Chlordane	<0.000007 mg/L		<0.0000071 mg/L		2	0.000007 mg/L
Chloride	198.95 mg/L		384 mg/L		2	0.712 mg/L

Pollutant	Average Concentration		Maxium Concentration		No. Storm Events Sampled	Quantitation Limit
	Grab Sample	Flow-Weighted Composite Sample	Grab Sample	Flow-Weighted Composite Sample		
Chlorobenzene	<0.0005 mg/L		<0.0005 mg/L		2	0.0005 mg/L
Chlorodibromomethane	<0.00084 mg/L		<0.00084 mg/L		2	0.00084 mg/L
Chloroethane	<0.0009 mg/L		<0.0009 mg/L		2	0.0009 mg/L
Chloroform	<0.0006 mg/L		<0.0006 mg/L		2	0.0006 mg/L
Chloromethane	<0.0009 mg/L		<0.0009 mg/L		2	0.0009 mg/L
Chromium	0.0017 mg/L		0.002 mg/L		2	0.0009 mg/L
Chrysene	<0.000092mg/L		<0.0001 mg/L		2	0.000092 mg/L
cis-1,3-Dichloropropene	<0.00059 mg/L		<0.00059 mg/L		2	0.00059 mg/L
Cobalt	0.000315 mg/L		0.00044 mg/L		2	0.00015 mg/L
Color, Apparent	17.5 Color Units		20 Color Units		4	5 Color Units
Color, True	10 Color Units		15 Color Units		4	5 Color Units
Copper	0.0035 mg/L		0.0046 mg/L		2	0.0012 mg/L
Cr (VI)	<0.006 mg/L		<0.006 mg/L		2	0.006 mg/L
Cyanide, Total	<0.008 mg/L		<0.008 mg/L		1	0.008 mg/L
DCB Decachlorobiphenyl	0.0000167 mg/L		0.00002 mg/L		8	
delta-BHC	<0.00000062 mg/L		<0.00000063 mg/L		2	0.00000062 mg/L
Dibenz(a,h)anthracene	<0.000083 mg/L		<0.00009 mg/L		2	0.000083 mg/L
Dibromofluoromethane	0.011 mg/L		0.011 mg/L		2	
Dichlorobromomethane	<0.00064 mg/L		<0.00064 mg/L		2	0.00064 mg/L
Dieldrin	<0.00000027 mg/L		<0.00000027 mg/L		2	0.000000027 mg/L
Diethyl phthalate	<0.00065 mg/L		<0.00071 mg/L		2	0.00065 mg/L
Dimethyl phthalate	<0.00023 mg/L		<0.00025 mg/L		2	0.00023 mg/L
Di-n-butyl phthalate	0.0035 mg/L		0.0059 mg/L		2	0.003 mg/L
Di-n-octyl phthalate	<0.00079 mg/L		<0.00086 mg/L		2	0.00079 mg/L
Endosulfan I	<0.00000066 mg/L		<0.00000067 mg/L		2	0.00000066 mg/L
Endosulfan II	<0.00000031 mg/L		<0.00000031 mg/L		2	0.00000031 mg/L
Endosulfan sulfate	<0.00000062 mg/L		<0.00000063 mg/L		2	0.00000062 mg/L
Endrin	<0.00000022 mg/L		<0.00000022 mg/L		2	0.00000022 mg/L
Endrin aldehyde	<0.0000005 mg/L		<0.00000051 mg/L		2	0.00000050 mg/L
Ethylbenzene	<0.00051 mg/L		<0.00051 mg/L		2	0.00051 mg/L
Fluoranthene	<0.000069 mg/L		<0.000075 mg/L		2	0.000069 mg/L
Fluorene	<0.000079 mg/L		<0.000086 mg/L		2	0.000079 mg/L
Fluoride	1.639 mg/L		2.984 mg/L		2	0.026 mg/L
gamma-BHC	<0.00000029 mg/L		<0.00000029 mg/L		2	0.00000029 mg/L
Hardness as calcium carbonate	240		240		1	0.52 mg/L
Heptachlor	<0.00000044 mg/L		<0.00000044 mg/L		2	0.00000044 mg/L
Heptachlor epoxide	<0.00000033 mg/L		<0.00000033 mg/L		2	0.00000033 mg/L
Hexachlorobenzene	<0.000064 mg/L		<0.00007 mg/L		2	0.000064 mg/L
Hexachlorobutadine	<0.000079 mg/L		<0.000086 mg/L		2	0.000079 mg/L
Hexachlorocyclopentadiene	<0.00057 mg/L		<0.00062 mg/L		2	0.00057 mg/L
Hexachloroethane	<0.00016 mg/L		<0.00017 mg/L		2	0.00016 mg/L

Pollutant	Average Concentration		Maxium Concentration		No. Storm Events Sampled	Quantitation Limit
	Grab Sample	Flow-Weighted Composite Sample	Grab Sample	Flow-Weighted Composite Sample		
Indeno[1,2,3-cd]pyrene	<0.0001 mg/L		<0.00011 mg/L		2	0.0001 mg/L
Iron	<0.307 mg/L		0.74 mg/L		3	0.044 mg/L
Isophorone	<0.00022 mg/L		<0.00024 mg/L		2	0.00022 mg/L
Lead	0.0019 mg/L		0.003 mg/L		2	0.00043 mg/L
Magnesium	11.45 mg/L		16 mg/L		2	0.066 mg/L
Manganese	0.01 mg/L		0.015 mg/L		2	0.0029 mg/L
Mercury	<0.00013 mg/L		<0.00013 mg/L		2	0.00013 mg/L
ethylene Blue Active Substanc	0.09 mg/L		0.1 mg/L		3	0.049 mg/L
Methylene Chloride	<0.00089 mg/L		<0.00089 mg/L		2	0.00089 mg/L
Molybdenum	0.0037 mg/L		0.0043 mg/L		2	0.0009 mg/L
Naphthalene	<0.000068 mg/L		<0.000074 mg/L		2	0.000068 mg/L
Nickel	0.0021 mg/L		0.0026 mg/L		2	0.00095 mg/L
Nitrate Nitrite as N	0.23 mg/L		0.31 mg/L		2	0.065 mg/L
Nitrobenzene	<0.00058 mg/L		<0.00063 mg/L		2	0.00058 mg/L
Nitrobenzene-d5	0.0036 mg/L		0.0036 mg/L		2	
Nitrogen, Kjeldahl	<0.305 mg/L		<0.48 mg/L		3	0.3 mg/L
N-Nitrosodiumethylamine	<0.00018 mg/L		<0.00027 mg/L		2	0.00018 mg/L
N-Nitrosodi-n-propylamine	<0.000082 mg/L		<0.000089 mg/L		2	0.000082 mg/L
N-Nitrosodiumphenylamine	<0.00014 mg/L		<0.00015 mg/L		2	0.00014 mg/L
PCB-1016	<0.0000046 mg/L		<0.0000047 mg/L		2	0.0000046 mg/L
PCB-1221	<0.0000055 mg/L		<0.0000056 mg/L		2	0.0000055 mg/L
PCB-1232	<0.0000051 mg/L		<0.0000051 mg/L		2	0.0000051 mg/L
PCB-1242	<0.0000089 mg/L		<0.000009 mg/L		2	0.0000089 mg/L
PCB-1248	<0.0000029 mg/L		<0.0000029 mg/L		2	0.0000029 mg/L
PCB-1254	<0.0000092 mg/L		<0.0000093 mg/L		2	0.0000092 mg/L
PCB-1260	<0.0000038 mg/L		<0.0000039 mg/L		2	0.0000038 mg/L
Pentachlorophenol	<0.00099 mg/L		<0.0011 mg/L		2	0.00099 mg/L
Phenanthrene	<0.00011 mg/L		<0.00016 mg/L		2	0.00011 mg/L
Phenol	<0.00061 mg/L		<0.00056 mg/L		2	0.00056 mg/L
Phenol-d5	0.0033 mg/L		0.0033 mg/L		2	
Phosphorous as P	<0.017 mg/L		<0.017 mg/L		1	0.017 mg/L
Pyrene	<0.000062 mg/L		<0.000068 mg/L		2	0.000062 mg/L
Selenium	<0.00105 mg/L		0.0012 mg/L		2	0.00080 mg/L
Silver	<0.00042 mg/L		<0.00079 mg/L		2	0.00042 mg/L
Sulfate	99.7 mg/L		132 mg/L		2	0.756 mg/L
Sulfide	<1.3 mg/L		<1.3 mg/L		2	1.3 mg/L
Terphenyl-d14	0.0041 mg/L		0.0043 mg/L		2	
Tetrachloroethene	<0.00047 mg/L		<0.00047 mg/L		2	0.00047 mg/L
Tetrachloro-m-xylene	0.000016 mg/L		0.000023 mg/L		8	
Thallium	<0.00029 mg/L		<0.00038 mg/L		2	0.00029 mg/L
Toluene	<0.00046 mg/L		<0.00046 mg/L		2	0.00046 mg/L
Toluene-d8	0.0089 mg/L		0.0097 mg/L		2	
TDS	530 mg/L		890 mg/L		2	10 mg/L
TOC	1.8 mg/L		2.1 mg/L		2	0.51 mg/L
Toxaphene	<0.000048 mg/L		<0.000048 mg/L		2	0.000048 mg/L
trans-1,2-Dichloroethene	<0.00067 mg/L		<0.00067 mg/L		2	0.00067 mg/L
trans-1,3-Dichloropropene	<0.00058 mg/L		<0.00058 mg/L		2	0.00058 mg/L
Trichloroethene	<0.00069 mg/L		<0.00069 mg/L		2	0.00069 mg/L
Vinyl chloride	<0.00041 mg/L		<0.00041 mg/L		2	0.00041 mg/L
Zinc	0.0435 mg/L		0.061 mg/L		2	0.011 mg/L

STORMWATER SAMPLING RESULTS

Complete the following tables for each stormwater outfalll sampled for analysis.

OUTFALL NO.:	**005**					
1. You must provide the results of at least one analysis for every pollutant identified in the table below						
Pollutant	Average Concentration		Maxium Concentration		No. Storm Events Sampled	Quantitation Limit
	Grab Sample	Flow-Weighted Composite Sample	Grab Sample	Flow-Weighted Composite Sample		
Oil and Grease (mg/L)	<4.15		<4.2		2	4.2
BOD5 (mg/L)	2		2		2	2
COD (mg/L)	9.10		9.10		2	9.1
TSS (mg/L)	<1.1		1.70		2	0.5
Total Nitrogen (mg/L)	<1.19		<1.4		2	0.545
Total Phosphorus (mg/L)	<0.04		<0.04		1	0.04
pH (S.U.)	7.10		7.10		1	0.1

2. List all pollutants contained within an Effluent Limitation Guideline (ELF) that is applicable to the facility's production. Also list all pollutants listed in the facility's existing NPDES permit for the outfall identified above; process wastewater discharges; and any other pollutants that are considered the cause of impairment to waters receiving stormwater discharges from the outfall. Provide the results of at least one analysis for every pollutant listed. Specify the units with your results (e.g., mg/L)

Pollutant	Average Concentration		Maxium Concentration		No. Storm Events Sampled	Quantitation Limit
	Grab Sample	Flow-Weighted Composite Sample	Grab Sample	Flow-Weighted Composite Sample		
1,1,1-Trichloroethane	<0.0006 mg/L		<0.0006 mg/L		2	0.0006 mg/L
1,1,2,2-Tetrachloroethane	<0.0006 mg/L		<0.0006 mg/L		2	0.0006 mg/L
1,1,2-Trichloroethane	<0.00045 mg/L		<0.00045 mg/L		2	0.00045 mg/L
1,1-Dichloroethane	<0.00047 mg/L		<0.00063 mg/L		2	0.00047 mg/L
1,1-Dichloroethene	<0.00055 mg/L		<0.00055 mg/L		2	0.00055 mg/L
1,2,4-Trichlorobenzene	<0.00021 mg/L		<0.00025 mg/L		2	0.00021 mg/L
1,2-Dichlorobenzene	<0.00017 mg/L		<0.00022 mg/L		2	0.00017 mg/L
1,2-Dichloroethane	<0.00057 mg/L		<0.00057 mg/L		2	0.00057 mg/L
1,2-Dichloroethane-d4	0.011 mg/L		0.011 mg/L		2	
1,2-Dichloropropane	<0.00066 mg/L		<0.00066 mg/L		2	0.00066 mg/L
phenylhydrazine (as Azober	<0.00022 mg/L		<0.00023 mg/L		2	0.00022 mg/L
1,3-Dinitrobenzene	<0.00052 mg/L		<0.00055 mg/L		2	0.00052 mg/L
1,4-Dichlorobenzene	<0.00016 mg/L		<0.00025 mg/L		2	0.00016 mg/L
1,4-Dioxane	<0.043 mg/L		<0.043 mg/L		2	0.043 mg/L
2,2'oxybis[1-chloropropane]	<0.000065 mg/L		<0.000069 mg/L		2	0.000065 mg/L
2,4,6-Tribromophenol	0.0037 mg/L		0.0044 mg/L		2	
2,4,6-Trichlorophenol	<0.00025 mg/L		<0.00027 mg/L		2	0.00025 mg/L
2,4-Dichlorophenol	<0.000057 mg/L		<0.000061 mg/L		2	0.000057 mg/L
2,4-Dimethylphenol	<0.00041 mg/L		<0.00061 mg/L		2	0.00041 mg/L
2,4-Dinitrophenol	<0.0026 mg/L		<0.0034 mg/L		2	0.0026 mg/L
2,4-Dinitrotoluene	<0.0004 mg/L		<0.00042 mg/L		2	0.00040 mg/L
2,6-Dinitrotoluene	<0.0002 mg/L		<0.00021 mg/L		2	0.0002 mg/L
2-Chlorethyl vinyl ether	<0.0017 mg/L		<0.0017 mg/L		2	0.0017 mg/L
2-Chloronaphthalene	<0.000066 mg/L		<0.00007 mg/L		2	0.000066 mg/L
2-Chlorophenol	<0.00019 mg/L		<0.00023 mg/L		2	0.00019 mg/L
2-Fluorobiphenyl	0.0037 mg/L		0.0041 mg/L		2	
2-Fluorophenol	0.004 mg/L		0.0045 mg/L		2	
2-Nitrophenol	<0.00022 mg/L		<0.00023 mg/L		2	0.00022 mg/L

Pollutant	Average Concentration		Maxium Concentration		No. Storm Events Sampled	Quantitation Limit
	Grab Sample	Flow-Weighted Composite Sample	Grab Sample	Flow-Weighted Composite Sample		
3,3'-Dichlorobenzidine	<0.00065 mg/L		<0.00069 mg/L		2	0.00065 mg/L
4,4'-DDD	<0.00000051 mg/L		<0.00000051 mg/L		2	0.00000051 mg/L
4,4'-DDE	<0.00000028 mg/L		<0.00000028 mg/L		2	0.00000028 mg/L
4,4'-DDT	<0.00000066 mg/L		<0.00000066 mg/L		2	0.00000066 mg/L
4,6-Dinitro-2-methylphenol	<0.0017 mg/L		<0.0018 mg/L		2	0.0017 mg/L
4-Bromofluorobenzene	0.01 mg/L		0.011 mg/L		2	
4-Bromophenyl phenyl ether	<0.00036 mg/L		<0.00038 mg/L		2	0.00036 mg/L
4-Chloro-3-methylphenol	<0.00039 mg/L		<0.00045 mg/L		2	0.00039 mg/L
4-Chlorophenyl phenyl ether	<0.00025 mg/L		<0.00026 mg/L		2	0.00025 mg/L
4-Nitrophenol	<0.001 mg/L		<0.0011 mg/L		2	0.001 mg/L
Acenaphthene	<0.000073 mg/L		<0.000077 mg/L		2	0.000073 mg/L
Acenaphthylene	<0.000073 mg/L		<0.000077 mg/L		2	0.000073 mg/L
Acrolein	<0.016 mg/L		<0.016 mg/L		2	0.016 mg/L
Acrylamide	<0.017 mg/L		<0.021 mg/L		2	0.017 mg/L
Acrylonitrile	<0.0078 mg/L		<0.0078 mg/L		2	0.0078 mg/L
Aldrin	<0.00000034 mg/L		<0.00000034 mg/L		2	0.00000034 mg/L
alpha-BHC	<0.00000023 mg/L		<0.00000023 mg/L		2	0.00000023 mg/L
Aluminum	0.062 mg/L		0.089 mg/L		2	0.016 mg/L
Ammonia	<0.088 mg/L		<0.088 mg/L		2	0.088 mg/L
Anthracene	<0.000055 mg/L		<0.000058 mg/L		2	0.000055 mg/L
Antimony	<0.0017 mg/L		<0.0018 mg/L		2	0.0012 mg/L
Arsenic	0.00042 mg/L		0.00049 mg/L		2	0.0003 mg/L
Barium	0.058 mg/L		0.062 mg/L		2	0.0016 mg/L
Benzene	<0.0006 mg/L		<0.0006 mg/L		2	0.0006 mg/L
Benzidine	<0.01 mg/L		<0.011 mg/L		2	0.010 mg/L
Benzo[a]anthracene	<0.000084 mg/L		<0.000089 mg/L		2	0.000084 mg/L
Benzo[a]pyrene	<0.000059 mg/L		<0.000063 mg/L		2	0.000059 mg/L
Benzo[b]fluoranthene	<0.00011 mg/L		<0.00012 mg/L		2	0.00011 mg/L
Benzo[g,h,i]perylene	<0.000077 mg/L		<0.000082 mg/L		2	0.000077 mg/L
Benzo[k]fluoranthene	<0.000096 mg/L		<0.0001 mg/L		2	0.000096 mg/L
Beryllium	<0.00025 mg/L		<0.00025 mg/L		2	0.00025 mg/L
beta-BHC	<0.00000035 mg/L		<0.00000035 mg/L		2	0.00000035 mg/L
Bis(2-chloroethoxy)methane	<0.00017 mg/L		<0.00018 mg/L		2	0.00017 mg/L
Bis(2-chloroethyl)ether	<0.000045 mg/L		<0.000048 mg/L		2	0.000045 mg/L
Bis(2-ethylhexyl) phthalate	<0.007 mg/L		<0.0074 mg/L		2	0.007 mg/L
Boron	0.145 mg/L		0.17 mg/L		2	0.063 mg/L
Bromide	<0.053 mg/L		<0.053 mg/L		2	0.053 mg/L
Bromoform	<0.00098 mg/L		<0.00098 mg/L		2	0.00098 mg/L
Bromomethane	<0.00089 mg/L		<0.00089 mg/L		2	0.00089 mg/L
Butyl benzyl phthalate	<0.00077 mg/L		<0.00098 mg/L		2	0.00077 mg/L
Cadmium	0.011 mg/L		0.014 mg/L		2	0.00028 mg/L
Calcium	75.5 mg/L		82 mg/L		2	0.18 mg/L
Carbon tetrachloride	<0.00088 mg/L		<0.00088 mg/L		2	0.00088 mg/L
Chlordane	<0.0000069 mg/L		<0.0000069 mg/L		2	0.0000069 mg/L
Chloride	104.7 mg/L		136 mg/L		2	0.712 mg/L

Pollutant	Average Concentration		Maxium Concentration		No. Storm Events Sampled	Quantitation Limit
	Grab Sample	Flow-Weighted Composite Sample	Grab Sample	Flow-Weighted Composite Sample		
Chlorobenzene	<0.0005 mg/L		<0.0005 mg/L		2	0.0005 mg/L
Chlorodibromomethane	<0.00084 mg/L		<0.00084 mg/L		2	0.00084 mg/L
Chloroethane	<0.0009 mg/L		<0.0009 mg/L		2	0.0009 mg/L
Chloroform	<0.0006 mg/L		<0.0006 mg/L		2	0.0006 mg/L
Chloromethane	<0.0009 mg/L		<0.0009 mg/L		2	0.0009 mg/L
Chromium	<0.00089 mg/L		<0.0012 mg/L		2	0.00089 mg/L
Chrysene	<0.00009 mg/L		<0.000096 mg/L		2	0.00009 mg/L
cis-1,3-Dichloropropene	<0.00059 mg/L		<0.00059 mg/L		2	0.00059 mg/L
Cobalt	0.00018 mg/L		0.00021 mg/L		2	0.0001 mg/L
Color, Apparent	15 Color Units		15 Color Units		2	5 Color Units
Color, True	10 Color Units		10 Color Units		2	5 Color Units
Copper	0.025 mg/L		0.026 mg/L		2	0.0011 mg/L
Cr (VI)	<0.006 mg/L		<0.006 mg/L		2	0.006 mg/L
Cyanide, Total	<0.008 mg/L		<0.008 mg/L		1	0.008 mg/L
DCB Decachlorobiphenyl	0.000014 mg/L		<0.000018 mg/L		8	
delta-BHC	<0.00000061 mg/L		<0.00000061 mg/L		2	0.00000061 mg/L
Dibenz(a,h)anthracene	<0.000081 mg/L		<0.000086 mg/L		2	0.000081 mg/L
Dibromofluoromethane	0.0095 mg/L		0.0098 mg/L		2	
Dichlorobromomethane	<0.00064 mg/L		<0.00064 mg/L		2	0.00064 mg/L
Dieldrin	<0.00000026 mg/L		<0.00000026 mg/L		2	0.000000026 mg/L
Diethyl phthalate	<0.00064 mg/L		<0.00068 mg/L		2	0.00064 mg/L
Dimethyl phthalate	<0.00023 mg/L		<0.00024 mg/L		2	0.00023 mg/L
Di-n-butyl phthalate	0.0036 mg/L		0.0051 mg/L		2	0.003 mg/L
Di-n-octyl phthalate	<0.00077 mg/L		<0.00082 mg/L		2	0.00077 mg/L
Endosulfan I	<0.00000065 mg/L		<0.00000065 mg/L		2	0.00000065 mg/L
Endosulfan II	<0.0000003 mg/L		<0.0000003 mg/L		2	0.0000003 mg/L
Endosulfan sulfate	<0.00000061 mg/L		<0.00000061 mg/L		2	0.00000061 mg/L
Endrin	<0.00000022 mg/L		<0.00000022 mg/L		2	0.00000022 mg/L
Endrin aldehyde	<0.00000049 mg/L		<0.00000049 mg/L		2	0.00000049 mg/L
Ethylbenzene	<0.00051 mg/L		<0.00051 mg/L		2	0.00051 mg/L
Fluoranthene	<0.000067 mg/L		<0.000071 mg/L		2	0.000067 mg/L
Fluorene	<0.000077 mg/L		<0.000082 mg/L		2	0.000077 mg/L
Fluoride	0.208 mg/L		0.235 mg/L		2	0.026 mg/L
gamma-BHC	<0.00000028 mg/L		<0.00000028 mg/L		2	0.00000028 mg/L
ardness as calcium carbona	280 mg/L		280 mg/L		1	0.52 mg/L
Heptachlor	<0.00000043 mg/L		<0.00000043 mg/L		2	0.00000043 mg/L
Heptachlor epoxide	<0.00000032 mg/L		<0.00000032 mg/L		2	0.00000032 mg/L
Hexachlorobenzene	<0.000063 mg/L		<0.000067 mg/L		2	0.000063 mg/L
Hexachlorobutadine	<0.000077 mg/L		<0.000082 mg/L		2	0.000077 mg/L
Hexachlorocyclopentadiene	<0.00056 mg/L		<0.00059 mg/L		2	0.00056 mg/L
Hexachloroethane	<0.00015 mg/L		<0.00016 mg/L		2	0.00015 mg/L
Indeno[1,2,3-cd]pyrene	<0.000095 mg/L		<0.0001 mg/L		2	0.000095 mg/L

Pollutant	Average Concentration		Maxium Concentration		No. Storm Events Sampled	Quantitation Limit
	Grab Sample	Flow-Weighted Composite Sample	Grab Sample	Flow-Weighted Composite Sample		
Iron	0.07 mg/L		0.12 mg/L		3	0.041 mg/L
Isophorone	<0.00021 mg/L		<0.00022 mg/L		2	0.00021 mg/L
Lead	0.002 mg/L		0.002 mg/L		2	0.00051 mg/L
Magnesium	17.5 mg/L		19 mg/L		2	0.07 mg/L
Manganese	0.015 mg/L		0.015 mg/L		2	0.0022 mg/L
Mercury	0.00021 mg/L		0.00028 mg/L		2	0.00013 mg/L
thylene Blue Active Substan	<0.049 mg/L		<0.049 mg/L		2	0.049 mg/L
Methylene Chloride	<0.00089 mg/L		<0.00089 mg/L		2	0.00089 mg/L
Molybdenum	0.0014 mg/L		0.0015 mg/L		2	0.0007 mg/L
Naphthalene	<0.00007 mg/L		<0.00007 mg/L		2	0.000066 mg/L
Nickel	0.075 mg/L		0.081 mg/L		2	0.00039 mg/L
Nitrate Nitrite as N	0.89 mg/L		0.92 mg/L		2	0.065 mg/L
Nitrobenzene	<0.00056 mg/L		<0.0006 mg/L		2	0.00056 mg/L
Nitrobenzene-d5	0.0038 mg/L		0.0042 mg/L		2	
Nitrogen, Kjeldahl	<0.3 mg/L		<0.48 mg/L		2	0.3 mg/L
N-Nitrosodiumethylamine	<0.00018 mg/L		<0.00027 mg/L		2	0.00018 mg/L
N-Nitrosodi-n-propylamine	<0.00008 mg/L		<0.000085 mg/L		2	0.00008 mg/L
N-Nitrosodiumphenylamine	<0.00013 mg/L		<0.00014 mg/L		2	0.00013 mg/L
PCB-1016	<0.0000045 mg/L		<0.0000045 mg/L		2	0.0000045 mg/L
PCB-1221	<0.0000054 mg/L		<0.0000054 mg/L		2	0.0000054 mg/L
PCB-1232	<0.000005 mg/L		<0.000005 mg/L		2	0.000005 mg/L
PCB-1242	<0.0000087 mg/L		<0.0000087 mg/L		2	0.0000087 mg/L
PCB-1248	<0.0000028 mg/L		<0.0000028 mg/L		2	0.0000028 mg/L
PCB-1254	<0.0000091 mg/L		<0.0000091 mg/L		2	0.0000091 mg/L
PCB-1260	<0.0000037 mg/L		<0.0000037 mg/L		2	0.0000037 mg/L
Pentachlorophenol	<0.00094 mg/L		<0.001 mg/L		2	0.00094 mg/L
Phenanthrene	<0.00011 mg/L		<0.00016 mg/L		2	0.00011 mg/L
Phenol	<0.00055 mg/L		<0.00058 mg/L		2	0.00055 mg/L
Phenol-d5	0.0039 mg/L		0.0043 mg/L		2	
Phosphorous as P	<0.017 mg/L		<0.017 mg/L		1	0.017 mg/L
Pyrene	<0.00006 mg/L		<0.000064 mg/L		2	0.00006 mg/L
Selenium	0.0034 mg/L		0.0037 mg/L		2	0.00095 mg/L
Silver	<0.00079 mg/L		<0.00079 mg/L		2	0.00079 mg/L
Sulfate	120 mg/L		120 mg/L		2	0.756 mg/L
Sulfide	<1.7 mg/L		2.1 mg/L		2	1.3 mg/L
Terphenyl-d14	0.004 mg/L		0.0044 mg/L		2	
Tetrachloroethene	<0.00047 mg/L		<0.00047 mg/L		2	0.00047 mg/L
Tetrachloro-m-xylene	0.000014 mg/L		0.000015 mg/L		8	
Thallium	<0.00054 mg/L		<0.00069 mg/L		2	0.00054 mg/L
Toluene	<0.00046 mg/L		<0.00046 mg/L		2	0.00046 mg/L
Toluene-d8	0.0092 mg/L		0.0099 mg/L		2	
TDS	475 mg/L		500 mg/L		2	10 mg/L
TOC	1.55 mg/L		1.8 mg/L		2	0.51 mg/L
Toxaphene	<0.000047 mg/L		<0.000047 mg/L		2	0.000047 mg/L
trans-1,2-Dichloroethene	<0.00067 mg/L		<0.00067 mg/L		2	0.00067 mg/L
trans-1,3-Dichloropropene	<0.00058 mg/L		<0.00058 mg/L		2	0.00058 mg/L
Trichloroethene	<0.00069 mg/L		<0.00069 mg/L		2	0.00069 mg/L
Vinyl chloride	<0.00041 mg/L		<0.00041 mg/L		2	0.00041 mg/L
Zinc	3.1 mg/L		3.6 mg/L		2	0.0077 mg/L

STORMWATER SAMPLING RESULTS

Complete the following tables for each stormwater outfalll sampled for analysis.

OUTFALL NO.:	**006**					
1. You must provide the results of at least one analysis for every pollutant identified in the table below						
Pollutant	Average Concentration		Maxium Concentration		No. Storm Events Sampled	Quantitation Limit
	Grab Sample	Flow-Weighted Composite Sample	Grab Sample	Flow-Weighted Composite Sample		
Oil and Grease (mg/L)	4.2		4.2		2	4.2
BOD5 (mg/L)	61.1		120		2	20
COD (mg/L)	<9.4		9.70		2	9.1
TSS (mg/L)	8.95		13.00		2	0.5
Total Nitrogen (mg/L)	<0.85		<1.01		2	0.545
Total Phosphorus (mg/L)	<0.04		<0.04		1	0.04
pH (S.U.)	7.60		7.60		1	0.1

2. List all pollutants contained within an Effluent Limitation Guideline (ELF) that is applicable to the facility's production. Also list all pollutants listed in the facility's existing NPDES permit for the outfall identified above; process wastewater discharges; and any other pollutants that are considered the cause of impairment to waters receiving stormwater discharges from the outfall. Provide the results of at least one analysis for every pollutant listed. Specify the units with your results (e.g., mg/L)

Pollutant	Average Concentration		Maxium Concentration		No. Storm Events Sampled	Quantitation Limit
	Grab Sample	Flow-Weighted Composite Sample	Grab Sample	Flow-Weighted Composite Sample		
1,1,1-Trichloroethane	<0.0006 mg/L		<0.0006 mg/L		2	0.0006 mg/L
1,1,2,2-Tetrachloroethane	<0.0006 mg/L		<0.0006 mg/L		2	0.0006 mg/L
1,1,2-Trichloroethane	<0.00045 mg/L		<0.00045 mg/L		2	0.00045 mg/L
1,1-Dichloroethane	<0.00047 mg/L		<0.00063 mg/L		2	0.00047 mg/L
1,1-Dichloroethene	<0.00055 mg/L		<0.00055 mg/L		2	0.00055 mg/L
1,2,4-Trichlorobenzene	<0.00019 mg/L		<0.00024 mg/L		2	0.00019 mg/L
1,2-Dichlorobenzene	<0.00016 mg/L		<0.00021 mg/L		2	0.00016 mg/L
1,2-Dichloroethane	<0.00057 mg/L		<0.00057 mg/L		2	0.00057 mg/L
1,2-Dichloroethane-d4	0.0086 mg/L		0.011 mg/L		2	
1,2-Dichloropropane	<0.00066 mg/L		<0.00066 mg/L		2	0.00066 mg/L
phenylhydrazine (as Azober	<0.00021 mg/L		<0.00021 mg/L		2	0.00021 mg/L
1,3-Dinitrobenzene	<0.00048 mg/L		<0.0005 mg/L		2	0.00048 mg/L
1,4-Dichlorobenzene	<0.00015 mg/L		<0.00024 mg/L		2	0.00015 mg/L
1,4-Dioxane	<0.043 mg/L		<0.043 mg/L		2	0.043 mg/L
2,2'oxybis[1-chloropropane]	<0.000061 mg/L		<0.000063 mg/L		2	0.000061 mg/L
2,4,6-Tribromophenol	0.004 mg/L		0.0046 mg/L		2	
2,4,6-Trichlorophenol	<0.00023 mg/L		<0.00024 mg/L		2	0.00023 mg/L
2,4-Dichlorophenol	<0.000053 mg/L		<0.000055 mg/L		2	0.000053 mg/L
2,4-Dimethylphenol	<0.00039 mg/L		<0.00059 mg/L		2	0.00039 mg/L
2,4-Dinitrophenol	<0.0025 mg/L		<0.0033 mg/L		2	0.0025 mg/L
2,4-Dinitrotoluene	<0.00037 mg/L		<0.00038 mg/L		2	0.00037 mg/L
2,6-Dinitrotoluene	<0.00018 mg/L		<0.00019 mg/L		2	0.00018 mg/L
2-Chlorethyl vinyl ether	<0.0017 mg/L		<0.0017 mg/L		2	0.0017 mg/L
2-Chloronaphthalene	<0.000062 mg/L		<0.000064 mg/L		2	0.000062 mg/L
2-Chlorophenol	<0.00019 mg/L		<0.00023 mg/L		2	0.00019 mg/L
2-Fluorobiphenyl	0.0039 mg/L		0.0044 mg/L		2	
2-Fluorophenol	0.0039 mg/L		0.0043 mg/L		2	
2-Nitrophenol	<0.0002 mg/L		<0.00021 mg/L		2	0.0002 mg/L

Pollutant	Average Concentration		Maxium Concentration		No. Storm Events Sampled	Quantitation Limit
	Grab Sample	Flow-Weighted Composite Sample	Grab Sample	Flow-Weighted Composite Sample		
3,3'-Dichlorobenzidine	<0.00061 mg/L		<0.00063 mg/L		2	0.00061 mg/L
4,4'-DDD	<0.00000052 mg/L		<0.00000053 mg/L		2	0.00000052 mg/L
4,4'-DDE	<0.00000029 mg/L		<0.0000003 mg/L		2	0.00000029 mg/L
4,4'-DDT	<0.00000068 mg/L		<0.00000069 mg/L		2	0.00000068 mg/L
4,6-Dinitro-2-methylphenol	<0.0016 mg/L		<0.0016 mg/L		2	0.0016 mg/L
4-Bromofluorobenzene	0.0078 mg/L		0.0085 mg/L		2	
4-Bromophenyl phenyl ether	<0.00034 mg/L		<0.00035 mg/L		2	0.00034 mg/L
4-Chloro-3-methylphenol	<0.00037 mg/L		<0.00044 mg/L		2	0.00037 mg/L
4-Chlorophenyl phenyl ether	<0.00023 mg/L		<0.00024 mg/L		2	0.00023 mg/L
4-Nitrophenol	<0.001 mg/L		<0.001 mg/L		2	0.001 mg/L
Acenaphthene	<0.000068 mg/L		<0.000071 mg/L		2	0.000068 mg/L
Acenaphthylene	<0.000068 mg/L		<0.000071 mg/L		2	0.000068 mg/L
Acrolein	<0.016 mg/L		<0.016 mg/L		2	0.016 mg/L
Acrylamide	<0.017 mg/L		<0.021 mg/L		2	0.017 mg/L
Acrylonitrile	<0.0078 mg/L		<0.0078 mg/L		2	0.0078 mg/L
Aldrin	<0.00000035 mg/L		<0.00000036 mg/L		2	0.00000035 mg/L
alpha-BHC	<0.00000024 mg/L		<0.00000024 mg/L		2	0.00000024 mg/L
Aluminum	0.263 mg/L		0.48 mg/L		2	0.024 mg/L
Ammonia	<0.119 mg/L		0.15 mg/L		2	0.088 mg/L
Anthracene	<0.000051 mg/L		<0.000053 mg/L		2	0.000051 mg/L
Antimony	<0.00064 mg/L		0.00071 mg/L		2	0.00063 mg/L
Arsenic	0.00068 mg/L		0.001 mg/L		2	0.00053 mg/L
Barium	0.047 mg/L		0.061 mg/L		2	0.0017 mg/L
Benzene	<0.0006 mg/L		<0.0006 mg/L		2	0.0006 mg/L
Benzidine	<0.0095 mg/L		<0.0099 mg/L		2	0.0095 mg/L
Benzo[a]anthracene	<0.000079 mg/L		<0.000082 mg/L		2	0.000079 mg/L
Benzo[a]pyrene	<0.000056 mg/L		<0.000058 mg/L		2	0.000056 mg/L
Benzo[b]fluoranthene	<0.0001 mg/L		<0.00011 mg/L		2	0.0001 mg/L
Benzo[g,h,i]perylene	<0.000072 mg/L		<0.000075 mg/L		2	0.000072 mg/L
Benzo[k]fluoranthene	<0.000092 mg/L		<0.000096 mg/L		2	0.000092 mg/L
Beryllium	<0.00044 mg/L		<0.00062 mg/L		2	0.00044 mg/L
beta-BHC	<0.00000036 mg/L		<0.00000037 mg/L		2	0.00000036 mg/L
Bis(2-chloroethoxy)methane	<0.00016 mg/L		<0.00017 mg/L		2	0.00016 mg/L
Bis(2-chloroethyl)ether	<0.000042 mg/L		<0.000043 mg/L		2	0.000042 mg/L
Bis(2-ethylhexyl) phthalate	<0.0065 mg/L		<0.0068 mg/L		2	0.0065 mg/L
Boron	<0.04 mg/L		<0.063 mg/L		2	0.04 mg/L
Bromide	<0.053 mg/L		<0.053 mg/L		2	0.053 mg/L
Bromoform	<0.00098 mg/L		<0.00098 mg/L		2	0.00098 mg/L
Bromomethane	<0.00089 mg/L		<0.00089 mg/L		2	0.00089 mg/L
Butyl benzyl phthalate	<0.00072 mg/L		<0.00094 mg/L		2	0.00072 mg/L
Cadmium	<0.00054 mg/L		0.00087 mg/L		2	0.00021 mg/L
Calcium	156 mg/L		260 mg/L		2	0.215 mg/L
Carbon tetrachloride	<0.00088 mg/L		<0.00088 mg/L		2	0.00088 mg/L
Chlordane	<0.0000071 mg/L		<0.0000073 mg/L		2	0.0000071 mg/L
Chloride	580.8 mg/L		1100 mg/L		2	2.14 mg/L

Pollutant	Average Concentration		Maxium Concentration		No. Storm Events Sampled	Quantitation Limit
	Grab Sample	Flow-Weighted Composite Sample	Grab Sample	Flow-Weighted Composite Sample		
Chlorobenzene	<0.0005 mg/L		<0.0005 mg/L		2	0.0005 mg/L
Chlorodibromomethane	<0.00084 mg/L		<0.00084 mg/L		2	0.00084 mg/L
Chloroethane	<0.0009 mg/L		<0.0009 mg/L		2	0.0009 mg/L
Chloroform	<0.0006 mg/L		<0.0006 mg/L		2	0.0006 mg/L
Chloromethane	<0.0009 mg/L		<0.0009 mg/L		2	0.0009 mg/L
Chromium	<0.0012 mg/L		<0.0012 mg/L		2	0.00089 mg/L
Chrysene	<0.000085 mg/L		<0.000088 mg/L		2	0.000085 mg/L
cis-1,3-Dichloropropene	<0.00059 mg/L		<0.00059 mg/L		2	0.00059 mg/L
Cobalt	0.0008 mg/L		0.001 mg/L		2	0.00015 mg/L
Color, Apparent	15 Color Units		25 Color Units		2	5 Color Units
Color, True	5 Color Units		5 Color Units		2	5 Color Units
Copper	0.0025 mg/L		0.0034 mg/L		2	0.0012 mg/L
Cr (VI)	<0.006 mg/L		<0.006 mg/L		2	0.006 mg/L
Cyanide, Total	<0.008 mg/L		<0.008 mg/L		1	0.008 mg/L
DCB Decachlorobiphenyl	0.000014 mg/L		0.000018 mg/L		8	
delta-BHC	<0.00000063 mg/L		<0.00000064 mg/L		2	0.00000063 mg/L
Dibenz(a,h)anthracene	<0.000075 mg/L		<0.000078 mg/L		2	0.000075 mg/L
Dibromofluoromethane	0.0094 mg/L		0.0098 mg/L		2	
Dichlorobromomethane	<0.00064 mg/L		<0.00064 mg/L		2	0.00064 mg/L
Dieldrin	<0.00000027 mg/L		<0.00000027 mg/L		2	0.00000027 mg/L
Diethyl phthalate	<0.0006 mg/L		<0.00062 mg/L		2	0.0006 mg/L
Dimethyl phthalate	<0.00021 mg/L		<0.00022 mg/L		2	0.00021 mg/L
Di-n-butyl phthalate	0.0039 mg/L		0.0052 mg/L		2	0.0029 mg/L
Di-n-octyl phthalate	<0.00072 mg/L		<0.00074 mg/L		2	0.00072 mg/L
Endosulfan I	<0.00000067 mg/L		<0.00000069 mg/L		2	0.00000067 mg/L
Endosulfan II	<0.00000031 mg/L		<0.00000032 mg/L		2	0.00000031 mg/L
Endosulfan sulfate	<0.00000063 mg/L		<0.00000064 mg/L		2	0.00000063 mg/L
Endrin	<0.00000023 mg/L		<0.00000023 mg/L		2	0.00000023 mg/L
Endrin aldehyde	<0.00000051 mg/L		<0.00000052 mg/L		2	0.00000051 mg/L
Ethylbenzene	<0.00051 mg/L		<0.00051 mg/L		2	0.00051 mg/L
Fluoranthene	<0.000063 mg/L		<0.000065 mg/L		2	0.000063 mg/L
Fluorene	<0.000072 mg/L		<0.000075 mg/L		2	0.000072 mg/L
Fluoride	7.75 mg/L		15.4 mg/L		2	0.026 mg/L
gamma-BHC	<0.00000029 mg/L		<0.00000029 mg/L		2	0.00000029 mg/L
ardness as calcium carbona	1000 mg/L		1000 mg/L		1	0.52 mg/L
Heptachlor	<0.00000044 mg/L		<0.00000045 mg/L		2	0.00000044 mg/L
Heptachlor epoxide	<0.00000033 mg/L		<0.00000034 mg/L		2	0.00000033 mg/L
Hexachlorobenzene	<0.000059 mg/L		<0.000061 mg/L		2	0.000059 mg/L
Hexachlorobutadine	<0.000072 mg/L		<0.000075 mg/L		2	0.000072 mg/L
Hexachlorocyclopentadiene	<0.00052 mg/L		<0.00054 mg/L		2	0.00052 mg/L
Hexachloroethane	<0.00014 mg/L		<0.00014 mg/L		2	0.00014 mg/L

Pollutant	Average Concentration		Maxium Concentration		No. Storm Events Sampled	Quantitation Limit
	Grab Sample	Flow-Weighted Composite Sample	Grab Sample	Flow-Weighted Composite Sample		
Indeno[1,2,3-cd]pyrene	<0.000089 mg/L		<0.000092 mg/L		2	0.000089 mg/L
Iron	0.29 mg/L		0.55 mg/L		3	0.043 mg/L
Isophorone	<0.0002 mg/L		<0.0002 mg/L		2	0.0002 mg/L
Lead	<0.0008 mg/L		0.0012 mg/L		2	0.00043 mg/L
Magnesium	54.5 mg/L		97 mg/L		2	0.066 mg/L
Manganese	0.21 mg/L		0.29 mg/L		2	0.0029 mg/L
Mercury	<0.00013 mg/L		<0.00013 mg/L		2	0.00013 mg/L
thylene Blue Active Substan	<0.105 mg/L		0.16 mg/L		2	0.049 mg/L
Methylene Chloride	<0.00089 mg/L		<0.00089 mg/L		2	0.00089 mg/L
Molybdenum	0.0021 mg/L		0.0026 mg/L		2	0.0009 mg/L
Naphthalene	<0.000062 mg/L		<0.000064 mg/L		2	0.000062 mg/L
Nickel	0.004 mg/L		0.006 mg/L		2	0.00095 mg/L
Nitrate Nitrite as N	0.41 mg/L		0.53 mg/L		2	0.065 mg/L
Nitrobenzene	<0.00052 mg/L		<0.00054 mg/L		2	0.00052 mg/L
Nitrobenzene-d5	0.0037 mg/L		0.0039 mg/L		2	
Nitrogen, Kjeldahl	<0.44 mg/L		<0.48 mg/L		2	0.3 mg/L
N-Nitrosodiumethylamine	<0.00017 mg/L		<0.00026 mg/L		2	0.00017 mg/L
N-Nitrosodi-n-propylamine	<0.000074 mg/L		<0.000077 mg/L		2	0.000074 mg/L
N-Nitrosodiumphenylamine	<0.00013 mg/L		<0.00013 mg/L		2	0.00013 mg/L
PCB-1016	<0.0000047 mg/L		<0.0000048 mg/L		2	0.0000047 mg/L
PCB-1221	<0.0000056 mg/L		<0.0000057 mg/L		2	0.0000056 mg/L
PCB-1232	<0.0000051 mg/L		<0.0000052 mg/L		2	0.0000051 mg/L
PCB-1242	<0.0000089 mg/L		<0.0000091 mg/L		2	0.0000089 mg/L
PCB-1248	<0.0000029 mg/L		<0.000003 mg/L		2	0.0000029 mg/L
PCB-1254	<0.0000093 mg/L		<0.0000095 mg/L		2	0.0000093 mg/L
PCB-1260	<0.0000038 mg/L		<0.0000039 mg/L		2	0.0000038 mg/L
Pentachlorophenol	<0.00089 mg/L		<0.00092 mg/L		2	0.00089 mg/L
Phenanthrene	<0.00011 mg/L		<0.00016 mg/L		2	0.00011 mg/L
Phenol	<0.00051 mg/L		<0.00053 mg/L		2	0.00051 mg/L
Phenol-d5	0.0036 mg/L		0.004 mg/L		2	
Phosphorous as P	0.047 mg/L		0.047 mg/L		1	0.017 mg/L
Pyrene	<0.000057 mg/L		<0.000059 mg/L		2	0.000057 mg/L
Selenium	<0.0015 mg/L		0.0022 mg/L		2	0.0008 mg/L
Silver	<0.00042 mg/L		<0.00079 mg/L		2	0.00042 mg/L
Sulfate	287.5 mg/L		474 mg/L		2	0.756 mg/L
Sulfide	<1.3 mg/L		<1.3 mg/L		2	1.3 mg/L
Terphenyl-d14	0.0039 mg/L		0.0044 mg/L		2	
Tetrachloroethene	<0.00047 mg/L		<0.00047 mg/L		2	0.00047 mg/L
Tetrachloro-m-xylene	0.000016 mg/L		0.000017 mg/L		8	
Thallium	<0.00029 mg/L		<0.00038 mg/L		2	0.00029 mg/L
Toluene	<0.00046 mg/L		<0.00046 mg/L		2	0.00046 mg/L
Toluene-d8	0.0092 mg/L		0.01 mg/L		2	
TDS	1610 mg/L		2900 mg/L		2	25 mg/L
TOC	32 mg/L		60 mg/L		2	0.51 mg/L
Toxaphene	<0.000048 mg/L		<0.000049 mg/L		2	0.000048 mg/L
trans-1,2-Dichloroethene	<0.00067 mg/L		<0.00067 mg/L		2	0.00067 mg/L
trans-1,3-Dichloropropene	<0.00058 mg/L		<0.00058 mg/L		2	0.00058 mg/L
Trichloroethene	<0.00069 mg/L		<0.00069 mg/L		2	0.00069 mg/L
Vinyl chloride	<0.00041 mg/L		<0.00041 mg/L		2	0.00041 mg/L
Zinc	0.042 mg/L		0.059 mg/L		2	0.011 mg/L

STORMWATER SAMPLING RESULTS

Complete the following tables for each stormwater outfalll sampled for analysis.

OUTFALL NO.:	**008**					
1. You must provide the results of at least one analysis for every pollutant identified in the table below						
Pollutant	Average Concentration		Maxium Concentration		No. Storm Events Sampled	Quantitation Limit
	Grab Sample	Flow-Weighted Composite Sample	Grab Sample	Flow-Weighted Composite Sample		
Oil and Grease (mg/L)	<4.3		<4.5		2	4.3
BOD5 (mg/L)	<2.75		3.5		2	2
COD (mg/L)	<9.1		<9.1		2	9.1
TSS (mg/L)	17.55		29.00		2	0.58
Total Nitrogen (mg/L)	<1.2		1.68		2	0.545
Total Phosphorus (mg/L)	0.16		0.16		1	0.04
pH (S.U.)	8.70		8.70		1	0.1

2. List all pollutants contained within an Effluent Limitation Guideline (ELF) that is applicable to the facility's production. Also list all pollutants listed in the facility's existing NPDES permit for the outfall identified above; process wastewater discharges; and any other pollutants that are considered the cause of impairment to waters receiving stormwater discharges from the outfall. Provide the results of at least one analysis for every pollutant listed. Specify the units with your results (e.g., mg/L)

Pollutant	Average Concentration		Maxium Concentration		No. Storm Events Sampled	Quantitation Limit
	Grab Sample	Flow-Weighted Composite Sample	Grab Sample	Flow-Weighted Composite Sample		
1,1,1-Trichloroethane	<0.0006 mg/L		<0.0006 mg/L		2	0.0006 mg/L
1,1,2,2-Tetrachloroethane	<0.0006 mg/L		<0.0006 mg/L		2	0.0006 mg/L
1,1,2-Trichloroethane	<0.00045 mg/L		<0.00045 mg/L		2	0.00045 mg/L
1,1-Dichloroethane	<0.00047 mg/L		<0.00063 mg/L		2	0.00047 mg/L
1,1-Dichloroethene	<0.00055 mg/L		<0.00055 mg/L		2	0.00055 mg/L
1,2,4-Trichlorobenzene	<0.0002 mg/L		<0.00025 mg/L		2	0.0002 mg/L
1,2-Dichlorobenzene	<0.00016 mg/L		<0.00022 mg/L		2	0.00016 mg/L
1,2-Dichloroethane	<0.00057 mg/L		<0.00057 mg/L		2	0.00057 mg/L
1,2-Dichloroethane-d4	0.01 mg/L		0.011 mg/L		2	
1,2-Dichloropropane	<0.00066 mg/L		<0.00066 mg/L		2	0.00066 mg/L
phenylhydrazine (as Azober	<0.00021 mg/L		<0.00021 mg/L		2	0.00021 mg/L
1,3-Dinitrobenzene	<0.00049 mg/L		<0.0005 mg/L		2	0.00049 mg/L
1,4-Dichlorobenzene	<0.00016 mg/L		<0.00025 mg/L		2	0.00016 mg/L
1,4-Dioxane	<0.043 mg/L		<0.043 mg/L		2	0.043 mg/L
2,2'oxybis[1-chloropropane]	<0.000062 mg/L		<0.000063 mg/L		2	0.000062 mg/L
2,4,6-Tribromophenol	0.0042 mg/L		0.0042 mg/L		2	
2,4,6-Trichlorophenol	<0.00024 mg/L		<0.00024 mg/L		2	0.00024 mg/L
2,4-Dichlorophenol	<0.000054 mg/L		<0.000055 mg/L		2	0.000054 mg/L
2,4-Dimethylphenol	<0.0004 mg/L		<0.00061 mg/L		2	0.0004 mg/L
2,4-Dinitrophenol	<0.0026 mg/L		<0.0034 mg/L		2	0.0026 mg/L
2,4-Dinitrotoluene	<0.00038 mg/L		<0.00038 mg/L		2	0.00038 mg/L
2,6-Dinitrotoluene	<0.00019 mg/L		<0.00019 mg/L		2	0.00019 mg/L
2-Chlorethyl vinyl ether	<0.0017 mg/L		<0.0017 mg/L		2	0.0017 mg/L
2-Chloronaphthalene	<0.000063 mg/L		<0.000064 mg/L		2	0.000063 mg/L
2-Chlorophenol	<0.00019 mg/L		<0.00023 mg/L		2	0.00019 mg/L
2-Fluorobiphenyl	0.0038 mg/L		0.004 mg/L		2	
2-Fluorophenol	0.0038 mg/L		0.0038 mg/L		2	
2-Nitrophenol	<0.00021 mg/L		<0.00021 mg/L		2	0.00021 mg/L

Pollutant	Average Concentration		Maxium Concentration		No. Storm Events Sampled	Quantitation Limit
	Grab Sample	Flow-Weighted Composite Sample	Grab Sample	Flow-Weighted Composite Sample		
3,3'-Dichlorobenzidine	<0.00062 mg/L		<0.00063 mg/L		2	0.00062 mg/L
4,4'-DDD	<0.00000052 mg/L		<0.00000052 mg/L		2	0.00000052 mg/L
4,4'-DDE	<0.00000029 mg/L		<0.0000003 mg/L		2	0.00000029 mg/L
4,4'-DDT	<0.00000068 mg/L		<0.00000068 mg/L		2	0.00000068 mg/L
4,6-Dinitro-2-methylphenol	<0.0016 mg/L		<0.0016 mg/L		2	0.0016 mg/L
4-Bromofluorobenzene	0.0091 mg/L		0.0099 mg/L		2	
4-Bromophenyl phenyl ether	<0.00034 mg/L		<0.00035 mg/L		2	0.00034 mg/L
4-Chloro-3-methylphenol	<0.00038 mg/L		<0.00045 mg/L		2	0.00038 mg/L
4-Chlorophenyl phenyl ether	<0.00024 mg/L		<0.00024 mg/L		2	0.00024 mg/L
4-Nitrophenol	<0.001 mg/L		<0.001 mg/L		2	0.001 mg/L
Acenaphthene	<0.00007 mg/L		<0.000071 mg/L		2	0.00007 mg/L
Acenaphthylene	<0.00007 mg/L		<0.000071 mg/L		2	0.00007 mg/L
Acrolein	<0.016 mg/L		<0.016 mg/L		2	0.016 mg/L
Acrylamide	<0.017 mg/L		<0.021 mg/L		2	0.017 mg/L
Acrylonitrile	<0.0078 mg/L		<0.0078 mg/L		2	0.0078 mg/L
Aldrin	<0.00000035 mg/L		<0.00000036 mg/L		2	0.00000035 mg/L
alpha-BHC	<0.00000024 mg/L		<0.00000024 mg/L		2	0.00000024 mg/L
Aluminum	0.31 mg/L		0.54 mg/L		2	0.024 mg/L
Ammonia	<0.088 mg/L		<0.088 mg/L		2	0.088 mg/L
Anthracene	<0.000052 mg/L		<0.000053 mg/L		2	0.000052 mg/L
Antimony	<0.00063 mg/L		<0.00068 mg/L		2	0.00063 mg/L
Arsenic	0.0016 mg/L		0.0026 mg/L		2	0.00053 mg/L
Barium	0.059 mg/L		0.069 mg/L		2	0.0017 mg/L
Benzene	<0.0006 mg/L		<0.0006 mg/L		2	0.0006 mg/L
Benzidine	<0.0097 mg/L		<0.0099 mg/L		2	0.0097 mg/L
Benzo[a]anthracene	<0.00008 mg/L		<0.000082 mg/L		2	0.00008 mg/L
Benzo[a]pyrene	<0.000057 mg/L		<0.000058 mg/L		2	0.000057 mg/L
Benzo[b]fluoranthene	<0.00011 mg/L		<0.00011 mg/L		2	0.00011 mg/L
Benzo[g,h,i]perylene	<0.000074 mg/L		<0.000075 mg/L		2	0.000074 mg/L
Benzo[k]fluoranthene	<0.000094 mg/L		<0.000096 mg/L		2	0.000094 mg/L
Beryllium	<0.00044 mg/L		<0.00062 mg/L		2	0.00044 mg/L
beta-BHC	<0.00000036 mg/L		<0.00000037 mg/L		2	0.00000036 mg/L
Bis(2-chloroethoxy)methane	<0.00017 mg/L		<0.00017 mg/L		2	0.00017 mg/L
Bis(2-chloroethyl)ether	<0.000043 mg/L		<0.000043 mg/L		2	0.000043 mg/L
Bis(2-ethylhexyl) phthalate	<0.0067 mg/L		<0.0068 mg/L		2	0.0067 mg/L
Boron	<0.045 mg/L		<0.063 mg/L		2	0.04 mg/L
Bromide	<0.053 mg/L		<0.053 mg/L		2	0.053 mg/L
Bromoform	<0.00098 mg/L		<0.00098 mg/L		2	0.00098 mg/L
Bromomethane	<0.00089 mg/L		<0.00089 mg/L		2	0.00089 mg/L
Butyl benzyl phthalate	<0.00074 mg/L		<0.00098 mg/L		2	0.00074 mg/L
Cadmium	0.00024 mg/L		0.00026 mg/L		2	0.00021 mg/L
Calcium	47 mg/L		48 mg/L		2	0.22 mg/L
Carbon tetrachloride	<0.00088 mg/L		<0.00088 mg/L		2	0.00088 mg/L
Chlordane	<0.0000071 mg/L		<0.0000073 mg/L		2	0.0000071 mg/L
Chloride	105 mg/L		143 mg/L		2	0.712 mg/L

Pollutant	Average Concentration		Maxium Concentration		No. Storm Events Sampled	Quantitation Limit
	Grab Sample	Flow-Weighted Composite Sample	Grab Sample	Flow-Weighted Composite Sample		
Chlorobenzene	<0.0005 mg/L		<0.0005 mg/L		2	0.0005 mg/L
Chlorodibromomethane	<0.00084 mg/L		<0.00084 mg/L		2	0.00084 mg/L
Chloroethane	<0.0009 mg/L		<0.0009 mg/L		2	0.0009 mg/L
Chloroform	<0.0006 mg/L		<0.0006 mg/L		2	0.0006 mg/L
Chloromethane	<0.0009 mg/L		<0.0009 mg/L		2	0.0009 mg/L
Chromium	<0.001 mg/L		<0.0012 mg/L		2	0.0009 mg/L
Chrysene	<0.000086 mg/L		<0.000088 mg/L		2	0.000086 mg/L
cis-1,3-Dichloropropene	<0.00059 mg/L		<0.00059 mg/L		2	0.00059 mg/L
Cobalt	0.00043 mg/L		0.00065 mg/L		2	0.00015 mg/L
Color, Apparent	20 mg/L		20 mg/L		2	5 Color Units
Color, True	12.5 mg/L		15 mg/L		2	5 Color Units
Copper	0.0028 mg/L		0.0039 mg/L		2	0.0012 mg/L
Cr (VI)	<0.006 mg/L		<0.006 mg/L		2	0.006 mg/L
Cyanide, Total	<0.008 mg/L		<0.008 mg/L		1	0.008 mg/L
DCB Decachlorobiphenyl	0.000022 mg/L		0.000036 mg/L		8	
delta-BHC	<0.00000063 mg/L		<0.00000064 mg/L		2	0.00000063 mg/L
Dibenz(a,h)anthracene	<0.000077 mg/L		<0.000078 mg/L		2	0.000077 mg/L
Dibromofluoromethane	0.01 mg/L		0.01 mg/L		2	
Dichlorobromomethane	<0.00064 mg/L		<0.00064 mg/L		2	0.000064 mg/L
Dieldrin	<0.00000027 mg/L		<0.00000027 mg/L		2	0.00000027 mg/L
Diethyl phthalate	<0.00061 mg/L		<0.00062 mg/L		2	0.00061 mg/L
Dimethyl phthalate	<0.00022 mg/L		<0.00022 mg/L		2	0.00022 mg/L
Di-n-butyl phthalate	<0.0042 mg/L		<0.0051 mg/L		2	0.003 mg/L
Di-n-octyl phthalate	<0.00073 mg/L		<0.00074 mg/L		2	0.00073 mg/L
Endosulfan I	<0.00000067 mg/L		<0.00000069 mg/L		2	0.00000067 mg/L
Endosulfan II	<0.00000031 mg/L		<0.00000032 mg/L		2	0.00000031 mg/L
Endosulfan sulfate	<0.00000063 mg/L		<0.00000064 mg/L		2	0.00000063 mg/L
Endrin	<0.00000023 mg/L		<0.00000023 mg/L		2	0.00000023 mg/L
Endrin aldehyde	<0.00000051 mg/L		<0.00000052 mg/L		2	0.00000051 mg/L
Ethylbenzene	<0.00051 mg/L		<0.00051 mg/L		2	0.00051 mg/L
Fluoranthene	<0.000064 mg/L		<0.000065 mg/L		2	0.000064 mg/L
Fluorene	<0.000074 mg/L		<0.000075 mg/L		2	0.000074 mg/L
Fluoride	0.12 mg/L		0.13 mg/L		2	0.026 mg/L
gamma-BHC	<0.00000029 mg/L		<0.00000029 mg/L		2	0.00000029 mg/L
ardness as calcium carbona	160 mg/L		160 mg/L		1	0.52 mg/L
Heptachlor	<0.00000044 mg/L		<0.00000045 mg/L		2	0.00000044 mg/L
Heptachlor epoxide	<0.00000033 mg/L		<0.00000034 mg/L		2	0.00000033 mg/L
Hexachlorobenzene	<0.00006 mg/L		<0.000061 mg/L		2	0.00006 mg/L
Hexachlorobutadine	<0.000074 mg/L		<0.000075 mg/L		2	0.000074 mg/L
Hexachlorocyclopentadiene	<0.00053 mg/L		<0.00054 mg/L		2	0.00053 mg/L
Hexachloroethane	<0.00014 mg/L		<0.00014 mg/L		2	0.00014 mg/L

Pollutant	Average Concentration		Maxium Concentration		No. Storm Events Sampled	Quantitation Limit
	Grab Sample	Flow-Weighted Composite Sample	Grab Sample	Flow-Weighted Composite Sample		
Indeno[1,2,3-cd]pyrene	<0.000091 mg/L		<0.000092 mg/L		2	0.000091 mg/L
Iron	0.34 mg/L		0.71 mg/L		3	0.043 mg/L
Isophorone	<0.0002 mg/L		<0.0002 mg/L		2	0.0002 mg/L
Lead	0.0015 mg/L		0.0022 mg/L		2	0.00043 mg/L
Magnesium	8 mg/L		8.7 mg/L		2	0.066 mg/L
Manganese	0.049 mg/L		0.067 mg/L		2	0.0029 mg/L
Mercury	<0.00013 mg/L		<0.00013 mg/L		2	0.00013 mg/L
thylene Blue Active Substan	<0.068 mg/L		0.087 mg/L		2	0.049 mg/L
Methylene Chloride	<0.00089 mg/L		<0.00089 mg/L		2	0.00089 mg/L
Molybdenum	0.0023 mg/L		0.0026 mg/L		2	0.0009 mg/L
Naphthalene	<0.00011 mg/L		0.00016 mg/L		2	0.000063 mg/L
Nickel	0.0022 mg/L		0.0027 mg/L		2	0.00095 mg/L
Nitrate Nitrite as N	0.52 mg/L		0.81 mg/L		2	0.065 mg/L
Nitrobenzene	<0.00053 mg/L		<0.00054 mg/L		2	0.00053 mg/L
Nitrobenzene-d5	0.0036 mg/L		0.0039 mg/L		2	
Nitrogen, Kjeldahl	<0.68 mg/L		0.87 mg/L		2	0.3 mg/L
N-Nitrosodiumethylamine	<0.00017 mg/L		<0.00027 mg/L		2	0.00017 mg/L
N-Nitrosodi-n-propylamine	<0.000076 mg/L		<0.000077 mg/L		2	0.000076 mg/L
N-Nitrosodiumphenylamine	<0.00013 mg/L		<0.00013 mg/L		2	0.00013 mg/L
PCB-1016	<0.0000047 mg/L		<0.0000048 mg/L		2	0.0000047 mg/L
PCB-1221	<0.0000056 mg/L		<0.0000057 mg/L		2	0.0000056 mg/L
PCB-1232	<0.0000051 mg/L		<0.0000052 mg/L		2	0.0000051 mg/L
PCB-1242	<0.0000089 mg/L		<0.0000089 mg/L		2	0.0000089 mg/L
PCB-1248	<0.0000029 mg/L		<0.000003 mg/L		2	0.0000029 mg/L
PCB-1254	<0.0000093 mg/L		<0.0000095 mg/L		2	0.0000093 mg/L
PCB-1260	<0.0000038 mg/L		<0.0000039 mg/L		2	0.0000038 mg/L
Pentachlorophenol	<0.0009 mg/L		<0.00092 mg/L		2	0.0009 mg/L
Phenanthrene	<0.00011 mg/L		<0.00016 mg/L		2	0.00011 mg/L
Phenol	<0.00052 mg/L		<0.00053 mg/L		2	0.00052 mg/L
Phenol-d5	0.0034 mg/L		0.0035 mg/L		2	
Phosphorous as P	<0.017 mg/L		<0.017 mg/L		1	0.017 mg/L
Pyrene	<0.000058 mg/L		<0.000059 mg/L		2	0.000058 mg/L
Selenium	0.00087 mg/L		0.00092 mg/L		2	0.0008 mg/L
Silver	<0.00042 mg/L		<0.00079 mg/L		2	0.00042 mg/L
Sulfate	89.5 mg/L		97.4 mg/L		2	0.756 mg/L
Sulfide	<1.3 mg/L		<1.3 mg/L		2	1.3 mg/L
Terphenyl-d14	0.0035 mg/L		0.0035 mg/L		2	
Tetrachloroethene	<0.00047 mg/L		<0.00047 mg/L		2	0.00047 mg/L
Tetrachloro-m-xylene	0.000021 mg/L		0.000031 mg/L		8	
Thallium	<0.00029 mg/L		<0.00038 mg/L		2	0.00029 mg/L
Toluene	<0.00046 mg/L		<0.00046 mg/L		2	0.00046 mg/L
Toluene-d8	0.009 mg/L		0.01 mg/L		2	
TDS	330 mg/L		420 mg/L		2	10 mg/L
TOC	3.8 mg/L		5.5 mg/L		2	0.51 mg/L
Toxaphene	<0.000048 mg/L		<0.000049 mg/L		2	0.000048 mg/L
trans-1,2-Dichloroethene	<0.00067 mg/L		<0.00067 mg/L		2	0.00067 mg/L
trans-1,3-Dichloropropene	<0.00058 mg/L		<0.00058 mg/L		2	0.00058 mg/L
Trichloroethene	<0.00069 mg/L		<0.00069 mg/L		2	0.00069 mg/L
Vinyl chloride	<0.00041 mg/L		<0.00041 mg/L		2	0.00041 mg/L
Zinc	0.059 mg/L		0.059 mg/L		2	0.011 mg/L

STORMWATER SAMPLING RESULTS

Complete the following tables for each stormwater outfalll sampled for analysis.

