a PPL company
220 West Main Street
Louisville, KY 40202

December 15, 2022

Kentucky Division of Water, Surface Water Permits Branch
300 Sower Boulevard, 3rd Floor
Frankfort, KY 40601

**RE: KPDES No. KY0003221 Mill Creek Generating Station, Jefferson County, KY;
Permit Reissuance Request
Agency Interest # A.I. 2122**

The Louisville Gas and Electric Company (LGE) provides this enclosed information to the Kentucky Division of Water (KDOW) for the reissuance of the expiring Mill Creek Generating Station KPDES permit KY0003221. KPDES Form 1, Form C, and an application fee check are enclosed with other related support documents.

Significant process water management changes have been initiated at the Mill Creek Station to comply with Steam-Electric Effluent Limitations Guidelines (ELG) issued by the USEPA. Generally, these changes are required for:

- construction of a biological wastewater treatment system and ancillary Ultrafiltration (UF) for Flue Gas Desulfurization (FGD) process waters.

Also, construction activities to dewater and close-in-place the site Ash Treatment Basin (ATB) were completed in September 2021, satisfying the closure requirements set by the USEPA Coal Combustion Residual (CCR) Rule.

EPA recently issued communications that it will reconsider the 2020 ELG rule with potential changes to limits for FGD wastewater, bottom ash transport water, legacy wastewater, and landfill leachate. However, until such proposed rulemaking is published and finalized, steam-electric utilities must comply with the 2020 ELG rule and its compliance dates. Therefore, LGE is proceeding with ELG rule construction activities under the applicability dates granted in the Mill Creek Generation Station KPDES permit KY0003221 modification with an effective date of November 1, 2021. Bottom ash is managed with a dry, pneumatic conveyance system which has no discharge of Bottom Ash Transport Water (BATW).

LGE is requesting permitting to allow wash waters from LGE distribution electrical vaults to be delivered to Mill Creek Generation Station and discharged into the site Process Pond. The Process Pond discharges through internal Outfall 002 to the high-rate multiport diffuser at external Outfall 025 to the Ohio River.

December 15, 2022
KPDES No. KY0003221 Mill Creek Generating Station
Permit Reissuance Request – Supplemental Information, Agency Interest # AI 2122

The KPDES Permit Application Synopsis, provided in **Attachment 1** of this submission, details site information and outfalls listing including categorization of outfalls discharges which contain process flows and many outfalls which consist only of uncontaminated stormwater runoff flows.

Form 1 and the application filing fee ($7,000.00 check for a major industry) are provided in **Attachment 2** and Atta**chment 3**. The USGS (United States Geological Survey) topographic map for the area including the Mill Creek Plant is provided in **Attachment 4**.
As directed by KPDES staff, Form C (provided in **Attachment 5**) has been prepared using recent 2022 samples including analyses for the Priority Pollutants constituents for KPDES Outfalls 002, 009, 023 and 025. Laboratory analyses supporting chemical information used in preparation of Form C is supplied in Attachment 6. Per KPDES staff direction, DMR analyses results from 2021 and 2022 are provided in **Attachment 7.**

The Plant water balance diagrams (**Attachment 8**) may sometimes include stormwater runoff flows from various site areas. Process flows are calculated as PMAC (Peak Monthly Average Conditions) value to reflect the average daily flow for the combination of 28 days normal operations, 1 day maximum operations and 1 day maintenance operations.

Stormwater Runoff Calculations and Diagrams (**Attachments 9** and **10**) were prepared using current information regarding construction of new wastewater treatment buildings, impoundments removal/refurbishment, CCR landfill and the ultimate stormwater controls-runoff management to be or already installed for all the affected areas. As such, the stormwater runoff calculations for industrial activity areas reflect the plant site conditions expected in-place by end-of-2028 (i.e., appropriate for the KPDES 5-year duration and to reflect end-of-permit-conditions).

The information mentioned above and provided in **Attachment 11**, Construction Projects Work Required for USEPA CCR and for USEPA ELG Federal Rules Compliance, also illustrates details of changes in Plant process equipment, impoundments flows management and combined discharges (besides inclusion of scheduling impacts information previously mentioned).

Provided in **Attachment 12** is the § 316(b) § 122.21(r)(2)-(8) studies report detailing efforts to establish cooling water intake technologies utilized at Mill Creek Generation Station as Best Available Technology (BAT) as established by USEPA. As discussed in the report, LGE expects to retire Mill Creek Unit 1 (and associated once-thru cooling system) in 2024.

Provided in **Attachment 13** is the water quality analysis for the AOC electrical vault wash waters.

As directed by, and discussed with KPDES staff, enclosed are:

1. Attachment 1: KPDES Permit Application Synopsis;
2. Attachment 2: KPDES Form 1;
3. Attachment 3: Check to Kentucky State Treasurer for KPDES application filing fee;
4. Attachment 4: USGS Topographic Map (noting the facility site and discharge points);
5. Attachment 5: KPDES Form C;
6. Attachment 6: Sample results for the priority pollutant analysis required for Form C from the contracted commercial laboratory – provides priority pollutant analyses performed in 2022 (per KPDES staff guidance);
7. Attachment 7: Quarterly Metals Analyses Summarized for 2021 and 2022;

8. Attachment 8: Water Balance Diagrams – 30-Day Peak Monthly Process and **Average Rainfall** conditions;
9. Attachment 9: Stormwater Runoff Calculations;
10. Attachment 10: Stormwater Runoff Diagram(s);
11. Attachment 11: Construction Activities Required at Mill Creek Generating Station to Comply with USEPA ELG Rule;
12. Attachment 12: Mill Creek Generation Station § 316(b) § 122.21(r)(2)-(8) Information and Factors that Must and May be Considered for the Entrainment BTA Determination
13. Attachment 13: Water Quality Analysis for LGE Distribution Electrical Vault Wash Waters

Chemical metal cleaning wastewaters (e.g. boiler chemical cleans) and non-chemical metals cleaning wastes (e.g. air heater wash waters include boiler/SCR/flue gas ductwork washing for maintenance activities, etc.) are shown on the flow diagrams and calculated as though these activities occur once in typical month.

If I may be of assistance or you have any questions concerning the attached information, please feel free to contact me at (502) 627-4144 (or by email at philip.imber@lge-ku.com) or Michael O'Guin at (502)-627-2338 (or by email at michael.o'guin@lge-ku.com).

Sincerely,

DocuSigned by:
Philip Imber
F0D3D3A42F7841C...

Philip A. Imber
Manager Environmental Land & Water
Louisville Gas and Electric Company

Enclosures (13)

VENDOR NO: 15166

ENDORSEMENT OF ATTACHED CHECK WILL ACKNOWLEDGE PAYMENT IN FULL OF ITEMS SET FORTH BELOW

LOUISVILLE GAS & ELECTRIC CO.

NO: 501805
DATE: 14-Nov-22

INVOICE NUMBER	INVOICE DATE	DESCRIPTION	DISCOUNT	NET AMOUNT
KENTUC111022LG	10-Nov-2022	DO NOT MAIL CHECK - PLEASE SEND CHECK	0.00	7,000.00
TOTALS			0.00	7,000.00

FILE COPY

PLEASE DETACH BEFORE PRESENTING CHECK

REMOVE DOCUMENT ALONG THIS PERFORATION

THIS DOCUMENT IS PRINTED IN TWO COLORS. DO NOT ACCEPT UNLESS BLUE AND GREEN ARE PRESENT.

LOUISVILLE GAS & ELECTRIC CO.
P.O. Box 32030
Louisville, KY 40232

CHECK DATE
14-Nov-22

VOID 6 MONTHS AFTER THIS DATE

VOID

BANK OF AMERICA, N.A.
Controlled Disbursement
Atlanta, Dekalb County , Georgia

NO: 501805

64-1278
611 GA

PAY Seven Thousand and 00/100 Dollars

CHECK AMOUNT
****$7,000.00

TO THE ORDER OF:
KENTUCKY STATE TREASURER
KENTUCKY DIVISION OF WATER
ATTN LABORATORY CERTIFICATION
200 FAIR OAKS LANE
FRANKFORT KY 40601

⑈00501805⑈ ⑆061112788⑆ 329 902 7609⑈

LOUISVILLE GAS & ELECTRIC CO.
P.O. Box 32030
Louisville, KY 40232

KENTUCKY STATE TREASURER
KENTUCKY DIVISION OF WATER
ATTN LABORATORY CERTIFICATION 200 FAIR OAKS LANE
FRANKFORT KY US 40601

SEE REVERSE SIDE FOR OPENING INSTRUCTIONS

SEE REVERSE SIDE FOR OPENING INSTRUCTIONS

September 26, 2022
KPDES No. KY0041971 Trimble County Generating Station
Permit Reissuance Request – Supplemental Information, Agency Interest # AI 4054

a PPL company
220 West Main Street
Louisville, KY 40202

September 26, 2022

Kentucky Division of Water, Surface Water Permits Branch
300 Sower Boulevard, 3rd Floor
Frankfort, KY 40601

RE: KPDES No. KY0041971 Trimble County Generating Station, Trimble County, KY; Permit Reissuance Request Agency Interest # A.I. 4054

The Louisville Gas and Electric Company (LGE) provides this enclosed information to the Kentucky Division of Water (KDOW) for the reissuance of the expiring Trimble County Generating Station KPDES permit KY0041971. KPDES Form 1, Form C, and an application fee check are enclosed with other related support documents.

Significant process water management and Coal Combustion Residual (CCR) impoundment changes have been initiated at the Trimble County Station to comply with CCR federal regulatory rules and Steam-Electric Effluent Limitations Guidelines (ELG) issued by the USEPA. Generally, these changes are required for:

- dewatering and closure-in-place of the site Bottom Ash Pond (BAP) and dewatering and clean-closure of the site Gypsum Storage Pond (GSP);
- construction of a dry, CCR Rule compliant landfill (phase I is complete and is expected to have an operating life of ten (10) years);
- and construction of a biological wastewater treatment system and ancillary Ultrafiltration (UF) for Flue Gas Desulfurization (FGD) process waters.

EPA recently issued communications that it will reconsider the 2020 ELG rule with potential changes to limits for FGD wastewater, bottom ash transport water, legacy wastewater, and landfill leachate. However, until such proposed rulemaking is published and finalized, steam-electric utilities must comply with the 2020 ELG rule and its compliance dates. Therefore, LGE is proceeding with ELG rule construction activities under the applicability dates granted in the Trimble County Generation Station KPDES permit KY0041971 modification with an effective date of December 1, 2021. The existing bottom ash handling systems for both Unit 1 and 2 are compliant with the Final ELG Rule and has no discharge of Bottom Ash Transport Water (BATW).

The KPDES Permit Application Synopsis, provided in **Attachment 1** of this submission, details site information and outfalls listing including categorization of outfalls discharges which contain process flows and many outfalls which consist only of uncontaminated stormwater runoff flows.

11. Attachment 11: Construction Activities Required at Trimble County Generating Station to Comply with USEPA CCR Rule and USEPA ELG Rule.
12. Attachment 12: Trimble County Generation Station § 316(b) § 122.21(r)(2)-(8) Information and Factors that Must and May be Considered for the Entrainment BTA Determination

Chemical metal cleaning wastewaters (e.g. boiler chemical cleans) and non-chemical metals cleaning wastes (e.g. air heater wash waters include boiler/SCR/flue gas ductwork washing for maintenance activities, etc.) are shown on the flow diagrams and calculated as though these activities occur once in typical month.

If I may be of assistance or you have any questions concerning the attached information, please feel free to contact me at (502) 627-4144 (or by email at philip.imber@lge-ku.com) or Michael O'Guin at (502)-627-2338 (or by email at michael.o'guin@lge-ku.com).

Sincerely,

Philip A. Imber
Manager Environmental Land & Water
Louisville Gas and Electric Company

Enclosures (12)

LOUISVILLE GAS AND ELECTRIC COMPANY
MILL CREEK GENERATING STATION

KPDES Permit No. KY0003221 Application Synopsis – 2022 Technical Update

Name and Address of Applicant

(Corporate)
Louisville Gas and Electric Company
P.O. Box 32010
Louisville, Kentucky 40232
c/o Michael O'Guin

(Facility)
Mill Creek Generating Station
14660 Dixie Highway
Louisville, Kentucky 40272
c/o Cody Gibbons

Description of Applicants' Operation

Fossil fuel fired steam electric power plant for the generation, transmission and distribution of electricity (SIC Code 4911 and NAICS Code 221112). Located on a 626+ acre site along the Ohio River at mile mark 626.0.

Production Capacity of Facility

Generation of electric power is from two fossil fired units with the following nominal generating capacity:

Unit 1 – 355 MW
Unit 2 – 355 MW
Unit 3 – 463 MW
Unit 4 – 544 MW

Total 1717 MW Coal-fired Steam Boilers

LOUISVILLE GAS AND ELECTRIC COMPANY
MILL CREEK GENERATING STATION

KPDES Permit No. KY0003221 Application Synopsis – 2022 Technical Update

Description of Submitted Outfalls

Note: See attached flow diagrams and rainfall runoff calculations for flow and acreage information)

Construction to close/cap the Ash Treatment Basin (ATB) CCR impoundment concluded in September 2021. Construction to provide FGD wastewaters treatment have begun and will continue to Q2 2024. This construction is being done for compliance with the USEPA ELG rule.

Outfall descriptions are mostly consistent with those described in the Mill Creek Generating Station KPDES permit KY0003221 modification with an effective date of November 1, 2021 with one exception which is as follows:

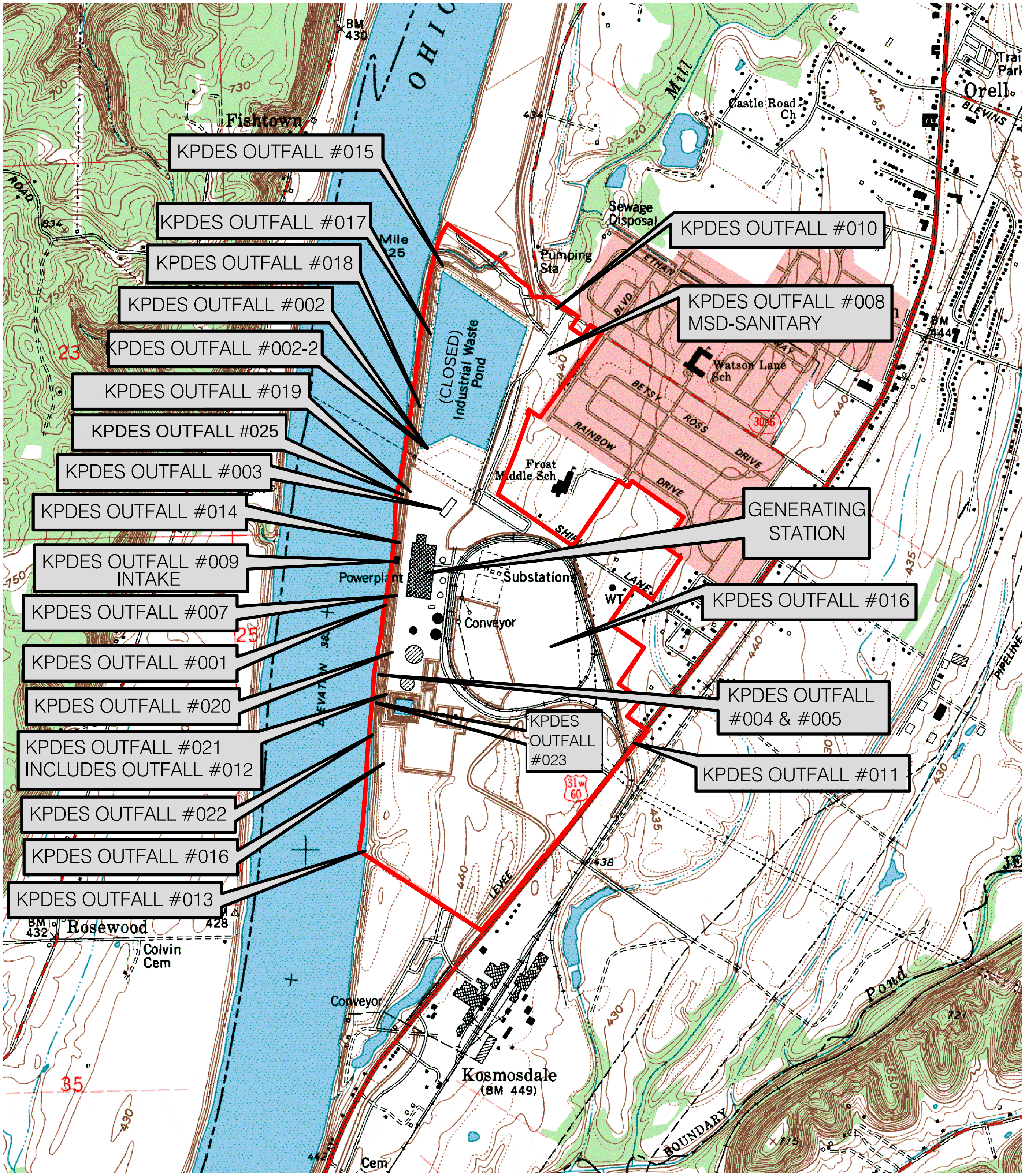
Outfall 002 Existing Description

Process Water Pond overflow which will consist of treated FGD wastewaters (all process and solids dewatering flows) from Units 1-4, Units 1-4 sumps, landfill stormwater runoff and leachate, boiler chemical metal cleaning wastes (006), water treatment wastewaters, Units 1-4 boiler blowdown and quench waters, natural gas system wastewaters, and stormwater runoff from Area 2.

Outfall 002 New Description

Process Water Pond overflow which will consist of treated FGD wastewaters (all process and solids dewatering flows) from Units 1-4, Units 1-4 sumps, landfill stormwater runoff and leachate, boiler chemical metal cleaning wastes (006), water treatment wastewaters, Units 1-4 boiler blowdown and quench waters, natural gas system wastewaters, **AOC electrical vault wash waters,** and stormwater runoff from Area 2.

Imber



MILL CREEK GENERATING STATION

LOUISVILLE GAS & ELECTRIC COMPANY

JEFFERSON COUNTY, LOUISVILLE, KENTUCKY

KOSMOSDALE, KY.-IND., USGS QUADRANGLE MAP

Scale: 1"=2000'

Form C	KENTUCKY POLLUTION DISCHARGE ELIMINATION SYSTEM Permit Application	Division of Water
NAME OF FACILITY: Mill Creek Generating Station		AGENCY USE ONLY
PERMIT NO.: KY 0003221		COUNTY: Jefferson

I. OUTFALL LOCATION

☐ For each outfall, list the latitude and longitude of its location to five decimal points.

OUTFALL NUMBER	LATITUDE In Decimal Degrees	LONGITUDE In Decimal Degrees	RECEIVING WATER (name)
001	38.05139	85.91278	Ohio River
002	38.05778	85.91083	Internal to #001
003	38.05556	85.91139	Internal to #001
004	38.04944	85.91306	Internal to #023
005	38.04944	85.91306	Internal to #023
006	38.05639	85.90972	Internal to #002
007	38.05278	85.91250	Ohio River
008	38.06111	85.90500	MSD Sewer
009	38.05306	85.91250	Plant Intake Water (Ohio River)
010	38.06278	85.90500	Mill Creek
011	38.04583	85.90028	County Roadside Ditch to Pond Creek
012	38.04778	85.91250	Internal to #023
013	38.04194	85.91250	Ohio River
014	38.05389	85.91222	Ohio River
015	38.06472	85.91028	Ohio River
016	38.04972	85.90444	Valley Village Drain to Ohio River
017	38.06194	85.91083	Ohio River
018	38.05944	85.91111	Ohio River
019	38.05583	85.91167	Ohio River
020	38.04944	85.91250	Ohio River
021	38.04778	85.91278	Ohio River
022	38.04639	85.91278	Ohio River

023	38.04750	85.91361	Ohio River
024	38.04778	85.90917	Internal to #002
025 (Proposed)	38.05515	85.91321	Ohio River

II. FLOWS, SOURCES OF POLLUTION, AND TREATMENT TECHNOLOGIES

A. Attach a line drawing showing the water flow through the facility. Indicate sources of intake water, operations contributing wastewater to the effluent, and treatment units labeled to correspond to the more detailed descriptions in Item B. Construct a water balance on the line drawing by showing average flows between intakes, operations, treatment units, and outfall. If a water balance cannot be determined (e.g., for certain mining activities), provide a pictorial description of the nature and amount of any sources of water and any collection or treatment measures.

B. For each outfall, provide a description of: (1) all operations contributing wastewater to the effluent, including process wastewater, sanitary wastewater, cooling water, and stormwater runoff; (2) the average flow contributed by each operation; and (3) the treatment received by the wastewater. Continue on additional sheets if necessary.

OUTFALL NUMBER	SOURCES OF WASTEWATER		TREATMENT DESCRIPTION (from Table C-1)
	Operations Contributing to Flow	**Avg/Design Flow (include units)**	
001 Combined Flows	Unit 1 Condenser Cooling Water	225.0 MGD	Disinfection (2-H), Surface Discharge (4-A)
	Unit-1 Non-Contact Cooling Water	1.0 MGD	Surface Discharge (4-A)
	Stormwater Runoff – Area 1.a-b	0.0211 MGD	Surface Discharge (4-A)
002 Combined Flows	Units 1-4 Pyrites Sluice Waters	0.4369 MGD	Settling (1-U), Neutralization (2-K)
	Units 1-4 Air Heater Wash Waters	0.1046 MGD	Settling (1-U)
	PLANT SUMPS (LOW VOLUME WASTES)		
	Units 1-4 Boiler Seal Water Flows and Floor-Eqpt Washdowns	1.0924 MGD	Settling (1-U), Neutralization (2-K)
	Units 1-4 Service Water Strainer Backwash Waters	0.2048 MGD	Settling (1-U)
	Units 1-4 Boiler Blowdown and Quench Waters	0.583 MGD	Settling (1-U), Neutralization (2-K)
	Stormwater Runoff – Areas 2.b	0.0019 MGD	Settling (1-U)
	Natural Gas System Wastewaters (Low Volume Waste)	0.0006 MGD	Settling (1-U), Neutralization (2-K)
	Boiler Water Treatment Wastewater	0.4577 MGD	Settling (1-U), Neutralization (2-K)
	Boiler Chemical Cleaning Waster Waters (006)	0.0326 MGD	Chemical Precipitation (2-C), Neutralization (2-K)
	FGD PROCESS WATERS		
	FGD Gypsum Solids Dewatering Filtrate or from FGD-PWS Treatment System Waters (024)	1.5967 MGD	Chemical Precipitation (2-C), Neutralization (2-K), Settling (1-U)
	Stormwater Runoff – Areas 2.a	0.1463 MGD	Settling (1-U)
	Stormwater Runoff – Areas 2.c	0.0024 MGD	Settling (1-U)
	COAL PILE SETTLING BASIN		

	Coal Pile Dust Control & Misc. Eqpt	0.0171 MGD	Settling (1-U), Neutralization (2-K)
	Distribution Electrical Vault Wash Waters	0.0039 MGD	Settling (1-U)
	Stormwater Runoff – Areas 2.d	0.0563 MGD	Settling (1-U)
	Stormwater Runoff – Areas 2.e	0.0355 MGD	Settling (1-U)
	Stormwater Runoff – Areas 2.f	0.0746 MGD	Settling (1-U)
003	Unit 2 Cooling Tower Blowdown (to Once-Thru Cooling Outfall 001)	4.225 MGD	
004	Unit 3 Cooling Tower Blowdown (to discharge diffuser Outfall 023)	3.44 MGD	Discharge Diffuser (4-A)
005	Unit 4 Cooling Tower Blowdown (to discharge diffuser Outfall 023)	3.02 MGD	Discharge Diffuser (4-A)
006	Boiler Chemical-Metal Cleaning Waste Waters (to Process Waters Pond Discharge Outfall #002)	0.0326 MGD	Chemical Precipitation (2-C), Neutralization (2-K), Settling (1-U)
007	Stormwater Runoff – Area 7L	0.0045 MGD	Discharge to Surface Water (4-A)
008	Sanitary Waste (to MSD Sewer)	0.012 MGD	
009	Plant Intake Water	255.23 MGD	
010	Stormwater Runoff (Non-Contaminated) (Area 10B – North Entrance Maintenance Areas)	0.1265 MGD	Discharge to Surface Water (4-A)
011	Stormwater Runoff (Non-Contaminated) (Area 11C, R – East Entry/Parking, Future Landfill)	0.0454 MGD	
012 (Combined Flows)	Clearwell Surplus Cooling/Service Waters	0.050 MGD	Settling (1-U), Chemical Precipitation (2-C), Neutralization (2-K), Discharge to Surface Water (4-A)
	Equipment- Truck Loadout Misc. Washdown	0.0171 MGD	Settling (1-U), Chemical Precipitation (2-C), Neutralization (2-K), Discharge to Surface Water (4-A)
	Stormwater Runoff – Areas 12.a-c	0.0287 MGD	Settling (1-U), Discharge to Surface Water (4-A)
	Stormwater Runoff – Areas 12.d-f	0.0312 MGD	Settling (1-U), Discharge to Surface Water (4-A)
013	Stormwater Runoff (Area 13 – Active Landfill A Runoff)	0.0669 MGD	Discharge to Surface Water (4-A)
014	Stormwater Runoff (Area 14 – Switchyard-Powerhouse NW Side)	0.030 MGD	Discharge to Surface Water (4-A)
015 (Future)	Stormwater Runoff (Non-Contaminated) (Area 15 – Old Ash Treatment Basin NW External Slopes and Closed-Capped Ash Treatment Basin N)	0.0045 MGD	Discharge to Surface Water (4-A)
016	Stormwater Runoff (Non-Contaminated) (Area 16 – Closed Landfill B Runoff)	0.1065 MGD	Discharge to Surface Water (4-A)
017	Stormwater Runoff (Non-Contaminated)	0.0025 MGD	Discharge to Surface Water (4-A)

	(Area 17 – Closed-Capped Ash Treatment Basin West External Slopes)		
018	Stormwater Runoff (Non-Contaminated) (Area 18 – Closed-Capped Ash Treatment Basin SW External Slopes)	0.0015 MGD	Discharge to Surface Water (4-A)
019	Stormwater Runoff (Non-Contaminated) (Area 19 – Riverbank slopes West of Unit 2 Cooling Tower)	0.0017 MGD	Discharge to Surface Water (4-A)
020	Stormwater Runoff (Non-Contaminated) (Area 20 – Riverbank slopes West of Unit 4 Cooling Tower)	0.0016 MGD	Discharge to Surface Water (4-A)
021	Stormwater Runoff (Non-Contaminated) (Area 21 – Riverbank slopes West of Unit 3 Cooling Tower)	0.0012 MGD	Discharge to Surface Water (4-A)
022	Stormwater Runoff (Non-Contaminated) (Area 22 – Yard area SW of Unit 3 Cooling Tower)	0.0018 MGD	Discharge to Surface Water (4-A)
023	Stormwater Runoff (Non-Contaminated) Flow to Diffuser Unit 3 Cooling Tower Blowdown (004) Unit 4 Cooling Tower Blowdown (005) Gypsum Processing Plant Runoff Pond (012)	6.587 MGD	Discharge to Surface Water Discharge Diffuser (4-A)
024	FGD Wastewaters Treatment System Discharge – Regulatory Monitoring Point	1.5967 MGD	Coagulation (2-D), Chemical Precipitation (2-C), Flocculation (1-G), Rapid Sand Filtration (1-R), Pressure Filtration (5-R), Denitrification (3-D), Anaerobic Treatment (3-C), Internal Discharge to 002 Process Pond (4-A)
025	Stormwater Runoff (Non-Contaminated) Flow to Diffuser Process Waters Pond Discharge (002) Unit 2 Cooling Tower Blowdown (003)	9.0449 MGD	Discharge to Surface Water Discharge Diffuser (4-A)

II. FLOWS, SOURCES OF POLLUTION, AND TREATMENT TECHNOLOGIES (Continued)

C. Except for stormwater runoff, leaks, or spills, are any of the discharges described in Items II-A or B intermittent or seasonal?

☐ Yes. If yes then complete the following table.

■ No. If no then go to Section III.

OUTFALL NUMBER	OPERATIONS CONTRIBUTING TO FLOW	DAYS PER WEEK (specify avg.)	MONTHS PER YEAR (specify avg.)	FLOW RATE (MGD)		TOTAL VOLUME (include units)		DURATION (days)
				Long-Term Avg.	Max Daily	Long-Term Avg.	Max Daily	

III. PRODUCTION

A. Does an effluent limitation guideline promulgated by EPA under Section 304 of the Clean Water Act apply to your facility? (40 CFR 401 – 471)

■ Yes. Complete Item III-B and list the effluent limitation guideline category(ies): 40 CFR Part 423

☐ No. Go to Section IV.

B. Are the limitations in the applicable effluent limitations guideline expressed in terms of production or other measures of operation? (40 CFR 401 – 471)

☐ Yes. Complete Item III-C.

■ No. Go to Section IV.

C. If you answered "Yes" to Item III-B, list the quantity which represents the actual measurement of your level of production, expressed in the terms and units used in the applicable effluent limitation guideline, and indicate the affected outfalls

AVERAGE DAILY PRODUCTION			Affected Outfalls (list outfall numbers)
Quantity Per Day	Units of Measure	Operation, Product, Material, Etc. (specify)	

IV. IMPROVEMENTS

A. Are you now required by any federal, state or local authority to meet any implementation schedule for the construction, upgrading, or operation of wastewater equipment or practices or any other environmental programs which may affect the discharges described in this application? This includes, but is not limited to, permit conditions, administrative or enforcement orders, enforcement compliance schedule letters, stipulations, court orders and grant or loan conditions

☐ Yes. Complete the following table.

☐ No. Go to Section IV-B.

INDENTIFICATION OF CONDITION AGREEMENT, ETC.	AFFECTED OUTFALLS		BRIEF DESCRIPTION OF PROJECT	FINAL COMPLIANCE DATE	
	No.	Source of Discharge		Required	Projected

B. **OPTIONAL:** You may attach additional sheets describing any additional water pollution control programs (or other environmental projects which may affect your discharges) you now have under way or which you plan. Indicate whether each program is now under way or planned, and indicate your actual or planned schedules for construction

V. INTAKE AND EFFLUENT CHARACTERISTICS

A.
B.
C.

Tables A, B, and C of this section are included on separate sheets numbered 5-18.
See instructions before proceeding.
Complete one set of tables for each outfall.
Place the outfall number in the space provided on each table.

D. Use the space below to list any of the pollutants (refer to SARA Title III, Section 313) listed in TABLE C-3 of the instructions which you know or have reason to believe is discharged or may be discharged from any outfall. For every pollutant you list, briefly describe the reasons you believe it to be present and report any analytical data in your possession

POLLUTANT	SOURCE	POLLUTANT	SOURCE
Ammonia & Ammonium Hydroxide, Sodium Phosphate (dibasic & tribasic)	Boiler/Feedwater System pH Control & Buffering	Sodium Hypochlorite, Calcium Hypochlorite, Hydrochloric Acid, Sodium BiSulfite	Cooling Tower Treatment Intake, Cooling Tower and Reverse Osmosis (RO) System Dechlorination-Pre-Treatment

Sodium Hydroxide & Sulfuric Acid	Demineralizer Regenerant Chemicals	Phosphoric Acid	RO System Membrane Cleaner
Aluminum Sulfate	Boiler Water Treatment	Quat-DIMAC Ammonium-Chloride	Cooling System Zebra Mussel Biocide Periodic Treatments
Sodium Hydroxide	Water Clarification Aid for PWS	Ferric Chloride	PWS Coagulant
Hydrochloric Acid	PWS pH Adjustment	Sodium Hydroxide	Closed-Cooling Treatment
Sodium Bisulfite	ELG Membrane Cleaning/Oxidant Neutralization		

VI. POTENTIAL DISCHARGES NOT COVERED BY ANALYSIS

A. Is any pollutant listed in Table C of this section a substance or a component of a substance which you currently use or manufacture as an intermediate or final product or byproduct?

☐ Yes. List all such pollutants in the space provided below.

☐ No. Go to Section VII.

VII. BIOLOGICAL TOXICITY TESTING DATA

Do you have any knowledge of or reason to believe that any biological test for acute or chronic toxicity has been made on any of your discharges or on a receiving water in relation to your discharge within the last 3 years?

■ Yes. Identify the test(s) and describe their purposes below.

☐ No. Go to Section VIII.

Toxicity Control & Biomonitoring Program Testing was incorporated into the current KPDES for Outfall 002 discharge including:

1. A 48-hour static toxicity test with Ceriodaphnia sp.;
2. A 48-hour static toxicity test with fathead minnow

These tests were performed at least annually and indicated full compliance with the KPDES toxicity limits.

VIII. CONTRACT ANALYSIS INFORMATION

Applicants that discharge pollutants to waters of the Commonwealth must provide analytical data for the parameters shown on this Form. The analysis must be performed by a laboratory that is certified in accordance with 401 KAR 5:320

All information reported must be based on data collected through analysis conducted using 40 CFR Part 136 methods. In addition, this data must comply with QA/QC requirements of 40 CFR Part 136 and other appropriate QA/QC requirements for standard methods for analytes not addressed by 40 CFR Part 136.

Below please list any analyses reported in Section V that were performed by a contract laboratory or consulting firm.

NAME	ADDRESS	TELEPHONE	POLLUTANTS ANALYZED

IX. CERTIFICATION.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

PRINTED NAME AND TITLE: Steven Turner Vice President Power Production	
SIGNATURE: DocuSigned by: Steven B. Turner 8AD647306F3F4A0...	DATE: 12-15-2022
TELEPHONE NO. 502-627-4121	EMAIL: Steven.Turner@lge-ku.com

Return completed application form and attachments to:
Division of Water
Surface Water Permits Branch
300 Sower Boulevard, 3rd Floor
Frankfort, KY 40601

Direct questions to: Surface Water Permits Branch at (502) 564-3410.

V. INTAKE AND EFFLUENT CHARACTERISTICS (Continued from Section V. INTAKE AND EFFLUENT CHARACTERISTICS)

PART A.	PLEASE PRINT OR TYPE IN THE UNSHADED AREAS ONLY OF TABLE A. See instructions before proceeding. Complete one set of tables for each outfall. Place the outfall number in the space provided on each table. You must provide the results of at least one analysis for every pollutant in this table.
TABLE A Page 1 of 1	**OUTFALL NO.** 001

1. POLLUTANT	**2. EFFLUENT**							**3. UNITS (specify if blank)**		**4. INTAKE (optional)**		
	a. Maximum Daily Value		**b. Maximum 30-Day Avg. Value (if available)**		**c. Long-Term Avg. Value (if available)**		**d. No. of Analyses**	**a. Concentration**	**b. Mass**	**a. Long-Term Avg. Value**		**b. No of Analyses**
	(1) Concentration	**(2) Mass**	**(1) Concentration**	**(2) Mass**	**(1) Concentration**	**(2) Mass**				**(1) Concentration**	**(2) Mass**	
1. Biochemical Oxygen Demand $(BOD)_5$	<3.0							mg/L				
2. Chemical Oxygen Demand (COD)	<50							mg/L				
3. Total Organic Carbon (TOC)	3.5							mg/L				
4. Total Suspended Solids (TSS)	15							mg/L				
5. Ammonia (as N)	<.50							mg/L				
6. Flow (MGD)	**134.8**		VALUE		VALUE			MGD		VALUE		
7. Temperature (winter)	**27.1**		VALUE		VALUE			°C		VALUE		
8. Temperature (summer)			VALUE		VALUE			°C		VALUE		
9. pH	MINIMUM 7.1	MAXIMUM 7.1	MINIMUM	MAXIMUM				STANDARD UNITS				

Business Use

V. INTAKE AND EFFLUENT CHARACTERISTICS (Continued)

PART B.

PLEASE PRINT OR TYPE IN THE UNSHADED AREAS ONLY OF TABLE B**.**
See instructions before proceeding.
Complete one set of tables for each outfall. Place the outfall number in the space provided on each table.

In column "2. MARK X", place an "X" in either the **Believed Present** column (2.a) for each pollutant you know or have reason to believe is present; or place an "X" in the **Believed Absent** column (2.b) for each pollutant you believe to be absent.
If you mark the **Believed Present** column for any pollutant, you must provide the results of at least one analysis for that pollutant.
Complete one table for each outfall. See the instructions for additional details and requirements.

TABLE B Page 1 of 2

OUTFALL NO. 001

1. POLLUTANT and CAS NO. (if available)	2. MARK "X"		3. EFFLUENT							4. UNITS		5. INTAKE (optional)		
	a. Believed Present	b. Believed Absent	a. Maximum Daily Value		b. Maximum 30-Day Avg. Value (if available)		c. Long-Term Avg. Value (if available)		d. No. of Analyses	a. Concentration	b. Mass	a. Long-Term Avg. Value		b. No of Analyses
			(1) Concentration	(2) Mass	(1) Concentration	(2) Mass	(1) Concentration	(2) Mass				(1) Concentration	(2) Mass	
1. Bromide (24959-67-9)			<0.50							mg/L				
2. Chloride			**38**							mg/L				
3. Chlorine, Total Residual			0.27							mg/L				
4. Color			**15**							CU				
5. E.coli			>2419.6							MPN/100mL				
6. Fluoride (16984-48-8)			<.50							mg/L				
7. Hardness ($CaCO_3$)			**160**							mg/L				
8.Nitrate–Nitrite (as N)			**1.0**							mg/L				
9. Nitrogen, Total Organic (as N)			<1.0							mg/L				
10. Oil and Grease			<5.3							mg/L				
11. Phosphorous (as P), Total (7723-14-0)			<0.20							mg/L				
12. Radioactivity														
(1) Alpha, Total			4.88+/-1.42							pCi/L				
(2) Beta, Total			3.52 +/-1.59							pCi/L				

(3) Radium, Total			1.08 +/-0.744							pCi/L					

TABLE B Page 2 of 2	OUTFALL NO. 001													
1. POLLUTANT and CAS NO. (if available)	2. MARK "X"		3. EFFLUENT							4. UNITS		5. INTAKE (optional)		
	a. Believed Present	b. Believed Absent	a. Maximum Daily Value		b. Maximum 30-Day Avg. Value (if available)		c. Long-Term Avg. Value (if available)		d. No. of Analyses	a. Concentration	b. Mass	a. Long-Term Avg. Value		b. No of Analyses
			(1) Concentration	(2) Mass	(1) Concentration	(2) Mass	(1) Concentration	(2) Mass				(1) Concentration	(2) Mass	
(4) Radium, 226, Total			0.365 +/-0.253							pCi/L				
(5) Strontium-90, Total			0.994 +/-1.04							pCi/L				
(6) Uranium			.000412							mg/L				
13. Sulfate (asSO_4) (14808-79-8)			**73**							mg/L				
14. Sulfide (as S)			<0.20							mg/L				
15. Sulfite (asSO4) (14286-46-3)			<2.0							mg/L				
16. Surfactants			<0.50							mg/L				
17.Aluminum,Total (7429-90)			**91**							ug/L				
18. Barium, Total (7440-39-3)			42							ug/L				
19. Boron, Total (7440-42-8)			**<0.50**							mg/L				
20. Cobalt, Total (7440-48-4)			**<0.50**							ug/L				
21. Iron, Total (7439-89-6)			**160**							ug/L				
22. Magnesium, Total (7439-96-4)			**14**							mg/L				
23. Molybdenum, Total (7439-98-7)			**<0.50**							ug/L				
24. Manganese, Total (7439-96-6)			**66**							ug/L				
25. Tin, Total (7440-31-5)			<0.0010							mg/L				
26. Titanium, Total (7440-32-6)			<0.030							mg/L				

V. INTAKE AND EFFLUENT CHARACTERISTICS (Continued)

PART C.

PLEASE PRINT OR TYPE IN THE UNSHADED AREAS ONLY OF TABLE C.
See instructions before proceeding.
Complete one set of tables for each outfall. Place the outfall number in the space provided on each table.

If you are a primary industry and this outfall contains process wastewater, refer to the instructions (Table C-2) to determine which of the GC/MS fractions you must test for.
Mark "X" in the **Testing Required** column for all such GC/MS fractions that apply to your industry and for ALL toxic metals, cyanides, and total phenols.
If you are not required to mark this column (secondary industries, nonprocess wastewater outfalls, and non-required GC/MS fractions), mark "X" in the **Believed Present** column for each pollutant you know or have reason to believe is present.
Mark "X: in the **Believed Absent** column for each pollutant you believe to be absent.
If you mark either the **Testing Required** or **Believed Present** columns for any pollutant, you must provide the result of at least one analysis for that pollutant. Note that there are eight pages to this part; please review each carefully. Complete one table (all eight pages) for each outfall.
See the instructions for additional details and requirements

TABLE C Page 1 of 8 — **OUTFALL NO.** 001

1. POLLUTANT and CAS NO. (if available)	2. MARK "X"			3. EFFLUENT							4. UNITS		5. INTAKE (optional)		
	a. Testing Required	b. Believed Present	c. Believed Absent	a. Maximum Daily Value		b. Maximum 30-Day Avg. Value (if available)		c. Long-Term Avg. Value (if available)		d. No. of Analyses	a. Concentration	b. Mass	a. Long-Term Avg. Value		b. No of Analyses
				(1) Concentration	(2) Mass	(1) Concentration	(2) Mass	(1) Concentration	(2) Mass				(1) Concentration	(2) Mass	
METALS, CYANIDE AND TOTAL PHENOLS															
1M. Antimony, Total (7440-36-0)				<0.50							ug/L				
2M. Arsenic, Total (7440-38-2)				0.86							ug/L				
3M. Beryllium, Total (7440-41-7)				<1.0							ug/L				
4M. Cadmium, Total (7440-43-9)				<0.50							ug/L				
5M. Chromium, Total (7440-43-9)				**0.60**							ug/L				
6M. Copper, Total (7550-50-8)				<5.0							ug/L				
7M. Lead, Total (7439-92-1)				<0.50							ug/L				
8M. Mercury, Total (7439-97-6)				<0.500							ng/L				
9M. Nickel, Total (7440-02-0)				**2.2**							ug/L				

10M. Selenium, Total (7782-49-2)				**<0.50**							ug/L				
11M. Silver, Total (7440-28-0)				<0.10							ug/L				
TABLE C Page 2 of 8	**OUTFALL NO.** 001														
1. POLLUTANT and CAS NO. (if available)	**2. MARK "X"**			**3. EFFLUENT**							**4. UNITS**		**5. INTAKE (optional)**		
	a. Testing Required	**b. Believed Present**	**c. Believed Absent**	**a. Maximum Daily Value**		**b. Maximum 30-Day Avg. Value (if available)**		**c. Long-Term Avg. Value (if available)**		**d. No. of Analyses**	**a. Concentration**	**b. Mass**	**a. Long-Term Avg. Value**		**b. No of Analyses**
				(1) Concentration	**(2) Mass**	**(1) Concentration**	**(2) Mass**	**(1) Concentration**	**(2) Mass**				**(1) Concentration**	**(2) Mass**	
METALS, CYANIDE AND TOTAL PHENOLS continued															
12M Thallium, Total (7440-28-0)				<0.50							ug/L				
13M. Zinc, Total (7440-66-6)				**<10**							ug/L				
14M. Cyanide, Total (57-12-5)				<0.010							mg/L				
15M. Phenols, Total				<0.010							mg/L				
DIOXIN															
2,3,7,8 Tetra-chlorodibenzo-P-Dioxin (1784-01-6)				DESCRIBE RESULTS:											
GC/MS FRACTION – VOLATILE COMPOUNDS															
1V. Acrolein (107-02-8)				<0.0022							mg/L				
2V. Acrylonitrile (107-13-1)				<0.0019							mg/L				
3V. Benzene (71-43-2)				<0.00015							mg/L				
4V. Bis (Chloromethyl) Ether (542-88-1)			X								mg/L				
5V. Bromoform (75-25-2)				<0.0050							mg/L				
6V. Carbon Tetrachloride (56-23-5)				**<0.00025**							mg/L				
7V. Chlorobenzene (108-90-7)				<0.00026							mg/L				
8V. Chlorodibromomethane (124-48-1)				<0.00024							mg/L				

9V. Chloroethane (74-00-3)				<0.00022							mg/L				
10V. 2-Chloroethylvinyl Ether (110-75-8)				<0.00019							mg/L				
11V. Chloroform (67-66-3)				<0.00026							mg/L				

TABLE C Page 3 of 8	**OUTFALL NO.** 001														
1. POLLUTANT and CAS NO. (if available)	**2. MARK "X"**			**3. EFFLUENT**							**4. UNITS**		**5. INTAKE (optional)**		
	a. Testing Required	**b. Believed Present**	**c. Believed Absent**	**a. Maximum Daily Value**		**b. Maximum 30-Day Avg. Value (if available)**		**c. Long-Term Avg. Value (if available)**		**d. No. of Analyses**	**a. Concentration**	**b. Mass**	**a. Long-Term Avg. Value**		**b. No of Analyses**
				(1) Concentration	**(2) Mass**	**(1) Concentration**	**(2) Mass**	**(1) Concentration**	**(2) Mass**				**(1) Concentration**	**(2) Mass**	
GC/MS FRACTION – VOLATILE COMPOUNDS continued															
12V. Dichloro-bromomethane (75-71-8)				<0.00021							mg/L				
13V. Dichloro-difluoromethane (75-71-8)			X								mg/L				
14V. 1,1-Dichloroethane (75-34-3)				<0.00025							mg/L				
15V. 1,2-Dichloroethane (107-06-2)				<0.00038							mg/L				
16V. 1,1-Dichlorethylene (75-35-4)				<0.00023							mg/L				
17V. 1,2-Dichloropropane (78-87-5)				<0.00019							mg/L				
18V. 1,3-Dichloropropylene (452-75-6)				**<0.00026**							mg/L				
19V. Ethylbenzene (100-41-4)				<0.0025							mg/L				
20V. Methyl Bromide (74-83-9)				**<0.00029**							mg/L				
21V. Methyl Chloride (74-87-3)				**<0.00024**							mg/L				
22V. Methylene Chloride (75-00-2)				<0.010							mg/L				
23V. 1,1,2,2-Tetrachloroethane (79-34-5)				<0.0032							mg/L				

24V. Tetra-chloroethylene (127-18-4)				**<0.00026**							mg/L				
25V. Toluene (108-88-3)				<0.00030							mg/L				
26V. 1,2-Trans-Dichloroethylene (156-60-5)				**<0.00022**							mg/L				
27V. 1,1,1-Trichloroethane (71-55-6)				<0.00023							mg/L				

TABLE C
Page 4 of 8

OUTFALL NO. 001

1. POLLUTANT and CAS NO. (if available)	2. MARK "X"			3. EFFLUENT							4. UNITS		5. INTAKE (optional)		
	a. Testing Required	b. Believed Present	c. Believed Absent	a. Maximum Daily Value		b. Maximum 30-Day Avg. Value (if available)		c. Long-Term Avg. Value (if available)		d. No. of Analyses	a. Concentration	b. Mass	a. Long-Term Avg. Value		b. No of Analyses
				(1) Concentration	(2) Mass	(1) Concentration	(2) Mass	(1) Concentration	(2) Mass				(1) Concentration	(2) Mass	
GC/MS FRACTION – VOLATILE COMPOUNDS continued															
28V. 1,1,2-Trichloroethane (79-00-5)				<0.00026							mg/L				
29V. Tri-chloroethylene (79-01-6)				<0.00026							mg/L				
30V. Trichloro-fluoromethane (75-69-4)				<0.00027							mg/L				
31V. Vinyl Chloride (75-01-4)				<0.00026							mg/L				
GC/MS FRACTION – ACID COMPOUNDS															
1A. 2-Chlorophenol (95-57-8)				<0.012							mg/L				
2A. 2,4-Dichlorophenol (120-83-2)				<0.012							mg/L				
3A. 2,4-Dimethylphenol (105-67-9)				<0.012							mg/L				
4A. 4,6-Dinitro-O-Cresol (534-52-1)				<0.031							mg/L				
5A. 2,4-Dinitrophenol (51-28-5)				<0.062							mg/L				
6A. 2-Nitrophenol (88-75-5)				<0.012							mg/L				

7A. 4-Nitrophenol (100-02-7)				<0.062							mg/L				
8A. P-Chloro-M-Cresol (59-50-7)				**<0.025**							mg/L				
9A. Pentachloro-phenol (87-88-5)				<0.062							mg/L				
10A. Phenol (108-05-2)				<0.012							mg/L				
11A. 2,4,6-Trichloro-phenol (88-06-2)				<0.012							mg/L				

TABLE C Page 5 of 8 | **OUTFALL NO.** 001

1. POLLUTANT and CAS NO. (if available)	2. MARK "X" a. Testing Required	2. b. Believed Present	2. c. Believed Absent	3. EFFLUENT a. Maximum Daily Value (1) Concentration	a. (2) Mass	b. Maximum 30-Day Avg. Value (if available) (1) Concentration	b. (2) Mass	c. Long-Term Avg. Value (if available) (1) Concentration	c. (2) Mass	d. No. of Analyses	4. UNITS a. Concentration	4. b. Mass	5. INTAKE (optional) a. Long-Term Avg. Value (1) Concentration	5. a. (2) Mass	5. b. No of Analyses
GC/MS FRACTION – BASE/NEUTRAL COMPOUNDS															
1B. Acenaphthene (83-32-9)				<0.012							mg/L				
2B. Acenaphtylene (208-96-8)				<0.012							mg/L				
3B. Anthracene (120-12-7)				<0.012							mg/L				
4B. Benzidine (92-87-5)				<0.062							mg/L				
5B . Benzo (a) Anthracene (56-55-3)				<0.012							mg/L				
6B. Benzo (a) Pyrene (50-32-8)				<0.012							mg/L				
7B. 3,4-Benzo-fluoranthene (205-99-2)				<0.012							mg/L				
8B. .Benzo (ghi) perylene (191-24-2)				<0.012							mg/L				
9B. .Benzo (k)-fluoranthene (207-08-9)				<0.012							mg/L				
10B. Bis (2-chloroethoxy) Methane (111-91-1)				<0.012							mg/L				
11B. Bis (2-chloroethel) Ether (111-44-4)				<0.012							mg/L				
12B. Bis (2-chloroisopropyl)-Ether (102-80-1)				**<0.012**							mg/L				
13B. Bis (2-ethyl-hexyl) Phthalate (117-81-7)				<0.012							mg/L				
14B. 4-Bromophenyl Phenyl Ether (101-55-3)				<0.012							mg/L				
15B. Butyl Benzyl Phthalate (85-68-7)				<0.012							mg/L				
16B. 2-Chloro-Naphthalene (7005-72-3)				<0.012							mg/L				

1. POLLUTANT and CAS NO. (if available)	2. MARK "X" a. Testing Required	2. b. Believed Present	2. c. Believed Absent	3. EFFLUENT a. Maximum Daily Value (1) Concentration	3. a. (2) Mass	3. b. Maximum 30-Day Avg. Value (if available) (1) Concentration	3. b. (2) Mass	3. c. Long-Term Avg. Value (if available) (1) Concentration	3. c. (2) Mass	3. d. No. of Analyses	4. UNITS a. Concentration	4. b. Mass	5. INTAKE (optional) a. Long-Term Avg. Value (1) Concentration	5. a. (2) Mass	5. b. No of Analyses
17B. 4-Chlorophenyl Phenyl Ether (7005-72-3)				**<0.012**							**mg/L**				
TABLE C Page 6 of 8	**OUTFALL NO.** 001														
GC/MS FRACTION – BASE/NEUTRAL COMPOUNDS continued															
18B. Chrysene (218-01-9)				<0.012							mg/L				
19B. Dibenzo (a,h) Anthracene (53-70-3)				<0.012							mg/L				
20B. 1,2-Dichloro-benzene (95-50-1)				<0.00030							mg/L				
21B. 1,3-Dichloro-Benzene (541-73-1)				<0.00024							mg/L				
22B. 1,4-Dichloro-benzene (106-46-7)				<0.00028							mg/L				
23B. 3,3-Dichloro-benzidene (91-94-1)				<0.062							mg/L				
24B. Diethyl Phthalate (84-66-2)				<0.012							mg/L				
25B. Dimethyl Phthalate (131-11-3)				<0.012							mg/L				
26B. Di-N-Butyl Phthalate (84-74-2)				<0.012							mg/L				
27B. 2,4-Dinitro-toluene (121-14-2)				<0.012							mg/L				
28B. 2,6-Dinitro-toluene (606-20-2)				<0.012							mg/L				
29B. Di-N-Octyl Phthalate (117-84-0)				<0.012							mg/L				
30B. 1,2-Diphenyl-hydrazine (as Azo-benzene) (122-66-7)			X								mg/L				
31B. Fluoranthene (208-44-0)				<0.012							mg/L				
32B. Fluorene (86-73-7)				<0.012							mg/L				
33B. Hexachloro-benzene (118-71-1)				<0.012							mg/L				
34B. Hexachloro-butadiene (87-68-3)				<0.012							mg/L				

35B. Hexachloro-cyclopentadiene (77-47-4)				<0.012							mg/L					

TABLE C Page 7 of 8	**OUTFALL NO.** 001														
1. POLLUTANT and CAS NO. (if available)	**2. MARK "X"**			**3. EFFLUENT**							**4. UNITS**		**5. INTAKE (optional)**		
	a. Testing Required	**b. Believed Present**	**c. Believed Absent**	**a. Maximum Daily Value**		**b. Maximum 30-Day Avg. Value (if available)**		**c. Long-Term Avg. Value (if available)**		**d. No. of Analyses**	**a. Concentration**	**b. Mass**	**a. Long-Term Avg. Value**		**b. No of Analyses**
				(1) Concentration	**(2) Mass**	**(1) Concentration**	**(2) Mass**	**(1) Concentration**	**(2) Mass**				**(1) Concentration**	**(2) Mass**	
GC/MS FRACTION – BASE/NEUTRAL COMPOUNDS continued															
36B. Hexachloro-ethane (67-72-1)				<0.012							mg/L				
37B. Indeno (1,2,3-cd) Pyrene (193-39-5)				<0.012							mg/L				
38B. Isophorone (78-59-1)				<0.012							mg/L				
39B. Napthalene (91-20-3)				<0.012							mg/L				
40B. Nitrobenzene (98-95-3)				<0.012							mg/L				
41B. N-Nitro-sodimethylamine (62-75-9)				<0.012							mg/L				
42B. N-Nitrosodi-N-Propylamine (621-64-7)				<0.012							mg/L				
43B. N-Nitro-sodiphenylamine (86-30-6)				<0.012							mg/L				
44B. Phenanthrene (85-01-8)				<0.012							mg/L				
45B. Pyrene (129-00-0)				<0.012							mg/L				
46B. 1,2,4-Trichloro-benzene (120-82-1)				<0.012							mg/L				

V. INTAKE AND EFFLUENT CHARACTERISTICS (Continued from Section V. INTAKE AND EFFLUENT CHARACTERISTICS)

PART A.	PLEASE PRINT OR TYPE IN THE UNSHADED AREAS ONLY OF TABLE A**.** See instructions before proceeding. Complete one set of tables for each outfall. Place the outfall number in the space provided on each table. You must provide the results of at least one analysis for every pollutant in this table.
TABLE A **Page 1 of 1**	**OUTFALL NO.** 002A

1. POLLUTANT	**2. EFFLUENT**							**3. UNITS (specify if blank)**		**4. INTAKE (optional)**		
	a. Maximum Daily Value		**b. Maximum 30-Day Avg. Value (if available)**		**c. Long-Term Avg. Value (if available)**		**d. No. of Analyses**	**a. Concentration**	**b. Mass**	**a. Long-Term Avg. Value**		**b. No of Analyses**
	(1) Concentration	**(2) Mass**	**(1) Concentration**	**(2) Mass**	**(1) Concentration**	**(2) Mass**				**(1) Concentration**	**(2) Mass**	
1. Biochemical Oxygen Demand $(BOD)_5$	<3.0							mg/L				
2. Chemical Oxygen Demand (COD)	<50							mg/L				
3. Total Organic Carbon (TOC)	**2.8**							mg/L				
4. Total Suspended Solids (TSS)	**14**							mg/L				
5. Ammonia (as N)	**0.63**							mg/L				
6. Flow (MGD)	7.79		VALUE		VALUE			MGD		VALUE		
7. Temperature (winter)			VALUE		VALUE			°C		VALUE		
8. Temperature (summer)	18.0		VALUE		VALUE			°C		VALUE		
9. pH	MINIMUM 7.5	MAXIMUM 7.5	MINIMUM	MAXIMUM				STANDARD UNITS				

V. INTAKE AND EFFLUENT CHARACTERISTICS (Continued)

PART B.

PLEASE PRINT OR TYPE IN THE UNSHADED AREAS ONLY OF TABLE B**.**
See instructions before proceeding.
Complete one set of tables for each outfall. Place the outfall number in the space provided on each table.

In column "2. MARK X", place an "X" in either the **Believed Present** column (2.a) for each pollutant you know or have reason to believe is present; or place an "X" in the **Believed Absent** column (2.b) for each pollutant you believe to be absent.
If you mark the **Believed Present** column for any pollutant, you must provide the results of at least one analysis for that pollutant.
Complete one table for each outfall. See the instructions for additional details and requirements.

TABLE B Page 1 of 2 — **OUTFALL NO.** 002A

1. POLLUTANT and CAS NO. (if available)	2. MARK "X"		3. EFFLUENT							4. UNITS		5. INTAKE (optional)		
	a. Believed Present	b. Believed Absent	a. Maximum Daily Value		b. Maximum 30-Day Avg. Value (if available)		c. Long-Term Avg. Value (if available)		d. No. of Analyses	a. Concentration	b. Mass	a. Long-Term Avg. Value		b. No of Analyses
			(1) Concentration	(2) Mass	(1) Concentration	(2) Mass	(1) Concentration	(2) Mass				(1) Concentration	(2) Mass	
1. Bromide (24959-67-9)			**1.8**							mg/L				
2. Chloride			**240**							mg/L				
3. Chlorine, Total Residual			**0.08**							mg/L				
4. Color			**10**							CU				
5. E.coli			**85.7**							MPN/100mL				
6. Fluoride (16984-48-8)			1.4							mg/L				
7. Hardness ($CaCO_3$)			**640**							mg/L				
8.Nitrate–Nitrite (as N)			**1.6**							mg/L				
9. Nitrogen, Total Organic (as N)			**<1.0**							mg/L				
10. Oil and Grease			<5.3							mg/L				
11. Phosphorous (as P), Total (7723-14-0)			**<0.10**							mg/L				
12. Radioactivity														
(1) Alpha, Total			16 +/-3.42							pCi/L				
(2) Beta, Total			15 +/-2.57							pCi/L				

(3) Radium, Total			0.54 +/-0.556							pCi/L				

TABLE B Page 2 of 2	**OUTFALL NO.** 002A													
1. POLLUTANT and CAS NO. (if available)	**2. MARK "X"**		**3. EFFLUENT**							**4. UNITS**		**5. INTAKE (optional)**		
	a. Believed Present	**b. Believed Absent**	**a. Maximum Daily Value**		**b. Maximum 30-Day Avg. Value (if available)**		**c. Long-Term Avg. Value (if available)**		**d. No. of Analyses**	**a. Concentration**	**b. Mass**	**a. Long-Term Avg. Value**		**b. No of Analyses**
			(1) Concentration	**(2) Mass**	**(1) Concentration**	**(2) Mass**	**(1) Concentration**	**(2) Mass**				**(1) Concentration**	**(2) Mass**	
(4) Radium, 226, Total			0.368 +/-0.254							pCi/L				
(5) Strontium-90, Total			0.264 +/-1.08							pCi/L				
(6) Uranium			0.0195							mg/L				
13. Sulfate (asSO_4) (14808-79-8)			**260**							mg/L				
14. Sulfide (as S)			<0.20							mg/L				
15. Sulfite (asSO4) (14286-46-3)			<2.0							mg/L				
16. Surfactants			<0.50							mg/L				
17.Aluminum,Total (7429-90)			**84**							ug/L				
18. Barium, Total (7440-39-3)			**91**							ug/L				
19. Boron, Total (7440-42-8)			8.8							mg/L				
20. Cobalt, Total (7440-48-4)			**3.5**							ug/L				
21. Iron, Total (7439-89-6)			**410**							ug/L				
22. Magnesium, Total (7439-96-4)			**87**							mg/L				
23. Molybdenum, Total (7439-98-7)			**8.3**							ug/L				
24. Manganese, Total (7439-96-6)			**940**							ug/L				
25. Tin, Total (7440-31-5)			**<0.0010**							mg/L				
26. Titanium, Total (7440-32-6)			<0.030							mg/L				

V. INTAKE AND EFFLUENT CHARACTERISTICS (Continued)

PART C.

PLEASE PRINT OR TYPE IN THE UNSHADED AREAS ONLY OF TABLE C**.**
See instructions before proceeding.
Complete one set of tables for each outfall. Place the outfall number in the space provided on each table.

If you are a primary industry and this outfall contains process wastewater, refer to the instructions (Table C-2) to determine which of the GC/MS fractions you must test for.
Mark "X" in the **Testing Required** column for all such GC/MS fractions that apply to your industry and for ALL toxic metals, cyanides, and total phenols. If you are not required to mark this column (secondary industries, nonprocess wastewater outfalls, and non-required GC/MS fractions), mark "X" in the **Believed Present** column for each pollutant you know or have reason to believe is present.
Mark "X: in the **Believed Absent** column for each pollutant you believe to be absent.
If you mark either the **Testing Required** or **Believed Present** columns for any pollutant, you must provide the result of at least one analysis for that pollutant. Note that there are eight pages to this part; please review each carefully. Complete one table (all eight pages) for each outfall.
See the instructions for additional details and requirements

TABLE C Page 1 of 8 — **OUTFALL NO.** 002A

1. POLLUTANT and CAS NO. (if available)	2. MARK "X"			3. EFFLUENT							4. UNITS		5. INTAKE (optional)		
	a. Testing Required	b. Believed Present	c. Believed Absent	a. Maximum Daily Value		b. Maximum 30-Day Avg. Value (if available)		c. Long-Term Avg. Value (if available)		d. No. of Analyses	a. Concentration	b. Mass	a. Long-Term Avg. Value		b. No of Analyses
				(1) Concentration	(2) Mass	(1) Concentration	(2) Mass	(1) Concentration	(2) Mass				(1) Concentration	(2) Mass	
METALS, CYANIDE AND TOTAL PHENOLS															
1M. Antimony, Total (7440-36-0)				**<0.50**							ug/L				
2M. Arsenic, Total (7440-38-2)				3.1							ug/L				
3M. Beryllium, Total (7440-41-7)				<1.0							ug/L				
4M. Cadmium, Total (7440-43-9)				**2.6**							ug/L				
5M. Chromium, Total (7440-43-9)				**3.1**							ug/L				
6M. Copper, Total (7550-50-8)				**10**							ug/L				
7M. Lead, Total (7439-92-1)				**<0.50**							ug/L				
8M. Mercury, Total (7439-97-6)				<0.500							ng/L				
9M. Nickel, Total (7440-02-0)				**21**							ug/L				

10M. Selenium, Total (7782-49-2)				11							ug/L				
11M. Silver, Total (7440-28-0)				<0.10							ug/L				

TABLE C Page 2 of 8 — **OUTFALL NO.** 002A

1. POLLUTANT and CAS NO. (if available)	2. MARK "X"			3. EFFLUENT							4. UNITS		5. INTAKE (optional)		
	a. Testing Required	b. Believed Present	c. Believed Absent	a. Maximum Daily Value		b. Maximum 30-Day Avg. Value (if available)		c. Long-Term Avg. Value (if available)		d. No. of Analyses	a. Concentration	b. Mass	a. Long-Term Avg. Value		b. No of Analyses
				(1) Concentration	(2) Mass	(1) Concentration	(2) Mass	(1) Concentration	(2) Mass				(1) Concentration	(2) Mass	
METALS, CYANIDE AND TOTAL PHENOLS continued															
12M Thallium, Total (7440-28-0)				**11**							ug/L				
13M. Zinc, Total (7440-66-6)				**36**							ug/L				
14M. Cyanide, Total (57-12-5)				0.011							mg/L				
15M. Phenols, Total				<0.010							mg/L				
DIOXIN															
2,3,7,8 Tetra-chlorodibenzo-P-Dioxin (1784-01-6)				DESCRIBE RESULTS:											
GC/MS FRACTION – VOLATILE COMPOUNDS															
1V. Acrolein (107-02-8)				<0.0022							mg/L				
2V. Acrylonitrile (107-13-1)				<0.0019							mg/L				
3V. Benzene (71-43-2)				<0.00015							mg/L				
4V. Bis (Chloromethyl) Ether (542-88-1)			X								mg/L				
5V. Bromoform (75-25-2)				<0.00025							mg/L				
6V. Carbon Tetrachloride (56-23-5)				**<0.00025**							mg/L				
7V. Chlorobenzene (108-90-7)				<0.00026							mg/L				
8V. Chlorodibromomethane (124-48-1)				<0.00024							mg/L				

9V. Chloroethane (74-00-3)				<0.00022							mg/L				
10V. 2-Chloroethylvinyl Ether (110-75-8)				<0.00019							mg/L				
11V. Chloroform (67-66-3)				<0.00026							mg/L				

TABLE C Page 3 of 8 — **OUTFALL NO.** 002A

1. POLLUTANT and CAS NO. (if available)	2. MARK "X"			3. EFFLUENT							4. UNITS		5. INTAKE (optional)		
	a. Testing Required	b. Believed Present	c. Believed Absent	a. Maximum Daily Value		b. Maximum 30-Day Avg. Value (if available)		c. Long-Term Avg. Value (if available)		d. No. of Analyses	a. Concentration	b. Mass	a. Long-Term Avg. Value		b. No of Analyses
				(1) Concentration	(2) Mass	(1) Concentration	(2) Mass	(1) Concentration	(2) Mass				(1) Concentration	(2) Mass	
GC/MS FRACTION – VOLATILE COMPOUNDS continued															
12V. Dichloro-bromomethane (75-71-8)				<0.00021							mg/L				
13V. Dichloro-difluoromethane (75-71-8)			X								mg/L				
14V. 1,1-Dichloroethane (75-34-3)				<0.00025							mg/L				
15V. 1,2-Dichloroethane (107-06-2)				<0.00038							mg/L				
16V. 1,1-Dichlorethylene (75-35-4)				<0.00023							mg/L				
17V. 1,2-Dichloropropane (78-87-5)				<0.00019							mg/L				
18V. 1,3-Dichloropropylene (452-75-6)				**<0.00026**							mg/L				
19V. Ethylbenzene (100-41-4)				<0.00025							mg/L				
20V. Methyl Bromide (74-83-9)				**<0.00029**							mg/L				
21V. Methyl Chloride (74-87-3)				**<0.00024**							mg/L				
22V. Methylene Chloride (75-00-2)				<0.010							mg/L				
23V. 1,1,2,2-Tetrachloroethane (79-34-5)				<0.00032							mg/L				

24V. Tetra-chloroethylene (127-18-4)				**<0.00026**							mg/L				
25V. Toluene (108-88-3)				<0.00030							mg/L				
26V. 1,2-Trans-Dichloroethylene (156-60-5)				**<0.00022**							mg/L				
27V. 1,1,1-Trichloroethane (71-55-6)				<0.00023							mg/L				

TABLE C Page 4 of 8 | **OUTFALL NO.** 002A

1. POLLUTANT and CAS NO. (if available)	2. MARK "X"			3. EFFLUENT							4. UNITS		5. INTAKE (optional)		
	a. Testing Required	b. Believed Present	c. Believed Absent	a. Maximum Daily Value		b. Maximum 30-Day Avg. Value (if available)		c. Long-Term Avg. Value (if available)		d. No. of Analyses	a. Concentration	b. Mass	a. Long-Term Avg. Value		b. No of Analyses
				(1) Concentration	(2) Mass	(1) Concentration	(2) Mass	(1) Concentration	(2) Mass				(1) Concentration	(2) Mass	
GC/MS FRACTION – VOLATILE COMPOUNDS continued															
28V. 1,1,2-Trichloroethane (79-00-5)				<0.00026							mg/L				
29V. Tri-chloroethylene (79-01-6)				**<0.00026**							mg/L				
30V. Trichloro-fluoromethane (75-69-4)				<0.00027							mg/L				
31V. Vinyl Chloride (75-01-4)				<0.00026							mg/L				
GC/MS FRACTION – ACID COMPOUNDS															
1A. 2-Chlorophenol (95-57-8)				<0.011							mg/L				
2A. 2,4-Dichlorophenol (120-83-2)				<0.011							mg/L				
3A. 2,4-Dimethylphenol (105-67-9)				<0.011							mg/L				
4A. 4,6-Dinitro-O-Cresol (534-52-1)				<0.028							mg/L				
5A. 2,4-Dinitrophenol (51-28-5)				<0.056							mg/L				
6A. 2-Nitrophenol (88-75-5)				<0.011							mg/L				
7A. 4-Nitrophenol (100-02-7)				<0.056							mg/L				

8A. P-Chloro-M-Cresol (59-50-7)				**<0.022**							mg/L				
9A. Pentachloro-phenol (87-88-5)				<0.056							mg/L				
10A. Phenol (108-05-2)				<0.011							mg/L				
11A. 2,4,6-Trichloro-phenol (88-06-2)				<0.011							mg/L				

TABLE C Page 5 of 8	**OUTFALL NO.** 002A														
1. POLLUTANT and CAS NO. (if available)	**2. MARK "X"**			**3. EFFLUENT**							**4. UNITS**		**5. INTAKE (optional)**		
	a. Testing Required	**b. Believed Present**	**c. Believed Absent**	**a. Maximum Daily Value**		**b. Maximum 30-Day Avg. Value (if available)**		**c. Long-Term Avg. Value (if available)**		**d. No. of Analyses**	**a. Concentration**	**b. Mass**	**a. Long-Term Avg. Value**		**b. No of Analyses**
				(1) Concentration	**(2) Mass**	**(1) Concentration**	**(2) Mass**	**(1) Concentration**	**(2) Mass**				**(1) Concentration**	**(2) Mass**	
GC/MS FRACTION – BASE/NEUTRAL COMPOUNDS															
1B. Acenaphthene (83-32-9)				<0.011							mg/L				
2B. Acenaphtylene (208-96-8)				<0.011							mg/L				
3B. Anthracene (120-12-7)				<0.011							mg/L				
4B. Benzidine (92-87-5)				<0.056							mg/L				
5B . Benzo (a) Anthracene (56-55-3)				<0.011							mg/L				
6B. Benzo (a) Pyrene (50-32-8)				<0.011							mg/L				
7B. 3,4-Benzo-fluoranthene (205-99-2)				<0.011							mg/L				
8B. .Benzo (ghi) perylene (191-24-2)				<0.011							mg/L				
9B. .Benzo (k)-fluoranthene (207-08-9)				<0.011							mg/L				
10B. Bis (2-chloroethoxy) Methane (111-91-1)				<0.011							mg/L				
11B. Bis (2-chloroethel) Ether (111-44-4)				<0.011							mg/L				
12B. Bis (2-chloroisopropyl)-Ether (102-80-1)				**<0.011**							mg/L				
13B. Bis (2-ethyl-hexyl) Phthalate (117-81-7)				<0.011							mg/L				
14B. 4-Bromophenyl Phenyl Ether (101-55-3)				<0.011							mg/L				
15B. Butyl Benzyl Phthalate (85-68-7)				<0.011							mg/L				
16B. 2-Chloro-Naphthalene (7005-72-3)				<0.011							mg/L				

17B. 4-Chlorophenyl Phenyl Ether (7005-72-3)				<0.011							mg/L				

TABLE C Page 6 of 8 — **OUTFALL NO.** 002A

1. POLLUTANT and CAS NO. (if available)	2. MARK "X"			3. EFFLUENT							4. UNITS		5. INTAKE (optional)		
	a. Testing Required	b. Believed Present	c. Believed Absent	a. Maximum Daily Value		b. Maximum 30-Day Avg. Value (if available)		c. Long-Term Avg. Value (if available)		d. No. of Analyses	a. Concentration	b. Mass	a. Long-Term Avg. Value		b. No of Analyses
				(1) Concentration	(2) Mass	(1) Concentration	(2) Mass	(1) Concentration	(2) Mass				(1) Concentration	(2) Mass	
GC/MS FRACTION – BASE/NEUTRAL COMPOUNDS continued															
18B. Chrysene (218-01-9)				<0.011							mg/L				
19B. Dibenzo (a,h) Anthracene (53-70-3)				<0.011							mg/L				
20B. 1,2-Dichloro-benzene (95-50-1)				<0.00030							mg/L				
21B. 1,3-Dichloro-Benzene (541-73-1)				<0.00024							mg/L				
22B. 1,4-Dichloro-benzene (106-46-7)				<0.00028							mg/L				
23B. 3,3-Dichloro-benzidene (91-94-1)				<0.056							mg/L				
24B. Diethyl Phthalate (84-66-2)				<0.011							mg/L				
25B. Dimethyl Phthalate (131-11-3)				<0.011							mg/L				
26B. Di-N-Butyl Phthalate (84-74-2)				<0.011							mg/L				
27B. 2,4-Dinitro-toluene (121-14-2)				<0.011							mg/L				
28B. 2,6-Dinitro-toluene (606-20-2)				<0.011							mg/L				
29B. Di-N-Octyl Phthalate (117-84-0)				<0.011							mg/L				
30B. 1,2-Diphenyl-hydrazine (as Azo-benzene) (122-66-7)			X								mg/L				
31B. Fluoranthene (208-44-0)				<0.011							mg/L				
32B. Fluorene (86-73-7)				<0.011							mg/L				
33B. Hexachloro-benzene (118-71-1)				<0.011							mg/L				
34B. Hexachloro-butadiene (87-68-3)				<0.011							mg/L				

35B. Hexachloro-cyclopentadiene (77-47-4)				<0.011							mg/L				

TABLE C Page 7 of 8	**OUTFALL NO.** 002A														
1. POLLUTANT and CAS NO. (if available)	**2. MARK "X"**			**3. EFFLUENT**							**4. UNITS**		**5. INTAKE (optional)**		
	a. Testing Required	**b. Believed Present**	**c. Believed Absent**	**a. Maximum Daily Value**		**b. Maximum 30-Day Avg. Value (if available)**		**c. Long-Term Avg. Value (if available)**		**d. No. of Analyses**	**a. Concentration**	**b. Mass**	**a. Long-Term Avg. Value**		**b. No of Analyses**
				(1) Concentration	**(2) Mass**	**(1) Concentration**	**(2) Mass**	**(1) Concentration**	**(2) Mass**				**(1) Concentration**	**(2) Mass**	
GC/MS FRACTION – BASE/NEUTRAL COMPOUNDS continued															
36B. Hexachloro-ethane (67-72-1)				<0.011							mg/L				
37B. Indeno (1,2,3-cd) Pyrene (193-39-5)				<0.011							mg/L				
38B. Isophorone (78-59-1)				<0.011							mg/L				
39B. Napthalene (91-20-3)				<0.011							mg/L				
40B. Nitrobenzene (98-95-3)				<0.011							mg/L				
41B. N-Nitro-sodimethylamine (62-75-9)				<0.011							mg/L				
42B. N-Nitrosodi-N-Propylamine (621-64-7)				<0.011							mg/L				
43B. N-Nitro-sodiphenylamine (86-30-6)				<0.011							mg/L				
44B. Phenanthrene (85-01-8)				<0.011							mg/L				
45B. Pyrene (129-00-0)				<0.011							mg/L				
46B. 1,2,4-Trichloro-benzene (120-82-1)				<0.011							mg/L				

V. INTAKE AND EFFLUENT CHARACTERISTICS (Continued from Section V. INTAKE AND EFFLUENT CHARACTERISTICS)												
PART A.	PLEASE PRINT OR TYPE IN THE UNSHADED AREAS ONLY OF TABLE A**.** See instructions before proceeding. Complete one set of tables for each outfall. Place the outfall number in the space provided on each table. You must provide the results of at least one analysis for every pollutant in this table.											
TABLE A Page 1 of 1	**OUTFALL NO.** 009											
1. POLLUTANT	**2. EFFLUENT**							**3. UNITS (specify if blank)**		**4. INTAKE (optional)**		
	a. Maximum Daily Value		**b. Maximum 30-Day Avg. Value (if available)**		**c. Long-Term Avg. Value (if available)**		**d. No. of Analyses**	**a. Concentration**	**b. Mass**	**a. Long-Term Avg. Value**		**b. No of Analyses**
	(1) Concentration	**(2) Mass**	**(1) Concentration**	**(2) Mass**	**(1) Concentration**	**(2) Mass**				**(1) Concentration**	**(2) Mass**	
1. Biochemical Oxygen Demand $(BOD)_5$	<3.0							mg/L				
2. Chemical Oxygen Demand (COD)	<50							mg/L				
3. Total Organic Carbon (TOC)	**3.1**							mg/L				
4. Total Suspended Solids (TSS)	**18**							mg/L				
5. Ammonia (as N)	<0.50							mg/L				
6. Flow (MGD)	**28.8**		VALUE		VALUE			MGD		VALUE		
7. Temperature (winter)			VALUE		VALUE			°C		VALUE		
8. Temperature (summer)	**20.6**		VALUE		VALUE			°C		VALUE		
9. pH	MINIMUM 6.9	MAXIMUM 6.9	MINIMUM	MAXIMUM				STANDARD UNITS				

V. INTAKE AND EFFLUENT CHARACTERISTICS (Continued)

PART B.

PLEASE PRINT OR TYPE IN THE UNSHADED AREAS ONLY OF TABLE B.
See instructions before proceeding.
Complete one set of tables for each outfall. Place the outfall number in the space provided on each table.

In column "2. MARK X", place an "X" in either the **Believed Present** column (2.a) for each pollutant you know or have reason to believe is present; or place an "X" in the **Believed Absent** column (2.b) for each pollutant you believe to be absent.
If you mark the **Believed Present** column for any pollutant, you must provide the results of at least one analysis for that pollutant.
Complete one table for each outfall. See the instructions for additional details and requirements.

TABLE B Page 1 of 2 — **OUTFALL NO.** 009

1. POLLUTANT and CAS NO. (if available)	2. MARK "X"		3. EFFLUENT							4. UNITS		5. INTAKE (optional)		
	a. Believed Present	b. Believed Absent	a. Maximum Daily Value		b. Maximum 30-Day Avg. Value (if available)		c. Long-Term Avg. Value (if available)		d. No. of Analyses	a. Concentration	b. Mass	a. Long-Term Avg. Value		b. No of Analyses
			(1) Concentration	(2) Mass	(1) Concentration	(2) Mass	(1) Concentration	(2) Mass				(1) Concentration	(2) Mass	
1. Bromide (24959-67-9)			<0.50							mg/L				
2. Chloride			**32**							mg/L				
3. Chlorine, Total Residual			**0.03**							mg/L				
4. Color			10							CU				
5. E.coli			**1553.1**							MPN/100mL				
6. Fluoride (16984-48-8)			<0.50							mg/L				
7. Hardness ($CaCO_3$)			160							mg/L				
8.Nitrate–Nitrite (as N)			**1.1**							mg/L				
9. Nitrogen, Total Organic (as N)			<1.0							mg/L				
10. Oil and Grease			<5.3							mg/L				
11. Phosphorous (as P), Total (7723-14-0)			<0.10							mg/L				
12. Radioactivity														
(1) Alpha, Total			-0.268 +/-1.07							pCi/L				
(2) Beta, Total			2.05 +/-1.32							pCi/L				

(3) Radium, Total			0.769 +/-0.388							pCi/L				

TABLE B Page 2 of 2	**OUTFALL NO.** 009														
1. POLLUTANT and CAS NO. (if available)	**2. MARK "X"**		**3. EFFLUENT**							**4. UNITS**		**5. INTAKE (optional)**			
	a. Believed Present	**b. Believed Absent**	**a. Maximum Daily Value**		**b. Maximum 30-Day Avg. Value (if available)**		**c. Long-Term Avg. Value (if available)**		**d. No. of Analyses**	**a. Concentration**	**b. Mass**	**a. Long-Term Avg. Value**		**b. No of Analyses**
			(1) Concentration	**(2) Mass**	**(1) Concentration**	**(2) Mass**	**(1) Concentration**	**(2) Mass**				**(1) Concentration**	**(2) Mass**	
(4) Radium, 226, Total			0.456 +/-0.246							pCi/L				
(5) Strontium-90, Total			1.49 +/-1.13							pCi/L				
(6) Uranium			0.000414							mg/L				
13. Sulfate (asSO_4) (14808-79-8)			68							mg/L				
14. Sulfide (as S)			<0.20							mg/L				
15. Sulfite (asSO4) (14286-46-3)			<2.0							mg/L				
16. Surfactants			<0.50							**mg/L**				
17.Aluminum,Total (7429-90)			99							ug/L				
18. Barium, Total (7440-39-3)			**53**							ug/L				
19. Boron, Total (7440-42-8)			0.10							mg/L				
20. Cobalt, Total (7440-48-4)			**<0.50**							ug/L				
21. Iron, Total (7439-89-6)			250							ug/L				
22. Magnesium, Total (7439-96-4)			13							mg/L				
23. Molybdenum, Total (7439-98-7)			**2.8**							ug/L				
24. Manganese, Total (7439-96-6)			**67**							ug/L				
25. Tin, Total (7440-31-5)			**<0.0010**							mg/L				
26. Titanium, Total (7440-32-6)			<0.030							mg/L				

V. INTAKE AND EFFLUENT CHARACTERISTICS (Continued)

PART C.	PLEASE PRINT OR TYPE IN THE UNSHADED AREAS ONLY OF TABLE C**.** See instructions before proceeding. Complete one set of tables for each outfall. Place the outfall number in the space provided on each table. If you are a primary industry and this outfall contains process wastewater, refer to the instructions (Table C-2) to determine which of the GC/MS fractions you must test for. Mark "X" in the **Testing Required** column for all such GC/MS fractions that apply to your industry and for ALL toxic metals, cyanides, and total phenols. If you are not required to mark this column (<u>secondary industries, nonprocess wastewater outfalls, and non-required GC/MS fractions</u>), mark "X" in the **Believed Present** column for each pollutant you know or have reason to believe is present. Mark "X: in the **Believed Absent** column for each pollutant you believe to be absent. If you mark either the **Testing Required** or **Believed Present** columns for any pollutant, you must provide the result of at least one analysis for that pollutant. Note that there are eight pages to this part; please review each carefully. Complete one table (all eight pages) for each outfall. See the instructions for additional details and requirements
TABLE C Page 1 of 8	**OUTFALL NO.** 009

1. POLLUTANT and CAS NO. (if available)	2. MARK "X"			3. EFFLUENT							4. UNITS		5. INTAKE (optional)		
	a. Testing Required	b. Believed Present	c. Believed Absent	a. Maximum Daily Value		b. Maximum 30-Day Avg. Value (if available)		c. Long-Term Avg. Value (if available)		d. No. of Analyses	a. Concentration	b. Mass	a. Long-Term Avg. Value		b. No of Analyses
				(1) Concentration	(2) Mass	(1) Concentration	(2) Mass	(1) Concentration	(2) Mass				(1) Concentration	(2) Mass	
METALS, CYANIDE AND TOTAL PHENOLS															
1M. Antimony, Total (7440-36-0)				<0.50							ug/L				
2M. Arsenic, Total (7440-38-2)				1.4							ug/L				
3M. Beryllium, Total (7440-41-7)				<1.0							ug/L				
4M. Cadmium, Total (7440-43-9)				<0.50							ug/L				
5M. Chromium, Total (7440-43-9)				**3.4**							ug/L				
6M. Copper, Total (7550-50-8)				<5.0							ug/L				
7M. Lead, Total (7439-92-1)				<0.50							ug/L				
8M. Mercury, Total (7439-97-6)				<0.500							ng/L				
9M. Nickel, Total (7440-02-0)				1.9							ug/L				

10M. Selenium, Total (7782-49-2)				0.99							ug/L				
11M. Silver, Total (7440-28-0)				<0.10							ug/L				

TABLE C Page 2 of 8 | **OUTFALL NO.** 009

1. POLLUTANT and CAS NO. (if available)	2. MARK "X"			3. EFFLUENT							4. UNITS		5. INTAKE (optional)		
	a. Testing Required	b. Believed Present	c. Believed Absent	a. Maximum Daily Value		b. Maximum 30-Day Avg. Value (if available)		c. Long-Term Avg. Value (if available)		d. No. of Analyses	a. Concentration	b. Mass	a. Long-Term Avg. Value		b. No of Analyses
				(1) Concentration	(2) Mass	(1) Concentration	(2) Mass	(1) Concentration	(2) Mass				(1) Concentration	(2) Mass	
METALS, CYANIDE AND TOTAL PHENOLS continued															
12M Thallium, Total (7440-28-0)				<0.50							ug/L				
13M. Zinc, Total (7440-66-6)				**15**							ug/L				
14M. Cyanide, Total (57-12-5)				<0.010							mg/L				
15M. Phenols, Total				<0.010							mg/L				
DIOXIN															
2,3,7,8 Tetra-chlorodibenzo-P-Dioxin (1784-01-6)				DESCRIBE RESULTS:											
GC/MS FRACTION – VOLATILE COMPOUNDS															
1V. Acrolein (107-02-8)				<0.0022							mg/L				
2V. Acrylonitrile (107-13-1)				<0.0019							mg/L				
3V. Benzene (71-43-2)				<0.00015							mg/L				
4V. Bis (Chloromethyl) Ether (542-88-1)			X								mg/L				
5V. Bromoform (75-25-2)				<0.00025							mg/L				
6V. Carbon Tetrachloride (56-23-5)				**<0.00025**							mg/L				
7V. Chlorobenzene (108-90-7)				<0.00026							mg/L				
8V. Chlorodibromomethane (124-48-1)				<0.00024							mg/L				

9V. Chloroethane (74-00-3)				<0.00022							mg/L					
10V. 2-Chloroethylvinyl Ether (110-75-8)				<0.00019							mg/L					
11V. Chloroform (67-66-3)				<0.00026							mg/L					
TABLE C Page 3 of 8	**OUTFALL NO.** 009															
1. POLLUTANT and CAS NO. (if available)	**2. MARK "X"**			**3. EFFLUENT**							**4. UNITS**		**5. INTAKE (optional)**			
	a. Testing Required	**b. Believed Present**	**c. Believed Absent**	**a. Maximum Daily Value**		**b. Maximum 30-Day Avg. Value (if available)**		**c. Long-Term Avg. Value (if available)**		**d. No. of Analyses**	**a. Concentration**	**b. Mass**	**a. Long-Term Avg. Value**		**b. No of Analyses**
				(1) Concentration	**(2) Mass**	**(1) Concentration**	**(2) Mass**	**(1) Concentration**	**(2) Mass**				**(1) Concentration**	**(2) Mass**	
GC/MS FRACTION – VOLATILE COMPOUNDS continued																
12V. Dichloro-bromomethane (75-71-8)				<0.0050							mg/L					
13V. Dichloro-difluoromethane (75-71-8)			X								mg/L					
14V. 1,1-Dichloroethane (75-34-3)				<0.00025							mg/L					
15V. 1,2-Dichloroethane (107-06-2)				<0.00038							mg/L					
16V. 1,1-Dichlorethylene (75-35-4)				<0.00023							mg/L					
17V. 1,2-Dichloropropane (78-87-5)				<0.00019							mg/L					
18V. 1,3-Dichloropropylene (452-75-6)				**<0.00026**							mg/L					
19V. Ethylbenzene (100-41-4)				<0.00025							mg/L					
20V. Methyl Bromide (74-83-9)				**<0.00029**							mg/L					
21V. Methyl Chloride (74-87-3)				**<0.00024**							mg/L					
22V. Methylene Chloride (75-00-2)				<0.010							mg/L					
23V. 1,1,2,2-Tetrachloroethane (79-34-5)				<0.00032							mg/L					

24V. Tetra-chloroethylene (127-18-4)				**<0.00026**							mg/L				
25V. Toluene (108-88-3)				<0.00030							mg/L				
26V. 1,2-Trans-Dichloroethylene (156-60-5)				**<0.00022**							mg/L				
27V. 1,1,1-Trichloroethane (71-55-6)				<0.00023							mg/L				
TABLE C Page 4 of 8	**OUTFALL NO.** 009														
1. POLLUTANT and CAS NO. (if available)	**2. MARK "X"**			**3. EFFLUENT**							**4. UNITS**		**5. INTAKE (optional)**		
	a. Testing Required	**b. Believed Present**	**c. Believed Absent**	**a. Maximum Daily Value**		**b. Maximum 30-Day Avg. Value (if available)**		**c. Long-Term Avg. Value (if available)**		**d. No. of Analyses**	**a. Concentration**	**b. Mass**	**a. Long-Term Avg. Value**		**b. No of Analyses**
				(1) Concentration	**(2) Mass**	**(1) Concentration**	**(2) Mass**	**(1) Concentration**	**(2) Mass**				**(1) Concentration**	**(2) Mass**	
GC/MS FRACTION – VOLATILE COMPOUNDS continued															
28V. 1,1,2-Trichloroethane (79-00-5)				<0.00026							mg/L				
29V. Tri-chloroethylene (79-01-6)				**<0.00026**							mg/L				
30V. Trichloro-fluoromethane (75-69-4)				<0.00027							mg/L				
31V. Vinyl Chloride (75-01-4)				<0.00026							mg/L				
GC/MS FRACTION – ACID COMPOUNDS															
1A. 2-Chlorophenol (95-57-8)				<0.010							mg/L				
2A. 2,4-Dichlorophenol (120-83-2)				<0.010							mg/L				
3A. 2,4-Dimethylphenol (105-67-9)				<0.010							mg/L				
4A. 4,6-Dinitro-O-Cresol (534-52-1)				<0.026							mg/L				
5A. 2,4-Dinitrophenol (51-28-5)				<0.052							mg/L				
6A. 2-Nitrophenol (88-75-5)				<0.010							mg/L				
7A. 4-Nitrophenol (100-02-7)				<0.052							mg/L				

8A. P-Chloro-M-Cresol (59-50-7)				**<0.021**							mg/L				
9A. Pentachloro-phenol (87-88-5)				<0.052							mg/L				
10A. Phenol (108-05-2)				<0.010							mg/L				
11A. 2,4,6-Trichloro-phenol (88-06-2)				<0.010							mg/L				

TABLE C Page 5 of 8	OUTFALL NO. 009														
1. POLLUTANT and CAS NO. (if available)	2. MARK "X"			3. EFFLUENT							4. UNITS		5. INTAKE (optional)		
	a. Testing Required	b. Believed Present	c. Believed Absent	a. Maximum Daily Value		b. Maximum 30-Day Avg. Value (if available)		c. Long-Term Avg. Value (if available)		d. No. of Analyses	a. Concentration	b. Mass	a. Long-Term Avg. Value		b. No of Analyses
				(1) Concentration	(2) Mass	(1) Concentration	(2) Mass	(1) Concentration	(2) Mass				(1) Concentration	(2) Mass	
GC/MS FRACTION – BASE/NEUTRAL COMPOUNDS															
1B. Acenaphthene (83-32-9)				<0.010							mg/L				
2B. Acenaphtylene (208-96-8)				<0.010							mg/L				
3B. Anthracene (120-12-7)				<0.010							mg/L				
4B. Benzidine (92-87-5)				<0.052							mg/L				
5B . Benzo (a) Anthracene (56-55-3)				<0.010							mg/L				
6B. Benzo (a) Pyrene (50-32-8)				<0.010							mg/L				
7B. 3,4-Benzo-fluoranthene (205-99-2)				<0.010							mg/L				
8B. .Benzo (ghi) perylene (191-24-2)				<0.010							mg/L				
9B. .Benzo (k)-fluoranthene (207-08-9)				<0.010							mg/L				
10B. Bis (2-chloroethoxy) Methane (111-91-1)				<0.010							mg/L				
11B. Bis (2-chloroethel) Ether (111-44-4)				<0.010							mg/L				
12B. Bis (2-chloroisopropyl)-Ether (102-80-1)				**<0.010**							mg/L				
13B. Bis (2-ethyl-hexyl) Phthalate (117-81-7)				<0.010							mg/L				
14B. 4-Bromophenyl Phenyl Ether (101-55-3)				<0.010							mg/L				
15B. Butyl Benzyl Phthalate (85-68-7)				<0.010							mg/L				
16B. 2-Chloro-Naphthalene (7005-72-3)				<0.010							mg/L				

17B. 4-Chlorophenyl Phenyl Ether (7005-72-3)				<0.010							mg/L				

TABLE C Page 6 of 8 — **OUTFALL NO.** 009

1. POLLUTANT and CAS NO. (if available)	2. MARK "X"			3. EFFLUENT							4. UNITS		5. INTAKE (optional)		
	a. Testing Required	b. Believed Present	c. Believed Absent	a. Maximum Daily Value		b. Maximum 30-Day Avg. Value (if available)		c. Long-Term Avg. Value (if available)		d. No. of Analyses	a. Concentration	b. Mass	a. Long-Term Avg. Value		b. No of Analyses
				(1) Concentration	(2) Mass	(1) Concentration	(2) Mass	(1) Concentration	(2) Mass				(1) Concentration	(2) Mass	
GC/MS FRACTION – BASE/NEUTRAL COMPOUNDS continued															
18B. Chrysene (218-01-9)				<0.010							mg/L				
19B. Dibenzo (a,h) Anthracene (53-70-3)				<0.010							mg/L				
20B. 1,2-Dichloro-benzene (95-50-1)				<0.00030							mg/L				
21B. 1,3-Dichloro-Benzene (541-73-1)				<0.00024							mg/L				
22B. 1,4-Dichloro-benzene (106-46-7)				<0.00028							mg/L				
23B. 3,3-Dichloro-benzidene (91-94-1)				<0.052							mg/L				
24B. Diethyl Phthalate (84-66-2)				<0.010							mg/L				
25B. Dimethyl Phthalate (131-11-3)				<0.010							mg/L				
26B. Di-N-Butyl Phthalate (84-74-2)				<0.010							mg/L				
27B. 2,4-Dinitro-toluene (121-14-2)				<0.010							mg/L				
28B. 2,6-Dinitro-toluene (606-20-2)				<0.010							mg/L				
29B. Di-N-Octyl Phthalate (117-84-0)				<0.010							mg/L				
30B. 1,2-Diphenyl-hydrazine (as Azo-benzene) (122-66-7)			X								mg/L				
31B. Fluoranthene (208-44-0)				<0.010							mg/L				
32B. Fluorene (86-73-7)				<0.010							mg/L				
33B. Hexachloro-benzene (118-71-1)				<0.010							mg/L				
34B. Hexachloro-butadiene (87-68-3)				<0.010							mg/L				

35B. Hexachloro-cyclopentadiene (77-47-4)				<0.010							mg/L				

TABLE C Page 7 of 8	OUTFALL NO. 009														
1. POLLUTANT and CAS NO. (if available)	2. MARK "X"			3. EFFLUENT							4. UNITS		5. INTAKE (optional)		
	a. Testing Required	b. Believed Present	c. Believed Absent	a. Maximum Daily Value		b. Maximum 30-Day Avg. Value (if available)		c. Long-Term Avg. Value (if available)		d. No. of Analyses	a. Concentration	b. Mass	a. Long-Term Avg. Value		b. No of Analyses
				(1) Concentration	(2) Mass	(1) Concentration	(2) Mass	(1) Concentration	(2) Mass				(1) Concentration	(2) Mass	
GC/MS FRACTION – BASE/NEUTRAL COMPOUNDS continued															
36B. Hexachloro-ethane (67-72-1)				<0.010							mg/L				
37B. Indeno (1,2,3-cd) Pyrene (193-39-5)				<0.010							mg/L				
38B. Isophorone (78-59-1)				<0.010							mg/L				
39B. Napthalene (91-20-3)				<0.010							mg/L				
40B. Nitrobenzene (98-95-3)				<0.010							mg/L				
41B. N-Nitro-sodimethylamine (62-75-9)				<0.010							mg/L				
42B. N-Nitrosodi-N-Propylamine (621-64-7)				<0.010							mg/L				
43B. N-Nitro-sodiphenylamine (86-30-6)				<0.010							mg/L				
44B. Phenanthrene (85-01-8)				<0.010							mg/L				
45B. Pyrene (129-00-0)				<0.010							mg/L				
46B. 1,2,4-Trichloro-benzene (120-82-1)				<0.010							mg/L				

V. INTAKE AND EFFLUENT CHARACTERISTICS (Continued from Section V. INTAKE AND EFFLUENT CHARACTERISTICS)

PART A.

