

## **NARRATIVE**

TO: Cynthia Dorrough  
FROM: Alexander Lagunas  
DATE: July 18, 2023

Facility Name: **Atlanta Gas Light Company – Riverdale LNG Plant**  
AIRS No.: 063-00083  
Location: Riverdale, GA (Clayton County)  
Application #: 28830  
Date of Application: April 13, 2023

---

### **Background Information**

The Atlanta Gas Light Company owns and operates three liquefied natural gas plants in Georgia, including the Riverdale LNG Plant (hereinafter the “facility”). The purpose of these plants is for the liquefaction and storage of natural gas during the spring, summer, and fall seasons followed by vaporization and distribution of the stored natural gas during the peak demand period of winter. These liquefied natural gas stations operate numerous pieces of fuel-burning equipment fired exclusively by natural gas.

During the liquefaction process, natural gas received from the interstate transmission pipeline is cooled and converted into a liquid phase through an expansion loop that lowers pressure and temperature of the incoming gas stream. Prior to refrigeration, carbon dioxide scrubbers cleanse the natural gas stream to avoid freezing of impurities. A regeneration heater (ID No. RH3, 14 MM Btu/hr) is used to regenerate these scrubbers. After refrigeration, liquefied natural gas (LNG) is drawn into two large, insulated tanks for storage until natural gas is needed. LNG storage tanks are essentially unpressurized, with natural gas vapor accumulating at the top of the tank when the tank temperature rises above the liquid boiling point. Boil-off gas compressors (ID Nos. BOA2 and BOB2, 731 hp each) draw this vapor from the tank and compress the gas to the appropriate pressure for injection into the distribution system.

During the vaporization process, when consumer demand for natural gas exceeds supply from the interstate pipeline system, LNG can be pumped via six LNG pumps/pump engines (ID Nos. PA, PB, PC, PD, PE, and PF, 305 hp each) from the storage tanks, vaporized, and injected into the distribution system. The facility employs booster pumps engines (ID Nos. BPD, BPE, and BPF, 740 hp each) downstream of the LNG pumps to provide additional pressure; however, these pumps are rarely utilized. The LNG pumps deliver LNG to six vaporizers that heat the LNG to a nominal pipeline send-out temperature of 60°F. Two 48.4 MMBtu/hr vaporizer heaters (ID Nos. VH7 and VH8) and four 73.9 MMBtu/hr vaporizer heaters (ID Nos. VH9, VH10, VH11, and VH12) heat a glycol/water solution which is then sent to the vaporizers to change the phase of natural gas from liquid to gas and raise the gas temperature to pipeline conditions.

The facility operates three 842-hp generators (ID Nos. G1, G2, and G3) to generate baseload electricity for on-site consumption. These generators are utilized during LNG peak shaving operations to ensure a reliable power supply for pumps and compressors during liquefaction or vaporization.

The facility also operates a back-up emergency generator (ID No. EG1, 755 hp) which provides power to an electric fire pump in the event of an emergency.

### **Purpose of Application**

The facility proposes to install an LNG pump engine (ID No. PA1, 325 HP) which was originally constructed in 2004 and installed at another facility. This LNG pump engine will replace LNG Pump Engine (ID No. PA, 305 HP). The facility also proposes to install Electric Generator Turbines (ID No. GT1 and GT2, 56.88 MMBtu/hr each). These generators will be used to generate electricity for use on-site.

Public Advisory expired on June 2, 2023. No comments were received.

### **Updated Equipment List**

Emission Units			Associated Control Devices	
ID No.	Description	Installation Date	ID No.	Description
G1	842-hp Generator No. 1	1997	CG01	Non-selective catalytic reduction with air-fuel control
G2	842-hp Generator No. 2	1999	CG02	Non-selective catalytic reduction with air-fuel control
G3	842-hp Generator No. 3	1999	CG03	Non-selective catalytic reduction with air-fuel control
<b>PA1*</b>	<b>325-hp LNG Pump Engine A1</b>	<b>New</b>	<b>CPA</b>	<b>Non-selective catalytic reduction</b>
PB	305-hp LNG Pump Engine B	1999	CPB	Non-selective catalytic reduction
PC	305-hp LNG Pump Engine C	1999	CPC	Non-selective catalytic reduction
PD	305-hp LNG Pump Engine D	1993	CPD	Non-selective catalytic reduction
PE	305-hp LNG Pump Engine E	1999	CPE	Non-selective catalytic reduction
PF	305-hp LNG Pump Engine F	1999	CPF	Non-selective catalytic reduction
BOA2	731-hp Boil-Off Gas Compressor Engine A	2004	BA2C	Non-selective catalytic reduction with air-fuel control
BOB2	731-hp Boil-Off Gas Compressor Engine B	2004	BB2C	Non-selective catalytic reduction with air-fuel control
BPD	740-hp Booster Pump Engine D	2013	BPDC	Non-selective catalytic reduction
BPE	740-hp Booster Pump Engine E	2013	BPEC	Non-selective catalytic reduction
BPF	740-hp Booster Pump Engine F	2013	BPFC	Non-selective catalytic reduction
VH7	48.4 MMBtu/hr Vaporizer Heater No. 7	1993	-	-
VH8	48.4 MMBtu/hr Vaporizer Heater No. 8	1993	-	-
VH9	73.9 MMBtu/hr Vaporizer Heater No. 9	2020	-	-
VH10	73.9 MMBtu/hr Vaporizer Heater No. 10	2020	-	-
VH11	73.9 MMBtu/hr Vaporizer Heater No. 11	2020	-	-
VH12	73.9 MMBtu/hr Vaporizer Heater No. 12	2020	-	-

