

**KENTUCKY POLLUTANT
DISCHARGE ELIMINATION
SYSTEM****FACT SHEET****KPDES No.:** KY0003611**AI No.:** 3808

EKPC John S. Cooper Power Station
670 Cooper Power Plant Road
Somerset, Pulaski County, Kentucky

Date: June 24, 2023**Public Notice Information**

Public Notice Start Date: May 19, 2023

Comment Due Date: June 18, 2023

General information concerning the public notice process may be obtained on the Division of Water's Public Notice Webpage at the following address:

<https://eec.ky.gov/Environmental-Protection/Water/Pages/Water-Public-Notices-and-Hearings.aspx>.

Public Notice Comments

Comments must be received by the Division of Water no later than 4:30 PM on the closing date of the comment period. Comments may be submitted by e-mail at: DOWPublicNotice@ky.gov or written comments may be submitted to the Division of Water at 300 Sower Blvd, Frankfort, Kentucky 40601.

Reference Documents

A copy of this proposed fact sheet, proposed permit, the application, other supporting material and the current status of the application may be obtained from the Department for Environmental Protection's Pending Approvals Search Webpage:

<https://dep.gateway.ky.gov/eSearch/Approvals/Pending>

Open Records

Copies of publicly-available documents supporting this fact sheet and proposed permit may also be obtained from the Department for Environmental Protection Central Office. Information regarding these materials may be obtained from the Open Records Coordinator at (502) 782-6849 or by e-mail at EEC.KORA@ky.gov.

THIS KPDES FACT SHEET CONSISTS OF THE FOLLOWING SECTIONS:

1. FACILITY SYNOPSIS.....	5
1.1. Name and Address of Applicant.....	5
1.2. Facility Location.....	5
1.3. Description of Applicant’s Operation.....	5
1.4. Wastewaters Collected and Treatment	5
1.5. Permitting Action	5
1.6. Significant Changes from Prior Permit	6
2. RECEIVING / INTAKE WATERS.....	8
2.1. Receiving Waters.....	8
2.2. Intake Waters – Nearest Downstream Intake.....	9
3. OUTFALL 001	11
3.1. Outfall Description	11
3.2. Reported Values.....	11
3.3. Effluent Limitations and Monitoring Requirements	11
3.4. Pertinent Factors.....	13
3.5. Limitation Calculations.....	13
3.6. Justification of Requirements.....	14
4. OUTFALL 003	17
4.1. Outfall Description	17
4.2. Reported Values.....	17
4.3. Effluent Limitations and Monitoring Requirements	18
4.4. Pertinent Factors.....	19
4.5. 316(a) Thermal Variance.....	19
4.6. Limitation Calculations.....	21
4.7. Justification of Requirements.....	22
5. OUTFALL 004	25
5.1. Outfall Description	25
5.2. Reported Values.....	25
5.3. Effluent Limitations and Monitoring Requirements	25
5.4. Pertinent Factors.....	26
5.5. Justification of Requirements.....	27
6. OUTFALL 005	30
6.1. Outfall Description	30
6.2. Reported Values.....	30

6.3. Effluent Limitations and Monitoring Requirements30

6.4. Pertinent Factors32

6.5. Limitation Calculations33

6.6. Justification of Requirements.....35

7. OUTFALL 00637

7.1. Outfall Description37

7.2. Reported Values37

7.3. Effluent Limitations and Monitoring Requirements37

7.4. Pertinent Factors39

7.5. Justification of Requirements.....43

8. OUTFALL 00746

8.1. Outfall Description46

8.2. Reported Values46

8.3. Effluent Limitations and Monitoring Requirements47

8.4. Pertinent Factors48

8.5. Limitation Calculations48

8.6. Justification of Requirements.....49

9. OUTFALL 00852

9.1. Outfall Description52

9.2. Reported Values52

9.3. Effluent Limitations and Monitoring Requirements52

9.4. Pertinent Factors54

9.5. Limitation Calculations56

9.6. Justification of Requirements.....56

10. OUTFALL 00959

10.1. Outfall Description59

10.2. Effluent Limitations and Monitoring Requirements59

10.3. Pertinent Factors60

10.4. Limitation Calculations60

10.5. Justification of Requirements.....61

11. OUTFALL 01064

11.1. Outfall Description64

11.2. Effluent Limitations and Monitoring Requirements64

11.3. Pertinent Factors65

11.4. Limitation Calculations65

11.5. Justification of Requirements..... 66

12. OTHER CONDITIONS..... 69

12.1. Schedule of Compliance 69

12.2. Antidegradation 69

12.3. Standard Conditions..... 69

12.4. Sufficiently Sensitive Analytical Methods 69

12.5. Certified Laboratory 69

12.6. Best Management Practices Plan (BMPP)..... 69

12.7. Cooling Water Additives, FIFRA, and Mollusk Control 69

12.8. Location Map..... 70

SECTION 1

FACILITY SYNOPSIS

1. FACILITY SYNOPSIS

1.1. Name and Address of Applicant

East Kentucky Power Cooperative, Inc.
 670 Cooper Power Plant Road
 Somerset, Kentucky 42501

1.2. Facility Location

EKPC John S. Cooper Power Station
 670 Cooper Power Plant Road
 Somerset, Pulaski County, Kentucky

1.3. Description of Applicant’s Operation

The facility is a two-unit coal-fired electric generating facility near Somerset, Kentucky that withdraws from and returns cooling water to lake Cumberland. Unit 1 (116 MW) has been in service since February 1965 and Unit 2 (225 MW) since October 1969.

1.4. Wastewaters Collected and Treatment

The following table lists the flow, wastewater types collected, and treatment type for each outfall:

TABLE 1.			
Outfall No.	Average Flow	Wastewater Types Collected	Treatment Type
001	1.38	Stormwater Runoff	Sedimentation Discharge to Surface Water
003	88.52	Non-Contact Cooling Water Process Wastewater	Screening Flocculation Sedimentation Chemical Precipitation Neutralization Discharge to Surface Water
004	0.00	Process Wastewater	Chemical Precipitation Neutralization
005	0.124	Stormwater Runoff Process Wastewater	Sedimentation Discharge to Surface Water
006	88.6	Plant Intake	None
007	0.316	Stormwater Runoff	Discharge to Surface Water
008	0.563	Process Wastewater	Flocculation Sedimentation Chemical Precipitation Neutralization
009	Not Constructed	Stormwater Runoff	Sedimentation Discharge to Surface Water
010	Not Constructed	Stormwater Runoff	Sedimentation Discharge to Surface Water

The design flow of the facility is 223 MGD. The average annual flow is 88.6 MGD.

1.5. Permitting Action

This is a reissuance of a major KPDES permit for an existing coal-fired electric generating facility [SIC Code 4911].

1.6. Significant Changes from Prior Permit

The significant changes for this permit include:

Updated the Effluent Limits at Outfall 008

Added two new Stormwater Outfalls 009 and 010

Include 316(b) BTA determination for Outfall 006 and updated the monitoring requirements at this outfall.

Granted a 316(a) thermal variance for Outfall 003

SECTION 2

RECEIVING/INTAKE WATERS

2. RECEIVING / INTAKE WATERS

2.1. Receiving Waters

All surface waters of the Commonwealth have been assigned stream use designations consisting of one or more of the following designations: Warmwater Aquatic Habitat (WAH), Primary Contact Recreation (PCR), Secondary Contact Recreation (SCR), Domestic Water Supply (DWS), Coldwater Aquatic Habitat (CAH) or Outstanding State Resource Water (OSRW)[401 KAR 10:026].

All surface waters of the Commonwealth are assigned one of the following antidegradation categories: Outstanding National Resource Water (ONRW), Exceptional Water (EW), Impaired Water (IW) or High Quality Water (HQ) [401 KAR 10:030].

Surface waters categorized as an IW are listed for non-support of uses in Kentucky’s most recently approved *Integrated Report to Congress on the Condition of Water Resources in Kentucky*. The 305 (b) List identifies stream segments that do not support their use designation. However, Outstanding State Resource Waters, Exceptional Waters, and waters found only as mercury or methylmercury impaired for fish consumption shall not be categorized as impaired *for antidegradation purposes*[401 KAR 10:030].

The following table lists the stream use classifications and antidegradation category associated with this permit.

TABLE 2.				
Receiving Water Name	Use Designation	Antidegradation Category	7Q10 Low Flow (cfs)	Harmonic Mean Flow (cfs)
Cumberland River (Lake Cumberland)	WAH PCR SCR DWS	HQ	137	1370
UT to Pitman Creek	WAH PCR SCR DWS	HQ	0.0	0.0

2.2. Intake Waters – Nearest Downstream Intake

TABLE 3.						
Intake Water Name	Public Water Supply Name	Latitude (N) Decimal Degrees	Longitude (W) Decimal Degrees	Miles Downstream	7Q10 Low Flow (cfs)	Harmonic Mean Flow (cfs)
Cumberland River (Lake Cumberland)	Somerset Water Service / Somerset WTP	37.014413°	84.632798°	1.1	137	1370

SECTION 3

OUTFALL 001

3. OUTFALL 001

3.1. Outfall Description

The following table lists the outfall type, location, and description:

TABLE 4.				
Outfall Type	Latitude (N)	Longitude (W)	Receiving Water	Description of Outfall
External	36.99844°	84.59394°	Cumberland River (Lake Cumberland)	Stormwater Runoff from substation area, parking lots, and plant roads.

3.2. Reported Values

The following table summarizes the reported values for Outfall 001:

TABLE 5.							
Reported Parameters	Units	EFFLUENT					
		Loadings (lbs./day)		Concentrations			
		Monthly Average	Daily Maximum	Minimum	Monthly Average	Daily Maximum	Maximum
Effluent Flow	MGD	1.38	3.02	N/A	N/A	N/A	N/A
Settleable Solids	mg/l	N/A	N/A	N/A	BDL	BDL	N/A
Oil & Grease	mg/l	N/A	N/A	N/A	BDL	BDL	N/A
pH	SU	N/A	N/A	7.38	N/A	N/A	7.95

The abbreviation BDL means Below Detection Level

The above values are based on 5-year Discharge Monitoring Report (DMR) averages from 09/30/2018 to 09/30/2022.

3.3. Effluent Limitations and Monitoring Requirements

The following table summarizes the effluent limitations and monitoring requirements for Outfall 001:

TABLE 6.									
EFFLUENT LIMITATIONS								MONITORING REQUIREMENTS	
Effluent Characteristic	Units	Loadings (lbs./day)		Concentrations				Frequency	Sample Type
		Monthly Average	Daily Maximum	Minimum	Monthly Average	Daily Maximum	Maximum		
Flow	MGD	Report	Report	N/A	N/A	N/A	N/A	1/Quarter	Instantaneous
Settleable Solids	mg/l	N/A	N/A	N/A	Report	Report	N/A	1/Quarter	Grab

TABLE 6.

EFFLUENT LIMITATIONS								MONITORING REQUIREMENTS	
Effluent Characteristic	Units	Loadings (lbs./day)		Concentrations				Frequency	Sample Type
		Monthly Average	Daily Maximum	Minimum	Monthly Average	Daily Maximum	Maximum		
Oil & Grease	mg/l	N/A	N/A	N/A	10	15	N/A	1/Quarter	Grab
pH	SU	N/A	N/A	6.0	N/A	N/A	9.0	1/Quarter	Grab

3.4. Pertinent Factors

The effluent limitations for this outfall were developed in accordance with DOW’s General Procedures for Limitations Development located on DOW’s webpage at: <https://eec.ky.gov/Environmental-Protection/Forms%20Library/General%20Procedures%20for%20Limitations%20Development.pdf>

3.4.1. Federally-Listed Threatened or Endangered Aquatic Species

There are no know federally-listed threatened or endangered aquatic species.

3.4.2. Technology-Based Effluent Limitations

3.4.2.1. General Requirement for Technology-Based Limitations

Technology-based effluent limitations and standards, based on federally promulgated standards, a case-by-case basis, or a combination of the two, shall be included in all KPDES permits, where applicable [401 KAR 5:065, Section 2(4) – 40 CFR 122.44(a)].

3.4.2.2. Federal Effluent Limitations Guidelines

The DOW has reviewed this non-POTW’s operation, its processes, it wastestreams and its Standard Industrial Classification. The DOW found no Effluent Guideline that applies to this Outfall’s discharge.

3.4.2.3. Best Professional Judgement

Oil & Grease

The facility does not treat its wastewater for this parameter before discharge. If treatment were to be necessary, an adequately sized oil /water separator with ample retention time would provide appropriate treatment. Flotation or gravity separation of lighter petroleum based products from water is a common and cost effective method for the removal of oil & grease. It has been the experience of the Division that this treatment method can achieve an oil & grease concentration of 10 mg/l as a monthly average and 15 mg/l as a daily maximum.

3.4.3. Water Quality-Based Effluent Limitations and/or Monitoring

The following table lists those pollutants and/or pollutant characteristics of concern that DOW has determined exhibit reasonable potential to cause or contribute to an excursion of a water quality-based criterion, and the basis of DOW’s determination. These determinations are consistent with the DOW’s reasonable potential analysis (RPA) procedures outlined in *Permitting Procedures For Determining “Reasonable Potential”* Kentucky Division of Water May 1, 2000. This table may also include pollutants for which DOW has found the existence of reasonable potential to be indeterminate or for which DOW needs additional study.

TABLE 7.	
Pollutant or Pollutant Characteristic	Basis
Settleable Solids	Due to the nature of the facility, it is the Divisions best professional judgement to continue monitoring for this pollutant.

