



May 9, 2024

Ohio EPA permit No. 2IG00007*MD
Application No. OH0002461
Effective Date: August 1, 2024
Facility Name: Ohio Refining Company, LLC

Refining Ohio Company, LLC
Heidi Hurst
4001 Cedar Point Road
Oregon, OH 43616

Dear Ladies and Gentlemen:

In accordance with Rule 3745-33-04 (D) of the Ohio Administrative Code (formerly Ohio EPA Regulation EP-31-06), the above referenced NPDES Permit is hereby modified as follows:

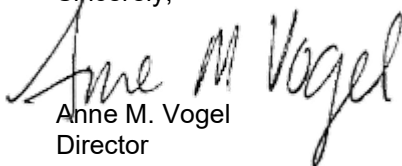
Revision

1. On page 2 of the permit, the Initial Outfall Table 001 will last until 12 months after the effective date of this permit modification.
2. On page 3 of the permit, the Final Outfall Table 001 will go into effect on the 12 month of the effective date of this permit modification.
3. On page 4 of the permit, the Initial Outfall Table 002 will the last until the 12 month of the permit life.
4. On page 5 of the permit, the Initial Outfall Table 002 will go into effect on the 12 month of the permit life.
5. On page 24, the Compliance Schedule Milestone for C.2.b will be due 12 months from the effective date of this permit modification, July 1, 2025.

All terms and conditions of the existing permit not recommended for modification by this document will remain in effect. Any modified term or condition contained in this modification shall supersede, on the date this modification is effective, the existing respective term or condition of the permit.

When the modification is effective, the Ohio EPA permit number will be changed to **2IG00007*ND**. The application number will remain OH0002461. Attached is a copy of the updated NPDES permit.

Sincerely,


Anne M. Vogel
Director

Ohio EPA Permit No.: 2IG00007*ND
Application No. OH0002461

Modification Issue Date: May 21, 2024
Modification Effective Date: August 1, 2024
Expiration Date: October 31, 2026

Ohio Environmental Protection Agency
Authorization to Discharge Under the
National Pollutant Discharge Elimination System

In compliance with the provisions of the Federal Water Pollution Control Act, as amended (33 U.S.C. 1251 et. seq., hereinafter referred to as the "Act"), and the Ohio Water Pollution Control Act (Ohio Revised Code Section 6111),

Ohio Refining Company LLC

is authorized by the Ohio Environmental Protection Agency, hereinafter referred to as "Ohio EPA," to discharge from the Ohio refining LLC - Toledo Refinery wastewater treatment works located at 4001 Cedar Point Road, Oregon, Ohio, Lucas County and discharging to Maumee Bay and Otter Creek in accordance with the conditions specified in Parts I, II, and III of this permit.

This permit is conditioned upon payment of applicable fees as required by Section 3745.11 of the Ohio Revised Code.

This permit and the authorization to discharge shall expire at midnight on the expiration date shown above. In order to receive authorization to discharge beyond the above date of expiration, the permittee shall submit such information and forms as are required by the Ohio EPA no later than 180 days prior to the above date of expiration.

Anne M. Vogel
Director

Total Pages: 43

Part I, A. - INTERIM EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

1. During the period beginning on the effective date and lasting until the 12 month, the permittee is authorized to discharge in accordance with the following limitations and monitoring requirements from outfall 2IG00007001. See Part II, OTHER REQUIREMENTS, for locations of effluent sampling.

Table - Final Outfall - 001 - Initial

Effluent Characteristic Parameter	Discharge Limitations							Monitoring Requirements		
	Concentration Specified Units				Loading* kg/day			Measuring Frequency	Sampling Type	Monitoring Months
	Maximum	Minimum	Weekly	Monthly	Daily	Weekly	Monthly			
00013 - High Water Temperature - F	-	-	-	-	-	-	-	1/Day	Maximum Indicating Thermometer	All
00015 - Thermal Discharge - Million BTU/Hr	1250	-	-	1250	-	-	-	1/Day	Calculated	All
00300 - Dissolved Oxygen - mg/l	-	4.0	-	-	-	-	-	2/Week	Grab	All
00400 - pH - S.U.	9.0	6.5	-	-	-	-	-	1/Day	Grab	All
00981 - Selenium, Total Recoverable - ug/l	-	-	-	-	-	-	-	1/Month	Grab	All
01220 - Chromium, Dissolved Hexavalent - ug/l	-	-	-	-	-	-	-	1/Month	Grab	All
31648 - E. coli - #/100 ml	-	-	284	126	-	-	-	1/Month	Grab	Summer
50050 - Flow Rate - MGD	-	-	-	-	-	-	-	1/Day	24hr Total	All
50060 - Chlorine, Total Residual - mg/l	0.038	-	-	-	-	-	-	1 / 2 Weeks	Grab	All
50092 - Mercury, Total (Low Level) - ng/l	1700	-	-	9.7	0.293	-	0.00167	1/Month	Grab	All
76025 - Toxicity Equivalent - pg/l	-	-	-	-	-	-	-	1/Quarter	Grab	Quarterly

Notes for Station Number 2IG00007001:

1. Effluent loadings based on average design flow of 45.4 MGD.

2. Sampling shall be performed when discharging. If NO DISCHARGE OCCURS DURING THE ENTIRE MONTH, select the "No Discharge" check box on data entry form and enter "No discharge during the month" in the Remarks Section. PIN the eDMR.
3. The monthly average concentration for dissolved oxygen shall be greater than or equal to 5.0 mg/L. The permittee shall report the monthly average concentration for dissolved oxygen each month in the eDMR in the Remarks Section.
4. The thermal discharge limits are net limits. See Part II, Item J, and Part III, Item 1, Definitions.
5. Mercury - See Part II, Item K.
6. Toxicity Equivalent - sample results reported under this reporting code shall be analyzed using EPA Method 1613. See Part II, Items S and T for additional information.

Part I, A. - FINAL EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

2. During the period beginning on the 12 month and lasting until the expiration date, the permittee is authorized to discharge in accordance with the following limitations and monitoring requirements from outfall 2IG00007001. See Part II, OTHER REQUIREMENTS, for locations of effluent sampling.

Table - Final Outfall - 001 - Final

Effluent Characteristic Parameter	Discharge Limitations							Monitoring Requirements		
	Concentration Specified Units				Loading* kg/day			Measuring Frequency	Sampling Type	Monitoring Months
	Maximum	Minimum	Weekly	Monthly	Daily	Weekly	Monthly			
00013 - High Water Temperature - F	-	-	-	-	-	-	-	1/Day	Maximum Indicating Thermometer	All
00015 - Thermal Discharge - Million BTU/Hr	500	-	-	-	-	-	-	1/Day	Calculated	June - Sep
00300 - Dissolved Oxygen - mg/l	-	4.0	-	-	-	-	-	2/Week	Grab	All
00400 - pH - S.U.	9.0	6.5	-	-	-	-	-	1/Day	Grab	All
00981 - Selenium, Total Recoverable - ug/l	-	-	-	-	-	-	-	1/Month	Grab	All
01220 - Chromium, Dissolved Hexavalent - ug/l	-	-	-	-	-	-	-	1/Month	Grab	All
31648 - E. coli - #/100 ml	-	-	284	126	-	-	-	1/Month	Grab	Summer
50050 - Flow Rate - MGD	-	-	-	-	-	-	-	1/Day	24hr Total	All
50060 - Chlorine, Total Residual - mg/l	0.038	-	-	-	-	-	-	1 / 2 Weeks	Grab	All
50092 - Mercury, Total (Low Level) - ng/l	1700	-	-	9.7	0.293	-	0.00167	1/Month	Grab	All
76025 - Toxicity Equivalent - pg/l	-	-	-	-	-	-	-	1/Quarter	Grab	Quarterly

Notes for Station Number 2IG00007001:

1. Effluent loadings based on average design flow of 45.4 MGD.

2. Sampling shall be performed when discharging. If NO DISCHARGE OCCURS DURING THE ENTIRE MONTH, select the "No Discharge" check box on data entry form and enter "No discharge during the month" in the Remarks Section. PIN the eDMR.
3. The monthly average concentration for dissolved oxygen shall be greater than or equal to 5.0 mg/L. The permittee shall report the monthly average concentration for dissolved oxygen each month in the eDMR in the Remarks Section.
4. The thermal discharge limits are net limits. See Part II, Item J, and Part III, Item 1, Definitions.
5. Mercury - See Part II, Item K.
6. Toxicity Equivalent - sample results reported under this reporting code shall be analyzed using EPA Method 1613. See Part II, Items S and T for additional information.

Part I, A. - INTERIM EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

3. During the period beginning on the effective date and lasting until the 12 month, the permittee is authorized to discharge in accordance with the following limitations and monitoring requirements from outfall 2IG00007002. See Part II, OTHER REQUIREMENTS, for locations of effluent sampling.

Table - Final Outfall - 002 - Initial

Effluent Characteristic Parameter	Discharge Limitations							Monitoring Requirements		
	Concentration Specified Units				Loading* kg/day			Measuring Frequency	Sampling Type	Monitoring Months
	Maximum	Minimum	Weekly	Monthly	Daily	Weekly	Monthly			
00013 - High Water Temperature - F	-	-	-	-	-	-	-	1/Day	Maximum Indicating Thermometer	All
00015 - Thermal Discharge - Million BTU/Hr	1250	-	-	1250	-	-	-	1/Day	Calculated	All
00300 - Dissolved Oxygen - mg/l	-	4.0	-	-	-	-	-	2/Week	Grab	All
00400 - pH - S.U.	9.0	6.5	-	-	-	-	-	1/Day	Grab	All
00981 - Selenium, Total Recoverable - ug/l	-	-	-	-	-	-	-	1/Month	Grab	All
01220 - Chromium, Dissolved Hexavalent - ug/l	-	-	-	-	-	-	-	1/Month	Grab	All
31648 - E. coli - #/100 ml	-	-	284	126	-	-	-	1/Month	Grab	Summer
50050 - Flow Rate - MGD	-	-	-	-	-	-	-	1/Day	24hr Total	All
50060 - Chlorine, Total Residual - mg/l	0.038	-	-	-	-	-	-	1 / 2 Weeks	Grab	All
50092 - Mercury, Total (Low Level) - ng/l	1700	-	-	9.7	0.293	-	0.00167	1/Month	Grab	All
76025 - Toxicity Equivalent - pg/l	-	-	-	-	-	-	-	1/Quarter	Grab	Quarterly

Notes for Station Number 2IG00007002:

1. Effluent loadings based on average design flow of 45.4 MGD.

2. The monthly average concentration for dissolved oxygen shall be greater than or equal to 5.0 mg/L. The permittee shall report the monthly average concentration for dissolved oxygen each month in the eDMR in the Remarks Section.
3. The thermal discharge limits are net limits. See Part II, Item J, and Part III, Item 1, Definitions.
4. Mercury - See Part II, Item K.
5. Toxicity Equivalent - sample results reported under this reporting code shall be analyzed using EPA Method 1613. See Part II, Item S and T for additional information.

Part I, A. - FINAL EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

4. During the period beginning on the 12 month and lasting until the expiration date, the permittee is authorized to discharge in accordance with the following limitations and monitoring requirements from outfall 2IG00007002. See Part II, OTHER REQUIREMENTS, for locations of effluent sampling.

Table - Final Outfall - 002 - Final

Effluent Characteristic Parameter	Discharge Limitations							Monitoring Requirements		
	Concentration Specified Units				Loading* kg/day			Measuring Frequency	Sampling Type	Monitoring Months
	Maximum	Minimum	Weekly	Monthly	Daily	Weekly	Monthly			
00013 - High Water Temperature - F	-	-	-	-	-	-	-	1/Day	Maximum Indicating Thermometer	All
00015 - Thermal Discharge - Million BTU/Hr	500	-	-	-	-	-	-	1/Day	Calculated	June - Sep
00300 - Dissolved Oxygen - mg/l	-	4.0	-	-	-	-	-	2/Week	Grab	All
00400 - pH - S.U.	9.0	6.5	-	-	-	-	-	1/Day	Grab	All
00981 - Selenium, Total Recoverable - ug/l	-	-	-	-	-	-	-	1/Month	Grab	All
01220 - Chromium, Dissolved Hexavalent - ug/l	-	-	-	-	-	-	-	1/Month	Grab	All
31648 - E. coli - #/100 ml	-	-	284	126	-	-	-	1/Month	Grab	Summer
50050 - Flow Rate - MGD	-	-	-	-	-	-	-	1/Day	24hr Total	All
50060 - Chlorine, Total Residual - mg/l	0.038	-	-	-	-	-	-	1 / 2 Weeks	Grab	All
50092 - Mercury, Total (Low Level) - ng/l	1700	-	-	9.7	0.293	-	0.00167	1/Month	Grab	All
76025 - Toxicity Equivalent - pg/l	-	-	-	-	-	-	-	1/Quarter	Grab	Quarterly

Notes for Station Number 2IG00007002:

1. Effluent loadings based on average design flow of 45.4 MGD.

2. The monthly average concentration for dissolved oxygen shall be greater than or equal to 5.0 mg/L. The permittee shall report the monthly average concentration for dissolved oxygen each month in the eDMR in the Remarks Section.
3. The thermal discharge limits are net limits. See Part II, Item J, and Part III, Item 1, Definitions.
4. Mercury - See Part II, Item K.
5. Toxicity Equivalent - sample results reported under this reporting code shall be analyzed using EPA Method 1613. See Part II, Item S and T for additional information.

PART I, A. INTERNAL MONITORING REQUIREMENTS

5. During the period beginning on the effective date of this permit and lasting until the expiration date of this permit, the permittee is authorized to discharge in accordance with the following limitations and monitoring requirements from outfall 2IG00007600. See Part II, OTHER REQUIREMENTS, for locations of effluent sampling.

Table - Internal Monitoring Station - 600 - Final

Effluent Characteristic Parameter	Discharge Limitations							Monitoring Requirements		
	Concentration Specified Units				Loading* kg/day			Measuring Frequency	Sampling Type	Monitoring Months
	Maximum	Minimum	Weekly	Monthly	Daily	Weekly	Monthly			
50092 - Mercury, Total (Low Level) - ng/l	-	-	-	-	-	-	-	1/Month	Grab	All

Notes for Station Number 2IG00007600:

1. Mercury - See Part II, Item K.
2. Toxicity Equivalent - sample results reported under this reporting code shall be analyzed using EPA Method 1613. See Part II, Item S and T for additional information.

PART I, A. INTERNAL MONITORING REQUIREMENTS

6. During the period beginning on the effective date of this permit and lasting until the expiration date of this permit, the permittee is authorized to discharge in accordance with the following limitations and monitoring requirements from outfall 2IG00007601. See Part II, OTHER REQUIREMENTS, for locations of effluent sampling.

Table - Internal Monitoring Station - 601 - Final

Effluent Characteristic Parameter	Discharge Limitations							Monitoring Requirements		
	Concentration Specified Units				Loading* kg/day			Measuring Frequency	Sampling Type	Monitoring Months
	Maximum	Minimum	Weekly	Monthly	Daily	Weekly	Monthly			
00045 - Total Precipitation - Inches	-	-	-	-	-	-	-	1/Day	Estimate	All
00310 - Biochemical Oxygen Demand, 5 Day - mg/l	-	-	-	-	1430	-	794	2/Week	24hr Composite	All
00335 - Chemical Oxygen Demand (Low Level) - mg/l	-	-	-	-	10687	-	5546	2/Week	24hr Composite	All
00400 - pH - S.U.	9.0	6.0	-	-	-	-	-	2/Week	Grab	All
00530 - Total Suspended Solids - mg/l	-	-	-	-	1336	-	852	2/Week	24hr Composite	All
00550 - Oil and Grease, Total - mg/l	-	-	-	-	580	-	310	2/Week	Grab	All
00610 - Nitrogen, Ammonia (NH3) - mg/l	-	-	-	-	1278	-	568	2/Week	24hr Composite	Summer
00610 - Nitrogen, Ammonia (NH3) - mg/l	-	-	-	-	1278	-	580	2/Week	24hr Composite	Winter
00745 - Sulfide, Total - mg/l	-	-	-	-	9.39	-	4.19	2/Week	24hr Composite	All
01034 - Chromium, Total (Cr) - ug/l	-	-	-	-	16.72	-	5.8	1/Month	24hr Composite	All
01220 - Chromium, Dissolved Hexavalent - ug/l	-	-	-	-	1.07	-	0.48	1/Month	Grab	All

Effluent Characteristic Parameter	Discharge Limitations							Monitoring Requirements		
	Concentration Specified Units				Loading* kg/day			Measuring Frequency	Sampling Type	Monitoring Months
	Maximum	Minimum	Weekly	Monthly	Daily	Weekly	Monthly			
31648 - E. coli - #/100 ml	-	-	-	-	-	-	-	1/Month	Grab	All
32730 - Phenolic 4AAP, Total - ug/l	-	-	-	-	10.69	-	4.99	2/Week	24hr Composite	All
50050 - Flow Rate - MGD	-	-	-	-	-	-	-	1/Day	24hr Total	All
50092 - Mercury, Total (Low Level) - ng/l	-	-	-	-	-	-	-	1/Month	Grab	All
76025 - Toxicity Equivalent - pg/l	-	-	-	-	-	-	-	1/Quarter	Grab	Quarterly

Notes for Station Number 2IG00007601:

1. The effluent limits and monitoring on this table apply to the discharge when the flow is less than 8.0 MGD
2. When the flow is greater than or equal to 8.0 MGD:
 - a. Limits and monitoring requirements under fictitious outfall 691 are applicable to the discharge; and
 - b. Report "AH" for parameters in this effluent table.
3. Mercury - See Part II, Item K.

PART I, A. INTERNAL MONITORING REQUIREMENTS

7. During the period beginning on the effective date of this permit and lasting until the expiration date of this permit, the permittee is authorized to discharge in accordance with the following limitations and monitoring requirements from outfall 2IG00007602. See Part II, OTHER REQUIREMENTS, for locations of effluent sampling.

Table - Internal Monitoring Station - 602 - Final

Effluent Characteristic Parameter	Discharge Limitations							Monitoring Requirements		
	Concentration Specified Units				Loading* kg/day			Measuring Frequency	Sampling Type	Monitoring Months
	Maximum	Minimum	Weekly	Monthly	Daily	Weekly	Monthly			
00013 - High Water Temperature - F	-	-	-	-	-	-	-	1/Day	Maximum Indicating Thermometer	All
00400 - pH - S.U.	-	-	-	-	-	-	-	2/Week	Grab	All
00680 - Carbon, Total Organic (TOC) - mg/l	5	-	-	5	-	-	-	2/Week	24hr Composite	All
50050 - Flow Rate - MGD	-	-	-	-	-	-	-	1/Day	24hr Total	All
76025 - Toxicity Equivalent - pg/l	-	-	-	-	-	-	-	1/Quarter	24hr Composite	Quarterly

Notes for Station Number 2IG00007602:

1. The total organic carbon net discharge shall be reported under fictitious outfall 2IG00007692. See Part III, Item, 1, Definitions.

PART I, A. INTERNAL MONITORING REQUIREMENTS

8. During the period beginning on the effective date of this permit and lasting until the expiration date of this permit, the permittee is authorized to discharge in accordance with the following limitations and monitoring requirements from outfall 2IG00007604. See Part II, OTHER REQUIREMENTS, for locations of effluent sampling.

Table - Internal Monitoring Station - 604 - Final

Effluent Characteristic Parameter	Discharge Limitations							Monitoring Requirements		
	Concentration Specified Units				Loading* kg/day			Measuring Frequency	Sampling Type	Monitoring Months
	Maximum	Minimum	Weekly	Monthly	Daily	Weekly	Monthly			
00550 - Oil and Grease, Total - mg/l	-	-	-	-	-	-	-	When Disch.	Grab	All
00680 - Carbon, Total Organic (TOC) - mg/l	-	-	-	-	-	-	-	When Disch.	Grab	All
50050 - Flow Rate - MGD	-	-	-	-	-	-	-	When Disch.	24hr Total Estimate	All

Notes for Station Number 2IG00007604:

1. Sampling shall be performed when discharging.
2. This effluent table shall be effective when the concentrations of oil and grease and total organic carbon are less than 15 mg/L and 110 mg/L, respectively. If a sample results in concentrations of oil and grease or total organic carbon equaling or exceeding 15 mg/L and 110 mg/L, respectively, the permittee shall monitor the parameters and comply with the limits in fictitious outfall 694 for the remainder of this permit.

PART I, A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

9. During the period beginning on the effective date of this permit and lasting until the expiration date of this permit, the permittee is authorized to discharge in accordance with the following limitations and monitoring requirements from outfall 2IG00007691. See Part II, OTHER REQUIREMENTS, for locations of effluent sampling.

Table - Fictitious Outfall/Station - 691 - Final

Effluent Characteristic Parameter	Discharge Limitations							Monitoring Requirements		
	Concentration Specified Units				Loading* kg/day			Measuring Frequency	Sampling Type	Monitoring Months
	Maximum	Minimum	Weekly	Monthly	Daily	Weekly	Monthly			
00045 - Total Precipitation - Inches	-	-	-	-	-	-	-	1/Day	Estimate	All
00310 - Biochemical Oxygen Demand, 5 Day - mg/l	-	-	-	-	1749	-	970	2/Week	24hr Composite	All
00335 - Chemical Oxygen Demand (Low Level) - mg/l	-	-	-	-	13085	-	6744	2/Week	24hr Composite	All
00400 - pH - S.U.	9.0	6.0	-	-	-	-	-	2/Week	Grab	All
00530 - Total Suspended Solids - mg/l	-	-	-	-	1448	-	924	2/Week	24hr Composite	All
00550 - Oil and Grease, Total - mg/l	-	-	-	-	632	-	337	2/Week	24hr Composite	All
00610 - Nitrogen, Ammonia (NH3) - mg/l	-	-	-	-	1278	-	568	2/Week	24hr Composite	Summer
00610 - Nitrogen, Ammonia (NH3) - mg/l	-	-	-	-	1278	-	580	2/Week	24hr Composite	Winter
00745 - Sulfide, Total - mg/l	-	-	-	-	9.39	-	4.19	2/Week	24hr Composite	All
01032 - Chromium, Hexavalent (Cr +6) - ug/l	-	-	-	-	1.3	-	0.58	1/Month	Grab	All
01034 - Chromium, Total (Cr) - ug/l	-	-	-	-	18.9	-	6.58	1/Month	24hr Composite	All

Effluent Characteristic Parameter	Discharge Limitations							Monitoring Requirements		
	Concentration Specified Units				Loading* kg/day			Measuring Frequency	Sampling Type	Monitoring Months
	Maximum	Minimum	Weekly	Monthly	Daily	Weekly	Monthly			
31648 - E. coli - #/100 ml	-	-	-	-	-	-	-	1/Month	Grab	Summer
32730 - Phenolic 4AAP, Total - ug/l	-	-	-	-	13	-	5.61	2/Week	24hr Composite	All
50050 - Flow Rate - MGD	-	-	-	-	-	-	-	1/Day	Grab	All
50092 - Mercury, Total (Low Level) - ng/l	-	-	-	-	-	-	-	1/Month	Grab	All

Notes for Station Number 2IG00007691:

1. Station 691 is a fictitious outfall and the effluent limits and monitoring on this table apply to outfall 601 when the discharge from that outfall is greater than or equal to 8.0 MGD.
2. When the flow rate is less than 8.0 MGD:
 - a. Limits and monitoring requirements under the effluent table for outfall 601 are applicable; and
 - b. Report "AH" for parameters in this effluent table.
3. Mercury - See Part II, Items K.

PART I, A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

10. During the period beginning on the effective date of this permit and lasting until the expiration date of this permit, the permittee is authorized to discharge in accordance with the following limitations and monitoring requirements from outfall 2IG00007692. See Part II, OTHER REQUIREMENTS, for locations of effluent sampling.

Table - Fictitious Outfall/Station - 692 - Final

Effluent Characteristic Parameter	Discharge Limitations							Monitoring Requirements		
	Concentration Specified Units				Loading* kg/day			Measuring Frequency	Sampling Type	Monitoring Months
	Maximum	Minimum	Weekly	Monthly	Daily	Weekly	Monthly			
00680 - Carbon, Total Organic (TOC) - mg/l	5.0	-	-	5.0	-	-	-	2/Week	24hr Composite	All

Notes for Station Number 2IG00007692:

1. This is a fictitious outfall to report the net total organic carbon discharged at outfall 2IG00007602.
2. The total organic carbon discharge limitations are net limitations. See Part III, Item 1, Definitions.