PLEASE PRINT OR TYPE IN THE UNSHADED AREAS ONLY OF TABLE A.
See instructions before proceeding.
Complete one set of tables for each outfall. Place the outfall number in the space provided on each table.
You must provide the results of at least one analysis for every pollutant in this table.

TABLE A Page 1 of 1 **OUTFALL NO.** 023

1. POLLUTANT	2. EFFLUENT a. Maximum Daily Value (1) Concentration	2. EFFLUENT a. Maximum Daily Value (2) Mass	2. EFFLUENT b. Maximum 30-Day Avg. Value (if available) (1) Concentration	2. EFFLUENT b. Maximum 30-Day Avg. Value (if available) (2) Mass	2. EFFLUENT c. Long-Term Avg. Value (if available) (1) Concentration	2. EFFLUENT c. Long-Term Avg. Value (if available) (2) Mass	2. EFFLUENT d. No. of Analyses	3. UNITS (specify if blank) a. Concentration	3. UNITS (specify if blank) b. Mass	4. INTAKE (optional) a. Long-Term Avg. Value (1) Concentration	4. INTAKE (optional) a. Long-Term Avg. Value (2) Mass	4. INTAKE (optional) b. No of Analyses
1. Biochemical Oxygen Demand ($BOD)_5$	<3.0							mg/L				
2. Chemical Oxygen Demand (COD)	<50							mg/L				
3. Total Organic Carbon (TOC)	**6.0**							mg/L				
4. Total Suspended Solids (TSS)	**32**							mg/L				
5. Ammonia (as N)	<0.50							mg/L				
6. Flow (MGD)	**1.824**		VALUE		VALUE			MGD		VALUE		
7. Temperature (winter)			VALUE		VALUE			°C		VALUE		
8. Temperature (summer)	**26.4**		VALUE		VALUE			°C		VALUE		
9. pH	MINIMUM **8.6**	MAXIMUM **8.6**	MINIMUM	MAXIMUM				STANDARD UNITS				

V. INTAKE AND EFFLUENT CHARACTERISTICS (Continued)

PART B.

PLEASE PRINT OR TYPE IN THE UNSHADED AREAS ONLY OF TABLE B.
See instructions before proceeding.
Complete one set of tables for each outfall. Place the outfall number in the space provided on each table.

In column “2. MARK X”, place an “X” in either the **Believed Present** column (2.a) for each pollutant you know or have reason to believe is present; or place an “X” in the **Believed Absent** column (2.b) for each pollutant you believe to be absent.
If you mark the **Believed Present** column for any pollutant, you must provide the results of at least one analysis for that pollutant.
Complete one table for each outfall. See the instructions for additional details and requirements.

TABLE B Page 1 of 2 | **OUTFALL NO.** 023

1. POLLUTANT and CAS NO. (if available)	2. MARK “X”		3. EFFLUENT							4. UNITS		5. INTAKE (optional)		
	a. Believed Present	b. Believed Absent	a. Maximum Daily Value		b. Maximum 30-Day Avg. Value (if available)		c. Long-Term Avg. Value (if available)		d. No. of Analyses	a. Concentration	b. Mass	a. Long-Term Avg. Value		b. No of Analyses
			(1) Concentration	(2) Mass	(1) Concentration	(2) Mass	(1) Concentration	(2) Mass				(1) Concentration	(2) Mass	
1. Bromide (24959-67-9)			**0.88**							mg/L				
2. Chloride			**96**							mg/L				
3. Chlorine, Total Residual			**0.12**							mg/L				
4. Color			**20**							CU				
5. E.coli			**146.7**							MPN/100mL				
6. Fluoride (16984-48-8)			<0.50							mg/L				
7. Hardness ($CaCO_3$)			**410**							mg/L				
8.Nitrate–Nitrite (as N)			**3.0**							mg/L				
9. Nitrogen, Total Organic (as N)			**1.2**							mg/L				
10. Oil and Grease			<5.4							mg/L				
11. Phosphorous (as P), Total (7723-14-0)			**0.51**							mg/L				
12. Radioactivity														
(1) Alpha, Total			0.423 +/-1.38							pCi/L				
(2) Beta, Total			9.61 +/-1.84							pCi/L				

(3) Radium, Total			1.87 +/-0.654							pCi/L					

TABLE B Page 2 of 2	OUTFALL NO. 023													
1. POLLUTANT and CAS NO. (if available)	2. MARK "X"		3. EFFLUENT							4. UNITS		5. INTAKE (optional)		
	a. Believed Present	b. Believed Absent	a. Maximum Daily Value (1) Concentration	a. Maximum Daily Value (2) Mass	b. Maximum 30-Day Avg. Value (if available) (1) Concentration	b. Maximum 30-Day Avg. Value (if available) (2) Mass	c. Long-Term Avg. Value (if available) (1) Concentration	c. Long-Term Avg. Value (if available) (2) Mass	d. No. of Analyses	a. Concentration	b. Mass	a. Long-Term Avg. Value (1) Concentration	a. Long-Term Avg. Value (2) Mass	b. No of Analyses
(4) Radium, 226, Total			0.891 +/-0.324							pCi/L				
(5) Strontium-90, Total			-0.606 +/-0.62							pCi/L				
(6) Uranium			0.00105							mg/L				
13. Sulfate (asSO_4) (14808-79-8)			180							mg/L				
14. Sulfide (as S)			<0.20							mg/L				
15. Sulfite (asSO4) (14286-46-3)			<2.0							mg/L				
16. Surfactants			<0.50							**mg/L**				
17.Aluminum,Total (7429-90)			**250**							ug/L				
18. Barium, Total (7440-39-3)			**100**							ug/L				
19. Boron, Total (7440-42-8)			**<0.50**							mg/L				
20. Cobalt, Total (7440-48-4)			**<0.50**							ug/L				
21. Iron, Total (7439-89-6)			**450**							ug/L				
22. Magnesium, Total (7439-96-4)			**33**							mg/L				
23. Molybdenum, Total (7439-98-7)			**7.7**							ug/L				
24. Manganese, Total (7439-96-6)			**93**							ug/L				
25. Tin, Total (7440-31-5)			**<0.0010**							mg/L				
26. Titanium, Total (7440-32-6)			<0.030							mg/L				

V. INTAKE AND EFFLUENT CHARACTERISTICS (Continued)

PART C.

PLEASE PRINT OR TYPE IN THE UNSHADED AREAS ONLY OF TABLE C**.**
See instructions before proceeding.
Complete one set of tables for each outfall. Place the outfall number in the space provided on each table.

If you are a primary industry and this outfall contains process wastewater, refer to the instructions (Table C-2) to determine which of the GC/MS fractions you must test for.
Mark “X” in the **Testing Required** column for all such GC/MS fractions that apply to your industry and for ALL toxic metals, cyanides, and total phenols.
If you are not required to mark this column (secondary industries, nonprocess wastewater outfalls, and non-required GC/MS fractions), mark “X” in the **Believed Present** column for each pollutant you know or have reason to believe is present.
Mark “X: in the **Believed Absent** column for each pollutant you believe to be absent.
If you mark either the **Testing Required** or **Believed Present** columns for any pollutant, you must provide the result of at least one analysis for that pollutant. Note that there are eight pages to this part; please review each carefully. Complete one table (all eight pages) for each outfall.
See the instructions for additional details and requirements

TABLE C Page 1 of 8 — **OUTFALL NO.** 009

1. POLLUTANT and CAS NO. (if available)	2. MARK “X”			3. EFFLUENT							4. UNITS		5. INTAKE (optional)		
	a. Testing Required	b. Believed Present	c. Believed Absent	a. Maximum Daily Value		b. Maximum 30-Day Avg. Value (if available)		c. Long-Term Avg. Value (if available)		d. No. of Analyses	a. Concentration	b. Mass	a. Long-Term Avg. Value		b. No of Analyses
				(1) Concentration	(2) Mass	(1) Concentration	(2) Mass	(1) Concentration	(2) Mass				(1) Concentration	(2) Mass	
METALS, CYANIDE AND TOTAL PHENOLS															
1M. Antimony, Total (7440-36-0)				**0.61**							ug/L				
2M. Arsenic, Total (7440-38-2)				2.1							ug/L				
3M. Beryllium, Total (7440-41-7)				<1.0							ug/L				
4M. Cadmium, Total (7440-43-9)				<0.50							ug/L				
5M. Chromium, Total (7440-43-9)				**0.83**							ug/L				
6M. Copper, Total (7550-50-8)				**120**							ug/L				
7M. Lead, Total (7439-92-1)				**0.92**							ug/L				
8M. Mercury, Total (7439-97-6)				<0.500							ng/L				
9M. Nickel, Total (7440-02-0)				**14**							ug/L				

10M. Selenium, Total (7782-49-2)				**1.3**							ug/L				
11M. Silver, Total (7440-28-0)				<0.10							ug/L				

TABLE C Page 2 of 8 — **OUTFALL NO.** 023

1. POLLUTANT and CAS NO. (if available)	2. MARK "X"			3. EFFLUENT							4. UNITS		5. INTAKE (optional)		
	a. Testing Required	b. Believed Present	c. Believed Absent	a. Maximum Daily Value		b. Maximum 30-Day Avg. Value (if available)		c. Long-Term Avg. Value (if available)		d. No. of Analyses	a. Concentration	b. Mass	a. Long-Term Avg. Value		b. No of Analyses
				(1) Concentration	(2) Mass	(1) Concentration	(2) Mass	(1) Concentration	(2) Mass				(1) Concentration	(2) Mass	
METALS, CYANIDE AND TOTAL PHENOLS continued															
12M Thallium, Total (7440-28-0)				<0.50							ug/L				
13M. Zinc, Total (7440-66-6)				**<10**							ug/L				
14M. Cyanide, Total (57-12-5)				<0.010							mg/L				
15M. Phenols, Total				<0.010							mg/L				
DIOXIN															
2,3,7,8 Tetra-chlorodibenzo-P-Dioxin (1784-01-6)				DESCRIBE RESULTS:											
GC/MS FRACTION – VOLATILE COMPOUNDS															
1V. Acrolein (107-02-8)				<0.0022							mg/L				
2V. Acrylonitrile (107-13-1)				<0.0019							mg/L				
3V. Benzene (71-43-2)				<0.00015							mg/L				
4V. Bis (Chloromethyl) Ether (542-88-1)			X								mg/L				
5V. Bromoform (75-25-2)				<0.00025							mg/L				
6V. Carbon Tetrachloride (56-23-5)				**<0.00025**							mg/L				
7V. Chlorobenzene (108-90-7)				<0.00026							mg/L				
8V. Chlorodibromomethane (124-48-1)				<0.00024							mg/L				

9V. Chloroethane (74-00-3)				<0.00022							mg/L				
10V. 2-Chloroethylvinyl Ether (110-75-8)				<0.00019							mg/L				
11V. Chloroform (67-66-3)				<0.00026							mg/L				

TABLE C Page 3 of 8 — **OUTFALL NO.** 023

1. POLLUTANT and CAS NO. (if available)	2. MARK "X"			3. EFFLUENT							4. UNITS		5. INTAKE (optional)		
	a. Testing Required	b. Believed Present	c. Believed Absent	a. Maximum Daily Value		b. Maximum 30-Day Avg. Value (if available)		c. Long-Term Avg. Value (if available)		d. No. of Analyses	a. Concentration	b. Mass	a. Long-Term Avg. Value		b. No of Analyses
				(1) Concentration	(2) Mass	(1) Concentration	(2) Mass	(1) Concentration	(2) Mass				(1) Concentration	(2) Mass	
GC/MS FRACTION – VOLATILE COMPOUNDS continued															
12V. Dichloro-bromomethane (75-71-8)				<0.00021							mg/L				
13V. Dichloro-difluoromethane (75-71-8)			X								mg/L				
14V. 1,1-Dichloroethane (75-34-3)				<0.00025							mg/L				
15V. 1,2-Dichloroethane (107-06-2)				<0.00038							mg/L				
16V. 1,1-Dichlorethylene (75-35-4)				<0.00023							mg/L				
17V. 1,2-Dichloropropane (78-87-5)				<0.00019							mg/L				
18V. 1,3-Dichloropropylene (452-75-6)				**<0.00026**							mg/L				
19V. Ethylbenzene (100-41-4)				<0.00025							mg/L				
20V. Methyl Bromide (74-83-9)				**<0.00029**							mg/L				
21V. Methyl Chloride (74-87-3)				**<0.00024**							mg/L				
22V. Methylene Chloride (75-00-2)				<0.010							mg/L				
23V. 1,1,2,2-Tetrachloroethane (79-34-5)				<0.00032							mg/L				

24V. Tetra-chloroethylene (127-18-4)				**<0.00026**							mg/L				
25V. Toluene (108-88-3)				<0.00030							mg/L				
26V. 1,2-Trans-Dichloroethylene (156-60-5)				**<0.00022**							mg/L				
27V. 1,1,1-Trichloroethane (71-55-6)				<0.00023							mg/L				

TABLE C Page 4 of 8 — **OUTFALL NO.** 023

1. POLLUTANT and CAS NO. (if available)	2. MARK "X"			3. EFFLUENT							4. UNITS		5. INTAKE (optional)		
	a. Testing Required	b. Believed Present	c. Believed Absent	a. Maximum Daily Value		b. Maximum 30-Day Avg. Value (if available)		c. Long-Term Avg. Value (if available)		d. No. of Analyses	a. Concentration	b. Mass	a. Long-Term Avg. Value		b. No of Analyses
				(1) Concentration	(2) Mass	(1) Concentration	(2) Mass	(1) Concentration	(2) Mass				(1) Concentration	(2) Mass	
GC/MS FRACTION – VOLATILE COMPOUNDS continued															
28V. 1,1,2-Trichloroethane (79-00-5)				<0.00026							mg/L				
29V. Tri-chloroethylene (79-01-6)				**<0.00026**							mg/L				
30V. Trichloro-fluoromethane (75-69-4)				<0.00027							mg/L				
31V. Vinyl Chloride (75-01-4)				<0.00026							mg/L				
GC/MS FRACTION – ACID COMPOUNDS															
1A. 2-Chlorophenol (95-57-8)				<0.011							mg/L				
2A. 2,4-Dichlorophenol (120-83-2)				<0.011							mg/L				
3A. 2,4-Dimethylphenol (105-67-9)				<0.011							mg/L				
4A. 4,6-Dinitro-O-Cresol (534-52-1)				<0.027							mg/L				
5A. 2,4-Dinitrophenol (51-28-5)				<0.054							mg/L				
6A. 2-Nitrophenol (88-75-5)				<0.011							mg/L				
7A. 4-Nitrophenol (100-02-7)				<0.054							mg/L				

8A. P-Chloro-M-Cresol (59-50-7)				**<0.022**							mg/L				
9A. Pentachloro-phenol (87-88-5)				<0.054							mg/L				
10A. Phenol (108-05-2)				<0.011							mg/L				
11A. 2,4,6-Trichloro-phenol (88-06-2)				<0.011							mg/L				

TABLE C Page 5 of 8	**OUTFALL NO.** 023														
1. POLLUTANT and CAS NO. (if available)	**2. MARK "X"**			**3. EFFLUENT**							**4. UNITS**		**5. INTAKE (optional)**		
	a. Testing Required	**b. Believed Present**	**c. Believed Absent**	**a. Maximum Daily Value**		**b. Maximum 30-Day Avg. Value (if available)**		**c. Long-Term Avg. Value (if available)**		**d. No. of Analyses**	**a. Concentration**	**b. Mass**	**a. Long-Term Avg. Value**		**b. No of Analyses**
				(1) Concentration	**(2) Mass**	**(1) Concentration**	**(2) Mass**	**(1) Concentration**	**(2) Mass**				**(1) Concentration**	**(2) Mass**	
GC/MS FRACTION – BASE/NEUTRAL COMPOUNDS															
1B. Acenaphthene (83-32-9)				<0.011							mg/L				
2B. Acenaphtylene (208-96-8)				<0.011							mg/L				
3B. Anthracene (120-12-7)				<0.011							mg/L				
4B. Benzidine (92-87-5)				<0.054							mg/L				
5B . Benzo (a) Anthracene (56-55-3)				<0.011							mg/L				
6B. Benzo (a) Pyrene (50-32-8)				<0.011							mg/L				
7B. 3,4-Benzo-fluoranthene (205-99-2)				<0.011							mg/L				
8B. .Benzo (ghi) perylene (191-24-2)				<0.011							mg/L				
9B. .Benzo (k)-fluoranthene (207-08-9)				<0.011							mg/L				
10B. Bis (2-chloroethoxy) Methane (111-91-1)				<0.011							mg/L				
11B. Bis (2-chloroethel) Ether (111-44-4)				<0.011							mg/L				
12B. Bis (2-chloroisopropyl)-Ether (102-80-1)				**<0.011**							mg/L				
13B. Bis (2-ethyl-hexyl) Phthalate (117-81-7)				<0.011							mg/L				
14B. 4-Bromophenyl Phenyl Ether (101-55-3)				<0.011							mg/L				
15B. Butyl Benzyl Phthalate (85-68-7)				<0.011							mg/L				
16B. 2-Chloro-Naphthalene (7005-72-3)				<0.011							mg/L				

17B. 4-Chlorophenyl Phenyl Ether (7005-72-3)				<0.011							mg/L				

TABLE C Page 6 of 8 — **OUTFALL NO.** 023

1. POLLUTANT and CAS NO. (if available)	2. MARK "X"			3. EFFLUENT							4. UNITS		5. INTAKE (optional)		
	a. Testing Required	b. Believed Present	c. Believed Absent	a. Maximum Daily Value		b. Maximum 30-Day Avg. Value (if available)		c. Long-Term Avg. Value (if available)		d. No. of Analyses	a. Concentration	b. Mass	a. Long-Term Avg. Value		b. No of Analyses
				(1) Concentration	(2) Mass	(1) Concentration	(2) Mass	(1) Concentration	(2) Mass				(1) Concentration	(2) Mass	
GC/MS FRACTION – BASE/NEUTRAL COMPOUNDS continued															
18B. Chrysene (218-01-9)				<0.011							mg/L				
19B. Dibenzo (a,h) Anthracene (53-70-3)				<0.011							mg/L				
20B. 1,2-Dichloro-benzene (95-50-1)				<0.00030							mg/L				
21B. 1,3-Dichloro-Benzene (541-73-1)				<0.00024							mg/L				
22B. 1,4-Dichloro-benzene (106-46-7)				<0.00028							mg/L				
23B. 3,3-Dichloro-benzidene (91-94-1)				<0.054							mg/L				
24B. Diethyl Phthalate (84-66-2)				<0.011							mg/L				
25B. Dimethyl Phthalate (131-11-3)				<0.011							mg/L				
26B. Di-N-Butyl Phthalate (84-74-2)				<0.011							mg/L				
27B. 2,4-Dinitro-toluene (121-14-2)				<0.011							mg/L				
28B. 2,6-Dinitro-toluene (606-20-2)				<0.011							mg/L				
29B. Di-N-Octyl Phthalate (117-84-0)				<0.011							mg/L				
30B. 1,2-Diphenyl-hydrazine (as Azo-benzene) (122-66-7)			X								mg/L				
31B. Fluoranthene (208-44-0)				<0.011							mg/L				
32B. Fluorene (86-73-7)				<0.011							mg/L				
33B. Hexachloro-benzene (118-71-1)				<0.011							mg/L				
34B. Hexachloro-butadiene (87-68-3)				<0.011							mg/L				

35B. Hexachloro-cyclopentadiene (77-47-4)				<0.011							mg/L				

TABLE C Page 7 of 8	OUTFALL NO. 023															
1. POLLUTANT and CAS NO. (if available)	2. MARK "X"			3. EFFLUENT							4. UNITS		5. INTAKE (optional)		
	a. Testing Required	b. Believed Present	c. Believed Absent	a. Maximum Daily Value		b. Maximum 30-Day Avg. Value (if available)		c. Long-Term Avg. Value (if available)		d. No. of Analyses	a. Concentration	b. Mass	a. Long-Term Avg. Value		b. No of Analyses
				(1) Concentration	(2) Mass	(1) Concentration	(2) Mass	(1) Concentration	(2) Mass				(1) Concentration	(2) Mass	
GC/MS FRACTION – BASE/NEUTRAL COMPOUNDS continued															
36B. Hexachloro-ethane (67-72-1)				<0.011							mg/L				
37B. Indeno (1,2,3-cd) Pyrene (193-39-5)				<0.011							mg/L				
38B. Isophorone (78-59-1)				<0.011							mg/L				
39B. Napthalene (91-20-3)				<0.011							mg/L				
40B. Nitrobenzene (98-95-3)				<0.011							mg/L				
41B. N-Nitro-sodimethylamine (62-75-9)				<0.011							mg/L				
42B. N-Nitrosodi-N-Propylamine (621-64-7)				<0.011							mg/L				
43B. N-Nitro-sodiphenylamine (86-30-6)				<0.011							mg/L				
44B. Phenanthrene (85-01-8)				<0.011							mg/L				
45B. Pyrene (129-00-0)				<0.011							mg/L				
46B. 1,2,4-Trichloro-benzene (120-82-1)				<0.011							mg/L				

V. INTAKE AND EFFLUENT CHARACTERISTICS (Continued from Section V. INTAKE AND EFFLUENT CHARACTERISTICS)

PART A.

PLEASE PRINT OR TYPE IN THE UNSHADED AREAS ONLY OF TABLE A.
See instructions before proceeding.
Complete one set of tables for each outfall. Place the outfall number in the space provided on each table.
You must provide the results of at least one analysis for every pollutant in this table.

TABLE A Page 1 of 1 — **OUTFALL NO.** 025

1. POLLUTANT	2. EFFLUENT							3. UNITS (specify if blank)		4. INTAKE (optional)		
	a. Maximum Daily Value		b. Maximum 30-Day Avg. Value (if available)		c. Long-Term Avg. Value (if available)		d. No. of Analyses	a. Concentration	b. Mass	a. Long-Term Avg. Value		b. No of Analyses
	(1) Concentration	(2) Mass	(1) Concentration	(2) Mass	(1) Concentration	(2) Mass				(1) Concentration	(2) Mass	
1. Biochemical Oxygen Demand $(BOD)_5$	<3.0							mg/L				
2. Chemical Oxygen Demand (COD)	<50							mg/L				
3. Total Organic Carbon (TOC)	**3.3**							mg/L				
4. Total Suspended Solids (TSS)	**18**							mg/L				
5. Ammonia (as N)	**0.68**							mg/L				
6. Flow (MGD)	**8.34**		VALUE		VALUE			MGD		VALUE		
7. Temperature (winter)			VALUE		VALUE			°C		VALUE		
8. Temperature (summer)	**20.1**		VALUE		VALUE			°C		VALUE		
9. pH	MINIMUM **8.0**	MAXIMUM **8.0**	MINIMUM	MAXIMUM				STANDARD UNITS				

V. INTAKE AND EFFLUENT CHARACTERISTICS (Continued)

PART B.

PLEASE PRINT OR TYPE IN THE UNSHADED AREAS ONLY OF TABLE B.
See instructions before proceeding.
Complete one set of tables for each outfall. Place the outfall number in the space provided on each table.

In column "2. MARK X", place an "X" in either the **Believed Present** column (2.a) for each pollutant you know or have reason to believe is present; or place an "X" in the **Believed Absent** column (2.b) for each pollutant you believe to be absent.
If you mark the **Believed Present** column for any pollutant, you must provide the results of at least one analysis for that pollutant.
Complete one table for each outfall. See the instructions for additional details and requirements.

TABLE B Page 1 of 2 — **OUTFALL NO.** 025

1. POLLUTANT and CAS NO. (if available)	2. MARK "X"		3. EFFLUENT							4. UNITS		5. INTAKE (optional)		
	a. Believed Present	b. Believed Absent	a. Maximum Daily Value		b. Maximum 30-Day Avg. Value (if available)		c. Long-Term Avg. Value (if available)		d. No. of Analyses	a. Concentration	b. Mass	a. Long-Term Avg. Value		b. No of Analyses
			(1) Concentration	(2) Mass	(1) Concentration	(2) Mass	(1) Concentration	(2) Mass				(1) Concentration	(2) Mass	
1. Bromide (24959-67-9)			**1.5**							mg/L				
2. Chloride			**190**							mg/L				
3. Chlorine, Total Residual			**0.02**							mg/L				
4. Color			15							CU				
5. E.coli			**93.3**							MPN/100mL				
6. Fluoride (16984-48-8)			**1.1**							mg/L				
7. Hardness ($CaCO_3$)			**560**							mg/L				
8.Nitrate–Nitrite (as N)			**1.7**							mg/L				
9. Nitrogen, Total Organic (as N)			<1.0							mg/L				
10. Oil and Grease			<5.0							mg/L				
11. Phosphorous (as P), Total (7723-14-0)			0.12							mg/L				
12. Radioactivity														
(1) Alpha, Total			6.9 +/-2.22							pCi/L				
(2) Beta, Total			6.38 +/-1.58							pCi/L				

(3) Radium, Total			1.28 +/-0.572							pCi/L					

TABLE B Page 2 of 2	**OUTFALL NO.** 025														
1. POLLUTANT and CAS NO. (if available)	**2. MARK "X"**		**3. EFFLUENT**							**4. UNITS**		**5. INTAKE (optional)**			
	a. Believed Present	**b. Believed Absent**	**a. Maximum Daily Value**		**b. Maximum 30-Day Avg. Value (if available)**		**c. Long-Term Avg. Value (if available)**		**d. No. of Analyses**	**a. Concentration**	**b. Mass**	**a. Long-Term Avg. Value**		**b. No of Analyses**
			(1) Concentration	**(2) Mass**	**(1) Concentration**	**(2) Mass**	**(1) Concentration**	**(2) Mass**				**(1) Concentration**	**(2) Mass**	
(4) Radium, 226, Total			1.01 +/-0.319							pCi/L				
(5) Strontium-90, Total			0.014 +/-0.55							pCi/L				
(6) Uranium			0.0102							mg/L				
13. Sulfate (asSO_4) (14808-79-8)			230							mg/L				
14. Sulfide (as S)			<0.20							mg/L				
15. Sulfite (asSO4) (14286-46-3)			<2.0							mg/L				
16. Surfactants			<0.50							**mg/L**				
17.Aluminum,Total (7429-90)			**190**							ug/L				
18. Barium, Total (7440-39-3)			**99**							ug/L				
19. Boron, Total (7440-42-8)			**5.7**							mg/L				
20. Cobalt, Total (7440-48-4)			**3.2**							ug/L				
21. Iron, Total (7439-89-6)			**520**							ug/L				
22. Magnesium, Total (7439-96-4)			**73**							mg/L				
23. Molybdenum, Total (7439-98-7)			**8.3**							ug/L				
24. Manganese, Total (7439-96-6)			**720**							ug/L				
25. Tin, Total (7440-31-5)			**<0.0010**							mg/L				
26. Titanium, Total (7440-32-6)			<0.030							mg/L				

V. INTAKE AND EFFLUENT CHARACTERISTICS (Continued)

PART C.

PLEASE PRINT OR TYPE IN THE UNSHADED AREAS ONLY OF TABLE C.
See instructions before proceeding.
Complete one set of tables for each outfall. Place the outfall number in the space provided on each table.

If you are a primary industry and this outfall contains process wastewater, refer to the instructions (Table C-2) to determine which of the GC/MS fractions you must test for.
Mark "X" in the **Testing Required** column for all such GC/MS fractions that apply to your industry and for ALL toxic metals, cyanides, and total phenols.
If you are not required to mark this column (secondary industries, nonprocess wastewater outfalls, and non-required GC/MS fractions), mark "X" in the **Believed Present** column for each pollutant you know or have reason to believe is present.
Mark "X: in the **Believed Absent** column for each pollutant you believe to be absent.
If you mark either the **Testing Required** or **Believed Present** columns for any pollutant, you must provide the result of at least one analysis for that pollutant. Note that there are eight pages to this part; please review each carefully. Complete one table (all eight pages) for each outfall.
See the instructions for additional details and requirements

TABLE C Page 1 of 8 — **OUTFALL NO.** 025

1. POLLUTANT and CAS NO. (if available)	2. MARK "X"			3. EFFLUENT							4. UNITS		5. INTAKE (optional)		
	a. Testing Required	b. Believed Present	c. Believed Absent	a. Maximum Daily Value		b. Maximum 30-Day Avg. Value (if available)		c. Long-Term Avg. Value (if available)		d. No. of Analyses	a. Concentration	b. Mass	a. Long-Term Avg. Value		b. No of Analyses
				(1) Concentration	(2) Mass	(1) Concentration	(2) Mass	(1) Concentration	(2) Mass				(1) Concentration	(2) Mass	
METALS, CYANIDE AND TOTAL PHENOLS															
1M. Antimony, Total (7440-36-0)				<0.50							ug/L				
2M. Arsenic, Total (7440-38-2)				2.3							ug/L				
3M. Beryllium, Total (7440-41-7)				<1.0							ug/L				
4M. Cadmium, Total (7440-43-9)				**2.2**							ug/L				
5M. Chromium, Total (7440-43-9)				**3.7**							ug/L				
6M. Copper, Total (7550-50-8)				**32**							ug/L				
7M. Lead, Total (7439-92-1)				<0.50							ug/L				
8M. Mercury, Total (7439-97-6)				<0.500							ng/L				
9M. Nickel, Total (7440-02-0)				**21**							ug/L				

10M. Selenium, Total (7782-49-2)				**10**							ug/L				
11M. Silver, Total (7440-28-0)				<0.10							ug/L				

TABLE C Page 2 of 8 — **OUTFALL NO. 025**

1. POLLUTANT and CAS NO. (if available)	2. MARK "X"			3. EFFLUENT							4. UNITS		5. INTAKE (optional)		
	a. Testing Required	b. Believed Present	c. Believed Absent	a. Maximum Daily Value		b. Maximum 30-Day Avg. Value (if available)		c. Long-Term Avg. Value (if available)		d. No. of Analyses	a. Concentration	b. Mass	a. Long-Term Avg. Value		b. No of Analyses
				(1) Concentration	(2) Mass	(1) Concentration	(2) Mass	(1) Concentration	(2) Mass				(1) Concentration	(2) Mass	
METALS, CYANIDE AND TOTAL PHENOLS continued															
12M Thallium, Total (7440-28-0)				**9.6**							ug/L				
13M. Zinc, Total (7440-66-6)				**31**							ug/L				
14M. Cyanide, Total (57-12-5)				<0.010							mg/L				
15M. Phenols, Total				<0.010							mg/L				
DIOXIN															
2,3,7,8 Tetra-chlorodibenzo-P-Dioxin (1784-01-6)				DESCRIBE RESULTS:											
GC/MS FRACTION – VOLATILE COMPOUNDS															
1V. Acrolein (107-02-8)				<0.0022							mg/L				
2V. Acrylonitrile (107-13-1)				<0.0019							mg/L				
3V. Benzene (71-43-2)				<0.00015							mg/L				
4V. Bis (Chloromethyl) Ether (542-88-1)			X								mg/L				
5V. Bromoform (75-25-2)				<0.00025							mg/L				
6V. Carbon Tetrachloride (56-23-5)				**<0.00025**							mg/L				
7V. Chlorobenzene (108-90-7)				<0.00026							mg/L				
8V. Chlorodibromomethane (124-48-1)				<0.00024							mg/L				

TABLE C Page 3 of 8 | **OUTFALL NO.** 025

1. POLLUTANT and CAS NO. (if available)	2. MARK "X"			3. EFFLUENT							4. UNITS		5. INTAKE (optional)		
	a. Testing Required	b. Believed Present	c. Believed Absent	a. Maximum Daily Value		b. Maximum 30-Day Avg. Value (if available)		c. Long-Term Avg. Value (if available)		d. No. of Analyses	a. Concentration	b. Mass	a. Long-Term Avg. Value		b. No of Analyses
				(1) Concentration	(2) Mass	(1) Concentration	(2) Mass	(1) Concentration	(2) Mass				(1) Concentration	(2) Mass	
9V. Chloroethane (74-00-3)				<0.00022							mg/L				
10V. 2-Chloroethylvinyl Ether (110-75-8)				<0.00019							mg/L				
11V. Chloroform (67-66-3)				<0.00026							mg/L				
GC/MS FRACTION – VOLATILE COMPOUNDS continued															
12V. Dichloro-bromomethane (75-71-8)				<0.00021							mg/L				
13V. Dichloro-difluoromethane (75-71-8)			X								mg/L				
14V. 1,1-Dichloroethane (75-34-3)				<0.00023							mg/L				
15V. 1,2-Dichloroethane (107-06-2)				<0.00038							mg/L				
16V. 1,1-Dichlorethylene (75-35-4)				<0.00023							mg/L				
17V. 1,2-Dichloropropane (78-87-5)				<0.00019							mg/L				
18V. 1,3-Dichloropropylene (452-75-6)				**<0.00026**							mg/L				
19V. Ethylbenzene (100-41-4)				<0.00025							mg/L				
20V. Methyl Bromide (74-83-9)				**<0.00029**							mg/L				
21V. Methyl Chloride (74-87-3)				**<0.00024**							mg/L				
22V. Methylene Chloride (75-00-2)				<0.010							mg/L				
23V. 1,1,2,2-Tetrachloroethane (79-34-5)				<0.00032							mg/L				

24V. Tetra-chloroethylene (127-18-4)				**<0.00026**							mg/L				
25V. Toluene (108-88-3)				<0.00030							mg/L				
26V. 1,2-Trans-Dichloroethylene (156-60-5)				**<0.00022**							mg/L				
27V. 1,1,1-Trichloroethane (71-55-6)				<0.00023							mg/L				
TABLE C Page 4 of 8	**OUTFALL NO.** 025														
1. POLLUTANT and CAS NO. (if available)	**2. MARK "X"**			**3. EFFLUENT**							**4. UNITS**		**5. INTAKE (optional)**		
	a. Testing Required	**b. Believed Present**	**c. Believed Absent**	**a. Maximum Daily Value**		**b. Maximum 30-Day Avg. Value (if available)**		**c. Long-Term Avg. Value (if available)**		**d. No. of Analyses**	**a. Concentration**	**b. Mass**	**a. Long-Term Avg. Value**		**b. No of Analyses**
				(1) Concentration	**(2) Mass**	**(1) Concentration**	**(2) Mass**	**(1) Concentration**	**(2) Mass**				**(1) Concentration**	**(2) Mass**	
GC/MS FRACTION – VOLATILE COMPOUNDS continued															
28V. 1,1,2-Trichloroethane (79-00-5)				<0.00026							mg/L				
29V. Tri-chloroethylene (79-01-6)				**<0.00026**							mg/L				
30V. Trichloro-fluoromethane (75-69-4)				<0.00027							mg/L				
31V. Vinyl Chloride (75-01-4)				<0.00026							mg/L				
GC/MS FRACTION – ACID COMPOUNDS															
1A. 2-Chlorophenol (95-57-8)				<0.010							mg/L				
2A. 2,4-Dichlorophenol (120-83-2)				<0.010							mg/L				
3A. 2,4-Dimethylphenol (105-67-9)				<0.010							mg/L				
4A. 4,6-Dinitro-O-Cresol (534-52-1)				<0.026							mg/L				
5A. 2,4-Dinitrophenol (51-28-5)				<0.051							mg/L				
6A. 2-Nitrophenol (88-75-5)				<0.010							mg/L				
7A. 4-Nitrophenol (100-02-7)				<0.051							mg/L				

8A. P-Chloro-M-Cresol (59-50-7)				**<0.020**							mg/L					
9A. Pentachloro-phenol (87-88-5)				<0.051							mg/L					
10A. Phenol (108-05-2)				<0.010							mg/L					
11A. 2,4,6-Trichloro-phenol (88-06-2)				<0.010							mg/L					

TABLE C
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OUTFALL NO. 025

1. POLLUTANT and CAS NO. (if available)	2. MARK "X"			3. EFFLUENT							4. UNITS		5. INTAKE (optional)		
	a. Testing Required	b. Believed Present	c. Believed Absent	a. Maximum Daily Value		b. Maximum 30-Day Avg. Value (if available)		c. Long-Term Avg. Value (if available)		d. No. of Analyses	a. Concentration	b. Mass	a. Long-Term Avg. Value		b. No of Analyses
				(1) Concentration	(2) Mass	(1) Concentration	(2) Mass	(1) Concentration	(2) Mass				(1) Concentration	(2) Mass	
GC/MS FRACTION – BASE/NEUTRAL COMPOUNDS															
1B. Acenaphthene (83-32-9)				<0.010							mg/L				
2B. Acenaphtylene (208-96-8)				<0.010							mg/L				
3B. Anthracene (120-12-7)				<0.010							mg/L				
4B. Benzidine (92-87-5)				<0.051							mg/L				
5B . Benzo (a) Anthracene (56-55-3)				<0.010							mg/L				
6B. Benzo (a) Pyrene (50-32-8)				<0.010							mg/L				
7B. 3,4-Benzo-fluoranthene (205-99-2)				<0.010							mg/L				
8B. .Benzo (ghi) perylene (191-24-2)				<0.010							mg/L				
9B. .Benzo (k)-fluoranthene (207-08-9)				<0.010							mg/L				
10B. Bis (2-chloroethoxy) Methane (111-91-1)				<0.010							mg/L				
11B. Bis (2-chloroethel) Ether (111-44-4)				<0.010							mg/L				
12B. Bis (2-chloroisopropyl)-Ether (102-80-1)				**<0.010**							mg/L				
13B. Bis (2-ethyl-hexyl) Phthalate (117-81-7)				<0.010							mg/L				
14B. 4-Bromophenyl Phenyl Ether (101-55-3)				<0.010							mg/L				
15B. Butyl Benzyl Phthalate (85-68-7)				<0.010							mg/L				
16B. 2-Chloro-Naphthalene (7005-72-3)				<0.010							mg/L				

17B. 4-Chlorophenyl Phenyl Ether (7005-72-3)				<0.010							mg/L				

TABLE C Page 6 of 8 — **OUTFALL NO.** 025

1. POLLUTANT and CAS NO. (if available)	2. MARK "X"			3. EFFLUENT							4. UNITS		5. INTAKE (optional)		
	a. Testing Required	b. Believed Present	c. Believed Absent	a. Maximum Daily Value		b. Maximum 30-Day Avg. Value (if available)		c. Long-Term Avg. Value (if available)		d. No. of Analyses	a. Concentration	b. Mass	a. Long-Term Avg. Value		b. No of Analyses
				(1) Concentration	(2) Mass	(1) Concentration	(2) Mass	(1) Concentration	(2) Mass				(1) Concentration	(2) Mass	
GC/MS FRACTION – BASE/NEUTRAL COMPOUNDS continued															
18B. Chrysene (218-01-9)				<0.010							mg/L				
19B. Dibenzo (a,h) Anthracene (53-70-3)				<0.010							mg/L				
20B. 1,2-Dichloro-benzene (95-50-1)				<0.00030							mg/L				
21B. 1,3-Dichloro-Benzene (541-73-1)				<0.00024							mg/L				
22B. 1,4-Dichloro-benzene (106-46-7)				<0.00028							mg/L				
23B. 3,3-Dichloro-benzidene (91-94-1)				<0.051							mg/L				
24B. Diethyl Phthalate (84-66-2)				<0.010							mg/L				
25B. Dimethyl Phthalate (131-11-3)				<0.010							mg/L				
26B. Di-N-Butyl Phthalate (84-74-2)				<0.010							mg/L				
27B. 2,4-Dinitro-toluene (121-14-2)				<0.010							mg/L				
28B. 2,6-Dinitro-toluene (606-20-2)				<0.010							mg/L				
29B. Di-N-Octyl Phthalate (117-84-0)				<0.010							mg/L				
30B. 1,2-Diphenyl-hydrazine (as Azo-benzene) (122-66-7)			X								mg/L				
31B. Fluoranthene (208-44-0)				<0.010							mg/L				
32B. Fluorene (86-73-7)				<0.010							mg/L				
33B. Hexachloro-benzene (118-71-1)				<0.010							mg/L				
34B. Hexachloro-butadiene (87-68-3)				<0.010							mg/L				

35B. Hexachloro-cyclopentadiene (77-47-4)				<0.010							mg/L				

TABLE C Page 7 of 8	OUTFALL NO. 025														
1. POLLUTANT and CAS NO. (if available)	2. MARK "X"			3. EFFLUENT							4. UNITS		5. INTAKE (optional)		
	a. Testing Required	b. Believed Present	c. Believed Absent	a. Maximum Daily Value		b. Maximum 30-Day Avg. Value (if available)		c. Long-Term Avg. Value (if available)		d. No. of Analyses	a. Concentration	b. Mass	a. Long-Term Avg. Value		b. No of Analyses
				(1) Concentration	(2) Mass	(1) Concentration	(2) Mass	(1) Concentration	(2) Mass				(1) Concentration	(2) Mass	
GC/MS FRACTION – BASE/NEUTRAL COMPOUNDS continued															
36B. Hexachloro-ethane (67-72-1)				<0.010							mg/L				
37B. Indeno (1,2,3-cd) Pyrene (193-39-5)				<0.010							mg/L				
38B. Isophorone (78-59-1)				<0.010							mg/L				
39B. Napthalene (91-20-3)				<0.010							mg/L				
40B. Nitrobenzene (98-95-3)				<0.010							mg/L				
41B. N-Nitro-sodimethylamine (62-75-9)				<0.010							mg/L				
42B. N-Nitrosodi-N-Propylamine (621-64-7)				<0.010							mg/L				
43B. N-Nitro-sodiphenylamine (86-30-6)				<0.010							mg/L				
44B. Phenanthrene (85-01-8)				<0.010							mg/L				
45B. Pyrene (129-00-0)				<0.010							mg/L				
46B. 1,2,4-Trichloro-benzene (120-82-1)				<0.010							mg/L				

KPDES FORM C – INSTRUCTIONS

Listed below are explanations of select Form C questions. If further information is needed concerning any questions, please contact the Division of Water, at (502) 564-3410.

Section I: Outfall Location
Use the map you provided for Item II of Form 1 to determine the latitude and longitude of each of your outfalls and the name of the receiving water.

Section II: Flows, Sources of Pollution, and Treatment Technologies

A. The line drawing should show generally the route taken by water in your facility from intake to discharge. Show all operations contributing wastewater, including process and production areas, sanitary flows, cooling water, and storm water runoff. Group similar operations into a single unit and label to correspond to the more detailed listing in Item II.B. The water balance should show average flows. Show all significant losses of water to products, atmosphere, and discharge. Use actual measurements whenever available. Otherwise, use your best estimate.

B. List all sources of wastewater to each outfall. Operations may be described in general terms (for example, "dye-making reactor" or "distillation tower"). Estimate the flow contributed by each source if no data are available. For storm water, use any reasonable measure of duration, volume, or frequency. For each treatment unit, indicate its size, flow rate, and retention time; and describe the ultimate disposal of any solid or liquid wastes not discharged. Treatment units should be listed in order. Select the proper code from Table C-1 to fill in the treatment code for each treatment unit. Insert "XX" for the treatment code if no code corresponds to a treatment unit you have listed.

   If the permit application is for a privately-owned treatment works, you must also identify all of your contributors in an attached listing.

C. A discharge is intermittent unless it occurs without interruption during the operating hours of the facility, except for shutdowns for maintenance, process changes, or other similar activities. A discharge is seasonal if it occurs during certain parts of the year. Fill in every applicable column in this item for each source of intermittent or seasonal discharge. Base your answers on actual data whenever available, otherwise, provide your best estimate. Report the highest daily for flow rate and total volume in the "Maximum Daily" columns. Report the average of all daily values measured during days when discharge occurred within the last year in the "Long Term Average" columns.

Section III: Production

A. All effluent guidelines promulgated by EPA appear in the Federal Register and are published annually in 40 CFR Subchapter N. A guideline applies to you if you have any operations contributing process wastewater in any subcategory covered by a BPT, BCT, or BAT guideline. If you are unsure whether you are covered by a promulgated effluent guideline, check with the Department for Environmental Protection, Division of Water. You must check "yes" if an applicable effluent guideline has been promulgated, even if the guideline limitations are being contested in court. If you believe that promulgated effluent guideline has been remanded for reconsideration by a court and does not apply to your operation, you may check "no."

B. An effluent guideline is expressed in terms of production (or other measure of operation) if the limitation is expressed as mass of pollutant per operational parameter, for example, "pounds of BOD per cubic foot of logs from which bark is removed," or "pounds of TSS per megawatt hour of electrical energy consumed by smelting furnace." An example of a guideline not expressed in terms of a measure of operation is one that limits the concentration of pollutants.

C. This item must be completed only if you check "yes" to Item III.B. The production information requested here is necessary to apply effluent guidelines to your facility and you may not claim it as confidential. However, you do not have to indicate how the reported information was calculated.

Report quantities in the units of measurements used in the applicable effluent guidelines. The figures provided must be a measure of actual operation over a one month period, such as the production for the highest month during the last twelve months, or the monthly average production for the highest year of the last five years, or other reasonable measure of actual operation. But these figures may not be based on design capacity or on predictions of future increases in operation.

If you have two or more substantially identical outfalls, request permission from the Division of Water to sample and analyze only one outfall and submit the results of the analysis for other substantially identical outfalls. If your request is granted, identify on a separate sheet attached to the application form the outfall tested, and describe why the outfalls not tested are substantially identical to the tested outfall.

Section IV: Improvements

A. If you check "yes" to this question, complete all parts of the chart or attach a copy of any previous submission you have made to the Department for Environmental Protection containing the same information.

Section V: Intake and Effluent Characteristics

This item requires you to collect and report data on the pollutants discharged for each of your outfalls. Each part of this item addresses a different set of pollutants and must be completed in accordance with the specific instructions for that part. The following general instructions apply to the entire item.

GENERAL INSTRUCTIONS

In the "Mark X" columns of Parts B and C mark only one box per pollutant. Part D requires you to list any of a group of pollutants which you believe to be present, with a brief explanation of why you believe it to be present. See specific instruction on the form and below for Parts A through D.

Base your determination that a pollutant is present in or absent from your discharge on your knowledge of your raw materials, maintenance chemicals, intermediate and final products and byproducts, and any previous analyses known to you of your effluent or of any similar effluent. (For example, if you manufacture pesticides, you should expect those pesticides to be present in contaminated storm water runoff.) If you would expect a pollutant to be present solely as a result of its presence in your intake water, you must mark "Believed Present" but "X" in that "Intake" column.

REPORTING

All levels must be reported as concentration and as total mass. Use the following abbreviations in the columns headed "Units" (column 3, Part A, and column 4, Parts B and C).

CONCENTRATIONS		MASS	
ppm	parts per million	lbs.	Pounds
mg/l	milligrams per liter	ton	Tons (english tons)
ppb	parts per billion	mg	Milligrams
µg/l	micrograms per liter	g	Grams
		kg	Kilograms
		T	Tonnes (metric tons)
		MGD	Million Gallons Per Day

If you measure only one daily value, complete only the "Maximum Daily Values" columns and insert "1" into the "Number of Analyses" columns (columns 2-a and 2-d, Part A, and columns 3-a and 3-d, Parts B and C).

For composite samples, the daily value is the total mass or average concentration found in a composite sample taken over the operating hours of the facility during a 24-hour period. For grab samples, the daily value is the arithmetic or flow-weighted total mass or average concentration found in a series of at least four grab samples taken over the operating hours of the facility during a 24-hour period.

If you measure more than one daily value for a pollutant, determine the average of all values within the last year and report the concentration and mass under the "Long-Term Average Values" columns (column 2-c, Part A, and column 3-c, Parts B and C). Also report the total number of daily values under the "Number of Analyses" columns (column 2-d, Part A, and column 3-d, Parts B and C). Determine the average of all daily values taken during each calendar month, and report the highest average under the "Maximum 30-Day Values" columns (2-b, Part A, and column 3-b, Parts B and C).

SAMPLING

The collection of the samples for the reported analyses should be supervised by a person experienced in performing sampling of industrial wastewater. You may contact the Department for Environmental Protection or appropriate regional office for detailed guidance on sampling techniques and for answers to specific questions. Any specific requirements contained in the applicable analytical methods should be followed for sample containers, sample preservation, holding times, the collection of duplicate samples, etc. The time when you sample should be representative of your normal operation, to the extent feasible, with all processes which contribute wastewater in normal operation, and with your treatment system operating properly with no system upsets.

ANALYSIS

Use test methods promulgated in 40 CFR Part 136; however, if none have been promulgated for a particular pollutant, use any suitable methods for measuring the level of the pollutant in your discharge provided that you submit a description of the methods or a reference to a published method. Your description should include the sample holding times, preservation techniques, and the quality control measures used.

REPORTING OF INTAKE DATA

You are not required to report data under the "Intake" columns unless you wish to demonstrate your eligibility for a "net" effluent limitation for one or more pollutants, that is, effluent limitations adjusted by subtracting the average level of the pollutant(s) present in your intake water. 401 KAR 5:065, Section 3(7), allows net limitations only in certain circumstances. To demonstrate your eligibility, report the average of the results of analysis on your intake water in the "Intake" columns (if your water is treated before use, test the water after it is treated), and attach a separate sheet containing the following for each pollutant:

1. A statement that the intake and discharge are from the same water body (Otherwise, you are not eligible for net limitations);
2. A statement of the extent to which the level of the pollutant is reduced by treatment of your wastewater (Your limitations will be adjusted only to the extent that the pollutant is not removed);
3. When applicable (for example, when the pollutant represents a class of compounds), a demonstration of the extent to which the pollutants in the intake vary physically, chemically, or biologically from the pollutants contained in your discharge. (Your limitations will be adjusted only to the extent that the intake pollutants do not vary from the discharged pollutants.)

SPECIFIC INSTRUCTIONS

A. This part must be completed by all applicants for all outfalls, including outfalls containing only noncontact cooling water or storm runoff. However, at your request, the Division of Water may waive the requirements to test for one or more of these pollutants upon a determination that testing for the pollutant(s) is not appropriate for your effluents.

Use grab samples for pH and temperature. Use composite samples for all pollutants in this part. See discussion in General Instructions to Item V for definitions of the columns in Part A. The "Long-Term

Average Values" column (column 2-c) and "Maximum 30-Day Values" column (column 2-b) are not compulsory but should be filled out if data are available.

B. This part must be completed by all applicants for all outfalls including those containing only noncontact cooling water or storm runoff.

Use composite samples for all pollutants you analyze in this part, except use grab samples for residual chlorine, oil and grease, fecal coliform, and E.coli. The "Long-Term Average Values" column (column 3-b) are not compulsory but should be filled out if data are available.

C. Table C-2 lists the 34 "primary" industry categories in the left-hand column. For each outfall, if any of your processes which contribute wastewater falls into one of those categories, you must mark "X" in "Testing Required" column (column 2-a) and test for: (A) all of the toxic metals, cyanide, and total phenols; and (B) the organic toxic pollutants contained in the gas chromatography/mass spectrometry (GC/MS) fractions indicated in Table C-2 as applicable to your category, unless you qualify as a small business (see below). The organic toxic pollutants are listed by GC/MS fractions on pages V-4 through V-10 in Part V-C. For example, the Organic Chemical industry has an "X" in all four fractions; therefore, applicants in this category must test for all organic toxic pollutants in Part V-C. If you are applying for a permit for a privately owned treatment works, determine your testing contributors. The industry category you use for testing requirements is not used to categorize you for any other purpose.

For all other cases (secondary industries, non-process wastewater outfalls, and non-required GC/MS fractions), you must mark "X" in either the "Believed Present" column (column 2-b) or the "Believed Absent" column (column 2-c) for each pollutant, and test for those you believe present (those marked "X" in column 2-b). If you qualify as a small business (see below) you are exempt from testing for the organic toxic pollutants listed on page V-4 through V-10 in Part C. For pollutants in intake water, see discussion in General Instructions to this item. The "Long-Term Average Values" column (column 3-c) and "Maximum 30-Day Values" column (column 3-b) are not compulsory but should be filled out if data are available.

Use grab samples for total phenols and cyanide. Use composite samples for all other pollutants in this part.

Mark "Testing Required" for dioxin if you use or manufacture one of the following compounds:

A. 2,4,5-trichlorophenoxy acetic acid (2,4,5-T);
B. 2-(2,4,5-trichlorophenoxy) propanoic acid (Silvex, 2,4,5,-TP);
C. 2-(2,4,5-trichlorophenoxy) ethyl 2,2-dichloropropionate (Erbon);
D. 0, 0-dimethyl 0-(2,4,5-trichlorophenyl) phosphorothioate (Ronnel);
E. 2,4,5-trichlorophenol (TCP); or
F. Hexachlorophene (HCP)

If you mark "Testing Required" or "Believed Present" you must perform a screening analysis for dioxins, using gas chromotography with an electron capture detector. A TCDD standard for quantification is not required. Describe the results of this analysis in the space provided, for example, "no measurable baseline deflection at the retention time of TCDD" or "a measurable peak within the tolerances of the retention time of TCDD." You may be required to perform a quantitative analysis if you report a positive result.

The Engineering and Analysis Division of EPA has collected and analyzed samples from some facilities for the pollutants listed in Part C in the course of its BAT guidelines development program. If your effluents were sampled and analyzed as part of this program in the last three years, you may use this data to answer Part C. This may be done provided that no process change or change in raw materials, process or operating practices has occurred since the samples were taken which would make the analyses unrepresentative of your current discharge.

Small Business Exemption

If you qualify as a "small business," under 401 KAR 5:060, Section 2(8) you are exempt from the reporting requirements for the organic toxic pollutants listed on pages 9 through 18 in Part C. If your facility is a coal mine with a probable total annual production of less than 100,000 tons, you may submit past production data or estimated future production (such as a schedule of estimated total production under 30 CFR Section 795.14(c)) instead of conducting analyses for the organic toxic pollutants. If your facility is not a coal mine, and if your gross total annual sales for the most recent three years average less than $100,000 per year (in second quarter 1980 dollars), you may submit sales data for those years instead of conducting analyses for the organic toxic pollutants.

The production or sales data must be for the facility that is the source of the discharge. The data should not be limited to production or sales for the process or processes that contribute to the discharge, unless those are the only processes of your facility. For sales data, in situations involving intra-corporate transfers of goods and services, the transfer price per unit should approximate market prices for those goods and services as closely as possible. Sales figures for years after 1980 should be indexed to the second quarter of 1980 by using the gross national product prices deflator (second quarter of 1980 = 100). This index is available in "National Income and Product Accounts of the United States" (U.S. Department of Commerce, Bureau of Economic Analysis).

D. List any pollutants in Table C-3 that you believe to be present and explain why you believe them to be present. No analysis is required, but if you have analytical data, you must report it also.

NOTE: Under 40 CFR 117.12(a)(2), certain discharges of hazardous substances (listed in Table C-3 of these instructions) may be exempted from the requirements of Section 311 of the Clean Water Act (33 USC Section 1321), which establishes reporting requirements, civil penalties, and liability for cleanup costs for spills of oil and hazardous substances. A discharge of a particular substance may be exempted if the origin, source, and amount of the discharged substance are identified in the KPDES permit application or in the permit, if the permit contains a requirement for treatment of the discharge, and if the treatment is in place. To apply for an exclusion of the discharge of any hazardous substance from the requirement of Section 311, attach additional sheets of paper to your form, setting forth the following information:

A. the substance and the amount of each substance which may be discharged;
B. the origin and source of the discharge of the substance;
C. the treatment which is provided or to be provided for the discharge by:

1. an on-site treatment system separate from any treatment system treating your normal discharge;
2. a treatment system designed to treat your normal discharge and which is additionally capable of treating the amount of the substance identified under paragraph 1 above; or
3. any combination of the above.

See 40 CFR Section 117.12(a)(2) and (c), published on August 29, 1979, or contact the Division of Water for further information on exclusions from Section 311.

Section VI. Potential Discharges Not covered by Analysis

A. You may not claim this information as confidential. However, you do not have to distinguish between use of production of the pollutants or list the amounts. Under KPDES regulations, your permit will contain limits to control all pollutants you report in answer to this question, as well as pollutants reported in Item V and VI.B at levels exceeding the technology-based limits appropriate to your facility. Your permit will also require you to report to the Department for Environmental Protection if you begin or expect to begin to use or manufacture any toxic pollutant as an immediate or final product or byproduct which you did not report here. Your permit may be modified at that time if necessary to control that pollutant.

B. Consider only those variations which may result in the concentrations of pollutants in effluents which exceed twice the maximum values you reported in Item V. These variations may be part of your routing operations, or part of your regular cleaning cycles.

Under KPDES regulations, your permit will contain limits to control any pollutant that you report in this item at levels exceeding the technology-based limits appropriate to your facility. Your permit will also require you to report to the Department for Environmental Protection if you know or have reason to believe that any toxic pollutant two times the maximum values reported in Item V-C or in this item. Your permit may be modified at that time if necessary to control the pollutant.

Do not consider variations that are the result of bypasses or upsets. Increased levels of pollutants that are discharged as a result of bypasses or upsets are regulated separately under KPDES regulations.

C. Variation exemptions to be described here include:

Changes in raw or intermediate materials
Changes in process equipment or materials;
Changes in product lines;
Significant chemical reactions among pollutants in waste streams; and
Significant variation in removal efficiencies of pollution control equipment.

You may indicate other types of variations as well, except those that are the result of bypasses or upsets. You may be required to further investigate or document variations you report here.

Base your prediction on expected levels of these pollutants upon your knowledge of your processes, raw materials, past and projected product ranges, etc., or upon any testing of your effluent which indicates the range of variability that can be expected over the next five years.

EXAMPLE: Outfall 001 discharges water used to clean six 500-gallon tanks. These tanks are used for formulation of dispersions of synthetic resins in water (adhesives). Use of toxic pollutants which can be expected in the next 5 years is:

1. copper acetate inhibitor, 1/2 lb. per tank;
2. dibutyl phthalate, 50 lbs. per tank;
3. toluene, 5 lbs. per tank; and
4. antimony oxide, 1 lb. per tank.

Based on normal cleaning, an average of 1% and a maximum of 3% of the contents of each tank is collected and discharged once every two weeks in the 150 gallons of water used for cleaning. Treatment (pH adjustment, flocculation, filtration) removes 85% of metals and 50% of organic compounds.

Section IX: Certification

The permit application must be signed as follows:

- **Corporation:** by a principal executive officer of at least the level of vice president.
- **Partnership or sole proprietorship:** by a general partner or the proprietor respectively.
- **Municipality, state, federal, or other public agency:** by either a principal executive officer or ranking elected official.

TABLE C-1
CODES FOR TREATMENT UNITS
(For use with Form C, Item II, Part B)

PHYSICAL TREATMENT PROCESSES

1-A	Ammonia Stripping	1-M	Grit Removal
1-B	Dialysis	1-N	Microstraining
1-C	Diatomaceous Earth Filtration	1-O	Mixing
1-D	Distillation	1-P	Moving Bed Filters
1-E	Electrodialysis	1-Q	Multimedia Filtration
1-F	Evaporation	1-R	Rapid Sand Filtration
1-G	Flocculation	1-S	Reverse Osmosis (Hyperfiltration)
1-H	Flotation	1-T	Screening
1-I	Foam Fractionation	1-U	Sedimentation (Settling)
1-J	Freezing	1-V	Slow Sand Filtration
1-K	Gas-Phase Separation	1-W	Solvent Extraction
1-L	Grinding (Comminutors)	1-X	Sorption

CHEMICAL TREATMENT PROCESSES

2-A	Carbon Adsorption	2-G	Disinfection (Ozone)
2-B	Chemical Oxidation	2-H	Disinfection (Other)
2-C	Chemical Precipitation	2-I	Electrochemical Treatment
2-D	Coagulation	2-J	Ion Exchange
2-E	Dechlorination	2-K	Neutralization
2-F	Disinfection (Chlorine)	2-L	Reduction

BIOLOGICAL TREATMENT PROCESSES

3-A	Activated Sludge	3-E	Pre-Aeration
3-B	Aerated Lagoons	3-F	Spray Irrigation/Land Application
3-C	Anaerobic Treatment	3-G	Stabilization Ponds
3-D	Nitrification-Denitrification	3-H	Trickling Filtration

OTHER PROCESSES

4-A	Discharge to Surface Water	4-C	Reuse/Recycle of Treated Effluent
4-B	Ocean Discharge Through Outfall	4-D	Underground Injection

SLUDGE TREATMENT AND DISPOSAL PROCESSES

5-A	Aerobic Digestion	5-M	Heat Drying
5-B	Anaerobic Digestion	5-N	Heat Treatment
5-C	Belt Filtration	5-O	Incineration
5-D	Centrifugation	5-P	Land Application
5-E	Chemical Conditioning	5-Q	Landfill
5-F	Chlorine Treatment	5-R	Pressure Filtration
5-G	Composting	5-S	Pyrolysis
5-H	Drying Beds	5-T	Sludge Lagoons
5-I	Elutriation	5-U	Vacuum Filtration
5-J	Flotation Thickening	5-V	Vibration
5-K	Freezing	5-W	Wet Oxidation
5-L	Gravity Thickening		

TABLE C-2
TESTING REQUIREMENTS FOR ORGANIC TOXIC POLLUTANTS BY INDUSTRY CATEGORY*
(For use with Form C, Item V, Part C)

	GC/MS FRACTION[1]			
INDUSTRY CATEGORY	**Volatile**	**Acid**	**Base/Neutral**	**Pesticide**
Adhesives and sealants	x	x	x	-
Aluminum forming	x	x	x	-
Auto and other laundries	x	x	x	x
Battery manufacturing	x	-	x	-
Coal mining	-*	-*	-*	-*
Coil coating	x	x	x	-
Copper forming	x	x	x	-
Electric and electronic compounds	x	x	x	x
Electroplating	x	x	x	-
Explosives manufacturing	-	x	x	-
Foundries	x	x	x	-
Gum and wood chemicals	x	x	x	-
Inorganic chemicals manufacturing	x	x	x	-
Iron and steel manufacturing	x	x	x	-
Leather tanning and finishing	x	x	x	-*
Mechanical products manufacturing	x	x	x	-
Nonferrous metals manufacturing	x	x	x	x
Ore mining	x	x	x	x
Organic chemicals manufacturing	x	x	x	x
Paint and ink formulation	x	x	x	-*
Pesticides	x	x	x	x
Petroleum refining	x	-	-	-
Pharmaceutical preparation	x	x	x	-
hotographic equipment and supplies	x	x	x	-*
Plastic and synthetic materials manufacturing	x	x	x	x
Plastic processing	x	-	-	-
Porcelain enameling	-*	-*	-*	-*
Printing and publishing	x	x	x	x
Pulp and paperboard mills	x	x	x	x
Rubber Processing	x	x	x	-
Soap and detergent manufacturing	x	x	x	-
Steam electric power plants	x	x	x	-
Textile mills	x	x	x	x
Timber products processing	x	x	x	x

***See note at conclusion of 40 CFR Part 122, Appendix D (1983) for explanation of effect of suspensions on testing requirements for primary industry categories. See Note 1 at 46 FR 2045, Jan. 8, 1981; Note 2 at 46 FR22585, Apr. 20, 1981; and Note 3 at FR 35090, July 1, 1981.**

[1] **The pollutants in each fraction are listed in item V-C.**

x = Testing required.

- = Testing not required.

TOXIC POLLUTANTS AND HAZARDOUS SUBSTANCES REQUIRED TO BE IDENTIFIED BY APPLICANTS IF EXPECTED TO BE PRESENT

(For use with Form C, Item V, Part D)

TOXIC POLLUTANT

Asbestos

HAZARDOUS SUBSTANCES

1.	Acetaldehyde	35.	Ammonium thiocyanate	69.	Calcium chromate
2.	Acetic Acid	36.	Ammonium thiosulfate	70.	Calcium cyanide
3.	Acetic anhydride	37.	Amyl acetate	71.	Calcium dodecylbenzenesulfonate
4.	Acetone cyanohydrin	38.	Aniline	72.	Calcium hypochlorite
5.	Acetyl bromide	39.	Antimony pentachloride	73.	Captan
6.	Acetyl chloride	40.	Antimony potassium tartrate	74.	Carbaryl
7.	Acrolein	41.	Antimony tribromide	75.	Carbofuran
8.	Acrylonitrile	42.	Antimony trichloride	76.	Carbon disulfide
9.	Adipic acid	43.	Antimony trifluoride	77.	Carbon tetrachloride
10.	Aldrin	44.	Antimony trioxide	78.	Chlordane
11.	Allyl alcohol	45.	Arsenic disulfide	79.	Chlorine
12.	Allyl chloride	46.	Arsenic pentoxide	80.	Chlorobenzene
13.	Aluminum sulfate	47.	Arsenic trichloride	81.	Chloroform
14.	Ammonia	48.	Arsenic trioxide	82.	Chloropyrifos
15.	Ammonium acetate	49.	Arsenic trisulfide	83.	Chlorosulfonic acid
16.	Ammonium benzoate	50.	Barium cyanide	84.	Chromic acetate
17.	Ammonium bicarbonate	51.	Benzene	85.	Chromic acid
18.	Ammonium bichromate	52.	Benzoic acid	86.	Chromic sulfate
19.	Ammonium bifluoride	53.	Benzonitrile	87.	Chromous chloride
20.	Ammonium bisulfite	54.	Benzoyl chloride	88.	Cobaltous bromide
21.	Ammonium carbamate	55.	Benzyl chloride	89.	Cobaltous formate
22.	Ammonium carbonate	56.	Beryllium chloride	90.	Cobaltous sulfamate
23.	Ammonium chloride	57.	Beryllium fluoride	91.	Coumaphos
24.	Ammonium chromate	58.	Beryllium nitrate	92.	Cresol
25.	Ammonium citrate	59.	Butylacetate	93.	Crotonaldehyde
26.	Ammonium fluoroborate	60.	n-Butylphthalate	94.	Cupric acetate
27.	Ammonium fluoride	61.	Butylamine	95.	Cupric acetoarsenite
28.	Ammonium hydroxide	62.	Butyric acid	96.	Cupric chloride
29.	Ammonium oxalate	63.	Cadmium acetate	97.	Cupric nitrate
30.	Ammonium silicofluoride	64.	Cadmium bromide	98.	Cupric oxalate
31.	Ammonium sulfamate	65.	Cadmium chloride	99.	Cupric sulfate
32.	Ammonium sulfide	66.	Cadmium arsenate	100.	Cupric sulfate ammoniated
33.	Ammonium sulfite	67.	Calcium arsenite	101.	Cupric tartrate

34.	Ammonium tartrate	68.	Calcium carbide	102.	Cyanogen chloride

HAZARDOUS SUBSTANCES (continued)

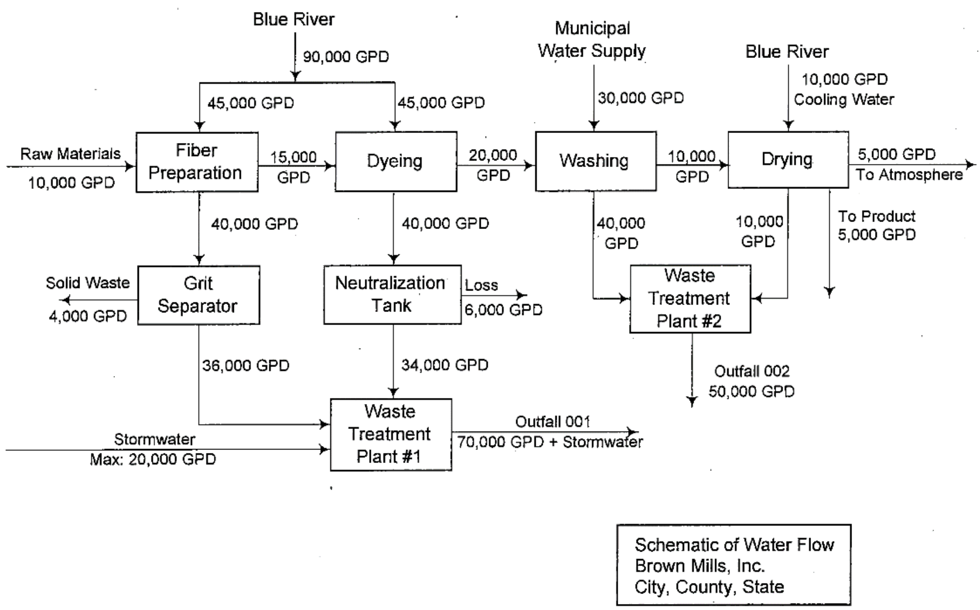
103.	Cyclohexane	134.	Ethylene dichloride	165.	Lead iodide
104.	2,4-D acid (2,4-Dichlorophenoxyacetic acid)	135.	Ethylene diaminetetracetic acid (EDTA)	166.	Lead nitrate
105.	2,4-D esters (2,4-Dichlorophenoxyacetic acid esters)	136.	Ferric ammonium citrate	167.	Lead stearate
106.	DDT	137.	Ferric ammonium oxalate	168.	Lead sulfate
107.	Diazinon	138.	Ferric chloride	169.	Lead sulfide
108.	Dicamba	139.	Ferric fluoride	170.	Lead thiocyanate
109.	Dichlobenil	140.	Ferric nitrate	171.	Lindane
110.	Dichlone	141.	Ferric sulfate	172.	Lithium chromate
111.	Dichlorobenzene	142.	Ferrous ammonium sulfate	173.	Malathion
112.	Dichloropropane	143.	Ferrous chloride	174.	Maleic acid
113.	Dichloropropene	144.	Ferrous sulfate	175.	Maleic anhydride
114.	Dichloropropene-dichloropropane mix	145.	Formaldehyde	176.	Mercaptodimethur
115.	2,2-Dichloropropionic acid	146.	Formic acid	177.	Mercuric cyanide
116.	Dichlorvos	147.	Fumaric acid	178.	Mercuric nitrate
117.	Dieldrin	148.	Furfural	179.	Mercuric sulfate
118.	Diethylamine	149.	Guthion	180.	Mercuric thiocyanate
119.	Dimethylamine	150.	Heptachlor	181.	Mercurous nitrate
120.	Dinitrobenzene	151.	Hexachlorocyclopentadiene	182.	Methoxychlor
121.	Dinitrophenol	152.	Hydrochloric acid	183.	Methyl mercaptan
122.	Dinitrotoluene	153.	Hydrofluoric acid	184.	Methyl methacrylate
123.	Diquat	154.	Hydrogen cyanide	185.	Methyl parathion
124.	Disulfoton	155.	Hydrogen sulfite	186.	Mevinphos
125.	Diuron	156.	Isoprene	187.	Mexacarbate
126.	Dodecylbenzesulfonic acid	157.	Isopropanolamine dodecylbenzenesulfonate	188.	Monoethylamine
127.	Endosulfan	158.	Kelthane	189.	Monomethylamine
128.	Endrin	159.	Kepone	190.	Naled
129.	Epichlorohydrin	160.	Lead acetate	191.	Naphthalene
130.	Ethion	161.	Lead arsenate	192.	Naphthenic acid
131.	Ethylbenzene	162.	Lead chloride	193.	Nickel ammonium sulfate
132.	Ethylenediamine	163.	Lead fluoborate	194.	Nickel chloride
133.	Ethylene dibromide	164.	Lead fluorite	195.	Nickel hydroxide

HAZARDOUS SUBSTANCES (continued)

196.	Nickel nitrate	221.	Propargite	246.	Sodium phosphate (tribasic)
197.	Nickel sulfate	222.	Propionic acid	247.	Sodium selenite
198.	Nitric acid	223.	Propionic anhydride	248.	Strontium choromate
199.	Nitrobenzene	224.	Propylene oxide	249.	Strychnine
200.	Nitrogen dioxide	225.	Pyrethrins	250.	Styrene
201.	Nitrophenol	226.	Quinoline	251.	Sulfuric acid
202.	Nitrotoluene	227.	Resorcinol	252.	Sulfur monochloride
203.	Paraformaldehyde	228.	Selenium oxide	253.	2,4,5-T acid (2,4,5-Trichlorophenoxy acetic acid)
204.	Parathion	229.	Silver nitrate	254.	2,4,5-T amines (2,4,5-Trichlorophenoxy acetic acid amines)
205.	Pentachlorophenol	230.	Sodium	255.	2,4,5-T esters (2,4,5-Trichlorophenoxy acetic acid esters)
206.	Phenol	231.	Sodium arsenate	256.	2,4,5-salts (2,4,5-Trichlorophenoxy acetic acid salts)
207.	Phosgene	232.	Sodium arsenite	257.	2,4,5-TP acid (2,4,5-Trichlorophenoxy propanoic acid)
208.	Phosphoric acid	233.	Sodium bichromate	258.	2,4,5-TP acid esters (2,4,5-Trichlorophenoxy propanoic acid esters)
209.	Phosphorus	234.	Sodium bifluoride	259.	TDE (Tetrachlorodiphenyl ethane)
210.	Phosphorus oxychloride	235.	Sodium bisulfite	260.	Tetraethyl lead
211.	Phosphorus pentasulfide	236.	Sodium chromate	261.	Tetraethyl pyrophosphate
212.	Phosphorus trichloride	237.	Sodium cyanide	262.	Thallium sulfate
213.	Polychlorinated biphenyls (PCB)	238.	Sodium dodecylbenzenesulfonate	263.	Toluene
214.	Potassium arsenate	239.	Sodium fluoride	264.	Toxaphene
215.	Potassium arsenite	240.	Sodium hydrosulfide	265.	Trichlorofon
216.	Potassium bichromate	241.	Sodium hydroxide	266.	Trichloroethylene
217.	Potassium chromate	242.	Sodium hypochlorite	267.	Trichlorophenol
218.	Potassium cyanide	243.	Sodium methylate	268.	Triethanolamine dodecylbenzenesulfonate
219.	Potassium hydroxide	244.	Sodium nitrate	269.	Triethylamine
220.	Potassium permanganate	245.	Sodium phosphate (dibasic)	270.	Trimethylamine
271.	Uranyl acetate	280.	Zinc ammonium chloride	289.	Zinc nitrate
272.	Uranyl nitrate	281.	Zinc borate	290.	Zinc phenolsulfonate
273.	Vanadium pentoxide	282.	Zinc bromide	291.	Zinc phosphate
274.	Vanadyl sulfate	283.	Zinc carbonate	292.	Zinc silicofluoride
275.	Vinyl acetate	284.	Zinc chloride	293.	Zinc sulfate
276.	Vinylidene chloride	285.	Zinc cyanide	294.	Zirconium nitrate
277.	Xylene	286.	Zinc fluoride	295.	Zirconium potassium fluoride
278.	Xylenol	287.	Zinc formate	296.	Zirconium sulfate
279.	Zinc acetate	288.	Zinc hydrosulfonate	297.	Zirconium tetrachloride

EXAMPLE

LINE DRAWING



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Microbac Laboratories, Inc., Louisville

CERTIFICATE OF ANALYSIS

L2I1199

Project Description

Form C - KPDES Renewal - Mill Creek

For:

Michael O'Guin

LG&E - KU ENERGY LLC.

820 West Broadway

Louisville, KY 40202

Customer Relationship Specialist

JOAN HEINSOHN

Tuesday, November 15, 2022

Please find enclosed the analytical results for the samples you submitted to Microbac Laboratories. Review and compilation of your report was completed by Microbac Laboratories, Inc., Louisville. If you have any questions, comments, or require further assistance regarding this report, please contact your service representative listed above.

I certify that all test results meet all of the requirements of the accrediting authority listed within this report. Analytical results are reported on a 'as received' basis unless specified otherwise. Analytical results for solids with units ending in (dry) are reported on a dry weight basis. A statement of uncertainty for each analysis is available upon request. This laboratory report shall not be reproduced, except in full, without the written approval of Microbac Laboratories. The reported results are related only to the samples analyzed as received.

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CERTIFICATE OF ANALYSIS

L2I1199

LG&E - KU ENERGY LLC.

Michael O'Guin
820 West Broadway
Louisville, KY 40202

Project Name: Form C - KPDES Renewal - Mill Creek
Project / PO Number: 1104203
Received: 09/30/2022
Reported: 11/15/2022

Sample Summary Report

Sample Name	Laboratory ID	Client Matrix	Sample Type	Sample Begin	Sample Taken	Lab Received
Outfall 001	L2I1199-01	Wastewater	Grab		10/21/22 10:18	09/30/22 11:03
HG LL Blank -Outfall 001	L2I1199-02	Wastewater	Grab		10/21/22 10:26	09/30/22 11:03
Outfall 002A	L2I1199-03	Wastewater	Grab		09/30/22 09:35	09/30/22 11:03
HG LL Blank -Outfall 002A	L2I1199-04	Wastewater	Grab		09/30/22 09:40	09/30/22 11:03
Outfall 023	L2I1199-05	Wastewater	Grab		10/21/22 10:38	09/30/22 11:03
LL HG Blank -Outfall 023	L2I1199-06	Wastewater	Grab		10/21/22 10:45	09/30/22 11:03
Outfall 025	L2I1199-07	Wastewater	Grab		09/30/22 09:55	09/30/22 11:03
LL HG Blank -Outfall 025	L2I1199-08	Wastewater	Grab		09/30/22 10:00	09/30/22 11:03
Outfall 009 (River Intake)	L2I1199-09	Wastewater	Grab		09/30/22 09:20	09/30/22 11:03
HG LL Blank -Outfall 009 (River Intake)	L2I1199-10	Wastewater	Grab		09/30/22 09:25	09/30/22 11:03
Outfall 002A Rads Only	L2I1199-11	Wastewater	Grab		10/21/22 09:56	09/30/22 11:03
Outfall 025 Rads Only	L2I1199-12	Wastewater	Grab		10/21/22 10:02	09/30/22 11:03
Outfall 009 Rads Only	L2I1199-13	Wastewater	Grab		10/21/22 09:47	09/30/22 11:03
HG LL Sample -Outfall 009 (River Intake)	L2I1199-14	Wastewater	Grab		10/21/22 09:45	09/30/22 11:03

Microbac Laboratories, Inc., Louisville

CERTIFICATE OF ANALYSIS

L2I1199

Analytical Testing Parameters

Client Sample ID:	Outfall 001		
Sample Matrix:	Wastewater	**Collected By:**	Wayne Mills
Lab Sample ID:	L2I1199-01	**Collection Date:**	10/21/2022 10:18

Analyses Performed by: Microbac Laboratories, Inc. - Chicagoland

Inorganics Total	Result	Limit(s)	MDL	RL	Units	Note	Prepared	Analyzed	Analyst
Method: EPA 420.4, Rv. 1 (1993)									
Phenolics, Total Recoverable	<0.010		0.0060	0.010	mg/L	B	10/28/22 1310	10/28/22 1512	ABG

Metals Total by CVAF	Result	Limit(s)	MDL	RL	Units	Note	Prepared	Analyzed	Analyst
Method: EPA 1631E									
Mercury	<5.00		2.31	5.00	ng/L		10/28/22 1520	10/31/22 1058	JNH

Metals Total by ICPMS	Result	Limit(s)	MDL	RL	Units	Note	Prepared	Analyzed	Analyst
Method: EPA 200.8, Rv. 5.4 (1994)									
Boron	<0.50		0.40	0.50	mg/L		10/27/22 0633	10/28/22 1212	JNH
Tin	<0.0010		0.0005	0.0010	mg/L		10/27/22 0633	10/27/22 1648	JNH
Titanium	<0.030		0.0037	0.030	mg/L		10/27/22 0633	10/27/22 1648	JNH

Volatile Organic Compounds by GCMS	Result	Limit(s)	MDL	RL	Units	Note	Prepared	Analyzed	Analyst
Method: EPA 624.1									
1,1,1-Trichloroethane	<0.00023		0.00023	0.0050	mg/L			10/27/22 1849	JLN
1,1,2,2-Tetrachloroethane	<0.00032		0.00032	0.0050	mg/L			10/27/22 1849	JLN
1,1,2-Trichloroethane	<0.00026		0.00026	0.0050	mg/L			10/27/22 1849	JLN
1,1-Dichloroethane	<0.00025		0.00025	0.0050	mg/L			10/27/22 1849	JLN
1,1-Dichloroethene	<0.00023		0.00023	0.0050	mg/L			10/27/22 1849	JLN
1,2-Dichlorobenzene	<0.00030		0.00030	0.010	mg/L			10/27/22 1849	JLN
1,2-Dichloroethane	<0.00038		0.00038	0.0050	mg/L			10/27/22 1849	JLN
1,2-Dichloropropane	<0.00019		0.00019	0.0050	mg/L			10/27/22 1849	JLN
1,3-Dichlorobenzene	<0.00024		0.00024	0.010	mg/L			10/27/22 1849	JLN
1,4-Dichlorobenzene	<0.00028		0.00028	0.010	mg/L			10/27/22 1849	JLN
2-Chloroethyl vinyl ether	<0.00019		0.00019	0.010	mg/L	Q11		10/27/22 1849	JLN
Benzene	<0.00015		0.00015	0.0050	mg/L			10/27/22 1849	JLN
Dichlorobromomethane	<0.00021		0.00021	0.0050	mg/L			10/27/22 1849	JLN
Bromoform	<0.00025		0.00025	0.0050	mg/L			10/27/22 1849	JLN
Bromomethane	<0.00029		0.00029	0.010	mg/L			10/27/22 1849	JLN
Carbon tetrachloride	<0.00025		0.00025	0.0050	mg/L			10/27/22 1849	JLN
Chlorobenzene	<0.00026		0.00026	0.0050	mg/L			10/27/22 1849	JLN
Chloroethane	<0.00022		0.00022	0.010	mg/L			10/27/22 1849	JLN
Chloroform	<0.00026		0.00026	0.0020	mg/L			10/27/22 1849	JLN
Chloromethane	<0.00024		0.00024	0.010	mg/L			10/27/22 1849	JLN
cis-1,3-Dichloropropene	<0.00026		0.00026	0.0050	mg/L			10/27/22 1849	JLN
Dibromochloromethane	<0.00024		0.00024	0.0050	mg/L			10/27/22 1849	JLN
Ethylbenzene	<0.00025		0.00025	0.0050	mg/L			10/27/22 1849	JLN
Methylene chloride	<0.010		0.010	0.010	mg/L			10/27/22 1849	JLN

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CERTIFICATE OF ANALYSIS

L2I1199

Client Sample ID:	Outfall 001		
Sample Matrix:	Wastewater	**Collected By:**	Wayne Mills
Lab Sample ID:	L2I1199-01	**Collection Date:**	10/21/2022 10:18

Volatile Organic Compounds by GCMS	Result	Limit(s)	MDL	RL	Units	Note	Prepared	Analyzed	Analyst
Tetrachloroethene	<0.00026		0.00026	0.0050	mg/L			10/27/22 1849	JLN
Toluene	<0.00030		0.00030	0.0050	mg/L			10/27/22 1849	JLN
trans-1,2-Dichloroethene	<0.00022		0.00022	0.0050	mg/L			10/27/22 1849	JLN
trans-1,3-Dichloropropene	<0.00026		0.00026	0.0050	mg/L			10/27/22 1849	JLN
Trichloroethene	<0.00026		0.00026	0.0050	mg/L			10/27/22 1849	JLN
Trichlorofluoromethane	<0.00027		0.00027	0.010	mg/L			10/27/22 1849	JLN
Vinyl chloride	<0.00026		0.00026	0.0020	mg/L			10/27/22 1849	JLN
Acrolein	<0.0022		0.0022	0.10	mg/L	**Q10**		10/27/22 1849	JLN
Acrylonitrile	<0.0019		0.0019	0.10	mg/L	**Q10**		10/27/22 1849	JLN
Surrogate: 1,2-Dichloroethane-D4	101		Limit: 74.5-132		% Rec			10/27/22 1849	JLN
Surrogate: 4-Bromofluorobenzene	91.7		Limit: 80-120		% Rec			10/27/22 1849	JLN
Surrogate: Dibromofluoromethane	100		Limit: 80-120		% Rec			10/27/22 1849	JLN
Surrogate: Toluene-D8	100		Limit: 80-120		% Rec			10/27/22 1849	JLN

Semivolatile Organic Compounds by GCMS	Result	Limit(s)	MDL	RL	Units	Note	Prepared	Analyzed	Analyst
Method: EPA 625.1									
1,2,4-Trichlorobenzene	<0.012		0.00074	0.012	mg/L	**Q3**	10/27/22 1202	10/29/22 0108	CLR
1,2,4-Trichlorobenzene	<0.012		0.00069	0.012	mg/L	**H2**	11/03/22 1353	11/04/22 0507	CLR
2,2´-oxybis(1-chloropropane)	<0.012		0.00085	0.012	mg/L		10/27/22 1202	10/29/22 0108	CLR
2,4,5-Trichlorophenol	<0.012		0.00095	0.012	mg/L	**Y**	10/27/22 1202	10/29/22 0108	CLR
2,4,6-Trichlorophenol	<0.012		0.00092	0.012	mg/L		10/27/22 1202	10/29/22 0108	CLR
2,4-Dichlorophenol	<0.012		0.00076	0.012	mg/L		10/27/22 1202	10/29/22 0108	CLR
2,4-Dimethylphenol	<0.012		0.00085	0.012	mg/L		10/27/22 1202	10/29/22 0108	CLR
2,4-Dinitrophenol	<0.062		0.00038	0.062	mg/L		10/27/22 1202	10/29/22 0108	CLR
2,4-Dinitrotoluene	<0.012		0.00055	0.012	mg/L	**H2**	11/03/22 1353	11/04/22 0507	CLR
2,4-Dinitrotoluene	<0.012		0.00059	0.012	mg/L	**Q3**	10/27/22 1202	10/29/22 0108	CLR
2,6-Dichlorophenol	<0.012		0.00089	0.012	mg/L		10/27/22 1202	10/29/22 0108	CLR
2,6-Dinitrotoluene	<0.012		0.00071	0.012	mg/L		10/27/22 1202	10/29/22 0108	CLR
2-Chloronaphthalene	<0.012		0.00089	0.012	mg/L		10/27/22 1202	10/29/22 0108	CLR
2-Chlorophenol	<0.012		0.00090	0.012	mg/L	**Q3**	10/27/22 1202	10/29/22 0108	CLR
2-Chlorophenol	<0.012		0.00085	0.012	mg/L	**H2**	11/03/22 1353	11/04/22 0507	CLR
2-Methylnaphthalene	<0.012		0.00086	0.012	mg/L	**Y**	10/27/22 1202	10/29/22 0108	CLR
2-Methylphenol	<0.012		0.00095	0.012	mg/L	**Y**	10/27/22 1202	10/29/22 0108	CLR
2-Nitroaniline	<0.012		0.00061	0.012	mg/L	**Y**	10/27/22 1202	10/29/22 0108	CLR
2-Nitrophenol	<0.012		0.0011	0.012	mg/L		10/27/22 1202	10/29/22 0108	CLR
3,3´-Dichlorobenzidine	<0.062		0.0016	0.062	mg/L		10/27/22 1202	10/29/22 0108	CLR
3/4-Methylphenol	<0.012		0.0010	0.012	mg/L	**Y**	10/27/22 1202	10/29/22 0108	CLR
3-Nitroaniline	<0.012		0.0010	0.012	mg/L	**Y**	10/27/22 1202	10/29/22 0108	CLR
4,6-Dinitro-2-methylphenol	<0.031		0.00042	0.031	mg/L		10/27/22 1202	10/29/22 0108	CLR
4-Bromophenyl phenyl ether	<0.012		0.00084	0.012	mg/L		10/27/22 1202	10/29/22 0108	CLR
4-Chloro-3-methylphenol	<0.025		0.00095	0.025	mg/L		10/27/22 1202	10/29/22 0108	CLR
4-Chloroaniline	<0.012		0.00086	0.012	mg/L	**Y**	10/27/22 1202	10/29/22 0108	CLR
4-Chlorophenyl phenyl ether	<0.012		0.00086	0.012	mg/L		10/27/22 1202	10/29/22 0108	CLR

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L2I1199

Client Sample ID:	Outfall 001		
Sample Matrix:	Wastewater	**Collected By:**	Wayne Mills
Lab Sample ID:	L2I1199-01	**Collection Date:**	10/21/2022 10:18

Semivolatile Organic Compounds by GCMS	Result	Limit(s)	MDL	RL	Units	Note	Prepared	Analyzed	Analyst
4-Nitroaniline	<0.012		0.0012	0.012	mg/L	Y	10/27/22 1202	10/29/22 0108	CLR
4-Nitrophenol	<0.062		0.0010	0.062	mg/L		10/27/22 1202	10/29/22 0108	CLR
Acenaphthene	<0.012		0.000015	0.012	mg/L	Q	10/27/22 1202	10/29/22 0108	CLR
Acenaphthylene	<0.012		0.0000038	0.012	mg/L		10/27/22 1202	10/29/22 0108	CLR
Acetophenone	<0.012		0.0010	0.012	mg/L	Y	10/27/22 1202	10/29/22 0108	CLR
Aniline	<0.012		0.0019	0.012	mg/L	Y	10/27/22 1202	10/29/22 0108	CLR
Anthracene	<0.012		0.0000088	0.012	mg/L		10/27/22 1202	10/29/22 0108	CLR
Benzidine	<0.062		0.025	0.062	mg/L		10/27/22 1202	10/29/22 0108	CLR
Benzo[a]anthracene	<0.012		0.0000050	0.012	mg/L		10/27/22 1202	10/29/22 0108	CLR
Benzo[a]pyrene	<0.012		0.0000075	0.012	mg/L		10/27/22 1202	10/29/22 0108	CLR
Benzo[b]fluoranthene	<0.012		0.0000071	0.012	mg/L	H2	11/03/22 1353	11/04/22 0507	CLR
Benzo[b]fluoranthene	<0.012		0.0000075	0.012	mg/L	Q3	10/27/22 1202	10/29/22 0108	CLR
Benzo[g,h,i]perylene	<0.012		0.0000062	0.012	mg/L		10/27/22 1202	10/29/22 0108	CLR
Benzo[k]fluoranthene	<0.012		0.0000088	0.012	mg/L		10/27/22 1202	10/29/22 0108	CLR
Benzoic acid	<0.062		0.00062	0.062	mg/L	Y	10/27/22 1202	10/29/22 0108	CLR
Benzyl alcohol	<0.012		0.00083	0.012	mg/L	Y	10/27/22 1202	10/29/22 0108	CLR
Bis(2-chloroethoxy)methane	<0.012		0.0011	0.012	mg/L		10/27/22 1202	10/29/22 0108	CLR
Bis(2-chloroethyl)ether	<0.012		0.00096	0.012	mg/L	Q	10/27/22 1202	10/29/22 0108	CLR
Bis(2-ethylhexyl)phthalate	<0.012		0.0015	0.012	mg/L		10/27/22 1202	10/29/22 0108	CLR
Butyl benzyl phthalate	<0.012		0.0011	0.012	mg/L		10/27/22 1202	10/29/22 0108	CLR
Carbazole	<0.012		0.00090	0.012	mg/L	Y	10/27/22 1202	10/29/22 0108	CLR
Chrysene	<0.012		0.0000075	0.012	mg/L		10/27/22 1202	10/29/22 0108	CLR
Dibenz[a,h]anthracene	<0.012		0.0000075	0.012	mg/L		10/27/22 1202	10/29/22 0108	CLR
Dibenzofuran	<0.012		0.00085	0.012	mg/L	Y	10/27/22 1202	10/29/22 0108	CLR
Diethyl phthalate	<0.012		0.0016	0.012	mg/L		10/27/22 1202	10/29/22 0108	CLR
Dimethyl phthalate	<0.012		0.00085	0.012	mg/L		10/27/22 1202	10/29/22 0108	CLR
Di-n-butyl phthalate	<0.012		0.0010	0.012	mg/L		10/27/22 1202	10/29/22 0108	CLR
Di-n-octyl phthalate	<0.012		0.00088	0.012	mg/L		10/27/22 1202	10/29/22 0108	CLR
Fluoranthene	<0.012		0.0000062	0.012	mg/L		10/27/22 1202	10/29/22 0108	CLR
Fluorene	<0.012		0.0000050	0.012	mg/L		10/27/22 1202	10/29/22 0108	CLR
Hexachlorobenzene	<0.012		0.0012	0.012	mg/L		10/27/22 1202	10/29/22 0108	CLR
Hexachlorobutadiene	<0.012		0.0012	0.012	mg/L		10/27/22 1202	10/29/22 0108	CLR
Hexachlorocyclopentadiene	<0.012		0.00050	0.012	mg/L		10/27/22 1202	10/29/22 0108	CLR
Hexachloroethane	<0.012		0.0012	0.012	mg/L		10/27/22 1202	10/29/22 0108	CLR
Indeno[1,2,3cd]pyrene	<0.012		0.0000050	0.012	mg/L		10/27/22 1202	10/29/22 0108	CLR
Isophorone	<0.012		0.0010	0.012	mg/L		10/27/22 1202	10/29/22 0108	CLR
Naphthalene	<0.012		0.0000075	0.012	mg/L		10/27/22 1202	10/29/22 0108	CLR
Nitrobenzene	<0.012		0.00099	0.012	mg/L		10/27/22 1202	10/29/22 0108	CLR
N-Nitrosodimethylamine	<0.012		0.0011	0.012	mg/L		10/27/22 1202	10/29/22 0108	CLR
N-Nitrosodi-n-propylamine	<0.012		0.0012	0.012	mg/L	H2	11/03/22 1353	11/04/22 0507	CLR
N-Nitrosodi-n-propylamine	<0.012		0.0012	0.012	mg/L	Q3	10/27/22 1202	10/29/22 0108	CLR
N-Nitrosodiphenylamine	<0.012		0.00090	0.012	mg/L		10/27/22 1202	10/29/22 0108	CLR
Pentachlorophenol	<0.062		0.00039	0.062	mg/L		10/27/22 1202	10/29/22 0108	CLR
Phenanthrene	<0.012		0.0000088	0.012	mg/L		10/27/22 1202	10/29/22 0108	CLR
Phenol	<0.012		0.00046	0.012	mg/L		10/27/22 1202	10/29/22 0108	CLR

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L2I1199

Client Sample ID:	Outfall 001		
Sample Matrix:	Wastewater	**Collected By:**	Wayne Mills
Lab Sample ID:	L2I1199-01	**Collection Date:**	10/21/2022 10:18

Semivolatile Organic Compounds by GCMS	Result	Limit(s)	MDL	RL	Units	Note	Prepared	Analyzed	Analyst
Pyrene	<0.012		0.0000059	0.012	mg/L	H2	11/03/22 1353	11/04/22 0507	CLR
Pyrene	<0.012		0.0000062	0.012	mg/L	Q3	10/27/22 1202	10/29/22 0108	CLR
Pyridine	<0.012		0.0016	0.012	mg/L	Y	10/27/22 1202	10/29/22 0108	CLR
Surrogate: 2,4,6-Tribromophenol	55.7			Limit: 47.8-138	% Rec		10/27/22 1202	10/29/22 0108	CLR
Surrogate: 2-Fluorobiphenyl	33.9			Limit: 10-110	% Rec		10/27/22 1202	10/29/22 0108	CLR
Surrogate: 2-Fluorophenol	21.0			Limit: 10-110	% Rec		10/27/22 1202	10/29/22 0108	CLR
Surrogate: Nitrobenzene-d5	29.3			Limit: 10-110	% Rec		10/27/22 1202	10/29/22 0108	CLR
Surrogate: Phenol-d5	18.7			Limit: 10-60.8	% Rec		10/27/22 1202	10/29/22 0108	CLR
Surrogate: Terphenyl-d14	50.1			Limit: 16.8-110	% Rec		10/27/22 1202	10/29/22 0108	CLR

Analyses Performed by: Microbac Laboratories, Inc., Louisville

Field Parameters	Result	Limit(s)	MDL	RL	Units	Note	Prepared	Analyzed	Analyst
Method: HACH 8167									
Chlorine, Total Residual	0.27		0.02	0.02	mg/L			10/21/22 1018	LWM
Method: NA									
Flow by Measurement & Calc.	134.8			0	MGD			10/21/22 1018	LWM
Method: SM 2550 B-2010									
Temperature	27.1		1.0	1.0	°C			10/21/22 1018	LWM
Method: SM 4500-H+ B-2011									
pH (at 25°C)	7.1		1.0	1.0	S.U.			10/21/22 1018	LWM