OUTFALL NO.:	**013**					
1. You must provide the results of at least one analysis for every pollutant identified in the table below						
Pollutant	Average Concentration		Maxium Concentration		No. Storm Events Sampled	Quantitation Limit
	Grab Sample	Flow-Weighted Composite Sample	Grab Sample	Flow-Weighted Composite Sample		
Oil and Grease (mg/L)	<4.3		<4.3		1	4.3
BOD5 (mg/L)	<2		<2		1	2
COD (mg/L)	<9.1		<9.1		1	9.1
TSS (mg/L)	12.00		12.00		1	0.5
Total Nitrogen (mg/L)	0.95		0.95		1	0.185
Total Phosphorus (mg/L)	0.041		0.041		1	0.04
pH (S.U.)	8.00		8.00		1	0.1

2. List all pollutants contained within an Effluent Limitation Guideline (ELF) that is applicable to the facility's production. Also list all pollutants listed in the facility's existing NPDES permit for the outfall identified above; process wastewater discharges; and any other pollutants that are considered the cause of impairment to waters receiving stormwater discharges from the outfall. Provide the results of at least one analysis for every pollutant listed. Specify the units with your results (e.g., mg/L)

Pollutant	Average Concentration		Maxium Concentration		No. Storm Events Sampled	Quantitation Limit
	Grab Sample	Flow-Weighted Composite Sample	Grab Sample	Flow-Weighted Composite Sample		
1,1,1-Trichloroethane	<0.0006 mg/L		<0.0006 mg/L		1	0.0006 mg/L
1,1,2,2-Tetrachloroethane	<0.0006 mg/L		<0.0006 mg/L		1	0.0006 mg/L
1,1,2-Trichloroethane	<0.00045 mg/L		<0.00045 mg/L		1	0.00045 mg/L
1,1-Dichloroethane	<0.00063 mg/L		<0.00063 mg/L		1	0.00063 mg/L
1,1-Dichloroethene	<0.00055 mg/L		<0.00055 mg/L		1	0.00055 mg/L
1,2,4-Trichlorobenzene	<0.00025 mg/L		<0.00025 mg/L		1	0.00025 mg/L
1,2-Dichlorobenzene	<0.00022 mg/L		<0.00022 mg/L		1	0.00022 mg/L
1,2-Dichloroethane	<0.00057 mg/L		<0.00057 mg/L		1	0.00057 mg/L
1,2-Dichloroethane-d4	0.008 mg/L		0.008 mg/L		1	
1,2-Dichloropropane	<0.00066 mg/L		<0.00066 mg/L		1	0.00066 mg/L
phenylhydrazine (as Azober	<0.0002 mg/L		<0.0002 mg/L		1	0.0002 mg/L
1,3-Dinitrobenzene	<0.00048 mg/L		<0.00048 mg/L		1	0.00048 mg/L
1,4-Dichlorobenzene	<0.00025 mg/L		<0.00025 mg/L		1	0.00025 mg/L
1,4-Dioxane	<0.043 mg/L		<0.043 mg/L		1	0.043 mg/L
2,2'oxybis[1-chloropropane]	<0.00006 mg/L		<0.00006 mg/L		1	0.00006 mg/L
2,4,6-Tribromophenol	0.0051 mg/L		0.0051 mg/L		1	
2,4,6-Trichlorophenol	<0.00023 mg/L		<0.00023 mg/L		1	0.00023 mg/L
2,4-Dichlorophenol	<0.000053 mg/L		<0.000053 mg/L		1	0.000053 mg/L
2,4-Dimethylphenol	<0.00061 mg/L		<0.00061 mg/L		1	0.00061 mg/L
2,4-Dinitrophenol	<0.0034 mg/L		<0.0034 mg/L		1	0.0034 mg/L
2,4-Dinitrotoluene	<0.00037 mg/L		<0.00037 mg/L		1	0.00037 mg/L
2,6-Dinitrotoluene	<0.00018 mg/L		<0.00018 mg/L		1	0.00018 mg/L
2-Chlorethyl vinyl ether	<0.0017 mg/L		<0.0017 mg/L		1	0.0017 mg/L
2-Chloronaphthalene	<0.000061 mg/L		<0.000061 mg/L		1	0.000061 mg/L
2-Chlorophenol	<0.00023 mg/L		<0.00023 mg/L		1	0.00023 mg/L
2-Fluorobiphenyl	0.0047 mg/L		0.0047 mg/L		1	
2-Fluorophenol	0.0042 mg/L		0.0042 mg/L		1	
2-Nitrophenol	<0.0002 mg/L		<0.0002 mg/L		1	0.0002 mg/L

Pollutant	Average Concentration		Maxium Concentration		No. Storm Events Sampled	Quantitation Limit
	Grab Sample	Flow-Weighted Composite Sample	Grab Sample	Flow-Weighted Composite Sample		
3,3'-Dichlorobenzidine	<0.00061 mg/L		<0.00061 mg/L		1	0.00061 mg/L
4,4'-DDD	<0.00000051 mg/L		<0.00000051 mg/L		1	0.00000051 mg/L
4,4'-DDE	<0.00000028 mg/L		<0.00000028 mg/L		1	0.00000028 mg/L
4,4'-DDT	<0.00000066 mg/L		<0.00000066 mg/L		1	0.00000066 mg/L
4,6-Dinitro-2-methylphenol	<0.0015 mg/L		<0.0015 mg/L		1	0.0015 mg/L
4-Bromofluorobenzene	0.0076 mg/L		0.0076 mg/L		1	
4-Bromophenyl phenyl ether	<0.00033 mg/L		<0.00033 mg/L		1	0.00033 mg/L
4-Chloro-3-methylphenol	<0.00045 mg/L		<0.00045 mg/L		1	0.00045 mg/L
4-Chlorophenyl phenyl ether	<0.00023 mg/L		<0.00023 mg/L		1	0.00023 mg/L
4-Nitrophenol	<0.00098 mg/L		<0.00098 mg/L		1	0.00098 mg/L
Acenaphthene	<0.000068 mg/L		<0.000068 mg/L		1	0.000068 mg/L
Acenaphthylene	<0.000068 mg/L		<0.000068 mg/L		1	0.000068 mg/L
Acrolein	<0.016 mg/L		<0.016 mg/L		1	0.016 mg/L
Acrylamide	<0.021 mg/L		<0.021 mg/L		1	0.021 mg/L
Acrylonitrile	<0.0078 mg/L		<0.0078 mg/L		1	0.0078 mg/L
Aldrin	<0.00000034 mg/L		<0.00000034 mg/L		1	0.00000034 mg/L
alpha-BHC	<0.00000023 mg/L		<0.00000023 mg/L		1	0.00000023 mg/L
Aluminum	0.34 mg/L		0.34 mg/L		1	0.034 mg/L
Ammonia	0.17 mg/L		0.17 mg/L		1	0.088 mg/L
Anthracene	<0.000051 mg/L		<0.000051 mg/L		1	0.000051 mg/L
Antimony	0.0006 mg/L		0.0006 mg/L		1	0.00057 mg/L
Arsenic	0.0012 mg/L		0.0012 mg/L		1	0.00075 mg/L
Barium	0.047 mg/L		0.047 mg/L		1	0.0022 mg/L
Benzene	<0.0006 mg/L		<0.0006 mg/L		1	0.0006 mg/L
Benzidine	<0.0095 mg/L		<0.0095 mg/L		1	0.0095 mg/L
Benzo[a]anthracene	<0.000078 mg/L		<0.000078 mg/L		1	0.000078 mg/L
Benzo[a]pyrene	<0.000055 mg/L		<0.000055 mg/L		1	0.000055 mg/L
Benzo[b]fluoranthene	<0.0001 mg/L		<0.0001 mg/L		1	0.0001 mg/L
Benzo[g,h,i]perylene	<0.000072 mg/L		<0.000072 mg/L		1	0.000072 mg/L
Benzo[k]fluoranthene	<0.000092 mg/L		<0.000092 mg/L		1	0.000092 mg/L
Beryllium	<0.00062 mg/L		<0.00062 mg/L		1	0.00062 mg/L
beta-BHC	<0.00000035 mg/L		<0.00000035 mg/L		1	0.00000035 mg/L
Bis(2-chloroethoxy)methane	<0.00016 mg/L		<0.00016 mg/L		1	0.00016 mg/L
Bis(2-chloroethyl)ether	<0.000042 mg/L		<0.000042 mg/L		1	0.000042 mg/L
Bis(2-ethylhexyl) phthalate	<0.0065 mg/L		<0.0065 mg/L		1	0.0065 mg/L
Boron	0.036 mg/L		0.036 mg/L		1	0.016 mg/L
Bromide	<0.053 mg/L		<0.053 mg/L		1	0.053 mg/L
Bromoform	<0.00098 mg/L		<0.00098 mg/L		1	0.00098 mg/L
Bromomethane	<0.00089 mg/L		<0.00089 mg/L		1	0.00089 mg/L
Butyl benzyl phthalate	<0.00098 mg/L		<0.00098 mg/L		1	0.00098 mg/L
Cadmium	0.00041 mg/L		0.00041 mg/L		1	0.0002 mg/L
Calcium	71 mg/L		71 mg/L		1	0.25 mg/L
Carbon tetrachloride	<0.00088 mg/L		<0.00088 mg/L		1	0.00088 mg/L
Chlordane	<0.000007 mg/L		<0.000007 mg/L		1	0.000007 mg/L
Chloride	56.2 mg/L		56.2 mg/L		1	0.712 mg/L

Pollutant	Average Concentration		Maxium Concentration		No. Storm Events Sampled	Quantitation Limit
	Grab Sample	Flow-Weighted Composite Sample	Grab Sample	Flow-Weighted Composite Sample		
Chlorobenzene	<0.0005 mg/L		<0.0005 mg/L		1	0.0005 mg/L
Chlorodibromomethane	<0.00084 mg/L		<0.00084 mg/L		1	0.00084 mg/L
Chloroethane	<0.0009 mg/L		<0.0009 mg/L		1	0.0009 mg/L
Chloroform	<0.0006 mg/L		<0.0006 mg/L		1	0.0006 mg/L
Chloromethane	<0.0009 mg/L		<0.0009 mg/L		1	0.0009 mg/L
Chromium	<0.0012 mg/L		<0.0012 mg/L		1	0.0012 mg/L
Chrysene	<0.000084 mg/L		<0.000084 mg/L		1	0.000084 mg/L
cis-1,3-Dichloropropene	<0.00059 mg/L		<0.00059 mg/L		1	0.00059 mg/L
Cobalt	0.00044 mg/L		0.00044 mg/L		1	0.00019 mg/L
Color, Apparent	15 Color Units		15 Color Units		1	5 Color Units
Color, True	5 Color Units		5 Color Units		1	5 Color Units
Copper	0.0031 mg/L		0.0031 mg/L		1	0.0017 mg/L
Cr (VI)	<0.006 mg/L		<0.006 mg/L		1	0.006 mg/L
DCB Decachlorobiphenyl	0.000015 mg/L		0.000019 mg/L		4	
delta-BHC	<0.00000062 mg/L		<0.00000062 mg/L		1	0.00000062 mg/L
Dibenz(a,h)anthracene	<0.000075 mg/L		<0.000075 mg/L		1	0.000075 mg/L
Dibromofluoromethane	0.01 mg/L		0.01 mg/L		1	
Dichlorobromomethane	<0.00064 mg/L		<0.00064 mg/L		1	0.00064 mg/L
Dieldrin	<0.00000026 mg/L		<0.00000026 mg/L		1	0.00000026 mg/L
Diethyl phthalate	<0.00059 mg/L		<0.00059 mg/L		1	0.00059 mg/L
Dimethyl phthalate	0.00035 mg/L		0.00035 mg/L		1	0.00021 mg/L
Di-n-butyl phthalate	0.0072 mg/L		0.0072 mg/L		1	0.0051 mg/L
Di-n-octyl phthalate	<0.00071 mg/L		<0.00071 mg/L		1	0.00071 mg/L
Endosulfan I	<0.00000066 mg/L		<0.00000066 mg/L		1	0.00000066 mg/L
Endosulfan II	<0.0000003 mg/L		<0.0000003 mg/L		1	0.0000003 mg/L
Endosulfan sulfate	<0.00000061 mg/L		<0.00000061 mg/L		1	0.00000061 mg/L
Endrin	<0.00000022 mg/L		<0.00000022 mg/L		1	0.00000022 mg/L
Endrin aldehyde	<0.0000005 mg/L		<0.0000005 mg/L		1	0.0000005 mg/L
Ethylbenzene	<0.00051 mg/L		<0.00051 mg/L		1	0.00051 mg/L
Fluoranthene	<0.000063 mg/L		<0.000063 mg/L		1	0.000063 mg/L
Fluorene	<0.000072 mg/L		<0.000072 mg/L		1	0.000072 mg/L
Fluoride	0.285 mg/L		0.285 mg/L		1	0.0260 mg/L
gamma-BHC	<0.00000028 mg/L		<0.00000028 mg/L		1	0.00000028 mg/L
ardness as calcium carbona	<4.3 mg/L		<4.3 mg/L		1	4.3 mg/L
Heptachlor	<0.00000043 mg/L		<0.00000043 mg/L		1	0.00000043 mg/L
Heptachlor epoxide	<0.00000033 mg/L		<0.00000033 mg/L		1	0.00000033 mg/L
Hexachlorobenzene	<0.000058 mg/L		<0.000058 mg/L		1	0.000058 mg/L
Hexachlorobutadine	<0.000072 mg/L		<0.000072 mg/L		1	0.000072 mg/L
Hexachlorocyclopentadiene	<0.00052 mg/L		<0.00052 mg/L		1	0.00052 mg/L
Hexachloroethane	<0.00014 mg/L		<0.00014 mg/L		1	0.00014 mg/L
Indeno[1,2,3-cd]pyrene	<0.000089 mg/L		<0.000089 mg/L		1	0.000089 mg/L
Iron	0.44 mg/L		0.44 mg/L		1	0.047 mg/L
Isophorone	<0.0002 mg/L		<0.0002 mg/L		1	0.0002 mg/L

Pollutant	Average Concentration		Maxium Concentration		No. Storm Events Sampled	Quantitation Limit
	Grab Sample	Flow-Weighted Composite Sample	Grab Sample	Flow-Weighted Composite Sample		
Lead	0.0016 mg/L		0.0016 mg/L		1	0.00045 mg/L
Magnesium	20 mg/L		20 mg/L		1	0.061 mg/L
Manganese	0.049 mg/L		0.049 mg/L		1	0.0035 mg/L
Mercury	<0.00013 mg/L		<0.00013 mg/L		1	0.00013 mg/L
thylene Blue Active Substan	0.099 mg/L		0.099 mg/L		1	0.049 mg/L
Methylene Chloride	<0.00089 mg/L		<0.00089 mg/L		1	0.00089 mg/L
Molybdenum	0.003 mg/L		0.003 mg/L		1	0.0011 mg/L
Naphthalene	<0.000061 mg/L		<0.000061 mg/L		1	0.000061 mg/L
Nickel	0.0027 mg/L		0.0027 mg/L		1	0.0015 mg/L
Nitrate Nitrite as N	0.53 mg/L		0.53 mg/L		1	0.065 mg/L
Nitrobenzene	<0.00052 mg/L		<0.00052 mg/L		1	0.00052 mg/L
Nitrobenzene-d5	0.0045 mg/L		0.0045 mg/L		1	
Nitrogen, Kjeldahl	0.42 mg/L		0.42 mg/L		1	0.12 mg/L
N-Nitrosodiumethylamine	<0.00027 mg/L		<0.00027 mg/L		1	0.00027 mg/L
N-Nitrosodi-n-propylamine	<0.000074 mg/L		<0.000074 mg/L		1	0.000074 mg/L
N-Nitrosodiumphenylamine	<0.00012 mg/L		<0.00012 mg/L		1	0.00012 mg/L
PCB-1016	<0.0000046 mg/L		<0.0000046 mg/L		1	0.0000046 mg/L
PCB-1221	<0.0000055 mg/L		<0.0000055 mg/L		1	0.0000055 mg/L
PCB-1232	<0.000005 mg/L		<0.000005 mg/L		1	0.000005 mg/L
PCB-1242	<0.0000088 mg/L		<0.0000088 mg/L		1	0.0000088 mg/L
PCB-1248	<0.0000029 mg/L		<0.0000029 mg/L		1	0.0000029 mg/L
PCB-1254	<0.0000092 mg/L		<0.0000092 mg/L		1	0.0000092 mg/L
PCB-1260	<0.0000038 mg/L		<0.0000038 mg/L		1	0.0000038 mg/L
Pentachlorophenol	<0.00088 mg/L		<0.00088 mg/L		1	0.00088 mg/L
Phenanthrene	<0.00016 mg/L		<0.00016 mg/L		1	0.00016 mg/L
Phenol	<0.00051 mg/L		<0.00051 mg/L		1	0.00051 mg/L
Phenol-d5	0.0043 mg/L		0.0043 mg/L		1	
Pyrene	<0.000056 mg/L		<0.000056 mg/L		1	0.000056 mg/L
Selenium	0.0015 mg/L		0.0015 mg/L		1	0.00089 mg/L
Silver	<0.000053 mg/L		<0.000053 mg/L		1	0.000053 mg/L
Sulfate	163 mg/L		163 mg/L		1	0.756 mg/L
Sulfide	<1.3 mg/L		<1.3 mg/L		1	1.3 mg/L
Terphenyl-d14	0.005 mg/L		0.005 mg/L		1	
Tetrachloroethene	<0.00047 mg/L		<0.00047 mg/L		1	0.00047 mg/L
Tetrachloro-m-xylene	0.000014 mg/L		0.000015 mg/L		4	
Thallium	<0.0002 mg/L		<0.0002 mg/L		1	0.0002 mg/L
Toluene	<0.00046 mg/L		<0.00046 mg/L		1	0.00046 mg/L
Toluene-d8	0.009 mg/L		0.009 mg/L		1	
TDS	470 mg/L		470 mg/L		1	10 mg/L
TOC	1.9 mg/L		1.9 mg/L		1	0.51 mg/L
Toxaphene	<0.000047 mg/L		<0.000047 mg/L		1	0.000047 mg/L
trans-1,2-Dichloroethene	<0.00067 mg/L		<0.00067 mg/L		1	0.00067 mg/L
trans-1,3-Dichloropropene	<0.00058 mg/L		<0.00058 mg/L		1	0.00058 mg/L
Trichloroethene	<0.00069 mg/L		<0.00069 mg/L		1	0.00069 mg/L
Vinyl chloride	<0.00041 mg/L		<0.00041 mg/L		1	0.00041 mg/L
Zinc	0.052 mg/L		0.052 mg/L		1	0.015 mg/L

STORMWATER SAMPLING RESULTS

Complete the following tables for each stormwater outfalll sampled for analysis.

OUTFALL NO.:	**015**					
1. You must provide the results of at least one analysis for every pollutant identified in the table below						
Pollutant	Average Concentration		Maxium Concentration		No. Storm Events Sampled	Quantitation Limit
	Grab Sample	Flow-Weighted Composite Sample	Grab Sample	Flow-Weighted Composite Sample		
Oil and Grease (mg/L)	<4.35		<4.4		2	4.4
BOD5 (mg/L)	<1.9		2		2	1.9
COD (mg/L)	<9.1		<9.1		2	9.1
TSS (mg/L)	0.75		1.00		2	0.75
Total Nitrogen (mg/L)	<1.04		1.18		2	0.545
Total Phosphorus (mg/L)	0.12		0.12		1	0.04
pH (S.U.)	8.10		8.10		1	0.1

2. List all pollutants contained within an Effluent Limitation Guideline (ELF) that is applicable to the facility's production. Also list all pollutants listed in the facility's existing NPDES permit for the outfall identified above; process wastewater discharges; and any other pollutants that are considered the cause of impairment to waters receiving stormwater discharges from the outfall. Provide the results of at least one analysis for every pollutant listed. Specify the units with your results (e.g., mg/L)

Pollutant	Average Concentration		Maxium Concentration		No. Storm Events Sampled	Quantitation Limit
	Grab Sample	Flow-Weighted Composite Sample	Grab Sample	Flow-Weighted Composite Sample		
1,1,1-Trichloroethane	<0.0006 mg/L		<0.0006 mg/L		2	0.0006 mg/L
1,1,2,2-Tetrachloroethane	<0.0006 mg/L		<0.0006 mg/L		2	0.0006 mg/L
1,1,2-Trichloroethane	<0.00045 mg/L		<0.00045 mg/L		2	0.00045 mg/L
1,1-Dichloroethane	<0.00047 mg/L		<0.00063 mg/L		2	0.00047 mg/L
1,1-Dichloroethene	<0.00055 mg/L		<0.00055 mg/L		2	0.00055 mg/L
1,2,4-Trichlorobenzene	<0.0002 mg/L		<0.00024 mg/L		2	0.0002 mg/L
1,2-Dichlorobenzene	<0.00016 mg/L		<0.00021 mg/L		2	0.00016 mg/L
1,2-Dichloroethane	<0.00057 mg/L		<0.00057 mg/L		2	0.00057 mg/L
1,2-Dichloroethane-d4	0.01 mg/L		0.011 mg/L		2	
1,2-Dichloropropane	<0.00066 mg/L		<0.00066 mg/L		2	0.00066 mg/L
phenylhydrazine (as Azober	<0.00021 mg/L		<0.00022 mg/L		2	0.00021 mg/L
1,3-Dinitrobenzene	<0.00049 mg/L		<0.00052 mg/L		2	0.00049 mg/L
1,4-Dichlorobenzene	<0.00015 mg/L		<0.00024 mg/L		2	0.00015 mg/L
1,4-Dioxane	<0.043 mg/L		<0.043 mg/L		2	0.043 mg/L
2,2'oxybis[1-chloropropane]	<0.000062 mg/L		<0.000066 mg/L		2	0.000062 mg/L
2,4,6-Tribromophenol	0.0038 mg/L		0.004 mg/L		2	
2,4,6-Trichlorophenol	<0.00024 mg/L		<0.00025 mg/L		2	0.00024 mg/L
2,4-Dichlorophenol	<0.000055 mg/L		<0.000058 mg/L		2	0.000055 mg/L
2,4-Dimethylphenol	<0.00039 mg/L		<0.00059 mg/L		2	0.00039 mg/L
2,4-Dinitrophenol	<0.0025 mg/L		<0.0033 mg/L		2	0.0025 mg/L
2,4-Dinitrotoluene	<0.00038 mg/L		<0.0004 mg/L		2	0.00038 mg/L
2,6-Dinitrotoluene	<0.00019 mg/L		<0.0002 mg/L		2	0.00019 mg/L
2-Chlorethyl vinyl ether	<0.0017 mg/L		<0.0017 mg/L		2	0.0017 mg/L
2-Chloronaphthalene	<0.000063 mg/L		<0.000063 mg/L		2	0.000063 mg/L
2-Chlorophenol	<0.00019 mg/L		<0.00023 mg/L		2	0.00019 mg/L
2-Fluorobiphenyl	0.0036 mg/L		0.0036 mg/L		2	
2-Fluorophenol	0.0038 mg/L		0.0039 mg/L		2	
2-Nitrophenol	<0.00021 mg/L		<0.00022 mg/L		2	0.00021 mg/L

Pollutant	Average Concentration		Maxium Concentration		No. Storm Events Sampled	Quantitation Limit
	Grab Sample	Flow-Weighted Composite Sample	Grab Sample	Flow-Weighted Composite Sample		
3,3'-Dichlorobenzidine	<0.00062 mg/L		<0.00066 mg/L		2	0.00062 mg/L
4,4'-DDD	<0.00000051 mg/L		<0.00000051 mg/L		2	0.00000051 mg/L
4,4'-DDE	<0.00000028 mg/L		<0.00000028 mg/L		2	0.00000028 mg/L
4,4'-DDT	<0.00000066 mg/L		<0.00000066 mg/L		2	0.00000066 mg/L
4,6-Dinitro-2-methylphenol	<0.0016 mg/L		<0.0017 mg/L		2	0.0016 mg/L
4-Bromofluorobenzene	0.0094 mg/L		0.01 mg/L		2	
4-Bromophenyl phenyl ether	<0.00034 mg/L		<0.00036 mg/L		2	0.00034 mg/L
4-Chloro-3-methylphenol	<0.00038 mg/L		<0.00044 mg/L		2	0.00038 mg/L
4-Chlorophenyl phenyl ether	<0.00024 mg/L		<0.00025 mg/L		2	0.00024 mg/L
4-Nitrophenol	<0.001 mg/L		<0.0011 mg/L		2	0.001 mg/L
Acenaphthene	<0.00007 mg/L		<0.000074 mg/L		2	0.00007 mg/L
Acenaphthylene	<0.00007 mg/L		<0.000074 mg/L		2	0.00007 mg/L
Acrolein	<0.016 mg/L		<0.016 mg/L		2	0.016 mg/L
Acrylamide	<0.017 mg/L		<0.021 mg/L		2	0.017 mg/L
Acrylonitrile	<0.0078 mg/L		<0.0078 mg/L		2	0.0078 mg/L
Aldrin	<0.00000034 mg/L		<0.00000034 mg/L		2	0.00000034 mg/L
alpha-BHC	<0.00000023 mg/L		<0.00000023 mg/L		2	0.00000023 mg/L
Aluminum	0.12 mg/L		0.19 mg/L		2	0.016 mg/L
Ammonia	<0.088 mg/L		<0.088 mg/L		2	0.088 mg/L
Anthracene	<0.000053 mg/L		<0.000056 mg/L		2	0.000053 mg/L
Antimony	<0.0017 mg/L		<0.0018 mg/L		2	0.0012 mg/L
Arsenic	0.0056 mg/L		0.0073 mg/L		2	0.0003 mg/L
Barium	0.05 mg/L		0.05 mg/L		2	0.0016 mg/L
Benzene	<0.0006 mg/L		<0.0006 mg/L		2	0.0006 mg/L
Benzidine	<0.01 mg/L		<0.01 mg/L		2	0.01 mg/L
Benzo[a]anthracene	<0.00008 mg/L		<0.000085 mg/L		2	0.00008 mg/L
Benzo[a]pyrene	<0.000057 mg/L		<0.00006 mg/L		2	0.000057 mg/L
Benzo[b]fluoranthene	<0.0001 mg/L		<0.00011 mg/L		2	0.0001 mg/L
Benzo[g,h,i]perylene	<0.000074 mg/L		<0.000078 mg/L		2	0.000074 mg/L
Benzo[k]fluoranthene	<0.000094 mg/L		<0.0001 mg/L		2	0.000094 mg/L
Beryllium	<0.00025 mg/L		<0.00025 mg/L		2	0.00025 mg/L
beta-BHC	<0.00000035 mg/L		<0.00000035 mg/L		2	0.00000035 mg/L
Bis(2-chloroethoxy)methane	<0.00016 mg/L		<0.00017 mg/L		2	0.00016 mg/L
Bis(2-chloroethyl)ether	<0.000043 mg/L		<0.000045 mg/L		2	0.000043 mg/L
Bis(2-ethylhexyl) phthalate	<0.0067 mg/L		<0.0071 mg/L		2	0.0067 mg/L
Boron	1.275 mg/L		1.6 mg/L		2	0.192 mg/L
Bromide	<0.053 mg/L		<0.053 mg/L		2	0.053 mg/L
Bromoform	<0.00098 mg/L		<0.00098 mg/L		2	0.00098 mg/L
Bromomethane	<0.00089 mg/L		<0.00089 mg/L		2	0.00089 mg/L
Butyl benzyl phthalate	<0.00074 mg/L		<0.00094 mg/L		2	0.00074 mg/L
Cadmium	0.0061 mg/L		0.0062 mg/L		2	0.00028 mg/L
Calcium	96.5 mg/L		110		2	0.18 mg/L
Carbon tetrachloride	<0.00088 mg/L		<0.00088 mg/L		2	0.00088 mg/L
Chlordane	<0.0000069 mg/L		<0.0000069 mg/L		2	0.0000069 mg/L
Chloride	94.8 mg/L		99.4 mg/L		2	0.712 mg/L

Pollutant	Average Concentration		Maxium Concentration		No. Storm Events Sampled	Quantitation Limit
	Grab Sample	Flow-Weighted Composite Sample	Grab Sample	Flow-Weighted Composite Sample		
Chlorobenzene	<0.0005 mg/L		<0.0005 mg/L		2	0.0005 mg/L
Chlorodibromomethane	<0.00084 mg/L		<0.00084 mg/L		2	0.00084 mg/L
Chloroethane	<0.0009 mg/L		<0.0009 mg/L		2	0.0009 mg/L
Chloroform	<0.0006 mg/L		<0.0006 mg/L		2	0.0006 mg/L
Chloromethane	<0.0009 mg/L		<0.0009 mg/L		2	0.0009 mg/L
Chromium	<0.0009 mg/L		<0.0012 mg/L		2	0.0009 mg/L
Chrysene	<0.000087 mg/L		<0.000092 mg/L		2	0.000087 mg/L
cis-1,3-Dichloropropene	<0.00059 mg/L		<0.00059 mg/L		2	0.00059 mg/L
Cobalt	0.00043 mg/L		0.00053 mg/L		2	0.0001 mg/L
Color, Apparent	7.5 Color Units		10 Color Units		2	5 Color Units
Color, True	<7.5 Color Units		10 Color Units		2	5 Color Units
Copper	0.0028 mg/L		0.003 mg/L		2	0.0011 mg/L
Cr (VI)	<0.006 mg/L		<0.006 mg/L		2	0.006 mg/L
Cyanide, Total	<0.008 mg/L		<0.008 mg/L		1	0.008 mg/L
DCB Decachlorobiphenyl	0.000015 mg/L		0.000019 mg/L		8	
delta-BHC	<0.00000061 mg/L		<0.00000061 mg/L		2	0.00000061 mg/L
Dibenz(a,h)anthracene	<0.000077 mg/L		<0.000082 mg/L		2	0.000077 mg/L
Dibromofluoromethane	0.0095 mg/L		0.01 mg/L		2	
Dichlorobromomethane	<0.00064 mg/L		<0.00064 mg/L		2	0.00064 mg/L
Dieldrin	<0.00000026 mg/L		<0.00000026 mg/L		2	0.00000026 mg/L
Diethyl phthalate	<0.00061 mg/L		<0.00064 mg/L		2	0.00061 mg/L
Dimethyl phthalate	<0.00022 mg/L		<0.00023 mg/L		2	0.00022 mg/L
Di-n-butyl phthalate	<0.0041 mg/L		<0.0049 mg/L		2	0.0029 mg/L
Di-n-octyl phthalate	<0.00074 mg/L		<0.00078 mg/L		2	0.00074 mg/L
Endosulfan I	<0.00000065 mg/L		<0.00000065 mg/L		2	0.00000065 mg/L
Endosulfan II	<0.0000003 mg/L		<0.0000003 mg/L		2	0.0000003 mg/L
Endosulfan sulfate	<0.00000061 mg/L		<0.00000061 mg/L		2	0.00000061 mg/L
Endrin	<0.00000022 mg/L		<0.00000022 mg/L		2	0.00000022 mg/L
Endrin aldehyde	<0.00000049 mg/L		<0.00000049 mg/L		2	0.00000049 mg/L
Ethylbenzene	<0.00051 mg/L		<0.00051 mg/L		2	0.00051 mg/L
Fluoranthene	<0.000064 mg/L		<0.000068 mg/L		2	0.000064 mg/L
Fluorene	<0.000074 mg/L		<0.000078 mg/L		2	0.000074 mg/L
Fluoride	0.258 mg/L		0.271 mg/L		2	0.026 mg/L
gamma-BHC	<0.00000028 mg/L		<0.00000028 mg/L		2	0.00000028 mg/L
ardness as calcium carbona	260 mg/L		260 mg/L		1	0.52 mg/L
Heptachlor	<0.00000043 mg/L		<0.00000043 mg/L		2	0.00000043 mg/L
Heptachlor epoxide	<0.00000032 mg/L		<0.00000032 mg/L		2	0.00000032 mg/L
Hexachlorobenzene	<0.00006 mg/L		<0.000064 mg/L		2	0.00006 mg/L
Hexachlorobutadine	<0.000074 mg/L		<0.000078 mg/L		2	0.000074 mg/L
Hexachlorocyclopentadiene	<0.00053 mg/L		<0.00056 mg/L		2	0.00053 mg/L
Hexachloroethane	<0.00014 mg/L		<0.00015 mg/L		2	0.00014 mg/L
Indeno[1,2,3-cd]pyrene	<0.000091 mg/L		<0.000097 mg/L		2	0.000091 mg/L

Pollutant	Average Concentration		Maxium Concentration		No. Storm Events Sampled	Quantitation Limit
	Grab Sample	Flow-Weighted Composite Sample	Grab Sample	Flow-Weighted Composite Sample		
Iron	<0.11 mg/L		0.25 mg/L		3	0.041 mg/L
Isophorone	<0.0002 mg/L		<0.00021 mg/L		2	0.0002 mg/L
Lead	<0.00051 mg/L		<0.00061 mg/L		2	0.00051 mg/L
Magnesium	13.5 mg/L		15 mg/L		2	0.07 mg/L
Manganese	0.15 mg/L		0.21 mg/L		2	0.0022 mg/L
Mercury	<0.00019 mg/L		0.00024 mg/L		2	0.00013 mg/L
thylene Blue Active Substan	<0.049 mg/L		<0.049 mg/L		2	0.049 mg/L
Methylene Chloride	<0.00089 mg/L		<0.00089 mg/L		2	0.00089 mg/L
Molybdenum	0.012 mg/L		0.014 mg/L		2	0.0007 mg/L
Naphthalene	<0.0001 mg/L		0.00015 mg/L		2	0.000063 mg/L
Nickel	0.051 mg/L		0.053 mg/L		2	0.00039 mg/L
Nitrate Nitrite as N	0.44 mg/L		0.47 mg/L		2	0.065 mg/L
Nitrobenzene	<0.00054 mg/L		<0.00057 mg/L		2	0.00054 mg/L
Nitrobenzene-d5	0.004 mg/L		0.004 mg/L		2	
Nitrogen, Kjeldahl	<0.6 mg/L		0.71 mg/L		2	0.3 mg/L
N-Nitrosodiumethylamine	<0.00017 mg/L		<0.00026 mg/L		2	0.00017 mg/L
N-Nitrosodi-n-propylamine	<0.000076 mg/L		<0.000081 mg/L		2	0.000076 mg/L
N-Nitrosodiumphenylamine	<0.00013 mg/L		<0.00014 mg/L		2	0.00013 mg/L
PCB-1016	<0.0000045 mg/L		<0.0000045 mg/L		2	0.0000045 mg/L
PCB-1221	<0.0000054 mg/L		<0.0000054 mg/L		2	0.0000054 mg/L
PCB-1232	<0.000005 mg/L		<0.000005 mg/L		2	0.000005 mg/L
PCB-1242	<0.0000087 mg/L		<0.0000087 mg/L		2	0.0000087 mg/L
PCB-1248	<0.0000028 mg/L		<0.0000028 mg/L		2	0.0000028 mg/L
PCB-1254	<0.0000091 mg/L		<0.0000091 mg/L		2	0.0000091 mg/L
PCB-1260	<0.0000037 mg/L		<0.0000037 mg/L		2	0.0000037 mg/L
Pentachlorophenol	<0.00091 mg/L		<0.00096 mg/L		2	0.00091 mg/L
Phenanthrene	<0.00011 mg/L		<0.00016 mg/L		2	0.00011 mg/L
Phenol	<0.00052 mg/L		<0.00055 mg/L		2	0.00052 mg/L
Phenol-d5	0.0038 mg/L		0.0039 mg/L		2	
Phosphorous as P	<0.017 mg/L		<0.017 mg/L		1	0.017 mg/L
Pyrene	<0.000058 mg/L		<0.000061 mg/L		2	0.000058 mg/L
Selenium	0.0049 mg/L		0.0063 mg/L		2	0.00095 mg/L
Silver	<0.00079 mg/L		<0.00079 mg/L		2	0.00079 mg/L
Sulfate	160.5 mg/L		192 mg/L		2	0.756 mg/L
Sulfide	<1.65 mg/L		2 mg/L		2	1.3 mg/L
Terphenyl-d14	0.004 mg/L		0.0041 mg/L		2	
Tetrachloroethene	<0.00047 mg/L		<0.00047 mg/L		2	0.00047 mg/L
Tetrachloro-m-xylene	0.000015 mg/L		0.000018 mg/L		8	
Thallium	<0.00054 mg/L		<0.00069 mg/L		2	0.00054 mg/L
Toluene	<0.00046 mg/L		<0.00046 mg/L		2	0.00046 mg/L
Toluene-d8	0.009 mg/L		0.0098 mg/L		2	
TDS	535 mg/L		610 mg/L		2	10 mg/L
TOC	1.2 mg/L		1.5 mg/L		2	0.51 mg/L
Toxaphene	<0.000047 mg/L		<0.000047 mg/L		2	0.000047 mg/L
trans-1,2-Dichloroethene	<0.00067 mg/L		<0.00067 mg/L		2	0.00067 mg/L
trans-1,3-Dichloropropene	<0.00058 mg/L		<0.00058 mg/L		2	0.00058 mg/L
Trichloroethene	<0.00069 mg/L		<0.00069 mg/L		2	0.00069 mg/L
Vinyl chloride	<0.00041 mg/L		<0.00041 mg/L		2	0.00041 mg/L
Zinc	2.1 mg/L		2.4 mg/L		2	0.0077 mg/L

STORMWATER SAMPLING RESULTS

Complete the following tables for each stormwater outfalll sampled for analysis.

OUTFALL NO.:	**016**					
1. You must provide the results of at least one analysis for every pollutant identified in the table below						
Pollutant	Average Concentration		Maxium Concentration		No. Storm Events Sampled	Quantitation Limit
	Grab Sample	Flow-Weighted Composite Sample	Grab Sample	Flow-Weighted Composite Sample		
Oil and Grease (mg/L)	<4.2		<4.2		2	4.2
BOD5 (mg/L)	2.7		2.7		2	2
COD (mg/L)	<36.55		64.00		2	9.1
TSS (mg/L)	1450.00		1500.00		2	15
Total Nitrogen (mg/L)	<1.56		2.19		2	0.545
Total Phosphorus (mg/L)	1.30		1.30		1	0.04
pH (S.U.)	8.00		8.00		1	0.1

2. List all pollutants contained within an Effluent Limitation Guideline (ELF) that is applicable to the facility's production. Also list all pollutants listed in the facility's existing NPDES permit for the outfall identified above; process wastewater discharges; and any other pollutants that are considered the cause of impairment to waters receiving stormwater discharges from the outfall. Provide the results of at least one analysis for every pollutant listed. Specify the units with your results (e.g., mg/L)

Pollutant	Average Concentration		Maxium Concentration		No. Storm Events Sampled	Quantitation Limit
	Grab Sample	Flow-Weighted Composite Sample	Grab Sample	Flow-Weighted Composite Sample		
1,1,1-Trichloroethane	<0.0006 mg/L		<0.0006 mg/L		2	0.0006 mg/L
1,1,2,2-Tetrachloroethane	<0.0006 mg/L		<0.0006 mg/L		2	0.0006 mg/L
1,1,2-Trichloroethane	<0.00045 mg/L		<0.00045 mg/L		2	0.00045 mg/L
1,1-Dichloroethane	<0.00047 mg/L		<0.00063 mg/L		2	0.00047 mg/L
1,1-Dichloroethene	<0.00055 mg/L		<0.00055 mg/L		2	0.00055 mg/L
1,2,4-Trichlorobenzene	<0.00019 mg/L		<0.00024 mg/L		2	0.00019 mg/L
1,2-Dichlorobenzene	<0.00015 mg/L		<0.00021 mg/L		2	0.00015 mg/L
1,2-Dichloroethane	<0.00057 mg/L		<0.00057 mg/L		2	0.00057 mg/L
1,2-Dichloroethane-d4	0.0064 mg/L		0.0081 mg/L		2	
1,2-Dichloropropane	<0.00066 mg/L		<0.00066 mg/L		2	0.00066 mg/L
phenylhydrazine (as Azober	<0.0002 mg/L		<0.0002 mg/L		2	0.0002 mg/L
1,3-Dinitrobenzene	<0.00047 mg/L		<0.00048 mg/L		2	0.00047 mg/L
1,4-Dichlorobenzene	<0.00015 mg/L		<0.00024 mg/L		2	0.00015 mg/L
1,4-Dioxane	<0.043 mg/L		<0.043 mg/L		2	0.043 mg/L
2,2'oxybis[1-chloropropane]	<0.00006 mg/L		<0.00006 mg/L		2	0.00006 mg/L
2,4,6-Tribromophenol	0.004 mg/L		0.0041 mg/L		2	
2,4,6-Trichlorophenol	<0.00023 mg/L		<0.00023 mg/L		2	0.00023 mg/L
2,4-Dichlorophenol	<0.000052 mg/L		<0.000053 mg/L		2	0.000052 mg/L
2,4-Dimethylphenol	<0.00038 mg/L		<0.00059 mg/L		2	0.00038 mg/L
2,4-Dinitrophenol	<0.0025 mg/L		<0.0033 mg/L		2	0.0025 mg/L
2,4-Dinitrotoluene	<0.00036 mg/L		<0.00037 mg/L		2	0.00036 mg/L
2,6-Dinitrotoluene	<0.00018 mg/L		<0.00018 mg/L		2	0.00018 mg/L
2-Chlorethyl vinyl ether	<0.0017 mg/L		<0.0017 mg/L		2	0.0017 mg/L
2-Chloronaphthalene	<0.00006 mg/L		<0.000061 mg/L		2	0.00006 mg/L
2-Chlorophenol	<0.00018 mg/L		<0.00023 mg/L		2	0.00018 mg/L
2-Fluorobiphenyl	0.004 mg/L		0.0046 mg/L		2	
2-Fluorophenol	0.0039 mg/L		0.0041 mg/L		2	
2-Nitrophenol	<0.0002 mg/L		<0.0002 mg/L		2	0.0002 mg/L

Pollutant	Average Concentration		Maxium Concentration		No. Storm Events Sampled	Quantitation Limit
	Grab Sample	Flow-Weighted Composite Sample	Grab Sample	Flow-Weighted Composite Sample		
3,3'-Dichlorobenzidine	<0.0006 mg/L		<0.00061 mg/L		2	0.0006 mg/L
4,4'-DDD	<0.00000052 mg/L		<0.00000052 mg/L		2	0.00000052 mg/L
4,4'-DDE	<0.00000029 mg/L		<0.00000029 mg/L		2	0.00000029 mg/L
4,4'-DDT	<0.00000057 mg/L		<0.00000067 mg/L		2	0.00000067 mg/L
4,6-Dinitro-2-methylphenol	<0.0015 mg/L		<0.0015 mg/L		2	0.0015 mg/L
4-Bromofluorobenzene	0.008 mg/L		0.0083 mg/L		2	
4-Bromophenyl phenyl ether	<0.00033 mg/L		<0.00033 mg/L		2	0.00033 mg/L
4-Chloro-3-methylphenol	<0.00037 mg/L		<0.00044 mg/L		2	0.00037 mg/L
4-Chlorophenyl phenyl ether	<0.00023 mg/L		<0.00023 mg/L		2	0.00023 mg/L
4-Nitrophenol	<0.00096 mg/L		<0.00098 mg/L		2	0.00096 mg/L
Acenaphthene	<0.000067 mg/L		<0.000068 mg/L		2	0.000067 mg/L
Acenaphthylene	<0.000067 mg/L		<0.000068 mg/L		2	0.000067 mg/L
Acrolein	<0.016 mg/L		<0.016 mg/L		2	0.016 mg/L
Acrylamide	<0.016 mg/L		<0.021 mg/L		2	0.008 mg/L
Acrylonitrile	<0.0078 mg/L		<0.0078 mg/L		2	0.0078 mg/L
Aldrin	<0.00000035 mg/L		<0.00000035 mg/L		2	0.00000035 mg/L
alpha-BHC	<0.00000023 mg/L		<0.00000023 mg/L		2	0.00000023 mg/L
Aluminum	6.2 mg/L		9.5 mg/L		2	0.024 mg/L
Ammonia	<0.088 mg/L		<0.088 mg/L		2	0.088 mg/L
Anthracene	<0.00005 mg/L		<0.000051 mg/L		2	0.00005 mg/L
Antimony	0.0013 mg/L		0.0013 mg/L		2	0.00063 mg/L
Arsenic	0.0097 mg/L		0.014 mg/L		2	0.00053 mg/L
Barium	0.3 mg/L		0.5 mg/L		2	0.0017 mg/L
Benzene	<0.0006 mg/L		<0.0006 mg/L		2	0.0006 mg/L
Benzidine	<0.0093 mg/L		<0.0095 mg/L		2	0.0093 mg/L
Benzo[a]anthracene	<0.000077 mg/L		<0.000078 mg/L		2	0.000077 mg/L
Benzo[a]pyrene	<0.000054 mg/L		<0.000055 mg/L		2	0.000054 mg/L
Benzo[b]fluoranthene	<0.0001 mg/L		<0.0001 mg/L		2	0.0001 mg/L
Benzo[g,h,i]perylene	<0.000071 mg/L		<0.000072 mg/L		2	0.000071 mg/L
Benzo[k]fluoranthene	<0.00009 mg/L		<0.000092 mg/L		2	0.00009 mg/L
Beryllium	0.00076 mg/L		0.00083 mg/L		2	0.00044 mg/L
beta-BHC	<0.00000036 mg/L		<0.00000036 mg/L		2	0.00000036 mg/L
Bis(2-chloroethoxy)methane	<0.00016 mg/L		<0.00016 mg/L		2	0.00016 mg/L
Bis(2-chloroethyl)ether	<0.000041 mg/L		<0.000042 mg/L		2	0.000041 mg/L
Bis(2-ethylhexyl) phthalate	<0.0064 mg/L		<0.0065 mg/L		2	0.0064 mg/L
Boron	<0.048 mg/L		<0.063 mg/L		2	0.040 mg/L
Bromide	<0.093 mg/L		<0.133 mg/L		2	0.093 mg/L
Bromoform	<0.00098 mg/L		<0.00098 mg/L		2	0.00098 mg/L
Bromomethane	<0.00089 mg/L		<0.00089 mg/L		2	0.00089 mg/L
Butyl benzyl phthalate	<0.00071 mg/L		<0.00094 mg/L		2	0.00071 mg/L
Cadmium	0.01 mg/L		0.017 mg/L		2	0.00021 mg/L
Calcium	415 mg/L		510 mg/L		2	0.22 mg/L
Carbon tetrachloride	<0.00088 mg/L		<0.00088 mg/L		2	0.00088 mg/L
Chlordane	<0.000007 mg/L		<0.000007 mg/L		2	0.000007 mg/L
Chloride	295 mg/L		428 mg/L		2	1.25 mg/L

Pollutant	Average Concentration		Maxium Concentration		No. Storm Events Sampled	Quantitation Limit
	Grab Sample	Flow-Weighted Composite Sample	Grab Sample	Flow-Weighted Composite Sample		
Chlorobenzene	<0.0005 mg/L		<0.0005 mg/L		2	0.0005 mg/L
Chlorodibromomethane	<0.00084 mg/L		<0.00084 mg/L		2	0.00084 mg/L
Chloroethane	<0.0009 mg/L		<0.0009 mg/L		2	0.0009 mg/L
Chloroform	<0.0006 mg/L		<0.0006 mg/L		2	0.0006 mg/L
Chloromethane	<0.0009 mg/L		<0.0009 mg/L		2	0.0009 mg/L
Chromium	0.012 mg/L		0.016 mg/L		2	0.0009 mg/L
Chrysene	<0.000083 mg/L		<0.000084 mg/L		2	0.000083 mg/L
cis-1,3-Dichloropropene	<0.00059 mg/L		<0.00059 mg/L		2	0.00059 mg/L
Cobalt	0.0092 mg/L		0.0094 mg/L		2	0.00015 mg/L
Color, Apparent	<5 Color Units		<5 Color Units		2	5 Color Units
Color, True	10 Color Units		15 Color Units		2	5 Color Units
Copper	0.07 mg/L		0.098 mg/L		2	0.0012 mg/L
Cr (VI)	<0.006 mg/L		<0.006 mg/L		2	0.006 mg/L
Cyanide, Total	<0.008 mg/L		<0.008 mg/L		1	0.008 mg/L
DCB Decachlorobiphenyl	0.000017 mg/L		0.000021 mg/L		8	
delta-BHC	<0.00000062 mg/L		<0.00000062 mg/L		2	0.00000062 mg/L
Dibenz(a,h)anthracene	<0.000074 mg/L		<0.000075 mg/L		2	0.000074 mg/L
Dibromofluoromethane	0.0078 mg/L		0.0081 mg/L		2	
Dichlorobromomethane	<0.00064 mg/L		<0.00064 mg/L		2	0.00064 mg/L
Dieldrin	<0.00000027 mg/L		<0.00000027 mg/L		2	0.00000027 mg/L
Diethyl phthalate	<0.00058 mg/L		<0.00059 mg/L		2	0.00058 mg/L
Dimethyl phthalate	<0.00021 mg/L		<0.00021 mg/L		2	0.00021 mg/L
Di-n-butyl phthalate	<0.0032 mg/L		<0.0049 mg/L		2	0.0028 mg/L
Di-n-octyl phthalate	<0.0007 mg/L		<0.00071 mg/L		2	0.0007 mg/L
Endosulfan I	<0.00000066 mg/L		<0.00000067 mg/L		2	0.00000066 mg/L
Endosulfan II	<0.00000031 mg/L		<0.00000031 mg/L		2	0.00000031 mg/L
Endosulfan sulfate	<0.00000062 mg/L		<0.00000062 mg/L		2	0.00000062 mg/L
Endrin	<0.00000022 mg/L		<0.00000022 mg/L		2	0.00000022 mg/L
Endrin aldehyde	<0.0000005 mg/L		<0.0000005 mg/L		2	0.0000005 mg/L
Ethylbenzene	<0.00051 mg/L		<0.00051 mg/L		2	0.00051 mg/L
Fluoranthene	<0.000062 mg/L		<0.000063 mg/L		2	0.000062 mg/L
Fluorene	<0.000071 mg/L		<0.000072 mg/L		2	0.000071 mg/L
Fluoride	0.17 mg/L		0.194 mg/L		2	0.046 mg/L
gamma-BHC	<0.00000028 mg/L		<0.00000028 mg/L		2	0.00000028 mg/L
ardness as calcium carbona	1145 mg/L		1400 mg/L		2	0.52 mg/L
Heptachlor	<0.00000044 mg/L		<0.00000044 mg/L		2	0.00000044 mg/L
Heptachlor epoxide	<0.00000033 mg/L		<0.00000033 mg/L		2	0.00000033 mg/L
Hexachlorobenzene	<0.000057 mg/L		<0.000058 mg/L		2	0.000057 mg/L
Hexachlorobutadine	<0.000071 mg/L		<0.000072 mg/L		2	0.000071 mg/L
Hexachlorocyclopentadiene	<0.00051 mg/L		<0.00052 mg/L		2	0.00051 mg/L
Hexachloroethane	<0.00014 mg/L		<0.00014 mg/L		2	0.00014 mg/L
Indeno[1,2,3-cd]pyrene	<0.000087 mg/L		<0.000089 mg/L		2	0.000087 mg/L

Pollutant	Average Concentration		Maxium Concentration		No. Storm Events Sampled	Quantitation Limit
	Grab Sample	Flow-Weighted Composite Sample	Grab Sample	Flow-Weighted Composite Sample		
Iron	10.4 mg/L		21 mg/L		3	0.043 mg/L
Isophorone	<0.0002 mg/L		<0.0002 mg/L		2	0.0002 mg/L
Lead	0.072 mg/L		0.11 mg/L		2	0.00043 mg/L
Magnesium	26.5 mg/L		32 mg/L		2	0.066 mg/L
Manganese	0.86 mg/L		1 mg/L		2	0.0029 mg/L
Mercury	0.0014 mg/L		0.0025 mg/L		2	0.00039 mg/L
thylene Blue Active Substan	0.37 mg/L		0.67 mg/L		2	0.27 mg/L
Methylene Chloride	<0.00089 mg/L		<0.00089 mg/L		2	0.00089 mg/L
Molybdenum	0.0027 mg/L		0.0038 mg/L		2	0.0009 mg/L
Naphthalene	<0.00006 mg/L		<0.000061 mg/L		2	0.00006 mg/L
Nickel	0.033 mg/L		0.034 mg/L		2	0.0009 mg/L
Nitrate Nitrite as N	0.57 mg/L		0.69 mg/L		2	0.065 mg/L
Nitrobenzene	<0.00051 mg/L		<0.00052 mg/L		2	0.00051 mg/L
Nitrobenzene-d5	0.004 mg/L		0.0042 mg/L		2	
Nitrogen, Kjeldahl	<0.99 mg/L		1.5 mg/L		2	0.3 mg/L
N-Nitrosodiumethylamine	<0.00017 mg/L		<0.00026 mg/L		2	0.00017 mg/L
N-Nitrosodi-n-propylamine	<0.000073 mg/L		<0.000074 mg/L		2	0.000073 mg/L
N-Nitrosodiumphenylamine	<0.00012 mg/L		<0.00012 mg/L		2	0.00012 mg/L
PCB-1016	<0.0000046 mg/L		<0.0000046 mg/L		2	0.0000046 mg/L
PCB-1221	<0.0000055 mg/L		<0.0000056 mg/L		2	0.0000055 mg/L
PCB-1232	<0.0000051 mg/L		<0.0000051 mg/L		2	0.0000051 mg/L
PCB-1242	<0.0000088 mg/L		<0.0000089 mg/L		2	0.0000088 mg/L
PCB-1248	<0.0000029 mg/L		<0.0000029 mg/L		2	0.0000029 mg/L
PCB-1254	<0.0000092 mg/L		<0.0000092 mg/L		2	0.0000092 mg/L
PCB-1260	<0.0000038 mg/L		<0.0000038 mg/L		2	0.0000038 mg/L
Pentachlorophenol	<0.00087 mg/L		<0.00088 mg/L		2	0.00087 mg/L
Phenanthrene	<0.00012 mg/L		<0.00016 mg/L		2	0.00011 mg/L
Phenol	<0.0005 mg/L		<0.00051 mg/L		2	0.0005 mg/L
Phenol-d5	0.0038 mg/L		0.0039 mg/L		2	
Phosphorous as P	2.3 mg/L		2.3 mg/L		1	0.17 mg/L
Pyrene	<0.000055 mg/L		<0.000056 mg/L		2	0.000055 mg/L
Selenium	0.0065 mg/L		0.0067 mg/L		2	0.0008 mg/L
Silver	<0.00058 mg/L		<0.00079 mg/L		2	0.00042 mg/L
Sulfate	369.5 mg/L		437 mg/L		2	2.84 mg/L
Sulfide	<1.3 mg/L		<1.3 mg/L		2	1.3 mg/L
Terphenyl-d14	0.0042 mg/L		0.0044 mg/L		2	
Tetrachloroethene	<0.00047 mg/L		<0.00047 mg/L		2	0.00047 mg/L
Tetrachloro-m-xylene	0.000023 mg/L		0.000041 mg/L		8	
Thallium	<0.00032 mg/L		<0.00038 mg/L		2	0.00029 mg/L
Toluene	<0.00046 mg/L		<0.00046 mg/L		2	0.00046 mg/L
Toluene-d8	0.0091 mg/L		0.0092 mg/L		2	
TDS	470 mg/L		750 mg/L		2	15 mg/L
TOC	4.15 mg/L		4.3 mg/L		2	0.51 mg/L
Toxaphene	<0.000048 mg/L		<0.000048 mg/L		2	0.000048 mg/L
trans-1,2-Dichloroethene	<0.00067 mg/L		<0.00067 mg/L		2	0.00067 mg/L
trans-1,3-Dichloropropene	<0.00058 mg/L		<0.00058 mg/L		2	0.00058 mg/L
Trichloroethene	<0.00069 mg/L		<0.00069 mg/L		2	0.00069 mg/L
Vinyl chloride	<0.00041 mg/L		<0.00041 mg/L		2	0.00041 mg/L
Zinc	1.12 mg/L		1.8 mg/L		2	0.011 mg/L

STORMWATER SAMPLING RESULTS

Complete the following tables for each stormwater outfalll sampled for analysis.

OUTFALL NO.:	**017**					
1. You must provide the results of at least one analysis for every pollutant identified in the table below						
Pollutant	Average Concentration		Maxium Concentration		No. Storm Events Sampled	Quantitation Limit
	Grab Sample	Flow-Weighted Composite Sample	Grab Sample	Flow-Weighted Composite Sample		
Oil and Grease (mg/L)	<4.15		<4.2		2	4.2
BOD5 (mg/L)	<2.2		2.3		2	2
COD (mg/L)	<12.05		15.00		2	9.1
TSS (mg/L)	124.50		170.00		2	2
Total Nitrogen (mg/L)	<0.87		1.15		2	0.545
Total Phosphorus (mg/L)	0.26		0.26		1	0.04
pH (S.U.)	7.80		7.80		1	0.1

2. List all pollutants contained within an Effluent Limitation Guideline (ELF) that is applicable to the facility's production. Also list all pollutants listed in the facility's existing NPDES permit for the outfall identified above; process wastewater discharges; and any other pollutants that are considered the cause of impairment to waters receiving stormwater discharges from the outfall. Provide the results of at least one analysis for every pollutant listed. Specify the units with your results (e.g., mg/L)

Pollutant	Average Concentration		Maxium Concentration		No. Storm Events Sampled	Quantitation Limit
	Grab Sample	Flow-Weighted Composite Sample	Grab Sample	Flow-Weighted Composite Sample		
1,1,1-Trichloroethane	<0.0006 mg/L		<0.0006 mg/L		2	0.0006 mg/L
1,1,2,2-Tetrachloroethane	<0.0006 mg/L		<0.0006 mg/L		2	0.0006 mg/L
1,1,2-Trichloroethane	<0.00045 mg/L		<0.00045 mg/L		2	0.00045 mg/L
1,1-Dichloroethane	<0.00047 mg/L		<0.00063 mg/L		2	0.00047 mg/L
1,1-Dichloroethene	<0.00055 mg/L		<0.00055 mg/L		2	0.00055 mg/L
1,2,4-Trichlorobenzene	<0.0002 mg/L		<0.00024 mg/L		2	0.0002 mg/L
1,2-Dichlorobenzene	<0.00016 mg/L		<0.00021 mg/L		2	0.00016 mg/L
1,2-Dichloroethane	<0.00057 mg/L		<0.00057 mg/L		2	0.00057 mg/L
1,2-Dichloroethane-d4	0.0096 mg/L		0.011 mg/L		2	
1,2-Dichloropropane	<0.00066 mg/L		<0.00066 mg/L		2	0.00066 mg/L
phenylhydrazine (as Azober	<0.00022 mg/L		<0.00023 mg/L		2	0.00022 mg/L
1,3-Dinitrobenzene	<0.00051 mg/L		<0.00055 mg/L		2	0.00051 mg/L
1,4-Dichlorobenzene	<0.00016 mg/L		<0.00024 mg/L		2	0.00016 mg/L
1,4-Dioxane	<0.043 mg/L		<0.043 mg/L		2	0.043 mg/L
2,2'oxybis[1-chloropropane]	<0.000064 mg/L		<0.000069 mg/L		2	0.000064 mg/L
2,4,6-Tribromophenol	0.0037 mg/L		0.004 mg/L		2	
2,4,6-Trichlorophenol	<0.00025 mg/L		<0.00027 mg/L		2	0.00025 mg/L
2,4-Dichlorophenol	<0.000056 mg/L		<0.000061 mg/L		2	0.000056 mg/L
2,4-Dimethylphenol	<0.0004 mg/L		<0.00059 mg/L		2	0.0004 mg/L
2,4-Dinitrophenol	<0.0026 mg/L		<0.0033 mg/L		2	0.0026 mg/L
2,4-Dinitrotoluene	<0.00039 mg/L		<0.00042 mg/L		2	0.00039 mg/L
2,6-Dinitrotoluene	<0.00019 mg/L		<0.00021 mg/L		2	0.00019 mg/L
2-Chlorethyl vinyl ether	<0.0017 mg/L		<0.0017 mg/L		2	0.0017 mg/L
2-Chloronaphthalene	<0.000065 mg/L		<0.00007 mg/L		2	0.000065 mg/L
2-Chlorophenol	<0.00019 mg/L		<0.00023 mg/L		2	0.00019 mg/L
2-Fluorobiphenyl	0.004 mg/L		0.0043 mg/L		2	
2-Fluorophenol	0.0034 mg/L		0.0036 mg/L		2	
2-Nitrophenol	<0.00021 mg/L		<0.00023 mg/L		2	0.00021 mg/L

Pollutant	Average Concentration		Maxium Concentration		No. Storm Events Sampled	Quantitation Limit
	Grab Sample	Flow-Weighted Composite Sample	Grab Sample	Flow-Weighted Composite Sample		
3,3'-Dichlorobenzidine	<0.00064 mg/L		<0.00069 mg/L		2	0.00064 mg/L
4,4'-DDD	<0.00000051 mg/L		<0.00000051 mg/L		2	0.00000051 mg/L
4,4'-DDE	<0.00000028 mg/L		<0.00000028 mg/L		2	0.00000028 mg/L
4,4'-DDT	<0.00000066 mg/L		<0.00000066 mg/L		2	0.00000066 mg/L
4,6-Dinitro-2-methylphenol	<0.0017 mg/L		<0.0018 mg/L		2	0.0017 mg/L
4-Bromofluorobenzene	0.0084 mg/L		0.0088 mg/L		2	
4-Bromophenyl phenyl ether	<0.00035 mg/L		<0.00038 mg/L		2	0.00035 mg/L
4-Chloro-3-methylphenol	<0.00039 mg/L		<0.00044 mg/L		2	0.00039 mg/L
4-Chlorophenyl phenyl ether	<0.00024 mg/L		<0.00026 mg/L		2	0.00024 mg/L
4-Nitrophenol	<0.001 mg/L		<0.0011 mg/L		2	0.001 mg/L
Acenaphthene	<0.000071 mg/L		<0.000077 mg/L		2	0.000071 mg/L
Acenaphthylene	<0.000071 mg/L		<0.000077 mg/L		2	0.000071 mg/L
Acrolein	<0.016 mg/L		<0.016 mg/L		2	0.016 mg/L
Acrylamide	<0.017 mg/L		<0.021 mg/L		2	0.017 mg/L
Acrylonitrile	<0.0078 mg/L		<0.0078 mg/L		2	0.0078 mg/L
Aldrin	<0.00000034 mg/L		<0.00000034 mg/L		2	0.00000034 mg/L
alpha-BHC	<0.00000023 mg/L		<0.00000023 mg/L		2	0.00000023 mg/L
Aluminum	2.4 mg/L		4.5 mg/L		2	0.024 mg/L
Ammonia	<0.124 mg/L		0.16 mg/L		2	0.088 mg/L
Anthracene	<0.000054 mg/L		<0.000058 mg/L		2	0.000054 mg/L
Antimony	<0.00084 mg/L		0.001 mg/L		2	0.00063 mg/L
Arsenic	0.0022 mg/L		0.0036 mg/L		2	0.00053 mg/L
Barium	0.059 mg/L		0.087 mg/L		2	0.0017 mg/L
Benzene	<0.0006 mg/L		<0.0006 mg/L		2	0.0006 mg/L
Benzidine	<0.01 mg/L		<0.011 mg/L		2	0.01 mg/L
Benzo[a]anthracene	<0.000082 mg/L		<0.000089 mg/L		2	0.000082 mg/L
Benzo[a]pyrene	<0.000058 mg/L		<0.000063 mg/L		2	0.000058 mg/L
Benzo[b]fluoranthene	<0.00011 mg/L		<0.00012 mg/L		2	0.00011 mg/L
Benzo[g,h,i]perylene	<0.000076 mg/L		<0.000082 mg/L		2	0.000076 mg/L
Benzo[k]fluoranthene	<0.00009 mg/L		<0.0001 mg/L		2	0.00009 mg/L
Beryllium	<0.00049 mg/L		0.00072 mg/L		2	0.00044 mg/L
beta-BHC	<0.00000035 mg/L		<0.00000035 mg/L		2	0.00000035 mg/L
Bis(2-chloroethoxy)methane	<0.00017 mg/L		<0.00018 mg/L		2	0.00017 mg/L
Bis(2-chloroethyl)ether	<0.000044 mg/L		<0.000048 mg/L		2	0.000044 mg/L
Bis(2-ethylhexyl) phthalate	<0.0068 mg/L		<0.0074 mg/L		2	0.0068 mg/L
Boron	<0.045 mg/L		<0.063 mg/L		2	0.04 mg/L
Bromide	<0.053 mg/L		<0.053 mg/L		2	0.053 mg/L
Bromoform	<0.00098 mg/L		<0.00098 mg/L		2	0.00098 mg/L
Bromomethane	<0.00089 mg/L		<0.00089 mg/L		2	0.00089 mg/L
Butyl benzyl phthalate	<0.00075 mg/L		<0.00094 mg/L		2	0.00075 mg/L
Cadmium	0.00033 mg/L		0.00045 mg/L		2	0.00021 mg/L
Calcium	57 mg/L		65 mg/L		2	0.22 mg/L
Carbon tetrachloride	<0.00088 mg/L		<0.00088 mg/L		2	0.00088 mg/L
Chlordane	<0.0000069 mg/L		<0.0000069 mg/L		2	0.0000069 mg/L
Chloride	27.2 mg/L		36.3 mg/L		2	0.712 mg/L

Pollutant	Average Concentration		Maxium Concentration		No. Storm Events Sampled	Quantitation Limit
	Grab Sample	Flow-Weighted Composite Sample	Grab Sample	Flow-Weighted Composite Sample		
Chlorobenzene	<0.0005 mg/L		<0.0005 mg/L		2	0.0005 mg/L
Chlorodibromomethane	<0.00084 mg/L		<0.00084 mg/L		2	0.00084 mg/L
Chloroethane	<0.0009 mg/L		<0.0009 mg/L		2	0.0009 mg/L
Chloroform	<0.0006 mg/L		<0.0006 mg/L		2	0.0006 mg/L
Chloromethane	<0.0009 mg/L		<0.0009 mg/L		2	0.0009 mg/L
Chromium	0.0041 mg/L		0.0071 mg/L		2	0.00089 mg/L
Chrysene	<0.000089 mg/L		<0.000096 mg/L		2	0.000089 mg/L
cis-1,3-Dichloropropene	<0.00059 mg/L		<0.00059 mg/L		2	0.00059 mg/L
Cobalt	0.0018 mg/L		0.0032 mg/L		2	0.00015 mg/L
Color, Apparent	22.5 Color Units		30 Color Units		2	5 Color Units
Color, True	10 Color Units		15 Color Units		2	5 Color Units
Copper	0.008 mg/L		0.013 mg/L		2	0.0012 mg/L
Cr (VI)	<0.006 mg/L		0.006 mg/L		2	0.006 mg/L
Cyanide, Total	0.011 mg/L		0.011 mg/L		1	0.008 mg/L
DCB Decachlorobiphenyl	0.000014 mg/L		0.000018 mg/L		8	
delta-BHC	<0.00000061 mg/L		<0.00000061 mg/L		2	0.00000061 mg/L
Dibenz(a,h)anthracene	<0.000079 mg/L		<0.000086 mg/L		2	0.000079 mg/L
Dibromofluoromethane	0.0098 mg/L		0.01 mg/L		2	
Dichlorobromomethane	<0.00064 mg/L		<0.00064 mg/L		2	0.00064 mg/L
Dieldrin	<0.00000026 mg/L		<0.00000026 mg/L		2	0.00000026 mg/L
Diethyl phthalate	<0.00063 mg/L		<0.00068 mg/L		2	0.00063 mg/L
Dimethyl phthalate	<0.000222 mg/L		<0.00024 mg/L		2	0.00022 mg/L
Di-n-butyl phthalate	<0.0036 mg/L		<0.0049 mg/L		2	0.0029 mg/L
Di-n-octyl phthalate	<0.00076 mg/L		<0.00082 mg/L		2	0.00076 mg/L
Endosulfan I	<0.00000065 mg/L		<0.00000065 mg/L		2	0.00000065 mg/L
Endosulfan II	<0.0000003 mg/L		<0.0000003 mg/L		2	0.0000003 mg/L
Endosulfan sulfate	<0.00000061 mg/L		<0.00000061 mg/L		2	0.00000061 mg/L
Endrin	<0.00000022 mg/L		<0.00000022 mg/L		2	0.00000022 mg/L
Endrin aldehyde	<0.00000049 mg/L		<0.00000049 mg/L		2	0.00000049 mg/L
Ethylbenzene	<0.00051 mg/L		<0.00051 mg/L		2	0.00051 mg/L
Fluoranthene	<0.000066 mg/L		<0.000071 mg/L		2	0.000066 mg/L
Fluorene	<0.000076 mg/L		<0.000082 mg/L		2	0.000076 mg/L
Fluoride	0.184 mg/L		0.194 mg/L		2	0.026 mg/L
gamma-BHC	<0.00000028 mg/L		<0.00000028 mg/L		2	0.00000028 mg/L
ardness as calcium carbona	170 mg/L		170 mg/L		1	0.52 mg/L
Heptachlor	<0.00000043 mg/L		<0.00000043 mg/L		2	0.00000043 mg/L
Heptachlor epoxide	<0.00000032 mg/L		<0.00000032 mg/L		2	0.00000032 mg/L
Hexachlorobenzene	<0.000062 mg/L		<0.000067 mg/L		2	0.000062 mg/L
Hexachlorobutadine	<0.000076 mg/L		<0.000082 mg/L		2	0.000076 mg/L
Hexachlorocyclopentadiene	<0.00055 mg/L		<0.00059 mg/L		2	0.00055 mg/L
Hexachloroethane	<0.00015 mg/L		<0.00016 mg/L		2	0.00015 mg/L
Indeno[1,2,3-cd]pyrene	<0.000093 mg/L		<0.0001 mg/L		2	0.000093 mg/L

Pollutant	Average Concentration		Maxium Concentration		No. Storm Events Sampled	Quantitation Limit
	Grab Sample	Flow-Weighted Composite Sample	Grab Sample	Flow-Weighted Composite Sample		
Iron	2.32 mg/L		6.4 mg/L		3	0.043 mg/L
Isophorone	<0.00021 mg/L		<0.00022 mg/L		2	0.00021 mg/L
Lead	0.0048 mg/L		0.0088 mg/L		2	0.00043 mg/L
Magnesium	8.5 mg/L		11 mg/L		2	0.066 mg/L
Manganese	0.14 mg/L		0.24 mg/L		2	0.0029 mg/L
Mercury	<0.00013 mg/L		<0.00013 mg/L		2	0.00013 mg/L
thylene Blue Active Substan	0.082 mg/L		0.11 mg/L		2	0.049 mg/L
Methylene Chloride	<0.00089 mg/L		<0.00089 mg/L		2	0.00089 mg/L
Molybdenum	0.0015 mg/L		0.0017 mg/L		2	0.0009 mg/L
Naphthalene	<0.0001 mg/L		0.00013 mg/L		2	0.000065 mg/L
Nickel	0.0072 mg/L		0.012 mg/L		2	0.00095 mg/L
Nitrate Nitrite as N	0.26 mg/L		0.41 mg/L		2	0.065 mg/L
Nitrobenzene	<0.00055 mg/L		<0.0006 mg/L		2	0.00055 mg/L
Nitrobenzene-d5	0.0039 mg/L		0.004 mg/L		2	
Nitrogen, Kjeldahl	<0.61 mg/L		0.74 mg/L		2	0.3 mg/L
N-Nitrosodiumethylamine	<0.00017 mg/L		<0.00026 mg/L		2	0.00017 mg/L
N-Nitrosodi-n-propylamine	<0.000078 mg/L		<0.000085 mg/L		2	0.000078 mg/L
N-Nitrosodiumphenylamine	<0.00013 mg/L		<0.00014 mg/L		2	0.00013 mg/L
PCB-1016	<0.0000045 mg/L		<0.0000045 mg/L		2	0.0000045 mg/L
PCB-1221	<0.0000054 mg/L		<0.0000054 mg/L		2	0.0000054 mg/L
PCB-1232	<0.000005 mg/L		<0.000005 mg/L		2	0.000005 mg/L
PCB-1242	<0.0000087 mg/L		<0.0000087 mg/L		2	0.0000087 mg/L
PCB-1248	<0.0000028 mg/L		<0.0000028 mg/L		2	0.0000028 mg/L
PCB-1254	<0.0000091 mg/L		<0.0000091 mg/L		2	0.0000091 mg/L
PCB-1260	<0.0000037 mg/L		<0.0000037 mg/L		2	0.0000037 mg/L
Pentachlorophenol	<0.00093 mg/L		<0.001 mg/L		2	0.00093 mg/L
Phenanthrene	<0.00011 mg/L		<0.00016 mg/L		2	0.00011 mg/L
Phenol	<0.00054 mg/L		<0.00058 mg/L		2	0.00054 mg/L
Phenol-d5	0.0033 mg/L		0.0034 mg/L		2	
Phosphorous as P	0.09 mg/L		0.09 mg/L		1	0.017 mg/L
Pyrene	<0.000059 mg/L		<0.000064 mg/L		2	0.000059 mg/L
Selenium	<0.00085 mg/L		0.001 mg/L		2	0.0008 mg/L
Silver	<0.00043 mg/L		<0.00079 mg/L		2	0.00042 mg/L
Sulfate	56.2 mg/L		63.2 mg/L		2	0.756 mg/L
Sulfide	<1.3 mg/L		<1.3 mg/L		2	1.3 mg/L
Terphenyl-d14	0.0036 mg/L		0.0037 mg/L		2	
Tetrachloroethene	<0.00047 mg/L		<0.00047 mg/L		2	0.00047 mg/L
Tetrachloro-m-xylene	0.000014 mg/L		0.000015 mg/L		8	
Thallium	<0.00029 mg/L		<0.00038 mg/L		2	0.00029 mg/L
Toluene	<0.00046 mg/L		<0.00046 mg/L		2	0.00046 mg/L
Toluene-d8	0.0085 mg/L		0.0086 mg/L		2	
TDS	285 mg/L		340 mg/L		2	10 mg/L
TOC	3.6 mg/L		4.4 mg/L		2	0.51 mg/L
Toxaphene	<0.000047 mg/L		<0.000047 mg/L		2	0.000047 mg/L
trans-1,2-Dichloroethene	<0.00067 mg/L		<0.00067 mg/L		2	0.00067 mg/L
trans-1,3-Dichloropropene	<0.00058 mg/L		<0.00058 mg/L		2	0.00058 mg/L
Trichloroethene	<0.00069 mg/L		<0.00069 mg/L		2	0.00069 mg/L
Vinyl chloride	<0.00041 mg/L		<0.00041 mg/L		2	0.00041 mg/L
Zinc	0.071 mg/L		0.11 mg/L		2	0.011 mg/L

STORMWATER SAMPLING RESULTS

Complete the following tables for each stormwater outfalll sampled for analysis.

