PADUCAH POWER SYSTEM

1500 BROADWAY • P.O. BOX 180 • PADUCAH, KENTUCKY 42002-0180 • (270) 575-4000 • FAX (270) 575-4027

October 9, 2023

Kentucky Division for Air Quality
200 Fair Oaks Lane, First Floor
Frankfort, KY 40601

Re: Paducah Power System
Title V Permit V-18-033 Renewal

Dear Mr. Morse:

Paducah Power System (PPS) is submitting the attached renewal application for Title V Permit V-13-014. The permit expires on October 12, 2023. There are no administrative changes requested.

The renewal submittal package includes the following DAQ forms: 7007AI, 7007A, 7007CC, 7007N, and 7007V. Emission calculations and MSDS are also included. Facility location drawings and layout drawings are on file with DAQ and have not changed.

Please let me know if there is anything else that needs to be submitted. Also, we would be happy to meet with you if you feel it would be of benefit. Please contact Molli Gerken (Molli.A.Gerken@leidos.com, 303-299-5312) with any questions.

Sincerely,

Rick Windhorst
Chief Operating Officer

Division for Air Quality

300 Sower Boulevard

Frankfort, KY 40601

(502) 564-3999

DEP7007AI

Administrative Information

___ Section AI.1: Source Information

___ Section AI.2: Applicant Information

___ Section AI.3: Owner Information

___ Section AI.4: Type of Application

___ Section AI.5: Other Required Information

___ Section AI.6: Signature Block

___ Section AI.7: Notes, Comments, and Explanations

Additional Documentation

___ Additional Documentation attached

Source Name: Paducah Power System (PPS), Power Plant No. 1

KY EIS (AFS) #: 21- **145-00096**

Permit #: V-18-033

Agency Interest (AI) ID: 84744

Date: 9/20/2023

Section AI.1: Source Information

Physical Location Address:	**Street:**	4801 Schneidman Road				
	City:	Paducah	**County:**	McCracken	**Zip Code:**	42003
Mailing Address:	**Street or P.O. Box:**	1500 Broadway P.O. Box 180				
	City:	Paducah	**State:**	KY	**Zip Code:**	42002

Standard Coordinates for Source Physical Location

Longitude: -88.61396 (decimal degrees) **Latitude:** 37.02841 (decimal degrees)

Primary (NAICS) Category: Other Electric Power Generation **Primary NAICS #:** 221118

AI

Classification (SIC) Category: Electric Power Generation **Primary SIC #:** 4911

Briefly discuss the type of business conducted at this site: Natural gas peaking power plant

Description of Area Surrounding Source: ☐ Rural Area ☐ Industrial Park ☐ Residential Area ☐ Urban Area ☑ Industrial Area ☐ Commercial Area

Is any part of the source located on federal land? ☐ Yes ☑ No

Number of Employees: 2-5 periodically onsite

Approximate distance to nearest residence or commercial property: 933.45 feet **Property Area:** 28 acres **Is this source portable?** ☐ Yes ☑ o

What other environmental permits or registrations does this source currently hold or need to obtain in Kentucky?

NPDES/KPDES:	☐ Currently Hold	☐ Need	☑ N/A
Solid Waste:	☐ Currently Hold	☐ Need	☐ N/A
RCRA:	☐ Currently Hold	☐ Need	☑ N/A
UST:	☐ Currently Hold	☐ Need	☑ N/A

Type of Regulated Waste Activity:

☐ Mixed Waste Generator ☐ Generator ☐ Recycler ☐ Other: _____

☐ U.S. Importer of Hazardous Waste ☐ Transporter ☐ Treatment/Storage/Disposal Facility [N/A

Section AI.2: Applicant Information

Applicant Name: Paducah Power System (PPS)

Title: (if individual)

Mailing Address: **Street or P.O. Box:** 1500 Broadway P.O. Box 180
City: Paducah **State:** KY **Zip Code:** 42002-0180

Email: (if individual)

Phone: (270) 575-4000

Technical Contact

Name: Dave Carroll

Title: General Manager

Mailing Address: **Street or P.O. Box:** same as applicant
City: **State:** **Zip Code:**

Email:

Phone: (270) 575-4000

Air Permit Contact for Source

Name: Same as Technical Contact

Title:

Mailing Address: **Street or P.O. Box:**
City: **State:** **Zip Code:**

Email:

Phone:

Section AI.3: Owner Information

☑ **Owner same as applicant**

Name: _____

Title: _____

Mailing Address: **Street or P.O. Box:** _____

City: _____ **State:** _____ **Zip Code:** _____

Email: _____

Phone: _____

List names of owners and officers of the company who have an interest in the company of 5% or more.

Name	Position

Section AI.4: Type of Application

Current Status: ☑ Title V ☐ Conditional Major ☐ State-Origin ☐ General Permit ☐ Registration ☐ None

Requested Action: *(check all that apply)*

☐ Name Change	☐ Initial Registration	[Significant Revision	☐ Administrative Permit Amendment
☑ Renewal Permit	☐ Revised Registration	[Minor Revision	☐ Initial Source-wide OperatingPermit
☐ 502(b)(10)Change	☐ Extension Request	[Addition of New Facility	☐ Portable Plant Relocation Notice
☐ Revision	☐ Off Permit Change	[Landfill Alternate Compliance Submittal	☐ Modification of Existing Facilities
☐ Ownership Change	☐ Closure		

Requested Status: ☑ Title V ☐ Conditional Major ☐ State-Origin ☐ PSD ☐ NSR ☐ Other: _____

Is the source requesting a limitation of potential emissions? ☐ Yes ☑ No

Pollutant:	Requested Limit:	Pollutant:	Requested Limit:
☐ Particulate Matter		☐ Single HAP	
☐ Volatile Organic Compounds (VOC)		☐ Combined HAPs	
☐ Carbon Monoxide		☐ Air Toxics (40 CFR 68, Subpart F)	
☐ Nitrogen Oxides		☐ Carbon Dioxide	
☐ Sulfur Dioxide		☐ Greenhouse Gases (GHG)	
☐ Lead		☐ Other	

For New Construction:

Proposed Start Date of Construction: *(MM/YYYY)* _____ **Proposed Operation Start-Up Date:** *(MM/YYYY)* _____

For Modifications:

Proposed Start Date of Modification: *(MM/YYYY)* _____ **Proposed Operation Start-Up Date:** *(MM/YYYY)* _____

Applicant is seeking coverage under a permit shield. ☑ **Yes** ☐ **No** **Identify any non-applicable requirements for which permit shield is sought on a separate attachment to the application.**

Section AI.5 Other Required Information

Indicate the documents attached as part of this application:

- [x] DEP7007A Indirect Heat Exchangers and Turbines
- [ ] DEP7007B Manufacturing or Processing Operations
- [ ] DEP7007C Incinerators and Waste Burners
- [ ] DEP7007F Episode Standby Plan
- [ ] DEP7007J Volatile Liquid Storage
- [ ] DEP7007K Surface Coating or Printing Operations
- [ ] DEP7007L Mineral Processes
- [ ] DEP7007M Metal Cleaning Degreasers
- [x] DEP7007N Source Emissions Profile
- [ ] DEP7007P Perchloroethylene Dry Cleaning Systems
- [ ] DEP7007R Emission Offset Credit
- [ ] DEP7007S Service Stations
- [ ] DEP7007T Metal Plating and Surface Treatment Operations
- [x] DEP7007V Applicable Requirements and Compliance Activities
- [ ] DEP7007Y Good Engineering Practice and Stack Height Determination
- [ ] DEP7007AA Compliance Schedule for Non-complying Emission Units
- [ ] DEP7007BB Certified Progress Report
- [x] DEP7007CC Compliance Certification
- [ ] DEP7007DD Insignificant Activities
- [ ] DEP7007EE Internal Combustion Engines
- [ ] DEP7007FF Secondary Aluminum Processing
- [x] DEP7007GG Control Equipment
- [ ] DEP7007HH Haul Roads
- [ ] Confidentiality Claim
- [ ] Ownership Change Form
- [ ] Secretary of State Certificate
- [x] Flowcharts or diagrams depicting process
- [ ] Digital Line Graphs (DLG) files of buldings, roads, etc.
- [x] Site Map
- [x] Map or drawing depicting location of facility
- [x] Safety Data Sheet (SDS)
- [ ] Emergency Response Plan
- [ ] Other: _____

Section AI.6: Signature Block

I, the undersigned, hereby certify under penalty of law, that I am a responsible official*, and that I have personally examined, and am familiar with, the information submitted in this document and all its attachments. Based on my inquiry of those individuals with primary responsibility for obtaining the information, I certify that the information is on knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false or incomplete information, including the possibility of fine or imprisonment.

Authorized Signature

October 9, 2023

Date

Rick Windhorst

Type or Printed Name of Signatory

Chief Operating Officer

Title of Signatory

*Responsible official as defined by 401 KAR 52:001.

Section AI.7: Notes, Comments, and Explanations
Map location, flow diagrams, and site plants are on file with the DAQ.

Division for Air Quality

300 Sower Boulevard

Frankfort, KY 40601

(502) 564-3999

DEP7007A

Indirect Heat Exchangers and Turbines

___ Section A.1: General Information

___ Section A.2: Operating and Fuel Information

___ Section A.3: Notes, Comments, and Explanations

Additional Documentation

___ Complete DEP7007AI, DEP7007N, DEP7007V, and DEP7007GG.

____ Manufacturer's specifications

Source Name: Paducah Power System (PPS), Power Plant No. 1

KY EIS (AFS) #: 21-145-00096

Permit #: V-18-033

Agency Interest (AI) ID: 84744

Date: 9/20/2023

Section A.1: General Information

Emission Unit #	Emission Unit Name	Process ID	Process Name	Identify General Type: Indirect Heat Exchanger, Gas Turbine, or Combustion Turbine	Indirect Heat Exchanger Configuration	Manufacturer	Model No./ Serial No.	Proposed/Actual Date of Construction Commencement *(MM/YYYY)*	SCC Code	SCC Units	Control Device ID	Stack ID
EU-01	EU-01a			Gas Turbine		Pratt and Whitney Power Systems	FT8-3 SwiftPac 60	Oct-09	20100201	MMBtu		EU-01a
EU-01	EU-01b			Gas Turbine		Pratt and Whitney Power Systems	FT8-3 SwiftPac 60	Oct-09	20100201	MMBtu		EU-01b
EU-02	EU-02a			Gas Turbine		Pratt and Whitney Power Systems	FT8-3 SwiftPac 60	Oct-09	20100201	MMBtu		EU-02a
EU-02	EU-02b			Gas Turbine		Pratt and Whitney Power Systems	FT8-3 SwiftPac 60	Oct-09	20100201	MMBtu		EU-02b

Section A.2: Operating and Fuel Information

Emission Unit #	If multipurpose unit, identify the percentage of use by purpose				Rated Capacity Heat Input *(MMBTU/hr)*	Rated Capacity Power Output		Describe Operating Scenario (only if this unit will be used in different configurations)	Classify Fuel as Primary or Secondary	Identify Fuel Type: Coal, Natural Gas, Wood, Biomass, Landfill/Digester Gas, Fuel Oil # (specify 1-6), or Other	Heat Content (HHV)		Maximum Operating Hours	Ash Content *(%)*	Sulfur Content *(%)*
	Space Heat	Process Heat	Power	Emergency			*(Specify units: hp, MW, or lb steam/hr)*					*(Specify units: Btu/lb, Btu/gal, or Btu/scf)*			
EU-01					313	60	MW		Primary	Natural Gas	1,027	Btu/scf	8,760 hrs/year		0.016
EU-02					313	60	MW		Primary	Natural Gas	1,027	Btu/scf	8,760 hrs/year		0.016

Section A.3: Notes, Comments, and Explanations

Division for Air Quality

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DEP7007N

Source Emissions Profile

__ Section N.1: Emission Summary
__ Section N.2: Stack Information
__ Section N.3: Fugitive Information
__ Section N.4: Notes, Comments, and Explanations

Additional Documentation

___ Complete DEP7007AI

Source Name: Paducah Power System (PPS), Power Plant 1
KY EIS (AFS) #: 21- 145-00096
Permit #: V-18-033
Agency Interest (AI) ID: 84744
Date: 45189

N.1: Emission Summary

Emission Unit #	Emission Unit Name	Process ID	Process Name	Control Device Name	Control Device ID	Stack ID	Maximum Design Capacity *(SCC Units/hour)*	Pollutant	Uncontrolled Emission Factor *(lb/SCC Units)*	Emission Factor Source (e.g. AP-42, Stack Test, Mass Balance)	Capture Efficiency *(%)*	Control Efficiency *(%)*	Hourly Emissions		Annual Emissions	
													Uncontrolled Potential *(lb/hr)*	Controlled Potential *(lb/hr)*	Uncontrolled Potential *(tons/yr)*	Controlled Potential *(tons/yr)*
EU01 and EU02	Natural Gas Combustion Turbine 01 and 02					EU-01a, EU-01b, EU-02a, and EU-02b	1,254	NOx	0.092880259	Manufacturer			114.8		502.824	
								CO	0.13566343	Manufacturer			167.68		734.4384	
								VOC	0.00776699	Manufacturer			9.6		42.048	
								PM/PM10	0.019029126	Manufacturer			23.52		103.0176	
								SO2	0.003106796	Mat'l Balance			3.84		16.8192	

N.1: Emission Summary Cont.

Emission Unit #	Emission Unit Name	Process ID	Process Name	Control Device Name	Control Device ID	Stack ID	Maximum Design Capacity *(SCC Units/hour)*	Pollutant	Uncontrolled Emission Factor *(lb/SCC Units)*	Emission Factor Source (e.g. AP-42, Stack Test, Mass Balance)	Capture Efficiency *(%)*	Control Efficiency *(%)*	Hourly Emissions		Annual Emissions	
													Uncontrolled Potential *(lb/hr)*	Controlled Potential *(lb/hr)*	Uncontrolled Potential *(tons/yr)*	Controlled Potential *(tons/yr)*
EU01 and EU02	Natural Gas Combustion Turbine 01 and 02					EU-01a, EU-01b, EU-02a, and EU-02b	1,254	1,3-Butadiene	0.00000043	AP-42,Table 3.1-3			0.00054		0.00066865	
								Acetaldehyde	0.00004	AP-42,Table 3.1-3			0.05		0.0622	
								Acrolein	0.0000064	AP-42,Table 3.1-3			0.008		0.009952	
								Benzene	0.000012	AP-42,Table 3.1-3			0.01504		0.01866	
								Ethylbenzene	0.000032	AP-42,Table 3.1-3			0.04		0.04976	
								Formaldehyde	0.00071	AP-42,Table 3.1-3			0.888		1.10405	
								Naphthalene	0.0000013	AP-42,Table 3.1-3			0.001628		0.0020215	
								PAH	0.0000022	AP-42,Table 3.1-3			0.002756		0.003421	
								Toluene	0.00013	AP-42,Table 3.1-3			0.1628		0.20215	
								Xylenes	0.000064	AP-42,Table 3.1-3			0.08		0.09952	

N.1: Emission Summary Cont.