PART I, A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

11. During the period beginning on the effective date of this permit and lasting until the expiration date of this permit, the permittee is authorized to discharge in accordance with the following limitations and monitoring requirements from outfall 2IG00007694. See Part II, OTHER REQUIREMENTS, for locations of effluent sampling.

Table - Fictitious Outfall/Station - 694 - Final

Effluent Characteristic Parameter	Discharge Limitations							Monitoring Requirements		
	Concentration Specified Units				Loading* kg/day			Measuring Frequency	Sampling Type	Monitoring Months
	Maximum	Minimum	Weekly	Monthly	Daily	Weekly	Monthly			
00310 - Biochemical Oxygen Demand, 5 Day - mg/l	-	-	-	-	75.8	-	41.7	When Disch.	Grab	All
00335 - Chemical Oxygen Demand (Low Level) - mg/l	-	-	-	-	568	-	284	When Disch.	Grab	All
00400 - pH - S.U.	9.0	6.0	-	-	-	-	-	When Disch.	Grab	All
00530 - Total Suspended Solids - mg/l	-	-	-	-	53.0	-	34.1	When Disch.	Grab	All
00550 - Oil and Grease, Total - mg/l	-	-	-	-	24.6	-	12.7	When Disch.	Grab	All
01034 - Chromium, Total (Cr) - ug/l	-	-	-	-	1.14	-	0.66	When Disch.	Grab	All
01220 - Chromium, Dissolved Hexavalent - ug/l	-	-	-	-	0.10	-	0.04	When Disch.	Grab	All
32730 - Phenolic 4AAP, Total - ug/l	-	-	-	-	0.55	-	0.27	When Disch.	Grab	All
50050 - Flow Rate - MGD	-	-	-	-	-	-	-	When Disch.	Total Estimate	All

Notes for Station Number 2IG00007694:

1. Station 694 is a fictitious outfall which applies to discharges from outfall 604 after a sampling event at outfall 604 shows sample results greater than or equal to:
 - a. 15 mg/L for oil and grease; or
 - b. 110 mg/L for total organic carbon.

PART I, A. BYPASS LIMITATIONS AND MONITORING REQUIREMENTS

13. Bypass Monitoring. During the period beginning on the effective date of this permit and lasting until the expiration date of this permit, the permittee shall monitor the Bypass at Station Number Notes for Station Number 2IG00007603:

Table - Bypass Monitoring - 603 - Final

Effluent Characteristic Parameter	Discharge Limitations							Monitoring Requirements		
	Concentration Specified Units				Loading* kg/day			Measuring Frequency	Sampling Type	Monitoring Months
	Maximum	Minimum	Weekly	Monthly	Daily	Weekly	Monthly			
00052 - Bypass Total Hours Per Day - Hrs/Day	-	-	-	-	-	-	-	1/Month	24hr Total	All
00300 - Dissolved Oxygen - mg/l	-	-	-	-	-	-	-	1/Month	Grab	All
00310 - Biochemical Oxygen Demand, 5 Day - mg/l	-	-	-	-	-	-	-	1/Month	Grab	All
00335 - Chemical Oxygen Demand (Low Level) - mg/l	-	-	-	-	-	-	-	1/Month	Grab	All
00400 - pH - S.U.	-	-	-	-	-	-	-	1/Month	Grab	All
00530 - Total Suspended Solids - mg/l	-	-	-	-	-	-	-	1/Month	Grab	All
00550 - Oil and Grease, Total - mg/l	-	-	-	-	-	-	-	1/Month	Grab	All
00610 - Nitrogen, Ammonia (NH3) - mg/l	-	-	-	-	-	-	-	1/Month	Grab	All
00745 - Sulfide, Total - mg/l	-	-	-	-	-	-	-	1/Month	Grab	All
01034 - Chromium, Total (Cr) - ug/l	-	-	-	-	-	-	-	1/Month	Grab	All
01220 - Chromium, Dissolved Hexavalent - ug/l	-	-	-	-	-	-	-	1/Month	Grab	All
32730 - Phenolic 4AAP, Total - ug/l	-	-	-	-	-	-	-	1/Month	Grab	All
34030 - Benzene - ug/l	-	-	-	-	-	-	-	1/Month	Grab	All
50050 - Flow Rate - MGD	-	-	-	-	-	-	-	1/Month	Estimate	All

Notes for Station Number 2IG00007603:

1. A Discharge Monitoring Report (DMR) for this station must be submitted every month.
 - a. Monitoring and sampling shall be conducted and reported on each day that there is a discharge through this station.
 - b. If there are no discharges during the entire month, select the "No Discharge" check box on the data entry form and PIN the eDMR.
2. Bypass Occurrence: If a discharge from this station occurs intermittently during a day starting and stopping several times report "1" for that day. If a discharge from this station occurs on more than one day but is the result of a continuing precipitation event, it should be counted as one occurrence: Report "1" on the first day of the discharge.
3. Discharge through this station is prohibited. The Director may take enforcement action for violations of this prohibition unless the three conditions specified at 40 CFR 122.41(m) and in Part III, Item 11.C.1 of this permit are met.

PART I, B. INTAKE MONITORING STATION REQUIREMENTS

1. Intake Monitoring. During the period beginning on the effective date of this permit and lasting until the expiration date of this permit, the permittee shall monitor the Intake at Station Number 2IG00007801, and report to the Ohio EPA in accordance with the following table. See Part II, OTHER REQUIREMENTS, for location of sampling.

Table - Intake Monitoring - 801 - Final

Effluent Characteristic Parameter	Discharge Limitations							Monitoring Requirements		
	Concentration Specified Units				Loading* kg/day			Measuring Frequency	Sampling Type	Monitoring Months
	Maximum	Minimum	Weekly	Monthly	Daily	Weekly	Monthly			
00013 - High Water Temperature - F	-	-	-	-	-	-	-	1/Day	Maximum Indicating Thermometer	All
00680 - Carbon, Total Organic (TOC) - mg/l	-	-	-	-	-	-	-	2/Week	24hr Composite	All
76025 - Toxicity Equivalent - pg/l	-	-	-	-	-	-	-	1/Quarter	Grab	Quarterly

Notes for Station Number 2IG00007801:

1. Toxicity Equivalent - sample results reported under this reporting code shall be analyzed using EPA Method 1613. See Part II, Item S and T for additional information.

Part I, B. - INTAKE MONITORING REQUIREMENTS

2. Intake Monitoring. During the period beginning on the effective date of the permit and lasting until expiration date, the permittee shall monitor the Intake at Station Number 2IG00007802, and report to the Ohio EPA in accordance with the following table. See Part II, OTHER REQUIREMENTS, for location of sampling.

Table - Intake Monitoring - 802 - Final

Effluent Characteristic Parameter	Discharge Limitations							Monitoring Requirements		
	Concentration Specified Units				Loading* kg/day			Measuring Frequency	Sampling Type	Monitoring Months
	Maximum	Minimum	Weekly	Monthly	Daily	Weekly	Monthly			
76025 - Toxicity Equivalent - pg/l	-	-	-	-	-	-	-	1/Quarter	Grab	Quarterly

Notes for Station Number 2IG00007802:

1. Toxicity Equivalent - sample results reported under this reporting code shall be analyzed using EPA Method 1613. See Part II, Item S and T for additional information.

Part I, C - SCHEDULE OF COMPLIANCE

<u>Section</u>	<u>Milestone Summary Report</u>		
	<u>Report</u>	<u>Event Code</u>	<u>Due Date</u>
Impingement Technology Performance Optimization Study	Submit Study Plan	34099	May 1, 2022
Impingement Technology Performance Optimization Study	Initiate Facility Plans	999	November 1, 2022
Schedule for Thermal Discharge Limit	Status Report	95999	November 1, 2022
Impingement Technology Performance Optimization Study	First Monitoring Report	7099	November 1, 2023
Impingement Technology Performance Optimization Study	Special Study	21599	November 1, 2024
Impingement Technology Performance Optimization Study	Other	97899	May 1, 2025
Schedule for Thermal Discharge Limit	Final Compliance w/ Eff Limits	5699	July 1, 2025

1. Impingement Technology Performance Optimization Study

In accordance with 40 CFR 125.94(c)(5), facilities proposing modified traveling screens as their chosen method of compliance with the impingement mortality standard must complete a study demonstrating the reduction in impingement of non-fragile species achieved by the intake structure.

Subject to the flexibility for timing provided in 40 CFR 125.95(a)(2), the permittee shall perform an impingement technology performance optimization study that includes two years of biological data collection measuring the reduction in impingement mortality achieved by the modified traveling screens as defined at 40 CFR 125.92(s) and demonstrating that the operation has been optimized to minimize impingement mortality.

a. COMPLETED (Event Code 34099)

b. COMPLETED (Event Code 00999)

c. COMPLETED (Event Code 07099)

d. The permittee shall submit the final study to the Ohio EPA, Central Office no later than 4 months from the effective date of this permit. November 1, 2024 (Event Code 21599)

e. No later than 10 months from the effective date of this permit, the permittee shall submit to the Ohio EPA Northwest District Office, a permit modification application for the addition of conditions that will require the permittee to perform maintenance activities identified in the Impingement Technology Performance Optimization Study. This requirement is consistent with 40 CFR 125.94(c)(5), which requires the Director to include verifiable and enforceable permit conditions to ensure the technology will perform as demonstrated. May 1, 2025 (Event Code 97899)

2. Schedule for Thermal Discharge Limit

As soon as possible, but not later than the dates developed in accordance with the following schedule, the permittee shall achieve final thermal discharge effluent limit in Part 1, A. of this permit.

a. COMPLETED (Event Code 95999)

b. Within 12 Months of the re-issuance date of this permit, the permittee shall attain full compliance with the thermal discharge limit. July 1, 2025 (Event Code 5699)

Part II, OTHER REQUIREMENTS

A. Description of the location of the required sampling stations are as follows:

Sampling Station	Description of Location
2IG00007001	Final effluent overflow emergency outfall to Otter Creek. (Lat: 41N 41' 27"; Long: 83W 27' 17")
2IG00007002	Final effluent to Maumee Bay. (Lat: 41N 42' 03"; Long: 83W 27' 14")
2IG00007600	Influent monitoring prior to wastewater treatment unit.
2IG00007601	Internal monitoring of effluent channel prior to outfall 2IG00007602.
2IG00007602	Internal monitoring station for once-through cooling water discharge.
2IG00007603	Bypass monitoring of overflow from storm water impoundment.
2IG00007604	Storm water overflow from swale surrounding closed north pond.
2IG00007691	Fictitious station which applies to the discharge at outfall 2IG00007691 when the flow is greater than or equal to 8.0 MGD.
2IG00007692	Fictitious station which is used to report the net discharge of total organic carbon at outfall 2IG00007602.
2IG00007694	Fictitious station which applies to the discharge at outfall 2IG00007604.
2IG00007801	Intake at Maumee Bay.
2IG00007802	Ground Water Well Cooling Water Intake

B. This permit shall be modified, or alternatively, revoked and reissued, to comply with any applicable effluent standard or limitation issued or approved under Sections 301(b)(2)(C) and (D), 304(b)(2), and 307(a)(2) of the Clean Water Act, if the effluent standard or limitation so issued or approved.

1. Contains different conditions or is otherwise more stringent than any effluent limitation in the permit;
or
2. Controls any pollutant not limited in the permit.

The permit as modified or reissued under this paragraph shall also contain any other requirements of the Act then applicable.

C. Written permission must be obtained from the director of the Ohio EPA prior to the use of any treatment additives, except for those exempt in rule. If additives are being used that have not previously been approved, an approval must be obtained for continued use. Discharges of these additives must meet Ohio Water Quality Standards and shall not be harmful or inimical to aquatic life. Request for approvals shall be filed in accordance with OAC 3745-33-03(G) and should be filed at least forty-five days prior to use or immediately if the additive is currently being used. Application forms are available for download on the DSW website:

<http://www.epa.ohio.gov/Portals/35/permits/Additive-Form.docx>

D. Composite samples shall be comprised of a series of grab samples collected over a 24-hour period and proportionate in volume to the wastewater flow rate at the time of sampling. Such samples shall be collected at such times and locations, and in such a fashion, as to be representative of the facility's overall performance.

E. Grab samples shall be collected at such times and locations, and in such fashion, as to be representative of the facility's performance.

F. Tracking of Group 4 Parameters

A preliminary effluent limit (PEL) has been provided below for parameters with a projected effluent quality (PEQ) equivalent to or exceeding seventy-five percent of the PEL. In accordance with rule 3745-33-07(A)(2) of the Ohio Administrative Code, the permittee must report in writing, any effluent concentration sample result greater than the PEL values listed below to Ohio EPA, Northwest District Office. Written notification must be submitted within 30 days of an effluent concentration sample result that exceeds the PEL and must detail the reasons why the PEL has been exceeded and the expectation of continued levels above the PEL.

Parameter	PQL	ML
Hexavalent Chromium	121 µg/L	--

The permittee must reduce discharge levels to below the PEL if either of the following conditions are met:

1. The maximum detected concentration per month is greater than the maximum PEL for four or more months during any consecutive six month period; or
2. The thirty-day average for any pollutant is greater than the average PEL for two or more months during any consecutive six month period; and

If the permittee cannot reduce discharge levels below the PEL within six months after either of conditions 1 or 2 above are met, the permittee may request to modify the permit to contain a compliance schedule. This request shall contain justification for the additional time necessary to reduce discharge levels.

G. Water quality based permit limitations in this permit may be revised based on updated wasteload allocations or use designation rules. This permit may be modified, or revoked and reissued, to include new water quality based effluent limits or other conditions that are necessary to comply with a revised wasteload allocation, or an approved total maximum daily loads (TMDL) report as required under Section 303 (d) of the Clean Water Act.

H. The permittee shall maintain a permanent sign on the stream bank at each outfall that is regulated under this NPDES permit. This includes final outfalls, bypasses, and combined sewer overflows. The sign shall include, at a minimum, the name of the establishment to which the permit was issued, the Ohio EPA permit number, and the outfall number and a contact telephone number. The information shall be printed in letters not less than two inches in height. The sign shall be a minimum of 2 feet by 2 feet and shall be a minimum of 3 feet above ground level. The sign shall not be obstructed such that persons in boats or persons swimming on the river or someone fishing or walking along the shore cannot read the sign. Vegetation shall be periodically removed to keep the sign visible. If the outfall is normally submerged the sign shall indicate that. When an existing sign is replaced or reset, the new sign shall comply with the requirements of this section.

I. In the event of an oil spill and/or storm impoundment basin overflow which results a discharge to Otter Creek via outfall 2IG00007001 (emergency discharge to Otter Creek), the permittee shall conform with special conditions contained within Part III, 11 to facilitate containment and minimize pollution of Lake Erie and to prevent severe property damage.

J. Computation of Thermal Loading

The thermal loads shall be computed in conformance with the following formula:

Thermal loading = (Effluent Temp - Influent Temp.) x Effluent Flow x Conv. Factor

Where Thermal loading is expressed in million BTU/Hr

Effluent Temp. is the 24 hour average effluent temperature in degrees Fahrenheit

Influent Temp. is the 24 hour average intake temperature in degrees Fahrenheit

Effluent Flow is expressed in million gallons per day (MGD)

Conv. Factor is [(1.0 BTU/lb in degrees Fahrenheit) x (8.345 lbs/gal)] / (24 hours/day)

K. General Mercury Variance

The permittee is granted a renewal of the general mercury variance under the provisions of Rule 3745-01-38(J) of the Ohio Administrative Code. Cenovus has demonstrated that the facility is currently unable to comply with the monthly average water quality based effluent limit of 1.3 ng/l without construction of expensive end-of-pipe controls more stringent than those required by sections 301(b) and 306 of the Clean Water Act. Cenovus is currently able to achieve an annual average mercury concentration of 12 ng/l. For general mercury variance purposes, the annual average mercury effluent concentration is defined as the average of the most recent 12 months of effluent data.

One of the conditions of the general mercury variance is that the permittee make reasonable progress towards attaining the water quality based effluent limits for mercury (1.b, below). To accomplish this, the permittee is required to continue implementing a pollutant minimization program (PMP) for mercury. The elements of a PMP include: a control strategy to locate, identify and, where cost-effective, reduce levels of mercury that contribute to discharge levels; periodic monitoring of sources and the treatment system; and annual reporting of results.

The plan of study that was part of the permittee's July 31, 2008 and revised October 22, 2008 application for coverage under the general mercury variance included items associated with developing a control strategy and initial implementation of a PMP. By implementing the plan of study and meeting other conditions of its NPDES permit, the permittee has been taking actions consistent with a PMP for mercury. Condition 1.d below, requires the permittee to continue implementing a PMP for mercury.

1. As conditions of this variance, the permittee shall meet the following requirements:

a. The permittee shall comply with the effluent limitations for mercury at outfall 2IG00007002 given in Part I, A. of this permit.

b. The permittee shall make reasonable progress towards attaining the monthly average water quality-based effluent limit for mercury by complying with the general mercury variance conditions included in this NPDES permit.

c. The permittee shall use EPA Method 1631 to comply with the influent and effluent mercury monitoring requirements of this permit.

d. The permittee shall continue implementing a PMP for mercury consistent with the plan of study included in the permittee's mercury variance application submitted on October 22, 2008 and any other

relevant information submitted by the permittee, including the following activities:

- i. Analyze new bulk chemicals for suitable "low-mercury" or "mercury-free" substitutes.
 - ii. Continue to administer mercury awareness training to new employees and contractors.
 - iii. Continue the recycling and reclamation of mercury-containing equipment.
 - iv. Continue to replace old, mercury-containing equipment with new, mercury-free equipment.
 - v. Continue sewer sediment removal to remove mercury-containing solids.
- e. The permittee shall assess the impact of the mercury variance on public health, safety, and welfare by, as a minimum, monitoring for mercury in the facility's influent and effluent as required by this NPDES permit.
- f. The permittee shall maintain an annual average mercury effluent concentration equal to or less than 12 ng/l.
- g. On or prior to March 1 of each year, the permittee shall submit two copies of an annual PMP report to Ohio EPA, Division of Surface Water, NPDES Permit Unit, P.O. Box 1049, Columbus, OH, 43216-1049. The annual PMP report shall include:
- i. All minimization program monitoring results for the year
 - ii. A list of potential sources of mercury
 - iii. A summary of all actions taken to meet the effluent limits for mercury
 - iv. Any updates of the control strategy, including actions planned to reduce the levels of mercury in the treatment plant's final effluent

The Ohio EPA Annual Mercury PMP Report and Appendices are available on the Division of Surface Water Permits Program Technical Assistance web page at

http://www.epa.ohio.gov/dsw/permits/technical_assistance.aspx . Open the Mercury list.

h. Upon completion of the actions identified in the plan of study as required in Part II, Item K.1.d. of this permit or upon submittal of the permittee's NPDES permit renewal application, whichever comes first, the permittee shall submit to Ohio EPA's Northwest District Office a certification stating that all permit conditions imposed to implement the plan of study and the PMP have been satisfied and whether compliance with the monthly average water quality based effluent limit for mercury has been achieved and can be maintained. This certification shall be accompanied by the following:

- i. All available mercury influent and effluent data for the most recent 12 month period.
- ii. Data documenting all known significant sources of mercury and the steps that have been taken to reduce or eliminate those sources; and
- iii. A determination of the lowest mercury concentration that currently available data indicate can be reliably achieved through implementation of the PMP.

2. Exceedance of the annual average limit of 12 ng/l. a. If at any time after the effective date of this permit, the permittee's annual average mercury effluent concentration exceeds 12 ng/l, the permittee shall:

- i. Notify Ohio EPA's Northwest District Office not later than 30 days from the date of the exceedance.

- ii. Submit an individual variance application, if a variance is desired, not later than 6 months from the date of the exceedance; or
- iii. Request a permit modification not later than 6 months from the date of the exceedance for a compliance schedule to attain compliance with the water quality-based effluent limits for mercury.

b. If the permittee complies with either 2.a.ii or 2.a.iii, above, the general mercury variance conditions included in this NPDES permit will remain in effect until the date that the Director acts on the individual variance application or the date that the permit modification becomes effective.

c. If the permittee does not comply with either 2.a.ii or 2.a.iii, above, a monthly water-quality based effluent limit for mercury of 1.3 ng/l shall apply at outfall 21G00007002 beginning 6 months from the date of the exceedance.

3. The requirements of Part II, Item K.2 shall not apply if the permittee demonstrates to the satisfaction of the Director that the mercury concentration in the permittee's effluent exceeds 12 ng/l due primarily to the presence of mercury in the permittee's intake water.

L. Permit Reopener for Mercury Variance Revisions

Ohio EPA may reopen and modify this permit at any time based upon Ohio EPA water quality standard revisions to the mercury variance granted in Part II, Item K of this permit.

M. Renewal of Mercury Variance

For renewal of the mercury variance authorized in this permit, the permittee shall include the following information with the submittal of the subsequent NPDES permit renewal application:

1. the certification described under Part II, Item K.1.h., and all information required under Part II, Item K.1.h.i. through Part II, Item K.1.h.iii;
2. a status report on the progress being made implementing the pollutant minimization program (PMP). This information may be included in the annual PMP report required under Part II, Item K.1.g;
3. a listing of the strategies and/or programs in the PMP which will be continued under the next renewal of this permit; and
4. a statement requesting the renewal of the mercury variance.

N. Reserved

O. Endangered Species Act

1. Nothing in this permit authorizes the intake of threatened or endangered species of fish and wildlife.

P. Cooling Water Intake Structure Minimization of Entrainment and Impingement

The permittee operates a cooling water intake structure which is designed to withdraw 72 MGD. The permittee shall reduce impingement mortality and entrainment commensurate with the implementation of the technologies or operational measures selected. Based on the selected technologies and operational measures below Ohio EPA has determined that the cooling water intake structure represents the best technology available to minimize adverse environmental impact in accordance with Section 316(b) of the

federal Clean Water Act (33 U.S.C. section 1326).

Impingement mortality option - 40 CFR 125.94(c)(5): and
Site-specific standards for entrainment - 40 CFR 125.94(d):

The facility recirculates a portion of its cooling water, which reduces intake flow by approximately 68 percent.

Based on the selected technologies and operational measures above, Ohio EPA has made a final determination under CFR Part 125, Subpart J that the intake meets the best technology available.

Q. Cooling Water Intake Structure Monitoring Requirements

The permittee is required to perform the following monitoring to demonstrate compliance with the performance standards of Part II.O.

1. Visual or Remote Inspections

The permittee shall either conduct weekly visual inspections or employ remote monitoring devices during the period the cooling water intake structure is in operation.

2. Impingement Technology Performance Optimization Study

The permittee shall perform two years of biological sampling and conduct a study of the impingement mortality achieved by the modified traveling screens. Details are in Part I,C of this permit.

R. Cooling Water Intake Structure Record Keeping and Reporting Requirements

1. Record Keeping Requirements

The permittee shall keep records of all the data used to complete the permit application and show compliance with the requirements of the 316(b) regulations until the subsequent permit is re-issued.

2. Reporting Requirements

The permittee shall submit an annual certification statement signed by the responsible corporate officer indicating whether there have been any substantial modifications of any units that impact the cooling water withdrawals and a summary of those changes. In addition, revisions must be submitted to the information required at 40 CFR 122.21(r) during the next permit application when new information is available.

S. Analyses for Dioxin Toxicity Equivalents shall be done using EPA Method 1613.

Toxicity equivalents (TEQs) shall be calculated using Ohio Administrative Code 3745-2-07(C)(1-4). For purposes of eDMR reporting, only congener values greater than the quantification levels below need to be included in the TEQ calculation. Analytical results for all congeners shall be submitted separately to the Northwest District Office of Ohio EPA each month.