Microbiology	Result	Limit(s)	MDL	RL	Units	Note	Prepared	Analyzed	Analyst
Method: SM 9223 B (Colilert-18)-1997									
E. coli	>2419.6		0.0	1.0	MPN/100mL		10/21/22 1615	10/22/22 1336	NWW

Inorganics Total	Result	Limit(s)	MDL	RL	Units	Note	Prepared	Analyzed	Analyst
Method: Calculation									
Total Organic Nitrogen	<1.0		0.53	1.0	mg/L		10/24/22 1229	10/25/22 1322	SSL
Method: EPA 1664B									
Oil & Grease	<5.3		3.0	5.3	mg/L			10/24/22 1048	RMT
Method: EPA 351.2, Rv. 2 (1993)									
Nitrogen, Total Kjeldahl	<1.0		0.53	1.0	mg/L		10/24/22 1012	10/25/22 1322	SSL
Method: EPA 365.1, Rv. 2 (1993)									
Phosphorus	<0.20		0.088	0.20	mg/L		10/24/22 1136	10/25/22 1619	SSL
Method: SM 2120 B-2011									

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L2I1199

Client Sample ID:	Outfall 001		
Sample Matrix:	Wastewater	**Collected By:**	Wayne Mills
Lab Sample ID:	L2I1199-01	**Collection Date:**	10/21/2022 10:18

Inorganics Total	Result	Limit(s)	MDL	RL	Units	Note	Prepared	Analyzed	Analyst
pH at Color	7			1	S.U.			10/21/22 1753	NWW
Color, Pt-Co	15		0	5	CU			10/21/22 1753	NWW
Method: SM 4500-CN¯ E-2011									
Cyanide	<0.010		0.0035	0.010	mg/L	**M1a**	10/25/22 1026	10/26/22 1426	SSL
Method: SM 4500-NH3 G-2011									
Nitrogen, Ammonia	<0.50		0.11	0.50	mg/L		10/24/22 1229	10/24/22 1814	SSL
Method: SM 4500-S2¯ D-2011									
Sulfide	<0.20		0.12	0.20	mg/L			10/26/22 1623	NWW
Method: SM 4500-SO3¯ B-2011									
Sulfite	<2.0		1.1	2.0	mg/L	**H1**		10/27/22 1613	NWW
Method: SM 5210 B-2011									
BOD, 5 Day	<3.0		3.0	3.0	mg/L		10/21/22 1649	10/26/22 1907	SZH
Method: SM 5220 D-2011									
COD	<50		24	50	mg/L	**M1a**	10/25/22 1121	10/25/22 1321	SZH
Method: SM 5310 C-2011									
Carbon, Total Organic	3.5		0.50	1.0	mg/L		10/25/22 1541	10/25/22 2001	SSL
Method: SM 5540 C-2011									
MBAS (as LAS MW 340)	<0.50		0.15	0.50	mg/L			10/21/22 1445	SSL
Method: USGS I-3765-85									
Solids, Total Suspended	15		5	5	mg/L		10/24/22 1504	10/25/22 0938	DKB

Metals Total by ICP	Result	Limit(s)	MDL	RL	Units	Note	Prepared	Analyzed	Analyst
Method: EPA 200.7, Rv. 4.4 (1994)									
Calcium	42		0.026	0.20	mg/L		10/24/22 1100	10/28/22 0047	SSL
Magnesium	14		0.054	0.20	mg/L		10/24/22 1100	10/28/22 0047	SSL
Method: SM 2340 B-2011									
Hardness, Total as CaCO3	160		0.22	0.82	mg/L		10/24/22 1100	10/28/22 0047	SSL

Metals Total by ICPMS	Result	Limit(s)	MDL	RL	Units	Note	Prepared	Analyzed	Analyst
Method: EPA 200.8, Rv. 5.4 (1994)									
Aluminum	91		30	75	ug/L		10/24/22 0936	10/26/22 1600	SSL
Antimony	<0.50		0.22	0.50	ug/L		10/24/22 0936	10/24/22 1653	SSL
Arsenic	0.86		0.27	0.50	ug/L		10/24/22 0936	10/24/22 1653	SSL
Beryllium	<1.0		0.53	1.0	ug/L		10/24/22 0936	10/24/22 1653	SSL
Cadmium	<0.50		0.28	0.50	ug/L		10/24/22 0936	10/24/22 1653	SSL

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L2I1199

Client Sample ID:	Outfall 001		
Sample Matrix:	Wastewater	**Collected By:**	Wayne Mills
Lab Sample ID:	L2I1199-01	**Collection Date:**	10/21/2022 10:18

Metals Total by ICPMS	Result	Limit(s)	MDL	RL	Units	Note	Prepared	Analyzed	Analyst
Chromium	0.60		0.22	0.50	ug/L		10/24/22 0936	10/24/22 1653	SSL
Copper	<5.0		1.1	5.0	ug/L		10/24/22 0936	10/24/22 1653	SSL
Iron	160		24	50	ug/L		10/24/22 0936	10/24/22 1653	SSL
Lead	<0.50		0.33	0.50	ug/L		10/24/22 0936	10/24/22 1653	SSL
Molybdenum	6.1		0.20	2.0	ug/L		10/24/22 0936	10/24/22 1653	SSL
Nickel	2.2		0.69	1.0	ug/L		10/24/22 0936	10/24/22 1653	SSL
Selenium	<0.50		0.45	0.50	ug/L		10/24/22 0936	10/24/22 1653	SSL
Silver	<0.10		0.012	0.10	ug/L		10/24/22 0936	10/24/22 1653	SSL
Thallium	<0.50		0.28	0.50	ug/L		10/24/22 0936	10/24/22 1653	SSL
Zinc	<10		6.2	10	ug/L		10/24/22 0936	10/24/22 1653	SSL
Barium	42		0.30	0.50	ug/L		10/24/22 0936	10/24/22 1653	SSL
Cobalt	<0.50		0.23	0.50	ug/L		10/24/22 0936	10/24/22 1653	SSL
Manganese	66		0.19	0.50	ug/L		10/24/22 0936	10/24/22 1653	SSL

Anions by IC	Result	Limit(s)	MDL	RL	Units	Note	Prepared	Analyzed	Analyst
Method: EPA 300.0, Rv. 2.1 (1993)									
Bromide	<0.50		0.017	0.50	mg/L		10/21/22 1701	10/21/22 2211	NWW
Chloride	38		0.018	0.50	mg/L	**B2**	10/21/22 1701	10/21/22 2211	NWW
Fluoride	<0.50		0.045	0.50	mg/L		10/21/22 1701	10/21/22 2211	NWW
Nitrogen, Nitrate + Nitrite	1.0		0.12	0.15	mg/L		10/21/22 1701	10/21/22 2211	NWW
Sulfate	73		0.026	0.50	mg/L	**B2**	10/21/22 1701	10/21/22 2211	NWW

Analyses Performed by: GEL Laboratories, LLC

Radiochemistry	Result	UNC	Limit(s)	MDA	Units	Note	Prepared	Analyzed	Analyst
Method: Calculation									
Radium-226+228 Sum	1.01	+/-0.553		1.01	pCi/L		11/01/22 0000	11/14/22 0000	NXL
Method: EPA 900.0/SW846 9310									
ALPHA	0.488	+/-1.42		3	pCi/L	**U**	11/01/22 0000	11/07/22 0000	KP1
BETA	3.52	+/-1.59		4	pCi/L		11/01/22 0000	11/07/22 0000	KP1
Method: EPA 903.1 Modified									
Radium-226	0.365	+/-0.253		1	pCi/L		11/01/22 0000	11/13/22 0000	LXP
Method: EPA 904.0/SW846 9320 Modified									
Radium-228	0.643	+/-0.491		1	pCi/L	**U**	11/01/22 0000	11/07/22 0000	JE1
Method: EPA 905.0 Modified/DOE RP501 Rev. 1 Modified									
Strontium-90	0.994	+/-1.04		2	pCi/L	**U**	11/01/22 0000	11/04/22 0000	KH1

Uranium	Result	Limit(s)	MDL	RL	Units	Note	Prepared	Analyzed	Analyst
Method: EPA 200.8									

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CERTIFICATE OF ANALYSIS

L2I1199

Client Sample ID:	Outfall 001		
Sample Matrix:	Wastewater	**Collected By:**	Wayne Mills
Lab Sample ID:	L2I1199-01	**Collection Date:**	10/21/2022 10:18

Uranium	Result	Limit(s)	MDL	RL	Units	Note	Prepared	Analyzed	Analyst
Uranium	0.000412		0.000067	0.0002	mg/L		11/01/22 0000	11/03/22 0000	PRB

Client Sample ID:	HG LL Blank -Outfall 001		
Sample Matrix:	Wastewater	**Collected By:**	Wayne Mills
Lab Sample ID:	L2I1199-02	**Collection Date:**	10/21/2022 10:26

Analyses Performed by: Microbac Laboratories, Inc. - Chicagoland

Metals Total by CVAF	Result	Limit(s)	MDL	RL	Units	Note	Prepared	Analyzed	Analyst
Method: EPA 1631E									
Mercury	<0.500		0.231	0.500	ng/L		10/28/22 1520	10/31/22 1100	JNH

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CERTIFICATE OF ANALYSIS

L2I1199

Client Sample ID:	Outfall 002A		
Sample Matrix:	Wastewater	**Collected By:**	Xavier Bullock
Lab Sample ID:	L2I1199-03	**Collection Date:**	09/30/2022 9:35

Analyses Performed by: Microbac Laboratories, Inc. - Chicagoland

Inorganics Total	**Result**	**Limit(s)**	**MDL**	**RL**	**Units**	**Note**	**Prepared**	**Analyzed**	**Analyst**
Method: EPA 420.4, Rv. 1 (1993)									
Phenolics, Total Recoverable	<0.010		0.0060	0.010	mg/L		10/13/22 1104	10/13/22 1719	ABG

Metals Total by CVAF	**Result**	**Limit(s)**	**MDL**	**RL**	**Units**	**Note**	**Prepared**	**Analyzed**	**Analyst**
Method: EPA 1631E									
Mercury	<5.00		2.31	5.00	ng/L		10/11/22 1002	10/12/22 1020	JNH

Metals Total by ICPMS	**Result**	**Limit(s)**	**MDL**	**RL**	**Units**	**Note**	**Prepared**	**Analyzed**	**Analyst**
Method: EPA 200.8, Rv. 5.4 (1994)									
Boron	8.8		2.0	2.5	mg/L	**Q8**	10/05/22 0607	10/07/22 1515	JNH
Tin	<0.0010		0.0005	0.0010	mg/L		10/05/22 0607	10/06/22 1647	JNH
Titanium	<0.030		0.0037	0.030	mg/L		10/05/22 0607	10/06/22 1647	JNH

Semivolatile Organic Compounds by GCMS	**Result**	**Limit(s)**	**MDL**	**RL**	**Units**	**Note**	**Prepared**	**Analyzed**	**Analyst**
Method: EPA 625.1									
1,2,4-Trichlorobenzene	<0.011		0.00066	0.011	mg/L	**Q**	10/06/22 0652	10/15/22 0005	CLR
2,2´-oxybis(1-chloropropane)	<0.011		0.00076	0.011	mg/L		10/06/22 0652	10/15/22 0005	CLR
2,4,5-Trichlorophenol	<0.011		0.00084	0.011	mg/L	**Y**	10/06/22 0652	10/15/22 0005	CLR
2,4,6-Trichlorophenol	<0.011		0.00082	0.011	mg/L		10/06/22 0652	10/15/22 0005	CLR
2,4-Dichlorophenol	<0.011		0.00068	0.011	mg/L		10/06/22 0652	10/15/22 0005	CLR
2,4-Dimethylphenol	<0.011		0.00076	0.011	mg/L		10/06/22 0652	10/15/22 0005	CLR
2,4-Dinitrophenol	<0.056		0.00033	0.056	mg/L		10/06/22 0652	10/15/22 0005	CLR
2,4-Dinitrotoluene	<0.011		0.00052	0.011	mg/L		10/06/22 0652	10/15/22 0005	CLR
2,6-Dichlorophenol	<0.011		0.00079	0.011	mg/L		10/06/22 0652	10/15/22 0005	CLR
2,6-Dinitrotoluene	<0.011		0.00063	0.011	mg/L		10/06/22 0652	10/15/22 0005	CLR
2-Chloronaphthalene	<0.011		0.00079	0.011	mg/L		10/06/22 0652	10/15/22 0005	CLR
2-Chlorophenol	<0.011		0.00077	0.011	mg/L	**H2**	10/20/22 1644	10/24/22 2112	CLR
2-Chlorophenol	<0.011		0.00080	0.011	mg/L	**Q3**	10/06/22 0652	10/15/22 0005	CLR
2-Methylnaphthalene	<0.011		0.00077	0.011	mg/L	**Y**	10/06/22 0652	10/15/22 0005	CLR
2-Methylphenol	<0.011		0.00084	0.011	mg/L	**Y**	10/06/22 0652	10/15/22 0005	CLR
2-Nitroaniline	<0.011		0.00054	0.011	mg/L	**Y**	10/06/22 0652	10/15/22 0005	CLR
2-Nitrophenol	<0.011		0.0010	0.011	mg/L		10/06/22 0652	10/15/22 0005	CLR
3,3´-Dichlorobenzidine	<0.056		0.0014	0.056	mg/L		10/06/22 0652	10/15/22 0005	CLR
3/4-Methylphenol	<0.011		0.00092	0.011	mg/L	**Y**	10/06/22 0652	10/15/22 0005	CLR
3-Nitroaniline	<0.011		0.00089	0.011	mg/L	**Y**	10/06/22 0652	10/15/22 0005	CLR
4,6-Dinitro-2-methylphenol	<0.028		0.00038	0.028	mg/L		10/06/22 0652	10/15/22 0005	CLR
4-Bromophenyl phenyl ether	<0.011		0.00074	0.011	mg/L		10/06/22 0652	10/15/22 0005	CLR
4-Chloro-3-methylphenol	<0.022		0.00084	0.022	mg/L		10/06/22 0652	10/15/22 0005	CLR
4-Chloroaniline	<0.011		0.00077	0.011	mg/L	**Y**	10/06/22 0652	10/15/22 0005	CLR
4-Chlorophenyl phenyl ether	<0.011		0.00077	0.011	mg/L		10/06/22 0652	10/15/22 0005	CLR
4-Nitroaniline	<0.011		0.0011	0.011	mg/L	**Y**	10/06/22 0652	10/15/22 0005	CLR

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L2I1199

Client Sample ID:	Outfall 002A		
Sample Matrix:	Wastewater	**Collected By:**	Xavier Bullock
Lab Sample ID:	L2I1199-03	**Collection Date:**	09/30/2022 9:35

Semivolatile Organic Compounds by GCMS	Result	Limit(s)	MDL	RL	Units	Note	Prepared	Analyzed	Analyst
4-Nitrophenol	<0.056		0.00092	0.056	mg/L		10/06/22 0652	10/15/22 0005	CLR
Acenaphthene	<0.011		0.000013	0.011	mg/L		10/06/22 0652	10/15/22 0005	CLR
Acenaphthylene	<0.011		0.0000033	0.011	mg/L		10/06/22 0652	10/15/22 0005	CLR
Acetophenone	<0.011		0.00089	0.011	mg/L	Y	10/06/22 0652	10/15/22 0005	CLR
Aniline	<0.011		0.0017	0.011	mg/L	Y	10/06/22 0652	10/15/22 0005	CLR
Anthracene	<0.011		0.0000078	0.011	mg/L		10/06/22 0652	10/15/22 0005	CLR
Benzidine	<0.056		0.022	0.056	mg/L		10/06/22 0652	10/15/22 0005	CLR
Benzo[a]anthracene	<0.011		0.0000044	0.011	mg/L		10/06/22 0652	10/15/22 0005	CLR
Benzo[a]pyrene	<0.011		0.0000067	0.011	mg/L		10/06/22 0652	10/15/22 0005	CLR
Benzo[b]fluoranthene	<0.011		0.0000067	0.011	mg/L		10/06/22 0652	10/15/22 0005	CLR
Benzo[g,h,i]perylene	<0.011		0.0000056	0.011	mg/L		10/06/22 0652	10/15/22 0005	CLR
Benzo[k]fluoranthene	<0.011		0.0000078	0.011	mg/L		10/06/22 0652	10/15/22 0005	CLR
Benzoic acid	<0.056		0.00056	0.056	mg/L	Y	10/06/22 0652	10/15/22 0005	CLR
Benzyl alcohol	<0.011		0.00073	0.011	mg/L	Y	10/06/22 0652	10/15/22 0005	CLR
Bis(2-chloroethoxy)methane	<0.011		0.00094	0.011	mg/L		10/06/22 0652	10/15/22 0005	CLR
Bis(2-chloroethyl)ether	<0.011		0.00086	0.011	mg/L	Q	10/06/22 0652	10/15/22 0005	CLR
Bis(2-ethylhexyl)phthalate	<0.011		0.0013	0.011	mg/L		10/06/22 0652	10/15/22 0005	CLR
Butyl benzyl phthalate	<0.011		0.0010	0.011	mg/L		10/06/22 0652	10/15/22 0005	CLR
Carbazole	<0.011		0.00080	0.011	mg/L	Y	10/06/22 0652	10/15/22 0005	CLR
Chrysene	<0.011		0.0000067	0.011	mg/L		10/06/22 0652	10/15/22 0005	CLR
Dibenz[a,h]anthracene	<0.011		0.0000067	0.011	mg/L		10/06/22 0652	10/15/22 0005	CLR
Dibenzofuran	<0.011		0.00076	0.011	mg/L	Y	10/06/22 0652	10/15/22 0005	CLR
Diethyl phthalate	<0.011		0.0014	0.011	mg/L		10/06/22 0652	10/15/22 0005	CLR
Dimethyl phthalate	<0.011		0.00076	0.011	mg/L		10/06/22 0652	10/15/22 0005	CLR
Di-n-butyl phthalate	<0.011		0.00091	0.011	mg/L		10/06/22 0652	10/15/22 0005	CLR
Di-n-octyl phthalate	<0.011		0.00078	0.011	mg/L		10/06/22 0652	10/15/22 0005	CLR
Fluoranthene	<0.011		0.0000056	0.011	mg/L		10/06/22 0652	10/15/22 0005	CLR
Fluorene	<0.011		0.0000044	0.011	mg/L		10/06/22 0652	10/15/22 0005	CLR
Hexachlorobenzene	<0.011		0.0011	0.011	mg/L		10/06/22 0652	10/15/22 0005	CLR
Hexachlorobutadiene	<0.011		0.0011	0.011	mg/L		10/06/22 0652	10/15/22 0005	CLR
Hexachlorocyclopentadiene	<0.011		0.00044	0.011	mg/L		10/06/22 0652	10/15/22 0005	CLR
Hexachloroethane	<0.011		0.0011	0.011	mg/L		10/06/22 0652	10/15/22 0005	CLR
Indeno[1,2,3cd]pyrene	<0.011		0.0000044	0.011	mg/L		10/06/22 0652	10/15/22 0005	CLR
Isophorone	<0.011		0.00089	0.011	mg/L		10/06/22 0652	10/15/22 0005	CLR
Naphthalene	<0.011		0.0000067	0.011	mg/L		10/06/22 0652	10/15/22 0005	CLR
Nitrobenzene	<0.011		0.00088	0.011	mg/L		10/06/22 0652	10/15/22 0005	CLR
N-Nitrosodimethylamine	<0.011		0.0010	0.011	mg/L		10/06/22 0652	10/15/22 0005	CLR
N-Nitrosodi-n-propylamine	<0.011		0.0011	0.011	mg/L		10/06/22 0652	10/15/22 0005	CLR
N-Nitrosodiphenylamine	<0.011		0.00080	0.011	mg/L		10/06/22 0652	10/15/22 0005	CLR
Pentachlorophenol	<0.056		0.00034	0.056	mg/L		10/06/22 0652	10/15/22 0005	CLR
Phenanthrene	<0.011		0.0000078	0.011	mg/L		10/06/22 0652	10/15/22 0005	CLR
Phenol	<0.011		0.00041	0.011	mg/L		10/06/22 0652	10/15/22 0005	CLR
Pyrene	<0.011		0.0000056	0.011	mg/L		10/06/22 0652	10/15/22 0005	CLR
Pyridine	<0.011		0.0014	0.011	mg/L	Y	10/06/22 0652	10/15/22 0005	CLR
Surrogate: 2,4,6-Tribromophenol	58.6		Limit: 47.8-138		% Rec		10/06/22 0652	10/15/22 0005	CLR

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CERTIFICATE OF ANALYSIS

L2I1199

Client Sample ID:	Outfall 002A		
Sample Matrix:	Wastewater	**Collected By:**	Xavier Bullock
Lab Sample ID:	L2I1199-03	**Collection Date:**	09/30/2022 9:35

Semivolatile Organic Compounds by GCMS	Result	Limit(s)	MDL	RL	Units	Note	Prepared	Analyzed	Analyst
Surrogate: 2-Fluorobiphenyl	40.8			Limit: 10-110	% Rec		10/06/22 0652	10/15/22 0005	CLR
Surrogate: 2-Fluorophenol	24.1			Limit: 10-110	% Rec		10/06/22 0652	10/15/22 0005	CLR
Surrogate: Nitrobenzene-d5	37.3			Limit: 10-110	% Rec		10/06/22 0652	10/15/22 0005	CLR
Surrogate: Phenol-d5	21.3			Limit: 10-60.8	% Rec		10/06/22 0652	10/15/22 0005	CLR
Surrogate: Terphenyl-d14	46.8			Limit: 16.8-110	% Rec		10/06/22 0652	10/15/22 0005	CLR

Volatile Organic Compounds by GCMS	Result	Limit(s)	MDL	RL	Units	Note	Prepared	Analyzed	Analyst
Method: EPA 624.1									
1,1,1-Trichloroethane	<0.00023		0.00023	0.0050	mg/L			10/12/22 1911	JBS
1,1,2,2-Tetrachloroethane	<0.00032		0.00032	0.0050	mg/L			10/12/22 1911	JBS
1,1,2-Trichloroethane	<0.00026		0.00026	0.0050	mg/L			10/12/22 1911	JBS
1,1-Dichloroethane	<0.00025		0.00025	0.0050	mg/L			10/12/22 1911	JBS
1,1-Dichloroethene	<0.00023		0.00023	0.0050	mg/L			10/12/22 1911	JBS
1,2-Dichlorobenzene	<0.00030		0.00030	0.010	mg/L			10/12/22 1911	JBS
1,2-Dichloroethane	<0.00038		0.00038	0.0050	mg/L			10/12/22 1911	JBS
1,2-Dichloropropane	<0.00019		0.00019	0.0050	mg/L			10/12/22 1911	JBS
1,3-Dichlorobenzene	<0.00024		0.00024	0.010	mg/L			10/12/22 1911	JBS
1,4-Dichlorobenzene	<0.00028		0.00028	0.010	mg/L			10/12/22 1911	JBS
2-Chloroethyl vinyl ether	<0.00019		0.00019	0.010	mg/L	**Q11**		10/12/22 1911	JBS
Benzene	<0.00015		0.00015	0.0050	mg/L			10/12/22 1911	JBS
Dichlorobromomethane	<0.00021		0.00021	0.0050	mg/L			10/12/22 1911	JBS
Bromoform	<0.00025		0.00025	0.0050	mg/L			10/12/22 1911	JBS
Bromomethane	<0.00029		0.00029	0.010	mg/L			10/12/22 1911	JBS
Carbon tetrachloride	<0.00025		0.00025	0.0050	mg/L			10/12/22 1911	JBS
Chlorobenzene	<0.00026		0.00026	0.0050	mg/L			10/12/22 1911	JBS
Chloroethane	<0.00022		0.00022	0.010	mg/L			10/12/22 1911	JBS
Chloroform	<0.00026		0.00026	0.0020	mg/L			10/12/22 1911	JBS
Chloromethane	<0.00024		0.00024	0.010	mg/L			10/12/22 1911	JBS
cis-1,3-Dichloropropene	<0.00026		0.00026	0.0050	mg/L			10/12/22 1911	JBS
Dibromochloromethane	<0.00024		0.00024	0.0050	mg/L			10/12/22 1911	JBS
Ethylbenzene	<0.00025		0.00025	0.0050	mg/L			10/12/22 1911	JBS
Methylene chloride	<0.010		0.010	0.010	mg/L			10/12/22 1911	JBS
Tetrachloroethene	<0.00026		0.00026	0.0050	mg/L			10/12/22 1911	JBS
Toluene	<0.00030		0.00030	0.0050	mg/L			10/12/22 1911	JBS
trans-1,2-Dichloroethene	<0.00022		0.00022	0.0050	mg/L			10/12/22 1911	JBS
trans-1,3-Dichloropropene	<0.00026		0.00026	0.0050	mg/L			10/12/22 1911	JBS
Trichloroethene	<0.00026		0.00026	0.0050	mg/L			10/12/22 1911	JBS
Trichlorofluoromethane	<0.00027		0.00027	0.010	mg/L			10/12/22 1911	JBS
Vinyl chloride	<0.00026		0.00026	0.0020	mg/L			10/12/22 1911	JBS
Acrolein	<0.0022		0.0022	0.10	mg/L	**Q10**		10/12/22 1911	JBS
Acrylonitrile	<0.0019		0.0019	0.10	mg/L	**Q10, Q2**		10/12/22 1911	JBS
Surrogate: 1,2-Dichloroethane-D4	111			Limit: 74.5-132	% Rec			10/12/22 1911	JBS

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L2I1199

Client Sample ID:	Outfall 002A		
Sample Matrix:	Wastewater	**Collected By:**	Xavier Bullock
Lab Sample ID:	L2I1199-03	**Collection Date:**	09/30/2022 9:35

Volatile Organic Compounds by GCMS	**Result**	**Limit(s)**	**MDL**	**RL**	**Units**	**Note**	**Prepared**	**Analyzed**	**Analyst**
Surrogate: 4-Bromofluorobenzene	90.1			Limit: 80-120	% Rec			10/12/22 1911	JBS
Surrogate: Dibromofluoromethane	101			Limit: 80-120	% Rec			10/12/22 1911	JBS
Surrogate: Toluene-D8	99.5			Limit: 80-120	% Rec			10/12/22 1911	JBS

Analyses Performed by: Microbac Laboratories, Inc., Louisville

Field Parameters	**Result**	**Limit(s)**	**MDL**	**RL**	**Units**	**Note**	**Prepared**	**Analyzed**	**Analyst**
Method: HACH 8167									
Chlorine, Total Residual	0.08		0.02	0.02	mg/L			09/30/22 0935	XDB
Method: NA									
Flow by Measurement & Calc.	7.79			0	MGD			09/30/22 0935	XDB
Method: SM 2550 B-2010									
Temperature	18.0		1.0	1.0	°C			09/30/22 0935	XDB
Method: SM 4500-H+ B-2011									
pH (at 25°C)	7.5		1.0	1.0	S.U.			09/30/22 0935	XDB

Microbiology	**Result**	**Limit(s)**	**MDL**	**RL**	**Units**	**Note**	**Prepared**	**Analyzed**	**Analyst**
Method: SM 9223 B (Colilert-18)-1997									
E. coli	85.7		0.0	1.0	MPN/100mL		09/30/22 1652	10/01/22 1112	NWW

Inorganics Total	**Result**	**Limit(s)**	**MDL**	**RL**	**Units**	**Note**	**Prepared**	**Analyzed**	**Analyst**
Method: Calculation									
Total Organic Nitrogen	<1.0		0.53	1.0	mg/L		10/05/22 1205	10/06/22 1958	SSL
Method: EPA 1664B									
Oil & Grease	<5.3		3.0	5.3	mg/L			10/03/22 1651	RMT
Method: EPA 351.2, Rv. 2 (1993)									
Nitrogen, Total Kjeldahl	1.4		0.53	1.0	mg/L		10/05/22 1040	10/06/22 1526	SSL
Method: EPA 365.1, Rv. 2 (1993)									
Phosphorus	<0.10		0.044	0.10	mg/L		10/03/22 1346	10/04/22 1548	SSL
Method: SM 2120 B-2011									
pH at Color	8			1	S.U.		09/30/22 1539	09/30/22 1544	NWW
Color, Pt-Co	10		0	5	CU		09/30/22 1539	09/30/22 1544	NWW
Method: SM 4500-CN^- E-2011									
Cyanide	0.011		0.0035	0.010	mg/L		10/11/22 1059	10/11/22 1929	SSL

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CERTIFICATE OF ANALYSIS

L2I1199

Client Sample ID:	Outfall 002A		
Sample Matrix:	Wastewater	**Collected By:**	Xavier Bullock
Lab Sample ID:	L2I1199-03	**Collection Date:**	09/30/2022 9:35

Inorganics Total	Result	Limit(s)	MDL	RL	Units	Note	Prepared	Analyzed	Analyst
Method: SM 4500-NH3 G-2011									
Nitrogen, Ammonia	0.63		0.11	0.50	mg/L		10/05/22 1205	10/06/22 1958	SSL
Method: SM 4500-S2¯ D-2011									
Sulfide	<0.20		0.12	0.20	mg/L			10/05/22 1700	NWW
Method: SM 4500-SO3¯ B-2011									
Sulfite	<2.0		1.1	2.0	mg/L	**H1**		10/07/22 1500	NWW
Method: SM 5210 B-2011									
BOD, 5 Day	<3.0		3.0	3.0	mg/L		09/30/22 1331	10/05/22 1311	SZH
Method: SM 5220 D-2011									
COD	<50		24	50	mg/L		10/04/22 1349	10/04/22 1549	SZH
Method: SM 5310 C-2011									
Carbon, Total Organic	2.8		0.50	1.0	mg/L		10/13/22 1529	10/14/22 0211	SSL
Method: SM 5540 C-2011									
MBAS (as LAS MW 340)	<0.50		0.15	0.50	mg/L			09/30/22 1834	NWW
Method: USGS I-3765-85									
Solids, Total Suspended	14		5	5	mg/L		10/05/22 1346	10/05/22 1500	DKB

Metals Total by ICP	Result	Limit(s)	MDL	RL	Units	Note	Prepared	Analyzed	Analyst
Method: EPA 200.7, Rv. 4.4 (1994)									
Calcium	110		0.26	2.0	mg/L		10/12/22 1206	10/14/22 1333	SSL
Magnesium	87		0.054	0.20	mg/L		10/12/22 1206	10/12/22 2254	SSL
Method: SM 2340 B-2011									
Hardness, Total as CaCO3	640		0.65	5.0	mg/L		10/12/22 1206	10/14/22 1333	SSL

Metals Total by ICPMS	Result	Limit(s)	MDL	RL	Units	Note	Prepared	Analyzed	Analyst
Method: EPA 200.8, Rv. 5.4 (1994)									
Aluminum	84		20	50	ug/L		10/07/22 1359	10/14/22 1915	SSL
Antimony	<0.50		0.22	0.50	ug/L		10/07/22 1359	10/14/22 1915	SSL
Arsenic	3.1		0.27	0.50	ug/L		10/07/22 1359	10/14/22 1915	SSL
Beryllium	<1.0		0.53	1.0	ug/L		10/07/22 1359	10/14/22 1915	SSL
Cadmium	2.6		0.28	0.50	ug/L		10/07/22 1359	10/14/22 1915	SSL
Chromium	3.1		0.22	0.50	ug/L		10/07/22 1359	10/14/22 1915	SSL
Copper	10		1.1	5.0	ug/L		10/07/22 1359	10/14/22 1915	SSL
Iron	410		24	50	ug/L		10/07/22 1359	10/14/22 1915	SSL
Lead	<0.50		0.33	0.50	ug/L		10/07/22 1359	10/14/22 1915	SSL
Molybdenum	8.3		0.20	2.0	ug/L		10/07/22 1359	10/14/22 1915	SSL
Nickel	21		0.69	1.0	ug/L		10/07/22 1359	10/17/22 1559	SSL

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L2I1199

Client Sample ID:	Outfall 002A			
Sample Matrix:	Wastewater		**Collected By:**	Xavier Bullock
Lab Sample ID:	L2I1199-03		**Collection Date:**	09/30/2022 9:35

Metals Total by ICPMS	Result	Limit(s)	MDL	RL	Units	Note	Prepared	Analyzed	Analyst
Selenium	11		0.45	0.50	ug/L		10/07/22 1359	10/14/22 1915	SSL
Silver	<0.10		0.012	0.10	ug/L		10/07/22 1359	10/14/22 1915	SSL
Thallium	11		0.28	0.50	ug/L		10/07/22 1359	10/14/22 1915	SSL
Zinc	36		6.2	10	ug/L		10/07/22 1359	10/14/22 1915	SSL
Barium	91		0.30	0.50	ug/L		10/07/22 1359	10/14/22 1915	SSL
Cobalt	3.5		0.23	0.50	ug/L		10/07/22 1359	10/14/22 1915	SSL
Manganese	940		3.8	10	ug/L		10/07/22 1359	10/17/22 1547	SSL

Anions by IC	Result	Limit(s)	MDL	RL	Units	Note	Prepared	Analyzed	Analyst
Method: EPA 300.0, Rv. 2.1 (1993)									
Bromide	1.8		0.017	0.50	mg/L		10/05/22 1810	10/06/22 0353	NWW
Chloride	240		0.090	2.5	mg/L		10/05/22 1810	10/06/22 0946	NWW
Fluoride	1.4		0.045	0.50	mg/L		10/05/22 1810	10/06/22 0353	NWW
Nitrogen, Nitrate + Nitrite	1.6		0.16	0.75	mg/L		10/05/22 1805	10/06/22 0759	NWW
Sulfate	260		0.13	2.5	mg/L	**B2**	10/05/22 1810	10/06/22 0946	NWW

Client Sample ID:	HG LL Blank -Outfall 002A			
Sample Matrix:	Wastewater		**Collected By:**	Xavier Bullock
Lab Sample ID:	L2I1199-04		**Collection Date:**	09/30/2022 9:40

Analyses Performed by: Microbac Laboratories, Inc. - Chicagoland

Metals Total by CVAF	Result	Limit(s)	MDL	RL	Units	Note	Prepared	Analyzed	Analyst
Method: EPA 1631E									
Mercury	<0.500		0.231	0.500	ng/L		10/11/22 1002	10/12/22 1023	JNH

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L2I1199

Client Sample ID:	Outfall 023		
Sample Matrix:	Wastewater	**Collected By:**	Wayne Mills
Lab Sample ID:	L2I1199-05	**Collection Date:**	10/21/2022 10:38

Analyses Performed by: Microbac Laboratories, Inc. - Chicagoland

Inorganics Total	Result	Limit(s)	MDL	RL	Units	Note	Prepared	Analyzed	Analyst
Method: EPA 420.4, Rv. 1 (1993)									
Phenolics, Total Recoverable	<0.010		0.0060	0.010	mg/L	B	10/28/22 1310	10/28/22 1513	ABG

Metals Total by CVAF	Result	Limit(s)	MDL	RL	Units	Note	Prepared	Analyzed	Analyst
Method: EPA 1631E									
Mercury	<5.00		2.31	5.00	ng/L		10/28/22 1520	10/31/22 1102	JNH

Metals Total by ICPMS	Result	Limit(s)	MDL	RL	Units	Note	Prepared	Analyzed	Analyst
Method: EPA 200.8, Rv. 5.4 (1994)									
Boron	<0.50		0.40	0.50	mg/L		10/27/22 0633	10/28/22 1226	JNH
Tin	<0.0010		0.0005	0.0010	mg/L		10/27/22 0633	10/27/22 1702	JNH
Titanium	<0.030		0.0037	0.030	mg/L		10/27/22 0633	10/27/22 1702	JNH

Volatile Organic Compounds by GCMS	Result	Limit(s)	MDL	RL	Units	Note	Prepared	Analyzed	Analyst
Method: EPA 624.1									
1,1,1-Trichloroethane	<0.00023		0.00023	0.0050	mg/L			10/27/22 1911	JLN
1,1,2,2-Tetrachloroethane	<0.00032		0.00032	0.0050	mg/L			10/27/22 1911	JLN
1,1,2-Trichloroethane	<0.00026		0.00026	0.0050	mg/L			10/27/22 1911	JLN
1,1-Dichloroethane	<0.00025		0.00025	0.0050	mg/L			10/27/22 1911	JLN
1,1-Dichloroethene	<0.00023		0.00023	0.0050	mg/L			10/27/22 1911	JLN
1,2-Dichlorobenzene	<0.00030		0.00030	0.010	mg/L			10/27/22 1911	JLN
1,2-Dichloroethane	<0.00038		0.00038	0.0050	mg/L			10/27/22 1911	JLN
1,2-Dichloropropane	<0.00019		0.00019	0.0050	mg/L			10/27/22 1911	JLN
1,3-Dichlorobenzene	<0.00024		0.00024	0.010	mg/L			10/27/22 1911	JLN
1,4-Dichlorobenzene	<0.00028		0.00028	0.010	mg/L			10/27/22 1911	JLN
2-Chloroethyl vinyl ether	<0.00019		0.00019	0.010	mg/L	Q11		10/27/22 1911	JLN
Benzene	<0.00015		0.00015	0.0050	mg/L			10/27/22 1911	JLN
Dichlorobromomethane	<0.00021		0.00021	0.0050	mg/L			10/27/22 1911	JLN
Bromoform	<0.00025		0.00025	0.0050	mg/L			10/27/22 1911	JLN
Bromomethane	<0.00029		0.00029	0.010	mg/L			10/27/22 1911	JLN
Carbon tetrachloride	<0.00025		0.00025	0.0050	mg/L			10/27/22 1911	JLN
Chlorobenzene	<0.00026		0.00026	0.0050	mg/L			10/27/22 1911	JLN
Chloroethane	<0.00022		0.00022	0.010	mg/L			10/27/22 1911	JLN
Chloroform	<0.00026		0.00026	0.0020	mg/L			10/27/22 1911	JLN
Chloromethane	<0.00024		0.00024	0.010	mg/L			10/27/22 1911	JLN
cis-1,3-Dichloropropene	<0.00026		0.00026	0.0050	mg/L			10/27/22 1911	JLN
Dibromochloromethane	<0.00024		0.00024	0.0050	mg/L			10/27/22 1911	JLN
Ethylbenzene	<0.00025		0.00025	0.0050	mg/L			10/27/22 1911	JLN
Methylene chloride	<0.010		0.010	0.010	mg/L			10/27/22 1911	JLN
Tetrachloroethene	<0.00026		0.00026	0.0050	mg/L			10/27/22 1911	JLN
Toluene	<0.00030		0.00030	0.0050	mg/L			10/27/22 1911	JLN

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L2I1199

Client Sample ID:	Outfall 023		
Sample Matrix:	Wastewater	**Collected By:**	Wayne Mills
Lab Sample ID:	L2I1199-05	**Collection Date:**	10/21/2022 10:38

Volatile Organic Compounds by GCMS	Result	Limit(s)	MDL	RL	Units	Note	Prepared	Analyzed	Analyst
trans-1,2-Dichloroethene	<0.00022		0.00022	0.0050	mg/L			10/27/22 1911	JLN
trans-1,3-Dichloropropene	<0.00026		0.00026	0.0050	mg/L			10/27/22 1911	JLN
Trichloroethene	<0.00026		0.00026	0.0050	mg/L			10/27/22 1911	JLN
Trichlorofluoromethane	<0.00027		0.00027	0.010	mg/L			10/27/22 1911	JLN
Vinyl chloride	<0.00026		0.00026	0.0020	mg/L			10/27/22 1911	JLN
Acrolein	<0.0022		0.0022	0.10	mg/L	**Q10**		10/27/22 1911	JLN
Acrylonitrile	<0.0019		0.0019	0.10	mg/L	**Q10**		10/27/22 1911	JLN
Surrogate: 1,2-Dichloroethane-D4	99.8		Limit: 74.5-132		% Rec			10/27/22 1911	JLN
Surrogate: 4-Bromofluorobenzene	92.6		Limit: 80-120		% Rec			10/27/22 1911	JLN
Surrogate: Dibromofluoromethane	100		Limit: 80-120		% Rec			10/27/22 1911	JLN
Surrogate: Toluene-D8	102		Limit: 80-120		% Rec			10/27/22 1911	JLN

Semivolatile Organic Compounds by GCMS	Result	Limit(s)	MDL	RL	Units	Note	Prepared	Analyzed	Analyst
Method: EPA 625.1									
1,2,4-Trichlorobenzene	<0.011		0.00063	0.011	mg/L	**A7, Q3**	10/27/22 1202	10/29/22 0132	CLR
2,2´-oxybis(1-chloropropane)	<0.011		0.00073	0.011	mg/L		10/27/22 1202	10/29/22 0132	CLR
2,4,5-Trichlorophenol	<0.011		0.00082	0.011	mg/L	**Y**	10/27/22 1202	10/29/22 0132	CLR
2,4,6-Trichlorophenol	<0.011		0.00080	0.011	mg/L		10/27/22 1202	10/29/22 0132	CLR
2,4-Dichlorophenol	<0.011		0.00066	0.011	mg/L		10/27/22 1202	10/29/22 0132	CLR
2,4-Dimethylphenol	<0.011		0.00073	0.011	mg/L		10/27/22 1202	10/29/22 0132	CLR
2,4-Dinitrophenol	<0.054		0.00032	0.054	mg/L		10/27/22 1202	10/29/22 0132	CLR
2,4-Dinitrotoluene	<0.011		0.00051	0.011	mg/L	**A7, Q3**	10/27/22 1202	10/29/22 0132	CLR
2,6-Dichlorophenol	<0.011		0.00076	0.011	mg/L		10/27/22 1202	10/29/22 0132	CLR
2,6-Dinitrotoluene	<0.011		0.00061	0.011	mg/L		10/27/22 1202	10/29/22 0132	CLR
2-Chloronaphthalene	<0.011		0.00076	0.011	mg/L		10/27/22 1202	10/29/22 0132	CLR
2-Chlorophenol	<0.011		0.00077	0.011	mg/L	**A7, Q3**	10/27/22 1202	10/29/22 0132	CLR
2-Methylnaphthalene	<0.011		0.00074	0.011	mg/L	**Y**	10/27/22 1202	10/29/22 0132	CLR
2-Methylphenol	<0.011		0.00082	0.011	mg/L	**Y**	10/27/22 1202	10/29/22 0132	CLR
2-Nitroaniline	<0.011		0.00053	0.011	mg/L	**Y**	10/27/22 1202	10/29/22 0132	CLR
2-Nitrophenol	<0.011		0.00098	0.011	mg/L		10/27/22 1202	10/29/22 0132	CLR
3,3´-Dichlorobenzidine	<0.054		0.0014	0.054	mg/L		10/27/22 1202	10/29/22 0132	CLR
3/4-Methylphenol	<0.011		0.00089	0.011	mg/L	**Y**	10/27/22 1202	10/29/22 0132	CLR
3-Nitroaniline	<0.011		0.00086	0.011	mg/L	**Y**	10/27/22 1202	10/29/22 0132	CLR
4,6-Dinitro-2-methylphenol	<0.027		0.00037	0.027	mg/L		10/27/22 1202	10/29/22 0132	CLR
4-Bromophenyl phenyl ether	<0.011		0.00072	0.011	mg/L		10/27/22 1202	10/29/22 0132	CLR
4-Chloro-3-methylphenol	<0.022		0.00082	0.022	mg/L		10/27/22 1202	10/29/22 0132	CLR
4-Chloroaniline	<0.011		0.00074	0.011	mg/L	**Y**	10/27/22 1202	10/29/22 0132	CLR
4-Chlorophenyl phenyl ether	<0.011		0.00074	0.011	mg/L		10/27/22 1202	10/29/22 0132	CLR
4-Nitroaniline	<0.011		0.0011	0.011	mg/L	**Y**	10/27/22 1202	10/29/22 0132	CLR
4-Nitrophenol	<0.054		0.00089	0.054	mg/L		10/27/22 1202	10/29/22 0132	CLR
Acenaphthene	<0.011		0.000013	0.011	mg/L	**Q**	10/27/22 1202	10/29/22 0132	CLR
Acenaphthylene	<0.011		0.0000032	0.011	mg/L		10/27/22 1202	10/29/22 0132	CLR
Acetophenone	<0.011		0.00086	0.011	mg/L	**Y**	10/27/22 1202	10/29/22 0132	CLR

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L2I1199

Client Sample ID:	Outfall 023		
Sample Matrix:	Wastewater	**Collected By:**	Wayne Mills
Lab Sample ID:	L2I1199-05	**Collection Date:**	10/21/2022 10:38

Semivolatile Organic Compounds by GCMS	Result	Limit(s)	MDL	RL	Units	Note	Prepared	Analyzed	Analyst
Aniline	<0.011		0.0016	0.011	mg/L	Y	10/27/22 1202	10/29/22 0132	CLR
Anthracene	<0.011		0.0000075	0.011	mg/L		10/27/22 1202	10/29/22 0132	CLR
Benzidine	<0.054		0.022	0.054	mg/L		10/27/22 1202	10/29/22 0132	CLR
Benzo[a]anthracene	<0.011		0.0000043	0.011	mg/L		10/27/22 1202	10/29/22 0132	CLR
Benzo[a]pyrene	<0.011		0.0000065	0.011	mg/L		10/27/22 1202	10/29/22 0132	CLR
Benzo[b]fluoranthene	<0.011		0.0000065	0.011	mg/L	A7, Q3	10/27/22 1202	10/29/22 0132	CLR
Benzo[g,h,i]perylene	<0.011		0.0000054	0.011	mg/L		10/27/22 1202	10/29/22 0132	CLR
Benzo[k]fluoranthene	<0.011		0.0000075	0.011	mg/L		10/27/22 1202	10/29/22 0132	CLR
Benzoic acid	<0.054		0.00054	0.054	mg/L	Y	10/27/22 1202	10/29/22 0132	CLR
Benzyl alcohol	<0.011		0.00071	0.011	mg/L	Y	10/27/22 1202	10/29/22 0132	CLR
Bis(2-chloroethoxy)methane	<0.011		0.00091	0.011	mg/L		10/27/22 1202	10/29/22 0132	CLR
Bis(2-chloroethyl)ether	<0.011		0.00083	0.011	mg/L	Q	10/27/22 1202	10/29/22 0132	CLR
Bis(2-ethylhexyl)phthalate	<0.011		0.0013	0.011	mg/L		10/27/22 1202	10/29/22 0132	CLR
Butyl benzyl phthalate	<0.011		0.00098	0.011	mg/L		10/27/22 1202	10/29/22 0132	CLR
Carbazole	<0.011		0.00077	0.011	mg/L	Y	10/27/22 1202	10/29/22 0132	CLR
Chrysene	<0.011		0.0000065	0.011	mg/L		10/27/22 1202	10/29/22 0132	CLR
Dibenz[a,h]anthracene	<0.011		0.0000065	0.011	mg/L		10/27/22 1202	10/29/22 0132	CLR
Dibenzofuran	<0.011		0.00073	0.011	mg/L	Y	10/27/22 1202	10/29/22 0132	CLR
Diethyl phthalate	<0.011		0.0014	0.011	mg/L		10/27/22 1202	10/29/22 0132	CLR
Dimethyl phthalate	<0.011		0.00073	0.011	mg/L		10/27/22 1202	10/29/22 0132	CLR
Di-n-butyl phthalate	<0.011		0.00088	0.011	mg/L		10/27/22 1202	10/29/22 0132	CLR
Di-n-octyl phthalate	<0.011		0.00075	0.011	mg/L		10/27/22 1202	10/29/22 0132	CLR
Fluoranthene	<0.011		0.0000054	0.011	mg/L		10/27/22 1202	10/29/22 0132	CLR
Fluorene	<0.011		0.0000043	0.011	mg/L		10/27/22 1202	10/29/22 0132	CLR
Hexachlorobenzene	<0.011		0.0010	0.011	mg/L		10/27/22 1202	10/29/22 0132	CLR
Hexachlorobutadiene	<0.011		0.0010	0.011	mg/L		10/27/22 1202	10/29/22 0132	CLR
Hexachlorocyclopentadiene	<0.011		0.00043	0.011	mg/L		10/27/22 1202	10/29/22 0132	CLR
Hexachloroethane	<0.011		0.0011	0.011	mg/L		10/27/22 1202	10/29/22 0132	CLR
Indeno[1,2,3cd]pyrene	<0.011		0.0000043	0.011	mg/L		10/27/22 1202	10/29/22 0132	CLR
Isophorone	<0.011		0.00086	0.011	mg/L		10/27/22 1202	10/29/22 0132	CLR
Naphthalene	<0.011		0.0000065	0.011	mg/L		10/27/22 1202	10/29/22 0132	CLR
Nitrobenzene	<0.011		0.00085	0.011	mg/L		10/27/22 1202	10/29/22 0132	CLR
N-Nitrosodimethylamine	<0.011		0.00098	0.011	mg/L		10/27/22 1202	10/29/22 0132	CLR
N-Nitrosodi-n-propylamine	<0.011		0.0011	0.011	mg/L	A7, Q3	10/27/22 1202	10/29/22 0132	CLR
N-Nitrosodiphenylamine	<0.011		0.00077	0.011	mg/L		10/27/22 1202	10/29/22 0132	CLR
Pentachlorophenol	<0.054		0.00033	0.054	mg/L		10/27/22 1202	10/29/22 0132	CLR
Phenanthrene	<0.011		0.0000075	0.011	mg/L		10/27/22 1202	10/29/22 0132	CLR
Phenol	<0.011		0.00040	0.011	mg/L		10/27/22 1202	10/29/22 0132	CLR
Pyrene	<0.011		0.0000054	0.011	mg/L	A7, Q3	10/27/22 1202	10/29/22 0132	CLR
Pyridine	<0.011		0.0014	0.011	mg/L	Y	10/27/22 1202	10/29/22 0132	CLR
Surrogate: 2,4,6-Tribromophenol	60.4		Limit: 47.8-138		% Rec		10/27/22 1202	10/29/22 0132	CLR
Surrogate: 2-Fluorobiphenyl	44.6		Limit: 10-110		% Rec		10/27/22 1202	10/29/22 0132	CLR
Surrogate: 2-Fluorophenol	28.0		Limit: 10-110		% Rec		10/27/22 1202	10/29/22 0132	CLR
Surrogate: Nitrobenzene-d5	41.1		Limit: 10-110		% Rec		10/27/22 1202	10/29/22 0132	CLR

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L2I1199

Client Sample ID:	Outfall 023		
Sample Matrix:	Wastewater	**Collected By:**	Wayne Mills
Lab Sample ID:	L2I1199-05	**Collection Date:**	10/21/2022 10:38

Semivolatile Organic Compounds by GCMS	Result	Limit(s)	MDL	RL	Units	Note	Prepared	Analyzed	Analyst
Surrogate: Phenol-d5	23.8			Limit: 10-60.8	% Rec		10/27/22 1202	10/29/22 0132	CLR
Surrogate: Terphenyl-d14	53.1			Limit: 16.8-110	% Rec		10/27/22 1202	10/29/22 0132	CLR

Analyses Performed by: Microbac Laboratories, Inc., Louisville

Field Parameters	Result	Limit(s)	MDL	RL	Units	Note	Prepared	Analyzed	Analyst
Method: HACH 8167									
Chlorine, Total Residual	0.12		0.02	0.02	mg/L			10/21/22 1038	LWM
Method: NA									
Flow by Measurement & Calc.	1.824			0	MGD			10/21/22 1038	LWM
Method: SM 2550 B-2010									
Temperature	26.4		1.0	1.0	°C			10/21/22 1038	LWM
Method: SM 4500-H+ B-2011									
pH (at 25°C)	8.6		1.0	1.0	S.U.			10/21/22 1038	LWM

Microbiology	Result	Limit(s)	MDL	RL	Units	Note	Prepared	Analyzed	Analyst
Method: SM 9223 B (Colilert-18)-1997									
E. coli	146.7		0.0	1.0	MPN/100mL		10/21/22 1615	10/22/22 1336	NWW

Inorganics Total	Result	Limit(s)	MDL	RL	Units	Note	Prepared	Analyzed	Analyst
Method: Calculation									
Total Organic Nitrogen	1.2		0.53	1.0	mg/L		10/24/22 1229	10/25/22 1324	SSL
Method: EPA 1664B									
Oil & Grease	<5.4		3.1	5.4	mg/L			10/24/22 1048	RMT
Method: EPA 351.2, Rv. 2 (1993)									
Nitrogen, Total Kjeldahl	1.2		0.53	1.0	mg/L		10/24/22 1012	10/25/22 1324	SSL
Method: EPA 365.1, Rv. 2 (1993)									
Phosphorus	0.51		0.088	0.20	mg/L		10/24/22 1136	10/25/22 1621	SSL
Method: SM 2120 B-2011									
pH at Color	9			1	S.U.			10/21/22 1753	NWW
Color, Pt-Co	20		0	5	CU			10/21/22 1753	NWW
Method: SM 4500-CN⁻ E-2011									
Cyanide	<0.010		0.0035	0.010	mg/L		10/25/22 1026	10/26/22 1428	SSL
Method: SM 4500-NH3 G-2011									

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CERTIFICATE OF ANALYSIS

L2I1199

Client Sample ID:	Outfall 023		
Sample Matrix:	Wastewater	**Collected By:**	Wayne Mills
Lab Sample ID:	L2I1199-05	**Collection Date:**	10/21/2022 10:38

Inorganics Total	Result	Limit(s)	MDL	RL	Units	Note	Prepared	Analyzed	Analyst
Nitrogen, Ammonia	<0.50		0.11	0.50	mg/L		10/24/22 1229	10/24/22 1817	SSL
Method: SM 4500-S2¯ D-2011									
Sulfide	<0.20		0.12	0.20	mg/L			10/26/22 1623	NWW
Method: SM 4500-SO3¯ B-2011									
Sulfite	<2.0		1.1	2.0	mg/L	**H1**		10/27/22 1613	NWW
Method: SM 5210 B-2011									
BOD, 5 Day	<3.0		3.0	3.0	mg/L		10/21/22 1649	10/26/22 1909	SZH
Method: SM 5220 D-2011									
COD	<50		24	50	mg/L		10/25/22 1121	10/25/22 1321	SZH
Method: SM 5310 C-2011									
Carbon, Total Organic	6.0		0.50	1.0	mg/L		10/25/22 1541	10/25/22 2023	SSL
Method: SM 5540 C-2011									
MBAS (as LAS MW 340)	<0.50		0.15	0.50	mg/L			10/21/22 1445	SSL
Method: USGS I-3765-85									
Solids, Total Suspended	32		5	5	mg/L		10/24/22 1504	10/25/22 0938	DKB

Metals Total by ICP	Result	Limit(s)	MDL	RL	Units	Note	Prepared	Analyzed	Analyst
Method: EPA 200.7, Rv. 4.4 (1994)									
Calcium	110		0.26	2.0	mg/L		10/24/22 1100	10/31/22 1913	SSL
Magnesium	33		0.054	0.20	mg/L		10/24/22 1100	10/28/22 0052	SSL
Method: SM 2340 B-2011									
Hardness, Total as CaCO3	410		0.65	5.0	mg/L		10/24/22 1100	10/31/22 1913	SSL

Metals Total by ICPMS	Result	Limit(s)	MDL	RL	Units	Note	Prepared	Analyzed	Analyst
Method: EPA 200.8, Rv. 5.4 (1994)									
Aluminum	250		60	150	ug/L		10/24/22 0936	10/26/22 1608	SSL
Antimony	0.61		0.22	0.50	ug/L		10/24/22 0936	10/24/22 1657	SSL
Arsenic	2.1		0.27	0.50	ug/L		10/24/22 0936	10/24/22 1657	SSL
Beryllium	<1.0		0.53	1.0	ug/L		10/24/22 0936	10/24/22 1657	SSL
Cadmium	<0.50		0.28	0.50	ug/L		10/24/22 0936	10/24/22 1657	SSL
Chromium	0.83		0.22	0.50	ug/L		10/24/22 0936	10/24/22 1657	SSL
Copper	120		5.5	25	ug/L		10/24/22 0936	10/26/22 1604	SSL
Iron	450		24	50	ug/L		10/24/22 0936	10/24/22 1657	SSL
Lead	0.92		0.33	0.50	ug/L		10/24/22 0936	10/24/22 1657	SSL
Molybdenum	7.7		0.20	2.0	ug/L		10/24/22 0936	10/24/22 1657	SSL
Nickel	14		1.4	2.0	ug/L		10/24/22 0936	10/26/22 1612	SSL
Selenium	1.3		0.45	0.50	ug/L		10/24/22 0936	10/24/22 1657	SSL

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L2I1199

Client Sample ID:	Outfall 023		
Sample Matrix:	Wastewater	**Collected By:**	Wayne Mills
Lab Sample ID:	L2I1199-05	**Collection Date:**	10/21/2022 10:38

Metals Total by ICPMS	Result	Limit(s)	MDL	RL	Units	Note	Prepared	Analyzed	Analyst
Silver	<0.10		0.012	0.10	ug/L		10/24/22 0936	10/24/22 1657	SSL
Thallium	<0.50		0.28	0.50	ug/L		10/24/22 0936	10/24/22 1657	SSL
Zinc	<10		6.2	10	ug/L		10/24/22 0936	10/24/22 1657	SSL
Barium	100		0.30	0.50	ug/L		10/24/22 0936	10/24/22 1657	SSL
Cobalt	0.71		0.23	0.50	ug/L		10/24/22 0936	10/24/22 1657	SSL
Manganese	93		0.19	0.50	ug/L		10/24/22 0936	10/24/22 1657	SSL

Anions by IC	Result	Limit(s)	MDL	RL	Units	Note	Prepared	Analyzed	Analyst
Method: EPA 300.0, Rv. 2.1 (1993)									
Bromide	0.88		0.017	0.50	mg/L		10/21/22 1701	10/21/22 2226	NWW
Chloride	96		0.018	0.50	mg/L	**B2**	10/21/22 1701	10/21/22 2226	NWW
Fluoride	<0.50		0.045	0.50	mg/L		10/21/22 1701	10/21/22 2226	NWW
Nitrogen, Nitrate + Nitrite	3.0		0.12	0.15	mg/L		10/21/22 1701	10/21/22 2226	NWW
Sulfate	180		0.10	2.0	mg/L	**B2**	10/21/22 1701	10/22/22 0421	NWW

Analyses Performed by: GEL Laboratories, LLC

Radiochemistry	Result	UNC	Limit(s)	MDA	Units	Note	Prepared	Analyzed	Analyst
Method: Calculation									
Radium-226+228 Sum	1.87	+/-0.654		1.87	pCi/L		11/01/22 0000	11/14/22 0000	NXL
Method: EPA 900.0/SW846 9310									
ALPHA	0.423	+/-1.38		3	pCi/L	**U**	11/01/22 0000	11/07/22 0000	KP1
BETA	9.61	+/-1.84		4	pCi/L		11/01/22 0000	11/07/22 0000	KP1
Method: EPA 903.1 Modified									
Radium-226	0.891	+/-0.324		1	pCi/L		11/01/22 0000	11/13/22 0000	LXP
Method: EPA 904.0/SW846 9320 Modified									
Radium-228	0.975	+/-0.568		1	pCi/L		11/01/22 0000	11/07/22 0000	JE1
Method: EPA 905.0 Modified/DOE RP501 Rev. 1 Modified									
Strontium-90	-0.606	+/-0.62		2	pCi/L	**U**	11/01/22 0000	11/07/22 0000	KH1

Uranium	Result	Limit(s)	MDL	RL	Units	Note	Prepared	Analyzed	Analyst
Method: EPA 200.8									
Uranium	0.00105		0.000067	0.0002	mg/L		11/01/22 0000	11/03/22 0000	PRB

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L2I1199

Client Sample ID:	LL HG Blank -Outfall 023		
Sample Matrix:	Wastewater	**Collected By:**	Wayne Mills
Lab Sample ID:	L2I1199-06	**Collection Date:**	10/21/2022 10:45

Analyses Performed by: Microbac Laboratories, Inc. - Chicagoland

Metals Total by CVAF	Result	Limit(s)	MDL	RL	Units	Note	Prepared	Analyzed	Analyst
Method: EPA 1631E									
Mercury	<0.500		0.231	0.500	ng/L		10/28/22 1520	10/31/22 1105	JNH

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L2I1199

Client Sample ID:	Outfall 025			
Sample Matrix:	Wastewater		**Collected By:**	Xavier Bullock
Lab Sample ID:	L2I1199-07		**Collection Date:**	09/30/2022 9:55

Analyses Performed by: Microbac Laboratories, Inc. - Chicagoland

Inorganics Total	**Result**	**Limit(s)**	**MDL**	**RL**	**Units**	**Note**	**Prepared**	**Analyzed**	**Analyst**
Method: EPA 420.4, Rv. 1 (1993)									
Phenolics, Total Recoverable	<0.010		0.0060	0.010	mg/L		10/13/22 1104	10/13/22 1720	ABG

Metals Total by CVAF	**Result**	**Limit(s)**	**MDL**	**RL**	**Units**	**Note**	**Prepared**	**Analyzed**	**Analyst**
Method: EPA 1631E									
Mercury	<5.00		2.31	5.00	ng/L		10/11/22 1002	10/12/22 1025	JNH

Metals Total by ICPMS	**Result**	**Limit(s)**	**MDL**	**RL**	**Units**	**Note**	**Prepared**	**Analyzed**	**Analyst**
Method: EPA 200.8, Rv. 5.4 (1994)									
Boron	5.7		2.0	2.5	mg/L	**Q8**	10/05/22 0607	10/07/22 1520	JNH
Tin	<0.0010		0.0005	0.0010	mg/L		10/05/22 0607	10/06/22 1651	JNH
Titanium	<0.030		0.0037	0.030	mg/L		10/05/22 0607	10/06/22 1651	JNH

Semivolatile Organic Compounds by GCMS	**Result**	**Limit(s)**	**MDL**	**RL**	**Units**	**Note**	**Prepared**	**Analyzed**	**Analyst**
Method: EPA 625.1									
1,2,4-Trichlorobenzene	<0.010		0.00060	0.010	mg/L	**Q**	10/06/22 0652	10/15/22 0029	CLR
2,2´-oxybis(1-chloropropane)	<0.010		0.00069	0.010	mg/L		10/06/22 0652	10/15/22 0029	CLR
2,4,5-Trichlorophenol	<0.010		0.00078	0.010	mg/L	**Y**	10/06/22 0652	10/15/22 0029	CLR
2,4,6-Trichlorophenol	<0.010		0.00076	0.010	mg/L		10/06/22 0652	10/15/22 0029	CLR
2,4-Dichlorophenol	<0.010		0.00062	0.010	mg/L		10/06/22 0652	10/15/22 0029	CLR
2,4-Dimethylphenol	<0.010		0.00069	0.010	mg/L		10/06/22 0652	10/15/22 0029	CLR
2,4-Dinitrophenol	<0.051		0.00031	0.051	mg/L		10/06/22 0652	10/15/22 0029	CLR
2,4-Dinitrotoluene	<0.010		0.00048	0.010	mg/L		10/06/22 0652	10/15/22 0029	CLR
2,6-Dichlorophenol	<0.010		0.00072	0.010	mg/L		10/06/22 0652	10/15/22 0029	CLR
2,6-Dinitrotoluene	<0.010		0.00058	0.010	mg/L		10/06/22 0652	10/15/22 0029	CLR
2-Chloronaphthalene	<0.010		0.00072	0.010	mg/L		10/06/22 0652	10/15/22 0029	CLR
2-Chlorophenol	<0.010		0.00073	0.010	mg/L	**Q3**	10/06/22 0652	10/15/22 0029	CLR
2-Chlorophenol	<0.010		0.00073	0.010	mg/L	**H2**	10/20/22 1644	10/24/22 2136	CLR
2-Methylnaphthalene	<0.010		0.00070	0.010	mg/L	**Y**	10/06/22 0652	10/15/22 0029	CLR
2-Methylphenol	<0.010		0.00078	0.010	mg/L	**Y**	10/06/22 0652	10/15/22 0029	CLR
2-Nitroaniline	<0.010		0.00050	0.010	mg/L	**Y**	10/06/22 0652	10/15/22 0029	CLR
2-Nitrophenol	<0.010		0.00093	0.010	mg/L		10/06/22 0652	10/15/22 0029	CLR
3,3´-Dichlorobenzidine	<0.051		0.0013	0.051	mg/L		10/06/22 0652	10/15/22 0029	CLR
3/4-Methylphenol	<0.010		0.00085	0.010	mg/L	**Y**	10/06/22 0652	10/15/22 0029	CLR
3-Nitroaniline	<0.010		0.00082	0.010	mg/L	**Y**	10/06/22 0652	10/15/22 0029	CLR
4,6-Dinitro-2-methylphenol	<0.026		0.00035	0.026	mg/L		10/06/22 0652	10/15/22 0029	CLR
4-Bromophenyl phenyl ether	<0.010		0.00068	0.010	mg/L		10/06/22 0652	10/15/22 0029	CLR
4-Chloro-3-methylphenol	<0.020		0.00078	0.020	mg/L		10/06/22 0652	10/15/22 0029	CLR
4-Chloroaniline	<0.010		0.00070	0.010	mg/L	**Y**	10/06/22 0652	10/15/22 0029	CLR
4-Chlorophenyl phenyl ether	<0.010		0.00070	0.010	mg/L		10/06/22 0652	10/15/22 0029	CLR
4-Nitroaniline	<0.010		0.0010	0.010	mg/L	**Y**	10/06/22 0652	10/15/22 0029	CLR

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L2I1199

Client Sample ID:	Outfall 025		
Sample Matrix:	Wastewater	**Collected By:**	Xavier Bullock
Lab Sample ID:	L2I1199-07	**Collection Date:**	09/30/2022 9:55

Semivolatile Organic Compounds by GCMS	Result	Limit(s)	MDL	RL	Units	Note	Prepared	Analyzed	Analyst
4-Nitrophenol	<0.051		0.00085	0.051	mg/L		10/06/22 0652	10/15/22 0029	CLR
Acenaphthene	<0.010		0.000012	0.010	mg/L		10/06/22 0652	10/15/22 0029	CLR
Acenaphthylene	<0.010		0.0000031	0.010	mg/L		10/06/22 0652	10/15/22 0029	CLR
Acetophenone	<0.010		0.00082	0.010	mg/L	Y	10/06/22 0652	10/15/22 0029	CLR
Aniline	<0.010		0.0015	0.010	mg/L	Y	10/06/22 0652	10/15/22 0029	CLR
Anthracene	<0.010		0.0000071	0.010	mg/L		10/06/22 0652	10/15/22 0029	CLR
Benzidine	<0.051		0.020	0.051	mg/L		10/06/22 0652	10/15/22 0029	CLR
Benzo[a]anthracene	<0.010		0.0000041	0.010	mg/L		10/06/22 0652	10/15/22 0029	CLR
Benzo[a]pyrene	<0.010		0.0000061	0.010	mg/L		10/06/22 0652	10/15/22 0029	CLR
Benzo[b]fluoranthene	<0.010		0.0000061	0.010	mg/L		10/06/22 0652	10/15/22 0029	CLR
Benzo[g,h,i]perylene	<0.010		0.0000051	0.010	mg/L		10/06/22 0652	10/15/22 0029	CLR
Benzo[k]fluoranthene	<0.010		0.0000071	0.010	mg/L		10/06/22 0652	10/15/22 0029	CLR
Benzoic acid	<0.051		0.00051	0.051	mg/L	Y	10/06/22 0652	10/15/22 0029	CLR
Benzyl alcohol	<0.010		0.00067	0.010	mg/L	Y	10/06/22 0652	10/15/22 0029	CLR
Bis(2-chloroethoxy)methane	<0.010		0.00087	0.010	mg/L		10/06/22 0652	10/15/22 0029	CLR
Bis(2-chloroethyl)ether	<0.010		0.00079	0.010	mg/L	Q	10/06/22 0652	10/15/22 0029	CLR
Bis(2-ethylhexyl)phthalate	<0.010		0.0012	0.010	mg/L		10/06/22 0652	10/15/22 0029	CLR
Butyl benzyl phthalate	<0.010		0.00093	0.010	mg/L		10/06/22 0652	10/15/22 0029	CLR
Carbazole	<0.010		0.00073	0.010	mg/L	Y	10/06/22 0652	10/15/22 0029	CLR
Chrysene	<0.010		0.0000061	0.010	mg/L		10/06/22 0652	10/15/22 0029	CLR
Dibenz[a,h]anthracene	<0.010		0.0000061	0.010	mg/L		10/06/22 0652	10/15/22 0029	CLR
Dibenzofuran	<0.010		0.00069	0.010	mg/L	Y	10/06/22 0652	10/15/22 0029	CLR
Diethyl phthalate	<0.010		0.0013	0.010	mg/L		10/06/22 0652	10/15/22 0029	CLR
Dimethyl phthalate	<0.010		0.00069	0.010	mg/L		10/06/22 0652	10/15/22 0029	CLR
Di-n-butyl phthalate	<0.010		0.00084	0.010	mg/L		10/06/22 0652	10/15/22 0029	CLR
Di-n-octyl phthalate	<0.010		0.00071	0.010	mg/L		10/06/22 0652	10/15/22 0029	CLR
Fluoranthene	<0.010		0.0000051	0.010	mg/L		10/06/22 0652	10/15/22 0029	CLR
Fluorene	<0.010		0.0000041	0.010	mg/L		10/06/22 0652	10/15/22 0029	CLR
Hexachlorobenzene	<0.010		0.00098	0.010	mg/L		10/06/22 0652	10/15/22 0029	CLR
Hexachlorobutadiene	<0.010		0.00098	0.010	mg/L		10/06/22 0652	10/15/22 0029	CLR
Hexachlorocyclopentadiene	<0.010		0.00041	0.010	mg/L		10/06/22 0652	10/15/22 0029	CLR
Hexachloroethane	<0.010		0.0010	0.010	mg/L		10/06/22 0652	10/15/22 0029	CLR
Indeno[1,2,3cd]pyrene	<0.010		0.0000041	0.010	mg/L		10/06/22 0652	10/15/22 0029	CLR
Isophorone	<0.010		0.00082	0.010	mg/L		10/06/22 0652	10/15/22 0029	CLR
Naphthalene	<0.010		0.0000061	0.010	mg/L		10/06/22 0652	10/15/22 0029	CLR
Nitrobenzene	<0.010		0.00081	0.010	mg/L		10/06/22 0652	10/15/22 0029	CLR
N-Nitrosodimethylamine	<0.010		0.00093	0.010	mg/L		10/06/22 0652	10/15/22 0029	CLR
N-Nitrosodi-n-propylamine	<0.010		0.0010	0.010	mg/L		10/06/22 0652	10/15/22 0029	CLR
N-Nitrosodiphenylamine	<0.010		0.00073	0.010	mg/L		10/06/22 0652	10/15/22 0029	CLR
Pentachlorophenol	<0.051		0.00032	0.051	mg/L		10/06/22 0652	10/15/22 0029	CLR
Phenanthrene	<0.010		0.0000071	0.010	mg/L		10/06/22 0652	10/15/22 0029	CLR
Phenol	<0.010		0.00038	0.010	mg/L		10/06/22 0652	10/15/22 0029	CLR
Pyrene	<0.010		0.0000051	0.010	mg/L		10/06/22 0652	10/15/22 0029	CLR
Pyridine	<0.010		0.0013	0.010	mg/L	Y	10/06/22 0652	10/15/22 0029	CLR
Surrogate: 2,4,6-Tribromophenol	53.6		Limit: 47.8-138		% Rec		10/06/22 0652	10/15/22 0029	CLR

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L2I1199

Client Sample ID:	Outfall 025		
Sample Matrix:	Wastewater	**Collected By:**	Xavier Bullock
Lab Sample ID:	L2I1199-07	**Collection Date:**	09/30/2022 9:55

Semivolatile Organic Compounds by GCMS	Result	Limit(s)	MDL	RL	Units	Note	Prepared	Analyzed	Analyst
Surrogate: 2-Fluorobiphenyl	38.0			Limit: 10-110	% Rec		10/06/22 0652	10/15/22 0029	CLR
Surrogate: 2-Fluorophenol	22.0			Limit: 10-110	% Rec		10/06/22 0652	10/15/22 0029	CLR
Surrogate: Nitrobenzene-d5	34.2			Limit: 10-110	% Rec		10/06/22 0652	10/15/22 0029	CLR
Surrogate: Phenol-d5	18.9			Limit: 10-60.8	% Rec		10/06/22 0652	10/15/22 0029	CLR
Surrogate: Terphenyl-d14	49.4			Limit: 16.8-110	% Rec		10/06/22 0652	10/15/22 0029	CLR

Volatile Organic Compounds by GCMS	Result	Limit(s)	MDL	RL	Units	Note	Prepared	Analyzed	Analyst
Method: EPA 624.1									
1,1,1-Trichloroethane	<0.00023		0.00023	0.0050	mg/L			10/12/22 1933	JBS
1,1,2,2-Tetrachloroethane	<0.00032		0.00032	0.0050	mg/L			10/12/22 1933	JBS
1,1,2-Trichloroethane	<0.00026		0.00026	0.0050	mg/L			10/12/22 1933	JBS
1,1-Dichloroethane	<0.00025		0.00025	0.0050	mg/L			10/12/22 1933	JBS
1,1-Dichloroethene	<0.00023		0.00023	0.0050	mg/L			10/12/22 1933	JBS
1,2-Dichlorobenzene	<0.00030		0.00030	0.010	mg/L			10/12/22 1933	JBS
1,2-Dichloroethane	<0.00038		0.00038	0.0050	mg/L			10/12/22 1933	JBS
1,2-Dichloropropane	<0.00019		0.00019	0.0050	mg/L			10/12/22 1933	JBS
1,3-Dichlorobenzene	<0.00024		0.00024	0.010	mg/L			10/12/22 1933	JBS
1,4-Dichlorobenzene	<0.00028		0.00028	0.010	mg/L			10/12/22 1933	JBS
2-Chloroethyl vinyl ether	<0.00019		0.00019	0.010	mg/L	**Q11**		10/12/22 1933	JBS
Benzene	<0.00015		0.00015	0.0050	mg/L			10/12/22 1933	JBS
Dichlorobromomethane	<0.00021		0.00021	0.0050	mg/L			10/12/22 1933	JBS
Bromoform	<0.00025		0.00025	0.0050	mg/L			10/12/22 1933	JBS
Bromomethane	<0.00029		0.00029	0.010	mg/L			10/12/22 1933	JBS
Carbon tetrachloride	<0.00025		0.00025	0.0050	mg/L			10/12/22 1933	JBS
Chlorobenzene	<0.00026		0.00026	0.0050	mg/L			10/12/22 1933	JBS
Chloroethane	<0.00022		0.00022	0.010	mg/L			10/12/22 1933	JBS
Chloroform	<0.00026		0.00026	0.0020	mg/L			10/12/22 1933	JBS
Chloromethane	<0.00024		0.00024	0.010	mg/L			10/12/22 1933	JBS
cis-1,3-Dichloropropene	<0.00026		0.00026	0.0050	mg/L			10/12/22 1933	JBS
Dibromochloromethane	<0.00024		0.00024	0.0050	mg/L			10/12/22 1933	JBS
Ethylbenzene	<0.00025		0.00025	0.0050	mg/L			10/12/22 1933	JBS
Methylene chloride	<0.010		0.010	0.010	mg/L			10/12/22 1933	JBS
Tetrachloroethene	<0.00026		0.00026	0.0050	mg/L			10/12/22 1933	JBS
Toluene	<0.00030		0.00030	0.0050	mg/L			10/12/22 1933	JBS
trans-1,2-Dichloroethene	<0.00022		0.00022	0.0050	mg/L			10/12/22 1933	JBS
trans-1,3-Dichloropropene	<0.00026		0.00026	0.0050	mg/L			10/12/22 1933	JBS
Trichloroethene	<0.00026		0.00026	0.0050	mg/L			10/12/22 1933	JBS
Trichlorofluoromethane	<0.00027		0.00027	0.010	mg/L			10/12/22 1933	JBS
Vinyl chloride	<0.00026		0.00026	0.0020	mg/L			10/12/22 1933	JBS
Acrolein	<0.0022		0.0022	0.10	mg/L	**Q10**		10/12/22 1933	JBS
Acrylonitrile	<0.0019		0.0019	0.10	mg/L	**Q10, Q2**		10/12/22 1933	JBS
Surrogate: 1,2-Dichloroethane-D4	112			Limit: 74.5-132	% Rec			10/12/22 1933	JBS

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CERTIFICATE OF ANALYSIS

L2I1199

Client Sample ID:	Outfall 025		
Sample Matrix:	Wastewater	**Collected By:**	Xavier Bullock
Lab Sample ID:	L2I1199-07	**Collection Date:**	09/30/2022 9:55

Volatile Organic Compounds by GCMS	Result	Limit(s)	MDL	RL	Units	Note	Prepared	Analyzed	Analyst
Surrogate: 4-Bromofluorobenzene	90.3			Limit: 80-120	% Rec			10/12/22 1933	JBS
Surrogate: Dibromofluoromethane	101			Limit: 80-120	% Rec			10/12/22 1933	JBS
Surrogate: Toluene-D8	98.5			Limit: 80-120	% Rec			10/12/22 1933	JBS

Analyses Performed by: Microbac Laboratories, Inc., Louisville

Field Parameters	Result	Limit(s)	MDL	RL	Units	Note	Prepared	Analyzed	Analyst
Method: HACH 8167									
Chlorine, Total Residual	0.02		0.02	0.02	mg/L			09/30/22 0955	XDB
Method: NA									
Flow by Measurement & Calc.	8.34			0	MGD			09/30/22 0955	XDB
Method: SM 2550 B-2010									
Temperature	20.1		1.0	1.0	°C			09/30/22 0955	XDB
Method: SM 4500-H+ B-2011									
pH (at 25°C)	8.0		1.0	1.0	S.U.			09/30/22 0955	XDB

Microbiology	Result	Limit(s)	MDL	RL	Units	Note	Prepared	Analyzed	Analyst
Method: SM 9223 B (Colilert-18)-1997									
E. coli	93.3		0.0	1.0	MPN/100mL		09/30/22 1652	10/01/22 1112	NWW

Inorganics Total	Result	Limit(s)	MDL	RL	Units	Note	Prepared	Analyzed	Analyst
Method: Calculation									
Total Organic Nitrogen	<1.0		0.53	1.0	mg/L		10/05/22 1205	10/06/22 2000	SSL
Method: EPA 1664B									
Oil & Grease	<5.0		2.8	5.0	mg/L			10/03/22 1651	RMT
Method: EPA 351.2, Rv. 2 (1993)									
Nitrogen, Total Kjeldahl	1.2		0.53	1.0	mg/L		10/05/22 1040	10/06/22 1528	SSL
Method: EPA 365.1, Rv. 2 (1993)									
Phosphorus	0.12		0.044	0.10	mg/L		10/03/22 1346	10/04/22 1550	SSL
Method: SM 2120 B-2011									
pH at Color	8			1	S.U.		09/30/22 1539	09/30/22 1544	NWW
Color, Pt-Co	15		0	5	CU		09/30/22 1539	09/30/22 1544	NWW
Method: SM 4500-CN^- E-2011									
Cyanide	<0.010		0.0035	0.010	mg/L		10/11/22 1059	10/11/22 1936	SSL

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L2I1199

Client Sample ID:	Outfall 025		
Sample Matrix:	Wastewater	**Collected By:**	Xavier Bullock
Lab Sample ID:	L2I1199-07	**Collection Date:**	09/30/2022 9:55

Inorganics Total	Result	Limit(s)	MDL	RL	Units	Note	Prepared	Analyzed	Analyst
Method: SM 4500-NH3 G-2011									
Nitrogen, Ammonia	0.68		0.11	0.50	mg/L		10/05/22 1205	10/06/22 2000	SSL
Method: SM 4500-S2¯ D-2011									
Sulfide	<0.20		0.12	0.20	mg/L			10/05/22 1700	NWW
Method: SM 4500-SO3¯ B-2011									
Sulfite	<2.0		1.1	2.0	mg/L	**H1**		10/07/22 1500	NWW
Method: SM 5210 B-2011									
BOD, 5 Day	<3.0		3.0	3.0	mg/L		09/30/22 1331	10/05/22 1313	SZH
Method: SM 5220 D-2011									
COD	<50		24	50	mg/L		10/04/22 1349	10/04/22 1549	SZH
Method: SM 5310 C-2011									
Carbon, Total Organic	3.3		0.50	1.0	mg/L		10/13/22 1529	10/14/22 0234	SSL
Method: SM 5540 C-2011									
MBAS (as LAS MW 340)	<0.50		0.15	0.50	mg/L			09/30/22 1834	NWW
Method: USGS I-3765-85									
Solids, Total Suspended	18		5	5	mg/L		10/05/22 1346	10/05/22 1500	DKB

Metals Total by ICP	Result	Limit(s)	MDL	RL	Units	Note	Prepared	Analyzed	Analyst
Method: EPA 200.7, Rv. 4.4 (1994)									
Calcium	100		0.26	2.0	mg/L		10/12/22 1206	10/14/22 1338	SSL
Magnesium	73		0.054	0.20	mg/L		10/12/22 1206	10/12/22 2319	SSL
Method: SM 2340 B-2011									
Hardness, Total as CaCO3	560		0.65	5.0	mg/L		10/12/22 1206	10/14/22 1338	SSL

Metals Total by ICPMS	Result	Limit(s)	MDL	RL	Units	Note	Prepared	Analyzed	Analyst
Method: EPA 200.8, Rv. 5.4 (1994)									
Aluminum	190		40	100	ug/L		10/07/22 1359	10/17/22 1555	SSL
Antimony	<0.50		0.22	0.50	ug/L		10/07/22 1359	10/14/22 1919	SSL
Arsenic	2.3		0.27	0.50	ug/L		10/07/22 1359	10/14/22 1919	SSL
Beryllium	<1.0		0.53	1.0	ug/L		10/07/22 1359	10/14/22 1919	SSL
Cadmium	2.2		0.28	0.50	ug/L		10/07/22 1359	10/14/22 1919	SSL
Chromium	3.7		0.22	0.50	ug/L		10/07/22 1359	10/14/22 1919	SSL
Copper	32		1.1	5.0	ug/L		10/07/22 1359	10/14/22 1919	SSL
Iron	520		24	50	ug/L		10/07/22 1359	10/14/22 1919	SSL
Lead	<0.50		0.33	0.50	ug/L		10/07/22 1359	10/14/22 1919	SSL
Molybdenum	8.3		0.20	2.0	ug/L		10/07/22 1359	10/14/22 1919	SSL
Nickel	21		0.69	1.0	ug/L		10/07/22 1359	10/17/22 1603	SSL

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L2I1199

Client Sample ID:	Outfall 025		
Sample Matrix:	Wastewater	**Collected By:**	Xavier Bullock
Lab Sample ID:	L2I1199-07	**Collection Date:**	09/30/2022 9:55

Metals Total by ICPMS	Result	Limit(s)	MDL	RL	Units	Note	Prepared	Analyzed	Analyst
Selenium	10		0.45	0.50	ug/L		10/07/22 1359	10/14/22 1919	SSL
Silver	<0.10		0.012	0.10	ug/L		10/07/22 1359	10/14/22 1919	SSL
Thallium	9.6		0.28	0.50	ug/L		10/07/22 1359	10/14/22 1919	SSL
Zinc	31		6.2	10	ug/L		10/07/22 1359	10/14/22 1919	SSL
Barium	99		0.30	0.50	ug/L		10/07/22 1359	10/14/22 1919	SSL
Cobalt	3.2		0.23	0.50	ug/L		10/07/22 1359	10/14/22 1919	SSL
Manganese	720		3.8	10	ug/L		10/07/22 1359	10/17/22 1551	SSL

Anions by IC	Result	Limit(s)	MDL	RL	Units	Note	Prepared	Analyzed	Analyst
Method: EPA 300.0, Rv. 2.1 (1993)									
Bromide	1.5		0.017	0.50	mg/L		10/05/22 1810	10/06/22 0408	NWW
Chloride	190		0.090	2.5	mg/L		10/05/22 1810	10/06/22 1002	NWW
Fluoride	1.1		0.045	0.50	mg/L		10/05/22 1810	10/06/22 0408	NWW
Nitrogen, Nitrate + Nitrite	1.7		0.16	0.75	mg/L		10/05/22 1805	10/06/22 0814	NWW
Sulfate	230		0.13	2.5	mg/L	**B2**	10/05/22 1810	10/06/22 1002	NWW

Client Sample ID:	LL HG Blank -Outfall 025		
Sample Matrix:	Wastewater	**Collected By:**	Xavier Bullock
Lab Sample ID:	L2I1199-08	**Collection Date:**	09/30/2022 10:00

Analyses Performed by: Microbac Laboratories, Inc. - Chicagoland

Metals Total by CVAF	Result	Limit(s)	MDL	RL	Units	Note	Prepared	Analyzed	Analyst
Method: EPA 1631E									
Mercury	<0.500		0.231	0.500	ng/L		10/11/22 1002	10/12/22 1027	JNH

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L2I1199

Client Sample ID:	Outfall 009 (River Intake)		
Sample Matrix:	Wastewater	**Collected By:**	Xavier Bullock
Lab Sample ID:	L2I1199-09	**Collection Date:**	09/30/2022 9:20

Analyses Performed by: Microbac Laboratories, Inc. - Chicagoland

Inorganics Total	**Result**	**Limit(s)**	**MDL**	**RL**	**Units**	**Note**	**Prepared**	**Analyzed**	**Analyst**
Method: EPA 420.4, Rv. 1 (1993)									
Phenolics, Total Recoverable	<0.010		0.0060	0.010	mg/L		10/13/22 1104	10/13/22 1722	ABG

Metals Total by ICPMS	**Result**	**Limit(s)**	**MDL**	**RL**	**Units**	**Note**	**Prepared**	**Analyzed**	**Analyst**
Method: EPA 200.8, Rv. 5.4 (1994)									
Boron	0.10		0.040	0.050	mg/L	**Q8**	10/05/22 0607	10/07/22 1524	JNH
Tin	<0.0010		0.0005	0.0010	mg/L		10/05/22 0607	10/06/22 1656	JNH
Titanium	<0.030		0.0037	0.030	mg/L		10/05/22 0607	10/06/22 1656	JNH

Semivolatile Organic Compounds by GCMS	**Result**	**Limit(s)**	**MDL**	**RL**	**Units**	**Note**	**Prepared**	**Analyzed**	**Analyst**
Method: EPA 625.1									
1,2,4-Trichlorobenzene	<0.010		0.00061	0.010	mg/L	**Q**	10/06/22 0652	10/15/22 0053	CLR
2,2´-oxybis(1-chloropropane)	<0.010		0.00070	0.010	mg/L		10/06/22 0652	10/15/22 0053	CLR
2,4,5-Trichlorophenol	<0.010		0.00078	0.010	mg/L	**Y**	10/06/22 0652	10/15/22 0053	CLR
2,4,6-Trichlorophenol	<0.010		0.00076	0.010	mg/L		10/06/22 0652	10/15/22 0053	CLR
2,4-Dichlorophenol	<0.010		0.00063	0.010	mg/L		10/06/22 0652	10/15/22 0053	CLR
2,4-Dimethylphenol	<0.010		0.00070	0.010	mg/L		10/06/22 0652	10/15/22 0053	CLR
2,4-Dinitrophenol	<0.052		0.00031	0.052	mg/L		10/06/22 0652	10/15/22 0053	CLR
2,4-Dinitrotoluene	<0.010		0.00048	0.010	mg/L		10/06/22 0652	10/15/22 0053	CLR
2,6-Dichlorophenol	<0.010		0.00073	0.010	mg/L		10/06/22 0652	10/15/22 0053	CLR
2,6-Dinitrotoluene	<0.010		0.00059	0.010	mg/L		10/06/22 0652	10/15/22 0053	CLR
2-Chloronaphthalene	<0.010		0.00073	0.010	mg/L		10/06/22 0652	10/15/22 0053	CLR
2-Chlorophenol	<0.011		0.00076	0.011	mg/L	**H2**	10/20/22 1644	10/24/22 2159	CLR
2-Chlorophenol	<0.010		0.00074	0.010	mg/L	**Q3**	10/06/22 0652	10/15/22 0053	CLR
2-Methylnaphthalene	<0.010		0.00071	0.010	mg/L	**Y**	10/06/22 0652	10/15/22 0053	CLR
2-Methylphenol	<0.010		0.00078	0.010	mg/L	**Y**	10/06/22 0652	10/15/22 0053	CLR
2-Nitroaniline	<0.010		0.00051	0.010	mg/L	**Y**	10/06/22 0652	10/15/22 0053	CLR
2-Nitrophenol	<0.010		0.00094	0.010	mg/L		10/06/22 0652	10/15/22 0053	CLR
3,3´-Dichlorobenzidine	<0.052		0.0013	0.052	mg/L		10/06/22 0652	10/15/22 0053	CLR
3/4-Methylphenol	<0.010		0.00086	0.010	mg/L	**Y**	10/06/22 0652	10/15/22 0053	CLR
3-Nitroaniline	<0.010		0.00082	0.010	mg/L	**Y**	10/06/22 0652	10/15/22 0053	CLR
4,6-Dinitro-2-methylphenol	<0.026		0.00035	0.026	mg/L		10/06/22 0652	10/15/22 0053	CLR
4-Bromophenyl phenyl ether	<0.010		0.00069	0.010	mg/L		10/06/22 0652	10/15/22 0053	CLR
4-Chloro-3-methylphenol	<0.021		0.00078	0.021	mg/L		10/06/22 0652	10/15/22 0053	CLR
4-Chloroaniline	<0.010		0.00071	0.010	mg/L	**Y**	10/06/22 0652	10/15/22 0053	CLR
4-Chlorophenyl phenyl ether	<0.010		0.00071	0.010	mg/L		10/06/22 0652	10/15/22 0053	CLR
4-Nitroaniline	<0.010		0.0010	0.010	mg/L	**Y**	10/06/22 0652	10/15/22 0053	CLR
4-Nitrophenol	<0.052		0.00086	0.052	mg/L		10/06/22 0652	10/15/22 0053	CLR
Acenaphthene	<0.010		0.000012	0.010	mg/L		10/06/22 0652	10/15/22 0053	CLR
Acenaphthylene	<0.010		0.0000031	0.010	mg/L		10/06/22 0652	10/15/22 0053	CLR
Acetophenone	<0.010		0.00082	0.010	mg/L	**Y**	10/06/22 0652	10/15/22 0053	CLR
Aniline	<0.010		0.0015	0.010	mg/L	**Y**	10/06/22 0652	10/15/22 0053	CLR

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CERTIFICATE OF ANALYSIS

L2I1199

Client Sample ID:	Outfall 009 (River Intake)		
Sample Matrix:	Wastewater	**Collected By:**	Xavier Bullock
Lab Sample ID:	L2I1199-09	**Collection Date:**	09/30/2022 9:20

Semivolatile Organic Compounds by GCMS	Result	Limit(s)	MDL	RL	Units	Note	Prepared	Analyzed	Analyst
Anthracene	<0.010		0.0000072	0.010	mg/L		10/06/22 0652	10/15/22 0053	CLR
Benzidine	<0.052		0.021	0.052	mg/L		10/06/22 0652	10/15/22 0053	CLR
Benzo[a]anthracene	<0.010		0.0000041	0.010	mg/L		10/06/22 0652	10/15/22 0053	CLR
Benzo[a]pyrene	<0.010		0.0000062	0.010	mg/L		10/06/22 0652	10/15/22 0053	CLR
Benzo[b]fluoranthene	<0.010		0.0000062	0.010	mg/L		10/06/22 0652	10/15/22 0053	CLR
Benzo[g,h,i]perylene	<0.010		0.0000052	0.010	mg/L		10/06/22 0652	10/15/22 0053	CLR
Benzo[k]fluoranthene	<0.010		0.0000072	0.010	mg/L		10/06/22 0652	10/15/22 0053	CLR
Benzoic acid	<0.052		0.00052	0.052	mg/L	**Y**	10/06/22 0652	10/15/22 0053	CLR
Benzyl alcohol	<0.010		0.00068	0.010	mg/L	**Y**	10/06/22 0652	10/15/22 0053	CLR
Bis(2-chloroethoxy)methane	<0.010		0.00088	0.010	mg/L		10/06/22 0652	10/15/22 0053	CLR
Bis(2-chloroethyl)ether	<0.010		0.00079	0.010	mg/L	**Q**	10/06/22 0652	10/15/22 0053	CLR
Bis(2-ethylhexyl)phthalate	<0.010		0.0012	0.010	mg/L		10/06/22 0652	10/15/22 0053	CLR
Butyl benzyl phthalate	<0.010		0.00094	0.010	mg/L		10/06/22 0652	10/15/22 0053	CLR
Carbazole	<0.010		0.00074	0.010	mg/L	**Y**	10/06/22 0652	10/15/22 0053	CLR
Chrysene	<0.010		0.0000062	0.010	mg/L		10/06/22 0652	10/15/22 0053	CLR
Dibenz[a,h]anthracene	<0.010		0.0000062	0.010	mg/L		10/06/22 0652	10/15/22 0053	CLR
Dibenzofuran	<0.010		0.00070	0.010	mg/L	**Y**	10/06/22 0652	10/15/22 0053	CLR
Diethyl phthalate	<0.010		0.0013	0.010	mg/L		10/06/22 0652	10/15/22 0053	CLR
Dimethyl phthalate	<0.010		0.00070	0.010	mg/L		10/06/22 0652	10/15/22 0053	CLR
Di-n-butyl phthalate	<0.010		0.00085	0.010	mg/L		10/06/22 0652	10/15/22 0053	CLR
Di-n-octyl phthalate	<0.010		0.00072	0.010	mg/L		10/06/22 0652	10/15/22 0053	CLR
Fluoranthene	<0.010		0.0000052	0.010	mg/L		10/06/22 0652	10/15/22 0053	CLR
Fluorene	<0.010		0.0000041	0.010	mg/L		10/06/22 0652	10/15/22 0053	CLR
Hexachlorobenzene	<0.010		0.00099	0.010	mg/L		10/06/22 0652	10/15/22 0053	CLR
Hexachlorobutadiene	<0.010		0.00099	0.010	mg/L		10/06/22 0652	10/15/22 0053	CLR
Hexachlorocyclopentadiene	<0.010		0.00041	0.010	mg/L		10/06/22 0652	10/15/22 0053	CLR
Hexachloroethane	<0.010		0.0010	0.010	mg/L		10/06/22 0652	10/15/22 0053	CLR
Indeno[1,2,3cd]pyrene	<0.010		0.0000041	0.010	mg/L		10/06/22 0652	10/15/22 0053	CLR
Isophorone	<0.010		0.00082	0.010	mg/L		10/06/22 0652	10/15/22 0053	CLR
Naphthalene	<0.010		0.0000062	0.010	mg/L		10/06/22 0652	10/15/22 0053	CLR
Nitrobenzene	<0.010		0.00081	0.010	mg/L		10/06/22 0652	10/15/22 0053	CLR
N-Nitrosodimethylamine	<0.010		0.00094	0.010	mg/L		10/06/22 0652	10/15/22 0053	CLR
N-Nitrosodi-n-propylamine	<0.010		0.0010	0.010	mg/L		10/06/22 0652	10/15/22 0053	CLR
N-Nitrosodiphenylamine	<0.010		0.00074	0.010	mg/L		10/06/22 0652	10/15/22 0053	CLR
Pentachlorophenol	<0.052		0.00032	0.052	mg/L		10/06/22 0652	10/15/22 0053	CLR
Phenanthrene	<0.010		0.0000072	0.010	mg/L		10/06/22 0652	10/15/22 0053	CLR
Phenol	<0.010		0.00038	0.010	mg/L		10/06/22 0652	10/15/22 0053	CLR
Pyrene	<0.010		0.0000052	0.010	mg/L		10/06/22 0652	10/15/22 0053	CLR
Pyridine	<0.010		0.0013	0.010	mg/L	**Y**	10/06/22 0652	10/15/22 0053	CLR
Surrogate: 2,4,6-Tribromophenol	43.3			Limit: 47.8-138	% Rec	**S2**	10/06/22 0652	10/15/22 0053	CLR
Surrogate: 2-Fluorobiphenyl	42.9			Limit: 10-110	% Rec		10/06/22 0652	10/15/22 0053	CLR
Surrogate: 2-Fluorophenol	16.0			Limit: 10-110	% Rec		10/06/22 0652	10/15/22 0053	CLR
Surrogate: Nitrobenzene-d5	35.0			Limit: 10-110	% Rec		10/06/22 0652	10/15/22 0053	CLR
Surrogate: Phenol-d5	16.6			Limit: 10-60.8	% Rec		10/06/22 0652	10/15/22 0053	CLR