OUTFALL NO.:	**019**					
1. You must provide the results of at least one analysis for every pollutant identified in the table below						
Pollutant	Average Concentration		Maxium Concentration		No. Storm Events Sampled	Quantitation Limit
	Grab Sample	Flow-Weighted Composite Sample	Grab Sample	Flow-Weighted Composite Sample		
Oil and Grease (mg/L)	<4.2		<4.2		2	4.2
BOD5 (mg/L)	2.1		2.2		2	2
COD (mg/L)	<11.05		13.00		2	9.1
TSS (mg/L)	21.50		30.00		2	0.5
Total Nitrogen (mg/L)	<0.72		0.89		2	0.545
Total Phosphorus (mg/L)	0.23		0.23		1	0.04
pH (S.U.)	7.50		7.50		1	0.1

2. List all pollutants contained within an Effluent Limitation Guideline (ELF) that is applicable to the facility's production. Also list all pollutants listed in the facility's existing NPDES permit for the outfall identified above; process wastewater discharges; and any other pollutants that are considered the cause of impairment to waters receiving stormwater discharges from the outfall. Provide the results of at least one analysis for every pollutant listed. Specify the units with your results (e.g., mg/L)

Pollutant	Average Concentration		Maxium Concentration		No. Storm Events Sampled	Quantitation Limit
	Grab Sample	Flow-Weighted Composite Sample	Grab Sample	Flow-Weighted Composite Sample		
1,1,1-Trichloroethane	<0.0006 mg/L		<0.0006 mg/L		2	0.0006 mg/L
1,1,2,2-Tetrachloroethane	<0.0006 mg/L		<0.0006 mg/L		2	0.0006 mg/L
1,1,2-Trichloroethane	<0.00045 mg/L		<0.00045 mg/L		2	0.00045 mg/L
1,1-Dichloroethane	<0.00047 mg/L		<0.00063 mg/L		2	0.00047 mg/L
1,1-Dichloroethene	<0.00055 mg/L		<0.00055 mg/L		2	0.00055 mg/L
1,2,4-Trichlorobenzene	<0.00021 mg/L		<0.00025 mg/L		2	0.00021 mg/L
1,2-Dichlorobenzene	<0.00017 mg/L		<0.00022 mg/L		2	0.00017 mg/L
1,2-Dichloroethane	<0.00057 mg/L		<0.00057 mg/L		2	0.00057 mg/L
1,2-Dichloroethane-d4	0.01 mg/L		0.011 mg/L		2	
1,2-Dichloropropane	<0.00066 mg/L		<0.00066 mg/L		2	0.00066 mg/L
phenylhydrazine (as Azober	<0.00023 mg/L		<0.00025 mg/L		2	0.00023 mg/L
1,3-Dinitrobenzene	<0.00053 mg/L		<0.00057 mg/L		2	0.00053 mg/L
1,4-Dichlorobenzene	<0.00016 mg/L		<0.00025 mg/L		2	0.00016 mg/L
1,4-Dioxane	<0.043 mg/L		<0.043 mg/L		2	0.043 mg/L
2,2'oxybis[1-chloropropane]	<0.000067 mg/L		<0.000073 mg/L		2	0.000067 mg/L
2,4,6-Tribromophenol	0.0045 mg/L		0.0046 mg/L		2	
2,4,6-Trichlorophenol	<0.00026 mg/L		<0.00028 mg/L		2	0.00026 mg/L
2,4-Dichlorophenol	<0.000059 mg/L		<0.000064 mg/L		2	0.000059 mg/L
2,4-Dimethylphenol	<0.00041 mg/L		<0.00061 mg/L		2	0.00041 mg/L
2,4-Dinitrophenol	<0.0027 mg/L		<0.0034 mg/L		2	0.0027 mg/L
2,4-Dinitrotoluene	<0.00041 mg/L		<0.00044 mg/L		2	0.00041 mg/L
2,6-Dinitrotoluene	<0.0002 mg/L		<0.00022 mg/L		2	0.0002 mg/L
2-Chlorethyl vinyl ether	<0.0017 mg/L		<0.0017 mg/L		2	0.0017 mg/L
2-Chloronaphthalene	<0.000068 mg/L		<0.000074 mg/L		2	0.000068 mg/L
2-Chlorophenol	<0.0002 mg/L		<0.00023 mg/L		2	0.0002 mg/L
2-Fluorobiphenyl	0.0041 mg/L		0.0044 mg/L		2	
2-Fluorophenol	0.0045 mg/L		0.0046 mg/L		2	
2-Nitrophenol	<0.00022 mg/L		<0.00024 mg/L		2	0.00022 mg/L

Pollutant	Average Concentration		Maxium Concentration		No. Storm Events Sampled	Quantitation Limit
	Grab Sample	Flow-Weighted Composite Sample	Grab Sample	Flow-Weighted Composite Sample		
3,3'-Dichlorobenzidine	<0.00067 mg/L		<0.00073 mg/L		2	0.00067 mg/L
4,4'-DDD	<0.00000051 mg/L		<0.00000051 mg/L		2	0.00000051 mg/L
4,4'-DDE	<0.00000028 mg/L		<0.00000028 mg/L		2	0.00000028 mg/L
4,4'-DDT	<0.00000066 mg/L		<0.00000066 mg/L		2	0.00000066 mg/L
4,6-Dinitro-2-methylphenol	<0.0017 mg/L		<0.0018 mg/L		2	0.0017 mg/L
4-Bromofluorobenzene	0.0086 mg/L		0.0091 mg/L		2	
4-Bromophenyl phenyl ether	<0.00037 mg/L		<0.0004 mg/L		2	0.00037 mg/L
4-Chloro-3-methylphenol	<0.0004 mg/L		<0.00045 mg/L		2	0.0004 mg/L
4-Chlorophenyl phenyl ether	<0.00026 mg/L		<0.00028 mg/L		2	0.00026 mg/L
4-Nitrophenol	<0.0011 mg/L		<0.0012 mg/L		2	0.0011 mg/L
Acenaphthene	<0.000075 mg/L		<0.000081 mg/L		2	0.000075 mg/L
Acenaphthylene	<0.000075 mg/L		<0.000081 mg/L		2	0.000075 mg/L
Acrolein	<0.016 mg/L		<0.016 mg/L		2	0.016 mg/L
Acrylamide	<0.018 mg/L		<0.021 mg/L		2	0.018 mg/L
Acrylonitrile	<0.0078 mg/L		<0.0078 mg/L		2	0.0078 mg/L
Aldrin	<0.00000034 mg/L		<0.00000034 mg/L		2	0.00000034 mg/L
alpha-BHC	<0.00000023 mg/L		<0.00000023 mg/L		2	0.00000023 mg/L
Aluminum	1.82 mg/L		3.5 mg/L		2	0.024 mg/L
Ammonia	<0.088 mg/L		<0.088 mg/L		2	0.088 mg/L
Anthracene	<0.000056 mg/L		<0.000061 mg/L		2	0.000056 mg/L
Antimony	<0.00067 mg/L		0.00077 mg/L		2	0.00063 mg/L
Arsenic	0.0023 mg/L		0.0042 mg/L		2	0.00053 mg/L
Barium	0.071 mg/L		0.11 mg/L		2	0.0017 mg/L
Benzene	<0.0006 mg/L		<0.0006 mg/L		2	0.0006 mg/L
Benzidine	<0.01 mg/L		<0.011 mg/L		2	0.01 mg/L
Benzo[a]anthracene	<0.000086 mg/L		<0.000094 mg/L		2	0.000086 mg/L
Benzo[a]pyrene	<0.000061 mg/L		<0.000066 mg/L		2	0.000061 mg/L
Benzo[b]fluoranthene	<0.00011 mg/L		<0.00012 mg/L		2	0.00011 mg/L
Benzo[g,h,i]perylene	<0.000079 mg/L		<0.000086 mg/L		2	0.000079 mg/L
Benzo[k]fluoranthene	<0.0001 mg/L		<0.00011 mg/L		2	0.0001 mg/L
Beryllium	<0.00044 mg/L		<0.00062 mg/L		2	0.00044 mg/L
beta-BHC	<0.00000035 mg/L		<0.00000035 mg/L		2	0.00000035 mg/L
Bis(2-chloroethoxy)methane	<0.00018 mg/L		<0.00019 mg/L		2	0.00018 mg/L
Bis(2-chloroethyl)ether	<0.000046 mg/L		<0.00005 mg/L		2	0.000046 mg/L
Bis(2-ethylhexyl) phthalate	<0.0072 mg/L		<0.0078 mg/L		2	0.0072 mg/L
Boron	<0.041mg/L		<0.063 mg/L		2	0.04 mg/L
Bromide	<0.053 mg/L		<0.053 mg/L		2	0.053 mg/L
Bromoform	<0.00098 mg/L		<0.00098 mg/L		2	0.00098 mg/L
Bromomethane	<0.00089 mg/L		<0.00089 mg/L		2	0.00089 mg/L
Butyl benzyl phthalate	<0.00078 mg/L		<0.00098 mg/L		2	0.00078 mg/L
Cadmium	<0.00021 mg/L		<0.00021 mg/L		2	0.00021 mg/L
Calcium	80 mg/L		91 mg/L		2	0.22 mg/L
Carbon tetrachloride	<0.00088 mg/L		<0.00088 mg/L		2	0.00088 mg/L
Chlordane	<0.0000069 mg/L		<0.0000069 mg/L		2	0.0000069 mg/L
Chloride	90.6 mg/L		115 mg/L		2	0.712 mg/L

Pollutant	Average Concentration		Maxium Concentration		No. Storm Events Sampled	Quantitation Limit
	Grab Sample	Flow-Weighted Composite Sample	Grab Sample	Flow-Weighted Composite Sample		
Chlorobenzene	<0.0005 mg/L		<0.0005 mg/L		2	0.0005 mg/L
Chlorodibromomethane	<0.00084 mg/L		<0.00084 mg/L		2	0.00084 mg/L
Chloroethane	<0.0009 mg/L		<0.0009 mg/L		2	0.0009 mg/L
Chloroform	<0.0006 mg/L		<0.0006 mg/L		2	0.0006 mg/L
Chloromethane	<0.0009 mg/L		<0.0009 mg/L		2	0.0009 mg/L
Chromium	0.0032 mg/L		0.0055 mg/L		2	0.0009 mg/L
Chrysene	<0.000092 mg/L		<0.0001 mg/L		2	0.000092 mg/L
cis-1,3-Dichloropropene	<0.00059 mg/L		<0.00059 mg/L		2	0.00059 mg/L
Cobalt	0.0017 mg/L		0.0031 mg/L		2	0.00015 mg/L
Color, Apparent	22.5 Color Units		30 Color Units		2	5 Color Units
Color, True	<10 Color Units		15 Color Units		2	5 Color Units
Copper	0.0044 mg/L		0.0075 mg/L		2	0.0012 mg/L
Cr (VI)	<0.006 mg/L		<0.006 mg/L		2	0.006 mg/L
Cyanide, Total	<0.008 mg/L		<0.008 mg/L		1	0.008 mg/L
DCB Decachlorobiphenyl	0.000014 mg/L		0.000017 mg/L		8	
delta-BHC	<0.00000061 mg/L		<0.00000061 mg/L		2	0.00000061 mg/L
Dibenz(a,h)anthracene	<0.000083 mg/L		<0.00009 mg/L		2	0.000083 mg/L
Dibromofluoromethane	0.01 mg/L		0.011 mg/L		2	
Dichlorobromomethane	<0.00064 mg/L		<0.00064 mg/L		2	0.00064 mg/L
Dieldrin	<0.00000026 mg/L		<0.00000026 mg/L		2	0.00000026 mg/L
Diethyl phthalate	<0.00065 mg/L		<0.00071 mg/L		2	0.00065 mg/L
Dimethyl phthalate	<0.00023 mg/L		<0.00025 mg/L		2	0.00023 mg/L
Di-n-butyl phthalate	<0.0039 mg/L		<0.0051 mg/L		2	0.003 mg/L
Di-n-octyl phthalate	<0.00079 mg/L		<0.00086 mg/L		2	0.00079 mg/L
Endosulfan I	<0.00000065 mg/L		<0.00000065 mg/L		2	0.00000065 mg/L
Endosulfan II	<0.0000003 mg/L		<0.0000003 mg/L		2	0.0000003 mg/L
Endosulfan sulfate	<0.00000061 mg/L		<0.00000061 mg/L		2	0.00000061 mg/L
Endrin	<0.00000022 mg/L		<0.00000022 mg/L		2	0.00000022 mg/L
Endrin aldehyde	<0.00000049 mg/L		<0.00000049 mg/L		2	0.00000049 mg/L
Ethylbenzene	<0.00051 mg/L		<0.00051 mg/L		2	0.00051 mg/L
Fluoranthene	<0.000069 mg/L		<0.000075 mg/L		2	0.000069 mg/L
Fluorene	<0.000079 mg/L		<0.000086 mg/L		2	0.000079 mg/L
Fluoride	0.13 mg/L		0.14 mg/L		2	0.026 mg/L
gamma-BHC	<0.00000028 mg/L		<0.00000028 mg/L		2	0.00000028 mg/L
ardness as calcium carbona	240 mg/L		240 mg/L		1	0.52 mg/L
Heptachlor	<0.00000043 mg/L		<0.00000043 mg/L		2	0.00000043 mg/L
Heptachlor epoxide	<0.00000032 mg/L		<0.00000032 mg/L		2	0.00000032 mg/L
Hexachlorobenzene	<0.000064 mg/L		<0.00007 mg/L		2	0.000064 mg/L
Hexachlorobutadine	<0.000079 mg/L		<0.000086 mg/L		2	0.000079 mg/L
Hexachlorocyclopentadiene	<0.00057 mg/L		<0.00062 mg/L		2	0.00057 mg/L
Hexachloroethane	<0.00016 mg/L		<0.00017 mg/L		2	0.00016 mg/L
Indeno[1,2,3-cd]pyrene	<0.0001 mg/L		<0.00011 mg/L		2	0.0001 mg/L

Pollutant	Average Concentration		Maxium Concentration		No. Storm Events Sampled	Quantitation Limit
	Grab Sample	Flow-Weighted Composite Sample	Grab Sample	Flow-Weighted Composite Sample		
Iron	2.3 mg/L		6.6 mg/L		3	0.043 mg/L
Isophorone	<0.00022 mg/L		<0.00024 mg/L		2	0.00022 mg/L
Lead	<0.0024 mg/L		0.0043 mg/L		2	0.00043 mg/L
Magnesium	11.35 mg/L		16 mg/L		2	0.066 mg/L
Manganese	0.33 mg/L		0.56 mg/L		2	0.0029 mg/L
Mercury	<0.00013 mg/L		<0.00013 mg/L		2	0.00013 mg/L
thylene Blue Active Substan	<0.071 mg/L		0.093 mg/L		2	0.049 mg/L
Methylene Chloride	<0.00089 mg/L		<0.00089 mg/L		2	0.00089 mg/L
Molybdenum	0.00091 mg/L		0.0011 mg/L		2	0.0009 mg/L
Naphthalene	<0.00016 mg/L		0.00025 mg/L		2	0.000068 mg/L
Nickel	0.0067 mg/L		0.011 mg/L		2	0.00095 mg/L
Nitrate Nitrite as N	<0.15 mg/L		0.23 mg/L		2	0.065 mg/L
Nitrobenzene	<0.00058 mg/L		<0.00063 mg/L		2	0.00058 mg/L
Nitrobenzene-d5	0.0045 mg/L		0.0047 mg/L		2	
Nitrogen, Kjeldahl	<0.57 mg/L		0.66 mg/L		2	0.3 mg/L
N-Nitrosodiumethylamine	<0.00018 mg/L		<0.00027 mg/L		2	0.00018 mg/L
N-Nitrosodi-n-propylamine	<0.000082 mg/L		<0.000089 mg/L		2	0.000082 mg/L
N-Nitrosodiumphenylamine	<0.00014 mg/L		<0.00015 mg/L		2	0.00014 mg/L
PCB-1016	<0.0000045 mg/L		<0.0000045 mg/L		2	0.0000045 mg/L
PCB-1221	<0.0000054 mg/L		<0.0000054 mg/L		2	0.0000054 mg/L
PCB-1232	<0.000005 mg/L		<0.000005 mg/L		2	0.000005 mg/L
PCB-1242	<0.0000087 mg/L		<0.0000087 mg/L		2	0.0000087 mg/L
PCB-1248	<0.0000028 mg/L		<0.0000028 mg/L		2	0.0000028 mg/L
PCB-1254	<0.0000091 mg/L		<0.0000091 mg/L		2	0.0000091 mg/L
PCB-1260	<0.0000037 mg/L		<0.0000037 mg/L		2	0.0000037 mg/L
Pentachlorophenol	<0.001 mg/L		<0.0011 mg/L		2	0.001 mg/L
Phenanthrene	<0.00012 mg/L		<0.00016mg/L		2	0.00011 mg/L
Phenol	<0.00056 mg/L		<0.00061 mg/L		2	0.00056 mg/L
Phenol-d5	0.0042 mg/L		0.0043 mg/L		2	
Phosphorous as P	0.052 mg/L		0.052 mg/L		1	0.017 mg/L
Pyrene	<0.000062 mg/L		<0.000068 mg/L		2	0.000062 mg/L
Selenium	<0.0008 mg/L		<0.00089 mg/L		2	0.0008 mg/L
Silver	<0.00042 mg/L		<0.00079 mg/L		2	0.00042 mg/L
Sulfate	66.4 mg/L		94.6 mg/L		2	0.756 mg/L
Sulfide	<1.3 mg/L		<1.3 mg/L		2	1.3 mg/L
Terphenyl-d14	0.0043 mg/L		0.0046 mg/L		2	
Tetrachloroethene	<0.00047 mg/L		<0.00047 mg/L		2	0.00047 mg/L
Tetrachloro-m-xylene	0.000015 mg/L		0.000019 mg/L		8	
Thallium	<0.00029 mg/L		<0.00038 mg/L		2	0.00029 mg/L
Toluene	<0.00046 mg/L		<0.00046 mg/L		2	0.00046 mg/L
Toluene-d8	0.0087 mg/L		0.0089 mg/L		2	
TDS	905 mg/L		1500 mg/L		2	10 mg/L
TOC	2.2 mg/L		2.8 mg/L		2	0.51 mg/L
Toxaphene	<0.000047 mg/L		<0.000047 mg/L		2	0.000047 mg/L
trans-1,2-Dichloroethene	<0.00067 mg/L		<0.00067 mg/L		2	0.00067 mg/L
trans-1,3-Dichloropropene	<0.00058 mg/L		<0.00058 mg/L		2	0.00058 mg/L
Trichloroethene	<0.00069 mg/L		<0.00069 mg/L		2	0.00069 mg/L
Vinyl chloride	<0.00041 mg/L		<0.00041 mg/L		2	0.00041 mg/L
Zinc	0.038 mg/L		0.062 mg/L		2	0.011 mg/L

STORMWATER SAMPLING RESULTS

Complete the following tables for each stormwater outfalll sampled for analysis.

OUTFALL NO.:	**021**					
1. You must provide the results of at least one analysis for every pollutant identified in the table below						
Pollutant	Average Concentration		Maxium Concentration		No. Storm Events Sampled	Quantitation Limit
	Grab Sample	Flow-Weighted Composite Sample	Grab Sample	Flow-Weighted Composite Sample		
Oil and Grease (mg/L)	<4.4		4.5		2	4.2
BOD5 (mg/L)	<2		<2		2	2
COD (mg/L)	<9.1		<9.1		2	9.1
TSS (mg/L)	12.80		17.00		2	0.75
Total Nitrogen (mg/L)	<0.80		1.27		2	0.545
Total Phosphorus (mg/L)	0.05		0.05		1	0.04
pH (S.U.)	7.30		7.30		1	0.1

2. List all pollutants contained within an Effluent Limitation Guideline (ELF) that is applicable to the facility's production. Also list all pollutants listed in the facility's existing NPDES permit for the outfall identified above; process wastewater discharges; and any other pollutants that are considered the cause of impairment to waters receiving stormwater discharges from the outfall. Provide the results of at least one analysis for every pollutant listed. Specify the units with your results (e.g., mg/L)

Pollutant	Average Concentration		Maxium Concentration		No. Storm Events Sampled	Quantitation Limit
	Grab Sample	Flow-Weighted Composite Sample	Grab Sample	Flow-Weighted Composite Sample		
1,1,1-Trichloroethane	<0.0006 mg/L		<0.0006 mg/L		2	0.0006 mg/L
1,1,2,2-Tetrachloroethane	<0.0006 mg/L		<0.0006 mg/L		2	0.0006 mg/L
1,1,2-Trichloroethane	<0.00045 mg/L		<0.00045 mg/L		2	0.00045 mg/L
1,1-Dichloroethane	<0.00047 mg/L		<0.00063 mg/L		2	0.00047 mg/L
1,1-Dichloroethene	<0.00055 mg/L		<0.00055 mg/L		2	0.00055 mg/L
1,2,4-Trichlorobenzene	<0.00021 mg/L		<0.00025 mg/L		2	0.00021 mg/L
1,2-Dichlorobenzene	<0.00017 mg/L		<0.00022 mg/L		2	0.00017 mg/L
1,2-Dichloroethane	<0.00057 mg/L		<0.00057 mg/L		2	0.00057 mg/L
1,2-Dichloroethane-d4	0.01 mg/L		0.012 mg/L		2	
1,2-Dichloropropane	<0.00066 mg/L		<0.00066 mg/L		2	0.00066 mg/L
phenylhydrazine (as Azober	<0.00023 mg/L		<0.00025 mg/L		2	0.00023 mg/L
1,3-Dinitrobenzene	<0.00053 mg/L		<0.00057 mg/L		2	0.00053 mg/L
1,4-Dichlorobenzene	<0.00016 mg/L		<0.00025 mg/L		2	0.00016 mg/L
1,4-Dioxane	<0.043 mg/L		<0.043 mg/L		2	0.043 mg/L
2,2'oxybis[1-chloropropane]	<0.000067 mg/L		<0.000073 mg/L		2	0.000067 mg/L
2,4,6-Tribromophenol	0.0036 mg/L		0.0037 mg/L		2	
2,4,6-Trichlorophenol	<0.00026 mg/L		<0.00028 mg/L		2	0.00026 mg/L
2,4-Dichlorophenol	<0.000059 mg/L		<0.000064 mg/L		2	0.000059 mg/L
2,4-Dimethylphenol	<0.00041 mg/L		<0.00061 mg/L		2	0.00041 mg/L
2,4-Dinitrophenol	<0.0027 mg/L		<0.0034 mg/L		2	0.0027 mg/L
2,4-Dinitrotoluene	<0.00041 mg/L		<0.00044 mg/L		2	0.00041 mg/L
2,6-Dinitrotoluene	<0.0002 mg/L		<0.00022 mg/L		2	0.0002 mg/L
2-Chlorethyl vinyl ether	<0.0017 mg/L		<0.0017 mg/L		2	0.0017 mg/L
2-Chloronaphthalene	<0.000068 mg/L		<0.000074 mg/L		2	0.000068 mg/L
2-Chlorophenol	<0.0002 mg/L		<0.00023 mg/L		2	0.0002 mg/L
2-Fluorobiphenyl	0.0046 mg/L		0.005 mg/L		2	
2-Fluorophenol	0.0035 mg/L		0.0039 mg/L		2	
2-Nitrophenol	<0.00022 mg/L		<0.00024 mg/L		2	0.00022 mg/L

Pollutant	Average Concentration		Maxium Concentration		No. Storm Events Sampled	Quantitation Limit
	Grab Sample	Flow-Weighted Composite Sample	Grab Sample	Flow-Weighted Composite Sample		
3,3'-Dichlorobenzidine	<0.00067 mg/L		<0.00073 mg/L		2	0.00067 mg/L
4,4'-DDD	<0.00000051 mg/L		<0.00000051 mg/L		2	0.00000051 mg/L
4,4'-DDE	<0.00000028 mg/L		<0.00000028 mg/L		2	0.00000028 mg/L
4,4'-DDT	<0.00000066 mg/L		<0.00000066 mg/L		2	0.00000066 mg/L
4,6-Dinitro-2-methylphenol	<0.0017 mg/L		<0.0018 mg/L		2	0.0017 mg/L
4-Bromofluorobenzene	0.0076 mg/L		0.0086 mg/L		2	
4-Bromophenyl phenyl ether	<0.00037 mg/L		<0.0004 mg/L		2	0.00037 mg/L
4-Chloro-3-methylphenol	<0.0004 mg/L		<0.00045 mg/L		2	0.0004 mg/L
4-Chlorophenyl phenyl ether	<0.00026 mg/L		<0.00028 mg/L		2	0.00026 mg/L
4-Nitrophenol	<0.0011 mg/L		<0.0012 mg/L		2	0.0011 mg/L
Acenaphthene	<0.000075 mg/L		<0.000081 mg/L		2	0.000075 mg/L
Acenaphthylene	<0.000075 mg/L		<0.000081 mg/L		2	0.000075 mg/L
Acrolein	<0.016 mg/L		<0.016 mg/L		2	0.016 mg/L
Acrylamide	<0.018 mg/L		<0.021 mg/L		2	0.018 mg/L
Acrylonitrile	<0.0078 mg/L		<0.0078 mg/L		2	0.0078 mg/L
Aldrin	<0.00000034 mg/L		<0.00000034 mg/L		2	0.00000034 mg/L
alpha-BHC	<0.00000023 mg/L		<0.00000023 mg/L		2	0.00000023 mg/L
Aluminum	0.126 mg/L		0.21 mg/L		2	0.024 mg/L
Ammonia	<0.088 mg/L		<0.088 mg/L		2	0.088 mg/L
Anthracene	<0.000056 mg/L		<0.000061 mg/L		2	0.000056 mg/L
Antimony	<0.00063 mg/L		<0.00068 mg/L		2	0.00063 mg/L
Arsenic	<0.00053 mg/L		<0.00075 mg/L		2	0.00053 mg/L
Barium	0.095 mg/L		0.11 mg/L		2	0.0017 mg/L
Benzene	<0.0006 mg/L		<0.0006 mg/L		2	0.0006 mg/L
Benzidine	<0.01 mg/L		<0.011 mg/L		2	0.01 mg/L
Benzo[a]anthracene	<0.000086 mg/L		<0.000094 mg/L		2	0.000086 mg/L
Benzo[a]pyrene	<0.000061 mg/L		<0.000066 mg/L		2	0.000061 mg/L
Benzo[b]fluoranthene	<0.00011 mg/L		<0.00012 mg/L		2	0.00011 mg/L
Benzo[g,h,i]perylene	<0.000079 mg/L		<0.000086 mg/L		2	0.000079 mg/L
Benzo[k]fluoranthene	<0.0001 mg/L		<0.00011 mg/L		2	0.0001 mg/L
Beryllium	<0.00044 mg/L		<0.00062 mg/L		2	0.00044 mg/L
beta-BHC	<0.00000035 mg/L		<0.00000035 mg/L		2	0.00000035 mg/L
Bis(2-chloroethoxy)methane	<0.00018 mg/L		<0.00019 mg/L		2	0.00018 mg/L
Bis(2-chloroethyl)ether	<0.000046 mg/L		<0.00005 mg/L		2	0.000046 mg/L
Bis(2-ethylhexyl) phthalate	<0.0072 mg/L		<0.0078 mg/L		2	0.0072 mg/L
Boron	0.052 mg/L		0.065 mg/L		2	0.04 mg/L
Bromide	<0.26 mg/L		0.47 mg/L		2	0.053 mg/L
Bromoform	<0.00098 mg/L		<0.00098 mg/L		2	0.00098 mg/L
Bromomethane	<0.00089 mg/L		<0.00089 mg/L		2	0.00089 mg/L
Butyl benzyl phthalate	<0.00078 mg/L		<0.00098 mg/L		2	0.00078 mg/L
Cadmium	0.002 mg/L		0.0024 mg/L		2	0.00021 mg/L
Calcium	66 mg/L		78 mg/L		2	0.22 mg/L
Carbon tetrachloride	<0.00088 mg/L		<0.00088 mg/L		2	0.00088 mg/L
Chlordane	<0.0000069 mg/L		<0.0000069 mg/L		2	0.0000069 mg/L
Chloride	131.4 mg/L		201 mg/L		2	0.712 mg/L

Pollutant	Average Concentration		Maxium Concentration		No. Storm Events Sampled	Quantitation Limit
	Grab Sample	Flow-Weighted Composite Sample	Grab Sample	Flow-Weighted Composite Sample		
Chlorobenzene	<0.0005 mg/L		<0.0005 mg/L		2	0.0005 mg/L
Chlorodibromomethane	<0.00084 mg/L		<0.00084 mg/L		2	0.00084 mg/L
Chloroethane	<0.0009 mg/L		<0.0009 mg/L		2	0.0009 mg/L
Chloroform	<0.0006 mg/L		<0.0006 mg/L		2	0.0006 mg/L
Chloromethane	<0.0009 mg/L		<0.0009 mg/L		2	0.0009 mg/L
Chromium	<0.0009 mg/L		<0.0012 mg/L		2	0.0009 mg/L
Chrysene	<0.000092 mg/L		<0.0001 mg/L		2	0.000092 mg/L
cis-1,3-Dichloropropene	<0.00059 mg/L		<0.00059 mg/L		2	0.00059 mg/L
Cobalt	0.00018 mg/L		0.0002 mg/L		2	0.00015 mg/L
Color, Apparent	12.5 Color Units		15 Color Units		2	5 Color Units
Color, True	7.5 Color Units		10 Color Units		2	5 Color Units
Copper	<0.0013 mg/L		<0.0017 mg/L		2	0.0012 mg/L
Cr (VI)	<0.006 mg/L		<0.006 mg/L		2	0.006 mg/L
Cyanide, Total	<0.008 mg/L		<0.008 mg/L		1	0.008 mg/L
DCB Decachlorobiphenyl	0.000018 mg/L		0.00002 mg/L		8	
delta-BHC	<0.00000061 mg/L		<0.00000061 mg/L		2	0.00000061 mg/L
Dibenz(a,h)anthracene	<0.000083 mg/L		<0.00009 mg/L		2	0.000083 mg/L
Dibromofluoromethane	0.01 mg/L		0.012 mg/L		2	
Dichlorobromomethane	<0.00064 mg/L		<0.00064 mg/L		2	0.00064 mg/L
Dieldrin	<0.00000026 mg/L		<0.00000026 mg/L		2	0.00000026 mg/L
Diethyl phthalate	<0.00065 mg/L		<0.00071 mg/L		2	0.00065 mg/L
Dimethyl phthalate	<0.00023 mg/L		<0.00025 mg/L		2	0.00023 mg/L
Di-n-butyl phthalate	0.0069 mg/L		0.0084 mg/L		2	0.003 mg/L
Di-n-octyl phthalate	<0.00079 mg/L		<0.00086 mg/L		2	0.00079 mg/L
Endosulfan I	<0.00000065 mg/L		<0.00000065 mg/L		2	0.00000065 mg/L
Endosulfan II	<0.0000003 mg/L		<0.0000003 mg/L		2	0.0000003 mg/L
Endosulfan sulfate	<0.00000061 mg/L		<0.00000061 mg/L		2	0.00000061 mg/L
Endrin	<0.00000022 mg/L		<0.00000022 mg/L		2	0.00000022 mg/L
Endrin aldehyde	<0.00000049 mg/L		<0.00000049 mg/L		2	0.00000049 mg/L
Ethylbenzene	<0.00051 mg/L		<0.00051 mg/L		2	0.00051 mg/L
Fluoranthene	<0.000069 mg/L		<0.000075 mg/L		2	0.000069 mg/L
Fluorene	<0.000079 mg/L		<0.000086 mg/L		2	0.000079 mg/L
Fluoride	0.22 mg/L		0.25 mg/L		2	0.026 mg/L
gamma-BHC	<0.00000028 mg/L		<0.00000028 mg/L		2	0.00000028 mg/L
ardness as calcium carbona	230 mg/L		230 mg/L		1	0.52 mg/L
Heptachlor	<0.00000043 mg/L		<0.00000043 mg/L		2	0.00000043 mg/L
Heptachlor epoxide	<0.00000032 mg/L		<0.00000032 mg/L		2	0.00000032 mg/L
Hexachlorobenzene	<0.000064 mg/L		<0.00007 mg/L		2	0.00064 mg/L
Hexachlorobutadine	<0.000079 mg/L		<0.000086 mg/L		2	0.000079 mg/L
Hexachlorocyclopentadiene	<0.00057 mg/L		<0.00062 mg/L		2	0.00057 mg/L
Hexachloroethane	<0.00016 mg/L		<0.00017 mg/L		2	0.00016 mg/L
Indeno[1,2,3-cd]pyrene	<0.0001 mg/L		<0.00011 mg/L		2	0.0001 mg/L

Pollutant	Average Concentration		Maxium Concentration		No. Storm Events Sampled	Quantitation Limit
	Grab Sample	Flow-Weighted Composite Sample	Grab Sample	Flow-Weighted Composite Sample		
Iron	0.15 mg/L		0.29 mg/L		3	0.043 mg/L
Isophorone	<0.00022 mg/L		<0.00024 mg/L		2	0.00022 mg/L
Lead	0.00067 mg/L		0.00076 mg/L		2	0.00043 mg/L
Magnesium	16.5 mg/L		19 mg/L		2	0.066 mg/L
Manganese	0.046 mg/L		0.063 mg/L		2	0.0029 mg/L
Mercury	<0.00013 mg/L		<0.00013 mg/L		2	0.00013 mg/L
thylene Blue Active Substan	<0.049 mg/L		<0.049 mg/L		2	0.049 mg/L
Methylene Chloride	<0.00089 mg/L		<0.00089 mg/L		2	0.00089 mg/L
Molybdenum	0.0009 mg/L		0.0011 mg/L		2	0.0009 mg/L
Naphthalene	<0.000068 mg/L		0.000074 mg/L		2	0.000068 mg/L
Nickel	<0.0012 mg/L		<0.0015 mg/L		2	0.001 mg/L
Nitrate Nitrite as N	0.45 mg/L		0.75 mg/L		2	0.065 mg/L
Nitrobenzene	<0.00058 mg/L		<0.00063 mg/L		2	0.00058 mg/L
Nitrobenzene-d5	0.0045 mg/L		0.0047 mg/L		2	
Nitrogen, Kjeldahl	0.35 mg/L		0.52 mg/L		2	0.3 mg/L
N-Nitrosodiumethylamine	<0.00018 mg/L		<0.00027 mg/L		2	0.00018 mg/L
N-Nitrosodi-n-propylamine	<0.000082 mg/L		<0.000089 mg/L		2	0.000082 mg/L
N-Nitrosodiumphenylamine	<0.00014 mg/L		<0.00015 mg/L		2	0.00014 mg/L
PCB-1016	<0.0000045 mg/L		<0.0000045 mg/L		2	0.0000045 mg/L
PCB-1221	<0.0000054 mg/L		<0.0000054 mg/L		2	0.0000054 mg/L
PCB-1232	<0.000005 mg/L		<0.000005 mg/L		2	0.000005 mg/L
PCB-1242	<0.0000087 mg/L		<0.0000087 mg/L		2	0.0000087 mg/L
PCB-1248	<0.0000028 mg/L		<0.0000028 mg/L		2	0.0000028 mg/L
PCB-1254	<0.0000091 mg/L		<0.0000091 mg/L		2	0.0000091 mg/L
PCB-1260	<0.0000037 mg/L		<0.0000037 mg/L		2	0.0000037 mg/L
Pentachlorophenol	<0.001 mg/L		<0.0011 mg/L		2	0.001 mg/L
Phenanthrene	<0.00014 mg/L		<0.00016 mg/L		2	0.00011 mg/L
Phenol	<0.00056 mg/L		<0.00061 mg/L		2	0.00056 mg/L
Phenol-d5	0.0037 mg/L		0.0042 mg/L		2	
Phosphorous as P	<0.017 mg/L		<0.017 mg/L		1	0.017 mg/L
Pyrene	<0.000062 mg/L		<0.000068 mg/L		2	0.000062 mg/L
Selenium	<0.00095 mg/L		0.001 mg/L		2	0.0008 mg/L
Silver	<0.00042 mg/L		<0.00079 mg/L		2	0.00042 mg/L
Sulfate	80.5 mg/L		92 mg/L		2	0.756 mg/L
Sulfide	<1.35 mg/L		1.4 mg/L		2	1.3 mg/L
Terphenyl-d14	0.0046 mg/L		0.0046 mg/L		2	
Tetrachloroethene	<0.00047 mg/L		<0.00047 mg/L		2	0.00047 mg/L
Tetrachloro-m-xylene	0.000017 mg/L		0.000021 mg/L		8	
Thallium	<0.00029 mg/L		<0.00038 mg/L		2	0.00029 mg/L
Toluene	<0.00046 mg/L		<0.00046 mg/L		2	0.00046 mg/L
Toluene-d8	0.0085 mg/L		0.0092 mg/L		2	
TDS	400 mg/L		460 mg/L		2	10 mg/L
TOC	1.65 mg/L		1.8 mg/L		2	0.51 mg/L
Toxaphene	<0.000047 mg/L		<0.000047 mg/L		2	0.000047 mg/L
trans-1,2-Dichloroethene	<0.00067 mg/L		<0.00067 mg/L		2	0.00067 mg/L
trans-1,3-Dichloropropene	<0.00058 mg/L		<0.00058 mg/L		2	0.00058 mg/L
Trichloroethene	<0.00069 mg/L		<0.00069 mg/L		2	0.00069 mg/L
Vinyl chloride	<0.00041 mg/L		<0.00041 mg/L		2	0.00041 mg/L
Zinc	0.051 mg/L		0.059 mg/L		2	0.011 mg/L

STORMWATER SAMPLING RESULTS

Complete the following tables for each stormwater outfalll sampled for analysis.

OUTFALL NO.:	**022**					
1. You must provide the results of at least one analysis for every pollutant identified in the table below						
Pollutant	Average Concentration		Maxium Concentration		No. Storm Events Sampled	Quantitation Limit
	Grab Sample	Flow-Weighted Composite Sample	Grab Sample	Flow-Weighted Composite Sample		
Oil and Grease (mg/L)	4.3		4.3		1	4.3
BOD5 (mg/L)	5.4		5.4		1	2
COD (mg/L)	33.00		33.00		1	9.1
TSS (mg/L)	15.00		15.00		1	0.83
Total Nitrogen (mg/L)	1.20		1.20		1	0.185
Total Phosphorus (mg/L)	0.09		0.09		1	0.04
pH (S.U.)	7.40		7.40		1	0.1

2. List all pollutants contained within an Effluent Limitation Guideline (ELF) that is applicable to the facility's production. Also list all pollutants listed in the facility's existing NPDES permit for the outfall identified above; process wastewater discharges; and any other pollutants that are considered the cause of impairment to waters receiving stormwater discharges from the outfall. Provide the results of at least one analysis for every pollutant listed. Specify the units with your results (e.g., mg/L)

Pollutant	Average Concentration		Maxium Concentration		No. Storm Events Sampled	Quantitation Limit
	Grab Sample	Flow-Weighted Composite Sample	Grab Sample	Flow-Weighted Composite Sample		
1,1,1-Trichloroethane	<0.0006 mg/L		<0.0006 mg/L		1	0.0006 mg/L
1,1,2,2-Tetrachloroethane	<0.0006 mg/L		<0.0006 mg/L		1	0.0006 mg/L
1,1,2-Trichloroethane	<0.00045 mg/L		<0.00045 mg/L		1	0.00045 mg/L
1,1-Dichloroethane	<0.00063 mg/L		<0.00063 mg/L		1	0.00063 mg/L
1,1-Dichloroethene	<0.00055 mg/L		<0.00055 mg/L		1	0.00055 mg/L
1,2,4-Trichlorobenzene	<0.00024 mg/L		<0.00024 mg/L		1	0.00024 mg/L
1,2-Dichlorobenzene	<0.00021 mg/L		<0.00021 mg/L		1	0.00021 mg/L
1,2-Dichloroethane	<0.00057 mg/L		<0.00057 mg/L		1	0.00057 mg/L
1,2-Dichloroethane-d4	0.0084 mg/L		0.0084 mg/L		1	
1,2-Dichloropropane	<0.00066 mg/L		<0.00066 mg/L		1	0.00066 mg/L
phenylhydrazine (as Azober	<0.0002 mg/L		<0.0002 mg/L		1	0.0002 mg/L
1,3-Dinitrobenzene	<0.00046 mg/L		<0.00046 mg/L		1	0.00046 mg/L
1,4-Dichlorobenzene	<0.00024 mg/L		<0.00024 mg/L		1	0.00024 mg/L
1,4-Dioxane	<0.043 mg/L		<0.043 mg/L		1	0.043 mg/L
2,2'oxybis[1-chloropropane]	<0.000058 mg/L		<0.000058 mg/L		1	0.000058 mg/L
2,4,6-Tribromophenol	0.0044 mg/L		0.0044 mg/L		1	
2,4,6-Trichlorophenol	<0.00022 mg/L		<0.00022 mg/L		1	0.00022 mg/L
2,4-Dichlorophenol	<0.000051 mg/L		<0.000051 mg/L		1	0.000051 mg/L
2,4-Dimethylphenol	<0.00059 mg/L		<0.00059 mg/L		1	0.00059 mg/L
2,4-Dinitrophenol	<0.0033 mg/L		<0.0033 mg/L		1	0.0033 mg/L
2,4-Dinitrotoluene	<0.00035 mg/L		<0.00035 mg/L		1	0.00035 mg/L
2,6-Dinitrotoluene	<0.00017 mg/L		<0.00017 mg/L		1	0.00017 mg/L
2-Chlorethyl vinyl ether	<0.0017 mg/L		<0.0017 mg/L		1	0.0017 mg/L
2-Chloronaphthalene	<0.000059 mg/L		<0.000059 mg/L		1	0.000059 mg/L
2-Chlorophenol	<0.00023 mg/L		<0.00023 mg/L		1	0.00023 mg/L
2-Fluorobiphenyl	0.0048 mg/L		0.0048 mg/L		1	
2-Fluorophenol	0.0044 mg/L		0.0044 mg/L		1	
2-Nitrophenol	<0.00019 mg/L		<0.00019 mg/L		1	0.00019 mg/L

Pollutant	Average Concentration		Maxium Concentration		No. Storm Events Sampled	Quantitation Limit
	Grab Sample	Flow-Weighted Composite Sample	Grab Sample	Flow-Weighted Composite Sample		
3,3'-Dichlorobenzidine	<0.00058 mg/L		<0.00058 mg/L		1	0.00058 mg/L
4,4'-DDD	<0.00000051 mg/L		<0.00000051 mg/L		1	0.00000051 mg/L
4,4'-DDE	<0.00000028 mg/L		<0.00000028 mg/L		1	0.00000028 mg/L
4,4'-DDT	<0.00000066 mg/L		<0.00000066 mg/L		1	0.00000066 mg/L
4,6-Dinitro-2-methylphenol	<0.0015 mg/L		<0.0015 mg/L		1	0.0015 mg/L
4-Bromofluorobenzene	0.0089 mg/L		0.0089 mg/L		1	
4-Bromophenyl phenyl ether	<0.00032 mg/L		<0.00032 mg/L		1	0.00032 mg/L
4-Chloro-3-methylphenol	<0.00044 mg/L		<0.00044 mg/L		1	0.00044 mg/L
4-Chlorophenyl phenyl ether	<0.00022 mg/L		<0.00022 mg/L		1	0.00022 mg/L
4-Nitrophenol	<0.00094 mg/L		<0.00094 mg/L		1	0.00094 mg/L
Acenaphthene	<0.000065 mg/L		<0.000065 mg/L		1	0.000065 mg/L
Acenaphthylene	<0.000065 mg/L		<0.000065 mg/L		1	0.000065 mg/L
Acrolein	<0.016 mg/L		<0.016 mg/L		1	0.016 mg/L
Acrylamide	<0.021 mg/L		<0.021 mg/L		1	0.021 mg/L
Acrylonitrile	<0.0078 mg/L		<0.0078 mg/L		1	0.0078 mg/L
Aldrin	<0.00000034 mg/L		<0.00000034 mg/L		1	0.00000034 mg/L
alpha-BHC	<0.00000023 mg/L		<0.00000023 mg/L		1	0.00000023 mg/L
Aluminum	0.19 mg/L		0.19 mg/L		1	0.034 mg/L
Ammonia	0.12 mg/L		0.12 mg/L		1	0.088 mg/L
Anthracene	<0.000049 mg/L		<0.000049 mg/L		1	0.000049 mg/L
Antimony	<0.00057 mg/L		<0.00057 mg/L		1	0.00057 mg/L
Arsenic	<0.00075 mg/L		<0.00075 mg/L		1	0.00075 mg/L
Barium	0.026 mg/L		0.026 mg/L		1	0.0022 mg/L
Benzene	<0.0006 mg/L		<0.0006 mg/L		1	0.0006 mg/L
Benzidine	<0.0091 mg/L		<0.0091 mg/L		1	0.0091 mg/L
Benzo[a]anthracene	<0.000075 mg/L		<0.000075 mg/L		1	0.000075 mg/L
Benzo[a]pyrene	<0.000053 mg/L		<0.000053 mg/L		1	0.000053 mg/L
Benzo[b]fluoranthene	<0.000097 mg/L		<0.000097 mg/L		1	0.000097 mg/L
Benzo[g,h,i]perylene	<0.000069 mg/L		<0.000069 mg/L		1	0.000069 mg/L
Benzo[k]fluoranthene	<0.000088 mg/L		<0.000088 mg/L		1	0.000088 mg/L
Beryllium	<0.00062 mg/L		<0.00062 mg/L		1	0.00062 mg/L
beta-BHC	<0.00000035 mg/L		<0.00000035 mg/L		1	0.00000035 mg/L
Bis(2-chloroethoxy)methane	<0.00015 mg/L		<0.00015 mg/L		1	0.00015 mg/L
Bis(2-chloroethyl)ether	<0.00004 mg/L		<0.00004 mg/L		1	0.00004 mg/L
Bis(2-ethylhexyl) phthalate	<0.0062 mg/L		<0.0062 mg/L		1	0.0062 mg/L
Boron	0.032 mg/L		0.032 mg/L		1	0.016 mg/L
Bromide	<0.053 mg/L		<0.053 mg/L		1	0.053 mg/L
Bromoform	<0.00098 mg/L		<0.00098 mg/L		1	0.00098 mg/L
Bromomethane	<0.00089 mg/L		<0.00089 mg/L		1	0.00089 mg/L
Butyl benzyl phthalate	<0.00094 mg/L		<0.00094 mg/L		1	0.00094 mg/L
Cadmium	0.00054 mg/L		0.00054 mg/L		1	0.0002 mg/L
Calcium	25 mg/L		25 mg/L		1	0.25 mg/L
Carbon tetrachloride	<0.00088 mg/L		<0.00088 mg/L		1	0.00088 mg/L
Chlordane	<0.0000069 mg/L		<0.0000069 mg/L		1	0.0000069 mg/L
Chloride	316 mg/L		316 mg/L		1	3.56 mg/L

Pollutant	Average Concentration		Maxium Concentration		No. Storm Events Sampled	Quantitation Limit
	Grab Sample	Flow-Weighted Composite Sample	Grab Sample	Flow-Weighted Composite Sample		
Chlorobenzene	<0.0005 mg/L		<0.0005 mg/L		1	0.0005 mg/L
Chlorodibromomethane	<0.00084 mg/L		<0.00084 mg/L		1	0.00084 mg/L
Chloroethane	<0.0009 mg/L		<0.0009 mg/L		1	0.0009 mg/L
Chloroform	<0.0006 mg/L		<0.0006 mg/L		1	0.0006 mg/L
Chloromethane	<0.0009 mg/L		<0.0009 mg/L		1	0.0009 mg/L
Chromium	0.026 mg/L		0.026 mg/L		1	0.0012 mg/L
Chrysene	<0.000081 mg/L		<0.000081 mg/L		1	0.000081 mg/L
cis-1,3-Dichloropropene	<0.00059 mg/L		<0.00059 mg/L		1	0.00059 mg/L
Cobalt	<0.00019 mg/L		<0.00019 mg/L		1	0.00019 mg/L
Color, True	40 Color Units		40 Color Units		1	5 Color Units
Copper	0.0036 mg/L		0.0036 mg/L		1	0.0017 mg/L
Cr (VI)	<0.006 mg/L		<0.006 mg/L		1	0.006 mg/L
DCB Decachlorobiphenyl	0.000016 mg/L		0.000019 mg/L		4	
delta-BHC	<0.00000061 mg/L		<0.00000061 mg/L		1	0.00000061 mg/L
Dibenz(a,h)anthracene	<0.000072 mg/L		<0.000072 mg/L		1	0.000072 mg/L
Dibromofluoromethane	0.0072 mg/L		0.0072 mg/L		1	
Dichlorobromomethane	<0.00064 mg/L		<0.00064 mg/L		1	0.00064 mg/L
Dieldrin	<0.00000026 mg/L		<0.00000026 mg/L		1	0.00000026 mg/L
Diethyl phthalate	<0.00057 mg/L		<0.00057 mg/L		1	0.00057 mg/L
Dimethyl phthalate	<0.0002 mg/L		<0.0002 mg/L		1	0.0002 mg/L
Di-n-butyl phthalate	<0.0049 mg/L		<0.0049 mg/L		1	0.0049 mg/L
Di-n-octyl phthalate	<0.00069 mg/L		<0.00069 mg/L		1	0.00069 mg/L
Endosulfan I	<0.00000065 mg/L		<0.00000065 mg/L		1	0.00000065 mg/L
Endosulfan II	<0.0000003 mg/L		<0.0000003 mg/L		1	0.0000003 mg/L
Endosulfan sulfate	<0.00000061 mg/L		<0.00000061 mg/L		1	0.00000061 mg/L
Endrin	<0.00000022 mg/L		<0.00000022 mg/L		1	0.00000022 mg/L
Endrin aldehyde	<0.00000049 mg/L		<0.00000049 mg/L		1	0.00000049 mg/L
Ethylbenzene	<0.00051 mg/L		<0.00051 mg/L		1	0.00051 mg/L
Fluoranthene	<0.00006 mg/L		<0.00006 mg/L		1	0.00006 mg/L
Fluorene	<0.000069 mg/L		<0.000069 mg/L		1	0.000069 mg/L
Fluoride	0.402 mg/L		0.402 mg/L		1	0.026 mg/L
gamma-BHC	<0.00000028 mg/L		<0.00000028 mg/L		1	0.00000028 mg/L
ardness as calcium carbona	74 mg/L		74 mg/L		1	0.52 mg/L
Heptachlor	<0.00000043 mg/L		<0.00000043 mg/L		1	0.00000043 mg/L
Heptachlor epoxide	<0.00000032 mg/L		<0.00000032 mg/L		1	0.00000032 mg/L
Hexachlorobenzene	<0.000056 mg/L		<0.000056 mg/L		1	0.000056 mg/L
Hexachlorobutadine	<0.000069 mg/L		<0.000069 mg/L		1	0.000069 mg/L
Hexachlorocyclopentadiene	<0.0005 mg/L		<0.0005 mg/L		1	0.0005 mg/L
Hexachloroethane	<0.00013 mg/L		<0.00013 mg/L		1	0.00013 mg/L
Indeno[1,2,3-cd]pyrene	<0.000085 mg/L		<0.000085 mg/L		1	0.000085 mg/L
Iron	0.33 mg/L		0.33 mg/L		1	0.047 mg/L
Isophorone	<0.00019 mg/L		<0.00019 mg/L		1	0.00019 mg/L

Pollutant	Average Concentration		Maxium Concentration		No. Storm Events Sampled	Quantitation Limit
	Grab Sample	Flow-Weighted Composite Sample	Grab Sample	Flow-Weighted Composite Sample		
Lead	<0.00045 mg/L		<0.00045 mg/L		1	0.00045 mg/L
Magnesium	2.8 mg/L		2.8 mg/L		1	0.061 mg/L
Manganese	0.022 mg/L		0.022 mg/L		1	0.0035 mg/L
Mercury	<0.00013 mg/L		<0.00013 mg/L		1	0.00013 mg/L
thylene Blue Active Substan	0.65 mg/L		0.65 mg/L		1	0.049 mg/L
Methylene Chloride	<0.00089 mg/L		<0.00089 mg/L		1	0.00089 mg/L
Molybdenum	0.0091 mg/L		0.0091 mg/L		1	0.0011 mg/L
Naphthalene	<0.000059 mg/L		<0.000059 mg/L		1	0.000059 mg/L
Nickel	0.0016 mg/L		0.0016 mg/L		1	0.0015 mg/L
Nitrate Nitrite as N	0.47 mg/L		0.47 mg/L		1	0.065 mg/L
Nitrobenzene	<0.0005 mg/L		<0.0005 mg/L		1	0.0005 mg/L
Nitrobenzene-d5	0.0045 mg/L		0.0045 mg/L		1	
Nitrogen, Kjeldahl	0.73 mg/L		0.73 mg/L		1	0.12 mg/L
N-Nitrosodiumethylamine	<0.00026 mg/L		<0.00026 mg/L		1	0.00026 mg/L
N-Nitrosodi-n-propylamine	<0.000071 mg/L		<0.000071 mg/L		1	0.000071 mg/L
N-Nitrosodiumphenylamine	<0.00012 mg/L		<0.00012 mg/L		1	0.00012 mg/L
PCB-1016	<0.0000045 mg/L		<0.0000045 mg/L		1	0.0000045 mg/L
PCB-1221	<0.0000054 mg/L		<0.0000054 mg/L		1	0.0000054 mg/L
PCB-1232	<0.000005 mg/L		<0.000005 mg/L		1	0.000005 mg/L
PCB-1242	<0.0000087 mg/L		<0.0000087 mg/L		1	0.0000087 mg/L
PCB-1248	<0.0000028 mg/L		<0.0000028 mg/L		1	0.0000028 mg/L
PCB-1254	<0.0000091 mg/L		<0.0000091 mg/L		1	0.0000091 mg/L
PCB-1260	<0.0000037 mg/L		<0.0000037 mg/L		1	0.0000037 mg/L
Pentachlorophenol	<0.00085 mg/L		<0.00085 mg/L		1	0.00085 mg/L
Phenanthrene	<0.00016 mg/L		<0.00016 mg/L		1	0.00016 mg/L
Phenol	<0.00049 mg/L		<0.00049 mg/L		1	0.00049 mg/L
Phenol-d5	0.0043 mg/L		0.0043 mg/L		1	
Pyrene	<0.000054 mg/L		<0.000054 mg/L		1	0.000054 mg/L
Selenium	<0.00089 mg/L		<0.0089 mg/L		1	0.00089 mg/L
Silver	<0.00053 mg/L		<0.00053 mg/L		1	0.00053 mg/L
Sulfate	36.4 mg/L		36.4 mg/L		1	0.756 mg/L
Sulfide	<1.3 mg/L		<1.3 mg/L		1	1.3 mg/L
Terphenyl-d14	0.0042 mg/L		0.0042 mg/L		1	
Tetrachloroethene	<0.00047 mg/L		<0.00047 mg/L		1	0.00047 mg/L
Tetrachloro-m-xylene	0.000021 mg/L		0.000032 mg/L		1	
Thallium	<0.0002 mg/L		<0.0002 mg/L		1	0.0002 mg/L
Toluene	<0.00046 mg/L		<0.00046 mg/L		1	0.00046 mg/L
Toluene-d8	0.0096 mg/L		0.0096 mg/L		1	
TDS	630 mg/L		630 mg/L		1	10 mg/L
TOC	28 mg/L		28 mg/L		1	0.51 mg/L
Toxaphene	<0.000047 mg/L		<0.000047 mg/L		1	0.000047 mg/L
trans-1,2-Dichloroethene	<0.00067 mg/L		<0.00067 mg/L		1	0.00067 mg/L
trans-1,3-Dichloropropene	<0.00058 mg/L		<0.00058 mg/L		1	0.00058 mg/L
Trichloroethene	<0.00069 mg/L		<0.00069 mg/L		1	0.00069 mg/L
Vinyl chloride	<0.00041 mg/L		<0.00041 mg/L		1	0.00041 mg/L
Zinc	0.066 mg/L		0.066 mg/L		1	0.015 mg/L

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF CLEAN WATER

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM APPLICATION FOR INDIVIDUAL PERMIT TO DISCHARGE INDUSTRIAL WASTEWATER

MODULE 5 – COOLING WATER INTAKE STRUCTURE

New Facilities

1. Identify the Track chosen to comply with 316(b) requirements:
   - ☐ Track I – 40 CFR 125.84(b) (facilities that withdraw greater than or equal to 10 MGD)
   - ☐ Track I – 40 CFR 125.84(c) (facilities that withdraw greater than 2 MGD and less than 10 MGD)
   - ☐ Track II – 40 CFR 125.84(d) (comparable to Track I)

2. Provide a narrative description of the system that has been designed to reduce intake flow to a level commensurate with that that can be attained by a closed-cycle recirculating cooling water system and any engineering calculations, including documentation that make-up and blowdown flows have been minimized.

   Not Applicable

3. If the flow reduction requirement is met entirely, or in part, by reusing or recycling water withdrawn for cooling purposes in subsequent industrial processes, provide documentation that the amount of cooling water that is not reused or recycled has been minimized.

   Not Applicable

4. Provide a narrative description of the design, structure, equipment and operation used to meet the maximum through-screen design intake velocity requirement of no more than 0.5 fps.

   Not Applicable

5. Provide design calculations showing that the velocity requirement will be met at minimum ambient source water surface elevations and maximum head loss across the screens or other device.

   Not Applicable

6. Track I – Attach a Design and Construction Technology Plan. Attached: ☐ Yes ☒ No

7. Flow Requirements – Report the annual mean flow, mean low water tidal excursion distance, or a narrative description of the water body thermal stratification, with supporting documentation and engineering calculations, as applicable (see instructions).

   Not Applicable

8. Track II – Attach a Comprehensive Demonstration Study. Attached: ☒ Yes ☐ No

Source Water Physical Data

1. List the name(s) of the water body(ies) from which cooling water is or will be withdrawn.

   Ohio River

2. Provide a narrative description of the physical configuration of all source water bodies and attach scaled drawings.

   See attached 112.21r Report

3. Identify and characterize the source water body's hydrological and geomorphological features and methods used to determine the intake's area of influence and results of such studies.

   See attached 112.21r Report

4. Attach locational maps showing the source waters. Attached: ☒ Yes ☐ No

Cooling Water Intake Structure Data

1. Provide a narrative description of the configuration of each CWIS and where it is located in the water body and in the water column.

   See attached 112.21r Report

2. Provide the latitude and longitude for each CWIS.

CWIS ID No.	Latitude			Longitude		
	DEG	MIN	SEC	DEG	MIN	SEC
1	40	40	4.57	80	20	47.34

3. Provide a narrative description of the operation of each CWIS, including design intake flows, daily hours of operation, number of days per year in operation, and seasonal changes, if applicable.

   Intake flow is expected to be in the range 18 to 21 MGD. Daily hours of operation is 24 hours and CWIS will operate 365 days a year.

4. Attach to Module 5 a flow distribution and water balance diagram that includes all sources of water to the facility, recirculating flows, and discharges. Attached: ☒ Yes ☐ No

5. Attach to Module 5 engineering drawings of the CWISs. Attached: ☒ Yes ☐ No

Source Water Baseline Biological Characterization Data

1. Identify all data requested by 40 CFR 122.21(r)(4)(ii) through (vi) that are not available and efforts made to identify sources of the data.

   See attached 112.21r Report

2. Report species (or relevant taxa) for all life stages and their relative abundance in the vicinity of the CWISs.

   See attached 112.21r Report

3. Identify the species and life stages that would be most susceptible to impingement and entrainment.

   See attached 112.21r Report

4. Identify and evaluate the primary period of reproduction, larval recruitment, and period of peak abundance for relevant taxa.

   See attached 112.21r Report

5. Report data representative of the seasonal and daily activities of biological organisms in the vicinity of the CWISs.

   See attached 112.21r Report

6. Identify all threatened, endangered and other protected species that might be susceptible to impingement and entrainment and the CWISs.

   See attached 112.21r Report

7. Document any public participation or consultation with federal or state agencies in development of the plan.

   See attached 112.21r Report

8. For owners or operators of existing facilities only, identify protective measures and stabilization activities that have been implemented, and a description of how these measures and activities affected the baseline water condition in the vicinity of the intake.

   The streambank directly upstream and downstream of the CWIS is susceptible to erosion; therefore, slope erosion protection approximately 50 feet upstream and downstream of the CWIS was installed. The stabilization was installed above the ordinary high-water elevation to avoid permanently impacting the riverbed and conducted under GP-3 issued by the DEP for no adverse impacts.

9. For owners or operators of existing facilities, provide a list of fragile species at the facility as defined in 40 CFR 125.92(m).

   See attached 112.21r Report

10. Identify all federally listed species and designated critical habitat in the vicinity of the CWIS.

    See attached 112.21r Report

Cooling Water System Data

1. Provide a narrative description of the operation of the cooling water system and its relationship to CWISs.

   See attached 112.21r Report

2. Identify the number of days per year the cooling water system is in operation and seasonal changes in the operation of the system, if applicable.

   Cooling water system is operated 365 days a year.

3. Report the proportion of design intake flow for contact cooling, non-contact cooling and process uses.

   Contact Cooling: **%** Non-Contact Cooling: **87%** Process: **13%**

4. Describe water reuse, if applicable, including cooling water reused as process water, process water reused for cooling, and the use of gray water for cooling.