Parameter	PQL
2,3,7,8-TCDD	10 pg/l
2,3,7,8-TCDF	10 pg/l
1,2,3,7,8-PeCDF	50 pg/l
2,3,4,7,8-PeCDF	50 pg/l
1,2,3,7,8-PeCDD	50 pg/l
1,2,3,4,7,8-HxCDF	50 pg/l
1,2,3,6,7,8-HxCDF	50 pg/l
1,2,3,7,8,9-HxCDF	50 pg/l
2,3,4,6,7,8-HxCDF	50 pg/l
1,2,3,4,7,8-HxCDD	50 pg/l
1,2,3,6,7,8-HxCDD	50 pg/l
1,2,3,7,8,9-HxCDD	50 pg/l
1,2,3,4,6,7,8-HpCDF	50 pg/l
1,2,3,4,7,8,9-HpCDF	50 pg/l
1,2,3,4,6,7,8-HpCDD	50 pg/l
OCDF	100 pg/l
OCDD	100 pg/l

T. Permit Reopener TEQ Reasonable Potential

Ohio EPA may reopen and modify this permit at any time based upon reasonable potential for TEQ attributed to quantifiable detections in the 601 station wastewater.

PART III - GENERAL CONDITIONS

1. DEFINITIONS

"Daily discharge" means the discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. For pollutants with limitations expressed in units of mass, the "daily discharge" is calculated as the total mass of the pollutant discharged over the day. For pollutants with limitations expressed in other units of measurement, the "daily discharge" is calculated as the average measurement of the pollutant over the day.

"Average weekly" discharge limitation means the highest allowable average of "daily discharges" over a calendar week, calculated as the sum of all "daily discharges" measured during a calendar week divided by the number of "daily discharges" measured during that week. Each of the following 7-day periods is defined as a calendar week: Week 1 is Days 1 - 7 of the month; Week 2 is Days 8 - 14; Week 3 is Days 15 - 21; and Week 4 is Days 22 - 28. If the "daily discharge" on days 29, 30 or 31 exceeds the "average weekly" discharge limitation, Ohio EPA may elect to evaluate the last 7 days of the month as Week 4 instead of Days 22 - 28. Compliance with fecal coliform bacteria or E coli bacteria limitations shall be determined using the geometric mean.

"Average monthly" discharge limitation means the highest allowable average of "daily discharges" over a calendar month, calculated as the sum of all "daily discharges" measured during a calendar month divided by the number of "daily discharges" measured during that month. Compliance with fecal coliform bacteria or E coli bacteria limitations shall be determined using the geometric mean.

"85 percent removal" means the arithmetic mean of the values for effluent samples collected in a period of 30 consecutive days shall not exceed 15 percent of the arithmetic mean of the values for influent samples collected at approximately the same times during the same period.

"Absolute Limitations" Compliance with limitations having descriptions of "shall not be less than," "nor greater than," "shall not exceed," "minimum," or "maximum" shall be determined from any single value for effluent samples and/or measurements collected.

"Net concentration" shall mean the difference between the concentration of a given substance in a sample taken of the discharge and the concentration of the same substances in a sample taken at the intake which supplies water to the given process. For the purpose of this definition, samples that are taken to determine the net concentration shall always be 24-hour composite samples made up of at least six increments taken at regular intervals throughout the plant day.

"Net Load" shall mean the difference between the load of a given substance as calculated from a sample taken of the discharge and the load of the same substance in a sample taken at the intake which supplies water to given process. For purposes of this definition, samples that are taken to determine the net loading shall always be 24-hour composite samples made up of at least six increments taken at regular intervals throughout the plant day.

"MGD" means million gallons per day.

"mg/l" means milligrams per liter.

"ug/l" means micrograms per liter.

"ng/l" means nanograms per liter.

"S.U." means standard pH unit.

"kg/day" means kilograms per day.

"Reporting Code" is a five digit number used by the Ohio EPA in processing reported data. The reporting code does not imply the type of analysis used nor the sampling techniques employed.

"Quarterly (1/Quarter) sampling frequency" means the sampling shall be done in the months of March, June, August, and December, unless specifically identified otherwise in the Effluent Limitations and Monitoring Requirements table.

"Yearly (1/Year) sampling frequency" means the sampling shall be done in the month of September, unless specifically identified otherwise in the effluent limitations and monitoring requirements table.

"Semi-annual (2/Year) sampling frequency" means the sampling shall be done during the months of June and December, unless specifically identified otherwise.

"Winter" shall be considered to be the period from November 1 through April 30.

"Bypass" means the intentional diversion of waste streams from any portion of the treatment facility.

"Summer" shall be considered to be the period from May 1 through October 31.

"Severe property damage" means substantial physical damage to property, damage to the treatment facilities which would cause them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

"Upset" means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

"Sewage sludge" means a solid, semi-solid, or liquid residue generated during the treatment of domestic sewage in a treatment works as defined in section 6111.01 of the Revised Code. "Sewage sludge" includes, but is not limited to, scum or solids removed in primary, secondary, or advanced wastewater treatment processes. "Sewage sludge" does not include ash generated during the firing of sewage sludge in a sewage sludge incinerator, grit and screenings generated during preliminary treatment of domestic sewage in a treatment works, animal manure, residue generated during treatment of animal manure, or domestic septage.

"Sewage sludge weight" means the weight of sewage sludge, in dry U.S. tons, including admixtures such as liming materials or bulking agents. Monitoring frequencies for sewage sludge parameters are based on the reported sludge weight generated in a calendar year (use the most recent calendar year data when the NPDES permit is up for renewal).

"Sewage sludge fee weight" means the weight of sewage sludge, in dry U.S. tons, excluding admixtures such as liming materials or bulking agents. Annual sewage sludge fees, as per section 3745.11(Y) of the Ohio Revised Code, are based on the reported sludge fee weight for the most recent calendar year.

2. GENERAL EFFLUENT LIMITATION

The effluent shall, at all times, be free of substances:

- A. In amounts that will settle to form putrescent, or otherwise objectionable, sludge deposits; or that will adversely affect aquatic life or water fowl;
- B. Of an oily, greasy, or surface-active nature, and of other floating debris, in amounts that will form noticeable accumulations of scum, foam, or sheen;
- C. In amounts that will alter the natural color or odor of the receiving water to such degree as to create a nuisance;
- D. In amounts that either singly or in combination with other substances are toxic to human, animal, or aquatic life;
- E. In amounts that are conducive to the growth of aquatic weeds or algae to the extent that such growth become inimical to more desirable forms of aquatic life, or create conditions that are unsightly, or constitute a nuisance in any other fashion;
- F. In amounts that will impair designated instream or downstream water uses

3. FACILITY OPERATION AND QUALITY CONTROL

All wastewater treatment works shall be operated in a manner consistent with the following:

- A. At all times, the permittee shall maintain in good working order and operate as efficiently as possible all treatment or control facilities or systems installed or used by the permittee necessary to achieve compliance with the terms and conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems which are installed by a permittee only when the operation is necessary to achieve compliance with conditions of the permit.
- B. The permittee shall effectively monitor the operation and efficiency of treatment and control facilities and the quantity and quality of the treated discharge.
- C. Maintenance of wastewater treatment works that results in degradation of effluent quality shall be scheduled during non-critical water quality periods and shall be carried out in a manner approved by Ohio EPA as specified in the Paragraph in the PART III entitled, "UNAUTHORIZED DISCHARGES".

4. REPORTING

- A. Monitoring data required by this permit shall be submitted monthly on Ohio EPA 4500 Discharge Monitoring Report (DMR) forms using the electronic DMR (e-DMR) internet application. e-DMR allows permitted facilities to enter, sign, and submit DMRs on the internet. e-DMR information is found on the following web page:

<https://epa.ohio.gov/divisions-and-offices/surface-water/permitting/electronic-business-services>

- B. DMRs shall be signed by a facility's Responsible Official or a Delegated Responsible Official (i.e. a person delegated by the Responsible Official). The Responsible Official of a facility is defined as:

1. For a corporation: by a responsible corporate officer. For the purpose of this section, a responsible corporate officer means: (a) a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation; or (b) The manager of one or more manufacturing, production or operating facilities, provided the manager is authorized to make management decisions that govern the operation of the regulated facility including having explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long-term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.

2. For a partnership or sole proprietorship: by a general partner or the proprietor, respectively; or

3. In the case of a municipal, state or other public facility, by either the principal executive officer, the ranking elected official or other duly authorized employee.

For e-DMR, the person signing and submitting the DMR will need to obtain an eBusiness Center account and Personal Identification Number (PIN). Additionally, Delegated Responsible Officials must be delegated by the Responsible Official, either on-line using the eBusiness Center's delegation function, or on a paper delegation form provided by Ohio EPA. For more information on the PIN and delegation processes, please view the following web page:

<https://epa.ohio.gov/help-center/ebusiness-center>

C. DMRs submitted using e-DMR shall be submitted to Ohio EPA by the 20th day of the month following the month-of-interest.

D. If the permittee monitors any pollutant at the location(s) designated herein more frequently than required by this permit, using approved analytical methods as specified in Section 5. SAMPLING AND ANALYTICAL METHODS, the results of such monitoring shall be included in the calculation and reporting of the values required in the reports specified above.

E. Analyses of pollutants not required by this permit, except as noted in the preceding paragraph, shall not be reported to the Ohio EPA, but records shall be retained as specified in Section 7. RECORDS RETENTION.

5. SAMPLING AND ANALYTICAL METHOD

Samples and measurements taken as required herein shall be representative of the volume and nature of the monitored flow. Test procedures for the analysis of pollutants shall conform to regulation 40 CFR 136, "Test Procedures For The Analysis of Pollutants" unless other test procedures have been specified in this permit. The permittee shall periodically calibrate and perform maintenance procedures on all monitoring and analytical instrumentation at intervals to ensure accuracy of measurements.

6. RECORDING OF RESULTS

For each measurement or sample taken pursuant to the requirements of this permit, the permittee shall record the following information:

A. The exact place and date of sampling; (time of sampling not required on EPA 4500)

- B. The person(s) who performed the sampling or measurements;
- C. The date the analyses were performed on those samples;
- D. The person(s) who performed the analyses;
- E. The analytical techniques or methods used; and
- F. The results of all analyses and measurements.

7. RECORDS RETENTION

The permittee shall retain all of the following records for the wastewater treatment works for a minimum of three years except those records that pertain to sewage sludge disposal, use, storage, or treatment, which shall be kept for a minimum of five years, including:

- A. All sampling and analytical records (including internal sampling data not reported);
- B. All original recordings for any continuous monitoring instrumentation;
- C. All instrumentation, calibration and maintenance records;
- D. All plant operation and maintenance records;
- E. All reports required by this permit; and
- F. Records of all data used to complete the application for this permit for a period of at least three years, or five years for sewage sludge, from the date of the sample, measurement, report, or application.

These periods will be extended during the course of any unresolved litigation, or when requested by the Regional Administrator or the Ohio EPA. The three year period, or five year period for sewage sludge, for retention of records shall start from the date of sample, measurement, report, or application.

8. AVAILABILITY OF REPORTS

Except for data determined by the Ohio EPA to be entitled to confidential status, all reports prepared in accordance with the terms of this permit shall be available for public inspection at the appropriate district offices of the Ohio EPA. Both the Clean Water Act and Section 6111.05 Ohio Revised Code state that effluent data and receiving water quality data shall not be considered confidential.

9. DUTY TO PROVIDE INFORMATION

The permittee shall furnish to the Director, within a reasonable time, any information which the Director may request to determine whether cause exists for modifying, revoking, and reissuing, or terminating the permit, or to determine compliance with this permit. The permittee shall also furnish to the Director, upon request, copies of records required to be kept by this permit.

10. RIGHT OF ENTRY

The permittee shall allow the Director or an authorized representative upon presentation of credentials and other documents as may be required by law to:

- A. Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit.
- B. Have access to and copy, at reasonable times, any records that must be kept under the conditions of the permit.
- C. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit.
- D. Sample or monitor at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by the Clean Water Act, any substances or parameters at any location.

11. UNAUTHORIZED DISCHARGES

A. Bypass Not Exceeding Limitations - The permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions of paragraphs 11.B and 11.C.

B. Notice

- 1. Anticipated Bypass - If the permittee knows in advance of the need for a bypass, it shall submit prior notice, if possible at least ten days before the date of the bypass.
- 2. Unanticipated Bypass - The permittee shall submit notice of an unanticipated bypass as required in paragraph 12.B (24 hour notice).

C. Prohibition of Bypass

- 1. Bypass is prohibited, and the Director may take enforcement action against a permittee for bypass, unless:
 - a. Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;
 - b. There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance; and
 - c. The permittee submitted notices as required under paragraph 11.B.
- 2. The Director may approve an anticipated bypass, after considering its adverse effects, if the Director determines that it will meet the three conditions listed above in paragraph 11.C.1.

12. NONCOMPLIANCE NOTIFICATION

A. Exceedance of a Daily Maximum Discharge Limit

- 1. The permittee shall report noncompliance that is the result of any violation of a daily maximum discharge limit for any of the pollutants listed by the Director in the permit by e-mail or telephone within twenty-four (24) hours of discovery.

The permittee may report to the appropriate Ohio EPA district office e-mail account as follows (this method is preferred):

Southeast District Office: sedo24hournpdes@epa.ohio.gov
Southwest District Office: swdo24hournpdes@epa.ohio.gov
Northwest District Office: nwdo24hournpdes@epa.ohio.gov
Northeast District Office: nedo24hournpdes@epa.ohio.gov
Central District Office: cdo24hournpdes@epa.ohio.gov
Central Office: co24hournpdes@epa.ohio.gov

The permittee shall attach a noncompliance report to the e-mail. A noncompliance report form is available on the following web site under the Monitoring and Reporting - Non-Compliance Notification section:

<https://epa.ohio.gov/divisions-and-offices/surface-water/permitting/individual-wastewater-discharge-permits>

Or, the permittee may report to the appropriate Ohio EPA district office by telephone toll-free between 8:00 AM and 5:00 PM as follows:

Southeast District Office: (800) 686-7330
Southwest District Office: (800) 686-8930
Northwest District Office: (800) 686-6930
Northeast District Office: (800) 686-6330
Central District Office: (800) 686-2330
Central Office: (614) 644-2001

The permittee shall include the following information in the telephone noncompliance report:

- a. The name of the permittee, and a contact name and telephone number;
- b. The limit(s) that has been exceeded;
- c. The extent of the exceedance(s);
- d. The cause of the exceedance(s);
- e. The period of the exceedance(s) including exact dates and times;
- f. If uncorrected, the anticipated time the exceedance(s) is expected to continue; and,
- g. Steps taken to reduce, eliminate or prevent occurrence of the exceedance(s).

B. Other Permit Violations

1. The permittee shall report noncompliance that is the result of any unanticipated bypass resulting in an exceedance of any effluent limit in the permit or any upset resulting in an exceedance of any effluent limit in the permit by e-mail or telephone within twenty-four (24) hours of discovery.

The permittee may report to the appropriate Ohio EPA district office e-mail account as follows (this method is preferred):

Southeast District Office: sedo24hournpdes@epa.ohio.gov
Southwest District Office: swdo24hournpdes@epa.ohio.gov
Northwest District Office: nwdo24hournpdes@epa.ohio.gov
Northeast District Office: nedo24hournpdes@epa.ohio.gov
Central District Office: cdo24hournpdes@epa.ohio.gov
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Northeast District Office: (800) 686-6330
Central District Office: (800) 686-2330
Central Office: (614) 644-2001

The permittee shall include the following information in the telephone noncompliance report:

- a. The name of the permittee, and a contact name and telephone number;
 - b. The time(s) at which the discharge occurred, and was discovered;
 - c. The approximate amount and the characteristics of the discharge;
 - d. The stream(s) affected by the discharge;
 - e. The circumstances which created the discharge;
 - f. The name and telephone number of the person(s) who have knowledge of these circumstances;
 - g. What remedial steps are being taken; and,
 - h. The name and telephone number of the person(s) responsible for such remedial steps.
2. The permittee shall report noncompliance that is the result of any spill or discharge which may endanger human health or the environment within thirty (30) minutes of discovery by calling the 24-Hour Emergency Hotline toll-free at (800) 282-9378. The permittee shall also report the spill or discharge by e-mail or telephone within twenty-four (24) hours of discovery in accordance with B.1 above.
- C. When the telephone option is used for the noncompliance reports required by A and B, the permittee shall submit to the appropriate Ohio EPA district office a confirmation letter and a completed noncompliance report within five (5) days of the discovery of the noncompliance. This follow up report is not necessary for the e-mail option which already includes a completed noncompliance report.
- D. If the permittee is unable to meet any date for achieving an event, as specified in a schedule of compliance in their permit, the permittee shall submit a written report to the appropriate Ohio EPA district office within fourteen (14) days of becoming aware of such a situation. The report shall include the following:
1. The compliance event which has been or will be violated;
 2. The cause of the violation;
 3. The remedial action being taken;
 4. The probable date by which compliance will occur; and,
 5. The probability of complying with subsequent and final events as scheduled.

E. The permittee shall report all other instances of permit noncompliance not reported under paragraphs A or B of this section on their monthly DMR submission. The DMR shall contain comments that include the information listed in paragraphs A or B as appropriate.

F. If the permittee becomes aware that it failed to submit an application, or submitted incorrect information in an application or in any report to the director, it shall promptly submit such facts or information.

13. RESERVED

14. DUTY TO MITIGATE

The permittee shall take all reasonable steps to minimize or prevent any discharge in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

15. AUTHORIZED DISCHARGES

All discharges authorized herein shall be consistent with the terms and conditions of this permit. The discharge of any pollutant identified in this permit more frequently than, or at a level in excess of, that authorized by this permit shall constitute a violation of the terms and conditions of this permit. Such violations may result in the imposition of civil and/or criminal penalties as provided for in Section 309 of the Act and Ohio Revised Code Sections 6111.09 and 6111.99.

16. DISCHARGE CHANGES

The following changes must be reported to the appropriate Ohio EPA district office as soon as practicable:

A. For all treatment works, any significant change in character of the discharge which the permittee knows or has reason to believe has occurred or will occur which would constitute cause for modification or revocation and reissuance. The permittee shall give advance notice to the Director of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements. Notification of permit changes or anticipated noncompliance does not stay any permit condition.

B. For publicly owned treatment works:

1. Any proposed plant modification, addition, and/or expansion that will change the capacity or efficiency of the plant;
2. The addition of any new significant industrial discharge; and
3. Changes in the quantity or quality of the wastes from existing tributary industrial discharges which will result in significant new or increased discharges of pollutants.

C. For non-publicly owned treatment works, any proposed facility expansions, production increases, or process modifications, which will result in new, different, or increased discharges of pollutants.

Following this notice, modifications to the permit may be made to reflect any necessary changes in permit conditions, including any necessary effluent limitations for any pollutants not identified and limited herein. A determination will also be made as to whether a National Environmental Policy Act (NEPA) review will be required. Sections 6111.44 and 6111.45, Ohio Revised Code, require that plans for

treatment works or improvements to such works be approved by the Director of the Ohio EPA prior to initiation of construction.

D. In addition to the reporting requirements under 40 CFR 122.41(l) and per 40 CFR 122.42(a), all existing manufacturing, commercial, mining, and silvicultural dischargers must notify the Director as soon as they know or have reason to believe:

1. That any activity has occurred or will occur which would result in the discharge on a routine or frequent basis of any toxic pollutant which is not limited in the permit. If that discharge will exceed the highest of the "notification levels" specified in 40 CFR Sections 122.42(a)(1)(i) through 122.42(a)(1)(iv).
2. That any activity has occurred or will occur which would result in any discharge, on a non-routine or infrequent basis, of a toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the "notification levels" specified in 122.42(a)(2)(i) through 122.42(a)(2)(iv).

17. TOXIC POLLUTANTS

The permittee shall comply with effluent standards or prohibitions established under Section 307 (a) of the Clean Water Act for toxic pollutants within the time provided in the regulations that establish these standards or prohibitions, even if the permit has not yet been modified to incorporate the requirement. Following establishment of such standards or prohibitions, the Director shall modify this permit and so notify the permittee.

18. PERMIT MODIFICATION OR REVOCATION

A. After notice and opportunity for a hearing, this permit may be modified or revoked, by the Ohio EPA, in whole or in part during its term for cause including, but not limited to, the following:

1. Violation of any terms or conditions of this permit;
2. Obtaining this permit by misrepresentation or failure to disclose fully all relevant facts; or
3. Change in any condition that requires either a temporary or permanent reduction or elimination of the permitted discharge.

B. Pursuant to rule 3745-33-04, Ohio Administrative Code, the permittee may at any time apply to the Ohio EPA for modification of any part of this permit. The filing of a request by the permittee for a permit modification or revocation does not stay any permit condition. The application for modification should be received by the appropriate Ohio EPA district office at least ninety days before the date on which it is desired that the modification become effective. The application shall be made only on forms approved by the Ohio EPA.

19. TRANSFER OF OWNERSHIP OR CONTROL

This permit may be transferred or assigned and a new owner or successor can be authorized to discharge from this facility, provided the following requirements are met:

A. The permittee shall notify the succeeding owner or successor of the existence of this permit by a letter, a copy of which shall be forwarded to the appropriate Ohio EPA district office. The copy of that letter will serve as the permittee's notice to the Director of the proposed transfer. The copy of that letter shall be received by the appropriate Ohio EPA district office sixty (60) days prior to the proposed date of transfer;

B. A written agreement containing a specific date for transfer of permit responsibility and coverage between the current and new permittee (including acknowledgement that the existing permittee is liable for violations up to that date, and that the new permittee is liable for violations from that date on) shall be submitted to the appropriate Ohio EPA district office within sixty days after receipt by the district office of the copy of the letter from the permittee to the succeeding owner;

At any time during the sixty (60) day period between notification of the proposed transfer and the effective date of the transfer, the Director may prevent the transfer if he concludes that such transfer will jeopardize compliance with the terms and conditions of the permit. If the Director does not prevent transfer, he will modify the permit to reflect the new owner.

20. OIL AND HAZARDOUS SUBSTANCE LIABILITY

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties to which the permittee is or may be subject under Section 311 of the Clean Water Act.

21. SOLIDS DISPOSAL

Collected grit and screenings, and other solids other than sewage sludge, shall be disposed of in such a manner as to prevent entry of those wastes into waters of the state, and in accordance with all applicable laws and rules.

22. CONSTRUCTION AFFECTING NAVIGABLE WATERS

This permit does not authorize or approve the construction of any onshore or offshore physical structures or facilities or the undertaking of any work in any navigable waters.

23. CIVIL AND CRIMINAL LIABILITY

Except as exempted in the permit conditions on UNAUTHORIZED DISCHARGES or UPSETS, nothing in this permit shall be construed to relieve the permittee from civil or criminal penalties for noncompliance.

24. STATE LAWS AND REGULATIONS

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable state law or regulation under authority preserved by Section 510 of the Clean Water Act.

25. PROPERTY RIGHTS

The issuance of this permit does not convey any property rights in either real or personal property, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of federal, state, or local laws or regulations.

26. UPSET

The provisions of 40 CFR Section 122.41(n), relating to "Upset," are specifically incorporated herein by reference in their entirety. For definition of "upset," see Part III, Paragraph 1, DEFINITIONS.

27. SEVERABILITY

The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby.

28. SIGNATORY REQUIREMENTS

All applications submitted to the Director shall be signed and certified in accordance with the requirements of 40 CFR 122.22.

All reports submitted to the Director shall be signed and certified in accordance with the requirements of 40 CFR Section 122.22.

29. OTHER INFORMATION

A. Where the permittee becomes aware that it failed to submit any relevant facts in a permit application or submitted incorrect information in a permit application or in any report to the Director, it shall promptly submit such facts or information.

B. ORC 6111.99 provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than \$25,000 per violation.

C. ORC 6111.99 states that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit including monitoring reports or reports of compliance or noncompliance shall, upon conviction, be punished by a fine of not more than \$25,000 per violation.

D. ORC 6111.99 provides that any person who violates Sections 6111.04, 6111.042, 6111.05, or division (A) of Section 6111.07 of the Revised Code shall be fined not more than \$25,000 or imprisoned not more than one year, or both.

30. NEED TO HALT OR REDUCE ACTIVITY

40 CFR 122.41(c) states that it shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with conditions of this permit.

31. APPLICABLE FEDERAL RULES

All references to 40 CFR in this permit mean the version of 40 CFR which is effective as of the effective date of this permit.

32. AVAILABILITY OF PUBLIC SEWERS

Notwithstanding the issuance or non-issuance of an NPDES permit to a semi-public disposal system, whenever the sewage system of a publicly owned treatment works becomes available and accessible, the permittee operating any semi-public disposal system shall abandon the semi-public disposal system and connect it into the publicly owned treatment works.