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L2I1199

Client Sample ID:	Outfall 009 (River Intake)		
Sample Matrix:	Wastewater	**Collected By:**	Xavier Bullock
Lab Sample ID:	L2I1199-09	**Collection Date:**	09/30/2022 9:20

Semivolatile Organic Compounds by GCMS	Result	Limit(s)	MDL	RL	Units	Note	Prepared	Analyzed	Analyst
Surrogate: Terphenyl-d14	60.0			Limit: 16.8-110	% Rec		10/06/22 0652	10/15/22 0053	CLR

Volatile Organic Compounds by GCMS	Result	Limit(s)	MDL	RL	Units	Note	Prepared	Analyzed	Analyst
Method: EPA 624.1									
1,1,1-Trichloroethane	<0.00023		0.00023	0.0050	mg/L			10/13/22 1146	JBS
1,1,2,2-Tetrachloroethane	<0.00032		0.00032	0.0050	mg/L			10/13/22 1146	JBS
1,1,2-Trichloroethane	<0.00026		0.00026	0.0050	mg/L			10/13/22 1146	JBS
1,1-Dichloroethane	<0.00025		0.00025	0.0050	mg/L			10/13/22 1146	JBS
1,1-Dichloroethene	<0.00023		0.00023	0.0050	mg/L			10/13/22 1146	JBS
1,2-Dichlorobenzene	<0.00030		0.00030	0.010	mg/L			10/13/22 1146	JBS
1,2-Dichloroethane	<0.00038		0.00038	0.0050	mg/L			10/13/22 1146	JBS
1,2-Dichloropropane	<0.00019		0.00019	0.0050	mg/L			10/13/22 1146	JBS
1,3-Dichlorobenzene	<0.00024		0.00024	0.010	mg/L			10/13/22 1146	JBS
1,4-Dichlorobenzene	<0.00028		0.00028	0.010	mg/L			10/13/22 1146	JBS
2-Chloroethyl vinyl ether	<0.00019		0.00019	0.010	mg/L	**Q11**		10/13/22 1146	JBS
Benzene	<0.00015		0.00015	0.0050	mg/L			10/13/22 1146	JBS
Dichlorobromomethane	<0.00021		0.00021	0.0050	mg/L			10/13/22 1146	JBS
Bromoform	<0.00025		0.00025	0.0050	mg/L			10/13/22 1146	JBS
Bromomethane	<0.00029		0.00029	0.010	mg/L			10/13/22 1146	JBS
Carbon tetrachloride	<0.00025		0.00025	0.0050	mg/L			10/13/22 1146	JBS
Chlorobenzene	<0.00026		0.00026	0.0050	mg/L			10/13/22 1146	JBS
Chloroethane	<0.00022		0.00022	0.010	mg/L			10/13/22 1146	JBS
Chloroform	<0.00026		0.00026	0.0020	mg/L			10/13/22 1146	JBS
Chloromethane	<0.00024		0.00024	0.010	mg/L			10/13/22 1146	JBS
cis-1,3-Dichloropropene	<0.00026		0.00026	0.0050	mg/L			10/13/22 1146	JBS
Dibromochloromethane	<0.00024		0.00024	0.0050	mg/L			10/13/22 1146	JBS
Ethylbenzene	<0.00025		0.00025	0.0050	mg/L			10/13/22 1146	JBS
Methylene chloride	<0.010		0.010	0.010	mg/L			10/13/22 1146	JBS
Tetrachloroethene	<0.00026		0.00026	0.0050	mg/L			10/13/22 1146	JBS
Toluene	<0.00030		0.00030	0.0050	mg/L			10/13/22 1146	JBS
trans-1,2-Dichloroethene	<0.00022		0.00022	0.0050	mg/L			10/13/22 1146	JBS
trans-1,3-Dichloropropene	<0.00026		0.00026	0.0050	mg/L			10/13/22 1146	JBS
Trichloroethene	<0.00026		0.00026	0.0050	mg/L			10/13/22 1146	JBS
Trichlorofluoromethane	<0.00027		0.00027	0.010	mg/L			10/13/22 1146	JBS
Vinyl chloride	<0.00026		0.00026	0.0020	mg/L			10/13/22 1146	JBS
Acrolein	<0.0022		0.0022	0.10	mg/L	**Q10**		10/13/22 1146	JBS
Acrylonitrile	<0.0019		0.0019	0.10	mg/L	**Q, Q10**		10/13/22 1146	JBS
Surrogate: 1,2-Dichloroethane-D4	118			Limit: 74.5-132	% Rec			10/13/22 1146	JBS
Surrogate: 4-Bromofluorobenzene	108			Limit: 80-120	% Rec			10/13/22 1146	JBS
Surrogate: Dibromofluoromethane	93.2			Limit: 80-120	% Rec			10/13/22 1146	JBS
Surrogate: Toluene-D8	106			Limit: 80-120	% Rec			10/13/22 1146	JBS

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CERTIFICATE OF ANALYSIS

L2I1199

Client Sample ID:	Outfall 009 (River Intake)		
Sample Matrix:	Wastewater	**Collected By:**	Xavier Bullock
Lab Sample ID:	L2I1199-09	**Collection Date:**	09/30/2022 9:20

Analyses Performed by: Microbac Laboratories, Inc., Louisville

Field Parameters	Result	Limit(s)	MDL	RL	Units	Note	Prepared	Analyzed	Analyst
Method: HACH 8167									
Chlorine, Total Residual	0.03		0.02	0.02	mg/L			09/30/22 0920	XDB
Method: NA									
Flow by Measurement & Calc.	28.8			0	MGD			09/30/22 0920	XDB
Method: SM 2550 B-2010									
Temperature	20.6		1.0	1.0	°C			09/30/22 0920	XDB
Method: SM 4500-H+ B-2011									
pH (at 25°C)	6.9		1.0	1.0	S.U.			09/30/22 0920	XDB

Microbiology	Result	Limit(s)	MDL	RL	Units	Note	Prepared	Analyzed	Analyst
Method: SM 9223 B (Colilert-18)-1997									
E. coli	1553.1		0.0	1.0	MPN/100mL		09/30/22 1652	10/01/22 1112	NWW

Inorganics Total	Result	Limit(s)	MDL	RL	Units	Note	Prepared	Analyzed	Analyst
Method: Calculation									
Total Organic Nitrogen	<1.0		0.53	1.0	mg/L		10/05/22 1205	10/06/22 2003	SSL
Method: EPA 1664B									
Oil & Grease	<5.3		3.0	5.3	mg/L			10/03/22 1651	RMT
Method: EPA 351.2, Rv. 2 (1993)									
Nitrogen, Total Kjeldahl	<1.0		0.53	1.0	mg/L		10/05/22 1040	10/06/22 1530	SSL
Method: EPA 365.1, Rv. 2 (1993)									
Phosphorus	<0.10		0.044	0.10	mg/L		10/03/22 1346	10/04/22 1551	SSL
Method: SM 2120 B-2011									
pH at Color	8			1	S.U.		09/30/22 1539	09/30/22 1544	NWW
Color, Pt-Co	10		0	5	CU		09/30/22 1539	09/30/22 1544	NWW
Method: SM 4500-CN^- E-2011									
Cyanide	<0.010		0.0035	0.010	mg/L		10/11/22 1059	10/11/22 1938	SSL
Method: SM 4500-NH3 G-2011									
Nitrogen, Ammonia	<0.50		0.11	0.50	mg/L		10/05/22 1205	10/06/22 2003	SSL
Method: SM 4500-$S2^-$ D-2011									
Sulfide	<0.20		0.12	0.20	mg/L			10/05/22 1700	NWW
Method: SM 4500-$SO3^-$ B-2011									
Sulfite	<2.0		1.1	2.0	mg/L	**H1**		10/07/22 1500	NWW

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L2I1199

Client Sample ID:	Outfall 009 (River Intake)		
Sample Matrix:	Wastewater	**Collected By:**	Xavier Bullock
Lab Sample ID:	L2I1199-09	**Collection Date:**	09/30/2022 9:20

Inorganics Total	Result	Limit(s)	MDL	RL	Units	Note	Prepared	Analyzed	Analyst
Method: SM 5210 B-2011									
BOD, 5 Day	<3.0		3.0	3.0	mg/L		09/30/22 1331	10/05/22 1318	SZH
Method: SM 5220 D-2011									
COD	<50		24	50	mg/L		10/04/22 1349	10/04/22 1549	SZH
Method: SM 5310 C-2011									
Carbon, Total Organic	3.1		0.50	1.0	mg/L		10/13/22 1529	10/14/22 0256	SSL
Method: SM 5540 C-2011									
MBAS (as LAS MW 340)	<0.50		0.15	0.50	mg/L			09/30/22 1834	NWW
Method: USGS I-3765-85									
Solids, Total Suspended	18		5	5	mg/L		10/05/22 1346	10/05/22 1500	DKB

Metals Total by ICP	Result	Limit(s)	MDL	RL	Units	Note	Prepared	Analyzed	Analyst
Method: EPA 200.7, Rv. 4.4 (1994)									
Calcium	42		0.026	0.20	mg/L		10/14/22 1112	10/14/22 1841	SSL
Magnesium	13		0.054	0.20	mg/L		10/14/22 1112	10/14/22 1841	SSL
Method: SM 2340 B-2011									
Hardness, Total as CaCO3	160		0.22	0.82	mg/L		10/14/22 1112	10/14/22 1841	SSL

Metals Total by ICPMS	Result	Limit(s)	MDL	RL	Units	Note	Prepared	Analyzed	Analyst
Method: EPA 200.8, Rv. 5.4 (1994)									
Aluminum	99		20	50	ug/L		10/07/22 1359	10/14/22 1924	SSL
Antimony	<0.50		0.22	0.50	ug/L		10/07/22 1359	10/14/22 1924	SSL
Arsenic	1.4		0.27	0.50	ug/L		10/07/22 1359	10/14/22 1924	SSL
Beryllium	<1.0		0.53	1.0	ug/L		10/07/22 1359	10/14/22 1924	SSL
Cadmium	<0.50		0.28	0.50	ug/L		10/07/22 1359	10/14/22 1924	SSL
Chromium	3.4		0.22	0.50	ug/L		10/07/22 1359	10/14/22 1924	SSL
Copper	<5.0		1.1	5.0	ug/L		10/07/22 1359	10/14/22 1924	SSL
Iron	250		24	50	ug/L		10/07/22 1359	10/14/22 1924	SSL
Lead	<0.50		0.33	0.50	ug/L		10/07/22 1359	10/14/22 1924	SSL
Molybdenum	2.8		0.20	2.0	ug/L		10/07/22 1359	10/14/22 1924	SSL
Nickel	1.9		0.69	1.0	ug/L		10/07/22 1359	10/17/22 1607	SSL
Selenium	0.99		0.45	0.50	ug/L		10/07/22 1359	10/14/22 1924	SSL
Silver	<0.10		0.012	0.10	ug/L		10/07/22 1359	10/14/22 1924	SSL
Thallium	<0.50		0.28	0.50	ug/L		10/07/22 1359	10/14/22 1924	SSL
Zinc	15		6.2	10	ug/L		10/07/22 1359	10/14/22 1924	SSL
Barium	53		0.30	0.50	ug/L		10/07/22 1359	10/14/22 1924	SSL
Cobalt	<0.50		0.23	0.50	ug/L		10/07/22 1359	10/14/22 1924	SSL
Manganese	67		0.19	0.50	ug/L		10/07/22 1359	10/14/22 1924	SSL

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L2I1199

Client Sample ID:	Outfall 009 (River Intake)		
Sample Matrix:	Wastewater	**Collected By:**	Xavier Bullock
Lab Sample ID:	L2I1199-09	**Collection Date:**	09/30/2022 9:20

Anions by IC	**Result**	**Limit(s)**	**MDL**	**RL**	**Units**	**Note**	**Prepared**	**Analyzed**	**Analyst**
Method: EPA 300.0, Rv. 2.1 (1993)									
Bromide	<0.50		0.017	0.50	mg/L		10/05/22 1810	10/06/22 0424	NWW
Chloride	32		0.018	0.50	mg/L	**B2**	10/05/22 1810	10/06/22 0424	NWW
Fluoride	<0.50		0.045	0.50	mg/L		10/05/22 1810	10/06/22 0424	NWW
Nitrogen, Nitrate + Nitrite	1.1		0.16	0.75	mg/L		10/05/22 1805	10/06/22 0830	NWW
Sulfate	68		0.026	0.50	mg/L	**B2**	10/05/22 1810	10/06/22 0424	NWW

Client Sample ID:	HG LL Blank -Outfall 009 (River Intake)		
Sample Matrix:	Wastewater	**Collected By:**	Xavier Bullock
Lab Sample ID:	L2I1199-10	**Collection Date:**	09/30/2022 9:25

Analyses Performed by: Microbac Laboratories, Inc. - Chicagoland

Metals Total by CVAF	**Result**	**Limit(s)**	**MDL**	**RL**	**Units**	**Note**	**Prepared**	**Analyzed**	**Analyst**
Method: EPA 1631E									
Mercury	<0.500		0.231	0.500	ng/L		10/11/22 1002	10/12/22 1030	JNH

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CERTIFICATE OF ANALYSIS

L2I1199

Client Sample ID:	Outfall 002A Rads Only		
Sample Matrix:	Wastewater	**Collected By:**	Wayne Mills
Lab Sample ID:	L2I1199-11	**Collection Date:**	10/21/2022 9:56

Analyses Performed by: GEL Laboratories, LLC

Radiochemistry	Result	UNC	Limit(s)	MDA	Units	Note	Prepared	Analyzed	Analyst
Method: Calculation									
Radium-226+228 Sum	0.54	+/-0.556		0.54	pCi/L		11/01/22 0000	11/14/22 0000	NXL
Method: EPA 900.0/SW846 9310									
ALPHA	16	+/-3.42		3	pCi/L		11/01/22 0000	11/07/22 0000	KP1
BETA	15	+/-2.57		4	pCi/L		11/01/22 0000	11/07/22 0000	KP1
Method: EPA 903.1 Modified									
Radium-226	0.368	+/-0.254		1	pCi/L		11/01/22 0000	11/13/22 0000	LXP
Method: EPA 904.0/SW846 9320 Modified									
Radium-228	0.172	+/-0.495		1	pCi/L	U	11/01/22 0000	11/07/22 0000	JE1
Method: EPA 905.0 Modified/DOE RP501 Rev. 1 Modified									
Strontium-90	0.264	+/-1.08		2	pCi/L	U	11/01/22 0000	11/04/22 0000	KH1

Uranium	Result	Limit(s)	MDL	RL	Units	Note	Prepared	Analyzed	Analyst
Method: EPA 200.8									
Uranium	0.0195		0.000067	0.0002	mg/L		11/01/22 0000	11/03/22 0000	PRB

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L2I1199

Client Sample ID:	Outfall 025 Rads Only		
Sample Matrix:	Wastewater	**Collected By:**	Wayne Mills
Lab Sample ID:	L2I1199-12	**Collection Date:**	10/21/2022 10:02

Analyses Performed by: GEL Laboratories, LLC

Radiochemistry	Result	UNC	Limit(s)	MDA	Units	Note	Prepared	Analyzed	Analyst
Method: Calculation									
Radium-226+228 Sum	1.28	+/-0.572		1.28	pCi/L		11/01/22 0000	11/14/22 0000	NXL
Method: EPA 900.0/SW846 9310									
ALPHA	6.9	+/-2.22		3	pCi/L		11/01/22 0000	11/07/22 0000	KP1
BETA	6.38	+/-1.58		4	pCi/L		11/01/22 0000	11/07/22 0000	KP1
Method: EPA 903.1 Modified									
Radium-226	1.01	+/-0.319		1	pCi/L		11/01/22 0000	11/13/22 0000	LXP
Method: EPA 904.0/SW846 9320 Modified									
Radium-228	0.279	+/-0.474		1	pCi/L	**U**	11/01/22 0000	11/07/22 0000	JE1
Method: EPA 905.0 Modified/DOE RP501 Rev. 1 Modified									
Strontium-90	0.014	+/-0.55		2	pCi/L	**U**	11/01/22 0000	11/07/22 0000	KH1

Uranium	Result	Limit(s)	MDL	RL	Units	Note	Prepared	Analyzed	Analyst
Method: EPA 200.8									
Uranium	0.0102		0.000067	0.0002	mg/L		11/01/22 0000	11/03/22 0000	PRB

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CERTIFICATE OF ANALYSIS

L2I1199

Client Sample ID:	Outfall 009 Rads Only		
Sample Matrix:	Wastewater	**Collected By:**	Wayne Mills
Lab Sample ID:	L2I1199-13	**Collection Date:**	10/21/2022 9:47

Analyses Performed by: GEL Laboratories, LLC

Radiochemistry	Result	UNC	Limit(s)	MDA	Units	Note	Prepared	Analyzed	Analyst
Method: Calculation									
Radium-226+228 Sum	0.769	+/-0.388		0.769	pCi/L		11/01/22 0000	11/14/22 0000	NXL
Method: EPA 900.0/SW846 9310									
ALPHA	-0.268	+/-1.07		3	pCi/L	U	11/01/22 0000	11/07/22 0000	KP1
BETA	2.05	+/-1.32		4	pCi/L		11/01/22 0000	11/07/22 0000	KP1
Method: EPA 903.1 Modified									
Radium-226	0.456	+/-0.246		1	pCi/L		11/01/22 0000	11/13/22 0000	LXP
Method: EPA 904.0/SW846 9320 Modified									
Radium-228	0.313	+/-0.3		1	pCi/L	U	11/01/22 0000	11/07/22 0000	JE1
Method: EPA 905.0 Modified/DOE RP501 Rev. 1 Modified									
Strontium-90	1.49	+/-1.13		2	pCi/L	U	11/01/22 0000	11/04/22 0000	KH1

Uranium	Result	Limit(s)	MDL	RL	Units	Note	Prepared	Analyzed	Analyst
Method: EPA 200.8									
Uranium	0.000414		0.000067	0.0002	mg/L		11/01/22 0000	11/03/22 0000	PRB

Client Sample ID:	HG LL Sample -Outfall 009 (River Intake)		
Sample Matrix:	Wastewater	**Collected By:**	Wayne Mills
Lab Sample ID:	L2I1199-14	**Collection Date:**	10/21/2022 9:45

Analyses Performed by: Microbac Laboratories, Inc. - Chicagoland

Metals Total by CVAF	Result	Limit(s)	MDL	RL	Units	Note	Prepared	Analyzed	Analyst
Method: EPA 1631E									
Mercury	<5.00		2.31	5.00	ng/L		10/28/22 1520	10/31/22 1107	JNH

*Results in **bold** have exceeded a limit defined for this project. Limits are provided for reference but as regulatory limits change frequently, Microbac Laboratories, Inc. advises the recipient of this report to confirm such limits and units of concentration with the appropriate Federal, state or local authorities before acting on the data.*

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CERTIFICATE OF ANALYSIS

L2I1199

Definitions

°C:	Degrees Celsius
A7:	Insufficient sample.
B:	Analyte found in the blank at or above the method acceptance criteria.
B2:	The analyte value in the Method Blank is between the MDL and the Reporting Limit.
CU:	Color Unit
H1:	Sample received outside of holding time for these analytes.
H2:	Initial analysis was within holding time. Reanalysis was past holding time.
M1a:	Matrix Spike recovery outside Control Limits due to sample matrix interference; biased high.
MDL:	Minimum Detection Limit
mg/L:	Milligrams per Liter
MGD:	Millions Of Gallons per Day
MPN/100mL	Most Probable Number per 100 Milliliters
ng/L:	Nanograms per Liter
pCi/L:	Picocuries per Liter
Q:	One or more quality control criteria failed.
Q10:	Analysis of acrolein and/or acrylonitrile was performed from a sample that was field preserved to pH < 2, which is less than the pH range of 4-5 specified in the test method and required for NPDES compliance per 40CFR Part 136.
Q11:	Analysis of 2-chloroethyl vinyl ether was performed from a sample that was field preserved to pH < 2 with HCl. Acid preservation is not allowed for this parameter by the test method or for NPDES compliance per 40CFR Part 136.
Q2:	LCS recovery is above acceptance limits. However there is no impact on the reported value.
Q3:	LCS recovery is below acceptance limits. The reported value is estimated.
Q8:	CCV recovery is below acceptance limits. The reported value is estimated.
RL:	Reporting Limit
S.U.:	Standard Units
S2:	Surrogate recovery is below acceptance limits.
U:	Result not detected above the detection limit
ug/L:	Micrograms per Liter
ug/mL:	Micrograms per Milliliter
Y:	This analyte is not on the laboratory's current scope of accreditation.

Cooler Receipt Log

Cooler ID: Default Cooler Temp: 1.8°C

Cooler Inspection Checklist

Ice Present or not required?	Yes	Shipping containers sealed or not required?	Yes
Custody seals intact or not required?	Yes	Chain of Custody (COC) Present?	Yes
COC includes customer information?	Yes	Relinquished and received signature on COC?	Yes
Sample collector identified on COC?	Yes	Sample type identified on COC?	Yes
Correct type of Containers Received	Yes	Correct number of containers listed on COC?	Yes
Containers Intact?	Yes	COC includes requested analyses?	Yes
Enough sample volume for indicated tests received?	Yes	Sample labels match COC (Name, Date & Time?)	Yes
Samples arrived within hold time?	Yes	Correct preservatives on COC or not required?	Yes
Chemical preservations checked or not required?	Yes	Preservation checks meet method requirements?	Yes
VOA vials have zero headspace, or not recd.?	Yes		

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Microbac Laboratories, Inc., Louisville

CERTIFICATE OF ANALYSIS

L2I1199

Project Requested Certification(s)

Microbac Laboratories, Inc. - Chicagoland

410.10	A2LA ISO/IEC 17025 Env.Testing
E-10397	Kansas Dept Health & Env. NELAP
90147	Kentucky Drinking Water Laboratory Certification Program
108202	Kentucky UST-Energy and Environment Cabinet
90147	Kentucky Wastewater Laboratory Certification Program

Report Comments

Samples were received in proper condition and the reported results conform to applicable accreditation standard unless otherwise noted.

The data and information on this, and other accompanying documents, represents only the sample(s) analyzed. This report is incomplete unless all pages indicated in the footnote are present and an authorized signature is included. ***The services were provided under and subject to Microbac's standard terms and conditions which can be located and reviewed at <https://www.microbac.com/standard-terms-conditions>.***

Reviewed and Approved By:

JOAN HEINSOHN
Customer Relationship Specialist
Reported: 11/15/2022 11:24

MICROBAC®

Lab Contact: JOAN HEINSOHN

Chain of Custody

Microbac Laboratories, Inc., Louisville

L2I1199

TAT 7 days

LG&E - KU ENERGY LLC.

Michael O'Guin
820 West Broadway
Louisville, KY 40202
Phone: 5024498815
michael.o'guin@lge-ku.com

Project Name: Form C - KPDES Renewal - Mill Creek

Project/PO Number: 1104203
Tenatively Scheduled: 9/29/2022
Route: PAD - Specified Date

Client Sample ID: **Outfall 001**

Lab Sample ID: **L2I1199-01**

Matrix: **Wastewater**

Type: **Grab**

Sampled Date & Time: N/A

Analysis	Method	Field Results/Comments	Hold Time
~~1631E Hg~~	EPA 1631E		14 days
200.7 Hardness CALC PKG	varies		180 days
200.8 Ag	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Al	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 As	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 B	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Ba	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Be	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Cd	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Co	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Cr	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Cu	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Fe	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Mn	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Mo	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Ni	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Pb	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Sb	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Se	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Sn	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Ti	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Tl	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 U	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Zn	EPA 200.8, Rv. 5.4 (1994)		180 days
BOD5 SM5210-B	SM 5210 B-2011		2 days
Bromide E300.0	EPA 300.0, Rv. 2.1 (1993)		28 days
~~Chloride E300.0~~	EPA 300.0, Rv. 2.1 (1993)		28 days
CHLORINE, TOTAL RESIDUAL-FIELD	HACH 8167	Instrument: ________ Result: ________ Unit: ________	
CN Total SM4500-CN-E	SM 4500-CN⁻ E-2011		14 days
COD SM5220-D	SM 5220 D-2011		28 days

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Lab Contact: JOAN HEINSOHN

Work Order Number

L2I1199

LG&E - KU ENERGY LLC.

Michael O'Guin
820 West Broadway
Louisville, KY 40202
Phone: 5024498815
michael.o'guin@lge-ku.com

Project Name: Form C - KPDES Renewal - Mill Creek

Project/PO Number: 1104203
Tenatively Scheduled: 9/29/2022
Route: PAD - Specified Date

~~Color True pH SM2120-B PKG~~	varies		2 days
E coli MPN 18hr SM9223B-Colilert	SM 9223 B (Colilert-18)-19		8 hrs
FLOW BY MEASUREMENT & CALC. - MGD	NA	Instrument: ________ Result: ________ Unit: ________	
Fluoride E300.0	EPA 300.0, Rv. 2.1 (1993)		28 days
GROSS ALPHA	*** DEFAULT SPECIFIC MI		180 days
GROSS BETA	*** DEFAULT SPECIFIC MI		180 days
HEM-OG E1664B	EPA 1664B		28 days
HOLD - SEE JOAN	NA	Change hourly labor $	365 days
MBAS SM5540-C	SM 5540 C-2011		2 days
Nitrate Nitrite E300.0 CALC	EPA 300.0, Rv. 2.1 (1993)		28 days
Nitrogen Organic E351.2 SM4500-NH3 G CALC PKG	varies		28 days
PH, FIELD	SM 4500-H+ B-2011	Instrument: ________ Result: ________ Unit: ________	
Phenolics E420.4	EPA 420.4, Rv. 1 (1993)		28 days
Phos Total E365.1	EPA 365.1, Rv. 2 (1993)		28 days
RADIUM 226	*** DEFAULT SPECIFIC MI		180 days
RADIUM 228	*** DEFAULT SPECIFIC MI		180 days
Strontium-90 E905.0	*** DEFAULT SPECIFIC MI		365 days
Sulfate SO4 E300.0	EPA 300.0, Rv. 2.1 (1993)		28 days
Sulfide S2 SM4500-S2-D	SM 4500-S2¯ D-2011		7 days
Sulfite SO3 SM4500-SO3-B	SM 4500-SO3¯ B-2011		0.00 mins
SVOC - 625	EPA 625		7 days
TEMPERATURE AT PH READING, ° C - FIELD	SM 2550 B-2010	Instrument: ________ Result: ________ Unit: ________	
TOC SM5310-C	SM 5310 C-2011		28 days
TSS USGS I-3765	USGS I-3765-85		7 days
VOC - 624	EPA 624.1		14 days

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LG&E - KU ENERGY LLC.

Michael O'Guin
820 West Broadway
Louisville, KY 40202
Phone: 5024498815
michael.o'guin@lge-ku.com

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Container(s)	Designator	Container(s)	Designator
1L-Bottle HDPE	A	300ml-DO Bottle	B
1L-Bottle Glass Amber	C	1L-Bottle Glass Amber	D
500ml-Bottle NM Glass Amber-Ultra C	E	1L-Bottle HDPE-HNO3	F
1L-Bottle HDPE-HNO3	G	1L-Bottle HDPE-HNO3	H
1L-Bottle HDPE-HNO3	I	1L-Bottle HDPE-HNO3	J
250ml-Bottle HDPE-HNO3	K	250ml-Bottle HDPE-HNO3	L
250ml-Bottle Glass Amber-H2SO4	M	1L-Bottle Glass Amber-H2SO4	N
250ml-Bottle HDPE-H2SO4	O	40ml-Vial Amber-H2SO4	P
40ml-Vial Amber-H2SO4	Q	120ml-Bottle LDPE-Sterile, Na2S2O3	R
40ml-Vial-HCL	S	40ml-Vial-HCL	T
40ml-Vial-HCL	U	40ml-Vial-HCL	V
250ml-Bottle HDPE-NaOH	W	250ml-Bottle HDPE-ZnAc NaOH	X

Client Sample ID: **HG LL Blank -Outfall 001**
Lab Sample ID: **L2I1199-02**
Matrix: **Wastewater**
Sampled Date & Time: N/A
Type: **Grab**

Analysis	Method	Field Results/Comments	Hold Time
1631E Hg	EPA 1631E		14 days

Container(s)	Designator	Container(s)	Designator
500ml-Bottle NM Glass Amber-Ultra C	A		

Client Sample ID: **Outfall 002A**
Lab Sample ID: **L2I1199-03**
Matrix: **Wastewater**
Sampled Date & Time: 9-30-22 9:35
Type: **Grab**

Analysis	Method	Field Results/Comments	Hold Time
1631E Hg	EPA 1631E		14 days
200.7 Hardness CALC PKG	varies		180 days
200.8 Ag	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Al	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 As	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 B	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Ba	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Be	EPA 200.8, Rv. 5.4 (1994)		180 days

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LG&E - KU ENERGY LLC.

Michael O'Guin
820 West Broadway
Louisville, KY 40202
Phone: 5024498815
michael.o'guin@lge-ku.com

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200.8 Cd	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Co	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Cr	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Cu	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Fe	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Mn	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Mo	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Ni	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Pb	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Sb	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Se	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Sn	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Ti	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Tl	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 U	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Zn	EPA 200.8, Rv. 5.4 (1994)		180 days
BOD5 SM5210-B	SM 5210 B-2011		2 days
Bromide E300.0	EPA 300.0, Rv. 2.1 (1993)		28 days
Chloride E300.0	EPA 300.0, Rv. 2.1 (1993)		28 days
CHLORINE, TOTAL RESIDUAL-FIELD	HACH 8167	Instrument: Cl-23 Result: 0.08 Unit: mg/L	
CN Total SM4500-CN-E	SM 4500-CN⁻ E-2011		14 days
COD SM5220-D	SM 5220 D-2011		28 days
Color True pH SM2120-B PKG	varies		2 days
E coli MPN 18hr SM9223B-Colilert	SM 9223 B (Colilert-18)-19!		8 hrs
FLOW BY MEASUREMENT & CALC. - MGD	NA	Instrument: Client Result: 7.79 Unit: MGD	
Fluoride E300.0	EPA 300.0, Rv. 2.1 (1993)		28 days
GROSS ALPHA	*** DEFAULT SPECIFIC MI		180 days
GROSS BETA	*** DEFAULT SPECIFIC MI		180 days
HEM-OG E1664B	EPA 1664B		28 days
HOLD - SEE JOAN	NA	Change hourly labor $	365 days
MBAS SM5540-C	SM 5540 C-2011		2 days
Nitrate Nitrite E300.0 CALC	EPA 300.0, Rv. 2.1 (1993)		28 days
Nitrogen Organic E351.2 SM4500-NH3 G CALC PKG	varies		28 days
PH, FIELD	SM 4500-H+ B-2011	Instrument: P-99 Result: 7.48 Unit: SU	
Phenolics E420.4	EPA 420.4, Rv. 1 (1993)		28 days
Phos Total E365.1	EPA 365.1, Rv. 2 (1993)		28 days

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LG&E - KU ENERGY LLC.

Michael O'Guin
820 West Broadway
Louisville, KY 40202
Phone: 5024498815
michael.o'guin@lge-ku.com

Project Name: Form C - KPDES Renewal - Mill Creek

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RADIUM 226	*** DEFAULT SPECIFIC MI		180 days
RADIUM 228	*** DEFAULT SPECIFIC MI		180 days
Strontium-90 E905.0	*** DEFAULT SPECIFIC MI		365 days
Sulfate SO4 E300.0	EPA 300.0, Rv. 2.1 (1993)		28 days
Sulfide S2 SM4500-S2-D	SM 4500-S2⁻ D-2011		7 days
Sulfite SO3 SM4500-SO3-B	SM 4500-SO3⁻ B-2011		0.00 mins
SVOC - 625	EPA 625		7 days
TEMPERATURE AT PH READING, ° C - FIELD	SM 2550 B-2010	Instrument: P-99 Result: 18.0 Unit: °C	
TOC SM5310-C	SM 5310 C-2011		28 days
TSS USGS I-3765	USGS I-3765-85		7 days
VOC - 624	EPA 624.1		14 days

Container(s)	Designator	Container(s)	Designator
1L-Bottle HDPE	A	1L-Bottle Glass Amber	B
300ml-DO Bottle	C	1L-Bottle Glass Amber	D
500ml-Bottle NM Glass Amber-Ultra C	E	1L-Bottle HDPE-HNO3	F
1L-Bottle HDPE-HNO3	G	1L-Bottle HDPE-HNO3	H
1L-Bottle HDPE-HNO3	I	1L-Bottle HDPE-HNO3	J
250ml-Bottle HDPE-HNO3	K	250ml-Bottle HDPE-HNO3	L
250ml-Bottle Glass Amber-H2SO4	M	1L-Bottle Glass Amber-H2SO4	N
250ml-Bottle HDPE-H2SO4	O	40ml-Vial Amber-H2SO4	P
40ml-Vial Amber-H2SO4	Q	120ml-Bottle LDPE-Sterile, Na2S2O3	R
40ml-Vial-HCL	S	40ml-Vial-HCL	T
40ml-Vial-HCL	U	40ml-Vial-HCL	V
250ml-Bottle HDPE-NaOH	W	250ml-Bottle HDPE-ZnAc NaOH	X

Client Sample ID: **HG LL Blank -Outfall 002A**

Lab Sample ID: **L2I1199-04**

Matrix: **Wastewater**

Type: **Grab**

Sampled Date & Time: 9-30-22 9:40

Analysis	Method	Field Results/Comments	Hold Time
1631E Hg	EPA 1631E		14 days

Container(s)	Designator	Container(s)	Designator
500ml-Bottle NM Glass Amber-Ultra C	A		

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LG&E - KU ENERGY LLC.

Michael O'Guin
820 West Broadway
Louisville, KY 40202
Phone: 5024498815
michael.o'guin@lge-ku.com

Project Name: Form C - KPDES Renewal - Mill Creek

Project/PO Number: 1104203
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Route: PAD - Specified Date

Client Sample ID: **Outfall 023**
Lab Sample ID: **L2I1199-05**
Matrix: **Wastewater**
Type: **Grab**

Sampled Date & Time: N/A

Analysis	Method	Field Results/Comments	Hold Time
1631E Hg	EPA 1631E		14 days
200.7 Hardness CALC PKG	varies		180 days
200.8 Ag	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Al	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 As	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 B	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Ba	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Be	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Cd	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Co	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Cr	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Cu	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Fe	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Mn	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Mo	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Ni	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Pb	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Sb	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Se	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Sn	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Ti	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Tl	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 U	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Zn	EPA 200.8, Rv. 5.4 (1994)		180 days
BOD5 SM5210-B	SM 5210 B-2011		2 days
Bromide E300.0	EPA 300.0, Rv. 2.1 (1993)		28 days
Chloride E300.0	EPA 300.0, Rv. 2.1 (1993)		28 days
CHLORINE, TOTAL RESIDUAL-FIELD	HACH 8167	Instrument:______ Result:______ Unit:______	
CN Total SM4500-CN-E	SM 4500-CN⁻ E-2011		14 days
COD SM5220-D	SM 5220 D-2011		28 days

Lab Contact: JOAN HEINSOHN

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Microbac Laboratories, Inc., Louisville

LG&E - KU ENERGY LLC.

Michael O'Guin
820 West Broadway
Louisville, KY 40202
Phone: 5024498815
michael.o'guin@lge-ku.com

Project Name: Form C - KPDES Renewal - Mill Creek

Project/PO Number: 1104203
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Color True pH SM2120-B PKG	varies		2 days
E coli MPN 18hr SM9223B-Colilert	SM 9223 B (Colilert-18)-19		8 hrs
FLOW BY MEASUREMENT & CALC. - MGD	NA	Instrument: ________ Result: ________ Unit:________	
Fluoride E300.0	EPA 300.0, Rv. 2.1 (1993)		28 days
GROSS ALPHA	*** DEFAULT SPECIFIC MI		180 days
GROSS BETA	*** DEFAULT SPECIFIC MI		180 days
HEM-OG E1664B	EPA 1664B		28 days
HOLD - SEE JOAN	NA	Change hourly labor $	365 days
MBAS SM5540-C	SM 5540 C-2011		2 days
Nitrate Nitrite E300.0 CALC	EPA 300.0, Rv. 2.1 (1993)		28 days
Nitrogen Organic E351.2 SM4500-NH3 G CALC PKG	varies		28 days
PH, FIELD	SM 4500-H+ B-2011	Instrument: ________ Result: ________ Unit:________	
Phenolics E420.4	EPA 420.4, Rv. 1 (1993)		28 days
Phos Total E365.1	EPA 365.1, Rv. 2 (1993)		28 days
RADIUM 226	*** DEFAULT SPECIFIC MI		180 days
RADIUM 228	*** DEFAULT SPECIFIC MI		180 days
Strontium-90 E905.0	*** DEFAULT SPECIFIC MI		365 days
Sulfate SO4 E300.0	EPA 300.0, Rv. 2.1 (1993)		28 days
Sulfide S2 SM4500-S2-D	SM 4500-S2¯ D-2011		7 days
Sulfite SO3 SM4500-SO3-B	SM 4500-SO3¯ B-2011		0.00 mins
SVOC - 625	EPA 625		7 days
TEMPERATURE AT PH READING, ° C - FIELD	SM 2550 B-2010	Instrument: ________ Result: ________ Unit:________	
TOC SM5310-C	SM 5310 C-2011		28 days
TSS USGS I-3765	USGS I-3765-85		7 days
VOC - 624	EPA 624.1		14 days

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Microbac Laboratories, Inc., Louisville

LG&E - KU ENERGY LLC.

Michael O'Guin
820 West Broadway
Louisville, KY 40202
Phone: 5024498815
michael.o'guin@lge-ku.com

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Project/PO Number: 1104203
Tenatively Scheduled: 9/29/2022
Route: PAD - Specified Date

Container(s)	Designator	Container(s)	Designator
1L-Bottle HDPE	A	1L-Bottle Glass Amber	B
1L-Bottle Glass Amber	C	300ml-DO Bottle	D
500ml-Bottle NM Glass Amber-Ultra C	E	1L-Bottle HDPE-HNO3	F
1L-Bottle HDPE-HNO3	G	1L-Bottle HDPE-HNO3	H
1L-Bottle HDPE-HNO3	I	1L-Bottle HDPE-HNO3	J
250ml-Bottle HDPE-HNO3	K	250ml-Bottle HDPE-HNO3	L
250ml-Bottle Glass Amber-H2SO4	M	1L-Bottle Glass Amber-H2SO4	N
250ml-Bottle HDPE-H2SO4	O	40ml-Vial Amber-H2SO4	P
40ml-Vial Amber-H2SO4	Q	120ml-Bottle LDPE-Sterile, Na2S2O3	R
40ml-Vial-HCL	S	40ml-Vial-HCL	T
40ml-Vial-HCL	U	40ml-Vial-HCL	V
250ml-Bottle HDPE-NaOH	W	250ml-Bottle HDPE-ZnAc NaOH	X

Client Sample ID: LL HG Blank -Outfall 023

Lab Sample ID: L2I1199-06

Matrix: Wastewater

Type: Grab

Sampled Date & Time: N/A

Analysis	Method	Field Results/Comments	Hold Time
1631E Hg	EPA 1631E		14 days

Container(s)	Designator	Container(s)	Designator
500ml-Bottle NM Glass Amber-Ultra C	A		

Client Sample ID: Outfall 025

Lab Sample ID: L2I1199-07

Matrix: Wastewater

Type: Grab

Sampled Date & Time: 9-30-22 9:55

Analysis	Method	Field Results/Comments	Hold Time
1631E Hg	EPA 1631E		14 days
200.7 Hardness CALC PKG	varies		180 days
200.8 Ag	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Al	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 As	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 B	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Ba	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Be	EPA 200.8, Rv. 5.4 (1994)		180 days

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Microbac Laboratories, Inc., Louisville

LG&E - KU ENERGY LLC.

Michael O'Guin
820 West Broadway
Louisville, KY 40202
Phone: 5024498815
michael.o'guin@lge-ku.com

Project Name: Form C - KPDES Renewal - Mill Creek

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200.8 Cd	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Co	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Cr	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Cu	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Fe	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Mn	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Mo	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Ni	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Pb	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Sb	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Se	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Sn	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Ti	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Tl	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 U	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Zn	EPA 200.8, Rv. 5.4 (1994)		180 days
BOD5 SM5210-B	SM 5210 B-2011		2 days
Bromide E300.0	EPA 300.0, Rv. 2.1 (1993)		28 days
Chloride E300.0	EPA 300.0, Rv. 2.1 (1993)		28 days
CHLORINE, TOTAL RESIDUAL-FIELD	HACH 8167	Instrument: Cl-23 Result: 0.02 Unit: mg/L	
CN Total SM4500-CN-E	SM 4500-CN⁻ E-2011		14 days
COD SM5220-D	SM 5220 D-2011		28 days
Color True pH SM2120-B PKG	varies		2 days
E coli MPN 18hr SM9223B-Colilert	SM 9223 B (Colilert-18)-19		8 hrs
FLOW BY MEASUREMENT & CALC. - MGD	NA	Instrument: Client Result: 8.34 Unit: MGD	
Fluoride E300.0	EPA 300.0, Rv. 2.1 (1993)		28 days
GROSS ALPHA	*** DEFAULT SPECIFIC MI		180 days
GROSS BETA	*** DEFAULT SPECIFIC MI		180 days
HEM-OG E1664B	EPA 1664B		28 days
HOLD - SEE JOAN	NA	Change hourly labor $	365 days
MBAS SM5540-C	SM 5540 C-2011		2 days
Nitrate Nitrite E300.0 CALC	EPA 300.0, Rv. 2.1 (1993)		28 days
Nitrogen Organic E351.2 SM4500-NH3 G CALC PKG	varies		28 days
PH, FIELD	SM 4500-H+ B-2011	Instrument: P-99 Result: 8.05 Unit: SU	
Phenolics E420.4	EPA 420.4, Rv. 1 (1993)		28 days
Phos Total E365.1	EPA 365.1, Rv. 2 (1993)		28 days

Lab Contact: JOAN HEINSOHN

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LG&E - KU ENERGY LLC.

Michael O'Guin
820 West Broadway
Louisville, KY 40202
Phone: 5024498815
michael.o'guin@lge-ku.com

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RADIUM 226	*** DEFAULT SPECIFIC MI		180 days
RADIUM 228	*** DEFAULT SPECIFIC MI		180 days
Strontium-90 E905.0	*** DEFAULT SPECIFIC MI		365 days
Sulfate SO4 E300.0	EPA 300.0, Rv. 2.1 (1993)		28 days
Sulfide S2 SM4500-S2-D	SM 4500-S2¯ D-2011		7 days
Sulfite SO3 SM4500-SO3-B	SM 4500-SO3¯ B-2011		0.00 mins
SVOC - 625	EPA 625		7 days
TEMPERATURE AT PH READING, ° C - FIELD	SM 2550 B-2010	Instrument: P-99 Result: 20.1 Unit: °C	
TOC SM5310-C	SM 5310 C-2011		28 days
TSS USGS I-3765	USGS I-3765-85		7 days
VOC - 624	EPA 624.1		14 days

Container(s)	Designator	Container(s)	Designator
1L-Bottle HDPE	A	1L-Bottle Glass Amber	B
1L-Bottle Glass Amber	C	300ml-DO Bottle	D
500ml-Bottle NM Glass Amber-Ultra C	E	1L-Bottle HDPE-HNO3	F
1L-Bottle HDPE-HNO3	G	1L-Bottle HDPE-HNO3	H
1L-Bottle HDPE-HNO3	I	1L-Bottle HDPE-HNO3	J
250ml-Bottle HDPE-HNO3	K	250ml-Bottle HDPE-HNO3	L
250ml-Bottle Glass Amber-H2SO4	M	1L-Bottle Glass Amber-H2SO4	N
250ml-Bottle HDPE-H2SO4	O	40ml-Vial Amber-H2SO4	P
40ml-Vial Amber-H2SO4	Q	120ml-Bottle LDPE-Sterile, Na2S2O3	R
40ml-Vial-HCL	S	40ml-Vial-HCL	T
40ml-Vial-HCL	U	40ml-Vial-HCL	V
250ml-Bottle HDPE-NaOH	W	250ml-Bottle HDPE-ZnAc NaOH	X

Client Sample ID: **LL HG Blank -Outfall 025**

Lab Sample ID: **L2I1199-08**

Matrix: **Wastewater**

Type: **Grab**

Sampled Date & Time: 9-30-22 10:00

Analysis	**Method**	**Field Results/Comments**	**Hold Time**
1631E Hg	EPA 1631E		14 days

Container(s)	Designator	Container(s)	Designator
500ml-Bottle NM Glass Amber-Ultra C	A		

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Lab Contact: JOAN HEINSOHN

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LG&E - KU ENERGY LLC.

Michael O'Guin
820 West Broadway
Louisville, KY 40202
Phone: 5024498815
michael.o'guin@lge-ku.com

Project Name: Form C - KPDES Renewal - Mill Creek

Project/PO Number: 1104203
Tenatively Scheduled: 9/29/2022
Route: PAD - Specified Date

Client Sample ID: **Outfall 009 (River Intake)**
Lab Sample ID: **L2I1199-09**
Matrix: **Wastewater**
Type: **Grab**

Sampled Date & Time: 9-30-22 9:20

Analysis	Method	Field Results/Comments	Hold Time
1631E Hg	EPA 1631E		14 days
200.7 Hardness CALC PKG	varies		180 days
200.8 Ag	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Al	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 As	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 B	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Ba	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Be	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Cd	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Co	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Cr	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Cu	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Fe	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Mn	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Mo	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Ni	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Pb	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Sb	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Se	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Sn	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Ti	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Tl	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 U	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Zn	EPA 200.8, Rv. 5.4 (1994)		180 days
BOD5 SM5210-B	SM 5210 B-2011		2 days
Bromide E300.0	EPA 300.0, Rv. 2.1 (1993)		28 days
Chloride E300.0	EPA 300.0, Rv. 2.1 (1993)		28 days
CHLORINE, TOTAL RESIDUAL-FIELD	HACH 8167	Instrument: Cl-23 Result: 0.03 Unit: mg/L	
CN Total SM4500-CN-E	SM 4500-CN⁻ E-2011		14 days
COD SM5220-D	SM 5220 D-2011		28 days

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LG&E - KU ENERGY LLC.

Michael O'Guin
820 West Broadway
Louisville, KY 40202
Phone: 5024498815
michael.o'guin@lge-ku.com

Project Name: Form C - KPDES Renewal - Mill Creek

Project/PO Number: 1104203
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Route: PAD - Specified Date

Color True pH SM2120-B PKG	varies		2 days
E coli MPN 18hr SM9223B-Colilert	SM 9223 B (Colilert-18)-19!		8 hrs
FLOW BY MEASUREMENT & CALC. - MGD	NA	Instrument: Client Result: 28.8 Unit: MGD	
Fluoride E300.0	EPA 300.0, Rv. 2.1 (1993)		28 days
GROSS ALPHA	*** DEFAULT SPECIFIC MI		180 days
GROSS BETA	*** DEFAULT SPECIFIC MI		180 days
HEM-OG E1664B	EPA 1664B		28 days
HOLD - SEE JOAN	NA	Change hourly labor $	365 days
MBAS SM5540-C	SM 5540 C-2011		2 days
Nitrate Nitrite E300.0 CALC	EPA 300.0, Rv. 2.1 (1993)		28 days
Nitrogen Organic E351.2 SM4500-NH3 G CALC PKG	varies		28 days
PH, FIELD	SM 4500-H+ B-2011	Instrument: P-99 Result: 6.91 Unit: SU	
Phenolics E420.4	EPA 420.4, Rv. 1 (1993)		28 days
Phos Total E365.1	EPA 365.1, Rv. 2 (1993)		28 days
RADIUM 226	*** DEFAULT SPECIFIC MI		180 days
RADIUM 228	*** DEFAULT SPECIFIC MI		180 days
Strontium-90 E905.0	*** DEFAULT SPECIFIC MI		365 days
Sulfate SO4 E300.0	EPA 300.0, Rv. 2.1 (1993)		28 days
Sulfide S2 SM4500-S2-D	SM 4500-S2¯ D-2011		7 days
Sulfite SO3 SM4500-SO3-B	SM 4500-SO3¯ B-2011		0.00 mins
SVOC - 625	EPA 625		7 days
TEMPERATURE AT PH READING, ° C - FIELD	SM 2550 B-2010	Instrument: P-99 Result: 20.6 Unit: °C	
TOC SM5310-C	SM 5310 C-2011		28 days
TSS USGS I-3765	USGS I-3765-85		7 days
VOC - 624	EPA 624.1		14 days

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Michael O'Guin
820 West Broadway
Louisville, KY 40202
Phone: 5024498815
michael.o'guin@lge-ku.com

Project Name: Form C - KPDES Renewal - Mill Creek

Project/PO Number: 1104203
Tenatively Scheduled: 9/29/2022
Route: PAD - Specified Date

Container(s)	Designator	Container(s)	Designator
1L-Bottle HDPE	A	300ml-DO Bottle	B
1L-Bottle Glass Amber	C	1L-Bottle Glass Amber	D
500ml-Bottle NM Glass Amber-Ultra C	E	1L-Bottle HDPE-HNO3	F
1L-Bottle HDPE-HNO3	G	1L-Bottle HDPE-HNO3	H
1L-Bottle HDPE-HNO3	I	1L-Bottle HDPE-HNO3	J
250ml-Bottle HDPE-HNO3	K	250ml-Bottle HDPE-HNO3	L
250ml-Bottle Glass Amber-H2SO4	M	1L-Bottle Glass Amber-H2SO4	N
250ml-Bottle HDPE-H2SO4	O	40ml-Vial Amber-H2SO4	P
40ml-Vial Amber-H2SO4	Q	120ml-Bottle LDPE-Sterile, Na2S2O3	R
40ml-Vial-HCL	S	40ml-Vial-HCL	T
40ml-Vial-HCL	U	40ml-Vial-HCL	V
250ml-Bottle HDPE-NaOH	W	250ml-Bottle HDPE-ZnAc NaOH	X

Client Sample ID: HG LL Blank -Outfall 009 (River Intake)

Lab Sample ID: **L2I1199-10**

Matrix: **Wastewater**

Type: **Grab**

Sampled Date & Time: 9-30-22 9:25

Analysis	Method	Field Results/Comments	Hold Time
1631E Hg	EPA 1631E		14 days

Container(s)	Designator	Container(s)	Designator
500ml-Bottle NM Glass Amber-Ultra C	A		

Sampled/Relinquished by: [signature]	Date/Time: 9-30-22 11:03	Received by: [signature]
Printed Name: Xavier Bullock		Printed Name: Joan Heinsohn
Relinquished by:	Date/Time:	Received by:
Printed Name:		Printed Name:
Relinquished by:	Date/Time:	Received by:
Printed Name:		Printed Name:

As Received at Laboratory: On Ice: Yes / No Temp: 1.8 °C Thermometer ID: L-24 Custody Seal: Yes / No / NA
Total Containers: 75

Microbac Laboratories may be unable to perform a portion of the requested testing in which case we will subcontract the analysis to an appropriately accredited laboratory. By signing this document you are acknowledging that you have been informed by Microbac that testing could be subcontracted and agree with this arrangement.

Notes:

Home Facility: Louisville
icing is per outfall for anlaytical cost. Labor charge per hour will vary based upon time in the field for each facility.
Mercury 1631E cost is for a Sample and a Blank

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Michael O'Guin
820 West Broadway
Louisville, KY 40202
Phone: 5024498815
michael.o'guin@lge-ku.com

Project Name: Form C - KPDES Renewal - Mill Creek

Project/PO Number: 1104203
Tenatively Scheduled: 9/30/2022
Route: PAD - Specified Date

Client Sample ID: **Outfall 001**

Lab Sample ID: **L2I1199-01**

Matrix: **Wastewater**

Sampled Date & Time: 10-21-22 10:18

Type: **Grab**

Analysis	Method	Field Results/Comments	Hold Time
1631E Hg	EPA 1631E		14 days
200.7 Ca	EPA 200.7, Rv. 4.4 (1994)		180 days
200.7 Hardness CALC PKG	varies		180 days
200.7 Mg	EPA 200.7, Rv. 4.4 (1994)		180 days
200.8 Ag	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Al	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 As	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 B	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Ba	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Be	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Cd	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Co	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Cr	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Cu	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Fe	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Mn	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Mo	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Ni	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Pb	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Sb	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Se	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Sn	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Ti	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Tl	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 U	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Zn	EPA 200.8, Rv. 5.4 (1994)		180 days
624.1 VOC	EPA 624.1		14 days
Ammonia SM4500-NH3-G	SM 4500-NH3 G-2011		28 days
BOD5 SM5210-B	SM 5210 B-2011		2 days
Bromide E300.0	EPA 300.0, Rv. 2.1 (1993)		28 days
Chloride E300.0	EPA 300.0, Rv. 2.1 (1993)		28 days

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LG&E - KU ENERGY LLC.

Michael O'Guin
820 West Broadway
Louisville, KY 40202
Phone: 5024498815
michael.o'guin@lge-ku.com

Project Name: Form C - KPDES Renewal - Mill Creek

Project/PO Number: 1104203
Tenatively Scheduled: 9/30/2022
Route: PAD - Specified Date

CN Total SM4500-CN-E	SM 4500-CN¯ E-2011			14 days
COD SM5220-D	SM 5220 D-2011			28 days
Color True pH SM2120-B PKG	varies			2 days
Color True SM2120-B	SM 2120 B-2011			2 days
E coli MPN 18hr SM9223B-Colilert	SM 9223 B (Colilert-18)-19!			8 hrs
Fluoride E300.0	EPA 300.0, Rv. 2.1 (1993)			28 days
GROSS ALPHA	*** DEFAULT SPECIFIC MI			180 days
GROSS BETA	*** DEFAULT SPECIFIC MI			180 days
Hardness Calc. (sub-analysis)	SM 2340 B-2011			180 days
HEM-OG E1664B	EPA 1664B			28 days
MBAS SM5540-C	SM 5540 C-2011			2 days
Nitrate Nitrite E300.0 CALC	EPA 300.0, Rv. 2.1 (1993)			28 days
Nitrogen Organic Analyte for Calc	Calculation			28 days
Nitrogen Organic E351.2 SM4500-NH3 G CALC PKG	varies			28 days
pH for Color SM2120-B	SM 2120 B-2011			2 days
Phenolics E420.4	EPA 420.4, Rv. 1 (1993)			28 days
Phos Total E365.1	EPA 365.1, Rv. 2 (1993)			28 days
RADIUM 226	*** DEFAULT SPECIFIC MI			180 days
RADIUM 228	*** DEFAULT SPECIFIC MI			180 days
Strontium-90 E905.0	*** DEFAULT SPECIFIC MI			365 days
Sulfate SO4 E300.0	EPA 300.0, Rv. 2.1 (1993)			28 days
Sulfide S2 SM4500-S2-D	SM 4500-S2¯ D-2011			7 days
Sulfite SO3 SM4500-SO3-B	SM 4500-SO3¯ B-2011			
SVOC - 625	EPA 625			7 days
TKN E351.2	EPA 351.2, Rv. 2 (1993)			28 days
TOC SM5310-C	SM 5310 C-2011			28 days
TSS USGS I-3765	USGS I-3765-85			7 days
CHLORINE, TOTAL RESIDUAL-FIELD	HACH 8167	Instrument: Cl-23	Result: 0.27	Unit: mg/L
FLOW BY MEASUREMENT & CALC. - MGD	NA	Instrument: Client	Result: 134.8	Unit: MGD
PH, FIELD	SM 4500-H+ B-2011	Instrument: P-99	Result: 7.10	Unit: SU
TEMPERATURE AT PH READING, ° C - FIELD	SM 2550 B-2010	Instrument: P-99	Result: 27.1	Unit: °C

Container(s)	Designator
No Container	A

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Lab Contact: JOAN HEINSOHN

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LG&E - KU ENERGY LLC.

Michael O'Guin
820 West Broadway
Louisville, KY 40202
Phone: 5024498815
michael.o'guin@lge-ku.com

Project Name: Form C - KPDES Renewal - Mill Creek

Project/PO Number: 1104203
Tenatively Scheduled: 9/30/2022
Route: PAD - Specified Date

Client Sample ID: **HG LL Blank -Outfall 001**
Lab Sample ID: **L2I1199-02**
Matrix: **Wastewater**
Type: **Grab**
Sampled Date & Time: 10-21-22 10:26

Analysis	Method	Field Results/Comments	Hold Time
1631E Hg	EPA 1631E		14 days

Container(s)	Designator
No Container	A

Client Sample ID: **Outfall 002A**
Lab Sample ID: **L2I1199-03**
Matrix: **Wastewater**
Type: **Grab**
Sampled Date & Time: ______

Analysis	Method	Field Results/Comments	Hold Time
1631E Hg	EPA 1631E		14 days
200.7 Ca	EPA 200.7, Rv. 4.4 (1994)		180 days
200.7 Hardness CALC PKG	varies		180 days
200.7 Mg	EPA 200.7, Rv. 4.4 (1994)		180 days
200.8 Ag	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Al	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 As	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 B	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Ba	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Be	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Cd	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Co	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Cr	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Cu	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Fe	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Mn	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Mo	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Ni	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Pb	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Sb	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Se	EPA 200.8, Rv. 5.4 (1994)		180 days

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Michael O'Guin
820 West Broadway
Louisville, KY 40202
Phone: 5024498815
michael.o'guin@lge-ku.com

Project Name: Form C - KPDES Renewal - Mill Creek

Project/PO Number: 1104203
Tenatively Scheduled: 9/30/2022
Route: PAD - Specified Date

200.8 Sn	EPA 200.8, Rv. 5.4 (1994)				180 days
200.8 Ti	EPA 200.8, Rv. 5.4 (1994)				180 days
200.8 Tl	EPA 200.8, Rv. 5.4 (1994)				180 days
200.8 Zn	EPA 200.8, Rv. 5.4 (1994)				180 days
624.1 VOC	EPA 624.1				14 days
Ammonia SM4500-NH3-G	SM 4500-NH3 G-2011				28 days
BOD5 SM5210-B	SM 5210 B-2011				2 days
Bromide E300.0	EPA 300.0, Rv. 2.1 (1993)				28 days
Chloride E300.0	EPA 300.0, Rv. 2.1 (1993)				28 days
CN Total SM4500-CN-E	SM 4500-CN⁻ E-2011				14 days
COD SM5220-D	SM 5220 D-2011				28 days
Color True pH SM2120-B PKG	varies				2 days
Color True SM2120-B	SM 2120 B-2011				2 days
E coli MPN 18hr SM9223B-Colilert	SM 9223 B (Colilert-18)-19				8 hrs
Fluoride E300.0	EPA 300.0, Rv. 2.1 (1993)				28 days
Hardness Calc. (sub-analysis)	SM 2340 B-2011				180 days
HEM-OG E1664B	EPA 1664B				28 days
MBAS SM5540-C	SM 5540 C-2011				2 days
Nitrate Nitrite E300.0 CALC	EPA 300.0, Rv. 2.1 (1993)				28 days
Nitrogen Organic Analyte for Calc	Calculation				28 days
Nitrogen Organic E351.2 SM4500-NH3 G CALC PKG	varies				28 days
pH for Color SM2120-B	SM 2120 B-2011				2 days
Phenolics E420.4	EPA 420.4, Rv. 1 (1993)				28 days
Phos Total E365.1	EPA 365.1, Rv. 2 (1993)				28 days
Sulfate SO4 E300.0	EPA 300.0, Rv. 2.1 (1993)				28 days
Sulfide S2 SM4500-S2-D	SM 4500-S2⁻ D-2011				7 days
Sulfite SO3 SM4500-SO3-B	SM 4500-SO3⁻ B-2011				0.00 mins
SVOC - 625	EPA 625				7 days
TKN E351.2	EPA 351.2, Rv. 2 (1993)				28 days
TOC SM5310-C	SM 5310 C-2011				28 days
TSS USGS I-3765	USGS I-3765-85				7 days
CHLORINE, TOTAL RESIDUAL-FIELD	HACH 8167	Instrument: ________	Result: ________	Unit: ______	
FLOW BY MEASUREMENT & CALC. - MGD	NA	Instrument: ________	Result: ________	Unit: ______	
PH, FIELD	SM 4500-H+ B-2011	Instrument: ________	Result: ________	Unit: ______	
TEMPERATURE AT PH READING, °C - FIELD	SM 2550 B-2010	Instrument: ________	Result: ________	Unit: ______	

Lab Contact: JOAN HEINSOHN

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LG&E - KU ENERGY LLC.

Michael O'Guin
820 West Broadway
Louisville, KY 40202
Phone: 5024498815
michael.o'guin@lge-ku.com

Project Name: Form C - KPDES Renewal - Mill Creek

Project/PO Number: 1104203
Tenatively Scheduled: 9/30/2022
Route: PAD - Specified Date

Container(s)	Designator
1L-Bottle HDPE	A
1L-Bottle Glass Amber	B
300ml-DO Bottle	C
1L-Bottle Glass Amber	D
500ml-Bottle NM Glass Amber-Ultra Clean	E
250ml-Bottle HDPE-HNO3	F
250ml-Bottle HDPE-HNO3	G
250ml-Bottle HDPE-HNO3	H
250ml-Bottle HDPE-HNO3	I
250ml-Bottle HDPE-HNO3	J
250ml-Bottle HDPE-HNO3	K
250ml-Bottle HDPE-HNO3	L
250ml-Bottle Glass Amber-H2SO4	M
1L-Bottle Glass Amber-H2SO4	N
250ml-Bottle HDPE-H2SO4	O
40ml-Vial Amber-H2SO4	P
40ml-Vial Amber-H2SO4	Q
120ml-Bottle LDPE-Sterile, Na2S2O3	R
40ml-Vial-HCL	S
40ml-Vial-HCL	T
40ml-Vial-HCL	U
40ml-Vial-HCL	V
250ml-Bottle HDPE-NaOH	W
250ml-Bottle HDPE-ZnAc NaOH	X

Client Sample ID: **HG LL Blank -Outfall 002A**
Lab Sample ID: **L2I1199-04**
Matrix: **Wastewater**
Sampled Date & Time:
Type: **Grab**

Analysis	Method	Field Results/Comments	Hold Time
1631E Hg	EPA 1631E		14 days

Container(s)	Designator
500ml-Bottle NM Glass Amber-Ultra Clean	A

Client Sample ID: **Outfall 023**
Lab Sample ID: **L2I1199-05**
Matrix: **Wastewater**
Sampled Date & Time: 10-21-22 10:38
Type: **Grab**

Lab Contact: JOAN HEINSOHN

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LG&E - KU ENERGY LLC.

Michael O'Guin
820 West Broadway
Louisville, KY 40202
Phone: 5024498815
michael.o'guin@lge-ku.com

Project Name: Form C - KPDES Renewal - Mill Creek

Project/PO Number: 1104203
Tenatively Scheduled: 9/30/2022
Route: PAD - Specified Date

Analysis	Method	Field Results/Comments	Hold Time
1631E Hg	EPA 1631E		14 days
200.7 Ca	EPA 200.7, Rv. 4.4 (1994)		180 days
200.7 Hardness CALC PKG	varies		180 days
200.7 Mg	EPA 200.7, Rv. 4.4 (1994)		180 days
200.8 Ag	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Al	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 As	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 B	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Ba	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Be	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Cd	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Co	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Cr	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Cu	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Fe	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Mn	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Mo	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Ni	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Pb	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Sb	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Se	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Sn	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Ti	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Tl	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 U	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Zn	EPA 200.8, Rv. 5.4 (1994)		180 days
624.1 VOC	EPA 624.1		14 days
Ammonia SM4500-NH3-G	SM 4500-NH3 G-2011		28 days
BOD5 SM5210-B	SM 5210 B-2011		2 days
Bromide E300.0	EPA 300.0, Rv. 2.1 (1993)		28 days
Chloride E300.0	EPA 300.0, Rv. 2.1 (1993)		28 days
CN Total SM4500-CN-E	SM 4500-CN⁻ E-2011		14 days
COD SM5220-D	SM 5220 D-2011		28 days
Color True pH SM2120-B PKG	varies		2 days
Color True SM2120-B	SM 2120 B-2011		2 days
E coli MPN 18hr SM9223B-Collilert	SM 9223 B (Colilert-18)-19		8 hrs

Lab Contact: JOAN HEINSOHN

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LG&E - KU ENERGY LLC.

Michael O'Guin
820 West Broadway
Louisville, KY 40202
Phone: 5024498815
michael.o'guin@lge-ku.com

Project Name: Form C - KPDES Renewal - Mill Creek

Project/PO Number: 1104203
Tenatively Scheduled: 9/30/2022
Route: PAD - Specified Date

Fluoride E300.0	EPA 300.0, Rv. 2.1 (1993)		28 days
GROSS ALPHA	*** DEFAULT SPECIFIC MI		180 days
GROSS BETA	*** DEFAULT SPECIFIC MI		180 days
Hardness Calc. (sub-analysis)	SM 2340 B-2011		180 days
HEM-OG E1664B	EPA 1664B		28 days
MBAS SM5540-C	SM 5540 C-2011		2 days
Nitrate Nitrite E300.0 CALC	EPA 300.0, Rv. 2.1 (1993)		28 days
Nitrogen Organic Analyte for Calc	Calculation		28 days
Nitrogen Organic E351.2 SM4500-NH3 G CALC PKG	varies		28 days
pH for Color SM2120-B	SM 2120 B-2011		2 days
Phenolics E420.4	EPA 420.4, Rv. 1 (1993)		28 days
Phos Total E365.1	EPA 365.1, Rv. 2 (1993)		28 days
RADIUM 226	*** DEFAULT SPECIFIC MI		180 days
RADIUM 228	*** DEFAULT SPECIFIC MI		180 days
Strontium-90 E905.0	*** DEFAULT SPECIFIC MI		365 days
Sulfate SO4 E300.0	EPA 300.0, Rv. 2.1 (1993)		28 days
Sulfide S2 SM4500-S2-D	SM 4500-S2⁻ D-2011		7 days
Sulfite SO3 SM4500-SO3-B	SM 4500-SO3⁻ B-2011		
SVOC - 625	EPA 625		7 days
TKN E351.2	EPA 351.2, Rv. 2 (1993)		28 days
TOC SM5310-C	SM 5310 C-2011		28 days
TSS USGS I-3765	USGS I-3765-85		7 days
CHLORINE, TOTAL RESIDUAL-FIELD	HACH 8167	Instrument: Cl-23 Result: 0.12 Unit: mg/L	
FLOW BY MEASUREMENT & CALC. - MGD	NA	Instrument: client Result: 1.824 Unit: MGD	
PH, FIELD	SM 4500-H+ B-2011	Instrument: P-99 Result: 8.56 Unit: SU	
TEMPERATURE AT PH READING, ° C - FIELD	SM 2550 B-2010	Instrument: P-99 Result: 26.4 Unit: °C	

Container(s)	Designator
No Container	A

Client Sample ID: **LL HG Blank -Outfall 023**

Lab Sample ID: **L2I1199-06**

Matrix: **Wastewater**

Type: **Grab**

Sampled Date & Time: 10-21-22 10:45

Analysis	Method	Field Results/Comments	Hold Time
1631E Hg	EPA 1631E		14 days

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LG&E - KU ENERGY LLC.

Michael O'Guin
820 West Broadway
Louisville, KY 40202
Phone: 5024498815
michael.o'guin@lge-ku.com

Project Name: Form C - KPDES Renewal - Mill Creek

Project/PO Number: 1104203
Tenatively Scheduled: 9/30/2022
Route: PAD - Specified Date

Container(s)	Designator
No Container	A

Client Sample ID: **Outfall 025**

Lab Sample ID: **L2I1199-07**

Matrix: **Wastewater**

Sampled Date & Time: ____________

Type: **Grab**

Analysis	Method	Field Results/Comments	Hold Time
1631E Hg	EPA 1631E		14 days
200.7 Ca	EPA 200.7, Rv. 4.4 (1994)		180 days
200.7 Hardness CALC PKG	varies		180 days
200.7 Mg	EPA 200.7, Rv. 4.4 (1994)		180 days
200.8 Ag	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Al	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 As	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 B	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Ba	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Be	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Cd	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Co	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Cr	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Cu	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Fe	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Mn	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Mo	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Ni	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Pb	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Sb	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Se	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Sn	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Ti	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Tl	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Zn	EPA 200.8, Rv. 5.4 (1994)		180 days
624.1 VOC	EPA 624.1		14 days
Ammonia SM4500-NH3-G	SM 4500-NH3 G-2011		28 days
BOD5 SM5210-B	SM 5210 B-2011		2 days
Bromide E300.0	EPA 300.0, Rv. 2.1 (1993)		28 days

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LG&E - KU ENERGY LLC.

Michael O'Guin
820 West Broadway
Louisville, KY 40202
Phone: 5024498815
michael.o'guin@lge-ku.com

Project Name: Form C - KPDES Renewal - Mill Creek

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Chloride E300.0	EPA 300.0, Rv. 2.1 (1993)				28 days
CN Total SM4500-CN-E	SM 4500-CN⁻ E-2011				14 days
COD SM5220-D	SM 5220 D-2011				28 days
Color True pH SM2120-B PKG	varies				2 days
Color True SM2120-B	SM 2120 B-2011				2 days
E coli MPN 18hr SM9223B-Colilert	SM 9223 B (Colilert-18)-19				8 hrs
Fluoride E300.0	EPA 300.0, Rv. 2.1 (1993)				28 days
Hardness Calc. (sub-analysis)	SM 2340 B-2011				180 days
HEM-OG E1664B	EPA 1664B				28 days
MBAS SM5540-C	SM 5540 C-2011				2 days
Nitrate Nitrite E300.0 CALC	EPA 300.0, Rv. 2.1 (1993)				28 days
Nitrogen Organic Analyte for Calc	Calculation				28 days
Nitrogen Organic E351.2 SM4500-NH3 G CALC PKG	varies				28 days
pH for Color SM2120-B	SM 2120 B-2011				2 days
Phenolics E420.4	EPA 420.4, Rv. 1 (1993)				28 days
Phos Total E365.1	EPA 365.1, Rv. 2 (1993)				28 days
Sulfate SO4 E300.0	EPA 300.0, Rv. 2.1 (1993)				28 days
Sulfide S2 SM4500-S2-D	SM 4500-S2⁻ D-2011				7 days
Sulfite SO3 SM4500-SO3-B	SM 4500-SO3⁻ B-2011				0.00 mins
SVOC - 625	EPA 625				7 days
TKN E351.2	EPA 351.2, Rv. 2 (1993)				28 days
TOC SM5310-C	SM 5310 C-2011				28 days
TSS USGS I-3765	USGS I-3765-85				7 days
CHLORINE, TOTAL RESIDUAL-FIELD	HACH 8167	Instrument: ________	Result: ________	Unit: ______	
FLOW BY MEASUREMENT & CALC. - MGD	NA	Instrument: ________	Result: ________	Unit: ______	
PH, FIELD	SM 4500-H+ B-2011	Instrument: ________	Result: ________	Unit: ______	
TEMPERATURE AT PH READING, ° C - FIELD	SM 2550 B-2010	Instrument: ________	Result: ________	Unit: ______	

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3323 Gilmore Industrial Blvd | Louisville, KY 40213 | 502.962.6400 p | www.microbac.com

Lab Contact: JOAN HEINSOHN

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LG&E - KU ENERGY LLC.

Michael O'Guin
820 West Broadway
Louisville, KY 40202
Phone: 5024498815
michael.o'guin@lge-ku.com

Project Name: Form C - KPDES Renewal - Mill Creek

Project/PO Number: 1104203
Tenatively Scheduled: 9/30/2022
Route: PAD - Specified Date

Container(s)	Designator
1L-Bottle HDPE	A
1L-Bottle Glass Amber	B
1L-Bottle Glass Amber	C
300ml-DO Bottle	D
500ml-Bottle NM Glass Amber-Ultra Clean	E
250ml-Bottle HDPE-HNO3	F
250ml-Bottle HDPE-HNO3	G
250ml-Bottle HDPE-HNO3	H
250ml-Bottle HDPE-HNO3	I
250ml-Bottle HDPE-HNO3	J
250ml-Bottle HDPE-HNO3	K
250ml-Bottle HDPE-HNO3	L
250ml-Bottle Glass Amber-H2SO4	M
1L-Bottle Glass Amber-H2SO4	N
250ml-Bottle HDPE-H2SO4	O
40ml-Vial Amber-H2SO4	P
40ml-Vial Amber-H2SO4	Q
120ml-Bottle LDPE-Sterile, Na2S2O3	R
40ml-Vial-HCL	S
40ml-Vial-HCL	T
40ml-Vial-HCL	U
40ml-Vial-HCL	V
250ml-Bottle HDPE-NaOH	W
250ml-Bottle HDPE-ZnAc NaOH	X

Client Sample ID: LL-HG Blank -Outfall 025
Lab Sample ID: L2I1199-08
Matrix: Wastewater
Type: Grab

Sampled Date & Time: ____________

Analysis	Method	Field Results/Comments	Hold Time
1631E Hg	EPA 1631E		14 days

Container(s)	Designator
500ml-Bottle NM Glass Amber-Ultra Clean	A

Client Sample ID: Outfall 009 (River Intake)
Lab Sample ID: L2I1199-09
Matrix: Wastewater
Type: Grab

Sampled Date & Time: N/A

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LG&E - KU ENERGY LLC.

Michael O'Guin
820 West Broadway
Louisville, KY 40202
Phone: 5024498815
michael.o'guin@lge-ku.com

Project Name: Form C - KPDES Renewal - Mill Creek

Project/PO Number: 1104203
Tenatively Scheduled: 9/30/2022
Route: PAD - Specified Date

Analysis	Method	Field Results/Comments	Hold Time
1631E Hg	EPA 1631E	Cancel - Bottle broke upon arrival from FedEx to CGL	14 days
200.7 Ca	EPA 200.7, Rv. 4.4 (1994)		180 days
200.7 Hardness CALC PKG	varies		180 days
200.7 Mg	EPA 200.7, Rv. 4.4 (1994)		180 days
200.8 Ag	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Al	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 As	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 B	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Ba	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Be	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Cd	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Co	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Cr	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Cu	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Fe	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Mn	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Mo	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Ni	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Pb	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Sb	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Se	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Sn	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Ti	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Tl	EPA 200.8, Rv. 5.4 (1994)		180 days
200.8 Zn	EPA 200.8, Rv. 5.4 (1994)		180 days
624.1 VOC	EPA 624.1		14 days
Ammonia SM4500-NH3-G	SM 4500-NH3 G-2011		28 days
BOD5 SM5210-B	SM 5210 B-2011		2 days
Bromide E300.0	EPA 300.0, Rv. 2.1 (1993)		28 days
Chloride E300.0	EPA 300.0, Rv. 2.1 (1993)		28 days
CN Total SM4500-CN-E	SM 4500-CN⁻ E-2011		14 days
COD SM5220-D	SM 5220 D-2011		28 days
Color True pH SM2120-B PKG	varies		2 days
Color True SM2120-B	SM 2120 B-2011		2 days
~~E coli MPN 18hr SM9223B-Colilert~~	~~SM 9223 B (Colilert-18)-19~~		~~8 hrs~~
Fluoride E300.0	EPA 300.0, Rv. 2.1 (1993)		28 days

Lab Contact: JOAN HEINSOHN

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LG&E - KU ENERGY LLC.

Michael O'Guin
820 West Broadway
Louisville, KY 40202
Phone: 5024498815
michael.o'guin@lge-ku.com

Project Name: Form C - KPDES Renewal - Mill Creek

Project/PO Number: 1104203
Tenatively Scheduled: 9/30/2022
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Hardness Calc. (sub-analysis)	SM 2340 B-2011				180 days
HEM-OG E1664B	EPA 1664B				28 days
MBAS SM5540-C	SM 5540 C-2011				2 days
Nitrate Nitrite E300.0 CALC	EPA 300.0, Rv. 2.1 (1993)				28 days
Nitrogen Organic Analyte for Calc	Calculation				28 days
Nitrogen Organic E351.2 SM4500-NH3 G CALC PKG	varies				28 days
pH for Color SM2120-B	SM 2120 B-2011				2 days
Phenolics E420.4	EPA 420.4, Rv. 1 (1993)				28 days
Phos Total E365.1	EPA 365.1, Rv. 2 (1993)				28 days
Sulfate SO4 E300.0	EPA 300.0, Rv. 2.1 (1993)				28 days
Sulfide S2 SM4500-S2-D	SM 4500-S2¯ D-2011				7 days
Sulfite SO3 SM4500-SO3-B	SM 4500-SO3¯ B-2011				0.00 mins
SVOC - 625	EPA 625				7 days
TKN E351.2	EPA 351.2, Rv. 2 (1993)				28 days
TOC SM5310-C	SM 5310 C-2011				28 days
TSS USGS I-3765	USGS I-3765-85				7 days
CHLORINE, TOTAL RESIDUAL-FIELD	HACH 8167	Instrument: ________	Result: ________	Unit: ________	
FLOW BY MEASUREMENT & CALC. - MGD	NA	Instrument: ________	Result: ________	Unit: ________	
PH, FIELD	SM 4500-H+ B-2011	Instrument: ________	Result: ________	Unit: ________	
TEMPERATURE AT PH READING, ° C - FIELD	SM 2550 B-2010	Instrument: ________	Result: ________	Unit: ________	

Lab Contact: JOAN HEINSOHN

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LG&E - KU ENERGY LLC.

Michael O'Guin
820 West Broadway
Louisville, KY 40202
Phone: 5024498815
michael.o'guin@lge-ku.com

Project Name: Form C - KPDES Renewal - Mill Creek

Project/PO Number: 1104203
Tenatively Scheduled: 9/30/2022
Route: PAD - Specified Date

Container(s)	Designator
1L-Bottle HDPE	A
300ml-DO Bottle	B
1L-Bottle Glass Amber	C
1L-Bottle Glass Amber	D
500ml-Bottle NM Glass Amber-Ultra Clean	E
250ml-Bottle HDPE-HNO3	F
250ml-Bottle HDPE-HNO3	G
250ml-Bottle HDPE-HNO3	H
250ml-Bottle HDPE-HNO3	I
250ml-Bottle HDPE-HNO3	J
250ml-Bottle HDPE-HNO3	K
250ml-Bottle HDPE-HNO3	L
250ml-Bottle Glass Amber-H2SO4	M
1L-Bottle Glass Amber-H2SO4	N
250ml-Bottle HDPE-H2SO4	O
40ml-Vial Amber-H2SO4	P
40ml-Vial Amber-H2SO4	Q
120ml-Bottle LDPE-Sterile, Na2S2O3	R
40ml-Vial-HCL	S
40ml-Vial-HCL	T
40ml-Vial-HCL	U
40ml-Vial-HCL	V
250ml-Bottle HDPE-NaOH	W
250ml-Bottle HDPE-ZnAc NaOH	X

Client Sample ID: **HG LL Blank -Outfall 009 (River Intake)**
Lab Sample ID: **L2I1199-10**
Matrix: **Wastewater**
Type: **Grab**

Sampled Date & Time: ~~10-21-22 9:45~~ N/A

Analysis	Method	Field Results/Comments	Hold Time
1631E Hg	EPA 1631E		14 days

Container(s)	Designator
500ml-Bottle NM Glass Amber-Ultra Clean	A

Client Sample ID: **Outfall 002A Rads Only**
Lab Sample ID: **L2I1199-11**
Matrix: **Wastewater**
Type: **Grab**

Sampled Date & Time: 10-21-22 ~~9:47~~ 9:56
10-21-22 XDB

Lab Contact: JOAN HEINSOHN

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L2I1199

LG&E - KU ENERGY LLC.

Michael O'Guin
820 West Broadway
Louisville, KY 40202
Phone: 5024498815
michael.o'guin@lge-ku.com

Project Name: Form C - KPDES Renewal - Mill Creek

Project/PO Number: 1104203
Tenatively Scheduled: 9/30/2022
Route: PAD - Specified Date

Analysis	Method	Field Results/Comments	Hold Time
200.8 U	EPA 200.8, Rv. 5.4 (1994)		180 days
GROSS ALPHA	*** DEFAULT SPECIFIC MI		180 days
GROSS BETA	*** DEFAULT SPECIFIC MI		180 days
RADIUM 226	*** DEFAULT SPECIFIC MI		180 days
RADIUM 228	*** DEFAULT SPECIFIC MI		180 days
Strontium-90 E905.0	*** DEFAULT SPECIFIC MI		365 days

Container(s)	Designator
1L-Bottle HDPE-HNO3	A
1L-Bottle HDPE-HNO3	B
1L-Bottle HDPE-HNO3	C
1L-Bottle HDPE-HNO3	D
1L-Bottle HDPE-HNO3	E

Client Sample ID: **Outfall 025 Rads Only**
Lab Sample ID: **L2I1199-12**
Matrix: **Wastewater**
Type: **Grab**

Sampled Date & Time: 10-21-22 10:02

Analysis	Method	Field Results/Comments	Hold Time
200.8 U	EPA 200.8, Rv. 5.4 (1994)		180 days
GROSS ALPHA	*** DEFAULT SPECIFIC MI		180 days
GROSS BETA	*** DEFAULT SPECIFIC MI		180 days
RADIUM 226	*** DEFAULT SPECIFIC MI		180 days
RADIUM 228	*** DEFAULT SPECIFIC MI		180 days
Strontium-90 E905.0	*** DEFAULT SPECIFIC MI		365 days

Container(s)	Designator
1L-Bottle HDPE-HNO3	A
1L-Bottle HDPE-HNO3	B
1L-Bottle HDPE-HNO3	C
1L-Bottle HDPE-HNO3	D
1L-Bottle HDPE-HNO3	E

Client Sample ID: **Outfall 009 Rads Only**
Lab Sample ID: **L2I1199-13**
Matrix: **Wastewater**
Type: **Grab**

Sampled Date & Time: 10-21-22 9:47

Lab Contact: JOAN HEINSOHN

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Michael O'Guin
820 West Broadway
Louisville, KY 40202
Phone: 5024498815
michael.o'guin@lge-ku.com

Project Name: Form C - KPDES Renewal - Mill Creek

Project/PO Number: 1104203
Tenatively Scheduled: 9/30/2022
Route: PAD - Specified Date

Analysis	Method	Field Results/Comments	Hold Time
200.8 U	EPA 200.8, Rv. 5.4 (1994)		180 days
GROSS ALPHA	*** DEFAULT SPECIFIC MI		180 days
GROSS BETA	*** DEFAULT SPECIFIC MI		180 days
RADIUM 226	*** DEFAULT SPECIFIC MI		180 days
RADIUM 228	*** DEFAULT SPECIFIC MI		180 days
Strontium-90 E905.0	*** DEFAULT SPECIFIC MI		365 days

Container(s)	Designator
1L-Bottle HDPE-HNO3	A
1L-Bottle HDPE-HNO3	B
1L-Bottle HDPE-HNO3	C
1L-Bottle HDPE-HNO3	D
1L-Bottle HDPE-HNO3	E

Client Sample ID: HG LL Sample -Outfall 009 (River Intake)

Lab Sample ID: **L2I1199-14**

Matrix: **Wastewater**

Type: **Grab**

Sampled Date & Time: 10-21-22 9:45

Analysis	Method	Field Results/Comments	Hold Time
1631E Hg	EPA 1631E		14 days

Container(s)	Designator
500ml-Bottle NM Glass Amber-Ultra Clean	A

Sampled/Relinquished by: [signature]	Date/Time: 10-21-22 12:41	Received by: [signature]
Printed Name: Wayne Mills		Printed Name: Joan Heinsohn
Relinquished by:	Date/Time:	Received by:
Printed Name:		Printed Name:
Relinquished by:	Date/Time:	Received by:
Printed Name:		Printed Name:

As Received at Laboratory: On Ice: Yes / No Temp: 2.4 °C Thermometer ID: L-24A Custody Seal: Yes / No / NA

Total Containers: 91.00

Microbac Laboratories may be unable to perform a portion of the requested testing in which case we will subcontract the analysis to an appropriately accredited laboratory. By signing this document you are acknowledging that you have been informed by Microbac that testing could be subcontracted and agree with this arrangement.

Notes:

Home Facility: Louisville
icing is per outfall for anlaytical cost. Labor charge per hour will vary based upon time in the field for each facility.
Mercury 1631E cost is for a Sample and a Blank. HgLL sample #9 broke in shipping. need to resample.