3.5. Limitation Calculations

3.5.1. Calculations for Water Quality-Based Effluent Limitations

These calculations were performed using a Microsoft EXCEL based workbook developed by DOW. The workbook is designed to compare effluent data to the applicable water quality standards while also

incorporating the characteristics of the receiving water and any regulatory ZID and/or MZ. The following table summarizes the results of these calculations for this outfall:

Effluent Characteristic	Units	Reported Av	Reported M	Average Limitation	Maximum Limitation	Average Discharge %	Maximum Discharge %	MZF	Data Source
Antimony	µg/L	0	0	364.7385507	N/A	0.00	N/A	0	APP
Arsenic	µg/L	0	0	150	340	0.00	0.00	0	APP
Barium	µg/L	10.3	10.3	65131.88406	N/A	0.02	N/A	0	APP
Cadmium	µg/L	0	0	0.790210635	1.900279717	0.00	0.00	0	APP
Chromium	µg/L	1.7	1.7	6513.188406	N/A	0.03	N/A	0	APP
Color	Platinum Cobalt Units	55	55	4884.891304	N/A	1.13	N/A	0	APP
Copper	µg/L	0	0	9.328907606	13.99907631	0.00	0.00	0	APP
Iron	µg/L	220	220	3500	4000	6.29	5.50	0	APP
Nickel	µg/L	1.2	1.2	52.16302848	469.1741293	2.30	0.26	0	APP
Nitrate (as N)	µg/L	40	40	651318.8406	N/A	0.01	N/A	0	APP
Selenium	µg/L	0	0	5	N/A	0.00	N/A	0	APP
Sulfate	µg/L	4400	4400	16282971.01	N/A	0.03	N/A	0	APP
Thallium	µg/L	0	0	0.47	N/A	0.00	N/A	0	APP
Zinc	µg/L	70.3	70.3	119.8164153	119.8164153	58.67	58.67	0	APP
Summer Ammonia (as N)	mg/l	0	0	264.9617029	N/A	0.00	N/A	0	APP
Winter Ammonia (as N)	mg/l	0	0	657.9092888	N/A	0.00	N/A	0	APP

Since this Outfall discharges intermittently the chronic criteria do not apply.

3.5.2. Comparison of Technology Based Effluent Limitations to Water Quality Based Effluent Limitations

The final step in determining a permit’s final limits is to compare the limitations generated from any effluent guidelines and other technology-based limitations to those generated from the water quality standards.

Oil & Grease

To ensure that both technology and water quality standards are achieved, both the numeric TBEL and the narrative water quality criteria [401 KAR 10:031 Section 2(b)] are applied.

3.6. Justification of Requirements

Chapters 5 and 10 of Title 401 of the Kentucky Administrative Regulations (KARs), cited in the following, have been duly promulgated pursuant to the requirements of Chapter 224 of the Kentucky Revised Statutes.

At a minimum, all permits shall contain technology-based effluent limitations (TBELs) [401 KAR 5:065, Section 2(4) – 40 CFR 122.44(a)]. When necessary to achieve water quality standards, all permits shall contain water quality-based effluent limitations (WQBELs) [401 KAR 5:065, Section 2(4) – 40 CFR 122.44(d)]. Any WQBELs included in this permit are based upon the Kentucky Water Quality Standards (KYWQS) [401 KAR 10:031].

3.6.1. Flow

The monitoring requirements for this parameter are consistent with the KPDES permit program requirements for establishing effluent limitations, standards, and permit conditions [401 KAR 5:065, Section 2(4) – 40 CFR 122.44(i)(1)(ii)] and requirements for recording and reporting of monitoring results [401 KAR 5:050, Section 4 – 40 CFR 122.48].

3.6.2. Oil & Grease

The limitations for this parameter are consistent with the requirements of 40 CFR 125.3(c)(2) as incorporated by reference in 401 KAR 5:080, Section 2(3). The limits are representative of the Division of

Water's "Best Professional Judgment" (BPJ) determination of the "Best Conventional Pollutant Control Technology" (BCT) requirements for these pollutants.

3.6.3. pH

The limitations for this parameter are consistent with Kentucky's Water Quality Standards [401 KAR 10:031, Section 4(1)(b) and Section 7].

3.6.4. Settleable Solids

The monitoring requirements for this parameter are consistent with the KPDES permit program requirements for establishing effluent limitations, standards, and permit conditions [401 KAR 5:065, Section 2(4) – 40 CFR 122.44(i)(1)(i)] and requirements for recording and reporting of monitoring results [401 KAR 5:050, Section 4 – 40 CFR 122.48].

SECTION 4

OUTFALL 003

4. OUTFALL 003

4.1. Outfall Description

The following table lists the outfall type, location, and description:

TABLE 8.				
Outfall Type	Latitude (N)	Longitude (W)	Receiving Water	Description of Outfall
External	36.99736°	84.59319°	Cumberland River (Lake Cumberland)	Once-through cooling water with treated effluent from internal Outfall 008

4.2. Reported Values

The following table summarizes the reported values for Outfall 003:

TABLE 9.							
Reported Parameters	Units	EFFLUENT					
		Loadings (lbs./day)		Concentrations			
		Monthly Average	Daily Maximum	Minimum	Monthly Average	Daily Maximum	Maximum
Effluent Flow	MGD	88.52	230.4	N/A	N/A	N/A	N/A
Temperature	°F	N/A	N/A	N/A	64.0	99.3	N/A
Free Available Chlorine	mg/l	N/A	N/A	N/A	DNO	DNO	N/A
Total Residual Chlorine	mg/l	N/A	N/A	N/A	DNO	DNO	N/A
Total Residual Oxidants	mg/l	N/A	N/A	N/A	DNO	DNO	N/A
Time of Oxidant Addition	Min/Unit/Day	N/A	N/A	N/A	N/A	DNO	N/A
pH	SU	N/A	N/A	6.55	N/A	N/A	8.68
Hardness (as mg/l CaCO ₃)	mg/l	N/A	N/A	N/A	73.65	102	N/A
Total Recoverable Copper	mg/l	N/A	N/A	N/A	0.011	0.054	N/A
Chronic WET ¹	TU _c	N/A	N/A	N/A	N/A	N/A	<1.00
¹ WET – Whole Effluent Toxicity							
The abbreviation DNO means Did Not Oxidate							

The above values are based on 5-year Discharge Monitoring Report (DMR) averages from 07/31/2018 to 11/30/2022.

4.3. Effluent Limitations and Monitoring Requirements

The following table summarizes the effluent limitations and monitoring requirements for Outfall 003:

TABLE 10.									
EFFLUENT LIMITATIONS								MONITORING REQUIREMENTS	
Effluent Characteristic	Units	Loadings (lbs./day)		Concentrations				Frequency	Sample Type
		Monthly Average	Daily Maximum	Minimum	Monthly Average	Daily Maximum	Maximum		
Flow	MGD	Report	Report	N/A	N/A	N/A	N/A	Continuous	Recorder
Temperature	°F	N/A	N/A	N/A	Report	100	N/A	Continuous	Recorder
Free Available Chlorine	mg/l	N/A	N/A	N/A	0.2	0.5	N/A	1/Occurrence ¹	Multiple Grab ²
Total Residual Chlorine	mg/l	N/A	N/A	N/A	Report	0.019	N/A	1/Occurrence ¹	Multiple Grab ²
Total Residual Oxidants ³	mg/l	N/A	N/A	N/A	Report	0.2	N/A	1/Occurrence ¹	Multiple Grab ²
Time of Oxidant Addition	Min/day	N/A	N/A	N/A	N/A	120	N/A	1/Occurrence ¹	Log
pH	SU	N/A	N/A	6.0	N/A	N/A	9.0	1/Week	Grab
Hardness (as mg/l CaCO ₃)	mg/l	N/A	N/A	N/A	Report	Report	N/A	1/Month	Grab
Total Recoverable Copper	mg/l	N/A	N/A	N/A	Report	Report	N/A	1/Month	Grab
Chronic WET ⁴	TU _c	N/A	N/A	N/A	N/A	N/A	1.10	1/Year	(⁵)

¹The measurement frequency "Occurrence" means during periods of chlorination or oxidation addition to cooling water, but no more frequent than once per week.

²The sample type 'Multiple Grab' means grab samples collected at the approximate beginning of oxidant discharge and once every fifteen (15) minutes thereafter until the end of the oxidant discharge.

³The term Total Residual Oxidants (TRO) means the value obtained by using the amperometric titration or DPD methods for Total Residual Chlorine described in 40 CFR Part 136. In the event of addition of an oxidant other than Chlorine, the permittee shall receive prior approval from the DOW permitting staff before the initial use. TRO monitoring and limits only apply if the applicant chooses to utilize an oxidant other than Chlorine.

⁴WET – Whole Effluent Toxicity

⁵See section 4 of the permit for WET sampling requirements

4.4. Pertinent Factors

The effluent limitations for this outfall were developed in accordance with DOW’s General Procedures for Limitations Development located on DOW’s webpage at: <https://eec.ky.gov/Environmental-Protection/Forms%20Library/General%20Procedures%20for%20Limitations%20Development.pdf>

4.4.1. Federally-Listed Threatened or Endangered Aquatic Species

There are no know federally-listed threatened or endangered aquatic species.

4.5. 316(a) Thermal Variance

The Division of Water has reviewed the facilities 316(a) thermal variance report and has determined that an alternative thermal limit of 100°F will not have an adverse effect on the aquatic community.

4.5.1. Technology-Based Effluent Limitations

4.5.1.1. General Requirement for Technology-Based Limitations

Technology-based effluent limitations and standards, based on federally promulgated standards, a case-by-case basis, or a combination of the two, shall be included in all KPDES permits, where applicable [401 KAR 5:065, Section 2(4) – 40 CFR 122.44(a)].

4.5.1.2. Federal Effluent Limitations Guidelines

EPA has established a minimum level of technology that must be applied to certain industries. Due to the operations at this facility, all applicable sections of 40 CFR 423 shall be applied to this outfall. The following is a list of those requirements:

40 CFR 423.12(b) (2)

There shall be no discharge of polychlorinated biphenyl compounds such as those commonly used for transformer fluid.

40 CFR 423.12(b)(6)

The quantity of pollutants discharged in once through cooling water shall not exceed the quantity determined by multiplying the flow of once through cooling water sources times the concentration listed in the following table:

TABLE 11.		
BPT Effluent Requirements – Once Through Cooling Water		
Effluent Characteristic	Maximum for any one day	Maximum for monthly average
Free Available Chlorine	0.5 mg/l	0.2 mg/l

40 CFR 423.12(b) (8)

Neither free available chlorine nor total residual chlorine may be discharged from any unit for more than two hours in any one day and not more than one unit in any plant may discharge free available or total residual chlorine at any one time unless the utility can demonstrate to the Regional Administrator or state, if the state has NPDES permit issuing authority, that the units in a particular location cannot operate at or below this level of chlorination.

40 CFR 423.12(b) (12)

At the permitting authority’s discretion, the quantity of pollutant allowed to be discharged may be expressed as concentration limitations instead of the mass-based limitations specified in paragraphs (b)(3)

through (b)(7), and (b)(11), of this section concentration limitations shall be those concentrations specified in this section.

40 CFR 423.13(b)(1)

For any plant with a total rated electric generating capacity of 25 or more megawatts, the quantity of pollutants discharged in once through cooling water from each discharge point shall not exceed the quantity determined by multiplying the flow of once through cooling water from each discharge point times the concentration listed in the following table:

TABLE 12.		
BPT Effluent Requirements – Once Through Cooling Water		
Effluent Characteristic	Maximum for any one day	Maximum for monthly average
Total residual chlorine	0.20 mg/l	-

40 CFR 423.13(b)(2)

Total residual chlorine may not be discharged from any single generating unit for more than two hours per day unless the discharger demonstrates to the permitting authority that discharge for more than two hours is required for macroinvertebrate control. Simultaneous multi-unit chlorination is permitted.

40 CFR 423.13(m)

At the permitting authority’s discretion, the quantity of pollutant allowed to be discharged may be expressed as concentration limitations instead of the mass-based limitations specified in paragraphs (b) through (l) of this section concentration limitations shall be those concentrations specified in this section.

In accordance with Sections 423.13 (m) the permitting authority may allow the quantity of pollutant discharge to be expressed as a concentration limitation instead of a mass based limitation. The DOW has determined to apply the requirements of 40 CFR Part 423 in this manner

4.5.1.3. Best Professional Judgement

Time of Oxidants Discharge

The Division of Water will impose a limit of 120 minutes/day/unit of chlorination / oxidation discharge time. The limit is representative of the BAT requirements for the discharge of chlorine in cooling tower blowdown as specified in 40 CFR 423.13(d)(2) as incorporated in 401 KAR 5:065, Section 2(6). It is the “Best Professional Judgement” (BPJ) of the Division of Water that this requirement is also applicable to the addition of other oxidants as well as chlorine.

Total Residual Oxidants

The Division of Water will impose a daily maximum limit of 0.20 mg/l for this parameter. The limit is representative of the BAT requirements for total residual chlorine in once through cooling water as specified in 40 CFR 423.13(b)(1) as incorporated in 401 KAR 5:065, Section 2(6). It is the Division of Water’s Best Professional Judgment (BPJ) determination to limit the addition of other oxidants as well as chlorine.

4.5.2. Water Quality-Based Effluent Limitations and/or Monitoring

The following table lists those pollutants and/or pollutant characteristics of concern that DOW has determined exhibit reasonable potential to cause or contribute to an excursion of a water quality-based criterion, and the basis of DOW’s determination. These determinations are consistent with the DOW’s reasonable potential analysis (RPA) procedures outlined in *Permitting Procedures For Determining “Reasonable Potential”* Kentucky Division of Water May 1, 2000. This table may also include pollutants

for which DOW has found the existence of reasonable potential to be indeterminate or for which DOW needs additional study.

TABLE 13.	
Pollutant or Pollutant Characteristic	Basis
Whole Effluent Toxicity	The facility is rated as a “major discharger”.
Temperature	Thermal pollution or heat loads are typically associated with industrial facilities where large volumes of cooling water are utilized. Therefore, DOW has determined that reasonable potential for this pollutant does exist.
Total Residual Chlorine	The ELG establishes a limit for this pollutant in once through cooling water that is less stringent than Kentucky Water Quality Standard. Therefore, the facility shows reasonable potential to violate WQS when chlorine is being added to the cooling water.
Total Recoverable Copper	While the reported discharge concentration is above the calculated WQS this outfall is comprised of mostly once through cooling water and intake data show most of the copper is coming from the water withdrawal. Monitoring has been added to this outfall and the intake to calculate a net copper concentration.