   Provisions are made to use cooling water blowdown for freeze protection of wastewater equalization tanks and to provide micronutrients for wastewater biological treatment plant

5. Describe reductions in total water withdrawals including cooling water intake flow reductions already achieved through minimized process water withdrawals.

   Water demand is reduced by using closed loop non-contact cooling and six cycles of concentration for the cooling towers. Steam condensate is recycled and mixed with demin water and returned to steam plant. Flow to the water treatment plant is controlled based on water demand to avoid excessive withdrawal.

6. Identify and describe any cooling water that is used in a manufacturing process either before or after it is used for cooling, including other recycled process water flows.

   Provisions are made to use cooling water blowdown for freeze protection of wastewater equalization tanks and to provide micronutrients for wastewater biological treatment plant

7. Report the proportion of the source water body withdrawn, on a monthly basis.

   Less than 0.6% at lowest monthly flow

8. Provide (or attach to Module 5) all design and engineering calculations prepared by a qualified professional and data to support responses to questions 1 through 7 in this section. Attached: ☒ Yes ☐ No

   Refer to Water Balance included in this NPDES renewal application

9. Describe existing impingement and entrainment technologies or operational measures and a summary of their performance.

   See attached 112.21r Report

Chosen Method(s) of Compliance with Impingement Mortality Standard

1. Check the appropriate box to indicate which method(s) have been selected to comply with the impingement mortality standard. Also check the appropriate box on the right to indicate whether this method applies to the facility as a whole or to a specific CWIS. If it applies to a specific CWIS, provide the ID No.

☒ 40 CFR 125.94(c)(1) – Closed-Cycle Recirculating System	☒ Facility ☐ CWIS ID:
☒ 40 CFR 125.94(c)(2) – 0.5 Feet Per Second Through-Screen Design Velocity	☒ Facility ☐ CWIS ID:
☐ 40 CFR 125.94(c)(3) – 0.5 Feet Per Second Through-Screen Actual Velocity	☐ Facility ☐ CWIS ID:
☐ 40 CFR 125.94(c)(4) – Existing Offshore Velocity Cap	☐ Facility ☐ CWIS ID:
☐ 40 CFR 125.94(c)(5) – Modified Traveling Screens	☐ Facility ☐ CWIS ID:
☐ 40 CFR 125.94(c)(6) – Systems of Technologies as the BTA for Impingement Mortality	☐ Facility ☐ CWIS ID:
☐ 40 CFR 125.94(c)(7) – Impingement Mortality Performance Standard	☐ Facility ☐ CWIS ID:

If options 125.94(c)(5) or 125.94(c)(6) are selected, attach an Impingement Technology Performance Optimization Study.

Attached: ☐ Yes ☒ No

2. If a BTA determination for impingement mortality under 40 CFR 125.94(c)(11) or (12), check the appropriate box and attach supporting documentation to Module 5.

☐ 40 CFR 125.94(c)(11) ☐ 40 CFR 125.94(c)(12) ☒ Not Applicable

Entrainment Performance Studies

Attach to Module 5 any previously conducted studies or studies obtained from other facilities addressing technology efficacy, through-facility entrainment survival, and other entrainment studies. See instructions.

Attached: ☒ Yes ☐ No

Operational Status

1. For power production or steam generation, describe each individual unit operating status, including age of each unit, capacity utilization rate for the previous 5 years, and any major upgrades completed within the past 15 years. See instructions.

2. Describe completed, approved or scheduled uprates and Nuclear Regulatory Commission relicensing status of each unit at nuclear facilities.

Not Applicable

3. For process units using cooling water other than for power production or steam generation, if the applicant intends to use reductions in flow or changes in operations to meet the requirements of 40 CFR 125.95(c), describe individual production processes and product lines, operating status including age of each line, seasonal operation, any major upgrades completed within the last 15 years, and plans or schedules for decommissioning or replacement of process units or production processes and product lines.

We are not proposing to use reduction in flow or changes in operation to meet these requirements.

4. For all manufacturing facilities, describe current and future production schedules.

5. Explain plans or schedules for any new units planned within the next 5 years.

No new units are planned

Additional Studies

1. Check the appropriate boxes to indicate whether required studies for existing facilities withdrawing greater than 125 MGD (actual intake flow) are attached to Module 5.

☐ 40 CFR 122.21(r)(9) – Entrainment Characterization Study

☐ 40 CFR 122.21(r)(10) – Comprehensive Technical Feasibility and Cost Evaluation Study

☐ 40 CFR 122.21(r)(11) – Benefits Valuation Study

☐ 40 CFR 122.21(r)(12) – Non-Water Quality Environmental and Other Impacts Study

2. Is an entrainment reduction technology evaluation for existing facilities withdrawing less than or equal to 125 MGD attached?
☐ Yes ☐ No

New Units

Identify the chosen compliance method for all new units at existing facilities. See instructions.

Not Applicable

Section 5

Clean Water Act 316(b) 122.21 (r) Reports

AECOM

40 CFR §122.21(r)(2-8) NPDES Renewal Application Requirements for Facilities with Cooling Water Intake Structures

Shell Chemical Appalachia LLC

Shell Polymers Monaca Facility

Beaver County, PA

NPDES Permit No. PA0002208

August 11, 2025

Delivering a better world

Prepared for:

Shell Chemical Appalachia LLC
300 Frankfort Road
Monaca, PA 15061-2210

Prepared by:

AECOM
625 West Ridge Pike
Conshohocken, PA 19428
aecom.com

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Attachment C – Drawings and Schematics

Attachment D – Threatened and Endangered Species Information

1.0 INTRODUCTION

This report provides supporting documentation for an existing cooling water intake structure (CWIS) located at the Shell Chemical Appalachia LLC (Shell), Shell Polymers Monaca Facility (SPM facility or "facility"). The SPM facility is located along the left descending bank of the Ohio River immediately west of the town of Monaca, Pennsylvania (**Figure 1-1**). The site resides on the Montgomery Pool of the Ohio River which is entirely within the state of Pennsylvania. The Beaver River flows into the Montgomery Pool from the north, upstream of the site. Raccoon Creek enters the Montgomery Pool along the left descending bank approximately 2,100 feet downstream of the SPM Facility CWIS (**Figure 1-2**). The existing CWIS is situated along the Montgomery Pool segment between river miles (RMs) 27.0 and 29.5.

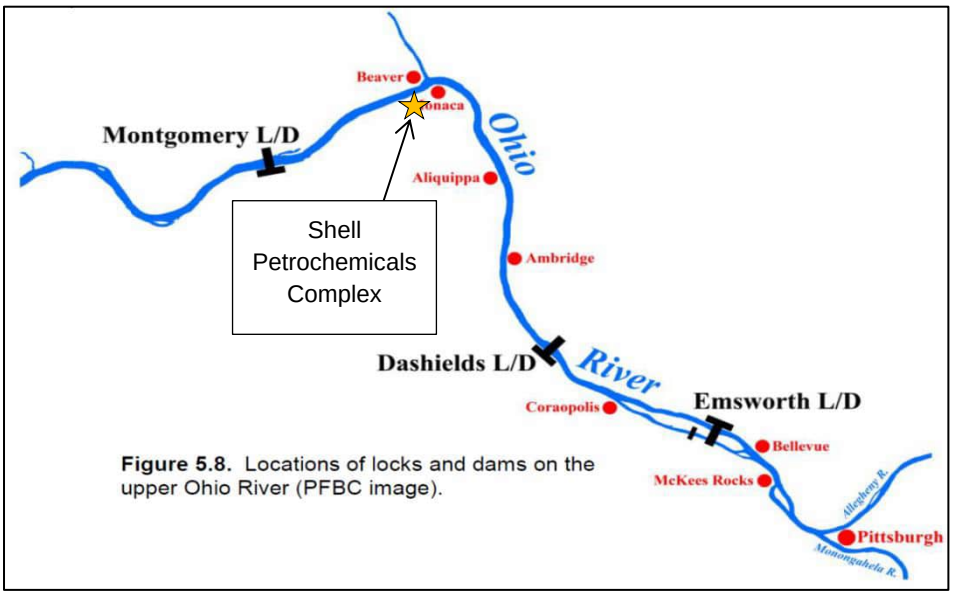

Figure 1-1: Location of SPM Petrochemicals Complex on the Montgomery Pool for the Ohio River in Pennsylvania (Original from PFBC 2010, Figure 5.8)

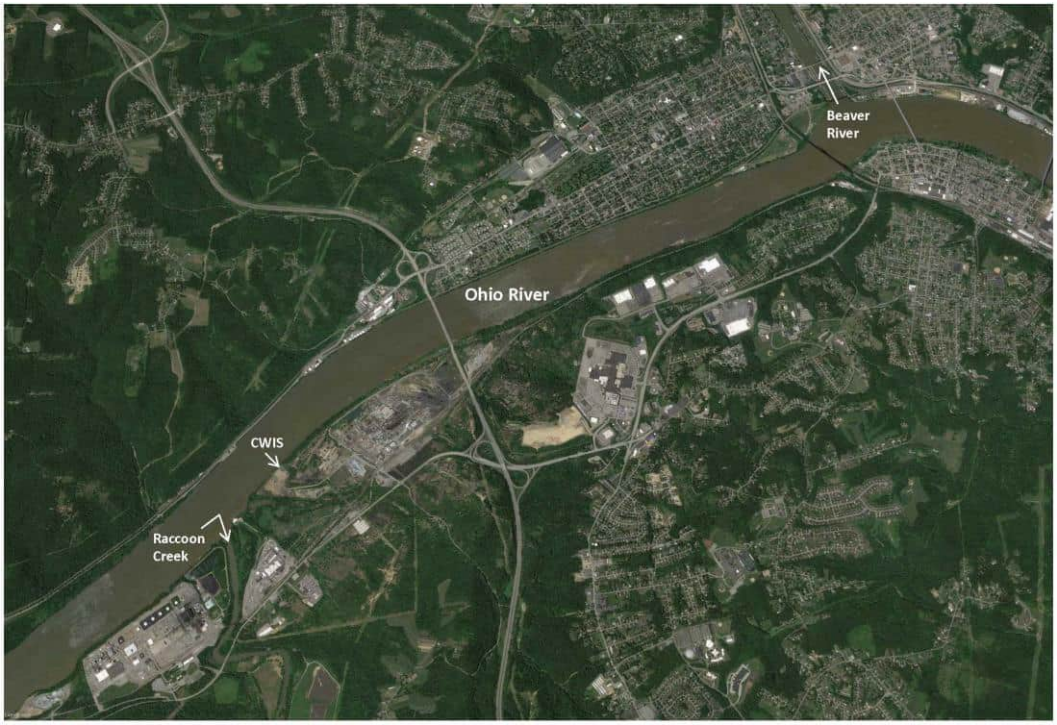

Figure 1-2: Location of SPM Facility CWIS

1.1 Regulatory Requirement

40 CFR §122.21(r) contains National Pollutant Discharge Elimination System (NPDES) application requirements for facilities with cooling water intake structures (CWIS). §122.21(r)(1)(ii) states that all existing facilities must submit to the Director for review the information required under paragraphs (r)(2) and (3), and applicable provisions of (r)(4), (5), (6), (7), and (8) of §122.21. This information consists of physical, biological, and operational data for each cooling water source, cooling water intake structure (CWIS), and cooling water system utilized at the facility.

This document is intended to:

- Fulfill the regulatory requirement for submittal of §122.21(r) (2-8) information for the Shell Chemical Appalachia LLC (Shell), Shell Polymers Monaca Facility (SPM Facility), an existing facility subject to the 2014 Existing Facilities Rule;
- Be submitted in support of the SPM Facility's NPDES permit renewal application.

1.2 SPM 'Existing Facility' Determination

This section also summarizes the relevant CWIS definitions promulgated by the United States Environmental Protection Agency (USEPA) under the authority of the CWA section 316(b) to demonstrate that the petrochemical complex is regulated as an Existing Facility under CWIS regulations.

On May 19, 2014, USEPA released a pre-publication version of a Final Rule with new CWIS regulations for Existing Facilities that included the following definition at 40 CFR Part 125.92(k):

> ***Existing facility*** *means any facility that commenced construction as described in 40 CFR 122.29(b)(4) on or before January 17, 2002 (or July 17, 2006 for an offshore oil and gas extraction facility) and any modification of, or any addition of a unit at such a facility.*[1] *A facility built adjacent*

[1] The site meets the definition of an Existing Facility.

to another facility would be a new facility while the original facility would remain as an existing facility for purposes of this subpart. A facility cannot both be an existing facility and a new facility as defined at §125.83.

On December 18, 2001, USEPA published the Final Phase I Rule with CWIS regulations for New Facilities that included the following definitions at 40 CFR Part 125.83:

Cooling water intake structure *means 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.*

Existing Facility *means any facility that is not a* ***New Facility;*** *and*

New Facility *means any building, structure, facility, or installation that meets the definition of a "new source" or "new discharger" in 40 CFR 122.2 and 122.29(b)(1), (2), and (4) and is a greenfield or standalone facility; commences construction after January 17, 2002; and uses either a newly constructed cooling water intake structure, or an existing cooling water intake structure whose design capacity is increased to accommodate the intake of additional cooling water.[2] New facilities include only "greenfield" and "standalone" facilities. A greenfield facility is a facility that is constructed at a site at which no other source is located, or that totally replaces the process or production equipment at an existing facility (see 40 CFR 122.29(b)(1)(i) and (ii)).[3] A stand-alone facility is a new, separate facility that is constructed on property where an existing facility is located and whose processes are substantially independent of the existing facility at the same site (see 40 CFR 122.29(b)(1)(iii)).[4] New facility does not include new units that are added to a facility for purposes of the same general industrial operation (for example, a new peaking unit at an electrical generating station).*

(1) Examples of "new facilities" include, but are not limited to the following scenarios:

(i) A new facility is constructed on a site that has never been used for industrial or commercial activity. It has a new cooling water intake structure for its own use.

(ii) A facility is demolished and another facility is constructed in its place. The newly-constructed facility uses the original facility's cooling water intake structure, but modifies it to increase the design capacity to accommodate the intake of additional cooling water.[5]

(iii) A facility is constructed on the same property as an existing facility, but is a separate and independent industrial operation. The cooling water intake structure used by the original facility is modified by constructing a new intake bay for the use of the newly constructed facility or is otherwise modified to increase the intake capacity for the new facility.

(2) Examples of facilities that would not be considered a "new facility" include, but are not limited to, the following scenarios:

[2] The SPM petrochemicals complex decreased total water intake from approximately 80 MGD to approximately 20 MGD.

[3] The SPM petrochemicals complex is not a greenfield facility.

[4] The SPM petrochemical complex is not a stand-alone facility.

[5] This example best represents the demolition of the former Horsehead facility and construction of the SPM facility. The Shell facility uses Horsehead's original intake structure. Rather than increasing design capacity, SPM decreased the intake's design capacity from approximately 80 MGD to approximately 20 MGD. As a result, SPM is not considered a New Facility.

> *(i) A facility in commercial or industrial operation is modified and either continues to use its original cooling water intake structure or uses a new or modified cooling water intake structure.* [6]
>
> *(ii) A facility has an existing intake structure. Another facility (a separate and independent industrial operation), is constructed on the same property and connects to the facility's cooling water intake structure behind the intake pumps, and the design capacity of the cooling water intake structure has not been increased.*[7] *This facility would not be considered a "new facility" even if routine maintenance or repairs that do not increase the design capacity were performed on the intake structure.*

As described by the above regulatory definitions and examples, the CWIS regulations that apply to an intake structure are not dependent on whether the intake structure is new or existing but whether the proposed facility is new or existing *and if a modification to increase capacity occurs.* Per the above regulatory citations, Shell's petrochemicals facility meets the definition of an Existing Facility.

In issuing the existing SPM NPDES Permit No. PA0002208 (effective March 1, 2021), PADEP concurred with the determination that Shell is an "existing facility" as described in the Fact Sheet (PADEP 2021):

> *DEP examined the regulatory classification of Shell in detail and concluded that, with respect to regulation under Section 316(b) of the Clean Water Act, Shell is an "existing facility".*

As such, SPM is subject to the requirement of the Existing Facilities Rule at §122.21(r) since it meets the following three criteria stated in §125.91(a):

- The facility is a point source;
- The facility uses or proposes to use one or more CWIS's 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
- Twenty-five percent or more of the water the facility withdraws on an actual intake flow (AIF) basis is used exclusively for cooling purposes

[6] The SPM petrochemicals complex meets the designated criteria and is not considered a New Facility.

[7] Since SPM did not increase the existing intake's design capacity, SPM is not considered a New Facility.

2.0 §122.21(r)(2) – SOURCE WATER PHYSICAL DATA

2.1 Source Waterbody Narrative Description

Regulatory requirement at §122.21(r)(2)(i): "A narrative description and scaled drawings showing the physical configuration of all source water bodies used by your facility, including areal dimensions, depths, salinity and temperature regimes, and other documentation that supports your determination of the waterbody type where each cooling water intake structure is located."

The SPM facility is located along the left descending riverbank between Ohio River miles 27.0 to 29.5 in Potter and Center Townships Beaver County, Pennsylvania (immediately west of the town of Monaca). The project area is located entirely within the Montgomery Pool and is approximately two miles upriver from the Montgomery Locks and Dam located at river mile 31.7. The Ohio River is formed from the confluence of the Allegheny and Monongahela Rivers and is the only navigable river in North America with river miles numbered from its origin. The Montgomery Pool is approximately 18.5 miles long and the third Pool on the Ohio River. SPM is within the last downstream quarter of the pool.

2.1.1 PA Ohio River setting

The Ohio River begins in the city of Pittsburgh, Pennsylvania with the confluence of the Allegheny and Monongahela Rivers (USACE 2016). It is the second largest river system in the United States, based on annual discharge with forty miles located in the state of Pennsylvania. Municipal and industrial wastes deposited into the River throughout the 1800s and early- to mid-1900s resulted in widespread water quality degradation and habitat destruction. Beginning in the 1970's state and federal efforts focused on increasing water quality in the River and have resulted in increased fish populations and native species reclaiming native ranges (PFBC 2010).

Although the aquatic community in the Pennsylvania portion of the Ohio River has shown positive trends since the 1970's, it is still negatively impacted by the lock and dam system that inhibits movement of fish and other organisms along the length of the River. These locks and dams have largely eliminated instream riparian habitat throughout the Pennsylvania portion of the Ohio River (PFBC 2010). Additional alterations to instream habitat have resulted from commercial sand and gravel dredging and dredging conducted to facilitate commercial navigation. Finally, the Ohio River is still impacted from persistent contaminants such as polychlorinated biphenyls (PCBs), chlordane and mercury that have prompted the Pennsylvania Department of Environmental Control to publish fish consumption advisories that include Do Not Eat Advisories for catfish and carp in the Ohio River (PFBC 2010).

2.1.2 Montgomery Pool

The Montgomery Pool is bound upstream by the Dashields Locks and Dam and downstream by the Montgomery Locks and Dam. The pool is gently graded and averages approximately 1,400 ft. wide and 25 ft. deep. Although the terrestrial habitat adjacent to the Pool is predominantly classified as deciduous forest or pasture/crop land, the water body is heavily influenced by the nearby Pittsburgh metropolitan area. High volumes of commercial barge traffic and recreational users are common on all Ohio River Pools in Pennsylvania. Benthic substrate within the Montgomery Pool is relatively coarse with boulder, cobble and gravel making up approximately 45 percent of the bottom, sand accounting for another 40 percent and only 13 percent of the substrate described as fines (ORSANCO 2010). Habitat along the shoreline has been largely altered with large rocks and boulders to prevent erosion. However, fallen trees provide significant shoreline aquatic habitat for fish. Small amounts of submerged aquatic vegetation have been noted within the Pool (ORSANCO 2010). The Beaver River, entering from the right descending back across from the town of Monaca, Pennsylvania is the only major tributary entering the Montgomery Pool (PFBC 2010). Raccoon Creek (a minor tributary) enters the Montgomery Pool along the left descending bank approximately 2,100 feet downstream of the CWIS (**Figure 1-2**).

2.1.3 Water Quality

Water quality parameters including pH, dissolved oxygen, and specific conductance are monitored at the Montgomery Dam by the United States Geological Survey (USGS) station 03108500 (USGS, 2025). Specific conductance and pH are monitored year-round and dissolved oxygen is monitored during the warmer months (approximately from April through October). The following discussion uses the most recent data set from the USGS site for the period of November 2022 through April 2025[8].

Specific conductance at the Montgomery Dam generally ranges from 200 microsiemens per centimeter (µS/cm) to 450 µS/cm throughout the year (**Figure 2-1**). Departures from this range are rare. Monthly average specific conductance ranges from 267 µS/cm to 381 µS/cm with lower values occurring during high flow months and higher values occurring during lower flow months in the summer and fall (**Table 2-1**). Published water quality standards for specific conductance for the Ohio River have not been identified.

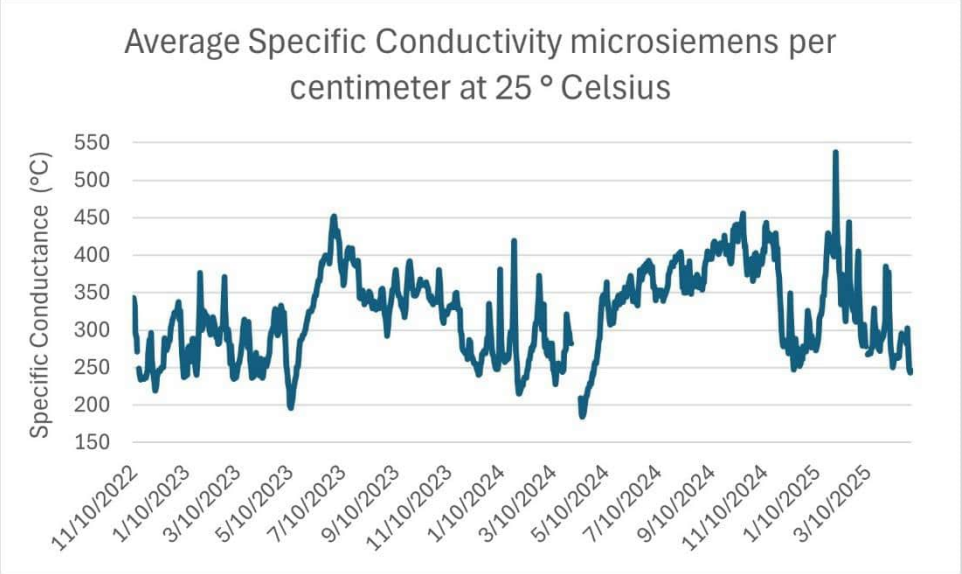

Figure 2-1: Specific Conductivity (µS/cm) at Montgomery Dam and Locks from 11/2022 through 04/2025 (USGS 03108500).

Table 2-1: Mean Monthly Specific Conductance at Montgomery Locks and Dam from 11/2022 through 04/2025 (USGS 03108500)[9].

Month	Mean Monthly Specific Conductance (µS/cm at 25 °C) (11/2022 – 04/2025)
January	301
February	317
March	274
April	267
May	296
June	367
July	381
August	354
September	376
October	381

[8] USGS recorded data are initially listed as "provisional" until they have been reviewed and pass through a quality assurance process. After this process they are considered "approved". Data used in this report are from November 2022 through April 2025, which includes some provisional data.
[9] Value is the mean of daily average values reported by the USGS.

Month	Mean Monthly Specific Conductance (µS/cm at 25 °C) (11/2022 – 04/2025)
November	338
December	274

The pH at the Montgomery Dam generally ranges from 7.0 to 8.5 throughout the year (**Figure 2-2**). Monthly average pH is stable with average values near 7.5 (**Table 2-2**). ORSANCO's water quality standard for pH is 6.0 to 9.0 (ORSANCO 2014). Based on the most recent data set from USGS monitoring station at Montgomery Locks and Dam, pH is within the acceptable range.

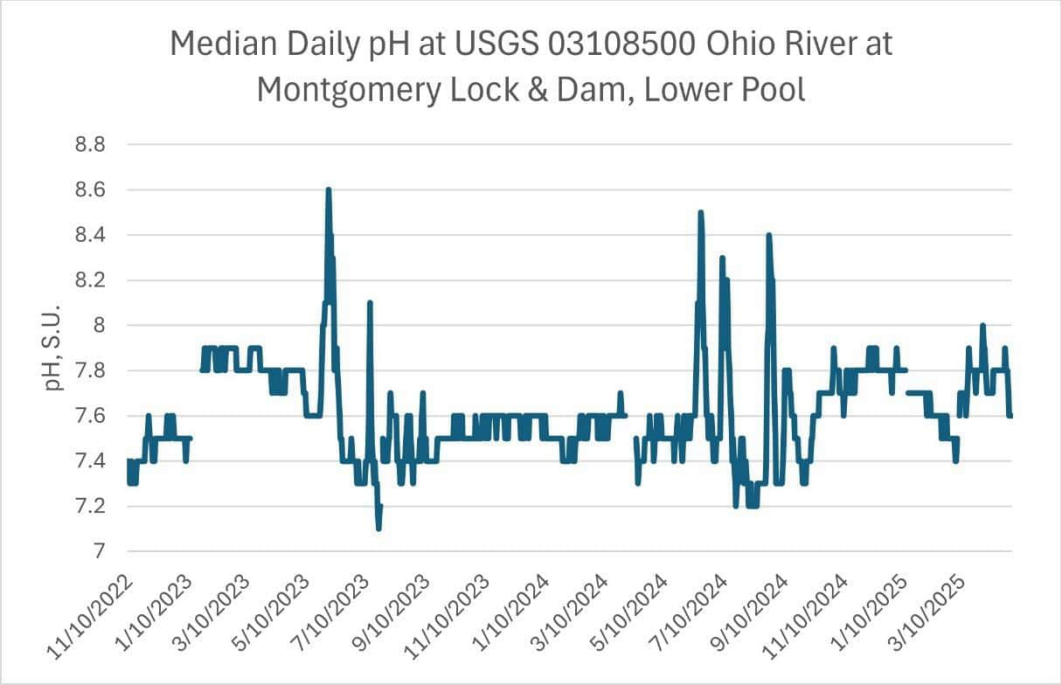

Figure 2-2: pH at Montgomery Dam and Locks from 11/2022 through 04/2025 (USGS 03108500).

Table 2-2: Average Monthly median pH at Montgomery Locks and Dam from 11/2022 through 04/2025 (USGS 03108500)[10]

Month	Mean Monthly pH (Standard Units) (11/2022 – 04/2025)
January	7.62
February	7.66
March	7.70
April	7.70
May	7.62
June	7.73
July	7.50
August	7.48
September	7.56
October	7.56
November	7.59

[10] Value is the Mean of Monthly Average Values reported by the USGS.

Month	Mean Monthly pH (Standard Units) (11/2022 – 04/2025)
December	7.63

Dissolved oxygen trends lower in warmer months and higher in cooler months with levels rarely dropping below 8.0 milligrams per liter (mg/L)(**Figure 2-3**). Minimum average dissolved oxygen is observed during July (7.8 mg/L) (**Table 2-3**). ORSANCO's water quality standard for dissolved oxygen is > 4.0 mg/L for acute exposure and > 5.0 mg/L for chronic exposure. Dissolved oxygen levels appear to be within ORSANCO's water quality standards at the USGS monitoring station at Montgomery Locks and Dam (ORSANCO 2014).

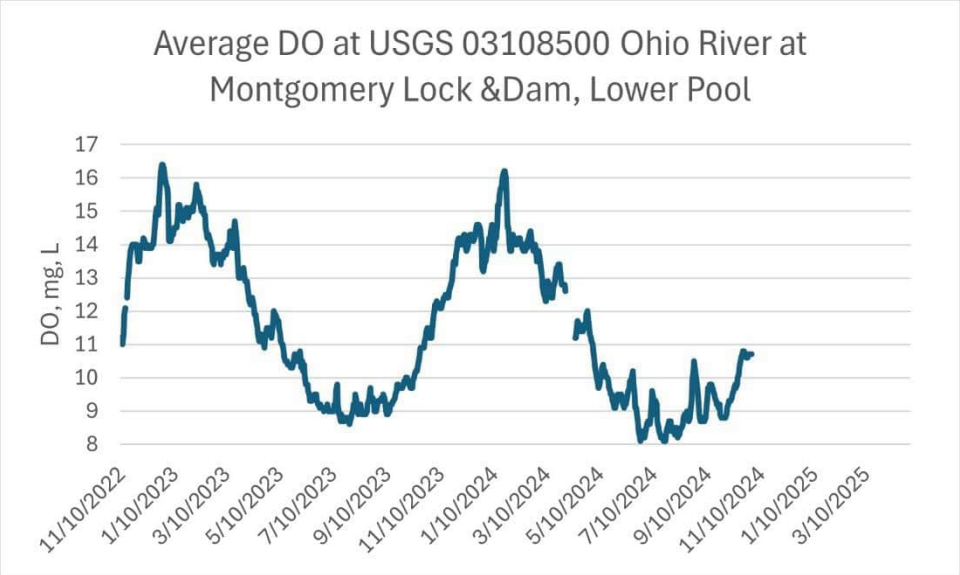

Figure 2-3: Dissolved Oxygen Measurements at Montgomery Dam and Locks from 11/2022 through 04/2025 (USGS 03108500).

Table 2-3: Mean Monthly Dissolved Oxygen at Montgomery Locks and Dam from 11/2022 through 04/2025 (USGS 03108500)[11]

Month	Mean Monthly Dissolved Oxygen (mg/L) (11/2022 – 04/2025)
January	14.8
February	14.3
March	13.3
April	11.7
May	10.4
June	9.4
July	8.8
August	9.1
September	9.3
October	10.3
November	12.7
December	14.4

[11] Value is the Mean of Daily Average Values reported by the USGS.

2.1.4 Temperature Regimes

Water temperature follows seasonal trends that are fairly consistent from year to year (**Figure 2-4**). Maximum water temperature is generally observed during July and August (monthly mean temperature of 26.7°C and 25.6°C for July and August, respectively (**Table 2-4**)). Annual absolute maximum temperatures are about 28°C (USGS 2025). Minimum annual temperatures are generally at or near 0°C and observed in January or February.

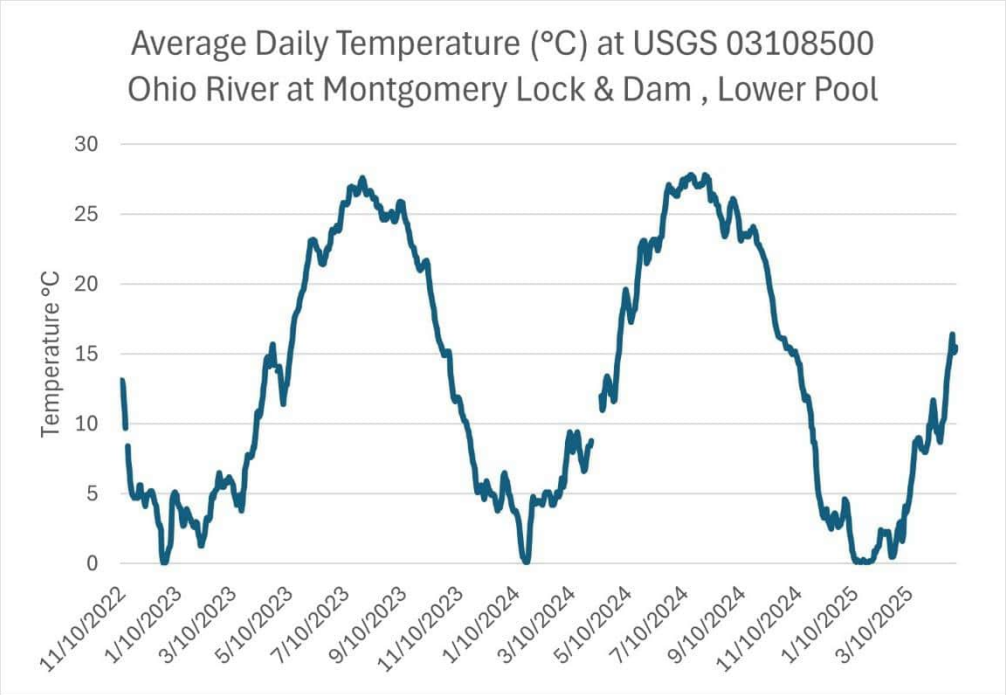

Figure 2-4: Temperature at Montgomery Dam and Locks from 11/2022 through 04/2025 (USGS 03108500).

Table 2-4: Mean Monthly Temperature at Montgomery Locks and Dam from 01/2023 through 04/2025 (USGS 03108500)[12]

Month	Mean Monthly Temperature (°C) (11/2022 – 04/2025)
January	2.4
February	3.4
March	6.7
April	12.2
May	18.0
June	23.5
July	26.7
August	25.6
September	23.8
October	18.1
November	10.3

[12] Value is the Mean of Daily Average Values reported by the USGS.

Month	Mean Monthly Temperature (°C) (11/2022 – 04/2025)
December	4.0

2.2 Hydrological and Geomorphological Features

Regulatory requirement at §122.21(r)(2)(ii): "Identification and characterization of the source waterbody's hydrological and geomorphological features, as well as the methods you used to conduct any physical studies to determine your intake's area of influence within the waterbody and the results of such studies."

2.2.1 Hydrology and Geomorphology

The Ohio River originates in southwestern Pennsylvania at the confluence of the Monongahela and Allegheny Rivers (Lock Hydro 2012). It extends 981 miles through the states of Pennsylvania, Ohio, West Virginia, Kentucky, Indiana, and Illinois before joining the Mississippi River in Cairo, Illinois (Olszowka et al. 1998). The drainage basin of the Ohio River is one of the largest in the United States, encompassing portions of 15 states, with a total drainage area of 203,940 square miles (mi^2) (ORSANCO 2025).

Based on multi-beam side-scan sonar surveys in the Pennsylvania portion of the Ohio River, the deepest locations are dredge pits created by commercial sand and gravel dredging (USACE 2016, PFBC 2010). While the dredge pits are present throughout the Dashields, Montgomery, and New Cumberland Pools, deep pits (>60 ft.) are only present in the New Cumberland Pool. Dashields and Montgomery Pools are more evenly graded with typical water depths reaching 22 ft. to 24 ft. (USACE 2016) although greater depths have been observed (40 ft. – 50 ft.) (URS 2014). Within the Montgomery pool, the channel is confined within a relatively narrow, steep-walled valley (PADEP 2010).

2.2.2 Flow Regimes

There are no discharge monitoring stations located on the Montgomery Pool. There is a discharge monitoring station attached to the Montgomery Locks and Dam, but that is located on the downstream side of the dam and attached to the right lock wall. Beaver Valley Power Station (BVPS), just south of Montgomery Locks and Dam, provided an analysis of available flow data that is applicable to SPM due to its proximity (approximately 6.5 river miles downstream of SPM) and since there are no major tributaries between the two locations. The analysis uses flow data from the closest upstream discharge monitoring station on the Ohio (USGS station 0308600) and a discharge monitoring station on the only major tributary to the Ohio River between the site and the Ohio River discharge monitoring station (USSG Station 03107500 on the Beaver River). The analysis is summarized below (**Table 2-5**).

Based on a 30-year data set, annual mean flow near the site is approximately 39,500 cubic feet per second (cfs). Monthly average flows range from 6,210 cfs in September to 137,000 cfs in March. Flows are generally highest from December through April and lowest in August and September. **Table 2-5** provides flow data from this analysis adapted from USGS river gauge data . For the purpose of developing effluent limits for NPDES permits within the Montgomery Pool, PADEP uses a conservative $7Q10^{13}$ flow of 4,730 cfs as input to their PENTOXSD model per ORSANCO requirements for the Ohio River from Pittsburgh (River Mile 0.0) to the Montgomery Dam (River Mile 31.7).

[13] The 7Q10 flow is defined as the lowest 7-day average flow that occurs at a frequency of once every ten years.

Table 2-5: Summary of Ohio River Flow Characteristics near Montgomery Locks and Dam[14]

SUMMARY OF OHIO RIVER FLOW CHARACTERISTICS NEAR MONTGOMERY LOCKS AND DAM													
Monthly Average Flow (cfs)													
	Jan	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Annual**
Min	20,717	22,870	32,760	20,180	19,619	8,600	8,088	7,108	6,210	8,241	7,193	10,548	26,173
Max	116,310	116,490	137,010	116,690	101,260	67,080	47,688	37,736	82,060	57,838	82,039	90,394	63,178
Mean	57,006	57,654	67,630	58,086	47,536	29,740	21,121	17,028	18,722	19,850	33,843	50,276	39,874

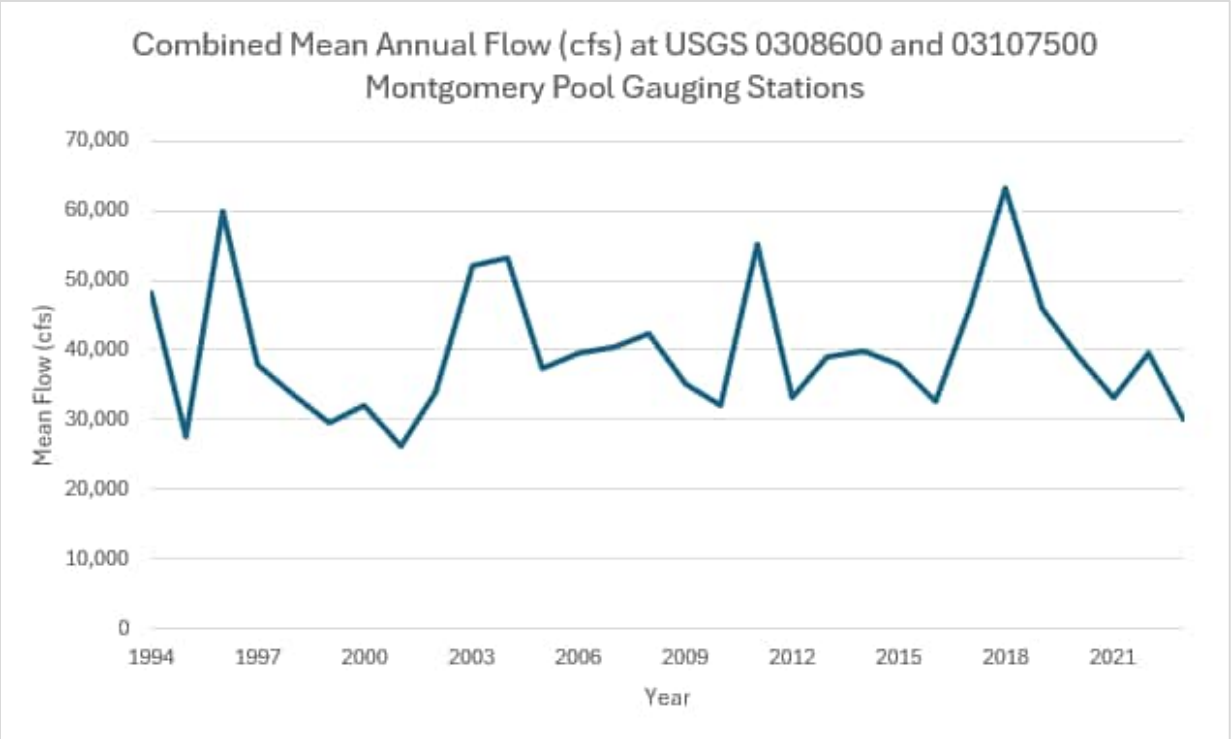

Figure 2-5: Combined mean annual flow at USGS gauging stations Sewickley (0308600) and Beaver Falls (03107500) from 1994 to 2023.

Flood events are common in the Pennsylvania section of the Ohio River due to high local topographic relief, confined river channels, highly sloped river valleys, and a high percentage of precipitation resulting in runoff (PFBC 2010). Although flooding has occurred at any time of year, the period between November through April is particularly prone to these events due to frozen or saturated soils in the drainage area (PFBC 2010).

2.2.3 Area of Influence

The hydraulic area of influence (AOI) refers to the portion of the source water body that is hydraulically affected by the withdrawal of surface water by the Facility CWIS. A desktop analysis was performed to calculate the approximate area of influence within the 0.5 fps velocity contour for the Ohio River intake. The United States Environmental Protection Agency (USEPA) considers this velocity to be a national *de minimis*

[14] Based on U.S. Geological Survey flow data from gauging stations at Sewickley (0308600, river mile 11.8) on the Ohio River and at Beaver Falls (03107500) on the Beaver River for the period of record 1994 – 2023.

value relative to significant impingement concerns because fish have the swimming ability to overcome this velocity and avoid impingement.

Based on the physical dimensions of the screen structure of the Ohio River Intake, the design intake flow, the minimum river water elevation of 678 feet and a river bed elevation of 670 feet, the approach velocity at the screenhouse trash racks is computed (using v = Q / A) to be 0.25 fps at the Design Intake Flow (DIF) rate of 21.12 MGD. At the maximum AIF of 10.44 MGD, the approach velocity is calculated at 0.12 fps. The hydraulic zone of influence at the SPM Facility therefore does not extend beyond the bar racks into the Ohio River. The calculations are provided in **Attachment B**.

2.3 Locational Maps

Regulatory requirement at §122.21(r)(2)(iii): "Locational maps."

Location maps are provided in **Attachment A.**

3.0 §122.21(r)(3) – COOLING WATER INTAKE STRUCTURE DATA

3.1 Narrative Description of Cooling Water Intake Structure

Regulatory requirement at §122.21(r)(3)(i): "A narrative description of the configuration of each of your cooling water intake structures and where it is located in the water body and in the water column"

The SPM Facility withdraws cooling water from the Ohio River via an existing CWIS that was previously used by the Horsehead Corporation. The SPM Facility is situated along the Montgomery Pool segment of the Ohio River between river miles (RMs) 27.0 and 29.5. The Ohio River is approximately 1,496 feet (ft.) wide at the SPM Facility CWIS. The Montgomery Pool is 18.5 RMs long and averages 1,400 ft. in width, with an average water column depth of 25 ft. The pool is bounded upstream by the Dashield Locks and Dam and downstream by the Montgomery Locks and Dam.

The SPM Facility's CWIS is situated slightly upstream of the Montgomery Locks and Dam. The CWIS withdraws cooling water via two partially submerged shoreline intake bays and channels. Water depth in the intake will normally be about 12 feet with a high water depth of 38 feet and a low water depth of 8 feet. The design intake flow of the CWIS is 21.12 million gallons per day (MGD).

Each of the two intake bays include the following:

- One (1) 20-foot high × 8-foot 2-inch-wide bar trash rack comprised of three sections of equal height with ½-inch × 2½-inch vertical stainless-steel bars spaced two inches on center yielding 1½-inch openings between bars (Evoqua 2017a).
- One (1) 24-foot long manually operated aluminum trash rack rake (Evoqua 2017a).
- One (1) 20-foot high × 8-foot 2-inch-wide stop log gate comprised of three sections of equal height. A lifting beam and equalizing valve are provided to allow for stop log removal (Evoqua 2017a).
- One (1) dual-flow Evoqua traveling water screen with 4-foot basket widths × 43" centers. In the dual flow system, the screen is oriented perpendicular to the direction of the intake. Influent flow is directed into both the upward and downward-moving sides of the traveling screen by wing walls. Screened flow recombines as a common effluent that leads to the intake pumps (Evoqua 2017b).

The Evoqua traveling screen is composed of 316 stainless steel with 0.072" diameter wire and 0.25" square openings. The design through screen velocity is 0.38 feet per second at normal pool elevations. There is one spray wash system leading into a common trough to a collection point for offsite disposal (debris basket). There is no fish return.

Three pumps are located downstream of the traveling screens. Up to two pumps are in operation at any given time and one is an installed standby pump.

3.2 Latitude and Longitude of Cooling Water Intake Structure

Regulatory requirement at §122.21(r)(3)(ii): "Latitude and longitude in degrees, minutes and seconds for each of your cooling water structure"

The SPM Facility's Ohio River CWIS is located at latitude 40° 40' 4.57" North and longitude 80° 20' 47.34" West.

3.3 Cooling Water Intake Structure Operation

Regulatory requirement at §122.21(r)(3)(iii): "A narrative description of the operation of each of your cooling water intake structures, including design intake flows, daily hours of operation, number of days of the year in operation and seasonal changes, if applicable"

The Ohio River CWIS operates to provide a continuous supply of water from the Ohio River for process water and water for closed-cycle cooling, 365 days per year to support facility operations.

Three raw water pumps are located downstream of the traveling screens. Up to two pumps are in operation at any given time and one is an installed standby pump. The pumps are typically operated on an as-needed basis and are automatically initiated as required to meet plant demand. The total Design Intake Flow (DIF) with two pumps operating at full capacity is 21.12 MGD (14,667 gpm). The design pump flows and DIF are listed in **Table 3-1** (Shell 2020).

Table 3-1: Design Intake Flow (DIF) at the SPM Facility

Pump Number	Design Flow (gpm)	Design Flow (MGD)
Pump 1:	7,333	10.6
Pump 2:	7,333	10.6
Pump 3: Standby	7,333	10.6
Total*	**14,667**	**21.12**

*Total DIF assumes up to two pumps in operation.
gpm – gallons per minute
MGD – million gallons per day

The traveling screens are normally operated automatically, but can be operated manually from a local control panel. In normal (automatic) operation, the screens start periodically, as set off by an exercise timer and run for a predetermined time, and then shut off. High differential pressure levels across the screens also start the screens for a predetermined time. During automatic operation, valves open to provide wash water to the screens.

The Actual Intake Flow (AIF) for the Ohio River CWIS, calculated as the average of all flow data points from January 2021 through April 2025, is approximately 4.4 MGD (3,674 gpm) (**Table 3-2**). **Table 3-2** also includes yearly average intake withdrawal rates. The maximum AIF for the period of February 1, 2021 through April 29, 2025 was 10.44 MGD (7,250 gpm) (Shell 2025).

Table 3-2: Actual Intake Flow (AIF)/Yearly Average Withdrawals at the SPM Facility

Year	Average AIF (MGD)
2021 Average	1.9
2022 Average	3.4
2023 Average	4.4
2024 Average	6.8
2025 Average	5.5
AIF	**4.4**

gpm – gallons per minute
MGD – million gallons per day

3.4 Water Balance

Regulatory requirement at §122.21(r)(3)(iv): "A flow distribution and water balance diagram that includes all sources of water to the facility, recirculating flows, and discharges"

A schematic diagram showing the flow distribution and water balance is provided in **Attachment C** – Drawings and Schematics.

3.5 Engineering Drawings

Regulatory requirement at §122.21(r)(3)(v): "Engineering drawings of the cooling water intake structure"

Engineering drawings of the cooling water intake structures are provided in **Attachment C** – Drawings and Schematics.

4.0 §122.21(r)(4) – SOURCE WATER BASELINE BIOLOGICAL CHARACTERIZATION DATA

4.1 Unavailable Data

Regulatory requirement at §122.21(r)(4)(i): "A list of the data in paragraphs (r)(4)(ii) through (vi) of this section that are not available and efforts made to identify sources of the data."

Although no historic site-specific Impingement or Entrainment data were available for the intake structure at the SPM facility, data to characterize the biology of the source waterbodies (i.e., the Ohio River) were available and used to complete this §122.21(r)(4) report.

Of note, in accordance with requirements in SPM's NPDES Permit PA0002208 and a PADEP-approved Sampling and Analysis Plan developed by AECOM (AECOM 2024), one year of monthly Impingement and Entrainment data collection and analyses is currently being conducted for the SPM Facility. The Field Study was initiated in August 2024 and is expected to be completed by the end of July 2025. However, data from the ongoing study has not been compiled for inclusion in this report.

Therefore, available data on the waterbody were derived from other sources, including the following:

- The Commonwealth of Pennsylvania *Designated Uses and Water Quality Criteria for the Ohio River*
- The life history characteristics of local fish and shellfish species, which are well-established, were obtained from the scientific literature (**Section 4.4 and Section 4.5**).
- ORSANCO fish population database and survey reports (http://www.ORSANCO.org/fish-population).
- Pennsylvania Fish and Boat Commission *White Bass Management and Fishing in Pennsylvania*
- Pennsylvania Fish and Boat Commission *Three Rivers Management Plan, A Strategy for Managing Fisheries Resources of the Allegheny, Monongahela, and Ohio Rivers*. Bureau of Fisheries Management Division Area 8.
- Pennsylvania Fish and Boat Commission (unpublished data) *Mussel Species of the Montgomery Pool of the Ohio River*
- Pennsylvania Fish and Boat Commission Gallery of Pennsylvania Fishes (https://www.fishandboat.com/Fish/PennsylvaniaFishes/GalleryPennsylvaniaFishes/Pages/GalleryPennsylvaniaFishes.aspx)
- United States Army Corps of Engineers *Upper Ohio Navigation Study*
- URS Corporation *Freshwater Mussel (Unionidae) Survey Report, Ohio River Mile 27.0 – 29.5 Beaver County*

4.2 Taxa in the Vicinity of the CWIS

Regulatory requirement at §122.21(r)(4)(ii): "A list of species (or relevant taxa) for all life stages and their relative abundance in the vicinity of the cooling water intake structure."

SPM withdraws cooling water from the Ohio River via an existing CWIS and is located within the Montgomery Pool segment of the Ohio River. Therefore, the Montgomery Pool is the primary waterbody described below. Studies analyzing this segment have typically encompassed the entire 18.5-mile length of the Montgomery Pool, extending from the Dashields Lock and Dam upstream to the Montgomery Lock and Dam downstream.

4.2.1 Ohio River Intake

The length of the Ohio River is divided into 19 Pools created by navigation locks and dams. Sampling of the fish community has been conducted on the Ohio River since the 1950's. From 1957 through 2005 rotenone surveys were conducted at lock chambers where all fish were killed and collected for the study. From 1991 through the present, non-lethal electrofishing surveys were conducted at sampling locations along the length of each Pool. Under either survey type, each Pool was not surveyed every year (i.e., pools may be surveyed once every several years and not annually). One recent survey of the Montgomery Pool was an electrofishing survey conducted in 2015 by ORSANCO. The bulk of the fisheries data below has been collected from the ORSANCO fish population database (http://www.ORSANCO.org/fish-population).

The lock and dam structures on the Ohio River are barriers to upstream fish passage, although fish may have a limited opportunity to pass upstream when the locks are operated. These navigation pools are considerably deeper, have lower water velocities, are more lake-like and have less complex instream habitats than that of tributary rivers such as the Allegheny (PFBC 2010). Substrates in the pools have been altered by dredging, both to improve navigation and for commercial dredging of gravel and sand (PFBC 2010). Although the dredged deeper water of the navigation channels provide less complex habitat overall, deep pools with higher water velocity created at the tail waters of the navigation dams provide substantial habitat for walleye and sauger (PFBC 2010).

Shallow water habitat is limited in the Montgomery Pool due to dredging activities (PFBC 2010). However, significant shoreline habitat has been created through placement of manmade structures (rock gabions, pilings, bridge abutments, abandoned barges and large boulder riprap shoreline structures). These structures provide increased habitat complexity which can be utilized by many aquatic species, predator and prey (PFBC 2010). Shallow backwater channels provide warm still water habitat during normal flows with access to the main river channel. The Montgomery Slough is an example of this type of feature and is located just upstream of the Montgomery Locks and Dam. Two tributary waterways feed into the Montgomery Pool near SPM: the Beaver River (upstream) and Raccoon Creek (downstream). These streams can provide river dwelling fish additional opportunity for feeding, spawning areas and nursery areas.

The current fish community in the Montgomery Pool is described by the Commonwealth of Pennsylvania (2025) as a warm water fishery (WWF). The Commonwealth of Pennsylvania defines a warm water fishery in general terms as "[waters that serve to provide] maintenance and propagation of fish species and additional flora and fauna which are indigenous to a warm water habitat." These waters tend to support most fishes except those such as trout or other salmonids that may not be able to survive in the water body due to summertime water temperatures.

4.2.2 Surveys of Fish Community in the Montgomery Pool

The fish community in the Ohio River Basin was greatly reduced in the first half of the 20th century due to domestic, mining and industrial pollution (USACE 2016). Populations of pollutant-intolerant species were greatly reduced and tolerant species such as gizzard shad, bullhead catfish, freshwater drum, and common carp increased in abundance (USACE 2016). However, due to efforts by state and federal agencies, fish community abundance in Montgomery Pool has been steadily improving since the 1950s and 1960s (**Figure 4-1**) (USACE 2016, PFBC 2010). Rotenone studies at the Montgomery Locks have shown that overall species richness has an increasing trend through 2005 (when lock chamber rotenone surveys ceased). Sport and commercially valuable fish species showed the greatest increase in abundance and many native species that were extirpated from portions of the Ohio River have reclaimed historical ranges (USACE 2016).

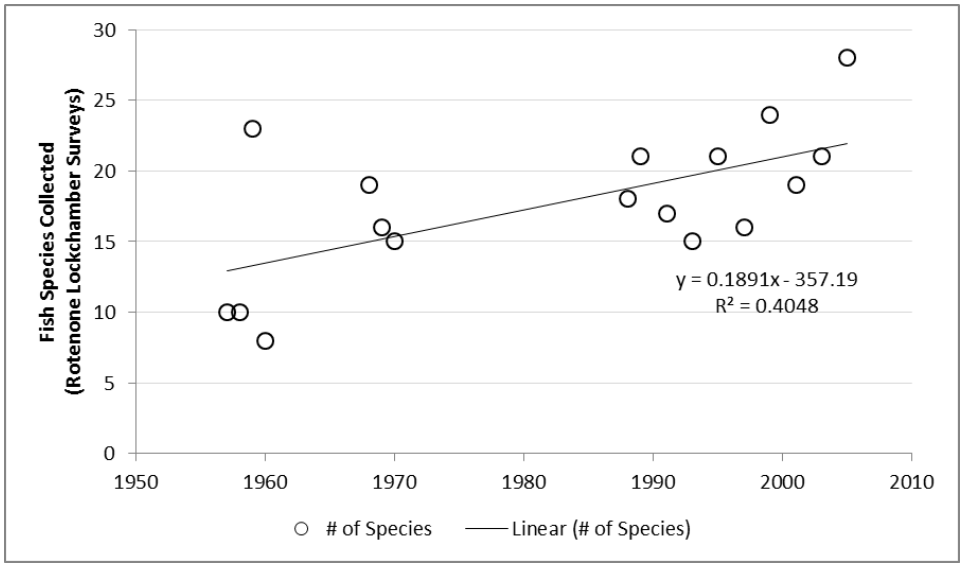

Figure 4-1: Lock Chamber Rotenone Fisheries Results from Montgomery Locks and Dam 1957 – 2005 with a Line of Best Fit Indicating Greater Fish Species Diversity over Time.

Recent electrofishing surveys of the Montgomery Pool occurred in 2006, 2010 and 2015 (ORSANCO 2007, 2010, and 2015). While comparisons between the three years may not be straightforward due to river discharge differences between the sampling events, they do provide data on the current fish assemblage in the Montgomery Pool. Approximately 40 taxa were collected during the three surveys (ORSANCO 2007, 2010, and 2015). The most numerous taxa between the surveys were gizzard shad, golden redhorse, silver redhorse, smallmouth buffalo, bluegill, smallmouth bass and sauger. The 2010 and 2015 ORSANCO survey also reported a notably high abundance of Emerald Shiner and Channel Shiner, with both species ranking as the two most dominant in terms of relative abundance during the 2015 assessment (ORSANCO 2015). **Table 4-1** provides total catch by species for the three surveys along with a list of species that have been noted in Montgomery Pool in historical sampling (PFBC 2010, ORSANCO 2007, 2010, and 2015).

Table 4-1: Species Observed in Historical Sampling in Montgomery Pool and Number Of Fish Collected by Species During Recent ORSANCO Electrofishing Sampling Events, 2006, 2010 and 2015[15]

Family Common Name	Scientific Name	Historical Presence Noted	2006 Electrofishing Survey	2010 Electrofishing Survey	2015 Electrofishing Survey
Polyodontidae (Paddlefishes)					
Paddlefish	*Polyodon spathula* [M]	X			
Lepisosteidae (Gars)					
Longnose gar	*Lepisosteus osseus* [M]	X	10	8	11
Hiodontidae (Mooneyes)					
Goldeye	*Hiodon alosoides* [M]	X			
Mooneye	*Hiodon tergisus* [M]	X	6	7	26
Anguillidae (Freshwater Eels)					
American eel	*Anguilla rostrata* [M]	X			
Clupeidae (Herrings & Shads)					
Skipjack herring	*Alosa chrysochloris* [M]	X			
Gizzard shad	*Dorosoma cepedianum*	X	266	4,058	26
Cyprinidae (Minnows)					
Goldfish	*Carassius auratus* [I]	X			
Central stoneroller	*Campostoma anomalum*	X			

[15] Data from PFBC 2010, ORSANCO 2007, 2010, and 2015

Family Common Name	Scientific Name	Historical Presence Noted	2006 Electrofishing Survey	2010 Electrofishing Survey	2015 Electrofishing Survey
Grass carp	*Ctenopharyngodon idella* [I]	X			
Spotfin shiner	*Cyprinella spiloptera*	X	1	35	68
Common carp	*Cyprinus carpio* [I]	X	44	44	45
Striped shiner	*Luxilus chrysocephalus*	X			
Silver chub	*Macrhybopsis storeriana*	X	12	32	
Golden shiner	*Notemigonus crysoleucas*	X			
Emerald shiner	*Notropis atherinoides*	X	8	171	216
River shiner	*Notropis blennius* [E]	X			
Bigeye shiner	*Notropis boops*	X			
Silverjaw minnow	*Notropis buccatus*	X			
Spottail shiner	*Notropis hudsonius* [I]	X		9	4
Silver shiner	*Notropis photogenis*	X			
Rosyface shiner	*Notropis rubellus*	X			
Sand shiner	*Notropis stramineus*	X			
Mimic shiner	*Notropis volucellus*	X	13		
Channel shiner	*Notropis wickliffi*	X		159	323
Bluntnose minnow	*Pimephales notatus*	X		21	30
Fathead minnow	*Pimephales promelas*	X			
Blacknose dace	*Rhinichthys atratulus*	X			
Creek chub	*Semotilus atromaculatus*	X			
Catostomidae (Suckers)					
River carpsucker	*Carpiodes carpio*	X	13	28	47
Quillback	*Carpiodes cyprinus* [M]	X	30	25	6
Highfin carpsucker	*Carpiodes velifer* [M]	X	37	14	12
White sucker	*Catostomus commersonii* [M]	X		1	
Northern hog sucker	*Hypentelium nigricans* [M]	X	3	7	6
Smallmouth buffalo	*Ictiobus bubalus* [M]	X	217	79	82
Black buffalo	*Ictiobus niger*	X		3	18
Bigmouth buffalo	*Ictiobus cyprinellus* [E, M]	X		1	
Silver redhorse	*Moxostoma anisurum* [M]	X	157	132	215
Smallmouth redhorse	*Moxostoma breviceps* [M]	X	110	25	27
River redhorse	*Moxostoma carinatum*	X	3	8	23
Black redhorse	*Moxostoma duquesnii* [M]	X		9	25
Golden redhorse	*Moxostoma erythrurum* [M]	X	227	282	156
Ictaluridae (Catfishes)					
White catfish	*Ameiurus catus* [I]	X			
Yellow bullhead	*Ameiurus natalis*	X			
Brown bullhead	*Ameiurus nebulosus*	X			
Channel catfish	*Ictalurus punctatus* [M]	X	34	17	83
Stonecat	*Noturus flavus*	X			
Flathead catfish	*Pylodictis olivaris* [M]	X	11	12	8
Esocidae (Pikes)					
Northern pike	*Esox lucius* [M]	X			
Tiger muskellunge	*Esox lucius x Esox masquinongy* [I]	X			
Muskellunge	*Esox masquinongy*	X			
Percopsidae (Trout-perches)					
Trout-perch	*Percopsis omiscomaycus*	X			137
Atherinopsidae (New World Silversides)					
Brook silverside	*Labidesthes sicculus*	X		1	

Family Common Name	Scientific Name	Historical Presence Noted	2006 Electrofishing Survey	2010 Electrofishing Survey	2015 Electrofishing Survey
Fundulidae (Topminnows)					
Banded killifish	*Fundulus diaphanus*	X			
Moronidae (Temperate Basses)					
White perch	*Morone americana* [I, M]	X			
White bass	*Morone chrysops* [M]	X	36		7
Hybrid striped bass	*Morone chrysops x Morone saxatilis* [I]	X			2
Unidentified Morone sp.	*Morone* sp. [I]			27	3
Centrarchidae (Sunfishes)					
Rock bass	*Ambloplites rupestris*	X	8	8	22
Green sunfish	*Lepomis cyanellus*	X	2		1
Pumpkinseed	*Lepomis gibbosus*	X	2	2	3
Warmouth	*Lepomis gulosus* [E]	X			
Bluegill	*Lepomis macrochirus*	X	216	58	88
Redear sunfish	*Lepomis microlophus* [I]	X	4		
Smallmouth bass	*Micropterus dolomieu* [M]	X	185	210	184
Spotted bass	*Micropterus punctulatus*	X	15	5	6
Largemouth bass	*Micropterus salmoides* [M]	X	8	8	12
White crappie	*Pomoxis annularis*	X		1	
Black crappie	*Pomoxis nigromaculatus*	X	6	1	9
Percidae (Perches)					
Greenside darter	*Etheostoma blennioides*	X	2	1	
Rainbow darter	*Etheostoma caeruleum*	X	4		2
*Bluebreast darter	*Etheostoma camurum* [T]	X			
Fantail darter	*Etheostoma flabellare*	X	1		
*Spotted darter	*Etheostoma maculatum* [T]	X			
Johnny darter	*Etheostoma nigrum*	X			1
*Tippecanoe darter	*Etheostoma tippecanoe* [T]	X			
Banded darter	*Etheostoma zonale*	X	1		
Logperch	*Percina caprodes*	X	67	47	26
Channel darter	*Percina copelandi*	X	1		
Yellow perch	*Perca flavescens*	X	4		44
Blackside darter	*Percina maculata*	X			
River darter	*Percina shumardi*	X			
Sauger	*Sander canadensis* [M]	X	243	92	110
Saugeye	*Sander canadensis x Sander vitreus*	X			42
Walleye	*Sander vitreus* [M]	X	11	21	68
Sciaenidae (**drums**)					
Freshwater drum	*Aplodinotus grunniens* [M]	X	47	84	36

Notes:

C = Species is listed as *Candidate* under 58 Pennsylvania Code Chapter 75.
E = Species is listed as *Endangered* under 58 Pennsylvania Code Chapter 75.
I = Introduced species.
M = Species is considered migratory (Wilcox *et al*. 2004).
T = Species is listed as *Threatened* under 58 Pennsylvania Code Chapter 75.
*** =** Bluebreast, spotted and tippecanoe darters are under consideration for de-listing (44 Pa.B. 7876)[16]

[16] Proposed Rulemaking – Pennsylvania Fish and Boat Commission [58 PA. CODE CH. 75] - Fishing; Endangered Species . Saturday, December 20, 2014. URL: http://www.pabulletin.com/secure/data/vol44/44-51/2621.html

Grouping data by family reveals that gizzard shad, suckers, minnows, sunfishes and perches comprise the majority of the fish assemblage during the 2006 survey, the 2010 survey, and the 2015 survey (**Figure 4-2**). ORSANCO (2010) postulated that gizzard shad and minnows (primarily emerald shiner) were more numerous in 2010 due to lower river flows that made sampling for these fish more effective. In 2015, sampling occurred during receding high flows. Even though flows during this sampling period more closely matched flows from 2006 than 2010, metric and index results changed only very marginally from 2010. A large drop off in gizzard shad was observed between the 2010 and 2015 sampling periods (ORSANCO 2015).

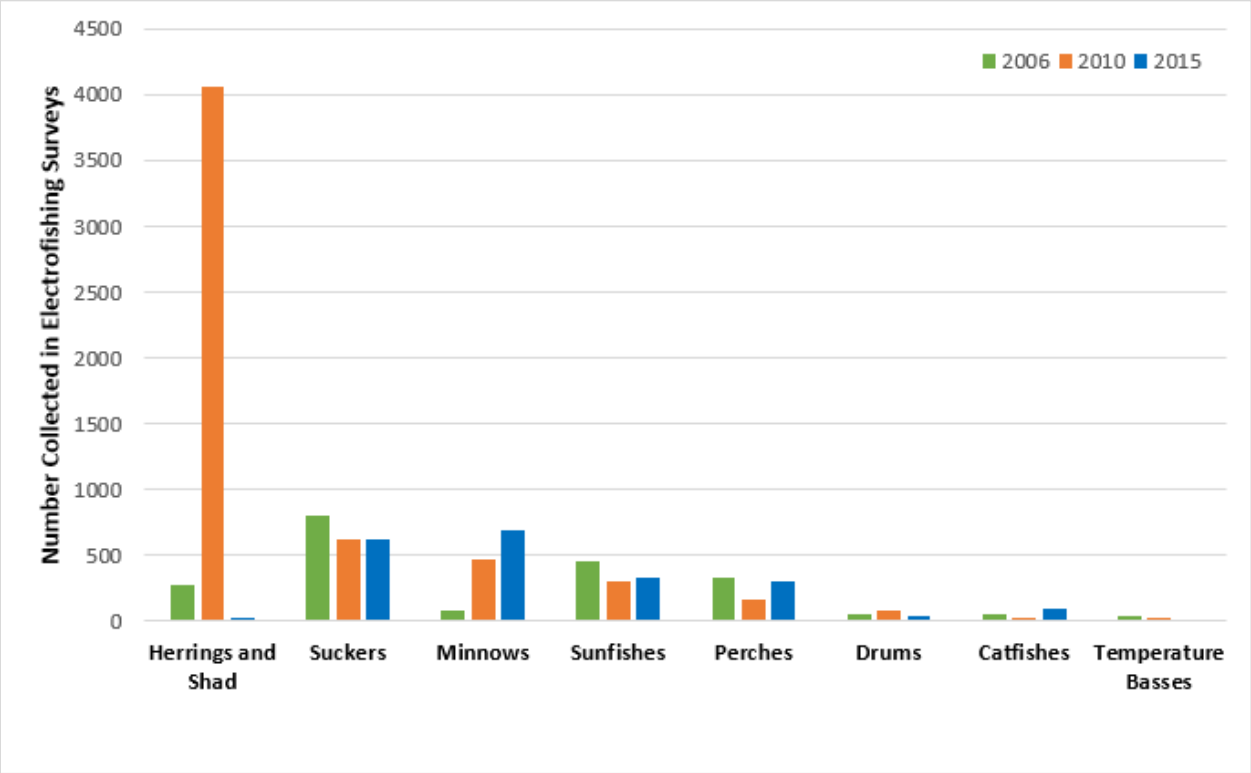

Figure 4-2: Raw Number of Fish Collected by Family in Electrofishing Samples in 2006 And 2010 in Montgomery Pool, Ohio River. Note, the Herrings and Shads Family Is Represented by a Single Species, Gizzard Shad.

Larval fishes are generally present from March through September in the Upper Ohio River (USACE 2016). Young-of-the-year (YOY) fishes (juveniles) occur concurrently with larval fishes and are present as larval fishes grow. A study of larval and YOY fishes conducted by Pennsylvania State University in 2008 and 2009 yielded 61 species and included several threatened or endangered fishes (Stauffer et. al. 2010 reported in USACE 2016). Tippecanoe darter and bluebreast darter individuals (PA threatened Species) were specifically collected in Montgomery Pool. Fifteen larval sport fish species were also collected indicating that spawning is occurring successfully throughout the upper Ohio River and the three rivers area (USACE 2010).