Emission Unit #	Emission Unit Name	Process ID	Process Name	Control Device Name	Control Device ID	Stack ID	Maximum Design Capacity *(SCC Units/hour)*	Pollutant	Uncontrolled Emission Factor *(lb/SCC Units)*	Emission Factor Source (e.g. AP-42, Stack Test, Mass Balance)	Capture Efficiency *(%)*	Control Efficiency *(%)*	Hourly Emissions		Annual Emissions	
													Uncontrolled Potential *(lb/hr)*	Controlled Potential *(lb/hr)*	Uncontrolled Potential *(tons/yr)*	Controlled Potential *(tons/yr)*
Emission Unit 03	Emergency Generator Engine					EU-03		NOx	471.08	Manufacturer			13.13		57.5094	
								CO	58.88	Manufacturer			1.64		7.1832	
								VOC	9.42	Manufacturer			0.26		1.1388	
								PM/PM10	14.13	Manufacturer			0.39		1.7082	
								SO2	5.74	Mat'l Balance			0.16		0.7008	
								Acetaldehyde	0.0000252	AP-42,Table 3.4-3			0.0000955		0.00041829	
								Acrolein	0.00000788	AP-42,Table 3.4-3			0.0000299		0.000130962	
								Benzene	0.000776	AP-42,Table 3.4-3			0.00294		0.0128772	
								Formaldehyde	0.0000789	AP-42,Table 3.4-3			0.000299		0.00130962	
								Naphthalene	0.00013	AP-42,Table 3.4-4			0.000493		0.00215934	
								Toluene	0.000281	AP-42,Table 3.4-3			0.00106		0.0046428	
								Xylenes	0.000193	AP-42,Table 3.4-3			0.000731		0.00320178	

Section N.2: Stack Information

UTM Zone:

Stack ID	Identify all Emission Units (with Process ID) and Control Devices that Feed to Stack	Stack Physical Data			Stack UTM Coordinates		Stack Gas Stream Data		
		Equivalent Diameter *(ft)*	Height *(ft)*	Base Elevation *(ft)*	Northing *(m)*	Easting *(m)*	Flowrate *(acfm)*	Temperature *(° F)*	Exit Velocity *(ft/sec)*
EU-01a		10. 19	50	339.62	4099609	356254	471,628	662	96.38
EU-01b		10. 19	50	339.62	4099608	356273	471,628	662	96.38
EU-02a		10. 19	50	339.62	4099605	356309	471,628	662	96.38
EU-02b		10. 19	50	339.62	4099604	356319	471,628	662	96.38
EU-03		1	28	339.62	4099633	356277	6,550	833	139

Section N.3: Fugitive Information

UTM Zone:

Emission Unit #	Emission Unit Name	Process ID	Area Physical Data		Area UTM Coordinates		Area Release Data	
			Length of the X Side *(ft)*	Length of the Y Side *(ft)*	Northing *(m)*	Easting *(m)*	Release Temperature *(°F)*	Release Height *(ft)*

Section N.4: Notes, Comments, and Explanations
Stack gas stream data is representative of base load operations at 12 degrees F. Stacks are rectangular and diameter is effective diameter.
Hourly emissions are estimated maximum average hourly rates. Annual emissions are based on these and approximately 10,360 combined annual operaitng hours for the turbines, however, the actual operating hours will be determined by turbine operations and emissions measured by the plant CEMS.
Blackstart Generator is limited to 500 operating hours per year.

Division for Air Quality

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DEP7007V

Applicable Requirements and Compliance Activities

___ Section V.1: Emission and Operating Limitation(s)
___ Section V.2: Monitoring Requirements
___ Section V.3: Recordkeeping Requirements
___ Section V.4: Reporting Requirements
___ Section V.5: Testing Requirements
___ Section V.6: Notes, Comments, and Explanations

Additional Documentation

___ Complete DEP7007AI

Source Name: **Paducah Power System (PPS), Power Plant 1**
KY EIS (AFS) #: **21- 145-00096**
Permit #: **V-18-033**
Agency Interest (AI) ID: **84744**
Date: **45189**

Section V.1: Emission and Operating Limitation(s)

Emission Unit #	Emission Unit Description	Applicable Regulation or Requirement	Pollutant	Emission Limit (if applicable)	Voluntary Emission Limit or Exemption (if applicable)	Operating Requirement or Limitation (if applicable)	Method of Determining Compliance with the Emission and Operating Requirement(s)
EU-01a and EU-01b	**Natural Gas Combustion Turbine 01**		NOx	225 tons per year			**Continuous compliance with this limit shall be demonstrated by a continuous emission monitor system (CEMS).**
		401 KAR 60:005; 40 CFR 60, Subpart KKKK, 60.4320	NOx	25 ppm @ 15% O2 (gas)			**Continuous compliance with this limit shall be demonstrated by a CEMS.**
		40 CFR 60, Subpart KKKK, 60.4325 (as applicable)	NOx	NOx emission limits for single fuel turbines			**Continuous compliance with this limit shall be demonstrated by a CEMS.**
		40 CFR 60, Subpart KKKK, 60.4330 (as applicable)	SO_2	100 ng/J (0.90 lb/MWh) SO_2 output or 26 ng SO_2/J (0.060 lb SO_2/MMBtu) heat input			**Continuous compliance with this limit shall be demonstrated by annual fuel analysis.**
		40 CFR 60, Subpart KKKK, 60.4333 (as applicable)	NOx	General Requirements			
			CO	225 tons per year			**Continuous compliance with this limit shall be demonstrated by a continuous emission monitor (CEM).**

Section V.2: Monitoring Requirements

Emission Unit #	Emission Unit Description	Pollutant	Applicable Regulation or Requirement	Parameter Monitored	Description of Monitoring
EU-01a and EU-01b	Natural Gas Combustion Turbine 01	NOx	40 CFR 60, Subpart KKKK, 60.4335 (as applicable)	NOx Emissions	Demonstrating compliance while using water or steam injection (if applicable)
		NOx	40 CFR 60, Subpart KKKK, 60.4340 (as applicable)	NOx Emissions	Demonstrate continuous compliance not using water or steam injection (if applicable)
		NOx	40 CFR 60, Subpart KKKK, 60.4345 (as applicable)	NOx Emissions	CEMs requirements (if applicable)
		NOx	40 CFR 60, Subpart KKKK, 60.4350 (as applicable)	NOx Emissions	How to use CEMs data (if applicable)
		NOx	40 CFR 60, Subpart KKKK, 60.4355 (as applicable)	NOx Emissions	Establishing and documenting a proper monitoring plan (if applicable)
		SO_2	40 CFR 60, Subpart KKKK, 60.4360 (as applicable)	SO_2 Emissions	Determining total sulfur content in the combustion fuel (if applicable)
		SO_2	40 CFR 60, Subpart KKKK, 60.4365 (as applicable)	SO_2 Emissions	Being exempt from monitoring the total fuel sulfur content (if applicable)
		SO_2	40 CFR 60, Subpart KKKK, 60.4370 (as applicable)	SO_2 Emissions	How often to measure fuel sulfur content (if applicable)
		NOx/SO_2 CO	40 CFR 75	NOx/SO_2	As required to demonstrate compliance (if applicable)

Section V.3: Recordkeeping Requirements

Emission Unit #	Emission Unit Description	Pollutant	Applicable Regulation or Requirement	Parameter Recorded	Description of Recordkeeping
EU-01a and EU-01b	Natural Gas Combustion Turbine 01		40 CFR 60, Subpart KKKK, 60.4375 (as applicable)	Emissions	Which records are to be submitted
		NO_X	40 CFR 60, Subpart KKKK, 60.4380 (as applicable)	Emissions	Defining excess emissions and monitor downtwim for NO_X
		SO_2	40 CFR 60, Subpart KKKK, 60.4385 (as applicable)	Emissions	Defining excess emissions and monitor downtwim for SO_2
		NO_X	40 CFR 60, Subpart KKKK, 60.4390 (as applicable)	Emissions	Reporting Requirements if operating an emergency turbine or a reaserch and development turbine
		NO_X / SO_2	40 CFR 60, Subpart KKKK, 60.4395 (as applicable)	Emissions	Report submission deadline
			40 CFR 60.7; 401 KAR 52.020	Nox emissions	CEM records, performance test records and all other information required to be monitored and reported will be maintained onsite.
				hours of operation	Hours of operation records will be maintained onsite.
		NO_X / SO_2	40 CFR 75	NO_X / SO_2	As required to demonstrate compliance (if applicable)

Section V.4: Reporting Requirements

Emission Unit #	Emission Unit Description	Pollutant	Applicable Regulation or Requirement	Parameter Reported	Description of Reporting
EU-01a and EU-01b	Natural Gas Combustion Turbine 01		40 CFR 60.7; 401 KAR 52:020, Section 10	excess emissions	CEM reports to be submitted quarterly.
				annual hours of operation	Submitted annually.
		NO_X / SO_2	40 CFR 75	NO_X / SO_2	As required to demonstrate compliance (if applicable)

Section V.5: Testing Requirements

Emission Unit #	Emission Unit Description	Pollutant	Applicable Regulation or Requirement	Parameter Tested	Description of Testing
EU-01a and EU-01b	Natural Gas Combustion Turbine 01	NO_X	40 CFR 60.8		Performance testing prior to startup.
		NO_X	40 CFR 60, Subpart KKKK, 60.4400 (as applicable)		Conducting performance tests requarding NO_X with an installed NO_X-diluent CEMS
		NO_X	40 CFR 60, Subpart KKKK, 60.4405 (as applicable)		Conducting performance tests requarding NO_X with an installed NO_X-diluent CEMS
		NO_X	40 CFR 60, Subpart KKKK, 60.4410 (as applicable)		Estabilishing valid parameter ranges
		SO_2	40 CFR 60, Subpart KKKK, 60.4415 (as applicable)		Conducting performance tests requarding SO_2
		NO_X / SO_2	40 CFR 75	NO_X / SO_2	As required to demonstrate compliance (if applicable)

Section V.6: Notes, Comments, and Explanations

Division for Air Quality

300 Sower Boulevard
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(502) 564-3999

DEP7007V

Applicable Requirements and Compliance Activities

___ Section V.1: Emission and Operating Limitation(s)
___ Section V.2: Monitoring Requirements
___ Section V.3: Recordkeeping Requirements
___ Section V.4: Reporting Requirements
___ Section V.5: Testing Requirements
___ Section V.6: Notes, Comments, and Explanations

Additional Documentation
___ Complete DEP7007AI

Source Name: **Paducah Power System (PPS), Power Plant 1**
KY EIS (AFS) #: **21- 145-00096**
Permit #: **V-18-033**
Agency Interest (AI) ID: **84744**
Date: **45189**

Section V.1: Emission and Operating Limitation(s)

Emission Unit #	Emission Unit Description	Applicable Regulation or Requirement	Pollutant	Emission Limit (if applicable)	Voluntary Emission Limit or Exemption (if applicable)	Operating Requirement or Limitation (if applicable)	Method of Determining Compliance with the Emission and Operating Requirement(s)
EU-02a and EU-02b	Natural Gas Combustion Turbine 02		NOx	225 tons per year			Continuous compliance with this limit shall be demonstrated by a continuous emission monitor system (CEMS).
		401 KAR 60:005; 40 CFR 60, Subpart KKKK, 60.4320	NOx	25 ppm @ 15% O2 (gas)			Continuous compliance with this limit shall be demonstrated by a CEMS.
		40 CFR 60, Subpart KKKK, 60.4325 (as applicable)	NOx	NOx emission limits for single fuel turbines			Continuous compliance with this limit shall be demonstrated by a CEMS.
		40 CFR 60, Subpart KKKK, 60.4330 (as applicable)	SO_2	100 ng/J (0.90 lb/MWh) SO_2 output or 26 ng SO_2/J (0.060 lb SO_2/MMBtu) heat input			Continuous compliance with this limit shall be demonstrated by annual fuel analysis.
		40 CFR 60, Subpart KKKK, 60.4333 (as applicable)	NOx	General Requirements			
			CO	225 tons per year			Continuous compliance with this limit shall be demonstrated by a continuous emission monitor (CEM).

Section V.2: Monitoring Requirements

Emission Unit #	Emission Unit Description	Pollutant	Applicable Regulation or Requirement	Parameter Monitored	Description of Monitoring
EU-02a and EU-02b	Natural Gas Combustion Turbine 02	NOx	40 CFR 60, Subpart KKKK, 60.4335 (as applicable)	NOx Emissions	Demonstrating compliance while using water or steam injection (if applicable)
		NOx	40 CFR 60, Subpart KKKK, 60.4340 (as applicable)	NOx Emissions	Demonstrate continuous compliance not using water or steam injection (if applicable)
		NOx	40 CFR 60, Subpart KKKK, 60.4345 (as applicable)	NOx Emissions	CEMs requirements (if applicable)
		NOx	40 CFR 60, Subpart KKKK, 60.4350 (as applicable)	NOx Emissions	How to use CEMs data (if applicable)
		NOx	40 CFR 60, Subpart KKKK, 60.4355 (as applicable)	NOx Emissions	Establishing and documenting a proper monitoring plan (if applicable)
		SO_2	40 CFR 60, Subpart KKKK, 60.4360 (as applicable)	SO_2 Emissions	Determining total sulfur content in the combustion fuel (if applicable)
		SO_2	40 CFR 60, Subpart KKKK, 60.4365 (as applicable)	SO_2 Emissions	Being exempt from monitoring the total fuel sulfur content (if applicable)
		SO_2	40 CFR 60, Subpart KKKK, 60.4370 (as applicable)	SO_2 Emissions	How often to measure fuel sulfur content (if applicable)
		NOx/SO_2 CO	40 CFR 75	NOx/SO_2	As required to demonstrate compliance (if applicable)

Section V.3: Recordkeeping Requirements

Emission Unit #	Emission Unit Description	Pollutant	Applicable Regulation or Requirement	Parameter Recorded	Description of Recordkeeping
EU-02a and EU-02b	Natural Gas Combustion Turbine 02		40 CFR 60, Subpart KKKK, 60.4375 (as applicable)	Emissions	Which records are to be submitted
		NO_X	40 CFR 60, Subpart KKKK, 60.4380 (as applicable)	Emissions	Defining excess emissions and monitor downtwim for NO_X
		SO_2	40 CFR 60, Subpart KKKK, 60.4385 (as applicable)	Emissions	Defining excess emissions and monitor downtwim for SO_2
		NO_X	40 CFR 60, Subpart KKKK, 60.4390 (as applicable)	Emissions	Reporting Requirements if operating an emergency turbine or a reaserch and development turbine
		NO_X / SO_2	40 CFR 60, Subpart KKKK, 60.4395 (as applicable)	Emissions	Report submission deadline
			40 CFR 60.7; 401 KAR 52.020	Nox emissions	CEM records, performance test records and all other information required to be monitored and reported will be maintained onsite.
				hours of operation	Hours of operation records will be maintained onsite.
		NO_X / SO_2	40 CFR 75	NO_X / SO_2	As required to demonstrate compliance (if applicable)

Section V.4: Reporting Requirements

Emission Unit #	Emission Unit Description	Pollutant	Applicable Regulation or Requirement	Parameter Reported	Description of Reporting
EU-02a and EU-02b	Natural Gas Combustion Turbine 02		40 CFR 60.7; 401 KAR 52:020, Section 10	excess emissions	CEM reports to be submitted quarterly.
				annual hours of operation	Submitted annually.
		NO_X / SO_2	40 CFR 75	NO_X / SO_2	As required to demonstrate compliance (if applicable)

Section V.5: Testing Requirements

Emission Unit #	Emission Unit Description	Pollutant	Applicable Regulation or Requirement	Parameter Tested	Description of Testing
EU-02a and EU-02b	Natural Gas Combustion Turbine 02	NO_X	40 CFR 60.8		Performance testing prior to startup.
		NO_X	40 CFR 60, Subpart KKKK, 60.4400 (as applicable)		Conducting performance tests requarding NO_X with an installed NO_X-diluent CEMS
		NO_X	40 CFR 60, Subpart KKKK, 60.4405 (as applicable)		Conducting performance tests requarding NO_X with an installed NO_X-diluent CEMS
		NO_X	40 CFR 60, Subpart KKKK, 60.4410 (as applicable)		Estabilishing valid parameter ranges
		SO_2	40 CFR 60, Subpart KKKK, 60.4415 (as applicable)		Conducting performance tests requarding SO_2
		NO_X / SO_2	40 CFR 75	NO_X / SO_2	As required to demonstrate compliance (if applicable)

Section V.6: Notes, Comments, and Explanations

Division for Air Quality

300 Sower Boulevard
Frankfort, KY 40601
(502) 564-3999

DEP7007V

Applicable Requirements and Compliance Activities

___ Section V.1: Emission and Operating Limitation(s)
___ Section V.2: Monitoring Requirements
___ Section V.3: Recordkeeping Requirements
___ Section V.4: Reporting Requirements
___ Section V.5: Testing Requirements
___ Section V.6: Notes, Comments, and Explanations

Additional Documentation

___ Complete DEP7007AI

Source Name: _____
KY EIS (AFS) #: 21- _____
Permit #: _____
Agency Interest (AI) ID: _____
Date: _____

Section V.1: Emission and Operating Limitation(s)

Emission Unit #	Emission Unit Description	Applicable Regulation or Requirement	Pollutant	Emission Limit (if applicable)	Voluntary Emission Limit or Exemption (if applicable)	Operating Requirement or Limitation (if applicable)	Method of Determining Compliance with the Emission and Operating Requirement(s)
EU-03	Emergency Generaor	40 CFR 60.4207(a)	N/A	The owner or operator of a stationary CI internal combustion engine that uses diesel fuel must use diesel fuel that meets the requirements of 40 CFR 80.510(a).			Diesel fuel that meets the requirements of 40 CFR 80.510(b) is used and MSDS sheets are kept at the facility.
		40 CFR 60.4205(b)	N/A	Beginning October 1, 2010, the owner or operator of a stationary CI internal combustion engine that uses diesel fuel must use diesel fuel that meets the requirements of 40 CFR 80.510(b).			Diesel fuel that meets the requirements of 40 CFR 80.510(b) is used and MSDS sheets are kept at the facility.