4.5.3. Mixing Zone (MZ)

The Kentucky Water Quality Standards (KYWQS) allow the assignment of a MZ for chronic aquatic life (Chronic) and human health fish consumption (Fish) WQBELs and thermal discharges [401 KAR 10:029, Section 4]. The pollutants and/or the pollutant characteristics for which DOW has granted a MZ are listed as follows:

TABLE 14.				
Pollutant or Pollutant Characteristic	Mixing Zone Factor (MZF)	Linear Distance (ft)	Surface Area (sq. ft)	Volume (cfs)
Whole Effluent Toxicity	0.1	118.8	11085	13.7

4.6. Limitation Calculations

4.6.1. Calculations for Water Quality-Based Effluent Limitations

These calculations were performed using a Microsoft EXCEL based workbook developed by DOW. The workbook is designed to compare effluent data to the applicable water quality standards while also incorporating the characteristics of the receiving water and any regulatory ZID and/or MZ. The following table summarizes the results of these calculations for this outfall:

Effluent Characteristic	Units	Reported Av	Reported M	Average Limitation	Maximum Limitation	Average Discharge %	Maximum Discharge %	MZF	Data Source
Antimony	µg/L	0	0	11.19886127	N/A	0.00	N/A	0	APP
Arsenic	µg/L	0	0	109.9796656	340	0.00	0.00	0	APP
Barium	µg/L	29.3	29.3	1999.796656	N/A	1.47	N/A	0	APP
Beryllium	µg/L	0	0	7.999186624	N/A	0.00	N/A	0	APP
Cadmium	µg/L	0	0	0.619136737	1.408617044	0.00	0.00	0	APP
Chloride	µg/L	4300	4300	499949.164	1200000	0.86	0.36	0	APP
Chromium	µg/L	0	0	199.9796656	N/A	0.00	N/A	0	APP
Color	Platinum Cobalt Units	20	20	149.9847492	N/A	13.33	N/A	0	APP
Copper	µg/L	11	54	7.183397641	10.49420508	153.13	514.57	0	DMR
Cyanide, Free	µg/L	0	0	5.2	22	0.00	0.00	0	APP
Ideno(1,2,3-cd)pyrene	µg/L	0.02	0.02	0.03599634	N/A	55.56	N/A	0.1	APP
Iron	µg/L	137	137	599.9389968	4000	22.84	3.43	0	APP
Lead	µg/L	0	0	2.155536469	55.31475188	0.00	0.00	0	APP
Mercury	µg/L	0	0	0.051	1.4	0.00	0.00	0	APP
Nickel	µg/L	1.5	1.5	40.2708638	362.2114745	3.72	0.41	0	APP

Nitrate (as N)	µg/L	730	730	19997.96656	N/A	3.65	N/A	0	APP
Phenol	µg/L	0	0	300	300	0.00	0.00	0	APP
Selenium	µg/L	0	0	5	N/A	0.00	N/A	0	APP
Silver	µg/L	0	0	N/A	2.236333123	N/A	0.00	0	APP
Sulfate	µg/L	33800	33800	499949.164	N/A	6.76	N/A	0	APP
Thallium	µg/L	0	0	0.47	N/A	0.00	N/A	0	APP
Zinc	µg/L	0	0	92.46381199	92.46381199	0.00	0.00	0	APP
Summer Ammonia (as N)	mg/l	0	0	8.135332414	N/A	0.00	N/A	0	APP
Winter Ammonia (as N)	mg/l	0	0	20.2003184	N/A	0.00	N/A	0	APP
Temperature	°F	64	99.3	0	89.49989833	71.51	110.95	0.1	DMR

Effluent Characteristic	Reported Units	Reported Avg	Reported Max	Toxicity Type	Toxicity Units	Maximum Limitation	%Effluent	MZF	Data Source
Toxicity	TUc	0.00	0.00	ChronicWET	TUc	1.10	90.91	0.1	DMR

4.6.2. Comparison of Technology Based Effluent Limitations to Water Quality Based Effluent Limitations

The final step in determining a permit’s final limits is to compare the limitations generated from any effluent guidelines and other technology-based limitations to those generated from the water quality standards. The final limitations are the more stringent of the WQBELs or the TBELs.

Pollutant	WQBEL (µg/l)		TBEL (µg/l)	
	Average	Maximum	Average	Maximum
Total Residual Chlorine	11	19	-	200

The TBEL is not be protective of the water quality criteria for Total Residual Chlorine. Therefore, DOW is including the water quality concentration-based effluent requirements for this pollutant.

4.7. Justification of Requirements

Chapters 5 and 10 of Title 401 of the Kentucky Administrative Regulations (KARs), cited in the following, have been duly promulgated pursuant to the requirements of Chapter 224 of the Kentucky Revised Statutes.

At a minimum, all permits shall contain technology-based effluent limitations (TBELs) [401 KAR 5:065, Section 2(4) – 40 CFR 122.44(a)]. When necessary to achieve water quality standards, all permits shall contain water quality-based effluent limitations (WQBELs) [401 KAR 5:065, Section 2(4) – 40 CFR 122.44(d)]. Any WQBELs included in this permit are based upon the Kentucky Water Quality Standards (KYWQS) [401 KAR 10:031].

4.7.1. Flow

The monitoring requirements for this parameter are consistent with the KPDES permit program requirements for establishing effluent limitations, standards, and permit conditions [401 KAR 5:065, Section 2(4) – 40 CFR 122.44(i)(1)(ii)] and requirements for recording and reporting of monitoring results [401 KAR 5:050, Section 4 – 40 CFR 122.48].

4.7.2. Free Available Chlorine

The limit for this parameter is consistent with the KPDES permit program requirements for establishing effluent limitations, standards, and permit conditions [401 KAR 5:065, Section 2(4) – 40 CFR 122.44(a)(1) and 122.44(i)(1)], the criteria and standards for imposing TBELs [401 KAR 5:065, Section 2(6) – 40 CFR 122 Appendix A], and representative of the BPT requirements for once through cooling water in [40 CFR 423.12 (b)(6)].

4.7.3. Total Residual Chlorine

The limit for this parameter is consistent with the KPDES permit program requirements for establishing effluent limitations, standards, and permit conditions [401 KAR 5:065, Section 2(4) – 40 CFR 122.44(a)(1) and 122.44(i)(1)], the criteria and standards for imposing TBELs [401 KAR 5:065, Section 2(6) – 40 CFR 122 Appendix A], representative of the BAT requirements for once through cooling water in [40 CFR 423.13 (b)(1)] and consistent with Kentucky's Water Quality Standards [401 KAR 10:031, Sections 4(1)(k)].

4.7.4. Time of Oxidants Discharge

The limit for this parameter is consistent with the KPDES permit program requirements for establishing effluent limitations, standards, and permit conditions [401 KAR 5:065, Section 2(4) – 40 CFR 122.44(a)(1) and 122.44(i)(1)], the criteria and standards for imposing TBELs [401 KAR 5:065, Section 2(6) – 40 CFR 122 Appendix A], representative of the BAT requirements for chlorine addition in [40 CFR 423.13 (b)(1)(2)] and imposing Best Professional Judgement [401 KAR 5:080, Section 2(3) – 40 CFR 125.3].

4.7.5. Total Residual Oxidants

The limit for this parameter is consistent with the KPDES permit program requirements for establishing effluent limitations, standards, and permit conditions [401 KAR 5:065, Section 2(4) – 40 CFR 122.44(a)(1) and 122.44(i)(1)], the criteria and standards for imposing Best Professional Judgement [401 KAR 5:080, Section 2(3) – 40 CFR 125.3].

4.7.6. Temperature

The limitations for this parameter are consistent with Kentucky's Water Quality Standards [401 KAR 10:031, Section 4(1)(d)]. An alternative thermal limit has been granted in accordance with 401 KAR 10:029 Section 4(1)(g).

4.7.7. pH

The limitations for this parameter are consistent Kentucky's Water Quality Standards [401 KAR 10:031, Section 4(1)(b) and Section 7].

4.7.8. Hardness and Total Recoverable Copper

The monitoring requirements for these parameters are consistent with the KPDES permit program requirements for establishing effluent limitations, standards, and permit conditions [401 KAR 5:065, Section 2(4) – 40 CFR 122.44(i)(1)(i)] and requirements for recording and reporting of monitoring results [401 KAR 5:050, Section 4 – 40 CFR 122.48].

4.7.9. Whole Effluent Toxicity

The limitations for this parameter are consistent with Kentucky's Water Quality Standards [401 KAR 10:031, Sections 4(1)(j)]. A mixing zone has been granted, in accordance with 401 KAR 10:029 Section 4, for this parameter.

SECTION 5

OUTFALL 004

5. OUTFALL 004

5.1. Outfall Description

The following table lists the outfall type, location, and description:

TABLE 16.				
Outfall Type	Latitude (N)	Longitude (W)	Receiving Water	Description of Outfall
Internal	36.99779°	84.58733°	Outfall 008	Boiler chemical metal cleaning waste

5.2. Reported Values

There was no reported discharge from this outfall during the last permit cycle.

5.3. Effluent Limitations and Monitoring Requirements

The following table summarizes the effluent limitations and monitoring requirements for Outfall 004:

TABLE 17.									
EFFLUENT LIMITATIONS								MONITORING REQUIREMENTS	
Effluent Characteristic	Units	Loadings (lbs./day)		Concentrations				Frequency	Sample Type
		Monthly Average	Daily Maximum	Minimum	Monthly Average	Daily Maximum	Maximum		
Flow	MGD	Report	Report	N/A	N/A	N/A	N/A	1/Batch ¹	Calculated
Total Recoverable Copper	mg/l	N/A	N/A	N/A	1.0	1.0	N/A	1/Batch ¹	Grab
Total Recoverable Iron	mg/l	N/A	N/A	N/A	1.0	1.0	N/A	1/Batch ¹	Grab
pH	SU	N/A	N/A	6.0	N/A	N/A	9.0	1/Batch ¹	Grab

¹Monitoring shall be conducted once per metal cleaning operation.

5.4. Pertinent Factors

The effluent limitations for this outfall were developed in accordance with DOW's General Procedures for Limitations Development located on DOW's webpage at: <https://eec.ky.gov/Environmental-Protection/Forms%20Library/General%20Procedures%20for%20Limitations%20Development.pdf>

5.4.1. Federally-Listed Threatened or Endangered Aquatic Species

There are no know federally-listed threatened or endangered aquatic species.

5.4.2. Jordan Memorandum

According to 40 CFR 423.11(c) the term chemical metal cleaning waste means any wastewater resulting from the cleaning of any metal process equipment with chemical compounds, including, but not limited to, boiler tube cleaning. According to 40 CFR 423.11(d) the term metal cleaning waste means any wastewater resulting from cleaning [with or without chemical compounds] any metal process equipment including, but not limited to, boiler tube cleaning, boiler fireside cleaning, and air preheater cleaning.

The air heater wash waters are discharged to the total plant drains system. These waters are not a result of cleaning with chemical compounds, and they do not flow through Outfall 004. In the past these wastewaters were permitted to discharge directly to the plant drains system without limitations or monitoring requirements. The total plant drains system drains to a wastewater storage tank that receives treatment prior to discharging through Outfall 008. That permitting action was done pursuant to the Jordan Memorandum. The memorandum is from J. William Jordan, US EPA Permit Assistance and Evaluation Division to Bruce P. Smith, US EPA Enforcement Division Region III, concerning interpretation of the metal cleaning wastes guidelines in the federal effluent limitation guidelines for steam electric power generating point sources. In the memorandum, Mr. Jordan explains that "All water washing operations are 'low volume' while any discharge from an operation involving chemical cleaning should be included in the metal cleaning category." With that in mind, it makes sense that the limitations for chemical metal cleaning wastes do not apply to the air heater wash waters at this facility.

It is the BPJ of the DOW to place low volume waste requirements on these wastewaters. The DOW has developed flow-weighted limitations at Outfall 008 to ensure compliance with the federal effluent limitation guidelines for low volume wastes, chemical metal cleaning wastes, and other process wastewaters.

5.4.3. Technology-Based Effluent Limitations

5.4.3.1. General Requirement for Technology-Based Limitations

Technology-based effluent limitations and standards, based on federally promulgated standards, a case-by-case basis, or a combination of the two, shall be included in all KPDES permits, where applicable [401 KAR 5:065, Section 2(4) – 40 CFR 122.44(a)].

5.4.3.2. Federal Effluent Limitations Guidelines

EPA has established a minimum level of technology that must be applied to certain industries. Due to the operations at this facility, all applicable sections of 40 CFR 423 shall be applied to this outfall. The following is a list of those requirements:

EPA has established a minimum level of technology that must be applied to certain industries. Due to the operations at this facility, all applicable sections of 40 CFR 423 shall be applied to this outfall. The following is a list of those requirements:

40 CFR 423.12(b)(5)

The quantity of pollutants discharged in metal cleaning wastes shall not exceed the quantity determined by multiplying the flow of metal cleaning wastes times the concentration listed in the following table:

TABLE 18.		
BPT Effluent Requirements – Metal Cleaning Wastes		
Effluent Characteristic	Maximum for any one day	Maximum for monthly average
TSS	100.0 mg/l	30.0 mg/l
Oil and Grease	20.0 mg/l	15.0 mg/l
Copper, Total	1.0 mg/l	1.0 mg/l
Iron, Total	1.0 mg/l	1.0 mg/l

40 CFR 423.12(b) (12)

At the permitting authority’s discretion, the quantity of pollutant allowed to be discharged may be expressed as concentration limitations instead of the mass-based limitations specified in paragraphs (b)(3) through (b)(7), and (b)(11), of this section concentration limitations shall be those concentrations specified in this section.

In accordance with Sections 423.12 (b) (12) the permitting authority may allow the quantity of pollutant discharge to be expressed as a concentration limitation instead of a mass based limitation. The DOW has determined to apply the requirements of 40 CFR Part 423 in this manner.

40 CFR 423.13(e)

The quantity of pollutants discharged in chemical metal cleaning wastes shall not exceed the quantity determined by multiplying the flow of chemical metal cleaning wastes times the concentration listed in the following table:

TABLE 19.		
BAT Effluent Requirements – Chemical Metal Cleaning Wastes		
Effluent Characteristic	Maximum for any one day	Maximum for monthly average
Copper, Total	1.0 mg/l	1.0 mg/l
Iron, Total	1.0 mg/l	1.0 mg/l

40 CFR 423.13(m)

At the permitting authority’s discretion, the quantity of pollutant allowed to be discharged may be expressed as concentration limitations instead of the mass-based limitations specified in paragraphs (b) through (l) of this section concentration limitations shall be those concentrations specified in this section.

In accordance with Sections 423.13 (m) the permitting authority may allow the quantity of pollutant discharge to be expressed as a concentration limitation instead of a mass based limitation. The DOW has determined to apply the requirements of 40 CFR Part 423 in this manner.