Outfall	Discharge#	Effluent Characteristic	Report Value	Permit Limit	Unit Code	Units	2021-01	2021-02	2021-03	2021-04	2021-05	2021-06	2021-07	2021-08	2021-09	2021-10	2021-11	2021-12
001	001-1	Temperature	Concentrations - Monthly Average	Report	15	°F	86.9	74.9	51.4	75.9	82.7	77.0	87.4	104.8	97.9	83.2	79.7	72.3
001	001-1	Temperature	Concentrations - Daily Maximum	110	15	°F	95.1	95.4	73.4	84.0	90.9	86.0	107.9	107.8	102.9	100.6	102	90.9
001	001-1	pH	Concentrations - Minimum	6.0	12	SU	7.6	7.7	7.6	7.7	7.6	7.6	7.6	7.7	7.5	7.6	7.7	7.79
001	001-1	pH	Concentrations - Maximum	9.0	12	SU	7.8	7.8	8.1	7.9	7.8	7.7	8.0	7.9	7.7	7.8	7.9	7.92
001	001-1	Hardness (as mg/l CaCO3)	Concentrations - Monthly Average	Report	19	mg/l	200	190	160	160	190	180	200.0	#N/A	#N/A	#N/A	#N/A	#N/A
001	001-1	Hardness (as mg/l CaCO3)	Concentrations - Daily Maximum	Report	19	mg/l	200	190	160	160	190	180	200.0	#N/A	#N/A	#N/A	#N/A	#N/A
001	001-1	Total Recoverable Arsenic	Concentrations - Monthly Average	0.306	19	mg/l	0.003	0.002	0.003	0.001	0.002	0.002	0.001	#N/A	#N/A	#N/A	#N/A	#N/A
001	001-1	Total Recoverable Arsenic	Concentrations - Daily Maximum	0.306	19	mg/l	0.003	0.002	0.003	0.001	0.002	0.002	0.001	#N/A	#N/A	#N/A	#N/A	#N/A
001	001-1	Total Recoverable Iron	Concentrations - Monthly Average	Report	19	mg/l	7.06	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	#N/A
001	001-1	Total Recoverable Iron	Concentrations - Daily Maximum	Report	19	mg/l	7.06	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	#N/A
001	001-1	Total Recoverable Selenium	Concentrations - Monthly Average	0.056	19	mg/l	0.005	0.005	0.005	0.005	0.01	0.01	0.005	NODI-9	NODI-9	NODI-9	NODI-9	#N/A
001	001-1	Total Recoverable Selenium	Concentrations - Daily Maximum	Report	19	mg/l	0.005	0.005	0.005	0.005	0.01	0.01	0.005	NODI-9	NODI-9	NODI-9	NODI-9	#N/A
001	001-1	Total Recoverable Thallium	Concentrations - Monthly Average	0.0085	19	mg/l	0.001	0.001	0.001	0.001	0.002	0.001	0.001	#N/A	#N/A	#N/A	#N/A	#N/A
001	001-1	Total Recoverable Thallium	Concentrations - Daily Maximum	Report	19	mg/l	0.001	0.001	0.001	0.001	0.002	0.001	0.001	#N/A	#N/A	#N/A	#N/A	#N/A
001	001-1	Total Recoverable Beryllium	Concentrations - Monthly Average	0.141	19	mg/l	0.002	0.002	0.003	0.002	0.002	0.002	0.002	#N/A	#N/A	#N/A	#N/A	#N/A
001	001-1	Total Recoverable Beryllium	Concentrations - Daily Maximum	Report	19	mg/l	0.002	0.002	0.003	0.002	0.002	0.002	0.002	#N/A	#N/A	#N/A	#N/A	#N/A
001	001-1	Total Recoverable Boron	Concentrations - Monthly Average	Report	19	mg/l	1.07	0.942	0.448	0.489	0.547	0.472	0.77	#N/A	#N/A	#N/A	#N/A	#N/A
001	001-1	Total Recoverable Boron	Concentrations - Daily Maximum	Report	19	mg/l	1.07	0.942	0.448	0.489	0.547	0.472	0.77	#N/A	#N/A	#N/A	#N/A	#N/A
001	001-1	Total Recoverable Nickel	Concentrations - Monthly Average	0.759	19	mg/l	0.013	0.011	0.011	0.005	0.01	0.01	0.005	#N/A	#N/A	#N/A	#N/A	#N/A
001	001-1	Total Recoverable Nickel	Concentrations - Daily Maximum	0.759	19	mg/l	0.013	0.011	0.011	0.005	0.01	0.01	0.005	#N/A	#N/A	#N/A	#N/A	#N/A
001	001-1	Total Recoverable Silver	Concentrations - Monthly Average	Report	19	mg/l	0.005	0.005	0.005	0.005	0.01	0.005	0.005	#N/A	#N/A	#N/A	#N/A	#N/A
001	001-1	Total Recoverable Silver	Concentrations - Daily Maximum	0.011	19	mg/l	0.005	0.005	0.005	0.005	0.01	0.005	0.005	#N/A	#N/A	#N/A	#N/A	#N/A
001	001-1	Total Recoverable Zinc	Concentrations - Monthly Average	0.194	19	mg/l	0.037	0.022	0.04	0.02	0.022	0.043	0.02	#N/A	#N/A	#N/A	#N/A	#N/A
001	001-1	Total Recoverable Zinc	Concentrations - Daily Maximum	0.194	19	mg/l	0.037	0.022	0.04	0.02	0.022	0.043	0.02	#N/A	#N/A	#N/A	#N/A	#N/A
001	001-1	Total Recoverable Cadmium	Concentrations - Monthly Average	0.004	19	mg/l	0.001	0.001	0.001	0.001	0.002	0.001	0.001	#N/A	#N/A	#N/A	#N/A	#N/A
001	001-1	Total Recoverable Cadmium	Concentrations - Daily Maximum	0.004	19	mg/l	0.001	0.001	0.001	0.001	0.002	0.001	0.001	#N/A	#N/A	#N/A	#N/A	#N/A
001	001-1	Total Recoverable Lead	Concentrations - Monthly Average	0.057	19	mg/l	0.001	0.003	0.008	0.003	0.002	0.001	0.002	#N/A	#N/A	#N/A	#N/A	#N/A
001	001-1	Total Recoverable Lead	Concentrations - Daily Maximum	0.178	19	mg/l	0.001	0.003	0.008	0.003	0.002	0.001	0.002	#N/A	#N/A	#N/A	#N/A	#N/A
001	001-1	Total Recoverable Chromium	Concentrations - Monthly Average	3.53	19	mg/l	0.008	0.011	0.006	0.003	0.002	0.002	0.002	#N/A	#N/A	#N/A	#N/A	#N/A
001	001-1	Total Recoverable Chromium	Concentrations - Daily Maximum	Report	19	mg/l	0.008	0.011	0.006	0.003	0.002	0.002	0.002	#N/A	#N/A	#N/A	#N/A	#N/A
001	001-1	Total Recoverable Copper	Concentrations - Monthly Average	0.024	19	mg/l	0.024	0.018	0.013	0.009	0.007	0.009	0.012	#N/A	#N/A	#N/A	#N/A	#N/A
001	001-1	Total Recoverable Copper	Concentrations - Daily Maximum	0.024	19	mg/l	0.024	0.018	0..013	0.009	0.007	0.009	0.012	#N/A	#N/A	#N/A	#N/A	#N/A
001	001-1	Total Recoverable Selenium (Fish Tissue)	Concentrations - Maximum	8.6	69	mg/kg dry wt	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	#N/A
001	001-1	Total Recoverable Antimony	Concentrations - Monthly Average	0.198	19	mg/l	0.005	0.005	0.005	0.005	0.01	0.005	0.005	#N/A	#N/A	#N/A	#N/A	#N/A
001	001-1	Total Recoverable Antimony	Concentrations - Daily Maximum	Report	19	mg/l	0.005	0.005	0.005	0.005	0.01	0.005	0.005	#N/A	#N/A	#N/A	#N/A	#N/A
001	001-1	Total Residual Oxidants	Concentrations - Monthly Average	Report	19	mg/l	0.11	0.1	0.04	0.08	0.09	0.09	0.1	0.1	0.1	0.08	0.07	0.05
001	001-1	Total Residual Oxidants	Concentrations - Daily Maximum	0.2	19	mg/l	0.12	0.12	0.09	0.1	0.1	0.1	0.11	0.1	0.11	0.1	0.08	0.11
001	001-1	Flow	Loadings - Monthly Average	Report	03	MGD	233.5603	210.925	126.23	233.084	224.3181	148.9913	172.7355	231.3981	232.1837	197.7823	203.7903	164.85
001	001-1	Flow	Loadings - Daily Maximum	Report	03	MGD	237.57	236.64	234.56	237.21	240.36	223.08	238.02	233.08	237.89	239.03	241.11	228.38
001	001-1	Total Residual Chlorine	Concentrations - Monthly Average	0.011	19	mg/l	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9
001	001-1	Total Residual Chlorine	Concentrations - Daily Maximum	0.019	19	mg/l	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9
001	001-1	Free Available Chlorine	Concentrations - Monthly Average	0.2	19	mg/l	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9
001	001-1	Free Available Chlorine	Concentrations - Daily Maximum	0.5	19	mg/l	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9
001	001-1	Time of Oxidant Addition	Concentrations - Daily Maximum	120	5B	Min/day	60	60	60	60	60	60	60	60	60	60	60	60
001	001-1	Acute WET	Concentrations - Maximum	1.00	73	TU_A	1.0	1.0	1.0	NODI-9	1.0	1.0	NODI-9	#N/A	#N/A	#N/A	#N/A	#N/A
001	001-1	Total Recoverable Mercury	Concentrations - Monthly Average	0.000051	19	mg/l	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005	NODI-9	NODI-9	NODI-9	#N/A	#N/A
001	001-1	Total Recoverable Mercury	Concentrations - Daily Maximum	0.0014	19	mg/l	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005	NODI-9	NODI-9	NODI-9	#N/A	#N/A
001	001-2	Chronic WET	Concentrations - Maximum	11.84	73	TU_C	#N/A	#N/A	2.962	#N/A	#N/A	2.962	#N/A	#N/A	2.962	#N/A	#N/A	2.962
002	002-1	Total Suspended Solids	Concentrations - Monthly Average	30.0	19	mg/l	18.0	6.0	7.0	12.0	17.0	10.0	6.0	6.0	10.0	6.0	11	26
002	002-1	Total Suspended Solids	Concentrations - Daily Maximum	97.9	19	mg/l	32.0	7.0	8.0	13.0	20.0	12.0	8.0	8.0	14.0	6.0	12	27
002	002-1	Oil & Grease	Concentrations - Monthly Average	14.5	19	mg/l	NODI-B	NODI-B	NODI-B	3.0	NODI-B	NODI-B	NODI-B	NODI-B	NODI-B	NODI-B	NODI-B	NODI-B
002	002-1	Oil & Grease	Concentrations - Daily Maximum	19.3	19	mg/l	NODI-B	NODI-B	NODI-B	5.1	NODI-B	NODI-B	NODI-B	NODI-B	NODI-B	NODI-B	NODI-B	NODI-B
002	002-1	Flow	Loadings - Monthly Average	Report	03	MGD	3.259	4.7447	4.77	3.8929	4.4616	4.4767	3.6206	3.0329	3.7894	6.47033	3.3028	3.39
002	002-1	Flow	Loadings - Daily Maximum	Report	03	MGD	6.18	11.35	6.18	6.18	7.79	4.7	6.18	4.7	9.51	9.51	11.52	11.35
002A	002A-1	pH	Concentrations - Minimum	6.0	12	SU	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C
002A	002A-1	pH	Concentrations - Maximum	9.0	12	SU	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C
002A	002A-1	Total Suspended Solids	Concentrations - Monthly Average	30.0	19	mg/l	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C
002A	002A-1	Total Suspended Solids	Concentrations - Daily Maximum	97.9	19	mg/l	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C
002A	002A-1	Oil & Grease	Concentrations - Monthly Average	14.5	19	mg/l	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C
002A	002A-1	Oil & Grease	Concentrations - Daily Maximum	19.3	19	mg/l	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C
002A	002A-1	Total Recoverable Iron	Concentrations - Monthly Average	Report	19	mg/l	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C
002A	002A-1	Total Recoverable Iron	Concentrations - Daily Maximum	Report	19	mg/l	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C
002A	002A-1	Total Recoverable Selenium	Concentrations - Monthly Average	0.056	19	mg/l	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C
002A	002A-1	Total Recoverable Selenium	Concentrations - Daily Maximum	Report	19	mg/l	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C
002A	002A-1	Total Recoverable Selenium (Fish Tissue)	Concentrations - Maximum	8.6	69	mg/kg dry wt	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C
002A	002A-1	Flow	Loadings - Monthly Average	Report	03	MGD	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C
002A	002A-1	Flow	Loadings - Daily Maximum	Report	03	MGD	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C
002A	002A-1	Total Recoverable Mercury	Concentrations - Monthly Average	0.000051	19	mg/l	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C
002A	002A-1	Total Recoverable Mercury	Concentrations - Daily Maximum	0.0014	19	mg/l	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C
002A	002A-2	Acute WET	Concentrations - Maximum	1.00	73	TU_A	#N/A	#N/A	NODI-9	#N/A	#N/A	NODI-9	#N/A	#N/A	NODI-C	#N/A	#N/A	NODI-C

003	003-1	Total Residual Oxidants	Concentrations - Monthly Average	Report	19	mg/l	0	0	NODI-C	0	0	0	0	NODI-C	NODI-C	0	0	0
003	003-1	Total Residual Oxidants	Concentrations - Daily Maximum	0.2	19	mg/l	0	0	NODI-C	0	0	0	0	NODI-C	NODI-C	0	0	0
003	003-1	Flow	Loadings - Monthly Average	Report	03	MGD	2.1395	1.0167	NODI-C	2.0835	7.17	2.7364	2.81	NODI-C	NODI-C	2.0093	2.2	1.036
003	003-1	Flow	Loadings - Daily Maximum	Report	03	MGD	2.758	2.07	NODI-C	2.92	7.17	5.136	2.94	NODI-C	NODI-C	2.853	3.078	1.309
003	003-1	Total Residual Chlorine	Concentrations - Monthly Average	Report	19	mg/l	NODI-9	NODI-9	NODI-C	NODI-9	NODI-9	NODI-9	NODI-9	NODI-C	NODI-C	NODI-9	NODI-9	NODI-9
003	003-1	Total Residual Chlorine	Concentrations - Daily Maximum	0.2	19	mg/l	NODI-9	NODI-9	NODI-C	NODI-9	NODI-9	NODI-9	NODI-9	NODI-C	NODI-C	NODI-9	NODI-9	NODI-9
003	003-1	Free Available Chlorine	Concentrations - Monthly Average	0.2	19	mg/l	NODI-9	NODI-9	NODI-C	NODI-9	NODI-9	NODI-9	NODI-9	NODI-C	NODI-C	NODI-9	NODI-9	NODI-9
003	003-1	Free Available Chlorine	Concentrations - Daily Maximum	0.5	19	mg/l	NODI-9	NODI-9	NODI-C	NODI-9	NODI-9	NODI-9	NODI-9	NODI-C	NODI-C	NODI-9	NODI-9	NODI-9
003	003-1	Time of Oxidant Addition	Concentrations - Daily Maximum	120	5B	Min/day	0	0	NODI-C	0	0	0	0	NODI-C	NODI-C	0	0	0
003	003-4	Priority Pollutants	Concentrations - Maximum	NDA	73	TU_A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NODI-9
003	003-4	Total Recoverable Chromium	Concentrations - Monthly Average	0.2	19	mg/l	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	0.011
003	003-4	Total Recoverable Chromium	Concentrations - Daily Maximum	0.2	19	mg/l	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	0.011
003	003-4	Total Recoverable Zinc	Concentrations - Monthly Average	1.0	19	mg/l	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	0.067
003	003-4	Total Recoverable Zinc	Concentrations - Daily Maximum	1.0	19	mg/l	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	0.067
004	004-1	Total Residual Oxidants	Concentrations - Monthly Average	Report	19	mg/l	0	0	0	0	0	0	0	0	0	0	NODI-C	0
004	004-1	Total Residual Oxidants	Concentrations - Daily Maximum	0.2	19	mg/l	0	0	0	0	0	0	0	0	0	0	NODI-C	0
004	004-1	Flow	Loadings - Monthly Average	Report	03	MGD	1.1378	1.5208	2.04	0.9622	2.8302	4.2748	5.6375	5.9407	2.8476	7.79	NODI-C	1.12
004	004-1	Flow	Loadings - Daily Maximum	Report	03	MGD	2.9	1.9	4.15	1.7	7.02	7.33	8.08	7.887	5.3	7.79	NODI-C	2.4
004	004-1	Total Residual Chlorine	Concentrations - Monthly Average	Report	19	mg/l	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-C	NODI-9
004	004-1	Total Residual Chlorine	Concentrations - Daily Maximum	0.2	19	mg/l	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-C	NODI-9
004	004-1	Free Available Chlorine	Concentrations - Monthly Average	0.2	19	mg/l	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-C	NODI-9
004	004-1	Free Available Chlorine	Concentrations - Daily Maximum	0.5	19	mg/l	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-C	NODI-9
004	004-1	Time of Oxidant Addition	Concentrations - Daily Maximum	120	5B	Min/day	0	0	0	0	0	0	0	0	0	0	NODI-C	0
004	004-4	Priority Pollutants	Concentrations - Daily Maximum	NDA	73	TU_A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NODI-9
005	005-1	Total Residual Oxidants	Concentrations - Monthly Average	Report	19	mg/l	0	0	0	0	0	0	0	0	0	0	0	0
005	005-1	Total Residual Oxidants	Concentrations - Daily Maximum	0.2	19	mg/l	0	0	0	0	0	0	0	0	0	0	0	0
005	005-1	Flow	Loadings - Monthly Average	Report	03	MGD	1.925	1.975	3.14	3.95	3.9	3.24	3.0	4.1	4.06	3.1667	1.8	1.48
005	005-1	Flow	Loadings - Daily Maximum	Report	03	MGD	3.6	3.7	4.5	4.2	4.2	4.2	3.6	4.3	4.4	4.0	2.5	3.5
005	005-1	Total Residual Chlorine	Concentrations - Monthly Average	Report	19	mg/l	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9
005	005-1	Total Residual Chlorine	Concentrations - Daily Maximum	0.2	19	mg/l	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9
005	005-1	Free Available Chlorine	Concentrations - Monthly Average	0.2	19	mg/l	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9
005	005-1	Free Available Chlorine	Concentrations - Daily Maximum	0.5	19	mg/l	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9
005	005-1	Time of Oxidant Addition	Concentrations - Daily Maximum	120	5B	Min/day	0	0	0	0	0	0	0	0	0	0	0	0
005	005-4	Priority Pollutants	Concentrations - Daily Maximum	NDA	73	TU_A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NODI-9
006	006-1	pH	Concentrations - Minimum	6.0	12	SU	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C
006	006-1	pH	Concentrations - Maximum	9.0	12	SU	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C
006	006-1	Total Copper	Concentrations - Monthly Average	1.0	19	mg/l	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C
006	006-1	Total Copper	Concentrations - Daily Maximum	1.0	19	mg/l	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C
006	006-1	Total Iron	Concentrations - Monthly Average	1.0	19	mg/l	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C
006	006-1	Total Iron	Concentrations - Daily Maximum	1.0	19	mg/l	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C
006	006-1	Flow	Loadings - Monthly Average	Report	03	MGD	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C
006	006-1	Flow	Loadings - Daily Maximum	Report	03	MGD	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C
009	009-1	Temperature	Concentrations - Monthly Average	Report	15	°F	46.2	42.8	53.4	61.7	68.4	74.2	81.6	80.7	80.4	72.9	59.8	51.7
009	009-1	Temperature	Concentrations - Daily Maximum	110	15	°F	49.0	46.4	58.8	65.2	70.7	79.6	85.4	86.4	83.5	77.1	62.2	53.1
009	009-1	Flow	Loadings - Monthly Average	Report	03	MGD	257.2	233.8	173.68	260.8	233.9	182.32	183.4	257.2	257.2	237.4	233.8	214.4
009	009-1	Flow	Loadings - Daily Maximum	Report	03	MGD	257.2	257.2	257.2	271.6	257.6	257.2	259.6	257.2	257.2	257.2	257.2	271.6
009	009-2	Total Recoverable Metals	Concentrations - Monthly Average	Report	19	mg/l	#N/A	#N/A	7.547	#N/A	#N/A	3.6165	#N/A	#N/A	1.671	#N/A	#N/A	0.846
009	009-2	Total Recoverable Metals	Concentrations - Daily Maximum	Report	19	mg/l	#N/A	#N/A	7.547	#N/A	#N/A	3.6165	#N/A	#N/A	1.671	#N/A	#N/A	0.846
012	012-1	Temperature	Concentrations - Monthly Average	Report	15	°F	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	#N/A	#N/A
012	012-1	Temperature	Concentrations - Daily Maximum	110	15	°F	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	#N/A	#N/A
012	012-1	pH	Concentrations - Minimum	6.0	12	SU	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	#N/A	#N/A
012	012-1	pH	Concentrations - Maximum	9.0	12	SU	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	#N/A	#N/A
012	012-1	Total Suspended Solids	Concentrations - Monthly Average	30	19	mg/l	8.0	6.0	10.0	6.0	11.0	10.0	7.0	6.0	9.0	7.0	2.0	6
012	012-1	Total Suspended Solids	Concentrations - Daily Maximum	67	19	mg/l	8.0	6.0	10.0	6.0	11.0	10.0	7.0	6.0	9.0	7.0	2.0	6
012	012-1	Oil & Grease	Concentrations - Monthly Average	9	19	mg/l	NODI-B	NODI-B	NODI-B	NODI-B	NODI-B	NODI-B	NODI-B	NODI-B	NODI-B	NODI-B	NODI-B	NODI-B
012	012-1	Oil & Grease	Concentrations - Daily Maximum	12	19	mg/l	NODI-B	NODI-B	NODI-B	NODI-B	NODI-B	NODI-B	NODI-B	NODI-B	NODI-B	NODI-B	NODI-B	NODI-B
012	012-1	Hardness (as mg/l CaCO3)	Concentrations - Monthly Average	Report	19	mg/l	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	#N/A	#N/A
012	012-1	Hardness (as mg/l CaCO3)	Concentrations - Daily Maximum	Report	19	mg/l	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	#N/A	#N/A
012	012-1	Total Recoverable Selenium	Concentrations - Monthly Average	24.0	19	mg/l	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	#N/A	#N/A
012	012-1	Total Recoverable Selenium	Concentrations - Daily Maximum	Report	19	mg/l	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	#N/A	#N/A
012	012-1	Total Recoverable Copper	Concentrations - Monthly Average	Report	19	mg/l	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	#N/A	#N/A
012	012-1	Total Recoverable Copper	Concentrations - Daily Maximum	Report	19	mg/l	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	#N/A	#N/A
012	012-1	Total Recoverable Selenium (Fish Tissue)	Concentrations - Maximum	8.6	69	mg/kg dry wt	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	#N/A	#N/A
012	012-1	Chloride	Concentrations - Monthly Average	Report	19	mg/l	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	#N/A	#N/A
012	012-1	Chloride	Concentrations - Daily Maximum	Report	19	mg/l	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	#N/A	#N/A
012	012-1	Flow	Loadings - Monthly Average	Report	03	MGD	1.16	1.49	0.91	1.17	2.27	1.29	1.14	0.88	2.07	1.97	0.43	1.88
012	012-1	Flow	Loadings - Daily Maximum	Report	03	MGD	1.16	1.49	0.91	1.17	2.27	1.29	1.14	0.88	2.07	1.97	0.43	1.88
012	012-1	Total Recoverable Mercury	Concentrations - Daily Maximum	0.000051	19	mg/l	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	#N/A	#N/A
012	012-1	Total Recoverable Mercury	Concentrations - Monthly Average	0.000051	19	mg/l	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	#N/A	#N/A
012	012-2	Free Cyanide	Concentrations - Daily Maximum	Report	19	mg/l	#N/A	#N/A	NODI-9	#N/A	#N/A	NODI-9	#N/A	#N/A	NODI-9	#N/A	#N/A	#N/A
012	012-2	Free Cyanide	Concentrations - Monthly Average	Report	19	mg/l	#N/A	#N/A	NODI-9	#N/A	#N/A	NODI-9	#N/A	#N/A	NODI-9	#N/A	#N/A	#N/A
012	012-2	Acute Toxicity	Concentrations - Maximum	1.00	73	TU_A	#N/A	#N/A	NODI-9	#N/A	#N/A	NODI-9	#N/A	#N/A	NODI-9	#N/A	#N/A	#N/A

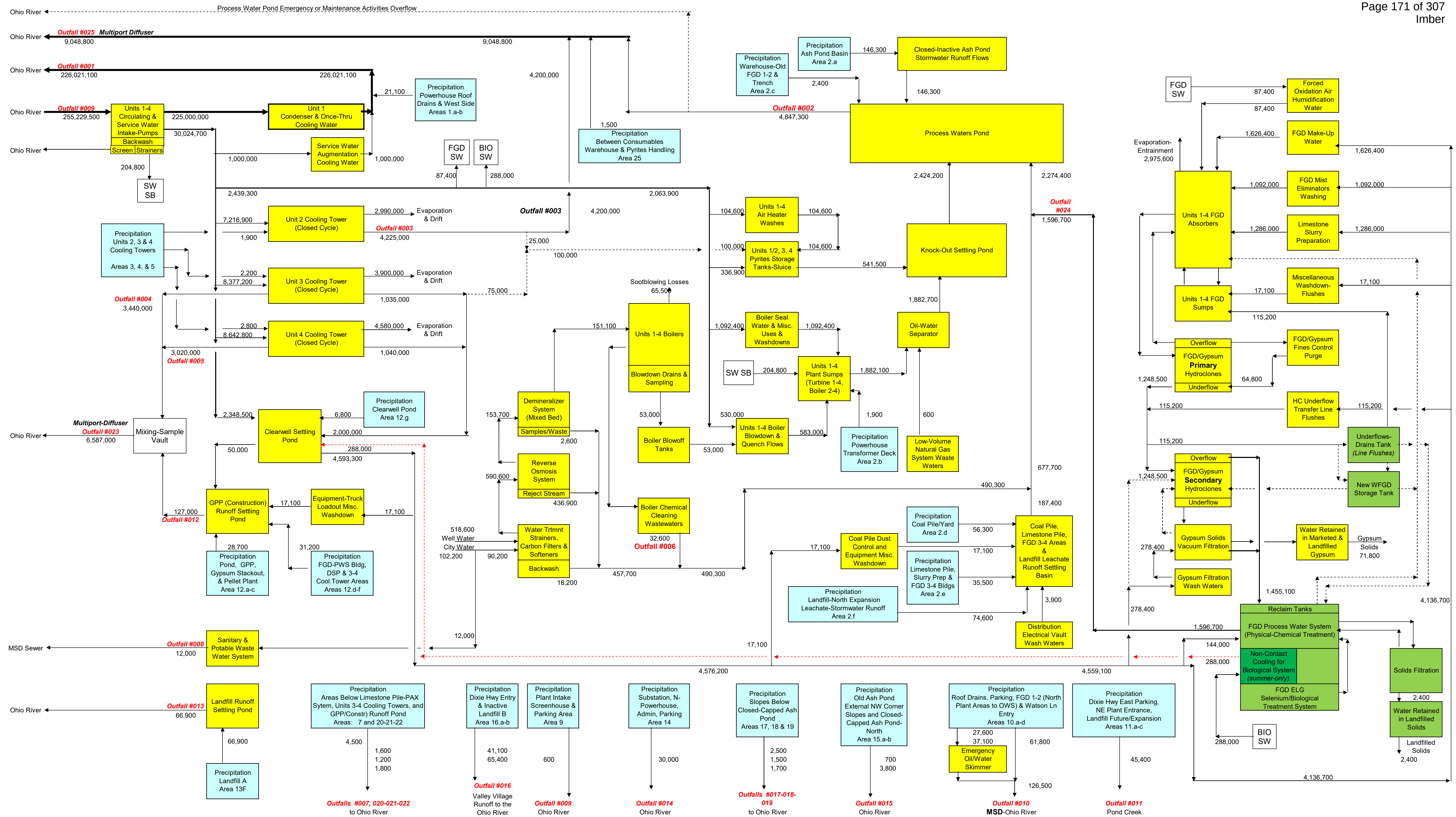
013	013-2	pH	Concentrations - Minimum	6.0	12	SU	#N/A	#N/A	NODI-C	#N/A	#N/A	NODI-C	#N/A	#N/A	NODI-3	#N/A	#N/A	NODI-C
013	013-2	pH	Concentrations - Maximum	9.0	12	SU	#N/A	#N/A	NODI-C	#N/A	#N/A	NODI-C	#N/A	#N/A	NODI-3	#N/A	#N/A	NODI-C
013	013-2	Total Suspended Solids	Concentrations - Monthly Average	30	19	mg/l	#N/A	#N/A	NODI-C	#N/A	#N/A	NODI-C	#N/A	#N/A	NODI-3	#N/A	#N/A	NODI-C
013	013-2	Total Suspended Solids	Concentrations - Daily Maximum	60	19	mg/l	#N/A	#N/A	NODI-C	#N/A	#N/A	NODI-C	#N/A	#N/A	NODI-3	#N/A	#N/A	NODI-C
013	013-2	Oil & Grease	Concentrations - Monthly Average	10	19	mg/l	#N/A	#N/A	NODI-C	#N/A	#N/A	NODI-C	#N/A	#N/A	NODI-3	#N/A	#N/A	NODI-C
013	013-2	Oil & Grease	Concentrations - Daily Maximum	15	19	mg/l	#N/A	#N/A	NODI-C	#N/A	#N/A	NODI-C	#N/A	#N/A	NODI-3	#N/A	#N/A	NODI-C
013	013-2	Flow	Loadings - Monthly Average	Report	03	MGD	#N/A	#N/A	NODI-C	#N/A	#N/A	NODI-C	#N/A	#N/A	NODI-3	#N/A	#N/A	NODI-C
013	013-2	Flow	Loadings - Daily Maximum	Report	03	MGD	#N/A	#N/A	NODI-C	#N/A	#N/A	NODI-C	#N/A	#N/A	NODI-3	#N/A	#N/A	NODI-C
015	015-2	pH	Concentrations - Minimum	Report	12	SU	#N/A	#N/A	NODI-9	#N/A	#N/A	NODI-9	#N/A	#N/A	7.69	#N/A	#N/A	7.32
015	015-2	pH	Concentrations - Maximum	Report	12	SU	#N/A	#N/A	NODI-9	#N/A	#N/A	NODI-9	#N/A	#N/A	7.69	#N/A	#N/A	7.32
015	015-2	Total Suspended Solids	Concentrations - Monthly Average	Report	19	mg/l	#N/A	#N/A	NODI-9	#N/A	#N/A	NODI-9	#N/A	#N/A	77	#N/A	#N/A	9
015	015-2	Total Suspended Solids	Concentrations - Daily Maximum	Report	19	mg/l	#N/A	#N/A	NODI-9	#N/A	#N/A	NODI-9	#N/A	#N/A	77	#N/A	#N/A	9
015	015-2	Hardness (as mg/l CaCO3)	Concentrations - Monthly Average	Report	19	mg/l	#N/A	#N/A	NODI-9	#N/A	#N/A	NODI-9	#N/A	#N/A	1000	#N/A	#N/A	330
015	015-2	Hardness (as mg/l CaCO3)	Concentrations - Daily Maximum	Report	19	mg/l	#N/A	#N/A	NODI-9	#N/A	#N/A	NODI-9	#N/A	#N/A	1000	#N/A	#N/A	330
015	015-2	Total Recoverable Arsenic	Concentrations - Monthly Average	Report	19	mg/l	#N/A	#N/A	NODI-9	#N/A	#N/A	NODI-9	#N/A	#N/A	0.002	#N/A	#N/A	0.001
015	015-2	Total Recoverable Arsenic	Concentrations - Daily Maximum	Report	19	mg/l	#N/A	#N/A	NODI-9	#N/A	#N/A	NODI-9	#N/A	#N/A	0.002	#N/A	#N/A	0.001
015	015-2	Total Recoverable Nickel	Concentrations - Monthly Average	Report	19	mg/l	#N/A	#N/A	NODI-9	#N/A	#N/A	NODI-9	#N/A	#N/A	0.012	#N/A	#N/A	0.005
015	015-2	Total Recoverable Nickel	Concentrations - Daily Maximum	Report	19	mg/l	#N/A	#N/A	NODI-9	#N/A	#N/A	NODI-9	#N/A	#N/A	0.012	#N/A	#N/A	0.005
015	015-2	Total Recoverable Silver	Concentrations - Monthly Average	Report	19	mg/l	#N/A	#N/A	NODI-9	#N/A	#N/A	NODI-9	#N/A	#N/A	0.005	#N/A	#N/A	0.005
015	015-2	Total Recoverable Silver	Concentrations - Daily Maximum	Report	19	mg/l	#N/A	#N/A	NODI-9	#N/A	#N/A	NODI-9	#N/A	#N/A	0.005	#N/A	#N/A	0.005
015	015-2	Total Recoverable Zinc	Concentrations - Monthly Average	Report	19	mg/l	#N/A	#N/A	NODI-9	#N/A	#N/A	NODI-9	#N/A	#N/A	0.015	#N/A	#N/A	0.01
015	015-2	Total Recoverable Zinc	Concentrations - Daily Maximum	Report	19	mg/l	#N/A	#N/A	NODI-9	#N/A	#N/A	NODI-9	#N/A	#N/A	0.015	#N/A	#N/A	0.01
015	015-2	Total Recoverable Cadmium	Concentrations - Monthly Average	Report	19	mg/l	#N/A	#N/A	NODI-9	#N/A	#N/A	NODI-9	#N/A	#N/A	0.001	#N/A	#N/A	0.001
015	015-2	Total Recoverable Cadmium	Concentrations - Daily Maximum	Report	19	mg/l	#N/A	#N/A	NODI-9	#N/A	#N/A	NODI-9	#N/A	#N/A	0.001	#N/A	#N/A	0.001
015	015-2	Total Recoverable Lead	Concentrations - Monthly Average	Report	19	mg/l	#N/A	#N/A	NODI-9	#N/A	#N/A	NODI-9	#N/A	#N/A	0.002	#N/A	#N/A	0.001
015	015-2	Total Recoverable Lead	Concentrations - Daily Maximum	Report	19	mg/l	#N/A	#N/A	NODI-9	#N/A	#N/A	NODI-9	#N/A	#N/A	0.002	#N/A	#N/A	0.001
015	015-2	Total Recoverable Chromium	Concentrations - Monthly Average	Report	19	mg/l	#N/A	#N/A	NODI-9	#N/A	#N/A	NODI-9	#N/A	#N/A	0.004	#N/A	#N/A	0.002
015	015-2	Total Recoverable Chromium	Concentrations - Daily Maximum	Report	19	mg/l	#N/A	#N/A	NODI-9	#N/A	#N/A	NODI-9	#N/A	#N/A	0.004	#N/A	#N/A	0.002
015	015-2	Total Recoverable Copper	Concentrations - Monthly Average	Report	19	mg/l	#N/A	#N/A	NODI-9	#N/A	#N/A	NODI-9	#N/A	#N/A	0.005	#N/A	#N/A	0.002
015	015-2	Total Recoverable Copper	Concentrations - Daily Maximum	Report	19	mg/l	#N/A	#N/A	NODI-9	#N/A	#N/A	NODI-9	#N/A	#N/A	0.005	#N/A	#N/A	0.002
015	015-2	Flow	Loadings - Monthly Average	Report	03	MGD	#N/A	#N/A	NODI-9	#N/A	#N/A	NODI-9	#N/A	#N/A	1.63	#N/A	#N/A	0.107
015	015-2	Flow	Loadings - Daily Maximum	Report	03	MGD	#N/A	#N/A	NODI-9	#N/A	#N/A	NODI-9	#N/A	#N/A	1.63	#N/A	#N/A	0.107
015	015-2	Total Recoverable Mercury	Concentrations - Monthly Average	Report	19	mg/l	#N/A	#N/A	NODI-9	#N/A	#N/A	NODI-9	#N/A	#N/A	0.000005	#N/A	#N/A	0.000005
015	015-2	Total Recoverable Mercury	Concentrations - Daily Maximum	Report	19	mg/l	#N/A	#N/A	NODI-9	#N/A	#N/A	NODI-9	#N/A	#N/A	0.000005	#N/A	#N/A	0.000005
023	023-1	Temperature	Concentrations - Monthly Average	Report	15	°F	76.2	72.8	79.2	80.3	82.0	84.6	89.4	93.1	88.4	83.4	75.2	51.5
023	023-1	Temperature	Concentrations - Daily Maximum	110	15	°F	79.0	77.8	85.8	84.5	87.1	92.1	90.8	98.9	90.4	89.2	80.6	63.9
023	023-1	pH	Concentrations - Minimum	6.0	12	SU	8.5	8.5	8.4	8.4	8.5	8.6	8.6	8.6	8.5	8.5	8.6	8.24
023	023-1	pH	Concentrations - Maximum	9.0	12	SU	8.6	8.7	8.7	8.7	8.7	8.8	8.7	8.7	8.7	8.7	8.8	8.64
023	023-1	Hardness (as mg/l CaCO3)	Concentrations - Monthly Average	Report	19	mg/l	270	280	1620	220	230	280	220	290	250	320	340	240
023	023-1	Hardness (as mg/l CaCO3)	Concentrations - Daily Maximum	Report	19	mg/l	270	280	1620	220	230	280	220	290	250	320	340	240
023	023-1	Total Recoverable Iron	Concentrations - Monthly Average	Report	19	mg/l	11.93	0.521	17.5	5.18	2.92	1.34	2.35	0.831	2.45	0.436	4.64	0.436
023	023-1	Total Recoverable Iron	Concentrations - Daily Maximum	Report	19	mg/l	11.93	0.521	17.5	5.18	2.92	1.34	2.35	0.831	2.45	0.436	4.64	0.436
023	023-1	Total Recoverable Copper	Concentrations - Monthly Average	Report	19	mg/l	0.459	0.059	0.31	0.238	0.197	0.167	0.12	0.148	0.163	0.058	0.302	0.058
023	023-1	Total Recoverable Copper	Concentrations - Daily Maximum	Report	19	mg/l	0.459	0.059	0.31	0.238	0.197	0.167	0.12	0.148	0.163	0.058	0.302	0.058
023	023-1	Flow	Loadings - Monthly Average	Report	03	MGD	5.5328	4.795	5.93	6.019	7.7252	9.072	10.1375	8.3257	10.2586	5.31	4.4585	6.494
023	023-1	Flow	Loadings - Daily Maximum	Report	03	MGD	6.13	6.6	10.07	7.57	9.55	12.1	12.78	13.417	12.43	7.04	6.207	8.16
023	023-1	Total Recoverable Mercury	Concentrations - Monthly Average	0.000051	19	mg/l	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005
023	023-1	Total Recoverable Mercury	Concentrations - Daily Maximum	0.0014	19	mg/l	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005
023	023-2	Total Recoverable Selenium	Concentrations - Monthly Average	24.0	19	mg/l	#N/A	#N/A	0.01	#N/A	#N/A	0.01	#N/A	#N/A	0.01	#N/A	#N/A	0.01
023	023-2	Total Recoverable Selenium	Concentrations - Daily Maximum	Report	19	mg/l	#N/A	#N/A	0.01	#N/A	#N/A	0.01	#N/A	#N/A	0.01	#N/A	#N/A	0.01
023	023-2	Total Recoverable Selenium (Fish Tissue)	Concentrations - Maximum	8.6	69	mg/kg dry wt	#N/A	#N/A	NODI-9	#N/A	#N/A	NODI-9	#N/A	#N/A	NODI-9	#N/A	#N/A	NODI-9
023	023-2	Acute Toxicity	Concentrations - Maximum	1.00	73	TU_A	#N/A	#N/A	1.0	#N/A	#N/A	1.0	#N/A	#N/A	1.0	#N/A	#N/A	1.0
023	023-4	Total Recoverable Zinc	Concentrations - Monthly Average	0.278	19	mg/l	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	0.071
023	023-4	Total Recoverable Zinc	Concentrations - Daily Maximum	0.278	19	mg/l	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	0.071
023	023-4	Total Recoverable Chromium	Concentrations - Monthly Average	0.2	19	mg/l	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	0.011
023	023-4	Total Recoverable Chromium	Concentrations - Daily Maximum	0.2	19	mg/l	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	0.011
023	023-4	Total Residual Chlorine	Concentrations - Monthly Average	0.019	19	mg/l	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	0
023	023-4	Total Residual Chlorine	Concentrations - Daily Maximum	0.019	19	mg/l	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	0
024	024-1	Total Recoverable Arsenic	Concentrations - Monthly Average	0.008	19	mg/l	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
024	024-1	Total Recoverable Arsenic	Concentrations - Daily Maximum	0.011	19	mg/l	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
024	024-1	Total Recoverable Selenium	Concentrations - Monthly Average	0.012	19	mg/l	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
024	024-1	Total Recoverable Selenium	Concentrations - Daily Maximum	0.023	19	mg/l	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
024	024-1	Flow	Loadings - Monthly Average	Report	03	MGD	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
024	024-1	Flow	Loadings - Daily Maximum	Report	03	MGD	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
024	024-1	Total Recoverable Mercury	Concentrations - Monthly Average	0.000356	19	mg/l	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
024	024-1	Total Recoverable Mercury	Concentrations - Daily Maximum	0.000788	19	mg/l	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
024	024-1	Nitrate/nitrite as N	Concentrations - Monthly Average	4.4	19	mg/l	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
024	024-1	Nitrate/nitrite as N	Concentrations - Daily Maximum	17.0	19	mg/l	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
025	025-1	Temperature	Concentrations - Monthly Average	Report	15	°F	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	61.6	52.1
025	025-1	Temperature	Concentrations - Daily Maximum	110	15	°F	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	73.3	53.1
025	025-1	pH	Concentrations - Minimum	6.0	12	SU	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	8.3	8.4
025	025-1	pH	Concentrations - Maximum	9.0	12	SU	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	8.5	8.95
025	025-1	Flow	Loadings - Monthly Average	Report	03	MGD	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	1.89	5.13

025	025-1	Flow	Loadings - Daily Maximum	Report	03	MGD	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	3.36	5.84
025	025-2	Hardness (as mg/l CaCO3)	Concentrations - Monthly Average	Report	19	mg/l	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	1140
025	025-2	Hardness (as mg/l CaCO3)	Concentrations - Daily Maximum	Report	19	mg/l	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	1140
025	025-2	Total Recoverable Iron	Concentrations - Monthly Average	Report	19	mg/l	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	0.456
025	025-2	Total Recoverable Iron	Concentrations - Daily Maximum	Report	19	mg/l	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	0.456
025	025-2	Total Recoverable Selenium	Concentrations - Monthly Average	0.628	19	mg/l	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	0.011
025	025-2	Total Recoverable Selenium	Concentrations - Daily Maximum	Report	19	mg/l	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	0.011
025	025-2	Total Recoverable Copper	Concentrations - Monthly Average	0.315	19	mg/l	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	0.016
025	025-2	Total Recoverable Copper	Concentrations - Daily Maximum	0.315	19	mg/l	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	0.016
025	025-2	Total Recoverable Selenium (Fish Tissue)	Concentrations - Maximum	8.6	69	mg/kg dry wt	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NODI-9
025	025-2	Acute Toxicity	Concentrations - Maximum	1.00	73	TU_A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	1.0
025	025-2	Total Recoverable Mercury	Concentrations - Monthly Average	0.000051	19	mg/l	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	0.00001
025	025-2	Total Recoverable Mercury	Concentrations - Daily Maximum	0.0014	19	mg/l	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	0.00001

Outfall	Discharge#	Effluent Characteristic	Report Value	Permit Limit	Unit Code	Units	2022-01	2022-02	2022-03	2022-04	2022-05	2022-06	2022-07	2022-08	2022-09	2022-10	2022-11	2022-12
001	001-1	Temperature	Concentrations - Monthly Average	Report	15	°F	58.3	66.8	78.5	86.4	79.7	90.6	87.8					
001	001-1	Temperature	Concentrations - Daily Maximum	110	15	°F	68.6	79.1	85.3	97.2	104.5	108.9	95.9					
001	001-1	pH	Concentrations - Minimum	6.0	12	SU	7.5	7.3	7.8	7.7	7.7	7.7	7.6					
001	001-1	pH	Concentrations - Maximum	9.0	12	SU	7.8	7.8	8.2	7.8	7.7	7.8	7.9					
001	001-1	Total Residual Oxidants	Concentrations - Monthly Average	Report	19	mg/l	0.09	0.1	0.09	0.1	0.12	0.1	0.13					
001	001-1	Total Residual Oxidants	Concentrations - Daily Maximum	0.2	19	mg/l	0.11	0.11	0.11	0.11	0.12	0.11	0.13					
001	001-1	Flow	Loadings - Monthly Average	Report	03	MGD	214.8403	195.5832	132.7161	133.7	203.25	161.4483	106.8216					
001	001-1	Flow	Loadings - Daily Maximum	Report	03	MGD	228.38	228.38	134.78	134.78	228.38	228.38	228.38					
001	001-1	Total Residual Chlorine	Concentrations - Monthly Average	0.011	19	mg/l	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9					
001	001-1	Total Residual Chlorine	Concentrations - Daily Maximum	0.019	19	mg/l	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9					
001	001-1	Free Available Chlorine	Concentrations - Monthly Average	0.2	19	mg/l	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9					
001	001-1	Free Available Chlorine	Concentrations - Daily Maximum	0.5	19	mg/l	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9					
001	001-1	Time of Oxidant Addition	Concentrations - Daily Maximum	120	5B	Min/day	60	60	30	30	60	60	60					
001	001-2	Chronic WET	Concentrations - Maximum	11.84	73	TU_C	#N/A	#N/A	NODI-9	#N/A	#N/A	NODI-9	#N/A	#N/A		#N/A	#N/A	
002	002-1	Total Suspended Solids	Concentrations - Monthly Average	30.0	19	mg/l	11.0	13.0	14.0	10.0	13.0	10.0	6.0					
002	002-1	Total Suspended Solids	Concentrations - Daily Maximum	97.9	19	mg/l	13.0	13.0	14.0	16.0	14.0	11.0	7.0					
002	002-1	Oil & Grease	Concentrations - Monthly Average	14.5	19	mg/l	NODI-B	NODI-B	NODI-B	NODI-B	NODI-B	NODI-B	NODI-B					
002	002-1	Oil & Grease	Concentrations - Daily Maximum	19.3	19	mg/l	NODI-B	NODI-B	NODI-B	NODI-B	NODI-B	NODI-B	NODI-B					
002	002-1	Flow	Loadings - Monthly Average	Report	03	MGD	3.7163	2.5583	3.3381	4.6657	4.2345	5.836	4.0428					
002	002-1	Flow	Loadings - Daily Maximum	Report	03	MGD	13.3	4.7	4.7	7.79	7.79	9.51	7.79					
002A	002A-1	pH	Concentrations - Minimum	6.0	12	SU	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C					
002A	002A-1	pH	Concentrations - Maximum	9.0	12	SU	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C					
002A	002A-1	Total Suspended Solids	Concentrations - Monthly Average	30.0	19	mg/l	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C					
002A	002A-1	Total Suspended Solids	Concentrations - Daily Maximum	97.9	19	mg/l	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C					
002A	002A-1	Oil & Grease	Concentrations - Monthly Average	14.5	19	mg/l	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C					
002A	002A-1	Oil & Grease	Concentrations - Daily Maximum	19.3	19	mg/l	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C					
002A	002A-1	Total Recoverable Iron	Concentrations - Monthly Average	Report	19	mg/l	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C					
002A	002A-1	Total Recoverable Iron	Concentrations - Daily Maximum	Report	19	mg/l	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C					
002A	002A-1	Total Recoverable Selenium	Concentrations - Monthly Average	0.056	19	mg/l	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C					
002A	002A-1	Total Recoverable Selenium	Concentrations - Daily Maximum	Report	19	mg/l	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C					
002A	002A-1	Total Recoverable Selenium (Fish Tissue)	Concentrations - Maximum	8.6	69	mg/kg dry wt	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C					
002A	002A-1	Flow	Loadings - Monthly Average	Report	03	MGD	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C					
002A	002A-1	Flow	Loadings - Daily Maximum	Report	03	MGD	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C					
002A	002A-1	Total Recoverable Mercury	Concentrations - Monthly Average	0.000051	19	mg/l	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C					
002A	002A-1	Total Recoverable Mercury	Concentrations - Daily Maximum	0.0014	19	mg/l	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C					
002A	002A-2	Acute WET	Concentrations - Maximum	1.00	73	TU_A	#N/A	#N/A	NODI-C	#N/A	#N/A	NODI-C	NODI-C	#N/A		#N/A	#N/A	
003	003-1	Total Residual Oxidants	Concentrations - Monthly Average	Report	19	mg/l	0	0	0	0	NODI-C	0	0	NODI-C				
003	003-1	Total Residual Oxidants	Concentrations - Daily Maximum	0.2	19	mg/l	0	0	0	0	NODI-C	0	0	NODI-C				
003	003-1	Flow	Loadings - Monthly Average	Report	03	MGD	1.1322	1.085	1.7018	2.2272	NODI-C	1.9718	2.637	NODI-C				
003	003-1	Flow	Loadings - Daily Maximum	Report	03	MGD	1.188	1.125	3.79	2.756	NODI-C	5.05	4.037	NODI-C				
003	003-1	Total Residual Chlorine	Concentrations - Monthly Average	Report	19	mg/l	NODI-9	NODI-9	NODI-9	NODI-9	NODI-C	NODI-9	NODI-9	NODI-C				
003	003-1	Total Residual Chlorine	Concentrations - Daily Maximum	0.2	19	mg/l	NODI-9	NODI-9	NODI-9	NODI-9	NODI-C	NODI-9	NODI-9	NODI-C				
003	003-1	Free Available Chlorine	Concentrations - Monthly Average	0.2	19	mg/l	NODI-9	NODI-9	NODI-9	NODI-9	NODI-C	NODI-9	NODI-9	NODI-C				
003	003-1	Free Available Chlorine	Concentrations - Daily Maximum	0.5	19	mg/l	NODI-9	NODI-9	NODI-9	NODI-9	NODI-C	NODI-9	NODI-9	NODI-C				
003	003-1	Time of Oxidant Addition	Concentrations - Daily Maximum	120	5B	Min/day	0	0	0	0	NODI-C	0	0	NODI-C				
003	003-4	Priority Pollutants	Concentrations - Maximum	NDA	73	TU_A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
003	003-4	Total Recoverable Chromium	Concentrations - Monthly Average	0.2	19	mg/l	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
003	003-4	Total Recoverable Chromium	Concentrations - Daily Maximum	0.2	19	mg/l	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
003	003-4	Total Recoverable Zinc	Concentrations - Monthly Average	1.0	19	mg/l	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
003	003-4	Total Recoverable Zinc	Concentrations - Daily Maximum	1.0	19	mg/l	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
004	004-1	Total Residual Oxidants	Concentrations - Monthly Average	Report	19	mg/l	0	0	0	0	0	0	0					
004	004-1	Total Residual Oxidants	Concentrations - Daily Maximum	0.2	19	mg/l	0	0	0	0	0	0	0					
004	004-1	Flow	Loadings - Monthly Average	Report	03	MGD	1.166	4.754	2.3022	3.3495	4.3515	5.1132	4.8842					
004	004-1	Flow	Loadings - Daily Maximum	Report	03	MGD	1.166	4.754	4.33	5.14	6.96	6.99	7.02					
004	004-1	Total Residual Chlorine	Concentrations - Monthly Average	Report	19	mg/l	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9					
004	004-1	Total Residual Chlorine	Concentrations - Daily Maximum	0.2	19	mg/l	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9					
004	004-1	Free Available Chlorine	Concentrations - Monthly Average	0.2	19	mg/l	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9					
004	004-1	Free Available Chlorine	Concentrations - Daily Maximum	0.5	19	mg/l	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9					
004	004-1	Time of Oxidant Addition	Concentrations - Daily Maximum	120	5B	Min/day	0	0	0	0	0	0	0					
004	004-4	Priority Pollutants	Concentrations - Daily Maximum	NDA	73	TU_A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
005	005-1	Total Residual Oxidants	Concentrations - Monthly Average	Report	19	mg/l	0	0	0	0	0	0	0					
005	005-1	Total Residual Oxidants	Concentrations - Daily Maximum	0.2	19	mg/l	0	0	0	0	0	0	0					
005	005-1	Flow	Loadings - Monthly Average	Report	03	MGD	2.3	1.575	2.82	3.3	3.4	3.26	2.875					
005	005-1	Flow	Loadings - Daily Maximum	Report	03	MGD	4	2	3.7	4	3.7	4.1	3.8					
005	005-1	Total Residual Chlorine	Concentrations - Monthly Average	Report	19	mg/l	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9					
005	005-1	Total Residual Chlorine	Concentrations - Daily Maximum	0.2	19	mg/l	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9					
005	005-1	Free Available Chlorine	Concentrations - Monthly Average	0.2	19	mg/l	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9					
005	005-1	Free Available Chlorine	Concentrations - Daily Maximum	0.5	19	mg/l	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9	NODI-9					
005	005-1	Time of Oxidant Addition	Concentrations - Daily Maximum	120	5B	Min/day	0	0	0	0	0	0	0					
005	005-4	Priority Pollutants	Concentrations - Daily Maximum	NDA	73	TU_A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	

006	006-1	pH	Concentrations - Minimum	6.0	12	SU	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C					
006	006-1	pH	Concentrations - Maximum	9.0	12	SU	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C					
006	006-1	Total Copper	Concentrations - Monthly Average	1.0	19	mg/l	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C					
006	006-1	Total Copper	Concentrations - Daily Maximum	1.0	19	mg/l	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C					
006	006-1	Total Iron	Concentrations - Monthly Average	1.0	19	mg/l	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C					
006	006-1	Total Iron	Concentrations - Daily Maximum	1.0	19	mg/l	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C					
006	006-1	Flow	Loadings - Monthly Average	Report	03	MGD	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C					
006	006-1	Flow	Loadings - Daily Maximum	Report	03	MGD	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C	NODI-C					
009	009-1	Temperature	Concentrations - Monthly Average	Report	15	°F	49.1	44.1	49.8	57.1	66	77.2	83.5					
009	009-1	Temperature	Concentrations - Daily Maximum	110	15	°F	52.6	48.5	55.9	60.7	69.3	79.8	85.9					
009	009-1	Flow	Loadings - Monthly Average	Report	03	MGD	257.2	233.8	164.06	163.6	146.6	225.52	134					
009	009-1	Flow	Loadings - Daily Maximum	Report	03	MGD	257.2	257.2	165.9	163.6	257.2	271.6	271.6					
009	009-2	Total Recoverable Metals	Concentrations - Monthly Average	Report	19	mg/l	#N/A	#N/A	7.38	#N/A	#N/A	0.864	#N/A	#N/A		#N/A	#N/A	
009	009-2	Total Recoverable Metals	Concentrations - Daily Maximum	Report	19	mg/l	#N/A	#N/A	7.38	#N/A	#N/A	0.864	#N/A	#N/A		#N/A	#N/A	
012	012-1	Total Suspended Solids	Concentrations - Monthly Average	30	19	mg/l	19.0	11.0	16.0	4.0	17.0	8.0	4.0					
012	012-1	Total Suspended Solids	Concentrations - Daily Maximum	67	19	mg/l	19.0	11.0	16.0	4.0	17.0	8.0	4.0					
012	012-1	Oil & Grease	Concentrations - Monthly Average	9	19	mg/l	NODI-B	NODI-B	NODI-B	NODI-B	NODI-B	NODI-B	NODI-B					
012	012-1	Oil & Grease	Concentrations - Daily Maximum	12	19	mg/l	NODI-B	NODI-B	NODI-B	NODI-B	NODI-B	NODI-B	NODI-B					
012	012-1	Flow	Loadings - Monthly Average	Report	03	MGD	1.67	2.28	1.34	1.05	2.58	2.75	2.18					
012	012-1	Flow	Loadings - Daily Maximum	Report	03	MGD	1.67	2.28	1.34	1.05	2.58	2.75	2.18					
013	013-2	pH	Concentrations - Minimum	6.0	12	SU	#N/A	#N/A	8.7	#N/A	#N/A	NODI-C	#N/A	#N/A		#N/A	#N/A	
013	013-2	pH	Concentrations - Maximum	9.0	12	SU	#N/A	#N/A	8.7	#N/A	#N/A	NODI-C	#N/A	#N/A		#N/A	#N/A	
013	013-2	Total Suspended Solids	Concentrations - Monthly Average	30	19	mg/l	#N/A	#N/A	15	#N/A	#N/A	NODI-C	#N/A	#N/A		#N/A	#N/A	
013	013-2	Total Suspended Solids	Concentrations - Daily Maximum	60	19	mg/l	#N/A	#N/A	15	#N/A	#N/A	NODI-C	#N/A	#N/A		#N/A	#N/A	
013	013-2	Oil & Grease	Concentrations - Monthly Average	10	19	mg/l	#N/A	#N/A	NODI-B	#N/A	#N/A	NODI-C	#N/A	#N/A		#N/A	#N/A	
013	013-2	Oil & Grease	Concentrations - Daily Maximum	15	19	mg/l	#N/A	#N/A	NODI-B	#N/A	#N/A	NODI-C	#N/A	#N/A		#N/A	#N/A	
013	013-2	Flow	Loadings - Monthly Average	Report	03	MGD	#N/A	#N/A	57.17	#N/A	#N/A	NODI-C	#N/A	#N/A		#N/A	#N/A	
013	013-2	Flow	Loadings - Daily Maximum	Report	03	MGD	#N/A	#N/A	57.17	#N/A	#N/A	NODI-C	#N/A	#N/A		#N/A	#N/A	
015	015-2	pH	Concentrations - Minimum	Report	12	SU	#N/A	#N/A	7.8	#N/A	#N/A	7.6	#N/A	#N/A		#N/A	#N/A	
015	015-2	pH	Concentrations - Maximum	Report	12	SU	#N/A	#N/A	7.8	#N/A	#N/A	7.6	#N/A	#N/A		#N/A	#N/A	
015	015-2	Total Suspended Solids	Concentrations - Monthly Average	Report	19	mg/l	#N/A	#N/A	4	#N/A	#N/A	16	#N/A	#N/A		#N/A	#N/A	
015	015-2	Total Suspended Solids	Concentrations - Daily Maximum	Report	19	mg/l	#N/A	#N/A	4	#N/A	#N/A	16	#N/A	#N/A		#N/A	#N/A	
015	015-2	Hardness (as mg/l CaCO3)	Concentrations - Monthly Average	Report	19	mg/l	#N/A	#N/A	550	#N/A	#N/A	650	#N/A	#N/A		#N/A	#N/A	
015	015-2	Hardness (as mg/l CaCO3)	Concentrations - Daily Maximum	Report	19	mg/l	#N/A	#N/A	550	#N/A	#N/A	650	#N/A	#N/A		#N/A	#N/A	
015	015-2	Total Recoverable Arsenic	Concentrations - Monthly Average	Report	19	mg/l	#N/A	#N/A	0.001	#N/A	#N/A	0.001	#N/A	#N/A		#N/A	#N/A	
015	015-2	Total Recoverable Arsenic	Concentrations - Daily Maximum	Report	19	mg/l	#N/A	#N/A	0.001	#N/A	#N/A	0.001	#N/A	#N/A		#N/A	#N/A	
015	015-2	Total Recoverable Nickel	Concentrations - Monthly Average	Report	19	mg/l	#N/A	#N/A	0.012	#N/A	#N/A	0.012	#N/A	#N/A		#N/A	#N/A	
015	015-2	Total Recoverable Nickel	Concentrations - Daily Maximum	Report	19	mg/l	#N/A	#N/A	0.012	#N/A	#N/A	0.012	#N/A	#N/A		#N/A	#N/A	
015	015-2	Total Recoverable Silver	Concentrations - Monthly Average	Report	19	mg/l	#N/A	#N/A	0.005	#N/A	#N/A	0.005	#N/A	#N/A		#N/A	#N/A	
015	015-2	Total Recoverable Silver	Concentrations - Daily Maximum	Report	19	mg/l	#N/A	#N/A	0.005	#N/A	#N/A	0.005	#N/A	#N/A		#N/A	#N/A	
015	015-2	Total Recoverable Zinc	Concentrations - Monthly Average	Report	19	mg/l	#N/A	#N/A	0.01	#N/A	#N/A	0.01	#N/A	#N/A		#N/A	#N/A	
015	015-2	Total Recoverable Zinc	Concentrations - Daily Maximum	Report	19	mg/l	#N/A	#N/A	0.01	#N/A	#N/A	0.01	#N/A	#N/A		#N/A	#N/A	
015	015-2	Total Recoverable Cadmium	Concentrations - Monthly Average	Report	19	mg/l	#N/A	#N/A	0.001	#N/A	#N/A	0.001	#N/A	#N/A		#N/A	#N/A	
015	015-2	Total Recoverable Cadmium	Concentrations - Daily Maximum	Report	19	mg/l	#N/A	#N/A	0.001	#N/A	#N/A	0.001	#N/A	#N/A		#N/A	#N/A	
015	015-2	Total Recoverable Lead	Concentrations - Monthly Average	Report	19	mg/l	#N/A	#N/A	0.001	#N/A	#N/A	0.001	#N/A	#N/A		#N/A	#N/A	
015	015-2	Total Recoverable Lead	Concentrations - Daily Maximum	Report	19	mg/l	#N/A	#N/A	0.001	#N/A	#N/A	0.001	#N/A	#N/A		#N/A	#N/A	
015	015-2	Total Recoverable Chromium	Concentrations - Monthly Average	Report	19	mg/l	#N/A	#N/A	0.001	#N/A	#N/A	0.002	#N/A	#N/A		#N/A	#N/A	
015	015-2	Total Recoverable Chromium	Concentrations - Daily Maximum	Report	19	mg/l	#N/A	#N/A	0.001	#N/A	#N/A	0.002	#N/A	#N/A		#N/A	#N/A	
015	015-2	Total Recoverable Copper	Concentrations - Monthly Average	Report	19	mg/l	#N/A	#N/A	0.002	#N/A	#N/A	0.003	#N/A	#N/A		#N/A	#N/A	
015	015-2	Total Recoverable Copper	Concentrations - Daily Maximum	Report	19	mg/l	#N/A	#N/A	0.002	#N/A	#N/A	0.003	#N/A	#N/A		#N/A	#N/A	
015	015-2	Flow	Loadings - Monthly Average	Report	03	MGD	#N/A	#N/A	2.64	#N/A	#N/A	0.1442	#N/A	#N/A		#N/A	#N/A	
015	015-2	Flow	Loadings - Daily Maximum	Report	03	MGD	#N/A	#N/A	2.64	#N/A	#N/A	0.1442	#N/A	#N/A		#N/A	#N/A	
015	015-2	Total Recoverable Mercury	Concentrations - Monthly Average	Report	19	mg/l	#N/A	#N/A	0.000005	#N/A	#N/A	0.000005	#N/A	#N/A		#N/A	#N/A	
015	015-2	Total Recoverable Mercury	Concentrations - Daily Maximum	Report	19	mg/l	#N/A	#N/A	0.000005	#N/A	#N/A	0.000005	#N/A	#N/A		#N/A	#N/A	
023	023-1	Temperature	Concentrations - Monthly Average	Report	15	°F	64.6	61.3	78.3	80.2	85.2	88.5	92.1					
023	023-1	Temperature	Concentrations - Daily Maximum	110	15	°F	69.9	81	81.4	83.1	89.3	93.7	98.1					
023	023-1	pH	Concentrations - Minimum	6.0	12	SU	8.3	8.1	8.5	8.5	8.5	8.5	7.2					
023	023-1	pH	Concentrations - Maximum	9.0	12	SU	8.7	8.5	8.6	8.7	8.6	8.7	8.7					
023	023-1	Hardness (as mg/l CaCO3)	Concentrations - Monthly Average	Report	19	mg/l	220	210	210	240	250	220	240					
023	023-1	Hardness (as mg/l CaCO3)	Concentrations - Daily Maximum	Report	19	mg/l	220	210	210	240	250	220	240					
023	023-1	Total Recoverable Iron	Concentrations - Monthly Average	Report	19	mg/l	5.96	2	6.5	1.36	1.22	1.42	1.08					
023	023-1	Total Recoverable Iron	Concentrations - Daily Maximum	Report	19	mg/l	5.96	2	6.5	1.36	1.22	1.42	1.08					
023	023-1	Total Recoverable Copper	Concentrations - Monthly Average	Report	19	mg/l	0.153	0.182	0.184	0.104	0.102	0.082	0.1					
023	023-1	Total Recoverable Copper	Concentrations - Daily Maximum	Report	19	mg/l	0.153	0.182	0.184	0.104	0.102	0.082	0.1					
023	023-1	Flow	Loadings - Monthly Average	Report	03	MGD	4.8775	5.1192	7.5244	7.2002	9.4965	9.9452	10.341					
023	023-1	Flow	Loadings - Daily Maximum	Report	03	MGD	6.011	7.597	10.842	8.79	13.14	13.32	11.94					
023	023-1	Total Recoverable Mercury	Concentrations - Monthly Average	0.000051	19	mg/l	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005					
023	023-1	Total Recoverable Mercury	Concentrations - Daily Maximum	0.0014	19	mg/l	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005	0.000005					
023	023-2	Total Recoverable Selenium	Concentrations - Monthly Average	24.0	19	mg/l	#N/A	#N/A	0.005	#N/A	#N/A	0.005	#N/A	#N/A		#N/A	#N/A	
023	023-2	Total Recoverable Selenium	Concentrations - Daily Maximum	Report	19	mg/l	#N/A	#N/A	0.005	#N/A	#N/A	0.005	#N/A	#N/A		#N/A	#N/A	
023	023-2	Total Recoverable Selenium (Fish Tissue)	Concentrations - Maximum	8.6	69	mg/kg dry wt	#N/A	#N/A	NODI-9	#N/A	#N/A	NODI-9	#N/A	#N/A		#N/A	#N/A	
023	023-2	Acute Toxicity	Concentrations - Maximum	1.00	73	TU_A	#N/A	#N/A	1.0	#N/A	#N/A	1.0	#N/A	#N/A		#N/A	#N/A	
023	023-4	Total Recoverable Zinc	Concentrations - Monthly Average	0.278	19	mg/l	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	

023	023-4	Total Recoverable Zinc	Concentrations - Daily Maximum	0.278	19	mg/l	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
023	023-4	Total Recoverable Chromium	Concentrations - Monthly Average	0.2	19	mg/l	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
023	023-4	Total Recoverable Chromium	Concentrations - Daily Maximum	0.2	19	mg/l	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
023	023-4	Total Residual Chlorine	Concentrations - Monthly Average	0.019	19	mg/l	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
023	023-4	Total Residual Chlorine	Concentrations - Daily Maximum	0.019	19	mg/l	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
025	025-1	Temperature	Concentrations - Monthly Average	Report	15	°F	**50.2**	**49.5**	**59.5**	**70**	**73.5**	**82.7**	**84.2**					
025	025-1	Temperature	Concentrations - Daily Maximum	110	15	°F	**50.5**	**58.9**	**60.7**	**73.1**	**76.3**	**84.6**	**86.2**					
025	025-1	pH	Concentrations - Minimum	6.0	12	SU	**8.2**	**8.1**	**8.1**	**8**	**8**	**8.3**	**7.2**					
025	025-1	pH	Concentrations - Maximum	9.0	12	SU	**8.2**	**8.2**	**8.2**	**8.2**	**8**	**8.3**	**8.3**					
025	025-1	Flow	Loadings - Monthly Average	Report	03	MGD	**5.269**	**4.46**	**4.55**	**6.991**	**5.575**	**8.46**	**6.215**					
025	025-1	Flow	Loadings - Daily Maximum	Report	03	MGD	**7.27**	**5.57**	**5.88**	**8.16**	**7.79**	**10.74**	**6.66**					
025	025-2	Hardness (as mg/l CaCO3)	Concentrations - Monthly Average	Report	19	mg/l	#N/A	#N/A	**1345**	#N/A	#N/A	**2700**	#N/A	#N/A		#N/A	#N/A	
025	025-2	Hardness (as mg/l CaCO3)	Concentrations - Daily Maximum	Report	19	mg/l	#N/A	#N/A	**1480**	#N/A	#N/A	**2700**	#N/A	#N/A		#N/A	#N/A	
025	025-2	Total Recoverable Iron	Concentrations - Monthly Average	Report	19	mg/l	#N/A	#N/A	**3.69**	#N/A	#N/A	**0.865**	#N/A	#N/A		#N/A	#N/A	
025	025-2	Total Recoverable Iron	Concentrations - Daily Maximum	Report	19	mg/l	#N/A	#N/A	**3.69**	#N/A	#N/A	**0.865**	#N/A	#N/A		#N/A	#N/A	
025	025-2	Total Recoverable Selenium	Concentrations - Monthly Average	0.628	19	mg/l	#N/A	#N/A	**0.009**	#N/A	#N/A	**0.028**	#N/A	#N/A		#N/A	#N/A	
025	025-2	Total Recoverable Selenium	Concentrations - Daily Maximum	Report	19	mg/l	#N/A	#N/A	**0.009**	#N/A	#N/A	**0.028**	#N/A	#N/A		#N/A	#N/A	
025	025-2	Total Recoverable Copper	Concentrations - Monthly Average	0.315	19	mg/l	#N/A	#N/A	**0.069**	#N/A	#N/A	**0.044**	#N/A	#N/A		#N/A	#N/A	
025	025-2	Total Recoverable Copper	Concentrations - Daily Maximum	0.315	19	mg/l	#N/A	#N/A	**0.069**	#N/A	#N/A	**0.044**	#N/A	#N/A		#N/A	#N/A	
025	025-2	Total Recoverable Selenium (Fish Tissue)	Concentrations - Maximum	8.6	69	mg/kg dry wt	#N/A	#N/A	NODI-9	#N/A	#N/A	NODI-9	#N/A	#N/A		#N/A	#N/A	
025	025-2	Acute Toxicity	Concentrations - Maximum	1.00	73	TU_A	#N/A	#N/A	1.0	#N/A	#N/A	**0.0**	#N/A	#N/A		#N/A	#N/A	
025	025-2	Total Recoverable Mercury	Concentrations - Monthly Average	0.000051	19	mg/l	#N/A	#N/A	0.000006	#N/A	#N/A	0.000005	#N/A	#N/A		#N/A	#N/A	
025	025-2	Total Recoverable Mercury	Concentrations - Daily Maximum	0.0014	19	mg/l	#N/A	#N/A	0.000006	#N/A	#N/A	0.000005	#N/A	#N/A		#N/A	#N/A	



MILL CREEK STATION - **FUTURE 2021 ELG & DIFFUSERS TYPICAL OPERATIONS**
PROCESS FLOWS = PEAK MONTHLY AVERAGE CONDITIONS (PMAC)
PRECIPITATION = AVERAGE (Annual Rainfall / 365 days)

NOTES:
1. All Flows expressed in gallons per day, Dashed Lines Show Alternative/Temporary Conditions
2. Diagram Flows Include PMAC Process Flows and Precipitation Runoff Flows Added
3. PMAC (Peak Monthly Average Conditions) Process Flows Represent Monthly Conditions Calculated as a Daily Average Flows = 28 days Normal Operations + 1 Day Maximum + 1 Day Maintenance

LG&E
a PPL company

PREPARED BY: MO
Rev 2 - Dec 15, 2022

MILL CREEK GENERATION STATION
WATER BALANCE DIAGRAM - **ELG+DIFFUSERS OPERATIONS**
PMAC CONDITIONS AND AVERAGE PRECIPITATION
KPDES PERMIT KY0003221

Louisville Gas & Electric Co
MILL CREEK GENERATING STATION

March 8, 2021

Rainfall Runoff Calculations

Data

Area	# Acres	
Coefficient for Rainfall Runoff	Cr	
10 Year 24 Hour Rainfall	4.5	inch/24 hours
Annual Average Rainfall	43.56	inch/year

Runoff Equations:

1-Day Flow:
(#Acres)(43560 ft2)/Acre)(Cr)(4.1 in/day)(1 ft/12 inch)(7.48 gal/ft3)(1MG/1000000 gal)
MGD = (# Acres) x (Cr) x **0.1221858**

30-Day Flow:
(#Acres)(43560 ft2)/Acre)(Cr)(43.56 in/yr)(1 ft/12 inch)(7.48 gal/ft3)(1MG/1000000 gal)
MGD = (# Acres) x (Cr) x **0.003240434**

Definition of Runoff Coefficients:

	Cr
Vegetated Areas (without slope considerations)	0.25
Gypsum & Loose Gravel (substations, rail beds, dam face, rock-faced slopes, etc.)	0.25
Packed Surfaces (Coal, Bare Soil, Packed Gravel [Roads, Parking Areas, etc.])	0.5
Impervious Surface (Pavement, Roofs, Cooling Tower Direct Precip)	0.85
Basin Surfaces	1

Louisville Gas & Electric Co
MILL CREEK GENERATING STATION

	KPDES OUTFALLS DESCRIPTION	***Internal/External***	***Outfall Location***
001	Once-Thru Cooling Water & Process Water Pond(s) Discharge to Ohio River	***External***	Ohio River Discharge Structure
002	Process Water Pond(s) Discharge (*Internal Outfall #002 to Outfall #001*)		
	NEW: Process Water Ponds Discharge to Outfall 001	***Internal***	Pond Discharge into Outfall 001
	EXISTING: Ash Pond Discharge to Outfall 001	***Internal***	Pond Discharge into Ash Pond
003	Unit 2 Cooling Tower Blowdown Internal Outfall to		
	NEW: Cooling Tower Blowdown Discharge to Outfall 001	***Internal***	Pipe Discharge into Outfall 001
	EXISTING: Cooling Tower Blowdown Discharge to Ash Pond	***Internal***	Pipe Discharge into Ash Pond
004	Unit 3 Cooling Tower Blowdown External to Ohio River	***External***	Pipe Discharge to Ohio River
005	Unit 4 Cooling Tower Blowdown External to Ohio River	***External***	Pipe Discharge to Ohio River
006	*Runoff Area not designated (Boiler Chemical Cleaning Wastewaters)*	***Internal***	na or 006=Frac Tanks
007	Non-Contact Runoff - Plant West Powerhouse Roof/Downhill Slopes Runoff to Ohio River	***External***	Ditch to Ohio River
008	*Runoff Area not designated (MSD Sanitary Connection)*	***External***	Sewer Manhole
009	*Plant River Water Intake*	***External***	Intake Screenhouse
010	Non-Contact Runoff -North Plant Maint/Parking/Entry Road Areas to Mill Creek	***External***	Stormpipe-Ditch to Mill Creek & MSD Pumping Station
011	Non-Contact Runoff- East Entry/Parking/Future Landfill Areas to Pond Creek	***External***	Stormpipe-Ditch Adjacent/Under 31W (Dixie Hwy)
012	Construction Runoff Settling Pond Discharge to Ohio River	***External***	Pond Discharge to Ohio River
013	Active Landfill A Settling Basin Discharge to Ohio River	***External***	Pond Discharge to Ohio River
014	Non-Contact Runoff - Switchyard/Powerhouse NW Side to Ohio River	***External***	Stormpipe-Ditch to Ohio River
015	Non-Contact Runoff - Closed Ash Treatment Basin NW External Slopes to Ohio River	***External***	Ditch to Ohio River
016	Non-Contact Runoff - Closed Landfill B to Valley Village Cutoff to Ohio River	***External***	Storm CatchBasin into Pipe to Ohio River
017	Non-Contact Runoff - Closed Ash Treatment Basin West External Slopes to Ohio River	***External***	Ditch to Ohio River
018	Non-Contact Runoff - Process Pond NW External Slopes to Ohio River	***External***	Ditch to Ohio River
019	Non-Contact Runoff - Riverbank Slopes West of Unit 2 CT to Ohio River	***External***	Ditch to Ohio River
020	Non-Contact Runoff - Riverbank Slopes West of Unit 4 CT to Ohio River	***External***	Ditch to Ohio River
021	Non-Contact Runoff - Riverbank Slopes West of Unit 3 CT to Ohio River	***External***	Ditch to Ohio River
022	Non-Contact Runoff - Yard Area SW of Unit 3 CT to Ohio River	***External***	Ditch to Ohio River

STORMWATER RUNOFF AREAS

Plant Property Areas - Rainfall Runoff Calculations

(Arranged by Outfalls - Reflects Construction Changes Completed by 2022)

AREA

1 **Outfall 001 - Once-Thru Cooling Water & Process Water Pond(s)/Ash Pond Discharge to Ohio River**
- **1.a** Powerhouse Roof Drains (incl Old Admin Bldg)
- **1.b** Powerhouse West Side/Below-Transformers/Deck Area Runoff

2 **Outfall 002 - Process Water Pond(s)/Ash Pond Discharge to Outfall #001 (#002-1) & Direct Discharge #002-2 to Ohio River**
- **2.a** Process Water Ponds (Previous Ash Pond Areas)
- **2.b** Powerhouse West SideTransformer Deck Area (concrete)
- **2.c** New Warehouse (old Unit 1-2 FGD/Equipment) Runoff Areas
- **2.d** Coal Yard/Pile Areas
- **2.e** Limestone Pile, Slurry Prep & FGD Areas Drainage
- **2.f** Landfill - North Expansion --- (Pre-Expansion Landfill Areas Runoff Continue to Outfall 013)

3 **Outfall 003 - Unit 2 Cooling Tower Blowdown (includes Tower Precipitation)**
4 **Outfall 004 - Unit 3 Cooling Tower Blowdown (includes Tower Precipitation)**
5 **Outfall 005 - Unit 4 Cooling Tower Blowdown (includes Tower Precipitation)**
6 **Outfall 006 - Boiler Chemical Cleaning Wastes - Runoff Area not designated**

7 **Outfall 007 - Non-Process Runoff - Plant Powerhouse West Roof Runoff to Ohio River**
8 **Outfall 008 - Facility Sanitary Wastewaters to Louisville MSD - Runoff Area not designated**
9 **Outfall 009 - Plant Intake - Screenhouse/Parking**

10 **Outfall 010 - Non-Process Runoff -North Plant Maintenance/Parking/Entry Road Areas to Mill Creek**
- **10.a** Drainage to Parking Lot Oil-Water Skimmer
- **10.b** Drainage from Areas that Combine into Discharge from Parking Lot Oil-Water Skimmer (Discharges Combine)
- **10.c** Watson Lane Entrance Roadway Areas
- **10.d** Frost School Property

11 **Outfall 011 - Non-Process Runoff- East (Dixie Hwy) Entrances, Contractor Parking & Railroad Wye Areas to Pond Creek**
- **11.a** Dixie Highway Plant Entrance Road Areas
- **11.b** Railroad Wye Area
- **11.c** Dixie Highway Construction Entrance Areas

12 **Outfall 012 - GPP Runoff Pond (Old Construction Runoff Pond) Discharge to Ohio River**
- **12.a** Construction/GPP Runoff Basin-North Pond #2 -Stormwater & Leachate
- **12.b** Gypsum Processing Plant Building/Roof(s), Slurry Feedtanks, and Piles Stackout
- **12.c** Gypsum Pelletizing Plant, Storage/Trucking Building & Office Areas
- **12.d** Maintenance Laydown (Old DSP Surge Pond) & Adjacent Areas
- **12.e** Cooling Towers 3-4 Areas (excl structures footprint)
- **12.f** FGD-PWS Buildings, Tanks, and Adjacent Areas
- **12.g** Clearwell

13 **Outfall 013 - Active Landfill A Settling Basin Discharge to Ohio River**
14 **Outfall 014 - Non-Process Runoff - Switchyard/Powerhouse NW Side to Ohio River**
15 **Outfall 015 - Non-Process Runoff - Closed-Capped North Ash Pond & Ash Pond NorthWest External Slopes to Ohio River**
- **15.a** Vegetated Areas Including Lower Access Roads
- **15.b** North Closed-Capped (Old) Ash Pond Runoff to Outfall 015

16 **Outfall 016 - Valley Village Cutoff Entrance Road Woods, Fields and Rail-Loop Covered Landfill Runoff to Ohio River**
- **16.a** Dixie Highway Plant Entrance Road Areas (from Receiving Warehouse Highpoint to Woods/Frost-School Highpoint Areas)
- **16.b** Covered Landfill Areas within (Old/Closed) Railroad Inner Loop

17 **Outfall 017 - Uncontaminated Runoff - Closed Ash Pond West External Slopes to Ohio River**
18 **Outfall 018 - Uncontaminated Runoff - Process Pond NW External Slopes to Ohio River**
19 **Outfall 019 - Uncontaminated Runoff - Riverbank Slopes West of Unit 2 CT to Ohio River**

20 **Outfall 020 - Uncontaminated Runoff - Riverbank Slopes West of Unit 4 CT to Ohio River**
21 **Outfall 021 - Uncontaminated Runoff - Riverbank Slopes West of Unit 3 CT to Ohio River**
22 **Outfall 022 - Uncontaminated Runoff - Yard Area SW of Unit 3 CT to Ohio River**

23 **Non-Point, Non-Process Area Runoff - North Slopes of Ash Pond Outside Floodwall to MSD Ditch to Ohio River**
24 **Non-Point, Non-Process Area Runoff - Riverbanks below West Slopes of ATB to Screenhouse Areas Runoff to Ohio River**
25 **Outfall 025 Non-Process Area Runoff - Closed/Capped Ashpond Hardscape Area Stormwater Runoff to Diffuser to Ohio River**
26 **Non-Point, Non-Process Area Runoff - Riverbanks Below West Slopes from Screenhouse to Coal Barge Unloader Areas**
27 **Non-Point, Non-Process Area Runoff - Dixie Highway West Roadside Areas to Aesthetic Berm to Pond Creek**

TOTAL SITE PROPERTY	**626.0**	**acres**
Pre-Frost Property Total Site	584.8	acres

Area #	Source	Runoff Description	Cr	# Acres	1-Day Max (MGD)	Daily (Annual Average) (MGD)

Outfall 001 - Once-Thru Cooling Water & Process Water Pond(s)/Ash Pond Discharge to Ohio River

1 Flows to Once-Thru Cooling Return to River Outfall #001

Total AREA **1** *acres* 9.51

Area #	Source	Runoff Description	Cr	# Acres	1-Day Max (MGD)	Daily (Annual Average) (MGD)
1.a	**Powerhouse Roof Drains (incl Old Admin Bldg)**					
1	Roof Area	Impervious Surface	0.85	4.91	0.5102	0.0135
1.b	**Powerhouse West Side/Below-Transformers/Deck Area Runoff**					
1	Grass-Field & Gravel Areas	Vegetated Area	0.25	2.60	0.0795	0.0021
2	Transformer (Unit 1-2 Main Aux) Pad with Manual Stormwater Drains to Area Below	Impervious Surface	0.85	0.03	0.0036	0.0001
3	Unit 2 Cooling Tower SW Access Area, Maintenance Bldg/Consumables Warehouse Access Areas, Ash Pond Office Area	Impervious Surface	0.85	1.57	0.1627	0.0043
4	Maintenance Bldg/Consumables Warehouse Buildings Roofs	Impervious Surface	0.85	0.39	0.0406	0.0011
	Area SUBTOTAL			**9.51**	**0.2864**	**0.0076**

Outfall 002 - Process Water Pond(s)/Ash Pond Discharge to Outfall #001 (#002-1) & Direct Discharge #002-2 to Ohio River

2 Flows to Process Water Pond(s)/Ash Pond Outfall #002

Total AREA **2** *acres* 187.57

Area #	Source	Runoff Description	Cr	# Acres	1-Day Max (MGD)	Daily (Annual Average) (MGD)
2.a	**Process Water Ponds *(Previous Ash Pond Areas)***					
1	Knock-out Pond ---Basin Surface	Basin Surface	1.0	0.67	0.0817	0.0022
2	KO Pond --- Perimeter Road and Inner Slope Areas	Impervious Surface	0.85	0.82	0.0851	0.0023
3	Process Water Pond ---Basin Surface	Basin Surface	1.0	18.33	2.2399	0.0594
4	Process Water Pond --- Perimeter Road and Inner Slopes	Impervious Surface	0.85	10.70	1.1116	0.0295
5	Closed-Capped Ash Pond Runoff into Process Water Pond Area	Vegetated Area	0.25	40.50	1.2372	0.0328
6	Unit 2 Cooling Tower Chemical Bldg, Adjacent Areas and Closed-Capped Ash Pond (Paved) Areas	Impervious Surface	0.85	7.34	0.7626	0.0202
	Area SUBTOTAL			**78.37**	**5.5181**	**0.1463**
2.b	**Powerhouse West SideTransformer Deck Area (concrete)**					
1	Concrete Deck, bermed, runoff drains into plant sumps to Process Pond	Impervious Surface	0.85	0.70	0.0727	0.0019
2.c	**New Warehouse (old Unit 1-2 FGD/Equipment) Runoff Areas**					
1	Drainage Ditch to Process Water Pond	Basin Surface	1.0	0.22	0.0268	0.0007
2	New Warehouse (Old FGD 1-2 Absorbers/Equipment) Drainage Area	Impervious Surface	0.85	0.62	0.0641	0.0017
	Area SUBTOTAL			**0.84**	**0.0909**	**0.0024**
2.d	**Coal Yard/Pile Areas**					
1	Pond Surface (Combined Coal+Limestone Runoff Pond)	Basin Surface	1.0	1.68	0.2047	0.0054
2	Coal Pile					
a	Coal Pile Storage Area	Packed Surface	0.5	14.97	0.9145	0.0243
b	Buildings & Roofs	Impervious Surface	0.85	2.02	0.2097	0.0056
c	Railroad Portion within Coal Yard Areas	Packed Surface	0.5	2.67	0.1630	0.0043
d	Coal Yard Flat Access Areas	Packed Surface	0.5	5.71	0.3486	0.0092
e	Pond Inward Slopes toward Rail-Loop Landfill (to Substation)	Vegetated Area	0.25	9.25	0.2824	0.0075
	Area SUBTOTAL			**36.28**	**2.1230**	**0.0563**
2.e	**Limestone Pile, Slurry Prep & FGD Areas Drainage**					
1	Limestone Pile, Slurry Prep & FGD Areas Drainage					
a	Limestone Slurry Tanks	Basin Surface	1	0.39	0.0478	0.0013
b	Limestone Slurry Eqpt/Vac.Truck Buildings Roofs & Adj Roadways	Impervious Surface	0.85	1.64	0.1705	0.0045
2	Limestone Pile, Slurry Prep & FGD Areas Drainage					
a	Limestone Pile Storage	Packed Surface	0.5	0.39	0.0236	0.0006
b	Limestone Pile Adjacent Roadways (incl Lab/Annex/east 1/2 roofs)	Impervious Surface	0.85	1.66	0.1723	0.0046
c	Limestone Slurry Prep Building Roofs	Impervious Surface	0.85	0.52	0.0541	0.0014
d	Unit 3 ESPs, PJFFs, FGDs and Chimney	Impervious Surface	0.85	3.11	0.3228	0.0086
e	Unit 4 ESPs, PJFFs, FGDs and Chimney	Impervious Surface	0.85	4.94	0.5133	0.0136
f	Ammonia Storage/Eqpt Buildings & Adj Pavement/Parking	Impervious Surface	0.85	0.25	0.0257	0.0007
g	Gravel/Drainage Area South of Ammonia Storage Areas	Packed Surface	0.5	0.15	0.0092	0.0002
	Area SUBTOTAL			**13.05**	**1.3392**	**0.0355**
2.f	**Landfill - North Expansion --- *(Pre-Expansion Landfill Areas Runoff Continue to Outfall 013)***					
1	Collection Basin-North Pond #2 -Stormwater & Leachate					
a	Pond Surface	Basin Surface	1	4.65	0.5685	0.0151
b	Pond Inward Slopes (2105-2016 Contours-Status)	Packed Surface	0.5	4.92	0.3006	0.0080
c	Parking Lot	Packed Surface	0.5	4.43	0.2706	0.0072
d	Landfill Sloped Areas to Pond	Vegetated Area	0.25	21.20	0.6474	0.0172
e	Below Landfill Areas to Pond (perimeter areas along entrance road, pond andtowardDixie Hwy)	Vegetated Area	0.25	6.13	0.1873	0.0050
2	Sediment Basin-Northwest Pond #3 (future)					
a	Pond Surface	Basin Surface	1	0.90	0.1095	0.0029
b	Pond Inward Slopes	Packed Surface	0.5	1.20	0.0735	0.0020
c	Landfill Sloped Areas to Pond	Vegetated Area	0.25	10.33	0.3154	0.0084
d	Below Landfill Areas to Pond (north pavement, gravel & coalyard office building areas)	Packed Surface	0.5	1.76	0.1073	0.0028
3	Fly Ash Silos Areas					
a	Fly Ash Silos- Truck Loadout Roadway Drainage	Impervious Surface	0.85	0.30	0.0307	0.0008
b	PJFF-PAC/Fly Ash Silos- Truck Loadout Washdown Areas Drainage	Impervious Surface	0.85	1.07	0.1114	0.0030
c	PJFF-PAC/Fly Ash Silos- Truck Loadout Washdown Areas Drainage	Packed Surface	0.5	1.46	0.0890	0.0024
	Area SUBTOTAL			**58.34**	**2.8113**	**0.0746**

Area #		Source	Runoff Description		Cr	# Acres	1-Day Max (MGD)	Daily (Annual Average) (MGD)
Outfall 003 - Unit 2 Cooling Tower Blowdown *(includes Tower Precipitation)*								
3	a.	Unit 2 Cooling Tower Deck & Basin-Pumps (within Process Pond Drainage)	Impervious Surface		0.85	0.68	0.0707	0.0019
Outfall 004 - Unit 3 Cooling Tower Blowdown *(includes Tower Precipitation)*								
4	a	Unit 3 Cooling Tower Deck & Basin-Pumps (within Runoff to #012 CR-Pond)	Impervious Surface		0.85	0.81	0.0845	0.0022
Outfall 005 - Unit 4 Cooling Tower Blowdown *(includes Tower Precipitation)*								
5	a	Unit 4 Cooling Tower Deck & Basin-Pumps (within Runoff to #012 CR-Pond)	Impervious Surface		0.85	1.00	0.1042	0.0028
Outfall 006 - Boiler Chemical Cleaning Wastes - *Runoff Area not designated*								
Outfall 007 - Non-Process Runoff - Plant Powerhouse West Roof Runoff to Ohio River								
7		**Plant West-side Powerhouse Roof & Downhill Slopes Runoff to River (Below Old Annex/Sta.Lab Area)**						
	a	Gravel Area downhill and/or flat from Powerhouse/Old Lab-Annex Buildings	Packed Surface		0.5	1.48	0.0901	0.0024
	b	Transformer Pad (Manual Stormwater Drains to slopes below)	Impervious Surface		0.85	0.05	0.0048	0.0001
	c	Vegetated Slopes & Gravel Drive Downhill to Riverbank	Vegetated Area		0.25	2.39	0.0729	0.0019
			Area SUBTOTAL			**3.91**	**0.1679**	**0.0045**
Outfall 008 - Facility Sanitary Wastewaters to Louisville MSD - *Runoff Area not designated*								
Outfall 009 - Plant Intake - *Screenhouse/Parking*								
9		**Plant Intake Screenhouse-Pumphouse/Parking**						
	a.	River Intake-Sreenhouse Building Roof Drains	Impervious Surface		0.85	0.20	0.0208	0.0006
	b.	Gravel Roadway & Parking Areas (Roadside)	Packed Surface		0.5	0.06	0.0035	0.0001
			Area SUBTOTAL			**0.26**	**0.0243**	**0.0006**
Outfall 010 - Non-Process Runoff -North Plant Maintenance/Parking/Entry Road Areas to Mill Creek								
10		**North Plant Maintenance Areas, Employee Parking & Plant Entrance Road Areas (from Watson Lane)**						
			Total AREA	***10***	*acres*	90.97		
10.a		**Drainage to Parking Lot Oil-Water Skimmer**						
	1	Unit 1-2 FGD, Garage Maintenance, and Environmental Storage Buildings including Adjacent Pavement Areas Runoff to Parking Lot Oil-Water Skimmer	Impervious Surface		0.85	7.06	0.7329	0.0194
	2	Security Building and Employee Parking Lot Pavement to Parking Lot Oil-Water Skimmer	Impervious Surface		0.85	2.41	0.2502	0.0066
	3	Railroad Portion from/along Plant Substation, Vehicle Maintenance, Environmental Storage Building Runoff to Oil-Water Skimmer	Packed Surface		0.5	0.26	0.0158	0.0004
	4	Vegetated Slopes from/along Plant Substation, Vehicle Maintenance, Environmental Storage Building Runoff to Oil-Water Skimmer	Vegetated Area		0.25	0.62	0.0189	0.0005
	5	Vegetated Slopes from/along Plant Entry Road and FGD Purge Ditch Runoff to Oil-Water Skimmer	Vegetated Area		0.25	0.78	0.0239	0.0006
			Area SUBTOTAL			**11.13**	**1.0418**	**0.0276**
10.b		**Drainage from Areas that Combine into Discharge from Parking Lot Oil-Water Skimmer (Discharges Combine)**						
	1	Railroad Portion from/along Plant Substation Eastward to Woods Highpoint Area Adjacent School Property and Runoff Toward Wetland	Packed Surface		0.5	1.14	0.0698	0.0019
	2	Vegetated Slopes from/along Plant Substation Eastward to Woods Highpoint Area Adjacent School Property and Runoff Toward Wetland	Vegetated Area		0.25	2.84	0.0866	0.0023
	3	Roadway to Dixie Hwy (including pavement & gravel parking areas) from Woods Highpoint Area Adjacent School Property to Employee Parking Lot with Runoff Toward Wetland	Impervious Surface		0.85	1.35	0.1400	0.0037
	4	Vegetated/Fields East-North of Employee Parking Lot, and along road to Dixie Hwy to Woods/School Highpoint with Runoff to Wetland to Mill Creek	Vegetated Area		0.25	1.22	0.0373	0.0010
			Area SUBTOTAL			**6.55**	**1.3995**	**0.0371**
10.c		**Watson Lane Entrance Roadway Areas**						
	1	Employee Parking Runoff to Wetland to Mill Creek	Impervious Surface		0.85	0.90	0.0937	0.0025
	2	North Plant Entrance Road Pavement Runoff to Ditches to Mill Creek	Impervious Surface		0.85	1.58	0.1643	0.0044
	3	Fields Westward between Ash Pond/Floodwall and Watson Lane Entrance Road with Runoff to Wetland to Mill Creek	Vegetated Area		0.25	10.53	0.3216	0.0085
	4	Fields Eastward between Wetland and Watson Lane Entrance Road with Runoff to Wetland to Mill Creek	Vegetated Area		0.25	19.11	0.5836	0.0155
			Area SUBTOTAL			**32.12**	**1.0696**	**0.0284**
10.d		**Frost School Property**						
	1	Frost School Property	Vegetated Area		0.25	41.18	1.2579	0.0334

Area #	Source	Runoff Description		Cr	# Acres	1-Day Max (MGD)	Daily (Annual Average) (MGD)
Outfall 011 - Non-Process Runoff- East (Dixie Hwy) Entrances, Contractor Parking & Railroad Wye Areas to Pond Creek							
11	**East Plant Entrance Roads (from Dixie Hwy) Areas, Contractor/Parking & Railroad Wye Runoff Areas**						
		Total AREA	***11***	*acres*	34.84		
11.a	**Dixie Highway Plant Entrance Road Areas**						
1	Railroad Portion from/along West/North Side of Roadway from Dixie Hwy (US-31W) to Shipping/Receiving Warehouse Highpoint Area	Packed Surface		0.5	1.25	0.0765	0.0020
2	Grass Fields between Railroad & Plant Entrance Road from Dixie Hwy to Shipping/Receiving Highpoint Area	Vegetated Area		0.25	6.35	0.1940	0.0051
3	Plant Entrance Road from Dixie Hwy (US-31W) to Shipping/Receiving Warehouse Highpoint Area	Impervious Surface		0.85	0.94	0.0974	0.0026
4	Receiving Warehouse Building Roof & Adjacent Paved Area	Impervious Surface		0.85	0.82	0.0849	0.0023
5	Grass Fields between Plant Entrance Road & North Property Border from Dixie Hwy to Shipping/Receiving Highpoint Area	Vegetated Area		0.25	5.49	0.1677	0.0044
	Area SUBTOTAL				**14.85**	**0.6204**	**0.0165**
11.b	**Railroad Wye Area**						
1	Railroad Portion between Railroad Wye Area and Landfill	Packed Surface		0.5	0.50	0.0303	0.0008
2	Railroad Wye Area	Packed Surface		0.5	4.86	0.2967	0.0079
	Area SUBTOTAL				**5.35**	**0.3270**	**0.0087**
11.c	**Dixie Highway Construction Entrance Areas**						
1	Railroad Tracks Portion along Contractor Entrance Road Portion of Railroad Wye	Packed Surface		0.5	0.73	0.0446	0.0012
2	Grass Slopes Between Consruction Entrance Road and Contractor Parking Lot to High Point Near Coalyard Offices	Vegetated Area		0.25	4.32	0.1321	0.0035
3	Construction Entrance (North) and Contractor Parking to Highpoint Near Coalyard Offices Parking Area	Packed Surface		0.5	9.58	0.5855	0.0155
	Area SUBTOTAL				**14.64**	**0.7621**	**0.0202**
Outfall 012 - GPP Runoff Pond (Old Construction Runoff Pond) Discharge to Ohio River							
12	**GPP Runoff Pond (*Old Construction Runoff Pond*) Areas**						
		Total AREA	***12***	*acres*	31.09		
12.a	Construction/GPP Runoff Basin-North Pond #2 -Stormwater & Leachate						
1	Pond Surface	Basin Surface		1	2.15	0.2627	0.0070
2	Pond Inward Slopes Areas to Coal Unloader Belt/Buildings	Vegetated Area		0.25	1.49	0.0454	0.0012
3	Coal Unloader Belt Buildings	Impervious Surface		0.85	0.25	0.0256	0.0007
4	Roadway Pavement East of Construction Runoff Pond	Impervious Surface		0.85	0.32	0.0333	0.0009
	Area SUBTOTAL				**4.20**	**0.3670**	**0.0097**
12.b	Gypsum Processing Plant Building/Roof(s), Slurry Feedtanks, and Piles Stackout						
1	GPP Building Roofs	Impervious Surface		0.85	0.37	0.0389	0.0010
2	Gypsum Slurry Tanks & Pavement Adjacent	Impervious Surface		0.85	1.30	0.1351	0.0036
3	GPP Gypsum Stackout Piles/Pavement	Impervious Surface		0.85	2.25	0.2334	0.0062
4	Unpaved Area between Landfill, Gypsum Stackout and Coal Conveyor	Packed Surface		0.5	3.21	0.1961	0.0052
5	**New** GPP Building/Pavement Area	Impervious Surface		0.85	2.18	0.2260	0.0060
	Area SUBTOTAL				**9.31**	**0.6035**	**0.0160**
12.c	Gypsum Pelletizing Plant, Storage/Trucking Building & Office Areas						
	Building Roofs & North/adjacent Gravel Areas toward Construction Runoff Pond	Impervious Surface		0.85	**1.10**	0.1147	0.0030
12.d	Maintenance Laydown (Old DSP Surge Pond) & Adjacent Areas						
1	Flat Gravel Area (Old DSP Surge Pond)	Packed Surface		0.5	2.58	0.1579	0.0042
2	Buildings (to North) Roofs & Paved Roadway	Impervious Surface		0.85	0.45	0.0468	0.0012
	Area SUBTOTAL				**3.03**	**0.2047**	**0.0054**
12.e	Cooling Towers 3-4 Areas (excl structures footprint)						
1	Cooling Towers 3-4 Pavement Perimeter Roads (north/east/south)	Impervious Surface		0.85	1.18	0.1229	0.0033
2	Cooling Towers 3-4 Gravel Areas Adjacent	Packed Surface		0.5	2.67	0.1632	0.0043
3	Chemical Building Roof	Impervious Surface		0.85	0.15	0.0152	0.0004
	Area SUBTOTAL				**4.00**	**0.3013**	**0.0080**
12.f	FGD-PWS Buildings, Tanks, and Adjacent Areas						
1	New FGD-PWS Building	Impervious Surface		0.85	1.04	0.1079	0.0029
2	Flat Paved Areas (in Old Pond Footprint After Excavated and Filled)	Impervious Surface		0.85	4.47	0.4642	0.0123
3	Paved Roadway Along E-Pond from Coalyard Offices to DSP	Impervious Surface		0.5	1.26	0.0768	0.0020
4	Yard Auxiliary (GPP) Transformers and Fenced Gravel Area	Packed Surface		0.5	0.35	0.0217	0.0006
	Area SUBTOTAL				**7.12**	**0.6705**	**0.0178**
12.g	Clearwell						
1	Clearwell Pond Surface	Basin Surface		1	1.86	0.2273	0.0060
2	Clearwell Pond Inward Slopes	Packed Surface		0.5	0.46	0.0282	0.0007
	Area SUBTOTAL				**2.32**	**0.2555**	**0.0068**

Area #		Source	Runoff Description	Cr	# Acres	1-Day Max (MGD)	Daily (Annual Average) (MGD)

Outfall 013 - Active Landfill A Settling Basin Discharge to Ohio River

Area #		Source	Runoff Description	Cr	# Acres	1-Day Max (MGD)	Daily (Annual Average) (MGD)
13		**Landfill Settling Pond #1 (Original Construction, SW Corner) - Runoff Areas**					
	a	Landfill Runoff Pond #1 Surface	Basin Surface	1	0.77	0.0935	0.0025
	b	Pond-to-Crest Inward Slopes	Vegetated Area	0.25	1.82	0.0555	0.0015
	c	South Collector Area Channel (Along/to South Property Line)	Vegetated Area	0.25	4.90	0.1497	0.0040
	d	Aesthetic Berm-to-Active Landfill Area (Drains to South Collector Area Channel)	Vegetated Area	0.25	2.49	0.0760	0.0020
	e	Primary Landfill (both Active & Covered) Vegetated Areas Draining to Runoff Pond #1 and/through South Collector Area Channel	Vegetated Area	0.25	56.97	1.7401	0.0461
	f	Finished/Covered/Vegetated Primary Landfill Areas Draining to Riverbank to Ohio River extending to Outfall #013	Vegetated Area	0.25	13.36	0.4081	0.0108
		Area SUBTOTAL			**80.30**	**2.5229**	**0.0669**

Outfall 014 - Non-Process Runoff - Switchyard/Powerhouse NW Side to Ohio River

Area #		Source	Runoff Description	Cr	# Acres	1-Day Max (MGD)	Daily (Annual Average) (MGD)
14		**Storm Sewer to Ohio River from Substation Areas, Units 1-2, Water Treatment and Admin Buildings-Parking**					
	a	Substation/Switchyard	Packed Surface	0.5	9.56	0.5838	0.0155
	b	Railroad Portion along Plant Substation Eastward toward Units 1-2 Areas	Packed Surface	0.5	0.62	0.0377	0.0010
	c	Roadway/Parking (Triangular) Area Between Railroad Tracks Adj. Substation to FGD Purge Ditch from Units 1-2 Old FGD Eqpt Area	Impervious Surface	0.85	0.79	0.0816	0.0022
	d	Units 1-2 ESPs and Old Administration Building Roadway-Parking Pavement Areas (including Old Chimney)	Impervious Surface	0.85	1.99	0.2065	0.0055
	e	New Administration Building, Water Treatment and Units 1-2 Absorbent Silos Buildings-Pavement Areas	Impervious Surface	0.85	2.12	0.2206	0.0059
		Area SUBTOTAL			**15.07**	**1.1302**	**0.0300**

Outfall 015 - Non-Process Runoff - Closed-Capped North Ash Pond & Ash Pond NorthWest External Slopes to Ohio River

Area #		Source	Runoff Description	Cr	# Acres	1-Day Max (MGD)	Daily (Annual Average) (MGD)
15		**Northwest Closed Ash Pond External Slopes and Riverbank Non-Process Runoff to Ohio River**					
			Total AREA	*15*	*acres* 5.54		
15.a	a	**Vegetated Areas Including Lower Access Roads**	Vegetated Area	0.25	0.91	0.0277	0.0007
15.b	b	**North Closed-Capped (Old) Ash Pond Runoff to Outfall 015**	Vegetated Area	0.25	4.63	0.1415	0.0038
		Area SUBTOTAL			**5.54**	**0.1691**	**0.0045**

Outfall 016 - Valley Village Cutoff Entrance Road Woods, Fields and Rail-Loop Covered Landfill Runoff to Ohio River

Area #		Source	Runoff Description	Cr	# Acres	1-Day Max (MGD)	Daily (Annual Average) (MGD)
16		**Dixie Highway Main Entrance Areas**					
			Total AREA	*16*	*acres* 96.88		
16.a		**Dixie Highway Plant Entrance Road Areas (from Receiving Warehouse Highpoint to Woods/Frost-School Highpoint Areas)**					
	1	Railroad Portion along Northeast Rail-Loop toward Entrance Road and Valley Village Stormpipe Inlet	Packed Surface	0.5	1.47	0.0901	0.0024
	2	Grass Slopes Between Entrance Road and Rail Loop	Vegetated Area	0.25	4.69	0.1433	0.0038
	3	Plant Entrance Roadway Pavement	Impervious Surface	0.85	0.63	0.0657	0.0017
	4	Woods adjacent Frost Middle School and Fields North/adjacent Roadway	Vegetated Area	0.25	40.97	1.2516	0.0332
		Area SUBTOTAL			**47.77**	**1.5507**	**0.0411**
16.b		**Covered Landfill Areas within (Old/Closed) Railroad Inner Loop**					
	1	Maintenance Laydown Areas	Packed Surface	0.5	31.56	1.9283	0.0511
	2	Vegetated Fields	Vegetated Area	0.25	17.55	0.5360	0.0142
		Area SUBTOTAL			**49.11**	**2.4644**	**0.0654**

Outfall 017 - Uncontaminated Runoff - Closed Ash Pond West External Slopes to Ohio River

Area #		Source	Runoff Description	Cr	# Acres	1-Day Max (MGD)	Daily (Annual Average) (MGD)
17	a	Closded Ash Treatment Basin West External Slopes to Lower Access Road from NW Property Corner to Outfall #002-2 (to Ohio River)	Vegetated Area	0.25	3.02	0.0924	0.0025

Outfall 018 - Uncontaminated Runoff - Process Pond NW External Slopes to Ohio River

Area #		Source	Runoff Description	Cr	# Acres	1-Day Max (MGD)	Daily (Annual Average) (MGD)
18	a	Process Pond NW External Slopes to Lower Access Road from Channel of Outfall #002-2 below Ash Pond Office Area (to Ohio River)	Vegetated Area	0.25	1.88	0.0575	0.0015