Emission Unit #	Emission Unit Description	Applicable Regulation or Requirement	Pollutant	Emission Limit (if applicable)	Voluntary Emission Limit or Exemption (if applicable)	Operating Requirement or Limitation (if applicable)	Method of Determining Compliance with the Emission and Operating Requirement(s)
		40 CFR 60.4205(b)	N/A	Owner and Operators of 2007 model year and later emergency stationary CI internal combustion engines must comply with the emission standards for new nonroad CI engines in 40 CFR 4202, for all pollutants, for the same model year and maximum engine power.			Purchased an engine certified to the emission standards in 40 CFR 60.4205(b) for the same model year and maximum engine power. The engine was installed and configured according to the manufacturer's specifications.
EU-04	Diesel Firepump	40 CFR 60.4209(a)	N/A	The owner or operator of an emergecny stationary CI internal combustion engine, must install a non rsettable hour meter proir to startup of the engine			A non resettable hour meter is installed on the diesel fire pump.
		40 CFR 60.4207(a)	N/A	The owner or operator of a stationary CI internal combustion engine that uses diesel fuel must use diesel fuel that meets the requirements of 40 CFR 80.510(a).			Diesel fuel that meets the requirements of 40 CFR 80.510(b) is used and MSDS sheets are kept at the facility.
		40 CFR 60.4205(b)	N/A	Beginning October 1, 2010, the owner or operator of a stationary CI internal combustion engine that uses diesel fuel must use diesel fuel that meets the requirements of 40 CFR 80.510(b).			Diesel fuel that meets the requirements of 40 CFR 80.510(b) is used and MSDS sheets are kept at the facility.
		40 CFR 60.4205©	N/A	Owners and operators of fire pump engines with a displacement of less than 30 litres per cylinder must comply with the emission standards			The Facility purchased an engine certified to the emission standards in 40 CFR 60.4205(b) for the same model year and maximum engine power.

Section V.2: Monitoring Requirements

Emission Unit #	Emission Unit Description	Pollutant	Applicable Regulation or Requirement	Parameter Monitored	Description of Monitoring
EU-03	Emergency Generator	N/A	401 KAR 52:020, Section 26	The permitee shall monitor the hours of operation and	An hourly log is kept onsite during hours of operation.
			40 CFR 60.4209(a)	The Owner or operator of an emergency	The Owner installed a non-resettable hour meter prior to the start of operation.
			40 CFR 60.4209(b)	If you are the owner or operator of a stationary CI	Not applicable
EU-04	Diesel Firepump	40 CFR 60.4205(b)	401 KAR 52:020, Section 26	The permitee shall monitor the hours of operation and	An hourly log is kept onsite during hours of operation.

Section V.3: Recordkeeping Requirements

Emission Unit #	Emission Unit Description	Pollutant	Applicable Regulation or Requirement	Parameter Recorded	Description of Recordkeeping
EU-03	Emergency Generator	N/A	401 KAR 52:020, Section 26	The permitee shall monitor the hours of operation and the power output, in horsepower, of the emergency generator.	An hourly log is kept onsite during hours of operation.
			40 CFR 60.4209(a)	The Owner or operator of an emergency stationary CI internal combustion engine, shall install a non-resettable hour meter prior to startup of the engine	The Owner installed a non-resettable hour meter prior to the start of operation.
			40 CFR 60.4209(b)	If the stationary CI internal combustion engine is equipped with a diesel particulate filter, the owner or operator must keep records of any corrective action taken after the backpressure monitor has notified the owner or operator that the high backpressure limit of the enginer is approached.	Not applicable
EU-04	Diesel Firepump	N/A	401 KAR 52:020, Section 26	The permitee shall monitor the hours of operation and the power output, in horsepower,	An hourly log is kept onsite during hours of operation.

Section V.4: Reporting Requirements

Emission Unit #	Emission Unit Description	Pollutant	Applicable Regulation or Requirement	Parameter Reported	Description of Reporting
EU-03	Emergency Generator	N/A	N/A	N/A	N/A
EU-04	Diesel Firepump	N/A	N/A	N/A	N/A

Section V.5: Testing Requirements

Emission Unit #	Emission Unit Description	Pollutant	Applicable Regulation or Requirement	Parameter Tested	Description of Testing
EU-03	Emergency Generator	N/A	N/A	N/A	None
EU-04	Diesel Firepump	N/A	N/A	N/A	None

Section V.6: Notes, Comments, and Explanations

Division for Air Quality
Submit to the Regional Office identified in your permit

DEP7007CC
Compliance Certification

____ Section CC.1: Source Information
____ Section CC.2: Signature Block
____ Section CC.3: Identification of Emission Units & Each Term or Condition of the Permit
____ Section CC.4: Notes, Comments, and Explanations

Section CC.1: Source Information

1) Source Name	2) Agency Interest (AI) ID
Paducah Power Systems Plant 1	84744

3) Source Location Address (street, city, state, zip)
4770 Schneidman Road

4) Technical Contact (name, e-mail, phone #)
Rick Windhorst, rwindhorst@paducahpower.com, 270-575-4000

5) Permit Number(s)	6) County	7) KY EIS (AFS) #
V-18-033	McCracken	21- 145-00096

8) Submittal Information

Are you certifying any requirement(s) as "not in continuous compliance?" ☐ Yes ☑ No **What is the reporting period?** 1 (mm/) 1 (dd/) 2022 (yy) **TO** 12 (mm/) 31 (dd/) 2022 (yy)

Section CC.2: Signature Block

9) CERTIFICATION SIGNATURE

I, THE UNDERSIGNED, HEREBY CERTIFY UNDER PENALTY OF LAW, THAT I AM A RESPONSIBLE OFFICIAL, AND THAT I HAVE PERSONALLY EXAMINED, AND AM FAMILIAR WITH, THE INFORMATION SUBMITTED IN THIS DOCUMENT AND ALL ITS ATTACHMENTS. BASED ON MY INQUIRY OF THOSE INDIVIDUALS WITH PRIMARY RESPONSIBILITY FOR OBTAINING THE INFORMATION, I CERTIFY THAT THE STATEMENTS AND INFORMATION IS ON KNOWLEDGE AND BELIEF, TRUE, ACCURATE, AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE OR INCOMPLETE INFORMATION, INCLUDING THE POSSIBILITY OF FINE OR IMPRISONMENT.

BY: R.W.L.e
AUTHORIZED SIGNATURE

10/9/23
DATE

Rick Windhorst
TYPED OR PRINTED NAME OF SIGNATORY

Chief Operating Officer
TITLE OF SIGNATORY

Section CC.3: Identification of Emission Units & Each Term or Condition of the Permit

Emission Units in Continuous Compliance

10a) Emission Units in Continuous Compliance. *The following emission units were in continuous compliance with each permit term or condition(s) and applicable requirements listed here, such as emission standards, emission control requirements, emission testing, court requirements, work practices, or enhanced monitoring, based on the compliance methods specified below. If additional space is required, reproduce this page as needed.*

Emission Unit/Permit ID#	Permit Term, Condition, or Applicable Regulation	Emission Unit Description	Permit Limit or requirement	Actual Emissions or status of requirement	The method used for determining compliance over the reporting period, and whether the method provided continuous or intermittent data. *(such as test methods, monitoring procedures, recordkeeping and reporting)*
EU-1 and EU-2	Condition B.2.a.i.1 - NOx emission level in the exhaust gas shall not exceed 25 ppm by volume at 15% oxygen or 150 ng/J of useful output from each turbine, except as specified in B.2.a.(2) [40 CFR 60.4320, 40 CFR 60, Subpart KKKK, Table 1]	Four 313 MMBtu/hr Natural Gas Fired Simple Cycle Combustion Turbines	25 ppm at 15% oxygen	≤25 ppm at 15% oxygen	Compliance demonstrated by hourly log of run time and CEMS Method: Continuous Compliance: Continuous
EU-1 and EU-2	Condition B.2.a.i.2 - 96 ppm by volume at 15% oxygen or 590 ng/J of useful output (4.7 lb/MWh) from each turbine when operating at less than 75 percent of peak load or at temperatures less than 0 °F [40 CFR 60.4320, and 40 CFR 60, Subpart KKKK, Table 1]. 60, Subpart KKKK, Table 1]	Four 313 MMBtu/hr Natural Gas Fired Simple Cycle Combustion Turbines	96 ppm at 15% oxygen	≤96 ppm at 15% oxygen	Compliance demonstrated by CEMS Method: Continuous Compliance: Continuous
EU-1 and EU-2	Condition B.1.a - Any 12-consecutive months shall not exceed 10,360 hours for the four turbines [401 KAR 51:017]	Four 313 MMBtu/hr Natural Gas Fired Simple Cycle Combustion Turbines	10,360 hours	5,982 hours	Compliance demonstrated by CEMS and monthly log Method: Continuous Compliance: Continuous

EU-1 and EU-2	Condition B.2.a.ii - NOx emission must not exceed 225 tons per any twelve (12) consecutive months for all turbines combined [to preclude applicability of 401 KAR 51:017, Prevention of Significant Deterioration].	Four 313 MMBtu/hr Natural Gas Fired Simple Cycle Combustion Turbines	225 tons	66.5 tons	Compliance demonstrated by CEMS and monthly log Method: Continuous Compliance: Continuous

Section CC.3: Identification of Emission Units & Each Term or Condition of the Permit

Emission Units in Continuous Compliance

10a) Emission Units in Continuous Compliance. *The following emission units were in continuous compliance with each permit term or condition(s) and applicable requirements listed here, such as emission standards, emission control requirements, emission testing, court requirements, work practices, or enhanced monitoring, based on the compliance methods specified below. If additional space is required, reproduce this page as needed.*

Emission Unit/Permit ID#	Permit Term, Condition, or Applicable Regulation	Emission Unit Description	Permit Limit or requirement	Actual Emissions or status of requirement	The method used for determining compliance over the reporting period, and whether the method provided continuous or intermittent data. *(such as test methods, monitoring procedures, recordkeeping and reporting)*
EU-1 and EU-2	Condition B.2.b - Sulfur dioxide (SO2) emissions shall not exceed: 1. 110 ng/J (0.90 lb/MWh) of gross energy output, each [40 CFR 60.4330(a)(1)], or 2. Fuel shall not be burned which contains total potential sulfur emissions in excess of 26 ng SO2/J (0.060 lb SO2/MMBtu) heat input [40 CFR 60.4330(a)(2)].	Four 313 MMBtu/hr Natural Gas Fired Simple Cycle Combustion Turbines	1. 110 ng/J (0.90 lb/MWh) or 26 ng SO2/J (0.060 lb SO2/MMBtu)	0.000054 lb SO2/MMBtu	Compliance determined by annual sampling by gas company to determine pipeline quality natural gas determined using ASTM D5504 per Section B. 4.e monitoring requirements Method: Intermittent Compliance: Continuous
EU-1 and EU-2	Condition B.2.c - Carbon monoxide emissions shall not exceed 225 tons per any twelve (12)-consecutive months for all turbines combined [To preclude applicability of 401 KAR 51:017, Prevention of Significant Deterioration].	Four 313 MMBtu/hr Natural Gas Fired Simple Cycle Combustion Turbines	225 tons	98.1 tons	Compliance demonstrated by CEMS Method: Continuous Compliance: Continuous
Emergency Generator Engine	Condition B.1.c - Beginning October 1, 2010, the permittee must use diesel fuel that meets the requirements of 40 CFR 80.510(b) [40 CFR 60.4207(b)].	1,490 HP Emergency Generator	Sulfur content less that 500 ppm for LM or less than 15 ppm for NR and minimum cetane index of 40 or maximum aromatic content of 35 volume percent	Marathon No. 2 Ultra Low Sulfur: Sulfur 15 ppm aromatic content 17-25% weight	MSDS forms and/or delivery records are inspected when diesel fuel is received Method: Intermittent Compliance: Continuous

Section CC.3: Identification of Emission Units & Each Term or Condition of the Permit

Emission Units in Continuous Compliance

10a) Emission Units in Continuous Compliance. *The following emission units were in continuous compliance with each permit term or condition(s) and applicable requirements listed here, such as emission standards, emission control requirements, emission testing, court requirements, work practices, or enhanced monitoring, based on the compliance methods specified below. If additional space is required, reproduce this page as needed.*

Emission Unit/Permit ID#	Permit Term, Condition, or Applicable Regulation	Emission Unit Description	Permit Limit or requirement	Actual Emissions or status of requirement	The method used for determining compliance over the reporting period, and whether the method provided continuous or intermittent data. *(such as test methods, monitoring procedures, recordkeeping and reporting)*
Emergency Generator Engine	Condition B.1.e. - In order for the engine to be considered an emergency engine under 40 CFR 60, Subpart IIII, any operation other than emergency operation, maintenance and testing, emergency demand response, and operation in non-emergency situations for fifty hours per year is prohibited	1,490 HP Emergency Generator	50 hours	25.5 non-emergency hours	Compliance determined by weekly run logs Method: Intermittent Compliance: Continuous
Emergency Generator Engine	Condition B.2 - The permittee shall comply with the emission standards for new nonroad CI engines in 40 CFR 60.4202, for all pollutants, for the same model year and maximum engine power [40 CFR 60.4205(b)].	Emergency Generator Engine	NMHC + NO_X : 4.8 g/hp-hr PM: 0.15 g/hp-hr	NMHC + NO_X : 4.08 g/hp-hr PM: 0.12 g/hp-hr	Manufacturer's specifications are consistent with applicable emissions standards Method: Continuous Compliance: Continuous
Diesel Fire Pump	Condition B.1.b and B.2 - The permittee must comply with the emission standards in table 4 of 40 CFR Subpart IIII, for all pollutants [40 CFR 60.4205(c)].	55 HP Diesel Fire Pump	Max Engine power: 50≤HP<75 NMHC+NOx: 7.8 g/hp-hr CO: 5.0 g/hp-hr PM: 0.80g/hp-hr	NO_X + NMHC: 5.58 g/hp-hr CO: 1.85 g/hp-hr PM: 0.4 g/hp-hr	Manufacturer's specifications are consistent with applicable emissions standards Method: Continuous Compliance: Continuous