5.4.4. Total Suspended Solids, and Oil and Grease

Outfall 004 effluent is directed to Outfall 008. There are other waste streams directed to Outfall 008 which also have total suspended solids and oil and grease limitations. For these reasons the DOW has developed flow-weighted limitations for these pollutants which will be applied at Outfall 008. The flow-weighted limitations are to insure compliance with the federal effluent limitations guidelines.

5.5. Justification of Requirements

Chapters 5 and 10 of Title 401 of the Kentucky Administrative Regulations (KARs), cited in the following, have been duly promulgated pursuant to the requirements of Chapter 224 of the Kentucky Revised Statutes.

At a minimum, all permits shall contain technology-based effluent limitations (TBELs) [401 KAR 5:065, Section 2(4) – 40 CFR 122.44(a)]. When necessary to achieve water quality standards, all permits shall contain water quality-based effluent limitations (WQBELs) [401 KAR 5:065, Section 2(4) – 40 CFR 122.44(d)]. Any WQBELs included in this permit are based upon the Kentucky Water Quality Standards (KYWQS) [401 KAR 10:031].

5.5.1. Internal Monitoring Point

The monitoring requirements for these parameters are consistent with the KPDES permit program requirements for establishing effluent limitations, standards, and permit conditions [401 KAR 5:065, Section 2(4) – 40 CFR 122.44(i)(1)(iii)], and the requirements for recording and reporting of monitoring results [401 KAR 5:050, Section 4 – 40 CFR 122.48].

5.5.2. Flow

The monitoring requirements for this parameter are consistent with the KPDES permit program requirements for establishing effluent limitations, standards, and permit conditions [401 KAR 5:065, Section 2(4) – 40 CFR 122.44(i)(1)(ii)] and requirements for recording and reporting of monitoring results [401 KAR 5:050, Section 4 – 40 CFR 122.48].

5.5.3. Total Copper, Total Iron, and pH

The limits for these parameters are consistent with the KPDES permit program requirements for establishing effluent limitations, standards, and permit conditions [401 KAR 5:065, Section 2(4) – 40 CFR 122.44(a)(1) and 122.44(i)(1)], the criteria and standards for imposing TBELs [401 KAR 5:065, Section 2(6) – 40 CFR 122 Appendix A], representative of the BPT and BAT requirements for metal cleaning wastes [40 CFR 423.12(b)(5)] and [40 CFR 423.13(e)].

SECTION 6

OUTFALL 005

6. OUTFALL 005

6.1. Outfall Description

The following table lists the outfall type, location, and description:

TABLE 20.				
Outfall Type	Latitude (N)	Longitude (W)	Receiving Water	Description of Outfall
External	36.99778°	84.58278°	Cumberland River (Lake Cumberland)	Stormwater runoff from active coal combustion residuals landfill and intermittent leachate discharge

6.2. Reported Values

The following table summarizes the reported values for Outfall 005:

TABLE 21.							
Reported Parameters	Units	EFFLUENT					
		Loadings (lbs./day)		Concentrations			
		Monthly Average	Daily Maximum	Minimum	Monthly Average	Daily Maximum	Maximum
Effluent Flow	MGD	0.124	0.602	N/A	N/A	N/A	N/A
Total Suspended Solids	mg/l	N/A	N/A	N/A	3.08	14.0	N/A
Oil & Grease	mg/l	N/A	N/A	N/A	0.12	3.90	N/A
pH	SU	N/A	N/A	7.54	N/A	N/A	8.56

The above values are based on 5-year Discharge Monitoring Report (DMR) averages from 07/31/2018 to 11/30/2022.

6.3. Effluent Limitations and Monitoring Requirements

The following table summarizes the effluent limitations and monitoring requirements for Outfall 005:

TABLE 22.									
EFFLUENT LIMITATIONS								MONITORING REQUIREMENTS	
Effluent Characteristic	Units	Loadings (lbs./day)		Concentrations				Frequency	Sample Type
		Monthly Average	Daily Maximum	Minimum	Monthly Average	Daily Maximum	Maximum		
Flow	MGD	Report	Report	N/A	N/A	N/A	N/A	1/Quarter	Instantaneous
Total Suspended Solids	mg/l	N/A	N/A	N/A	30	60	N/A	1/Quarter	Grab
Oil & Grease	mg/l	N/A	N/A	N/A	5.0	5.0	N/A	1/Quarter	Grab

TABLE 22.

EFFLUENT LIMITATIONS								MONITORING REQUIREMENTS	
Effluent Characteristic	Units	Loadings (lbs./day)		Concentrations				Frequency	Sample Type
		Monthly Average	Daily Maximum	Minimum	Monthly Average	Daily Maximum	Maximum		
pH	SU	N/A	N/A	6.0	N/A	N/A	9.0	1/Quarter	Grab

6.4. Pertinent Factors

The effluent limitations for this outfall were developed in accordance with DOW’s General Procedures for Limitations Development located on DOW’s webpage at: <https://eec.ky.gov/Environmental-Protection/Forms%20Library/General%20Procedures%20for%20Limitations%20Development.pdf>

6.4.1. Federally-Listed Threatened or Endangered Aquatic Species

There are no know federally-listed threatened or endangered aquatic species.

6.4.2. Technology-Based Effluent Limitations

6.4.2.1. General Requirement for Technology-Based Limitations

Technology-based effluent limitations and standards, based on federally promulgated standards, a case-by-case basis, or a combination of the two, shall be included in all KPDES permits, where applicable [401 KAR 5:065, Section 2(4) – 40 CFR 122.44(a)].

6.4.2.2. Federal Effluent Limitations Guidelines

EPA has established a minimum level of technology that must be applied to certain industries. Due to the operations at this facility, all applicable sections of 40 CFR 423 shall be applied to this outfall. The following is a list of those requirements:

40 CFR 423.12(b) (1)

The pH of all discharges, except once through cooling water, shall be within the range of 6.0-9.0.

40 CFR 423.12(b) (2)

There shall be no discharge of polychlorinated biphenyl compounds such as those commonly used for transformer fluid.

40 CFR 423.12(b) (11)

The quantity of pollutants discharged in FGD wastewater, flue gas mercury control wastewater, combustion residual leachate, or gasification wastewater shall not exceed the quantity determined by multiplying the flow of the applicable wastewater times the concentration listed in the following table:

TABLE 23.		
BPT Effluent Requirements – combustion residual leachate		
Effluent Characteristic	Maximum for any one day	Maximum for monthly average
TSS	100.0 mg/l	30.0 mg/l
Oil and Grease	20.0 mg/l	15.0 mg/l

40 CFR 423.12(b) (12)

At the permitting authority’s discretion, the quantity of pollutant allowed to be discharged may be expressed as concentration limitations instead of the mass-based limitations specified in paragraphs (b)(3) through (b)(7), and (b)(11), of this section concentration limitations shall be those concentrations specified in this section.

In accordance with Sections 423.12 (b) (12) the permitting authority may allow the quantity of pollutant discharge to be expressed as a concentration limitation instead of a mass based limitation. The DOW has determined to apply the requirements of 40 CFR Part 423 in this manner.

40 CFR 423.12(b)(13)

In the event that waste streams from various sources are combined for treatment to be discharge, the quantity of each pollutant or pollutant property controlled in paragraphs (b)(1) through (b)(12) of this section attributable to each controlled waste source shall not exceed the specified limitations for that waste source.

40 CFR 423.13(l)

Combustion residual leachate. The quantity of pollutants discharged in combustion residual leachate shall not exceed the quantity determined by multiplying the flow of combustion residual leachate times the concentration for TSS listed in 423.12(b)(11)

40 CFR 423.13(m)

At the permitting authority's discretion, the quantity of pollutant allowed to be discharged may be expressed as concentration limitations instead of the mass-based limitations specified in paragraphs (b) through (l) of this section concentration limitations shall be those concentrations specified in this section.

In accordance with Sections 423.13 (m) the permitting authority may allow the quantity of pollutant discharge to be expressed as a concentration limitation instead of a mass based limitation. The DOW has determined to apply the requirements of 40 CFR Part 423 in this manner

40 CFR 423.13(n)

In the event that wastestreams from various sources are combined for treatment or discharged, the quantity of each pollutant or pollutant property controlled in paragraphs (a) through (m) of this section attributable to each controlled waste source shall not exceed the specified limitation for that waste source.

6.4.2.3. Best Professional Judgement

Stormwater - Total Suspended Solids

The facility treats its storm water for this parameter before discharge in a holding pond. Sedimentation is a commonly used treatment technology for the removal of total suspended solids that is both efficient and cost effective. Although several factors may influence the final concentration of total suspended solids in the discharge, it has been the experience of the Division that ponds that retain wastewater for 6 hours or more can achieve a total suspended solids concentration of 30 mg/l as a monthly average and 60 mg/l as a daily maximum.

Stormwater -Oil & Grease

It is the BPJ of the DOW to place a 5 mg/l limitation on oil and grease for the stormwater portion of the effluent. Stormwater should not contain a significant amount of oil and grease. The DOW has developed flow-weighted limitations for TSS, and oil and grease at Outfall 005 to ensure compliance with the federal effluent limitation guidelines for combustion residual leachate.

6.5. Limitation Calculations

6.5.1. Calculations for Technology-Based Effluent Limitations

Stormwater from the CCR landfill site is collected in a sedimentation pond, which serves as Outfall 005 to Lake Cumberland. Landfill leachate is collected in collection tanks adjacent to landfill. From the leachate storage tanks the leachate is pumped to the cola pile runoff pond for treatment and discharge through internal Outfall 008. On occasion, leachate will be discharged from the storage tanks directly to the sedimentation pond at Outfall 005. This may occur due to storage capacity limitations in the tanks or coal pile runoff pond. The effluent form this outfall is stormwater only the majority of the time and the amount

of leachate directed to the is pond is difficult to capture. Therefore, DOW has determined to just apply the stormwater TSS and Oil & Grease limitations, which are protective of the CCR leachate ELG, to this outfall verse developing flow-weighted limitations. The limits are consistent with the previous KPDES permit.

6.5.2. Calculations for Water Quality-Based Effluent Limitations

These calculations were performed using a Microsoft EXCEL based workbook developed by DOW. The workbook is designed to compare effluent data to the applicable water quality standards while also incorporating the characteristics of the receiving water and any regulatory ZID and/or MZ. The following table summarizes the results of these calculations for this outfall:

Effluent Characteristic	Units	Reported Av	Reported M	Average Limitation	Maximum Limitation	Average Discharge %	Maximum Discharge %	MZF	Data Sou
Acrolein	µg/L	0	0	3	3	0.00	0.00	0	APP
Antimony	µg/L	0	0	640	N/A	0.00	N/A	0	APP
Arsenic	µg/L	10.5	10.5	150	340	7.00	3.09	0	APP
Barium	µg/L	47.7	47.7	714725.8065	N/A	0.01	N/A	0	APP
Beryllium	µg/L	0	0	2858.903226	N/A	0.00	N/A	0	APP
Cadmium	µg/L	0	0	1.318574333	3.561963238	0.00	0.00	0	APP
Chloride	µg/L	10600	10600	600000	1200000	1.77	0.88	0	APP
Color	Platinum Cobalt Units	35	35	53604.43548	N/A	0.07	N/A	0	APP
Copper	µg/L	0	0	16.14454255	25.62955251	0.00	0.00	0	APP
Cyanide, Free	µg/L	0	0	5.2	22	0.00	0.00	0	APP
Lead	µg/L	0	0	7.20274097	184.8346504	0.00	0.00	0	APP
Mercury	µg/L	0	0	0.051	1.4	0.00	0.00	0	APP
Nickel	µg/L	0	0	89.78180744	807.5317434	0.00	0.00	0	APP
Nitrate (as N)	µg/L	1200	1200	7147258.065	N/A	0.02	N/A	0	APP
Phenol	µg/L	0	0	300	300	0.00	0.00	0	APP
Selenium	µg/L	2.3	2.3	5	N/A	46.00	N/A	0	APP
Silver	µg/L	0	0	N/A	11.41446492	N/A	0.00	0	APP
Sulfate	µg/L	116000	116000	178681451.6	N/A	0.06	N/A	0	APP
Thallium	µg/L	0	0	0.47	N/A	0.00	N/A	0	APP
Zinc	µg/L	0	0	206.3974123	206.3974123	0.00	0.00	0	APP
Summer Ammonia (as N)	mg/l	0.054	0.054	2907.561628	N/A	0.00	N/A	0	APP
Winter Ammonia (as N)	mg/l	0.054	0.054	7219.578457	N/A	0.00	N/A	0	APP

Since this Outfall discharges intermittently the chronic criteria do not apply.

6.5.3. Comparison of Technology Based Effluent Limitations to Water Quality Based Effluent Limitations

The final step in determining a permit’s final limits is to compare the limitations generated from any effluent guidelines and other technology-based limitations to those generated from the water quality standards.

Oil & Grease

To ensure that both technology and water quality standards are achieved, both the numeric TBEL and the narrative water quality criteria [401 KAR 10:031 Section 2(b)] are applied.

TSS

Based upon review of the proposed discharge and the receiving stream. The Division of Water does not believe the calculated total suspended solids limit will have an adverse effect on the indigenous aquatic community [401 KAR 10:031, Section 4(1)(g)].

6.6. Justification of Requirements

Chapters 5 and 10 of Title 401 of the Kentucky Administrative Regulations (KARs), cited in the following, have been duly promulgated pursuant to the requirements of Chapter 224 of the Kentucky Revised Statutes.

At a minimum, all permits shall contain technology-based effluent limitations (TBELs) [401 KAR 5:065, Section 2(4) – 40 CFR 122.44(a)]. When necessary to achieve water quality standards, all permits shall contain water quality-based effluent limitations (WQBELs) [401 KAR 5:065, Section 2(4) – 40 CFR 122.44(d)]. Any WQBELs included in this permit are based upon the Kentucky Water Quality Standards (KYWQS) [401 KAR 10:031].

6.6.1. Flow

The monitoring requirements for this parameter are consistent with the KPDES permit program requirements for establishing effluent limitations, standards, and permit conditions [401 KAR 5:065, Section 2(4) – 40 CFR 122.44(i)(1)(ii)] and requirements for recording and reporting of monitoring results [401 KAR 5:050, Section 4 – 40 CFR 122.48].