Area #		Source	Runoff Description	Cr	# Acres	1-Day Max (MGD)	Daily (Annual Average) (MGD)
Outfall 019 - Uncontaminated Runoff - Riverbank Slopes West of Unit 2 CT to Ohio River							
19	**a**	Ash Treatment Basin West Slopes to Lower Access Road below Ash Sluice/Sumps Piperack and Access Road to Ash Pond Office Area	Vegetated Area	0.25	2.13	0.0650	0.0017
Outfall 020 - Uncontaminated Runoff - Riverbank Slopes West of Unit 4 CT to Ohio River							
20	**a**	Riverbank Slopes West of Unit 4 Cooling Tower	Vegetated Area	0.25	1.99	0.0607	0.0016
Outfall 021 - Uncontaminated Runoff - Riverbank Slopes West of Unit 3 CT to Ohio River							
21	**a**	Riverbank Slopes West of Unit 3 Cooling Tower	Vegetated Area	0.25	1.53	0.0468	0.0012
Outfall 022 - Uncontaminated Runoff - Yard Area SW of Unit 3 CT to Ohio River							
22	**a**	Yard Areas SouthWest of Unit 3 Cooling Tower	Vegetated Area	0.25	2.21	0.0675	0.0018
Non-Point, Non-Process Area Runoff - North Slopes of Ash Pond Outside Floodwall to MSD Ditch to Ohio River							
23	**a**	Undeveloped Areas South & East of North Slopes of ATB Outside Floodwall to MSD Ditch (no discharge ditch)	Vegetated Area	0.25	15.03	0.4592	0.0122
Non-Point, Non-Process Area Runoff - Riverbanks below West Slopes-Ash Pond to Screenhouse Areas Runoff to Ohio River							
24	**a**	Undeveloped Riverbanks Areas Below West Slopes of Ash Pond to Screenhouse	Vegetated Area	0.25	16.68	0.5094	0.0135
Outfall 025 Non-Process Area Runoff - Closed/Capped Ashpond Hardscape Area Stormwater Runoff to Diffuser to Ohio River							
25	**a**	Closed/Capped Ashpond Hardscape Area Stormwater Runoff to Diffuser	Impervious Surface	0.85	0.54	0.0563	0.0015
Non-Point, Non-Process Area Runoff - Riverbanks Below West Slopes from Outfall 001 Gypsum Barge Loader Areas							
26	**a**	Undeveloped Riverbanks Areas Below West Slopes from Screenhouse to Outfall #013 Areas (including Coal Barge Unloading Area)	Vegetated Area	0.25	16.96	0.5181	0.0137
	a						
Non-Point, Non-Process Area Runoff - Dixie Highway West Roadside Areas to Aesthetic Berm to Construction Entrance							
27	**a**	Undeveloped Areas Dixie Highway West Roadside Areas to Aesthetic Berm to Construction Entrance	Vegetated Area	0.25	6.10	0.1865	0.0049
	a						
		TOTAL SITE PROPERTY			626.0	**acres**	

Louisville Gas & Electric Co
MILL CREEK GENERATING STATION

March 8, 2021

Rainfall Runoff Calculations

Data

Area	# Acres	
Coefficient for Rainfall Runoff	Cr	
10 Year 24 Hour Rainfall	4.5	inch/24 hours
Annual Average Rainfall	43.56	inch/year

Runoff Equations:

1-Day Flow:
(#Acres)(43560 ft2)/Acre)(Cr)(4.1 in/day)(1 ft/12 inch)(7.48 gal/ft3)(1MG/1000000 gal)
MGD = (# Acres) x (Cr) x **0.1221858**

30-Day Flow:
(#Acres)(43560 ft2)/Acre)(Cr)(43.56 in/yr)(1 ft/12 inch)(7.48 gal/ft3)(1MG/1000000 gal)
MGD = (# Acres) x (Cr) x **0.003240434**

Definition of Runoff Coefficients:

	Cr
Vegetated Areas (without slope considerations)	0.25
Gypsum & Loose Gravel (substations, rail beds, dam face, rock-faced slopes, etc.)	0.25
Packed Surfaces (Coal, Bare Soil, Packed Gravel [Roads, Parking Areas, etc.])	0.5
Impervious Surface (Pavement, Roofs, Cooling Tower Direct Precip)	0.85
Basin Surfaces	1

Louisville Gas & Electric Co
MILL CREEK GENERATING STATION

KPDES OUTFALLS DESCRIPTION		***Internal/External***	***Outfall Location***
001	Once-Thru Cooling Water & Process Water Pond(s) Discharge to Ohio River	***External***	Ohio River Discharge Structure
002	Process Water Pond(s) Discharge (*Internal Outfall #002 to Outfall #001*)		
	NEW: Process Water Ponds Discharge to Outfall 001	***Internal***	Pond Discharge into Outfall 001
	EXISTING: Ash Pond Discharge to Outfall 001	***Internal***	Pond Discharge into Ash Pond
003	Unit 2 Cooling Tower Blowdown Internal Outfall to		
	NEW: Cooling Tower Blowdown Discharge to Outfall 001	***Internal***	Pipe Discharge into Outfall 001
	EXISTING: Cooling Tower Blowdown Discharge to Ash Pond	***Internal***	Pipe Discharge into Ash Pond
004	Unit 3 Cooling Tower Blowdown External to Ohio River	***External***	Pipe Discharge to Ohio River
005	Unit 4 Cooling Tower Blowdown External to Ohio River	***External***	Pipe Discharge to Ohio River
006	*Runoff Area not designated (Boiler Chemical Cleaning Wastewaters)*	***Internal***	na or 006=Frac Tanks
007	Non-Contact Runoff - Plant West Powerhouse Roof/Downhill Slopes Runoff to Ohio River	***External***	Ditch to Ohio River
008	*Runoff Area not designated (MSD Sanitary Connection)*	***External***	Sewer Manhole
009	*Plant River Water Intake*	***External***	Intake Screenhouse
010	Non-Contact Runoff -North Plant Maint/Parking/Entry Road Areas to Mill Creek	***External***	Stormpipe-Ditch to Mill Creek & MSD Pumping Station
011	Non-Contact Runoff- East Entry/Parking/Future Landfill Areas to Pond Creek	***External***	Stormpipe-Ditch Adjacent/Under 31W (Dixie Hwy)
012	Construction Runoff Settling Pond Discharge to Ohio River	***External***	Pond Discharge to Ohio River
013	Active Landfill A Settling Basin Discharge to Ohio River	***External***	Pond Discharge to Ohio River
014	Non-Contact Runoff - Switchyard/Powerhouse NW Side to Ohio River	***External***	Stormpipe-Ditch to Ohio River
015	Non-Contact Runoff - Closed Ash Treatment Basin NW External Slopes to Ohio River	***External***	Ditch to Ohio River
016	Non-Contact Runoff - Closed Landfill B to Valley Village Cutoff to Ohio River	***External***	Storm CatchBasin into Pipe to Ohio River
017	Non-Contact Runoff - Closed Ash Treatment Basin West External Slopes to Ohio River	***External***	Ditch to Ohio River
018	Non-Contact Runoff - Process Pond NW External Slopes to Ohio River	***External***	Ditch to Ohio River
019	Non-Contact Runoff - Riverbank Slopes West of Unit 2 CT to Ohio River	***External***	Ditch to Ohio River
020	Non-Contact Runoff - Riverbank Slopes West of Unit 4 CT to Ohio River	***External***	Ditch to Ohio River
021	Non-Contact Runoff - Riverbank Slopes West of Unit 3 CT to Ohio River	***External***	Ditch to Ohio River
022	Non-Contact Runoff - Yard Area SW of Unit 3 CT to Ohio River	***External***	Ditch to Ohio River

STORMWATER RUNOFF AREAS

Plant Property Areas - Rainfall Runoff Calculations

(Arranged by Outfalls - Reflects Construction Changes Completed by 2022)

AREA	
1	Outfall 001 - Once-Thru Cooling Water & Process Water Pond(s)/Ash Pond Discharge to Ohio River
1.a	Powerhouse Roof Drains (incl Old Admin Bldg)
1.b	Powerhouse West Side/Below-Transformers/Deck Area Runoff
2	Outfall 002 - Process Water Pond(s)/Ash Pond Discharge to Outfall #001 (#002-1) & Direct Discharge #002-2 to Ohio River
2.a	Process Water Ponds (Previous Ash Pond Areas)
2.b	Powerhouse West SideTransformer Deck Area (concrete)
2.c	New Warehouse (old Unit 1-2 FGD/Equipment) Runoff Areas
2.d	Coal Yard/Pile Areas
2.e	Limestone Pile, Slurry Prep & FGD Areas Drainage
2.f	Landfill - North Expansion --- (Pre-Expansion Landfill Areas Runoff Continue to Outfall 013)
3	Outfall 003 - Unit 2 Cooling Tower Blowdown (includes Tower Precipitation)
4	Outfall 004 - Unit 3 Cooling Tower Blowdown (includes Tower Precipitation)
5	Outfall 005 - Unit 4 Cooling Tower Blowdown (includes Tower Precipitation)
6	Outfall 006 - Boiler Chemical Cleaning Wastes - Runoff Area not designated
7	Outfall 007 - Non-Process Runoff - Plant Powerhouse West Roof Runoff to Ohio River
8	Outfall 008 - Facility Sanitary Wastewaters to Louisville MSD - Runoff Area not designated
9	Outfall 009 - Plant Intake - Screenhouse/Parking
10	Outfall 010 - Non-Process Runoff -North Plant Maintenance/Parking/Entry Road Areas to Mill Creek
10.a	Drainage to Parking Lot Oil-Water Skimmer
10.b	Drainage from Areas that Combine into Discharge from Parking Lot Oil-Water Skimmer (Discharges Combine)
10.c	Watson Lane Entrance Roadway Areas
10.d	Frost School Property
11	Outfall 011 - Non-Process Runoff- East (Dixie Hwy) Entrances, Contractor Parking & Railroad Wye Areas to Pond Creek
11.a	Dixie Highway Plant Entrance Road Areas
11.b	Railroad Wye Area
11.c	Dixie Highway Construction Entrance Areas
12	Outfall 012 - GPP Runoff Pond (Old Construction Runoff Pond) Discharge to Ohio River
12.a	Construction/GPP Runoff Basin-North Pond #2 -Stormwater & Leachate
12.b	Gypsum Processing Plant Building/Roof(s), Slurry Feedtanks, and Piles Stackout
12.c	Gypsum Pelletizing Plant, Storage/Trucking Building & Office Areas
12.d	Maintenance Laydown (Old DSP Surge Pond) & Adjacent Areas
12.e	Cooling Towers 3-4 Areas (excl structures footprint)
12.f	FGD-PWS Buildings, Tanks, and Adjacent Areas
12.g	Clearwell
13	Outfall 013 - Active Landfill A Settling Basin Discharge to Ohio River
14	Outfall 014 - Non-Process Runoff - Switchyard/Powerhouse NW Side to Ohio River
15	Outfall 015 - Non-Process Runoff - Closed-Capped North Ash Pond & Ash Pond NorthWest External Slopes to Ohio River
15.a	Vegetated Areas Including Lower Access Roads
15.b	North Closed-Capped (Old) Ash Pond Runoff to Outfall 015
16	Outfall 016 - Valley Village Cutoff Entrance Road Woods, Fields and Rail-Loop Covered Landfill Runoff to Ohio River
16.a	Dixie Highway Plant Entrance Road Areas (from Receiving Warehouse Highpoint to Woods/Frost-School Highpoint Areas)
16.b	Covered Landfill Areas within (Old/Closed) Railroad Inner Loop
17	Outfall 017 - Uncontaminated Runoff - Closed Ash Pond West External Slopes to Ohio River
18	Outfall 018 - Uncontaminated Runoff - Process Pond NW External Slopes to Ohio River
19	Outfall 019 - Uncontaminated Runoff - Riverbank Slopes West of Unit 2 CT to Ohio River
20	Outfall 020 - Uncontaminated Runoff - Riverbank Slopes West of Unit 4 CT to Ohio River
21	Outfall 021 - Uncontaminated Runoff - Riverbank Slopes West of Unit 3 CT to Ohio River
22	Outfall 022 - Uncontaminated Runoff - Yard Area SW of Unit 3 CT to Ohio River
23	Non-Point, Non-Process Area Runoff - North Slopes of Ash Pond Outside Floodwall to MSD Ditch to Ohio River
24	Non-Point, Non-Process Area Runoff - Riverbanks below West Slopes of ATB to Screenhouse Areas Runoff to Ohio River
25	Outfall 025 Non-Process Area Runoff - Closed/Capped Ashpond Hardscape Area Stormwater Runoff to Diffuser to Ohio River
26	Non-Point, Non-Process Area Runoff - Riverbanks Below West Slopes from Screenhouse to Coal Barge Unloader Areas
27	Non-Point, Non-Process Area Runoff - Dixie Highway West Roadside Areas to Aesthetic Berm to Pond Creek

TOTAL SITE PROPERTY	**626.0**	**acres**
Pre-Frost Property Total Site	584.8	acres

Area #	Source	Runoff Description	Cr	# Acres	1-Day Max (MGD)	Daily (Annual Average) (MGD)
Outfall 001 - Once-Thru Cooling Water & Process Water Pond(s)/Ash Pond Discharge to Ohio River						
1	**Flows to Once-Thru Cooling Return to River Outfall #001**					
		Total AREA 1	*acres*	9.51		
1.a	**Powerhouse Roof Drains (incl Old Admin Bldg)**					
1	Roof Area	Impervious Surface	0.85	4.91	0.5102	0.0135
1.b	**Powerhouse West Side/Below-Transformers/Deck Area Runoff**					
1	Grass-Field & Gravel Areas	Vegetated Area	0.25	2.60	0.0795	0.0021
2	Transformer (Unit 1-2 Main Aux) Pad with Manual Stormwater Drains to Area Below	Impervious Surface	0.85	0.03	0.0036	0.0001
3	Unit 2 Cooling Tower SW Access Area, Maintenance Bldg/Consumables Warehouse Access Areas, Ash Pond Office Area	Impervious Surface	0.85	1.57	0.1627	0.0043
4	Maintenance Bldg/Consumables Warehouse Buildings Roofs	Impervious Surface	0.85	0.39	0.0406	0.0011
	Area SUBTOTAL			**9.51**	**0.2864**	**0.0076**
Outfall 002 - Process Water Pond(s)/Ash Pond Discharge to Outfall #001 (#002-1) & Direct Discharge #002-2 to Ohio River						
2	**Flows to Process Water Pond(s)/Ash Pond Outfall #002**					
		Total AREA 2	*acres*	187.57		
2.a	**Process Water Ponds *(Previous Ash Pond Areas)***					
1	Knock-out Pond ---Basin Surface	Basin Surface	1.0	0.67	0.0817	0.0022
2	KO Pond --- Perimeter Road and Inner Slope Areas	Impervious Surface	0.85	0.82	0.0851	0.0023
3	Process Water Pond ---Basin Surface	Basin Surface	1.0	18.33	2.2399	0.0594
4	Process Water Pond --- Perimeter Road and Inner Slopes	Impervious Surface	0.85	10.70	1.1116	0.0295
5	Closed-Capped Ash Pond Runoff into Process Water Pond Area	Vegetated Area	0.25	40.50	1.2372	0.0328
6	Unit 2 Cooling Tower Chemical Bldg, Adjacent Areas and Closed-Capped Ash Pond (Paved) Areas	Impervious Surface	0.85	7.34	0.7626	0.0202
	Area SUBTOTAL			**78.37**	**5.5181**	**0.1463**
2.b	**Powerhouse West SideTransformer Deck Area (concrete)**					
1	Concrete Deck, bermed, runoff drains into plant sumps to Process Pond	Impervious Surface	0.85	0.70	0.0727	0.0019
2.c	**New Warehouse (old Unit 1-2 FGD/Equipment) Runoff Areas**					
1	Drainage Ditch to Process Water Pond	Basin Surface	1.0	0.22	0.0268	0.0007
2	New Warehouse (Old FGD 1-2 Absorbers/Equipment) Drainage Area	Impervious Surface	0.85	0.62	0.0641	0.0017
	Area SUBTOTAL			**0.84**	**0.0909**	**0.0024**
2.d	**Coal Yard/Pile Areas**					
1	Pond Surface (Combined Coal+Limestone Runoff Pond)	Basin Surface	1.0	1.68	0.2047	0.0054
2	Coal Pile					
a	Coal Pile Storage Area	Packed Surface	0.5	14.97	0.9145	0.0243
b	Buildings & Roofs	Impervious Surface	0.85	2.02	0.2097	0.0056
c	Railroad Portion within Coal Yard Areas	Packed Surface	0.5	2.67	0.1630	0.0043
d	Coal Yard Flat Access Areas	Packed Surface	0.5	5.71	0.3486	0.0092
e	Pond Inward Slopes toward Rail-Loop Landfill (to Substation)	Vegetated Area	0.25	9.25	0.2824	0.0075
	Area SUBTOTAL			**36.28**	**2.1230**	**0.0563**
2.e	**Limestone Pile, Slurry Prep & FGD Areas Drainage**					
1	Limestone Pile, Slurry Prep & FGD Areas Drainage					
a	Limestone Slurry Tanks	Basin Surface	1	0.39	0.0478	0.0013
b	Limestone Slurry Eqpt/Vac.Truck Buildings Roofs & Adj Roadways	Impervious Surface	0.85	1.64	0.1705	0.0045
2	Limestone Pile, Slurry Prep & FGD Areas Drainage					
a	Limestone Pile Storage	Packed Surface	0.5	0.39	0.0236	0.0006
b	Limestone Pile Adjacent Roadways (incl Lab/Annex/east 1/2 roofs)	Impervious Surface	0.85	1.66	0.1723	0.0046
c	Limestone Slurry Prep Building Roofs	Impervious Surface	0.85	0.52	0.0541	0.0014
d	Unit 3 ESPs, PJFFs, FGDs and Chimney	Impervious Surface	0.85	3.11	0.3228	0.0086
e	Unit 4 ESPs, PJFFs, FGDs and Chimney	Impervious Surface	0.85	4.94	0.5133	0.0136
f	Ammonia Storage/Eqpt Buildings & Adj Pavement/Parking	Impervious Surface	0.85	0.25	0.0257	0.0007
g	Gravel/Drainage Area South of Ammonia Storage Areas	Packed Surface	0.5	0.15	0.0092	0.0002
	Area SUBTOTAL			**13.05**	**1.3392**	**0.0355**
2.f	**Landfill - North Expansion --- *(Pre-Expansion Landfill Areas Runoff Continue to Outfall 013)***					
1	Collection Basin-North Pond #2 -Stormwater & Leachate					
a	Pond Surface	Basin Surface	1	4.65	0.5685	0.0151
b	Pond Inward Slopes (2105-2016 Contours-Status)	Packed Surface	0.5	4.92	0.3006	0.0080
c	Parking Lot	Packed Surface	0.5	4.43	0.2706	0.0072
d	Landfill Sloped Areas to Pond	Vegetated Area	0.25	21.20	0.6474	0.0172
e	Below Landfill Areas to Pond (perimeter areas along entrance road, pond andtowardDixie Hwy)	Vegetated Area	0.25	6.13	0.1873	0.0050
2	Sediment Basin-Northwest Pond #3 (future)					
a	Pond Surface	Basin Surface	1	0.90	0.1095	0.0029
b	Pond Inward Slopes	Packed Surface	0.5	1.20	0.0735	0.0020
c	Landfill Sloped Areas to Pond	Vegetated Area	0.25	10.33	0.3154	0.0084
d	Below Landfill Areas to Pond (north pavement, gravel & coalyard office building areas)	Packed Surface	0.5	1.76	0.1073	0.0028
3	Fly Ash Silos Areas					
a	Fly Ash Silos- Truck Loadout Roadway Drainage	Impervious Surface	0.85	0.30	0.0307	0.0008
b	PJFF-PAC/Fly Ash Silos- Truck Loadout Washdown Areas Drainage	Impervious Surface	0.85	1.07	0.1114	0.0030
c	PJFF-PAC/Fly Ash Silos- Truck Loadout Washdown Areas Drainage	Packed Surface	0.5	1.46	0.0890	0.0024
	Area SUBTOTAL			**58.34**	**2.8113**	**0.0746**

Area #		Source	Runoff Description	Cr	# Acres	1-Day Max (MGD)	Daily (Annual Average) (MGD)
Outfall 003 - Unit 2 Cooling Tower Blowdown *(includes Tower Precipitation)*							
3	a.	Unit 2 Cooling Tower Deck & Basin-Pumps (within Process Pond Drainage)	Impervious Surface	0.85	0.68	0.0707	0.0019
Outfall 004 - Unit 3 Cooling Tower Blowdown *(includes Tower Precipitation)*							
4	a	Unit 3 Cooling Tower Deck & Basin-Pumps (within Runoff to #012 CR-Pond)	Impervious Surface	0.85	0.81	0.0845	0.0022
Outfall 005 - Unit 4 Cooling Tower Blowdown *(includes Tower Precipitation)*							
5	a	Unit 4 Cooling Tower Deck & Basin-Pumps (within Runoff to #012 CR-Pond)	Impervious Surface	0.85	1.00	0.1042	0.0028
Outfall 006 - Boiler Chemical Cleaning Wastes - *Runoff Area not designated*							
Outfall 007 - Non-Process Runoff - Plant Powerhouse West Roof Runoff to Ohio River							
7		**Plant West-side Powerhouse Roof & Downhill Slopes Runoff to River (Below Old Annex/Sta.Lab Area)**					
	a	Gravel Area downhill and/or flat from Powerhouse/Old Lab-Annex Buildings	Packed Surface	0.5	1.48	0.0901	0.0024
	b	Transformer Pad (Manual Stormwater Drains to slopes below)	Impervious Surface	0.85	0.05	0.0048	0.0001
	c	Vegetated Slopes & Gravel Drive Downhill to Riverbank	Vegetated Area	0.25	2.39	0.0729	0.0019
		Area SUBTOTAL			**3.91**	**0.1679**	**0.0045**
Outfall 008 - Facility Sanitary Wastewaters to Louisville MSD - *Runoff Area not designated*							
Outfall 009 - Plant Intake - *Screenhouse/Parking*							
9		**Plant Intake Screenhouse-Pumphouse/Parking**					
	a.	River Intake-Sreenhouse Building Roof Drains	Impervious Surface	0.85	0.20	0.0208	0.0006
	b.	Gravel Roadway & Parking Areas (Roadside)	Packed Surface	0.5	0.06	0.0035	0.0001
		Area SUBTOTAL			**0.26**	**0.0243**	**0.0006**
Outfall 010 - Non-Process Runoff -North Plant Maintenance/Parking/Entry Road Areas to Mill Creek							
10		**North Plant Maintenance Areas, Employee Parking & Plant Entrance Road Areas (from Watson Lane)**					
			Total AREA ***10***	*acres*	90.97		
10.a		**Drainage to Parking Lot Oil-Water Skimmer**					
	1	Unit 1-2 FGD, Garage Maintenance, and Environmental Storage Buildings including Adjacent Pavement Areas Runoff to Parking Lot Oil-Water Skimmer	Impervious Surface	0.85	7.06	0.7329	0.0194
	2	Security Building and Employee Parking Lot Pavement to Parking Lot Oil-Water Skimmer	Impervious Surface	0.85	2.41	0.2502	0.0066
	3	Railroad Portion from/along Plant Substation, Vehicle Maintenance, Environmental Storage Building Runoff to Oil-Water Skimmer	Packed Surface	0.5	0.26	0.0158	0.0004
	4	Vegetated Slopes from/along Plant Substation, Vehicle Maintenance, Environmental Storage Building Runoff to Oil-Water Skimmer	Vegetated Area	0.25	0.62	0.0189	0.0005
	5	Vegetated Slopes from/along Plant Entry Road and FGD Purge Ditch Runoff to Oil-Water Skimmer	Vegetated Area	0.25	0.78	0.0239	0.0006
		Area SUBTOTAL			**11.13**	**1.0418**	**0.0276**
10.b		**Drainage from Areas that Combine into Discharge from Parking Lot Oil-Water Skimmer (Discharges Combine)**					
	1	Railroad Portion from/along Plant Substation Eastward to Woods Highpoint Area Adjacent School Property and Runoff Toward Wetland	Packed Surface	0.5	1.14	0.0698	0.0019
	2	Vegetated Slopes from/along Plant Substation Eastward to Woods Highpoint Area Adjacent School Property and Runoff Toward Wetland	Vegetated Area	0.25	2.84	0.0866	0.0023
	3	Roadway to Dixie Hwy (including pavement & gravel parking areas) from Woods Highpoint Area Adjacent School Property to Employee Parking Lot with Runoff Toward Wetland	Impervious Surface	0.85	1.35	0.1400	0.0037
	4	Vegetated/Fields East-North of Employee Parking Lot, and along road to Dixie Hwy to Woods/School Highpoint with Runoff to Wetland to Mill Creek	Vegetated Area	0.25	1.22	0.0373	0.0010
		Area SUBTOTAL			**6.55**	**1.3995**	**0.0371**
10.c		**Watson Lane Entrance Roadway Areas**					
	1	Employee Parking Runoff to Wetland to Mill Creek	Impervious Surface	0.85	0.90	0.0937	0.0025
	2	North Plant Entrance Road Pavement Runoff to Ditches to Mill Creek	Impervious Surface	0.85	1.58	0.1643	0.0044
	3	Fields Westward between Ash Pond/Floodwall and Watson Lane Entrance Road with Runoff to Wetland to Mill Creek	Vegetated Area	0.25	10.53	0.3216	0.0085
	4	Fields Eastward between Wetland and Watson Lane Entrance Road with Runoff to Wetland to Mill Creek	Vegetated Area	0.25	19.11	0.5836	0.0155
		Area SUBTOTAL			**32.12**	**1.0696**	**0.0284**
10.d		**Frost School Property**					
	1	Frost School Property	Vegetated Area	0.25	41.18	1.2579	0.0334

Area #		Source	Runoff Description	Cr	# Acres	1-Day Max (MGD)	Daily (Annual Average) (MGD)
Outfall 011 - Non-Process Runoff- East (Dixie Hwy) Entrances, Contractor Parking & Railroad Wye Areas to Pond Creek							
11		**East Plant Entrance Roads (from Dixie Hwy) Areas, Contractor/Parking & Railroad Wye Runoff Areas**					
			Total AREA	***11***	*acres* 34.84		
11.a		**Dixie Highway Plant Entrance Road Areas**					
	1	Railroad Portion from/along West/North Side of Roadway from Dixie Hwy (US-31W) to Shipping/Receiving Warehouse Highpoint Area	Packed Surface	0.5	1.25	0.0765	0.0020
	2	Grass Fields between Railroad & Plant Entrance Road from Dixie Hwy to Shipping/Receiving Highpoint Area	Vegetated Area	0.25	6.35	0.1940	0.0051
	3	Plant Entrance Road from Dixie Hwy (US-31W) to Shipping/Receiving Warehouse Highpoint Area	Impervious Surface	0.85	0.94	0.0974	0.0026
	4	Receiving Warehouse Building Roof & Adjacent Paved Area	Impervious Surface	0.85	0.82	0.0849	0.0023
	5	Grass Fields between Plant Entrance Road & North Property Border from Dixie Hwy to Shipping/Receiving Highpoint Area	Vegetated Area	0.25	5.49	0.1677	0.0044
		Area SUBTOTAL			**14.85**	**0.6204**	**0.0165**
11.b		**Railroad Wye Area**					
	1	Railroad Portion between Railroad Wye Area and Landfill	Packed Surface	0.5	0.50	0.0303	0.0008
	2	Railroad Wye Area	Packed Surface	0.5	4.86	0.2967	0.0079
		Area SUBTOTAL			**5.35**	**0.3270**	**0.0087**
11.c		**Dixie Highway Construction Entrance Areas**					
	1	Railroad Tracks Portion along Contractor Entrance Road Portion of Railroad Wye	Packed Surface	0.5	0.73	0.0446	0.0012
	2	Grass Slopes Between Consruction Entrance Road and Contractor Parking Lot to High Point Near Coalyard Offices	Vegetated Area	0.25	4.32	0.1321	0.0035
	3	Construction Entrance (North) and Contractor Parking to Highpoint Near Coalyard Offices Parking Area	Packed Surface	0.5	9.58	0.5855	0.0155
		Area SUBTOTAL			**14.64**	**0.7621**	**0.0202**
Outfall 012 - GPP Runoff Pond (Old Construction Runoff Pond) Discharge to Ohio River							
12		**GPP Runoff Pond (*Old Construction Runoff Pond*) Areas**					
			Total AREA	***12***	*acres* 31.09		
12.a		Construction/GPP Runoff Basin-North Pond #2 -Stormwater & Leachate					
	1	Pond Surface	Basin Surface	1	2.15	0.2627	0.0070
	2	Pond Inward Slopes Areas to Coal Unloader Belt/Buildings	Vegetated Area	0.25	1.49	0.0454	0.0012
	3	Coal Unloader Belt Buildings	Impervious Surface	0.85	0.25	0.0256	0.0007
	4	Roadway Pavement East of Construction Runoff Pond	Impervious Surface	0.85	0.32	0.0333	0.0009
		Area SUBTOTAL			**4.20**	**0.3670**	**0.0097**
12.b		Gypsum Processing Plant Building/Roof(s), Slurry Feedtanks, and Piles Stackout					
	1	GPP Building Roofs	Impervious Surface	0.85	0.37	0.0389	0.0010
	2	Gypsum Slurry Tanks & Pavement Adjacent	Impervious Surface	0.85	1.30	0.1351	0.0036
	3	GPP Gypsum Stackout Piles/Pavement	Impervious Surface	0.85	2.25	0.2334	0.0062
	4	Unpaved Area between Landfill, Gypsum Stackout and Coal Conveyor	Packed Surface	0.5	3.21	0.1961	0.0052
	5	**New** GPP Building/Pavement Area	Impervious Surface	0.85	2.18	0.2260	0.0060
		Area SUBTOTAL			**9.31**	**0.6035**	**0.0160**
12.c		Gypsum Pelletizing Plant, Storage/Trucking Building & Office Areas					
		Building Roofs & North/adjacent Gravel Areas toward Construction Runoff Pond	Impervious Surface	0.85	**1.10**	0.1147	0.0030
12.d		Maintenance Laydown (Old DSP Surge Pond) & Adjacent Areas					
	1	Flat Gravel Area (Old DSP Surge Pond)	Packed Surface	0.5	2.58	0.1579	0.0042
	2	Buildings (to North) Roofs & Paved Roadway	Impervious Surface	0.85	0.45	0.0468	0.0012
		Area SUBTOTAL			**3.03**	**0.2047**	**0.0054**
12.e		Cooling Towers 3-4 Areas (excl structures footprint)					
	1	Cooling Towers 3-4 Pavement Perimeter Roads (north/east/south)	Impervious Surface	0.85	1.18	0.1229	0.0033
	2	Cooling Towers 3-4 Gravel Areas Adjacent	Packed Surface	0.5	2.67	0.1632	0.0043
	3	Chemical Building Roof	Impervious Surface	0.85	0.15	0.0152	0.0004
		Area SUBTOTAL			**4.00**	**0.3013**	**0.0080**
12.f		FGD-PWS Buildings, Tanks, and Adjacent Areas					
	1	New FGD-PWS Building	Impervious Surface	0.85	1.04	0.1079	0.0029
	2	Flat Paved Areas (in Old Pond Footprint After Excavated and Filled)	Impervious Surface	0.85	4.47	0.4642	0.0123
	3	Paved Roadway Along E-Pond from Coalyard Offices to DSP	Impervious Surface	0.5	1.26	0.0768	0.0020
	4	Yard Auxiliary (GPP) Transformers and Fenced Gravel Area	Packed Surface	0.5	0.35	0.0217	0.0006
		Area SUBTOTAL			**7.12**	**0.6705**	**0.0178**
12.g		Clearwell					
	1	Clearwell Pond Surface	Basin Surface	1	1.86	0.2273	0.0060
	2	Clearwell Pond Inward Slopes	Packed Surface	0.5	0.46	0.0282	0.0007
		Area SUBTOTAL			**2.32**	**0.2555**	**0.0068**

Area #		Source	Runoff Description	Cr	# Acres	1-Day Max (MGD)	Daily (Annual Average) (MGD)

Outfall 013 - Active Landfill A Settling Basin Discharge to Ohio River

Area #		Source	Runoff Description	Cr	# Acres	1-Day Max (MGD)	Daily (Annual Average) (MGD)
13		**Landfill Settling Pond #1 (Original Construction, SW Corner) - Runoff Areas**					
	a	Landfill Runoff Pond #1 Surface	Basin Surface	1	0.77	0.0935	0.0025
	b	Pond-to-Crest Inward Slopes	Vegetated Area	0.25	1.82	0.0555	0.0015
	c	South Collector Area Channel (Along/to South Property Line)	Vegetated Area	0.25	4.90	0.1497	0.0040
	d	Aesthetic Berm-to-Active Landfill Area (Drains to South Collector Area Channel)	Vegetated Area	0.25	2.49	0.0760	0.0020
	e	Primary Landfill (both Active & Covered) Vegetated Areas Draining to Runoff Pond #1 and/through South Collector Area Channel	Vegetated Area	0.25	56.97	1.7401	0.0461
	f	Finished/Covered/Vegetated Primary Landfill Areas Draining to Riverbank to Ohio River extending to Outfall #013	Vegetated Area	0.25	13.36	0.4081	0.0108
		Area SUBTOTAL			**80.30**	**2.5229**	**0.0669**

Outfall 014 - Non-Process Runoff - Switchyard/Powerhouse NW Side to Ohio River

Area #		Source	Runoff Description	Cr	# Acres	1-Day Max (MGD)	Daily (Annual Average) (MGD)
14		**Storm Sewer to Ohio River from Substation Areas, Units 1-2, Water Treatment and Admin Buildings-Parking**					
	a	Substation/Switchyard	Packed Surface	0.5	9.56	0.5838	0.0155
	b	Railroad Portion along Plant Substation Eastward toward Units 1-2 Areas	Packed Surface	0.5	0.62	0.0377	0.0010
	c	Roadway/Parking (Triangular) Area Between Railroad Tracks Adj. Substation to FGD Purge Ditch from Units 1-2 Old FGD Eqpt Area	Impervious Surface	0.85	0.79	0.0816	0.0022
	d	Units 1-2 ESPs and Old Administration Building Roadway-Parking Pavement Areas (including Old Chimney)	Impervious Surface	0.85	1.99	0.2065	0.0055
	e	New Administration Building, Water Treatment and Units 1-2 Absorbent Silos Buildings-Pavement Areas	Impervious Surface	0.85	2.12	0.2206	0.0059
		Area SUBTOTAL			**15.07**	**1.1302**	**0.0300**

Outfall 015 - Non-Process Runoff - Closed-Capped North Ash Pond & Ash Pond NorthWest External Slopes to Ohio River

15 **Northwest Closed Ash Pond External Slopes and Riverbank Non-Process Runoff to Ohio River**

Total AREA	***15***	*acres*	5.54

Area #		Source	Runoff Description	Cr	# Acres	1-Day Max (MGD)	Daily (Annual Average) (MGD)
15.a	a	**Vegetated Areas Including Lower Access Roads**	Vegetated Area	0.25	0.91	0.0277	0.0007
15.b	b	**North Closed-Capped (Old) Ash Pond Runoff to Outfall 015**	Vegetated Area	0.25	4.63	0.1415	0.0038
		Area SUBTOTAL			**5.54**	**0.1691**	**0.0045**

Outfall 016 - Valley Village Cutoff Entrance Road Woods, Fields and Rail-Loop Covered Landfill Runoff to Ohio River

16 **Dixie Highway Main Entrance Areas**

Total AREA	***16***	*acres*	96.88

Area #		Source	Runoff Description	Cr	# Acres	1-Day Max (MGD)	Daily (Annual Average) (MGD)
16.a		**Dixie Highway Plant Entrance Road Areas (from Receiving Warehouse Highpoint to Woods/Frost-School Highpoint Areas)**					
	1	Railroad Portion along Northeast Rail-Loop toward Entrance Road and Valley Village Stormpipe Inlet	Packed Surface	0.5	1.47	0.0901	0.0024
	2	Grass Slopes Between Entrance Road and Rail Loop	Vegetated Area	0.25	4.69	0.1433	0.0038
	3	Plant Entrance Roadway Pavement	Impervious Surface	0.85	0.63	0.0657	0.0017
	4	Woods adjacent Frost Middle School and Fields North/adjacent Roadway	Vegetated Area	0.25	40.97	1.2516	0.0332
		Area SUBTOTAL			**47.77**	**1.5507**	**0.0411**
16.b		**Covered Landfill Areas within (Old/Closed) Railroad Inner Loop**					
	1	Maintenance Laydown Areas	Packed Surface	0.5	31.56	1.9283	0.0511
	2	Vegetated Fields	Vegetated Area	0.25	17.55	0.5360	0.0142
		Area SUBTOTAL			**49.11**	**2.4644**	**0.0654**

Outfall 017 - Uncontaminated Runoff - Closed Ash Pond West External Slopes to Ohio River

Area #		Source	Runoff Description	Cr	# Acres	1-Day Max (MGD)	Daily (Annual Average) (MGD)
17	a	Closded Ash Treatment Basin West External Slopes to Lower Access Road from NW Property Corner to Outfall #002-2 (to Ohio River)	Vegetated Area	0.25	3.02	0.0924	0.0025

Outfall 018 - Uncontaminated Runoff - Process Pond NW External Slopes to Ohio River

Area #		Source	Runoff Description	Cr	# Acres	1-Day Max (MGD)	Daily (Annual Average) (MGD)
18	a	Process Pond NW External Slopes to Lower Access Road from Channel of Outfall #002-2 below Ash Pond Office Area (to Ohio River)	Vegetated Area	0.25	1.88	0.0575	0.0015

Area #		Source	Runoff Description	Cr	# Acres	1-Day Max (MGD)	Daily (Annual Average) (MGD)
Outfall 019 - Uncontaminated Runoff - Riverbank Slopes West of Unit 2 CT to Ohio River							
19	**a**	Ash Treatment Basin West Slopes to Lower Access Road below Ash Sluice/Sumps Piperack and Access Road to Ash Pond Office Area	Vegetated Area	0.25	2.13	0.0650	0.0017
Outfall 020 - Uncontaminated Runoff - Riverbank Slopes West of Unit 4 CT to Ohio River							
20	**a**	Riverbank Slopes West of Unit 4 Cooling Tower	Vegetated Area	0.25	1.99	0.0607	0.0016
Outfall 021 - Uncontaminated Runoff - Riverbank Slopes West of Unit 3 CT to Ohio River							
21	**a**	Riverbank Slopes West of Unit 3 Cooling Tower	Vegetated Area	0.25	1.53	0.0468	0.0012
Outfall 022 - Uncontaminated Runoff - Yard Area SW of Unit 3 CT to Ohio River							
22	**a**	Yard Areas SouthWest of Unit 3 Cooling Tower	Vegetated Area	0.25	2.21	0.0675	0.0018
Non-Point, Non-Process Area Runoff - North Slopes of Ash Pond Outside Floodwall to MSD Ditch to Ohio River							
23	**a**	Undeveloped Areas South & East of North Slopes of ATB Outside Floodwall to MSD Ditch (no discharge ditch)	Vegetated Area	0.25	15.03	0.4592	0.0122
Non-Point, Non-Process Area Runoff - Riverbanks below West Slopes-Ash Pond to Screenhouse Areas Runoff to Ohio River							
24	**a**	Undeveloped Riverbanks Areas Below West Slopes of Ash Pond to Screenhouse	Vegetated Area	0.25	16.68	0.5094	0.0135
Outfall 025 Non-Process Area Runoff - Closed/Capped Ashpond Hardscape Area Stormwater Runoff to Diffuser to Ohio River							
25	**a**	Closed/Capped Ashpond Hardscape Area Stormwater Runoff to Diffuser	Impervious Surface	0.85	0.54	0.0563	0.0015
Non-Point, Non-Process Area Runoff - Riverbanks Below West Slopes from Outfall 001 Gypsum Barge Loader Areas							
26	**a**	Undeveloped Riverbanks Areas Below West Slopes from Screenhouse to Outfall #013 Areas (including Coal Barge Unloading Area)	Vegetated Area	0.25	16.96	0.5181	0.0137
	a						
Non-Point, Non-Process Area Runoff - Dixie Highway West Roadside Areas to Aesthetic Berm to Construction Entrance							
27	**a**	Undeveloped Areas Dixie Highway West Roadside Areas to Aesthetic Berm to Construction Entrance	Vegetated Area	0.25	6.10	0.1865	0.0049
	a						
		TOTAL SITE PROPERTY			626.0	**acres**	

LG&E-Mill Creek Station – *KPDES Permit Renewal Information*
Construction Projects Work Required for ELG Federal Rule Compliance

Rev December 15, 2022

SUMMARY

To update the renewal of the Louisville Gas & Electric Company (LG&E) Mill Creek Generating Station (Plant) KPDES permit, this description of construction activities provides technical and scheduling information to support retaining applicability dates for KPDES permit conditions to meet Federal Effluent Limitations Guidelines (ELG) regulations. EPA recently issued communications that it will reconsider the 2020 ELG rule with potential changes to limits for FGD wastewater, bottom ash transport water, legacy wastewater, and landfill leachate. However, until such proposed rulemaking is published and finalized, steam-electric utilities must comply with the 2020 ELG rule and its compliance dates. Therefore, LGE is proceeding with ELG rule construction activities under the applicability dates granted in the Mill Creek Generation Station KPDES permit KY0003221 modification with an effective date of November 1, 2021. Mill Creek utilizes a dry pneumatic bottom ash conveying system and has no discharge of Bottom Ash Transport Water (BATW).

Therefore, to comply with the ELG Rule, LG&E is continuing activities to:

- construct a biological wastewater treatment system and ancillary Ultrafiltration (UF) for Flue Gas Desulfurization (FGD) process waters.

Specifically at the Mill Creek Plant, construction of new biological wastewater treatment facilities for FGD (Flue Gas Desulfurization) systems wastewaters and other plant process waters require:

- Construction of a biological treatment system building to house tanks, chemical storage, equipment, electrical components, controls, etc.;
- procurement and installation of a sophisticated, modular biological treatment system which includes multiple biological fluidized bed reactors and ancillary pumps, piping, valving, electrical, and controls as well as a large Ultrafiltration system;
- A complex design to retrofit new equipment with the existing physical-chemical wastewater treatment facility;
- Complex construction scheduling sequencing to construct while units operate and install tie-ins when outages are scheduled;

With the intent to reduce the discharge of wastewater contaminants as expeditiously and economically as possible, the description and schedule provided here are accelerated and represent a current best-estimate, but it must be recognized that construction activities are still in the early stages and all-weather construction activities may have a profound effect upon the final completion date. Accordingly, LG&E-Mill Creek will contact KDOW-KPDES staff to provide updated information if the actual schedule significantly deviates from that provided here including if adjustment in ELG applicability dates are required.

LG&E-Mill Creek Station – *KPDES Permit Renewal Information*

Construction Projects Work Required for ELG Federal Rule Compliance

Rev December 15, 2022

CONSTRUCTION ACTIVITIES DESCRIPTION

Construction activities for the following projects are currently underway.

Flue Gas Desulfurization Wastewater (FGDWW) Project

For the FGDWW project, discreet steps of the engineering-procurement-installation contract include multiple overlapping phases which are not specifically sequential but highly interdependent so that delays of any step likely lead to delays of completing the entire project.

For the FGDWW specific-activities, these phases and general expected durations include:

- Detailed engineering: beginning May 2021
- Procurement: beginning Q3 2021
- Construction -multi-discipline and multi-trades: beginning Q4 2021
- Mechanical startup, troubleshooting and testing: beginning Q2 2023
- Commercial completion and performance test: beginning Q1 2024
- Plant testing and optimization: Q2 – Q4 2024
- Applicability Date: January 1, 2025

Construction – FGDWW

Engineering and procurement activities, associated with changes or impacts of the finalized ELG Rule, are already underway for the Flue Gas Desulfurization Wastewater (FGDWW) treatment system.

FGDWW System Design

Specifically, the Mill Creek Station existing FGDWW treatment system will be modified by constructing a new selenium/biological treatment system (ELG System) to post-treat the existing physical-chemical equipment flows. Included in the ELG System are outdoor bioreactors, sump and a new building housing additional process equipment, electrical switchgear, control panels, laboratory and chemical storage tanks. The solids from the ELG System will be integrated into the existing FGDWW solids flows for management in existing onsite CCR storage facility.

Treated effluent flows will continue to be discharged through internal Outfall 024 and combined with other plant process flows to the Process Pond to internal Outfall 002 to the high-rate multiport diffuser at external outfall 025 to the Ohio River.

Mill Creek § 316(b) § 122.21(r)(2)-(8) Information and Factors that Must and May be Considered for the Entrainment BTA Determination

Final Report, September 2022

ACKNOWLEDGMENTS

The following organizations, under contract to the Electric Power Research Institute (EPRI), prepared this report:

Mr. David Bailey
Ulman and Associates
8819 Trafalgar Ct.
Springfield, VA 22151

Mr. William Dey
ASA Analysis and Communication, Inc.
383 Plattekill Rd.
Marlboro, New York 12542

Mr. Nate Olken
Alden Research Laboratory Inc.
30 Shrewsbury St.,
Holden, MA 01520-1843

Mr. Jack Tramontano
AECOM
625 West Ridge Pike
Suite E-100
Conshohocken, Pennsylvania 19428

Mr. Joe Vondruska
EA Engineering, Science, and Technology, Inc., PBC
444 Lake Cook Road, Suite 18
Deerfield, IL 60015

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ACRONYMS

AIF – Actual Intake Flow
AOI- Area of Influence
BPJ – Best Professional Judgement
BTA - Best Technology Available
CCRS – Closed-cycle Recirculating System
CFS – Cubic Feet Per Second
CWA – Clean Water Act
CWIS – Cooling Water Intake Structure
DIF- Design Intake Flow
EPA - United States Environmental Protection Agency
EPRI – Electric Power Research Institute
GPM- Gallons per Minute
KDEP – Kentucky Department for Environmental Protection
KDFWR – Kentucky Department of Fish and Wildlife Resources
KSNPC – Kentucky State Nature Preserves Commission
LG&E – Louisville Gas and Electric Company
MGD – Million Gallons Per Day
mORFIn – Modified Ohio River Fish Index
NGVD- National Geodetic Vertical Datum
NPDES – National Pollutant Discharge Elimination System
O & M – Operation and Maintenance
ORSANCO- Ohio River Valley Sanitation Commission
ORM – Ohio River Mile
PSI- Pounds per Square inch
RFLP - Restriction Fragment Length Polymorphisms
RM- River Mile
T&E – Threatened and Endangered
USACE- United States Army Corps of Engineers
USFWS – United States Fish and Wildlife Service
YOY – Young of the Year

EXECUTIVE SUMMARY

This document is submitted in compliance with U.S. Environmental Protection Agency (EPA) final § 316(b) regulations (Rule) for existing facilities that became effective on October 14, 2014. The Mill Creek Generating Station (Mill Creek) is owned by Louisville Gas and Electric Company (LG&E). Mill Creek is covered by the Rule that requires all facilities using >2 MGD to use best technology available (BTA) for entrainment and impingement. All facilities are required to submit the § 122.21(r)(2) and (3) information and applicable provisions of the (r)(4) through (8) information for impingement that includes:
(r)(2) – Source Water Physical Data
(r)(3) – Cooling Water Intake Structure Data
(r)(4) – Source Water Baseline Biological Characterization Data
(r)(5) – Cooling Water System Data
(r)(6) – Chosen Method of Compliance with the Impingement Mortality Standard
(r)(7) – Entrainment Performance Studies
(r)(8) – Operational Status

The BTA determination for entrainment is based on information provided to the National Pollutant Discharge Elimination System (NPDES) permitting authority, the Kentucky Department of Environmental Protection (KDEP) for Mill Creek. The BTA determination for entrainment is made on a site-specific basis. At a minimum, all facilities using >125 MGD actual intake flow (AIF) are required to submit entrainment information that includes the § 122.21(r)(9)-(12) information as follows:
(r)(9) – Entrainment Characterization Study
(r)(10) – Comprehensive Technical Feasibility and Cost Evaluation Study
(r)(11) – Benefits Valuation Study
(r)(12) – Non-water Quality Environmental and Other Impacts Study

The § 122.21(r)(10) – (12) information must be peer reviewed as required at § 122.21(r)(13) of the Rule.

While Mill Creek's AIF currently exceeds 125 MGD, the Rule has a provision at §122.21(r)(1)(ii)(G) that states: *"If the owner or operator of an existing facility plans to retire the facility after the current permit expires but within one permit cycle, then the Director may waive the requirements of paragraphs (r)(7), (9), (10), (11), (12), and (13) of this section pending a signed certification statement from the owner or operator of the facility specifying the last operating date of the facility.* LG&E is planning to retire Unit 1 (the only once-through unit at Mill Creek) no later than the end of 2024. LG&E has already informed the public service commission that it plans to retire the Mill Creek once-through condenser cooled unit (Unit 1 during the next permit cycle and therefore qualifies for the exemption from having to submit the entrainment BTA determination. Unit 2 (a closed-cycle unit) will also be retired by the end of 2028. LG&E is still required to submit the § 122.21(r)(2) through (8) information and that information is provided in this document.

Flow Reductions - The planned retirement of Unit 1 by 2024 will reduce the station's current DIF from 285.7 MGD to 59.0 MGD. This will result in a 79% reduction from the current DIF. The three remaining units at Mill Creek, Units 2, 3 and 4, use closed-cycle recirculating systems (CCRS) that meets the definition of CCRS at § 125.92 of the Rule. CCRS for these units reduces flow by approximately 93% when compared to similar units if they were designed for once-through cooling. Actual flow reductions are expected to be greater because the annual peak monthly average make-up water flow for Units 2 through 4 is less than the design make-up water flow.

Additional reductions in the DIF will occur after 2028 with the retirement of Unit 2.

Federally Protected Species – Potential risks to federally protected species are discussed in Section 4.6 of this document. No federally protected species have been collected in any of the entrainment or impingement samples during the course of Mill Creek's entrainment characterization studies. Currently, there is a low risk of entrainment, impingement or designated critical habitat impacts as a result of current operations. As noted above any risk will be reduced by the 79% reduction in cooling water flow with the retirement of Unit 1. This includes elimination of any impacts as a result of the Unit 1 thermal discharge downstream of the facility.

Conclusion

As a result of retiring Unit 1, the only once-through cooled unit, the Mill Creek DIF will be reduced by 79% by the end of 2024. The remaining three units, Units 2, 3 and 4 already have closed-cycle recirculating systems as defined at § 125.92. These units will meet the impingement mortality and entrainment standards of the Rule and continued operation does not pose a significant risk to federally protected species.

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1 INTRODUCTION

1.1 General § 316(b) Rule Overview

The U.S. Environmental Protection Agency (EPA) issued final § 316(b) regulations (Rule) for existing facilities that became effective on October 14, 2014. These regulations require all facilities using >2 MGD to use best technology available (BTA) for entrainment and impingement. All facilities are required to submit the § 122.21(r)(2) and (3) information and applicable provisions of the (r)(4) through (8) information for impingement that includes:
(r)(2) – Source Water Physical Data
(r)(3) – Cooling Water Intake Structure Data
(r)(4) – Source Water Baseline Biological Characterization Data
(r)(5) – Cooling Water System Data
(r)(6) – Chosen Method of Compliance with the Impingement Mortality Standard
(r)(7) – Entrainment Performance Studies
(r)(8) – Operational Status

The BTA determination for entrainment is based on information provided to the National Pollutant Discharge Elimination System (NPDES) permitting authority, Kentucky Division of Environmental Protection (KDEP) for Mill Creek. The BTA determination for entrainment is made on a site-specific basis. At a minimum, all facilities using >125 MGD actual intake flow (AIF) are required to submit entrainment information that includes the § 122.21(r)(9)-(12) information as follows:
(r)(9) – Entrainment Characterization Study
(r)(10) – Comprehensive Technical Feasibility and Cost Evaluation Study
(r)(11) – Benefits Valuation Study
(r)(12) – Non-water Quality Environmental and Other Impacts Study
The § 122.21(r)(10) – (12) information must be peer reviewed as required at § 122.21(r)(13) of the Rule.

The Rule includes a number of potential exemptions that include:

- a *de minimis* exemption for low levels of impingement,
- a provision for less stringent standards for low capacity utilization,
- an exemption for some or all of the §122.21(r) information for facilities that withdraw cooling water from manmade lakes and reservoirs and have stocked or managed fisheries,
- an exemption from use of technologies at nuclear facilities that conflict with federal nuclear safety requirements, and
- an exemption from submitting entrainment information for facilities retiring in the current or next NPDES permit cycle.

The Rule provides broad discretionary authority to KDEP to deny exemptions or even impose additional requirements, especially if federally protected threatened or endangered species or their designated critical habitat are at risk.

1.2 Compliance Approach for Mill Creek

While Mill Creek's AIF currently exceeds 125 MGD, the Rule has a provision at §122.21(r)(1)(ii)(G) that states: *"If the owner or operator of an existing facility plans to retire the facility after the current permit expires but within one permit cycle, then the Director may waive the requirements of paragraphs (r)(7), (9), (10), (11), (12), and (13) of this section pending a signed certification statement from the owner or operator of the facility specifying the last operating date of the facility.* LG&E is planning to retire Unit 1 (the once through cooled unit) at Mill Creek no later than the end of 2024 and it will also retire Unit 2, a closed-cycle unit by the end of 2028. Thus, the facility is exempted from having to provide the entrainment information. In this document LG&E is providing the § 122.21(r)(2) through (8) information for Mill Creek's once-through cooled Unit (Units 1) as well as the closed-cycle cooled units (Units 2, 3 and 4). In Chapter 6, LG&E plans to use BTA for Impingement through retiring Unit 1 and 2 and the continued use of closed-cycle recirculating systems (CCRS) as BTA for Units 3 and 4. This compliance approach is allowed under the provision at §122.21(r)(1)(ii)(G) of the Rule. LG&E recognizes that KDEP is still required to make an entrainment BTA determination based on factors that must and may be considered as required at §125.98(f) of the Rule. However, LG&E provides information in Chapter 9 and the executive summary to assist KDEP in making the determination relative to those factors.

1.3 Report Organization

The report is organized such that the § 122.21(r)(2) through (8) information is presented in Chapters 2 through 8 of this report respectively. Chapter 9 provides information to KDEP to inform the entrainment BTA determination that is based on factors that must and may be considered in making that determination. Chapter 10 provides a list of references used in this document. A high quality flow line diagram is provided as Appendix A.

The entrainment characterization study (r)(9), reports on use of CCRS and fine-mesh screens (r)(10), information and information on the non-water quality and (r)(12), other environmental impact were also completed for Mill Creek. These reports were drafted prior to the LG&E decision to retire Units 1 and 2 and no longer required for Mill Creek. They are therefore not included in this submittal.

2 § 122.21(R)(2) SOURCE WATERBODY PHYSICAL DATA

The Rule at § 122.21(r)(2) requires LG&E to provide the following source waterbody physical data for Mill Creek:

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

(ii) Identification and characterization of the source waterbody's hydrological and geomorphological features, as well as the methods you used to conduct any physical studies to determine your intake's area of influence within the waterbody and the results of such studies; and

(iii) Locational maps.

The following physical data are being provided to characterize the source waterbody in the vicinity of Mill Creek. This information is used, in part, to evaluate the various measures that LG&E are required to consider to meet the BTA requirements of the Rule. The following sections describe the Ohio River's dimensions, key physical and chemical characteristics, and provides the figures and maps required under 40 CFR 122.21(r)(2).

2.1 Narrative Description of Source Waterbody

The Ohio River is nearly 1,000 miles long, flowing from the confluence of the Allegheny and the Monongahela Rivers in Pittsburgh, Pennsylvania to where it joins the Mississippi River in Cairo, Illinois. The drainage area of the Ohio River and approximate location of Mill Creek is shown on Figure 2-1. The Ohio River is divided into a series of pools by 20 locks and dams. These locks and dams were installed to improve navigation and control flooding on the river and are managed by the U.S. Army Corps of Engineers (USACE).

Mill Creek is located on the eastern shore of the Ohio River in Louisville, Kentucky at River Mile (RM) 625.8 within the Cannelton Pool. This pool is 113.9 miles long, extending from the McAlpine Locks and Dam (RM 606.8) downstream to the Cannelton Locks and Dam (RM 720.7), as shown on Figure 2-2. The pool has a gradient drop of 0.3 feet per mile (ft/mi.) and averages 1,674 feet wide and 32 feet deep (ORSANCO 2020a).

Major inflows into the Cannelton Pool include the Salt River, Big Indian Creek, Sinking Creek and Blue River (ORSANCO 2020a). The Salt River, the closest tributary to Mill Creek, discharges into the Ohio River at RM 629.8, 4.0 miles downstream of the station.

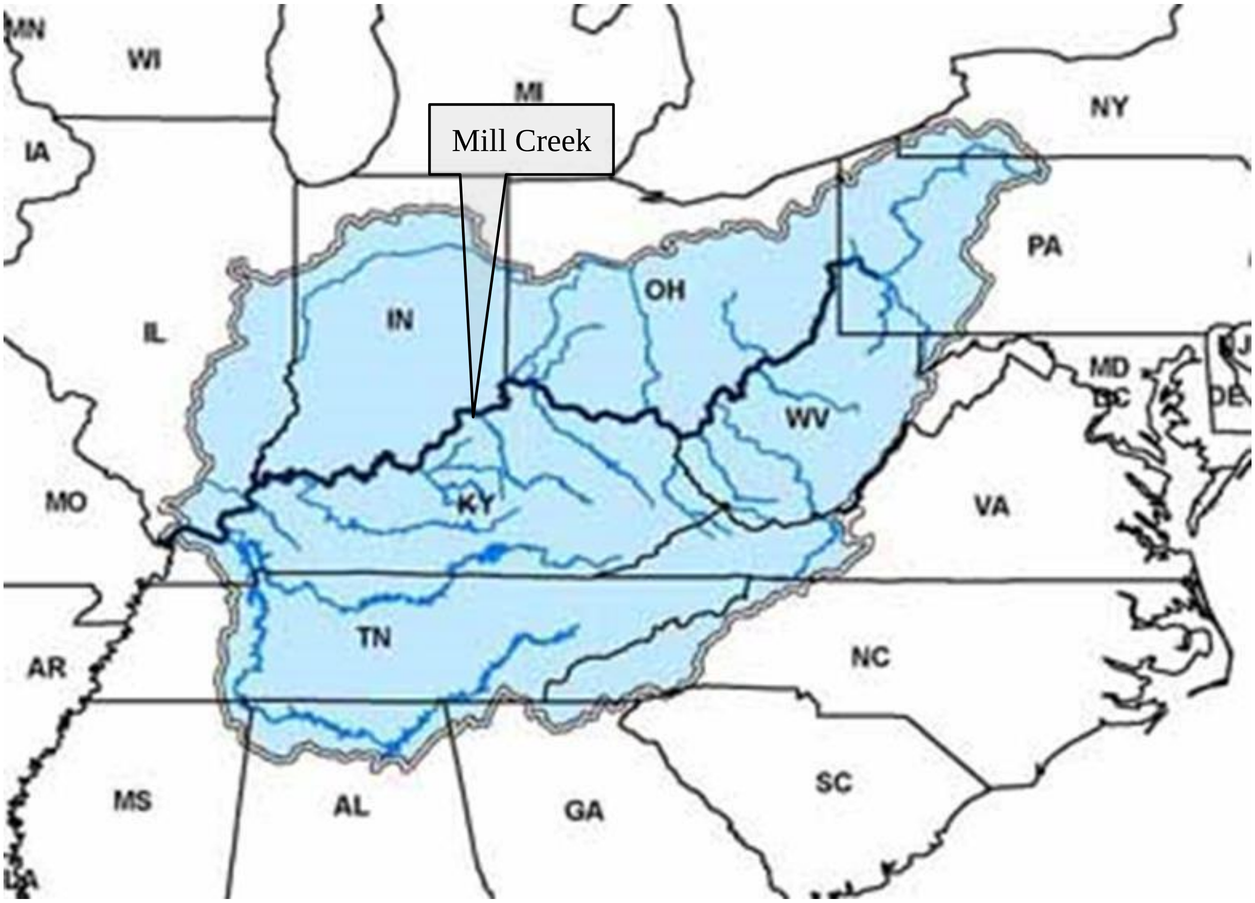


Figure 2-1 Ohio River Watershed (ORSANCO 2020b)

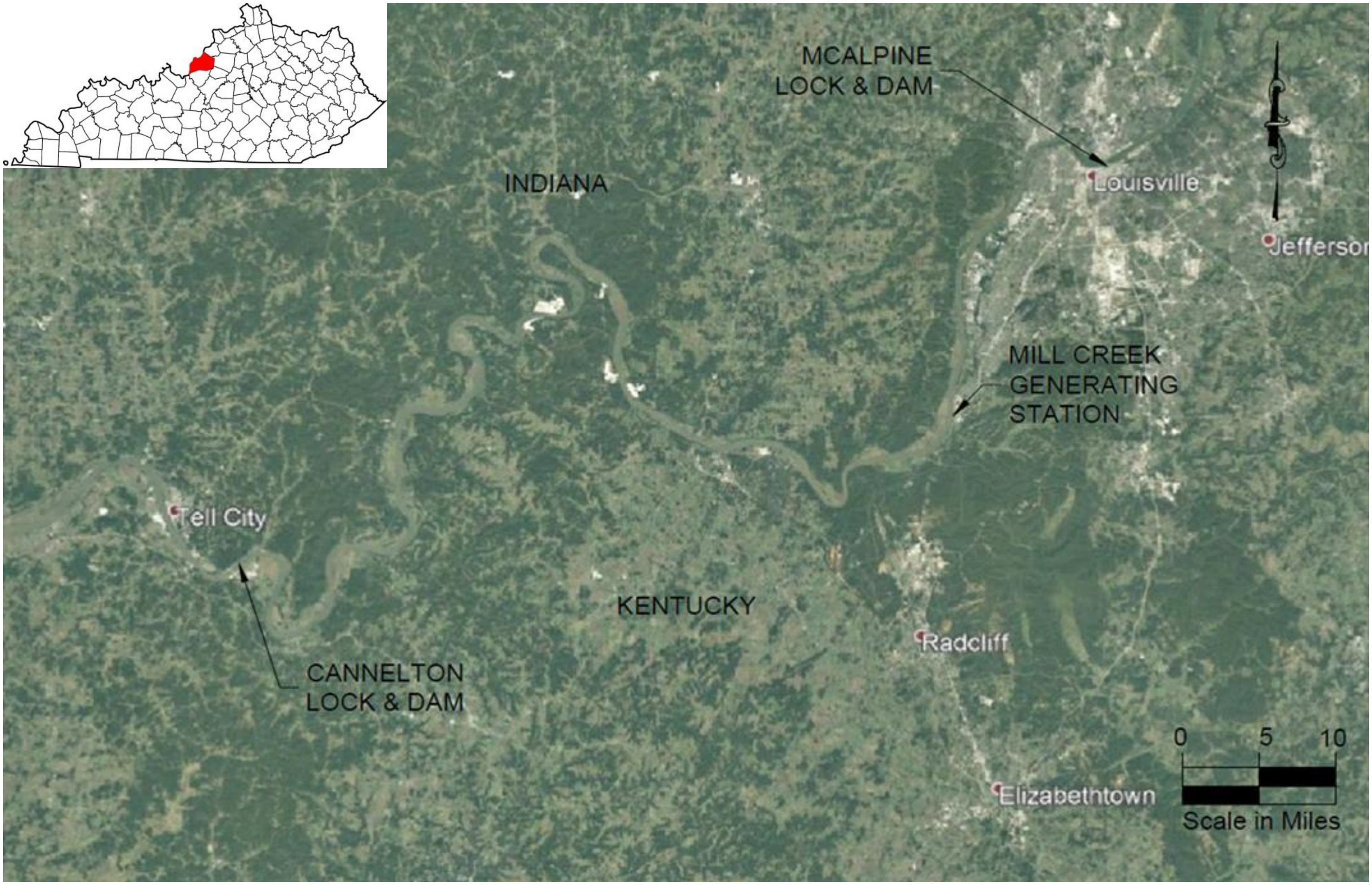


Figure 2-2 Locational Map of Mill Creek

2.2 Aerial Dimensions

Mill Creek is located on the eastern shore of the Ohio River at RM 625.8. The river near the CWIS is approximately 1,800 ft wide and flows in a southerly direction, as shown in Figure 2-3.

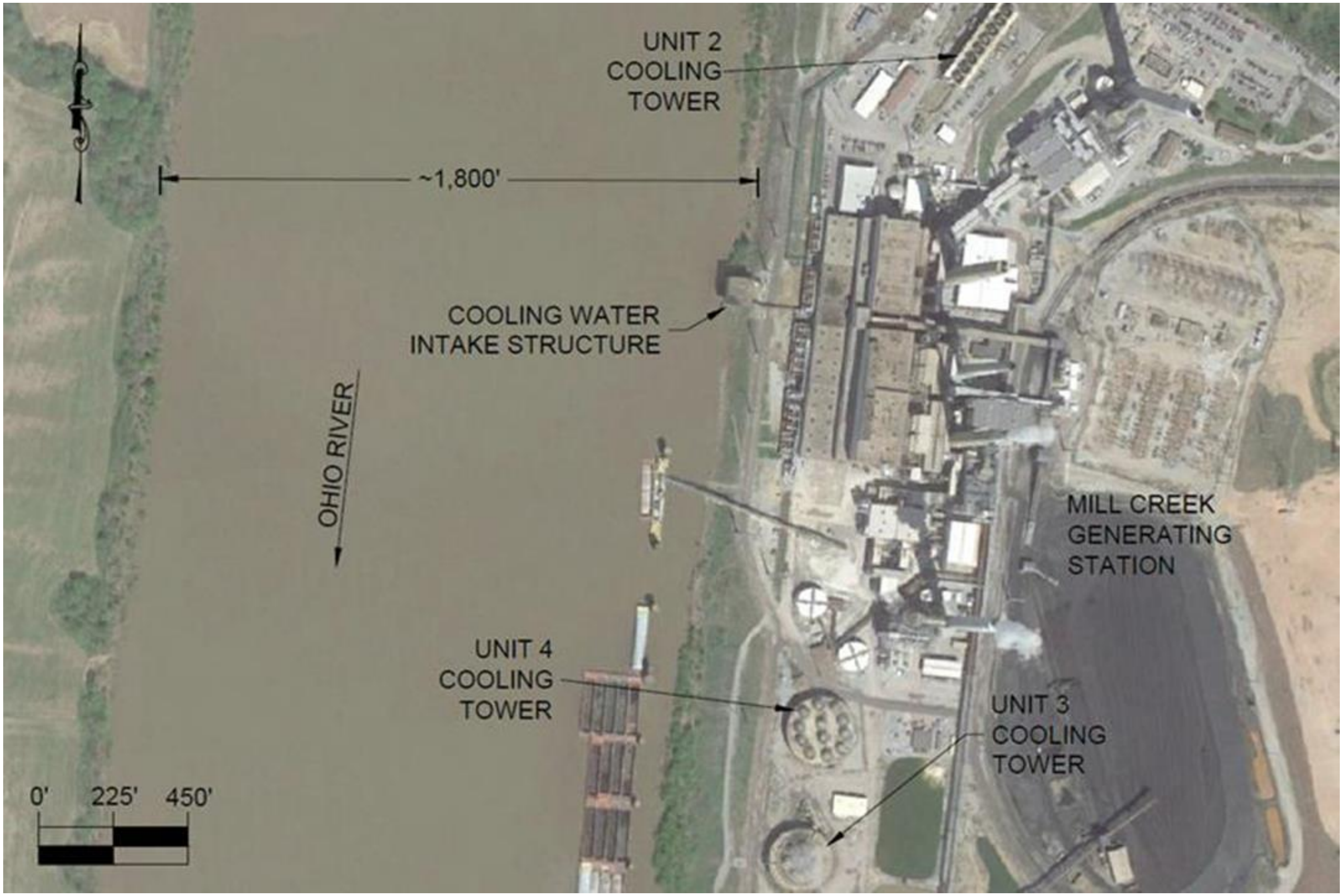


Figure 2-3 Site Configuration of Mill Creek

2.3 Depths

Limited information is available on the water levels and river bathymetry in the Cannelton Pool near Mill Creek. The normal pool level in the Cannelton Pool is El. 383.0 ft. Water level information within the pool was obtained from USGS Gage #03294600 for the Ohio River at Kosmosdale, KY, which is located at approximately RM 627, 1.2 river miles downstream of Mill Creek (USGS 2022a). For the period of record from January 1, 2002 through December 31, 2021, water levels at this site ranged from a low of El. 380.34 ft which occurred on July 27, 2011, to a high on February 26, 2018 of El. 435.48 ft with an average surface elevation of 391.95 ft. The 50% exceedance water level during this period was El. 388.51 ft. Assuming a pool gradient of 0.3 ft/mile during low water, the low water level at Mill Creek would be El. 380.7 ft. All elevations are given in NGVD29. The stage duration curve for this period is provided in Figure 2-4. The average monthly water level for this period is provided in Table 2-1.

Historic design information from Mill Creek indicates both a normal and low water elevation of 383.0 ft. This water level is consistent with the project pool elevation but is not expected to be a good representation of low water levels at the site. A water level of El. 375.0 ft., approximately 5.7 ft below the estimated lowest water level recorded during the period of record, was assumed for the design low water level at Mill Creek. This low water level is consistent with the design low water level at Cane Run, located 9.2 river miles upstream of Mill Creek, and provides a conservatively low estimate of low water at the site. A river level of El. 375.0 ft is therefore used for velocity calculations and technology designs throughout the 122.21(r) studies. This water level may not however be indicative of the lowest water level that the station can operate.

Bathymetric data is not available for the Ohio River near Mill Creek. The only information on water depths is provided in the navigation chart for the Ohio River near Mill Creek (Figure 2-5). The white sections of river in the navigation chart indicate a water depth of 9 ft or more at the project pool (El. 383.0 ft), and the blue sections represent water depths less than 9 ft at the project pool.

Table 2-1 Water Surface Elevations

Month	Average Surface Elevation (ft) (2002-2021)
January	397.76
February	396.15
March	399.93
April	398.94
May	395.86
June	390.3
July	387.31
August	384.6
September	386.05
October	385.14
November	389.32
December	394.75

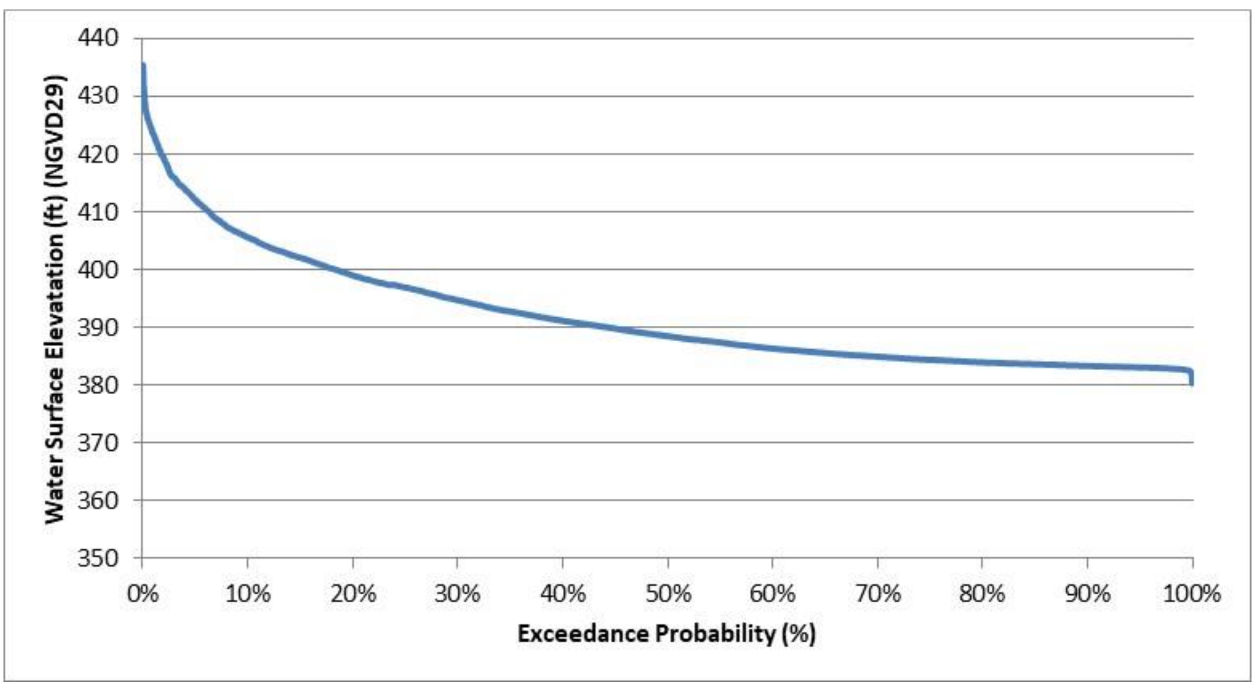


Figure 2-4 Stage Duration Curve for USGS Gage #03294600 (2002-2021)

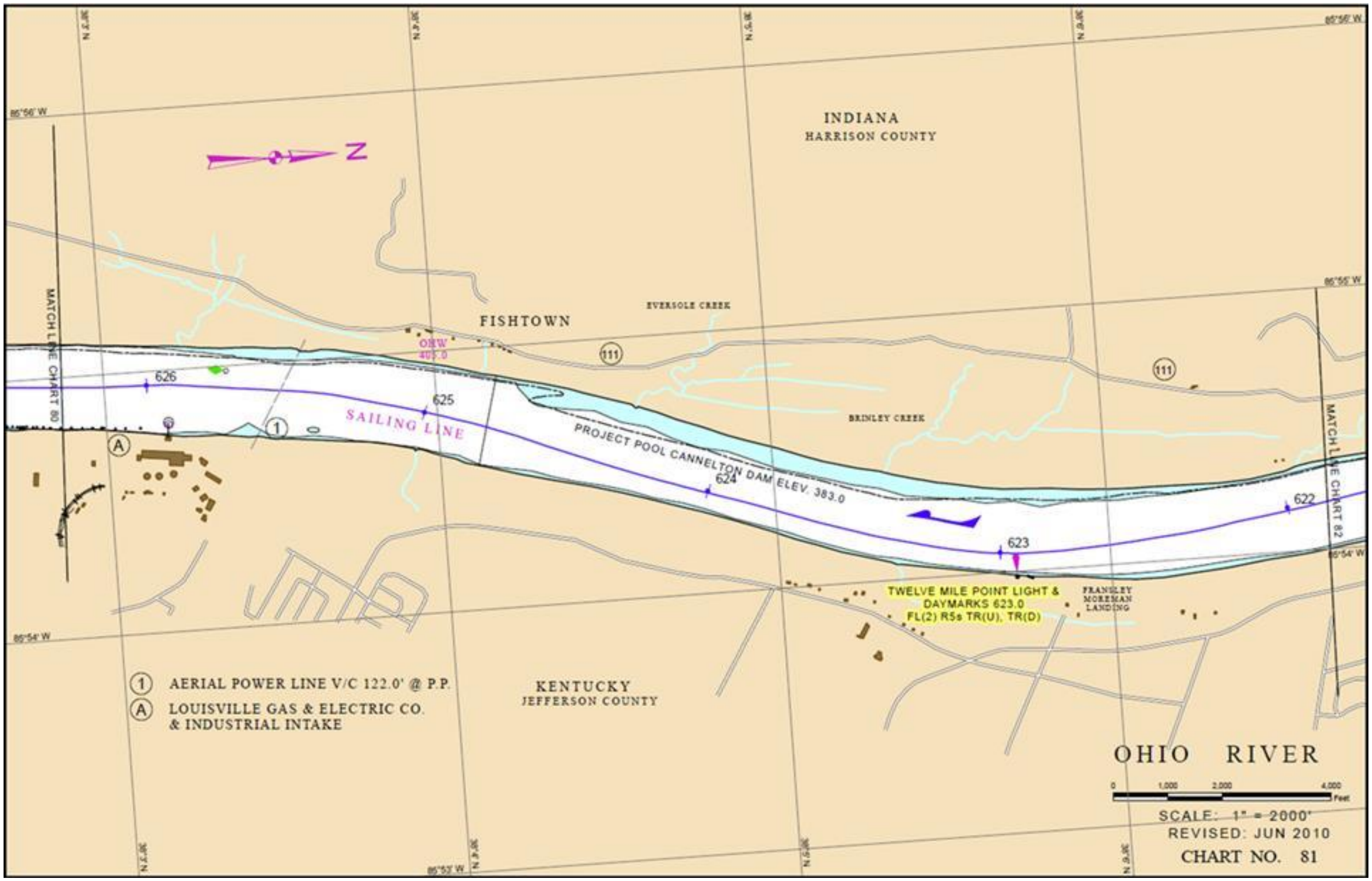


Figure 2-5 Ohio River Navigation Chart for Mill Creek and Surrounding River (USACE 2010)

2.4 Flows

River flows in the Ohio River near Mill Creek are based on river flows recorded from USGS Gage #03294500 for the Ohio River at Louisville, KY (USGS 2022b). River flows at this site have been recorded since January 1, 1928, however only information from the last 20 calendar years on record (2002-2021) were used for this report. EPRI limited the data to the last 20 years, because this period is expected to be a good representation of existing land use, water use and climactic conditions on the Ohio River. For the period of record daily mean flows ranged from a high of 720,000 cubic feet per second (cfs) measured February 26, 2018 to the low of 877 cfs measured in September 21, 2010. The average mean river flow was approximately 141,638 cfs and the median flow (50% exceedance) was 104,000 cfs. The average annual flows for the period of record are provided in Table 2-2. The flows in this stretch of the river follow seasonal trends with higher flows occurring in the late winter and lower flows in the late summer as shown in Table 2-3 and Figure 2-6.

Table 2-2 Mean Annual Flow as Measured From USGS Gage #03294500 for the Ohio River at Louisville, KY (Annual Years 2002-2021)

Year	Mean Annual Flow (cfs)
2002	120,600
2003	177,000
2004	178,700
2005	121,700
2006	123,500
2007	117,000
2008	136,700
2009	116,600
2010	108,300
2011	188,300
2012	108,400
2013	139,300
2014	131,100
2015	151,100
2016	112,100
2017	137,300
2018	210,600
2019	172,800
2020	158,800
2021	123,000*

* Daily average flows used to estimate the flows during September-December 2021

Table 2-3 Average Monthly Ohio River Flows as Measured at Louisville, KY (January 1, 2002 Through December 31, 2021) (USGS Gage #03294500)

Month	Monthly Average Flow (cfs)
January	200,013
February	214,400
March	252,915
April	216,858
May	184,246
June	111,550
July	77,036
August	48,256
September	60,015
October	59,450
November	111,247
December	173,128

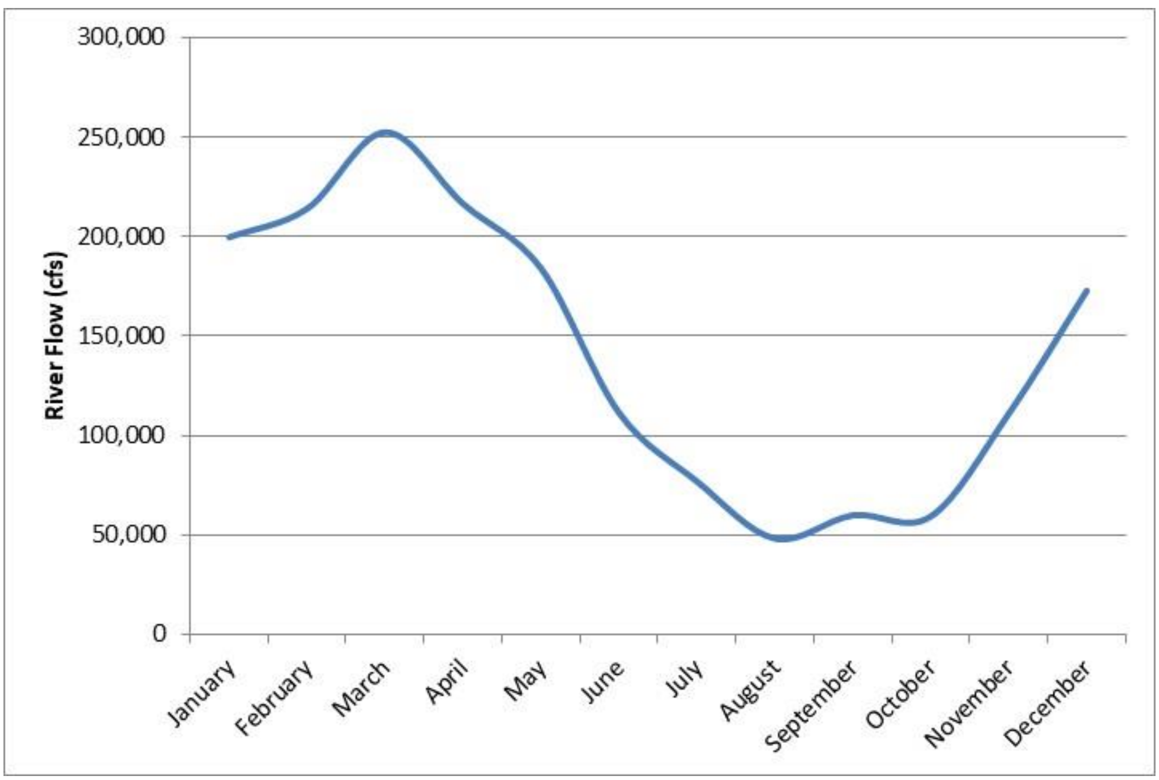


Figure 2-6 Average Monthly Ohio River Flows as Measured at Louisville, KY (2002 through 2021) (USGS Gage #03294500)

2.5 Salinity

The Ohio River is characterized as freshwater and therefore has very low salinity (i.e., <1 ppt).

2.6 Temperature

Monthly average water temperatures for the Ohio River are available from ORSANCO (ORSANCO 2020c). River temperatures measured at Newburgh Lock and Dam are available for the months of May through October through 2017. Daily average water temperatures for the Ohio River from the McAlpine Lock and Dam to Cairo, IL are available from 1995 to 2003. The daily data set, while older is presented in this analysis because it includes all twelve months. During this time the daily river water temperature ranged from 38.8°F to 83.0°F with an average daily temperature of 61.2°F (Table 2-4). The seasonal change in water temperature is shown on Figure 2-7.

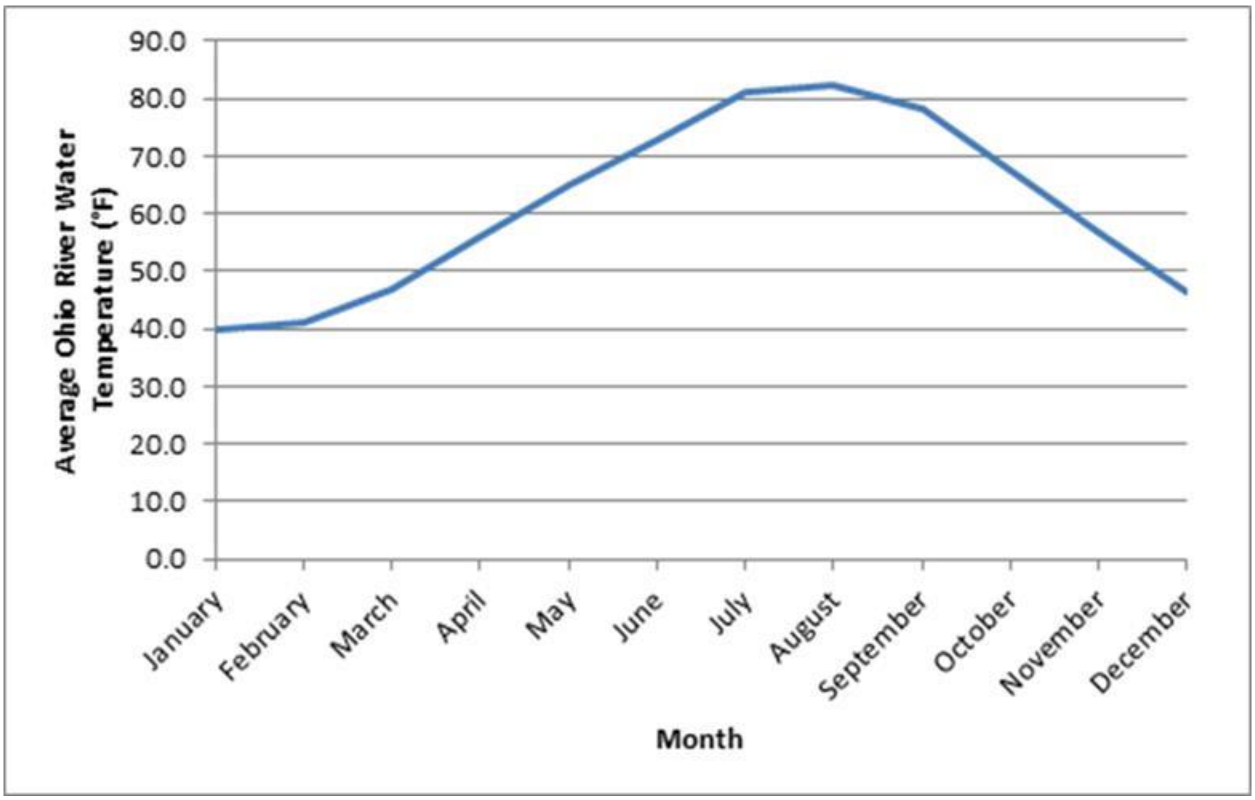


Figure 2-7 Average Ohio River Water Temperatures in Degrees Fahrenheit for McAlpine L&D to Cairo, IL (1995-2003)

Table 2-4 Average Monthly Ohio River Temperatures in Degrees Fahrenheit for McAlpine L&D to Cairo, IL (1995-2003)

Month	Monthly River Temperatures (°F)
January	40.0
February	41.2
March	46.9
April	55.9
May	64.9
June	73.0
July	81.2
August	82.4
September	78.3
October	67.5
November	56.7
December	46.4
Average	61.2

2.7 Area of Influence

The area of influence (AOI) of a CWIS represents the portion of the source waterbody that is affected by the CWIS cooling water withdrawal (i.e.. area in the source waterbody where organisms are potentially subject to entrainment or impingement by the CWIS). This information is needed to indicate the potential area of adverse environmental impact on the source waterbody and to appropriateness of any design or technologies proposed by the applicant. The AOI differs depending on whether it is considered for impingement or entrainment. From an impingement standpoint, the AOI can be defined as the area where a healthy fish may not be able to swim against and escape the intake flow. The AOI from an entrainment standpoint is the chance of a particle within the source waterbody becoming entrained. This area can vary depending on the number of cooling water pumps in operation.

Accurately defining the AOI at the CWIS requires a detailed understanding of the intake and the surrounding waterbody environment. Simple desktop models using available information can however provide sufficient AOI estimates for the purpose of designing entrainment and/or source waterbody studies and evaluating fish protection technologies and/or operational measures.

2.7.1 Impingement AOI

A desktop model was used to estimate the impingement area of influence (AOI) for Mill Creek's CWIS. The first step in determining the impingement AOI is to define the approximate area within the 0.5 foot per second (ft/sec) velocity contour. EPA considers this velocity to be a *de minimis* value for impingement. That is, a fish can swim freely in a flow at this velocity and avoid impingement. Several basic and common assumptions were made for Mill Creek to define the approximate AOI using simplified calculations. These assumptions are:

- The maximum AOI occurs at the minimum design water level;
- The maximum AOI occurs when the station is operating at its maximum design intake flow (DIF) (442.0 cfs), which includes the once-through cooling water flow;
- Due to the absence of detailed bottom bathymetry of the river in front of the CWIS, the inverts were assumed to be horizontal and level with the invert of the CWIS (El. 364.0 ft);
- All of the currents in the area are a direct result of the Mill Creek withdrawal; and
- The flow field extends the full depth of the water column;
- The flow per unit area increase towards the center of the CWIS resulting in an elliptical AOI.

The geometry of the intake, the adjacent shoreline, the bottom bathymetry, and design intake flow were based on information presented in §122.21(r)(2), (3).

All four units at Mill Creek share the same CWIS, therefore, the simplified estimate of the AOI uses a DIF of 442.0 cfs, which includes both once-though cooling water and make-up water flow for the closed-cycle units. This DIF was divided by 0.5 fps to calculate the effective flow area necessary to achieve a 0.5 fps velocity (884 ft^2). With a minimum water depth of 11 ft, the 0.5 fps velocity contour will be approximately 80.4 ft long. This length along with the length of the intake was used to solve the Ramanujan equation for the radius of an ellipse along the minor axis. The Ramanujan equation is provided below.

$$p \approx \pi \left[3(a+b) - \sqrt{(3a+b)(a+3b)}\right]$$

p= perimeter of ellipse (twice the effective flow length)
a= radius of ellipse along the long axis (half of the intake or intake bay width)
b= radius of ellipse along the short axis (maximum distance of the velocity contour)

The results of this analysis indicate that the 0.5 fps contour extends out a maximum of 16.9 ft from the face of CWIS at the design low water level (El. 375.0 ft) as shown on Figure 2-8. At the lowest recorded river level (El. 380.7), the impingement AOI is expected to extend out a maximum of 9.5 ft from the face of the CWIS when operating at the DIF.

Unit 1, the once-though unit at Mill Creek, is slated to be retired by the end of 2024. Once Unit 1 is retired, the four long-shaft pumps that provide make-up water for the three closed-cycle units will be the only pumps withdrawing water from the Ohio River. This will reduce the Mill Creek DIF to 91.4 cfs, a 79% flow reduction. Under this operating scenario, the 0.5 ft/sec contour would extend 2.3 ft into the river assuming flow is limited to only one trash rack opening and a low water level of El. 375.0 ft as shown on Figure 2-8. At the lowest recorded river level of El. 380.7 ft, the impingement AOI occurs within the CWIS. After 2028, the DIF may be lower than what is estimated here, because one or more of the long-shaft pumps may be retired as part of the Unit 2 retirement.

2.7.2 Entrainment AOI

The AOI from an entrainment standpoint is the area in the river within which a suspended particle is likely to become drawn into the Mill Creek CWIS along with the cooling water. In the Rule preamble (see Footnote 48) EPA states that

"*Entrainment is generally considered to be proportional to flow and therefore a reduction in flow results in a proportional reduction in entrainment, as EPA assumes for purposes of national rulemaking that entrainable organisms are uniformly distributed throughout the source water*".

A simple desktop model was used to determine the AOI for entrainment at the Mill Creek CWIS. Accurately defining the AOI for entrainment at CWIS(s) requires an understanding of both intake and river flows. The following basic and common assumptions were made for Mill Creek to define the approximate entrainment AOI using simplified calculations.

- The design intake flow of the Mill Creek CWIS is 442.0 cfs.
- The maximum AOI occurs at the lowest daily mean river flow as recorded in Louisville, KY (877 cfs occurring on September 21, 2010).
- The river near the CWIS has a width of 1,800 feet with a uniform bottom
- The flow in the Ohio River is uniform throughout the river cross section.

Localized flows and currents were not considered in this simplified model but could potentially effect entrainment.

During the lowest recorded flow conditions, the Mill Creek CWIS could withdraw up to 50% of the Ohio River flow. Based on the river geometry assumptions, the AOI for entrainment would extend approximately 907 ft out from the face of the CWIS during the extreme low river flow conditions. During average daily mean river flow conditions from 2002 to 2021 (141,638 cfs), the Mill Creek CWIS could withdraw up to approximately 0.31% of the Ohio River flow resulting in an entrainment AOI extending approximately 6 ft from the face of the CWIS.

The percent of the river flow withdrawn based on the average monthly river flows from 2002-2021, and the estimated distance the entrainment AOI extends out into the river under the existing DIF are provided in Table 2-5. The main spawning and larval recruitment period for the Ohio River at Mill Creek extends from mid-April through mid-August. From April through August, Mill Creek could withdraw up to 0.35% of the average monthly river flow (127,589 cfs) resulting in an affected entrainment AOI extending approximately 6 ft from the face of the CWIS.

With the retirement of Unit 1 during the next permit cycle, the Mill Creek DIF will drop from 442.0 cfs to 91.4 cfs. During extreme low flow conditions and Mill Creek operating at the new DIF, the station could withdraw up to 10% of the river flow, with an entrainment AOI extending up to 188 ft from the CWIS. If operating at its DIF, Mill Creek would withdraw less than 0.1% of both the average annual river flow and the average monthly river flow during the entrainment season. The entrainment AOI under these conditions extend approximately 1 ft out from the CWIS. The entrainment AOI would be reduced further if one or more long-shaft pumps are retired in conjunction with the Unit 2 retirement. The percent of the river flow withdrawn and the estimated distance the entrainment AOI extends out into the river, for the average monthly river flow from 2002-2021 and assuming Mill Creek is operating at its future DIF are provided in Table 2-6.