Section CC.3: Identification of Emission Units & Each Term or Condition of the Permit

Emission Units in Continuous Compliance

10a) Emission Units in Continuous Compliance. *The following emission units were in continuous compliance with each permit term or condition(s) and applicable requirements listed here, such as emission standards, emission control requirements, emission testing, court requirements, work practices, or enhanced monitoring, based on the compliance methods specified below. If additional space is required, reproduce this page as needed.*

Emission Unit/Permit ID#	Permit Term, Condition, or Applicable Regulation	Emission Unit Description	Permit Limit or requirement	Actual Emissions or status of requirement	The method used for determining compliance over the reporting period, and whether the method provided continuous or intermittent data. *(such as test methods, monitoring procedures, recordkeeping and reporting)*
Diesel Fire Pump	Condition B.1.c. - Beginning October 1, 2010, the owner or operator must use diesel fuel that meets the requirements of 40 CFR 80.510(b)	55 HP Diesel Fire Pump	Sulfur content less that 500 ppm for LM or less than 15 ppm for NR and minimum cetane index of 40 or maximum aromatic content of 35 volume percent	Marathon No. 2 Ultra Low Sulfur: Sulfur 15 ppm aromatic content 17-25% weight	MSDS forms and/or delivery records are inspected when diesel fuel is received Method: Intermittent Compliance: Continuous

Section CC.3: Identification of Emission Units & Each Term or Condition of the Permit

Emission Units Subject to Future Compliance Dates

10b) Emission Units Subject to Future Compliance Dates. *The following emission units will achieve compliance on a timely basis and maintain compliance with future compliance dates as they become applicable during the permit term. If additional space is required, reproduce this page as needed.*

Emission Unit/Permit ID#	Future Compliance Schedule	Emission Unit Description	Reason for Future Compliance Date

Section CC.3: Identification of Emission Units & Each Term or Condition of the Permit

Emission Units Not in Continuous Compliance

10c)(1) Emission Units Not in Continuous Compliance. *The following emission units were not in continuous compliance with each permit term or condition and applicable requirements listed here, such as emission standards, emission control requirements, emission testing, court requirements, work practices, or enhanced monitoring, based on the compliance methods specified below. If additional space is required, reproduce this page as needed.*

Emission Unit/Permit ID#	Permit Term, Condition, or Applicable Regulation	Emission Unit Description	Permit Limit or Requirement	Actual Emissions or Status of Requirement	The method used for determining compliance over the reporting period, and whether compliance was continuous or intermittent. *(such as test methods, monitoring procedures, recordkeeping and reporting)*

Section CC.3: Identification of Emission Units & Each Term or Condition of the Permit

Emission Units Not in Continuous Compliance (continued)

10c)(2) Emission Units Not in Continuous Compliance. *For the emission units and requirements listed in 10c)(1) that were not in continuous compliance since the last reporting period, state the duration, magnitude, and reason or reasons for non-compliance. Each row of 10c)(2) must relate to the corresponding row of 10c)(1). If additional space is required, reproduce this page as needed.*

Emission Unit/Permit ID#	Description of duration, magnitude, and reason(s) for non-compliance and corrective steps taken or planned.

Section CC.4: Notes, Comments, and Explanations

United States
Environmental Protection Agency
Acid Rain Program

OMB No. 2060-0258
Approval expires 11/30/2012

Acid Rain Permit Application

For more information, see instructions and 40 CFR 72.30 and 72.31.

This submission is: ~ new ~ revised ✔ for Acid Rain permit renewal

STEP 1

Identify the facility name, State, and plant (ORIS) code.

Paducah Power System PPS Power Plant No. 1 Facility (Source) Name	KY State	56556 Plant Code

STEP 2

Enter the unit ID# for every affected unit at the affected source in column "a."

a	b
Unit ID#	Unit Will Hold Allowances in Accordance with 40 CFR 72.9(c)(1)
EU-01a	Yes
EU-01b	Yes
EU-02a	Yes
EU-02b	Yes
	Yes
	Yes
	Yes
	Yes
	Yes
	Yes
	Yes
	Yes
	Yes
	Yes
	Yes
	Yes
	Yes
	Yes
	Yes

Facility (Source) Name (from STEP 1)

Permit Requirements

STEP 3

Read the standard requirements.

(1) The designated representative of each affected source and each affected unit at the source shall:

(i) Submit a complete Acid Rain permit application (including a compliance plan) under 40 CFR part 72 in accordance with the deadlines specified in 40 CFR 72.30; and

(ii) Submit in a timely manner any supplemental information that the permitting authority determines is necessary in order to review an Acid Rain permit application and issue or deny an Acid Rain permit;

(2) The owners and operators of each affected source and each affected unit at the source shall:

(i) Operate the unit in compliance with a complete Acid Rain permit application or a superseding Acid Rain permit issued by the permitting authority; and

(ii) Have an Acid Rain Permit.

Monitoring Requirements

(1) The owners and operators and, to the extent applicable, designated representative of each affected source and each affected unit at the source shall comply with the monitoring requirements as provided in 40 CFR part 75.

(2) The emissions measurements recorded and reported in accordance with 40 CFR part 75 shall be used to determine compliance by the source or unit, as appropriate, with the Acid Rain emissions limitations and emissions reduction requirements for sulfur dioxide and nitrogen oxides under the Acid Rain Program.

(3) The requirements of 40 CFR part 75 shall not affect the responsibility of the owners and operators to monitor emissions of other pollutants or other emissions characteristics at the unit under other applicable requirements of the Act and other provisions of the operating permit for the source.

Sulfur Dioxide Requirements

(1) The owners and operators of each source and each affected unit at the source shall:

(i) Hold allowances, as of the allowance transfer deadline, in the source's compliance account (after deductions under 40 CFR 73.34(c)), not less than the total annual emissions of sulfur dioxide for the previous calendar year from the affected units at the source; and

(ii) Comply with the applicable Acid Rain emissions limitations for sulfur dioxide.

(2) Each ton of sulfur dioxide emitted in excess of the Acid Rain emissions limitations for sulfur dioxide shall constitute a separate violation of the Act.

(3) An affected unit shall be subject to the requirements under paragraph (1) of the sulfur dioxide requirements as follows:

(i) Starting January 1, 2000, an affected unit under 40 CFR 72.6(a)(2); or

(ii) Starting on the later of January 1, 2000 or the deadline for monitor certification under 40 CFR part 75, an affected unit under 40 CFR 72.6(a)(3).

Facility (Source) Name (from STEP 1)

Sulfur Dioxide Requirements, Cont'd.

STEP 3, Cont'd.

(4) Allowances shall be held in, deducted from, or transferred among Allowance Tracking System accounts in accordance with the Acid Rain Program.
(5) An allowance shall not be deducted in order to comply with the requirements under paragraph (1) of the sulfur dioxide requirements prior to the calendar year for which the allowance was allocated.
(6) An allowance allocated by the Administrator under the Acid Rain Program is a limited authorization to emit sulfur dioxide in accordance with the Acid Rain Program. No provision of the Acid Rain Program, the Acid Rain permit application, the Acid Rain permit, or an exemption under 40 CFR 72.7 or 72.8 and no provision of law shall be construed to limit the authority of the United States to terminate or limit such authorization.
(7) An allowance allocated by the Administrator under the Acid Rain Program does not constitute a property right.

Nitrogen Oxides Requirements

The owners and operators of the source and each affected unit at the source shall comply with the applicable Acid Rain emissions limitation for nitrogen oxides.

Excess Emissions Requirements

(1) The designated representative of an affected source that has excess emissions in any calendar year shall submit a proposed offset plan, as required under 40 CFR part 77.
(2) The owners and operators of an affected source that has excess emissions in any calendar year shall:
(i) Pay without demand the penalty required, and pay upon demand the interest on that penalty, as required by 40 CFR part 77; and
(ii) Comply with the terms of an approved offset plan, as required by 40 CFR part 77.

Recordkeeping and Reporting Requirements

(1) Unless otherwise provided, the owners and operators of the source and each affected unit at the source shall keep on site at the source each of the following documents for a period of 5 years from the date the document is created. This period may be extended for cause, at any time prior to the end of 5 years, in writing by the Administrator or permitting authority:
(i) The certificate of representation for the designated representative for the source and each affected unit at the source and all documents that demonstrate the truth of the statements in the certificate of representation, in accordance with 40 CFR 72.24; provided that the certificate and documents shall be retained on site at the source beyond such 5-year period until such documents are superseded because of the submission of a new certificate of representation changing the designated representative;

Recordkeeping and Reporting Requirements, Cont'd.

STEP 3, Cont'd.

(ii) All emissions monitoring information, in accordance with 40 CFR part 75, provided that to the extent that 40 CFR part 75 provides for a 3-year period for recordkeeping, the 3-year period shall apply.
(iii) Copies of all reports, compliance certifications, and other submissions and all records made or required under the Acid Rain Program; and,
(iv) Copies of all documents used to complete an Acid Rain permit application and any other submission under the Acid Rain Program or to demonstrate compliance with the requirements of the Acid Rain Program.

(2) The designated representative of an affected source and each affected unit at the source shall submit the reports and compliance certifications required under the Acid Rain Program, including those under 40 CFR part 72 subpart I and 40 CFR part 75.

Liability

(1) Any person who knowingly violates any requirement or prohibition of the Acid Rain Program, a complete Acid Rain permit application, an Acid Rain permit, or an exemption under 40 CFR 72.7 or 72.8, including any requirement for the payment of any penalty owed to the United States, shall be subject to enforcement pursuant to section 113(c) of the Act.
(2) Any person who knowingly makes a false, material statement in any record, submission, or report under the Acid Rain Program shall be subject to criminal enforcement pursuant to section 113(c) of the Act and 18 U.S.C. 1001.
(3) No permit revision shall excuse any violation of the requirements of the Acid Rain Program that occurs prior to the date that the revision takes effect.
(4) Each affected source and each affected unit shall meet the requirements of the Acid Rain Program.
(5) Any provision of the Acid Rain Program that applies to an affected source (including a provision applicable to the designated representative of an affected source) shall also apply to the owners and operators of such source and of the affected units at the source.
(6) Any provision of the Acid Rain Program that applies to an affected unit (including a provision applicable to the designated representative of an affected unit) shall also apply to the owners and operators of such unit.
(7) Each violation of a provision of 40 CFR parts 72, 73, 74, 75, 76, 77, and 78 by an affected source or affected unit, or by an owner or operator or designated representative of such source or unit, shall be a separate violation of the Act.

Effect on Other Authorities

No provision of the Acid Rain Program, an Acid Rain permit application, an Acid Rain permit, or an exemption under 40 CFR 72.7 or 72.8 shall be construed as:
(1) Except as expressly provided in title IV of the Act, exempting or excluding the owners and operators and, to the extent applicable, the designated representative of an affected source or affected unit from compliance with any other provision of the Act, including the provisions of title I of the Act relating

Facility (Source) Name (from STEP 1)

Effect on Other Authorities, Cont'd.

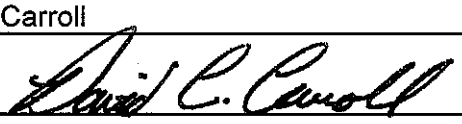
STEP 3, Cont'd.

to applicable National Ambient Air Quality Standards or State Implementation Plans;
(2) Limiting the number of allowances a source can hold; *provided,* that the number of allowances held by the source shall not affect the source's obligation to comply with any other provisions of the Act;
(3) Requiring a change of any kind in any State law regulating electric utility rates and charges, affecting any State law regarding such State regulation, or limiting such State regulation, including any prudence review requirements under such State law;
(4) Modifying the Federal Power Act or affecting the authority of the Federal Energy Regulatory Commission under the Federal Power Act; or,
(5) Interfering with or impairing any program for competitive bidding for power supply in a State in which such program is established.

Certification

STEP 4
Read the certification statement, sign, and date.

I am authorized to make this submission on behalf of the owners and operators of the affected source or affected units for which the submission is made. I certify under penalty of law that I have personally examined, and am familiar with, the statements and information submitted in this document and all its attachments. Based on my inquiry of those individuals with primary responsibility for obtaining the information, I certify that the statements and information are to the best of my knowledge and belief true, accurate, and complete. I am aware that there are significant penalties for submitting false statements and information or omitting required statements and information, including the possibility of fine or imprisonment.

Name Dave Carroll	
Signature 	Date October 9, 2023

Instructions for the Acid Rain Program Permit Application

The Acid Rain Program requires the designated representative to submit an Acid Rain permit application for each source with an affected unit. A complete Certificate of Representation must be received by EPA before the permit application is submitted to the title V permitting authority. A complete Acid Rain permit application, once submitted, is binding on the owners and operators of the affected source and is enforceable in the absence of a permit until the title V permitting authority either issues a permit to the source or disapproves the application.

Please type or print. If assistance is needed, contact the title V permitting authority.

STEP 1 A Plant Code is a 4 or 5 digit number assigned by the Department of Energy=s (DOE) Energy Information Administration (EIA) to facilities that generate electricity. For older facilities, "Plant Code" is synonymous with "ORISPL" and "Facility" codes. If the facility generates electricity but no Plant Code has been assigned, or if there is uncertainty regarding what the Plant Code is, send an email to the EIA. The email address is EIA-860@eia.gov.

STEP 2 In column "a," identify each unit at the facility by providing the appropriate unit identification number, consistent with the identifiers used in the Certificate of Representation and with submissions made to DOE and/or EIA. Do not list duct burners. For new units without identification numbers, owners and operators must assign identifiers consistent with EIA and DOE requirements. Each Acid Rain Program submission that includes the unit identification number(s) (e.g., Acid Rain permit applications, monitoring plans, quarterly reports, etc.) should reference those unit identification numbers in exactly the same way that they are referenced on the Certificate of Representation.

Submission Deadlines

For new units, an initial Acid Rain permit application must be submitted to the title V permitting authority 24 months before the date the unit commences operation. Acid Rain permit renewal applications must be submitted at least 6 months in advance of the expiration of the acid rain portion of a title V permit, or such longer time as provided for under the title V permitting authority=s operating permits regulation.

Submission Instructions

Submit this form to the appropriate title V permitting authority. If you have questions regarding this form, contact your local, State, or EPA Regional Acid Rain contact, or call EPA's Acid Rain Hotline at (202) 343-9620.

Paperwork Burden Estimate

The public reporting and record keeping burden for this collection of information is estimated to average 8 hours per response. Burden means the total time, effort, or financial resources expended by persons to generate, maintain, retain, or disclose or provide information to or for a Federal agency. This includes the time needed to review instructions; develop, acquire, install, and utilize technology and systems for the purposes of collecting, validating, and verifying information, processing and maintaining information, and disclosing and providing information; adjust the existing ways to comply with any previously applicable instructions and requirements; train personnel to be able to respond to a collection of information; search data sources; complete and review the collection of information; and transmit or otherwise disclose the information. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number.