6.6.2. Total Suspended Solids and Oil & Grease

The limits for these parameters are consistent with the KPDES permit program requirements for establishing effluent limitations, standards, and permit conditions [401 KAR 5:065, Section 2(4) – 40 CFR 122.44(a)(1) and 122.44(i)(1)], the criteria and standards for imposing TBELs [401 KAR 5:065, Section 2(6) – 40 CFR 122 Appendix A], representative of the BPT requirements for combustion residual leachate [40 CFR 423.12(b)(11)], representative of BAT requirements for combustion residual leachate [40 CFR 423.13(l)], and imposing Best Professional Judgement [401 KAR 5:080, Section 2(3) – 40 CFR 125.3].

6.6.3. pH

The limit for this parameter is consistent with the KPDES permit program requirements for establishing effluent limitations, standards, and permit conditions [401 KAR 5:065, Section 2(4) – 40 CFR 122.44(a)(1) and 122.44(i)(1)], the criteria and standards for imposing TBELs [401 KAR 5:065, Section 2(6) – 40 CFR 122 Appendix A], representative of the BPT requirements for pH [40 CFR 423.12 (b)(1)], and state water quality standards [401 KAR 10:031, Sections 4(1)(b) and 7].

SECTION 7

OUTFALL 006

7. OUTFALL 006

7.1. Outfall Description

The following table lists the outfall type, location, and description:

TABLE 24.				
Outfall Type	Latitude (N)	Longitude (W)	Receiving Water	Description of Outfall
External	36.99814°	84.59256°	Cumberland River (Lake Cumberland)	Plant water intake

7.2. Reported Values

The following table summarizes the reported values for Outfall 006:

TABLE 25.							
Reported Parameters	Units	EFFLUENT					
		Loadings (lbs./day)		Concentrations			
		Monthly Average	Daily Maximum	Minimum	Monthly Average	Daily Maximum	Maximum
Effluent Flow	MGD	88.6	230.4	N/A	N/A	N/A	N/A
Temperature	°F	N/A	N/A	N/A	58.8	83.6	N/A

The above values are based on 5-year Discharge Monitoring Report (DMR) averages from 07/31/2018 to 11/30/2022.

7.3. Effluent Limitations and Monitoring Requirements

The following table summarizes the effluent limitations and monitoring requirements for Outfall 006:

TABLE 26.								MONITORING REQUIREMENTS	
EFFLUENT LIMITATIONS								Frequency	Sample Type
Effluent Characteristic	Units	Loadings (lbs./day)		Concentrations					
		Monthly Average	Daily Maximum	Minimum	Monthly Average	Daily Maximum	Maximum		
Flow	MGD	Report	Report	N/A	N/A	N/A	N/A	Daily	Calculated
Temperature	°F	N/A	N/A	N/A	Report	Report	N/A	Daily	Grab
¹ Cooling Water Intake Inspection	Fail=1 Pass=0	N/A	N/A	N/A	N/A	N/A	Report ²	1/Week	Inspection ³
Hardness (as mg/l CaCO ₃)	mg/l	N/A	N/A	N/A	Report	Report	N/A	1/Month	Grab

TABLE 26.

EFFLUENT LIMITATIONS								MONITORING REQUIREMENTS	
Effluent Characteristic	Units	Loadings (lbs./day)		Concentrations				Frequency	Sample Type
		Monthly Average	Daily Maximum	Minimum	Monthly Average	Daily Maximum	Maximum		
Total Recoverable Copper	mg/l	N/A	N/A	N/A	Report	Report	N/A	1/Month	Grab
¹ Weekly monitoring of the cooling water intake system shall be performed, during the period the cooling water intake structure is in operation, to ensure that the design and construction technology comply with §125.94 is functioning as designed and is being appropriately maintained and operated.									
² If intake system is not functioning as designed and described in the facilities 316(b) Report a "1" is to be reported. If intake system is functioning as designed a "0" is to be reported.									
³ This inspection may take the form of either visual inspections or the use of remote monitoring devices.									
An annual certification statement signed by the authorized representative shall be submitted to the DOW surface water permits branch no later than January 31 st for the previous year. See Section 5.8.3.3. "Reporting Requirements for Cooling Water Intake" for additional details.									

7.4. Pertinent Factors

The effluent limitations for this outfall were developed in accordance with DOW's General Procedures for Limitations Development located on DOW's webpage at:

<http://dep.ky.gov/formslibrary/Documents/General%20Procedures%20for%20Limitations%20Development.pdf>

7.4.1. Cooling Water Intake

7.4.1.1. Cooling Water Intake Description

Cooper Station consists of two once-through cooled coal-fired generating units with a capacity of 341 megawatts. Each unit has its own cooling water intake structure consisting of a single deep-water, offshore withdrawal. Cooper Station withdraws water from Lake Cumberland, which is a constructed reservoir that was completed in 1951 for flood control, production of hydroelectric power, and recreation. The design intake flow for the two intakes is 223 MGD. The actual intake flow for calendar years 2017 – 2021 was 84 MGD, which is 37.7 percent of the design intake flow. Cooper Station's two intakes are located at an invert depth of 57 feet during normal pool levels. EPA has acknowledged that deep-water intakes can substantially reduce impingement and entrainment due to lower biological abundance at depth. The deep intakes are also below the depth of naturally occurring seasonal thermocline which results in low dissolved oxygen levels below the thermocline. The deeper, colder water in the lake bottom enables Cooper Station to use less cooling water, particularly during winter when it is able to operate only one of two circulating pumps per unit to meet its condenser cooling requirements. Water is withdrawn by two separate intake structures which are similar, though not identical, in setup and size. One CWIS is designated at the Unit 1 CWIS while the second is designated as the Unit 2 CWIS; however, piping allows for water from either intake to supply cooling to either of the power generating units. The primary components of each CWIS include:

- A low submerged inlet with coarse bar rack screening
- Two hydraulic turbine pumps per CWIS used to lift water up to a raised wet well
- A single vertical traveling screen per CWIS housed within the raised wet well
- Two raw water circulating pumps per CWIS which withdraw water from the raised wet well and feed water to the units

The estimated intake velocities during design flow (with both pumps operating) at the vertical traveling screens for Unit 1 and Unit 2 are 1.9 fps and 2.62 fps respectively. The traveling screens are typically manually operated twice daily, approximately 10 minutes per shift, but may operate more frequently when the debris loads are high and increased differential pressure across the screens triggers automatic operation. Spray wash is provided to each traveling screen by a spray wash pump. Debris and any organisms that may be collected are washed into a debris trough on the front side of the traveling screen and conveyed out through the side of the CWIS, with open discharge to the water surface of Lake Cumberland. When possible, Cooper Station operates on one lift/circulating pump per unit when cooling demand conditions allow. The 84 MGD actual intake flow is equivalent to 257.8 acre-feet and an average monthly withdrawal of 7,734 acre-feet. This withdrawal comprises only 0.42 percent of the minimum storage volume and 0.19 percent of the normal pool volume.

7.4.1.2. Impingement Mortality BTA Determination

The Division of Water has reviewed impingement data from the facility and determined that the impingement rate is *de minimis*. Therefore, no additional controls are warranted.

7.4.1.3. Entrainment BTA Determination

The current technology and operations for the cooling water intake structure have been identified by the Division as the best technology available for minimizing entrainment at this intake structure. Since the facility already operates with closed-cycle recirculating system the following additional technologies were also evaluated: (1) fine mesh screens with a mesh size of 2mm or smaller with a safe return mechanism, (2) variable speed pumps, and (3) water reuse or alternate sources of cooling water. Each technology was evaluated using the criteria listed in 40 CFR 125.98(f)(2) and, where relevant, the criteria listed in 40 CFR 125.98(f)(3). See the tables below for analyses:

Cooling Towers	
Numbers and Types of organisms entrained	Optimized cooling towers in freshwater areas can reduce entrainment by 97.25%. However, entrainable ichthyoplankton and juveniles would not likely be present in abundance at the intake depths due to the thermocline and low dissolved oxygen concentrations there.
Particulate emissions or other pollutants	Increased emissions would result from two separate factors (1) particulate emissions from retrofit with a cooling tower, and (2) loss of generation capacity associated with parasitic loads and loss of efficiency due to potential retrofits that would require the lost power to be replaced by other generators.
Land availability	There appears to be sufficient space available.
Remaining useful plant life	The retirement date of the equipment has not been established. However given, the age of the equipment and the forecasted low rate of dispatch, the potential benefit of any major capital expenditure would be very small.
Quantified and qualitative social benefits	Based on EKPCs contractors experience with other similar facilities, capital costs for closed cycle retrofit would be on the order of \$100 million. Given that costs are fixed and substantial while benefits are low and only accrue during operation during periods of increased biological activity (i.e., during warmer months when Cooper Station is expected to have low generation rates), the net social costs would be strongly negative.
Conclusion	This technology is expected to only have minimal impact on entrainment due to the reduction already achieved from a deep-water intake. Additionally, this facility mainly only operates during periods of peak demand in the winter and intermittently during the rest of the year. Biological activity in Lake Cumberland is very low during the winter, with the onset of spawning and recruitment for resident species beginning in April and extending into September. The CWIS already has a negligible impact on the entrainment of the overall ichthyoplankton community thus a retrofit to a closed-cycle cooling system is not necessary as the costs to the controls are not justified by their associated benefits.

Fine Mesh Screens with a Mesh Size of 2 mm or smaller	
Numbers and Types of organisms entrained	The facility does not have historical, relevant entrainment data that can be compared with data for this technology. In order for any entrainment reductions to be seen a screen with a mesh size of <2.0 mm should be used, as nearly 100% of

	eggs are still pass through a 2.0 mm mesh screen. Through EPA’s review of control technologies, the Agency found that the survival of “converts” on fine mesh screen was very poor, and in some extreme cases comparable to the extremely low survival of entrained organisms that are allowed to pass entirely through the facility.
Particulate emissions or other pollutants	None expected other than increase in solids clogging the mesh slot size.
Land availability	The size of the screen face may need to be increased to maintain current flow rates. As EPA noted in the 316(b) existing facilities rule technical development document, in order to equip fine mesh screen and maintain a through-screen velocity of 0.5 fps, as many as 68% of facilities would need to expand their intake screen area by more than five times. Due to the large amount of make-up flow required at this facility the Impingement area of influence would be increased significantly. EPA estimated that 17% of existing intake screens in the U.S. could not be enlarged to accommodate a 2 mm screen. Retrofit of fine-mesh traveling water screens would have limited potential to return viable screened organisms to the lake.
Remaining useful plant life	The retirement date of the equipment has not been established. However given, the age of the equipment and the forecasted low rate of dispatch, the potential benefit of any major capital expenditure would be very small.
Quantified and qualitative social benefits	Based on EKPCs contractors experience with other similar facilities, capital costs for retrofit with fine mesh screens would be on the order of \$10 million. Given that costs are fixed and substantial while benefits are low and only accrue during operation during periods of increased biological activity (i.e., during warmer months when Cooper Station is expected to have low generation rates), the net social costs would be strongly negative.
Conclusion	The use of a fine mesh screen is not required, in part, because the main entrainment reduction expected from the use of fine mesh screens with a mesh size of 2 mm or smaller is early life stage organisms (i.e. nursery areas) and the facility only operates intermittently during those times. Since the facilities CWIS are located in the deep water of Lake Cumberland the Division does not expect this technology to provide a significant reduction to entrainment. Additionally, the use of fine mesh screens would have the potential to clog more frequently thereby increasing the through screen velocity and facility would have limited potential to return organisms to the lake.

Variable Speed Pumps	
Numbers and Types of organisms entrained	Proper use of variable frequency drives can reduce entrainment mortality by decreasing the volume of water withdrawn. However, using less cooling water increases in-plant and discharge temperatures, lowering the survival rate of entrained. This technology is estimated to provide only minor reductions to entrainment. This is because the facility already cycles pumps to meet water demands. Also, opportunities for flow reduction are expected to be greater during cooler months because of ambient water temperatures. To the extent that this is true and entrainment impacts are less probable during conditions with cooler water temperatures, the reductions achieved will be low.

Particulate emissions or other pollutants	There would probably be both trivial increases and trivial decreases in pollution as part of slight energy penalties caused by increased temperature of condensers and slightly decreased pump energy use, respectively. Lower flow rates in cooling tubes may require use of more chemicals or energy to control scaling.
Land availability	Not typically an issue.
Remaining useful plant life	The retirement date of the equipment has not been established. However given, the age of the equipment and the forecasted low rate of dispatch, the potential benefit of any major capital expenditure would be very small.
Quantified and qualitative social benefits	The permittee is not required to provide Cost Evaluation Study (40 CFR 122.21(r)(10)) or Benefits Evaluation (40 CFR 122.21(r)(11)) because AIF is less than 125 MGD. The permittee provided no estimate of cost. The data that is available for this factor is not of sufficient rigor to allow the Division to preclude this technology.
Thermal Discharge Impacts	The use of variable speed pumps would not reduce thermal loads but would probably increase temperature and decrease flow so temperature impacts would be variable and probably minimal. But the current thermal impact from the facility is not a concern. This was not considered a significant factor.
Conclusion	Use of variable speed pumps is not required, in part, because each CWIS already uses 2 pumps. Cooper Station is able to reduce flows through one-pump operation during colder months. This technology is estimated to provide only minor reductions to entrainment. This is because the facility already cycles pumps to meet water demands.

Water Reuse or Alternate Sources of Cooling Water
This is typically not an option for steam electric power plants due to the high volume of cooling water that is required. Recent cooling water withdraw flows average around 84 MGD. Nearby well and water treatment plants have a capacity of 0.06 MGD and 4.4 MGD respectively.

Conclusion

These technologies were evaluated: closed-cycle recirculating cooling systems, modified Ristroph screens with a mesh size of 2mm or smaller and a fish return, narrow-slot wedgewire screens, and variable speed pumps. The cost, benefit, and environmental impact of each was considered. The current technology and operations for the CWIS have been identified by the Division of Water as the best technology available for minimizing entrainment at this intake structure.

7.4.2. Intake Structure Standard Requirements

7.4.2.1. Future BTA Determination

This is a Final BTA determination made in accordance with the requirements of the federal regulations in 40 CFR 125.90-98, based upon the materials submitted by the permittee through 40 CFR 122.21(r). Future BTA determinations will be re-confirmed under the same regulations, but the permittee may request that some application materials be waived under 40 CFR 125.95(c) and 40 CFR 125.98(g).

7.4.2.2. Visual or Remote Inspections

The permittee is required to conduct visual or remote inspections of the intake structure at least weekly during periods of operation, pursuant to 40 CFR 125.96(e).