Table 2-5 Percent of the Ohio River Withdrawn Through the Mill Creek CWIS at the Existing Design Intake Flow (442.0 cfs) Based on Average Monthly Ohio River Flows as Measured at Louisville, KY (January 1, 2002 through January 31, 2021)

Month	Mean Monthly Ohio River Flow (cfs)	Design Intake Flow (cfs)	Percent of River Withdrawn	Distance AOI Extends Into the River (ft)
January	200,013	442.0	0.22%	4
February	214,400	442.0	0.21%	4
March	252,915	442.0	0.17%	3
April	216,858	442.0	0.20%	4
May	184,246	442.0	0.24%	4
June	111,550	442.0	0.40%	7
July	77,036	442.0	0.57%	10
August	48,256	442.0	0.92%	16
September	60,015	442.0	0.74%	13
October	59,450	442.0	0.74%	13
November	111,247	442.0	0.40%	7
December	173,128	442.0	0.26%	5

Table 2-6 Percent of the Ohio River Withdrawn Through the Mill Creek CWIS at the Future Design Intake Flow (91.4 cfs) Based on Average Monthly Ohio River Flows as Measured at Louisville, KY (January 1, 2002 through January 31, 2021)

Month	Mean Monthly Ohio River Flow (cfs)	Design Intake Flow (cfs)	Percent of River Withdrawn	Distance AOI Extends Into the River (ft)
January	200,013	91.4	0.05%	1
February	214,400	91.4	0.04%	1
March	252,915	91.4	0.04%	1
April	216,858	91.4	0.04%	1
May	184,246	91.4	0.05%	1
June	111,550	91.4	0.08%	1
July	77,036	91.4	0.12%	2
August	48,256	91.4	0.19%	3
September	60,015	91.4	0.15%	3
October	59,450	91.4	0.15%	3
November	111,247	91.4	0.08%	1
December	173,128	91.4	0.05%	1

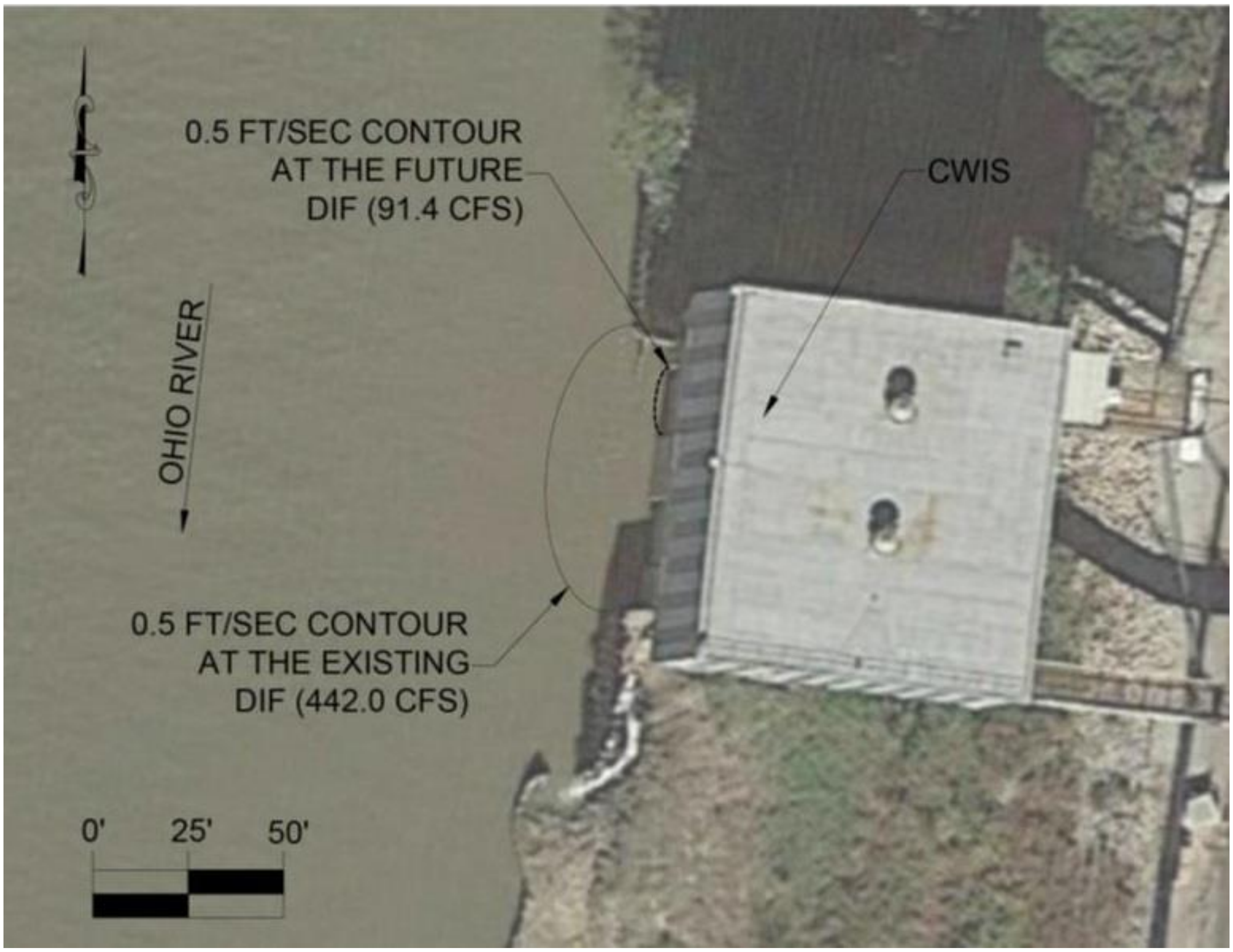


Figure 2-8 Area of Influence for Impingement for Mill Creek at a Low Water Elevation of 375.0 ft

3 § 122.21(R)(3) COOLING WATER INTAKE STRUCTURE DATA

The Rule at § 122.21(r)(3) requires LG&E to provide the following cooling water intake information for Mill Creek:

(i) A narrative description of the configuration of each of your cooling water intake structures and where it is located in the water body and in the water column;

(ii) Latitude and longitude in degrees, minutes and seconds for each of your cooling water structures;

(iii) A narrative description of the operation of each of your cooling water intake structures, including design intake flows, daily hours of operation number of days of the year in operation and seasonal changes, if applicable;

(iv) A flow distribution and water balance diagram that includes all sources of water to the facility, recirculating flows, and discharges; and

(v) Engineering drawings of the cooling water intake structure.

The following CWIS data are being provided to characterize the Mill Creek CWIS and evaluate the potential for impingement and entrainment of aquatic organisms.

3.1 CWIS Configuration

Mill Creek is a steam electric generating station with four coal-fired units located on the eastern shore of the Ohio River at River Mile (RM) 625.8, in Louisville, Jefferson County, Kentucky (KY). This is approximately 15 miles southwest of downtown Louisville, KY and 9.2 miles downstream from the Cane Run Generating Station. The Mill Creek CWIS is located at latitude 38°03’11.2” and longitude 85°54’44.0”. The Mill Creek CWIS provides circulating water to the Unit 1 once-through cooling water system, and make-up water to three units’ (Units 2, 3, and 4) with CCRS.

The shoreline CWIS includes a skimmer wall, trash racks, a baffle wall and four traveling water screens that are used to keep fish and debris out of the circulating and make-up water systems. The CWIS has a total width of approximately 70 ft, a top deck elevation of 462.0 ft and is divided into four intake bays, two for Unit 1 and two for Units 2, 3, and 4. The overall arrangement of the Mill Creek site and CWIS is shown in Figure 3-1. Plan and section views of the CWIS are provided in Figure 3-3 and Figure 3-4 respectively.

The skimmer wall is located at the face of the CWIS. This skimmer wall extends 2 ft below the normal water level to El. 381.0 ft. There are two openings in the skimmer wall, each 17 ft high by 14 ft wide. Trash racks span the total width and height of both openings. The trash racks have 3 inch by 0.375 inch bars spaced 4 inches on center.

The CWIS, downstream of the skimmer wall, is divided into four screen bays; each 11.3 ft wide. A baffle wall, located at the face of each screen bay extends down to El. 373.2 ft. The floor under the baffle wall is at El. 365.2 ft providing an 8 ft high by 11.3 ft wide opening.

Traveling water screens are located downstream of the baffle wall openings. The centerline of the traveling water screens is located 5.75 ft downstream of the baffle walls. These screens are 10 ft wide and equipped with 0.375 (3/8) inch square stainless-steel mesh. The screens extend from the invert of the CWIS (El. 364.0 ft) to above the top deck (El. 462.0 ft). The screens rotate at either 2.5 ft/min or 10/ft min, depending on river and debris conditions. Typically, one screen is rotated at a time for one hour. Once all four screens are rotated, there is a two-hour period before the sequence starts again. All the screens may be operated simultaneously during periods of heavy debris loading. The screens are inspected every week and any damaged baskets are corrected at that time. Debris loading on the screens typically consists of sticks and leaves and is heaviest during the spring and fall. The debris is washed off the screens using a high-pressure front spray wash. An open debris trough conveys screen wash water back to the river at the south (downstream) side of the screen house. Large debris is collected and removed from the screens for disposal. The traveling water screens are on a four-year overhaul cycle with one screen being completed each year.

The Unit 1 circulating water pumps are located downstream of traveling water screens in the two southernmost (downstream) bays. Typically, both circulating water pumps are operated when the unit is operating, however one pump can be taken out of service during cold weather. Operating with only one circulating water pump puts station reliability at risk and is only conducted to facilitate maintenance. Operating only one pump results in a flow of 206.2 cfs (92,600 gpm, 133.3 MGD). The combined flow rate with both pumps operating is 350.7 cfs, (157,400 gpm, 226.7 MGD). The difference between the flow rate through each pump with one and two pumps operating is a result of increased backpressure on the circulating water pumps associated with the increased flow. The two circulating water pumps will be retired by the end of 2024 in conjunction with the Unit 1 retirement. The Unit 1 circulating water is discharged back to the Ohio River approximately 577 ft downstream of the CWIS.

Four, long-shaft service water pumps are located in the other two bays. These pumps are used to provide service water and auxiliary make-up water to the three closed-cycle units. Two pumps are located in the northernmost bay and have a combined flow of 44.6 cfs (20,000 gpm, 28.8 MGD); the two other pumps are located in the other screen bay and have a combined flow of 46.8 cfs, (21,000 gpm, 30.2 MGD). These pumps will remain in service beyond the retirement of Unit 1, however there is potential that one or more of these pumps can be retired in conjunction with the retirement of Unit 2, by the end of 2028. Cooling tower blow down for Units 2, 3, and 4 is discharged back to the Ohio River through the same discharge structure as Unit 1.

The maximum combined DIF through the CWIS is 442.0 cfs (198,400 gpm, 285.7 MGD) with Unit 1 operating. After Unit 1 is retired the new Mill Creek DIF will be 91.4 cfs (41,000 gpm, 59.0 MGD), when all four long-shaft pumps are operating. This represents a 79% reduction in the design flow.

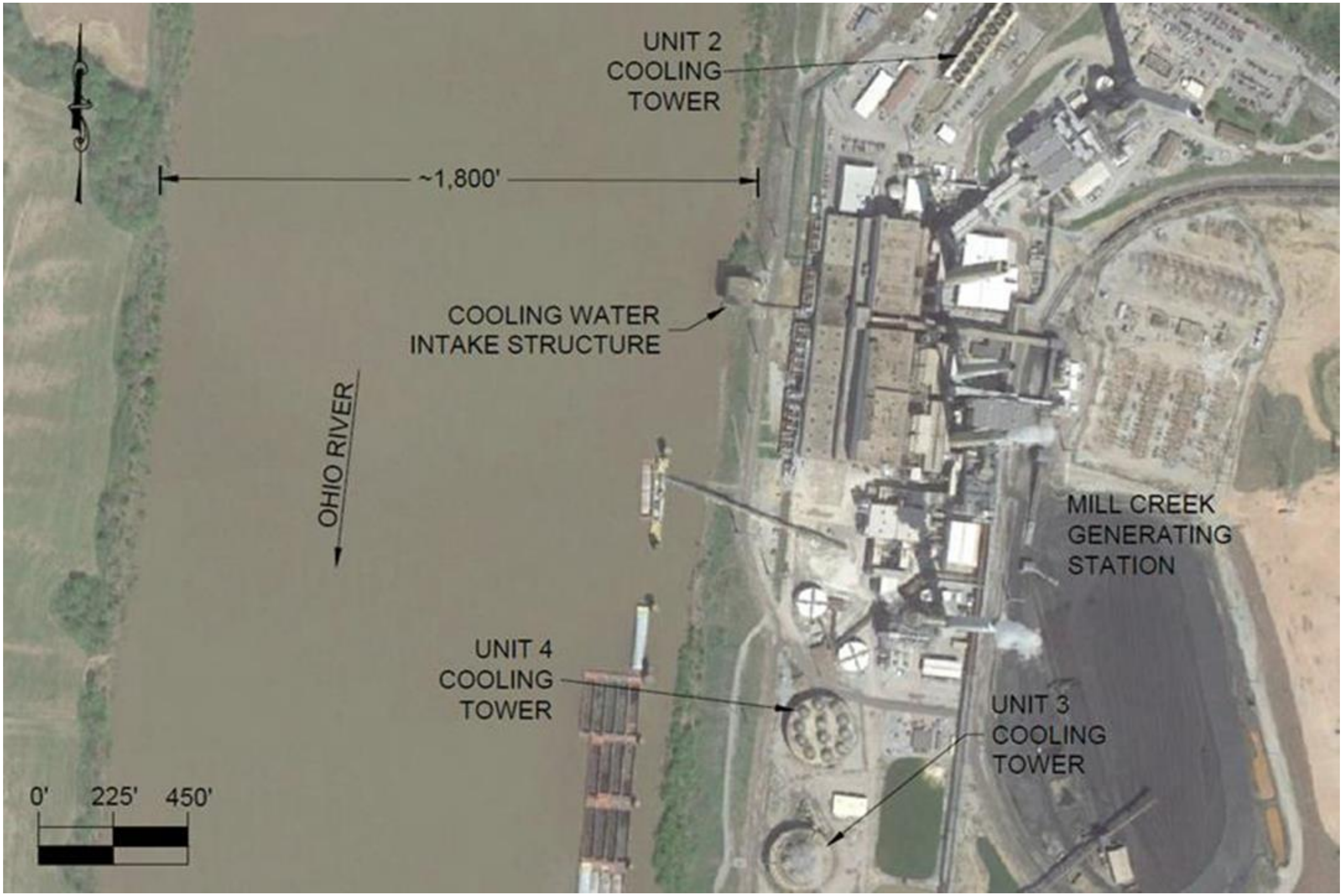


Figure 3-1 Mill Creek Site Configuration

Figure 3-2 Mill Creek CWIS Configuration

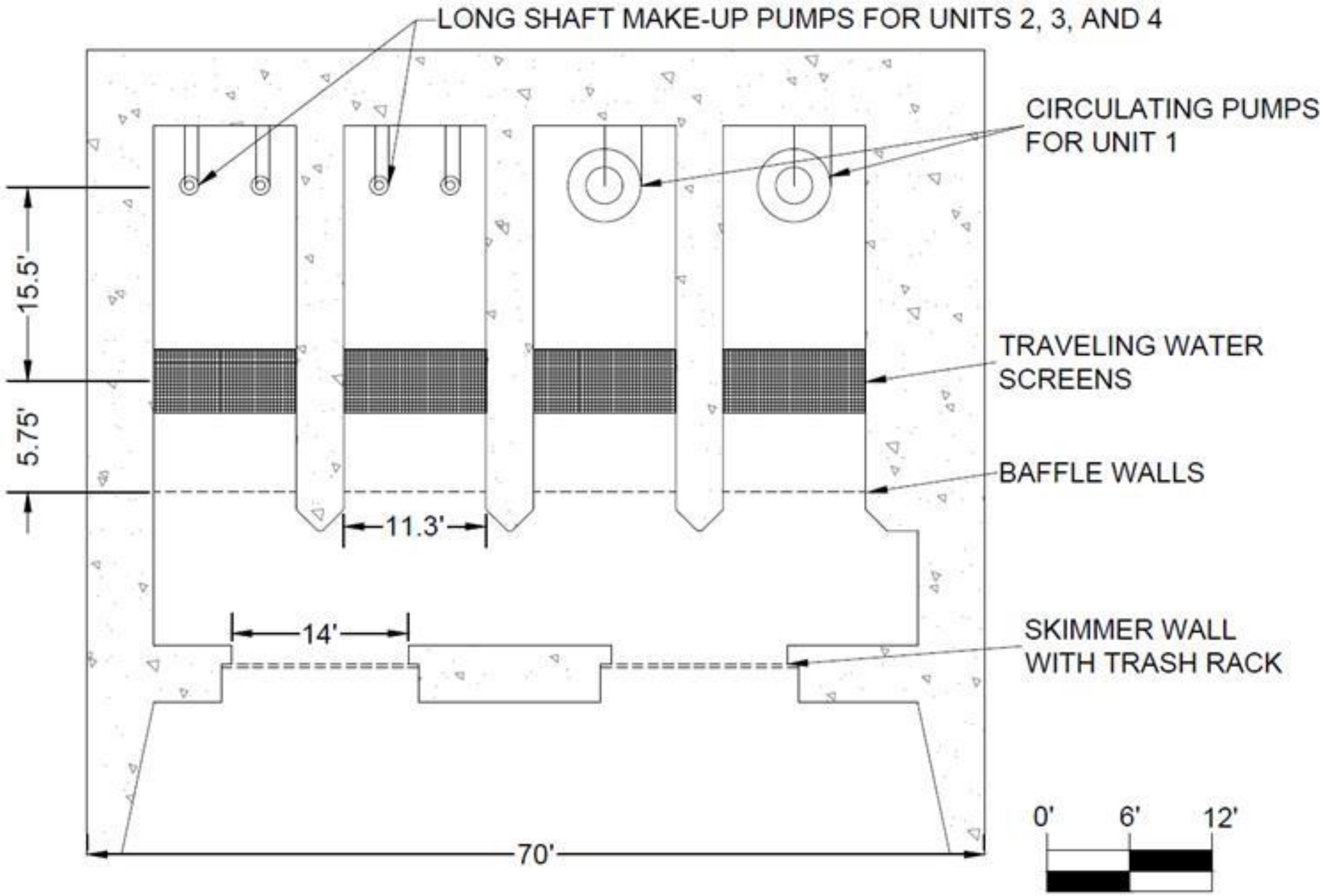


Figure 3-3 Mill Creek CWIS - Plan View

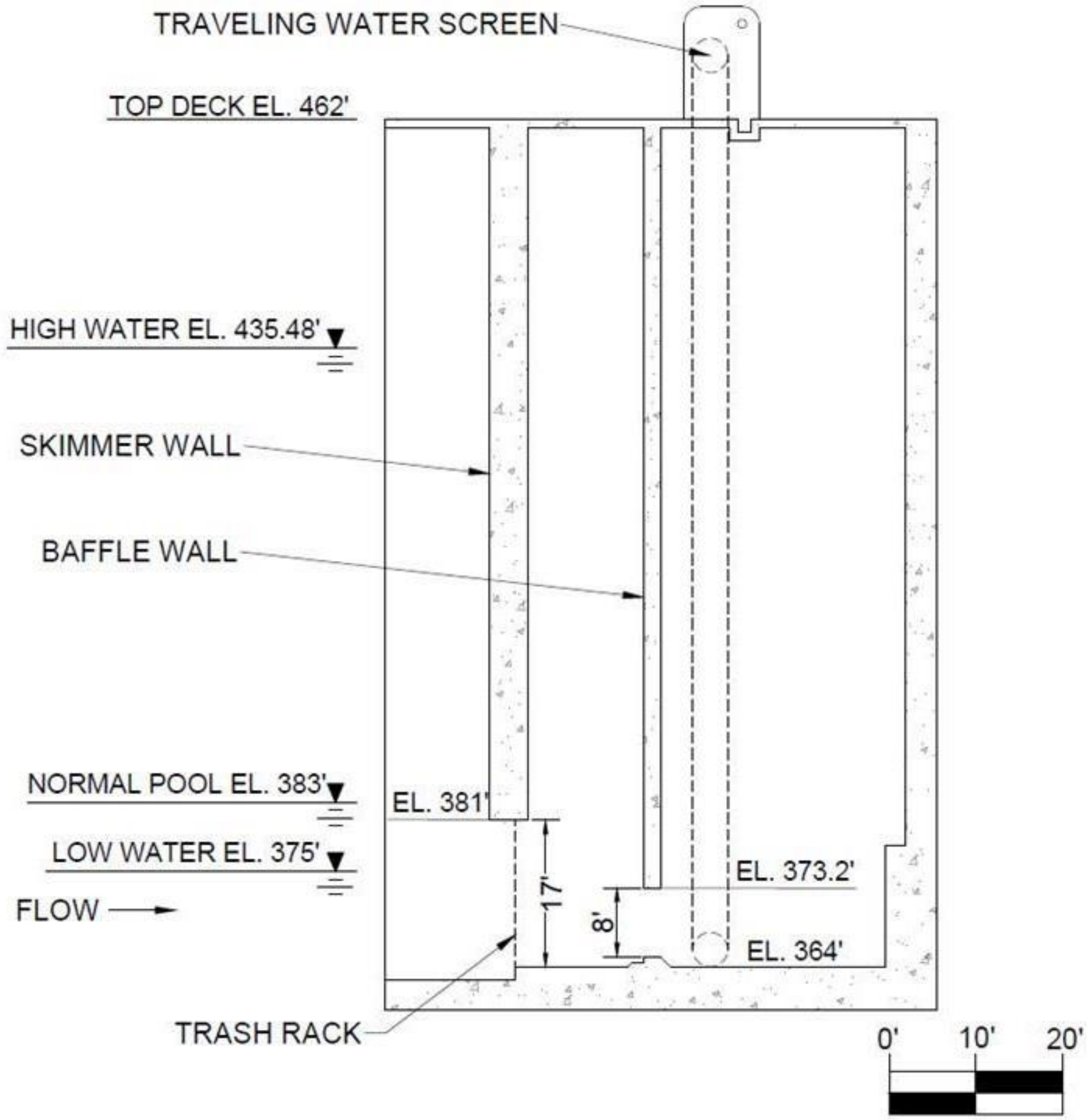


Figure 3-4 Mill Creek CWIS - Section View

3.2 CWIS Operation and Intake Flows

There are two circulating water pumps for Unit 1, and a total of four long-shaft service water pumps located downstream of the traveling water screens. The circulating water pump flow for Unit 1 is 206.2 cfs (92,600 gpm, 133.3 MGD), when one pump is operating. Two pump operation, which is how the unit is normally operated, results in the total circulating water flow rate for Unit 1 of 350.7 cfs (157,400 gpm, 226.7 MGD). The difference between the flow rate through each pump with one and two pumps operating is a result of increased backpressure on the circulating pumps associated with the increased flow. These two circulating water pumps will no longer operate after Unit 1 is retired.

The two long-shaft service water pumps that are located in the northernmost bay have a combined flow of 44.6 cfs (20,000 gpm, 28.8 MGD); the two other long-shaft pumps are located in the adjacent screen bay and have a combined flow of 46.8 cfs (21,000 gpm, 30.2MGD). The combined design intake flow (DIF) of the four long-shaft pumps is 91.4 cfs (41,000 gpm, 59.0 MGD). The total DIF with all six pumps operating is 442.0 cfs (198,400 gpm, 285.7 MGD).

Pump capacities and the design intake flow for the Mill Creek station are listed in Table 3-1. Typically, both circulating water pumps are operated when the unit is operating, however one pump can be taken out of service during cold weather. Operating with only one circulating water pump puts station reliability at risk and is only conducted to facilitate maintenance. Two or three long-shaft service water pumps are usually operated depending on the service and make-up water needs for the Units 2, 3, and 4 cooling towers. Starting in 2020, Mill Creek was able to reduce the total average daily river intake flow of the station by 1.9%. The majority of the flow reduction is a result of the conversion of the Units 1, 2, 3, and 4 fly and bottom ash sluicing system to dry handling, and gypsum wash water reductions. A small portion of this reduction was also a result of reduced flows to the Units 2, 3, and 4 cooling water make-up systems. Unit 1 average daily intake flows for the once-through cooling system remain constant and were not reduced by these improvements. The flow through the Unit 1 pumps will be reduced to zero by the end of 2024, when Unit 1 is retired.

The annual pump hours of operation and estimated withdrawal rate for each long shaft service water pump over the last 5 years (2017-2021) are provided in Table 3-2. The operation of the Unit 1 circulating water pumps is not included in Table 3-2 or subsequent tables in this section to provide a better representation of the withdrawal rate once Unit 1 is retired. The annual average daily long shaft service water flow, annual hours of operation, and the percent of future maximum design intake flow for the Mill Creek facility based on the last 5 years of operating data (2017-2021) are provided in Table 3-3. As shown in Table 3-3 Mill Creek would have withdrawn an average of 58.5% of its future DIF during the last 5 years. The average monthly daily intake flow, number of days per month and total monthly and annual withdrawal for the Mill Creek long shaft service water pumps over the past 5 years (2017-2021) is provided in Table 3-4.

Table 3-1 Pump Capacities and Design Intake Flow for the Mill Creek CWIS

Pump Description	DIF (gpm)	DIF (MGD)	DIF (cfs)
Unit 1 Circulating Water Pump A	78,700[1]	113.3[1]	175.3[1]
Unit 1 Circulating Water Pump B	78,700[1]	113.3[1]	175.3[1]
Long-Shaft Service Water Pump 1	10,000	14.4	22.3
Long-Shaft Service Water Pump 2	10,000	14.4	22.3
Long-Shaft Service Water Pump 3	10,500	15.1	23.4
Long-Shaft Service Water Pump 4	10,500	15.1	23.4
Mill Creek Total DIF (Pre-Unit 1 Retirement)	**198,400**[2]	**285.7**[2]	**442.0**[2]
Mill Creek Total DIF (Post-Unit 1 Retirement)	**41,000**	**59.0**	**91.4**

1. DIF of each circulating water pump increases to 206.3 cfs (92,600 gpm, 133.3 MGD) when only one circulating water pumps is operating.
2. Based on the design flow with two circulating water pumps operating.

Table 3-2 Annual Pump Hours of Operation and Estimated Annual Intake Flow for the Mill Creek Long Shaft Service Water Pumps (LSSWP) (2017-2021)

Pump	LSSWP #1	LSSWP #2	LSSWP #3	LSSWP #4
2017				
Pump Hours of Operation	5,628	4,714	6,374	6,342
Estimated Actual Annual Intake Flows (Millions of Gallons)	3,377	2,828	4,015	3,995
Maximum Annual Design Intake Flow (Millions of Gallons)	5,256	5,256	5,519	5,519
Percent of Maximum Design Intake Flow	64.2%	53.8%	72.8%	72.4%
2018				
Pump Hours of Operation	6,103	4,781	6,725	3,899
Estimated Actual Annual Intake Flows (Millions of Gallons)	3,662	2,869	4,237	2,456
Maximum Annual Design Intake Flow (Millions of Gallons)	5,256	5,256	5,519	5,519
Percent of Maximum Design Intake Flow	69.7%	54.6%	76.8%	44.5%
2019				
Pump Hours of Operation	6,829	7,088	6,591	2,338
Estimated Actual Annual Intake Flows (Millions of Gallons)	4,097	4,253	4,152	1,473
Maximum Annual Design Intake Flow (Millions of Gallons)	5,256	5,256	5,519	5,519
Percent of Maximum Design Intake Flow	78.0%	80.9%	75.2%	26.7%

Table 3-2 (Continued)

Pump	LSSWP #1	LSSWP #2	LSSWP #3	LSSWP #4
2020				
Pump Hours of Operation	5,618	4,993	1,975	4,374
Estimated Actual Annual Intake Flows (Millions of Gallons)	3,371	2,996	1,244	2,756
Maximum Annual Design Intake Flow (Millions of Gallons)	5,270	5,270	5,519	5,519
Percent of Maximum Design Intake Flow	64.0%	56.8%	22.5%	49.9%
2021				
Pump Hours of Operation	5,075	3,928	5,095	4,151
Estimated Actual Annual Intake Flows (Millions of Gallons)	3,045	2,357	3,210	2,615
Maximum Annual Design Intake Flow (Millions of Gallons)	5,256	5,256	5,519	5,519
Percent of Maximum Design Intake Flow	57.9%	44.8%	58.2%	47.4%
2017-2021				
Pump Hours of Operation	29,252	25,505	26,760	21,104
Estimated Actual Annual Intake Flows (Millions of Gallons)	17,551	15,303	16,859	13,296
Maximum Annual Design Intake Flow (Millions of Gallons)	26,294	26,294	27,594	27,594
Percent of Maximum Design Intake Flow	66.7%	58.2%	61.1%	48.2%

Table 3-3 Estimated Actual Annual Intake Flow for the Mill Creek Long Shaft Service Water Pumps (2017-2021)

Year	2016	2017	2018	2019	2020	5 Year Average
Total Pump Hours of Operation	23,056	21,509	22,846	16,960	18,250	20,524
Average Daily Intake Flow (MGD)	38.9	36.2	38.3	28.3	30.8	35
Design Intake Flow Post Unit 1 Retirement (MGD)	59	59	59	59	59	59
Percent of Maximum Design Intake Flow	66.0%	61.4%	64.9%	48.0%	52.1%	58.5%

Table 3-4 Estimated Actual Monthly Intake Flow for Mill Creek Long Shaft Service Water Pumps (2017-2021)

Month	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Yearly Total
2017													
Daily Average Intake Flow (MGD)	30.3	37.4	33.2	38.2	44.4	44.5	44.3	43.0	36.4	44.6	39.7	31.2	38.9
Days Per Month	31	28	31	30	31	30	31	31	30	31	30	31	365
Intake Flow (Millions of Gallons)	939	1,046	1,031	1,146	1,377	1,336	1,375	1,333	1,092	1,384	1191	967	14,215
2018													
Daily Average Intake Flow (MGD)	37.5	32.0	32.8	26.0	44.6	48.4	48.5	36.7	39.8	29.0	30.2	28.9	36.2
Days Per Month	31	28	31	30	31	30	31	31	30	31	30	31	365
Intake Flow (Millions of Gallons)	1,162	897	1,016	780	1,382	1,453	1,504	1,138	1,195	898	906	895	13,224
2019													
Daily Average Intake Flow (MGD)	29.7	29.5	38.6	36.1	41.5	43.7	44.2	40.7	36.5	44.5	41.7	32.0	38.3
Days Per Month	31	28	31	30	31	30	31	31	30	31	30	31	365
Intake Flow (Millions of Gallons)	920	827	1,198	1,084	1,288	1,311	1,370	1,261	1,094	1,380	1,250	992	13,976

Table 3-4 (Continued)

Month	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Yearly Total
2020													
Daily Average Intake Flow (MGD)	29.4	29.8	30.1	29.7	18.8	29.1	30.4	31.4	23.9	28.8	29.6	28.8	28.3
Days Per Month	31	29	31	30	31	30	31	31	30	31	30	31	366
Intake Flow (Millions of Gallons)	911	865	933	892	584	873	943	974	717	893	887	893	10,367
2021													
Daily Average Intake Flow (MGD)	31.8	36.4	25.3	38.5	29.8	29.2	26.6	31.0	24.1	33.1	29.8	33.9	30.8
Days Per Month	31	28	31	30	31	30	31	31	30	31	30	31	365
Intake Flow (Millions of Gallons)	987	1,018	783	1,155	922	877	825	962	723	1,027	895	1,052	11,227
2017-2021													
Daily Average Intake Flow (MGD)	31.7	33.2	32.0	33.7	35.8	39.0	38.8	36.6	32.1	36.0	34.2	31.0	34.5
Days Per Month	31	28	31	30	31	30	31	31	30	31	30	31	365
Monthly Average Intake Flow (Millions of Gallons)	984	931	992	1,011	1,111	1,170	1,203	1,134	964	1,117	1,026	960	12,602

3.3 Flow Distribution and Water Balance Diagrams

The water balance diagram for the Mill Creek circulating water system is shown below in Figure 3-5. This diagram is based on the current flow conditions with Unit 1 operating. After Unit 1 is retired by the end of 2024, the new Mill Creek DIF will be 91.4 cfs (41,000 gpm, 59.0 MGD), with all four long-shaft pumps operating. This will represent a 79% reduction in the design flow. A higher quality version of the water balance diagram is provided as a separate PDF that is attached to this submittal (Appendix A).

§ 122.21(r)(3) Cooling Water Intake Structure data

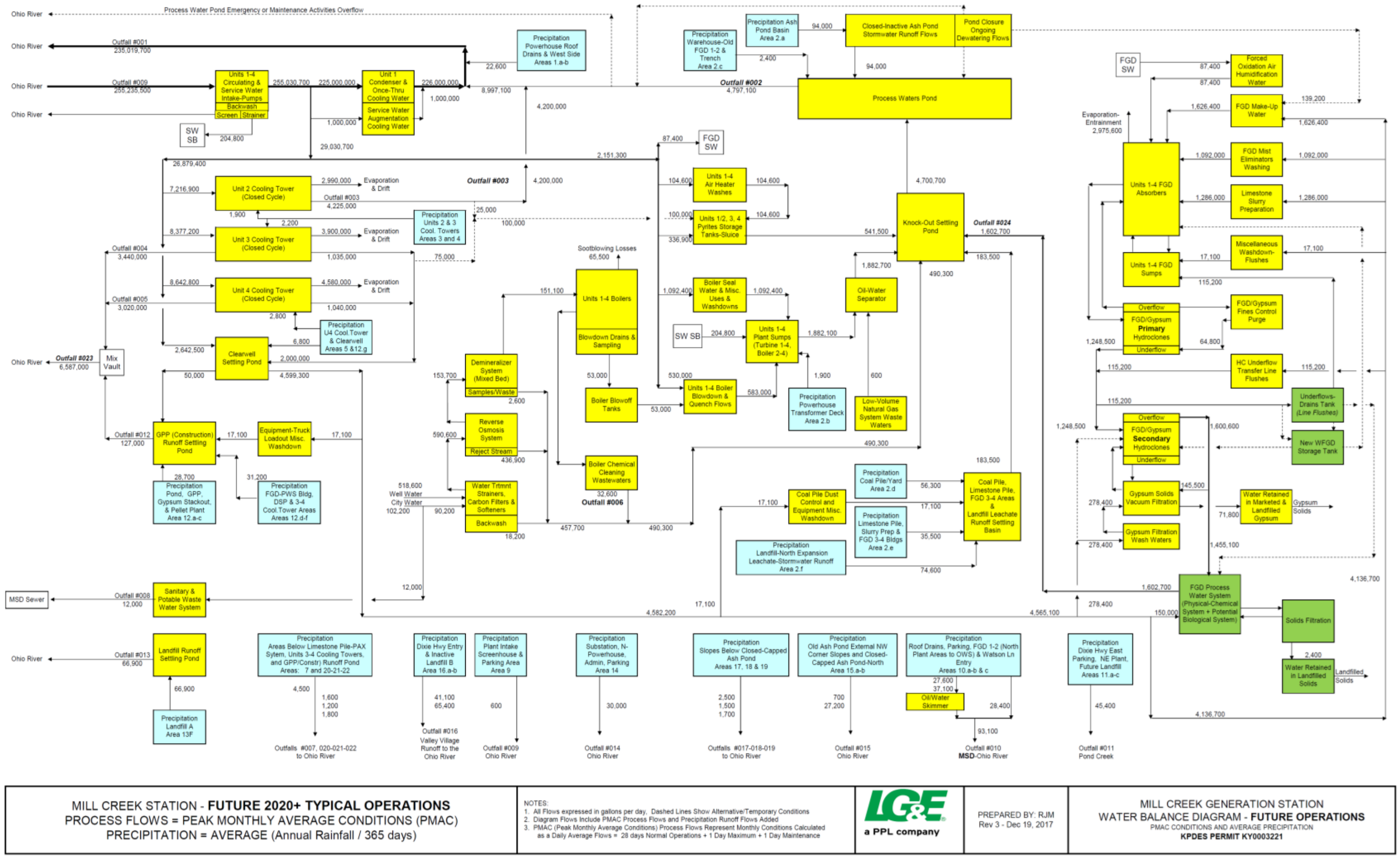


Figure 3-5 Water Balance Diagram for the Mill Creek Circulating Water System

4 § 122.21(R)(4) SOURCE WATER BASELINE BIOLOGICAL CHARACTERIZATION DATA

This section includes the source water baseline biological characterization data for Mill Creek Generating Station (Mill Creek Station), required at § 122.21(r)(4) of the Rule. Since there are twelve subsections for this information, the requirement for each subsection will be stated followed by information responsive to the required information.

Source water baseline biological characterization data*. This information is required to characterize the biological community in the vicinity of the cooling water intake structure and to characterize the operation of the cooling water intake structures. The Director may also use this information in subsequent permit renewal proceedings to determine if your Design and Construction Technology Plan as required in § 125.86(b)(4) or § 125.136(b)(3) of this chapter should be revised. This supporting information must include existing data (if they are available). However, you may supplement the data using newly conducted field studies if you choose to do so. The information you submit must include:*

4.1 Missing Data

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

Except for information describing the source water crayfish community near Mill Creek Station, data required in paragraphs (r)(4)(ii) through (r)(4)(vi) were available. However, other information and the site-specific impingement study at a nearby facility was used to determine that crayfish are not susceptible to entrainment and have limited susceptibility to impingement.

4.2 List of Relevant Taxa in the Vicinity of the CWIS

(ii) A list of species (or relevant taxa) for all life stages and their relative abundance in the vicinity of the cooling water intake structure.

4.2.1 Shellfish

A mussel survey was conducted immediately upstream and downstream of Mill Creek Station in 2012 by Ecological Specialists, Inc. (ESI 2012). In addition, EPRI (2012) identified five freshwater mussel surveys conducted from 1994 to 2007 upstream of Mill Creek Station (Ohio River Miles [ORM] 613.5 to 623.5), and EPRI (2018) contained one survey that was conducted along the Indiana shoreline from 0.5 miles upstream of the facility to 1.8 miles downstream of the facility in 2017 (LEC 2017). These data are summarized in Table 4-1.

Table 4-1 Summary of historical live mussel collections near the Mill Creek Station (EPRI 2012, 2018; ESI 2012; LEC 2017)

		1994[a]	1996[b]		2001[b]		2002[c]		2007[d]	2012[e]		2017[f]		Combined[g]	
Scientific Name[h]	**Common Name**	**P**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**P**	**No.**	**%**	**No.**	**%**	**No.**	**%**
Actinonaias ligamentina	Mucket	--	--	--	--	--	--	--	--	--	--	1	0.1	1	0.0
Amblema plicata	Threeridge	✓	19	13.9	2	11.8	12	46.2	✓	61	38.9	96	5.6	190	9.2
Cyclonaias nodulata	Wartyback	--	1	0.7	1	5.9	--	--	✓	1	0.6	20	1.2	23	1.1
Cyclonaias pustulosa	Pimpleback	--	14	10.2	2	11.8	--	--	✓	26	16.6	373	21.6	415	20.1
Cyclonaias tuberculata	Purple Wartyback	--	--	--	--	--	--	--	--	--	--	2	0.1	2	0.1
Ellipsaria lineolata	Butterfly	✓	35	25.5	--	--	--	--	✓	3	1.9	134	7.8	172	8.3
Elliptio crassidens	Elephantear	✓	3	2.2	--	--	--	--	--	--	--	21	1.2	24	1.2
Fusconaia flava	Wabash Pigtoe	--	2	1.5	1	5.9	2	7.7	✓	2	1.3	18	1.0	25	1.2
Lampsilis cardium	Plain Pocketbook	✓	1	0.7	--	--	--	--	--	3	1.9	11	0.6	15	0.7
Lampsilis ovata	Pocketbook	--	--	--	--	--	--	--	--	--	--	17	1.0	17	0.8
Leptodea fragilis	Fragile Papershell	--	--	--	--	--	1	3.8	--	1	0.6	2	0.1	4	0.2
Ligumia recta	Black Sandshell	--	9	6.6	2	11.8	1	3.8	✓	2	1.3	42	2.4	56	2.7
Megalonaias nervosa	Washboard	✓	16	11.7	1	5.9	2	7.7	✓	1	0.6	29	1.7	49	2.4
Obliquaria reflexa	Threehorn Wartyback	✓	22	16.1	6	35.3	5	19.2	✓	24	15.3	77	4.5	134	6.5
Pleurobema cordatum	Ohio Pigtoe	--	--	--	--	--	1	3.8	--	--	--	12	0.7	13	0.6
Potamilus alatus	Pink Heelsplitter	--	--	--	1	5.9	1	3.8	✓	24	15.3	13	0.8	39	1.9
Quadrula quadrula	Mapleleaf	--	3	2.2	--	--	--	--	--	1	0.6	4	0.2	8	0.4
Reginaia ebenus	Ebonyshell	✓	4	2.9	1	5.9	--	--	✓	1	0.6	696	40.3	702	34.0
Theliderma metanevra	Monkeyface	✓	4	2.9	--	--	--	--	✓	7	4.5	159	9.2	170	8.2
Tritogonia verrucosa	Pistolgrip	--	4	2.9	--	--	--	--	✓	--	--	--	--	4	0.2
Truncilla donaciformis	Fawnsfoot	--	--	--	--	--	1	3.8	--	--	--	--	--	1	0.0
	Total No. Individuals		**137**	**100.0**	**17**	**100.0**	**26**	**100.0**		**157**	**100.0**	**1,727**	**100.0**	**2,064**	**100.0**
	No. Species per Survey	**8**	**14**		**9**		**9**		**12**	**14**		**19**			
	Total Species	**21**													

[a] ORM 613.5 to 617.4; [b] ORM 615.5 to 617.7; [c] near ORM 616.8; [d] ORM 610.3 to 616.7 and ORM 617.5 to 623.5; [e] ORM 625.2 to 626.4; and [f] ORM 625.3-627.6 (Rosebud Mussel Bed).
[g] Represents data from only the five surveys that had count information. [h] Naming convention follows Williams et al. (2017). Note: P=✓denotes present, No.=number collected, % = relative abundance, "--" indicates none collected, and 0.0 denotes values less than 0.05.

Among those seven surveys, 21 mussel species were reported (Table 4-1). Threeridge (*Amblema plicata*), Washboard (*Megalonaias nervosa*), and Threehorn Wartyback (*Obliquaria reflexa*) were observed during each survey, while Mucket (*Actinonaias ligamentina*), Purple Wartyback (*Cyclonaias tuberculata*), Pocketbook (*Lampsilis ovata*), and Fawnsfoot (*Truncilla donaciformis*) were collected during only one survey. Ebonyshell (*Reginaia ebenus*, 34.0%) and Pimpleback (*Cyclonaias pustulosa*, 20.1%) were the most abundant species observed during the five years for which count data were available.

Information describing the source water crayfish community near Mill Creek Station was not identified. However, crayfish were a target organism during an impingement study at a nearby facility on Cannelton Pool (see Section 4.3.1), but were not identified to species (i.e., they were recorded only as “crayfish”).

4.2.2 Fish

Adult and juvenile fish studies in the immediate vicinity of Mill Creek Station have not been conducted in recent years. However, to obtain more recent data, surveys conducted by the Ohio River Ecological Research Program (ORERP), which was administered by the Electric Power Research Institute (e.g., EPRI 2019) were used These surveys consist of annual adult fish electrofishing and seining investigations in Cannelton Pool near LGE-KU’s Cane Run Plant at ORM 616.8, approximately nine miles upstream of Mill Creek Station. Seasonal electrofishing and seining surveys conducted at the Cane Run Plant from 2014 through 2018 provided the basis of the compiled list of fish species. The ORERP results were supplemented with electrofishing data collected by the Ohio River Valley Water Sanitation Commission (ORSANCO) from ORM 616.6 to ORM 630.1 in July 2016 (http://www.orsanco.org/data/fish-population/).

The list of adult and juvenile fish compiled from the ORERP and ORSANCO data comprises of 59 species and three hybrids, representing 15 fish families (Table 4-2). Families with the most species were the carps and minnows (18 species), sunfishes (12), and suckers (10). Twenty-eight species and hybrid striper were encountered each year. Six of those common species accounted for 93.4% of the six-year total: Emerald Shiner (53.7%), Channel Shiner (26.4%), Gizzard Shad (5.8%), River Shiner (4.0%), Sauger (1.8%), and Freshwater Drum (1.7%).

Table 4-2 Number and relative abundance of fish collected by electrofishing and seining near Mill Creek Station (ORMs 614.3 to 630.1) during the ORERP and by ORSANCO, 2014–2018 (EPRI 2016, 2017a, 2019, 2020a,b)

SPECIES	2014[(a)]		2015[(a)]		2016[(a,b)]		2017[(a)]		2018[(a)]		YEARS COMBINED	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
CHESTNUT LAMPREY	1	0.0	--	--	--	--	--	--	--	--	1	0.0
PADDLEFISH	--	--	1	0.0	--	--	--	--	--	--	1	0.0
Lepisosteus sp.	--	--	--	--	--	--	--	--	2	0.0	2	0.0
LONGNOSE GAR	23	0.2	16	0.1	47	0.4	18	0.3	10	0.1	114	0.2
SHORTNOSE GAR	--	--	--	--	--	--	1	0.0	--	--	1	0.0
SKIPJACK HERRING	7	0.1	2	0.0	2	0.0	6	0.1	4	0.0	21	0.0
GIZZARD SHAD	739	6.5	382	2.4	915	7.2	667	9.3	511	5.9	3,214	5.8
THREADFIN SHAD	2	0.0	--	--	1	0.0	2	0.0	1	0.0	6	0.0
MOONEYE	1	0.0	6	0.0	5	0.0	--	--	--	--	12	0.0
COMMON CARP	1	0.0	12	0.1	2	0.0	6	0.1	6	0.1	27	0.0
SILVER CARP	--	--	1	0.0	1	0.0	5	0.1	1	0.0	8	0.0
BIGHEAD CARP	--	--	--	--	--	--	--	--	1	0.0	1	0.0

Table 4-2 (Continued)

SPECIES	2014[a] No.	2014[a] %	2015[a] No.	2015[a] %	2016[a,b] No.	2016[a,b] %	2017[a] No.	2017[a] %	2018[a] No.	2018[a] %	YEARS COMBINED No.	YEARS COMBINED %
GOLDEN SHINER	1	0.0	--	--	--	--	--	--	--	--	1	0.0
Notropis sp.	--	--	--	--	--	--	--	--	3	0.0	3	0.0
STRIPED SHINER	1	0.0	--	--	--	--	--	--	--	--	1	0.0
CHANNEL SHINER	2,293	20.3	5,134	32.4	3,466	27.4	2,042	28.4	1,759	20.3	14,694	26.4
CHANNEL/MIMIC SHINER	--	--	--	--	--	--	--	--	838	9.7	838	1.5
ROSYFACE SHINER	--	--	--	--	1	0.0	--	--	--	--	1	0.0
SPOTFIN SHINER	8	0.1	106	0.7	63	0.5	22	0.3	26	0.3	225	0.4
EMERALD SHINER	7,191	63.7	8,138	51.3	6,791	53.7	3,596	50.0	4,196	48.4	29,912	53.7
GHOST SHINER	--	--	--	--	1	0.0	1	0.0	2	0.0	4	0.0
SAND SHINER	1	0.0	--	--	--	--	--	--	--	--	1	0.0
RIVER SHINER	216	1.9	1,014	6.4	293	2.3	187	2.6	511	5.9	2,221	4.0
SHOAL CHUB	--	--	--	--	--	--	--	--	6	0.1	6	0.0
SILVER CHUB	49	0.4	22	0.1	31	0.2	13	0.2	13	0.1	128	0.2
RIVER CHUB	--	--	10	0.1	--	--	--	--	--	--	10	0.0
CENTRAL STONEROLLER	1	0.0	--	--	--	--	--	--	--	--	1	0.0
BLUNTNOSE MINNOW	2	0.0	6	0.0	3	0.0	1	0.0	1	0.0	13	0.0
BULLHEAD MINNOW	2	0.0	12	0.1	21	0.2	17	0.2	4	0.0	56	0.1
CATOSTOMINAE sp.	--	--	3	0.0	--	--	--	--	--	--	3	0.0
Carpiodes sp.	5	0.0	--	--	1	0.0	--	--	--	--	6	0.0
ICTIOBINAE sp.	4	0.0	2	0.0	--	--	--	--	6	0.1	12	0.0
QUILLBACK	43	0.4	28	0.2	21	0.2	8	0.1	21	0.2	121	0.2
RIVER CARPSUCKER	67	0.6	54	0.3	69	0.5	54	0.8	266	3.1	510	0.9
SMALLMOUTH REDHORSE	10	0.1	22	0.1	83	0.7	47	0.7	35	0.4	197	0.4
SILVER REDHORSE	1	0.0	--	--	3	0.0	3	0.0	4	0.0	11	0.0
RIVER REDHORSE	--	--	4	0.0	3	0.0	4	0.1	--	--	11	0.0
GOLDEN REDHORSE	13	0.1	11	0.1	23	0.2	17	0.2	7	0.1	71	0.1
NORTHERN HOG SUCKER	5	0.0	1	0.0	2	0.0	2	0.0	--	--	10	0.0
SMALLMOUTH BUFFALO	6	0.1	6	0.0	4	0.0	21	0.3	4	0.0	41	0.1
BIGMOUTH BUFFALO	2	0.0	1	0.0	2	0.0	5	0.1	1	0.0	11	0.0
SPOTTED SUCKER	--	--	--	--	--	--	1	0.0	--	--	1	0.0
CHANNEL CATFISH	48	0.4	47	0.3	106	0.8	53	0.7	47	0.5	301	0.5
FLATHEAD CATFISH	10	0.1	9	0.1	18	0.1	9	0.1	3	0.0	49	0.1
TROUT-PERCH	--	--	1	0.0	--	--	--	--	--	--	1	0.0
WESTERN MOSQUITOFISH	8	0.1	3	0.0	1	0.0	--	--	13	0.1	25	0.0
BROOK SILVERSIDE	6	0.1	2	0.0	1	0.0	3	0.0	4	0.0	16	0.0
Morone sp.	3	0.0	1	0.0	12	0.1	--	--	--	--	16	0.0
STRIPED BASS	--	--	--	--	1	0.0	--	--	1	0.0	2	0.0
HYBRID STRIPER	48	0.4	34	0.2	28	0.2	29	0.4	9	0.1	148	0.3
WHITE BASS	5	0.0	8	0.1	37	0.3	28	0.4	25	0.3	103	0.2
ROCK BASS	--	--	--	--	2	0.0	1	0.0	--	--	3	0.0
Lepomis HYBRID	--	--	2	0.0	--	--	--	--	--	--	2	0.0
Lepomis sp.	--	--	3	0.0	--	--	--	--	--	--	3	0.0
GREEN SUNFISH	4	0.0	--	--	5	0.0	2	0.0	2	0.0	13	0.0
WARMOUTH	--	--	1	0.0	--	--	1	0.0	--	--	2	0.0
BLUEGILL	7	0.1	65	0.4	25	0.2	16	0.2	17	0.2	130	0.2
ORANGESPOTTED SUNFISH	--	--	--	--	--	--	--	--	2	0.0	2	0.0
LONGEAR SUNFISH	16	0.1	31	0.2	34	0.3	12	0.2	7	0.1	100	0.2
REDEAR SUNFISH	--	--	--	--	2	0.0	--	--	--	--	2	0.0
Micropterus sp.	--	--	--	--	1	0.0	--	--	--	--	1	0.0
SMALLMOUTH BASS	17	0.2	28	0.2	22	0.2	16	0.2	16	0.2	99	0.2
LARGEMOUTH BASS	--	--	2	0.0	--	--	2	0.0	1	0.0	5	0.0
SPOTTED BASS	8	0.1	17	0.1	27	0.2	26	0.4	6	0.1	84	0.2
WHITE CRAPPIE	1	0.0	3	0.0	3	0.0	2	0.0	1	0.0	10	0.0
BLACK CRAPPIE	1	0.0	3	0.0	1	0.0	--	--	1	0.0	6	0.0
GREENSIDE DARTER	--	--	--	--	--	--	1	0.0	--	--	1	0.0
LOGPERCH	--	--	6	0.0	3	0.0	--	--	1	0.0	10	0.0
Sander sp.	2	0.0	30	0.2	--	--	--	--	17	0.2	49	0.1
SAUGEYE	--	--	1	0.0	2	0.0	--	--	--	--	3	0.0
SAUGER	63	0.6	423	2.7	287	2.3	117	1.6	122	1.4	1,012	1.8
FRESHWATER DRUM	348	3.1	154	1.0	176	1.4	123	1.7	137	1.6	938	1.7
TOTAL FISH	11,290	100.0	15,868	100.0	12,648	100.0	7,187	100.0	8,671	100.0	55,664	100.0
TOTAL SPECIES	40		40		43		41		41		59	

(a) ORERP ELECTROFISHING AND SEINING DATA COLLECTED NEAR CANE RUN PLANT IN JUNE/JULY, AUGUST, AND OCTOBER.
(b) INCLUDES SIX ORSANCO ELECTROFISHING EVENTS FROM JULY (http://www.orsanco.org/data/fish-population/).
NOTE: 0.0 DENOTES VALUES LESS THAN 0.05.

A two-year entrainment study was conducted at Mill Creek Station in 2015 and 2016 to fulfill 40 CFR 122.21(r)(9) of the U.S. Environmental Protection Agency's (EPA) final Clean Water Act § 316(b) Existing Facilities Rule (see Section 9 and EPRI 2020c). Sampling was conducted in the Area of Influence (AOI) in front of the CWIS at multiple depths and during two diel periods to characterize annual, seasonal, and diel variations in entrainment. In 2015, sampling was conducted every two weeks from March through September. Sampling in 2016 was also conducted every two weeks from April through early May and July through August, but every week from early May through June to gather more data during times of highest ichthyoplankton density. This study provides the most recent data describing the ichthyofauna at Mill Creek Station.

In 2015, 35,743 fish including all life stages (adults, juveniles, larvae, and eggs) were collected, consisting of 25 distinct identifications[1] (Table 4-3). The 2016 collections yielded 52,971 fish (juveniles, larvae, and eggs) representing 27 distinct identifications. For the two years combined, 88,714 specimens were collected that represented 33 distinct identifications across 11 fish families.

Table 4-3 Number and relative abundance of taxa collected by entrainment sampling at Mill Creek Station in 2015 and 2016 (EPRI 2020c)

Family	Taxa	2015		2016		Years Combined	
		#	%	#	%	#	%
Polyodontidae	Paddlefish	--	--	4	<0.05%	4	<0.05%
Lepisosteidae	Gar sp.	1	<0.05%	--	--	1	<0.05%
Clupeidae	Clupeidae type	--	--	1	<0.05%	1	<0.05%
	Clupeidae sp.	4,384	12.3%	1,024	1.9%	5,408	6.1%
	Skipjack Herring	109	0.3%	296	0.6%	405	0.5%
	Alosa type	1	<0.05%	--	--	1	<0.05%
	Gizzard Shad	18,099	50.6%	5,664	10.7%	23,763	26.8%
	Threadfin Shad	4	<0.05%	151	0.3%	155	0.2%
	Dorosoma sp.	1,194	3.3%	80	0.2%	1,274	1.4%
Hiodontidae	Goldeye	1	<0.05%	--	--	1	<0.05%
	Mooneye	20	0.1%	3	<0.05%	23	<0.05%
Cyprinidae	Central Stoneroller	--	--	1	<0.05%	1	<0.05%
	Common Carp	74	0.2%	38	0.1%	112	0.1%
	Asian Carp (+type)[(a)]	705	2.0%	10,632	20.1%	11,337	12.8%
	Macrhybopsis type	1	<0.05%	3	<0.05%	4	<0.05%
	Shiner type	7	<0.05%	19	<0.05%	26	<0.05%
	Shiner sp.	9	<0.05%	--	--	9	<0.05%
	Emerald Shiner	30	0.1%	18	<0.05%	48	0.1%
	Emerald Shiner type	311	0.9%	1,329	2.5%	1,640	1.8%
	Channel Shiner	1	<0.05%	--	--	1	<0.05%
	Notropis sp.	14	<0.05%	4	<0.05%	18	<0.05%
	Suckermouth Minnow type	1	<0.05%	12	<0.05%	13	<0.05%

[1] Distinct taxa counts do not include higher level identifications (e.g., family or subfamily) when lower (e.g., genus or species) identifications were made.

Table 4-3 (Continued)

Family	Taxa	2015 #	2015 %	2016 #	2016 %	Years Combined #	Years Combined %
Cyprinidae	*Pimephales* type	474	1.3%	1,591	3.0%	2,065	2.3%
	Pimephales sp.	2	<0.05%	--	--	2	<0.05%
	Cyprindae type	6	<0.05%	19	<0.05%	25	<0.05%
	Cyprinidae sp.	82	0.2%	241	0.5%	323	0.4%
Catostomidae	Quillback	--	--	1	<0.05%	1	<0.05%
	White Sucker	--	--	1	<0.05%	1	<0.05%
	Spotted Sucker	1	<0.05%	--	--	1	<0.05%
	Moxostoma sp.	6	<0.05%	6	<0.05%	12	<0.05%
	Catostominae type	--	--	4	<0.05%	4	<0.05%
	Catostominaw sp.	--	--	3	<0.05%	3	<0.05%
	Ictiobinae sp.	4,077	11.4%	8,775	16.6%	12,852	14.5%
	Catostomidae sp.	1	<0.05%	--	--	1	<0.05%
Ictaluridae	Channel Catfish	1	<0.05%	--	--	1	<0.05%
Moronidae	White Bass	1	<0.05%	--	--	1	<0.05%
	Striped Bass type	--	--	5	<0.05%	5	<0.05%
	Morone sp. (not Striped Bass)	425	1.2%	125	0.2%	550	0.6%
	Morone sp.	243	0.7%	118	0.2%	361	0.4%
Centrarchidae	Rock Bass	--	--	1	<0.05%	1	<0.05%
	Green Sunfish	--	--	1	<0.05%	1	<0.05%
	Bluegill type	--	--	1	<0.05%	1	<0.05%
	Lepomis sp.	24	0.1%	33	0.1%	57	0.1%
	Smallmouth Bass	--	--	1	<0.05%	1	<0.05%
	White Crappie	1	<0.05%	--	--	1	<0.05%
	Pomoxis sp.	4	<0.05%	5	<0.05%	9	<0.05%
Percidae	Sauger	43	0.1%	38	0.1%	81	0.1%
	Walleye	1	<0.05%	--	--	1	<0.05%
	Sander sp.	40	0.1%	32	0.1%	72	0.1%
	Logperch type	23	0.1%	182	0.3%	205	0.2%
	Darter sp.	3	<0.05%	5	<0.05%	8	<0.05%
	Darter (not Logperch) sp.	--	--	1	<0.05%	1	<0.05%
	Percidae sp.	1	<0.05%	--	--	1	<0.05%
Sciaenidae	Freshwater Drum	5,122	14.3%	22,404	42.3%	27,526	31.0%
	Freshwater Drum type	--	--	1	<0.05%	1	<0.05%
	Cyprinidae/Catostomidae	19	0.1%	12	<0.05%	31	<0.05%
	Cyprindae/Catostomidae type	56	0.2%	--	--	56	0.1%
	Morone/Freshwater Drum	--	--	1	<0.05%	1	<0.05%
	UNIDENTIFIED	121	0.3%	85	0.2%	206	0.2%
	Total Fish	**35,743**	**100.0%**	**52,971**	**100.0%**	**88,714**	**100.0%**

(a) Asian carp taxa and groupings were combined into Asian carp (+type) because relatively few Asian carp (Grass Carp [+type], Silver Carp type, or *Hypophthalmichthys* sp.) were identified beyond the Asian carp or Asian carp type categories (EPRI 2020c).

Note: # = number collected; % = relative abundance; "--" indicates none collected.

The most abundant taxa collected in 2015 were, in decreasing order of abundance, Gizzard Shad, Freshwater Drum, Clupeidae sp. (Gizzard Shad, Threadfin Shad, and/or Skipjack Herring), and Ictiobinae sp. (carpsucker/buffalo species). These taxa composed 88.6% of the specimens collected at Mill Creek Station in 2015 (EPRI 2020c). In fact, Gizzard Shad post yolk-sac larvae alone composed 50.5% of the entire catch. The dominant taxa for 2016, in decreasing order of abundance, were Freshwater Drum, Asian carp (+type)[2], Ictiobinae sp., and Gizzard Shad. These taxa composed 89.6% of the specimens collected in 2016. The two most abundant taxa in 2016, Freshwater Drum and Asian carp (+type), were dominated by the viable egg life stage (EPRI 2020c).

4.3 Species and Life Stages Most Susceptible to Impingement and Entrainment

(iii) Identification of the species and life stages that would be most susceptible to impingement and entrainment. Species evaluated should include the forage base as well as those most important in terms of significance to commercial and recreational fisheries.

Impingeable sized organisms are defined in § 125.92(n) of the Rule and are individuals sufficiently large enough to not pass through 3/8-inch square or 1/2 x 1/4-inch rectangular mesh screens. They are trapped against the screen by the force of intake water flowing through the screen. Organisms that pass through the mesh are entrained (see Rule definition at § 125.92(h)). Entrained specimens will pass through the condenser cooling water systems and do not impact facility operation. Generally, a fish species vulnerability to impingement and/or entrainment is a function of life history such as habitat preference, water column distribution, reproductive behavior, early life history characteristics, swimming ability, natural mortality, or physical influences such as water body hydraulics and ambient water temperature. Vulnerability to impingement and/or entrainment for most fish species is not dictated by their abundance in the source water body.

4.3.1 Shellfish

Adult and juvenile Unionida mussels reside in the sediment and have very limited mobility; therefore, it can reasonably be concluded that they are not susceptible to entrainment nor are they readily susceptible to impingement. Larval Unionida mussels, glochidia, require temporary attachment to a “host” (almost exclusively fish) to survive beyond the larval stage. Some Unionida species use active methods to ensnare or attract a host: 1) they release “webs” or “trot lines” of mucus containing glochidia that ensnare passing fishes; 2) they bind glochidia into matrices called conglutinates that can resemble fish larvae, worms, insect larvae, or other food items that attract fish, which are subsequently infested with glochidia when they attempt to feed on the conglutinates; or 3) they have modified their mantle into lures resembling fishes, insects, and other food items such that when it is struck by a predatory fish, females snap their shells closed on the protruded marsupia, causing the marsupia to rupture and release clouds of glochidia (Watters et al. 2003). It is reasonable to assume that glochidia of such species would only be indirectly susceptible to entrainment if their host is entrained.

[2] Asian carp taxa and groupings were combined into Asian carp (+type) because relatively few Asian carp (Grass Carp [+type], Silver Carp type, or *Hypophthalmichthys* sp.) were identified beyond the Asian carp or Asian carp type categories (EPRI 2020c).

Other Unionida species are broadcast spawners that expel the glochidia along with water and waste products. Hosts either take in suspended glochidia and pass them over their gills, where they attach, or the hosts contact glochidia on the substrate, where they attach to the fins or skin (Watters et al. 2009).

Although unattached glochidia may be susceptible to direct entrainment, it would be challenging or impossible to: 1) effectively and efficiently collect them; 2) identify them to species; and 3) determine whether they are viable or moribund. For example, glochidia range in size from 50 to 450 µ (Williams et al. 2008) and therefore would require a net with a minimum mesh size of 50 µ, which would become clogged quickly upon deployment (water will not passively flow through 50 µ). Most importantly, once shed by the female, glochidia must acquire a suitable host or die, usually within 24-48 hours (Watters et al. 2009). As such, glochidia collected during entrainment sampling are likely moribund because they would have drifted past hundreds or thousands of potential host fish before being entrained.

Little is known about host use in nature for most mussel species because using morphological characteristics to identify encysted glochidia is difficult. Morphological characteristics have been used with some success when only one or a few mussel species are present in a location; however, in species rich communities, only a fraction of glochidia are identifiable based on morphology and some are not identifiable below the genus or subfamily levels. Molecular identification keys, using restriction fragment length polymorphisms (RFLPs) for species identification of encysted glochidia, have been created in response to the difficulty of identifying glochidia; however, these keys have not been used frequently in nature (Kneeland and Rhymer 2008). Given the above information, all life stages of Unionida mussels would **not** be considered among "*the species and life stages that would be **most susceptible** to impingement and entrainment*". For example, Unionida mussels were a target organism during the 2005-2007 impingement study at the nearby Cane Run Plant and none were collected during that two-year study (EPRI 2009). Additionally, the KDEP did not request that mussels be a target organism for the 2015-2016 entrainment study at Mill Creek Station.

Crayfish do not appear in entrainment samples due to their reproductive behavior. Females retain and protect eggs attached to their swimmerets. After hatching, the young may stay with the mother until after the second or third molt[3]. Therefore, crayfish are not susceptible to entrainment and have limited susceptibility to impingement. For example, they composed only 0.8% of the 2005-2007 impingement catch at the nearby Cane Run Plant (Table 4-4).

[3] http://www.uky.edu/Ag/CritterFiles/casefile/relatives/crayfish/crayfish.htm

Table 4-4 Number and relative abundance of fish and shellfish collected during impingement studies at Cane Run Plant, June 2005 – June 2007 (EPRI 2009)

Species	June 2005 – June 2006		June 2006 – June 2007		Years Combined	
	Number	%	Number	%	Number	%
Crayfish	11	1.28	7	0.50	19	0.80
Shovelnose Sturgeon	--	--	1	0.08	1	0.05
Longnose Gar	1	0.11	--	--	1	0.04
Mooneye	1	0.12	--	--	1	0.05
Skipjack Herring	52	5.84	1	0.07	53	2.26
Gizzard Shad	442	49.87	50	3.46	492	21.12
Common Carp	2	0.23	--	--	2	0.09
Emerald Shiner	10	1.17	--	--	10	0.45
River Carpsucker	--	--	1	0.08	1	0.05
Quillback	3	0.36	1	0.07	4	0.18
Blue Sucker	1	0.12	--	--	1	0.05
Smallmouth Buffalo	22	2.50	--	--	22	0.95
Bigmouth Buffalo	1	0.12	--	--	1	0.05
Blue Catfish	--	--	1	0.07	1	0.04
Channel Catfish	6	0.69	14	0.95	20	0.85
Flathead Catfish	5	0.60	3	0.21	8	0.36
White Bass	13	1.49	3	0.21	16	0.70
Morone sp.	19	2.14	--	--	19	0.81
Warmouth	--	--	1	0.08	1	0.05
Bluegill	4	0.48	27	1.87	31	1.34
Smallmouth Bass	1	0.11	--	--	1	0.04
Largemouth Bass	--	--	1	0.07	1	0.04
Sauger	10	1.15	1	0.08	11	0.49
Freshwater Drum	278	31.38	1,330	92.20	1,608	69.06
Unidentified	2	0.23	--	--	2	0.09
Total Fish and Crayfish	**886**	**100.00**	**1,442**	**100.00**	**2,328**	**100.00**
Total Fish Species	**17**		**14**		**22**	
24-hour sampling events	**20**		**20**		**40**	

Note: Nomenclature follows Page et al. (2013); % = relative abundance; "--" indicates none collected.

4.3.2 Fish Impingement

Although recent impingement data are not available for the Mill Creek Station, a two-year study was conducted at the nearby Cane Run Plant during 2005-2007 (EPRI 2009; King et al. 2010). That study consisted of 40, 24-hour sampling events during which 22 fish species were impinged (Table 4-4). Over 99% of the impinged organisms were fish; the remainder consisted of unidentified crayfish that accounted for 0.8% of the two-year total. All fish species collected during impingement sampling, except Shovelnose Sturgeon, Blue Sucker, and Blue Catfish were also collected during the in-river surveys near Cane Run (Table 4-2 and Table 4-4), whereas 41 of the 59 species collected during the in-river surveys were not encountered during impingement sampling. Impingement collections were dominated by Freshwater Drum and Gizzard Shad that collectively accounted for 91.0% of the fish impinged during the study. The Kentucky Administrative Regulations[4] classifies Freshwater Drum and Gizzard Shad as rough fish. Freshwater Drum was the sixth most abundant species during the in-river surveys near Mill Creek Station, whereas Gizzard Shad was the third most abundant. The relative abundance of Freshwater Drum and Gizzard Shad were much lower in the in-river surveys (1.7% and 5.8%, respectively) than in the impingement fish collections (69.7% and 21.3%, respectively), indicating they are disproportionately susceptible to impingement. Impingement of both Gizzard Shad and Freshwater Drum can be attributed to their overall abundance in the river and pelagic schooling behavior of their young-of-the-year (YOY). Markedly lower numbers of all other impinged species or taxa during the two-year study suggests low susceptibility to impingement. For example, Emerald Shiner, Channel Shiner, and River Shiner were among the four most abundant species in the in-river catch for 2014 through 2018 combined (Table 4-2), but no Channel Shiner or River Shiner and only 10 Emerald Shiner specimens were impinged during the two-year study (Table 4-4). The in-river collections show that cyprinids were much more abundant than indicated by the impingement collections, suggesting that they are not susceptible to impingement. Similarly, Longnose Gar, River Carpsucker, Quillback, Smallmouth Bass, and Sauger had higher relative abundances in the in-river surveys compared to impingement collections. Sport fish[4] taxa contributed only 2.1% to the impingement catch. White Bass and *Morone* sp. were the most commonly impinged sport fish taxa, composing 72.9% of the sport fish catch.

Commercial harvest data from 1999 through 2007 for the portion of the Ohio River bordering Indiana and Kentucky was dominated by Paddlefish (51.6%) followed by catfish (Channel Catfish, Blue Catfish, and Flathead Catfish) and buffalo that accounted for 24.2% and 23.2% of the total harvest, respectively (Stefanavage 2009). These dominant commercial (rough fish[4]) species accounted for only 2.3% of the fish impinged during the two-year study.

4.3.3 Fish Entrainment

The two-year entrainment study conducted in 2015 and 2016 provided recent data that addressed the taxa and life stages susceptible to entrainment at Mill Creek Station (EPRI 2020c). The sampling periods each year encompassed the vast majority of the time when ichthyoplankton were present in the Ohio River. Thirty-three unique taxa were collected during the Mill Creek Station study with Gizzard Shad, Freshwater Drum, Clupeidae sp. (Gizzard Shad, Threadfin Shad, and/or Skipjack Herring), and Ictiobinae sp. (carpsucker/buffalo species) accounting for 88.6% of the catch in 2015, and Freshwater Drum, Asian carp (+type)[2], Ictiobinae sp., and Gizzard Shad composing 89.6% of the catch in 2016 (Table 4-3 and Table 4-5). Collectively, these five taxa composed 90.6% to 91.6% of the catch each year. These taxa are considered rough fish by the Kentucky Administrative Regulations[4]. In addition, Asian carp (+type) are

[4] At 301 KAR 1:060 (http://www.lrc.state.ky.us/kar/301/001/060.pdf), the Kentucky Administrative Regulations define “sport fish” and “rough fish”: **Section 1.** The following fishes are designated sport fishes and may be taken only by angling: Largemouth Bass; rock fish (Striped Bass); Smallmouth Bass; White Bass; Kentucky [Spotted] Bass; Yellow Bass; Coosa Bass; Musky; Rock Bass; Northern Pike; White Crappie; Black Crappie; Chain Pickerel; trout; Walleye; Sauger; Redear Sunfish; and hybrids of any of the above. **Section 2.** All species of fishes, except those listed in Section 1 of this administrative regulation, are hereby designated as rough fish and may be harvested by the methods prescribed by any section of KRS Chapter 150 or 301 KAR Chapter 1.

considered aquatic nuisance species by the Kentucky Department of Fish and Wildlife Resources[5].

Table 4-5 Number, density, and relative abundance of common and abundant taxa collected in entrainment samples at Mill Creek Station in 2015 and 2016 (EPRI 2020c)

Year:	**2015**			**2016**		
Volume Sampled (m^3):	**9,152.5**			**9,919.1**		
Taxa	**Number**	**%**	**Density**	**Number**	**%**	**Density**
Clupeidae sp.	4,384	12.3%	4.79	1,024	1.9%	1.03
Gizzard Shad	18,099	50.6%	19.77	5,664	10.7%	5.71
Ictiobinae sp.	4,077	11.4%	4.45	8,775	16.6%	8.85
Asian carp (+type)[a]	705	2.0%	0.77	10,632	20.1%	10.72
Freshwater Drum	5,122	14.3%	5.60	22,404	42.3%	22.59
Other Identified Taxa	3,235	9.1%	3.53	4,387	8.3%	4.42
UNIDENTIFIED	121	0.3%	0.13	85	0.2%	0.09
Total	**35,743**	**100.0%**	**39.05**	**52,971**	**100.0%**	**53.40**

[a] Asian carp taxa and groupings were combined into Asian carp (+type) because relatively few Asian carp (Grass Carp [+type], Silver Carp type, or *Hypophthalmichthys* sp.) were identified beyond the Asian carp or Asian carp type categories.

Note: % = relative abundance and Density = #/10m³.

In 2015, specimen density for all taxa combined was 39.1 specimens per ten cubic meters (#/10m^3) (Table 4-5). Gizzard Shad dominated (50.6%) the 2015 catch with a density of 19.8/10m^3, followed by Freshwater Drum (14.3%; 5.6/10m^3), Clupeidae sp. (12.3%; 4.8/10m^3), and Ictiobinae sp. (11.4%; 4.5/10m^3). *Dorosoma* sp. (Gizzard Shad and/or Threadfin Shad), Asian carp (+type), *Pimephales* type[6], and *Morone* sp. (not Striped Bass)[7] were the only other taxa that contributed greater than 1.0% to the 2015 catch (Table 4-3; EPRI 2020c). Collectively, *Dorosoma* sp., *Pimephales* type, and *Morone* sp. (not Striped Bass) composed 64.7% of the "Other Identified Taxa" in 2015 (Table 4-3 and Table 4-5).

Specimen density for all taxa combined in 2016 was 53.4/10m^3 (Table 4-5). Freshwater Drum dominated (42.3%) the 2016 catch with a density of 22.6/10m^3, followed by Asian carp (+type) (20.1%; 10.7/10m^3), Ictiobinae sp. (16.6%; 8.9/10m^3), and Gizzard Shad (10.7%; 5.7/10m^3).

[5] https://fw.ky.gov/Fish/Pages/Asian-Carp-Information.aspx#ACI04

[6] Larvae in this grouping were characterized by flattened, elliptical eyes, sometimes flattened heads, and scattered ventral chromatophores. Myomere counts for this group varied but most often had 22-24 preanal myomeres. In the Ohio River, this grouping contains members of *Pimephales*, the old *Hybopsis* complex (*Macrhybopsis* sp., *Erimystax* sp., and *Hybopsis* sp.), Suckermouth Minnow, and some shiner species (possibly River Shiner and Spotfin Shiner) (EPRI 2020c).

[7] This category distinguished the small larvae of White Perch or White Bass from Striped Bass, the latter being much larger in the egg and yolk-sac larval stages. Typically, *Morone* larvae from about 4 to 6 mm in total length, without visible yolk or oil, were placed in this grouping (EPRI 2020c).

Pimephales type, Emerald Shiner type[8], and Clupeidae sp. were the only other taxa that contributed greater than 1.0% to the 2016 catch (Table 4-3; EPRI 2020c). Collectively, *Pimephales* type and Emerald Shiner type composed 66.6% of the "Other Identified Taxa" in 2016 (Table 4-3 and Table 4-5).

The dominant life stage in 2015 was post yolk-sac larvae (72.2%), followed by yolk-sac larvae (14.6%) and viable eggs (6.8%) (Table 4-6). Gizzard Shad post yolk-sac larvae alone composed 50.5% of the 2015 catch, and Clupeidae sp. post yolk-sac larvae contributed an additional 7.8% (Table 4-7). Freshwater Drum ichthyoplankton were co-dominated by viable eggs and post yolk-sac larvae, which collectively composed 12.0% of the 2015 catch. The most abundant life stage for Ictiobinae sp. was yolk-sac larvae, and they accounted for 9.9% of the 2015 catch. Combined, these five taxa-life stages composed 80.3% of the entrainment catch at Mill Creek Station in 2015.

In contrast to 2015, the dominant life stage in 2016 was viable eggs (50.4%). Freshwater Drum and Asian carp (+type) accounted for 68.5% and 31.0% of the 2016 viable egg catch, respectively (Table 4-6 and Table 4-7). Yolk-sac larvae was the second most abundant life stage in 2016, composing 26.8% of the catch and 57.1% of them were Ictiobinae sp. Slightly less than 20% of the 2016 catch was made up of post yolk-sac larvae compared to slightly over 50% in 2015 (Table 4-6). As in 2015, post yolk-sac larvae was again the dominant life stage for Gizzard Shad in 2016; however, their relative abundance was much lower in 2016 (10.4%) than in 2015 (50.5%) (Table 4-7). Collectively, these four taxa-life stages composed 75.8% of the entrainment catch at Mill Creek Station in 2016.

[8] Most of the cyprinid larvae in this grouping had high preanal myomere counts (usually > 25), and streamlined, slender bodies. Pigmentation consisted of a mid-ventral row of melanophores on the yolk sac or gut, occipital and mid-lateral pigment that increased with total length, and a developing double row of dorsal pigment. Most of the representatives had round eyes, but a few specimens with all the above characters had slightly flattened eyes. Based on the taxonomic literature, these characteristics are typical of Emerald Shiner. However, since descriptive or developmental taxonomic information are lacking for most Cyprinidae species, this grouping probably represents more than one species and may include Channel Shiner, Mimic Shiner, Ghost Shiner, and Silver Shiner. For many of these "type" eggs, the chorions were collapsed. These eggs appeared to be 3 to 4 mm in diameter, with a clear perivitelline space and small embryos, which are characteristic of Emerald Shiner (EPRI 2020c).

Table 4-6 Number and relative abundance of life stages collected at Mill Creek Station in 2015 and 2016 (EPRI 2020c)

Life Stage	2015		2016	
	Number	% Composition	Number	% Composition
Eggs (non-viable)	13	<0.05%	348	0.7%
Eggs (viable)	2,440	6.8%	26,721	50.4%
Not Determined	2	<0.05%	78	0.1%
Yolk-sac Larvae	5,234	14.6%	14,170	26.8%
Larvae[a]	1,734	4.9%	938	1.8%
Post Yolk-sac Larvae	25,794	72.2%	10,481	19.8%
Juveniles	524	1.5%	235	0.4%
Adult	2	<0.05%	--	--
Total	**35,743**	**100.0%**	**52,971**	**100.0%**

[a] Yolk-sac and/or post yolk-sac larvae that could not be differentiated due to damage or were in a transitional phase between yolk-sac and post yolk-sac (T1) (EPRI 2020c).

Table 4-7 Number and relative abundance of ichthyoplankton by taxon and life stage collected at Mill Creek Station in 2015 and 2016 (EPRI 2020c)

Taxa	Life Stage	2015			2016		
		#	%	Density	#	%	Density
Paddlefish	Post Yolk-sac Larvae	--	--	--	4	<0.01%	<0.01
Gar sp.	Post Yolk-sac Larvae	1	<0.01%	<0.01	--	--	--
Clupeidae type	Eggs (viable)	--	--	--	1	<0.01%	<0.01
Clupeidae sp.	Eggs (viable)	--	--	--	1	<0.01%	<0.01
	Yolk-sac Larvae	61	<0.01%	0.07	61	<0.01%	0.06
	Post Yolk-sac Larvae	2,782	7.8%	3.04	849	1.6%	0.86
	Larvae[(a)]	1,541	4.3%	1.68	113	<0.01%	0.11
Skipjack Herring	Eggs (viable)	1	<0.01%	<0.01	19	<0.01%	0.02
	Not Determined	--	--	--	3	<0.01%	<0.01
	Yolk-sac Larvae	22	<0.01%	0.02	182	<0.01%	0.18
	Post Yolk-sac Larvae	84	<0.01%	0.09	84	<0.01%	0.08
	Larvae	--	--	--	5	<0.01%	0.01
	Juveniles	2	<0.01%	<0.01	3	<0.01%	<0.01
Alosa type	Eggs (viable)	1	<0.01%	<0.01	--	--	--
Gizzard Shad	Yolk-sac Larvae	18	<0.01%	0.02	56	<0.01%	0.06
	Post Yolk-sac Larvae	18,061	50.5%	19.73	5,522	10.4%	5.57
	Larvae	--	--	--	80	<0.01%	0.08
	Juveniles	20	<0.01%	0.02	6	<0.01%	0.01
Threadfin Shad	Yolk-sac Larvae	4	<0.01%	<0.01	1	<0.01%	<0.01
	Post Yolk-sac Larvae	--	--	--	150	<0.01%	0.15
Dorosoma sp.	Yolk-sac Larvae	23	<0.01%	0.03	3	<0.01%	<0.01
	Post Yolk-sac Larvae	1,170	3.3%	1.28	26	<0.01%	0.03
	Larvae	--	--	--	51	<0.01%	0.05
	Juveniles	1	<0.01%	<0.01	--	--	--
Goldeye	Yolk-sac Larvae	1	<0.01%	<0.01	--	--	--
Mooneye	Yolk-sac Larvae	18	<0.01%	0.02	2	<0.01%	<0.01
	Post Yolk-sac Larvae	2	<0.01%	<0.01	1	<0.01%	<0.01
Central Stoneroller	Post Yolk-sac Larvae	--	--	--	1	<0.01%	<0.01
Common Carp	Yolk-sac Larvae	67	<0.01%	0.07	30	<0.01%	0.03
	Post Yolk-sac Larvae	7	<0.01%	0.01	6	<0.01%	0.01
	Larvae	--	--	--	2	<0.01%	<0.01
Asian carp (+type)	Eggs (non-viable)	--	--	--	268	0.5%	0.27
	Eggs (viable)	174	<0.01%	0.19	8,277	15.6%	8.34
	Yolk-sac Larvae	512	1.4%	0.56	1,691	3.2%	1.70
	Post Yolk-sac Larvae	--	--	--	392	0.7%	0.40
	Larvae	19	<0.01%	0.02	4	<0.01%	<0.01
Macrhybopsis type	Post Yolk-sac Larvae	1	<0.01%	<0.01	3	<0.01%	<0.01

Table 4-7 (Continued)

Taxa	Life Stage	2015			2016		
		#	%	Density	#	%	Density
Shiner type	Yolk-sac Larvae	--	--	--	1	<0.01%	<0.01
	Post Yolk-sac Larvae	7	<0.01%	0.01	16	<0.01%	0.02
	Juveniles	--	--	--	2	<0.01%	<0.01
Shiner sp.	Post Yolk-sac Larvae	8	<0.01%	0.01	--	--	--
	Juveniles	1	<0.01%	<0.01	--	--	--
Emerald Shiner	Post Yolk-sac Larvae	16	<0.01%	0.02	17	<0.01%	0.02
	Larvae	1	<0.01%	<0.01	--	--	--
	Juveniles	12	<0.01%	0.01	1	<0.01%	<0.01
	Adult	1	<0.01%	<0.01	--	--	--
Emerald Shiner type	Eggs (viable)	29	<0.01%	0.03	89	<0.01%	0.09
	Yolk-sac Larvae	69	<0.01%	0.08	509	1.0%	0.51
	Post Yolk-sac Larvae	200	0.6%	0.22	699	1.3%	0.70
	Larvae	--	--	--	14	<0.01%	0.01
	Juveniles	13	<0.01%	0.01	18	<0.01%	0.02
Channel Shiner	Adult	1	<0.01%	<0.01	--	--	--
Notropis sp.	Post Yolk-sac Larvae	4	<0.01%	<0.01	1	<0.01%	<0.01
	Juveniles	10	<0.01%	0.01	3	<0.01%	<0.01
Suckermouth Minnow type	Yolk-sac Larvae	--	--	--	9	<0.01%	0.01
	Post Yolk-sac Larvae	1	<0.01%	<0.01	3	<0.01%	<0.01
Pimephales type	Yolk-sac Larvae	347	1.0%	0.38	1,073	2.0%	1.08
	Post Yolk-sac Larvae	112	<0.01%	0.12	515	1.0%	0.52
	Larvae	10	<0.01%	0.01	--	--	--
	Juveniles	5	<0.01%	0.01	3	<0.01%	<0.01
Pimephales sp.	Post Yolk-sac Larvae	1	<0.01%	<0.01	--	--	--
	Juveniles	1	<0.01%	<0.01	--	--	--
Cyprinidae type	Eggs (viable)	6	<0.01%	0.01	19	<0.01%	0.02
Cyprinidae sp.	Eggs (viable)	4	<0.01%	<0.01	2	<0.01%	<0.01
	Not Determined	2	<0.01%	<0.01	61	<0.01%	0.06
	Yolk-sac Larvae	7	<0.01%	0.01	159	<0.01%	0.16
	Post Yolk-sac Larvae	14	<0.01%	0.02	7	<0.01%	0.01
	Larvae	53	<0.01%	0.06	12	<0.01%	0.01
	Juveniles	2	<0.01%	<0.01	--	--	--
Quillback	Yolk-sac Larvae	--	--	--	1	<0.01%	<0.01
White Sucker	Yolk-sac Larvae	--	--	--	1	<0.01%	<0.01
Spotted Sucker	Yolk-sac Larvae	1	<0.01%	<0.01	--	--	--
Moxostoma sp.	Yolk-sac Larvae	6	<0.01%	0.01	6	<0.01%	0.01
Catostominae type	Eggs (viable)	--	--	--	2	<0.01%	<0.01
	Eggs (non-viable)	--	--	--	2	<0.01%	<0.01
Catostominae sp.	Yolk-sac Larvae	--	--	--	2	<0.01%	<0.01
	Larvae	--	--	--	1	<0.01%	<0.01

Table 4-7 (Continued)

Taxa	Life Stage	2015 #	2015 %	2015 Density	2016 #	2016 %	2016 Density
Ictiobinae sp.	Yolk-sac Larvae	3,548	9.9%	3.88	8,084	15.3%	8.15
	Post Yolk-sac Larvae	528	1.5%	0.58	87	<0.01%	0.09
	Larvae	1	<0.01%	<0.01	603	1.1%	0.61
	Juveniles	--	--	--	1	<0.01%	<0.01
Catostomidae sp.	Larvae	1	<0.01%	<0.01	--	--	--
Channel Catfish	Juveniles	1	<0.01%	<0.01	--	--	--
White Bass	Juveniles	1	<0.01%	<0.01	--	--	--
Striped Bass type	Eggs (viable)	--	--	--	5	<0.01%	0.01
Morone sp. (not Striped Bass)	Eggs (viable)	--	--	--	2	<0.01%	<0.01
	Yolk-sac Larvae	21	<0.01%	0.02	82	<0.01%	0.08
	Post Yolk-sac Larvae	404	1.1%	0.44	39	<0.01%	0.04
	Larvae	--	--	--	2	<0.01%	<0.01
Morone sp.	Yolk-sac Larvae	--	--	--	69	<0.01%	0.07
	Post Yolk-sac Larvae	243	0.7%	0.27	49	<0.01%	0.05
Rock Bass	Post Yolk-sac Larvae	--	--	--	1	<0.01%	<0.01
Green Sunfish	Juveniles	--	--	--	1	<0.01%	<0.01
Bluegill type	Juveniles	--	--	--	1	<0.01%	<0.01
Lepomis sp.	Yolk-sac Larvae	5	<0.01%	0.01	11	<0.01%	0.01
	Post Yolk-sac Larvae	19	<0.01%	0.02	18	<0.01%	0.02
	Larvae	--	--	--	1	<0.01%	<0.01
	Juveniles	--	--	--	3	<0.01%	<0.01
Smallmouth Bass	Post Yolk-sac Larvae	--	--	--	1	<0.01%	<0.01
White Crappie	Juveniles	1	<0.01%	<0.01	--	--	--
Pomoxis sp.	Post Yolk-sac Larvae	4	<0.01%	<0.01	5	<0.01%	0.01
Sauger	Yolk-sac Larvae	20	<0.01%	0.02	23	<0.01%	0.02
	Post Yolk-sac Larvae	22	<0.01%	0.02	15	<0.01%	0.02
	Juveniles	1	<0.01%	<0.01	--	--	--
Walleye	Yolk-sac Larvae	1	<0.01%	<0.01	--	--	--
Sander sp.	Yolk-sac Larvae	38	<0.01%	0.04	10	<0.01%	0.01
	Post Yolk-sac Larvae	--	--	--	22	<0.01%	0.02
	Juveniles	2	<0.01%	<0.01	--	--	--
Logperch type	Yolk-sac Larvae	18	<0.01%	0.02	177	<0.01%	0.18
	Post Yolk-sac Larvae	4	<0.01%	<0.01	5	<0.01%	0.01
	Larvae	1	<0.01%	<0.01	--	--	--
Darter sp.	Yolk-sac Larvae	3	<0.01%	<0.01	4	<0.01%	<0.01
	Juveniles	--	--	--	1	<0.01%	<0.01
Darter (not Logperch) sp.	Yolk-sac Larvae	--	--	--	1	<0.01%	<0.01
Percidae sp.	Yolk-sac Larvae	1	<0.01%	<0.01	--	--	--
Freshwater Drum	Eggs (viable)	2,208	6.2%	2.41	18,295	34.5%	18.44
	Eggs (non-viable)	9	<0.01%	0.01	49	<0.01%	0.05
	Not Determined	--	--	--	6	<0.01%	0.01
	Yolk-sac Larvae	356	1.0%	0.39	1,919	3.6%	1.93
	Post Yolk-sac Larvae	2,097	5.9%	2.29	1,943	3.7%	1.96
	Larvae	1	<0.01%	<0.01	--	--	--
	Juveniles	451	1.3%	0.49	192	<0.01%	0.19

Table 4-7 (Continued)

Taxa	Life Stage	2015 #	2015 %	2015 Density	2016 #	2016 %	2016 Density
Freshwater Drum type	Yolk-sac Larvae	--	--	--	1	<0.01%	<0.01
Cyprinidae/Catostomidae	Eggs (viable)	5	<0.01%	0.01	1	<0.01%	<0.01
	Not Determined	--	--	--	8	<0.01%	0.01
	Yolk-sac Larvae	6	<0.01%	0.01	--	--	--
	Larvae	8	<0.01%	0.01	3	<0.01%	<0.01
Cyprinidae/Catostomidae type	Yolk-sac Larvae	56	<0.01%	0.06	--	--	--
Morone/Freshwater Drum	Yolk-sac Larvae	--	--	--	1	<0.01%	<0.01
UNIDENTIFIED	Eggs (viable)	12	<0.01%	0.01	8	<0.01%	0.01
	Eggs (non-viable)	4	<0.01%	<0.01	29	<0.01%	0.03
	Yolk-sac Larvae	5	<0.01%	0.01	1	<0.01%	<0.01
	Post Yolk-sac Larvae	2	<0.01%	<0.01	--	--	--
	Larvae	98	<0.01%	0.11	47	<0.01%	0.05
	Total Fish	**35,743**	**100.00%**	**39.05**	**52,971**	**100.00%**	**53.40**

[a] Yolk-sac and/or post yolk-sac larvae that could not be differentiated due to damage or were in a transitional phase between yolk-sac and post yolk-sac (T1) (EPRI 2020c).

Note: # = number collected; % = relative abundance; Density = #/10m³.

Based on information summarized above, the native taxa most susceptible to entrainment and/or impingement at or near Mill Creek Station are Gizzard Shad, Freshwater Drum, and Ictiobinae sp. (assumed Quillback, River Carpsucker, and Smallmouth Buffalo). Freshwater Drum and Gizzard Shad were the two most abundant species collected in a recent impingement study at the nearby Cane Run Plant (Table 4-4), and they also ranked first and second, respectively, during the two-year entrainment study at Mill Creek Station (Table 4-3 and Table 4-5). Although Ictiobinae species collectively composed only 1.2% of the fish impinged (Table 4-4), Ictiobinae sp. was the third most abundant taxon during the Mill Creek Station entrainment study and accounted for 14.5% of the two-year entrainment catch (Table 4-3). Ictiobinae species identified during both the in-river and impingement studies were River Carpsucker, Quillback, Smallmouth Buffalo, and Bigmouth Buffalo; however, Bigmouth Buffalo was uncommon during both the in-river and impingement studies (Table 4-2 and Table 4-4). Therefore, due to their higher relative abundance in the in-river catch, Quillback, River Carpsucker, and Smallmouth Buffalo will be discussed for Ictiobinae sp. It should be noted that Stefanavage (2009) listed buffalo species as an important commercial fish group in the Kentucky/Indiana portion of the Ohio River. Freshwater Drum, Gizzard Shad, Quillback, River Carpsucker, and Smallmouth Buffalo are rough fish as defined by the Kentucky Administrative Regulations[4].

Sport fish species[4] were uncommon in the entrainment and impingement collections with *Morone* taxa being the most abundant sport fish taxa group collected during both studies (Table 4-3 and Table 4-4). *Morone* taxa (White Bass and *Morone* sp.) composed only 1.5% of the fish impinged during the two-year study at the nearby Cane Run Plant, and all *Morone* taxa collectively accounted for only 1.0% of the two-year entrainment catch at Mill Creek Station. Since White Bass was the most abundant or only identifiable *Morone* species during the in-river, impingement, and entrainment studies (Table 4-2, Table 4-3, and Table 4-4), it represents the White Bass (+*Morone* sp.) sport fish group. White Bass is classified as a sport fish species by the Kentucky Administrative Regulations[4] and therefore are subject to statewide and regional recreational fishing regulations of the Kentucky Department of Fish and Wildlife Resources (KDFWR 2020).

4.4 Primary Period of Reproduction, Larval Recruitment, and Period of Peak Abundance for Relevant Taxa

(iv) Identification and evaluation of the primary period of reproduction, larval recruitment, and period of peak abundance for relevant taxa.

In the Ohio River, there is a marked seasonality to ichthyoplankton in the water column (ESE 1992). Most species have a limited spawning season, outside of which individuals are not susceptible to entrainment due to growth beyond the size that can pass through traveling screens. Some taxa have a defined single spawning season that is temporally compressed and measured in days or weeks, while others may spawn over a longer season, measured in months. Ichthyoplankton are effectively absent in the winter months. Ichthyoplankton densities begin to increase mid-spring, peak in late spring or early summer, and then decline in July and August. This pattern occurred in 2015 and 2016 during the Mill Creek Station entrainment study (Figure 4-1).

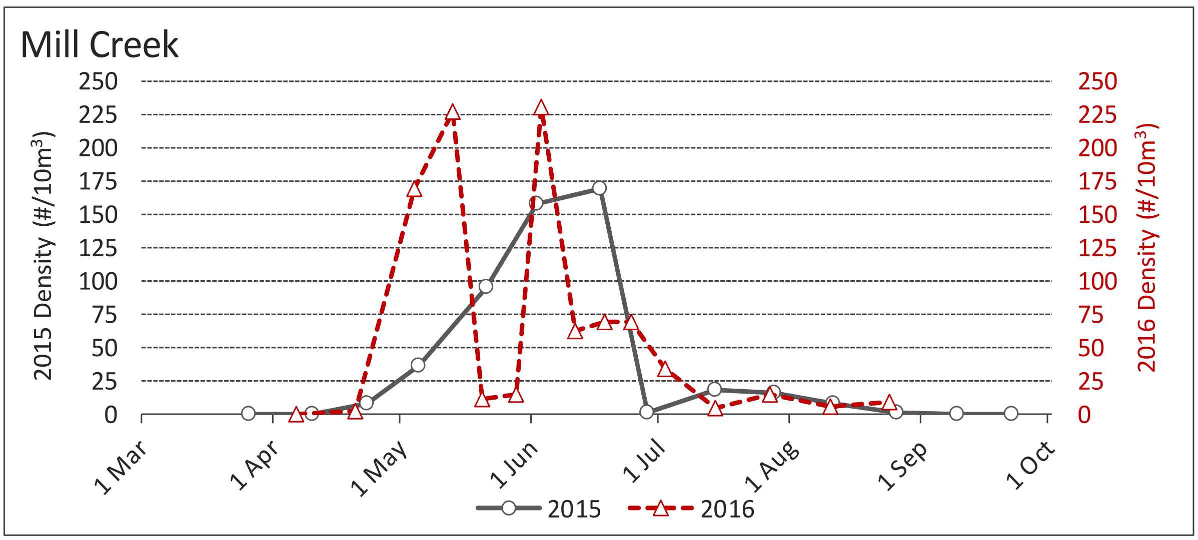


Figure 4-1 Ichthyoplankton density by sampling event at Mill Creek Station, 2015 and 2016

The temporal pattern in 2015 consisted of increasing densities from latter April through mid-June, a sharp decrease in densities during late June, followed by low and variable densities through August; only a few ichthyoplankton were collected in September (Figure 4-1). The maximum densities in 2015 were observed in early June (157.8/10m^3) and mid-June (169.3/10m^3), when Gizzard Shad composed 62.8% and 70.0% of the catches, respectively (EPRI 2020c). Clupeidae sp., most likely Gizzard Shad, accounted for an additional 21.4% and 9.7% of those peak densities, respectively. The two peak-density periods yielded 64.4% of the 2015 ichthyoplankton catch.

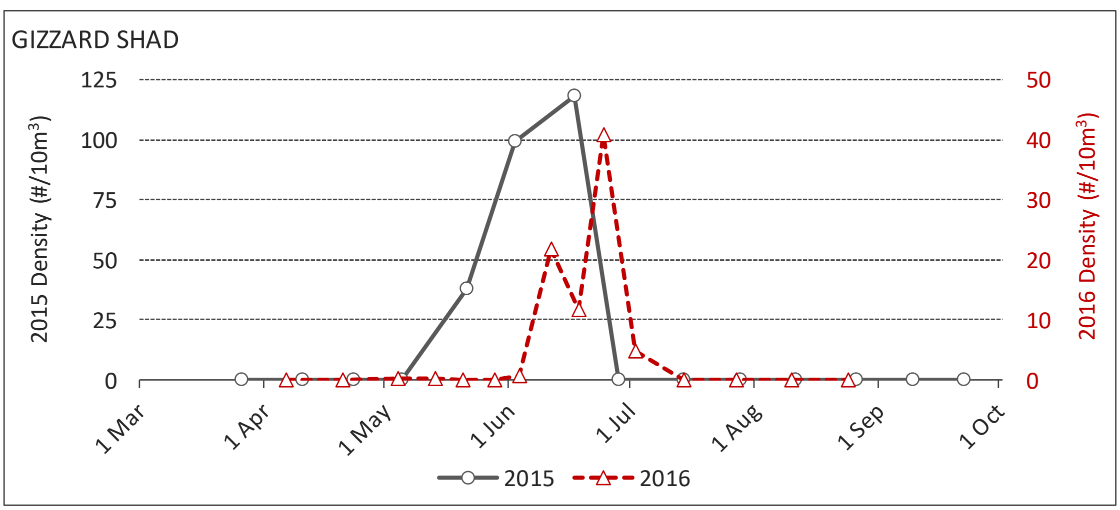
In 2016, initial density peaks (168.7/10m^3 to 227.0/10m^3) were observed during the first half of May with markedly lower densities in the latter half of May. Following that low-density period, another peak (231.0/10m^3) was observed in early June. Elevated densities (61.8/10m^3 to

69.2/10m^3) were also observed through late June, after which densities decreased and remained low through August (Figure 4-1). The three peak-density periods produced 61.1% of the ichthyoplankton collected in 2016. Ictiobinae sp. (primarily yolk-sac larvae) composed 78.0% of the early May peak, whereas Asian carp (+type) eggs accounted for 93.8% of the mid-May peak. The early June peak was dominated (92.1%) by Freshwater Drum (primarily eggs). Freshwater Drum and Gizzard Shad collectively composed between 69% and 87% of the elevated densities through the remainder of June (EPRI 2020c).