To supplement the published ORSANCO data, additional fish and benthic data from the 2015 electrofishing survey—conducted in the general vicinity of the existing water intake—were obtained through prior correspondence with ORSANCO. The existing water intake is located at approximate river Mile 29. **Table 4-2** provides a summary of the data for an ORSANCO electrofishing sampling event that occurred July 21 and 23 of 2015. The data was obtained from River Mile 27.6 to 30. **Table 4-3** summarizes ORSANCO benthic data that they obtained October 28, 2015 from River Mile 28 to 30.

Table 4-2: Species Observed in the Most Recent ORSANCO Electrofishing Sampling Event July 2015. River Mile 27.6 to 30.

Family Common Name	Scientific Name	Left Descending Bank	Right Descending Bank
Lepisosteidae (Gars)			
Longnose gar	*Lepisosteus osseus*	1	
Hiodontidae (Mooneyes)			
Mooneye	*Hiodon tergisus*	3	1
Clupeidae (Herrings & Shads)			
Gizzard shad	*Dorosoma cepedianum*	1	9
Cyprinidae (Minnows)			
Spotfin shiner	*Cyprinella spiloptera*	15	3
Common carp	*Cyprinus carpio* [I]	9	1
Emerald shiner	*Notropis atherinoides*	2	
Channel shiner	*Notropis wickliffi*	2	3
Bluntnose minnow	*Pimephales notatus*	1	5
Catostomidae (Suckers)			
River carpsucker	*Carpiodes carpio*	16	5
Highfin carpsucker	*Carpiodes velifer*	5	
Smallmouth buffalo	*Ictiobus bubalus*	6	2
Black buffalo	*Ictiobus niger*	3	
Silver redhorse	*Moxostoma anisurum*	33	17
Smallmouth redhorse	*Moxostoma breviceps*		2
Black redhorse	*Moxostoma duquesnii*		2
Golden redhorse	*Moxostoma erythrurum*	6	10
Ictaluridae (Catfishes)			
Channel catfish	*Ictalurus punctatus*	12	1
Flathead catfish	*Pylodictis olivaris*	1	
Percopsidae (Trout-perches)			
Trout-perch	*Percopsis omiscomaycus*	17	9
Moronidae (Temperate Basses)			
White bass	*Morone chrysops*	2	
Hybrid striped bass	*Morone chrysops x Morone saxatilis*	1	
Centrarchidae (Sunfishes)			
Rock bass	*Ambloplites rupestris*	1	1
Pumpkinseed	*Lepomis gibbosus*		3
Bluegill	*Lepomis macrochirus*	3	13
Smallmouth bass	*Micropterus dolomieu*	18	15
Spotted bass	*Micropterus punctulatus*	1	
Largemouth bass	*Micropterus salmoides*		4
Black crappie	*Pomoxis nigromaculatus*	2	
Percidae (Perches)			
Rainbow darter	*Etheostoma caeruleum*	1	
Logperch	*Percina caprodes*	2	1
Yellow perch	*Perca flavescens*	8	10
Sauger	*Sander canadensis*	10	8
Saugeye	*Sander canadensis x Sander vitreus*	7	2
Walleye	*Sander vitreus* [M]	15	13
Sciaenidae (**drums**)			
Freshwater drum	*Aplodinotus grunniens* [M]		3

Table 4-3: Benthic Species Observed in the Most Recent ORSANCO Electrofishing Sampling Event October 2015. River Mile 28 to 30

	RMI					RMI		
	27.6	29.6	30			27.6	29.6	30
Taxa_Name	Count				Taxa_Name	Count		
Ablabesmyia mallochi			2		Laevapex fuscus	24	2	
Arcteonais lomondi		1			Limnesia sp	1		
Argia sp	4	3	5		Limonia sp		2	
Branchiura sowerbyi	5		3		Limnodrilus hoffmeisteri	2		
Caecidotea sp			2		Lirceus sp		3	10
Caenis sp	93	4			Lumbriculidae sp		2	
Chironomus sp	7	23	148		Macromia sp			1
Chrysops sp		1	4		Menetus dilatatus	2		1
Coelotanypus sp	140	13	12		Musculium sp		2	
Coenagrionidae sp	2				Naididae W.O.H.C. sp	93	11	11
Corbicula fluminea	21	6	4		Nanocladius sp			2
Corixidae sp			1		Natarsia sp		1	
Cricotopus (Cricotopus) bicinctus		1	4		Nectopsyche candida	3		
Cryptochironomus sp	22				Oecetis sp	2	4	2
Cyrnellus fraternus	5	20	1		Physa sp	37	4	
Dicrotendipes sp	394	264	107		Pisidiidae sp	1	6	
Dreissena polymorpha	155	260	14		Pisidium sp	2		
Echinogammarus ischnus		6	13		Polypedilum halterale	4	8	3
Enallagma sp		2	1		Polypedilum flavum		4	
Dubiraphia sp	7				Polypedilum illinoense	3	2	2
Gammarus sp	191	430	293		Procladius sp	11	6	
Glossiphoniidae sp			3		Prostoma sp	4		
Glyptotendipes sp	49	42	25		Pseudochironomus sp	7	2	10
Gomphus sp	1				Stenacron sp	8	27	13
Helobdella sp		1			Stenelmis sp		1	
Hemerodromia sp	5		6		Tipula sp		1	
Hydrobiidae sp	74	2	1		Trichocorixa sp		29	
Hydroptila sp	2	2	6		Tribelos sp			2
					Tricorythodes sp		1	
					Turbellaria sp	17	2	20

4.2.3 Unionid (Mussel) Community in the Montgomery Pool

According to data provided by PFBC, there are 14 unionid species known to occur in the Montgomery Pool (**Table 4-4**) (PFBC, 2013). These data are a compilation of survey data and species encounters from a variety of survey efforts from 2001 to 2012. Of the 14 species known to occur in the Montgomery Pool, seven are listed as riverine species indicative of lotic (flowing water) systems with stable habitat. Fragile papershell (*Leptodea fragilis*), mapleleaf (*Quadrula. quadrula*), and pink heelsplitter (*Potamilus alatus*) are considered habitat generalists and are not indicative of riverine species.

Table 4-4: Live and Fresh Dead Unionid Species Observed in the Pennsylvania Pools of the Ohio River

Species	Common Name	Emsworth	Dashields	Montgomery	New Cumberland
Actinonaias ligamentina	Mucket	-	-	X	X
Alasmidonta marginata	Elktoe	-	-	X	-
Amblema plicata	Three-ridge	-	-	X	-
Anodonta suborbiculata	Flat floater	-	-	-	X
Elliptio dilatata	Spike	-	-	X	X[2]
Lampsilis siliquoidea	Fatmucket	X	-	-	X
Lasmigona complanata	White heelsplitter	-	-	X	X
Lasmigona costata	Fluted-shell	-	X	X	X
Leptodea fragilis	Fragile papershell	-	X[1]	X	X
Ligumia recta	Black Sandshell	-	-	X	X
Obliquaria reflexa	Threehorn wartyback	-	X	X	X
Potamilus alatus	Pink heelsplitter	X[1]	X	X	X
Pyganodon grandis	Giant floater	-	-	X	X
Quadrula quadrula	Mapleleaf	-	X	X	X
Truncilla donaciformis	Fawnsfoot	-	X	X	X
Truncilla truncata	Deertoe	-	-	-	X
Utterbackia imbecillis	Paper pondshell	-	-	X	X
Total		2	6	14	15

[1] Denotes fresh dead record
[2] Denotes species recently re-introduced

In 2013, URS (now AECOM) performed a study designed to assess the existing mussel community between river miles 27.0 and 29.5 near the SPM cooling water intake structure (URS 2014). Ten species of mussels were observed during the study. No State or Federally listed threatened or endangered mussel species

were identified through the Pennsylvania Natural Diversity Inventory (PNDI), however, a few species of freshwater mussel were identified as a Special Concern Species. These freshwater mussels are not considered threatened or endangered. In addition, no State or Federally listed threatened or endangered mussel species were found during the field study. The PNDI receipts and the SIR letter can be found in **Attachment D** of this document.

4.2.1 2006 – 2007 Impingement Study at NOVA Chemicals/AES Beaver Valley Generating Station

A year-long impingement study was conducted at the NOVA Chemicals/AES Beaver Valley Generating Station cooling water intake structure on the Montgomery Pool in 2006 – 2007. Twenty taxa were collected during 46, 24-hour sampling events. Over 99 percent of the fish collected were gizzard shad and most fish were in the YOY life stage. Impingement rates were greatest in July and August (**Figure 4-3**).

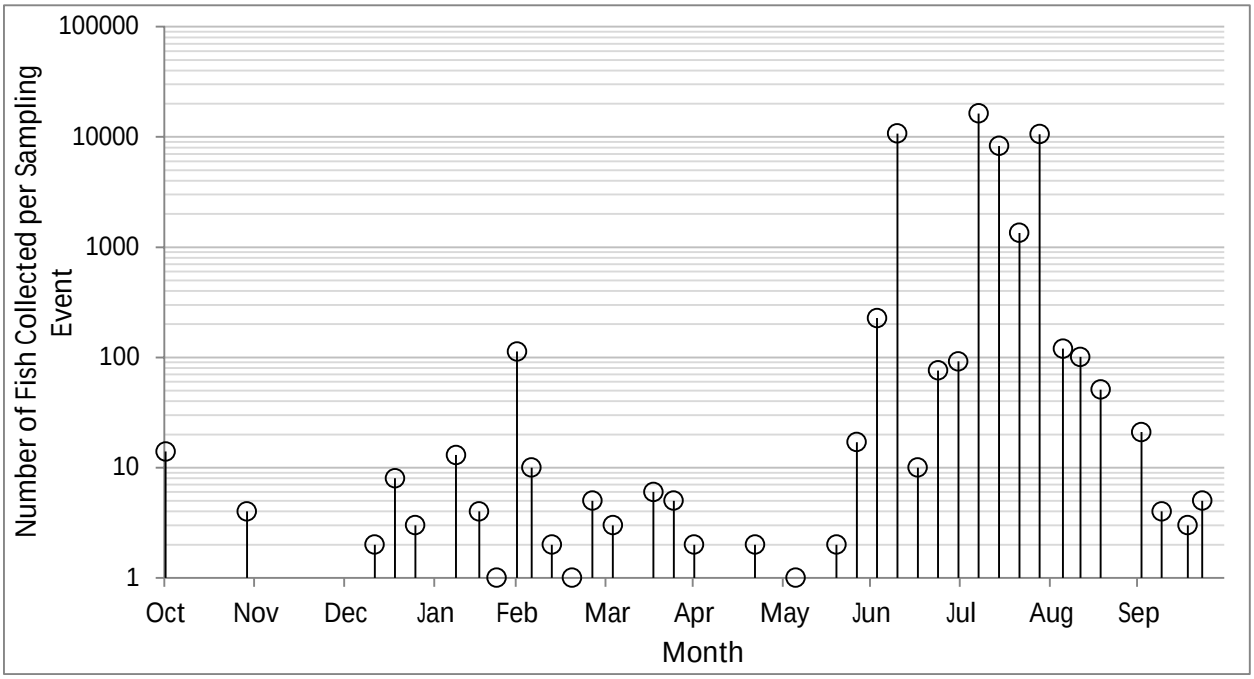

Figure 4-3: Number of Fish Collected Per Impingement Sampling Event at NOVA Chemical's / AES Beaver Valley Generating Station (2006 - 2007) (ENSR 2008)

Gizzard shad, freshwater drum, white bass, bluegill, and channel catfish were the most frequently collected species (**Table 4-5**). No taxon besides gizzard shad represented more than 0.5 percent of the total number of fish collected suggesting that impingement of fish from future cooling water intake structures on the Montgomery Pool may be largely dominated by this species. No taxon currently (7/2015) listed as Threatened or Endangered in the State of Pennsylvania was collected during this study.

Table 4-5: Raw Number of Fish Collected in Impingement Sampling at NOVA Chemical's / AES Beaver Valley Generating Station (2006 - 2007) (ENSR 2008)

Species	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Total
Gizzard shad	-	8	129	8	3	-	9	10,941	36,393	260	37	**47,788**
Freshwater drum	-	1	-	-	2	-	2	35	147	7	3	**197**
White bass	-	-	-	2	3	-	5	173	1	-	-	**184**
Bluegill	-	1	-	1	2	-	-	-	6	1	3	**14**
Channel catfish	-	1	-	-	2	1	-	2	2	3	1	**12**
Sauger	-	1	2	3	-	-	-	-	-	-	1	**7**
White crappie	-	-	-	1	3	-	-	-	2	-	-	**6**
Quillback carpsucker	-	-	-	-	-	1	-	-	2	-	-	**3**

Species	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Total
Common carp	-	-	-	-	-	-	2	-	-	-	-	**2**
Emerald shiner	-	-	-	-	-	-	-	1	1	-	-	**2**
Flathead catfish	-	-	-	1	-	-	-	-	-	-	1	**2**
Striped bass	-	-	-	-	-	-	-	1	-	1	-	**2**
Black crappie	-	-	-	-	-	-	-	-	-	-	1	**1**
Largemouth bass	-	-	-	1	-	-	-	-	-	-	-	**1**
Mimic shiner	-	-	-	-	-	-	1	-	-	-	-	**1**
Rainbow smelt	-	-	-	-	1	-	-	-	-	-	-	**1**
Silver chub	-	-	-	-	-	-	-	-	1	-	-	**1**
Silver redhorse	-	-	-	-	-	-	1	-	-	-	-	**1**
Silver shiner	-	-	-	1	-	-	-	-	-	-	-	**1**
Smallmouth bass	-	1	-	-	-	-	-	-	-	-	-	**1**
Monthly Total	**-**	**13**	**131**	**18**	**16**	**2**	**20**	**11,153**	**36,555**	**272**	**47**	**48,227**

4.3 Species and Life Stages Susceptible to Impingement or Entrainment

Regulatory requirement at §122.21(r)(4)(iii): "Identification of the species and life stages that would be most susceptible to impingement and entrainment. Species evaluated should include the forage base as well as those most important in terms of significance to commercial and recreational fisheries."

Susceptibility to impingement or entrainment is dependent on a number of biotic and abiotic factors, as shown in **Table 4-6**. Potential exists for state threatened and endangered fish species observed in the Montgomery Pool to be impinged or entrained. However, it is highly unlikely based on the observed habitat at the location of the existing structure. Additionally, over 99% of the species collected at the nearby Nova Chemical facility were gizzard shad (a fragile but non-listed fish species). The tippecanoe and bluebreast darters were recently proposed for delisting by the PFBC in July 2010.

Table 4-6: Factors Effecting Susceptibility to Impingement or Entrainment

Category	Factor Type	Factors	Source
Impingement	Abiotic Factors	Water temperature, dissolved oxygen, turbidity, cooling water intake design, and intake velocities.	Baker (2007)
	Biotic Factors	Swimming ability, body shape, size, diel and seasonal movements, and health of the organism.	Baker (2007)
Entrainment	Abiotic Factors	Intake location, water volume used for cooling, velocity at intake, and screen mesh size.	Graham et al. (2008)
	Biotic Factors	Organism size, swimming ability, swimming behavior (pelagic or benthic), diurnal behavior, and spawning habitat.	Graham et al. (2008)

Water quality abiotic factors listed in **Table 4-6** are documented and discussed in **Section 2**. Discussion of species that are most susceptible to impingement or entrainment at SPM is focused on documented abundance in the Montgomery Pool and known life history characteristics of those species.

The following taxa and groups are considered to be susceptible to potential impingement or entrainment at the CWIS based on available fish community data, recreational importance, and an understanding of life history of the fishes in the Montgomery Pool (**Table 4-7**):

Table 4-7: Potentially Susceptible Fish Species to Impingement and Entrainment in the Montgomery Pool.

Taxa	Reasoning
Smallmouth bass	Smallmouth bass are one of the most sought after species in the Upper Ohio River/Three Rivers area and the fishery has supported national bass fishing tournaments (PFBC 2010). One of the most abundant recreationally targeted fish in the 2006, 2010, and 2015 ORSANCO electrofishing surveys. Susceptible based on abundance and the presence of persistent populations within the Pool.
Sauger	Sauger is one of the most sought after species in the Upper Ohio River/Three Rivers area and, along with walleye, have developed into a popular fishery (PFBC 2010). In Montgomery Pool, Sauger was more abundant than walleye in surveys conducted by the PFBC from 1990 through 2008 (PFBC 2010). Susceptible based on abundance and the presence of persistent populations within the Pool.
Freshwater drum	A recreational fishery exists for freshwater drum in Montgomery Pool (PFBC 2010). Freshwater drum eggs and larvae are highly susceptible to entrainment due to their buoyant, free floating nature.
Bluegill	Bluegill is the most abundant panfish collected in electrofishing sampling of the Montgomery Pool in 2006, 2010, and 2015. Although sunfish are nest builders, the larvae are motile and are susceptible to entrainment. Juvenile and adult bluegill are regularly observed in impingement samples in many freshwater settings.
Gizzard shad	Gizzard shad were the most numerous fish in the 2010 electrofishing sampling of Montgomery Pool and were the most numerous fish collectied in impingement sampling by many power generating facilities on the Ohio River (EPRI 2009). This species can be abundant and be impinged in large numbers, especially during the late fall and winter months when they can experience mortality due to cold water temperature (EPRI 2009).
Cyprinidae spp. (shiners and minnows)	Shiner and minnow spp. were abundant in the 2010 and 2015 electrofishing sampling of Montgomery Pool. Two species, emerald shiner and channel shiner comprised the bulk of the Cyprinidae spp. collected. This group of fish is an important part of the food web for recreationally important species including black bass species, walleye, sauger, and pike/muskellunge. Susceptible based on abundance and the presence of persistent populations within the Pool. Species within this group are generally susceptible to impingement or entrainment throughout their lives due to their small size. However, some larger cyprinids such as common carp and smallmouth buffalo have also been observed in moderate abundance within the Montgomery pool during the ORSANCO 2006 and 2010 electrofishing surveys. These larger cyprinids produce eggs that are susceptible to entrainment but are not commonly impinged due to their large size as adults.

Taxa	Reasoning
Redhorse sp. (*Moxostoma* spp.)	Redhorse sucker species were the second most numerically dominant group in the 2006, 2010, and 2015 electrofishing surveys of Montgomery Pool. Golden redhorse and silver redhorse were consistently abundant between surveys. Although relatively few of these fish are collected in impingement sampling surveys on the Ohio River (EPRI 2009), they are included due to their abundance in the aquatic community surveys. Susceptible based on abundance and the presence of persistent populations within the Pool.
White Bass	Although absent or not abundant during the ORSANCO electrofishing surveys conducted in 2006, 2010, and 2015, white bass were the third most abundant species in impingement sampling during the NOVA Chemicals / AES Beaver Valley Generating Station investigation in 2006-2007. This species was primarily collected during July and averaged about four inches in length (YOY life stage). Susceptible based on observed impingement at a nearby cooling water intake.
Trout-Perch	Although absent during the ORSABCO 2006 and 2010 electrofishing surveys, Trout-Perch were the sixth most abundant species collected during the 2015 ORSANCO electrofishing survey. This species reaches an average total length of around 3.5 inches. Susceptible based abundance and their relatively small size.
Channel Catfish	Channel catfish is the most abundant catfish collected in electrofishing sampling of the Montgomery Pool in 2006, 2010, and 2015. It was the fifth more frequently impinged species observed during the 2006-2007 NOVA Chemicals/AES Beaver Valley Generating Station Impingement Study.

4.4 Periods of Reproduction, Recruitment, and Peak Abundance

Regulatory requirement at §122.21(r)(4)(iv): "Identification and evaluation of the primary period of reproduction, larval recruitment, and period of peak abundance for relevant taxa."

Nearly all of the native fish species in the Ohio River drainage are oviparous (i.e., eggs are laid, fertilized, and hatch outside the mother's body). Most fish species in the Ohio River drainage spawn in the spring and summer (Auer 1983, Becker 1982). Recruitment of larvae (i.e., the point at which the larval fish transitions from feeding off its yolk-sac to independent feeding in the environment) occurs from late spring into early fall. Well established research indicates that spawning is primarily driven by increased water temperature and flow (LovellFord et al. 2020; Koenigbauer et al. 2024). Some species of shiners and minnows may mature within their first year.. Based on the life histories compiled for potentially susceptible fish species in Section 4.4.1, May through June is typically the period of greatest spawning activity in the Upper Ohio River. A larval and YOY fish study performed in the upper Ohio River in 2008 and 2009 during the months of March through September yielded 61 species (USACE 2016, Stauffer 2010). Only seven of these species were represented solely by adults suggesting that successful spawning of the majority of collected fish species was occurring throughout the surveyed area (USACE 2016).

Freshwater unionids (mussels) require a fish host to complete their life cycle. Most species of unionids are dioecious (separate males and females). However, some species are hermaphroditic and may self-fertilize. Unionids are ovoviviparous (i.e., eggs are fertilized and develop within the organism) and the eggs are contained within the female's gills during the brooding period. The eggs hatch into tiny glochidia (parasitic larva) which are expelled by the female directly to their host or into the water column where they may be picked up by foraging fish. The parasitic larva require this host (typically fish) to continue development. The larva attach to the host's gills and/or fins where they become blood parasites for a period before developing

into juvenile unionids. The juveniles then release from the host fish and fall into the substrate where they grow into adults. The intermediate fish host is integral to the dispersal and survival of unionids in the systems in which they live (Dascher et al., 2018). Some unionid species such as the salamander mussel require a specific host (mudpuppy), while others are less selective. The pink heelsplitter and the fragile papershell are thought to use the freshwater drum as an intermediate host while the mapleleaf is thought to use the flathead catfish and channel catfish as hosts. According to the Three Rivers Management Plan, both the flathead catfish and freshwater drum are common fish species observed in the Montgomery Pool (PFBC, 2010). Species may be classified as long-term or short-term brooders (Clayton 2023). Short-term brooders spawn in spring or early summer and brood for a few weeks. Long-term brooders have been observed to spawn in shorter periods during the spring summer and autumn (Culp et al. 2011). The eggs are brooded over winter and typically released as glochidia in spring or early summer (Clayton 2023).

4.4.1 Life Histories of Important Taxa

Life history details for taxa or group of taxa potentially susceptible to impingement or entrainment at SPM have been gathered from peer reviewed articles, regional and state agency documents, and books containing life history and identification keys. General behavior and preferred habitat details are provided in the text and spawning and early life history details are provided in the tables for each taxon or grouping. See within the gizzard shad and Cyprinidae spp. sections for a discussion of fragile species in the Montgomery Pool.

Smallmouth bass

Smallmouth bass spawning in Pennsylvania typically occurs from May through early-June when water temperatures reach 60°F to 70°F (PFBC 2017). Males build the nests, which are approximately 14-30 inches in diameter, in areas typically three to four feet deep (PFBC 2017). Nests are built along the shorelines of rivers and lakes, typically over gravel and rubble, but have also been found over sand and large rock substrata (Becker 1983). Multiple females will spawn over the same nest, adding 2,000 to 7,000 eggs per pound of body weight (PFBC 2017). The male protects the nest, and the young are typically protected for two to nine days, but the male could guard the nest for as long as 28 days (Lyons (2021)

The eggs are demersal, adhesive, and 1.2 to 2.5 mm in diameter (Scott and Crossman 1998). Hatching occurs after 9.5 days at 55°F to 2.25 days at 75°F (Becker 1983). Poor reproductive success during spawning seasons is often correlated to flooding, which results in a rapid drop in water temperature and/or excessive siltation, or events involving low of the water levels (Becker 1983).

Yolk-sac absorption occurs approximately six to 15 days after hatching and coincides with the larvae leaving the nest (IDNR 2019). At the time of yolk sac absorption, larvae are approximately a half inch in length (IDNR 2019). Young smallmouth bass feed on midge larvae, daphnia, and other small crustaceans even prior to yolk-sac absorption (Becker 1983). By the time they reach three inches in length, juvenile smallmouth bass actively feed on crayfish, other bass fry, and almost any other suitably sized life form that swims or floats (Becker 1983).

Spawning and early life stage information is given in **Table 4-8**.

Table 4-8: Smallmouth Bass Life History Data - Spawning and Early Life Stages

Species	Spawning Period	Spawning Temperature	Larval Recruitment	Life History Notes
Smallmouth bass	Mid May – June	55-75°F	June - July	Eggs- Demersal and adhesive eggs laid in a nest, protected by the male. Hatch in 2.25-9.5 days. Larvae – Remain in nest for 6-15 days, remain in school above the nest protected by the male for as long as 28 days. High mortality rate after leaving the nest due to predation.

From Becker (1983)

Sauger

Sauger in large rivers are found in backwaters and mouths of slow moving tributaries (Smith 1979). In the Montgomery Pool, they have been noted to be present in the plunge pool created by the Dashields Dam (PFBC 2010). Juvenile sauger prey upon small invertebrates while adults are generally piscivorous (Schell et. al. 2004, Smith 1979). Spawning occurs around April and occurs over gravel or cobble substrate. Females can generally deposit between 5,000 and 40,000 eggs (Auer 1982, Smith 1979). Spawning occurs at night (Becker 1983). Eggs are demersal and adhesive and hatching may take three weeks (Smith 1979). Sauger have been found spawning in habitat immediately downstream of Ohio River navigational dams (Vallazza et. al. 1984 as referenced in Schell et. al. 2004). Spawning and early life stage information is given in **Table 4-9**.

Table 4-9: Sauger Life History Data - Spawning and Early Life Stages

Species	Spawning Period	Spawning Temperature	Larval Recruitment	Life History Notes
Sauger	April – Early May	39-54°F	May - June	Eggs – Eggs harden in water are demersal and adhesive prior to hardening – semi-buoyant and non-adhesive after hardening. Eggs are round and 1.0 mm to 1.5 mm in length. YOY – juvenile fish in the Ohio River attain a length of at least 8 inched within the first year.

From Becker (1983), Auer (1982) and Schell et. al. (2004)

Freshwater drum

Freshwater drum are primarily benthic-feeders whose prey items include macroinvertebrates and bivalves. Younger fish (under 20 millimeters) feed in the water column on zooplankton, while adults may occasionally feed on YOY fish in the water column (Ross et al. 2001). Freshwater drum demonstrate 24-hour cyclical in their movements (Rypel and Mitchell 2007). During the day, drum reside in deeper waters, while at night, their densities increase along shorelines (Rypel and Mitchell 2007). Juvenile (age 0 – age 1) drum have the highest presence on the shoreline at night, possibly as a method of predation avoidance (Rypel and Mitchell 2007). Freshwater drum also have shown feeding behavior in the water column during the day, but primarily benthic activity at night (Rypel and Mitchell 2007). It is also possible that freshwater drum shoreline density increases at night due to macroinvertebrate drift also increasing at night. They spawn in the water column, and have planktonic larvae and eggs (Ross et al. 2001). Freshwater drum spawn in the main channel in large rivers such as the Ohio River, generally far from the shore (Wallus and Simon 2006). Eggs are neutrally or positively buoyant and drift with the current (Wallus and Simon 2006). Spawning and early life stage information is given in **Table 4-10**.

Table 4-10: Freshwater Drum Life History Data - Spawning and Early Life Stages

Species	Spawning Period	Spawning Temperature	Larval Recruitment	Life History Notes
Freshwater drum [b]	June – August	64-77°F	June - September	Eggs – May be buoyant to semi-buoyant. Deposited in open waters. Hatch between 22 and 36 hours. Most abundant in early summer. Vertical distribution in the water column appears to be uniform in the day, but denser towards the bottom at night. Larvae – Buoyant or semi-buoyant, mostly relying on current transportation. Horizontal swimming and feeding behavior begins after 6 days post hatching. Yolk sac larvae abundant near surface during daylight, however, post-yolk sac drum more

Species	Spawning Period	Spawning Temperature	Larval Recruitment	Life History Notes
				abundant near surface at night. Young of year spend most time on bottom.

From Becker (1983) and Wallus and Simon (2006).

Bluegill

Bluegill of all life stages are opportunistic feeders, feeding on zooplankton and aquatic insects throughout the water column. Bluegill will move into deeper waters during the summer to seek cooler water, as well as during the winter to seek warmer water (Stuber et al. 1982). Young bluegill and other sunfish display behavior where they tend to reside in shallow waters or shoreline during the day, retreating to deeper water at night to avoid predation (Rypel and Mitchell 2007). Spawning and early life stage information is given in **Table 4-11**.

Table 4-11: Bluegill Life History Data - Spawning and Early Life Stages

Species	Spawning Period	Spawning Temperature	Larval Recruitment	Life History Notes
Bluegill	Late May – Early August; Peak in June	67-80°F	June - September	Eggs – Demersal and adhesive eggs laid in a nest, protected by the male. Bluegill nests are in colonies of 40-50 nests. Hatch in 32.5-71 hours. Larvae – Free swimming 3 days after hatching. Larvae per nest up to 67,000 reported.

From Becker (1983) and Auer (1982).

Gizzard shad

Spawning can begin in late-April or early-May, and last into early-August (Becker 1983). Gonads begin to ripen when water temperatures reach 44.6°F to 50.0°F (Williamson and Nelson 1985). Spawning activity begins when water temperatures reach 59.9°F to 61.7°F, and peaks at 66.2°F to 69.8°F. The maximum spawning temperature recorded for gizzard shad is 80.6°F (Williamson and Nelson 1985). Spawning habitat includes sandy, rocky bars in two to four feet of water (Becker 1983). Spawning is random, occurs near the surface at night, and involves large schools (Becker 1983; Etnier and Starnes 2001).

Average fecundity is 300,000 eggs per female per year (Etnier and Starnes 2001). Egg Lvons (2021) adhesive, and 0.75 mm in diameter. Eggs hatch into 3.5 mm long larvae in 36-95 hours, in waters 61°F - 80°F, respectively (Becker 1983). After one day, larvae reach 4.5-5.0 mm (Williamson and Nelson 1985). The yolk-sac is absorbed in two to three days (Williamson and Nelson 1985). Three to four days after hatching, general behavior consists of upward swimming and downward settling. Larvae are either negatively geotaxic, positively phototaxic, or both. They tend to occur closer to the surface until they reach approximately four weeks old, then move into deeper waters. Larvae will occur closer to the surface in turbid waters (Williamson and Nelson 1985). After three-four days, fish display horizontal swimming behaviors but are generally poor swimmers for several weeks after hatching until they reach a length approximately 25 mm (Becker 1983; Williamson and Nelson 1985).

Spawning and early life stage information is given in **Table 4-12**.

Table 4-12: Gizzard Shad Life History Data - Spawning and Early Life Stages

Species	Spawning Period	Spawning Temperature	Larval Recruitment	Life History Notes
Gizzard shad	Late April - August	50-70°F	Late April - August	Eggs - Demersal, adhesive, hatch in 36-95 hours. Larvae – Exhibit upward swimming and downward settling behavior, poor swimming ability for several weeks after hatching.

From Becker (1983).

Cyprinidae spp. (Shiners and minnows)

Fishes of the Family Cyprinidae are the largest and most widely distributed family in North America. Certain members of the family can reach considerable sizes and may support commercial fisheries in certain regions. However, the majority of the species in the family are relatively small in size, but extremely diverse. They can make up a large portion of this mid-water biomass in many streams. Smaller Cyprinids are important forage for predatory fish and some can be used as indicators of water quality (Smith 1979). Two species, emerald shiner and channel shiner, were the most abundant Cyprinidae spp. collected in electrofishing sampling of the Montgomery Pool in 2015 when river flows were low and conditions were conducive for collections of smaller fish (ORSANCO 2015). Spawning and early life stage information for these species is given in **Table 4-13**.

The emerald shiner has been noted to be the most abundant fish in large North American River systems (Smith 1979). This small fish (up to 3.5 in) aggregates into large schools in mid- or surface-waters. Its food consists of small aquatic or terrestrial insects, small crustaceans and algae (Smith 1979). Spawning occurs in the summer but may commence as early as late May (Becker 1983). Eggs (about 900 to 5,400 per female) are broadcast spawned over sand or gravel substrate free of detritus (Auer 1982). Emerald shiner likely mature within the first year of life (Smith 1979).

The channel shiner was recently distinguished from the mimic shiner. Both fish occur sympatrically and have overlapping physical characteristics. Hrabik (1996) provides a good summary of what is known about the channel shiner. The channel shiner is generally restricted to large rivers and the lower portions of larger streams. It is often found along the shoreline over mud sand and gravel substrates.

Table 4-13: Shiner sp. Life History Data - Spawning and Early Life Stages

Species	Spawning Period	Spawning Temperature	Larval Recruitment	Life History Notes
Emerald shiner	Late May – Early August	68.2 – 73.8°F, triggered at 72°F	June-August	Eggs – Large (3.0 to 3.3 mm diameter; Demersal, non-adhesive. Larvae – Remain near bottom for 72-96 hours, then become planktonic within the upper 2 m of water, drifting with currents. Fry gather into large schools.
Channel Shiner*	May - July	No Data	June - September	Eggs – Demersal and adhesive until after water hardening. About 1.0 mm in diameter. Three day incubation period. Larvae – Growth is rapid and fish can reach sexual maturity within the year.

From Becker (1983) and Auer (1982).

* Data from mimic shiner a similar species occurring sympatrically with channel shiner.

Redhorse sp. (Moxostoma sp.)

Redhorse are a group of suckers in the family Moxostoma. Suckers play an important ecological role in the early stages of the freshwater food web. They feed mostly on benthic invertebrates, including aquatic insects, mollusks and crustaceans. They may make up most of the fish biomass in many streams and they can be valuable forage fish for larger predatory sport fish (Becker 1983). Spawning and early life stage information for these species is given in **Table 4-14**.

Golden redhorse are a benthic species, feeding primarily in shallow areas with slow current. Feeding increases throughout the day, significantly increasing after sunset, and peaks an hour before midnight. Golden redhorse tend to retain high site fidelity for most of the year but have been recorded to travel distances of 13 to 55 km. Movements tend to be minimal during low water periods of mid-summer. Adults will occupy shallow shoals during spawning in late spring. Spawning activity occurs only during daytime hours (Ross et. al. 1982).

Silver redhorse are very similar in appearance to golden redhorse and share some of the same life history traits. The Silver redhorse prefers slower currents and fine substrates as can be found in long deep pools in medium to large rivers (Ross et. al 1982 and Smith 1979). Spawning occurs in the spring over gravel in shallow riffles or deep runs (Ross et al. 1982).

Table 4-14: Redhorse sp. Life History Data - Spawning and Early Life Stages

Species	Spawning Period	Spawning Temperature	Larval Recruitment	Life History Notes
Golden redhorse	May	60-72°F	Late May - June	Eggs – Laid in shallow runs/ripples over gravel. Young of year are 25-45 mm by early august (southern Wisconsin).
Silver Redhorse	April - May	Not specified	May - June	Eggs – Demersal and adhesive, about 3.4 mm in diameter. Yellow in color. Hatching occurs in 5 to 6 days. Larvae – Most growth is observed in July, August and early September. Demersal.

[a] From Becker (1983).

White Bass

White bass are a temperate bass species that can be found throughout the Mississippi River drainage. They prefer open waters of reservoirs or medium to large rivers with slow to moderate currents (Becker 1983). White bass are targeted by recreational fishermen and are governed as panfish in Pennsylvania (PFBC 2005). White bass are prolific and considerable changes in abundance can be observed from year to year (PFBC 2005). Young feed on zooplankton, but transition to a mainly piscivorous diet as they grow (Becker 1983).

Table 4-15: White Bass. Life History Data - Spawning and Early Life Stages

Species	Spawning Period	Spawning Temperature	Larval Recruitment	Life History Notes
White Bass	April-June	55-79°F	May-June	Eggs – demersal eggs are scattered at or near the surface preferably over firm sand or gravel bottoms. Eggs are 0.7 – 1.2 mm in diameter. Larvae – Larvae less than 4 days old swim vertically throughout the water column but maintained horizontal position on day 4. Larvae feed on zooplankton.

[a] From Becker (1983).

Trout-Perch

Trout-perch are a small fish with a pale olive coloring that can be found in tributaries and water bodies throughout the Great Lakes Region of the United States. It is a characteristic species in large rivers and widely scattered lakes, and It avoids shallow, mud-filled bays. It is also present in tributary streams, particularly during spawning (Becker 1983). Even in waters where the trout-perch is abundant, it is seldom seen, for it appears to stay in deep water during the day and to move into shallow shore waters after dark. It is seldom caught during lake surveys, except by night seining, although it can be caught by trawlers in the daytime (Becker 1983).

Trout-perch are eaten by walleyes, northern pike burbot, lake trout, brook trout, sauger, yellow perch, and freshwater drum. The trout-perch makes its greatest contribution as a major link in the food cycle of many waters. Although trout-perch are competitive with larger fish in that they occupy the same habitat and feed upon the same foods as the young of all the important game and food fishes, they have become a major source of food to many game fishes (Becker 1983).

Table 4-16: Trout-Perch Life History Data - Spawning and Early Life Stages

Species	Spawning Period	Spawning Temperature	Larval Recruitment	Life History Notes
Trout-Perch	Late April - August	60-73.4°F	July-October	Eggs – Sand bars in lake are usually selected for spawning, but can also be spawned among rocks. Since the trout-perch are random spawners, no care is given to the eggs or fry by either parent. Eggs can reach up to around 1.8 mm in diameter. Larvae – Larvae hatch out of eggs over the course of a few days at around 5 mm long. Over the course of the next few days, the yolk-sac is absorbed. At 39.5 mm the trout-perch is fully scaled and has assumed the adult appearance.

[a] From Becker (1983)

Channel Catfish

Channel catfish spawn between May and July (Wang and Kernehan, 1979). Spawning is triggered at 21°C (McMahon and Terrel, 1982). Spawning occurs in water temperatures ranging from 21°C to 30°C. Spawning takes place in a nest that is built within a cavity of a submerged object or shoreline, which is built by the male. Immediately after mating, the male chases the female away from the nest, but she remains nearby to protect the nest from predators at a distance (McMahon and Terrel, 1982). Fecundity is as high as 20,000 eggs per female (Pool 2007). Eggs are demersal and very adhesive (Wang and Kernehan, 1979). Eggs hatch in 6-7 days at 27°C (McMahon and Terrel, 1982). Larvae remain in the nest for 7-8 days and then disperse into shallow water areas with cover (McMahon and Terrel, 1982). Young channel catfish tend to school and frequent inshore waters (Wang and Kernehan, 1979). Larvae concentrate in slow flowing (< 15 cm/s) areas near rocky riffles, debris covered gravel, or sand bars in clear streams, or in shallow (< 0.5 meters) mud or sand substrate edges of flowing channels in turbid rivers and bayous (McMahon and Terrel, 1982). Larvae avoid vegetation due to high predation by centrarchids. Larvae will overwinter under boulders in riffles or move into cover within deeper water. Juveniles reside in similar habitat to larvae (McMahon and Terrel, 1982).

4.5 Seasonal and Daily Activities

Regulatory requirement at §122.21(r)(4)(v): "Data representative of the seasonal and daily activities (e.g., feeding and water column migration) of biological organisms in the vicinity of the cooling water intake structure."

The seasonal and daily activities of the taxa most susceptible to impingement and entrainment, as identified in Section 4.3 above, are described in this section.

4.5.1 General Daily & Seasonal Activities

Smallmouth bass

Smallmouth bass have been extensively introduced throughout North America (Becker 1983). Smallmouth bass occur over rocky habitats of medium to large streams where water temperatures range from 60 to 80°F in the summer. Preferred stream habitat includes pools, pocket water, and deep, moving waters (PFBC 2025a). They tend to avoid aquatic vegetation, due to the likelihood of competition with or predation by largemouth bass (Becker 1983). Smallmouth bass are non-migratory, and rarely demonstrate schooling behavior (Becker 1983). Site fidelity is high, and annual movement is estimated to be limited to less than five miles (Scott and Crossman 1998). During the day, smallmouth bass occur in pools, undercut banks, or deep waters, but swim openly during dusk and dawn and actively feed near the shore (Becker 1983). Nighttime behavior includes lying on the bottom, but they may be more active during moonlit nights (Becker 1983).

When water temperatures reach below 50°F, the bass become lethargic and retreat to deeper waters. At this time, they are semi-dormant and demonstrate limited feeding behavior (Becker 1983). They will also retreat to deeper, cooler waters during the summer when water temperatures are high (Scott and Crossman 1998). During the summer, juvenile smallmouth bass occur in waters slightly warmer than the preference of adult bass (Lower Columbia Fish Recovery Board 2004).

Smallmouth bass forage on fish, crayfish, and aquatic insects. Fish forage includes various cyprinids, perch, and sunfish (Becker 1983). Smallmouth bass diets are typically 40% fish, 30% crayfish, and 20% insects (IDNR 2017). When crayfish are abundant, they can constitute up to 66% of smallmouth bass diets. Small fish and insects become the bulk of their diets once they reach 1.5 inches in length (IDNR 2017).

Sauger

Saugers exhibit seasonal movement patterns associated with spawning and habitat use. In late winter, they begin congregating near spawning areas and may migrate considerable distances to reach them (PFBC, 2025; Becker, 1983). After spawning, adults return to deeper waters (PFBC, 2025). In large lakes and reservoirs, they are generally found in bays above the thermocline and tend to remain in deeper water during midday, especially in clear conditions (Becker, 1983).

Daily activity is influenced by light and water clarity. Saugers possess a well-developed tapetum lucidum, a reflective layer behind the retina, which enhances their ability to feed in low-light conditions such as dawn, dusk, or turbid water (PFBC, 2025; Becker, 1983). In clearer water, they are most active during early morning and evening, while in more turbid environments, their activity period may extend throughout the day (Becker, 1983). Their activity may also increase in shallow water during windy conditions (Becker, 1983).

Juvenile saugers may be found in shallower mud flats, while adults typically occupy deeper, open water habitats (Becker, 1983). These patterns reflect their preference for large, often muddy rivers and silty reservoirs, where they form schools and avoid smaller or clearer water bodies (PFBC, 2025).

Freshwater drum

Freshwater drum inhabit large rivers, lakes, and impoundments (Becker 1983). They prefer warm, sluggish, open water areas over muddy substrates. They are a schooling species. Freshwater drum rarely occur in shallow, vegetated areas. They prefer turbid waters but may occur in clear waters. They are benthic feeders and will feed during all times of the day (Becker 1983). Freshwater drum typically feed on benthic invertebrates such as cladocerans and mollusks (Hardisty 2007). Young of year fish show some planktonic behavior, as their diet primarily consists of planktonic cladocerans. Adults larger than 250 mm may also turn to piscivorous behavior, feeding on small fish and fish eggs (Hardisty 2007).

During the winter, they remain in deeper waters and exhibit limited feeding and movement (Becker 1983). As waters warm in the spring, they move closer inshore into shallower waters, then retreat into deeper waters in the fall as water temperatures begin to fall (Becker 1983). Juvenile (age 0 – age 1) drum tend to have the highest presence on the shoreline at night, possibly as a method of predation avoidance (Rypel and Mitchell 2007). During the summer months, drum will move into waters less than 4.9 ft. deep at twilight to feed (Becker 1983). It is also possible that freshwater drum shoreline density increases at night due to macroinvertebrate drift also increasing at night. They spawn in the water column and have planktonic larvae and eggs (Ross et al. 2001). They are hardy fish, but may show signs of distress at temperatures greater than 78°F.

Bluegill

Bluegill prefer warm water in temperature ranges of 85°F to 88°F, and can tolerate temperatures of up to 95°F (Mecozzi 2008a). Bluegill will move into deeper waters during the summer to seek cooler water, as well as during the winter to seek warmer water (Stuber et al. 1982). They prefer warm, shallow waters (Mecozzi 2008a). During the spring, bluegill may move into slow flowing streams or channels that warm up faster than lakes (Mecozzi 2008a). Bluegills congregate into schools of 10 to 20 fish. Schools may mix with other sunfish or minnows. They tend to remain in a small home range and do not migrate long distances.

All life stages of bluegill are opportunistic feeders, feeding on zooplankton and aquatic insects throughout the water column (Stuber et al. 1982). Forage consists of a diverse diet including algae, aquatic vegetation, zooplankton, insects, insect larvae, fish eggs, and occasionally minnows and small fish (Mecozzi 2008a). Feeding activity occurs primarily at dusk and dawn, but bluegill will feed throughout the day. Bluegill move closer inshore at night, but will swim in open waters during the day. Bluegill are intolerant of low dissolved oxygen levels (Mecozzi 2008a).

Gizzard shad

Gizzard shad occur in numerous types of water bodies (Becker 1983). Populations occurring in lakes or reservoirs are found in both the littoral and limnetic zones. They are primarily a pelagic species, inhabiting waters at or near the surface, but have been collected at depths of up to 108 ft. Adults feed in both the limnetic zone and near the benthos. This is evident by the occurrence of both plankton and sand in their digestive system. The sand in the digestive tract is believed to be used to aid in grinding food (Becker 1983). Juveniles tend to prefer habitats close to shore in shallow waters. Young of year tend to form compact schools after hatching but dissipate by the fall (Miller 1960). Fish begin to move into deeper waters once temperatures in the fall reach less than 55.4°F (Williamson and Nelson 1985). During the winter, gizzard shad migrate into the deep portions of lakes, or may overwinter in sheltered coves with refugia provided by spring-fed streams (Williamson and Nelson 1985).

Gizzard shad behavior and abundance tend to be facilitated by water temperatures. Populations can be significantly affected by cold winters, resulting in high mortality rates. Mortality events typically occur when water temperatures fall below 38°F, primarily effecting juvenile fish. Older shad are susceptible to mortality when exposed to temperatures below 38°F for an extended period of time, or if water temperatures fall below 36°F. Warm winter water temperatures often correlate with increases in gizzard shad populations. Even when temperatures are moderate, sudden changes, even if only by a few degrees, can disrupt equilibrium and swimming capabilities. Loss of equilibrium or mortality occurs from sudden rises in temperature, as well as sudden drops. The preferred temperature range is from 71.6°F–84.2°F, with a maximum tolerance of 93.2°F and lethal threshold of 97.7°F (Williamson and Nelson 1985). They are known to congregate near the warm waters of industrial discharges (Miller 1960). However, issues arise if the discharge stops, as the sudden change in water temperature can disrupt equilibrium and/or result in mortality events.

Populations may be most dense in areas of high turbidity (Williamson and Nelson 1985). Higher catch rates were observed within the turbid Sandusky Bay of Lake Erie than in areas of low turbidity. However, individual shad collected from more turbid waters are generally smaller and spawn earlier than those in clear waters. Distribution is also influenced by dissolved oxygen levels. They are absent from waters with less than dissolved oxygen levels of ≤ 2 mg/L and only occur above the thermocline during the summer months (Williamson and Nelson 1985).

Cyprinidae spp. (Shiners and minnows)

Two species, emerald shiner and channel shiner, were the most abundant Cyprinidae spp. collected in electrofishing sampling of the Montgomery Pool in 2015 when river flows were low and conditions were conducive for collections of smaller fish (ORSANCO 2015). Available data regarding daily and seasonal activities of these shiner sp. are provided in **Table 4-17.** During the spring, emerald shiners may travel into the warmer waters of tributaries, returning to the mainstem by mid-June (Becker 1983).

Table 4-17: Montgomery Pool Cyprinidae spp. – Activity and Habitat Use

Shiner Species	Feeding Behavior	Diel Periodicity & Seasonal Movement	Habitat Use
Emerald shiner	• Primarily feed on terrestrial insects, also forage on small fish, fish eggs, aquatic insects and zooplankton • Often feed at surface	• Remain in mid-water during the day, move towards surface at night to feed on terrestrial insects	• Prefer open waters of large streams/lakes • Common in clear water 2-5 ft. deep over sandy substrates • Pelagic; prefer surface/mid-waters • Slow moving waters; Rare near riffles • Preferred water temperature is 77ºF
Channel Shiner	n/a	n/a	• Limited to big-river habitats • Prefers quiet water to moderate currents • Occurs in midwaters of large pools that lack visible current • Occasionally found mixed with schools of emerald shiner below dams

Redhorse sp. (Moxostoma sp.)

Redhorses display seasonal shifts in movement and habitat use, particularly in spring when most species migrate upstream into faster water (PFBC, 2025). These migrations bring them from deeper or slower habitats into shallow, gravelly areas. Some species, like the silver redhorse, move from slow-flowing pools into swifter river sections or small streams during this time (PFBC, 2025).

Outside of the spawning season, redhorses occupy a range of habitats depending on the species. They may be found in slow areas of large rivers, fast-moving creeks, or lakes. For example, golden redhorse adults prefer slow, deep runs in rivers, while shorthead redhorses are known to use both lake and river habitats (PFBC, 2025).

Redhorses are bottom-dwelling fish that feed on aquatic invertebrates and plant material found on the streambed. Their diet includes snails, mollusks, midges, insect larvae, and algae. River redhorses are especially noted for feeding on freshwater clams, which they crush using strong pharyngeal teeth (PFBC, 2025).

White Bass

White bass occur in open, clear to turbid waters (Becker 1983). They are most abundant in waters less than six meters deep and prefer sandy or muddy substrates (Becker 1983). They are opportunistic feeders and form large schools at the surface to search for prey (Hamilton and Nelson 1984). White bass occurrence is not habitat driven, but driven by forage availability. Diet varies seasonally due to prey availability and current life stage. Juveniles less than 38 mm long commonly feed on macroinvertebrates, while larger white bass are piscivorous, preferring clupeids as prey. Adult diets will shift to macroinvertebrates or zooplankton if there is a lack of forage fish. Production is highest in areas of large clupeid populations (Hamilton and Nelson 1984).

White bass activity peaks, from the early spring to the fall, at the surface during the early morning and late afternoon (Becker 1983). They can often be found near floating vegetation or other emergent structures with little movement at night. Older bass occur primarily in the pelagic zone, while younger bass will be found in the littoral zone. Young white bass prefer sandy beaches. White bass occur near the bottom during the winter, but are primarily found near the surface during the summer. White bass also appear to have a strong homing tendency to a specific spawning ground (Becker 1983).

Trout-Perch

Trout-perch typically are found in lakes but can also be found in deep flowing pools of creeks and rivers. During daylight hours, trout-perch typically remain in deeper water and shift into shallower areas at night (Becker, 1983). This daily pattern has been observed in both lake and river environments. In spring, trout-perch migrate into shallow areas to spawn. Lake-dwelling populations often move into streams for spawning and return to deeper water afterward (ADFG, 2005). Spawning usually occurs at night near the surface, along the edges of slow-moving streams or lake beaches. Many large females and most males die after spawning, though some individuals may survive to spawn again (ADFG, 2005).

Juveniles begin life in shallow water, feeding primarily on zooplankton, and gradually transition to deeper habitats as they grow (Becker, 1983). Seasonal shifts in depth use are most pronounced during the warmer months, when trout-perch are more frequently found in surface waters.

Channel Catfish

Channel catfish are native east of the Appalachian Mountains but have been introduced throughout the 48 contiguous states (McMahon and Terrell 1982). All life stages of channel catfish concentrate in the warmest sections of rivers and reservoirs. They seek cover, and reside in cavities, boulders, and areas of debris in low velocity waters. Optimum habitats are deep pools and littoral areas less than 16 feet deep with more than 40 percent suitable cover. Cover may not be necessary in waters with high turbidity (McMahon and Terrell 1982). They prefer sand, gravel, or rubble bottoms, but still occur over mud (Wellborn 1988).

Channel catfish are nocturnal foragers (Pool 2007). During daytime hours, they typically reside in holes within submerged structure such as logs or boulders (Wellborn 1988). Feeding occurs at night just after sunset and just before sunrise. Adults are sedentary and have high site fidelity, while juveniles are frequently active and moving into new habitats, especially at night during feeding (McMahon and Terrell 1982; Wellborn 1988). Channel catfish leave their cover at night to feed along riffles, runs, tributaries, and shorelines (McMahon and Terrell 1982). They are benthic feeders, utilizing external sensory organs on their body to sense prey (Wellborn 1988). Young catfish feed on aquatic insects, while adults feed on insects, snails, crawfish, green algae, aquatic plants, seeds, and small fish. Fish are important for their diet once channel catfish reach 18 inches, and fish will constitute as much as 75 percent of their diet (Wellborn 1988). Young fish will move much more extensively than adults, who rarely move from one area to another (McMahon and Terrell 1982).

4.5.2 Impingement

In accordance with requirements in SPM's NPDES Permit PA0002208 and a PADEP-approved Sampling and Analysis Plan developed by AECOM (AECOM 2024), one year of monthly Impingement and Entrainment data collection and analyses is currently being conducted for the SPM Facility. The Field Study was initiated in August 2024 and is expected to be completed by the end of July 2025. However, data from the ongoing study has not been compiled for inclusion in this report.

4.5.3 Entrainment

As noted above, one year of monthly Impingement and Entrainment data collection and analyses is currently being conducted for the SPM Facility. The Field Study was initiated in August 2024 and is expected to be complete by the end of July 2025. A summary report of the Impingement and Entrainment Field Study findings will be prepared and submitted to PADEP in January 2026 in accordance with the NPDES permit. However, data from the ongoing study has not been compiled for inclusion in this report.

4.6 Threatened, Endangered, and Other Protected Species

Regulatory requirement at §122.21(r)(4)(vi): "Identification of all threatened, endangered, and other protected species that might be susceptible to impingement and entrainment at your cooling water intake structures."

The Rule requires that the USEPA or state permitting authority transmit permit applications to the appropriate Field Office of the United State Fish and Wildlife Service (USFWS) and/or Regional Office of

the National Marine Fisheries Service (NMFS) for review. The Services have the ability to recommend control measures, monitoring and reporting of take and other impacts to listed species and critical habitats. The Rule specifically addresses federally listed threatened and endangered (T&E) species; however, state-listed species are included for completeness. The federally and state-listed aquatic species that may be present near the intake were identified based on on-line reviews of the USFWS' Information for Planning and Consultation (IPaC) database and the Pennsylvania Natural Heritage Program's (PNHP) Pennsylvania Natural Diversity Inventory (PNDI) database.

No federally threatened or endangered aquatic species susceptible to impingement or entrainment were identified in the vicinity of the SPM intake (USFWS 2025; **Attachment D**). A review of Pennsylvania Natural Diversity Inventory (PNDI) records identified potential impacts to species managed by the PFBC (PADCNR 2025). PFBC identified two endangered species (bigmouth buffalo and ghost shiner) and three species of special concern (fragile papershell, threehorn wartyback, and mapleleaf) in the PNDI receipt requiring further review for potential impacts. Federal and state correspondences are provided in **Attachment D**.

One bigmouth buffalo was collected in electrofishing samples in 2010 (ORSANCO 2010) and tippecanoe darter and bluebreast darter larvae were collected from the Montgomery Pool in 2008-2009. Bigmouth buffalo are listed as endangered in Pennsylvania while tippecanoe darter and bluebreast darter are listed as species of concern (previously listed as threatened.).

Two other endangered fish species (river shiner and warmouth) and one other threatened species (spotted darter) (**Table 4-18**) have been documented in the Montgomery Pool in historical sampling (PFBC 2010). No other Pennsylvania listed threatened, endangered or candidate species have been identified in the Montgomery Pool.

Historically, 53 species of unionids have been recorded within the upper Ohio River drainage basin within Pennsylvania (**Table 4-18**; Taylor 1989; PFBC 2013). There are ten federally endangered species listed within the Ohio River drainage basin in Pennsylvania. The PFBC lists seven state endangered species (some overlap with federal listings) and one state threatened species within the Ohio River drainage basin in Pennsylvania; three of the seven species listed are federally endangered species that had historical occurrences in the Ohio River in Beaver County (USFWS 2025). None of these species has recent observations in the main stem Pennsylvania portion of the Ohio River. The most recent recording of a state and/or federally listed threatened or endangered unionid species in the Montgomery Pool of the Ohio River was noted by Arnold E. Ortmann, circa 1919.

Table 4-18: Unionid Records for the Upper Ohio River in Pennsylvania

Species	Common Name	Federal Status[1]	PA Status[1,2]	Montgomery Pool[1,2]	Ohio River[1,3]
Subfamily Ambleminae					
Amblema plicata	threeridge	-	-	O	R
Cyclonaias tuberculata	purple wartyback	-	-	-	R
Elliptio crassidens	elephantear	-	-	-	R
Elliptio dilatata	spike	-	-	O	R
Fusconaia flava	Wabash pigtoe	-	-	-	R
Fusconaia subrotunda	longsolid	T	T	-	R
Plethobasus cooperianus	orangefoot pimpleback	E	-	-	H
Plethobasus cyphyus	sheepnose	E	T	-	R
Pleurobema clava	cClubshell	E	E	-	H
Pleurobema cordatum	Ohio pigtoe	-	-	-	R
Pleurobema plenum	rough pigtoe	E	-	-	O
Pleurobema rubrum	pyramid pigtoe	-	-	-	H

Species	Common Name	Federal Status[1]	PA Status[1,2]	Montgomery Pool[1,2]	Ohio River[1,3]
Pleurobema sintoxia	round pigtoe	-	-	-	H
Quadrula metanevra	monkeyface	-	-	-	R
Quadrula pustulosa	pimpleback	-	-	-	R
Quadrula quadrula	mapleleaf	-	-	O	R
Quadrula verrucosa	pistolgrip	-	E	-	H
Theliderma cylindrica	rabbitsfoot	T	E	-	H
Subfamily Anodontinae					
Alasmidonta marginata	elktoe	-	-	O	O
Pyganodon grandis	giant floater	-	-	O	R
Utterbackia imbecillis	paper pondshell	-	-	O	R
Anodonta suborbiculata	flat floater	-	-	-	O
Anodontoides ferussacianus	cylindrical papershell	-	-	-	H
Lasmigona complanata	white heelsplitter	-	-	O	R
Lasmigona compressa	creek heelsplitter	-	-	-	R
Lasmigona costata	flutedshell	-	-	O	H
Simpsonaias ambigua	salamander mussel	-	E	-	O
Strophitus undulatus	creeper	-	-	-	R
Subfamily Lampsilinae					
Actinonaias ligamentina	mucket	-	-	O	R
Cyprogenia stegaria	fanshell		-	-	H
Ellipsaria lineolata	butterfly	-	-	-	R
Epioblasma torulosa rangiana	northern riffleshell	E	E	-	H
Epioblasma triquetra	snuffbox	E	E	-	H
Lampsilis abrupta	pink mucket	E	-	-	R
Lampsilis cardium	plain pocketbook	-	-	-	O
Lampsilis fasciola	wavyrayed lampmussel	-	-	-	H
Lampsilis ovata	pocketbook	-	-	-	H
Lampsilis siliquoidea	fatmucket	-	-	-	R
Leptodea fragilis	fragile papershell	-	-	O	R
Ligumia recta	black sandshell	-	-	O	R
Obliquaria reflexa	threehorn wartyback	-	-	O	R
Obovaria olivaria	hickorynut	-	-	-	H
Obovaria retusa	ring pink	-	-	-	H
Obovaria subrotunda	round hickorynut	T	E	-	R
Potamilus alatus	pink heelsplitter	-	-	O	R
Potamilus ohiensis	pink papershell	-	-	-	R
Ptychobranchus fasciolaris	kidneyshell	-	-	-	H
Toxolasma parvus	lilliput	-	-	-	R
Truncilla donaciformis	fawnsfoot	-	-	O	R
Truncilla truncata	deertoe	-	-	-	H
Villosa fabalis	rayed bean	E	E	-	O

Species	Common Name	Federal Status[1]	PA Status[1,2]	Montgomery Pool[1,2]	Ohio River[1,3]
Villosa iris	rainbow	-	-	-	R
Total Records		**11**	**10**	**14**	**52**

[1]E = endangered; T = threatened; PT = Proposed Threatened; O = live record; H = pre 1920; R = recent
[2] PAFBC (unpublished data, 2013)
[3]Taylor (1989) records of mussels in the Upper Ohio River miles zero to 300

4.7 Public Participation and Agency Consultation

Regulatory requirement at §122.21(r)(4)(vii): "Documentation of any public participation or consultation with Federal or State agencies undertaken in development of the plan."

A PNDI database search for state protected species and an IPaC database search for federally protected species and critical habitats were completed. Additional correspondence is occurring with the PFBC to supplement PNDI threatened and endangered species review. No other public consultation with Federal or State agencies related to CWA Section 316(b) was undertaken during the development of the §122.21(r) reports.

4.8 Supplemental Field Studies

Regulatory requirement at §122.21(r)(4)(viii): "If you supplement the information requested in paragraph (r)(4)(i) of this section with data collected using field studies, supporting documentation for the Source Water Baseline Biological Characterization must include a description of all methods and quality assurance procedures for sampling, and data analysis including a description of the study area; taxonomic identification of sampled and evaluated biological assemblages (including all life stages of fish and shellfish); and sampling and data analysis methods. The sampling and/or data analysis methods you use must be appropriate for a quantitative survey and based on consideration of methods used in other biological studies performed within the same source water body. The study area should include, at a minimum, the area of influence of the cooling water intake structure."

In accordance with requirements in SPM's NPDES Permit PA0002208 and a PADEP-approved Sampling and Analysis Plan developed by AECOM (AECOM 2024), one year of monthly Impingement and Entrainment data collection and analyses is currently being conducted for the SPM Facility. The Field Study was initiated in August 2024 and was completed in July 2025. A summary report of the Impingement and Entrainment Field Study findings will be prepared and submitted to PADEP in January 2026 in accordance with the NPDES permit.

4.9 Regulatory Requirement

Regulatory requirement at §122.21(r)(4)(ix): "In the case of the owner or operator of an existing facility or new unit at an existing facility, the Source Water Baseline Biological Characterization Data is the information in paragraphs (r)(4)(i) through (xii) of this section."

Regulatory requirement cited for informational purposes only. No response necessary.

4.10 Protective Measures and Stabilization Activities Near the Intake

Regulatory requirement at §122.21(r)(4)(x): "For the owner or operator of an existing facility, identification of protective measures and stabilization activities that have been implemented, and a description of how these measures and activities affected the baseline water condition in the vicinity of the intake."

The SPM intake is flush with the shoreline, which is outfitted with a trash rack at its face (Evoqua 2017a). The SPM Facility operates a closed-cycle recirculating system as defined at §125.92 to minimize make-up and blowdown flows withdrawn from the Ohio River. Additionally, the dual-flow traveling water screens operate with design through-screen velocity of 0.38 feet per second (fps) at normal pool elevations and at 0.57 fps at low water elevation. No further protective measures or stabilization activities are known to occur at the SPM intake.

4.11 Fragile Species

Regulatory requirement at §122.21(r)(4)(xi): "For the owner or operator of an existing facility, a list of fragile species, as defined at 40 CFR 125.92(m), at the facility. The applicant need only identify those species not already identified as fragile at 40 CFR 125.92(m). New units at an existing facility are not required to resubmit this information if the cooling water withdrawals for the operation of the new unit are from an existing intake."

Fragile species are those species of fish and shellfish that are least likely to survive any form of impingement. For purposes of this subpart, *fragile species* are defined as those with an impingement survival rate of less than 30 percent, including but not limited to alewife, American shad, Atlantic herring, Atlantic long-finned squid, Atlantic menhaden, bay anchovy, blueback herring, bluefish, butterfish, gizzard shad, grey snapper, hickory shad, menhaden, rainbow smelt, round herring, and silver anchovy (79 FR 48432, August 15, 2014).

Fragile species are defined in 40 CFR §125.92(m) as…

> "*…a species of fish or shellfish that has an impingement survival rate of less than 30 percent even when the BTA technology of modified traveling screens are in operation*."

No site-specific impingement studies at the SPM CWIS have yet been completed as of the time of this report. The only "fragile species" listed in 40 CFR §125.92(m) that was collected in the vicinity of (the Ohio River) during biological studies were gizzard shad (collected by electrofishing downstream of the Ohio River intake), one post yolk sac larvae (collected during the 2018 entrainment study), and one alewife (also captured via electrofishing downstream of the Ohio River intake).

The Rule requests the identification of species not listed in 40 CFR §125.92(m) that may be considered a fragile species. The majority of species recorded to collected near SPM are either explicitly identified by USEPA (2014) as "non-fragile" or have a similarly related species considered to be "non-fragile".

4.12 Incidental Take Exemption or Authorization

Regulatory requirement at §122.21(r)(4)(xii): "For the owner or operator of an existing facility that has obtained incidental take exemption or authorization for its cooling water intake structure(s) from the U.S. Fish and Wildlife Service or the National Marine Fisheries Service, any information submitted in order to obtain that exemption or authorization may be used to satisfy the permit application information requirement of paragraph 40 CFR 125.95(f) if included in the application."

The SPM Facility does not anticipate any incidental take, and, therefore, has not obtained an incidental take exemption of authorization for its cooling water intake structures from the USFWS or NMFS. No response is necessary.

5.0 §122.21(r)(5) – COOLING WATER SYSTEM DATA

5.1 Narrative Description of Cooling Water System

Regulatory requirement at §122.21(r)(5)(i): "A narrative description of the operation of the cooling water system and its relationship to cooling water intake structures; the proportion of the design intake flow that is used in the system; the number of days of the year the cooling water system is in operation and seasonal changes in the operation of the system, if applicable; the proportion of design intake flow for contact cooling, non-contact cooling, and process uses; a distribution of water reuse to include cooling water reused as process water, process water reused for cooling, and the use of gray water for cooling; a description of reductions in total water withdrawals including cooling water intake flow reductions already achieved through minimized process water withdrawals; a description of any cooling water that is used in a manufacturing process either before or after it is used for cooling, including other recycled process water flows; the proportion of the source waterbody withdrawn (on a monthly basis)"

The SPM Facility operates the CWIS to supply process and cooling water to support the conversion of ethane feedstock into ethylene for manufacturing on site into various grades of linear low density and high-density polyethylene as the final product. To minimize water withdrawals from the Ohio River, SPM employs a closed-cycle recirculating system (CCRS).

Raw water withdrawn through the CWIS is pumped to a clarifier, filtered, stored, and distributed to the Facility for cooling and other process related purposes. Approximately 78% of the treated water from the clarifiers and filters is used for non-contact cooling in a system that employs a CCRS with cooling towers; 11.4% is used for high quality / demineralized water for use in boilers and production processes, and 10.8% is used for other purposes.

The Facility utilizes two cooling tower systems, including the Cogen Cooling Tower and Process Cooling Tower. The Cogen Cooling Tower system consists of six 48-ft by 54-ft cooling tower 'cells' arranged in a back-to-back configuration, with an overall footprint of 144-ft by 108 ft. (Bechtel 2019a). The Process Cooling Tower system consists of twenty-six 54-ft square cooling tower 'cells' arranged in a back-to-back configuration, with an overall footprint of 702-ft by 108 ft (Bechtel 2019b). The two cooling tower systems are connected to one another. Each cooling tower arrangement includes induced-draft, mechanical draft cooling towers to provide closed-cycle cooling to support the Facility's production activities. Blowdown from the cooling towers is directed back to the Ohio River through Outfall 001.

Section 3.0 describes the CWIS from the point-of-entry of the River water up to, and including, the intake pumps, while this section of the report includes a description of the remaining cooling system.

5.1.1 Closed-Cycle Recirculating System Description

The CCRS includes two mechanical draft cooling tower systems (the Cogen Cooling Tower system and Process Cooling Tower system) that are used to dissipate heat from the production processes. The CCRS is designed to provide cooling water to the Facility to remove heat from the heat cycle of the associated processes and collect the heated water and transfer it to the cooling tower for dissipation of the heat to the atmosphere. The heated water from the areas in the Facility requiring cooling water is pumped to the cooling towers' elevated distribution lines and is cooled via evaporation by the air current created by the towers' fans as it flows down through the fill material to the basins. The heated water vapor rises through the cooling towers and discharges into the atmosphere as a vapor plume. Water losses in the system are offset by makeup flows from the CWIS.