7.4.2.3. Reporting Requirements

The permittee is required to submit an annual certification statement and report, pursuant to 40 CFR 125.97(c).

7.4.2.4. Endangered Species Act

Nothing in this permit authorizes take for the purpose of a facility's compliance with the Endangered Species Act. 40 CFR 125.98(b)(1) requires the inclusion of this provision in all permits subject to 316(b) requirements. Contact the state Natural Heritage Inventory (NHI) staff with inquiries regarding incidental take of state-listed threatened and endangered species and the US Fish and Wildlife Service with inquiries regarding incidental take of federally-listed threatened and endangered species.

7.5. Justification of Requirements

Chapters 5 and 10 of Title 401 of the Kentucky Administrative Regulations (KARs), cited in the following, have been duly promulgated pursuant to the requirements of Chapter 224 of the Kentucky Revised Statutes.

At a minimum, all permits shall contain technology-based effluent limitations (TBELs) [401 KAR 5:065, Section 2(4) – 40 CFR 122.44(a)]. When necessary to achieve water quality standards, all permits shall contain water quality-based effluent limitations (WQBELs) [401 KAR 5:065, Section 2(4) – 40 CFR 122.44(d)]. Any WQBELs included in this permit are based upon the Kentucky Water Quality Standards (KYWQS) [401 KAR 10:031].

7.5.1. Flow

The monitoring requirements for this parameter are consistent with the KPDES permit program requirements for establishing effluent limitations, standards, and permit conditions [401 KAR 5:065, Section 2(4) – 40 CFR 122.44(i)(1)(ii)] and requirements for recording and reporting of monitoring results [401 KAR 5:050, Section 4 – 40 CFR 122.48].

7.5.2. Temperature

The monitoring requirements for this parameter is consistent with the KPDES permit program requirements for establishing effluent limitations, standards, and permit conditions [401 KAR 5:065, Section 2(4) – 40 CFR 122.44(i)(1)(ii)] and requirements for recording and reporting of monitoring results [401 KAR 5:050, Section 4 – 40 CFR 122.48].

7.5.3. Cooling Water Intake Inspection

The monitoring requirements for this parameter is consistent with the KPDES permit program requirements for establishing effluent limitations, standards, and permit conditions [401 KAR 5:065, Section 2(4) – 40 CFR 122.44(i)(1)(ii)], requirements for visual or remote inspections [40 CFR 125.96 (e)], and requirements for recording and reporting of monitoring results [401 KAR 5:050, Section 4 – 40 CFR 122.48].

7.5.4. Total Recoverable Copper and Hardness

The monitoring requirements for these parameters are consistent with the KPDES permit program requirements for establishing effluent limitations, standards, and permit conditions [401 KAR 5:065, Section 2(4) – 40 CFR 122.44(i)(1)(i)] and requirements for recording and reporting of monitoring results [401 KAR 5:050, Section 4 – 40 CFR 122.48].

SECTION 8

OUTFALL 007

8. OUTFALL 007

8.1. Outfall Description

The following table lists the outfall type, location, and description:

TABLE 27.				
Outfall Type	Latitude (N)	Longitude (W)	Receiving Water	Description of Outfall
External	36.99714°	84.59078°	Cumberland River (Lake Cumberland)	Stormwater runoff from other plant areas

8.2. Reported Values

The following table summarizes the reported values for Outfall 007:

TABLE 28.							
Reported Parameters	Units	EFFLUENT					
		Loadings (lbs./day)		Concentrations			
		Monthly Average	Daily Maximum	Minimum	Monthly Average	Daily Maximum	Maximum
Effluent Flow	MGD	0.316	0.628	N/A	N/A	N/A	N/A
Settleable Solids	mg/l	N/A	N/A	N/A	BDL	BDL	N/A
Oil & Grease	mg/l	N/A	N/A	N/A	BDL	BDL	N/A
pH	SU	N/A	N/A	7.66	N/A	N/A	8.22
Hardness (as mg/l CaCO ₃)	mg/l	N/A	N/A	N/A	139	230	N/A
Total Recoverable Copper ¹	mg/l	N/A	N/A	N/A	0.021	0.066	N/A
The abbreviation BDL means Below Detection Level							
¹ The facility has established drainage basin specific BMPs to improve the quality of Outfall 007 effluent. On 9/22/2021 all BMPs were implemented and since then the DMR data shows a monthly average concentration of 0.00099 mg/l and a daily maximum concentration of 0.0029 mg/l for Total Recoverable Copper.							

The above values are based on 5-year Discharge Monitoring Report (DMR) averages from 09/30/2018 to 09/30/2022.

8.3. Effluent Limitations and Monitoring Requirements

The following table summarizes the effluent limitations and monitoring requirements for Outfall 007:

TABLE 29.									
EFFLUENT LIMITATIONS								MONITORING REQUIREMENTS	
Effluent Characteristic	Units	Loadings (lbs./day)		Concentrations				Frequency	Sample Type
		Monthly Average	Daily Maximum	Minimum	Monthly Average	Daily Maximum	Maximum		
Flow	MGD	Report	Report	N/A	N/A	N/A	N/A	1/Quarter	Instantaneous
Settleable Solids	mg/l	N/A	N/A	N/A	Report	Report	N/A	1/Quarter	Grab
Oil & Grease	mg/l	N/A	N/A	N/A	10	15	N/A	1/Quarter	Grab
pH	SU	N/A	N/A	6.0	N/A	N/A	9.0	1/Quarter	Grab

8.4. Pertinent Factors

The effluent limitations for this outfall were developed in accordance with DOW’s General Procedures for Limitations Development located on DOW’s webpage at: <https://eec.ky.gov/Environmental-Protection/Forms%20Library/General%20Procedures%20for%20Limitations%20Development.pdf>

8.4.1. Federally-Listed Threatened or Endangered Aquatic Species

There are no know federally-listed threatened or endangered aquatic species.

8.4.2. Technology-Based Effluent Limitations

8.4.2.1. General Requirement for Technology-Based Limitations

Technology-based effluent limitations and standards, based on federally promulgated standards, a case-by-case basis, or a combination of the two, shall be included in all KPDES permits, where applicable [401 KAR 5:065, Section 2(4) – 40 CFR 122.44(a)].

8.4.2.2. Federal Effluent Limitations Guidelines

The DOW has reviewed this non-POTW’s operation, its processes, its wastestreams and its Standard Industrial Classification. The DOW found no Effluent Guideline that applies to this Outfall’s discharge.

8.4.2.3. Best Professional Judgement

Oil & Grease

The facility does not treat its wastewater for this parameter before discharge. If treatment were to be necessary, an adequately sized oil /water separator with ample retention time would provide appropriate treatment. Flotation or gravity separation of lighter petroleum based products from water is a common and cost effective method for the removal of oil & grease. It has been the experience of the Division that this treatment method can achieve an oil & grease concentration of 10 mg/l as a monthly average and 15 mg/l as a daily maximum.

8.4.3. Water Quality-Based Effluent Limitations and/or Monitoring

The following table lists those pollutants and/or pollutant characteristics of concern that DOW has determined exhibit reasonable potential to cause or contribute to an excursion of a water quality-based criterion, and the basis of DOW’s determination. These determinations are consistent with the DOW’s reasonable potential analysis (RPA) procedures outlined in *Permitting Procedures For Determining “Reasonable Potential”* Kentucky Division of Water May 1, 2000. This table may also include pollutants for which DOW has found the existence of reasonable potential to be indeterminate or for which DOW needs additional study.

TABLE 30.	
Pollutant or Pollutant Characteristic	Basis
Settleable Solids	Due to the nature of the facility, it is the Divisions best professional judgement to continue monitoring for this pollutant.

8.5. Limitation Calculations

8.5.1. Calculations for Water Quality-Based Effluent Limitations

These calculations were performed using a Microsoft EXCEL based workbook developed by DOW. The workbook is designed to compare effluent data to the applicable water quality standards while also

incorporating the characteristics of the receiving water and any regulatory ZID and/or MZ. The following table summarizes the results of these calculations for this outfall:

Effluent Characteristic	Units	Reported Av	Reported M	Average Limitation	Maximum Limitation	Average Discharge %	Maximum Discharge %	MZF	Data Source
Antimony	µg/L	0	0	640	N/A	0.00	N/A	0	APP
Arsenic	µg/L	10.8	10.8	150	340	7.20	3.18	0	APP
Barium	µg/L	26.3	26.3	281069.6203	N/A	0.01	N/A	0	APP
Cadmium	µg/L	0	0	1.027603977	2.623099236	0.00	0.00	0	APP
Chromium	µg/L	1.7	1.7	28106.96203	N/A	0.01	N/A	0	APP
Color	Platinum Cobalt Units	130	130	21080.22152	N/A	0.62	N/A	0	APP
Copper	µg/L	0.99	2.9	12.36052561	19.09184613	8.01	15.19	0	DMR
Iron	µg/L	447	447	3500	4000	12.77	11.18	0	APP
Nickel	µg/L	1.2	1.2	68.9212775	619.9041984	1.74	0.19	0	APP
Nitrate (as N)	µg/L	400	400	2810696.203	N/A	0.01	N/A	0	APP
Selenium	µg/L	3.6	3.6	5	N/A	72.00	N/A	0	APP
Sulfate	µg/L	37800	37800	70267405.06	N/A	0.05	N/A	0	APP
Thallium	µg/L	0.11	0.11	0.47	N/A	23.40	N/A	0	APP
Zinc	µg/L	70.3	70.3	158.377237	158.377237	44.39	44.39	0	APP
Summer Ammonia (as N)	mg/l	0	0	1143.413649	N/A	0.00	N/A	0	APP

Since this Outfall discharges intermittently the chronic criteria do not apply.

8.5.2. Comparison of Technology Based Effluent Limitations to Water Quality Based Effluent Limitations

The final step in determining a permit’s final limits is to compare the limitations generated from any effluent guidelines and other technology-based limitations to those generated from the water quality standards.

TSS

Based upon review of the proposed discharge and the receiving stream. The Division of Water does not believe the calculated total suspended solids limit will have an adverse effect on the indigenous aquatic community [401 KAR 10:031, Section 4(1)(g)].

8.6. Justification of Requirements

Chapters 5 and 10 of Title 401 of the Kentucky Administrative Regulations (KARs), cited in the following, have been duly promulgated pursuant to the requirements of Chapter 224 of the Kentucky Revised Statutes.

At a minimum, all permits shall contain technology-based effluent limitations (TBELs) [401 KAR 5:065, Section 2(4) – 40 CFR 122.44(a)]. When necessary to achieve water quality standards, all permits shall contain water quality-based effluent limitations (WQBELs) [401 KAR 5:065, Section 2(4) – 40 CFR 122.44(d)]. Any WQBELs included in this permit are based upon the Kentucky Water Quality Standards (KYWQS) [401 KAR 10:031].

8.6.1. Flow

The monitoring requirements for this parameter are consistent with the KPDES permit program requirements for establishing effluent limitations, standards, and permit conditions [401 KAR 5:065, Section 2(4) – 40 CFR 122.44(i)(1)(ii)] and requirements for recording and reporting of monitoring results [401 KAR 5:050, Section 4 – 40 CFR 122.48].

8.6.2. Oil & Grease

The limitations for this parameter are consistent with the requirements of 40 CFR 125.3(c)(2) as incorporated by reference in 401 KAR 5:080, Section 2(3). The limits are representative of the Division of

Water's "Best Professional Judgment" (BPJ) determination of the "Best Conventional Pollutant Control Technology" (BCT) requirements for these pollutants.

8.6.3. pH

The limitations for this parameter are consistent with Kentucky's Water Quality Standards [401 KAR 10:031, Section 4(1)(b) and Section 7].

8.6.4. Settleable Solids

The monitoring requirements for this parameter are consistent with the KPDES permit program requirements for establishing effluent limitations, standards, and permit conditions [401 KAR 5:065, Section 2(4) – 40 CFR 122.44(i)(1)(i)] and requirements for recording and reporting of monitoring results [401 KAR 5:050, Section 4 – 40 CFR 122.48].

8.6.5. Hardness and Total Recoverable Copper

Cooper station implemented some additional BMPs related to Outfall 007 to help reduce Copper. After the date of 9/22/2021 all BMPs have been implemented and since then the facility has not shown reasonable potential for this parameter at this outfall. Therefore, the decision to remove this parameter from the permit is based on the Division of Water's EPA-Approved "Permitting Procedures For Determining Reasonable Potential" and 40 CFR 122.44(d). Since none of the remaining parameters are hardness dependent, the monitoring requirements for hardness have also been removed.

SECTION 9

OUTFALL 008

9. OUTFALL 008

9.1. Outfall Description

The following table lists the outfall type, location, and description:

TABLE 31.				
Outfall Type	Latitude (N)	Longitude (W)	Receiving Water	Description of Outfall
Internal	36.99779°	84.58733°	Outfall 003	Treated wastewater from total plant drain system, coal pile runoff, landfill leachate, and metal cleaning wastewater from Outfall 004

9.2. Reported Values

The following table summarizes the reported values for Outfall 008:

TABLE 32.							
Reported Parameters	Units	EFFLUENT					
		Loadings (lbs./day)		Concentrations			
		Monthly Average	Daily Maximum	Minimum	Monthly Average	Daily Maximum	Maximum
Effluent Flow	MGD	0.563	0.950	N/A	N/A	N/A	N/A
Total Suspended Solids	mg/l	N/A	N/A	N/A	1.77	28.0	N/A
Oil & Grease	mg/l	N/A	N/A	N/A	0.13	5.60	N/A
pH	SU	N/A	N/A	6.39	N/A	N/A	8.95

The above values are based on 5-year Discharge Monitoring Report (DMR) averages from 07/31/2018 to 11/30/2022.

9.3. Effluent Limitations and Monitoring Requirements

The following table summarizes the effluent limitations and monitoring requirements for Outfall 008:

TABLE 33.									
EFFLUENT LIMITATIONS								MONITORING REQUIREMENTS	
Effluent Characteristic	Units	Loadings (lbs./day)		Concentrations				Frequency	Sample Type
		Monthly Average	Daily Maximum	Minimum	Monthly Average	Daily Maximum	Maximum		
Flow	MGD	Report	Report	N/A	N/A	N/A	N/A	2/Month	Instantaneous
Total Suspended Solids	mg/l	N/A	N/A	N/A	30.0	91.8	N/A	2/Month	Grab

TABLE 33.