Send comments on the Agency's need for this information, the accuracy of the provided burden estimates, and any suggested methods for minimizing respondent burden, including through the use of automated collection techniques to the Director, Collection Strategies Division, U.S. Environmental Protection Agency (2822T), 1200 Pennsylvania Ave., NW., Washington, D.C. 20460. Include the OMB control number in any correspondence. **Do not send the completed form to this address.**

SAFETY DATA SHEET

SDS ID NO.: 0289MAR019
Revision Date: 06/01/2016

1. IDENTIFICATION

Product Name: Marathon Petroleum No. 1 Ultra Low Sulfur Diesel

Synonym: Kerosene; Diesel, Motor Vehicle Use, Undyed; ULSD No. 1 Diesel 15 ppm Sulfur Max; No. 1 MV 15 Diesel; No. 1 Ultra Low Sulfur Diesel Dyed 15 ppm Sulfur Max; Ultra Low Sulfur Diesel No. 1 Dyed 15 ppm Sulfur Max; No. 1 Diesel, Tax Exempt-Motor Vehicle Use, Dyed; ULSD No. 1 Diesel Dyed 15 ppm Sulfur Max; No. 1 MV 15 Diesel Dyed; Kerosine

Chemical Family: Complex Hydrocarbon Substance

Recommended Use: Fuel.
Restrictions on Use: All others.

Manufacturer, Importer, or Responsible Party Name and Address:

MARATHON PETROLEUM COMPANY LP
539 South Main Street
Findlay, OH 45840

SDS information: 1-419-421-3070

Emergency Telephone: 1-877-627-5463

2. HAZARD IDENTIFICATION

Classification

OSHA Regulatory Status
This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Flammable liquids	Category 3
Skin corrosion/irritation	Category 2
Carcinogenicity	Category 2
Specific target organ toxicity (single exposure)	Category 3
Aspiration toxicity	Category 1
Acute aquatic toxicity	Category 2
Chronic aquatic toxicity	Category 2

Hazards Not Otherwise Classified (HNOC)
Static accumulating flammable liquid

Label elements

EMERGENCY OVERVIEW

Danger

FLAMMABLE LIQUID AND VAPOR
May accumulate electrostatic charge and ignite or explode
May be fatal if swallowed and enters airways

Causes skin irritation
May cause respiratory irritation
May cause drowsiness or dizziness
Suspected of causing cancer
Toxic to aquatic life with long lasting effects

Appearance Clear or Colored Liquid **Physical State** Liquid **Odor** Slight Hydrocarbon

Precautionary Statements - Prevention
Obtain special instructions before use
Do not handle until all safety precautions have been read and understood
Keep away from heat/sparks/open flames/hot surfaces. - No smoking
Keep container tightly closed
Ground/bond container and receiving equipment
Use explosion-proof electrical/ventilating/lighting/equipment
Use only non-sparking tools.
Take precautionary measures against static discharge
Avoid breathing mist/vapors/spray
Use only outdoors or in a well-ventilated area
Wear protective gloves/protective clothing/eye protection/face protection
Wash hands and any possibly exposed skin thoroughly after handling
Avoid release to the environment

Precautionary Statements - Response
IF exposed or concerned: Get medical attention
IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower
If skin irritation occurs: Get medical attention
Wash contaminated clothing before reuse
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing
Call a POISON CENTER or doctor if you feel unwell
IF SWALLOWED: Immediately call a POISON CENTER or doctor
Do NOT induce vomiting
In case of fire: Use water spray, fog or regular foam for extinction
Collect spillage

Precautionary Statements - Storage
Store in a well-ventilated place. Keep container tightly closed
Keep cool
Store locked up

Precautionary Statements - Disposal
Dispose of contents/container at an approved waste disposal plant

3. COMPOSITION/INFORMATION ON INGREDIENTS

No. 1 Ultra Low Sulfur Diesel is a complex mixture of paraffins, cycloparaffins, olefins and aromatic hydrocarbons having hydrocarbon chain lengths predominantly in the range of nine to sixteen carbons. May contain small amounts of red dye and additives (<0.15%) which are not considered hazardous at the concentrations used.

Composition Information:

Name	CAS Number	% Concentration
Kerosine, Petroleum	8008-20-6	100
Naphthalene	91-20-3	0.3-2.6

All concentrations are percent by weight unless material is a gas. Gas concentrations are in percent by volume.

4. FIRST AID MEASURES

First Aid Measures

General Advice: In case of accident or if you feel unwell, seek medical advice immediately (show directions for use or safety data sheet if possible).

Inhalation: Remove to fresh air. If not breathing, institute rescue breathing. If breathing is difficult, ensure airway is clear, give oxygen and continue to monitor. If heart has stopped, immediately begin cardiopulmonary resuscitation (CPR). Keep affected person warm and at rest. If symptoms occur get medical attention.

Skin Contact: Immediately wash exposed skin with plenty of soap and water while removing contaminated clothing and shoes. May be absorbed through the skin in harmful amounts. Get medical attention if irritation occurs. Any injection injury from high pressure equipment should be evaluated immediately by a physician as potentially serious (See NOTES TO PHYSICIAN).

Place contaminated clothing in closed container until cleaned or discarded. If clothing is to be laundered, inform the person performing the operation of contaminant's hazardous properties. Destroy contaminated, non-chemical resistant footwear.

Eye Contact: Flush immediately with large amounts of water for at least 15 minutes. Eyelids should be held away from the eyeball to ensure thorough rinsing. Gently remove contacts while flushing. Get medical attention if irritation persists.

Ingestion: Do not induce vomiting because of danger of aspirating liquid into lungs, causing serious damage and chemical pneumonitis. If spontaneous vomiting occurs, keep head below hips, or if patient is lying down, turn body and head to side to prevent aspiration and monitor for breathing difficulty. Never give anything by mouth to an unconscious person. Keep affected person warm and at rest. GET IMMEDIATE MEDICAL ATTENTION.

Most important signs and symptoms, both short-term and delayed with overexposure

Adverse Effects: Irritating to the skin and mucous membranes. Symptoms may include redness, itching, and inflammation. May cause nausea, vomiting, diarrhea, and signs of nervous system depression: headache, drowsiness, dizziness, loss of coordination, disorientation and fatigue. Additional effects may include skin sensitization. Aspiration hazard. May cause coughing, chest pains, shortness of breath, pulmonary edema and/or chemical pneumonitis. Repeated or prolonged skin contact may cause drying, reddening, itching and cracking.

Indication of any immediate medical attention and special treatment needed

Notes To Physician: INHALATION: This material (or a component) sensitizes the myocardium to the effects of sympathomimetic amines. Epinephrine and other sympathomimetic drugs may initiate cardiac arrhythmias in individuals exposed to this material. Administration of sympathomimetic drugs should be avoided.

SKIN: Leaks or accidents involving high-pressure equipment may inject a stream of material through the skin and initially produce an injury that may not appear serious. Only a small puncture wound may appear on the skin surface but, without proper treatment and depending on the nature, original pressure, volume, and location of the injected material, can compromise blood supply to an affected body part. Prompt surgical debridement of the wound may be necessary to prevent irreversible loss of function and/or the affected body part. High pressure injection injuries may be SERIOUS SURGICAL EMERGENCIES.

INGESTION: This material represents a significant aspiration and chemical pneumonitis hazard. Induction of emesis is not recommended. The metabolism of fatty acid methyl ester may release free methanol in the body that could induce metabolic acidosis with delayed effects. If a large amount of product is ingested, i.e. several ounces, consider the use of ethanol or fomepizole (Antizol) and hemodialysis. Consult standard literature or contact a poison control center for treatment details.

5. FIRE-FIGHTING MEASURES

Suitable extinguishing media
For small fires, Class B fire extinguishing media such as CO2, dry chemical, foam (AFFF/ATC) or water spray can be used. For large fires, water spray, fog or foam (AFFF/ATC) can be used. Firefighting should be attempted only by those who are adequately trained and equipped with proper protective equipment.

Unsuitable extinguishing media
Do not use straight water streams to avoid spreading fire.

Specific hazards arising from the chemical
This product has been determined to be a flammable liquid per the OSHA Hazard Communication Standard and should be handled accordingly. May accumulate electrostatic charge and ignite or explode. Vapors may travel along the ground or be moved by ventilation and ignited by many sources such as pilot lights, sparks, electric motors, static discharge, or other ignition sources at locations distant from material handling. Flashback can occur along vapor trail. For additional fire related information, see NFPA 30 or the Emergency Response Guidebook 128.

Hazardous combustion products
Smoke, carbon monoxide, and other products of incomplete combustion.

Explosion data
Sensitivity to Mechanical Impact No.
Sensitivity to Static Discharge Yes.

Special protective equipment and precautions for firefighters
Firefighters should wear full protective clothing and positive-pressure self-contained breathing apparatus (SCBA) with a full face-piece, as appropriate. Avoid using straight water streams. Water spray and foam (AFFF/ATC) must be applied carefully to avoid frothing and from as far a distance as possible. Avoid excessive water spray application. Keep surrounding area cool with water spray from a distance and prevent further ignition of combustible material. Keep run-off water out of sewers and water sources.

Additional firefighting tactics
FIRES INVOLVING TANKS OR CAR/TRAILER LOADS: Fight fire from maximum distance or use unmanned hose holders or monitor nozzles. Cool containers with flooding quantities of water until well after the fire is out. Do not direct water at source of leak or safety devices; icing may occur. Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank. ALWAYS stay away from tanks engulfed in fire. For massive fire, use unmanned hose holders or monitor nozzles: if this is impossible, withdraw from area and let fire burn.

EVACUATION: Consider initial downwind evacuation for at least 1000 feet. If tank, rail car or tank truck is involved in a fire, ISOLATE for 5280 feet (1 mile) in all directions; also, consider initial evacuation of 5280 feet (1 mile) in all directions.

NFPA	Health 1	Flammability 2	Instability 0	Special Hazard -

6. ACCIDENTAL RELEASE MEASURES

Personal precautions: Keep public away. Isolate and evacuate area. Shut off source if safe to do so. Eliminate all ignition sources. All contaminated surfaces will be slippery.

Protective equipment: Use personal protection measures as recommended in Section 8.

Emergency procedures: Advise authorities and National Response Center (800-424-8802) if the product has

entered a water course or sewer. Notify local health and pollution control agencies, if appropriate.

Environmental precautions: Avoid release to the environment. Avoid subsoil penetration.

Methods and materials for containment: Contain liquid with sand or soil. Prevent spilled material from entering storm drains, sewers, and open waterways.

Methods and materials for cleaning up: Use suitable absorbent materials such as vermiculite, sand, or clay to clean up residual liquids. Recover and return free product to proper containers. When recovering free liquids ensure all equipment is grounded and bonded. Use only non-sparking tools.

7. HANDLING AND STORAGE

Safe Handling Precautions: NEVER SIPHON THIS PRODUCT BY MOUTH. Use appropriate grounding and bonding practices. Static accumulating flammable liquid. Bonding and grounding may be insufficient to eliminate the hazard from static electricity. Do not expose to heat, open flames, strong oxidizers or other sources of ignition. Vapors may travel along the ground or be moved by ventilation. Flashback may occur along vapor trails. No smoking. Use only non-sparking tools. Avoid repeated and prolonged skin contact. Avoid breathing vapors or mists. Use only with adequate ventilation. Use personal protection measures as recommended in Section 8. Exercise good personal hygiene including removal of soiled clothing and prompt washing with soap and water. Do not cut, drill, grind or weld on empty containers since explosive residues may remain. Refer to applicable EPA, OSHA, NFPA and consistent state and local requirements.

Hydrocarbons are basically non-conductors of electricity and can become electrostatically charged during mixing, filtering, pumping at high flow rates or loading and transfer operations. If this charge reaches a sufficiently high level, sparks can form that may ignite the vapors of flammable liquids. Sudden release of hot organic chemical vapors or mists from process equipment operating under elevated temperature and pressure, or sudden ingress of air into vacuum equipment may result in ignition of vapors or mists without the presence of obvious ignition sources. Nozzle spouts must be kept in contact with the containers or tank during the entire filling operation.

Portable containers should never be filled while in or on a motor vehicle or marine craft. Containers should be placed on the ground. Static electric discharge can ignite fuel vapors when filling non-grounded containers or vehicles on trailers. The nozzle spout must be kept in contact with the container before and during the entire filling operation. Use only approved containers.

A buildup of static electricity can occur upon re-entry into a vehicle during fueling especially in cold or dry climate conditions. The charge is generated by the action of dissimilar fabrics (i.e., clothing and upholstery) rubbing across each other as a person enters/exits the vehicle. A flash fire can result from this discharge if sufficient flammable vapors are present. Therefore, do not get back in your vehicle while refueling.

Cellular phones and other electronic devices may have the potential to emit electrical charges (sparks). Sparks in potentially explosive atmospheres (including fueling areas such as gas stations) could cause an explosion if sufficient flammable vapors are present. Therefore, turn off cellular phones and other electronic devices when working in potentially explosive atmospheres or keep devices inside your vehicle during refueling.

High-pressure injection of any material through the skin is a serious medical emergency even though the small entrance wound at the injection site may not initially appear serious. These injection injuries can occur from high-pressure equipment such as paint spray or grease or guns, fuel injectors, or pinhole leaks in hoses or hydraulic lines and should all be considered serious. High pressure injection injuries may be SERIOUS SURGICAL EMERGENCIES (See First Aid Section 4).

Storage Conditions: Store in properly closed containers that are appropriately labeled and in a cool, well-ventilated area. Do not store near an open flame, heat or other sources of ignition.

Incompatible Materials Strong oxidizing agents.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Name	ACGIH TLV	OSHA PELS:	OSHA - Vacated PELs	NIOSH IDLH
Kerosine, Petroleum 8008-20-6	200 mg/m³ TWA Skin - potential significant contribution to overall exposure by the cutaneous route	-	-	-
Naphthalene 91-20-3	10 ppm TWA Skin - potential significant contribution to overall exposure by the cutaneous route	TWA: 10 ppm TWA: 50 mg/m³	10 ppm TWA 50 mg/m³ TWA 15 ppm STEL 75 mg/m³ STEL	250 ppm

Notes: The manufacturer has voluntarily elected to provide exposure limits contained in OSHA's 1989 air contaminants standard in its SDSs, even though certain of those exposure limits were vacated in 1992.

Engineering measures: Local or general exhaust required in an enclosed area or with inadequate ventilation. Use mechanical ventilation equipment that is explosion-proof.

Personal protective equipment

Eye protection: Use goggles or face-shield if the potential for splashing exists.

Skin and body protection: Wear neoprene, nitrile or PVA gloves to prevent skin contact. Glove suitability is based on workplace conditions and usage. Contact the glove manufacturer for specific advice on glove selection and breakthrough times.

Respiratory protection: Use a NIOSH approved organic vapor chemical cartridge or supplied air respirators when there is the potential for airborne exposures to exceed permissible exposure limits or if excessive vapors are generated. Observe respirator assigned protection factors (APFs) criteria cited in federal OSHA 29 CFR 1910.134. Self-contained breathing apparatus should be used for fire fighting.

Hygiene measures: Handle in accordance with good industrial hygiene and safety practice. Avoid contact with skin, eyes and clothing.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Physical State	Liquid
Appearance	Clear or Colored Liquid
Color	Yellow to Red
Odor	Slight Hydrocarbon
Odor Threshold	No data available.