The CCRS includes a blowdown system to control the dissolved solids concentration in the circulating water. The mechanical draft cooling towers also discharge water vapor to the atmosphere through evaporative losses. The blowdown and evaporative losses are replaced by river water withdrawn through the CWIS. **Table 5-1** provides a summary of the design circulating water, makeup water, evaporation, and blowdown flowrates for each of the cooling tower systems (Bechtel 2017).

Table 5-1: Cooling Tower Design Flowrates

Tower Name	Circulating Water Rate (GPM)	Makeup Rate (GPM)	Evaporation Rate (GPM)	Blowdown Rate (GPM)	ΔT (°F)
Cogen Cooling Water Tower	74,056	2,033	1,629	339	27
Process Cooling Water Tower	295,900	8,008	6,598	1,333	27
Total	369,956 [532 MGD]	10,041 [14 MGD]	8,227 [12 MGD]	1,672 [2 MGD]	N/A

The cooling towers typically operate at six cycles of concentration, with the design temperature difference [ΔT] between the inlet / hot water temperature and outlet / cold water of approximately 27 °F.

5.1.2 Annual and Seasonal Operation

Regulatory requirement at §122.21(r)(5)(i): "… the number of days of the year the cooling water system is in operation and seasonal changes in the operation of the system, if applicable…"

The CWIS operates year around with consistent flows (i.e., up to two pumps are typically in operation) with minimal seasonal variability.

5.1.3 Proportion of Intake Flow Used for Non-Contact Cooling

Regulatory requirement at §122.21(r)(5)(i): "… the proportion of design intake flow for contact cooling, non-contact cooling, and process uses…"

The total intake flow from the Ohio River to SPM 21.12 MGD on a maximum basis, of which the majority (approximately 78 %) is used for non-contact cooling. The water withdrawn through the CWIS will provide a closed-cycle cooling system to remove heat from the manufacturing process, among other uses.

5.1.4 Water Reuse

Regulatory requirement at §122.21(r)(5)(i): "…a distribution of water reuse to include cooling water reused as process water, process water reused for cooling, and the use of gray water for cooling…"

The proportion of flow to the facility that is to be used for cooling is approximately 78%.

5.1.5 Total Water Withdrawal Reductions

Regulatory requirement at §122.21(r)(5)(i): "…a description of reductions in total water withdrawals including cooling water intake flow reductions already achieved through minimized process water withdrawals…"

The water withdrawn through the CWIS provides a CCRS to remove heat from the manufacturing process, among other uses. The cooling towers are designed to operate at approximately six cycles of concentration, which provide a reduction in cooling water intake flow through minimized makeup water withdrawals. Percent reduction in intake water flows are provided in **Section 5.2.3**.

5.1.6 Cooling Water Used in Manufacturing Processes

Regulatory requirement at §122.21(r)(5)(i): "…a description of any cooling water that is used in a manufacturing process either before or after it is used for cooling, including other recycled process water flows…"

Raw water withdrawn through the CWIS is pumped to a clarifier, filtered, stored, and distributed to the Facility for cooling and other process related purposes. Approximately 78% of the treated water from the clarifiers and filters is used for non-contact cooling in a system that employs a CCRS with cooling towers; 11.4% is used for high quality / demineralized water for use in boilers and production processes, and 10.8% is used for other purposes.

5.1.7 Proportion of Source Water Body Withdrawn

Regulatory requirement at §122.21(r)(5)(i): "… the proportion of the source waterbody withdrawn (on a monthly basis)…"

See **Section 5.2.4**

5.2 Design and Engineering Calculations

Regulatory requirement at §122.21(r)(5)(ii): "Design and engineering calculations prepared by a qualified professional and supporting data to support the description required by paragraph (r)(5)(i) of this section"

5.2.1 Design Intake Flow

The DIF is provided in **Section 3.0**.

5.2.2 Through-Screen Velocity

The through-screen velocity has been calculated at the screens under low water elevations for DIF and for the maximum AIF for the period of January 2020 through April 2025. The results are listed in **Table 5-2**.

Table 5-2: Through-Screen Velocities

Assumptions	TSV at Normal Pool Elev (fps)	TSV at Low Water Elev (fps)
DIF (21.12 MGD / 14,667 gpm)	0.38	0.57
Maximum AIF (10.44 MGD / 7,250 gpm)	0.19	0.28

Through-screen velocity calculations are provided in **Attachment B - Calculations**.

5.2.3 Percent Reduction in Cooling Water

Due to the operation of the cooling towers, cooling water intake flow reductions are achieved through minimized makeup water withdrawals when compared to plant circulating water flow. Additional flow reduction is recognized during plant outages and planned maintenance activities. The cooling towers are typically operated at two to six cycles of concentration (Shell 2020). The percent of flow reduction is listed in **Table 5-3**.

Table 5-3: Percent reduction in Flow

Total Make-up Water	Percent Flow Reduction
DIF – 21.12 MGD	96%
Maximum Total AIF – 10.44 MGD	98%

5.2.4 Proportion of the Source Waterbody Withdrawn

The proportion of the source waterbody withdrawn has been calculated on a monthly basis as a percentage for the Ohio River. The streamflow is based on Ohio River flows at the USGS Gage Stations at Sewickley (0308600, river mile 11.8) on the Ohio River and at Beaver Falls (03107500) on the Beaver River, PA. The period of record for the average monthly Ohio River streamflow is from January 1994 through December 2023. The proportion of water withdrawn as a percentage of river flow, based on Facility withdrawal data for the period of February 1, 2021 through April 29, 2025 (Shell 2025), is listed in **Table 5-4**.

Table 5-4: Proportion of Source Waterbody Withdrawn

Month	Mean Streamflow	Average Monthly AIF		Proportion of Stream Flow Withdrawn
	cfs	MGD	cfs	%
January	57,006	5.5	8.5	0.01%
February	57,654	4.9	7.6	0.01%
March	67,630	5.0	7.8	0.01%
April	58,086	3.9	6.0	0.01%
May	47,536	4.2	6.5	0.01%
June	29,740	4.9	7.6	0.03%
July	21,121	5.3	8.3	0.04%
August	17,028	5.8	8.9	0.05%
September	18,722	6.3	9.8	0.05%
October	19,850	5.2	8.1	0.04%
November	33,843	5.0	7.7	0.02%
December	50,276	4.8	7.4	0.01%

Source: Combined mean monthly flow at USGS gauging stations Sewickley (0308600) and Beaver Falls (03107500) from 1994 to 2023 & Average Monthly AIF provided in **Attachment B – Calculations.**

5.3 Existing Impingement and Entrainment Technologies

Regulatory requirement at §122.21(r)(5)(ii): "Description of existing impingement and entrainment technologies or operational measures and a summary of their performance, including but not limited to reductions in impingement mortality and entrainment due to intake location and reductions in total water withdrawals and usage"

The SPM Facility operates a closed-cycle recirculating system as defined at §125.92 to minimize make-up and blowdown flows withdrawn from the Ohio River to support process and non-contact cooling uses at the facility. As such, SPM meets BTA standards for impingement mortality at §125.94(c)(1) and BTA for entrainment. Additionally, the dual-flow traveling water screens operate with design through-screen velocity of 0.38 feet per second (fps) at normal pool elevations and at 0.57 fps at low water elevation.

6.0 §122.21(r)(6) – CHOSEN METHOD OF COMPLIANCE WITH IMPINGEMENT MORTALITY STANDARD

Regulatory requirement at §122.21(r)(6): "The owner or operator of the facility must identify the chosen compliance method for the entire facility; alternatively, the applicant must identify the chosen compliance method for each cooling water intake structure at its facility. The applicant must identify any intake structure for which a BTA determination for Impingement Mortality under 40 CFR 125.94 (c)(11) or (12) is requested."

The SPM Facility operates a closed-cycle recirculating system (CCRS) as defined at §125.92 to minimize make-up and blowdown flows withdrawn from the Ohio River to support process and non-contact cooling uses at the facility. Due to the operation of the mechanical draft cooling towers, cooling water intake flow reductions are achieved through minimized water withdrawals when compared to plant circulating water flow. The percent reduction in flow is approximately 96% for the DIF of 21.12 MGD (14,700 gpm) and 98% for the previous Maximum AIF of 10.44 MGD (7,250 gpm). The cooling towers are typically operated at approximately two to six cycles of concentration. In addition to the operation of the CCRS, the dual-flow traveling water screens operate with design through-screen velocity of 0.38 feet per second (fps) at normal pool elevations and at 0.57 fps at low water elevation.

Given that SPM operates a closed-cycle recirculating system as defined at §125.92, it meets BTA standards for impingement mortality at §125.94(c)(1) and BTA for entrainment under Best Professional Judgment (BPJ).

7.0 §122.21(R)(7) – ENTRAINMENT PERFORMANCE STANDARDS

Regulatory requirement at §122.21(r)(7): "The owner or operator of an existing facility must submit any previously conducted studies or studies obtained from other facilities addressing technology efficacy, through-facility entrainment survival, and other entrainment studies. Any such submittals must include a description of each study, together with underlying data, and a summary of any conclusions or results. Any studies conducted at other locations must include an explanation as to why the data from other locations are relevant and representative of conditions at your facility. In the case of studies more than 10 years old, the applicant must explain why the data are still relevant and representative of conditions at the facility and explain how the data should be interpreted using the definition of entrainment at 40 CFR 125.92(h)."

In accordance with requirements in SPM's NPDES Permit PA0002208 and a PADEP-approved Sampling and Analysis Plan developed by AECOM (AECOM 2024), one year of monthly Impingement and Entrainment data collection and analyses has been conducted for the SPM Facility. The Field Study was initiated in August 2024 and was completed in July 2025. However, data from the ongoing study has not been compiled for inclusion in this report. A summary report of the Impingement and Entrainment Field Study findings will be prepared and submitted to PADEP in January 2026 in accordance with the NPDES permit.

8.0 §122.21(r)(8) – OPERATIONAL STATUS

8.1 Narrative Description of Power Production

Regulatory requirement at §122.21(r)(8)(i): "For power production or steam generation, descriptions of individual unit operating status including age of each unit, capacity utilization rate (or equivalent) for the previous 5 years, including any extended or unusual outages that significantly affect current data for flow, impingement, entrainment, or other factors, including identification of any operating unit with a capacity utilization rate of less than 8 percent averaged over a 24-month block contiguous period, and any major upgrades completed within the last 15 years, including but not limited to boiler replacement, condenser replacement, turbine replacement, or changes to fuel type"

Not applicable. The SPM Facility is an industrial manufacturing facility.

8.2 Descriptions of Uprates and USNRC Relicensing

Regulatory requirement at §122.21(r)(8)(ii): "Descriptions of completed, approved, or scheduled uprates and Nuclear Regulatory Commission relicensing status of each unit at nuclear facilities"

Not applicable to the SPM Facility.

8.3 Process Units Using Cooling Water Other than for Power Production

Regulatory requirement at §122.21(r)(8)(iii): "For process units at your facility that use cooling water other than for power production or steam generation, if you intend to use reductions in flow or changes in operations to meet the requirements of 40 CFR 125.94(c), descriptions of individual production processes and product lines, operating status including age of each line, seasonal operation, including any extended or unusual outages that significantly affect current data for flow, impingement, entrainment, or other factors, any major upgrades completed within the last 15 years, and plans or schedules for decommissioning or replacement of process units or production processes and product lines."

Not applicable. The Facility started operations in 2021.

8.4 Descriptions of Production Schedules

Regulatory requirement at §122.21(r)(8)(iv): "For all manufacturing facilities, descriptions of current and future production schedules"

See NPDES Permit Application for current and future production data and schedules.

8.5 New Unit Plans and Schedules

Regulatory requirement at §122.21(r)(8)(v): "Descriptions of plans or schedules for any new units planned within the next 5 years"

There are no plans or schedules for new units at the SPM Facility within the next five years.

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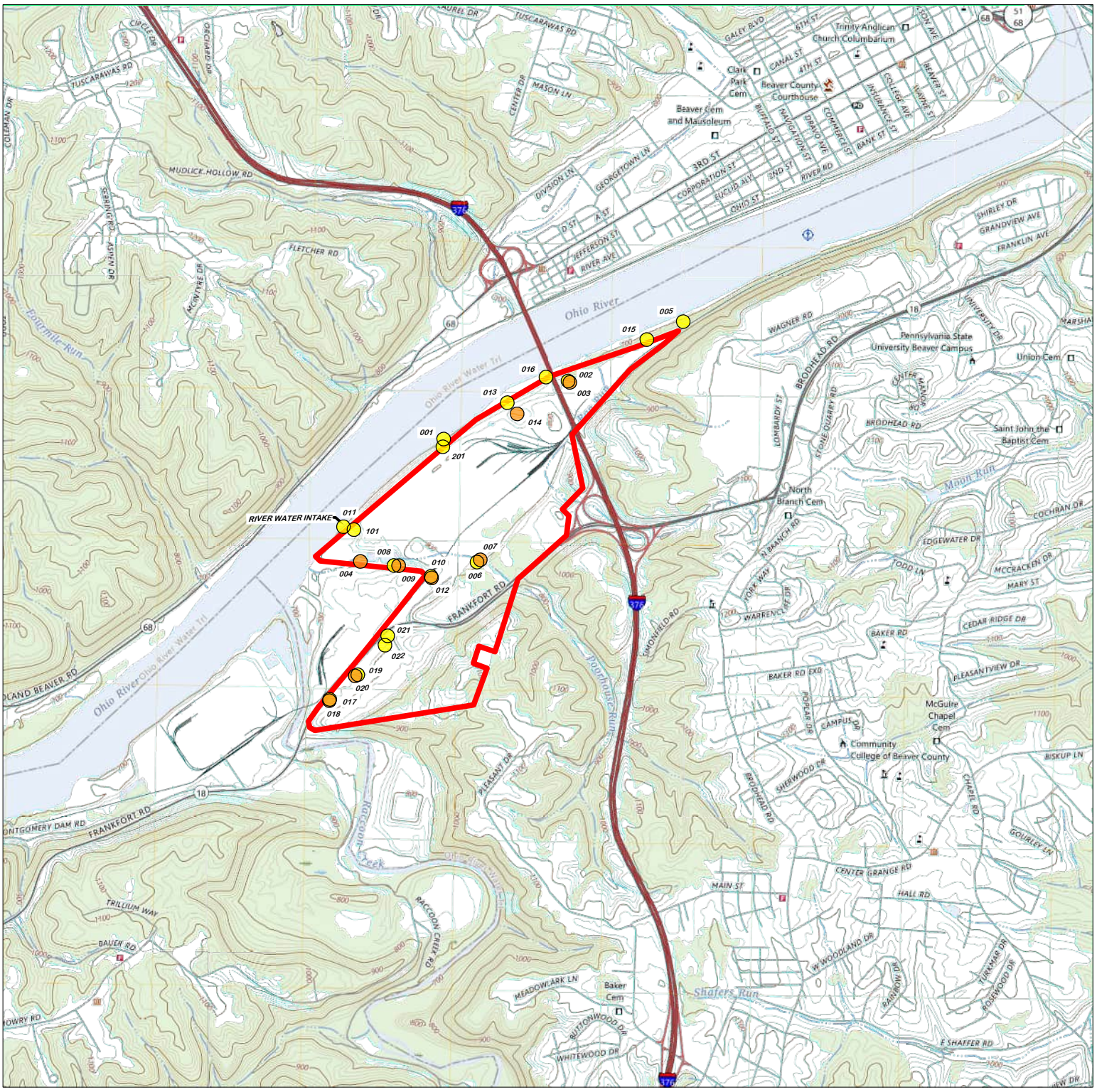
Attachment A

Locational Maps



LEGEND

- 300 Frankfort Road Monaca, PA 15061
- NPDES Overflow
- NPDES Outfall

Topographical Map produced by United States Geological Survey
Beaver Quadrangle, Pennsylvania
7.5-Minute Series

FIGURE: 1

SITE LOCATION MAP

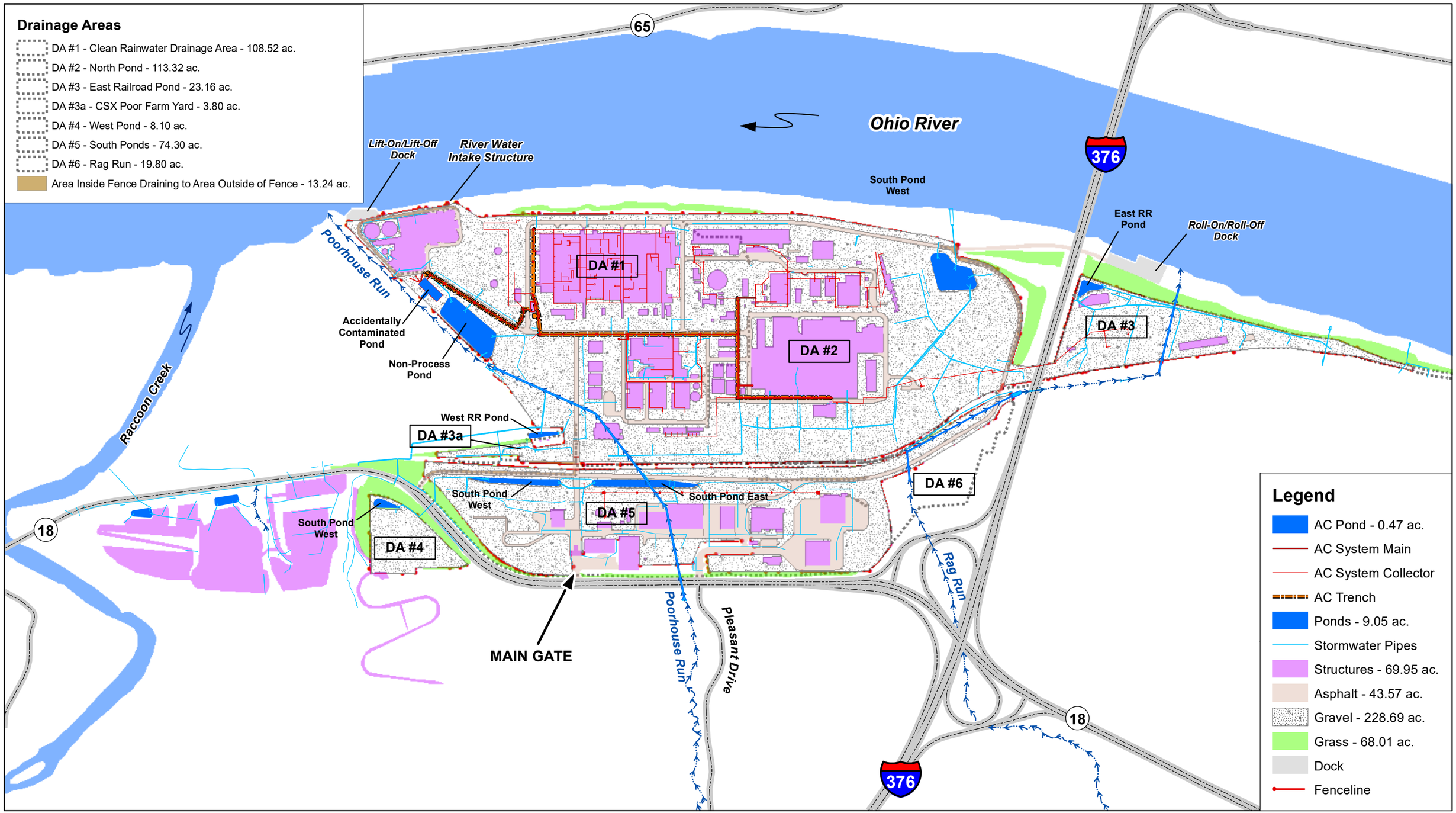
Shell Polymers Monaca, PA
300 FRANKFORT ROAD
MONACA, PA 15061
Project No.: 60755603

AECOM

Last saved by: TRUSIKC(2025-06-10) Last Plotted: 2025-06-10 Project Management Initials: Designer: CT Checked: LC Approved: ANSI A 8.5" x 11"

Drainage Areas

- DA #1 - Clean Rainwater Drainage Area - 108.52 ac.
- DA #2 - North Pond - 113.32 ac.
- DA #3 - East Railroad Pond - 23.16 ac.
- DA #3a - CSX Poor Farm Yard - 3.80 ac.
- DA #4 - West Pond - 8.10 ac.
- DA #5 - South Ponds - 74.30 ac.
- DA #6 - Rag Run - 19.80 ac.
- Area Inside Fence Draining to Area Outside of Fence - 13.24 ac.



Legend

- AC Pond - 0.47 ac.
- AC System Main
- AC System Collector
- AC Trench
- Ponds - 9.05 ac.
- Stormwater Pipes
- Structures - 69.95 ac.
- Asphalt - 43.57 ac.
- Gravel - 228.69 ac.
- Grass - 68.01 ac.
- Dock
- Fenceline

Environmental Resources Management, Inc.

May 2025

Scale in Feet
1 inch = 800 feet

800 400 0 800 Feet

Notes:
1. See SPCC Plan/ FRP for contents, capacities, and sizes of tanks, vessels, drums, and totes.
2. Personnel badge readers present at each Muster Point, Emergency Central Control Bldg, and Administration Bldg.
3. CO2 fire suppression systems present at each gas turbine.
4. All main roads within the facility are 2-way traffic.
5. Facility is OSRO dependent - No response equipment on site.
6. All communications equipment housed in Emergency Central Control Bldg.

Date: May 28, 2025
Version: 2.0
Prepared by: Brian Sterner (ERM)
Checked by:
Approved by:

Site Drainage Areas and Impervious Areas Shell Polymers Monaca, PA

Sheet 1 of 1

C:\Users\Brian.sterner\Documents\Clients\Shell\Franklin\GIS\MXD\Drainage_Plan\NPDES 2025 Renewal\Site_Drainage_Areas_and_Impervious_Areas_2025-05-28.mxd - 5/28/2025| BAS

Attachment B

Calculations

AECOM
Conshohocken, PA

SHELL POLYMERS MONACA FACILITY
316b PROJECT

OHIO RIVER CWIS APPROACH VELOCITY

PREPARED FOR

Shell Chemical Appalachia, LLC

Prepared By: Lisa DeFranco, Project Scientist — **Date:** 4/9/2025

Reviewed By: Jonny Rickwood, Project Scientist — **Date:** 06/03/2025

Approved By: Joella Posey, P.E., Technical Expert — **Date:** 6/16/2025

Rev.	Date	Prepared by	Rev'wd by	Approved by
0	6/16/2025	LD	JDR	JLP
1				
2				
3				

Shell Polymers Monaca Facility 316b Project

OHIO RIVER CWIS APPROACH VELOCITY

Calculation Purpose:

1. Calculate the design approach velocity for the Shell Polymers Monaca traveling water screens to assess area of influence.

Calculation Objectives:

1. Identify the outer screens physical parameters and design intake flow rate.
2. Calculate the wetted area immediately in front of the outer screens.
3. Calculate the design approach velocity under the listed assumptions.

System Description:

The Shell Polymer Monaca (SPM) Facility manufactures polyethylene pellets. SPM withdraws cooling water from the Ohio River via an existing CWIS that was previously used by the Horsehead Corporation. SPM's CWIS is situated slightly upstream of the Montgomery Locks and Dam. The CWIS withdraws cooling water via two partially submerged shoreline intake bays and channels.

Calculation Methodology:

The approach velocity will be calculated using the design flow through the area of the screen structure.

V = Q / A = Q / (WD * OSW)

where:

Q = flow rate in gallons per minute (gpm)
V = approach velocity in feet per second (fps)
WD = water depth in feet (ft)
OSW = nominal width of the outer screen structure through which water flows in ft

Design Inputs:

Pump Capacities:	21.120	MGD	32.67	cfs	14,667	gpm	
Intake Pump 1	10.6	MGD	16.34	cfs	7,333	gpm	(Ref 1a)
Intake Pump 2	10.6	MGD	16.34	cfs	7,333	gpm	(Ref 1a)
Intake Pump 3 (Redundant)	*10.6*	*MGD*	*16.34*	*cfs*	*7,333*	*gpm*	(Ref 1a)
Total Pump Capacity at DIF	21.12	MGD	32.67	cfs	14,667	gpm	(Assumption 4)
1b. DIF:	21.12	MGD	32.67	cfs	14,667	gpm	
1c. Maximum AIF:	10.44	MGD	16.14	cfs	7,247	gpm	(Ref 1b)
Screen Well Width			8.2	ft			(Ref 2)
Number of Screen Wells			2				(Ref 2)
Screenhouse Floor Elevation			670.0	feet			(Ref 3)
Design Water Elevation			678.0	feet			(Ref 3)
Water Height (Depth)			8.0	feet			

Assumptions:

1. Water elevation inside screenhouse is per Evoqua General Arrangement Traveling Water Screen Wing Wall Dual Flow Drawing CHI1385-101
2. No changes to as-built configuration after dates of references used.
3. Two intake screens are normally in service.
4. One of the three intake pumps is a standby pump.

References Used:

1a. Shell Chemical Appalachia LLC Cooling Water Intake Structure Follow-Up submittal to Pennsylvania Department of Environmental Protection, Table 1 side by side comparison of existing vs. new intake, January 22, 2020.
1b. Shell Water Withdrawal Data provided in Excel Spreadsheet titled "5_year_Net_Riverwater_export.xlsx", April 2025
2. Evoqua General Arrangement Drawing Bar Rack and Manual Rake CHI1385-104, May 30, 2017.
3. Evoqua General Arrangement Traveling Water Screen Wing Wall Dual Flow Drawing CHI1385-101, May 22, 2017.

Formulas Used:

Area at Face of Screen = (Well Width) x (Water Depth)
Velocity = (Withdrawal Rate) / (Area at Face of Screen)

Summary and Conclusions:

1. The calculated design approach velocity is: **0.25 fps**
2. The calculated design approach velocity at the Maximum AIF: **0.12 fps**

AECOM
Conshohocken, PA

SHELL POLYMERS MONACA FACILITY
316b PROJECT

OHIO RIVER CWIS THROUGH-SCREEN VELOCITY - NORMAL WATER SURFACE

PREPARED FOR

Shell Chemical Appalachia, LLC

Prepared By: _____ **Date:** _____
Lisa DeFranco 4/9/2025
Project Scientist

Reviewed By: _____ **Date:** _____
Jonny Rickwood 6/16/2025
Project Scientist

Approved By: _____ **Date:** _____
Joella Posey, P.E. 6/16/2025
Technical Expert

Rev.	Date	Prepared by	Rev'wd by	Approved by
0	6/16/2025	LD	JDR	JLP
1				
2				

Shell Polymers Monaca Facility 316b Project

THROUGH-SCREEN VELOCITY CALCULATION - Ohio River CWIS

Calculation Purpose:

1. Calculate the design through-screen velocity for the Ohio River cooling water intake structure.
2. Determine if Existing Facilities 316(b) performance standards for impingement mortality are met at Shell Polymers Monaca

Calculation Objectives:

1. Identify the screen physical parameters and design intake flow rate.
2. Calculate the proportion of open screen area to screen surface area.
3. Calculate the design through-screen velocity.

System Description:
The Shell Polymer Monaca (SPM) Facility manufactures polyethylene pellets. SPM withdraws cooling water from the Ohio River via an existing CWIS that was previously used by the Horsehead Corporation. SPM's CWIS is situated slightly upstream of the Montgomery Locks and Dam. The CWIS withdraws cooling water via two partially submerged shoreline intake bays and channels.

Calculation Methodology:

The through-screen velocity will be calculated using formulas adapted from Pankratz, 1988.

$V = Q / (WD * OA * TW * K)$ **(Formula 1)**

where:

Q = flow rate in gallons per minute (gpm)
V = through-screen velocity in feet per second (fps)
WD = water depth in feet (ft)
OA = proportion of screen open area to total screen area
TW = nominal screen tray width in ft
K = constant* = 396 for through-flow screen, or 740 for dual-flow screen

and $OA = (W \times L) / ((W + D) * (L + d))$ **(Formula 2)**

where:

d = screen horizontal (shute) wire diameter in inches (in)
D = screen vertical (warp) wire diameter (in)
W = width of screen opening (in)
L = vertical length of screen opening (in)

The Existing Facilities impingement mortality standard will be met at Limerick if the design through-screen velocity is equal to or less than 0.5 feet per second

Shell Polymers Monaca Facility 316b Project

THROUGH-SCREEN VELOCITY CALCULATION - Ohio River CWIS

Design Inputs:

1a.	Pump Capacities:	21.119	MGD		32.67	cfs	14,666 gpm	
	Makeup 1	10.6	MGD		16.34	cfs	7,333 gpm	(Ref 1a)
	Makeup 2	10.6	MGD		16.34	cfs	7,333 gpm	(Ref 1a)
	Makeup 3	10.6	MGD		16.34	cfs	7,333 gpm	(Ref 1a)
	Total Pump Capacity at DIF	21.12	MGD		32.67	cfs	14,666 gpm	(Assumption 5)
1c.	Maximum AIF:	10.44	MGD		16.14	cfs	7,247 gpm	(Ref 1b)
2.	Number of screens				2			(Ref 2)
3.	Design Water Withdrawal Rate (per screen)				7,333.0	gpm		
4.	Screen Width				3.8	feet		(Ref 2)
5.	Well Width				3.8	feet		(Ref 2)
6.	Screenhouse Floor Elevation				670.0	feet		(Ref 2)
7.	Normal Water Elevation				682.0	feet		(Ref 4)
8.	Normal Water Height (Depth)				12.0	feet		
9.	Mesh Size (Square)			Length	0.250	inch		(Ref 2)
				Width	0.250	inch		(Ref 2)
10.	Wire Size - W&M				12	Gauge		Assumption
11.	Wire Width				0.0808	inch		(Ref 3)

Assumptions:

1. Water elevation inside screenhouse is per Evoqua General Arrangement Traveling Water Screen Wing Wall Dual Flow Drawing CHI1385-101
2. No changes to as-built configuration after dates of references used.
3. Two intake screens are normally in service.
4. The constant for Formula 1 includes units conversion (gpm to cfs) and other screen factors.
5. One of the three intake pumps is a standby pump.

References Used:

1a. Shell Chemical Appalachia LLC Cooling Water Intake Structure Follow-Up submittal to Pennsylvania Department of Environmental Protection, Table 1 side by side comparison of existing vs. new intake, January 22, 2020.

1b. Shell Water Withdrawal Data provided in Excel Spreadsheet titled “5_year_Net_Riverwater_export.xlsx”, April 2025.

2. Evoqua General Arrangement Drawing Bar Rack and Manual Rake CHI1385-104, May 30, 2017.

3. Standard Handbook for Mechanical Engineers, eighth edition, p. 6-45

4. Evoqua General Arrangement Traveling Water Screen Wing Wall Dual Flow Drawing CHI1385-101, May 22, 2017.

Summary and Conclusions:

1. The calculated design through-screen velocity for the Ohio River CWIS at the DIF is **0.38 fps**
2. The calculated through-screen velocity at the maximum AIF is **0.19 fps**

Shell Polymers Monaca Facility 316b Project

THROUGH-SCREEN VELOCITY CALCULATION - Ohio River CWIS

Calculations:

1. Screen Physical Parameters and Design Intake Flow Rate

Formulas Used:
none

Given:

Q=	7,333	gpm per screen
Screen : D=d=	0.0808	in
W=	0.250	in
L=	0.250	in
WD=	12.0	ft
K=	740	
TW=	3.8	ft

Calculate:
N/A

2. Proportion of Open Screen Area to Total Screen Area

Formulas Used:
Formula 2

Given:
screen parameters as above

Calculate:
Screen 1A,1B
OA = (W x L) / ((W + D) * (L + d)) = **0.5711**

3. Design Through-screen Velocity

Formulas Used:
Formula 1

Given:
screen parameters as above and calculated screen open area proportion

Calculate:

V = Q / (WD * OA * TW * K) =	**0.38**	fps	TSV for DIF
	0.19	fps	TSV for Max. AIF

AECOM
Conshohocken, PA

SHELL POLYMERS MONACA FACILITY
316b PROJECT

OHIO RIVER CWIS APPROACH VELOCITY

PREPARED FOR

OHIO RIVER CWIS THROUGH-SCREEN VELOCITY - LOW WATER SURFACE

Prepared By: _____ **Date:** _____
Lisa DeFranco 4/9/2025
Project Scientist

Reviewed By: _____ **Date:** _____
Jonny Rickwood 6/16/2025
Project Scientist

Approved By: _____ **Date:** _____
Joella Posey, P.E. 6/16/2025
Technical Expert

Rev.	Date	Prepared by	Rev'wd by	Approved by
0	6/16/2025	LD	JDR	JLP
1				
2				

Shell Polymers Monaca Facility 316b Project

THROUGH-SCREEN VELOCITY CALCULATION - Ohio River CWIS

Calculation Purpose:

1. Calculate the design through-screen velocity for the Ohio River cooling water intake structure.
2. Determine if Existing Facilities 316(b) performance standards for impingement mortality are met at Shell Polymers Monaca

Calculation Objectives:

1. Identify the screen physical parameters and design intake flow rate.
2. Calculate the proportion of open screen area to screen surface area.
3. Calculate the design through-screen velocity.

System Description:
The Shell Polymer Monaca (SPM) Facility manufactures polyethylene pellets. SPM withdraws cooling water from the Ohio River via an existing CWIS that was previously used by the Horsehead Corporation. SPM's CWIS is situated slightly upstream of the Montgomery Locks and Dam. The CWIS withdraws cooling water via two partially submerged shoreline intake bays and channels.

Calculation Methodology:

The through-screen velocity will be calculated using formulas adapted from Pankratz, 1988.

$V = Q / (WD * OA * TW * K)$ **(Formula 1)**

where:

Q = flow rate in gallons per minute (gpm)
V = through-screen velocity in feet per second (fps)
WD = water depth in feet (ft)
OA = proportion of screen open area to total screen area
TW = nominal screen tray width in ft
K = constant* = 396 for through-flow screen, or 740 for dual-flow screen

and $OA = (W \times L) / ((W + D) * (L + d))$ **(Formula 2)**

where:

d = screen horizontal (shute) wire diameter in inches (in)
D = screen vertical (warp) wire diameter (in)
W = width of screen opening (in)
L = vertical length of screen opening (in)

The Existing Facilities impingement mortality standard will be met at Limerick if the design through-screen velocity is equal to or less than 0.5 feet per second

Shell Polymers Monaca Facility 316b Project

THROUGH-SCREEN VELOCITY CALCULATION - Ohio River CWIS

Design Inputs:

1a. Pump Capacities:	21.119	MGD		32.67	cfs	14,666	gpm	
Makeup 1	10.6	MGD		16.34	cfs	7,333	gpm	(Ref 1a)
Makeup 2	10.6	MGD		16.34	cfs	7,333	gpm	(Ref 1a)
Makeup 3	10.6	MGD		16.34	cfs	7,333	gpm	(Ref 1a)
Total Pump Capacity at DIF	21.12	MGD		32.67	cfs	14,666	gpm	(Assumption 5)
1c. Maximum AIF:	10.44	MGD		16.14	cfs	7,247	gpm	(Ref 1b)
2. Number of screens				2				(Ref 2)
3. Design Water Withdrawal Rate (per screen)				7,333.0	gpm			
4. Screen Width				3.8	feet			(Ref 2)
5. Well Width				3.8	feet			(Ref 2)
6. Screenhouse Floor Elevation				670.0	feet			(Ref 2)
7. Normal Water Elevation				678.0	feet			(Ref 4)
8. Normal Water Height (Depth)				8.0	feet			
9. Mesh Size (Square)			Length	0.250	inch			(Ref 2)
			Width	0.250	inch			(Ref 2)
10. Wire Size - W&M				12	Gauge			Assumption
11. Wire Width				0.0808	inch			(Ref 3)

Assumptions:

1. Water elevation inside screenhouse is per Evoqua General Arrangement Traveling Water Screen Wing Wall Dual Flow Drawing CHI1385-101
2. No changes to as-built configuration after dates of references used.
3. Two intake screens are normally in service.
4. The constant for Formula 1 includes units conversion (gpm to cfs) and other screen factors.
5. One of the three intake pumps is a standby pump.

References Used:

1a. Shell Chemical Appalachia LLC Cooling Water Intake Structure Follow-Up submittal to Pennsylvania Department of Environmental Protection, Table 1 side by side comparison of existing vs. new intake, January 22, 2020.

1b. Shell Water Withdrawal Data provided in Excel Spreadsheet titled “5_year_Net_Riverwater_export.xlsx”, April 2025.

2. Evoqua General Arrangement Drawing Bar Rack and Manual Rake CHI1385-104, May 30, 2017.

3. Standard Handbook for Mechanical Engineers, eighth edition, p. 6-45

4. Evoqua General Arrangement Traveling Water Screen Wing Wall Dual Flow Drawing CHI1385-101, May 22, 2017.

Summary and Conclusions:

1. The calculated design through-screen velocity for the Ohio River CWIS at the DIF is **0.57 fps**
2. The calculated through-screen velocity at the maximum AIF is **0.28 fps**

Shell Polymers Monaca Facility 316b Project

THROUGH-SCREEN VELOCITY CALCULATION - Ohio River CWIS

Calculations:

1. Screen Physical Parameters and Design Intake Flow Rate

Formulas Used:
none

Given:

Q=	7,333	gpm per screen
Screen : D=d=	0.0808	in
W=	0.250	in
L=	0.250	in
WD=	8.0	ft
K=	740	
TW=	3.8	ft

Calculate:
N/A

2. Proportion of Open Screen Area to Total Screen Area

Formulas Used:
Formula 2

Given:
screen parameters as above

Calculate:
Screen 1A,1B
OA = (W x L) / ((W + D) * (L + d)) = **0.5711**

3. Design Through-screen Velocity

Formulas Used:
Formula 1

Given:
screen parameters as above and calculated screen open area proportion

Calculate:

V = Q / (WD * OA * TW * K) =	**0.57**	fps	TSV for DIF
	0.28	fps	TSV for Max. AIF

Attachment C

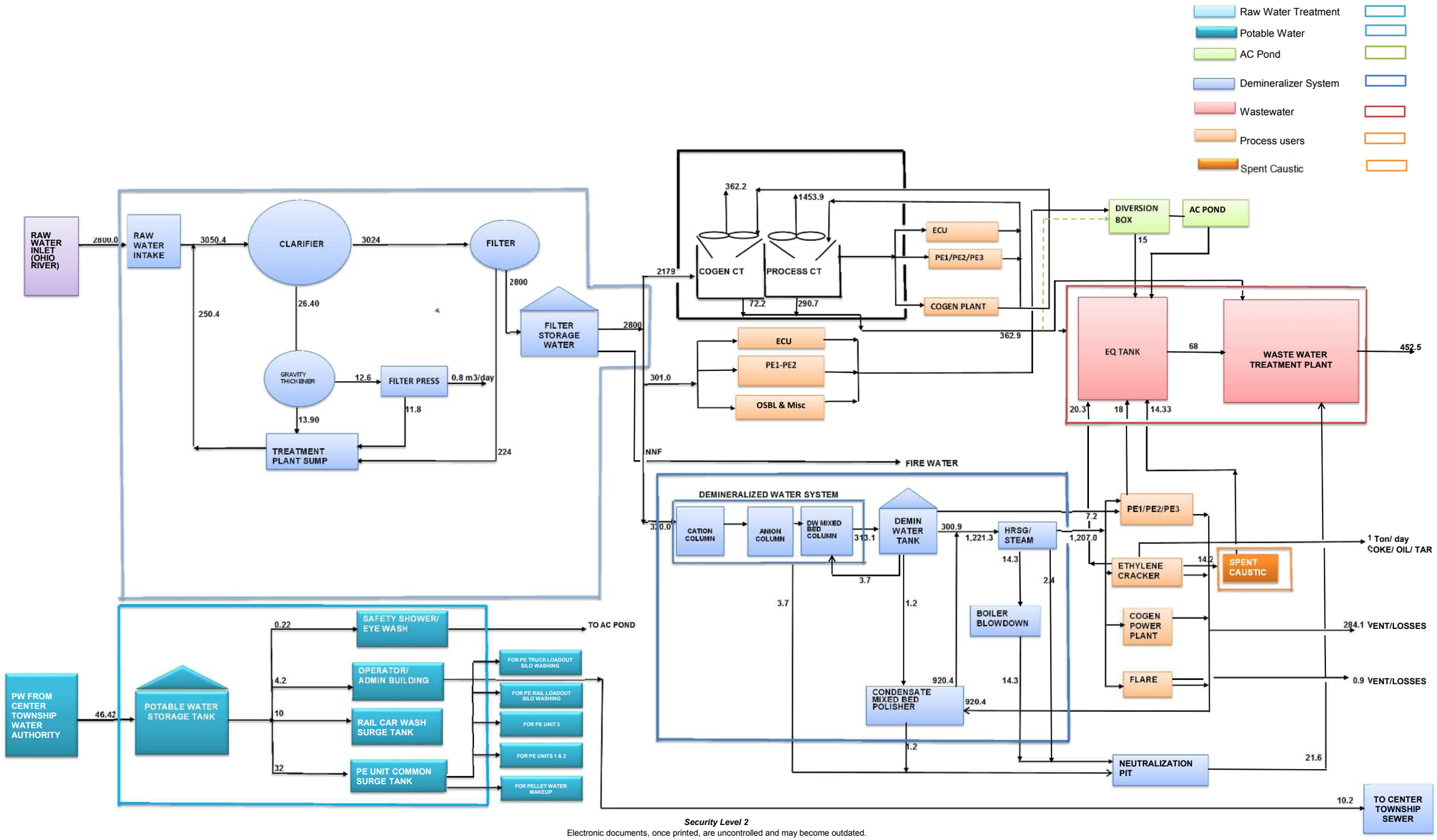
Drawings and Schematics

Attachment C (a)

Shell Chemical Appalachia LLC:

Wastewater Balance and Treatment Diagram

WATER BALANCE DESIGN CASE



25873-001-M4-000-00001

Shell Chemical Appalachia LLC : Wastewater Balance and Treatment

Flow: gpm

ISBL | OSBL

ELG Compliance Point (IMP 101)
Existing Wastewater Flows from Facility
Existing Wastewater Treatment Equipment
New Wastewater Pretreament Equipment
Chemical / Nutrient Addition

ECU
Spent Caustic
22.9 (Norm) 62.5 (Max)
Process Water Quench & Stream Blowdown
89.3 (Norm) 282.5 (Max, Normal Case)
Spent Caustic Oxidizer
Off Gas to Thermal Oxidizer
Brine
25.52
673.6 (Design Capacity of new ECU Wastewater pre-treatment system)

PE1 PE2 PE3
WW from PE 1 Extrusion Section
26.4
Filtration of PE Pellets and other Solids
WW from PE 2 Extrusion Section
26.4
Filtration of PE Pellets and other Solids
WW from PE 3 Extrusion Section
26.4
Filtration of PE Pellets and other Solids
79.2

Wash Water / Rainfall Runoff from ECU and PE Units
WW from PE 1 Extrusion Section
110.0 (Norm)
Runoff (Max)
315.0
Flow Diversion Box
335.5 (Max)
Overflow

Wash Water from EWSS and PE Silo Washing
EWSS Wash Water
0.9
PE Silo/Railcar Wash Water
70.0

Demineralizer Plant
HRSG Blowdown
55.0
Demin Regeneration Waste
62.2 (Regeneration is not 24x7 Operation)

Cooling Water Tower
Cooling Tower Blowdown
1786.4 (Max)

Accidently Contaminated (AC) Water Pond
330.0

NNF

Settlement Drum
30.8 (Max)
657.4
DAF Unit-1
7.0
0.9
356.2
291.5
Steam Stripper
0.13
302.9
Flow Equalization and Oil Removal Tanks
355.8
Off Gas to Thermal Oxidizer
1019.3

Floats / Sludge Drum
DAF Unit-2
1019.3

Recovered Oil Storage Tank

pH Adjustment
Nutrients (N & P)

Bioreactor Aeration Tank
RAS
Secondary Clarifier
WAS
16.8
1%
589.5 (Dry) 919.5 (Wet)
651.7 (Dry) 981.7 (Wet)

Polymer Feed System
Sludge Thickener Tank
11.2
5.6 3%
Dewatering Centrifuge
4.2

Tertiary Sand Filter
95.1
Treated Effluent Sump
95.1
556.7 (Dry) 886.7 (Wet)
2277.1
2607.1
Treated Effluent to Outfall 001
Off-spec Effluent

Sand Filter Backwash & Sludge Dewatering Wast Sump
110.4
1.40
Biosludge Cake to Offsite
0.01
Recovered Oil to Offsite

1 Cooling Tower Blowdown Routed to FEOR Tanks, if the hydrocarbon contamination lasts more than a day

2 Cooling Tower Blowdown Routed to Biotreater, if the hydrocarbon contamination lasts less than a day

3 Cooling Tower Blowdown Normally Comingles with Treated Effluent Downstream of WWTP

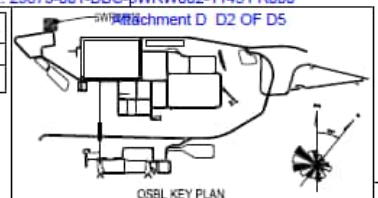
Note: Oil and sludge draw rate to float / sludge drum and recovered oil tank depends on ECU wastewater quality. The balances are shown for worst case of ECU TA as well as high cooling tower blowdown.

Attachment C (b)

Shell Chemical Appalachia LLC:

Cooling Water Intake Structure Drawings

HOLD NO.	DESCRIPTION / REASON	RESP. ENGR.	RELEASE DATE	RELD.
1	CONCRETE REPAIR DETAIL VERIFICATION	CSA	16NOV17	
2	ELP NOT RELEASED	PDMP	16NOV17	



OSBL KEY PLAN

NOTES

1. ALL DIMENSIONS ARE IN FEET-INCHES UNO.
2. FOR CONCRETE GENERAL NOTES AND REFERENCES SEE DWG GM1-700-G0000-CIK-2397-00001 (25873-001-DB-000-00101).
3. FOR LOCATION SEE EQUIPMENT LAYOUT PLAN DRAWING NO. GM1-700J-G0000-MEP-4014-00679 (25873-001-DB-SWRW-00224).
4. ALL CONCRETE SHALL HAVE A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 4000PSI (U-A). ALL REINFORCING STEEL SHALL CONFORM TO ASTM A615 GRADE 60, UNCOATED DEFORMED BARS.
5. FOR REBAR DEVELOPMENT AND SPLICE LENGTHS SEE STANDARD DWG GM1-700-G0000-CIK-2397-00002 (25873-001-DB-000-00102).
6. GROUT UNDER BASE PLATE SHALL BE NON SHRINK TYPE IN ACCORDANCE WITH SPECIFICATION NO. GM1-700-S0000-CIX-7736-00002 (25873-001-SPS-0000-F0002).
7. UNO ALL REFERENCE DRAWINGS SHALL BE PREFIXED WITH "GM1-700J-S0000-CIK-4016-" OR "25873-001-DB-SWRW0022K".
8. ALL EXISTING CONCRETE REFERENCE DIMENSIONS SHALL BE FIELD VERIFIED PRIOR TO FABRICATIONS AND INSTALLATIONS.
9. SEAL OPENING WITH CLOSED CELL POLYURETHANE FOAM WITH A MINIMUM CORE DENSITY OF 2.0 PCF, OPENING SHALL BE BACKED WITH 3/4" PLYWOOD PRIOR TO APPLICATION. FOAM SHALL BE APPLIED PER MANUFACTURERS RECOMMENDATIONS. APPLY SPRAYED FOAM INSULATION IN CONSECUTIVE LAYERS OF NOT LESS THAN 1/2" AND NOT MORE THAN 2" THICK EACH TO ACHIEVE A TOTAL THICKNESS OF 6". FOAM SHALL NOT BE APPLIED TO ELECTRICAL WIRES. ELECTRICAL WIRES SHALL BE PROPERLY PROTECTED WITH CONDUIT OR OTHER APPROVED PROTECTION METHOD.

REFERENCE DRAWINGS

11451 - DETAIL AND SECTION
11452 - DETAILS AND SECTIONS
11453 - DETAIL AND SECTION
11454 - ENLARGED KEY PLANS
11455 - ENLARGED KEY PLAN, DETAILS AND SECTIONS
11456 - DETAILS
11457 - DETAILS AND SECTIONS BELOW DECK
11458 - DETAILS AND SECTIONS BELOW DECK
11459 - DETAILS AND SECTIONS BELOW DECK
11460 - EXISTING CONCRETE SURFACE REPAIR & COATING DETAILS
11461 - EXISTING CONCRETE SURFACE REPAIR & COATING DETAILS

COMPANY	DATE	DWG NO.:
KAISER ENGINEERS	APR. 1957	P-119-BC, P-119-BC P-120-A P-124-C P-125-C P-126-C

HOLD #2

HOLD #1

HOLD #1

CONCRETE SURFACE SHALL BE INSPECTED FOR DEFECTS REQUIRING REPAIR AS DEFINED IN DRAWING 11460, CONCRETE SHALL BE REPAIRED PER NOTES AND SPECIFICATIONS GIVEN ON DRAWING 11460.

QUANTITIES	
ITEM	QUANTITY
CONCRETE	4 CY
AB-1x144 THRU BOLTS	30

REV	DATE	DESCRIPTION	BY	CHK	APP	PEM	CLIENT
00A	03OCT17	ISSUED FOR REVIEW	RAH	JW	RD	RB	

BECHTEL OG&C
PROJECT FRANKLIN
UTILITIES AND GENERAL FACILITIES

25873-001
ECDN - EWR 99

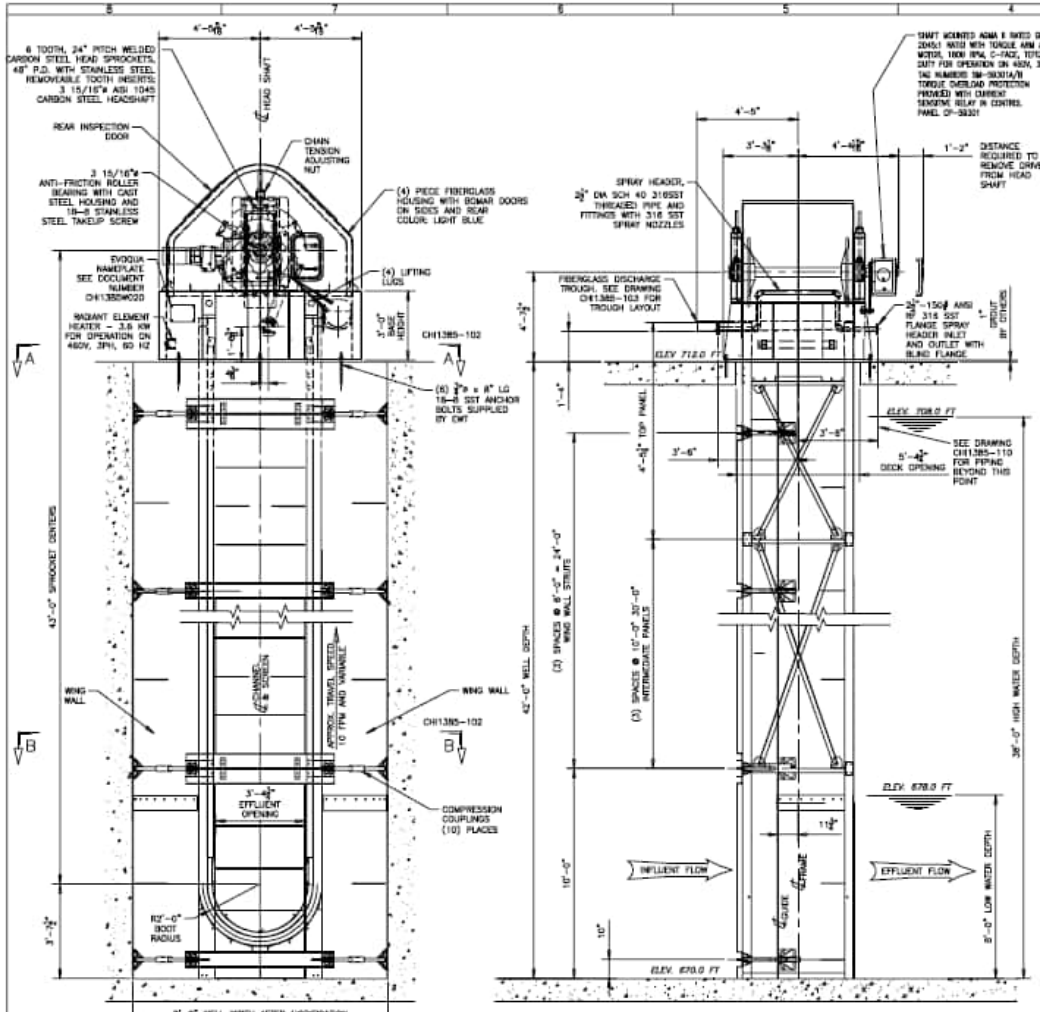
WBS/MODULE NO: SWRW002X — REV
BECHTEL DRAWING NO: 25873-001-DB-SWRW002X-11450 — 00A

CONCRETE
WATER INTAKE STRUCTURE
OVERALL LAYOUT PLAN

LOCATION:	PLANT AREA:	COMPANY PROJECT NO:	SCALE:	SHEET:
Monaco, PA	OSBL	GM1	1/2" = 1'-0" UNO	1 OF 1

PROJECT FRANKLIN — COMPANY DRAWING NO: GM1-700J-S0000-CIK-4016-11450 — REV 00A

OVERALL LAYOUT PLAN



INFLUENT VIEW
LOOKING DOWNSTREAM

CHAIN AND SCREEN BASKET ASSEMBLIES

CHAIN – 24" PITCH, NON-LUBRICATED
SIDEBAR – 3/8" x 3", AISI 1040 CARBON STEEL
PINS – AISI 8620 CASE HARDENED CARBON STEEL
BUSHINGS –AISI 8620 CASE HARDENED CARBON STEEL
ROLLERS – AISI 8620 CASE HARDENED CARBON STEEL

TRAY FRAME – HIGH STRENGTH COMPOSITE
RETAINER TABS – HIGH STRENGTH COMPOSITE
SCREEN CLOTH – 316 SSTL 0.072"ø WIRE WITH 0.25" SQUARE OPENINGS

FASTENERS–BASKET TO CLOTH–316 SSTL
BASKET TO CHAIN–316 SSTL

SEAL PLATE – NON-METALLIC

SPARE PARTS TO BE SUPPLIED LOOSE SEPARATELY

(10) SPRAY NOZZLES
(3) PIECES OF SCREEN CLOTH
(3) SETS OF CLOTH TO BASKET FASTENERS
(6) SEAL PLATES
(6) SETS OF BASKET TO CHAIN FASTENERS

SPRAY WASH ACCESSORY SHIPPED LOOSE FOR INSTALLATION BY OTHERS

(2) 2½"ø MANUAL BUTTERFLY FLUSH VALVES WITH DUCTILE IRON BODY, 316 STAINLESS STEEL DISC AND STEM AND EPDM SEAT WITH 150# ANSI FLANGED CONNECTIONS

CONTRACT NOTE

THESE SCREENS REPLACE THE THROUGH FLOW MODEL 45 SCREENS PROVIDED ON CONTRACT FK5818 CIRCA 1957.

WORK THIS DRAWING WITH THE FOLLOWING DRAWINGS:

CHI1385-102 DETAILS OF TRAVELING WATER SCREEN
CHI1385-103 TROUGH LAYOUT
CHI1385-110 SPRAY WASH PIPING SKID ARRANGEMENT
CHI1385-171 CONTROL PANEL GENERAL ARRANGEMENT

SCREEN DATA

TWO (2) 24" PITCH DUAL FLOW TRAVELING WATER SCREENS WITH WING WALLS , 4'-0" BASKET WIDTH x 4.3'-0" CENTERS

CAPACITY (PER SCREEN):
14090 GPM @ 8'-0" LWD, VELOCITY = 1.2 FPS
SPRAY WATER (PER SCREEN):
102 GPM @ 80 PSI FOR GENERAL REFUSE

ESTIMATED WEIGHTS (IN POUNDS, PER SCREEN):

HEAD SECTION	3600	WING WALLS	3960
DRIVE ASSEMBLY	900	MAIN FRAME	7600
BASKETS	3900	CHAIN	2260
SPLASH HOUSING	550		
SCREEN TOTAL	22,770 LBS		

PAINTING INSTRUCTIONS

ALL STRUCTURAL STEEL AND CASTINGS EXCEPT STAINLESS STEEL, MACHINERY, MACHINED SURFACES, ANY ITEMS THAT AFFECT PERFORMANCE WILL HAVE SURFACE PREPARATION IN ACCORDANCE WITH SSPC-SP10 FOLLOWED BY SHOP APPLICATION OF PPG AMERCOAT 370 EPOXY (BLACK) WITH A FINAL DFT OF 10-12 MILS. ALL SHAFTING AND EXPOSED MACHINED SURFACES WILL RECEIVE STANDARD SHOP PRESERVATION. MAIN TRAY CHAIN WILL RECEIVE ONE COAT OF POTABLE PROTECTIVE COATING. MOTOR AND REDUCER WILL RECEIVE THE MANUFACTURERS STANDARD FINISH.

SCREEN CONSTRUCTION

HEAD SECTION FRAME – 1/4" MINIMUM THICKNESS ASTM A36 CARBON STEEL
MAIN FRAME – ¾" MINIMUM THICKNESS ASTM A36 CARBON STEEL
WING WALLS – ⅜" MINIMUM THICKNES ASTM A36 CARBON STEEL
WALL GUIDES – ASTM A48 CAST IRON
FASTENERS – 316 STAINLESS STEEL
ANCHOR BOLTS AND NUTS – 18-8 STAINLESS STEEL
SPLASH HOUSING – 3/16" MINIMUM THICKNESS FIBERGLASS

SCREEN DESIGN

THE SCREEN DRIVE IS DESIGNED TO START AT A MAXIMUM DIFFERENTIAL HEAD OF 1'-0" AND RUN CONTINUOUSLY AT A DIFFERENTIAL HEAD OF 6" AT A HIGH WATER OF DEPTH OF 38'-0" AND STRUCTURALLY WITHSTAND A DIFFERENTIAL HEAD OF 3'-3⅜" AT THE HIGH WATER DEPTH.

FIELD NOTE

HOLES FOR BOLTING THE FIBERGLASS HOUSINGS TO THE FRAME ARE TO BE DRILLED IN THE FIBERGLASS DURING FIELD INSTALLATION USING THE HOLES IN THE STAINLESS STEEL FRAME AS A TEMPLATE.

ASSEMBLY NOTE

BOTH TRAVELING WATER SCREENS WILL SHOP ASSEMBLED. ONE SCREEN WILL BE TEST RUN. SHOP ASSEMBLY WILL INCLUDE THE FRAME, HEAD SECTION, MAIN CHAIN, BASKETS, INTERNAL SPRAY PIPING AND DRIVE UNIT. THE WING WALLS, COMPRESSION STRUTS AND FIBERGLASS COMPONENTS WILL BE SHIPPED LOOSE FOR FIELD ASSEMBLY.

CUSTOMER: SHELL CHEMICAL APPALACHIA LLC
PROJECT: FRANKLIN
LOCATION: MONACA, PA
P.O. NUMBER: 25873-100-POA-MLST-00001
EWT PROJECT NO.: 2052/000323 (CHI1385)
EQUIPMENT NUMBERS: S-59301A, S-59301B

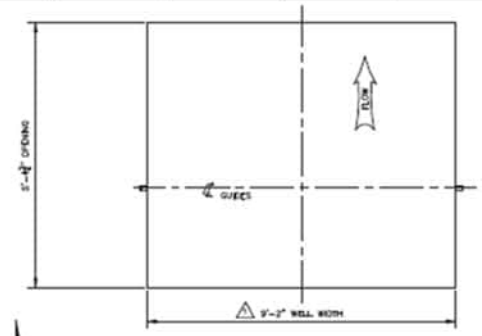
25873-100-V1A-MLST-00001

DESIGNED	DM	5/23/17	
CHECKED		DATE	
ENGINEER	DM	5/23/17	
MANAGER	RH	5/23/17	
FILE: CHI1385-101			
SCALE:			

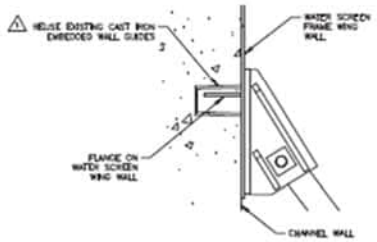
TITLE: GENERAL ARRANGEMENT TRAVELING WATER SCREEN WING WALL DUAL FLOW 4'-0" BASKET
CLIENT: SHELL CHEMICAL APPALACHIA LLC PROJECT FRANKLIN
evoqua WATER TECHNOLOGIES — Water Technologies, Chalfont, PA, 215-712-0260

PROJECT	CODE	DRAWING	SHEET	REV
2052/000323		CHI1385-101	1 OF 1	0

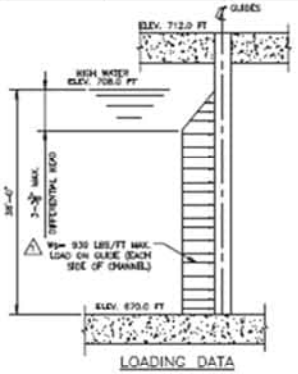
STD: 2-0799-22x340 | MADE FROM: CHI1163-101 AND CHI1336-101 | BAR = 1" AT PLOT SCALE



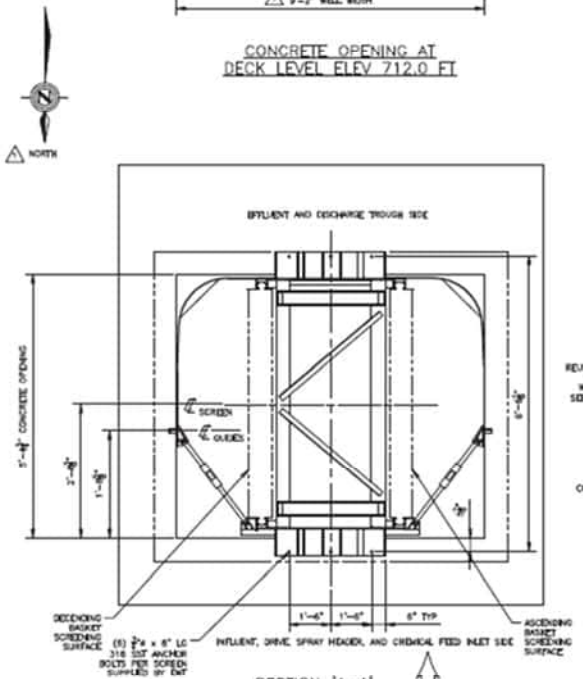
CONCRETE OPENING AT
DECK LEVEL ELEV 712.0 FT



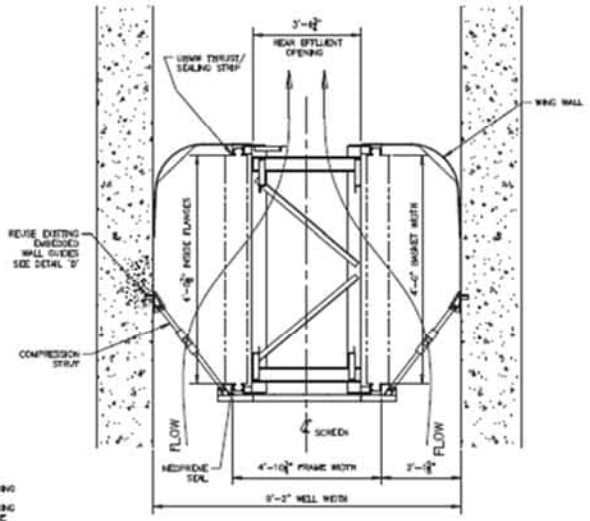
DETAIL 'D'
SHOWING ENGAGEMENT OF WATER SCREEN FRAME WING WALL IN EXISTING WALL GUIDES



LOADING DATA



SECTION 'A–A'



SECTION 'B–B'

NOTE: WORK THIS DRAWING WITH DRAWINGS CHI1385–101 AND CHI1385–103

5873-100-V1A-MLST-00002

CUSTOMER: SHELL CHEMICAL APPALACHIA LLC
PROJECT: FRANKLIN
LOCATION: MONACA, PA
P.O. NUMBER: 25873–100–POA–MLST–00001
EWT PROJECT NO.: 2052/000323 (CHI1385)
EQUIPMENT NUMBERS: S–59301A, S–59301B
BECHTEL DOCUMENT NO. 25873–100–V1A–MLST–00002

REV	DESCRIPTION	DATE	DM	DW	RH
1	WELL WIDTH WAS 8'–0". ELIMINATE NEW GUIDES, AND REVISIONS PER BECHTEL COMMENTS AND EMAIL 5–30–17	5–29–17	DM	DW	RH

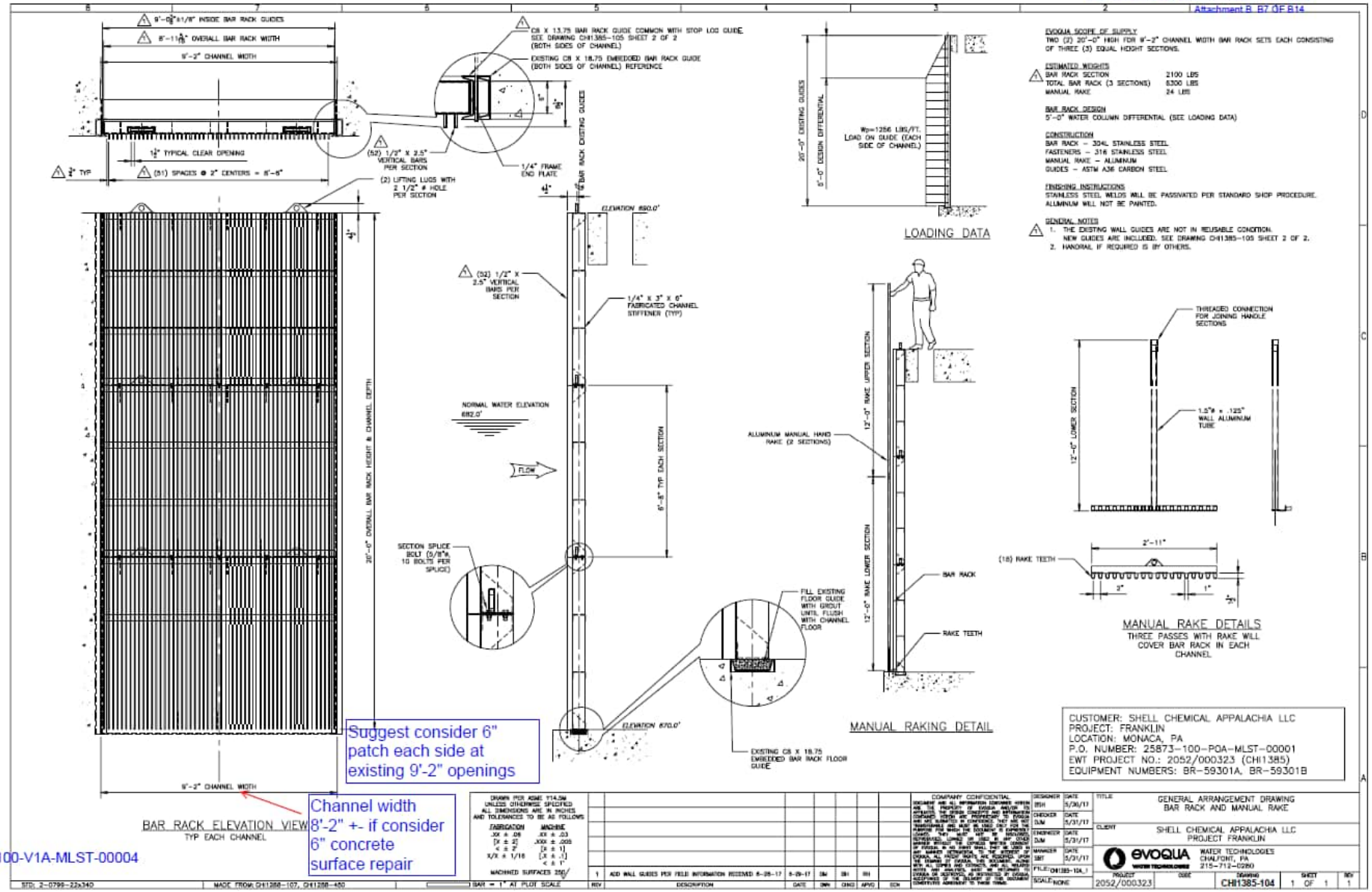
DESIGNER	DW	5–18–17
CHECKER	DA/RH	5–29–17
ENGINEER	DW	5–18–17
MANAGER	RH	5–29–17
FILE	CHI1385–102_1	
SCALE	NONE	

TITLE: DETAILS OF TRAVELING WATER SCREEN WING WALL DUAL FLOW 4'–0" BASKET
CLIENT: SHELL CHEMICAL APPALACHIA LLC PROJECT FRANKLIN

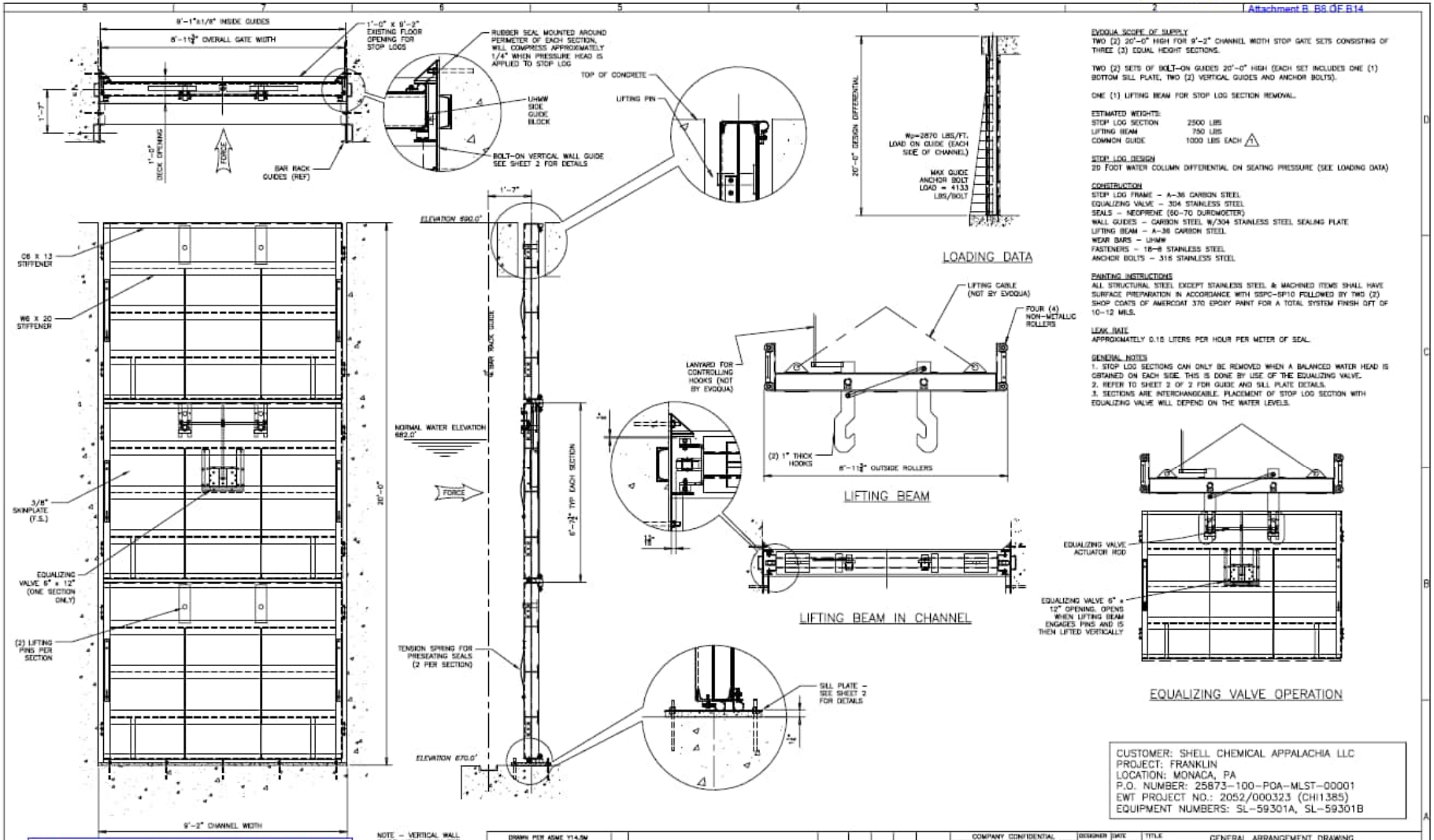
EVOQUA WATER TECHNOLOGIES
Water Technologies
Chalfont, PA
215–712–0260

PROJECT	ISSUE	DRAWING	SHEET	REV
2052/000323		CHI1385-102	1 OF 1	1

STD. 2–0796–22x340 | MADE FROM: | BAR = 1" AT PLOT SCALE



25873-100-V1A-MLST-00004



EVOQUA SCOPE OF SUPPLY
TWO (2) 20'-0" HIGH FOR 9'-2" CHANNEL WIDTH STOP GATE SETS CONSISTING OF THREE (3) EQUAL HEIGHT SECTIONS.