National Pollutant Discharge Elimination System (NPDES) Permit Program

FACT SHEET

Regarding an NPDES Permit to Discharge to Waters of the State of Ohio
for Ohio Refining Company LLC

Public Notice No.: 203480
Public Notice Date: May 28, 2024
Comment Period Ends: June 27, 2024

Ohio EPA Permit No.: 2IG00007*ND
Application No.: OH0002461

Name and Address of Applicant:

Ohio Refining Company LLC
P.O. Box 696
Toledo, Ohio 43697

Name and Address of Facility Where

Discharge Occurs:

Ohio Refining Company LLC
4001 Cedar Point Road
Oregon, Ohio 43616
Lucas County

Receiving Water: Otter Creek, Maumee Bay

Subsequent Stream Network: Lake Erie

INTRODUCTION

Development of a Fact Sheet for NPDES permits is mandated by Title 40 of the Code of Federal Regulations (CFR), Section 124.8 and 124.56. This document fulfills the requirements established in those regulations by providing the information necessary to inform the public of actions proposed by the Ohio Environmental Protection Agency (Ohio EPA), as well as the methods by which the public can participate in the process of finalizing those actions.

This Fact Sheet is prepared in order to document the technical basis and risk management decisions that are considered in the determination of water quality based NPDES Permit effluent limitations. The technical basis for the Fact Sheet may consist of evaluations of promulgated effluent guidelines, existing effluent quality, instream biological, chemical and physical conditions, and the relative risk of alternative effluent limitations. This Fact Sheet details the discretionary decision-making process empowered to the Director by the Clean Water Act (CWA) and Ohio Water Pollution Control Law (Ohio Revised Code [ORC] 6111). Decisions to award variances to Water Quality Standards (WQS) or promulgated effluent guidelines for economic or technological reasons will also be justified in the Fact Sheet where necessary.

No antidegradation review was necessary.

Effluent limits based on available treatment technologies are required by Section 301(b) of the CWA. Many of these have already been established by the United States Environmental Protection Agency (U.S. EPA) in the effluent guideline regulations (a.k.a. categorical regulations) for industry categories in 40 CFR Parts 405-499. Technology-based regulations for publicly-owned treatment works are listed in the Secondary Treatment Regulations (40 CFR Part 133). If regulations have not been established for a category of dischargers, the director may establish technology-based limits based on best professional judgment (BPJ).

Ohio EPA reviews the need for water-quality-based limits on a pollutant-by-pollutant basis. Wasteload allocations (WLAs) are used to develop these limits based on the pollutants that have been detected in the discharge, and the receiving water's assimilative capacity. The assimilative capacity depends on the flow in the

water receiving the discharge, and the concentration of the pollutant upstream. The greater the upstream flow, and the lower the upstream concentration, the greater the assimilative capacity is. Assimilative capacity may represent dilution (as in allocations for metals), or it may also incorporate the break-down of pollutants in the receiving water (as in allocations for oxygen-demanding materials).

The need for water-quality-based limits is determined by comparing the WLA for a pollutant to a measure of the effluent quality. The measure of effluent quality is called Projected Effluent Quality (PEQ). This is a statistical measure of the average and maximum effluent values for a pollutant. As with any statistical method, the more data that exists for a given pollutant, the more likely that PEQ will match the actual observed data. If there is a small data set for a given pollutant, the highest measured value is multiplied by a statistical factor to obtain a PEQ; for example, if only one sample exists, the factor is 6.2, for two samples - 3.8, for three samples - 3.0. The factors continue to decline as samples sizes increase. These factors are intended to account for effluent variability, but if the pollutant concentrations are fairly constant, these factors may make PEQ appear larger than it would be shown to be if more sample results existed.

SUMMARY OF PERMIT CONDITIONS

Most of the effluent limits and monitoring requirements proposed are the same as in the current permit, although some monitoring frequencies have changed.

The facility's mercury variance has been renewed for this permit.

A lower daily maximum seasonal thermal discharge limit is proposed based on the maximum data reported in EDMR for the last 5 years. The limit is being lowered to correspond with the actual operating conditions that were associated with the 2012 thermal mixing zone model. The 2012 model showed that maximum WQS were met at 2010 effluent conditions, but there was the potential to exceed WQS at the current maximum limit of 1250 MBTU/HR. A compliance schedule is included in the permit to allow for an evaluation that the facility can meet the lower limit. The schedule also includes language indicating that an updated thermal model can be completed, and an alternative limit based on the model could be proposed that would meet WQS.

A limit is proposed for chlorine because of the reasonable potential to exceed water quality standards.

2,3, 7, 8 Tetrachlorodibenzo-P-Dioxin (Toxicity Equivalent) falls into group 5 of the reasonable potential evaluation, but it has been determined that there is no reasonable potential for 2,3, 7, 8 Tetrachlorodibenzo-P-Dioxin (Toxicity Equivalent) based on the quantifiable detections in the cooling water and using the procedures in OAC 3745-33-07(A)(9). The dry process design for the reformer and non-quantifiable sampling results for the 601 internal process outfall support this determination. Monitoring at all stations will continue to verify that no reasonable potential is maintained. A reopener is added to the permit if reasonable potential is observed from the process water.

A new intake monitoring station 802 for the ground water well cooling water is being added to the permit to track toxicity equivalent detections in the intake water.

Dissolved Hexavalent Chromium will have a tracking requirement due to the parameter being in group 4 of the WLA and the PEQ max being greater than 75% of the PEL max.

In Part II of the permit, special conditions are included that address storm water compliance; tracking of group 4 parameters; mercury variance; Section 316(b); thermal loading calculations; and outfall signage.

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PROCEDURES FOR PARTICIPATION IN THE FORMULATION OF FINAL DETERMINATIONS

The draft action shall be issued as a final action unless the Director revises the draft after consideration of the record of a public meeting or written comments, or upon disapproval by the Administrator of the U.S. Environmental Protection Agency.

Within thirty days of the date of the Public Notice, any person may request or petition for a public meeting for presentation of evidence, statements or opinions. The purpose of the public meeting is to obtain additional evidence. Statements concerning the issues raised by the party requesting the meeting are invited. Evidence may be presented by the applicant, the state, and other parties, and following presentation of such evidence other interested persons may present testimony of facts or statements of opinion.

Requests for public meetings shall be in writing and shall state the action of the Director objected to, the questions to be considered, and the reasons the action is contested. Such requests should be addressed to:

**Legal Records Section
Ohio Environmental Protection Agency
P.O. Box 1049
Columbus, Ohio 43216-1049**

Interested persons are invited to submit written comments upon the discharge permit. Comments should be submitted in person or by mail no later than 30 days after the date of this Public Notice. Deliver or mail all comments to:

**Ohio Environmental Protection Agency
Attention: Division of Surface Water
Permits Processing Unit
P.O. Box 1049
Columbus, Ohio 43216-1049**

The Ohio EPA permit number and Public Notice numbers should appear on each page of any submitted comments. All comments received no later than 30 days after the date of the Public Notice will be considered.

Citizens may conduct file reviews regarding specific companies or sites. Appointments are necessary to conduct file reviews, because requests to review files have increased dramatically in recent years. The first 250 pages copied are free. For requests to copy more than 250 pages, there is a five-cent charge for each page copied. Payment is required by check or money order, made payable to Treasurer State of Ohio.

For additional information about this fact sheet or the draft permit, contact Michael Donnelly, (419) 373-3070, Michael.Donnelly@epa.ohio.gov

INFORMATION REGARDING CERTAIN WATER QUALITY BASED EFFLUENT LIMITS

This draft permit may contain proposed water-quality-based effluent limits (WQBELs) for parameters that **are not** priority pollutants. (See the following link for a list of the priority pollutants:

http://epa.ohio.gov/portals/35/pretreatment/Pretreatment_Program_Priority_Pollutant_Detection_Limits.pdf.)

In accordance with ORC 6111.03(J)(3), the Director established these WQBELs after considering, to the extent consistent with the Federal Water Pollution Control Act, evidence relating to the technical feasibility and economic reasonableness of removing the polluting properties from those wastes and to evidence relating to conditions calculated to result from that action and their relation to benefits to the people of the state and to accomplishment of the purposes of this chapter. This determination was made based on data and information

available at the time the permit was drafted, which included the contents of the timely submitted NPDES permit renewal application, along with any and all pertinent information available to the Director.

This public notice allows the permittee to provide to the Director for consideration during this public comment period additional site-specific pertinent and factual information with respect to the technical feasibility and economic reasonableness for achieving compliance with the proposed final effluent limitations for these parameters. The permittee shall deliver or mail this information to:

**Ohio Environmental Protection Agency
Attention: Division of Surface Water
Permits Processing Unit
P.O. Box 1049
Columbus, Ohio 43216-1049**

Should the applicant need additional time to review, obtain or develop site-specific pertinent and factual information with respect to the technical feasibility and economic reasonableness of achieving compliance with these limitations, a written request for any additional time shall be sent to the above address no later than 30 days after the Public Notice Date on Page 1.

Should the applicant determine that compliance with the proposed WQBELs for parameters other than the priority pollutants is technically and/or economically unattainable, the permittee may submit an application for a variance to the applicable WQS used to develop the proposed effluent limitation in accordance with the terms and conditions set forth in OAC 3745-33-07(D). The permittee shall submit this application to the above address no later than 30 days after the Public Notice Date.

Alternately, the applicant may propose the development of site-specific WQS pursuant to OAC 3745-1-39. The permittee shall submit written notification regarding their intent to develop site specific WQS for parameters that are not priority pollutants to the above address no later than 30 days after the Public Notice Date.

LOCATION OF DISCHARGE/RECEIVING WATER USE CLASSIFICATION

Ohio Refining Company LLC Toledo Refinery (Cenovus) discharges to Maumee Bay, which flows into Lake Erie at shore mile 1300.8. Figure 1 shows the approximate location of the facility.

This segment of the Maumee Bay is described by Ohio EPA River Code: 24-100, Hydrologic Unit Code: 04100010-07-06 County: Lucas, Ecoregion: Huron/Erie Lake Plains. Lake Erie is designated for the following uses under Ohio's WQS (OAC 3745-1-31) : Exceptional Warmwater Habitat (EWH), Superior High Quality Water (SHQW) , Agricultural Water Supply (AWS), Industrial Water Supply (IWS) , Public Water Supply (PWS), and Bathing Waters (BW) .

Outfall 001, which is generally not utilized, discharges to Otter Creek. This tributary to Maumee Bay is designated for the following uses under OAC 3745-1-23: Modified Warmwater (MWH) , AWS, IWS, and Primary Contact Recreation (PCR) .

Use designations define the goals and expectations of a waterbody. These goals are set for aquatic life protection, recreation use and water supply use, and are defined in the Ohio WQS (OAC 3745-1-07) . The use designations for individual waterbodies are listed in rules -08 through -32 of the Ohio WQS. Once the goals are set, numeric WQS are developed to protect these uses. Different uses have different water quality criteria.

Use designations for aquatic life protection include habitats for coldwater fish and macroinvertebrates, warmwater aquatic life and waters with exceptional communities of warmwater organisms. These uses all meet the goals of the federal CWA. Ohio WQS also include aquatic life use designations for waterbodies which cannot meet the CWA goals because of human-caused conditions that cannot be remedied without causing fundamental changes to land use and widespread economic impact. The dredging and clearing of some small streams to support agricultural or urban drainage is the most common of these conditions. These streams are given Modified Warmwater or Limited Resource Water designations.

Recreation uses are defined by the depth of the waterbody and the potential for wading or swimming. Uses are defined for bathing waters, swimming/canoeing (Primary Contact Recreation) and wading only (Secondary Contact which are generally waters too shallow for swimming or canoeing) .

Water supply uses are defined by the actual or potential use of the waterbody. Public Water Supply designations apply near existing water intakes so that waters are safe to drink with standard treatment. Most other waters are designated for agricultural water supply and industrial water supply.

FACILITY DESCRIPTION

Cenovus has the capacity to process 160,000 barrels of crude oil per day and produces all grades of unleaded gasoline, jet fuels, kerosene, diesel fuel, low sulfur diesel, petroleum coke, asphalt, liquid propane gas (LPG), propylene, heating oils, gas oil, decanted oil, and molten sulfur. The industrial processes at the facility include:

- Atmospheric crude distillation
- Vacuum crude distillation
- Fluid catalytic cracking
- Continuous catalytic reforming
- Naphtha hydrotreating unit
- Diesel/gas oil hydrotreating unit
- Petroleum coking unit
- Isocracking unit

- Sulfuric acid alkylation
- Coker Gas Plant

The process operations at Cenovus are classified in the Standard Industrial Classification (SIC) category 2911, Petroleum Refining. The process wastewaters generated from these operations are regulated under 40 CFR 419, “Petroleum Refining Point Source Category,” Subpart B, “Cracking Subcategory.”

Cenovus obtains water from three sources – an intake in Maumee Bay provides water for once-through cooling, well water is utilized for process cooling, and the City of Oregon provides potable water and water for boilers and process units.

DESCRIPTION OF EXISTING DISCHARGE

Cenovus discharges wastewater into Maumee Bay through outfall 002 at an average flow rate of 35.5 MGD based upon information provided in the NPDES renewal permit application. For a description of all outfalls, see Table 1. Outfall 001 is used only in the event of an emergency. Outfall 001 discharged a total of 28 days between January 2014 and January 2019.

In 2013 a new refinery sewer subsystem was installed to augment the existing system and to directly support the new continuous catalytic reforming unit. This new sewer system includes a 72 inch trunk line and two major branch lines that discharges directly into the existing 84 inch oily-water sewer.

All of Cenovus’ process wastewaters, as well as cooling tower blowdown, sanitary wastewater, stormwater runoff, and wastewater from adjacent company Chemtrade, Inc., is processed in the wastewater treatment unit (WWTU) (see Figure 2), which discharged through internal monitoring station 601. The WWTU flow diagram is presented on Figure 3. If the flow in the sewer leading to the WWTU exceeds 6000 gallons per minute (gpm) due to excessive stormwater runoff, wastewater is diverted to two 8 million gallon impoundment tanks. If those tanks become full, there is the potential for the wastewater overflows into the south impoundment basin, which has a capacity of 7 million gallons. It has been the refinery’s practice since 2012 not to use the south impoundment basin unless necessary. In the event all three impoundment structures may fill up, untreated wastewater can be discharged through bypass station 603 to the once-through cooling water sewer and into the WWTU effluent channel to be ultimately discharged through outfall 001. Cenovus has taken several steps to eliminate outfall 603, including upgrading the WWTU to a sustained peak flow of 6500 gpm, with intermittent flows above 7000 gpm. The facility is proposing the following projects to continue with the elimination of the 603 bypass; new flocculators in the AFU, sludge draft tubes on the AFU, improved coagulant feed system, upgrade variable speed drive transfer pumps for the biological treatment system feed line, clarifier influent por splash wall/baffle with effluent weir supports, recycled activated sludge pump upgrades, and upgrades to the tertiary sand filter mud well pumps. Cenovus reported no bypasses through outfall 603 between January 2014 and January 2019. Process wastewater is treated by the following processes:

- API Oil Water Separator
- Secondary API Boxes
- Dissolved Air Flootation
- Coagulant and Polymer addition
- Activated Sludge Pond
- Secondary Clarifiers
- Sand Filter

All wastewater processed by the WWTU first flows into the primary API separator (an oil-water separator that meets the standards of the American Petroleum Institute), where oil is skimmed from the surface and solids settle to the bottom. Secondary API boxes are used to allow further oil-water separation and sludge settling.

Wastewater is next treated in the dissolved air flotation unit to further reduce oil and suspended solids. A coagulant and polymer are added to improve the coagulation of solids. Water exiting the dissolved air flotation unit is pumped to a pond to undergo further treatment through an activated sludge process. A secondary clarifier settles additional solids prior to the wastewater being sent through a sand filter for final treatment.

Sludge produced from the various treatment operations in the WWTU is processed with a sludge thickener and a belt press. Dewatered sludge produced from biological treatment is disposed of in a landfill. Dewatered sludge produced from the oily solids are typically recycled back into the refinery as a feedstock for the thermal cracking process.

Cenovus' once-through cooling system discharge includes non-contact cooling water and zeolite regeneration backwash effluent from the facility's raw water treatment plant. The wastewater from this system receives treatment prior to discharge at internal station 602 and then combines with the effluent from the WWTU.

The average flow rates for the permit cycle for the outfalls is shown on Table 2.

Effluent violations can be found on Table 3.

Table 4 presents data compiled from the NPDES permit renewal application Form 2C and data collected by Ohio EPA.

Table 5 presents a summary of unaltered Discharge Monitoring Report (DMR). Data are presented for the period January 2014 to January 2019, and current permit limits are provided for comparison.

Table 6 summarizes the chemical specific data for outfall 002 by presenting the average and maximum PEQ values.

Table 7 summarizes the results of acute and chronic WET tests of the final effluent.

Table 8 summarizes the screening results of Ohio EPA bioassay sampling of the final effluent.

ASSESSMENT OF IMPACT ON RECEIVING WATERS

The Lake Erie Western Basin Shoreline watershed assessment unit, which includes the Maumee Bay in the vicinity of Ohio Refining Company LLC, is listed as impaired for aquatic life, recreation, human health and public water supply on Ohio's 303(d) list.

The attainment status of Maumee Bay is reported in the Final *Ohio 2018 Integrated Water Quality Monitoring and Assessment Report*. An assessment of the impact of a permitted point source on the immediate receiving waters includes an evaluation of the available chemical/physical, biological, and habitat data which have been collected by Ohio EPA pursuant to the Five-Year Basin Approach for Monitoring and NPDES Reissuance. Other data may be used provided it was collected in accordance with Ohio EPA methods and protocols as specified by the Ohio WQS and Ohio EPA guidance documents. Other information which may be evaluated includes but is not limited to: NPDES permittee self-monitoring data; effluent and mixing zone bioassays conducted by Ohio EPA, the permittee, or U.S. EPA.

In evaluating this data, Ohio EPA attempts to link environmental stresses and measured pollutant exposure to the health and diversity of biological communities. Stresses can include pollutant discharges (permitted and unpermitted), land use effects, and habitat modifications. Indicators of exposure to these stresses include whole effluent toxicity tests, fish tissue chemical data, and fish health biomarkers (for example, fish blood tests).

Use attainment is a term which describes the degree to which environmental indicators are either above or below criteria specified by the Ohio WQS (OAC 3745-1). Assessing use attainment status for aquatic life uses primarily relies on the Ohio EPA biological criteria (OAC 3745-1-07; Table 7-15). These criteria apply to rivers and streams outside of mixing zones. Numerical biological criteria are based on measuring several characteristics of the fish and macroinvertebrate communities; these characteristics are combined into multimetric biological indices including the Index of Biotic Integrity and modified Index of Well-Being, which indicate the response of the fish community, and the Invertebrate Community Index, which indicates the response of the macroinvertebrate community. Numerical criteria are broken down by ecoregion, use designation, and stream or river size. Ohio has five ecoregions defined by common topography, land use, potential vegetation and soil type.

Three attainment status results are possible at each sampling location -full, partial, or non-attainment. Full attainment means that all of the applicable indices meet the biocriteria. Partial attainment means that one or more of the applicable indices fails meet the biocriteria. Nonattainment means that either none of the applicable indices meet the biocriteria or one of the organism groups indicates poor or very poor performance. An aquatic life use attainment table (is constructed based on the sampling results and is arranged from upstream to downstream and includes the sampling locations indicated by river mile, the applicable biological indices, the use attainment status (i.e., full, partial, or non), the Qualitative Habitat Evaluation Index, and comments and observations for each sampling location.

The Lake Erie Western Basin Shoreline watershed is impaired for nutrients, siltation, organic enrichment, and polychlorinated biphenyls due to the following: municipal point sources, combined sewer overflows, non-point sources. Cenovus is not considered a source of impairment at this time. A TMDL has not been developed for the Lake Erie Western Basin Shoreline.

The full study is available through the Ohio EPA, Division of Surface Water website at: <http://epa.ohio.gov/dsw/tmdl/OhioIntegratedReport.aspx>

DEVELOPMENT OF WATER-QUALITY-BASED EFFLUENT LIMITS

Determining appropriate effluent concentrations is a multiple-step process in which parameters are identified as likely to be discharged by a facility, evaluated with respect to Ohio water quality criteria, and examined to determine the likelihood that the existing effluent could violate the calculated limits.

Parameter Selection

Effluent data for the Ohio Refining Company LLC were used to determine what parameters should undergo WLA. The parameters discharged are identified by the data available to Ohio EPA DMR data submitted by the permittee, compliance sampling data collected by Ohio EPA, and any other data submitted by the permittee, such as priority pollutant scans required by the NPDES application or by pretreatment, or other special conditions in the NPDES permit. The sources of effluent data used in this evaluation are as follows:

Self-monitoring data (DMR)	July 2015through June 2020
Ohio EPA bioassay sampling data	2018
NPDES application Form 2C data	2019

Statistical Outliers and Other Non-representative Data

The data were examined, and no values were removed from the evaluation.

This data is evaluated statistically, and PEQ values are calculated for each pollutant. Average PEQ (PEQ_{avg}) values represent the 95th percentile of monthly average data, and maximum PEQ (PEQ_{max}) values represent the 95th percentile of all data points (see Table 6).

The PEQ values are used according to Ohio rules to compare to applicable WQS and allowable WLA values for each pollutant evaluated. Initially, PEQ values are compared to the applicable average and maximum WQS. If both PEQ values are less than 25 percent of the applicable WQS, the pollutant does not have the reasonable potential to cause or contribute to exceedances of WQS, and no WLA is done for that parameter. If either PEQ_{avg} or PEQ_{max} is greater than 25 percent of the applicable WQS, a WLA is conducted to determine whether the parameter exhibits reasonable potential and needs to have a limit or if monitoring is required (see Table 9).

Wasteload Allocation

For those parameters that require a WLA, the results are based on the uses assigned to the receiving waterbody in OAC 3745-1. Dischargers are allocated pollutant loadings/concentrations based on the Ohio WQS (OAC 3745-1). Most pollutants are allocated by a mass-balance method because they do not degrade in the receiving water.

WLAs for direct discharges to lakes are done using the following equation for average criteria: $WLA = (11 \times \text{Water Quality Criteria}) - (10 \times \text{Background Concentration})$. Allocations for maximum criteria are set equal to the Inside Mixing Zone Maximum (IMZM) values.

Allocations are developed using a percentage of stream design flow as specified in Table 10, and allocations cannot exceed the Inside Mixing Zone Maximum (IMZM) criteria.

The data used in the WLA are listed in Table 9 and Table 10. The WLA results to maintain all applicable criteria are presented in Table 11.

Whole Effluent Toxicity Wasteload Allocation

Whole effluent toxicity (WET) is the total toxic effect of an effluent on aquatic life measured directly with a toxicity test. Acute WET measures short term effects of the effluent while chronic WET measures longer term and potentially more subtle effects of the effluent.

WQS for WET are expressed in Ohio's narrative "free from" WQS rule [OAC 3745-1-04(D)]. These "free froms" are translated into toxicity units (TUs) by the associated WQS Implementation Rule (OAC 3745-2-09). WLAs can then be calculated using TUs as if they were water quality criteria.

The WLA calculations for WET are similar to those for aquatic life criteria - using the chronic toxicity unit (TU_c) and 7Q10 flow for the average and the acute toxicity unit (TU_a) and 1Q10 flow for the maximum. These values are the levels of effluent toxicity that should not cause instream toxicity during critical low-flow conditions. For Ohio Refining Company LLC, the WLA values are 1.0 TU_a and 11.0 TU_c.

The chronic toxicity unit (TU_c) is defined as 100 divided by the estimate of the effluent concentration which causes a 25% reduction in growth or reproduction of test organisms (IC₂₅):

$$TU_c = 100/IC_{25}$$

This equation applies outside the mixing zone for warmwater, modified warmwater, exceptional warmwater, coldwater, and seasonal salmonid use designations except when the following equation is more restrictive (*Ceriodaphnia dubia* only):

$$TU_c = 100/\text{geometric mean of No Observed Effect Concentration and Lowest Observed Effect Concentration}$$

The acute toxicity unit (TU_a) is defined as 100 divided by the concentration in water having 50% chance of causing death to aquatic life (LC_{50}) for the most sensitive test species:

$$TU_a = 100/LC_{50}$$

This equation applies outside the mixing zone for warmwater, modified warmwater, exceptional warmwater, coldwater, and seasonal salmonid use designations.