Property	Values (Method)
Melting Point / Freezing Point	-55 to -39 °C -68 to -39 °F (ASTM D5949)
Initial Boiling Point / Boiling Range	134-294 °C / 274-562 °F (ASTM D86)
Flash Point	46-71 °C / 116-159 °F (ASTM D93)
Evaporation Rate	No data available.
Flammability (solid, gas)	Not applicable.
Flammability Limit in Air (%):	
Upper Flammability Limit:	5.0
Lower Flammability Limit:	0.4
Explosion limits:	No data available.

Vapor Pressure	No data available.
Vapor Density	No data available.
Specific Gravity / Relative Density	0.70-0.82
Water Solubility	No data available.
Solubility in other solvents	Negligible
Partition Coefficient	No data available.
Decomposition temperature	No data available.
pH:	Not applicable
Autoignition Temperature	210 °C / 410 °F
Kinematic Viscosity	1.37-1.72 cSt @ 40°C (ASTM D445)
Dynamic Viscosity	No data available.
Explosive Properties	No data available.
VOC Content (%)	No data available.
Density	No data available.
Bulk Density	Not applicable.

10. STABILITY AND REACTIVITY

Reactivity The product is non-reactive under normal conditions.

Chemical stability The material is stable at 70°F, 760 mmHg pressure.

Possibility of hazardous reactions None under normal processing.

Hazardous polymerization Will not occur.

Conditions to avoid Excessive heat, sources of ignition, open flame.

Incompatible Materials Strong oxidizing agents.

Hazardous decomposition products None known under normal conditions of use.

11. TOXICOLOGICAL INFORMATION

Potential short-term adverse effects from overexposures

Inhalation May cause irritation of respiratory tract. May cause drowsiness or dizziness. Breathing high concentrations of this material, for example, in a confined space or by intentional abuse, can cause irregular heartbeats which can cause death.

Eye contact Exposure to vapor or contact with liquid may cause mild eye irritation, including tearing, stinging, and redness.

Skin contact Causes skin irritation. Effects may become more serious with repeated or prolonged contact. May be absorbed through the skin in harmful amounts.

Ingestion May be fatal if swallowed or vomited and enters airways. May cause irritation of the mouth, throat and gastrointestinal tract.

Acute toxicological data

Name	Oral LD50	Dermal LD50	Inhalation LC50
Kerosine, Petroleum 8008-20-6	> 5000 mg/kg (Rat)	> 2000 mg/kg (Rabbit)	> 5.28 mg/L (Rat) 4 h
Naphthalene 91-20-3	490 mg/kg (Rat)	> 2000 mg/kg (Rabbit)	> 340 mg/m³ (Rat) 1 h

Delayed and immediate effects as well as chronic effects from short and long-term exposure

MIDDLE DISTILLATES, PETROLEUM: Long-term repeated (lifetime) skin exposure to

similar materials has been reported to result in an increase in skin tumors in laboratory rodents. The relevance of these findings to humans is not clear at this time. Altered mental state, drowsiness, peripheral motor neuropathy, irreversible brain damage (so-called Petrol Sniffer's Encephalopathy), delirium, seizures, and sudden death have been reported from repeated overexposure to some hydrocarbon solvents, naphthas, and gasoline.

ISOPARAFFINS: Studies in laboratory animals have shown that long-term exposure to similar materials (isoparaffins) can cause kidney damage and kidney cancer in male laboratory rats. However, in-depth research indicates that these findings are unique to the male rat, and that these effects are not relevant to humans.

NAPHTHALENE: Severe jaundice, neurotoxicity (kernicterus) and fatalities have been reported in young children and infants as a result of hemolytic anemia from overexposure to naphthalene. Persons with glucose 6-phosphate dehydrogenase (G6PD) deficiency are more prone to the hemolytic effects of naphthalene. Adverse effects on the kidney have been reported in persons overexposed to naphthalene but these effects are believed to be a consequence of hemolytic anemia, and not a direct effect. Hemolytic anemia has been observed in laboratory animals exposed to naphthalene. Laboratory rodents exposed to naphthalene vapor for 2 years (lifetime studies) developed non-neoplastic and neoplastic tumors and inflammatory lesions of the nasal and respiratory tract. Cataracts and other adverse effects on the eye have been observed in laboratory animals exposed to high levels of naphthalene. Findings from a large number of bacterial and mammalian cell mutation assays have been negative. A few studies have shown chromosomal effects (elevated levels of Sister Chromatid Exchange or chromosomal aberrations) in vitro. Naphthalene has been classified as Possibly Carcinogenic to Humans (2B) by IARC, based on findings from studies in laboratory animals.

DIESEL EXHAUST: The combustion of diesel fuels produces gases including carbon monoxide, carbon dioxide, oxides of nitrogen and/or sulfur, and hydrocarbons that can be irritating and hazardous with overexposure. Long-term occupational overexposure to diesel exhaust and diesel exhaust particulate matter has been associated with an increased risk of respiratory disease, including lung cancer, and is characterized as a “known human carcinogen” by the International Agency for Research on Cancer (IARC), as “a reasonably anticipated human carcinogen” by the National Toxicology Program, and as “likely to be carcinogenic to humans” by the EPA, based upon animal and occupational exposure studies. However, uncertainty exists with these classifications because of deficiencies in the supporting occupational exposure/epidemiology studies, including reliable exposure estimates. Lifetime animal inhalation studies with pulmonary overloading exposure concentrations of diesel exhaust emissions have produced tumors and other adverse health effects. However, in more recent long-term animal inhalation studies of diesel exhaust emissions, no increase in tumor incidence and in fact a substantial reduction in adverse health effects along with significant reductions in the levels of hazardous material emissions were observed and are associated with fuel composition alterations coupled with new technology diesel engines.

Adverse effects related to the physical, chemical and toxicological characteristics

Signs and Symptoms Irritating to the skin and mucous membranes. Symptoms may include redness, itching, and inflammation. May cause nausea, vomiting, diarrhea, and signs of nervous system depression: headache, drowsiness, dizziness, loss of coordination, disorientation and fatigue. Additional effects may include skin sensitization. Aspiration hazard. May cause coughing, chest pains, shortness of breath, pulmonary edema and/or chemical pneumonitis. Repeated or prolonged skin contact may cause drying, reddening, itching and cracking.

Sensitization Not expected to be a skin or respiratory sensitizer.

Mutagenic effects None known.

Carcinogenicity Suspected of causing cancer.

Cancer designations are listed in the table below

Name	ACGIH (Class)	IARC (Class)	NTP	OSHA
Kerosine, Petroleum 8008-20-6	Confirmed animal carcinogen (A3)	Not Classifiable (3)	Not Listed	Not Listed
Naphthalene 91-20-3	Confirmed animal carcinogen (A3)	Possible human carcinogen (2B)	Reasonably anticipated to be a human carcinogen	Not Listed

Reproductive toxicity None known.

Specific Target Organ Toxicity (STOT) - single exposure Respiratory system. Central nervous system.

Specific Target Organ Toxicity (STOT) - repeated exposure Not classified.

Aspiration hazard May be fatal if swallowed or vomited and enters airways.

12. ECOLOGICAL INFORMATION

Ecotoxicity This product should be considered toxic to aquatic organisms, with the potential to cause long lasting adverse effects in the aquatic environment.

Name	Algae/aquatic plants	Fish	Toxicity to Microorganisms	Crustacea
Kerosine, Petroleum 8008-20-6	72-hr EL50 = 5.0-11 mg/l Algae	96-hr LL50 = 18-25 mg/l Fish	-	48-hr EL50 = 1.4-21 mg/l Invertebrates
Naphthalene 91-20-3	-	96-hr LC50 = 0.91-2.82 mg/l Rainbow trout (static) 96-hr LC50 = 1.99 mg/l Fathead minnow (static)	-	48-hr LC50 = 1.6 mg/l Daphnia magna

Persistence and degradability Expected to be inherently biodegradable.

Bioaccumulation Has the potential to bioaccumulate.

Mobility in soil May partition into air, soil and water.

Other adverse effects No information available.

13. DISPOSAL CONSIDERATIONS

Description of Waste Residues
This material may be a flammable liquid waste.

Safe Handling of Wastes
Handle in accordance with applicable local, state, and federal regulations. Use personal protection measures as required. Use appropriate grounding and bonding practices. Use only non-sparking tools. Do not expose to heat, open flames, strong oxidizers or other sources of ignition. No smoking.

Disposal of Wastes / Methods of Disposal
The user is responsible for determining if any discarded material is a hazardous waste (40 CFR 262.11). Dispose of in accordance with federal, state and local regulations.

Methods of Contaminated Packaging Disposal
Empty containers should be completely drained and then discarded or recycled, if possible. Do not cut, drill, grind or weld on empty containers since explosive residues may be present. Dispose of in accordance with federal, state and local regulations.

14. TRANSPORT INFORMATION

DOT (49 CFR 172.101):

UN Proper Shipping Name:	Fuel Oil, No. 1
UN/Identification No:	NA 1993
Transport Hazard Class(es):	3
Packing Group:	III

TDG (Canada):

UN Proper Shipping Name:	Fuel Oil
UN/Identification No:	UN 1202
Transport Hazard Class(es):	3
Packing Group:	III

15. REGULATORY INFORMATION

US Federal Regulatory Information:

US TSCA Chemical Inventory Section 8(b): This product and/or its components are listed on the TSCA Chemical Inventory.

EPA Superfund Amendment & Reauthorization Act (SARA):

SARA Section 302: This product does not contain any component(s) included on EPA's Extremely Hazardous Substance (EHS) List.

Name	CERCLA/SARA - Section 302 Extremely Hazardous Substances and TPQs
Kerosine, Petroleum	NA
Naphthalene	NA

SARA Section 304: This product may contain component(s) identified either as an EHS or a CERCLA Hazardous substance which in case of a spill or release may be subject to SARA reporting requirements:

Name	Hazardous Substances RQs
Kerosine, Petroleum	NA
Naphthalene	100 lb final RQ 45.4 kg final RQ

SARA: The following EPA hazard categories apply to this product:

Acute Health Hazard
Fire Hazard
Chronic Health Hazard

SARA Section 313: This product may contain component(s), which if in exceedance of the de minimus threshold, may be subject to the reporting requirements of SARA Title III Section 313 Toxic Release Reporting (Form R).

Name	CERCLA/SARA 313 Emission reporting:
Kerosine, Petroleum	None
Naphthalene	0.1 % de minimis concentration

State and Community Right-To-Know Regulations:
The following component(s) of this material are identified on the regulatory lists below:

Kerosine, Petroleum

Louisiana Right-To-Know:	Not Listed
California Proposition 65:	Not Listed
New Jersey Right-To-Know:	SN 1091
Pennsylvania Right-To-Know:	Present
Massachusetts Right-To Know:	Present
Florida Substance List:	Not Listed
Rhode Island Right-To-Know:	Not Listed

Michigan Critical Materials Register List:	Not Listed
Massachusetts Extraordinarily Hazardous Substances:	Not Listed
California - Regulated Carcinogens:	Not Listed
Pennsylvania RTK - Special Hazardous Substances:	Not Listed
New Jersey - Special Hazardous Substances:	Not Listed
New Jersey - Environmental Hazardous Substances List:	SN 1091 TPQ: 10000 lb (Under N.J.A.C. 7:1G, environmental hazardous substances in mixtures such as gasoline or new and used petroleum oil may be reported under these categories)
Illinois - Toxic Air Contaminants:	Not Listed
New York - Reporting of Releases Part 597 - List of Hazardous Substances:	Not Listed

Naphthalene

Louisiana Right-To-Know:	Not Listed
California Proposition 65:	Carcinogen, initial date 4/19/02
New Jersey Right-To-Know:	SN 1322 SN 3758
Pennsylvania Right-To-Know:	Environmental hazard Present (particulate)
Massachusetts Right-To Know:	Present
Florida Substance List:	Not Listed
Rhode Island Right-To-Know:	Toxic; Flammable
Michigan Critical Materials Register List:	Not Listed
Massachusetts Extraordinarily Hazardous Substances:	Not Listed
California - Regulated Carcinogens:	Not Listed
Pennsylvania RTK - Special Hazardous Substances:	Not Listed
New Jersey - Special Hazardous Substances:	Carcinogen
New Jersey - Environmental Hazardous Substances List:	SN 1322 TPQ: 500 lb (Reportable at the de minimis quantity of >0.1%)
Illinois - Toxic Air Contaminants:	Present
New York - Reporting of Releases Part 597 - List of Hazardous Substances:	100 lb RQ (air); 1 lb RQ (land/water)

Canada DSL/NDSL Inventory: This product and/or its components are listed either on the Domestic Substances List (DSL) or are exempt.

Canadian Regulatory Information: This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the (M)SDS contains all the information required by the Controlled Products Regulations.

Name	Canada - WHMIS: Classifications of Substances:	Canada - WHMIS: Ingredient Disclosure:
Kerosine, Petroleum	B3,D2B	1%
Naphthalene	B4,D2A	0.1%

Note: Not applicable.

16. OTHER INFORMATION

Prepared By Toxicology and Product Safety

Revision Date: 06/01/2016

Revision Note:

Disclaimer

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information is intended as guidance for safe handling, use, processing, storage, transportation, accidental release, clean-up and disposal and is not considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

C&D TECHNOLOGIES, INC.
Power Solutions

SAFETY DATA SHEET – 14-352

1. IDENTIFICATION

REVISION DATE: 2/20/2020

PRODUCT IDENTITY: **Sealed, Lead-Calcium Battery, Non-spillable** **CDID: ATL Series, ATP Series, msEndur ll**	**Product Use**: Electric Storage Battery **Manufacturer/Supplier:** C&D Technologies, Inc. **Address:** C&D Technologies, Inc. 1400 Union Meeting Road Blue Bell, PA 19422-0858 Web Sites: www.cdtechno.com North America 24 Hour Emergency Telephone: (CHEM TEL) 1-800-255-3924 International 24 Hour Emergency Telephone: (CHEM TEL) 1-813-248-0585 C&D Technologies Inc. Telephone: 215-619-2700

2. GHS HAZARDS IDENTIFICATION

Health		Environmental	Physical
			
Acute Toxicity (Oral/Dermal/Inhalation)	**Category 4**	Aquatic **Chronic 1** Aquatic **Acute 1**	Explosive Chemical, Division 1.3
Skin Corrosion/Irritation	**Category 1A**		
Eye Damage	**Category 1**		
Reproductive	**Category 1A**		
Carcinogenicity (lead compounds)	**Category 1B**		
Carcinogenicity (arsenic)	**Category 1A**		
Carcinogenicity (acid mist)	**Category 1A**		
Specific Target Organ Toxicity (repeated exposure)	**Category 2**		

GHS Label:

Health	Environmental	Physical
		
Hazard Statements	***Precautionary Statements***	

SAFETY DATA SHEET – 14-352

DANGER! Harmful if swallowed, inhaled, or in contact with skin. Acid causes severe skin burns and eye damage. May damage fertility or the unborn child if ingested or inhaled. May cause harm to breast-fed children. May cause cancer if ingested or inhaled. Causes skin irritation, serious eye damage. Contact with internal components may cause irritation or severe burns. Causes damage to central nervous system, blood and kidneys through prolonged or repeated exposure if ingested or inhaled. Irritating to eyes, respiratory system, and skin. May form explosive air/gas mixture during charging. Explosive, fire, blast or projection hazard.	Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Wash thoroughly after handling. Do not eat drink or smoke when using this product. Avoid contact during pregnancy/while nursing. Wear protective gloves/protective clothing, eye protection/face protection. Use only outdoors or in a well-ventilated area. Avoid contact with internal acid. Do not breathe dust/fume/gas/mist/vapors/spray. Keep away from heat/sparks/open flames/hot surfaces. No smoking **IF SWALLOWED OR CONSUMED:** rinse mouth. Do NOT induce vomiting. Call a poison center/doctor if you feel unwell. **IF ON CLOTHING OR SKIN** (or hair): Remove/Take off immediately all contaminated clothing and wash it before reuse. Rinse skin with water/shower. **IF INHALED**: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER or doctor/physician. **IF IN EYES**: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If exposed/concerned, or if you feel unwell seek medical attention/advice. Store locked up, in a well-ventilated area, in accordance with local and national regulation. Dispose of contents/container in accordance with local and national regulation Keep out of reach of children.