TWO (2) SETS OF BOLT-ON GUIDES 20'-0" HIGH (EACH SET INCLUDES ONE (1) BOTTOM SILL PLATE, TWO (2) VERTICAL GUIDES AND ANCHOR BOLTS).

ONE (1) LIFTING BEAM FOR STOP LOG SECTION REMOVAL.

ESTIMATED WEIGHTS:
STOP LOG SECTION 2500 LBS
LIFTING BEAM 750 LBS
COMMON GUIDE 1000 LBS EACH (1)

STOP LOG DESIGN
20 FOOT WATER COLUMN DIFFERENTIAL ON SEATING PRESSURE (SEE LOADING DATA)

CONSTRUCTION
STOP LOG FRAME - A-36 CARBON STEEL
EQUALIZING VALVE - 304 STAINLESS STEEL
SEALS - NEOPRENE (60-70 DUROMOETER)
WALL GUIDES - CARBON STEEL W/304 STAINLESS STEEL SEALING PLATE
LIFTING BEAM - A-36 CARBON STEEL
WEAR BARS - UHMW
FASTENERS - 18-8 STAINLESS STEEL
ANCHOR BOLTS - 316 STAINLESS STEEL

PAINTING INSTRUCTIONS
ALL STRUCTURAL STEEL EXCEPT STAINLESS STEEL & MACHINED ITEMS SHALL HAVE SURFACE PREPARATION IN ACCORDANCE WITH SSPC-SP10 FOLLOWED BY TWO (2) SHOP COATS OF AMERCOAT 370 EPOXY PAINT FOR A TOTAL SYSTEM FINISH DFT OF 10-12 MILS.

LEAK RATE
APPROXIMATELY 0.15 LITERS PER HOUR PER METER OF SEAL.

GENERAL NOTES
1. STOP LOG SECTIONS CAN ONLY BE REMOVED WHEN A BALANCED WATER HEAD IS OBTAINED ON EACH SIDE. THIS IS DONE BY USE OF THE EQUALIZING VALVE.
2. REFER TO SHEET 2 OF 2 FOR GUIDE AND SILL PLATE DETAILS.
3. SECTIONS ARE INTERCHANGEABLE. PLACEMENT OF STOP LOG SECTION WITH EQUALIZING VALVE WILL DEPEND ON THE WATER LEVELS.

CUSTOMER: SHELL CHEMICAL APPALACHIA LLC
PROJECT: FRANKLIN
LOCATION: MONACA, PA
P.O. NUMBER: 25873-100-POA-MLST-00001
EWT PROJECT NO.: 2052/000323 (CHI1385)
EQUIPMENT NUMBERS: SL-59301A, SL-59301B

Suggest 6" concrete surface patch each side at existing 9'-2" openings. (similar to the detail on 25873-100-V1A-MLST-00002)

NOTE - VERTICAL WALL GUIDE NOT SHOWN FOR CLARITY

DRAWN PER ASME Y14.5M
UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS ARE IN INCHES AND TOLERANCES TO BE AS FOLLOWS
FABRICATION: .XX ± .06, [X ± 2], < ± 2°, X/X ± 1/16, < ± 1°
MACHINE: .XX ± .03, .XXX ± .005, [X ± 1], [X ± .1], < ± 1°
MACHINED SURFACES 250/

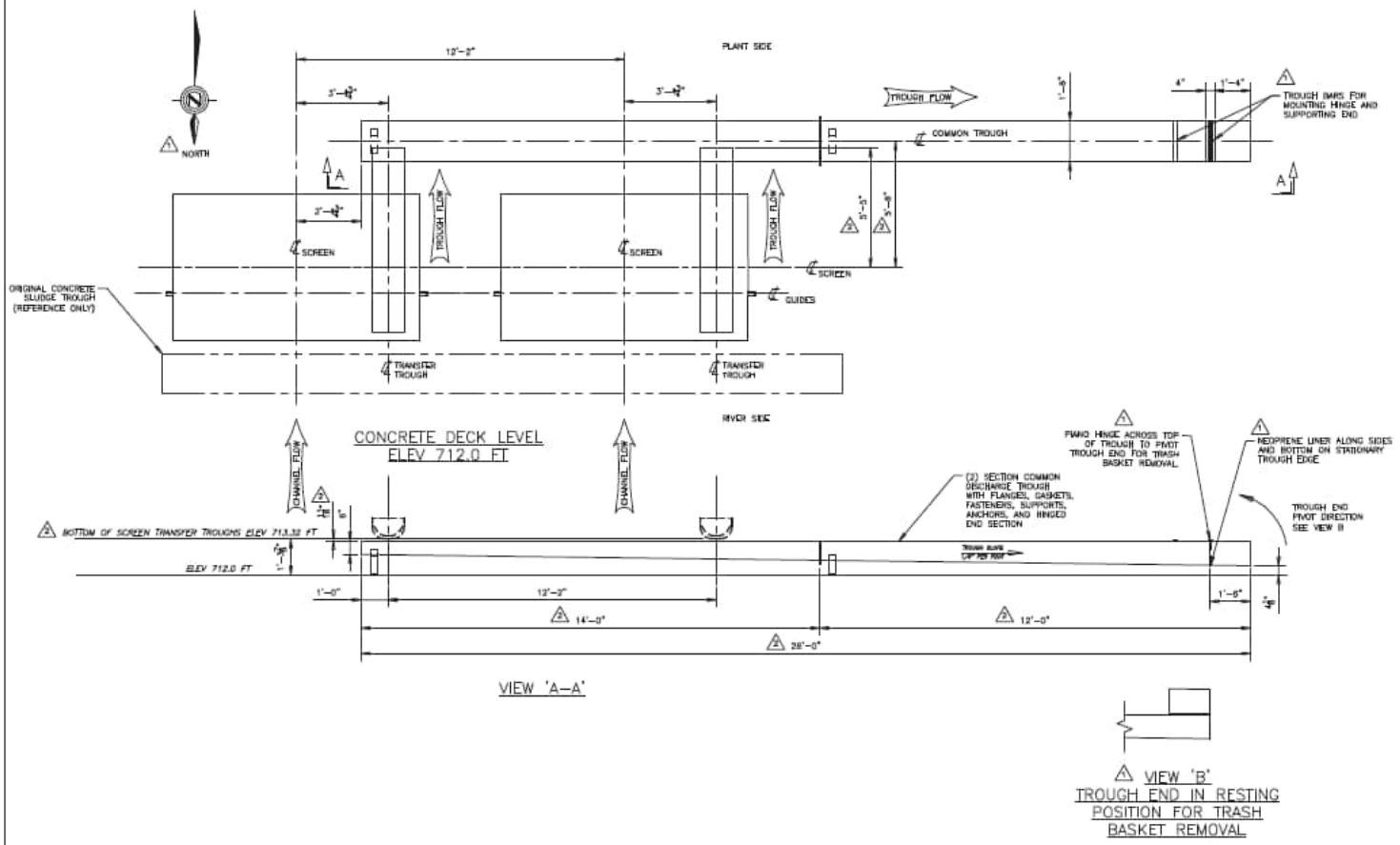
REV	DESCRIPTION	DATE	DRN	CHKD	APVD	ECR
1	REVISED SECTION C-C ON SHEET 2 OF 2 PER FIELD INFORMATION RECEIVED 9-26-17	6-27-17	DM	BH	RH	

COMPANY CONFIDENTIAL
DESIGNER: BSH 5/24/17
CHECKER: DJH 5/25/17
ENGINEER: DJH 5/25/17
MANAGER: SBT 5/25/17
FILE: CHI1385-105_1
SCALE: NONE

TITLE: GENERAL ARRANGEMENT DRAWING STOP LOGS, BOLT-ON WALL GUIDES AND LIFTING BEAM
CLIENT: SHELL CHEMICAL APPALACHIA LLC PROJECT FRANKLIN
EVOQUA WATER TECHNOLOGIES CHALFONT, PA 215-712-0290
PROJECT: 2052/000323
DRAWING: CHI1385-105
SHEET: 1 OF 2
REV: 1

STD: 2-0799-22x340
MADE FROM:
BAR = 1" AT PLOT SCALE

25873-100-V1A-MLST-00005



VIEW 'A–A'

VIEW 'B'
TROUGH END IN RESTING POSITION FOR TRASH BASKET REMOVAL

25873-100-V1A-MLST-00003

NOTE: WORK THIS DRAWING WITH DRAWINGS CH1385–101 AND CH1385–102

CUSTOMER: SHELL CHEMICAL APPALACHIA LLC
PROJECT: FRANKLIN
LOCATION: MONACA, PA
P.O. NUMBER: 25873–100–POA–MLST–00001
EWT PROJECT NO.: 2052/000323 (CH1385)
EQUIPMENT NUMBERS: S–59301A, S–59301B
BECHTEL DOCUMENT NO. 25873–100–V1A–MLST–00003

REV	DESCRIPTION	DATE	DRN	DES	APVD	ECN
2	EXTEND TRANSFER TROUGHS BY 1FT, SHORTEN COMMON TROUGH BY 1FT PER COMMENTS DATED 7–10–17	9–28–17	DM	DM	RH	
1	ADD HINGED TROUGH END AND REVISIONS PER COMMENTS DATED 7–10–17	7–28–17	DM	DM	RH	

COMPANY CONFIDENTIAL

DESIGNED	DM 5–30–17
CHECKED	RH 6–2–17
ENGINEER	DM 5–30–17
MANAGER	RH 6–2–17
FILE	CH1385–102_2
SCALE	NONE

TITLE: TROUGH LAYOUT – WING WALL DUAL FLOW TRAVELING WATER SCREEN 4'–0" BASKET

CLIENT: SHELL CHEMICAL APPALACHIA LLC PROJECT FRANKLIN

evoqua WATER TECHNOLOGIES — Water Technologies, Chalfont, PA, 215–712–0280

PROJECT	CODE	DRAWING	SHEET	REV
2052/000323		CH1385-103	1 OF 1	2

STD: 2–0799–22x340 | MADE FROM: | BAR = 1" AT PLOT SCALE

Attachment C (c)

Shell Chemical Appalachia LLC:

Cooling Tower Figures and Data

PROJECT FRANKLIN
DOCUMENT SUBMITTAL COVER SHEET

Authorized Representative	Bechtel Oil, Gas and Chemicals, Inc.
Project Name	Project Franklin
Project Job Number	25873
Contract Number	25873-100-HC1-MECM-00003
Company Name	Shell Chemical Appalachia LLC
Project Location	Monaca, PA
Bechtel Document Number	25873-100-V31-MECM-00004
Company Document Number	GM1-7808-U59200-ZV-B01-00001
ECCN Identification	EAR-99
Contractor Document Number	9035-100
Contractor Revision Number	9
Contractor Document Title	General Arrangement Drawing
Equipment/Tag Number	E-59201, E-59202
Contractor File Name	9035-100 – General Arrangement Drawing.pdf
Contractor Shop Order Number, if applicable	9035

Project Franklin Bechtel Vendor Print Stamp (OSBL-Used by Bechtel)

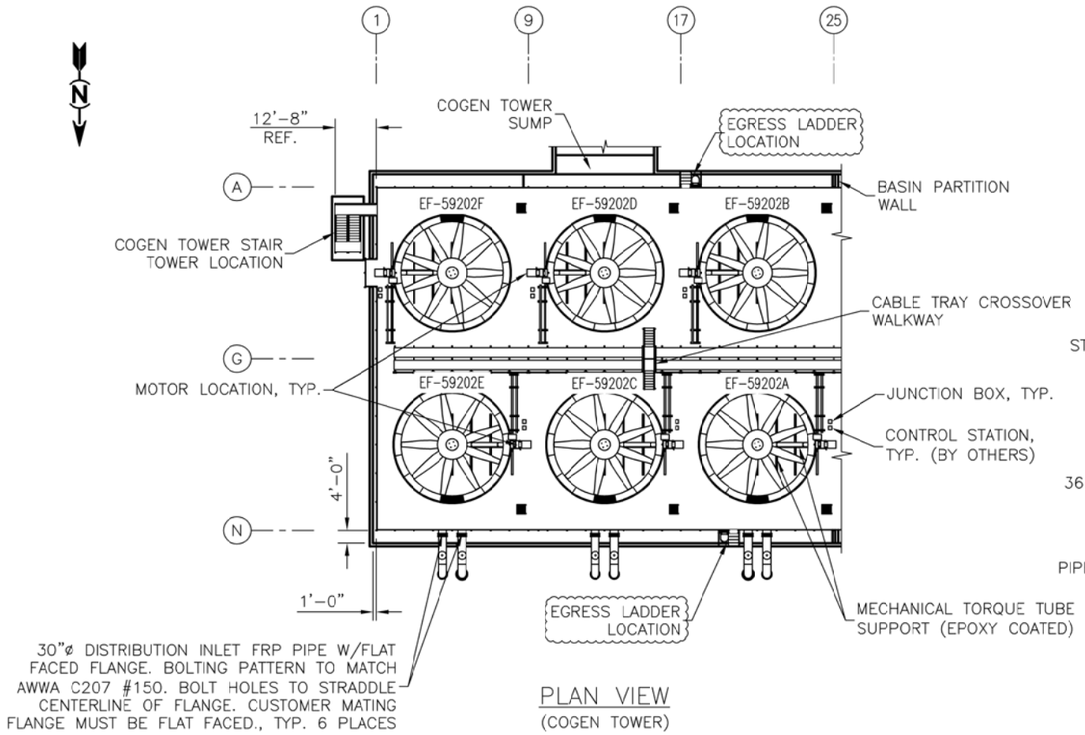
25873-100-V31-MECM-00004

OSBL-Vendor Print Status Code: 1

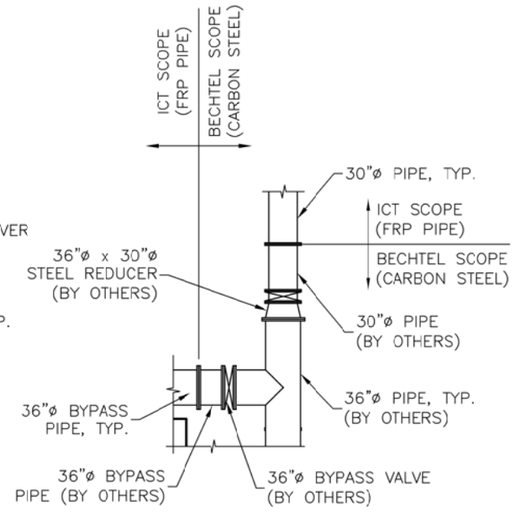
Code 1: Work May Proceed
Code 2NC: Revise & Resubmit, Work May Proceed
Code 2EX: Revise & Resubmit, Work May Proceed; Expedite Return
Code 2CR: Revise & Resubmit, Work May Proceed; Priority Return
Code 3: Revise & Resubmit, Work May Not Proceed
Code 4: Review Not Required, Work May Proceed
Permission to proceed does not constitute acceptance or approval of design details, calculation, analyses, test methods or materials developed or selected by the Supplier and does not relieve the Supplier from compliance with contractual obligations.

Responsible Person: Escudero-Hernandez_Alfredo
Revision: 009
Date Issued: 02/20/2019
XMTL No: TRN-MECM-C003-00070
Equipment No: E-59201,E-59202

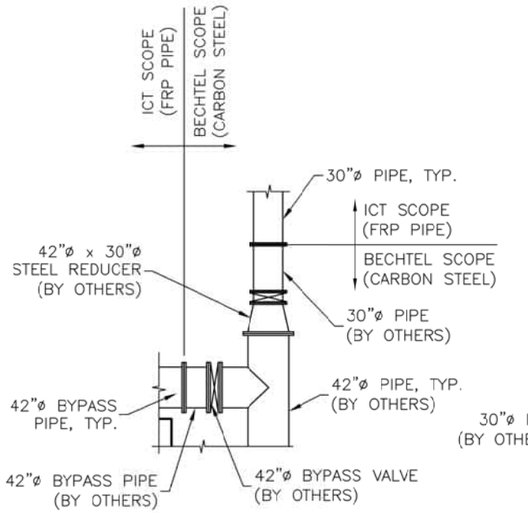
APPROVED AND CERTIFIED CORRECT FOR CONSTRUCTION
By BRAD VICKERS
Changes Could Result In Added Cost And/Or Delay In Shipment
ICT INTERNATIONAL COOLING TOWER
Date JAN. 29, 2019



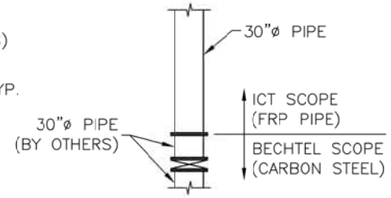
PLAN VIEW
(COGEN TOWER)



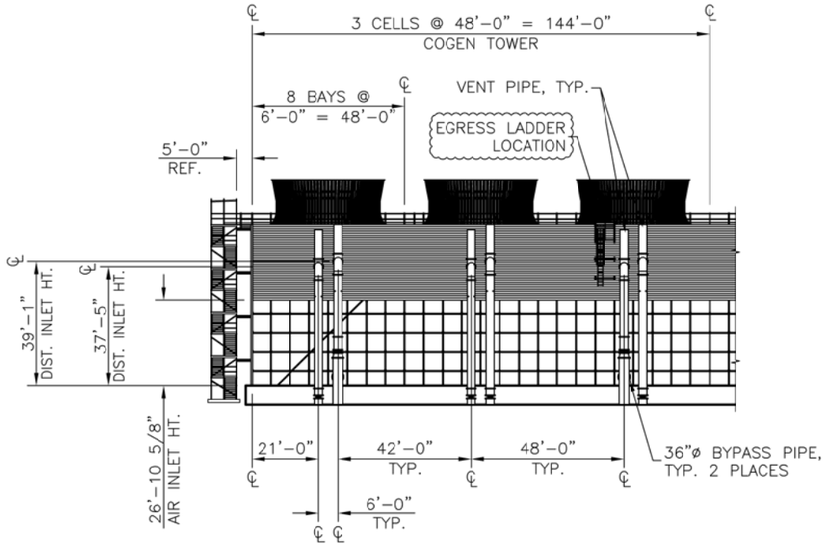
DETAIL 1
(36"ø BYPASS MATING FLANGES)



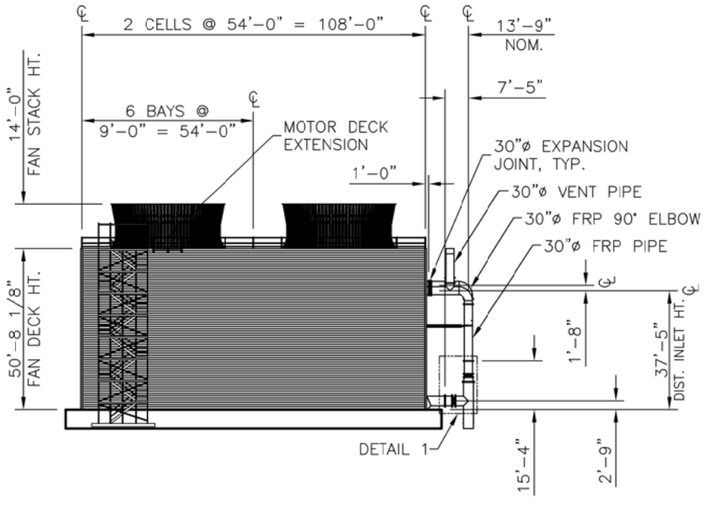
DETAIL 2
(42"ø BYPASS MATING FLANGES)



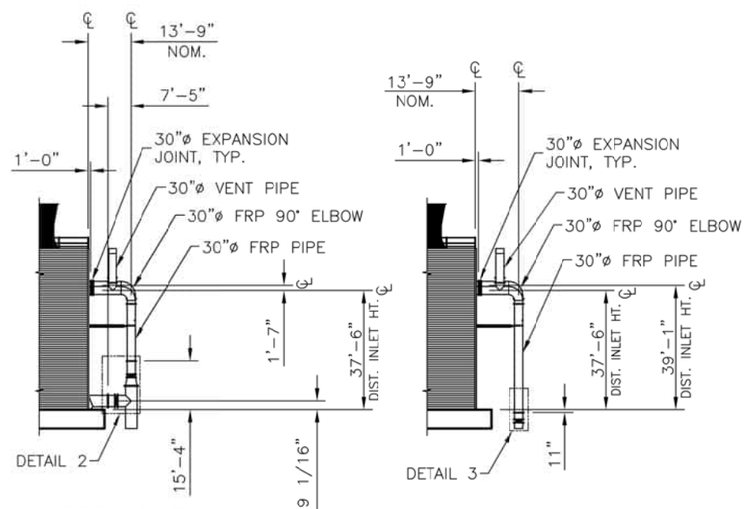
DETAIL 3
(30"ø RISER MATING FLANGE)



LONGITUDINAL ELEVATION
(COGEN TOWER)



TRANSVERSE ELEVATION
(COGEN TOWER)



TRANSVERSE ELEVATION
(PROCESS TOWER)

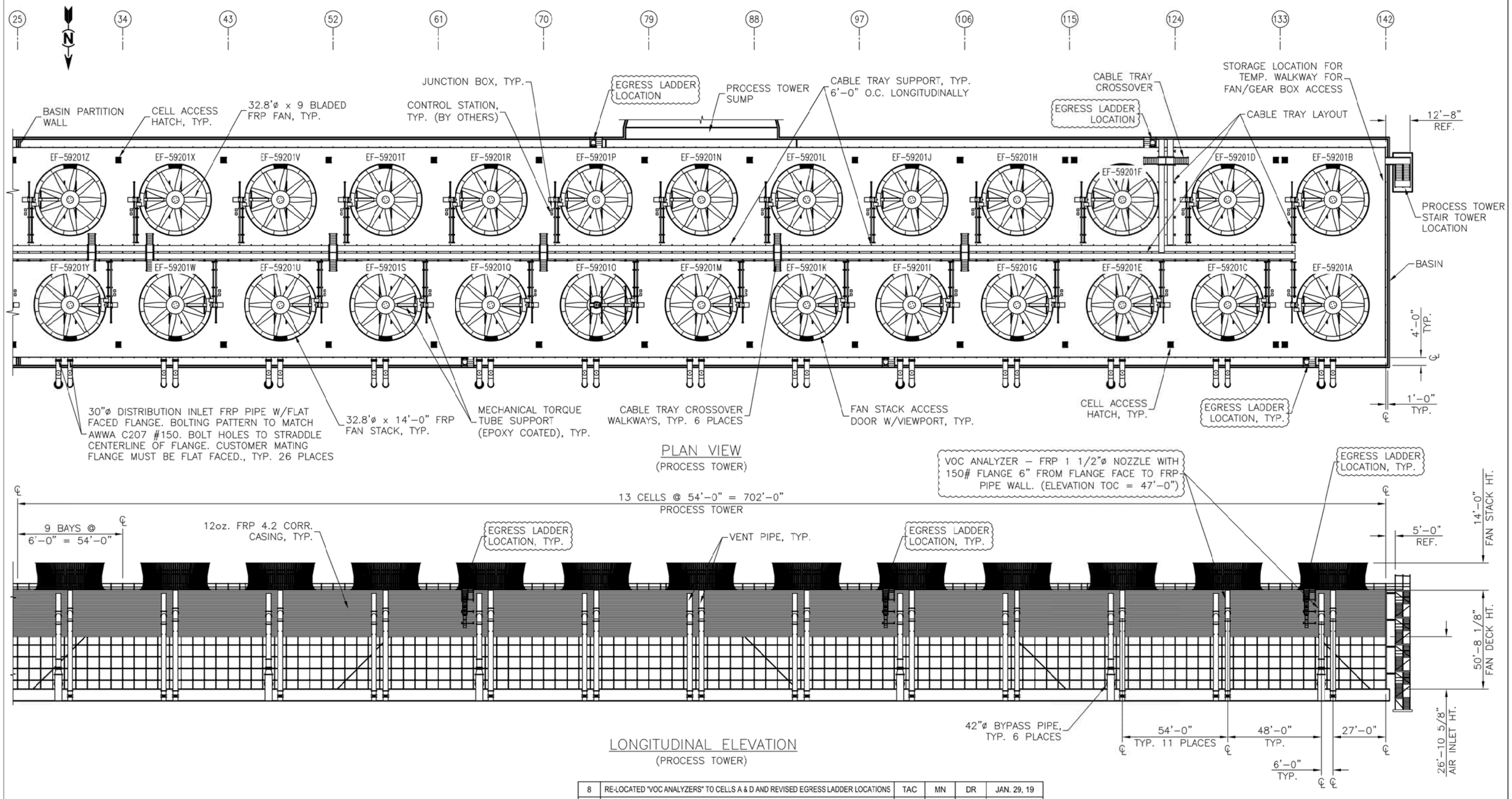
REV	REVISION DESCRIPTION	DRAWN	CHKD	APPR	DATE
8	RE-LOCATED "VOC ANALYZERS" TO CELLS A & D AND REVISED EGRESS LADDER LOCATIONS	TAC	MN	DR	JAN. 29, 19
7	CERTIFIED FOR CONSTRUCTION - UPDATED DISTRIBUTION HT.	TAC	TSA	SA	JUN. 11, 18
6	CERTIFIED FOR CONSTRUCTION - UPDATED CABLE TRAY DESIGN	TAC	TSA	BV	APR. 02, 18
5	CERTIFIED FOR CONSTRUCTION	TAC	TSA	BV	FEB. 13, 18
4	CERTIFIED FOR CONSTRUCTION	TAC	TSA	BV	DEC. 13, 17
3	CERTIFIED FOR CONSTRUCTION	TAC	TSA	BV	SEP. 28, 17
2	REVISED RISER, DISTRIBUTION AND BYPASS DESIGNS. ADDED ACID TROUGH	TAC	TSA	BV	JUN. 16, 17
1	PRELIMINARY DRAWING - CUSTOMER RETURNS	TAC	TSA	BV	NOV. 02, 16
0	PRELIMINARY DRAWING	TAC	TSA	BV	JUN. 14, 16

ICT INTERNATIONAL COOLING TOWER

BECHTEL - SHELL FRANKLIN
BEAVER COUNTY, PA

GENERAL ARRANGEMENT

PROJECT NUMBER	DRAWING NUMBER	SHEET	REV
9035	100	1 OF 2	8



PLAN VIEW
(PROCESS TOWER)

LONGITUDINAL ELEVATION
(PROCESS TOWER)

REV	REVISION DESCRIPTION	DRAWN	CHKD	APPR	DATE
8	RE-LOCATED "VOC ANALYZERS" TO CELLS A & D AND REVISED EGRESS LADDER LOCATIONS	TAC	MN	DR	JAN. 29, 19
7	CERTIFIED FOR CONSTRUCTION	TAC	TSA	DR	JUN. 14, 18
6	CERTIFIED FOR CONSTRUCTION	TAC	TSA	BV	APR. 02, 18
5	CERTIFIED FOR CONSTRUCTION	TAC	TSA	BV	FEB. 13, 18
4	CERTIFIED FOR CONSTRUCTION	TAC	TSA	BV	DEC. 13, 17
3	CERTIFIED FOR CONSTRUCTION	TAC	TSA	BV	SEP. 28, 17
2	REVISED RISER, DISTRIBUTION AND BYPASS DESIGNS. ADDED ACID TROUGH	TAC	TSA	BV	JUN. 16, 17
1	PRELIMINARY DRAWING - CUSTOMER RETURNS	TAC	TSA	BV	NOV. 02, 16
0	PRELIMINARY DRAWING	TAC	TSA	BV	JUN. 14, 16

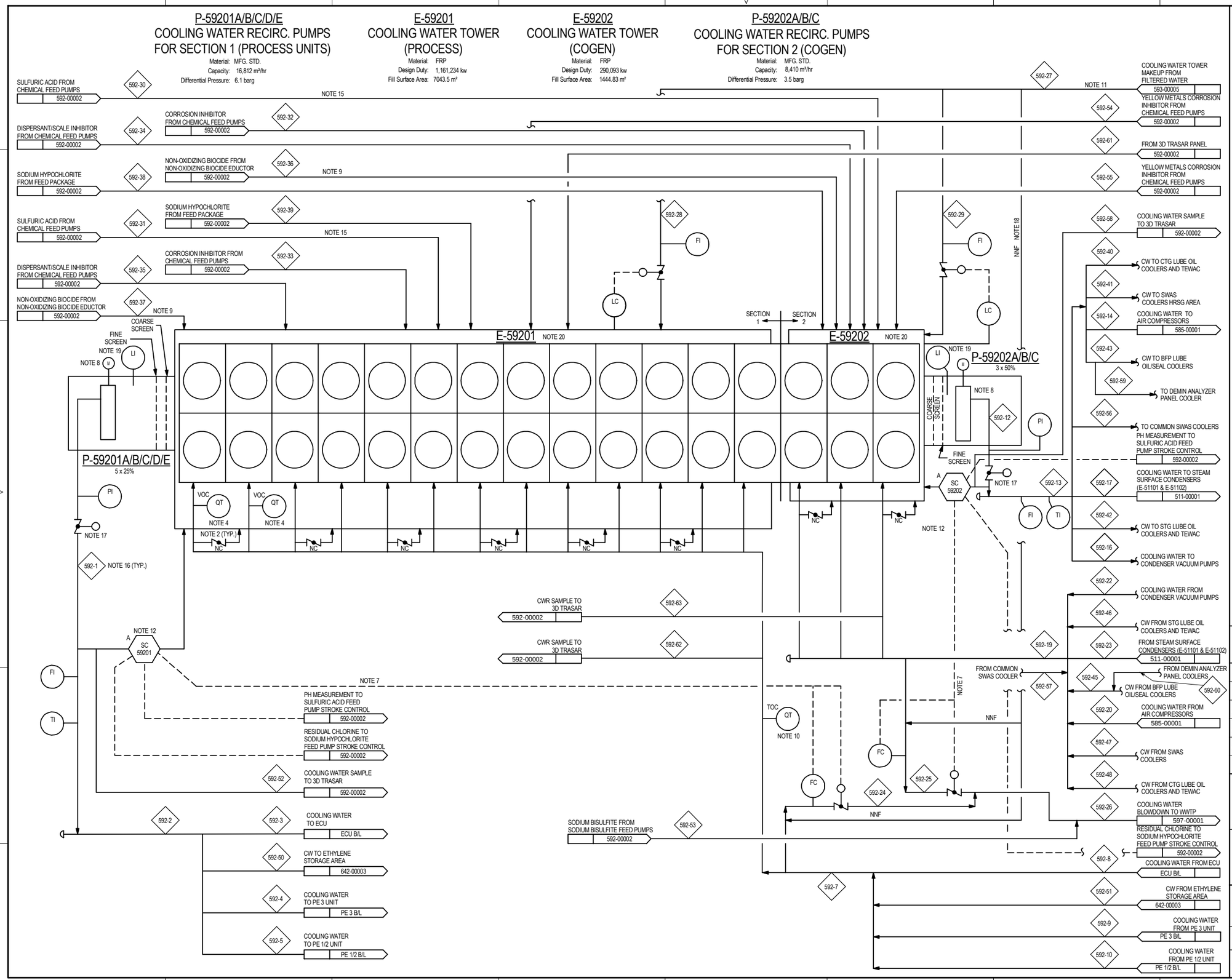
APPROVED AND CERTIFIED CORRECT FOR CONSTRUCTION
By BRAD VICKERS
Changes Could Result In Added Cost And/Or Delay In Shipment
ICT INTERNATIONAL COOLING TOWER
Date JAN. 29, 2019

ICT INTERNATIONAL COOLING TOWER

BECHTEL - SHELL FRANKLIN
BEAVER COUNTY, PA

GENERAL ARRANGEMENT

PROJECT NUMBER	DRAWING NUMBER	SHEET	REV
9035	100	2 OF 2	8



NOTES:

1. SEE PEFS DRAWINGS GM1-700-G0000-PX-2365-00001 THROUGH GM1-700-G0000-PX-2365-00008 FOR ALL SYMBOLOGY.
2. BYPASS LINE IS PROVIDED TO PROTECT THE TOWER FILL FROM FREEZING DURING COLD WEATHER STARTUP/OPERATION. BYPASS LINE DIRECTS HOT RETURN COOLING WATER TO THE BASIN.
3. DELETED.
4. ANALYZER FOR HYDRO CARBON GAS LEAKS AS GENERAL VOLATILE ORGANIC COMPOUNDS. LOCATE ANALYZER ON COOLING TOWER RISER STAND PIPE, ABOVE FREEBOARD WATER LEVEL, FOR HYDROCARBON GAS MONITORING.
5. DELETED.
6. DELETED.
7. SPECIFIC CONDUCTIVITY MEASUREMENT.
8. REDUNDANT ELECTRICAL BUSES FOR RESPECTIVE RECIRC PUMP.
9. NON-OXIDIZING BIOCIDE WILL BE MANUALLY DOSED INTERMITTENTLY WHEN OBSERVING HIGH BIOMASS VALUES OR BIOFILM ON PACKING.
10. ANALYZES FOR HYDROCARBON CONTAMINATION (TOC) AND CONTROL OF COOLING WATER BLOWDOWN STREAM TO BIOREACTOR FOR HYDROCARBON REMOVAL.
11. FILTERED WATER OPERATING PRESSURE IS BASED ON HEADER PRESSURE SUPPLIED BY FILTERED WATER PUMPS WITH AN ESTIMATED 0.5 BARG OF STATIC AND 6.5 BARG PIPING AND CONTROL VALVE LOSS.
12. CONTINUOUS SAMPLE STATION SHALL MONITOR PH, SPECIFIC CONDUCTIVITY AND RESIDUAL CHLORINE.
13. CHEMICAL ADDITIVES THAT ARE CAUSTIC IN NATURE SHOULD BE ADDED TO ABOVE THE WATER LEVEL TO PREVENT PRECIPITATION AND PLUGGING OF THE ADDITIVE WATER LINE. ADDITIVES SHOULD BE INJECTED THROUGH INDIVIDUAL LINES AND THEIR DISCHARGE SHOULD BE SEPARATED BY A MINIMUM OF 300 mm (12 in). FOR INJECTIONS ABOVE WATER LEVEL, EXTEND THE LINE FAR ENOUGH INTO TOWER SO THAT ADDITIVES DO NOT BECOME AIRBORNE AND EXIT TOWER.
14. DELETED.
15. SULFURIC ACID FOR PH CONTROL SHOULD BE INJECTED CLOSE TO THE PUMP STATION BUT OUT INTO THE BASIN WHERE IT WILL NOT IMPINGE ON A STRUCTURAL TOWER MEMBER OR CONCRETE. THE ACID SHOULD BE DROPPED INTO A MIXING TROUGH AND DILUTED WITH UTILITY/SERVICE WATER. THE MIXING TROUGH SHOULD BE AT LEAST 3 m (10 ft) FROM THE SODIUM HYPOCHLORITE INJECTION POINT.
16. FOR STREAM DATA VALUES, SEE DRAWING GM1-700-U59200-PX-2366-00002.
17. AOV'S SHALL BE CLASS VI TIGHTNESS RATING.
18. INITIAL SYSTEM FILL.
19. ONE LEVEL INDICATOR PER PUMP BAY.
20. FANS SHOULD HAVE SPLIT ARRANGEMENT FOR ELECTRICAL LOAD FROM SEPARATE BUSES.

REFERENCE

- STREAM NUMBER
- TEMPERATURE, °C
- PRESSURE barg
- FLOW, kg/hr
- GAS FLOW, Nm3/hr
- LIQUID FLOW, m3/hr

THE PROCESS CONDITIONS OF FLOW QUANTITIES, TEMPERATURES, PRESSURES, COMPOSITIONS, DESCRIPTIONS, AND EQUIPMENT DUTIES SHOWN ON THIS FLOW DIAGRAM ARE FOR DESIGN PURPOSES ONLY. WHILE USEFUL AS A GUIDE FOR OPERATIONS, THIS DOES NOT REPRESENT EXACT OR GUARANTEED OPERATING CONDITIONS.

REV No.	DATE	DESCRIPTION	PROC. ENGR	CHK	PROC. EGS	APE	PEM	CLIENT
00C	30AUG17	RE-ISSUED FOR DESIGN	HG	AJK	AG	SB	SS	-
00B	4NOV15	ISSUED FOR DESIGN	NAL	LBK	CSL	-	RPK	-
00A	7/30/14	ISSUED FOR FEED	NJM	RWA	CSL	KB	MLM	-

BECHTEL OG&C
PROJECT FRANKLIN

25873-001
ECCN: EAR99

BECHTEL DRAWING No: 25873-001-M5-592-00004 Rev. 00C

PROCESS FLOW SCHEME
COOLING WATER

LOCATION:	PLANT AREA:	COMPANY PROJECT No.
Monaca, PA	OSBL	GM1

PROJECT FRANKLIN	SCALE: NTS	COMPANY DRG No. GM1-700-U59200-PX-2366-00003	Rev. 00C

PCAP-D1390

Stream No.		592-1	592-2	592-3	592-4	592-5	592-6	592-7	592-8	592-9	592-10	592-11	592-12	592-13	592-14	592-15	592-16	592-17	592-18	592-19	592-20	592-21
Stream Name		Process CW pump discharge (each)	Process CW Supply header	ECU CW supply	PE3 CW supply	PE1&2 CW supply (Note 11)	DELETED	Process CW return header	ECU CW return	PE3 CW return	PE1&2 CW return	DELETED	Cogen CW pump discharge (each)	Cogen CW Supply header	Air Compressor CW supply	DELETED	Condenser Vacuum Pumps CW supply (each)	Steam Surface Condensers CW supply (each)	DELETED	Cogen CW return header	Air Compressor CW return	DELETED
Flow Type		Continuous	Continuous	Continuous	Continuous	Continuous	-	Continuous	Continuous	Continuous	Continuous	-	Continuous	Continuous	Continuous	-	Continuous	Continuous	-	Continuous	Continuous	-
Phase		Liquid	Liquid	Liquid	Liquid	Liquid	-	Liquid	Liquid	Liquid	Liquid	-	Liquid	Liquid	Liquid	-	Liquid	Liquid	-	Liquid	Liquid	-
Temperature	°C	26.7	26.7	26.7	26.7	26.7	-	41.7	41.7	41.7	41.7	-	28.3	28.3	28.3	-	28.3	28.3	-	43.3	43.3	-
Pressure	barg	6.1	6.1	6.2	5.9	6.1	-	3.2	3.2	3.1	3.2	-	3.5	3.5	3.1	-	2.8	3.15	-	1.6	1.6	-
Flow (Normal)	m^3/h	16,812	66590 Note 14	32,171	8,400	25,612	-	66590 Note 14	32,171	8,400	25,612	-	8,410	15475 Note 14	690	-	19	6,800	-	15475 Note 14	690	-
Flow (Design)	m^3/h	16,812	67250 Note14	32,171	8,400	25,612	-	67250 Note 14	32,171	8,400	25,612	-	8,410	16820 Note 14	690	-	19	6,800	-	16820 Note 14	690	-
Actual Density	kg/m^3	996	996	996	996	996	-	992	992	992	992	-	996	996	996	-	996	996	-	991	991	-

Stream No.		592-22	592-23	592-24	592-25	592-26	592-27	592-28	592-29	592-30	592-31	592-32	592-33	592-34	592-35	592-36	592-37	592-38	592-39	592-40	592-41	592-42	592-43
Stream Name		Condenser Vacuum Pumps CW return	Steam Surface Condensers CW return (each)	Process CW Blowdown	Cogen CW Blowdown	Combined CW Blowdown to WWTP	Filtered Water Makeup	Filtered Water Makeup to Process CWT	Filtered Water Makeup to Cogen CWT	93% Sulfuric Acid Feed to Cogen CWT Basin	93% Sulfuric Acid Feed to Process CWT Basin	Corrosion Inhibitor Feed to Cogen CW Recirc. Pump Forebay	Corrosion Inhibitor Feed to Process CW Recirc. Pump Forebay	Dispersant/Scale Inhibitor Feed to Cogen CW Recirc. Pump Forebay	Dispersant/Scale Inhibitor Feed to Process CW Recirc. Pump Forebay	Non-Oxidizing Biocide to Cogen CW Recirc. Pump Forebay	Non-Oxidizing Biocide to Process CW Recirc. Pump Forebay	Sodium Hypochlorite to Cogen CWT Basin	Sodium Hypochlorite to Process CWT Basin	CW to CTG Lube Oil Coolers and TEWAC (each)	CW to SWAS Coolers HRSG Area	CW to STG Lube Oil Coolers and TEWAC (each)	CW to BFP Lube Oil/Seal Coolers (each)
Flow Type		Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Intermittent	Intermittent	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous
Phase		Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid
Temperature	°C	43.3	43.3	41.7	43.3	41.7	23	23	17	23	23	15	15	15	15	23	23	15	15	28.3	28.3	28.3	28.3
Pressure	barg	1.9	1.9	2.7	2.3	2.5	7	7	2	3.5	3.5	4	4	4	4	6.7	6.7	3.5	3.5	3.2	3.2	3.1	3.1
Flow (Normal)	m^3/h	19	6,800	303	77	380	2,282	1,820	462	0.011	0.044	0.002	0.0036	0.0022	0.0092	NNF	NNF	0.14	0.56	224	7.45	187	16
Flow (Design)	m^3/h	19	6,800	303	77	380	2,282	1,820	462	0.015	0.063	0.002	0.0036	0.0036	0.0123	0.6	0.6	0.28	1.12	224	7.45	187	16
Actual Density	kg/m^3	991	991	992	991	992	1,000	1,000	996	1,828	1,828	1240	1240	1200	1200	997	997	1200	1,200	996	996	996	996

Stream No.		592-44	592-45	592-46	592-47	592-48	592-49	592-50	592-51	592-52	592-53	592-54	592-55	592-56	592-57	592-58	592-59	592-60	592-61	592-62	592-63
Stream Name		DELETED	CW from BFP Lube Oil/Seal Coolers (each)	CW from STG Lube Oil Coolers and TEWAC (each)	CW from SWAS Coolers HRSG Area	CW from CTG Lube Oil Coolers and TEWAC (each)	DELETED	Process CW to Ethylene Storage Area	Process CW from Ethylene Storage Area	Process CW Supply Sample to 3D-TRASAR	Sodium Bisulfite to Blowdown	Yellow Metal Corrosion Inhibitor to Process Tower	Yellow Metal Corrosion Inhibitor to Cogen Tower	CW to Common SWAS Coolers	CW From Common SWAS Coolers	Cogen CW Supply Sample to 3D-TRASAR	CW to Demin Analyzer	CW From Demin Analyzer	3D-TRASAR Panel Return (Total)	Process CWR Sample to 3D-TRASAR	Cogen CWR Sample to 3D-TRASAR
Flow Type		-	Continuous	Continuous	Continuous	Continuous	-	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous
Phase		-	Liquid	Liquid	Liquid	Liquid	-	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid
Temperature	°C	-	43.3	43.3	43.3	43.3	-	26.7	41.7	26.7	15	15	15	28.3	43.3	28.3	28.3	43.3	43.3	41.7	43.3
Pressure	barg	-	2.1	2.1	1.0	2.1	-	6.1	3.2	6.1	3.26	4	4	3.1	2.1	3.3	3.05	2.1	0.5	2.5	1.8
Flow (Normal)	m^3/h	-	16	187	7.45	224	-	409	409	1.1	0.007	0.002	0.001	6.5	6.5	1.1	1.0	1.0	6	1.10	1.10
Flow (Design)	m^3/h	-	16	187	7.45	224	-	409	409	1.1	0.007	0.002	0.001	6.5	6.5	1.1	1.0	1.0	6	1.10	1.10
Actual Density	kg/m^3	-	991	991	991	991	-	996	992	996	1370	1190	1190	996	991	996	996	991	991	992	991

NOTES:

1. SEE PEFS DRAWINGS GM1-700-G0000-PX-2365-00001 THROUGH GM1-700-G0000-PX-2365-00008 FOR ALL SYMBOLOGY.
2. DESIGN FLOWS ARE FOR PIPE SIZING PURPOSES ONLY AND ARE NOT NECESSARILY COINCIDENT FOR ALL STREAMS.
3. NNF STANDS FOR "NORMALLY NO FLOW".
4. SODIUM HYPOCHLORITE DENSITY IS BASED ON 12% CONCENTRATION.
5. ACTUAL DENSITY FOR PROPRIETARY CHEMICALS WILL BE DETERMINED AFTER CHEMICAL SUPPLIER IS SELECTED.
6. DELETED.
7. THE COOLING TOWER MAKEUP AND BLOWDOWN FLOWS ARE BASED ON 6 CYCLES OF CONCENTRATION.
8. THE ECU COOLING WATER DESIGN FLOW IS BASED ON THE MAXIMUM CASE FROM THE INTERFACE TABLES, WHICH INCLUDES A 10% DESIGN MARGIN.
9. THE PE 1/2 COOLING WATER DESIGN FLOWS ARE BASED ON THE MAXIMUM CASES FROM THE INTERFACE TABLES, PLUS 15% MARGIN FOR NON-LICENSED EQUIPMENT.
10. THE PE 3 COOLING WATER DESIGN FLOW IS BASED ON THE PEAK DEMAND FROM THE INTERFACE TABLES, WHICH INCLUDES 10% MARGIN.
11. PE 1 AND PE2 WILL MODULATE THEIR COOLING WATER FLOWS BASED ON PRODUCTION RATES. ADDITIONAL FLOW BALANCING EQUIPMENT. (I.E., RESTRICTION ORIFICE, AND/OR CONTROL VALVES) MAY BE NEEDED TO MAINTAIN THE REQUIRED CW FLOWS TO THE OTHER PROCESS USERS.
12. DELETED.
13. DELETED.
14. NORMAL FLOWS COMPRISE ALL INDIVIDUAL USERS TO EQUAL THE OVERALL REQUIRED COOLING WATER FLOW. DESIGN FLOWS ARE THE NORMAL FLOWS WITH AN ADDITIONAL DESIGN ALLOWANCE TO ENSURE COOLING TOWER IS APPROPRIATELY SIZED.
15. FLOWS ARE INDICATED PER UNIT FOR CERTAIN FLOW STREAMS DESCRIBED AS "EACH".

Project Franklin Shell Consolidator/ATA Stamp

Responsible Person/ATA Approver: Diaz_Huberto

Status Code: 1P - Proxy - Work May Proceed

Client Doc No: GM1-700-U59200-PX-2366-00002

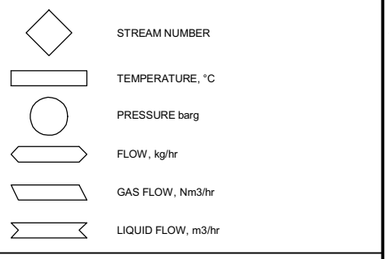
PCAP No: D1390

Revision: 00D

Date: 7/16/2018

Equipment No: NA

REFERENCE



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REV No.	DATE	DESCRIPTION	PROC. ENGR	CHK	PROC. EGS	APE	PEM	CLIENT
00D	30AUG17	RE-ISSUED FOR DESIGN	HG	AJK	AG	SB	SS	-
00C	04NOV15	ISSUED FOR DESIGN	NAL	LBK	CSL	-	RPK	-
00B	7/31/14	ISSUED FOR FEED	NJM	RWA	CSL	KB	MLM	-
00A	02MAY14	ISSUED FOR APPROVAL	NJM	RWA	CSL	KB	MLM	-

BECHTEL OG&C
PROJECT FRANKLIN

25873-001
ECCN: EAR99

BECHTEL DRAWING No: 25873-001-M5-592-00003 Rev. 00D

UTILITY FLOW SCHEME
COOLING WATER
1 of 1

LOCATION:	PLANT AREA:	COMPANY PROJECT No.
Monaca, PA	OSBL	GM1

PROJECT FRANKLIN	SCALE: NTS	COMPANY DRG No.	Rev.
		GM1-700-U59200-PX-2366-00002	00D

PCAP-D1390

Consolidated without comments by Steve Giles July 6, 2018
NOTE: Allen Miller did not have comments

Project Franklin Shell Consolidator Stamp
Responsible Person: Giles_Steve
Status Code: 1 - Work May Proceed
Client Doc No: GM1-700-U59200-MX-2105-00002
PCAP No: NA
Revision: 002
Date: July 6, 2018
Equipment No: E-59202

CLIENT: SHELL CHEMICAL APPALACHIA LLC

PROJECT TITLE: PROJECT FRANKLIN

PROJECT LOCATION: Beaver County, Pennsylvania, USA

JOB NUMBER: 25873

SR NUMBER: 25873-100-SR1-MECM-00001

EQUIPMENT TAG NUMBER: E-59202

EQUIPMENT SERVICE: Cogen Cooling Water Tower

SERIAL NUMBER: LATER

COMMENTS: Vendor shall complete data sheet and submit.

REV.	DATE	REASON FOR REVISION	BY	CK'D	PE	EL	EGS	APE	PEM
002	21-Dec-2017	ISSUED FOR PURCHASE	BKK	JK	CSL	—	CSL	—	DB
001	22-Mar-2016	ISSUED FOR PURCHASE	NJP	NAL	CSL	-	CSL	-	RPK
000	5-Oct-2015	ISSUED FOR QUOTATION	NJP	NAL	CSL	-	CSL	-	RPK

PROJECT FRANKLIN	SHELL DOCUMENT NUMBER	REV.
	GM1-700-U59200-MX-2105-00002	002
Data Sheet for	BECHTEL DOCUMENT NUMBER	REV.
	25873-001-MED-592-E59202	002
ECCN: EAR99 — Cogen Cooling Water Tower	BECHTEL PROJECT NO.: 25873	Page 1 of 8

Security Level 2

PROVIDE INFORMATION IN BOTH ENGLISH AND METRIC UNITS BELOW

	ITEMS	UNITS	BASE CASE - ENGLISH UNITS	UNITS	BASE CASE - METRIC UNITS
1	**GENERAL INFORMATION**				
2	TAG NUMBER		International Cooling Tower		
3	TOWER MODEL		CF8951-32.8-5-6B		*
4	TYPE		BACK-TO-BACK, COUNTER-FLOW		BACK-TO-BACK, COUNTER-FLOW
5	**SITE DATA**				
6	TOWER SITE		POTTER & CENTER TOWNSHIPS, BEAVER COUNTY, PENNSYLVANIA, USA		POTTER & CENTER TOWNSHIPS, BEAVER COUNTY, PENNSYLVANIA, USA
7	ELEVATION ABOVE SEA LEVEL	(ft)	713 - 795	(m)	217.32 - 242.32
8	TOWER ORIENTATION		REFER TO PLOT PLAN		REFER TO PLOT PLAN
9	PREVAILING SUMMER WIND DIRECTION		REFER TO PLOT PLAN		REFER TO PLOT PLAN
10	DESIGN WIND SPEED AND LOAD		SEE NOTE 2		SEE NOTE 2
11	LOADING REQUIREMENTS		SEE NOTE 2		SEE NOTE 2
12	SEISMIC ZONE		SEE NOTE 2		SEE NOTE 2
13	AVAILABLE PLOT DIMENSIONS (LENGTH x WIDTH)	(ft)	SEE NOTE 3	(m)	SEE NOTE 3
14	DESCRIPTION OF NEAREST OBSTRUCTION TO COOLING TOWER		REFER TO PLOT PLAN		REFER TO PLOT PLAN
15	CIRCULATING WATER SUSPENDED SOLIDS (TSS)	(mg/L)	REFER TO CIRCULATING WATER QUALITY	(mg/L)	REFER TO CIRCULATING WATER QUALITY
16	CIRCULATING WATER DISSOLVED SOLIDS (TDS)	(mg/L)	REFER TO CIRCULATING WATER QUALITY	(mg/L)	REFER TO CIRCULATING WATER QUALITY
17	NOISE GUARANTEE	(dBA)	REFER TO NOISE DATA SHEETS	(dBA)	REFER TO NOISE DATA SHEETS
18	METHOD OF SOUND ATTENUATION		3 Layers of ENKAMAT at Top of Water Level in Basin		*
19	**DESIGN CONDITIONS**				
20	DESIGN WATER FLOW	(gpm)	74,056	(m^3/hr)	16,820
21	DESIGN HOT (INLET) WATER TEMPERATURE (GUARANTEE)	(°F)	110	(°C)	43.3
22	DESIGN COLD (OUTLET) WATER TEMPERATURE (GUARANTEE)	(°F)	83	(°C)	28.3
23	DESIGN INLET WBT	(°F)	75	(°C)	23.9
24	AMBIENT DRY BULB TEMP (MIN / MAX / DESIGN)	(°F)	11.9 / 86.6 / 82.6	(°C)	-11.2 / 30.3 / 28.1
25	MAXIMUM DRIFT LOSS (PERCENT OF WATER FLOW)	(%)	0.0005	(%)	0.0005
26	**TOWER PARAMETERS**				
27	EVAPORATION LOSS AT DESIGN CONDITIONS	(gpm)	1629	(m^3/hr)	*
28	GUARANTEED PUMPING HEAD, ABOVE CURB	(ft)	42.1	(m)	*
29	NOZZLE PRESSURE DROP	(ft)	1.25 psi	(m)	*
30	TOTAL TOWER HEAD LOSSES IN DISTRIBUTION PIPING, INCLUDING NOZZLES	(ft)	8	(m)	*
31	PRESSURE DROP IN DISTRIBUTION HEADER AND WATER DISTRIBUTION SYSTEM FOR EACH CELL	(ft)	8	(m)	*
32	DEPTH OF BASIN	(ft)	4' 11"	(m)	1.499 2
33	HEIGHT FROM BASIN CURB TO HEADER CENTERLINE	(ft)	37'-6" / 39'-1" 2	(m)	*
34	HEIGHT OF NOZZLE DISCHARGE TO TOP OF FILL	(in)	30	(m)	*
35	TOP OF FILL TO BOTTOM OF FAN DECK	(ft)	18'-6"	(m)	*
36	TOP OF DE'S TO BOTTOM OF FAN DECK	(ft)	10'-6"	(m)	*
37	AIR INLETS (NUMBER OF OPEN SIDES)		2		2
38	AIR INLET HEIGHT ABOVE CURB	(ft)	26'-10 5/8" 2	(m)	*
39	NET WET AIR INLET AREA TOTAL FOR TOWER / % OBSTRUCTION AIR INLET	(ft^2) / (%)	8910 / 3	(m^2) / (%)	* / *
40	AIR INLET VELOCITY	(ft/min)	986	(m/s)	*
41	DESIGN L/G		1.122		*
42	PRESSURE RATIO		8.82		*
43	WATER LOADING	(gpm/ft^2)	4.81	((m3/hr)/m^2)	*
44	SLOPE OF CHARACTERISTIC CURVE		-0.8		*
45	CONSTANT FOR CHARACTERISTIC CURVE		*		*
46	DESIGN KaV/L OR KaY/L		2.328		*

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47	**PHYSICAL DETAILS**		SEE NOTE 3			SEE NOTE 3	
48	NUMBER OF CELLS		6			6	
49	NUMBER OF FANS PER CELL		1			1	
50	**TOWER OVERALL DIMENSIONS (WITHOUT STAIRS)**						
51	LENGTH / WIDTH	(ft)/(ft)	144	108	(m)/(m)	*	*
52	REQUIRED SPACING REQUIRED AROUND TOWER (CLEAR AREA BETWEEN ADJACENT TOWERS OR TOWER AND NEAREST OBSTACLES)	(ft)	60		(m)	*	
53	HEIGHT (BASIN CURB TO FAN DECK)	(ft)	50'- 8 1/8" 2		(m)	*	
54	**NOMINAL CELL DIMENSIONS**						
55	LENGTH / WIDTH	(ft)/(ft)	48	54	(m)/(m)	*	*
56	**REQUIRED INSIDE BASIN DIMENSIONS**						
57	LENGTH / WIDTH	(ft)/(ft)	145	118 (out to out)	(m)/(m)	*	*
58	COLUMN EXTENSION BELOW BASIN CURB	(ft)	4' 11" 2		(m)	*	
59	NUMBER OF CONCRETE PIERS		NONE			NONE	
60	**STAIRWAYS**						
61	NUMBER PER TOWER		2 - Total for both Process and Cogen Towers			*	
62	DESCRIPTION		FRP Double Back Stair			*	
63	MATERIAL / HARDWARE		FRP	316 SS		*	*
64	LOCATION		1 per endwall			*	
65	**EXTERNAL ESCAPE LADDERS**						
66	NUMBER PER TOWER		7 - Total for both Process and Cogen Towers			*	
67	MATERIAL / HARDWARE		HDG Steel	HDG Steel		*	*
68	LOCATION		Various - From Fan Deck to grade			*	
69	SAFETY CAGES	(yes / no)	YES		(yes / no)	YES	
70	**CONNECTORS AND SUPPORTS**						
71	**STRUCTURAL HARDWARE MATERIALS**		SEE NOTE 4			SEE NOTE 4	
72	BOLTS		316 SS			*	
73	NUTS		316 SS			*	
74	WASHERS		316 SS			*	
75	**STRUCTURAL CONNECTORS**						
76	TYPE / DESCRIPTION		FRP Straps			*	
77	MATERIAL		FRP			*	
78	ANCHOR ASSEMBLIES		316SS			*	
79	CONNECTOR MATERIAL		316SS			*	
80	ANCHOR BOLT MATERIAL		316SS			*	
81	ANCHOR BOLTS / GROUT FURNISHED BY:		CONTRACTOR			CONTRACTOR	
82	**MECHANICAL EQUIPMENT SUPPORTS**						
83	DESCRIPTION		Torque Tube			*	
84	MATERIAL / HARDWARE		Steel	Steel		*	*
85	COATING		Epoxy Coated			*	
86	**FRAMEWORK**						
87	**COLUMNS**						
88	DESCRIPTION		FRP - 3"x3" Tube			*	
89	MATERIAL / GRADE		FRP	Polyester		FRP	*
90	WIDTH / HEIGHT OF MEMBER	(in) / (in)	3"	3"	(mm) / (mm)	*	*
91	LENGTH / THICKNESS OF MEMBER	(ft) / (in)	Various	1/4"	(m) / (mm)	*	*
92	HORIZONTAL SPACING	(ft)	6' x 6'		(m)	*	
93	NUMBER PER TOWER		1475			*	
94	CONNECTION TYPE		4 bolt splice blocks			*	

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95	**HORIZONTAL TIES**						
96	DESCRIPTION		4" FRP Channel			*	
97	MATERIAL / GRADE		FRP	Polyester		FRP	*
98	WIDTH / HEIGHT OF MEMBER	(in) / (in)	1 3/8	4	(mm) / (mm)	*	*
99	LENGTH / THICKNESS OF MEMBER	(ft) / (in)	Various	3/16	(m) / (mm)	*	*
100	SPACING	(ft)	Double Girt line every 6'L x 6'W x 6'H		(m)	*	
101	NUMBER PER TOWER		Approximately 5000			*	
102	CONNECTION TYPE		4 bolt splice block			*	
103	**DIAGONALS**						
104	DESCRIPTION		FRP - 3"x3" Tube			*	
105	MATERIAL / GRADE		FRP	Polyester		FRP	*
106	WIDTH / HEIGHT OF MEMBER	(in) / (in)	3"	3"	(mm) / (mm)	*	*
107	LENGTH / THICKNESS OF MEMBER	(ft) / (in)	Various	1/4"	(m) / (mm)	*	*
108	NUMBER PER TOWER		Approximately 1000			*	
109	CONNECTION TYPE		5 hole FRP Strap			*	
110	**RESIN**						
111	TYPE		Polyester			*	
112	NAME / MANUFACTURER		TBA	Brentwood		*	*
113	IS THE SAME RESIN USED ON ALL TOWER FRP	(yes / no)	Yes		(yes / no)	*	
114	**DECKING, BASINS & PARTITIONS**						
115	**FAN DECK**						
116	MATERIAL / GRADE		FRP	Polyester		FRP	*
117	DECKING THICKNESS	(in)	1 1/8"	*	(mm)	*	*
118	JOINT TYPE		Lap			*	
119	FAN DECK LOADING	(lb/ft^2)	100		(kg/m^2)	*	
120	**DECK JOISTS**						
121	WIDTH / HEIGHT OF MEMBER	(in) / (in)	1 5/8"	6	(mm) / (mm)	*	*
122	LENGTH / THICKNESS OF MEMBER	(ft) / (in)	Various	1/4	(m) / (mm)	*	*
123	NUMBER PER TOWER		270			*	
124	SPACING	(ft)	Dougle girt line every 6' Longitudinally		(m)	*	
125	**DECK JOIST SUPPORT**						
126	WIDTH / HEIGHT OF MEMBER	(in) / (in)	1 3/8	4	(mm) / (mm)	*	*
127	LENGTH / THICKNESS OF MEMBER	(ft) / (in)	Various	3/16	(m) / (mm)	*	*
128	NUMBER PER TOWER		270			*	
129	SPACING	(ft)	Dougle girt line every 6' Transversely		(m)	*	
130	OVERLAY		NA			*	
131	**CASING**						
132	MATERIAL / THICKNESS OR WEIGHT	(oz)	FRP	12oz/sqft	(oz)	FRP	
133	FASTENER MATERIAL / TYPE		SS Screws w/ neoprene backed washers			*	
134	FASTENER LOCATION SPACING	(in)	Every Corrugation Vertically, Every 3' Horizontally		(mm)	*	
135	SUPPORT SPAN	(ft)	3'		(m)	*	
136	**LOUVERS**						
137	MATERIAL / THICKNESS OR WEIGHT	(oz)	FRP	12oz/sqft	(oz)	FRP	
138	FASTENER MATERIAL / TYPE		SS w/ Neoprene backed washers	Screws		*	*
139	LOCATION / NUMBER		Air Inlet	60		*	*
140	DISTANCE BETWEEN LOUVERS / INSTALLATION ANGLE		6'	45		*	*
141	ICE RETAINER BAR INCLUDED	(yes/no)	Yes		(yes/no)	*	
142	**PARTITION WALLS**						
143	MATERIAL / THICKNESS OR WEIGHT	(oz)	Corrugated FRP	12oz/sqft	(oz)	*	
144	FASTENER MATERIAL/TYPE		SS screws w/ Neoprene backed washers			*	
145	SUPPORT SPAN	(ft)	3'		(m)	*	