REASONABLE POTENTIAL/EFFLUENT LIMITS/MANAGEMENT DECISIONS

After appropriate effluent limits are calculated, the reasonable potential of the discharger to violate the WQS must be determined. Each parameter is examined and placed in a defined "group". Parameters that do not have a WQS or do not require a WLA based on the initial screening are assigned to either group 1 or 2. For the allocated parameters, the preliminary effluent limits (PEL) based on the most restrictive average and maximum WLAs are selected from Table 11. The average PEL (PEL_{avg}) is compared to the average PEQ (PEQ_{avg}) from Table 6, and the PEL_{max} is compared to the PEQ_{max} . Based on the calculated percentage of the allocated value [$(PEQ_{avg} \div PEL_{avg}) \times 100$, or $(PEQ_{max} \div PEL_{max}) \times 100$], the parameters are assigned to group 3, 4, or 5. The groupings are listed in Table 12.

The final effluent limits are determined by evaluating the groupings in conjunction with other applicable rules and regulations. Table 13 presents the final effluent limits and monitoring requirements proposed for Ohio Refining Company LLC outfalls 001, 002, internal monitoring stations 601/691, 602, 603, and 604/694, and the basis for their recommendation.

Outfall 001

Outfall 001 is only utilized in case of emergencies; in these instances, it is expected Otter Creek will have a significantly higher flow rate than under average conditions. Outfall 001 will have the same permit limitations as Outfall 002.

Outfall 002

High Water Temperature and Thermal Discharge

Cenovus was required to perform a thermal mixing zone study in 2010 with a report submitted on March 1, 2012, to characterize the size, areal extent, and depth of the discharge plume from outfall 002 for temperature.

A primary finding of the study was that a static thermal mixing zone did not exist for outfall 002. In order for a stable thermal mixing zone to develop there must be a balance between the thermal loading and the processes that dissipate heat. This balance does not exist in Maumee Bay because of seiche activity (wind-driven periods of water level oscillation) which causes regular reversal of the direction of flow near outfall 002. Since a static thermal mixing zone does not develop, a "most probable thermal mixing zone" was developed instead, which was defined as the zone of locations along the Maumee River channel at which the median predicted change in temperature was 0.5° F or greater. The most probable thermal mixing zone under maximum discharge conditions was modeled as the top 12 feet of the water column ranging from 3,170 feet upstream of outfall 002 to 10,800 feet downstream of outfall 002. The most probable thermal mixing zone under standard operating

conditions was modeled as the top four feet of the water column ranging from 2,750 ft upstream to 5,500 ft downstream. It is unlikely the thermal plume would occur through the entire zone at a given time.

The estimated thermal WQS exceedances at the average thermal loading and the maximum permitted thermal loading is presented in Attachment 4. Under the average thermal loading utilized in the study, there is no reasonable potential for Cenovus to exceed thermal WQS at the surface. Under the maximum permitted thermal loading, there is reasonable potential to exceed both the daily maximum and monthly average WQS at the surface. However, the majority of expected exceedances for the daily maximum and all the expected exceedances of the monthly average are predicted to occur within 1,000 ft of the discharge point, which is near the bottom of the ship channel near Grassy Island. Based on the dynamic nature of the plume, it is unlikely these exceedances would cause long-term harm to any aquatic communities that might be found in the ship channel or for human recreation, which should be limited in the ship channel. The report states the following: *“The predicted temperatures from the calibrated and validated EFDC model were compared to Ohio WQS at 11 locations in Maumee Bay between the mouth of the Maumee River and a distance approximately 2 miles downstream of the BP-H outfall. The evaluation completed using actual field conditions show no increase in frequency of exceeding the period-average temperature standard due to the presence of the BP-H outfall. Similarly, only for a single day(at a single location) was an exceedance of the daily maximum temperature standard attributed to the BP-H outfall. ...Operating the BP-H outfall at the maximum permitted thermal loading would result in a larger most probable thermal mixing zone but would not consistently result in exceedances of the Ohio WQS for temperature in the Maumee Bay.”* The average BTU/Hr from July 2015 to June 2020 was 345.8 BTU/Hr which is less than the 408 BTU/Hr used in the thermal mixing zone model. The Maximum BTU/Hr that was reported from July 2015 to June 2020 was 500 BTU/Hr.

A lower daily maximum seasonal thermal discharge limit is proposed based on the maximum data reported in EDMR for the last 5 years. The limit is being lowered to correspond with the actual operating conditions that were associated with the 2010 thermal mixing zone study. The 2010 model showed that maximum WQS were met at 2010 effluent conditions, but there was the potential to exceed WQS at the current maximum limit of 1250 MBTU/HR. A compliance schedule is included in the permit to allow for an evaluation that the facility can meet the lower limit. The schedule also includes language indicating that an updated thermal model can be completed, and an alternative limit based on the model could be proposed that would meet WQS.

Dissolved Oxygen, pH and E. Coli

Limits proposed for dissolved oxygen, pH. And E. coli are based on WQS (OAC 3745-1-35 and 37). The limit for dissolved oxygen is based upon standards for warmwater habitat even though Lake Erie and Maumee Bay are designated as EWH. Water quality modeling performed in 1999 and 2000 showed that the limit is protective of the outside mixing zone criteria for EWH. Bathing water recreation E.coli standards apply to Maumee Bay.

Chlorine

The Ohio EPA risk assessment (Table 12) places chlorine-in group 5. This placement, as well as the data in Table 5 and Table 6, indicates that the reasonable potential to exceed WQS exists and limits are necessary to protect water quality. For this parameter, the PEQ is greater than 100 percent of the WLA. Pollutants that meet this requirement must have permit limits under OAC 3745-33-07(A)(1). The daily maximum concentration limit for chlorine is based on aquatic life criteria.

2,3, 7, 8 Tetrachlorodibenzo-P-Dioxin (Toxicity Equivalent)

In 2013, Reformer 3 went into service and Reformers 1&2 came offline. Reformer #3 was designed as a continuous process of catalyst regeneration that would not need a scrubber tower. With the dry regeneration system it eliminated the potential for sources of dioxin from the process water. A monthly Dioxin sampling plan (Dioxin PMP) was implemented to determine if the Refinery was still a source of Dioxins. The results of the

study showed that Dioxin congeners were no longer present at quantifiable levels in the Process Wastewater stream but continued to be detected at Intake 801 (Maumee River) and Outfall 002 (source from Outfall 602 non-contact cooling water). Based on the design on the reformer system and the non-quantifiable sampling results for the process discharge there is no reasonable potential to exceed dioxin standards from the process wastewater using the procedures of OAC 3745-33-07(A)(9). Dioxin data collected quarterly throughout the current permit still supports this conclusion. As observed in appendix 6, all calculated TEQ results indicate that the process water tests were below quantifiable levels.

As a result of this analysis, there is no reasonable potential for toxicity equivalent discharges from outfall 002 to cause or contribute to WQS exceedances, and the limits are not necessary. Monitoring at outfall 002, 601, 602 intake station 801 and the ground water cooling well water will be required to continue to track that there is no reasonable potential. A reopener clause will be included in the permit to include dioxin limits if sampling indicates that dioxins are being added at the internal process monitoring station.

Dissolved Hexavalent Chromium

The Ohio EPA risk assessment (Table 12) places dissolved hexavalent chromium in group 4. This placement, as well as the data in Table 5 and Table 6, support that this parameter does not have the reasonable potential to contribute to WQS exceedances, and limits are not necessary to protect water quality. Monitoring for Group 4 pollutants (where PEQ exceeds 50 percent of the WLA) is required by OAC 3745-33-07(A)(2).

In addition, dissolved hexavalent chromium effluent quality falls within 75 percent of the WLA. Under OAC 3745-33-07(A)(2), parameters in this range must have a tracking requirement in the permit that specifies reductions in pollutant concentrations if effluent concentrations exceed the WLA. The tracking/reduction requirements are included in Part II of the permit.

Selenium

The Ohio EPA risk assessment (Table 12) places selenium in group 3. This placement, as well as the data in Table 5 and Table 6, support that this parameter does not have the reasonable potential to contribute to WQS exceedances, and limits are not necessary to protect water quality. Monitoring is proposed to continue to document that this pollutant continues to remain at low levels.

Aluminum, Arsenic, Barium, Boron, Bromodichloromethane, Cadmium, Carbon Disulfide, Chloroform, Chromium, Copper, Iron, Lead, Manganese, Methyl Bromide, Molybdenum, Nickel, Selenium, Thallium, Total Filterable Residue and Zinc

The Ohio EPA risk assessment (Table 12) places Aluminum, Arsenic, Barium, Boron, Bromodichloromethane, Cadmium, Carbon Disulfide, Chloroform, Chromium, Copper, Iron, Lead, Manganese, Methyl Bromide, Molybdenum, Nickel, Selenium, Thallium, Total Filterable Residue and Zinc in groups 2 and 3. This placement, as well as the data in Table 5 and Table 6, support that these parameters do not have the reasonable potential to contribute to WQS exceedances, and limits are not necessary to protect water quality. No new monitoring is proposed.

Flow

Monitoring for this parameter is proposed to continue in order to evaluate the performance of the treatment plant.

Mercury

The Ohio EPA risk assessment (Table 12) places mercury in group 5. This placement, as well as the data in Table 5 and Table 6, indicates that the reasonable potential to exceed WQS exists and limits are necessary to

protect water quality. For these parameters, the PEQ is greater than 100 percent of the WLA. Pollutants that meet this requirement must have permit limits under OAC 3745-33-07(A)(1).

The Ohio Refining Company LLC permit was renewed in 2009 to include a mercury variance, and variance-based limits for mercury. Based on the monitoring results from July 2015 thru June 2020, and the new application information, the Ohio Refining Company LLC has determined that the facility will not meet the 30-day average permit limit of 1.3 ng/L. However, the effluent data shows that the permittee can meet the mercury annual average value of 12 ng/L. Attachment 5 show the mercury reduction results for the treatment system wastewater. The permittee's application has also demonstrated to the satisfaction of Ohio EPA that there is no readily apparent means of complying with the WQBEL without constructing prohibitively expensive end-of-pipe controls for mercury. Based upon these demonstrations, the Ohio Refining Company LLC is eligible for the mercury variance under OAC 3745-1-38(J).

The current programs implemented through the PMP were: Site Training for Proper Mercury Disposal and Clean up, Complete review of bulk chemicals utilized on site for Mercury content, Inventory Mercury containing equipment on site, A site assessment of process discharges for mercury concentrations, A review of the site's purchasing policies, and implementation of a program for sewer cleaning and sediment removal.

Ohio Refining Company LLC submitted information supporting the renewal of the variance. The following information was included in the submittal:

"BP-Husky Refining LLC assessed several pilot scale mercury removal treatment units, 'Blue Pro' (coated sand filter), ultra-filtration (UF) membrane systems (GE ZEE WEED® 500), and the 'Mersorb®' process (selective ion adsorbent). Toledo Refinery's process wastewater streams were evaluated for Mercury treatment potential in regard to these pilot tests. BP-Husky Toledo Refinery's effluent consists of 82 percent non-contact cooling water; therefore any upstream Mercury treatment process appears to be inconsequential towards removing mercury from the final effluent. They are also calculating the removal rate of mercury from solid streams such as the Oily Belt Press Cake to calculate of the amount of mercury removed from the refinery sewer system. "

Ohio EPA has reviewed the mercury variance application and has determined that it meets the requirements of the OAC. A condition in Part II of the NPDES permit lists the provisions of the mercury variance, and includes the following requirements:

- A variance-based monthly average effluent limit of 9.7 ng/L, which was developed from sampling data submitted by the permittee and based on the previous permit limit;
- A requirement that the permittee make reasonable progress to meet the WQBEL for mercury by implementing the plan of study, which has been developed as part of the PMP;
- Low-level mercury monitoring of the plant's influent and effluent;
- A requirement that the annual average mercury effluent concentration is less than or equal to 12 ng/L as specified in the plan of study;
- A summary of the elements of the plan of study;
- A requirement to submit an annual report on implementation of the PMP; and
- A requirement for submittal of a certification stating that all permit conditions related to implementing the plan of study and the PMP have been satisfied, but that compliance with the monthly average WQBEL for mercury has not been achieved.

Internal Station 601/691

This internal station monitors discharge from the facility's WWTU. Limits and monitoring for internal station 601 are based on flow rates less than 8.0 MGD, which consist almost entirely of process wastewater. Internal station 691 is physically the same location; limits and monitoring are based on flow rates greater than or equal to 8.0 MGD, which consists of process water and contaminated stormwater. Load limits for internal station 691 are based on a flow rate of 8.0 MGD (see Figure 2).

The loadings for internal station 601 (Attachment 1) have been calculated using the FEGs listed in 40 CFR 419.22 and 419.23 to determine the Best Practicable Control Technology (BPT) and Best Available Technology Economically Achievable (BAT) permit limits, and the loadings for internal station 691 (which includes contaminated stormwater flow).

Total Precipitation, E. coli, and Toxicity Equivalent

Monitoring for all other parameters is proposed to continue.

Ammonia

BPT and BAT limits for ammonia are the same. Winter ammonia limits are proposed to continue and reflect the calculated FEG limits. Summer ammonia limits have been continued from the existing permit based on anti-backsliding rules (OAC 3745-33-05). The imposition of less stringent limits is allowed only if certain conditions are satisfied, including an antidegradation review. Since these conditions have not been satisfied, the existing summer limits are proposed to continue.

Total Suspended Solids, Oil and Grease, and pH

The BPT limits for total suspended solids and oil and grease shown in Attachment 1 are the same as the current permit limits; the limits for all these parameters are proposed to continue.

Biological Oxygen Demand (5 day)

The BPT limits shown in Attachment 1 are less stringent than the existing permit limits. The imposition of less stringent limits is subject to anti-backsliding rules (OAC 3745-33-05), which allow the imposition of less stringent limits only if certain conditions are satisfied, including an antidegradation review. Since these conditions have not been satisfied, the existing limits are proposed to continue.

Chemical Oxygen Demand, Sulfide, Hexavalent Chromium, Chromium – Total, and Phenolics – Total

The BAT limits shown in Attachment 1 are less stringent than the existing permit limits. The imposition of less stringent limits is subject to anti-backsliding rules (OAC 3745-33-05), which allow the imposition of less stringent limits only if certain conditions are satisfied, including an antidegradation review. Since these conditions have not been satisfied, the existing limits are proposed to continue.

Internal Station 602

This station monitors once-through cooling water. Monitoring requirements in the existing permit are proposed to continue.

Bypass Station 603

This station monitors emergency discharges from the facility in the event that all stormwater impoundment structures are full, and the facility has to discharge from the impoundment by pumping. The monitoring requirements in the existing permit are proposed to continue and represent a combination of parameters monitored at the other internal stations under normal operating conditions. Station 603 did not have a discharge from July 2015 to June 2020.

Cenovus is continuing with WWTU improvement projects to eliminate this discharge.

Internal Station 604\694

This station monitors contaminated stormwater. Station 604 has monitoring only; station 694 has limits that are applicable when concentrations of oil and grease or total organic carbon exceed trigger levels at station 604. These requirements are proposed to continue. Station 604 only discharged once from July 2015 to June 2020

Whole Effluent Toxicity Reasonable Potential

Evaluating the acute toxicity results in Table 7 and Table 8 shows no reasonable potential because all the results were none detect. No monitoring is proposed at this time. Cenovus is under Director's Final Findings and Orders

(DFF&Os) to conduct WET testing when using certain chemical additives in the non-contact cooling water system. The requirements of this permit do not supersede the requirements of the DFF&Os.

Additional Monitoring Requirements

Additional monitoring requirements proposed at the final effluent, influent and upstream/downstream stations are included for all facilities in Ohio and vary according to the type and size of the discharge. In addition to permit compliance, this data is used to assist in the evaluation of effluent quality and treatment plant performance and for designing plant improvements and conducting future stream studies.

OTHER REQUIREMENTS

Compliance Schedule

New Limit - A 12-month compliance schedule is proposed for Ohio Refining Company LLC to meet the new seasonal maximum thermal loading limit. Details are in Part I.C of the permit. .

Cooling Water Intake Structure Compliance

Under Section 316(b) of the federal CWA, cooling water intake structures (CWISs) are required to use best technology available (BTA) to minimize adverse environmental impact resulting from the operation of the intake. New rules were promulgated on October 14, 2014, and facilities with permits that expire after July 18, 2018 must be in compliance with the new rules. The CWIS is considered an existing unit at an existing facility and therefore must comply with 40 CFR 125, Subpart J. Information supplied from the permittee regarding the CWIS and other pertinent data include the following:

- Design intake flow rate – 50,000 gpm or 72 MGD
- Percentage of intake flow used for cooling purposes – 82%
- Through-screen design intake velocity – actual field measurements were collected with a lake level of 572 feet and one intake lift pump running; the average linear velocity was 0.40 ft/s at the sump at a distance 3 ft upstream of the traveling screens.
- Estimate of intake flow reduction – 7.8%
- Operation of the cooling water system – 365 days per year.
- Screen description – all water is withdrawn through one or two screen systems; first, a large diameter (6 inch nominal) screen serves as a trash rack; after the trash racks, water is withdrawn through traveling screens (the screens were replaced in 2012 and 2013 with new Siemens Ristroph modified traveling screens); the traveling screens are generally activated when organisms are detected on the screens by the operator and checked once per shift; a low pressure wash is used to remove fish prior to a high pressure spray to remove debris.

Ohio EPA has evaluated this information and at this time has determined that the CWIS represents BTA in accordance with Section 316(b) of the CWA. This BTJ conclusion has been reached based on:

- Submittal of the CWIS study in 2011
- Replacement of the traveling screens with new modified Ristroph traveling screens
- Actual measurements showed an average through-screen flow velocity of 0.40 ft/s, which is less than the threshold value of 0.5 ft/s, which is used as a design standard for new CWISs

In order to ensure that the facility remains compliant with Section 316(b), special conditions are included in Part II of the permit.

Outfall Signage

Part II of the permit includes requirements for the permittee to place and maintain a sign at each outfall to Otter Creek and Maumee Bay providing information about the discharge. Signage at outfalls is required pursuant to OAC 3745-33-08(A).

Part III

Part III of the permit details standard conditions that include monitoring, reporting requirements, compliance responsibilities, and general requirements.

Storm Water Compliance

To comply with industrial storm water regulations, the permittee submitted a form for "No Exposure Certification" which was signed on November 14, 2014. The certification number is 2GRN00472. Compliance with the industrial storm water regulations must be re-affirmed every five years. No later than November 14, 2019, the permittee must submit a new form for "No Exposure Certification" or make other provisions to comply with the industrial storm water regulations.