EFFLUENT LIMITATIONS								MONITORING REQUIREMENTS	
Effluent Characteristic	Units	Loadings (lbs./day)		Concentrations				Frequency	Sample Type
		Monthly Average	Daily Maximum	Minimum	Monthly Average	Daily Maximum	Maximum		
Oil & Grease	mg/l	N/A	N/A	N/A	13.4	17.5	N/A	2/Month	Grab
pH	SU	N/A	N/A	6.0	N/A	N/A	9.0	2/Month	Grab

9.4. Pertinent Factors

The effluent limitations for this outfall were developed in accordance with DOW’s General Procedures for Limitations Development located on DOW’s webpage at: <https://eec.ky.gov/Environmental-Protection/Forms%20Library/General%20Procedures%20for%20Limitations%20Development.pdf>

9.4.1. Federally-Listed Threatened or Endangered Aquatic Species

There are no know federally-listed threatened or endangered aquatic species.

9.4.2. Technology-Based Effluent Limitations

9.4.2.1. General Requirement for Technology-Based Limitations

Technology-based effluent limitations and standards, based on federally promulgated standards, a case-by-case basis, or a combination of the two, shall be included in all KPDES permits, where applicable [401 KAR 5:065, Section 2(4) – 40 CFR 122.44(a)].

9.4.2.2. Federal Effluent Limitations Guidelines

EPA has established a minimum level of technology that must be applied to certain industries. Due to the operations at this facility, all applicable sections of 40 CFR 423 shall be applied to this outfall. The following is a list of those requirements:

40 CFR 423.12(b) (1)

The pH of all discharges, except once through cooling water, shall be within the range of 6.0-9.0.

40 CFR 423.12(b) (2)

There shall be no discharge of polychlorinated biphenyl compounds such as those commonly used for transformer fluid.

40 CFR 423.12(b) (3)

The quantity of pollutants discharged from low volume waste sources shall not exceed the quantity determined by multiplying the flow of low volume waste sources times the concentration listed in the following table:

TABLE 34.		
BPT Effluent Requirements – Low Volume Waste		
Effluent Characteristic	Maximum for any one day	Maximum for monthly average
TSS	100.0 mg/l	30.0 mg/l
Oil and Grease	20.0 mg/l	15.0 mg/l

40 CFR 423.12(b)(5)

The quantity of pollutants discharged in metal cleaning wastes shall not exceed the quantity determined by multiplying the flow of metal cleaning wastes times the concentration listed in the following table:

TABLE 35.		
BPT Effluent Requirements – Metal Cleaning Wastes		
Effluent Characteristic	Maximum for any one day	Maximum for monthly average
TSS	100.0 mg/l	30.0 mg/l
Oil and Grease	20.0 mg/l	15.0 mg/l
Copper, Total	1.0 mg/l	1.0 mg/l
Iron, Total	1.0 mg/l	1.0 mg/l

40 CFR 423.12(b) (9)

Subject to the provisions of paragraph (b)(10) of this section, the following effluent limitations shall apply to the point source discharges of coal pile runoff:

TABLE 36.		
BPT Effluent Requirements – Coal Pile Runoff		
Effluent Characteristic	Maximum for any one day	Maximum for monthly average
TSS	50 mg/l	-

40 CFR 423.12(b) (10)

Any untreated overflow from facilities designed, constructed, and operated to treat the volume of coal pile runoff which is associated with a 10 year, 24 hour rainfall event shall not be subject to the limitations in paragraph (b)(9) of this section

40 CFR 423.12(b) (11)

The quantity of pollutants discharged in FGD wastewater, flue gas mercury control wastewater, combustion residual leachate, or gasification wastewater shall not exceed the quantity determined by multiplying the flow of the applicable wastewater times the concentration listed in the following table:

TABLE 37.		
BPT Effluent Requirements – combustion residual leachate		
Effluent Characteristic	Maximum for any one day	Maximum for monthly average
TSS	100.0 mg/l	30.0 mg/l
Oil and Grease	20.0 mg/l	15.0 mg/l

40 CFR 423.12(b) (12)

At the permitting authority’s discretion, the quantity of pollutant allowed to be discharged may be expressed as concentration limitations instead of the mass-based limitations specified in paragraphs (b)(3) through (b)(7), and (b)(11), of this section concentration limitations shall be those concentrations specified in this section.

In accordance with Sections 423.12 (b) (12) the permitting authority may allow the quantity of pollutant discharge to be expressed as a concentration limitation instead of a mass based limitation. The DOW has determined to apply the requirements of 40 CFR Part 423 in this manner.

40 CFR 423.12(b)(13)

In the event that waste streams from various sources are combined for treatment to be discharge, the quantity of each pollutant or pollutant property controlled in paragraphs (b)(1) through (b)(12) of this section attributable to each controlled waste source shall not exceed the specified limitations for that waste source.

40 CFR 423.13(a)

There shall be no discharge of polychlorinated biphenyl compounds such as those commonly used for transformer fluid.

40 CFR 423.13(l)

Combustion residual leachate. The quantity of pollutants discharged in combustion residual leachate shall not exceed the quantity determined by multiplying the flow of combustion residual leachate times the concentration for TSS listed in 423.12(b)(11)

40 CFR 423.13(m)

At the permitting authority’s discretion, the quantity of pollutant allowed to be discharged may be expressed as concentration limitations instead of the mass-based limitations specified in paragraphs (b) through (l) of this section concentration limitations shall be those concentrations specified in this section.

In accordance with Sections 423.13 (m) the permitting authority may allow the quantity of pollutant discharge to be expressed as a concentration limitation instead of a mass based limitation. The DOW has determined to apply the requirements of 40 CFR Part 423 in this manner

40 CFR 423.13(n)

In the event that wastestreams from various sources are combined for treatment or discharged, the quantity of each pollutant or pollutant property controlled in paragraphs (a) through (m) of this section attributable to each controlled waste source shall not exceed the specified limitation for that waste source.

9.4.2.3. Best Professional Judgement

Coal Pile Runoff

In accordance with 401 KAR 5:080, Section 2(3) – 40 CFR 125.3 in the absence of promulgated technology based standards, the cabinet may develop appropriate technology based standards utilizing its ‘Best Professional Judgment’ (BPJ). The previous permit established the following BPJ limits for coal pile runoff.

TABLE 38.		
BPJ Effluent Requirements – Coal Pile Runoff		
Effluent Characteristic	Maximum for any one day	Maximum for monthly average
TSS	N/A	30.0 mg/l
Oil and Grease	5.0 mg/l	5.0 mg/l

9.5. Limitation Calculations

9.5.1. Calculations for Technology-Based Effluent Limitations

Current Operations	Flow	TSS		TSS Cal		Oil & Grease		Oil & Grease Cal	
		Avg	MAX	Avg	MAX	Avg	Max	Avg	Max
Coal Pile Runoff	0.0677	30	50	2.031	3.385	5	5	0.3385	0.3385
Landfill Leachate	0.0144	30	100	0.432	1.44	15	20	0.216	0.288
Metal Cleaning Wastewater	0.0005	30	100	0.015	0.05	15	20	0.0075	0.01
Total Plant Drain System	0.331	30	100	9.93	33.1	15	20	4.965	6.62
Total	0.4136			12.408	37.975			5.527	7.2565
	Limits	30	91.81576			13.36315	17.54473		

9.6. Justification of Requirements

Chapters 5 and 10 of Title 401 of the Kentucky Administrative Regulations (KARs), cited in the following, have been duly promulgated pursuant to the requirements of Chapter 224 of the Kentucky Revised Statutes.

At a minimum, all permits shall contain technology-based effluent limitations (TBELs) [401 KAR 5:065, Section 2(4) – 40 CFR 122.44(a)]. When necessary to achieve water quality standards, all permits shall contain water quality-based effluent limitations (WQBELs) [401 KAR 5:065, Section 2(4) – 40 CFR 122.44(d)]. Any WQBELs included in this permit are based upon the Kentucky Water Quality Standards (KYWQS) [401 KAR 10:031].

9.6.1. Internal Monitoring Point

The monitoring requirements for these parameters are consistent with the KPDES permit program requirements for establishing effluent limitations, standards, and permit conditions [401 KAR 5:065, Section 2(4) – 40 CFR 122.44(i)(1)(iii)], and the requirements for recording and reporting of monitoring results [401 KAR 5:050, Section 4 – 40 CFR 122.48].

9.6.2. Flow

The monitoring requirements for this parameter are consistent with the KPDES permit program requirements for establishing effluent limitations, standards, and permit conditions [401 KAR 5:065, Section 2(4) – 40 CFR 122.44(i)(1)(ii)] and requirements for recording and reporting of monitoring results [401 KAR 5:050, Section 4 – 40 CFR 122.48].

9.6.3. Total Suspended Solids and Oil & Grease

The limits for these parameters are consistent with the KPDES permit program requirements for establishing effluent limitations, standards, and permit conditions [401 KAR 5:065, Section 2(4) – 40 CFR 122.44(a)(1) and 122.44(i)(1)], the criteria and standards for imposing TBELs [401 KAR 5:065, Section 2(6) – 40 CFR 122 Appendix A], representative of the BPT requirements for low volume waste [40 CFR 423.12(b)(3)], representative of BPT requirements for coal pile runoff [40 CFR 423.12(b)(9)], representative of BPT requirements for metal cleaning waste [40 CFR 423.12(b)(5)], representative of BAT requirements for combustion residual leachate [40 CFR 423.13(l)], and imposing Best Professional Judgement [401 KAR 5:080, Section 2(3) – 40 CFR 125.3].

9.6.4. pH

The limit for this parameter is consistent with the KPDES permit program requirements for establishing effluent limitations, standards, and permit conditions [401 KAR 5:065, Section 2(4) – 40 CFR 122.44(a)(1) and 122.44(i)(1)], the criteria and standards for imposing TBELs [401 KAR 5:065, Section 2(6) – 40 CFR 122 Appendix A], representative of the BPT requirements for pH [40 CFR 423.12 (b)(1)], and state water quality standards [401 KAR 10:031, Sections 4(1)(b) and 7].

SECTION 10

OUTFALL 009

10. OUTFALL 009

10.1. Outfall Description

The following table lists the outfall type, location, and description:

TABLE 39.				
Outfall Type	Latitude (N)	Longitude (W)	Receiving Water	Description of Outfall
External	37.00681°	84.60032°	UT to Pitman Creek	Stormwater Runoff and Treated Construction Dewatering

10.2. Effluent Limitations and Monitoring Requirements

The following table summarizes the effluent limitations and monitoring requirements for Outfall 009:

TABLE 40.									
EFFLUENT LIMITATIONS								MONITORING REQUIREMENTS	
Effluent Characteristic	Units	Loadings (lbs./day)		Concentrations				Frequency	Sample Type
		Monthly Average	Daily Maximum	Minimum	Monthly Average	Daily Maximum	Maximum		
Flow	MGD	Report	Report	N/A	N/A	N/A	N/A	1/Quarter	Instantaneous
Total Suspended Solids	mg/l	N/A	N/A	N/A	30	60	N/A	1/Quarter	Grab
Oil & Grease	mg/l	N/A	N/A	N/A	10	15	N/A	1/Quarter	Grab
pH	SU	N/A	N/A	6.0	N/A	N/A	9.0	1/Quarter	Grab

10.3. Pertinent Factors

The effluent limitations for this outfall were developed in accordance with DOW's General Procedures for Limitations Development located on DOW's webpage at: <https://eec.ky.gov/Environmental-Protection/Forms%20Library/General%20Procedures%20for%20Limitations%20Development.pdf>

10.3.1. Federally-Listed Threatened or Endangered Aquatic Species

There are no know federally-listed threatened or endangered aquatic species.

10.3.2. Technology-Based Effluent Limitations

10.3.2.1. General Requirement for Technology-Based Limitations

Technology-based effluent limitations and standards, based on federally promulgated standards, a case-by-case basis, or a combination of the two, shall be included in all KPDES permits, where applicable [401 KAR 5:065, Section 2(4) – 40 CFR 122.44(a)].

10.3.2.2. Federal Effluent Limitations Guidelines

The DOW has reviewed this non-POTW's operation, its processes, its wastestreams and its Standard Industrial Classification. The DOW found no Effluent Guideline that applies to this Outfall's discharge.

10.3.2.3. Best Professional Judgement

Stormwater - Total Suspended Solids

The facility treats its storm water for this parameter before discharge in a holding pond. Sedimentation is a commonly used treatment technology for the removal of total suspended solids that is both efficient and cost effective. Although several factors may influence the final concentration of total suspended solids in the discharge, it has been the experience of the Division that ponds that retain wastewater for 6 hours or more can achieve a total suspended solids concentration of 30 mg/l as a monthly average and 60 mg/l as a daily maximum.

Stormwater -Oil & Grease

The facility does not treat its wastewater for this parameter before discharge. If treatment were to be necessary, an adequately sized oil /water separator with ample retention time would provide appropriate treatment. Flotation or gravity separation of lighter petroleum based products from water is a common and cost effective method for the removal of oil & grease. It has been the experience of the Division that this treatment method can achieve an oil & grease concentration of 10 mg/l as a monthly average and 15 mg/l as a daily maximum.

10.4. Limitation Calculations

10.4.1. Calculations for Water Quality-Based Effluent Limitations

These calculations were performed using a Microsoft EXCEL based workbook developed by DOW. The workbook is designed to compare effluent data to the applicable water quality standards while also incorporating the characteristics of the receiving water and any regulatory ZID and/or MZ. The following table summarizes the results of these calculations for this outfall:

The discharge from this new outfall is expected to be similar in effluent characteristics as Outfall 005. Therefore, Outfall 005 was used to determine the expected discharge from this outfall until monitoring data can be obtained following the onset of operations.