HEALTH HAZARDS		
Acute Toxicity	Signal Word	Hazard Statement
Oral A.1 (6)	Warning	H302: Harmful if swallowed
Dermal A.1 (5)	Warning	H312: Harmful in contact with skin
Inhalation A.1 (5)	Warning	H332: Harmful if inhaled
Skin Irritation		
A.2 (2)	Warning	H315: Causes skin irritation
Skin Corrosion		
A.2 (1A,1B,1C)	Danger	H314: Causes serious skin burns and eye damage
Serious Eye Damage		
A.3 (1)	Danger	H318: Causes serious eye damage
Eye Irritation		
A.3 (2A)	Warning	H319: Causes serious eye irritation
Respiratory Sensitization		
A.4 (1A, 1B)	Danger	H334: May cause allergy or asthma symptoms or breathing difficulties if inhaled
Skin Sensitization		
A.4 (1A, 1B)	Warning	H317: May cause an allergic skin reaction
Germ Cell Mutagenicity		
A.5 (1A, 1B)	Danger	H:340: May cause genetic defects
A.5 (2)	Warning	H341: Suspected of causing genetic defects
Carcinogenicity		

SAFETY DATA SHEET – 14-352

A.6 (1A, 1B)	Danger	H350: May cause cancer
A.6 (2)	Warning	H351: Suspected of causing cancer
Reproductive Toxicity		
A.7 (1A, 1B)	Danger	H360: May damage fertility or the unborn child.
A.7 (2)	Warning	H361: Suspected of damaging fertility or the unborn child.
Specific Target Organ Toxicity Single Exposure		
A.8 (1)	Danger	H370: Causes damage to organs
A.8 (2)	Warning	H371: May cause damage to organs
Specific Target Organ Toxicity Repeated or Prolonged Exposure		
A.9 (1)	Danger	H372: Causes damage to organs
A.9 (2)	Warning	H373: May cause damage to organs
Aspiration Hazard		
A.10 (1)	Danger	H304: May be fatal if swallowed and enters airways
ENVIRONMENTAL HAZARDS		
Aquatic Toxicity Acute		
1.1	Warning	H400: Very toxic to aquatic life
Aquatic Toxicity Chronic		
2.1	Warning	H410: Very toxic to aquatic life with long lasting effects

3. *COMPOSITION / INFORMATION ON INGREDIENTS

INGREDIENTS (Chemical/Common Names):	CAS No.:	% by Wt:
*Lead , Lead Compounds	7439-92-1	72 - 73
*Sulfuric Acid/ Battery Electrolyte 1.300 sg 40% wt (H2SO4/H2O)	7664-93-9	7 - 8
Tin	7440-31-5	<0.1
Aluminum	7429-90-5	< 0.01
*Copper	7440-50-8	< 0.01
NON-HAZARDOUS INGREDIENTS		
Water	7732-18-5	15 - 17
Calcium	7440-70-2	0.01
Inert Components	N/A	3 - 6
*Section 313 (40 CFR 372) Listed Toxic Chemical		

4. FIRST AID MEASURES

INHALATION:

Sulfuric Acid: Remove to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Consult a physician.

Lead: Remove from exposure, gargle, wash nose and lips; consult physician.

INGESTION:

Sulfuric Acid: Give large quantities of water; Do NOT induce vomiting or aspiration into the lungs may occur and can cause permanent injury or death; consult physician.
Lead: Consult physician immediately.

SKIN:
Sulfuric Acid: Flush with large amounts of water for at least 15 minutes; remove contaminated clothing completely, including shoes. If symptoms persist, seek medical attention. Wash contaminated clothing before reuse. Discard contaminated shoes.
Lead: Wash immediately with soap and water.

EYES:
Sulfuric Acid and Lead: Flush immediately with large amounts of water for at least 15 minutes while lifting lids; Seek immediate medical attention if eyes have been exposed directly to acid.

5. FIRE FIGHTING MEASURES
Flash Point: Not Applicable
Oxygen Index = > 28
Flammable Limits: LEL = 4.1% (Hydrogen Gas in air); UEL = 74.2%
Extinguishing media: CO2; foam; dry chemical. Do not use carbon dioxide directly on cells. Avoid breathing vapors. Use appropriate media for surrounding fire.

Fire Fighting Procedures:
Use positive pressure, self-contained breathing apparatus. Beware of acid splatter during water application and wear acid-resistant clothing, gloves, face and eye protection. If batteries are on charge, shut off power to the charging equipment, but note that strings of series connected batteries may still pose risk of electric shock even when charging equipment is shut down.

Hazardous Combustion Products:
Highly flammable hydrogen gas is generated during charging and operation of batteries. If ignited by burning cigarette, naked flame or spark, may cause battery explosion with dispersion of casing fragments and corrosive liquid electrolyte. Carefully follow manufacturer's instructions for installation and service. Keep away all sources of gas ignition and do not allow metallic articles to simultaneously contact the negative and positive terminals of a battery. Follow manufacturer's instructions for installation and service.

6: ACCIDENTAL RELEASE MEASURES
Stop flow of material, contain/absorb small spills with dry sand, earth or vermiculite. Do not use combustible materials. If possible, carefully neutralize spilled electrolyte with soda ash, sodium bicarbonate, lime, etc. Wear acid-resistant clothing, boots, gloves, and face shield. Do not allow discharge of un-neutralized acid to sewer. Acid must be managed in accordance with approved local, state, and federal requirements. Consult state environmental agency and/or federal EPA.

7. HANDLING AND STORAGE
Handling:

Unless involved in recycling operations, do not breach the casing or empty the contents of the battery. Handle carefully and avoid tipping, which may allow electrolyte leakage. There may be increasing risk of electric shock from strings of connected batteries. Keep containers tightly closed when not in use. If battery case is broken, avoid contact with internal components. Keep vent caps on and cover terminals to prevent short circuits. Place cardboard between layers of stacked automotive batteries to avoid damage and short circuits. Keep away from combustible materials, organic chemicals, reducing substances, metals, strong oxidizers and water. Use banding or stretch wrap to secure items for shipping.

Storage:
Store batteries under roof in cool, dry, well-ventilated areas separated from incompatible materials and from activities that may create flames, spark, or heat. Store on smooth, impervious surfaces provided with measures for liquid containment in the event of electrolyte spills. Keep away from metallic objects that could bridge the terminals on a battery and create a dangerous short-circuit.

Charging:
There is a possible risk of electric shock from charging equipment and from strings of series connected batteries, whether or not being charged. Shut-off power to chargers whenever not in use and before detachment of any circuit connections. Batteries being charged will generate and release flammable hydrogen gas. Charging space should be ventilated. Keep battery vent caps in position. Prohibit smoking and avoid creation of flames and sparks nearby. Wear face and eye protection when near batteries being charged.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure Limits (mg/m^3) **Note: N.E. = Not Established**

INGREDIENTS (Chemical/Common Names):	OSHA PEL	ACGIH	US NIOSH	Quebec PEV	Ontario OEL	EU OEL
Lead, Lead Compounds	0.05	0.05	0.05	0.05	0.05	0.15 (b)
Sulfuric Acid/Electrolyte (H_2SO_4/H_2O)	1	0.2	1	1	0.2	0.05 (c)
Tin	2.0	2.0	2.0			
Aluminum	15.0	10.0	10.0			
Copper	1.0	1.0	1.0			

(a) As dusts/mists **(b)**As inhalable aerosol **(c)**Thoracic fraction

Engineering Controls (Ventilation):
Store and handle in well-ventilated area. If mechanical ventilation is used, components must be acid-resistant. Handle batteries cautiously, do not tip to avoid spills. Make certain vent caps are on securely. If battery case is damaged, avoid bodily contact with internal components. Wear protective clothing, eye and face protection, when filling, charging or handling batteries. Do not allow metallic materials to simultaneously contact both the positive and negative terminals of the batteries. Charge batteries in areas with adequate ventilation. General dilution ventilation is acceptable.

Respiratory Protection (NIOSH/MSHA approved):
None required under normal conditions. When concentrations of sulfuric acid mist are known to exceed PEL, use NIOSH or MSHA-approved respiratory protection.

Skin Protection:
If battery case is damaged, use rubber or plastic acid-resistant gloves with elbow-length gauntlet, acid-resistant apron, clothing and boots.
Eye Protection:
If battery case is damaged, use chemical goggles or face shield.

Other Protection:
In areas where water and sulfuric acid solutions are handled in concentrations greater than 1%, emergency eyewash stations and showers should be provided, with unlimited water supply. Chemically impervious apron and face shield recommended when adding water or electrolyte to batteries. Wash Hands after handling.

9. PHYSICAL AND CHEMICAL PROPERTIES

Properties Listed Below are for Electrolyte:			
Boiling Point:	**N/A**	Specific Gravity (H2O = 1):	**1.310 +/-0.010**
Melting Point:	**N/A**	Vapor Pressure (mm Hg):	**N/A**
Solubility in Water:	**N/A**	Vapor Density (AIR = 1):	**Greater than 1**
Evaporation Rate: (Butyl Acetate = 1)	**Less than 1**	% Volatile by Weight:	**N/A**
pH:	**~1 to 2**	Flash Point:	**Below room temperature (as hydrogen gas)**
LEL (Lower Explosive Limit)	**4% (Hydrogen)**	UEL (Upper Explosive Limit)	**74% (Hydrogen)**
Appearance and Odor:	**Manufactured article; no apparent odor. Gelled electrolyte is a clear to cloudy liquid with a sharp, penetrating, pungent odor. Formed lead dioxide is dark brown in color with a slight acidic odor.**		

10. STABILITY AND REACTIVITY
Stability: Stable _X_ Unstable ___
This product is stable under normal conditions at ambient temperature.

Conditions to Avoid: Prolonged overcharge at high current; sources of ignition.

Incompatibilities: (materials to avoid)
Electrolyte: Contact with combustibles and organic materials may cause fire and explosion. Also reacts violently with strong reducing agents, metals, sulfur trioxide gas, strong oxidizers, and water. Contact with metals may produce toxic sulfur dioxide fumes and may release flammable hydrogen gas.
Lead compounds: Avoid contact with strong acids, bases, halides, halogenates, potassium nitrate, permanganate, peroxides, nascent hydrogen, and reducing agents.
Arsenic compounds: strong oxidizers; bromine azide. NOTE: hydrogen gas can react with inorganic arsenic to form the highly toxic gas – arsine

Hazardous Decomposition Products:

SAFETY DATA SHEET – 14-352

Electrolyte: Sulfur trioxide, carbon monoxide, sulfuric acid mist, sulfur dioxide, hydrogen sulfide.
Lead compounds: Temperatures above the melting point are likely to produce toxic metal fume, vapor, or dust; contact with strong acid or base or presence of nascent hydrogen may generate highly toxic arsine gas.

Hazardous Polymerization:
Will not occur

11. TOXICOLOGICAL INFORMATION
Routes of Entry:
Sulfuric Acid: Harmful by all routes of entry.
Lead Compounds: Hazardous exposure can occur only when product is heated, oxidized or otherwise processed or damaged to create dust, vapor or fume. The presence of nascent hydrogen may generate highly toxic arsine gas.

Inhalation:
Sulfuric Acid: Breathing of sulfuric acid vapors or mists may cause severe respiratory irritation.
Lead Compounds: Inhalation of lead dust or fumes may cause irritation of upper respiratory tract and lungs.

Ingestion:
Sulfuric Acid: May cause severe irritation of mouth, throat, esophagus and stomach.
Lead Compounds: Acute ingestion may cause abdominal pain, nausea, vomiting, diarrhea and severe cramping. This may lead rapidly to systemic toxicity and must be treated by a physician.

Skin Contact:
Sulfuric Acid: Severe irritation, burns and ulceration.
Lead Compounds: Not absorbed through the skin.
Arsenic compounds: Contact may cause dermatitis and skin hyperpigmentation

Eye Contact:
Sulfuric Acid: Severe irritation, burns, cornea damage, and blindness.
Lead Compounds: May cause eye irritation.

Effects of Overexposure - Acute:
Sulfuric Acid: Severe skin irritation, damage to cornea, upper respiratory irritation.
Lead Compounds: Symptoms of toxicity include headache, fatigue, abdominal pain, loss of appetite, muscular aches and weakness, sleep disturbances and irritability.

Effects of Overexposure - Chronic:
Sulfuric Acid: Possible erosion of tooth enamel, inflammation of nose, throat & bronchial tubes.
Lead Compounds: Anemia; neuropathy, particularly of the motor nerves, with wrist drop; kidney damage; reproductive changes in males and females. Repeated exposure to lead and lead compounds in the workplace may result in nervous system toxicity. Some toxicologists report abnormal conduction velocities in persons with blood lead levels of 50 µg/100 ml or higher. Heavy lead exposure may result in central nervous system damage, encephalopathy and damage to the blood-forming (hematopoietic) tissues.

Carcinogenicity:
Sulfuric Acid: The International Agency for Research on Cancer (IARC) has classified "strong inorganic acid mist containing sulfuric acid" as a Category I carcinogen, a substance that is carcinogenic to humans. This classification does not apply to liquid forms of sulfuric acid or sulfuric acid solutions contained within a battery. Inorganic acid mist (sulfuric acid mist) is not generated under normal use of this product. Misuse of the product, such as overcharging, may result in the generation of sulfuric acid mist.

Lead Compounds: Lead is listed as a 2B carcinogen, likely in animals at extreme doses. Proof of carcinogenicity in humans is lacking at present.

Arsenic: Listed by National Toxicology Program (NTP), International Agency for Research on Cancer (IARC), OSHA and NIOSH as a carcinogen only after prolonged exposure at high levels.

Medical Conditions Generally Aggravated by Exposure:
Overexposure to sulfuric acid mist may cause lung damage and aggravate pulmonary conditions. Contact of sulfuric acid with skin may aggravate diseases such as eczema and contact dermatitis. Lead and its compounds can aggravate some forms of kidney, liver and neurologic diseases.

Acute Toxicity:
Inhalation LD50:
Electrolyte: LC50 rat: 375 mg/m3; LC50: guinea pig: 510 mg/m3
Elemental Lead: Acute Toxicity Point Estimate = 4500 ppmV (based on lead bullion)

Oral LD50:
Electrolyte: rat: 2140 mg/kg
Elemental lead: Acute Toxicity Estimate (ATE) = 500 mg/kg body weight (based on lead bullion)

Additional Health Data:
All heavy metals, including the hazardous ingredients in this product, are taken into the body primarily by inhalation and ingestion. Most inhalation problems can be avoided by adequate precautions such as ventilation and respiratory protection covered in Section 8. Follow good personal hygiene to avoid inhalation and ingestion: wash hands, face, neck and arms thoroughly before eating, smoking or leaving the work site. Keep contaminated clothing out of non-contaminated areas, or wear cover clothing when in such areas. Restrict the use and presence of food, tobacco and cosmetics to non-contaminated areas. Work clothes and work equipment used in contaminated areas must remain in designated areas and never taken home or laundered with personal non-contaminated clothing. This product is intended for industrial use only and should be isolated from children and their environment.