Figure 1. Location of Ohio Refining Company LLC

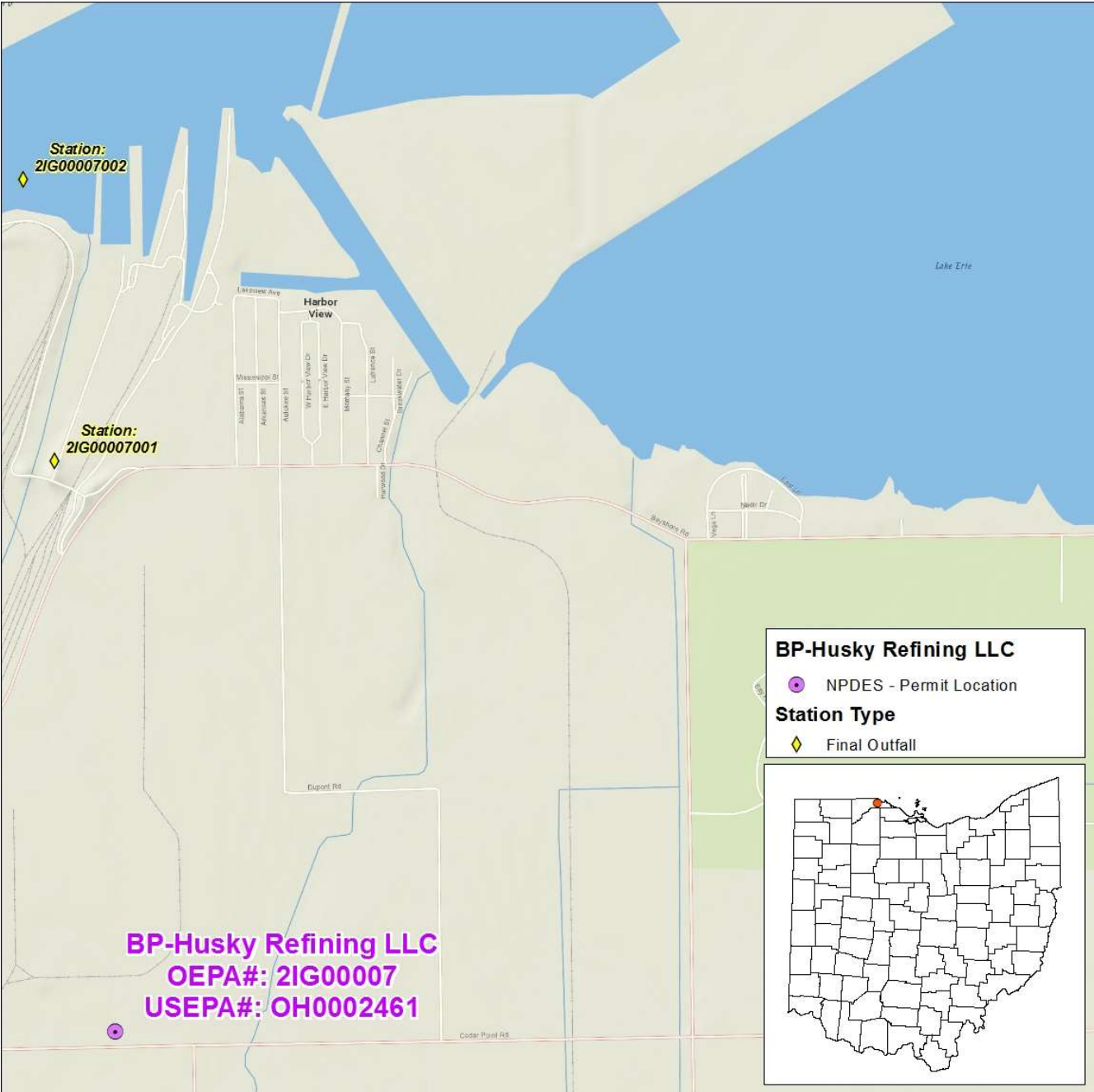


Figure 2. Water Balance Diagram

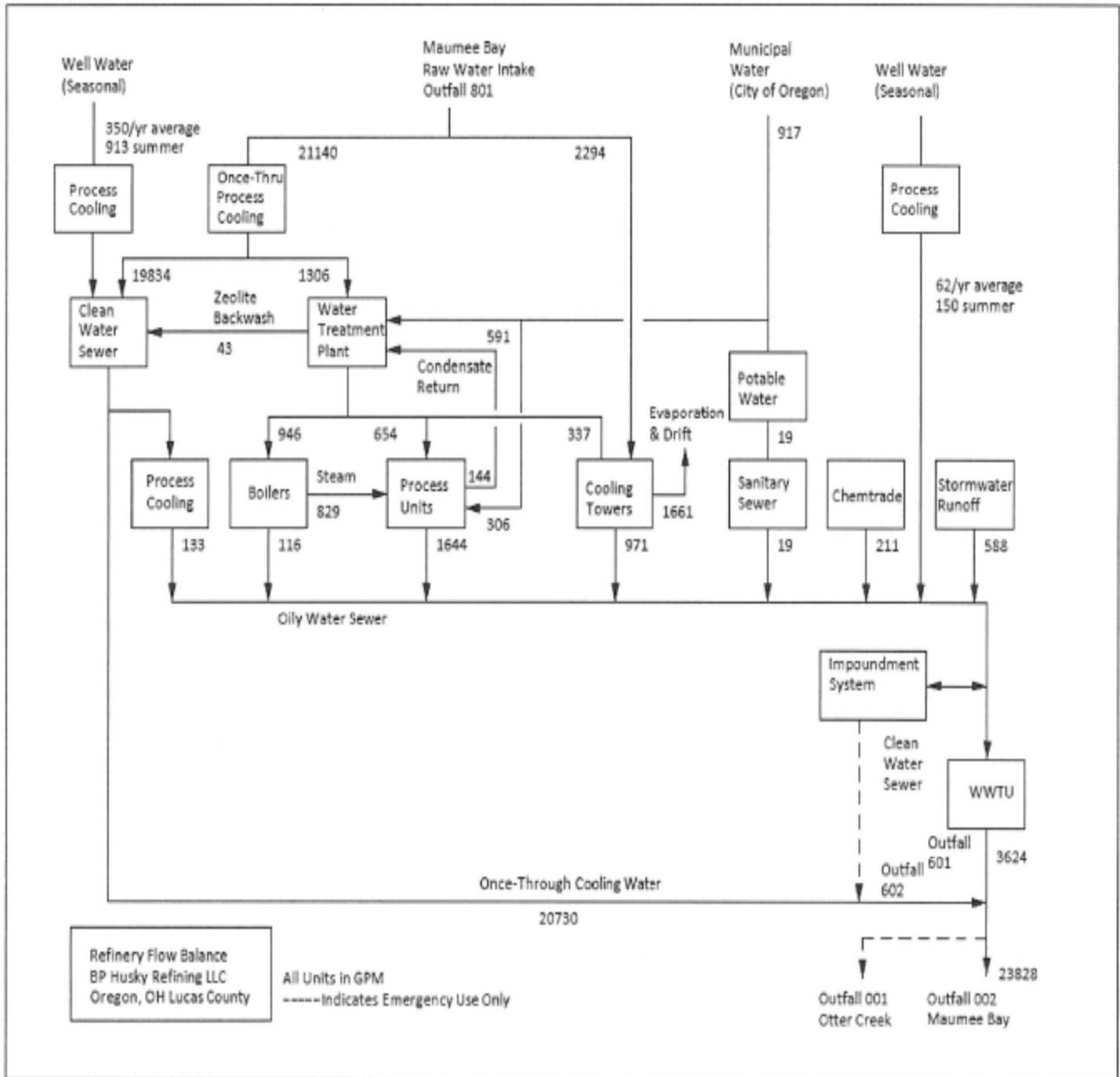


Figure 3. Facility Wastewater Treatment Unit Flow Diagram

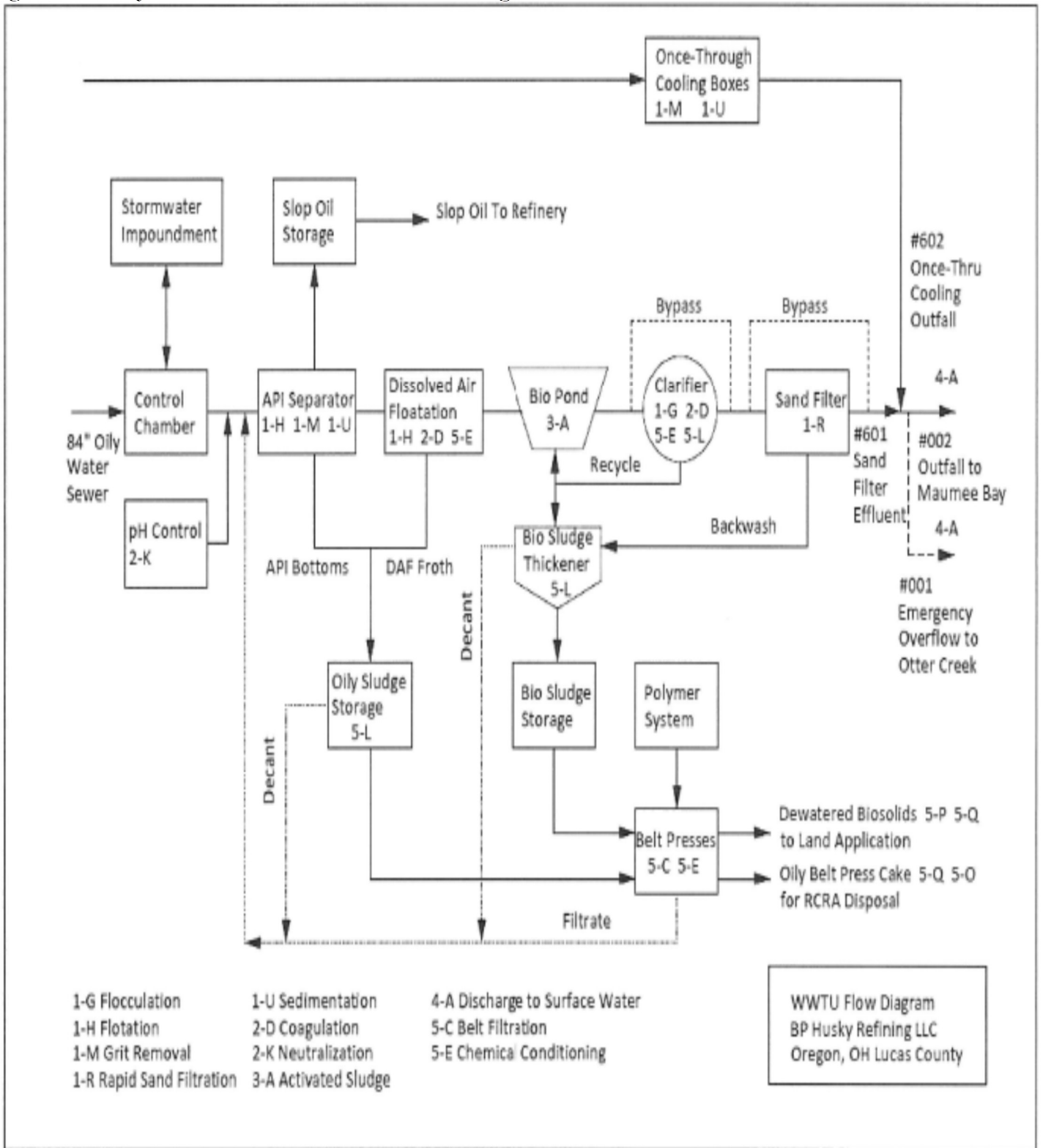


Table 1. Monitoring Stations, Wastewater Sources, Treatment Processes, Discharge Points, and Flow Rates

Station #	Wastewater	Treatment System	Discharge Point	Flow Rate (MGD)
001	Emergency discharge of once-through cooling water, stormwater, and treated process wastewater	None	Otter Creek	--
002	Once-through cooling water, stormwater, and treated wastewater from station 601	None	Maumee Bay	35.5
601	Cooling tower blowdown, process wastewater, stormwater, Chemtrade, Inc. wastewater, sanitary, and stormwater	Grit removal, sedimentation, dissolved air flotation, coagulation, chemical conditioning, activated sludge, rapid sand filtration	Outfall 002	5.6
602	Once-through cooling water	Grit removal, sedimentation, disinfection	Outfall 002	30.0
603	Stormwater impoundment overflow	None	Outfall 001 or 002	--
604	Stormwater	None	Outfall 001 or 002	--

Table 2. Effluent Violations for Outfalls 002, 601, 691 and 692

PARAMETER	2015	2016	2017	2018	2019	2020
2 - E. coli	0	0	0	2	0	0
2 - Mercury, Total (Low Le	0	1	4	0	4	0
601 - Biochemical Oxygen Dem	0	0	0	0	1	0
601 - Oil and Grease, Total	0	0	0	2	0	0
601 - Total Suspended Solids	0	0	0	0	1	0
692 - Carbon, Total Organic	1	7	1	2	1	1
Total	1	8	5	6	7	1

Table 3. Average Annual Effluent Flow Rates Outfall 002

Year	Annual Flow in MGD		
	50th Percentile	95th Percentile	Maximum
2015	32.93	37.51	39.13
2016	27.06	33.18	33.56
2017	36.64	41.84	45.19
2018	38.89	45.84	47.35
2019	38.11	44.38	45.90
2020	38.41	42.80	44.10

MGD = million gallons per day

Table 4. Effluent Characterization Based on Ohio EPA Data and Form 2C Data for Outfall 002

PARAMETER	Ohio EPA	Ohio EPA	Form 2C Data		
	4/10/2018	5/22/2018	# of Samples	Average	Maximum
Total Dissolved Solids (mg/L)	530	542	NT	NT	NT
Arsenic	2.82	2.12	5	AA(8)	AA(8)
Cadmium	0.835	0.134	5	AA(1)	AA(1)
Chromium	4.98	2.26	5	4.25	10
Copper	9.44	8.13	5	8.9	14
Lead	4.16	0.878	5	AA (5)	AA (5)
Nickel	8.37	5.05	5	6.28	11
Selenium	6.07	16.7	48	14.4	43
Thallium	0.154	0.492	5	AA (10)	AA (10)
Aluminum	NT	NT	1	1810	1810
Barium	NT	NT	1	49	49
Iron	NT	NT	1	1820	1820
Manganese	NT	NT	1	47	47
Zinc	33.3	9.2	5	21.06	41
Carbon disulfide	0.588	AA (0.5)	NT	NT	NT
Chloroform	.684	2.2	5	1.56	3.9
Dichlorobromomethane	AA (.23)	0.312	5	AA (1)	AA (1)
Iodomethane	17	AA(0.89)	NT	NT	NT
Magnesium	11.6	15	5	13.74	16.7
Methyl bromide	5.41	AA(.32)	5	1.43	5.41
Sulfate	NT	NT	1	101	101
Molybdenum	NT	NT	1	6	6

AA = not-detected (analytical method detection limit)
 NT = not tested

Table 5. Effluent Characterization Using Self-Monitoring Data

Outfall	Parameter	Unit	Current Limits		# Obs	Percentiles		Data Range
			30 Day	Daily		50th	95th	
001	High Water Temperature	°F	Monitoring Only		1	70	70	70 - 70
	Thermal Discharge	Million BTU/Hr	1250	1250	1	441	441	441 - 441
	Dissolved Oxygen	mg/L	--	4.0 ^m	1	8.7	8.7*	8.7 - 8.7
	pH	S.U.	--	6.5 - 9.0	4	7.63	7.88	7.4 - 7.88
	Selenium, TR	µg/L	Monitoring Only		1	18	18	18 - 18
	Chromium, Hexavalent (Cr +6)	µg/L	Monitoring Only		3	--	--	< 5
	Flow Rate	MGD	Monitoring Only		27	2.9	8.45	0 - 8.97
	Chlorine, Total Residual	mg/L	Monitoring Only		1	--	--	< .02
	Mercury, Total	kg/day	0.00195	0.299	1	.00000562	.00000562	.00000562 - .00000562
	Mercury, Total	ng/L	11.1	1700	1	4.01	4.01	4.01 - 4.01
002	High Water Temperature	°F	Monitoring Only		1824	85	107	57 - 120
	Thermal Discharge	Million BTU/Hr	1250	1250	1827	365	455	-16 - 500
	Dissolved Oxygen	mg/L	--	4.0 ^m	494	7.45	5.4*	4.4 - 10.7
	pH	S.U.	--	6.5 - 9.0	1797	7.86	8.11	7 - 8.47
	Selenium, TR	µg/L	Monitoring Only		61	13	26	0 - 92
	Chromium, Hexavalent (Cr +6)	µg/L	Monitoring Only		60	--	--	< 5
	E. coli	#/100 mL	126	284 ^w	33	20	173	0 - 1140
	Flow Rate	MGD	Monitoring Only		1819	35.4	43.6	0 - 47.4
	Chlorine, Total Residual	mg/L	Monitoring Only		122	< .02	.035	0 - .25
	Mercury, Total	kg/day	0.00167	0.293	85	.000658	.00238	.0000196 - .00968
	Mercury, Total	ng/L	9.7	1700	85	4.89	20.1	1.19 - 54
	Toxicity Equivalent	pg/L	Monitoring Only		19	.0017	.00659	0 - .00769
600	Mercury, Total	ng/L	Monitoring Only		60	202	893	3.28 - 6110
601	Total Precipitation	Inches	Monitoring Only		1800	0	.441	0 - 2.18
	Biochemical Oxygen Demand, 5 Day	kg/day	794	1430	470	< 72.7	217	0 - 2130

	Chemical Oxygen Demand	kg/day	5546	10687	473	968	2310	0 - 8070
	pH	S.U.	--	6.0 - 9.0	464	7.7	8	6.1 - 8.45
	Total Suspended Solids	kg/day	852	1336	481	102	383	0 - 4550
	Oil and Grease, Total	kg/day	310	580	481	< 111	< 111	0 - 693
	Nitrogen, Ammonia - Summer	kg/day	568	1278	235	5.19	174	0 - 554
	Nitrogen, Ammonia - Winter	kg/day	580	1278	237	7.5	245	0 - 428
	Sulfide, Total	kg/day	4.19	9.39	473	.408	1.02	0 - 2.13
	Chromium, Hexavalent (Cr +6)	kg/day	0.48	1.07	59	< .0814	< .0814	0 - .17
	Chromium, Total (Cr)	kg/day	5.8	16.72	60	< .0742	.145	0 - .315
	E. coli	#/100 mL	Monitoring Only		32	< 10	47.9	0 - 108
	Phenolic 4AAP, Total	kg/day	4.99	10.69	472	.218	.691	0 - 3.72
	Flow Rate	MGD	Monitoring Only		1800	5.06	7.33	0 - 8.8
	Mercury, Total	ng/L	Monitoring Only		66	5.4	38.7	.862 - 195
	Toxicity Equivalent	pg/L	Monitoring Only		20	< .001	.00171	0 - .0018
602	High Water Temperature	°F	Monitoring Only		1797	85	108	23 - 122
	pH	S.U.	Monitoring Only		469	7.84	8.11	7 - 8.5
	Carbon, Total Organic (TOC)	mg/L	Monitoring Only		483	8	12.4	3.8 - 40.3
	Flow Rate	MGD	Monitoring Only		1797	30.8	38.2	0 - 40.4
691	Total Precipitation	Inches	Monitoring Only		27	0	.452	0 - .9
	Biochemical Oxygen Demand, 5 Day	kg/day	970	1749	7	< 122	110	0 - 158
	Chemical Oxygen Demand	kg/day	6744	13085	8	846	1340	393 - 1360
	pH	S.U.	--	6.0 - 9.0	6	7.63	7.8	6.98 - 7.8
	Total Suspended Solids	kg/day	924	1448	7	185	303	0 - 305
	Oil and Grease, Total	kg/day	337	632	7	--	--	< 154
	Nitrogen, Ammonia - Summer	kg/day	568	1278	6	7.22	13.6	6.18 - 15.1
	Nitrogen, Ammonia - Winter	kg/day	580	1278	1	--	--	< 6.7

	Sulfide, Total	kg/day	4.19	9.39	7	--	--	< .609
	Phenolic 4AAP, Total	kg/day	5.61	13	7	.352	.691	0 - .775
	Flow Rate	MGD	Monitoring Only		27	8.34	8.95	8.03 - 10.2
692	Carbon, Total Organic (TOC)	mg/L	5.0	5.0	469	.6	3.46	-5 - 31.6
801	High Water Temperature	°F	Monitoring Only		1797	57	82	32 - 100
	Carbon, Total Organic (TOC)	mg/L	Monitoring Only		499	8	343	1.6 - 397

All values are based on annual records unless otherwise indicated. * = For minimum pH, 5th percentile shown in place of 50th percentile; ** = For dissolved oxygen, 5th percentile shown in place of 95th percentile; a = weekly average.”

Table 6. Projected Effluent Quality for Outfall 002

Parameter	Units	Number of Samples	Number > MDL	PEQ Average	PEQ Maximum
2,3,7,8-Tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD)	pg/L	20	13	0.007418	0.012936
Aluminum	µg/L	1	1	8192	11220
Arsenic - TR	µg/L	2	2	7.82268	10.716
Barium	µg/L	1	1	221.774	303.8
Bromodichloromethane	µg/L	2	1	0.865488	1.1856
Cadmium - TR	µg/L	7	2	1.46	2
Carbon disulfide	µg/L	2	1	1.631112	2.2344
Chlorine, Total Residual	mg/L	122	55	0.034837	0.053369
Chloroform (Trichloromethane)	µg/L	7	7	3.212	4.4
Chromium - TR	µg/L	7	7	7.2708	9.96
Hexavalent Chromium (Dissolved)	µg/L	60	1	19.71	27
Copper - TR	µg/L	7	7	13.7824	18.88
Dissolved Solids	mg/L	2	2	1503.508	2059.6
Iron - TR	µg/L	1	1	8237.32	11284
Lead - TR	µg/L	7	2	7.3	10
Manganese - TR	µg/L	1	1	212.722	291.4
Mercury	ng/L	85	85	15.26	23.753
Methyl bromide (Bromomethane)	µg/L	7	6	7.8986	10.82
Molybdenum	µg/L	1	1	27.156	37.2
Nickel - TR	µg/L	7	7	12.2202	16.74
Selenium - TR	µg/L	63	45	26.269	39.753
Thallium	µg/L	2	2	1.364808	1.8696
Zinc - TR	µg/L	7	7	48.618	66.6
Boron	µg/L	1	1	393.762	539.4

MDL = analytical method detection limit
PEQ = projected effluent quality

Table 7. Summary of Facility Acute Toxicity Results

Date	<i>Ceriodaphnia dubia</i> (TU_a)	<i>Pimephales promelas</i> (TU_a)
5/23/2014	AA	AA
8/7/2014	AA	AA
10/9/2014	AA	AA
12/4/2014	AA	AA
6/8/2015	AA	AA
8/28/2015	AA	AA
10/22/2015	AA	AA
5/5/2016	AA	AA
6/22/17	AA	AA

AA = non-detection; analytical method detection limit of 0.2 TU_a, 1.0 TU_c
TU_a = acute toxicity unit

Table 8. Ohio EPA Toxicity Results for Outfall 002

Date	<i>Ceriodaphnia dubia</i> TU_a	<i>Pimephales promelas</i> TU_a
04/09/18	AA	AA
5/22/18	AA	AA

AA = non-detection; analytical method detection limit of 0.2 TU_a,
TU_a = acute toxicity unit
TU_c = chronic toxicity unit

Table 9. Water Quality Criteria in the Study Area

Parameter	Units	Outside Mixing Zone Criteria					Maximum Aquatic Life	Inside Mixing Zone Maximum
		Average						
		Wildlife	Human Health	Agri-culture	Aquatic Life			
2,3,7,8-Tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD)	pg/L	0.0031	0.0086 ^c	--	--	--	--	
Aluminum	µg/L	--	4500	--	--	--	--	
Arsenic - TR	µg/L	--	580	100	150	340	680	
Barium	µg/L	--	160000	--	220	2000	4000	
Bromodichloromethane	µg/L	--	180 ^c	--	340	3100	6200	
Cadmium - TR	µg/L	--	730	50	4.1	9.5	19	
Carbon disulfide	µg/L	--	--	--	15	130	260	
Chlorine, Total Residual	mg/L	--	--	--	0.011	0.019	0.038	
Chloroform (Trichloromethane)	µg/L	--	1700 ^c	--	140	1300	2600	
Chromium - TR	µg/L	--	14000	100	150	3100	6200	
Hexavalent Chromium (Dissolved)	µg/L	--	14000	--	11	16	31	
Copper - TR	µg/L	--	64000	500	16	26	52	
Dissolved Solids	mg/L	--	--	--	1500	--	--	
Iron - TR	µg/L	--	--	5000	--	--	--	
Lead - TR	µg/L	--	--	100	15	280	570	
Manganese - TR	µg/L	--	61000	--	--	--	--	
Mercury	ng/L	1.3	3.1	10000	910	1700	3400	
Methyl bromide (Bromomethane)	µg/L	--	2600	--	16	38	75	
Molybdenum	µg/L	--	10000	--	20000	190000	370000	
Nickel - TR	µg/L	--	43000	200	91	820	1600	
Selenium - TR	µg/L	--	3100	50	5	--	--	
Thallium	µg/L	--	--	--	17	79	160	
Zinc - TR	µg/L	--	35000	25000	210	210	420	
Boron	µg/L	--	200000	--	3900	33000	65000	

Table 10. Instream Conditions and Discharger Flow

Parameter	Units	Season	Value	Basis
<i>Hardness</i>	mg/L	annual	193	N=4 Station P11S32
<i>Cenovus Refinery flow</i>	cfs	annual	63.684	95 percentile of monthly average flow rates EDMR 002 station
<i>Background Water Quality</i>				
2,3,7,8-Tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD)	pg/L		0	No representative data available.
Aluminum	µg/L		781.5	Ohio EPA; 2012-2013; n=4; 0<MDL; Station P11S32 Mean Value
Arsenic - TR	µg/L		4.2	Ohio EPA; 2012-2013; n=4; 0<MDL; Station P11S32 Mean Value
Barium	µg/L		43.5	Ohio EPA; 2012-2013; n=4; 0<MDL; Station P11S32 Mean Value
Bromodichloromethane	µg/L		0	No representative data available.
Cadmium - TR	µg/L		0	Ohio EPA; 2012-2013; n=4; 4<MDL; Station P11S32
Carbon disulfide	µg/L		0	No representative data available.
Chlorine, Total Residual	mg/L		0	No representative data available.
Chloroform (Trichloromethane)	µg/L		0	No representative data available.
Chromium - TR	µg/L		1.45	Ohio EPA; 2012-2013; n=4; 3<MDL; Station P11S32 Mean Value
Hexavalent Chromium (Dissolved)	µg/L		0	No representative data available.
Copper - TR	µg/L		3.6	Ohio EPA; 2012-2013; n=4; 0<MDL; Station P11S32 Mean Value
Dissolved Solids	mg/L		319	Ohio EPA; 2012-2017; n=46; 0<MDL; Station P11S32 Median value
Iron - TR	µg/L		1073.5	Ohio EPA; 2012-2013; n=4; 0<MDL; Station P11S32 Mean Value
Lead - TR	µg/L		1.35	Ohio EPA; 2012-2013; n=4; 3<MDL; Station P11S32 Mean Value
Manganese - TR	µg/L		60	Ohio EPA; 2012-2013; n=4; 0<MDL; Station P11S32 Mean Value
Mercury	ng/L		0	No representative data available.
Methyl bromide (Bromomethane)	µg/L		0	No representative data available.
Molybdenum	µg/L		0	No representative data available.
Nickel - TR	µg/L		4.9	Ohio EPA; 2012-2013; n=4; 0<MDL; Station P11S32 Mean Value
Selenium - TR	µg/L		0	Ohio EPA; 2012-2013; n=4; 4<MDL; Station P11S32
Thallium	µg/L		0	No representative data available.
Zinc - TR	µg/L		0	Ohio EPA; 2012-2013; n=4; 4<MDL; Station P11S32

Boron	µg/L	0	No representative data available.
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MDL = analytical method detection limit
n = number of samples
NPDES = National Pollutant Discharge Elimination System
Ohio EPA = Ohio Environmental Protection Agency

Table 11. Summary of Effluent Limits to Maintain Applicable Water Quality Criteria

Parameter	Units	Outside Mixing Zone Criteria					Maximum Aquatic Life	Inside Mixing Zone Maximum
		Average						
		Wildlife	Human Health	Agri-culture	Aquatic Life			
2,3,7,8-Tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD)	pg/L	0.0031	0.0086 ^c	--	--	--	--	
Aluminum	µg/L	--	41685	--	--	--	--	
Arsenic - TR	µg/L	--	6338	1058	1608	--	680	
Barium	µg/L	--	1759565	--	1985	--	4000	
Bromodichloromethane	µg/L	--	1980	--	3740	--	6200	
Cadmium - TR	µg/L	--	8030	550	45	--	19	
Carbon disulfide	µg/L	--	--	--	165	--	260	
Chlorine, Total Residual	mg/L	--	--	--	0.12	--	0.038	
Chloroform (Trichloromethane)	µg/L	--	18700	--	1540	--	2600	
Chromium - TR	µg/L	--	153986	1086	1636	--	6200	
Hexavalent Chromium (Dissolved)	µg/L	--	154000	--	121	--	31	
Copper - TR	µg/L	--	703964	5464	140	--	52	
Dissolved Solids	mg/L	--	--	--	13310	--	--	
Iron - TR	µg/L	--	--	44265	--	--	--	
Lead - TR	µg/L	--	--	1086	152	--	570	
Manganese - TR	µg/L	--	670400	--	--	--	--	
Mercury	ng/L	1.3	3.1	10000	910	--	3400	
Methyl bromide (Bromomethane)	µg/L	--	28600	--	176	--	75	
Molybdenum	µg/L	--	110000	--	220000	--	370000	
Nickel - TR	µg/L	--	472951	2151	952	--	1600	
Selenium - TR	µg/L	--	34100	550	55	--	--	
Thallium	µg/L	--	--	--	187	--	160	
Zinc - TR	µg/L	--	385000	275000	2310	--	420	
Boron	µg/L	--	2200000	--	42900	--	65000	