Effluent Characteristic	Units	Reported Av	Reported M	Average Limitation	Maximum Limitation	Average Discharge %	Maximum Discharge %	MZF	Data Sou
Acrolein	µg/L	27.3	27.3	3	3	910.00	910.00	0	APP
Antimony	µg/L	0	0	640	N/A	0.00	N/A	0	APP
Arsenic	µg/L	10.5	10.5	150	340	7.00	3.09	0	APP
Barium	µg/L	47.7	47.7	714725.8065	N/A	0.01	N/A	0	APP
Beryllium	µg/L	0	0	2858.903226	N/A	0.00	N/A	0	APP
Cadmium	µg/L	0	0	1.318574333	3.561963238	0.00	0.00	0	APP
Chloride	µg/L	10600	10600	600000	1200000	1.77	0.88	0	APP
Color	Platinum Cobalt Units	35	35	53604.43548	N/A	0.07	N/A	0	APP
Copper	µg/L	0	0	16.14454255	25.62955251	0.00	0.00	0	APP
Cyanide, Free	µg/L	0	0	5.2	22	0.00	0.00	0	APP
Lead	µg/L	0	0	7.20274097	184.8346504	0.00	0.00	0	APP
Mercury	µg/L	0	0	0.051	1.4	0.00	0.00	0	APP
Nickel	µg/L	0	0	89.78180744	807.5317434	0.00	0.00	0	APP
Nitrate (as N)	µg/L	1200	1200	7147258.065	N/A	0.02	N/A	0	APP
Phenol	µg/L	0	0	300	300	0.00	0.00	0	APP
Selenium	µg/L	2.3	2.3	5	N/A	46.00	N/A	0	APP
Silver	µg/L	0	0	N/A	11.41446492	N/A	0.00	0	APP
Sulfate	µg/L	116000	116000	178681451.6	N/A	0.06	N/A	0	APP
Thallium	µg/L	0	0	0.47	N/A	0.00	N/A	0	APP
Zinc	µg/L	0	0	206.3974123	206.3974123	0.00	0.00	0	APP
Summer Ammonia (as N)	mg/l	0.054	0.054	2907.561628	N/A	0.00	N/A	0	APP
Winter Ammonia (as N)	mg/l	0.054	0.054	7219.578457	N/A	0.00	N/A	0	APP

10.4.2. Comparison of Technology Based Effluent Limitations to Water Quality Based Effluent Limitations

The final step in determining a permit’s final limits is to compare the limitations generated from any effluent guidelines and other technology-based limitations to those generated from the water quality standards.

Oil & Grease

To ensure that both technology and water quality standards are achieved, both the numeric TBEL and the narrative water quality criteria [401 KAR 10:031 Section 2(b)] are applied.

TSS

Based upon review of the proposed discharge and the receiving stream. The Division of Water does not believe the calculated total suspended solids limit will have an adverse effect on the indigenous aquatic community [401 KAR 10:031, Section 4(1)(g)].

10.5. Justification of Requirements

Chapters 5 and 10 of Title 401 of the Kentucky Administrative Regulations (KARs), cited in the following, have been duly promulgated pursuant to the requirements of Chapter 224 of the Kentucky Revised Statutes.

At a minimum, all permits shall contain technology-based effluent limitations (TBELs) [401 KAR 5:065, Section 2(4) – 40 CFR 122.44(a)]. When necessary to achieve water quality standards, all permits shall contain water quality-based effluent limitations (WQBELs) [401 KAR 5:065, Section 2(4) – 40 CFR 122.44(d)]. Any WQBELs included in this permit are based upon the Kentucky Water Quality Standards (KYWQS) [401 KAR 10:031].

10.5.1. Flow

The monitoring requirements for this parameter are consistent with the KPDES permit program requirements for establishing effluent limitations, standards, and permit conditions [401 KAR 5:065, Section 2(4) – 40 CFR 122.44(i)(1)(ii)] and requirements for recording and reporting of monitoring results [401 KAR 5:050, Section 4 – 40 CFR 122.48].

10.5.2. Total Suspended Solids and Oil & Grease

The limitations for these parameters are consistent with the requirements of 40 CFR 125.3(c)(2) as incorporated by reference in 401 KAR 5:080, Section 2(3). The limits are representative of the Division of Water's "Best Professional Judgment" (BPJ) determination of the "Best Conventional Pollutant Control Technology" (BCT) requirements for these pollutants.

10.5.3. pH

The limitations for this parameter are consistent with Kentucky's Water Quality Standards [401 KAR 10:031, Section 4(1)(b) and Section 7].

SECTION 11

OUTFALL 010

11. OUTFALL 010

11.1. Outfall Description

The following table lists the outfall type, location, and description:

TABLE 41.				
Outfall Type	Latitude (N)	Longitude (W)	Receiving Water	Description of Outfall
External	37.00669°	84.60042°	UT to Pitman Creek	Stormwater Runoff and Treated Construction Dewatering

11.2. Effluent Limitations and Monitoring Requirements

The following table summarizes the effluent limitations and monitoring requirements for Outfall 010:

TABLE 42.									
EFFLUENT LIMITATIONS								MONITORING REQUIREMENTS	
Effluent Characteristic	Units	Loadings (lbs./day)		Concentrations				Frequency	Sample Type
		Monthly Average	Daily Maximum	Minimum	Monthly Average	Daily Maximum	Maximum		
Flow	MGD	Report	Report	N/A	N/A	N/A	N/A	1/Quarter	Instantaneous
Total Suspended Solids	mg/l	N/A	N/A	N/A	30	60	N/A	1/Quarter	Grab
Oil & Grease	mg/l	N/A	N/A	N/A	10	15	N/A	1/Quarter	Grab
pH	SU	N/A	N/A	6.0	N/A	N/A	9.0	1/Quarter	Grab

11.3. Pertinent Factors

The effluent limitations for this outfall were developed in accordance with DOW's General Procedures for Limitations Development located on DOW's webpage at: <https://eec.ky.gov/Environmental-Protection/Forms%20Library/General%20Procedures%20for%20Limitations%20Development.pdf>

11.3.1. Federally-Listed Threatened or Endangered Aquatic Species

There are no know federally-listed threatened or endangered aquatic species.

11.3.2. Technology-Based Effluent Limitations

11.3.2.1. General Requirement for Technology-Based Limitations

Technology-based effluent limitations and standards, based on federally promulgated standards, a case-by-case basis, or a combination of the two, shall be included in all KPDES permits, where applicable [401 KAR 5:065, Section 2(4) – 40 CFR 122.44(a)].

11.3.2.2. Federal Effluent Limitations Guidelines

The DOW has reviewed this non-POTW's operation, its processes, its wastestreams and its Standard Industrial Classification. The DOW found no Effluent Guideline that applies to this Outfall's discharge.

11.3.2.3. Best Professional Judgement

Stormwater - Total Suspended Solids

The facility treats its storm water for this parameter before discharge in a holding pond. Sedimentation is a commonly used treatment technology for the removal of total suspended solids that is both efficient and cost effective. Although several factors may influence the final concentration of total suspended solids in the discharge, it has been the experience of the Division that ponds that retain wastewater for 6 hours or more can achieve a total suspended solids concentration of 30 mg/l as a monthly average and 60 mg/l as a daily maximum.

Stormwater -Oil & Grease

The facility does not treat its wastewater for this parameter before discharge. If treatment were to be necessary, an adequately sized oil /water separator with ample retention time would provide appropriate treatment. Flotation or gravity separation of lighter petroleum based products from water is a common and cost effective method for the removal of oil & grease. It has been the experience of the Division that this treatment method can achieve an oil & grease concentration of 10 mg/l as a monthly average and 15 mg/l as a daily maximum.

11.4. Limitation Calculations

11.4.1. Calculations for Water Quality-Based Effluent Limitations

These calculations were performed using a Microsoft EXCEL based workbook developed by DOW. The workbook is designed to compare effluent data to the applicable water quality standards while also incorporating the characteristics of the receiving water and any regulatory ZID and/or MZ. The following table summarizes the results of these calculations for this outfall:

The discharge from this new outfall is expected to be similar in effluent characteristics as Outfall 005. Therefore, Outfall 005 was used to determine the expected discharge from this outfall until monitoring data can be obtained following the onset of operations.

Effluent Characteristic	Units	Reported Av	Reported M	Average Limitation	Maximum Limitation	Average Discharge %	Maximum Discharge %	MZF	Data Sou
Acrolein	µg/L	27.3	27.3	3	3	910.00	910.00	0	APP
Antimony	µg/L	0	0	640	N/A	0.00	N/A	0	APP
Arsenic	µg/L	10.5	10.5	150	340	7.00	3.09	0	APP
Barium	µg/L	47.7	47.7	714725.8065	N/A	0.01	N/A	0	APP
Beryllium	µg/L	0	0	2858.903226	N/A	0.00	N/A	0	APP
Cadmium	µg/L	0	0	1.318574333	3.561963238	0.00	0.00	0	APP
Chloride	µg/L	10600	10600	600000	1200000	1.77	0.88	0	APP
Color	Platinum Cobalt Units	35	35	53604.43548	N/A	0.07	N/A	0	APP
Copper	µg/L	0	0	16.14454255	25.62955251	0.00	0.00	0	APP
Cyanide, Free	µg/L	0	0	5.2	22	0.00	0.00	0	APP
Lead	µg/L	0	0	7.20274097	184.8346504	0.00	0.00	0	APP
Mercury	µg/L	0	0	0.051	1.4	0.00	0.00	0	APP
Nickel	µg/L	0	0	89.78180744	807.5317434	0.00	0.00	0	APP
Nitrate (as N)	µg/L	1200	1200	7147258.065	N/A	0.02	N/A	0	APP
Phenol	µg/L	0	0	300	300	0.00	0.00	0	APP
Selenium	µg/L	2.3	2.3	5	N/A	46.00	N/A	0	APP
Silver	µg/L	0	0	N/A	11.41446492	N/A	0.00	0	APP
Sulfate	µg/L	116000	116000	178681451.6	N/A	0.06	N/A	0	APP
Thallium	µg/L	0	0	0.47	N/A	0.00	N/A	0	APP
Zinc	µg/L	0	0	206.3974123	206.3974123	0.00	0.00	0	APP
Summer Ammonia (as N)	mg/l	0.054	0.054	2907.561628	N/A	0.00	N/A	0	APP
Winter Ammonia (as N)	mg/l	0.054	0.054	7219.578457	N/A	0.00	N/A	0	APP

11.4.2. Comparison of Technology Based Effluent Limitations to Water Quality Based Effluent Limitations

The final step in determining a permit’s final limits is to compare the limitations generated from any effluent guidelines and other technology-based limitations to those generated from the water quality standards.

Oil & Grease

To ensure that both technology and water quality standards are achieved, both the numeric TBEL and the narrative water quality criteria [401 KAR 10:031 Section 2(b)] are applied.

TSS

Based upon review of the proposed discharge and the receiving stream. The Division of Water does not believe the calculated total suspended solids limit will have an adverse effect on the indigenous aquatic community [401 KAR 10:031, Section 4(1)(g)].

11.5. Justification of Requirements

Chapters 5 and 10 of Title 401 of the Kentucky Administrative Regulations (KARs), cited in the following, have been duly promulgated pursuant to the requirements of Chapter 224 of the Kentucky Revised Statutes.

At a minimum, all permits shall contain technology-based effluent limitations (TBELs) [401 KAR 5:065, Section 2(4) – 40 CFR 122.44(a)]. When necessary to achieve water quality standards, all permits shall contain water quality-based effluent limitations (WQBELs) [401 KAR 5:065, Section 2(4) – 40 CFR 122.44(d)]. Any WQBELs included in this permit are based upon the Kentucky Water Quality Standards (KYWQS) [401 KAR 10:031].

11.5.1. Flow

The monitoring requirements for this parameter are consistent with the KPDES permit program requirements for establishing effluent limitations, standards, and permit conditions [401 KAR 5:065, Section 2(4) – 40 CFR 122.44(i)(1)(ii)] and requirements for recording and reporting of monitoring results [401 KAR 5:050, Section 4 – 40 CFR 122.48].

11.5.2. Total Suspended Solids and Oil & Grease

The limitations for these parameters are consistent with the requirements of 40 CFR 125.3(c)(2) as incorporated by reference in 401 KAR 5:080, Section 2(3). The limits are representative of the Division of Water's "Best Professional Judgment" (BPJ) determination of the "Best Conventional Pollutant Control Technology" (BCT) requirements for these pollutants.

11.5.3. pH

The limitations for this parameter are consistent with Kentucky's Water Quality Standards [401 KAR 10:031, Section 4(1)(b) and Section 7].

SECTION 12

OTHER CONDITIONS

12. OTHER CONDITIONS**12.1. Schedule of Compliance**

The permittee is required to comply with all effluent limitations by the effective date of the permit unless a compliance schedule is included with the permit. The schedule of compliance is consistent with the regulatory provisions for establishing a schedule of compliance [401 KAR 5:050, Section 3 and 40 CFR 122.47].

12.2. Antidegradation

The conditions of Kentucky's Antidegradation Policy have been satisfied [401 KAR 10:029, Section 1]. This permitting action is/a reissuance of a KPDES permit that does not authorize an expanded discharge.

12.3. Standard Conditions

The conditions listed in the Standard Conditions Section of the permit are consistent with the conditions applicable to all permits [401 KAR 5:065, Section 2(1) – 40 CFR 122.41].

12.4. Sufficiently Sensitive Analytical Methods

Analytical methods utilized to demonstrate compliance with the effluent limitations established in this permit shall be sufficiently sensitive to detect pollutant levels at or below the required effluent limit [401 KAR 5:065, Section 2(4) – 40 CFR 122.44(i)(1)(iv)].

12.5. Certified Laboratory

The condition that all environmental analysis to be performed by a certified laboratory is consistent with the certified wastewater laboratory requirements [401 KAR 5:320, Section 1].

12.6. Best Management Practices Plan (BMPP)

Permits are to include BMPs to control or abate the discharge of pollutants when: 1) authorized under section 304(e) of the CWA for the control of toxic pollutants and hazardous substances from ancillary industrial activities; 2) authorized under Section 402(p) of the CWA for the control of stormwater discharges; 3) numeric effluent limitations are infeasible; or 4) the practices are reasonably necessary to achieve effluent limitations and standards or to carry out the purposes and intent of the CWA [401 KAR 5:065, Section 2(4) – 40 CFR 122.44(k)]

12.7. Cooling Water Additives, FIFRA, and Mollusk Control

The discharge of any product registered under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) in cooling water which ultimately may be released to the waters of the Commonwealth is prohibited, except Herbicides, unless specifically identified and authorized by the KPDES permit. In the event the permittee needs to use a biocide or chemical not previously reported for mollusk control or other purpose, the permittee shall submit sufficient information, a minimum of thirty (30) days prior to the commencement of use of said biocides or chemicals to the Division of Water for review and establishment of appropriate control parameters.

12.8. Location Map