The 19th Amendment to EC Directive 67/548/EEC classified lead compounds, but not lead in metal form, as possibly toxic to reproduction. Risk phrase 61: May cause harm to the unborn child, applies to lead compounds, especially soluble forms.

12. ECOLOGICAL INFORMATION

SAFETY DATA SHEET – 14-352

Environmental Fate: lead is very persistent in soil and sediments. No data on environmental degradation. Mobility of metallic lead between ecological compartments is slow. Bioaccumulation of lead occurs in aquatic and terrestrial animals and plants but little bioaccumulation occurs through the food chain. Most studies include lead compounds and not elemental lead.

Environmental Toxicity: Aquatic Toxicity:
Sulfuric acid: 24-hr LC50, freshwater fish (Brachydanio rerio): 82 mg/L
96 hr- LOEC, freshwater fish (Cyprinus carpio): 22 mg/L
Lead: 48 hr LC50 (modeled for aquatic invertebrates): <1 mg/L, based on lead bullion

Additional Information
· No known effects on stratospheric ozone depletion.
· Volatile organic compounds: 0% (by Volume)
· Water Endangering Class (WGK): NA

13. DISPOSAL CONSIDERATIONS (UNITED STATES)
Spent batteries: Send to secondary lead smelter for recycling. Spent lead-acid batteries are not regulated as hazardous waste when the requirements of 40 CFR Section 266.80 are met. Spilled sulfuric acid is a characteristic hazardous waste; EPA hazardous waste number D002 (corrosivity) and D008 (lead).

Electrolyte: Place neutralized slurry into sealed acid resistant containers and dispose of as hazardous waste, as applicable. Large water diluted spills, after neutralization and testing, should be managed in accordance with approved local, state, and federal requirements. Consult state environmental agency and/or federal EPA.

Following local, State/Provincial, and Federal/National regulations applicable to end-of-life characteristics will be the responsibility of the end-user.

14. TRANSPORT INFORMATION

United States:
Wet, non-spillable batteries do not need to be shipped and transported as fully-regulated Class 8 Corrosive hazardous materials / dangerous goods when tested, packaged and marked in accordance with the following regulations:

U.S. Hazardous Materials Regulations: 49 CFR 173.159(f) and 49 CFR 173.159a

- The batteries are excepted from regulation if they have been tested in accordance with the vibration and pressure differential tests found in 49 CFR 173.159(f) and "rupture test" found at 49 CFR 173.159a;
- When offered for transport, the batteries must be protected against short circuits and securely packaged in accordance with 49 CFR 173.159a; and
- The batteries and outer packaging must be marked NON-SPILLABLE BATTERY or NON-SPILLABLE as required by 49 CFR 173.159a

IATA Dangerous Goods Regulations: Packing Instruction 872 and Special Provision A67

- The batteries are excepted from regulation if they have been tested in accordance with the vibration and pressure differential tests found in Packing Instruction 872 and "rupture test" found in Special Provision A67 of the International Air Transport Association (IATA) Dangerous Goods Regulations
- When offered for transport, the batteries must be protected against short circuits and securely packaged in accordance with Special Provision A67.
- The words "Not Restricted" and "Special Provision A67" must be included in the description of the substance on the Air Waybill when an Air Waybill is issued.

IMDG Code: Special Provision 238.1 and 238.2

- The batteries are excepted from regulation if they have been tested in accordance with the vibration and pressure differential tests and "rupture test" found in Special Provision 238.1 and 238.2.
- When offered for transport, the batteries must be protected against short circuits and securely packaged in accordance with Special Provision 238.1 and 238.2.

If the regulations listed above are not met, then Batteries, wet, nonspillable (UN2800) are regulated as Class 8 Corrosive hazardous materials / dangerous goods by the U.S. Department of Transportation (DOT) and international dangerous goods regulatory authorities pursuant to the IATA Dangerous Goods Regulations and IMDG Code.

If any of these requirements are not met, the batteries must be shipped as hazardous materials:

Proper Shipping Name:	Batteries, Wet, Filled with Acid
Hazard Class:	8
ID Number:	UN2794
Packing Group:	III
Labels:	Corrosive

15. REGULATORY INFORMATION

UNITED STATES:

EPCRA Sections 302, 304, 311 & 312
Lead-acid batteries do **NOT** meet the OSHA definition of an "article" (US EPA, Oct. 1998). The lead and acid that compose these batteries must be included when determining the various thresholds for these EPCRA section regulations. The acid in lead-acid batteries is **Sulfuric Acid**, which is an Extremely Hazardous Substance (EHS). The following table outlines the applicable EPCRA Sections and their respective thresholds for **Sulfuric Acid**:

EPCRA Sections – Sulfuric Acid	***Thresholds***
302 - Emergency Planning Notification	TPQ ≥ 1,000 lbs.
304 - Emergency Release Notification	RQ ≥ 1,000 lbs.

311 - MSDS Reporting	*TPQ ≥ 500 lbs.
312 - Chemical Inventory Reporting (i.e. Tier II)	*TPQ ≥ 500 lbs.

***The reporting threshold for Sulfuric Acid is ≥ the designated TPQ or 500 lbs, whichever is less.**

The lead used in lead-acid batteries does not qualify for any OSHA or EPCRA exemptions. Lead is not an EHS, and the following table outlines the applicable EPCRA Sections and their respective thresholds for **lead**:

EPCRA Sections - Lead	***Thresholds***
311 - MSDS Reporting	≥ 10,000 lbs.
312 - Chemical Inventory Reporting (i.e. Tier II)	≥ 10,000 lbs.

EPCRA Section 313
The reporting of lead and sulfuric acid (and their releases) in lead-acid batteries used in cars, trucks, most cranes, forklifts, locomotive engines, and aircraft for the purposes of EPCRA Section 313 is not required. Lead-acid batteries used for these purposes are exempt for Section 313 reporting per the "Motor Vehicle Exemption." See page B-22 of the *U.S. EPA Guidance Document for Lead and Lead Compound Reporting under EPCRA Section 313* for additional information of this exemption.

TSCA:
TSCA Section 8b – Inventory Status: All chemicals comprising this product are either exempt or listed on the TSCA Inventory.

TSCA Section 12b (40 CFR Part 707.60(b)) No notice of export will be required for articles, except PCB articles, unless the Agency so requires in the context of individual section 5, 6, or 7 actions.

TSCA Section 13 (40 CFR Part 707.20): No import certification required (EPA 305-B-99-001, June 1999, Introduction to the Chemical Import Requirements of the Toxic Substances Control Act, Section IV.A)

RCRA: Spent Lead Acid Batteries are subject to streamlined handling requirements when managed in compliance with 40 CFR section 266.80 or 40 CFR part 273. Waste sulfuric acid is a characteristic hazardous waste; EPA hazardous waste number D002 (corrosivity) and D008 (lead).

STATE REGULATIONS (US):
***Proposition 65 Warning**
Battery posts, terminals and related accessories contain lead and lead compounds, chemicals known to the state of California to cause cancer and reproductive harm. Wash hands after handling.

*Battery companies not party to the 1999 consent judgment with Mateel Environmental Justice Foundation should include a Proposition 65 Warning that complies with the current version of Proposition 65.

INTERNATIONAL REGULATIONS:
Distribution into Quebec to follow Canadian Controlled Product Regulations (CPR) 24(1) and 24(2).

SAFETY DATA SHEET – 14-352

Distribution into the EU to follow applicable Directives to the Use, Import/Export of the product as-sold.

16. OTHER INFORMATION

NFPA Hazard Rating for sulfuric acid:
Flammability (Red) = 0
Health (Blue) = 3
Reactivity (Yellow) = 2
X = Acid
Sulfuric acid is water-reactive if concentrated.

MSDS Preparation/Review Date: 2/20/2020 Revision: 5
Prepared by: W.E. Kozlowski – Director EHS

PPS Power Plant No. 1
Paducah, Kentucky
Simple Cycle Turbine Operation
Emission Summary

Turbine Maximum Hourly Emission Rates

	lb/hr
NOx	28.70
CO	58.27
VOC*	2.60
PM/PM10**	5.88
SO2***	4.79

Site Annual Permitted Emission Limits

	ton/yr
NOx	156.96
CO	224.75
VOC*	12.91
PM/PM10**	31.57
SO2***	5.16

Annual emission limits based on operations at average annual ambient conditions (59 deg F)

* VOC reported "as methane". Includes organic HAPs.
** All particulate matter assumed to be PM10. Includes both front-half filterable and back-half condensables. Includes metallic HAPs.
*** Max hourly SO2 emissions based on 5 gr S/100 scf in natural gas and average annual emissiona are based on 1 gr S/100 scf in natural gas

PPS Power Plant No. 1
Paducah, Kentucky
Simple Cycle Turbine Operation
Gas Firing - Max Hourly and Annual Emission Calculations

Gas heat content: 1027 Btu/scf, HHV
Gas sulfur content: 5 gr/100 scf

Fuel:	Gas		
Ambient (deg F):	12		
MMBtu/hr:	313	approx., based on HHV	

	lb/hr	Concentration ppmv @ 15% O2	mw lb/mole
NOx	28.29	25	46
CO	58.27	84.6	28
VOC	2.60	6.6	16
PM/PM10	5.88	f&b per P&W	
SO2	4.79		

Fuel:	Gas		
Ambient (deg F):	59		
MMBtu/hr:	309	approx., based on HHV	

	lb/hr	Concentration ppmv @ 15% O2	mw lb/mole
NOx	28.70	25	46
CO	41.92	60	28
VOC	2.40	6	16
PM/PM10	5.88	f&b per P&W	
SO2	0.96		

Note: Avg hourly emissions based on annual avg temp of 59 deg F
Avg SO@ based on 1 gr S/scf in gas

Combined Annual Gas Hours 10700 hr/yr

Annual NOx:	153.53	tons
Annual CO:	224.28	tons
Annual VOC:	12.82	tons, as methane
Annual PM/PM10:	31.46	tons, includes both front-half filterable portion and back-half condensables
Annual SO2:	5.12	tons

Pound per hour emissions calculated based on information provided by Pratt and Whitney
VOC reported "as methane".
PM/PM10 max hourly rate includes both front-half filterable and back-half condensable fractions
Annual emission estimates based on operations at average annual ambient conditions (59 deg F)

PPS Power Plant No. 1
Paducah, Kentucky
Simple Cycle Turbine Operation
Natural Gas Stack Parameters

Height:	50	ft
Diameter:	10.19	ft (diameter is effective, stacks are rectangular)

	lb/mole	lb/scf @387 scf/mole
Argon	39.994	0.103343669
Nitrogen	28.020	0.072403101
Carbon Dioxide	44.010	0.11372093
Water	18.016	0.046552972
Oxygen	32.000	0.082687339

Std Temp 70 deg F

Fuel:	Gas	
Load	Base	
Ambient (deg F):	12	dry bulb
Exhaust Flow (lb/hr)	980,640	
Temperature (deg F)	662	

12 deg F dry bulb

Composition	mole frac dry	mole frac wet
Argon	0.0095	0.0088
Nitrogen	0.8005	0.7430
CO2	0.0263	0.0244
Water	0.0000	0.0712
Oxygen	0.1638	0.1520

12 deg F dry bulb

Exhaust (lb/scf)	0.0734
Exhaust Flow (scfm)	222,783
Exhaust Flow (acfm)	471,628
Exhaust Flow (dscfm)	206,921
dscfm @ 15% O2	158,671
velocity (ft/sec)	96.38

Fuel:	Gas	
Load	Base	
Ambient (deg F):	59	dry bulb
Exhaust Flow (lb/hr)	914,760	
Temperature (deg F)	746	

59 deg F dry bulb

Composition	mole frac dry	mole frac wet
Argon	0.0096	0.0087
Nitrogen	0.8025	0.7310
CO2	0.0288	0.0262
Water	0.0000	0.0884
Oxygen	0.1592	0.1450

59 deg F dry bulb

Exhaust (lb/scf)	0.0729
Exhaust Flow (scfm)	209,107
Exhaust Flow (acfm)	475,856
Exhaust Flow (dscfm)	190,622
dscfm @ 15% O2	160,952
velocity (ft/sec)	97.25

Note: exhaust flow information is without use of foggers

PPS Power Plant No. 1
Paducah, Kentucky
Hazardous Air Pollutant Emissions

Natural Gas Firing

MMBtu/hr: 313
Combined Annual Hours: 10700

Pollutant	Emission Factor lb/MMBtu	Per Turbine Max Hourly lb/hr	Total All Turbines Annual ton/yr
1,3-Butadiene	4.30E-07	1.35E-04	7.20E-04
Acetaldehyde	4.00E-05	1.25E-02	0.07
Acrolein	6.40E-06	2.00E-03	0.01
Benzene	1.20E-05	3.76E-03	0.02
Ethylbenzene	3.20E-05	1.00E-02	0.05
Formaldehyde	7.10E-04	2.22E-01	1.19
Naphthalene	1.30E-06	4.07E-04	2.18E-03
PAH	2.20E-06	6.89E-04	3.68E-03
Toluene	1.30E-04	4.07E-02	0.22
Xylenes	6.40E-05	2.00E-02	0.11
	Total HAPs all turbines		1.67

Emission factors from Table 3.1-3 of AP-42, 4/00

PPS Power Plant No. 1
Paducah, Kentucky
Blackstart Generator

g/hp-hr emissions data provided by engine manufacturer (Cummins Power Generation)
except SO2, which is based on 0.05% S in the fuel

Engine Horsepower: 1490 nameplate 3.79 MMBtu/hr

at 136000 Btu/gal 27.86765 gal/hr

0.027868 1000 gal/hr

	g/hp-hr	lb/hr	lb/1000 gal
NOx	4.00	13.13	471.08
CO	0.50	1.64	58.88
VOC	0.08	0.26	9.42
PM/PM10	0.12	0.39	14.13
SO2	0.05	0.16	5.74

Total Annual Hours: 500

Annual NOx: 3.28 tons
Annual CO: 0.41 tons
Annual VOC: 0.07 tons, as methane
Annual PM/PM10: 0.10 tons, includes both front-half filterable portion only
Annual SO2: 0.04 tons

MMBtu/hr: 3.79
Annual Hours: 500

Pollutant	Emission Factor lb/MMBtu	Max Hourly lb/hr	lb/1000 gal
Acetaldehyde	2.52E-05	9.55E-05	3.43E-03
Acrolein	7.88E-06	2.99E-05	1.07E-03
Benzene	7.76E-04	2.94E-03	1.06E-01
Formaldehyde	7.89E-05	2.99E-04	1.07E-02
Naphthalene	1.30E-04	4.93E-04	1.77E-02
Toluene	2.81E-04	1.06E-03	3.82E-02
Xylenes	1.93E-04	7.31E-04	2.62E-02

Emission factors from Table 3.4-3 and 3.4-4 of AP-42, 10/96

PPS Power Plant No. 1
Paducah, Kentucky
Firepump

g/hp-hr emissions data provided by engine manufacturer (John Deere)
except SO2, which is based on 0.05% S in the fuel

Engine Horsepower: 55 nameplate

	g/hp-hr	lb/hr
NOx	4.80	0.58
CO	1.85	0.22
VOC	0.78	0.09
PM/PM10	0.40	0.05
SO2	0.00	0.00

Total Annual Hours: 500

Annual NOx: 0.15 tons
Annual CO: 0.06 tons
Annual VOC: 0.02 tons, as methane
Annual PM/PM10: 0.01 tons, includes both front-half filterable portion only
Annual SO2: 0.00 tons