Table 12. Parameter Assessment

Group 1:	Due to a lack of criteria, the following parameters could not be evaluated at this time.				
Group 2:	PEQ < 25 percent of WQS or all data below minimum detection limit.				
	WLA not required. No limit recommended; monitoring optional.				
	Arsenic - TR	Bromodichloromethane	Carbon disulfide		
	Chloroform (Trichloromethane)	Chromium - TR	Manganese - TR		
	Molybdenum	Nickel - TR	Thallium		
	Boron				
Group 3:	PEQmax < 50 percent of maximum PEL and PEQavg < 50 percent of average PEL.				
	No limit recommended; monitoring optional.				
	Aluminum	Barium	Cadmium - TR		
	Copper - TR	Dissolved Solids	Iron - TR		
	Lead - TR	Methyl bromide (Bromomethane)	Selenium - TR		
	Zinc - TR				
Group 4:	PEQmax >= 50 percent, but < 100 percent of the maximum PEL or				
	PEQavg >= 50 percent, but < 100 percent of the average PEL. Monitoring is appropriate.				
		Hexavalent Chromium (Dissolved)			
Group 5:	Maximum PEQ >= 100 percent of the maximum PEL or average PEQ >= 100				
	percent of the average PEL, or either the average or maximum PEQ is between 75				
	and 100 percent of the PEL and certain conditions that increase the risk to the				
	environment are present. Limit recommended.				
	<u>Limits to Protect Numeric Water Quality Criteria</u>				
			<i>Recommended Effluent Limits</i>		
	<i>Parameter</i>	<i>Units</i>	<i>Average</i>		<i>Maximum</i>
	Chlorine, Total Residual	mg/L	--		0.038
	Mercury	ng/L	1.3		1700
	2,3,7,8 TCDD/TEQ	pg/L	0.0031		--

PEL = preliminary effluent limit
 PEQ = projected effluent quality
 WLA = wasteload allocation
 WQS = water quality standard

Table 13. Final Effluent Limits

Parameter	Units	Concentration		Loading (kg/day) ^a		Basis ^b
		30 Day Average	Daily Maximum	30 Day Average	Daily Maximum	
<u>Outfall 001</u>						
High Water Temperature	°F	----- Monitor -----				M ^c
Thermal Discharge	Million BTU/Hr		500	--	--	BTJ
Dissolved Oxygen	mg/L	4.0 Minimum		--	--	WQS
pH	S.U.	6.5 - 9.0		--	--	WQS
Hexavalent Chromium (dissolved)	µg/L	----- Monitor -----				RP
Selenium	µg/L	----- Monitor -----				BTJ
<i>E. coli</i>	#/100 mL	126	284 ^d	--	--	WQS
Flow Rate	MGD	----- Monitor -----				M ^c
Chlorine, Total Residual	mg/L	--	0.038	--	--	RP
Mercury	ng/L	9.7	1700	0.00167	0.293	VAR
Toxicity Equivalent	µg/L	----- Monitor -----				RP
<u>Outfall 002</u>						
High Water Temperature	°F	----- Monitor -----				M ^c
Thermal Discharge	Million BTU/Hr	--	500	--	--	EP
Dissolved Oxygen	mg/L	4.0 Minimum		--	--	WQS
pH	S.U.	6.5 - 9.0		--	--	WQS
Hexavalent Chromium (dissolved)	µg/L	----- Monitor -----				RP
Selenium	µg/L	----- Monitor -----				BTJ
<i>E. coli</i>	#/100 mL	126	284 ^d	--	--	WQS
Flow Rate	MGD	----- Monitor -----				M ^c
Chlorine, Total Residual	mg/L	--	0.038	--	--	RP
Mercury	ng/L	9.7	1700	0.00167	0.293	VAR
Toxicity Equivalent	µg/L	----- Monitor -----				RP
<u>Internal Monitoring Station 601</u>						
Total Precipitation	Inches	----- Monitor -----				M ^c
Biological Oxygen Demand (5 day)	mg/L	--	--	794	1430	ABS
Chemical Oxygen Demand	mg/L	--	--	5546	10687	ABS
pH	S.U.	6.0 - 9.0		--	--	BPT
Total Suspended Solids	mg/L	--	--	852	1336	BPT

Parameter	Units	Concentration		Loading (kg/day) ^a		Basis ^b
		30 Day Average	Daily Maximum	30 Day Average	Daily Maximum	
Oil & Grease	mg/L	--	--	310	580	BPT
<u>Ammonia</u>						
Summer	mg/L	--	--	568	1278	ABS/BAT
Winter	mg/L	--	--	580	1278	BAT
Sulfide	mg/L	--	--	4.19	9.39	ABS
Hexavalent Chromium	µg/L	--	--	0.48	1.07	ABS
Chromium, Total	µg/L	--	--	5.8	16.72	ABS
<i>E. coli</i> (summer)	#/100 mL	----- Monitor -----				BPJ
Phenolics, Total	µg/L	--	--	4.99	10.69	ABS
Flow Rate	MGD	----- Monitor -----				M ^c
Mercury	ng/L	----- Monitor -----				M ^c
<u>Fictitious Station 691</u>						
Total Precipitation	Inches	----- Monitor -----				M ^c
Biological Oxygen Demand (5 day)	mg/L	--	--	970	1749	ABS
Chemical Oxygen Demand	mg/L	--	--	6744	13085	ABS
pH	S.U.	6.0 - 9.0		--	--	BPT
Total Suspended Solids	mg/L	--	--	924	1448	BPT
Oil & Grease	mg/L	--	--	337	632	BPT
<u>Ammonia</u>						
Summer	mg/L	--	--	568	1278	ABS/BAT
Winter	mg/L	--	--	580	1278	BAT
Sulfide	mg/L	--	--	4.19	9.39	ABS
Hexavalent Chromium	µg/L	--	--	0.58	1.3	ABS
Chromium, Total	µg/L	--	--	6.58	18.9	ABS
<i>E. coli</i> (summer)	#/100 mL	----- Monitor -----				BPJ
Phenolics, Total	µg/L	--	--	5.61	13	ABS
Flow Rate	MGD	----- Monitor -----				M ^c
Mercury	ng/L	----- Monitor -----				M ^c
<u>Internal Monitoring Station 602</u>						
High Water Temperature	°F	----- Monitor -----				BTJ
pH	S.U.	----- Monitor -----				BTJ
Total Organic Carbon	mg/L	--	----- Monitor -----	-----	-----	BTJ
Flow Rate	MGD	----- Monitor -----				M ^c
<u>Bypass Station 603</u>						

Parameter	Units	Concentration		Loading (kg/day) ^a		Basis ^b
		30 Day Average	Daily Maximum	30 Day Average	Daily Maximum	
Bypass Hours/Day	Hrs/Day	----- Monitor -----				BTJ
Dissolved Oxygen	mg/L	----- Monitor -----				BTJ
Flow Rate	MGD	----- Monitor -----				BTJ
Chemical Oxygen Demand	mg/L	----- Monitor -----				BTJ
Biological Oxygen Demand (5 day)	mg/L	----- Monitor -----				BTJ
Total Suspended Solids	mg/L	----- Monitor -----				BTJ
Oil & Grease	mg/L	----- Monitor -----				BTJ
pH	S.U.	----- Monitor -----				BTJ
Ammonia	mg/L	----- Monitor -----				BTJ
Sulfide	mg/L	----- Monitor -----				BTJ
Hexavalent Chromium	µg/L	----- Monitor -----				BTJ
Chromium, Total	µg/L	----- Monitor -----				BTJ
Phenolics, Total	µg/L	----- Monitor -----				BTJ
Benzene	µg/L	----- Monitor -----				BTJ

^a Effluent loadings at Outfall 002 based on discharge flow of 45.4 MGD. The limits for internal station 601 apply when the flow rate is less than 8.0 MGD. The limits for internal station 691 apply when the flow rate is greater than 8.0 MGD.

- ^b Definitions:
- ABS = Antibalancing Rule (OAC 3745-33-05(F) and 40 CFR Part 122.44(l))
 - BAT = Best Available Technology Economically Achievable, 40 CFR Part 419, “Petroleum Refining Point Source, Subpart B, Cracking Subcategory”
 - BPT = Best Practicable Control Technology Currently Available, 40 CFR Part 419, “Petroleum Refining Point Source, Subpart B, Cracking Subcategory”
 - BTJ = Best Technical Judgment
 - M = BEJ of Permit Guidance 2: Determination of Sampling Frequency Formula for Industrial Waste Discharges
 - RP = Reasonable Potential for requiring water quality-based effluent limits and monitoring requirements in permits (OAC 3745-33-07(A))
 - VAR = Mercury variance (OAC 3745-1-38(J))
 - WQS = Ohio Water Quality Standards (OAC 3745-1)

^c Monitoring of flow and other indicator parameters is specified to assist in the evaluation of effluent quality and treatment plant performance.

Attachment 1. Applicable Federal Effluent Limitation Guidelines

Table A. Best Practicable Control Technology currently available (BPT) - 40 CFR 419.22

Parameter	Lbs/1000 barrels of feedstock	
	Daily Max	30-day Average
Biological Oxygen Demand (5 day)	9.9	5.5
Total Suspended Solids	6.9	4.4
Chemical Oxygen Demand	74	38.4
Oil & Grease	3	1.6
Phenolics	0.074	0.036
Ammonia	6.6	3
Sulfide	0.065	0.029
Chromium, Total	0.15	0.088
Hexavalent Chromium	0.012	0.0056
pH	6.0 - 9.0	

These effluent limitations are then multiplied by a size factor and a process factor to determine the BPT limits for the facility. The size factor is found in 40 CFR 419.22(b)(1) and based upon the capacity of the facility at 160,000 barrels of feedstock per day. The first step in determining the process factor is calculating the refinery capacity for each process category relative to the total throughput and then multiplying by the appropriate weighting factor. The processing configuration values for each category are summed to calculate a total processing configuration value which is then used in the table found in 40 CFR 419.22(b)(2) to determine the process factor for the facility.

Table B. Determination of Size and Process Factors for BPT Calculations

Process Category	Capacity (1000 barrels/day)	Capacity relative to total throughput	Weighing Factor	Processing Configuration
<u>Crude</u>				
Atmospheric distillation	160	1	--	--
Vacuum Distillation	72	0.45	--	--
Crude desalting	160	1	--	--
<i>Sum</i>	<i>392</i>	<i>2.45</i>	<i>1</i>	<i>2.45</i>
<u>Cracking and Coking</u>				
Fluid Catalyst Cracking	55	0.344	--	--
Hydrocracking	31	0.193	--	--
Hydrotreating	113	0.706	--	--
Delayed Coking	35	0.219	--	--
<i>Sum</i>	<i>234</i>	<i>1.46</i>	<i>6</i>	<i>8.76</i>

Process Category	Capacity (1000 barrels/day)	Capacity relative to total throughput	Weighing Factor	Processing Configuration
<u>Asphalt Processing</u>				
Asphalt Production	9	0.056	--	--
<i>Sum</i>	9	0.056	12	0.67
<u>Reforming/Alkylation</u>				
Catalytic Reforming	42	--	--	--
Sulfuric Acid Alkylation	12	--	--	--
<i>Sum</i>	54	--	--	--
<i>Total Process Configuration</i>				
				11.88
<i>Process Factor</i>				1.89
<i>Size Factor</i>				1.41

Calculation of the process factor as required in the federal effluent guidelines and demonstrated in Cenovus' NPDES permit renewal application is shown in Table C by substituting capacity and throughput values for Cenovus into the example found in 40 CFR 419.42(b)(3). The size factor is calculated to be 1.41. Using a total process configuration factor of 11.61 and the table found in 40 CFR 419.22(b)(2), the process factor becomes 1.89. The BPT effluent limits shown Table A are then multiplied by the capacity in barrels per day (160,000), the size factor, the process factor, and a unit conversion factor (pounds to kilograms) to determine the BPT permit limits for the facility:

$$\text{Discharge Limit} = \text{BPT limit} * \text{Crude Capacity} * \text{Size Factor} * \text{Process Factor} * 0.454 \text{ lb/kg}$$

Table C. BPT Effluent and Loading Limits

Parameter	BPT Effluent Limitations		BPT Loading Limits	
	Lbs/1000 barrels of feedstock		kg/day	
	Daily Max	30-day Average	Daily Max	30-day Average
Biological Oxygen Demand (5 day)	9.9	5.5	1916	1065
Total Suspended Solids	6.9	4.4	1336	852
Chemical Oxygen Demand	74.0	38.4	14325	7433
Oil & Grease	3.0	1.6	581	310
Phenolics	0.074	0.036	14.3	6.97
Ammonia	6.6	3.0	1278	581
Sulfide	0.065	0.029	12.6	5.61
Chromium, Total	0.15	0.088	29.0	17.0
Hexavalent Chromium	0.012	0.0056	2.32	1.08

If contaminated runoff is included or mixed with the process wastewaters, additional loadings for the BPT limits are determined in accordance with 40 CFR 419.22(e)(2). The flow rate for contaminated runoff has been calculated at 0.878 MGD, which is used to determine the additional loadings:

$$\text{Loading limit} = \text{BPT Effluent Limit} * \text{Flow Rate (MGD)} * 1000 * 0.454 \text{ kg/lb}$$

Table D. BPT Effluent and Loading Limits for Contaminated Runoff

Parameter	BPT Effluent Limitations		BPT Loading Limits	
	Lbs/1000 gallons of flow		kg/day	
	Daily Max	30-day Average	Daily Max	30-day Average
Biological Oxygen Demand (5 day)	0.4	0.22	159	88
Total Suspended Solids	0.28	0.18	112	72
Chemical Oxygen Demand	3.0	1.5	1196	598
Oil & Grease	0.13	0.067	52	27
Phenolics	0.0029	0.0014	1.16	0.56
Chromium, Total	0.006	0.0035	2.39	1.4
Hexavalent Chromium	0.00052	0.00023	0.21	0.09

Table E. Best Available Technology Economically Achievable (BAT) - 40 CFR 419.23: Ammonia, Chemical Oxygen Demand, and Sulfide

$$\text{Loading Limit} = \text{BAT Effluent limit} * \text{Crude Capacity} * \text{Size Factor} * \text{Process Factor} * 0.454 \text{ lb/kg}$$

Parameter	BAT Effluent Limitations		BAT Loading Limits	
	Lbs/1000 gallons of flow		kg/day	
	Daily Max	30-day Average	Daily Max	30-day Average
Chemical Oxygen Demand	74	38.4	14324	7433
Ammonia	6.6	3.0	1278	581
Sulfide	0.065	0.029	12.6	5.61

Calculated BAT permit limits for the parameters in Table E are the same as the BPT permit limits. BAT permit limits for phenolic compounds, total chromium, and hexavalent chromium are determined by summing the products of the BAT effluent limitation factors for each processing category multiplied by the total capacity of the corresponding processing category and a unit conversion factor (pounds to kilograms).

$$\text{Loading Limit} = \text{BAT Effluent Limit} * \text{Total Capacity} * 0.454 \text{ lb/kg}$$

Table F. BAT Effluent and Loading Limits for Phenolic Compounds

	BAT Effluent Limitations			BAT Loading Limits	
	Lbs/1000 gallons of flow			kg/day	
Process	Daily Max	30-day Average	Total Capacity (1000 barrels)	Daily Max	30-day Average
Crude Processing	0.013	0.003	392	2.31	0.53
Cracking/Coking	0.147	0.036	229	15.22	3.73
Asphalt Processing	0.079	0.019	9	0.32	0.08
Reforming/Alkylation	0.132	0.032	57	3.42	0.83
<i>Total</i>				<i>21.27</i>	<i>5.17</i>

Table G. BAT Effluent and Loading Limits for Total Chromium

	BAT Effluent Limitations			BAT Loading Limits	
	Lbs/1000 gallons of flow			kg/day	
Process	Daily Max	30-day Average	Total Capacity (1000 barrels)	Daily Max	30-day Average
Crude Processing	0.011	0.004	392	1.96	0.71
Cracking/Coking	0.119	0.041	229	12.32	4.24
Asphalt Processing	0.064	0.022	9	0.26	0.09
Reforming/Alkylation	0.107	0.037	57	2.77	0.96
<i>Total</i>				<i>17.31</i>	<i>6</i>

Table H. BAT Effluent and Loading Limits for Hexavalent Chromium

	BAT Effluent Limitations			BAT Loading Limits	
	Lbs/1000 gallons of flow			kg/day	
Process	Daily Max	30-day Average	Total Capacity (1000 barrels)	Daily Max	30-day Average
Crude Processing	0.0007	0.0003	392	0.12	0.05
Cracking/Coking	0.0076	0.0034	229	0.79	0.35
Asphalt Processing	0.0041	0.0019	9	0.02	0.01
Reforming/Alkylation	0.0069	0.0031	57	0.18	0.081
<i>Total</i>				<i>1.11</i>	<i>0.49</i>

If contaminated runoff is included or mixed with the process wastewaters, additional loadings for the BAT limits are determined in accordance with 40 CFR 419.23(f)(2). The flow rate for contaminated runoff has been calculated at 0.878 MGD, which is used to determine the additional loadings.

$$\text{Loading limit} = \text{BAT Effluent Limit} * \text{Flow Rate (MGD)} * 1000 * 0.454 \text{ kg/lb}$$

Table I. BAT Effluent and Loading Limits for Contaminated Runoff

Parameter	BAT Effluent Limitations		BAT Loading Limits	
	Lbs/1000 gallons of flow		kg/day	
	Daily Max	30-day Average	Daily Max	30-day Average
Phenolics	0.0029	0.0014	1.16	0.56
Chromium, Total	0.005	0.0018	1.99	0.72
Hexavalent Chromium	0.00052	0.00023	0.21	0.09
Chemical Oxygen Demand	3.0	1.5	1196	598

Attachment 2. Cooling Water Additives List

BP Boiler and Cooling Water Chemicals	
Chemical Name	Purpose
EVAC Biocide	Mollusk Control Treatment
Coagulant Aid 35	Coagulant - Detoxicant for Mollusk Treatment
Nalco 7408	Dechlorination Aid
Nalco 3DT184	Cooling Water Corrosion Inhibitor
Nalco 3DT396	Cooling Water Corrosion and Scale Inhibitor
Nalco 3DT397	Cooling Water Yellow Metal Corrosion Inhibitor
Nalco 7346 Tab	Oxidizing Biocide
Nalco H-550	Non-oxidizing biocide
Nalco 71D5 Plus	Antifoam
Nalco Nalsperse 7348	Cooling Water Dispersant
Nalco Nalsperse 73550	Cooling Tower Dispersant and Detergent
Nalco 3DT701	Cooling Water Corrosion Inhibitor
Nalco 3DT190	Cooling Water Dipersant
Nalco 3DT180	Cooling Water Corrosion Inhibitor
Nalco NALCOLYTE 7134	Coagulant - Clarification Aid
Nalco NALCLEAR 7744	Anionic Flocculant - Clarification Aid
Nalco SUR-GARD 1700	Oxygen Scavenger
Nalco Tri-ACT 1825	Condensate Corrosion Inhibitor
Nalco NexGuard 22310	Internal Boiler Treatment
Nalco 1720	Sodium Bisulfite
Nalco PermaTreat PC-191	Reverse Osmosis Antiscalant
Hydro test dyes (blue powder/red powder)	Dye for tank testing
LIME	Cold Lime Softening
Usalco 38	Sodium Aluminate - Clarification Aid
Sodium Hypochlorite	Bleach/Biocide
Sulfuric Acid	Cooling Water Neutralizer

ChemTrade Boiler and Cooling Water Chemicals	
Chemical Name	Purpose
Chemtreat BL-1544	Condensate Nuetralizing Amine (ChemTrade)
Chemtreat BL-4350	Primary Scale Inhibitor (ChemTrade)
Chemtreat CL-450	Surfactant Biodispersant (ChemTrade)
Chemtreat CL-401	Scale Inhibitor
Sodium Hypochlorite	Bleach for Cooling Water
CL 240	Chemtrade Cooling Water Defoamer
BL 1258	Chemtrade Catalyzed Sodium Sulfite
CL 4858	Replacement for CL 4848

Attachment 3. Cooling Water Intake Structure Compliance

Cooling water intake structure information

The CWIS is considered an existing unit at an existing facility and therefore must comply with 40 CFR 125, Subpart J. Information supplied from the permittee regarding the CWIS and other pertinent data include the following:

- The design intake flow (DIF) of the CWIS is 72 MGD. The actual intake flow (AIF) is 44.1 MGD.
- Approximately 82 percent of the intake flow is used for cooling purposes.
- The use of closed-cycle cooling for portions of the flow results in a reduction of approximately 68%.
- Biological data for impingement and entrainment evaluation were compiled from the neighboring Bay Shore Plant's 2018 316(b) submittal.
- The average through-screen intake velocity – 0.44 feet per second (fps).
- In 2012 and 2013, rotating screens at Cenovus were replaced with new Siemens Ristroph modified traveling screens.

Description of intake structure

The CWIS withdrawals water from a 1,000-foot intake channel, through a sheet piling wall, and into the screen house. Intake water flows through two 10-foot wide modified Ristroph travelling screens with ¼ -inch openings. Impinged organisms are released from the screens using a pressurized water stream and returned to the intake channel via an 18-inch return flume. Two pumps with a design capacity of 25,000 gpm each pump water from the screen house to the intake basin, from which water passively flows to the plant by gravity.

Flow Reduction

The facility utilizes cooling towers, which reduce the total intake flow by approximately 68% compared to the baseline water need of 137 MGD. Cenovus minimizes the required makeup flow by maintaining a 95% flow reduction in the closed-cycle recirculation system. As opposed to the 68 MGD that would be required with a once-through system, the facility only routes 3.4 MGD to this system for make-up water. The facility has also maximized their surface water withdrawal reduction via operational changes within their processes. Additional expenditures to further reduce withdrawals would not result in equal reductions in entrainment.

Fish and wildlife in the vicinity of the intake structure

Cenovus references the neighboring Bay Shore Station's 316(b) report for biological data.

Federal and State-Listed Endangered Mussel Species

The U.S. Fish and Wildlife Services (USFWS) and Ohio Department of Natural Resources (ODNR) lists the mussel species in the table below as endangered or threatened in the State of Ohio and nationally.

Common Name	Scientific Name	Listing Status	
Black sandshell	<i>Ligumia recta</i>	Threatened	State

Eastern pondmussel	<i>Ligumia nasuta</i>	Endangered	State
Fawnsfoot	<i>Truncilla donaciformis</i>	Threatened	State
Pondhorn mussel	<i>Unio merus tetralasmus</i>	Threatened	State
Rayed bean	<i>Villosa fabalis</i>	Endangered	State and Federal
Snuffbox mussel	<i>Epioblasma triquetra</i>	Endangered	State
Threehorn wartyback	<i>Obliquaria reflexa</i>	Threatened	State

*Data from Bay Shore Station 316(b) requirements report (2018).

Federal Critical Habitat

None were identified.

State-Listed Endangered or Threatened Fish Species

The ODNR lists the fish species in the table below as endangered or threatened in the State of Ohio.

Common Name	Scientific Name	Listing Status
American eel	<i>Anguilla rostrata</i>	Threatened
Channel darter	<i>Percina copelandi</i>	Threatened
Western banded killifish	<i>Fundulus diphanus</i>	Endangered

*Data from Bay Shore Station 316(b) requirements report (2018).

Fragile Species

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 travelling screens are in operation.” The fragile species occurring near Cenovus includes alewife, gizzard shad, and rainbow smelt.

Other Agency Reviews

The USFWS, Ohio Ecological Services office was provided Cenovus’ 316(b) information submittal for a 60-day review period. No objections regarding the facility’s biological data were received by Ohio EPA.