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146	**FILM FILL**		UTILIZE HIGH EFFICIENCY, CROSS FLUTED TYPE: MARLEY MC75 / BRENTWOOD CF1900 OR EQUIVALENT				UTILIZE HIGH EFFICIENCY, CROSS FLUTED TYPE: MARLEY MC75 / BRENTWOOD CF1900 OR EQUIVALENT			
147	MANUFACTURER / MODEL		Brentwood or equal		CF1900 or equal		*		*	
148	MATERIAL / FLAME SPREAD RATING		PVC				*			
149	TYPE (CROSSFLUTED / OFFSET VERTICAL / VERTICAL)		Crossfluted				*			
150	FLUTE SIZE	(mm)	19			(mm)	*			
151	INDIVIDUAL FILL PACK DIMENSIONS	(in x in x in)	2'x1'x6' and 3'x1'x6'			(mm x mm x mm)	*			
152	NUMBER OF FILL PACKS PER CELL		864				*			
153	TOTAL TOWER FILL SURFACE AREA	(ft^2)	15552			(m^2)	*			
154	TOTAL FILL HEIGHT	(ft)	5			(m)	*			
155	FILL AIR TRAVEL	(ft)	5			(m)	*			
156	MINIMUM FILL SHEET THICKNESS AFTER FORMING	(mils)	15			(mm)	*			
157	SYSTEM LOAD BEARING CAPABILITY	(lb/ft^2)	15			(kg/m^2)	*			
158	MAXIMUM ALLOWABLE CONTINUOUS OPERATING TEMPERATURE	(°F)	140			(°C)	*			
159	**FILL SUPPORT**									
160	METHOD / MATERIAL		Bottom Supported		FRP		*		*	
161	SIZE OF SUPPORTING MEMBERS (WIDTH / HEIGHT / LENGTH)	(in) / (in) / (ft)	1 5/8	6	Various	(mm) / (mm) / (m)	*	*	*	
162	MAXIMUM FILL SUPPORT SPAN	(ft)	2'			(m)	*			
163	AIR VELOCITY THROUGH THE FILL	(ft/min)	529			(m/s)	*			
164	**DRIFT ELIMINATORS (DE'S)**									
165	MANUFACTURER / MODEL		Brentwood CF080max or Equal				*			
166	MATERIAL / FLAME SPREAD RATING		PVC				*			
167	TYPE (CELLULAR / WAVE / BLADE)		Cellular				*			
168	NUMBER OF PASSES		3				*			
169	SPACING OR FLUTE SIZE / THICKNESS	(in)	0.8		15	(mm)	*		*	
170	**DE SUPPORT**		*				*			
171	METHOD / MATERIAL		Bottom Supported		FRP		*		*	
172	SIZE OF SUPPORTING MEMBERS (WIDTH / HEIGHT / LENGTH)	(in) / (in) / (ft)	1 3/8	4	Various	(mm) / (mm) / (m)	*	*	*	
173	MAXIMUM DE SUPPORT SPAN	(in)	3			(mm)	*			
174	AIR VELOCITY THROUGH DRIFT ELIMINATORS	(ft/min)	546			(m/s)	*			
175	**WATER DISTRIBUTION**									
176	TYPE OF SPRAY		DOWNSPRAY				DOWNSPRAY			
177	**DISTRIBUTION HEADER - INSIDE TOWER**									
178	NUMBER PER TOWER		6				*			
179	MATERIAL / SCHEDULE		FRP		*		*		*	
180	DIAMETER	(in)	Ø30"			(mm)	*			
181	FLANGE (RATING / TYPE)		150 lb		Flat Faced		*		*	
182	**SUPPORT**									
183	METHOD / MATERIAL		Pipe Saddles		FRP		*		*	
184	SIZE OF SUPPORT (WIDTH / HEIGHT / LENGTH)	(in) / (in) / (ft)	3	12	6'	(mm) / (mm) / (m)	*	*	*	
185	MAXIMUM SUPPORT SPAN	(ft)	6'			(m)	*			
186	**DISTRIBUTION LATERALS**									
187	NUMBER PER TOWER		216				*			
188	MATERIAL / SCHEDULE		PVC		Sched 40		*		*	
189	DIAMETER	(in)	Ø4" / Ø6"			(mm)	*			
190	METHOD OF ATTACHMENT TO MAIN HEADERS		Grommets				*			
191	METHOD OF ATTACHMENT TO STRUCTURAL MEMBERS		Thru-bolt and pipe straps				*			
192	**SUPPORT**									
193	METHOD / MATERIAL		Bottom Supported		FRP		*		*	
194	SIZE OF SUPPORT (WIDTH / HEIGHT / LENGTH)	(in) / (in) / (ft)	1 3/8	4	Various	(mm) / (mm) / (m)	*	*	*	
195	MAXIMUM SUPPORT SPAN	(ft)	6'			(m)	*			

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196	**DISTRIBUTION NOZZLES**						
197	MANUFACTURER / MODEL		CE Shepherd or equal	LP or equal		*	*
198	NUMBER PER CELL		288			*	
199	DISTANCE BETWEEN NOZZLES (WIDTH / LENGTH)	(in) / (in)	36	36	(mm) / (mm)	*	*
200	NOZZLE OUTLET ABOVE TOP OF FILL	(in)	30		(mm)	*	
201	ORIFICE DIAMETER	(in)	1.25		(mm)	*	
202	OPERATING PRESSURE	(in H2O)	1.25 psi		(bara)	*	
203	METHOD OF ATTACHMENT TO LATERALS / DISTRIBUTION PIPING		Nozzle Adapter	*		*	*
204	**RISER PIPING**		Refer to 1.4 of Exhibit D for Description of Piping Terminal Point Refer to Appendix D-5 for Design Pressure Requirements			Refer to 1.4 of Exhibit D for Description of Piping Terminal Point Refer to Appendix D-5 for Design Pressure Requirements	
205	FURNISHED BY:		CONTRACTOR			CONTRACTOR	
206	NUMBER OF RISERS PER TOWER		6			*	
207	MATERIAL / SCHEDULE		FRP	*		*	*
208	DIAMETER	(in)	Ø30"		(m)	*	
209	WATER VELOCITY IN PIPING	(ft/min)	5.6		(m/s)		
210	FLANGE (RATING / TYPE)		150 lb	Flat Faced		*	*
211	DESCRIPTION OF PIPING SUPPORT		Sway Brace			*	
212	**RISER ISOLATION VALVES**		BY COMPANY			BY COMPANY	
213	MANUFACTURER		BY COMPANY			BY COMPANY	
214	DIAMETER	(in)	BY COMPANY		(mm)	BY COMPANY	
215	METHOD OF OPENING / CLOSING		BY COMPANY			BY COMPANY	
216	MATERIALS		BY COMPANY			BY COMPANY	
217	BODY		BY COMPANY			BY COMPANY	
218	STEM		BY COMPANY			BY COMPANY	
219	LOCKING DEVICE		BY COMPANY			BY COMPANY	
220	DISC		BY COMPANY			BY COMPANY	
221	SEAT		BY COMPANY			BY COMPANY	
222	**BYPASS PIPING**		Refer to 1.4 of Exhibit D for Description of Piping Terminal Point Refer to Appendix D-5 for Design Pressure Requirements			Refer to 1.4 of Exhibit D for Description of Piping Terminal Point Refer to Appendix D-5 for Design Pressure Requirements	
223	FURNISHED BY:		CONTRACTOR			CONTRACTOR	
224	TOTAL BYPASS FLOW CONSIDERED FOR SIZING / FLOW PER PIPE	(gpm)/(gpm)	*	*	(m^3/hr)/(m3/hr)	*	*
225	NUMBER OF BYPASS PIPES		2			*	
226	MATERIAL / SCHEDULE		FRP	*		*	*
227	DIAMETER	(in)	Ø36"		(m)	*	
228	WATER VELOCITY IN PIPING	(ft/min)	*		(m/s)	*	
229	**BYPASS VALVES**		BY COMPANY			BY COMPANY	
230	MANUFACTURER		BY COMPANY			BY COMPANY	
231	DIAMETER	(in)	BY COMPANY		(mm)	BY COMPANY	
232	METHOD OF OPENING / CLOSING		BY COMPANY			BY COMPANY	
233	MATERIALS		BY COMPANY			BY COMPANY	
234	BODY		BY COMPANY			BY COMPANY	
235	STEM		BY COMPANY			BY COMPANY	
236	LOCKING DEVICE		BY COMPANY			BY COMPANY	
237	DISC		BY COMPANY			BY COMPANY	
238	SEAT		BY COMPANY			BY COMPANY	

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239	**MECHANICAL EQUIPMENT**					
240	REVERSE OPERATION	(yes / no)	**YES (Motor leads can be manually switched to run in reverse).**		(yes / no)	*
241	**FANS**					
242	NUMBER PER CELL		1			*
243	MANUFACTURER / TYPE OR MODEL		Cofimco or equal	10000-9-35F		* | *
244	DIAMETER	(ft)	32.81'		(m)	*
245	NUMBER OF BLADES PER FAN		9			*
246	FAN SPEED	(RPM)	116		(RPM)	*
247	TIP SPEED	(ft/min)	11,956		(m/s)	*
248	FIRST CRITICAL SPEED	(RPM)	TBA		(RPM)	*
249	SECOND CRITICAL SPEED	(RPM)	TBA		(RPM)	*
250	FAN MOMENT OF INERTIA (WR^2)	($lb\text{-}ft^2$)	483,600		($kg\text{-}m^2$)	*
251	DESIGN kW PER FAN @ **FAN SHAFT**	(kW)	146		(kW)	*
252	EXIT AIR DELIVERY PER FAN - DESIGN POINT	(lb/min)	1,380,099		(kg/hr)	*
253	DESIGN EXIT AIR TEMPERATURE (DBT) AT DESIGN POINT	(°F)	99		(°C)	*
254	DESIGN EXIT AIR TEMPERATURE (WBT) AT DESIGN POINT	(°F)	99		(°C)	*
255	EXIT AIR DENSITY AT DESIGN POINT	(lb/ft^3)	0.0676		(kg/m^3)	*
256	FANS STATIC EFFICIENCY	(%)	70.2		(%)	*
257	FAN TOTAL EFFICIENCY	(%)	83.1		(%)	*
258	(TOTAL) STATIC PRESSURE DROP PROVIDE EACH AT THERMAL DESIGN GUARANTEE POINT: - AIR INLET PRESSURE DROP - RAIN ZONE PRESSURE DROP - FILL PRESSURE DROP - DRIFT ELIMINATOR PRESSURE DROP - FAN INLET PRESSURE DROP	(in H2O)	0.593 0.147 0.107 0.288 0.047 0.035		(in H2O)	* * * * * * *
259	VELOCITY PRESSURE @ FAN	(in H2O)	0.144		(bara)	*
260	VELOCITY RECOVERY	(in H2O)	0.013		(bara)	*
261	NET TOTAL PRESSURE	(in H2O)	0.737		(bara)	*
262	DESIGN PITCH SETTING	(degrees)	5.7		(degrees)	*
263	MAXIMUM PITCH SETTING ALLOWABLE (TO AVOID STALL CONDITION)	(degrees)	18		(degrees)	*
264	TIP CLEARANCE (MAXIMUM / MINIMUM)	(in) / (in)	0.75	1.5	(mm) / (mm)	* | *
265	BLADE MATERIAL		FRP			*
267	HARDWARE MATERIAL		316SS			*
266	HUB MATERIAL		Ductile Iron			*
268	HUB COVER (SEAL DISC) MATERIAL		FRP			*
267	HUB COVER DIAMETER	(ft)	9'		(m)	*
269	**FAN STACK**					
268	MANUFACTURER		Amtech			*
270	MATERIALS / HARDWARE		FRP	316SS		* | *
269	HEIGHT	(ft)	14		(m)	14
271	DISTANCE OF FAN ABOVE FAN DECK	(in)	6		(m)	*
272	DISTANCE OF FAN FROM TOP OF STACK	(in)	8		(m)	*
273	FAN STACK THROAT DIAMETER @ FAN LEVEL	(ft)	33'-1"		(m)	*
274	STACK INLET DIAMETER	(ft)	36'-3"		(m)	*
275	STACK EXIT DIAMETER	(ft)	35'-2"		(m)	*

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GEARBOX		TEXTRON, SUMITOMO, OR MERGER NOT ALLOWED			TEXTRON, SUMITOMO, OR MERGER NOT ALLOWED		
MANUFACTURER		Amarillo or equal			*		
MODEL NUMBER		1713 or equal			*		
TYPE		Right Angle			*		
GEAR RATIO		15.5:1			*		
AGMA HP RATING BASED ON 2.0 SERVICE FACTOR		296			*		
GEAR BOX EFFICIENCY	%	96		%	*		
NUMBER OF REDUCTIONS		2			*		
TYPE OF OIL LUBRICATION SYSTEM		Splash			*		
ANCHOR HARDWARE MATERIAL		HDG Steel			*		
CASE PROTECTIVE COATING		Epoxy			*		
FILL& DRAIN LINE MATERIAL / LOCATION		Neoprene	Gearbox to outside of Fan Stack		*	*	
VENT LINE MATERIAL / LOCATION		PVC	Gearbox to outside of Fan Stack		*	*	
GAUGE GLASS LOCATION		Outside of fan stack			*		
DIPSTICK LOCATION		NA			*		
BEARING LIFE (MINIMUM / MAXIMUM)	(hr)	100,000	*	(hr)	100,000	*	
DRIVE SHAFT							
MANUFACTURER		Addax or equal			*		
MODEL NUMBER		LRR850.625			*		
TUBE DIAMETER	(in)	6.25		(mm)	*		
RATED HP (Kw) AT MOTOR NAMEPLATE RPM AND 2.0 SERVICE FACTOR	(HP)	500		(kW)	*		
TUBE MATERIALS		Composite			*		
COUPLING MATERIALS		316SS			*		
TYPE OF FLEXIBLE COMPONENTS / MATERIALS		Flex Element	Composite		*	*	
HARDWARE MATERIAL		316SS			*		
DRIVE SHAFT GUARD MATERIAL / QUANTITY		Epoxy Coated	2 per driveshaft		*	*	
MOTORS		All motors shall be ABB			All motors shall be ABB		
MANUFACTURER		ABB Baldor			*		
NUMBER OF MOTOR PER TOWER		6			*		
TYPE OF STARTER REQUIRED		TBA			*		
TYPE OF ENCLOSURE / METHOD OF COOLING		TEFC	TEFC		*	*	
NAMEPLATE NOMINAL RPM		1800			*		
FULL LOAD AMPS		40.4			*		
POWER SOURCE (PHASE / HERTZ / VOLTS)	(ph / Hz / V)	SEE NOTE 5		(ph / Hz / V)	SEE NOTE 5		
FRAME SIZE		5008			*		
NAMEPLATE HP / S.F.		300	1		*	*	
FULL LOAD MOTOR EFFICIENCY	(%)	95		(%)	*		
GUARANTEED POWER REQUIRED TOTAL TOWER AT MIT	(HP)	1500		(kW)	*		
SPECIAL FEATURES							
HEATER INCLUDED / VOLTAGE	(Volts)	YES	120	(Volts)	YES	*	
AREA CLASSIFICATION / INSULATION	(yes / no)	Class 1 Group C, D, Div 2		(yes / no)	*		
VIBRATION MONITORING		SEE NOTE 5			SEE NOTE 5		
DESCRIPTION		BN 190501 Velometers			*		
LOCATION		Gearbox			*		
NUMBER		2 per gearbox - 12 total			*		

NOTES:

1. Replace all * (asterisks) and incomplete check boxes with appropriate information. Does not relieve the Subcontractor from performance responsibilities.
2. Refer to Attachment 1 of the SR, Project Franklin Basic Engineering Design Data, for requirements.
3. The Process and Cogen towers shall essentially be installed as one continuous tower, as indicated in the Plot Plan. Both towers will sit on one single foundation but will have separate basins and pump forebays. The total number of cooling tower cells (both Process + Cogen) shall be limited to 32 (Process 26, Cogen 6). The Process and Cogen cell dimensions can be different but all of the mechanical equipment shall be identical - refer to Section 1.1 of the main body of Exhibit D for details.
4. All materials shall be suitable for service in indicated circulating water quality.
5. Motors 250 hp and larger shall be medium voltage, 4000V. See Appendix D-5 for vibration monitoring requirements.

Consolidated without comments by Steve Giles July 6, 2018
NOTE: Allen Miller did not have comments

Project Franklin Shell Consolidator Stamp
Responsible Person: Giles_Steve
Status Code: 1 - Work May Proceed
Client Doc No: GM1-700-U59200-MX-2105-00001
PCAP No: NA
Revision: 002
Date: July 6, 2018
Equipment No: E-59201

CLIENT: SHELL CHEMICAL APPALACHIA LLC

PROJECT TITLE: PROJECT FRANKLIN

PROJECT LOCATION: Beaver County, Pennsylvania, USA

JOB NUMBER: 25873

SR NUMBER: 25873-100-SR1-MECM-00001

EQUIPMENT TAG NUMBER: E-59201

EQUIPMENT SERVICE: Process Cooling Water Tower

SERIAL NUMBER: LATER

COMMENTS: Vendor shall complete data sheet and submit.

REV.	DATE	REASON FOR REVISION	BY	CK'D	PE	EL	EGS	APE	PEM
002	21-Dec-2017	ISSUED FOR PURCHASE	[illegible]	[illegible]	CSL	—	CSL	—	[illegible]
001	22-Mar-2016	ISSUED FOR PURCHASE	NJP	NAL	CSL	-	CSL	-	RPK
000	5-Oct-2015	ISSUED FOR QUOTATION	NJP	NAL	CSL	-	CSL	-	RPK

	PROJECT FRANKLIN	SHELL DOCUMENT NUMBER	REV.
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	Data Sheet for	BECHTEL DOCUMENT NUMBER	REV.
		25873-001-MED-592-E59201	002
ECCN: EAR99	Process Cooling Water Tower	BECHTEL PROJECT NO.: 25873	Page 1 of 8

Security Level 2

PROVIDE INFORMATION IN BOTH ENGLISH AND METRIC UNITS BELOW

	ITEMS	UNITS	BASE CASE - ENGLISH UNITS	UNITS	BASE CASE - METRIC UNITS
1	**GENERAL INFORMATION**				
2	TAG NUMBER		International Cooling Tower		
3	TOWER MODEL		**CF9951-32.8-6-26B**		*
4	TYPE		BACK-TO-BACK, COUNTER-FLOW		BACK-TO-BACK, COUNTER-FLOW
5	**SITE DATA**				
6	TOWER SITE		POTTER & CENTER TOWNSHIPS, BEAVER COUNTY, PENNSYLVANIA, USA		POTTER & CENTER TOWNSHIPS, BEAVER COUNTY, PENNSYLVANIA, USA
7	ELEVATION ABOVE SEA LEVEL	(ft)	713 - 795	(m)	217.32 - 242.32
8	TOWER ORIENTATION		REFER TO PLOT PLAN		REFER TO PLOT PLAN
9	PREVAILING SUMMER WIND DIRECTION		REFER TO PLOT PLAN		REFER TO PLOT PLAN
10	DESIGN WIND SPEED AND LOAD		SEE NOTE 2		SEE NOTE 2
11	LOADING REQUIREMENTS		SEE NOTE 2		SEE NOTE 2
12	SEISMIC ZONE		SEE NOTE 2		SEE NOTE 2
13	AVAILABLE PLOT DIMENSIONS (LENGTH x WIDTH)	(ft)	SEE NOTE 3	(m)	SEE NOTE 3
14	DESCRIPTION OF NEAREST OBSTRUCTION TO COOLING TOWER		REFER TO PLOT PLAN		REFER TO PLOT PLAN
15	CIRCULATING WATER SUSPENDED SOLIDS (TSS)	(mg/L)	REFER TO CIRCULATING WATER QUALITY	(mg/L)	REFER TO CIRCULATING WATER QUALITY
16	CIRCULATING WATER DISSOLVED SOLIDS (TDS)	(mg/L)	REFER TO CIRCULATING WATER QUALITY	(mg/L)	REFER TO CIRCULATING WATER QUALITY
17	NOISE GUARANTEE	(dBA)	REFER TO NOISE DATA SHEETS	(dBA)	REFER TO NOISE DATA SHEETS
18	METHOD OF SOUND ATTENUATION		3 Layers of ENKAMAT at Top of Water Level in Basin		*
19	**DESIGN CONDITIONS**				
20	DESIGN WATER FLOW	(gpm)	295,900	(m^3/hr)	67,250
21	DESIGN HOT (INLET) WATER TEMPERATURE (GUARANTEE)	(°F)	107	(°C)	41.7
22	DESIGN COLD (OUTLET) WATER TEMPERATURE (GUARANTEE)	(°F)	80	(°C)	26.7
23	DESIGN INLET WBT	(°F)	75	(°C)	23.9
24	AMBIENT DRY BULB TEMP (MIN / MAX / DESIGN)	(°F)	11.9 | 86.6 | 82.6	(°C)	-11.2 | 30.3 | 28.1
25	MAXIMUM DRIFT LOSS (PERCENT OF WATER FLOW)	(%)	0.0005	(%)	0.0005
26	**TOWER PARAMETERS**				
27	EVAPORATION LOSS AT DESIGN CONDITIONS	(gpm)	6598	(m^3/hr)	*
28	GUARANTEED PUMPING HEAD, ABOVE CURB	(ft)	42.6	(m)	*
29	NOZZLE PRESSURE DROP	(ft)	1.25 psi	(m)	*
30	TOTAL TOWER HEAD LOSSES IN DISTRIBUTION PIPING, INCLUDING NOZZLES	(ft)	8	(m)	*
31	PRESSURE DROP IN DISTRIBUTION HEADER AND WATER DISTRIBUTION SYSTEM FOR EACH CELL	(ft)	8	(m)	*
32	DEPTH OF BASIN	(ft)	4'-11"	(m)	1.499 △2
33	HEIGHT FROM BASIN CURB TO HEADER CENTERLINE	(ft)	37'-6" / 39'-1" △2	(m)	*
34	HEIGHT OF NOZZLE DISCHARGE TO TOP OF FILL	(in)	30	(m)	*
35	TOP OF FILL TO BOTTOM OF FAN DECK	(ft)	17'-6"	(m)	*
36	TOP OF DE'S TO BOTTOM OF FAN DECK	(ft)	10'-6"	(m)	*
37	AIR INLETS (NUMBER OF OPEN SIDES)		2		2
38	AIR INLET HEIGHT ABOVE CURB	(ft)	26'-10 5/8" △2	(m)	*
39	NET WET AIR INLET AREA TOTAL FOR TOWER / % OBSTRUCTION AIR INLET	(ft^2) / (%)	40,040 | 3	(m^2) / (%)	* | *
40	AIR INLET VELOCITY	(ft/min)	1044	(m/s)	*
41	DESIGN L/G		0.888		*
42	PRESSURE RATIO		9.19		*
43	WATER LOADING	(gpm/ft^2)	4.03	((m3/hr)/m^2)	*
44	SLOPE OF CHARACTERISTIC CURVE		-0.8		*
45	CONSTANT FOR CHARACTERISTIC CURVE		*		*
46	DESIGN KaV/L OR KaY/L		2.992		*

	MECHANICAL DRAFT COOLING TOWER DATA SHEET	**SHELL DOCUMENT NUMBER**	**REV.**
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		BECHTEL DOCUMENT NUMBER	**REV.**
	PROCESS COOLING WATER TOWER	**25873-001-MED-592-E59201**	**002**
		BECHTEL PROJECT NO.: 25873-001	**PAGE 2 OF 8**

PROVIDE INFORMATION IN BOTH ENGLISH AND METRIC UNITS BELOW

	ITEMS	UNITS	BASE CASE - ENGLISH UNITS		UNITS	BASE CASE - METRIC UNITS	
47	**PHYSICAL DETAILS**		SEE NOTE 3			SEE NOTE 3	
48	NUMBER OF CELLS		26			26	
49	NUMBER OF FANS PER CELL		1			1	
50	**TOWER OVERALL DIMENSIONS (WITHOUT STAIRS)**						
51	LENGTH / WIDTH	(ft)/(ft)	702	108	(m)/(m)	*	*
52	REQUIRED SPACING REQUIRED AROUND TOWER (CLEAR AREA BETWEEN ADJACENT TOWERS OR TOWER AND NEAREST OBSTACLES)	(ft)	60		(m)	*	
53	HEIGHT (BASIN CURB TO FAN DECK)	(ft)	50'- 8 1/8" 2		(m)	*	
54	**NOMINAL CELL DIMENSIONS**						
55	LENGTH / WIDTH	(ft)/(ft)	54	54	(m)/(m)	*	*
56	**REQUIRED INSIDE BASIN DIMENSIONS**						
57	LENGTH / WIDTH	(ft)/(ft)	704	118 (out to out)	(m)/(m)	*	*
58	COLUMN EXTENSION BELOW BASIN CURB	(ft)	4'-11" 2		(m)	*	
59	NUMBER OF CONCRETE PIERS		NONE			NONE	
60	**STAIRWAYS**						
61	NUMBER PER TOWER		2 - Total for both Process and Cogen Towers			*	
62	DESCRIPTION		FRP Double Back Stair			*	
63	MATERIAL / HARDWARE		FRP	316 SS		*	*
64	LOCATION		1 per endwall			*	
65	**EXTERNAL ESCAPE LADDERS**						
66	NUMBER PER TOWER		7 - Total for both Process and Cogen Towers			*	
67	MATERIAL / HARDWARE		HDG Steel	HDG Steel		*	*
68	LOCATION		Various - From Fan Deck to grade			*	
69	SAFETY CAGES	(yes / no)	YES		(yes / no)	YES	
70	**CONNECTORS AND SUPPORTS**						
71	**STRUCTURAL HARDWARE MATERIALS**		SEE NOTE 4			SEE NOTE 4	
72	BOLTS		316 SS			*	
73	NUTS		316 SS			*	
74	WASHERS		316 SS			*	
75	**STRUCTURAL CONNECTORS**						
76	TYPE / DESCRIPTION		FRP Straps			*	
77	MATERIAL		FRP			*	
78	ANCHOR ASSEMBLIES		316SS			*	
79	CONNECTOR MATERIAL		316SS			*	
80	ANCHOR BOLT MATERIAL		316SS			*	
81	ANCHOR BOLTS / GROUT FURNISHED BY:		CONTRACTOR			CONTRACTOR	
82	**MECHANICAL EQUIPMENT SUPPORTS**						
83	DESCRIPTION		Torque Tube			*	
84	MATERIAL / HARDWARE		Steel	Steel		*	*
85	COATING		Epoxy Coated			*	
86	**FRAMEWORK**						
87	**COLUMNS**						
88	DESCRIPTION		FRP - 3"x3" Tube			*	
89	MATERIAL / GRADE		FRP	Polyester		FRP	*
90	WIDTH / HEIGHT OF MEMBER	(in) / (in)	3"	3"	(mm) / (mm)	*	*
91	LENGTH / THICKNESS OF MEMBER	(ft) / (in)	Various	1/4"	(m) / (mm)	*	*
92	HORIZONTAL SPACING	(ft)	6'x6'		(m)	*	
93	NUMBER PER TOWER		Approximately 6318			*	
94	CONNECTION TYPE		4 bolt splice blocks			*	

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PROVIDE INFORMATION IN BOTH ENGLISH AND METRIC UNITS BELOW

95	**HORIZONTAL TIES**						
96	DESCRIPTION		4" FRP Channel			*	
97	MATERIAL / GRADE		FRP	**Polyester**		FRP	*
98	WIDTH / HEIGHT OF MEMBER	(in) / (in)	1 3/8	4	(mm) / (mm)	*	*
99	LENGTH / THICKNESS OF MEMBER	(ft) / (in)	Various	3/16	(m) / (mm)	*	*
100	SPACING	(ft)	Double Girt line every 6'L x 6'W x 6'H		(m)	*	
101	NUMBER PER TOWER		Approximately 22,984			*	
102	CONNECTION TYPE		4 bolt splice block			*	
103	**DIAGONALS**						
104	DESCRIPTION		FRP - 3"x3" Tube			*	
105	MATERIAL / GRADE		FRP	Polyester		FRP	*
106	WIDTH / HEIGHT OF MEMBER	(in) / (in)	3"	3"	(mm) / (mm)	*	*
107	LENGTH / THICKNESS OF MEMBER	(ft) / (in)	Various	1/4"	(m) / (mm)	*	*
108	NUMBER PER TOWER		Approximately 4000			*	
109	CONNECTION TYPE		5 hole FRP Strap			*	
110	**RESIN**						
111	TYPE		Polyester			*	
112	NAME / MANUFACTURER		TBA	Brentwood		*	*
113	IS THE SAME RESIN USED ON ALL TOWER FRP	(yes / no)	Yes		(yes / no)	*	
114	**DECKING, BASINS & PARTITIONS**						
115	**FAN DECK**						
116	MATERIAL / GRADE		FRP	Polyester		FRP	*
117	DECKING THICKNESS	(in)	1 1/8"	*	(mm)	*	*
118	JOINT TYPE		Lap			*	
119	FAN DECK LOADING	(lb/ft^2)	100		(kg/m^2)	*	
120	**DECK JOISTS**						
121	WIDTH / HEIGHT OF MEMBER	(in) / (in)	1 5/8"	6	(mm) / (mm)	*	*
122	LENGTH / THICKNESS OF MEMBER	(ft) / (in)	Various	1/4	(m) / (mm)	*	*
123	NUMBER PER TOWER		1260			*	
124	SPACING	(ft)	Dougle girt line every 6' Longitudinally		(m)	*	
125	**DECK JOIST SUPPORT**						
126	WIDTH / HEIGHT OF MEMBER	(in) / (in)	1 3/8	4	(mm) / (mm)	*	*
127	LENGTH / THICKNESS OF MEMBER	(ft) / (in)	Various	3/16	(m) / (mm)	*	*
128	NUMBER PER TOWER		1500			*	
129	SPACING	(ft)	Dougle girt line every 6' Transversely		(m)	*	
130	OVERLAY		**NA**			*	
131	**CASING**						
132	MATERIAL / THICKNESS OR WEIGHT	(oz)	FRP	12oz/sqft	(oz)	FRP	
133	FASTENER MATERIAL / TYPE		SS Screws w/ neoprene backed washers			*	
134	FASTENER LOCATION SPACING	(in)	Every Corrugation Vertically, Every 3' Horizontally		(mm)	*	
135	SUPPORT SPAN	(ft)	3'		(m)	*	
136	**LOUVERS**						
137	MATERIAL / THICKNESS OR WEIGHT	(oz)	FRP	12oz/sqft	(oz)	FRP	
138	FASTENER MATERIAL / TYPE		SS w/ Neoprene backed washers	Screws		*	*
139	LOCATION / NUMBER		Air Inlet	234		*	*
140	DISTANCE BETWEEN LOUVERS / INSTALLATION ANGLE		6'	45		*	*
141	ICE RETAINER BAR INCLUDED	(yes/no)	Yes		(yes/no)	*	
142	**PARTITION WALLS**						
143	MATERIAL / THICKNESS OR WEIGHT	(oz)	Corrugated FRP	12oz/sqft	(oz)	*	
144	FASTENER MATERIAL/TYPE		SS screws w/ Neoprene backed washers			*	
145	SUPPORT SPAN	(ft)	3'		(m)	*	

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		BECHTEL DOCUMENT NUMBER	**REV.**
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		BECHTEL PROJECT NO.: 25873-001	**PAGE 4 OF 8**

PROVIDE INFORMATION IN BOTH ENGLISH AND METRIC UNITS BELOW

146	**FILM FILL**		UTILIZE CLOG RESISTANT, VERTICAL FLUTED TYPE: MARLEY DF254, DF381, CleanFlow, MCR16 / BRENTWOOD VF19Plus or AFVF19 OR EQUIVALENT				UTILIZE CLOG RESISTANT, VERTICAL FLUTED TYPE: MARLEY DF254, DF381, CleanFlow, MCR16 / BRENTWOOD VF19Plus or AFVF19 OR EQUIVALENT			
147	MANUFACTURER / MODEL		Marley	DF254			*	*		
148	MATERIAL / FLAME SPREAD RATING		PVC				*			
149	TYPE (CROSSFLUTED / OFFSET VERTICAL / VERTICAL)		Vertical				*			
150	FLUTE SIZE	(mm)	NA			(mm)	*			
151	INDIVIDUAL FILL PACK DIMENSIONS	(in x in x in)	4'x1'x6'			(mm x mm x mm)	*			
152	NUMBER OF FILL PACKS PER CELL		972				*			
153	TOTAL TOWER FILL SURFACE AREA	(ft^2)	75, 816			(m^2)	*			
154	TOTAL FILL HEIGHT	(ft)	6.5			(m)	*			
155	FILL AIR TRAVEL	(ft)	6.5			(m)	*			
156	MINIMUM FILL SHEET THICKNESS AFTER FORMING	(mils)	15mil			(mm)	*			
157	SYSTEM LOAD BEARING CAPABILITY	(lb/ft^2)	15			(kg/m^2)	*			
158	MAXIMUM ALLOWABLE CONTINUOUS OPERATING TEMPERATURE	(°F)	130			(°C)	*			
159	**FILL SUPPORT**									
160	METHOD / MATERIAL		Bottom Supported	FRP			*	*		
161	SIZE OF SUPPORTING MEMBERS (WIDTH / HEIGHT / LENGTH)	(in) / (in) / (ft)	1 5/8	6	Various	(mm) / (mm) / (m)	*	*	*	
162	MAXIMUM FILL SUPPORT SPAN	(ft)	2'			(m)	*			
163	AIR VELOCITY THROUGH THE FILL	(ft/min)	556			(m/s)	*			
164	**DRIFT ELIMINATORS (DE'S)**									
165	MANUFACTURER / MODEL		Brentwood CF080max or Equal				*			
166	MATERIAL / FLAME SPREAD RATING		PVC				*			
167	TYPE (CELLULAR / WAVE / BLADE)		Cellular				*			
168	NUMBER OF PASSES		3				*			
169	SPACING OR FLUTE SIZE / THICKNESS	(in)	0.8	15		(mm)	*	*		
170	**DE SUPPORT**		*				*			
171	METHOD / MATERIAL		Bottom Supported	FRP			*	*		
172	SIZE OF SUPPORTING MEMBERS (WIDTH / HEIGHT / LENGTH)	(in) / (in) / (ft)	1 3/8	4	Various	(mm) / (mm) / (m)	*	*	*	
173	MAXIMUM DE SUPPORT SPAN	(in)	3'			(mm)	*			
174	AIR VELOCITY THROUGH DRIFT ELIMINATORS	(ft/min)	570			(m/s)	*			
175	**WATER DISTRIBUTION**									
176	TYPE OF SPRAY		DOWNSPRAY				DOWNSPRAY			
177	**DISTRIBUTION HEADER - INSIDE TOWER**									
178	NUMBER PER TOWER		26				*			
179	MATERIAL / SCHEDULE		FRP	*			*	*		
180	DIAMETER	(in)	Ø30"			(mm)	*			
181	FLANGE (RATING / TYPE)		150 lb	Flat Faced			*	*		
182	**SUPPORT**									
183	METHOD / MATERIAL		Pipe Saddles	FRP			*	*		
184	SIZE OF SUPPORT (WIDTH / HEIGHT / LENGTH)	(in) / (in) / (ft)	3	12	6	(mm) / (mm) / (m)	*	*	*	
185	MAXIMUM SUPPORT SPAN	(ft)	6'			(m)	*			
186	**DISTRIBUTION LATERALS**									
187	NUMBER PER TOWER		936				*			
188	MATERIAL / SCHEDULE		PVC	Sched 40			*	*		
189	DIAMETER	(in)	Ø4" / Ø6"			(mm)	*			
190	METHOD OF ATTACHMENT TO MAIN HEADERS		Grommets				*			
191	METHOD OF ATTACHMENT TO STRUCTURAL MEMBERS		Thru-bolt and pipe straps				*			
192	**SUPPORT**									
193	METHOD / MATERIAL		Bottom Supported	FRP			*	*		
194	SIZE OF SUPPORT (WIDTH / HEIGHT / LENGTH)	(in) / (in) / (ft)	1 3/8	4	Various	(mm) / (mm) / (m)	*	*	*	
195	MAXIMUM SUPPORT SPAN	(ft)	6			(m)	*			

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PROVIDE INFORMATION IN BOTH ENGLISH AND METRIC UNITS BELOW

196	**DISTRIBUTION NOZZLES**						
197	MANUFACTURER / MODEL		CE Shepherd or equal	LP or equal		*	*
198	NUMBER PER CELL		324			*	
199	DISTANCE BETWEEN NOZZLES (WIDTH / LENGTH)	(in) / (in)	36	36	(mm) / (mm)	*	*
200	NOZZLE OUTLET ABOVE TOP OF FILL	(in)	30		(mm)	*	
201	ORIFICE DIAMETER	(in)	1 1/8"		(mm)	*	
202	OPERATING PRESSURE	(in H2O)	1.25 psi		(bara)	*	
203	METHOD OF ATTACHMENT TO LATERALS / DISTRIBUTION PIPING		Nozzle Adapter	*		*	*
204	**RISER PIPING**		Refer to 1.4 of Exhibit D for Description of Piping Terminal Point Refer to Appendix D-5 for Design Pressure Requirements			Refer to 1.4 of Exhibit D for Description of Piping Terminal Point Refer to Appendix D-5 for Design Pressure Requirements	
205	FURNISHED BY:		CONTRACTOR			CONTRACTOR	
206	NUMBER OF RISERS PER TOWER		26			*	
207	MATERIAL / SCHEDULE		FRP	*		*	*
208	DIAMETER	(in)	Ø30"		(m)	*	
209	WATER VELOCITY IN PIPING	(ft/min)	5.17		(m/s)		
210	FLANGE (RATING / TYPE)		150 lb	Flat Faced		*	*
211	DESCRIPTION OF PIPING SUPPORT		Sway Brace			*	
212	**RISER ISOLATION VALVES**		BY COMPANY			BY COMPANY	
213	MANUFACTURER		BY COMPANY			BY COMPANY	
214	DIAMETER	(in)	BY COMPANY		(mm)	BY COMPANY	
215	METHOD OF OPENING / CLOSING		BY COMPANY			BY COMPANY	
216	MATERIALS		BY COMPANY			BY COMPANY	
217	BODY		BY COMPANY			BY COMPANY	
218	STEM		BY COMPANY			BY COMPANY	
219	LOCKING DEVICE		BY COMPANY			BY COMPANY	
220	DISC		BY COMPANY			BY COMPANY	
221	SEAT		BY COMPANY			BY COMPANY	
222	**BYPASS PIPING**		BY COMPANY			BY COMPANY	
223	FURNISHED BY:		Refer to 1.4 of Exhibit D for Description of Piping Terminal Point Refer to Appendix D-5 for Design Pressure Requirements			Refer to 1.4 of Exhibit D for Description of Piping Terminal Point Refer to Appendix D-5 for Design Pressure Requirements	
224	TOTAL BYPASS FLOW CONSIDERED FOR SIZING / FLOW PER PIPE	(gpm)/(gpm)	*	*	$(m^3/hr)/(m3/hr)$	*	*
225	NUMBER OF BYPASS PIPES		6			*	
226	MATERIAL / SCHEDULE		FRP	*		*	*
227	DIAMETER	(in)	Ø42"		(m)	*	
228	WATER VELOCITY IN PIPING	(ft/min)	*		(m/s)	*	
229	**BYPASS VALVES**		BY COMPANY			BY COMPANY	
230	MANUFACTURER		BY COMPANY			BY COMPANY	
231	DIAMETER	(in)	BY COMPANY		(mm)	BY COMPANY	
232	METHOD OF OPENING / CLOSING		BY COMPANY			BY COMPANY	
233	MATERIALS		BY COMPANY			BY COMPANY	
234	BODY		BY COMPANY			BY COMPANY	
235	STEM		BY COMPANY			BY COMPANY	
236	LOCKING DEVICE		BY COMPANY			BY COMPANY	
237	DISC		BY COMPANY			BY COMPANY	
238	SEAT		BY COMPANY			BY COMPANY	

PROVIDE INFORMATION IN BOTH ENGLISH AND METRIC UNITS BELOW

239	**MECHANICAL EQUIPMENT**				
240	REVERSE OPERATION	(yes / no)	**YES (Motor leads can be manually switched to run in reverse).**	(yes / no)	*
241	**FANS**				
242	NUMBER PER CELL		1		*
243	MANUFACTURER / TYPE OR MODEL		Marley or Cofimco | 10000-9-35F		* | *
244	DIAMETER	(ft)	32.81'	(m)	*
245	NUMBER OF BLADES PER FAN		9		*
246	FAN SPEED	(RPM)	116	(RPM)	*
247	TIP SPEED	(ft/min)	11,957	(m/s)	*
248	FIRST CRITICAL SPEED	(RPM)	TBA	(RPM)	*
249	SECOND CRITICAL SPEED	(RPM)	TBA	(RPM)	*
250	FAN MOMENT OF INERTIA (WR^2)	($lb\text{-}ft^2$)	483,600	($kg\text{-}m^2$)	*
251	DESIGN kW PER FAN @ **FAN SHAFT**	(kW)	186	(kW)	*
252	EXIT AIR DELIVERY PER FAN - DESIGN POINT	(lb/min)	1,619,918	(kg/hr)	*
253	DESIGN EXIT AIR TEMPERATURE (DBT) AT DESIGN POINT	(°F)	95	(°C)	*
254	DESIGN EXIT AIR TEMPERATURE (WBT) AT DESIGN POINT	(°F)	95	(°C)	*
255	EXIT AIR DENSITY AT DESIGN POINT	(lb/ft^3)	0.0682	(kg/m^3)	*
256	FANS STATIC EFFICIENCY	(%)	37	(%)	*
257	FAN TOTAL EFFICIENCY	(%)	86	(%)	*
258	(TOTAL) STATIC PRESSURE DROP PROVIDE EACH AT THERMAL DESIGN GUARANTEE POINT: - AIR INLET PRESSURE DROP - RAIN ZONE PRESSURE DROP - FILL PRESSURE DROP - DRIFT ELIMINATOR PRESSURE DROP - FAN INLET PRESSURE DROP	(in H2O)	0.687 0.159 0.091 0.365 0.051 0.048	(in H2O)	* * * * * * *
259	VELOCITY PRESSURE @ FAN	(in H2O)	0.161	(bara)	*
260	VELOCITY RECOVERY	(in H2O)	0.015	(bara)	*
261	NET TOTAL PRESSURE	(in H2O)	0.848	(bara)	*
262	DESIGN PITCH SETTING	(degrees)	8	(degrees)	*
263	MAXIMUM PITCH SETTING ALLOWABLE (TO AVOID STALL CONDITION)	(degrees)	18	(degrees)	*
264	TIP CLEARANCE (MAXIMUM / MINIMUM)	(in) / (in)	0.75 | 1.5	(mm) / (mm)	* | *
265	BLADE MATERIAL		FRP		*
267	HARDWARE MATERIAL		316SS		*
266	HUB MATERIAL		Ductile Iron		*
268	HUB COVER (SEAL DISC) MATERIAL		FRP		*
267	HUB COVER DIAMETER	(ft)	9'	(m)	*
269	**FAN STACK**				
268	MANUFACTURER		Marley or Amtech		*
270	MATERIALS / HARDWARE		FRP | 316SS		* | *
269	HEIGHT	(ft)	14	(m)	14
271	DISTANCE OF FAN ABOVE FAN DECK	(in)	6	(m)	*
272	DISTANCE OF FAN FROM TOP OF STACK	(in)	12	(m)	*
273	FAN STACK THROAT DIAMETER @ FAN LEVEL	(ft)	33'-1"	(m)	*
274	STACK INLET DIAMETER	(ft)	**36'-3"**	(m)	*
275	STACK EXIT DIAMETER	(ft)	35'-2"	(m)	*

	MECHANICAL DRAFT COOLING TOWER DATA SHEET	**SHELL DOCUMENT NUMBER**	**REV.**
		GM1-700-U59200-MX-2105-00001	**002**
		BECHTEL DOCUMENT NUMBER	**REV.**
	PROCESS COOLING WATER TOWER	**25873-001-MED-592-E59201**	**002**
		BECHTEL PROJECT NO.: 25873-001	**PAGE 7 OF 8**

PROVIDE INFORMATION IN BOTH ENGLISH AND METRIC UNITS BELOW

276	**GEARBOX**		TEXTRON, SUMITOMO, OR MERGER NOT ALLOWED			TEXTRON, SUMITOMO, OR MERGER NOT ALLOWED	
277	MANUFACTURER		Amarillo or equal			*	
278	MODEL NUMBER		1713 or equal			*	
279	TYPE		Right Angle			*	
280	GEAR RATIO		15.5:1			*	
281	AGMA HP RATING BASED ON 2.0 SERVICE FACTOR		294			*	
282	GEAR BOX EFFICIENCY	%	96		%	*	
283	NUMBER OF REDUCTIONS		2			*	
284	TYPE OF OIL LUBRICATION SYSTEM		Splash			*	
285	ANCHOR HARDWARE MATERIAL		HDG Steel			*	
286	CASE PROTECTIVE COATING		Epoxy			*	
287	FILL& DRAIN LINE MATERIAL / LOCATION		Neoprene	Gearbox to outside of Fan Stack		*	*
288	VENT LINE MATERIAL / LOCATION		PVC	Gearbox to outside of Fan Stack		*	*
289	GAUGE GLASS LOCATION		Outside of fan stack			*	
290	DIPSTICK LOCATION		NA			*	
291	BEARING LIFE (MINIMUM / MAXIMUM)	(hr)	100,000	*	(hr)	100,000	*
292	**DRIVE SHAFT**						
293	MANUFACTURER		Addax or equal			*	
294	MODEL NUMBER		LRR850.625			*	
295	TUBE DIAMETER	(in)	6.25		(mm)	*	
296 297	RATED HP (Kw) AT MOTOR NAMEPLATE RPM AND 2.0 SERVICE FACTOR	(HP)	500		(kW)	*	
298	TUBE MATERIALS		Composite			*	
299	COUPLING MATERIALS		316SS			*	
300	TYPE OF FLEXIBLE COMPONENTS / MATERIALS		Flex Element	Composite		*	*
301	HARDWARE MATERIAL		316SS			*	
302	DRIVE SHAFT GUARD MATERIAL / QUANTITY		Epoxy Coated Steel	2 per driveshaft		*	*
303	**MOTORS**		All motors shall be ABB			All motors shall be ABB	
304	MANUFACTURER		ABB Baldor			*	
305	NUMBER OF MOTOR PER TOWER		26			*	
306	TYPE OF STARTER REQUIRED		TBA			*	
307	TYPE OF ENCLOSURE / METHOD OF COOLING		TEFC	TEFC		*	*
308	NAMEPLATE NOMINAL RPM		1800			*	
309	FULL LOAD AMPS		40.4			*	
310	POWER SOURCE (PHASE / HERTZ / VOLTS)	(ph / Hz / V)	SEE NOTE 5		(ph / Hz / V)	SEE NOTE 5	
311	FRAME SIZE		5008			*	
312	NAMEPLATE HP / S.F.		300	1		*	*
313	FULL LOAD MOTOR EFFICIENCY	(%)	95		(%)	*	
314	GUARANTEED POWER REQUIRED TOTAL TOWER AT MIT	(HP)	7800		(kW)	*	
315	**SPECIAL FEATURES**						
316	HEATER INCLUDED / VOLTAGE	(Volts)	YES	120	(Volts)	YES	*
317	AREA CLASSIFICATION / INSULATION	(yes / no)	Class 1 Group C, D, Div 2		(yes / no)	*	
318	**VIBRATION MONITORING**		SEE NOTE 5			SEE NOTE 5	
319	DESCRIPTION		BN 190501 Velometers			*	
320	LOCATION		Gearbox			*	
321	NUMBER		2 per gearbox - 52 total			*	

322 **NOTES:**

323 1. Replace all * (asterisks) and incomplete check boxes with appropriate information. Does not relieve the Subcontractor from performance responsibilities.

324 2. Refer to Attachment 1 of the SR, Project Franklin Basic Engineering Design Data, for requirements.

325 3. The Process and Cogen towers shall essentially be installed as one continuous tower, as indicated in the Plot Plan. Both towers will sit on one single foundation but will have separate basins and pump forebays. The total number of cooling tower cells (both Process + Cogen) shall be limited to 32 (Process 26, Cogen 6). The Process and Cogen cell dimensions can be different but all of the mechanical equipment shall be identical - refer to Section 1.1 of the main body of Exhibit D for details.

326 4. All materials shall be suitable for service in indicated circulating water quality.

327 5. Motors 250 hp and larger shall be medium voltage, 4000V. Refer to Appendix D-5 for vibration monitoring requirements.

	MECHANICAL DRAFT COOLING TOWER DATA SHEET	**SHELL DOCUMENT NUMBER**	**REV.**
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		BECHTEL DOCUMENT NUMBER	**REV.**
	PROCESS COOLING WATER TOWER	**25873-001-MED-592-E59201**	**002**
		BECHTEL PROJECT NO.: 25873-001	**PAGE 8 OF 8**

Attachment D

Threatened and Endangered Species

Information

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Pennsylvania Ecological Services Field Office
110 Radnor Road Suite 101
State College, PA 16801-7987
Phone: (814) 234-4090 Fax: (814) 234-0748

In Reply Refer To: 05/08/2025 19:28:31 UTC
Project Code: 2025-0093931
Project Name: Shell Monaca 316b

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological

evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

https://www.fws.gov/sites/default/files/documents/endangered-species-consultation-handbook.pdf

Migratory Birds: In addition to responsibilities to protect threatened and endangered species under the Endangered Species Act (ESA), there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity, intentional or unintentional, resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts see https://www.fws.gov/program/migratory-bird-permit/what-we-do.

The MBTA has no provision for allowing take of migratory birds that may be unintentionally killed or injured by otherwise lawful activities. It is the responsibility of the project proponent to comply with these Acts by identifying potential impacts to migratory birds and eagles within applicable NEPA documents (when there is a federal nexus) or a Bird/Eagle Conservation Plan (when there is no federal nexus). Proponents should implement conservation measures to avoid or minimize the production of project-related stressors or minimize the exposure of birds and their resources to the project-related stressors. For more information on avian stressors and recommended conservation measures see https://www.fws.gov/library/collections/threats-birds.

In addition to MBTA and BGEPA, Executive Order 13186: *Responsibilities of Federal Agencies to Protect Migratory Birds*, obligates all Federal agencies that engage in or authorize activities that might affect migratory birds, to minimize those effects and encourage conservation measures that will improve bird populations. Executive Order 13186 provides for the protection of both migratory birds and migratory bird habitat. For information regarding the implementation of Executive Order 13186, please visit https://www.fws.gov/partner/council-conservation-migratory-birds.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Code in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List
- USFWS National Wildlife Refuges and Fish Hatcheries
- Bald & Golden Eagles
- Migratory Birds
- Wetlands

OFFICIAL SPECIES LIST

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

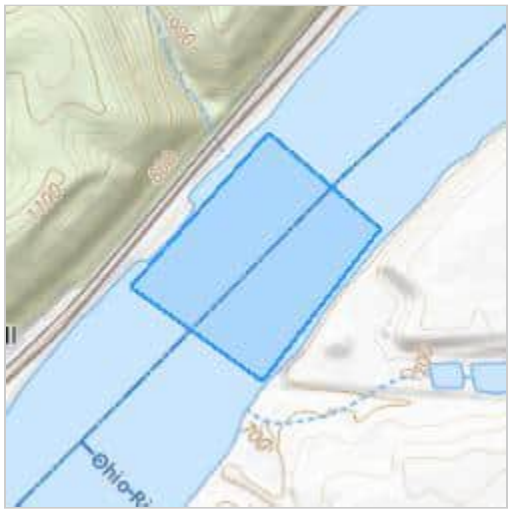
This species list is provided by:

Pennsylvania Ecological Services Field Office
110 Radnor Road Suite 101
State College, PA 16801-7987
(814) 234-4090

PROJECT SUMMARY

Project Code: 2025-0093931
Project Name: Shell Monaca 316b
Project Type: Water Withdrawal / Depletion
Project Description: 316b documentation to support NPDES renewal application
Project Location:

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@40.668188349999994,-80.34907393069032,14z



Counties: Beaver County, Pennsylvania

ENDANGERED SPECIES ACT SPECIES

There is a total of 7 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

MAMMALS

NAME	STATUS
Indiana Bat *Myotis sodalis* There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/5949	Endangered
Northern Long-eared Bat *Myotis septentrionalis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Endangered
Tricolored Bat *Perimyotis subflavus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/10515	Proposed Endangered

CLAMS

NAME	STATUS
Clubshell *Pleurobema clava* Population: Wherever found; Except where listed as Experimental Populations No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/3789	Endangered
Northern Riffleshell *Epioblasma rangiana* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/527	Endangered
Rayed Bean *Villosa fabalis* There is **proposed** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/5862	Endangered

INSECTS

NAME	STATUS
Monarch Butterfly *Danaus plexippus* There is **proposed** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/9743	Proposed Threatened

CRITICAL HABITATS

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

YOU ARE STILL REQUIRED TO DETERMINE IF YOUR PROJECT(S) MAY HAVE EFFECTS ON ALL ABOVE LISTED SPECIES.

USFWS NATIONAL WILDLIFE REFUGE LANDS AND FISH HATCHERIES

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS OR FISH HATCHERIES WITHIN YOUR PROJECT AREA.

BALD & GOLDEN EAGLES

Bald and Golden Eagles are protected under the Bald and Golden Eagle Protection Act [2] and the Migratory Bird Treaty Act (MBTA) [1]. Any person or organization who plans or conducts activities that may result in impacts to Bald or Golden Eagles, or their habitats, should follow appropriate regulations and consider implementing appropriate avoidance and minimization measures, as described in the various links on this page.

---

1. The Bald and Golden Eagle Protection Act of 1940.
2. The Migratory Birds Treaty Act of 1918.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

BALD & GOLDEN EAGLES INFORMATION WAS NOT AVAILABLE WHEN THIS SPECIES LIST WAS GENERATED. PLEASE CONTACT THE FIELD OFFICE FOR FURTHER INFORMATION.

MIGRATORY BIRDS

The Migratory Bird Treaty Act (MBTA) [1] prohibits the take (including killing, capturing, selling, trading, and transport) of protected migratory bird species without prior authorization by the Department of Interior U.S. Fish and Wildlife Service (Service). The incidental take of migratory birds is the injury or death of birds that results from, but is not the purpose, of an activity. The Service interprets the MBTA to prohibit incidental take.

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1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

MIGRATORY BIRD INFORMATION WAS NOT AVAILABLE WHEN THIS SPECIES LIST WAS GENERATED. PLEASE CONTACT THE FIELD OFFICE FOR FURTHER INFORMATION.

WETLANDS

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

RIVERINE

- R2UBH

IPAC USER CONTACT INFORMATION

Agency: Private Entity
Name: Jonathan Rickwood
Address: 250 Apollo Drive
City: Chelmsford
State: MA
Zip: 01824
Email jonny.rickwood@aecom.com
Phone: 5702903595

LEAD AGENCY CONTACT INFORMATION

Lead Agency: Environmental Protection Agency

1. PROJECT INFORMATION

Project Name: **Shell Monaca 316b**
Date of Review: **5/8/2025 02:18:23 PM**
Project Category: **Water extraction/transfer, Extraction of surface water (e.g., from stream, river, creek, lake, or pond)**
Project Area: **20.52 acres**
County(s): **Beaver**
Township/Municipality(s): **Industry Borough; Potter Township**
ZIP Code:
Quadrangle Name(s): **BEAVER**
Watersheds HUC 8: **Upper Ohio**
Watersheds HUC 12: **Sixmile Run-Ohio River**
Decimal Degrees: **40.668516, -80.348815**
Degrees Minutes Seconds: **40° 40' 6.6565" N, 80° 20' 55.7346" W**

This is a draft receipt for information only. It has not been submitted to jurisdictional agencies for review.

2. SEARCH RESULTS

Agency	Results	Response
PA Game Commission	No Known Impact	No Further Review Required
PA Department of Conservation and Natural Resources	No Known Impact	No Further Review Required
PA Fish and Boat Commission	**Potential Impact**	**FURTHER REVIEW IS REQUIRED, See Agency Response**
U.S. Fish and Wildlife Service	No Known Impact	No Further Review Required

As summarized above, Pennsylvania Natural Diversity Inventory (PNDI) records indicate there may be potential impacts to threatened and endangered and/or special concern species and resources within the project area. If the response above indicates "No Further Review Required" no additional communication with the respective agency is required. If the response is "Further Review Required" or "See Agency Response," refer to the appropriate agency comments below. Please see the DEP Information Section of this receipt if a PA Department of Environmental Protection Permit is required.

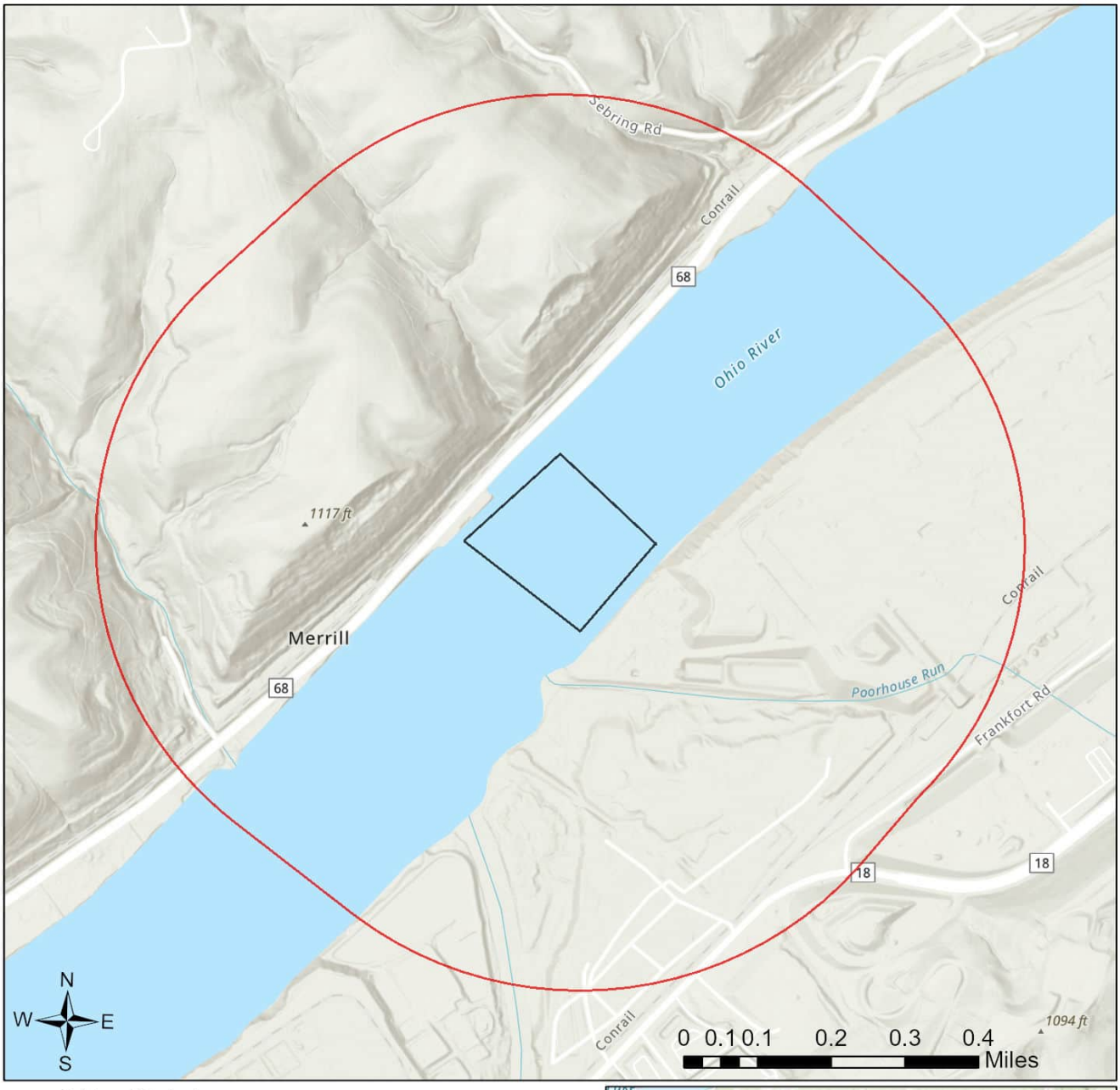
Shell Monaca 316b

Buffered Project Boundary

Project Boundary

Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community
Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community

Shell Monaca 316b



Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community
Sources: Esri, Maxar, Airbus DS, USGS, NGA, NASA, CGIAR, N Robinson, NCEAS, NLS, OS, NMA, Geodatastyrelsen, Rijkswaterstaat, GSA,

RESPONSE TO QUESTION(S) ASKED

Q1: Is tree removal, tree cutting or forest clearing necessary to implement all aspects of this project?
Your answer is: No

Q2: Will the action include disturbance to trees such as tree cutting (or other means of knocking down, or bringing down trees, tree topping. or tree trimming), pesticide/herbicide application or prescribed fire?
Your answer is: No

Q3: Does the action area contain any caves (or associated sinkholes, fissures, or other karst features), mines, rocky outcroppings, culverts, or tunnels that could provide habitat for hibernating bats?
Your answer is: No

Q4: Does the action area contain any caves (or associated sinkholes, fissures, or other karst features), mines, rocky outcroppings, culverts, or tunnels that could provide habitat for hibernating bats?
Your answer is: No

3. AGENCY COMMENTS

Regardless of whether a DEP permit is necessary for this proposed project, any potential impacts to threatened and endangered species and/or special concern species and resources must be resolved with the appropriate jurisdictional agency. In some cases, a permit or authorization from the jurisdictional agency may be needed if adverse impacts to these species and habitats cannot be avoided.

These agency determinations and responses are **valid for two years** (from the date of the review), and are based on the project information that was provided, including the exact project location; the project type, description, and features; and any responses to questions that were generated during this search. If any of the following change: 1) project location, 2) project size or configuration, 3) project type, or 4) responses to the questions that were asked during the online review, the results of this review are not valid, and the review must be searched again via the PNDI Environmental Review Tool and resubmitted to the jurisdictional agencies. The PNDI tool is a primary screening tool, and a desktop review may reveal more or fewer impacts than what is listed on this PNDI receipt. The jurisdictional agencies **strongly advise against** conducting surveys for the species listed on the receipt prior to consultation with the agencies.

PA Game Commission
RESPONSE:
No Impact is anticipated to threatened and endangered species and/or special concern species and resources.

PA Department of Conservation and Natural Resources
RESPONSE:
No Impact is anticipated to threatened and endangered species and/or special concern species and resources.

PA Fish and Boat Commission
RESPONSE:
Further review of this project is necessary to resolve the potential impact(s). Please send project information to this agency for review (see WHAT TO SEND).

PFBC Species: (Note: The Pennsylvania Conservation Explorer tool is a primary screening tool, and a desktop review may reveal more or fewer species than what is listed below.)

Scientific Name	Common Name	Current Status
Ictiobus cyprinellus	Bigmouth Buffalo	Endangered
Leptodea fragilis	Fragile Papershell	Special Concern Species*
Notropis buchanani	Ghost Shiner	Endangered

Scientific Name	Common Name	Current Status
Obliquaria reflexa	Threehorn Wartyback	Special Concern Species*
Quadrula quadrula	Mapleleaf	Special Concern Species*

U.S. Fish and Wildlife Service
RESPONSE:

No impacts to **federally** listed or proposed species are anticipated. Therefore, no further consultation/coordination under the Endangered Species Act (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq. is required. Because no take of federally listed species is anticipated, none is authorized. This response does not reflect potential Fish and Wildlife Service concerns under the Fish and Wildlife Coordination Act or other authorities.

* Special Concern Species or Resource - Plant or animal species classified as rare, tentatively undetermined or candidate as well as other taxa of conservation concern, significant natural communities, special concern populations (plants or animals) and unique geologic features.
** Sensitive Species - Species identified by the jurisdictional agency as collectible, having economic value, or being susceptible to decline as a result of visitation.

WHAT TO SEND TO JURISDICTIONAL AGENCIES

If project information was requested by one or more of the agencies above, upload* or email the following information to the agency(s) (see AGENCY CONTACT INFORMATION). Instructions for uploading project materials can be found here. This option provides the applicant with the convenience of sending project materials to a single location accessible to all three state agencies (but not USFWS).
*If information was requested by USFWS, applicants must email, or mail, project information to IR1_ESPenn@fws.gov to initiate a review. USFWS will not accept uploaded project materials.

Check-list of Minimum Materials to be submitted:
____Project narrative with a description of the overall project, the work to be performed, current physical characteristics of the site and acreage to be impacted.
____A map with the project boundary and/or a basic site plan(particularly showing the relationship of the project to the physical features such as wetlands, streams, ponds, rock outcrops, etc.)
In addition to the materials listed above, USFWS REQUIRES the following
____**SIGNED** copy of a Final Project Environmental Review Receipt

The inclusion of the following information may expedite the review process.
____Color photos keyed to the basic site plan (i.e. showing on the site plan where and in what direction each photo was taken and the date of the photos)
____Information about the presence and location of wetlands in the project area, and how this was determined (e.g., by a qualified wetlands biologist), if wetlands are present in the project area, provide project plans showing the location of all project features, as well as wetlands and streams.

4. DEP INFORMATION

The Pa Department of Environmental Protection (DEP) requires that a signed copy of this receipt, along with any required documentation from jurisdictional agencies concerning resolution of potential impacts, be submitted with applications for permits requiring PNDI review. Two review options are available to permit applicants for handling PNDI coordination in conjunction with DEP's permit review process involving either T&E Species or species of special concern. Under sequential review, the permit applicant performs a PNDI screening and completes all coordination with the appropriate jurisdictional agencies prior to submitting the permit application. The applicant will include with its application, both a PNDI receipt and/or a clearance letter from the jurisdictional agency if the PNDI Receipt shows a Potential Impact to a species or the applicant chooses to obtain letters directly from the jurisdictional agencies. Under concurrent review, DEP, where feasible, will allow technical review of the permit to occur concurrently with the T&E species consultation with the jurisdictional agency. The applicant must still supply a copy of the PNDI Receipt with its permit application. The PNDI Receipt should also be submitted to the appropriate agency according to directions on the PNDI Receipt. The applicant and the jurisdictional agency will work together to resolve the potential impact(s). See the DEP PNDI policy at https://conservationexplorer.dcnr.pa.gov/content/resources.

5. ADDITIONAL INFORMATION

The PNDI environmental review website is a preliminary screening tool. There are often delays in updating species status classifications. Because the proposed status represents the best available information regarding the conservation status of the species, state jurisdictional agency staff give the proposed statuses at least the same consideration as the current legal status. If surveys or further information reveal that a threatened and endangered and/or special concern species and resources exist in your project area, contact the appropriate jurisdictional agency/agencies immediately to identify and resolve any impacts.

For a list of species known to occur in the county where your project is located, please see the species lists by county found on the PA Natural Heritage Program (PNHP) home page (www.naturalheritage.state.pa.us). Also note that the PNDI Environmental Review Tool only contains information about species occurrences that have actually been reported to the PNHP.