The primary period of reproduction near Mill Creek Station begins latter April and extends through July, whereas the period of peak abundance occurs in May and June (Figure 4-1). Temporal characteristics of four taxa most susceptible to entrainment in upper Cannelton Pool, Gizzard Shad, Clupeidae sp., Ictiobinae sp., and Freshwater Drum (Table 4-5) are presented below. Asian carp (+type) are not discussed because this grouping represents aquatic nuisance species[5]; taxa that are not "relevant". Although *Morone* taxa were uncommon during the two-year entrainment catch (Table 4-3 and Table 4-7), the White Bass (+*Morone* sp.) taxa group is discussed below because it was the most abundant sport fish taxa group entrained (1.0% of the two-year entrainment catch) and likely represents primarily White Bass.

4.4.1 Gizzard Shad

In 2015, Gizzard Shad was collected from latter May through late June and in mid-August (Figure 4-2), though only three post yolk-sac larvae and 10 juveniles were collected after mid-June (EPRI 2020c). No Gizzard Shad or other Clupeidae specimens were collected during July 2015, possibly the result of historic high river flow conditions during much of July that may have interrupted clupeid spawning (Figure 4-2; USACE 2015; EPRI 2020c). 2015 peak Gizzard Shad densities occurred from latter May (38.1/10m3) through mid-June (118.5/10m3), whereas densities were low during the other two sampling events in which they were collected in 2015 (Figure 4-2). In fact, 99.9% of the 2015 Gizzard Shad catch occurred in those three peak-density sampling events, and 60.4% of the ichthyoplankton catch during that period was made up of Gizzard Shad (EPRI 2020c).



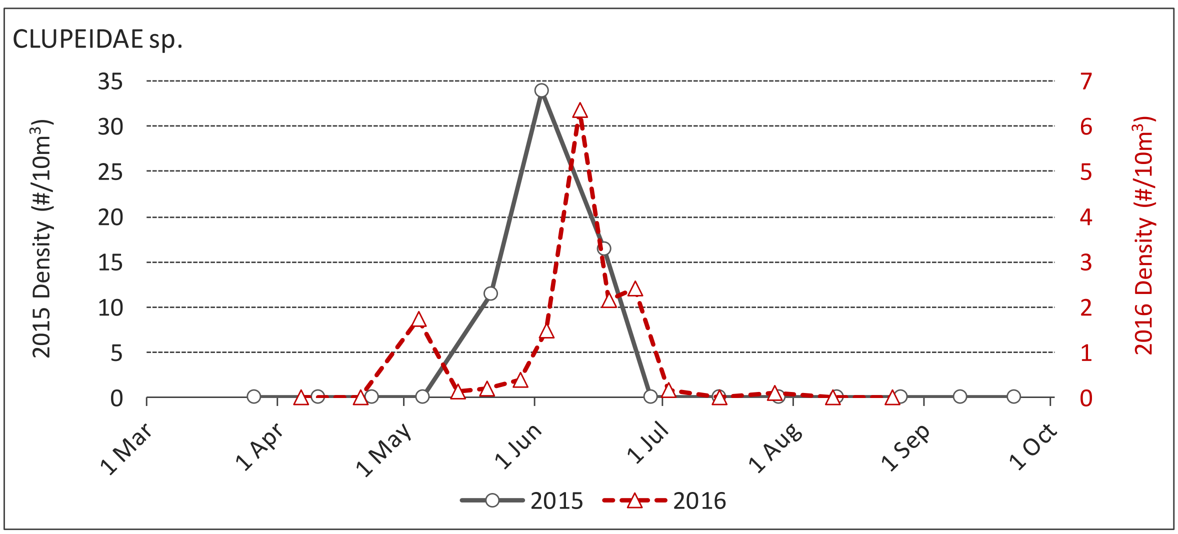
Note: The scale of the y-axis is different for each year.

Figure 4-2 Gizzard Shad density by sampling event at Mill Creek Station, 2015 and 2016

In 2016, Gizzard Shad larvae were collected from early May through the first half of August (Figure 4-2). Peak densities (11.7/10m^3 to 40.9/10m^3) occurred during the latter three June sampling events, particularly late June (Figure 4-2; EPRI 2020c). Those three peak-density periods produced 92.5% of the 2016 Gizzard Shad catch (EPRI 2020c). Gizzard Shad were collected more frequently in 2016 (12 sampling events) than in 2015 (five sampling events). Based on the 2015 and 2016 data, the primary period of reproduction for Gizzard Shad near Mill Creek Station is from mid-May through early July, whereas the period of peak abundance occurs in June (Figure 4-2).

4.4.2 Clupeidae sp.

Specimens identified as Clupeidae sp. were often in a physical condition that did not allow identification to lower taxonomic levels nor differentiation between post yolk-sac and yolk-sac larval life stages, many were therefore categorized as "larvae[9]" (EPRI 2020c). It is likely that many Clupeidae sp. specimens were Gizzard Shad because this taxa group shared a similar temporal distribution to Gizzard Shad (Figure 4-3 and Figure 4-2).



Note: The scale of the y-axis is different for each year.

Figure 4-3 Clupeidae sp. density by sampling event at Mill Creek Station, 2015 and 2016

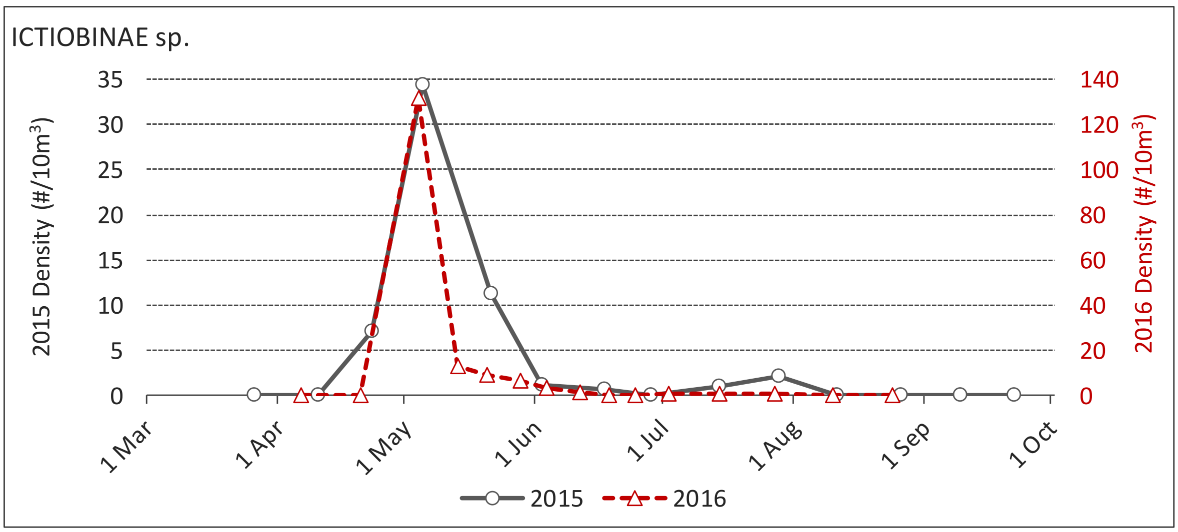
As per Gizzard Shad, 99.9% of the 2015 Clupeidae sp. catch occurred from latter May through mid-June, with densities ranging from 11.4/10m^3 (latter May) to 33.9/10m^3 (early June) (Figure 4-3). Only three post yolk-sac larvae were collected outside of that 2015 period, in mid-August (EPRI 2020c). Similarly, 99.9% of the 2016 Clupeidae sp. catch occurred in June. However, the maximum density in 2016 (6.4/10m^3) was noticeably lower than that observed in 2015 (33.9/10m^3) (Figure 4-3; EPRI 2020c). As observed for Gizzard Shad, Clupeidae sp. were collected more frequently in 2016 (10 sampling events) than in 2015 (four sampling events). Based on these data, the primary period of reproduction for Clupeidae sp. near Mill Creek

[9] Yolk-sac and/or post yolk-sac larvae that could not be differentiated due to damage or were in a transitional phase between yolk-sac and post yolk-sac (T1).

Station is from early May through June, whereas the period of peak abundance occurs from latter May through June (Figure 4-3).

4.4.3 Ictiobinae sp.

Ictiobinae sp., primarily yolk-sac larvae, were collected from latter April through the first half of August in 2015, but they were most abundant (7.1/10m^3 to 34.4/10m^3) from latter April through May when 92.1% of all Ictiobinae sp. were caught (Figure 4-4; EPRI 2020c). In addition, this taxon composed 89.0% to 96.3% of the ichthyoplankton catches in latter April and early May of 2015. Ictiobinae sp. densities in 2016 exhibited a temporal pattern similar to 2015 (Figure 4-4). Specimens, primarily yolk-sac larvae, were again collected over a broad season (latter April through late July) during 2016, and the peak density (131.6/10m^3) occurred in early May. That peak-density sampling event produced 79.0% of the 2016 Ictiobinae sp. catch, and this taxon composed 78.0% the ichthyoplankton catch in early May (EPRI 2020c). The 2015-2016 temporal density patterns indicate that the primary period of reproduction for Ictiobinae sp. near Mill Creek Station occurs from latter April through early June with the period of peak abundance is abbreviated and occurs in early May (Figure 4-4; EPRI 2020c).

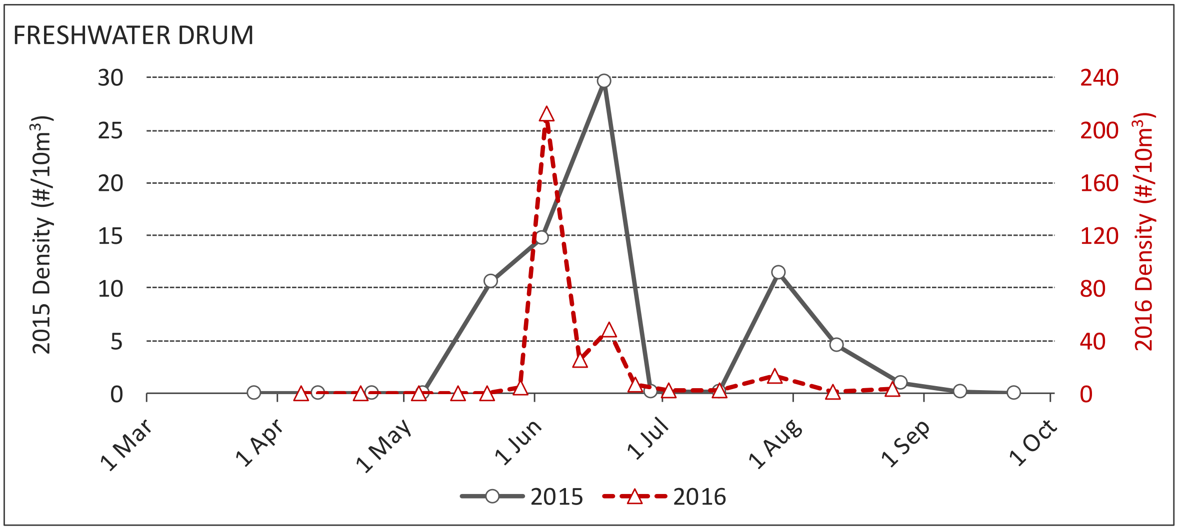


Note: The scale of the y-axis is different for each year.

Figure 4-4 Ictiobinae sp. density by sampling event at Mill Creek Station, 2015 and 2016

4.4.4 Freshwater Drum

Freshwater Drum was collected from May through September in 2015, but it was most abundant (10.6/10m^3 to 29.7/10m^3) during two periods: latter May through mid-June and late July through mid-August (Figure 4-5; EPRI 2020c). The latter May through mid-June period produced 76.0% of its 2015 catch, but Freshwater Drum composed only 9.4% to 17.5% of those ichthyoplankton catches. Conversely, the second period contributed only 22.2% to the 2015 Freshwater Drum catch, but it composed 57.5% to 71.5% of the ichthyoplankton catches during that period (EPRI 2020c). Few specimens were collected from late June to mid-July (Figure 4-5), which was likely the result of Freshwater Drum spawning being interrupted by the historic high river flow conditions that occurred from late June through mid-July (USACE 2015; EPRI 2020c).



Note: The scale of the y-axis is different for each year.

Figure 4-5 Freshwater Drum density by sampling event at Mill Creek Station, 2015 and 2016

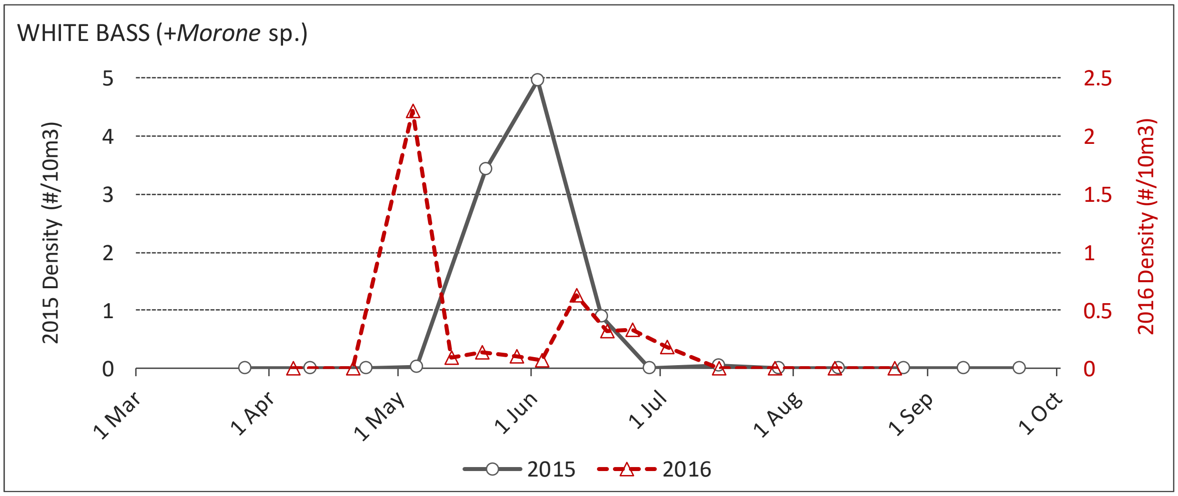
As in 2015, Freshwater drum was collected from May through the end of the sampling season in 2016 (Figure 4-5). The primary peak density in 2016 ($212.8/10m^3$) was about seven times higher than the 2015 peak ($29.7/10m^3$), and it occurred about two weeks earlier than the 2015 peak. The 2016 peak produced 66.4% of the 2016 Freshwater Drum catch, and this species composed 92.1% of the ichthyoplankton catch during that peak (Figure 4-5; EPRI 2020c). The 2015-2016 temporal density patterns indicate that the primary period of reproduction for Freshwater Drum near Mill Creek Station occurs from latter May through July, with less intensive reproduction through August. The period of peak abundance for Freshwater Drum occurs in June (Figure 4-5; EPRI 2020c).

4.4.5 White Bass (+Morone sp.)

White Bass (+*Morone* sp.[10]), primarily post yolk-sac larvae, were collected almost exclusively from early May through mid-June in 2015, with only two larvae collected outside that period in mid-July (Figure 4-6; EPRI 2020c). Their peak 2015 densities occurred in latter May ($3.4/10m^3$) and early June ($5.0/10m^3$), whereas densities were low ($\leq 0.9/10m^3$) during the other three sampling events in which they were collected that year. Those two peak events produced 90.1% of all White Bass (+*Morone* sp.) specimens collected in 2015 (EPRI 2020c). In 2016, White Bass (+*Morone* sp.) were collected over a period that was similar to 2015, early May through early July (Figure 4-6; EPRI 2020c). The yolk-sac larval stage was the most abundant life stage collected in 2016 (Table 4-7). Two density peaks were also observed in 2016. However, the primary peak ($2.2/10m^3$) occurred in early May, three to four weeks earlier than the 2015 peaks, and the second (minor) peak in 2016 ($0.6/10m^3$) occurred near mid-June, which was about a week later than the primary peak in 2015 (Figure 4-6; EPRI 2020c). The two peak events in 2016 produced 66.3% of all White Bass (+*Morone* sp.) specimens collected that year. White Bass (+*Morone* sp.) densities were low ($\leq 0.3/10m^3$) during the other seven sampling events in which they were collected in 2016 (EPRI 2020c). The primary period of reproduction for White Bass

[10] Excludes Striped Bass type (Table 4-3 and Table 4-7).

(+*Morone* sp.) near Mill Creek Station begins in early May and extends through June, whereas the period of peak abundance extends from early May to mid-June (Figure 4-6).



Note: The scale of the y-axis is different for each year.

Figure 4-6 White Bass (+*Morone* sp.) density by sampling event at Mill Creek Station, 2015 and 2016

4.5 Seasonal and Daily Activities of Relevant Taxa

(v) Data representative of the seasonal and daily activities (e.g., feeding and water column migration) of biological organisms in the vicinity of the cooling water intake structure.

The studies conducted in upper Cannelton Pool during 2005-2006 and 2015-2016 determined that Gizzard Shad, Freshwater Drum, and Ictiobinae sp. (assumed Quillback, River Carpsucker, and Smallmouth Buffalo) were the native taxa most susceptible to impingement and/or entrainment. Sport fish species[4] were uncommon in the entrainment and impingement collections with *Morone* taxa being the most abundant sport fish taxa group collected during both studies.

4.5.1 Gizzard Shad

Gizzard Shad is classified as a rough fish by the Kentucky Administrative Regulations[4]. It is a pelagic species, usually living in schools at or the near surface, and inhabits large rivers, lakes, reservoirs, swamps, bays, sloughs, and similar quieter open waters (Becker 1983). Although Gizzard Shad is not considered a migratory species, spring and fall runs as well as winter migrations have been noted (Wallus et al. 1990). Spawning occurs from April through June in the Midwest (Smith 2002), which is consistent with the primary collection periods of its early life stages in upper Cannelton Pool (Figure 4-2 and Figure 4-3). They usually spawn at night in shallow shoreline areas over a variety of substrates (Wallus et al. 1990). Gizzard Shad egg production is highest in age-2 females, averaging about 380,000 per individual. Fertilized eggs are demersal and adhesive, and therefore adhere to submerged vegetation and various benthic substrate (Becker 1983), which makes them less susceptible to entrainment. Conversely, their pelagic larval stages are highly susceptible to entrainment (Table 4-3 and Table 4-7; EPRI 2011). Yolk-sac larvae can move vertically in the water column soon after hatching and after three or four days, they begin active horizontal movements. However, larvae are weak swimmers for at least several weeks after hatching (Becker 1983). Yolk-sac and post yolk-sac larvae appear to feed primarily on protozoans, but transition to zooplankton as juveniles and greater percentages of phytoplankton as they grow older (Becker 1983). Within its range, Gizzard Shad is usually among the most abundant species entrained and tends to dominate impingement collections (EPRI 2011; Table 4-3 and Table 4-4). Its prevalence in impingement studies is largely associated with winter-die offs (EPRI 2008a and 2008b) and the fact that they are considered a fragile species, as classified by The Rule at 40 CFR 125.92(m).

4.5.2 Freshwater Drum

Freshwater Drum is classified as a rough fish by the Kentucky Administrative Regulations[4]. It is a bottom dweller and often found over mixed substrates such as sand, silt, and mud, and prefers moderately deep water. Freshwater Drum is considered a mobile species and tends to travel long distances downstream and much shorter distances upstream. In large rivers, it may travel distances up to approximately 100 miles (Wallus and Simon 2006). Spawning occurs from May through mid-summer (Mettee et al. 1996; Figure 4-5). Freshwater Drum spawns pelagically in main channel areas of large rivers and reservoirs, usually far from shore, in schools of a few to several hundred individuals (Wallus and Simon 2006; Becker 1983). Fecundity of females varies greatly from about 27,000 to 850,000 eggs per individual, but most females tend to produce between 200,000 and 400,000 eggs (Wallus and Simon 2006). Fertilized, water-hardened eggs are buoyant or semibuoyant; therefore, eggs and newly hatched yolk-sac larvae float at or near the surface and are scattered by currents and wind (Wallus and Simon 2006; Becker 1983), which makes these early life stages of Freshwater Drum highly susceptible to river drift and entrainment (Table 4-3 and Table 4-7; EPRI 2011). At approximately 25 mm in length, Freshwater Drum juveniles are found on or near the bottom where they remain for most of their lives. Feeding often begins before the yolk-sac is completely absorbed; the early diet consists primarily of copepods and cladocerans, though early piscivory on clupeids and cyprinids has been observed (Wallus and Simon 2006; Becker 1983). Larger Freshwater Drum feed primarily on aquatic insects, along with snails, crayfish, and fish (Mettee et al. 1996; Becker 1983). Freshwater Drum is also susceptible to impingement. For example, EPRI (2011) summarized the results of 2004 Phase II EPA Rule § 316(b) impingement data for large rivers such as the Ohio River, and Freshwater Drum was the third most frequently impinged species. During the Cane Run Plant impingement study, it was the most abundant species (Table 4-4).

4.5.3 Ictiobinae sp.

Ictiobinae sp. were the third most abundant taxon collected during the 2015-2016 entrainment study at Mill Creek Station (Table 4-3 and Table 4-5). Ictiobinae species identified during both the in-river and impingement studies were River Carpsucker, Quillback, Smallmouth Buffalo, and Bigmouth Buffalo; however, Bigmouth Buffalo was uncommon during both the in-river and impingement studies (Table 4-2 and Table 4-4). Therefore, due to their higher relative abundance in the in-river catch, Quillback, River Carpsucker, and Smallmouth Buffalo will be discussed for Ictiobinae sp. All three species are classified as a rough fish by the Kentucky Administrative Regulations[4], and buffalo were noted as an important commercial fish on the Kentucky/Indiana portion of the Ohio River (Stefanavage 2009). Quillback, River Carpsucker, and Smallmouth Buffalo are bottom-dwelling species found in pools, oxbow lakes, and deeper water of large rivers (Smith 2002; Becker 1983). All three species can tolerate turbid and silty waters (Smith

2002; Kay et al. 1994). Peak spawning occurs in the spring, typically starting in April or May, but may continue into September in its southern range (Smith 2002; Kay et al. 1994; Becker 1983; Figure 4-4). These species are broadcast spawners with adhesive eggs that attach to the substrate, woody debris, and vegetation (Smith 2002; Kay et al. 1994). Fecundity has been estimated to be 18,200 eggs per age-2 female to over 500,000 per age-15 female for Smallmouth Buffalo, 15,000 to 64,000 per female for Quillback, and 18,000 to 196,000 per female for River Carpsucker (Kay et al. 1994; Becker 1983). No parental care is provided to the early life stages. Immediately after hatching, planktonic yolk-sac larvae repeatedly swim to the surface and drift back to the bottom of the water column (Kay et al. 1994). As such, these species are susceptible to entrainment during the yolk-sac larval life stage. For example, over 90% of collected Ictiobinae sp. specimens were yolk-sac larvae during the two-year entrainment study at Mill Creek Station (Table 4-7). Young Smallmouth Buffalo feed on small planktonic invertebrates such as copepods and cladocerans, but algae and duckweed may also be consumed. Smallmouth Buffalo become more opportunistic as they grow, feeding on algae and associated invertebrates (Becker 1983). Quillback and River Carpsucker are bottom feeders that typically consume algae, insects, and small invertebrates from bottom substrate (Becker 1983). Ictiobinae taxa composed only 1.3% of the fish collected during electrofishing/seining surveys near Mill Creek Station from 2014 through 2018 (Table 4-2). Based on this community composition, Ictiobinae species appear to be moderately susceptible to impingement, composing 1.3% of all fish impinged during the 2005-2007 study (Table 4-4), and slightly more susceptible to entrainment as they composed 14.5% of all specimens entrained during the 2015-2016 study (Table 4-3 and Table 4-5).

4.5.4 White Bass (+*Morone* sp.)

White Bass (+*Morone* sp.[11]) composed only 1.5% of the impinged fish and only 1.0% of the entrained ichthyoplankton; however, they were the most abundant sport fish taxa group collected during these two studies (Table 4-3 and Table 4-4). Since White Bass was the most abundant or only identifiable *Morone* species during the in-river, impingement, and entrainment studies (Table 4-2, Table 4-3, and Table 4-4), it represents the White Bass (+*Morone* sp.) sport fish group. White Bass is classified as a sport fish species by the Kentucky Administrative Regulations[4] and therefore are subject to statewide and regional recreational fishing regulations of the Kentucky Department of Fish and Wildlife Resources (KDFWR 2020). White Bass is a schooling pelagic species that prefers open water of lakes, reservoirs, and large rivers. This species is capable of large movements (up to 1 mile per day) and in one study of post-spawning adults, the average distance traveled prior to recapture was 21 miles (Becker 1983). Spawning primarily occurs from April through June (e.g., Figure 4-6) and is temperature dependent with peak spawning occurring at 16.9-22.6°C. Spawning takes place mid-water with spawning groups rising to the surface where eggs are scattered. Eggs are adhesive and attach to vegetation, gravel, and rocks. The average female produces 565,000 eggs per season, but larger individuals may produce over 900,000 (Becker 1983; Wallus and Simon 2006). Young White Bass feed on planktonic crustaceans and insect larvae such as cladocerans, chironomid larvae, and copepods. As they grow, White Bass incorporate fish as a food item, though small invertebrates still

[11] Excludes Striped Bass type collected during the entrainment study (Table 4-3 and Table 4-7). However, the entrained and impinged *Morone* sp. may include Striped Bass and/or hybrid striper in addition to White Bass (Table 4-2).

compose an important portion of their diet (Becker 1983). *Morone* taxa composed 0.5% of the fish collected during in-river surveys near Mill Creek Station (Table 4-2), but slightly higher percentages (1.0% to 1.5%) of all fish specimens impinged and entrained (Table 4-3 and Table 4-4). Based on those relative abundance data, White Bass (+*Morone* sp.) appear to be moderately susceptible to impingement and entrainment in upper Cannelton Pool.

4.6 Threatened, Endangered, and Other Protected Species that Might be Susceptible to Impingement and Entrainment

(vi) Identification of all threatened, endangered, and other protected species that might be susceptible to impingement and entrainment at your cooling water intake structures.

Federally-listed and state-listed threatened and endangered (T&E) species were identified that are known to or believed to occur in Jefferson County, Kentucky, where Mill Creek Station is located and Harrison County, Indiana, which is across the river from the facility. The following addresses these federally-listed T&E species, whereas discussion of state-listed T&E is limited to aquatic species that potentially have a nexus with the operation of the Mill Creek Station CWIS.

Although the Kentucky State Nature Preserves Commission (KSNPC 2019)[12] lists taxa as T&E, the definition of endangered species in the Kentucky Administrative Regulations (Title 301, Chapter 3, Part 061, Section 2)[13] states:

> *Any species or subspecies designated as endangered by the Secretary of the Interior on a current United States List of Endangered and Threatened Wildlife as recorded in 50 Code of Federal Regulations, Part 17, is considered an endangered species in Kentucky under the provisions of KRS 150.183. Those species described as "threatened" on the above federal list are not included under KRS 150.183 or this administrative regulation.*

This definition does not include a state list of T&E species; nonetheless, the KSNPC T&E designations are presented here with the federal- and Indiana state-level listings.

4.6.1 Federally-listed Species

Federally-listed species for Jefferson County, Kentucky, and Harrison County, Indiana, were gathered from the USFWS Environmental Conservation Online System (ECOS)[14] and Information for Planning and Consultation (IPaC)[15] websites (USFWS 2020a and 2020b). The IPaC Project area encompasses 350 acres and includes the Ohio River near Mill Creek Station and surrounding terrestrial habitat on both sides of the river (Figure 4-7):

[12] http://app.fw.ky.gov/speciesinfo/speciesinfo.asp
[13] https://apps.legislature.ky.gov/law/kar/301/003/061.pdf
[14] https://ecos.fws.gov/ecp/
[15] https://ecos.fws.gov/ipac/

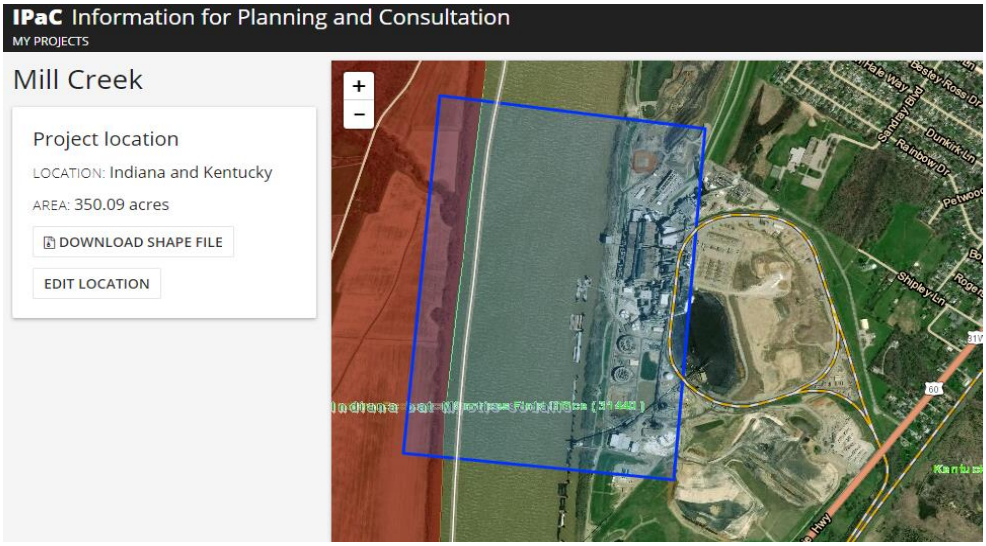


Figure 4-7 Project area designated for investigation in the IPaC website (https://ecos.fws.gov/ipac/; USFWS 2020b).

The USFWS lists 18 species as endangered and three as threatened under the Endangered Species Act (Table 4-8; USFWS 2020a and 2020b). Eleven freshwater mussel species are listed as endangered and one as threatened in Jefferson County, Kentucky, and/or Harrison County, Indiana, and two additional endangered mussels were identified through the IPaC website search. None of these 14 federally-listed mussel species were collected during recent mussel surveys conducted upstream and downstream of the facility (ESI 2012; LEC 2017), nor during historical surveys conducted upstream of the facility from ORM 610.3 to ORM 623.5 (Table 4-1). The other federally-listed species consist of the endangered Running Buffalo Clover (*Trifolium stoloniferum*), Short's Goldenrod (*Solidago shortii*), Least Tern (*Sterna antillarum*), Indiana Bat (*Myotis sodalis*), Gray Bat (*Myotis grisescens*), and the threatened Kentucky Glade Cress (*Leavenworthia exigua laciniate*) and Northern Long-eared Bat (*Myotis septentrionalis*) (Table 4-8). There is no nexus between these seven species and operation of the Mill Creek Station CWIS. Federally-listed fish species are not known to occur in the action area based on the county listings (USFWS 2020a) and the IPaC website search (USFWS 2020b).

There is designated critical habitat for only the Indiana Bat, which is located across the river from the Mill Creek Station CWIS (USFWS 2020b). The Indiana Bat critical habitat is limited to terrestrial environments and is not affected by the operation of the Mill Creek Station CWIS.

As discussed in Section 4.3.1, mussels are not among organisms that are most susceptible to impingement and entrainment. However, impingement of host fish likely represents the highest risk among all potential CWIS impact pathways for mussels (EPRI 2017b). Most common host species for listed mussels are bottom-dwelling species, as they provide the greatest opportunity for interaction with mussels and provide the greatest success rates for glochidia attachment (EPRI 2017b). Known host fish species for the 14 federally-listed mussel species are given in Table 4-9; this is an incomplete list because all mussel species have not been tested with all fish species presented, and hosts are not known for three of the mussel species.

Table 4-8 Endangered and Threatened Species listed by the USFWS known to or believed to occur in Jefferson County, KY, and Harrison County, IN, and species listed in Jefferson County by the KDFWR and in Harrison County by the IDNR

Common Name	Scientific Name	Status (E=Endangered, T=Threatened)				
		Federal			State	
		Jefferson, KY	Harrison, IN	IPaC Search	Jefferson, KY[a]	Harrison, IN
Mussels						
Elktoe	*Alasmidonta marginata*				T	--
Fanshell	*Cyprogenia stegaria*	E	NL[b]	E	E	E
Catspaw	*Epioblasma obliquata*	NL	NL	E	--	--
Northern Riffleshell	*Epioblasma rangiana*	NL	NL	E	--	--
Snuffbox	*Epioblasma triquetra*	E	E	NL	E	E
Pink Mucket	*Lampsilis abrupta*	E	NL	E	E	--
Pocketbook	*Lampsilis ovata*				E	--
Spectaclecase	*Margaritifera monodonta*	E	NL	E	E	--
Ring Pink	*Obovaria retusa*	E	NL	E	E	--
Round Hickorynut	*Obovaria subrotunda*				--	E
Orangefoot Pimpleback	*Plethobasus cooperianus*	E	NL	E	E	--
Sheepnose	*Plethobasus cyphyus*	NL	E	E	E	E
Clubshell	*Pleurobema clava*	E	NL	E	E	E
Rough Pigtoe	*Pleurobema plenum*	E	NL	E	--	--
Pyramid Pigtoe	*Pleurobema rubrum*				E	--
Fat Pocketbook	*Potamilus capax*	E	NL	NL	E	--
Salamander Mussel	*Simpsonaias ambigua*				T	--
Rabbitsfoot	*Theliderma cylindrica*	T	NL	T	T	--
Rayed Bean	*Villosa fabalis*	E	NL	NL	--	--
Crustaceans						
Bousfield's Amphipod	*Gammarus bousfieldi*				E	--
Louisville Crayfish	*Faxonius jeffersoni*				E	--
Fish						
Lake Sturgeon	*Acipenser fulvescens*				E	--
Alabama Shad	*Alosa alabamae*				E	--
Hoosier Cavefish	*Amblyopsis hoosieri*				--	E
Alligator Gar	*Atractosteus spatula*				E	--
Variegate Darter	*Etheostoma variatum*				--	E
Bird[c]						
Least Tern	*Sterna antillarum*	E	NL	E	E	--
Amphibian						
Eastern Hellbender	*Cryptobranchus a. alleganiensis*				E	E

Table 4-8 (Continued)

Common Name	Scientific Name	Status (E=Endangered, T=Threatened)				
		Federal			State	
		Jefferson, KY	Harrison, IN	IPaC Search	Jefferson, KY[a]	Harrison, IN
Mammals						
Indiana Bat	*Myotis sodalis*	E	E	E	E	E
Gray Bat	*Myotis grisescens*	E	E	E	T	E
Northern Long-eared Bat	*Myotis septentrionalis*	T	T	T	E	E
Insects – Dragonflies and Damselflies						
Handsome Clubtail	*Gomphus crassus*				--	T
Green-faced Clubtail	*Gomphus viridifrons*				--	T
Smoky Shadowdragon	*Neurocordulia molesta*				--	E
Stygian Shadowfly	*Neurocordulia yamaskanensis*				--	T
Spatterdock Darner	*Rhionaeschna mutata*				--	T
Least Clubtail	*Stylogomphus sigmastylus*				--	E
Riverine Clubtail	*Stylurus amnicola*				--	T
Elusive Clubtail	*Stylurus notatus*				--	E
Insects – Stoneflies						
Southern Stone	*Agnetina annulipes*				--	E
Alta Needlefly	*Leuctra alta*				--	E
Narrow-lobed Needlefly	*Leuctra tenuis*				--	E
Coosa Stone	*Neoperla coosa*				--	E
Insects – Caddisfly						
A Northern Casemaker Caddisfly	*Pycnopsyche rossi*				--	E
Reptile						
Western Cottonmouth	*Agkistrodon piscivorus leucostoma*				--	E
Plants[c]						
Kentucky Glade Cress	*Leavenworthia exigua laciniata*	T	NL	NL	--	--
Short's Goldenrod	*Solidago shortii*	NL	E	NL	--	E
Running Buffalo Clover	*Trifolium stoloniferum*	E	NL	E	--	--

[a] The Jefferson County, KY, list of T&E species is compiled by KDFWR (2019) from the state-wide list of T&E species generated by the KSNPC (2019).

[b] NL denotes that the federally-listed species was not present on that USFWS list.

[c] Only the federally-listed bird and plant species are presented.

Source: USFWS (2020a); USFWS (2020b); KDFWR (2019); IDNR (2019, 2020); mussel scientific nomenclature follows Williams et al. (2017).

Table 4-9 Known host fish species of Federally-listed mussel species known to or believed to occur in Jefferson County, Kentucky, and Harrison County, Indiana

Mussel Species	**Host Species** (from EPRI [2017b] and INHS [2014] unless otherwise noted)
Fanshell (*Cyprogenia stegaria*)	**Greenside Darter (*Etheostoma blennioides*)**, Mottled Sculpin (*Cottus bairdii*), Snubnose Darter (*Etheostoma simoterum*), Banded Darter (*Etheostoma zonale*), Tangerine Darter (*Percina aurantiaca*), Blotchside Logperch (*Percina burtoni*), **Logperch (*Percina caprodes*)**, and Roanoke Logperch (*Percina rex*)
Catspaw (*Epioblasma obliquata*)	**Rock Bass (*Ambloplites rupestris*)**, Mottled Sculpin, Stonecat (*Noturus flavus*), Blackside Darter (*Percina maculata*), and **Logperch** (USFWS 2015)
Northern Riffleshell (*Epioblasma rangiana*)	Mottled Sculpin, Rainbow Darter (*Etheostoma caeruleum*), Bluebreast Darter (*Etheostoma camurum*), Iowa Darter (*Etheostoma exile*), Johnny Darter (*Etheostoma nigrum*), Banded Darter (*Etheostoma zonale*), **Logperch**, Blackside Darter, and Brown Trout (*Salmo trutta*)
Snuffbox (*Epioblasma triquetra*)	Mottled Sculpin, Banded Sculpin (*Cottus carolinae*), Blackspotted Topminnow (*Fundulus olivaceus*), Round Goby (*Neogobius melanostomus*), **Logperch**, and Blackside Darter
Pink Mucket (*Lampsilis abrupta*)	Walleye (*Sander vitreus*), **<u>Sauger (*Sander canadensis*)</u>**, **<u>Freshwater Drum (*Aplodinotus grunniens*)</u>**, **<u>Smallmouth Bass (*Micropterus dolomieu*)</u>**, **Spotted Bass (*Micropterus punctulatus*)**, **<u>Largemouth Bass (*Micropterus salmoides*)</u>**, and **White Crappie (*Pomoxis annularis*)**
Spectaclecase (*Margaritifera monodonta*)	Shorthead Redhorse (*Moxostoma macrolepidotum*) and Bigeye Chub (*Hybopsis amblops*)
Ring Pink (*Obovaria retusa*)	None Identified
Orangefoot Pimpleback (*Plethobasus cooperianus*)	None Identified
Sheepnose (*Plethobasus cyphyus*)	Primary hosts: **<u>Sauger</u>**, **Central Stoneroller (*Campostoma anomalum*)**, and **Mimic Shiner (*Notropis volucellus*)** Potential hosts: Blackspotted Topminnow, Blacktail Shiner (*Cyprinella venusta*), Bleeding Shiner (*Luxilus zonatus*), **Bluntnose Minnow (*Pimephales notatus*)**, Brassy Minnow (*Hybognathus hankinsoni*), **Bullhead Minnow (*Pimephales vigilax*)**, Common Shiner (*Luxilus cornutus*), Eastern Blacknose Dace (*Rhinichthys atratulus*), Fathead Minnow (*Pimephales promelas*), Longnose Dace (*Rhinichthys cataractae*), Ozark Minnow (*Notropis nubilus*), Pearl Dace (*Margariscus margarita*), Red Shiner (*Cyprinella lutrensis*), **River Shiner (*Notropis blennius*), Silver Chub (*Macrhybopsis storeriana*)**, Southern Redbelly Dace (*Chrosomus erythrogaster*), **Spotfin Shiner (*Cyprinella spiloptera*)**, Steelcolor Shiner (*Cyprinella whipplei*), **Striped Shiner (*Luxilus chrysocephalus*)**, Suckermouth Minnow (*Phenacobius mirabilis*), **Western Mosquitofish (*Gambusia affinis*)**, and Whitetail Shiner (*Cyprinella galactura*)
Clubshell (*Pleurobema clava*)	Blackside Darter, **Central Stoneroller**, **Logperch**, and **Striped Shiner** (O'Dee and Watters 2000)
Rough Pigtoe (*Pleurobema plenum*)	None Confirmed
Fat Pocketbook (*Potamilus capax*)	**<u>Freshwater Drum</u>**
Rabbitsfoot (*Theliderma cylindrica*)	Whitetail Shiner, **Spotfin Shiner**, Bigeye Chub, and Rainbow Darter (NatureServe 2019)
Rayed Bean (*Villosa fabalis*)	Tippecanoe Darter (*Etheostoma tippecanoe*), Rainbow Darter, **Greenside Darter**, Mottled Sculpin, and **<u>Largemouth Bass</u>** (Woolnough 2002; White et al. 1996)

Note: Bolded taxa were collected during in-river surveys in Cannelton Pool from 2014 to 2018 (Table 4-2).
Underlined taxa were impinged at the nearby Cane Run Plant during 2005-2007 (Table 4-4).

With the exception of Spectaclecase (*Margaritifera monodonta*) and three mussel species for which hosts have not been identified, host fish for each mussel species have been collected during Cannelton Pool in-river surveys (Table 4-9 and Table 4-2). In addition, at least one fish host species for four of the 10 remaining mussel species was collected during the 2005-2007 impingement study at the nearby Cane Run Plant (Table 4-9 and Table 4-4). The Fanshell (*Cyprogenia stegaria*), which prefers coarse sand or gravel that is stable and silt free, typically uses darter species as hosts. The Catspaw (*Epioblasma obliquata*) uses Rock Bass, Mottled Sculpin, Stonecat, and darter species as hosts. It prefers shallow water and requires swift current; it is found in substrates from sand to boulders and is intolerant of siltation. Preferred habitat for Northern Riffleshell (*Epioblasma rangiana*) is medium to large rivers with riffles and coarse substrate; hosts for this species are primarily darter species. The Snuffbox (*Epioblasma triquetra*) is typically found in large or medium rivers with coarse substrate and riffles; it utilizes small demersal species such as darters and sculpin as hosts. The Pink Mucket (*Lampsilis abrupta*) utilizes Walleye, Sauger, Freshwater Drum, black bass species, and White Crappie as hosts and prefers silt-free substrates in areas with swift currents and riffles. Only two species (Shorthead Redhorse and Bigeye Chub) have been identified as hosts for Spectaclecase, which occurs primarily under slab rocks and bedrock shelves or among boulders. However, it is likely that Smallmouth Redhorse (*Moxostoma breviceps*), a former Shorthead Redhorse subspecies, is a host species for Spectaclecase. Host species are not known for Ring Pink (*Obovaria retusa*) or Orangefoot Pimpleback (*Plethobasus cooperianus*); both of these species prefer sand and gravel substrates. Sheepnose (*Plethobasus cyphyus*), which may occur in gravel and cobble riffles or areas with mixtures of sand, gravel, and mud, is known to use Sauger, Central Stoneroller, and Mimic Shiner as hosts, but may be able to utilize a wide array of small cyprinid species based on laboratory studies. The Clubshell is generally found in medium to small rivers and streams within clean, coarse sand and gravel of runs, often just downstream of a riffle and uses Blackside Darter, Central Stoneroller, Logperch, and Striped Shiner as hosts. Hosts are not known for Rough Pigtoe (*Pleurobema plenum*), which requires stable substrates composed of a mixture of firm and clean gravel and sand. Preferred habitat for Fat Pocketbook (*Potamilus capax*) includes medium or large rivers with finer sediment such as gravel, sand, and muck. Freshwater Drum is the only species known to act as a host for the Fat Pocketbook. The Rabbitsfoot mussel is typically found in small to medium streams but may be found in larger rivers in areas with sand and gravel. Whitetail Shiner, Spotfin Shiner, Bigeye Chub, and Rainbow Darter have been confirmed hosts of Rabbitsfoot glochidia. Though the Rayed Bean (*Villosa fabalis*) is often found in smaller headwater creeks, it can also inhabit large rivers in areas of gravel and sand. The Rayed Bean's hosts include Largemouth Bass, Rainbow Darter, Greenside Darter, and Mottled Sculpin.

4.6.2 State-listed Species

As stated above, the Kentucky Administrative Regulations' definition of endangered species of fish and wildlife[13] does not include a state list of T&E species. However, the KSNPC's list of T&E species is considered here for completeness. KDFWR compiles wildlife T&E species by county from the KSNPC's state-encompassing list (KDFWR 2019; KSNPC 2019)[12]. One amphibian, 28 birds (only one presented in Table 4-8), three mammals, 14 mussels, two crustaceans, and three fish are listed as T&E by the KSNPC in Jefferson County, Kentucky

(Table 4-8). The list of T&E species in Harrison County, Indiana, was obtained from the IDNR[16] (IDNR 2020). One amphibian species, one reptilian species, three bird species (not presented in Table 4-8), eight dragonfly/damselfly species, four stonefly species, one caddisfly species, five mussel species, and two fish species are Indiana state-listed T&E species in Harrison County (Table 4-8). The plant, bird (e.g., Barn Owl), and bat (e.g., Indiana Bat) species are not considered here because they are not susceptible to entrainment nor impingement. The remaining state-listed T&E animal species include one amphibian, one reptile, eight dragonfly/damselfly, four stonefly, one caddisfly, 15 mussel, two crustacean, and five fish species (Table 4-8).

The Eastern Hellbender (*Cryptobranchus a. alleganiensis*) is listed as endangered in Indiana and as endangered by the KSNPC for Kentucky (Table 4-8). Its native habitat consists of large slab rocks in clear and well-aerated streams and rivers (Burgmeier et al. 2011), habitat that is lacking in the impounded Ohio River in the vicinity of the Mill Creek Station.

Western Cottonmouth (*Agkistrodon piscivorus leucostoma*) is listed as endangered for Harrison County, Indiana (Table 4-8). This species utilizes aquatic habitat and feeds primarily on small fish and amphibians; therefore, if this species occurs near Mill Creek Station, an indirect effect of CWIS operation could occur if entrainment or impingement losses are substantial, which is highly unlikely.

Eight Dragonfly/damselfly species are listed as endangered or threatened in Harrison County, Indiana. Known habitats for these insect species are given in Table 4-10. The majority would not occur in the Ohio River due to habitat requirements. However, three species (Smoky Shadowdragon [*Neurocordulia molesta*], Stygian Shadowfly [*Neurocordulia yamaskanensis*], and Elusive Clubtail [*Stylurus notatus*]) have been noted to use larger rivers. It is unknown if these three species occur in the vicinity of Mill Creek Station.

Table 4-10 Dragonfly and Damselfly species listed as endangered or threatened in Harrison County, Indiana.

Common Name	Habitat Details
Handsome Clubtail (*Gomphus crassus*)	Small to medium rivers with rapid current and gravel bottom (NatureServe 2019).
Green-faced Clubtail (*Gomphus viridifrons*)	Small to large moderate-gradient rivers; free flowing with high water quality; larvae burrow in silt (NatureServe 2019).
Smoky Shadowdragon (*Neurocordulia molesta*)	Rivers, including the large rivers, sometimes large streams, all with rocks or logs to which the larvae cling (NatureServe 2019).
Stygian Shadowfly (*Neurocordulia yamaskanensis*)	It prefers clean lakes and large rivers with water in constant motion and not too acidic. It is occasionally found in larger rivers (NatureServe 2019).
Spatterdock Darner (*Rhionaeschna mutata*)	Sinkhole ponds, bog ponds, small lakes, and artificial ponds; usually fishless; *Nuphar* sp. (spatterdock) frequently present at breeding sites (NatureServe 2019).
Least Clubtail (*Stylogomphus sigmastylus*)	Small, clear rivers with moderate current and sand to rock substrates, usually in woodlands. Larvae burrow in bottom substrates (Paulson 2017).
Riverine Clubtail (*Stylurus amnicola*)	Clear rivers with moderate current and gravel/sandy substrates (NatureServe 2019).
Elusive Clubtail (*Stylurus notatus*)	Large, clear rivers with moderate current and gravel or sandy substrates; can also occur in large lakes with bottom substrates of silt or gravel rather than just sand (NatureServe 2019).

[16] http://www.in.gov/dnr/naturepreserve/files/np_harrison.pdf

Four stonefly species are listed as endangered in Harrison County, Indiana (Table 4-8); however, species-specific habitat data are not available (NatureServe 2020). Stoneflies (Order Plecoptera) have an immature larval stage that is entirely aquatic in North America. Nymphs of most genera occur in cold lotic habitats with several occurring in warm lotic systems, but comparatively few occur in cold lentic habitats, and none in warm lentic habitats (NatureServe 2020). Dispersal is primarily accomplished stochastically by nymphs and actively by winged adults. Most stoneflies require some form of moving water for development of nymphs but drift tendency is low for stoneflies (NatureServe 2020). As such, they would have low susceptibility to entrainment. It is unlikely that these four species occur in the vicinity of Mill Creek Station.

Of the 15 mussel species listed for Indiana or by the KSNPC for Kentucky, ten have been discussed above as they are also federally-listed. Of the remaining taxa, Pocketbook (*Lampsilis ovata*) and Pyramid Pigtoe (*Pleurobema rubrum*) are endangered in Jefferson County, Kentucky; Round Hickorynut (*Obovaria subrotunda*) is listed as endangered in Harrison County, Indiana; and Elktoe (*Alasmidonta marginata*) and Salamander Mussel (*Simpsonaias ambigua*) are listed as threatened in Jefferson County, Kentucky (Table 4-8). Pocketbook is the only state-listed mussel species that has been collected near Mill Creek Station (Table 4-1). However, it was only reported along the Indiana shoreline (LEC 2017) and not in the immediate vicinity of the CWIS during the ESI (2012) study.

Information for the host fish of the Pocketbook could not be identified. It adapts well to variable waterbody characteristics including strong currents or standing water. Pocketbook may be found in big rivers or reservoirs at depths of 5 to 6 m and in small streams in less than 0.6 m water. It prefers mixed substrate of gravel, coarse sand, and silt or mud (Woolnough and Seddon 2017). The Pyramid Pigtoe is typically found in medium to large rivers with sand or gravel substrates. A single species has been identified as a host for this species: the Spotfin Shiner (INHS 2014). The Round Hickorynut can be found in medium rivers with flow and substrates of sand and gravel; host fish include Banded Sculpin, Greenside Darter, Iowa Darter, Fantail Darter (*Etheostoma flabellare*), and Blackside Darter. The Elktoe is associated with medium to large streams with swift flow. They utilize a wide variety of sucker species, cyprinid species, and topminnow species as hosts (24 species listed in INHS 2014). The Salamander Mussel only utilizes the Common Mudpuppy (*Necturus maculosus*) as a host and is therefore typically found in habitat that suits its host, medium to large streams with coarse substrate and slab rocks (INHS 2014).

Two crustaceans, Bousfield's Amphipod (*Gammarus bousfieldi*) and Louisville Crayfish (*Faxonius jeffersoni*) are listed as endangered by the KSNPC for Jefferson County, Kentucky (Table 4-8). Neither of these species are known to occur in the vicinity of the Mill Creek Station CWIS and would not be at risk to entrainment. For example, Bousfield's Amphipod is found in mud substrates of small streams[17,18] and habitat of the Louisville Crayfish consists of small tributaries to the Ohio River, but not in the river proper[19].

Although federally-listed fish species are not known to occur in the action area (USFWS 2020a and 2020b), five fish species are state-listed for the action area (Table 4-8). Three are listed as

[17] https://explorer.natureserve.org/Taxon/ELEMENT_GLOBAL.2.115181/Gammarus_bousfieldi
[18] https://nepis.epa.gov/Exe/ZyNET.exe/...
[19] https://explorer.natureserve.org/Taxon/ELEMENT_GLOBAL.2.116858/Faxonius_jeffersoni

endangered in Jefferson County (KDFWR 2019): Lake Sturgeon (*Acipenser fulvescens*), Alabama Shad (*Alosa alabamae*), and Alligator Gar (*Atractosteus spatula*), but they have not been reported in Kentucky since 2000[20], 1995[21], and 1977[22], respectively (waterbodies unknown but Ohio River is likely). Indiana lists two fish species as endangered in Harrison County (IDNR 2020): Hoosier Cavefish (*Amblyopsis hoosieri*) and Variegate Darter (*Etheostoma variatum*). The cavefish obviously does not occur in the Ohio River, and Variegate Darter has only been collected in the upper portion of the Ohio River (ORMs 45.6-126.8) based on ORSANCO fisheries data from 1957 through 2018[23] and ORERP fisheries data from 1973 through 2018 (EPRI 2016, 2017a, 2019, 2020a,b). Therefore, it is reasonable to conclude that these five species do not occur in the vicinity of the Mill Creek Station CWIS. Furthermore, no state-listed species were collected during the recent in-river (Table 4-2), entrainment (Table 4-3), nor impingement (Table 4-4) studies at or near Mill Creek Station.

4.7 Public Participation

(vii) Documentation of any public participation or consultation with Federal or State agencies undertaken in development of the plan.

This pubic participate documentation refers to the Design and Construction Technology Plan for new facilities and for offshore oil and gas facilities that was previously required in the 2011 proposed EPA Rule, but does not apply to existing facilities under the new Rule. There is no required plan submittal associated with the § 122.21(r) studies, nor are there requirements for public participation or consultation with Federal or State agencies in completion of the required studies in this section.

4.8 Methods and Quality Assurance Procedures for Supporting Field Studies

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

No new field studies were conducted because information for upper Cannelton Pool was available to address § 122.21(r)(4). Methods for the collection of juvenile and adult fish from the Ohio River near the Mill Creek Station are described in EPRI (2019) and ORSANCO (2020d),

[20] http://app.fw.ky.gov/speciesinfo/speciesListCounty.asp?strScientificName=Acipenser+fulvescens&strGroup=1
[21] http://app.fw.ky.gov/speciesinfo/speciesListCounty.asp?strScientificName=Alosa+alabamae&strGroup=1
[22] http://fw.ky.gov/Fish/Pages/Alligator-Gar.aspx
[23] http://www.orsanco.org/data/fish-population/

entrainment sampling methods are described in EPRI (2020c), and the Cane Run Plant impingement study methods can be found in EPRI (2009).

4.9 Source Water Baseline Biological Characterization Data Affirmation

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

This provision simply contains a statement of clarification and does not call for specific information. This report provides the information required under §122.21(r)(4)(i-xii).

4.10 Protective Measures and Stabilization Activities near the CWIS

(x) For the owner or operator of an existing facility, identification of protective measures and stabilization activities that have been implemented, and a description of how these measures and activities affected the baseline water condition in the vicinity of the intake.

Protective measures at Mill Creek Station consist of the cooling towers on Units 2, 3, and 4, which have reduced the design intake flow rate by 82.7 percent and the retirement of Unit 1. There have been no stabilization activities or other protective measures performed by LGE-KU near the intake that would affect fish populations or baseline water conditions.

4.11 Fragile Species

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

Gizzard Shad is the only species known to occur in Cannelton Pool (Table 4-2) that is listed as a fragile species in 40 CFR 125.92(m). EPA defines a fragile species of fish or shellfish as those that have an impingement survival rate of less than 30%, which ensures that a facility's performance in reducing impingement mortality would only reflect effects of its improvements to the CWIS technology and not be biased by effects of data collection that are not caused by impingement.

4.12 USFWS Incidental Take Exemption or Authorization

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

This is not applicable to Mill Creek Station because it does not hold an incidental take exemption or authorization from the USFWS.

5 § 122.21(R)(5) COOLING WATER SYSTEM DATA

The Rule at § 122.21(r)(5) requires that LG&E provide the following cooling water system data for Mill Creek:

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

(ii) Design and engineering calculations prepared by a qualified professional and supporting data to support the description required by paragraph (r)(5)(i) of this section; and

(iii) Description of existing impingement and entrainment technologies or operational measures and a summary of their performance, including but not limited to reductions in impingement mortality and entrainment due to intake location and reductions in total water withdrawals and usage.

The data presented in this section is used to evaluate the existing cooling water system and potential designs of entrainment BTAs that would apply to Mill Creek.

5.1 Cooling Water System Design and Operation

Four generating units are currently operated at Mill Creek. Unit 1 is designed with once-through cooling, while Units 2, 3, and 4 have closed-cycle recirculating systems. All four units use the Ohio River as the cooling water source. There are two circulating water pumps for Unit 1. Both pumps are typically operated resulting in a maximum circulating water flow rate is 350.7 cfs (157,400 gpm, 226.7 MGD). When only one pump is operated, such as when one pump is offline for maintenance, the flow to Unit 1 is 206.3 cfs (92,600 gpm, 133.3 MGD). The difference between the flow rate through each pump with one and two pumps operating is a result of increased discharge pressure on the circulating water pumps associated with the increased flow. The two Unit 1 circulating water pumps will cease operations by the end of 2024 when Unit 1 is retired.

The two circulating water pumps for Unit 1 discharge into two 60 inch diameter inlet pipes, which run from the CWIS to the unit's condenser. Only one pipe is used while the unit is in one pump operation, while both pipes are utilized when both circulating pumps are operating. The condenser is divided into two independent condenser halves with cross-over valves. This arrangement allows each half to be taken out of service for maintenance while the other remains in operation.

There are also four long-shaft service water pumps that provide service water and auxiliary make-up water to Units 2, 3, and 4 CCRS. Two service water pumps are located in the northernmost intake bay and have a combined flow of 44.6 cfs (20,000 gpm, 28.8 MGD); the two other pumps are located in the adjacent screen bay and have a combined flow of 46.8 cfs (21,000 gpm, 30.2 MGD). Two or three long-shaft service water pumps are operated depending on service water needs. The amount of service water needed is expected to be reduced with the retirement of Unit 2, which will occur no later than the end of 2028.

A single 20-inch diameter pipe carries water from the long-shaft service water pumps at the screen house, to the Unit 2 condenser and cooling tower. The Unit 2 condenser is designed for a flow rate of 289.6 cfs (130,000 gpm, 187.2 MGD). The Unit 2 cooling tower is an 8-cell induced draft cooling tower that is approximately 290 ft long, and 75 ft wide. Each of the 8 cells contains a 28-ft diameter fan with a 200 hp motor. The cooling tower is designed for an internal circulating water flow of 334.2 cfs (150,000 gpm, 216 MGD). According to the water balance diagram, (Figure 3-5), the Unit 2 cooling tower has an annual peak monthly average make-up water flow rate of approximately 11.1 cfs (5,000 gpm, 7.2 MGD). The tower is located approximately 890 ft northeast of the CWIS. Unit 2 is scheduled to be retired by the end of 2028. Once this unit is retired, additional long-shaft pumps may also be retired.

Units 3 and 4 condensers and cooling towers are also provided cooling water by two long-shaft service water pumps in the CWIS. The Unit 3 condenser is designed for a flow rate of 287.7 cfs (174,000 gpm, 250.6 MGD), while the Unit 4 condenser is designed for a flow rate of 449.5 cfs (201,770 gpm, 290.5 MGD).

The Unit 3 cooling tower is a round, 8-cell mechanical draft cross-flow designed cooling tower that is approximately 211 ft in diameter, and 60 ft tall. Each of the 8 cells contains a 28 ft diameter fan with a 200 hp motor. The cooling tower is designed for an internal circulating water flow of 456.7 cfs (205,000 gpm, 295.2 MGD) measured at the cooling tower discharge. The Unit 3 cooling tower is designed for an inlet temperature of 116°F and an outlet temperature of 95°F at a wet bulb temperature of 78°F. According to the water balance diagram, (Figure 3-5), the Unit 3 cooling tower has an annual peak monthly average make-up water flow rate of approximately 13.0 cfs (5,833 gpm, 8.4 MGD). Approximately 8.4 cfs (3,778 gpm, 5.4 MGD) is lost to evaporation from heat rejection by the towers and another 0.02 cfs (10.25 gpm, 0.014 MGD) is lost to drift. The tower is located approximately 1,700 ft southwest of the CWIS.

The Unit 4 cooling tower is a round, 12-cell counter-flow design that is approximately 215 ft in diameter, and approximately 61 ft tall. Each of the 12 cells contains an 8 bladed, 30 ft diameter fan with a 200 hp motor. The cooling tower is designed for an internal circulating water flow of 496.0 cfs (222,600 gpm, 320.5 MGD), with an inlet temperature of 116°F and an outlet temperature of 94°F at a wet bulb temperature of 78°F. According to the water balance diagram, (Figure 3-5), the Unit 4 cooling tower has an annual peak monthly average make-up water flow rate of approximately 13.3 cfs (5,972 gpm, 8.6 MGD). Approximately 9.2 cfs (4,117 gpm, 5.9

MGD) is lost to evaporation from heat rejection by the towers and another 0.02 cfs (11.13 gpm, 0.016 MGD) is lost to drift. The tower is located immediately north of the Unit 3 cooling tower.

After passing through the condenser, the flows from Unit 1 combine into a 6.5 ft wide by 7 ft high discharge tunnel. The cooling tower blowdown from Units 2, 3 and 4 also flows into this common discharge tunnel. The tunnel directs the water where it is discharged back to the Ohio River approximately 577 ft downstream of the CWIS.

The current design intake flow (DIF) for Mill Creek with all six pumps operating is 442.0 cfs (198,400 gpm, 285.7 MGD). Except for emergency fire suppression water, no other pumps withdraw water directly from the Ohio River. After the retirement of Unit 1 and its two circulating water pumps by the end of 2024, the Mill Creek DIF will be reduced to 91.4 cfs (41,000 gpm, 59.0 MGD). This is a 79% reduction in flow. Additional flow reductions will be realized after the retirement of Unit 2 in 2028.

The annual pump hours of operation for the four long-shaft service water pumps for the last 5 years (2017-2021) are provided in Table 3-2.

5.2 Proportion of Design Intake Flow for Contact Cooling, Non-contact Cooling, and Process Uses

The current Mill Creek DIF is 442.0 cfs (198,400 gpm, 285.7 MGD). The proportion of the design intake flow used for contact cooling, non-contact cooling, and process uses were estimated using the flow splits identified in the water balance diagram Figure 3-5. All but approximately 2.4% of the water withdrawn is used for contact or non-contact cooling. This small percentage (2.4%) is comprised of flue gas desulfurization (FGD)service water, spraywash water, clear well settling, The remaining water is used for the Unit 1 once-through cooling and make-up water to Units 2, 3, and 4 CCRS. Mill Creek is an electrical generating facility and does not use any water for manufacturing processes.

With the retirement of Unit 1 before the end of 2024, the Mill Creek DIF will be reduced from 442.0 cfs (198,400 gpm, 285.7 MGD) down to 91.4 cfs (41,000 gpm, 59.0 MGD).

5.3 Proportion of Source Waterbody Withdrawn

The current Mill Creek DIF is 442.04 cfs (198,400 gpm, 285.7 MGD). The actual intake flow (AIF) varies throughout the year, based on the intake water temperature and number of units operating. The average monthly AIF for the long shaft service water pumps from 2017 through 2021, as presented in Table 3-4 were used when calculating the percent of the Ohio River flow withdrawn by Mill Creek. The circulating water flow withdrawn by Unit 1 was excluded from these calculations to provide a better estimate of the amount of river flow that will be withdrawn once Unit 1 is retired. This is consistent with how Mill Creek will be operated after Unit 1 is retired in 2024.

Average monthly Ohio River flows were estimated using daily flow data from January 1, 2002 through December 31, 2021 the period of record, for flows measured at USGS 03294500 at

Louisville, KY. The average monthly river flow was compared to the future DIF (post retirement of Unit 1), and the average monthly AIF of just the long shaft service water pumps from 2017 to 2021 to estimate the percent of river flow withdrawn. The following equation was used to determine the proportion of the Ohio River flow withdrawn by Mill Creek;

$$Proportion\ of\ Source\ Waterbody = \frac{Mill\ Creek\ Intake\ flow\ (cfs)}{Ohio\ River\ Flow\ (cfs)} \times 100$$

After the retirement of Unit 1 by the end of 2024, the Mill Creek DIF will be reduced to 91.4 cfs (41,000 gpm, 59.0 MGD). The average monthly proportion of the Ohio River withdrawn by Mill Creek for both the future DIF and monthly AIF is provided in Table 5-1. As can be seen from this table, if operated at its future DIF, Mill Creek would withdraw a maximum of 0.19% of the Ohio River occurring in the month of August. Based on historic operations, Mill Creek's long-shaft service water pumps withdrew up to 0.12% of the Ohio River flow, also occurring in the Month of August. The future DIF does not account for the possible retirement of one or more of the long-shaft pumps as part of the Unit 2 retirement, which will occur by the end of 2028.

Table 5-1 Average Monthly Ohio River Flow (January 2000 through December 2019) and Percent of Ohio River Flow Withdrawn by the Mill Creek Long Shaft Service Water Pumps based on Historic Operations from 2017 through 2021

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Mean of Monthly Ohio River Discharge (cfs)	200,013	214,400	252,915	216,858	184,246	111,550	77,036	48,256	60,015	59,450	111,247	173,128
Design Intake Flow (59.0 MGD)												
Design Intake Flow (cfs)	91.4	91.4	91.4	91.4	91.4	91.4	91.4	91.4	91.4	91.4	91.4	91.4
Percent of River Flow	0.05%	0.04%	0.04%	0.04%	0.05%	0.08%	0.12%	0.19%	0.15%	0.15%	0.08%	0.05%
Monthly Daily Average Intake Flow (2016-2020)												
Actual Intake Flow (cfs)	49.1	51.4	49.5	52.2	55.4	60.3	60.1	56.6	49.7	55.7	52.9	47.9
Percent of River Flow	0.02%	0.02%	0.02%	0.02%	0.03%	0.05%	0.08%	0.12%	0.08%	0.09%	0.05%	0.03%

5.4 Intake Velocities

Velocities at the Mill Creek CWIS were calculated approaching the trash racks, approaching the traveling water screens, and through the traveling water screen mesh. The velocities under the skimmer and baffle wall were also calculated. The velocities were calculated for two different inflow conditions, the current DIF (442.0 cfs, 198,400 gpm, 285.7 MGD) with all four long-shaft service water pumps operating and both the Unit 1circulating water pumps operating and the future DIF (91.4 cfs, 41,000 gpm, 59.0 MGD). The velocities were also calculated at two different water levels, the assumed design low water level El. 375.0 ft and the lowest recorded river level from January 1, 2002 through December 31, 2021 adjusted to Mill Creek of El. 380.7 ft.

Velocities in the intake opening, through the trash racks and traveling water screens were calculated at 100% clean condition. The traveling water screens have a 0.375 inch square mesh with 14 gauge wires. This mesh has an estimated percent open area of 67.9%. In lieu of a measured percent open area for the Mill Creek traveling water screen frames, percent open area values provided by screen vendors for similar screens were used for determining the through-screen velocities. The traveling water screens are standard through-flow traveling water screens with an assumed framing open area of 86%. Taking into account the screen mesh and framing, the traveling water screens are estimated to have a 58.0% combined open area.

The results of the intake velocity calculations at the assumed design low water level are summarized in Table 5-2. The calculated velocities at the lowest recorded water levels are provided in Table 5-3. Once Unit 1 is retired, the velocities within the CWIS, including the through-screen velocity, are expected to remain at 0.5 ft/sec or below down to the minimum recorded water level as shown in Table 5-3. The velocity calculations are provided in Figure 5-1.

Table 5-2 Estimated Intake Velocities (ft/sec) During Assumed Design Low Water Levels (El. 375.0 ft)

Existing DIF			Velocity (ft/sec)			
Pumps	**Flow (gpm)**	**Low Water (ft)**	**Approach to Trash Rack/ Under Skimmer Wall**	**Under Baffle Wall**	**Approach to Screens**	**Through-screen (clean)**
Unit 1	157,400	El. 375.0 ft	1.4	1.9/2.3[1]	1.6/2.7[1]	3.2/3.8[1]
Long-shaft	41,000			0.5	0.4	0.7
Future DIF			**Velocity (ft/sec)**			
Pumps	**Flow (gpm)**	**Low Water (ft)**	**Approach to Trash Rack/ Under Skimmer Wall**	**Under Baffle Wall**	**Approach to Screens**	**Through-screen (clean)**
Long-shaft	41,000	El. 375.0 ft	0.6[2]	0.5	0.4	0.7

1 Velocities within the Unit 1 screen bay were calculated with both one pump (92,600 gpm) and two pumps (157,400 gpm) operating.

2 Assumed all the flow is concentrated through one trash rack opening

Table 5-3 Estimated Intake Velocities (ft/sec) During Observed Lowest Low Water Levels ((El. 380.7 ft) (January 1, 2002 through December 31, 2022)

Existing DIF			Velocity (ft/sec)			
Pumps	**Flow (gpm)**	**Low Water (ft)**	**Approach to Trash Rack/ Under Skimmer Wall**	**Under Baffle Wall**	**Approach to Screens**	**Through-screen (clean)**
Unit 1	157,400	El. 380.7 ft	0.9	1.9/2.3[1]	1.0/1.2[1]	1.8/2.1[1]
Long-shaft	41,000			0.5	0.3	0.5
Future DIF			**Velocity (ft/sec)**			
Pumps	**Flow (gpm)**	**Low Water (ft)**	**Approach to Trash Rack/ Under Skimmer Wall**	**Under Baffle Wall**	**Approach to Screens**	**Through-screen (clean)**
Long-shaft	41,000	El. 380.7 ft	0.4[2]	0.5	0.3	0.5

1 Velocities within the Unit 1 screen bay were calculated with both one pump (92,600 gpm) and two pumps (157,400 gpm) operating.

2 Assumed all of the flow is concentrated through one trash rack opening

Formulas Used

Approach Velocity

$$V(approach) = \frac{Q(flow)}{A\ (area)}$$

Through Screen Velocity

$$V(through\ screen) = \frac{V_{approach}}{Screen\ open\ area}$$

Unit 1, Long-shaft Pumps 1 and 2, and Long-shaft Pumps 3 and 4

Data Used

Unit 1 Flow with 1 Pump Operating (Q): 206.3 cfs
Unit 1 Flow with 2 Pumps Operating (Q): 350.7 cfs
Long Shaft pumps 1 and 2 Flow (Q): 44.6 cfs
Long Shaft pumps 3 and 4 Flow (Q): 46.8 cfs
Total Flow with one Unit 1 pump operating (Q): 297.7 cfs
Total Flow with both Unit 1 pumps operating, or DIF (Q): 442.0 cfs
Low water: El. 375.0 ft
Skimmer Wall Openings/Trash Rack
- Number of Openings: 2
- Skimmer Wall Opening Width: 14 ft
- Skimmer Wall Opening Height: 17 ft
- Invert: El 364.0ft

Baffle Wall Openings
- Number of Openings: 4
- Baffle Wall Opening Width: 11.3 ft
- Baffle Wall Opening Height: 8 ft

Traveling Water Screens
- Number of Screens: 4
- Screen Width: 10.0 ft
- Invert: El. 364.0 ft
- Estimated framing open area: 86.0%
- Estimated open area: 67.9% (3/8 inch square mesh with 14 gauge wire)

Calculations

Trash rack/Under Skimmer Wall

$$V_{Approach\ Trash\ rack\ (1\ Unit\ 1\ Pump)} = \frac{297.7\ cfs}{2\ \times 14\ ft \times (375.0\ ft -\ 364.0\ ft)} = 1.0\ \frac{ft}{sec}$$

$$V_{Approach\ Trash\ rack\ (DIF)} = \frac{442.04cfs}{2\ \times 14ft \times (375.0\ ft -\ 364.0\ ft)} = 1.4\ \frac{ft}{sec}$$

Under Baffle Wall

§ 122.21(r)(5) Cooling Water system data

$$V_{Unit\ 1(1\ pump\ operating)} = \frac{206.3\ cfs}{1\ \times 8\ ft \times 11.3} = 2.3\frac{ft}{sec}$$

$$V_{Long\ Shafts\ 1\ and\ 2} = \frac{44.6\ cfs}{1 \times 8\ ft \times 11.3} = 0.5\ \frac{ft}{sec}$$

$$V_{Long\ Shafts\ 3\ and\ 4} = \frac{46.8\ cfs}{1 \times 8\ ft \times 11.3} = 0.5\ \frac{ft}{sec}$$

$$V_{Unit\ 1(both\ pumps\ operating)} = \frac{350.7\ cfs}{2 \times 8\ ft \times 11.3} = 1.9\ \frac{ft}{sec}$$

Traveling screen

$$Screen\ open\ area = 86.0\% \times 67.9\% = 58.0\%$$

$$V_{Approach\ Unit\ 1\ with\ 1\ pump\ operating} = \frac{206.3cfs}{1 \times 10\ ft \times (375.0\ ft -\ 364.0ft)} = 1.9\frac{ft}{sec}$$

$$V_{Approach\ Long\ Shaft\ Pumps\ 1\ and\ 2} = \frac{44.6\ cfs}{1 \times 10\ ft \times (375.0\ ft -\ 364.0ft)} = 0.4\frac{ft}{sec}$$

$$V_{Approach\ Long\ Shaft\ pumps\ 3\ and\ 4} = \frac{46.8\ cfs}{1 \times 10\ ft \times (375.0\ ft -\ 364.0ft)} = 0.4\frac{ft}{sec}$$

$$V_{Approach\ Unit\ 1\ with\ 2\ pumps\ operating} = \frac{350.7\ cfs}{2 \times 10\ ft \times (375.0\ ft -\ 364.0ft)} = 1.6\frac{ft}{sec}$$

$$V_{Through\ screen\ Unit\ 1\ with\ 1\ pump\ operating} = \frac{1.88\frac{ft}{sec}}{0.58} = 3.2\ \frac{ft}{sec}$$

$$V_{Through\ screen\ Long\ Shaft\ Pumps\ 1\ and\ 2} = \frac{0.41\frac{ft}{sec}}{0.58} = 0.7\ \frac{ft}{sec}$$

$$V_{Through\ screen\ Long\ Shaft\ Pumps\ 3\ and\ 4} = \frac{0.43\frac{ft}{sec}}{0.58} = 0.7\ \frac{ft}{sec}$$

$$V_{Through\ screen\ Unit\ 1\ with\ 2\ pumps\ operating} = \frac{1.59\frac{ft}{sec}}{0.58} = 2.8\ \frac{ft}{sec}$$

Figure 5-1 Mill Creek Velocity Calculations

5.5 Existing I&E Reduction Measures

Mill Creek's CWIS is equipped with trash racks and standard through-flow traveling water screens. These features alone do not constitute I&E reduction measures. The CWIS shared between four units, one once-through cooled unit (Unit 1) and three with CCRS (Units 2, 3, and 4). The existing design and operation of Mill Creek Units 2, 3, and 4 are expected to provide a significant reduction in impingement and entrainment at the CWIS. The use of CCRS greatly reduces the amount of cooling water withdrawn from the Ohio River and is considered BTA for both impingement and entrainment under 316(b).

The estimated level of flow reduction provided by the Units 2 through 4 cooling towers was calculated by determining the ratio of make-up water flow to the internal circulating water flow in the cooling towers.

$$\%\,Flow\ Reduction = 1 - \frac{Makeup\ \ Water}{Internal\ Circulating\ Water\ Flow}$$

The combined internal circulating water flow for Units 2 through 4 cooling towers is 831.7 MGD. As a result of CCRS, the combined annual peak monthly average flow of cooling tower make-up water for Units 2 through 4 is only 37.4 cfs (16,800 gpm, 24.2 MGD). This results in a 97% flow reduction compared to what the units would have withdrawn if they were designed with once-through cooling.

The planned retirement of Unit 1 by the end of 2024 will reduce the station's DIF to 91.4 cfs (41,000 gpm, 59.0 MGD). This will result in a 79% flow reduction from the existing DIF. Additional reductions in the DIF are expected to occur after 2028 with the retirement of Unit 2.

6 § 122.21(R)(6) CHOSEN METHOD OF COMPLIANCE WITH IMPINGEMENT MORTALITY IMPINGEMENT STANDARD

The Rule at § 122.21(r)(6) requires LG&E to discuss the chosen method of compliance with the impingement mortality standard for Mill Creek. Facilities must select one of the seven alternatives at § 125.95(c)(1) through (7) unless the facility qualifies for an exemption or less stringent standard. The owner/operator must identify the chosen compliance method for the entire facility; alternatively, the applicant must identify the chosen compliance method for each cooling water intake structure.

LG&E selects use of § 125.94(c)(1), operating a closed-cycle recirculating system as defined at § 125.92. LG&E is planning on retiring Unit 1, the only unit that uses once-through cooling, by the end of 2024, leaving Units 2, 3 and 4 in operation. These three units currently use CCRS. Unit 2, which uses CCRS will be retired by the end of 2028.

7 § 122.21(R)(7) ENTRAINMENT PERFORMANCE STUDIES

7.1 Entrainment Performance Studies at §122.21(r)(7)

The Rule at § 122.21(r)(7) requires LG&E to discuss entrainment performance studies for Mill Creek. Specifically, the Rule requires "*The owner or operator of an existing facility must submit any previously conducted studies or studies obtained from other facilities addressing technology efficacy, through-facility entrainment survival, and other entrainment studies. Any such submittals must include a description of each study, together with underlying data, and a summary of any conclusions or results. Any studies conducted at other locations must include an explanation as to why the data from other locations are relevant and representative of conditions at your facility. In the case of studies more than 10 years old, the applicant must explain why the data are still relevant and representative of conditions at the facility and explain how the data should be interpreted using the definition of entrainment at 40 CFR 125.92(h).*"

LG&E has never conducted entrainment performance studies at Mill Creek. LG&E did participate in an EPRI § 316(b) supplemental project that included conducting a literature survey of all impingement and entrainment performance studies that could be located. The final report for the literature survey is titled "*Narrative Descriptions of Impingement and Entrainment Survival Studies*" (EPRI 2014). This study identified 16 entrainment survival studies, some of which were through plant survival studies and some of which were survival after collection on fine-mesh traveling water screens. However, 13 of the studies were conducted at facilities located on oceans and estuaries where species are not representative of Mill Creek's source waterbody and two of the studies were conducted on the Great Lakes and are also not considered representative for Mill Creek's species. A single study that is potentially relevant for Mill Creek was conducted at Fort Calhoun, located on the mainstem Missouri River from 1974 – 1977. This was a through plant entrainment survival study that compared intake larval fish survival with discharge larvae survival. Freshwater Drum was also a commonly entrained species for Mill Creek (Freshwater Drum made up 16.4% of total entrainment in 2015 and 41.5% of total entrainment study in 2016, see Chapter 4, section 4.9.5 of Appendix A). Following is a summary of the Missouri River entrainment survival study taken from the report.

"Freshwater drum (*Aplodinotus grunniens*) was the most abundant species collected ranging from 43.7% (1974) to 88.2% (1977) of the total yearly larval collection (Table 3-45). Catostomids; consisting of carpsucker (*Carpiodes* spp.), white sucker (*Catostomus commersoni*), buffalo (*Ictiobus* sp.), and redhorse (*Moxostoma* spp.) were the only other taxa collected in sufficient number for survival analysis. Discharge mortalities of all species averaged 86.4% over the four-year study, with a range of 57 to 95% in June and July during peak seasonal larval abundance. Freshwater drum which accounted for nearly 75% of the entrained larvae, experience 96% entrainment mortality, while Catostomids experience nearly 49% mortality at the discharge. Collection in 1977 samples indicated that nearly 62% of the larvae collected at the intake were dead. The author attributed the high intake mortality to net- and naturally-induced mortality.

Additionally, the data obtained from separation of opaque and transparent dead larvae indicated that natural mortality was less than 60% at the intake."

8 § 122.21(R)(8) OPERATIONAL STATUS

The Rule at § 122.21(r)(8) requires LG&E to discuss the operational status of Mill Creek. Specifically, *"the owner or operator of an existing facility must submit a description of the operational status of each generating, production, or process unit that uses cooling water, including but not limited to:*

(i) For power production or steam generation, descriptions of individual unit operating status including age of each unit, capacity utilization rate (or equivalent) for the previous 5 years, including any extended or unusual outages that significantly affect current data for flow, impingement, entrainment, or other factors, including identification of any operating unit with a capacity utilization rate of less than 8 percent averaged over a 24-month block contiguous period, and any major upgrades completed within the last 15 years, including but not limited to boiler replacement, condenser replacement, turbine replacement, or changes to fuel type;
(ii) Descriptions of completed, approved, or scheduled uprates and Nuclear Regulatory Commission relicensing status of each unit at nuclear facilities;
(iii) For process units at your facility that use cooling water other than for power production or steam generation, if you intend to use reductions in flow or changes in operations to meet the requirements of 40 CFR 125.94(c), descriptions of individual production processes and product lines, operating status including age of each line, seasonal operation, including any extended or unusual outages that significantly affect current data for flow, impingement, entrainment, or other factors, any major upgrades completed within the last 15 years, and plans or schedules for decommissioning or replacement of process units or production processes and product lines;
(iv) For all manufacturing facilities, descriptions of current and future production schedules; and
(v) Descriptions of plans or schedules for any new units planned within the next 5 years."

The section provides information on the operation of the Mill Creek as required by § 122.21(r)(8).

8.1 Operating Status

Mill Creek is owned and operated by LG&E and has four coal-fired units. Unit 1 has a gross generating capacity of 303 MW, Unit 2 has a gross generating capacity of 299 MW, Unit 3 has a gross generating capacity of 397 MW, while Unit 4 has a gross generating capacity of 492 MW for a combined generating capability of 1,491 MW. Unit 1 utilizes a once-through cooling system and was put into service in 1972 (50 years). Units 2, 3, and 4 all utilize a CCRS system with mechanical draft cooling towers. Unit 2 was put into service in 1974 (48 years), Unit 3 was put into service in 1978 (44 years), while Unit 4 was put into service in 1982 (40 years). The net annual capacity factor for the entire Mill Creek facility from 2017 through 2021 was 59.7%. The annual capacity factor for each of the four Mill Creek units from 2017 through 2021 is summarized in Table 8-1.

Table 8-1 Average Annual Net Capacity Factor for Mill Creek (2017-2021)

Year	Unit 1	Unit 2	Unit 3	Unit 4
2017	63.6%	64.9%	75.3%	68.9%
2018	74.4%	59.5%	71.6%	63.3%
2019	57.1%	70.1%	53.7%	73.3%
2020	64.2%	35.4%	50.2%	54.5%
2021	50.6%	43.0%	62.1%	67.4%
Average	62.0%	54.6%	62.6%	65.5%

8.2 Major Upgrades in Last 15 Years

There have been no major structural changes to the Mill Creek CWIS in the last fifteen years. However, there were some operational changes made. Starting in 2020, Mill Creek was able to reduce the total average daily river intake flow of the station by 1.9%. The majority of the flow reduction is a result of the conversion of the Units 1, 2, 3, and 4 fly and bottom ash sluicing system to dry handling, and gypsum wash water reductions.

8.3 Other Cooling Water Uses

The Mill Creek generating station is a coal-fired steam electric generating facility and does not use water for manufacturing purposes.

8.4 Plans or Schedules for New Units within Five Years

There are no plans for any new units at Mill Creek in the next five years. Unit 1 and 2 are however scheduled to be retired during the next permit cycle.

9 § 125.98(F) FACTORS THAT MUST AND MAY BE CONSIDERED FOR THE ENTRAINMENT BTA DETERMINATION

KDEP is required to make an entrainment BTA determination for Mill Creek as discussed in §125.98(f) of the Rule which states:

"(f) Site-specific entrainment requirements. The Director must establish site-specific requirements for entrainment after reviewing the information submitted under 40 CFR 122.21(r) and § 125.95. These entrainment requirements must reflect the Director's determination of the maximum reduction in entrainment warranted after consideration of factors relevant for determining the best technology available for minimizing adverse environmental impact at each facility. These entrainment requirements may also reflect any control measures to reduce entrainment of Federally-listed threatened and fendangered species and designated critical habitat (e.g. prey base). The Director may reject an otherwise available technology as a basis for entrainment requirements if the Director determines there are unacceptable adverse impacts including impingement, entrainment, or other adverse effects to Federally-listed threatened or endangered species or designated critical habitat. Prior to any permit reissuance after July 14, 2018, the Director must review the performance of the facility's installed entrainment technology to determine whether it continues to meet the requirements of § 125.94(d).

> *(1) The Director must provide a written explanation of the proposed entrainment determination in the fact sheet or statement of basis for the proposed permit under 40 CFR 124.7 or 124.8. The written explanation must describe why the Director has rejected any entrainment control technologies or measures that perform better than the selected technologies or measures, and must reflect consideration of all reasonable attempts to mitigate any adverse impacts of otherwise available better performing entrainment technologies.*
>
> *(2) The proposed determination in the fact sheet or statement of basis must be based on consideration of any additional information required by the Director at § 125.98(i) and the following factors listed below. The weight given to each factor is within the Director's discretion based upon the circumstances of each facility.*
>
> > *(i) Numbers and types of organisms entrained, including, specifically, the numbers and species (or lowest taxonomic classification possible) of Federally-listed, threatened and endangered species, and designated critical habitat (e.g., prey base);*
> >
> > *(ii) Impact of changes in particulate emissions or other pollutants associated with entrainment technologies;*
> >
> > *(iii) Land availability inasmuch as it relates to the feasibility of entrainment technology;*
> >
> > *(iv) Remaining useful plant life; and*

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

(3) The proposed determination in the fact sheet or statement of basis may be based on consideration of the following factors to the extent the applicant submitted information under 40 CFR 122.21(r) on these factors:

(i) Entrainment impacts on the waterbody;
(ii) Thermal discharge impacts;
(iii) Credit for reductions in flow associated with the retirement of units occurring within the ten years preceding October 14, 2014;
(iv) Impacts on the reliability of energy delivery within the immediate area;
(v) Impacts on water consumption; and
(vi) Availability of process water, gray water, waste water, reclaimed water, or other waters of appropriate quantity and quality for reuse as cooling water.

(4) If all technologies considered have social costs not justified by the social benefits, or have unacceptable adverse impacts that cannot be mitigated, the Director may determine that no additional control requirements are necessary beyond what the facility is already doing. The Director may reject an otherwise available technology as a BTA standard for entrainment if the social costs are not justified by the social benefits."

9.1 Factors That Must Be Considered:

○ *Numbers and Types of Organisms Entrained*

The Rule states for this factor "*(i) Numbers and types of organisms entrained, including, specifically, the numbers and species (or lowest taxonomic classification possible) of Federally-listed, threatened and endangered species, and designated critical habitat (e.g., prey base);"*

The purpose of the factor is to identify the reduction in entrainment as a result of the alternative fish protection technologies evaluated. For Mill Creek, retirement of Unit 1 will completely eliminate any entrainment associated with once-through cooling. This will reduce the DIF of the facility by 79% and is expected to result in a commensurate reduction in entrainment. Organisms will still be susceptible to entrainment into the Units 2, 3 and 4 make-up water systems. The CCRS used by these units represents BTA for both impingement and entrainment.

○ *Impact of Particulate Emissions or Other Pollutants*

The Rule states for this factor "*(ii) Impact of changes in particulate emissions or other pollutants associated with entrainment technologies;"*

Since Unit 1 will be retired, there will be an overall reduction in particulate emissions and other pollutants that are currently generated by Unit 1. Particulate emission rates for the remaining three units are expected to be the same as current operations.

○ *Land Availability*

The Rule states for this factor "*(iii) Land availability inasmuch as it relates to the feasibility of entrainment technology;"*

Since Unit 1 is being retired, no entrainment technology is considered and as a result land availability is not an issue for Mill Creek.

○ ***Remaining Useful Plant Life***

The Rule states for this factor "*(iv) Remaining useful plant life;"*

As discussed, Unit 1 will be retired by the end of 2024 and thus there are less than three years of operation left for Mill Creek.

○ ***Quantified Benefits and Costs***

The Rule states for this factor *"(v) Quantified and qualitative social benefits and costs of available entrainment technologies when such information on both benefits and costs is of sufficient rigor to make a decision."*

There is insufficient time for the design, permitting and construction of any alternative entrainment fish protection technology for Unit 1 prior to its retirement. Thus, there would be a very significant cost for no biological benefit.

9.2 Factors that May be Considered

○ ***Entrainment Waterbody Impacts***

The Rule states for this factor "*(i) Entrainment impacts on the waterbody;"*. The purpose of this factor is to quantify the benefit of alternative fish protection technologies evaluated.

For Mill Creek, the decision to retire Unit 1 will eliminate all entrainment associated with once-through cooling. It is therefore unnecessary to evaluate other technologies for Unit 1. Units 2, 3 and 4 already use CCRS, which minimize their cooling water withdrawals and are considered BTA for entrainment. Therefore, it is unnecessary to evaluate other entrainment reducing technologies for Units 2, 3 and 4.

○ ***Thermal Discharge Impacts***

The Rule states for this factor "*Thermal discharge impacts;"*. The purpose of this factor is to consider the change in the thermal plume resulting from a fish protection technology such as a CCRS that would significantly reduce the size of the thermal plume.

For Mill Creek, the retirement of Unit 1 will completely eliminate the thermal discharge associated with once-through cooling. Cooling tower blowdown will still be discharged. The amount of water discharged will however be significantly reduced along with any thermal discharge related impacts,

○ ***Credit for Retired Unit Flow Reductions***

The Rule states for this factor "*(iii) Credit for reductions in flow associated with the retirement of units occurring within the ten years preceding October 14, 2014;"*

No units were retired at Mill Creek prior to October 14, 2014.

○ ***Impacts on Energy Delivery***

The Rule states for this factor "*(iv) Impacts on the reliability of energy delivery within the immediate area;"*. The purpose of this factor is to consider the impact of electrical output to the grid as a result of energy loss due to the energy requirement of an alternative fish protection technology such as a CCRS.

While the retirement of Unit 1 will reduce the electrical output to the grid provided by this unit, the retirement decision was based on economic considerations not related to § 316(b).

- ***Impacts on Water Consumption***

The Rule states for this factor "*(v) Impacts on water consumption;*". The purpose of this factor is to consider loss of freshwater due to increased evaporation from use of a CCRS.

In the case of Mill Creek, this will not be an issue and there will be a decrease in water consumption from evaporative water loss within the thermal plume.

- ***Availability of Other Cooling Water Sources***

The Rule states for this factor "*Availability of process water, gray water, waste water, reclaimed water, or other waters of appropriate quantity and quality for reuse as cooling water.*" The purpose of this factor is to evaluate the use of alternative sources of cooling to reduce withdrawals from the source waterbody.

Since Retirement of Unit 1 will completely eliminate the need for once-through cooling water, consideration of this factor is not relevant for Mill Creek.

10 REFERENCES

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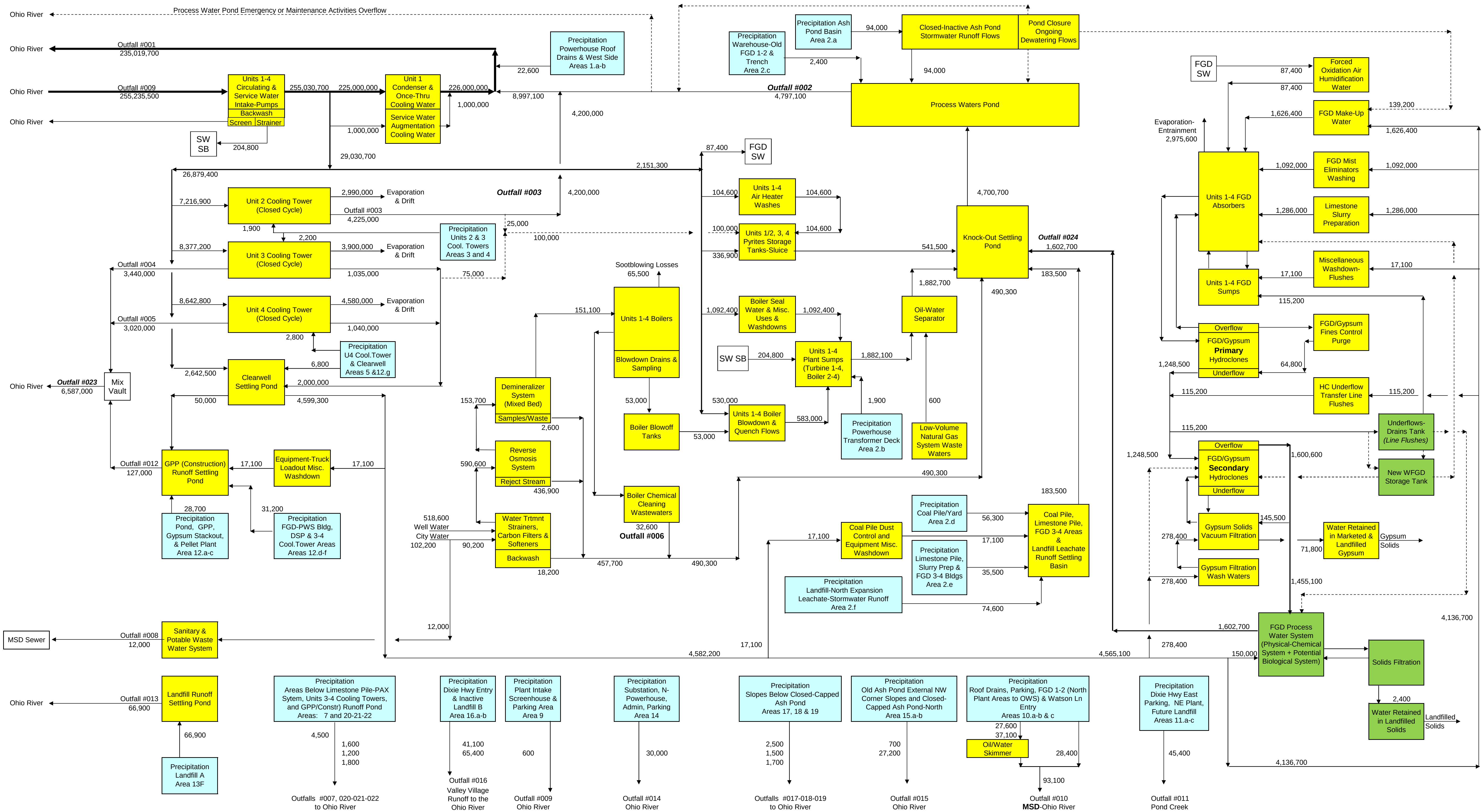
APPENDIX A
MILL CREEK FLOW LINE DIAGRAM



MILL CREEK STATION - **FUTURE 2020+ TYPICAL OPERATIONS**
PROCESS FLOWS = PEAK MONTHLY AVERAGE CONDITIONS (PMAC)
PRECIPITATION = AVERAGE (Annual Rainfall / 365 days)

NOTES:
1. All Flows expressed in gallons per day, Dashed Lines Show Alternative/Temporary Conditions
2. Diagram Flows Include PMAC Process Flows and Precipitation Runoff Flows Added
3. PMAC (Peak Monthly Average Conditions) Process Flows Represent Monthly Conditions Calculated as a Daily Average Flows = 28 days Normal Operations + 1 Day Maximum + 1 Day Maintenance

LG&E
a PPL company

PREPARED BY: RJM
Rev 3 - Dec 19, 2017

MILL CREEK GENERATION STATION
WATER BALANCE DIAGRAM - **FUTURE OPERATIONS**
PMAC CONDITIONS AND AVERAGE PRECIPITATION
KPDES PERMIT KY0003221

Below is the lab analysis performed on the distribution electrical vault wash waters:

Hg (ng/L)	O&G (mg/L)	TSS (mg/L)	Fe (mg/L)	Cu (mg/L)	Se (mg/L)
28.0	5.1	690	25.9	1.0	<0.100