Impingement and Entrainment

Impingement

Due to lack of facility-specific impingement data, the impingement studies conducted at the Bay Shore Station in 2005 – 2006 and 2014 – 2015 were used to evaluate susceptibility. The 2014 – 2015 study was performed after installation of the fish diversion system, which likely reduces impingement mortality compared to the Refinery’s screening system. The table below compares the intakes for Cenovus and the Bay Shore Station.

	Facility	
	BP Husky Refinery	Bay Shore Station
Screening Technology	Siemens Ristroph modified traveling screens	Dual-flow traveling screens w/ gravity-fed fish return system

Screen Opening Size	1/4"	3/8"
Actual Intake Flow (MGD)	44.1	187.8
Intake Velocity (fps)	0.44	0.33
Intake Location	Onshore	Onshore

* Bay Shore Station CWIS information after installation of fish return system.

The 2005 – 2006 study indicated an annual impingement rate of approximately 46 million fish, representing 55 species and 16 families. The primary species collected were emerald shiner (52.3%), gizzard shad (31.1%), and white perch (10.4%)

The most recent study demonstrated an estimated annual impingement rate of 9.4 million fish, an 80% reduction from the previous sampling. A total of 28 species were collected, 73% of which were gizzard shad.

Family	Common Name	Scientific Name	Pre-Fish Diversion System		Post-Fish Diversion System	
			N	%	N	%
Petromyzontidae	Silver lamprey	<i>Ichthyomyzon unicuspis</i>	152	< 0.01	-	-
Clupeidae	Alewife	<i>Alosa pseudoharengus</i>	270	< 0.01	-	-
	Gizzard shad	<i>Dorosoma cepedianum</i>	14,313,113	31.10	6,995,412	74.21
Cyprinidae	Bluntnose minnow	<i>Pimephales notatus</i>	2,357	0.01	-	-
	Central stoneroller	<i>Campostoma anomalum</i>	815	< 0.01	-	-
	Common carp	<i>Cyprinus carpio</i>	8,673	0.02	71	< 0.01
	Creek chub	<i>Semotilus atromaculatus</i>	130	< 0.01	-	-
	Emerald shiner	<i>Notropis atherinoides</i>	24,080,877	52.32	984,123	10.44
	Fathead minnow	<i>Pimephales promelas</i>	995	< 0.01	-	-
	Golden shiner	<i>Notemigonus crysoleucas</i>	416	< 0.01	-	-
	Goldfish	<i>Carassius auratus</i>	4,571	0.01	370	< 0.01
	Northern redbfin shiner	<i>Lythrurus umbratilis</i>	130	< 0.01	-	-
	Sand shiner	<i>Notropis stramineus</i>	32,112	0.07	-	-
	Silver chub	<i>Macrhybopsis storeriana</i>	10,703	0.02	30	< 0.01
	Spotfin shiner	<i>Cyprinella spiloptera</i>	741	< 0.01	-	-
	Spottail shiner	<i>Notropis hudsonius</i>	313,326	0.68	26,540	0.28
	Striped shiner	<i>Luxilus chrysocephalus</i>	-	-	323	< 0.01
Catostomidae	Bigmouth buffalo	<i>Ictiobus cyprinellus</i>	281	< 0.01	-	-
	Black redbhorse	<i>Moxostoma duquesnei</i>	826	< 0.01	-	-
	Quillback	<i>Carpionodes cyprinus</i>	1,430	< 0.01	-	-
	Redhorse spp.	<i>Moxostoma spp.</i>	1,315	< 0.01	-	-

Family	Common Name	Scientific Name	Pre-Fish Diversion System		Post-Fish Diversion System	
			N	%	N	%
	Shorthead redhorse	<i>Moxostoma macrolepidotum</i>	1,555	< 0.01	-	-
	White sucker	<i>Catostomus commersonii</i>	1,172	< 0.01	836	0.01
Esocidae	Northern pike	<i>Esox Lucius</i>	421	< 0.01	160	< 0.01
Ictaluridae	Black bullhead	<i>Ameiurus melas</i>	458	< 0.01	-	-
	Brown bullhead	<i>Ameiurus nebulosus</i>	7,448	0.02	-	-
	Channel catfish	<i>Ictalurus punctatus</i>	77,469	0.17	3,670	0.04
	Flathead catfish	<i>Pylodictis olivaris</i>	158	< 0.01	55	< 0.01
	Stonecat madtom	<i>Noturus flavus</i>	296	< 0.01	23	< 0.01
	Tadpole madtom	<i>Noturus gyrinus</i>	1,272	< 0.01	-	-
	Yellow bullhead	<i>Ameiurus natalis</i>	1,249	< 0.01	-	-
Salmonidae	Rainbow trout	<i>Oncorhynchus mykiss</i>	93	< 0.01	-	-
Lepisosteidae	Longnose gar	<i>Lepisotus osseus</i>	-	-	72	< 0.01
Osmeridae	Rainbow smelt	<i>Osmerus mordax</i>	11,472	0.02	-	-
Atherinidae	Brook silverside	<i>Labidesthes sicculus</i>	20,538	0.04	-	-
Fundulidae	Western banded killifish	<i>Fundulus diaphanus Menona</i>	171	< 0.01	-	-
Percopsidae	Trout-perch	<i>Percopsis omiscomaycus</i>	159,379	0.35	9,519	0.10
Moronidae	White perch	<i>Morone americana</i>	4,769,163	10.36	1,349,310	14.31
	White bass	<i>Morone chrysops</i>	1,593,199	3.46	90	< 0.01
Centrarchidae	Black crappie	<i>Pomoxis nigromaculatus</i>	545	< 0.01	-	-
	Bluegill	<i>Lepomis macrochirus</i>	23,103	0.05	9,284	0.10
	Green sunfish	<i>Lepomis cyanellus</i>	384	< 0.01	348	< 0.01
	Largemouth bass	<i>Micropterus salmoides</i>	3,031	0.01	1,245	0.01
	<i>Lepomis</i> spp.	<i>Lepomis</i> spp.	171	< 0.01	-	-
	Orangespotted sunfish	<i>Lepomis humilis</i>	1,621	< 0.01	198	< 0.01
	Pumpkinseed	<i>Lepomis gibbosus</i>	3,333	0.01	121	< 0.01
	Rock bass	<i>Ambloplites rupestris</i>	-	-	317	< 0.01
	Smallmouth bass	<i>Micropterus dolomieu</i>	4,445	0.01	-	-
	White crappie	<i>Pomoxis annularis</i>	1,306	< 0.01	108	< 0.01
Percidae	Black darter	<i>Etheostoma duryi</i>	372	< 0.01	-	-

Family	Common Name	Scientific Name	Pre-Fish Diversion System		Post-Fish Diversion System	
			N	%	N	%
	Channel darter	<i>Percina copelandi</i>	342	< 0.01	-	-
	Logperch	<i>Percina caprodes</i>	51,547	0.11	2,289	0.02
	Sauger	<i>Sander canadensis</i>	128	< 0.01	-	-
	Walleye	<i>Sander vitreus</i>	77,812	0.17	-	-
	Yellow perch	<i>Perca flavescens</i>	123,405	0.27	27,291	0.29
Sciaenidae	Freshwater drum	<i>Aplodinotus grunniens</i>	225,706	0.49	10,631	0.11
Gobiidae	Round goby	<i>Neogobius melanostomus</i>	93,918	0.20	3,864	0.04
Total Species			55		28	
Total Impinged			46,030,008		9,427,134	

Entrainment

Bay Shore studies from 2005 – 2006 and 2016 – 2017 were analyzed to evaluate entrainment potential at Cenovus. The yields of both studies were highly composed of freshwater drum larvae, *Morone* spp. larvae, unidentified larvae, and freshwater drum eggs. In addition, the 2005 – 2006 sampling consisted of 24% smelt/clupeid larvae and the more recent study turned up a large percentage of gizzard shad larvae.

In comparison, *Morone* spp. lifestages were a dominant taxon in 2016 and 2017, but white bass and white perch (which are *Morone* spp.) only constituted approximately 9% of entrainment in 2005 – 2006. Logperch, trout-perch, and *Notropis* spp. entrainment was notably lower during the 2016 – 2017 study compared to historical data. Additionally, many species entrained historically were not collected during 2016-2017, including lake whitefish, burbot, rainbow smelt, and grass pickerel.

The composition of species entrained at Cenovus is expected to be consistent with sampling results from the Bay Shore Plant studies due to the intake structure types and proximity of the intakes. Based on the smaller screen opening size and an intake flow that is approximately 23% of that at the Bay Shore Plant, significantly lower entrainment rates are expected at the Refinery.

Compliance with 40 CFR 125.94(c) and (d)

This facility utilizes the following to minimize adverse environmental impacts:

1. Impingement

- a. **Impingement Mortality BTA - 40 CFR 125.94(c)(5)** Cenovus proposes modified traveling screens as the impingement BTA compliance option. In accordance with 40 CFR 122.21(r)(6) (i), the permittee will be required to perform an impingement technology performance optimization study.

2. Entrainment

- a. **Site-Specific Entrainment Standards – 40 CFR 125.94(d):** The permittee proposes closed-cycle recirculation to minimize entrainment. Assuming that the reduction in entrainment is commensurate with reduction in flow, Cenovus' CWIS reduces entrainment by

approximately 68 percent. By rule, closed-cycle recirculating systems are considered BTA for both new units at existing facilities and new facilities.

Director Requirements

The Director is required to include monitoring requirements, record keeping requirements, and reporting requirements within the permit. Additionally, the Director is required to make site-specific entrainment requirements weighing various factors.

Monitoring

40 CFR 125.96(a) – Monitoring requirements for impingement mortality for existing facilities:

The Director may establish monitoring requirements such as intake velocity, biological monitoring, and flow measurements. The permittee shall complete two years of biological data measuring the reduction in impingement mortality achieved by the modified traveling screens.

40 CFR 125.96(b) – Monitoring requirements for entrainment for existing facilities:

The Director may establish monitoring requirements for entrainment. A flow monitoring requirement is proposed for the intake station to characterize flows used for makeup and once-through cooling.

40 CFR 125.96(e) – Visual or remote inspections:

To comply with the regulation, the permit proposes weekly visual or remote monitoring devices to ensure that all technologies installed are maintained and operated as designed.

Reporting and Recordkeeping Requirements

40 CFR 125.97(a) – Monitoring Reports

The permittee is required to submit eDMRs which will characterize discharge rates.

40 CFR 125.97(c) – Annual certification

The permittee is required to submit an annual certification indicating any substantial changes at any unit which may impact cooling water intake. This is consistent with the rule.

40 CFR 125.97(d) – Permit reporting records retention

The permittee shall retain all records of all submissions related to 316(b) until the subsequent permit is issued.

Site Specific Entrainment BTA Determination

The permittee proposes closed-cycle recirculating system to minimize entrainment. For both *new units at existing facilities* and *new facilities*, closed-cycle recirculating systems are indicated as the best technology available according to the 40 CFR 125.94(e) and 40 CFR 125.85, respectively, although additional measures may be required depending on site conditions and *new facilities* also require additional flow requirements based on water source body. For *existing units*, the Director must weigh factors to determine whether there are entrainment control technologies that perform better than the selected technologies. However, since this facility employs closed cycle cooling and minimizes the amount of makeup water withdrawn, it was the only technology evaluated.

Must Consider Factors

The following correlate to subparagraphs of 40 CFR 125.98(f)(2) and are factors the Director must consider in BTA determination.

Numbers and types of organism entrained, including, specifically, the numbers and species (or lowest taxonomic classification possible) of Federally-listed, threatened and endangered species, and designated critical habitat (e.g., prey base).

The rayed bean, a freshwater mussel, is the only federally-listed species that is likely to occur near the Refinery's intake. Mussels are not subject to impingement or entrainment during the adult life stage. However, larval glochidia of the rayed bean are known to parasitize logperch, which have been documented near the facility.

In addition, one western banded killifish (state endangered) and two channel darters (state threatened) were impinged at Bay Shore in August 2005 and an American eel (state threatened) was collected via electrofishing from the lower Maumee River in June 1986. Eggs and larval stages of these species may be entrained if present near the intake.

Impact of changes in particulate emissions or other pollutants associated with entrainment technologies.

This is not applicable.

Land availability inasmuch as it relates to the feasibility of entrainment technology.

No evaluation was performed on land availability as it relates to additional entrainment reduction technologies. Conversion of the once-through cooling portion of the system to a recirculating system would require extensive planning and construction of additional structures. In addition to water reroutes, these factors would make this alternative unnecessary, as the facility already has a low potential to cause extensive impacts from entrainment.

Remaining useful plant life.

There is no proposed production end date for this facility.

Quantified and qualitative social benefits and costs of available entrainment technologies when such information on both benefits and costs is of sufficient rigor to make a decision.

There is no data on the social benefits and costs of available entrainment technology of sufficient rigor to weigh this factor.

May consider factors

The following correlate to subparagraphs of 40 CFR 125.98(f)(3) and are factors the Director may consider when determining BTA.

Entrainment impacts on the waterbody.

The entrainment impacts are thought to be negligible based on the small size of the intake versus the size of the water body. Whereas a retrofit to complete recirculation would reduce necessary withdrawals, the anticipated biological benefits are not expected to be proportional to the cost.

Thermal discharge impacts.

Ohio EPA is proposing thermal discharge limits that are protective of WQS for temperature. Eliminating the once-through cooling component of the current system would reduce the thermal load, but temperature standards should already be attained without the addition of new technologies. Therefore, the biology in the vicinity of the discharge should not be harmed or impaired due to thermal effects.

Credit for reductions in flow associated with the retirement of units occurring within the ten years preceding October 14, 2014.

This is not applicable.

Impacts on the reliability of energy delivery within the immediate area.

This is not applicable.

Impacts on water consumption.

The impact on water consumption is thought to be negligible as the withdrawals a minimal amount versus the size of the water body.

Availability of process water, gray water, waste water, reclaimed water, or other waters of appropriate quantity and quality for reuse as cooling water.

The permittee has evaluated alternatives for water reuse and is operating at the minimum-required volume with the system that is currently in place.

Summary

The Director considers Cenovus' cooling water intake structure to be BTA to minimize adverse environmental impacts based on the use of closed-cycle recirculation for a portion of cooling water flows and modified traveling screens.

Attachment 4. Summary of Results of Thermal Mixing Zone Study

Table A. Frequency of Estimated Excursions at the Surface Above the Thermal Water Quality Standard

Distance from Outfall (ft)	Ambient Conditions		Average Thermal Loading ^a		Maximum Thermal Loading ^b	
	Daily Max	Monthly Avg	Daily Max	Monthly Avg	Daily Max	Monthly Avg
-3168	2.5%	0%	2.5%	0%	2.5%	0%
-1848	2.5%	0%	2.5%	0%	5.1%	0%
-528	2.5%	0%	2.5%	0%	14.4%	50.0%
0	2.5%	0%	3.4%	0%	21.2%	50.0%
528	2.5%	0%	3.4%	0%	12.7%	50.0%
1848	2.5%	0%	2.5%	0%	7.6%	0%
3168	2.5%	0%	2.5%	0%	5.1%	0%
4488	2.5%	0%	2.5%	0%	4.2%	0%
5808	2.5%	0%	2.5%	0%	3.4%	0%
8448	3.4%	0%	3.4%	0%	4.2%	0%
11088	2.5%	0%	2.5%	0%	2.5%	0%

^a = average thermal loading utilized for the model was 408 BTU/hr

^b = maximum permitted thermal load of 1250 BTU/hr

Table B. Estimated Changes in Temperature at the Surface

Distance from Outfall (ft)	Average Thermal Loading			Maximum Permitted Thermal Loading		
	ΔT - 50th Percentile	ΔT - 70th Percentile	ΔT - 90th Percentile	ΔT - 50th Percentile	ΔT - 70th Percentile	ΔT - 90th Percentile
-3,168	0.4	0.8	1.5	1.4	2.3	3.5
-1,848	0.7	1.2	2.4	2.3	3.4	4.9
-528	1.4	2.2	3.9	4.2	5.5	7.3
0	1.8	2.8	4.6	5.2	6.4	8.1
528	1.6	2.5	4	4.6	5.7	7.2

1,848	1	1.8	3.2	3.3	4.6	6
3,168	0.8	1.5	2.8	2.7	3.9	5.4
4,488	0.6	1.1	2.3	2	3.1	4.5
5,808	0.5	0.8	1.8	1.4	2.4	3.8
8,448	0.3	0.5	1.2	0.9	1.5	2.8
11,088	0.2	0.3	0.7	0.5	0.8	1.8

The change in temperature is estimated based on recorded temperatures at the 50th, 70th, and 90th percentiles.

Attachment 5. Mercury Reduction Results

Date	Process treatment influent Station 600 (ng/L)	Process treatment effluent Station 601 (ng/L)	% Reduction
1/4/2016	96.9	4.73	95.12%
2/1/2016	85.7	4.1	95.22%
3/14/2016	228	3.95	98.27%
4/15/2016	296	2.43	99.18%
5/12/2016	495	7.65	98.45%
6/8/2016	547	0.862	99.84%
7/14/2016	489	10.3	97.89%
8/9/2016	154	2.78	98.19%
9/12/2016	63.2	1.7	97.31%
10/10/2016	113	2.61	97.69%
11/7/2016	217	5.38	97.52%
12/20/2016	283	7.73	97.27%
1/16/2017	122	3.19	97.39%
2/13/2017	166	4.47	97.31%
3/20/2017	162	31.1	80.80%
4/21/2017	109	3.58	96.72%
5/16/2017	66	3.94	94.03%
6/6/2017	156	2.93	98.12%
7/17/2017	217	3.04	98.60%
8/15/2017	209	5.88	97.19%
9/26/2017	32.5	1.24	96.18%
10/10/2017	44.3	3.34	92.46%
11/13/2017	517	2.33	99.55%
12/5/2017	194	2.91	98.50%
1/22/2018	44.6	1.62	96.37%

2/13/2018	142	6.46	95.45%
3/15/2018	192	9.63	94.98%
4/9/2018	173	7.79	95.50%
5/21/2018	140	3.5	97.50%
6/19/2018	107	2.18	97.96%
7/19/2018	222	9.29	95.82%
8/9/2018	298	3.61	98.79%
9/17/2018	513	195	61.99%
10/1/2018	295	2.73	99.07%
11/8/2018	621	4.24	99.32%
12/10/2018	167	46.7	72.04%
1/8/2019	241	10.9	95.48%
2/15/2019	265	28.6	89.21%
3/8/2019	355	38.2	89.24%
4/1/2019	160	10.6	93.38%
5/6/2019	165	4.29	97.40%
6/6/2019	461	8.24	98.21%
7/1/2019	216	10.3	95.23%
8/5/2019	3.28	11.3	-244.51%
9/3/2019	48.4	19.3	60.12%
10/1/2019	1120	22.9	97.96%
11/18/2019	881	13.7	98.44%
12/10/2019	305	6.08	98.01%
1/3/2020	308	38.8	87.40%
2/3/2020	537	4.88	99.09%
3/9/2020	637	5.42	99.15%
4/20/2020	6110	14.5	99.76%
5/4/2020	5410	5.01	99.91%
6/2/2020	644	49.9	92.25%
7/7/2020	1260	5.51	99.56%

Attachment 6. Dioxin Results

Dioxin Congeners				
Quarter	Intake 801	602 Cooling Water	Process 601	002 Final
8/17/2015	23478-PeCDF - 2.05 123789-HxCDD - 3.41 OCDD - 168	123678-HxCDF - 3.27 234678-HxCDF - 3.05 1234678-HpCDD - 10.6 OCDD - 230	AA	1234678-HpCDF - 12.8 OCDD - 15.4 OCDF - 22.3
12/14/2015	OCDD - 90.8	AA	OCDD - 80.1	OCDD - 88.5
3/14/2016	AA	OCDD - 50.2	1234678-HpCDF - 5.65 OCDD - 43 OCDF - 37.5	1234678-HpCDF - 30.6 OCDD - 289 OCDF - 158
6/8/2016	OCDD - 175	NS	AA	AA
8/14/2016	OCDD - 34.0 OCDF - 14.4	OCDF - 8.59	OCDF - 6.04	OCDD - 3.97
12/20/2016	OCDD - 248	OCDD - 275	AA	AA
3/20/2017	AA	OCDD - 136	OCDD - 54.4	AA
6/12/2017	OCDD - 254	OCDD - 364	AA	OCDD - 208
8/15/2017	OCDD - 238	OCDD - 186	AA	OCDD - 187
12/5/2017	OCDD - 463	OCDD - 400	AA	OCDD - 416
3/15/2018	OCDD - 292	OCDD - 299	OCDD - 52.6	OCDD - 468
6/19/2018	OCDD - 223	OCDD - 226	AA	OCDD - 167
8/7/2018	OCDD - 78.9	OCDD - 105	AA	AA

12/10/2018	OCDD-573	OCDD - 542	OCDD - 40.1	OCDD - 482
3/8/2019	OCDD - 624 HpCDD 14.3	OCDD - 617	OCDD - 95.2	OCDD - 630
6/5/2019	OCDD - 374	OCDD-369 HPCDD 12.2	AA	OCDD - 345 HpCDD - 6.03
8/19/2019	OCDD - 168	OCDD - 349	AA	OCDD - 164
12/10/2019	OCDD - 1050	OCDD - 499	AA	OCDD - 477
3/9/2020	OCDD -337	OCDD - 790	AA	OCDD-769
3/9/2020 (retest)	OCDD - 767	OCDD -326	AA	OCDD -589
6/2/2020	OCDD - 144	AA	AA	OCDD -167

Calculated TEQ Results

Quarter	Intake 801	602 Cooling Water	Process 601	002 Final
8/17/2015	0.0017	0.0023	AA	AA
12/14/2015	AA	AA	AA	AA
3/14/2016	AA	AA	AA	AE
6/8/2016	0.0018	NS	AA	AA
8/14/2016	AA	AA	AA	AA
12/20/2016	0.0025	0.0028	AA	AA
3/20/2017	ND	0.0014	AA	AA
6/12/2017	0.0025	0.0036	AA	0.0021
8/15/2017	0.0024	0.0019	AA	0.0019
12/5/2017	0.0046	0.004	AA	0.0042
3/15/2018	0.0029	0.003	AA	0.0047
6/19/2018	0.0022	0.0023	AA	0.0017
8/7/2018	ND	0.0015	AA	ND
12/10/2018	0.0057	0.0054	AA	0.0048
3/8/2019	0.0062	0.0062	AA	0.0063

6/5/2019	0.0037	0.0037	AA	0.0035
8/19/2019	0.0017	0.0035	AA	0.0016
12/10/2019	0.011	0.005	AA	0.0048
3/9/2020	0.0034	0.0033	AA	0.0077
3/9/2020 (retest)	0.0077	0.0079	AA	0.0059
6/2/2020	0.00144	AA	AA	0.0017

AA non detect all values were below the PQL for the specific congener, so the value was not calculated.

Addendum 1. Acronyms

ABS	Anti-backsliding
BAT	Best Available Technology Economically Achievable
BCT	Best Conventional Pollutant Control Technology
BPJ	Best professional judgment
BPT	Best Practicable Control Technology Currently Available
BTJ	Best technical judgment
CFR	Code of Federal Regulations
CONSWLA	Conservative substance wasteload allocation
CWA	Clean Water Act
CWIS	Cooling water intake structure
DMR	Discharge Monitoring Report
DMT	Dissolved metal translator
ELG	Federal effluent limitation guideline
gpm	Gallons per minute
IMZM	Inside mixing zone maximum
MDL	Analytical method detection limit
MGD	Million gallons per day
NPDES	National Pollutant Discharge Elimination System
NSPS	New source performance standards
OAC	Ohio Administrative Code
Ohio EPA	Ohio Environmental Protection Agency
ORC	Ohio Revised Code
ORSANCO	Ohio River Valley Water Sanitation Commission
PEL	Preliminary effluent limit
PEQ	Projected effluent quality
PMP	Pollution Minimization Program
PPE	Plant performance evaluation
SIC	Standard Industrial Classification
TBEL	Technology-based effluent limit
TMDL	Total Daily Maximum Load
TRE	Toxicity reduction evaluation
TU	Toxicity unit
U.S. EPA	United States Environmental Protection Agency
WET	Whole effluent toxicity
WLA	Wasteload allocation
WQBEL	Water-quality-based effluent limit
WQS	Water Quality Standards