RH3	14.0 MMBtu/hr Regeneration Heater No. 3	2010	-	-
EG1	755-hp Emergency Generator	2020	-	-
SB	1.7 MMBtu/hr Steam Boiler	1993	-	-
<b>GT1*</b>	<b>56.88 MMBtu/hr Generator Turbine</b>	<b>New</b>	-	-
<b>GT2*</b>	<b>56.88 MMBtu/hr Generator Turbine</b>	<b>New</b>	-	-

\*proposed within current application

### **Emissions Summary**

Emissions from the facility occur as a result of natural gas combustion from the fuel-burning equipment. These emissions were calculated using vendor data, permit limits, AP-42, U.S. EPA GHG Mandatory Reporting Rule, U.S. EPA emissions factor database for Reciprocating Internal Combustion Engines (RICE), and GRI-HAP Cal 3.0 field test data. Except when limited by the permit, annual potential emissions for all emission units assume continuous operation (8,760 hr/yr). SIP Application No. 28830 may be referenced for a detailed look at the emissions calculations for each emission unit.

#### **Facility-Wide Emissions** (in tons per year)

<b>Pollutant</b>	<b>Potential Emissions</b>			<b>Actual Emissions</b>		
	<b>Before Mod.</b>	<b>After Mod.</b>	<b>Emissions Change</b>	<b>Before Mod.</b>	<b>After Mod.</b>	<b>Emissions Change</b>
PM/PM <sub>10</sub> /PM <sub>2.5</sub>	1.63/3.70/3.70	2.58/6.99/6.99	0.95/3.29/3.29	--	--	--
NO <sub>x</sub>	34.4	52.4	18.0	--	--	--
SO <sub>2</sub>	0.15	1.84	1.69	--	--	--
CO	36.9	55.1	18.2	--	--	--
VOC	7.10	8.14	1.04	--	--	--
Max. Individual HAP	0.88	0.88	0.0	--	--	--
Total HAP	3.0	3.46	0.46	--	--	--
Total GHG (if applicable)	29,647	88,018	58,371	--	--	--

**Regulatory Applicability****40 CFR 60 Subpart GG – “Standards of Performance for Stationary Gas Turbines”**

Not applicable.

This rule applies to stationary gas turbines with heat input at peak load equal to or greater than 10 MMBtu per hour and commenced construction, modification, or reconstruction after October 3, 1977.

Electric Generator Turbines Nos. 1 and 2 (ID No. GT1 and GT2) will be constructed after October 3, 1977 and have a heat input greater than 10 MMBtu. However, they are subject to 40 CFR 60 Subpart KKKK and thus are not subject to this subpart.

**40 CFR 60 Subpart JJJJ – “Standards of Performance for Stationary Spark Ignition Internal Combustion Engines”**

Not applicable.

This subpart applies to owners and operators of SI ICE that commence construction after June 12, 2006 and manufactured after January 1, 2008.

LNG Pump Engine A1 (ID No. PA1) was constructed before June 12, 2006 and manufactured prior to July 1, 2008, and thus is not subject to this subpart.

**40 CFR 60 Subpart KKKK – “Standards of Performance for Stationary Combustion Turbines”**

Applicable to the electric generator turbines (ID No. GT1 and GT2).

This subpart applies to stationary combustion turbines with a heat input at peak load equal to or greater than 10 MMBtu/hr and commenced construction, modification, or reconstruction after February 18, 2005.

The electric generator turbines will be constructed after February 18, 2005 and have a heat input equal to or greater than 10 MMBtu/hr, and thus are subject to this subpart. The turbines are subject to a NO<sub>x</sub> emission limit as specified on Table 1 to this subpart and to either the SO<sub>2</sub> limit emission or the sulfur content limit. The turbines must be operated to minimize emissions at all times. Annual performance tests will be conducted to demonstrate continuous compliance. The frequency of subsequent performance tests may be changed if certain criteria is met.

**40 CFR 63 Subpart ZZZZ – “National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines”**

Applicable to LNG Pump Engine A1 (ID No. PA1).

This subpart applies to stationary reciprocating internal combustion engines (RICE) at a major or area source of HAP emissions.

LNG Pump Engine A1 is a stationary RICE located at an area source and thus subject to this subpart. It is considered *existing* because it was constructed before June 12, 2006 at an area source of HAP emissions. *Existing* stationary RICE must comply with the requirements in Table 2d to this subpart and operating

limitations of Table 2b to this subpart. There are no requirements applicable to the pump engine in Table 2b to Subpart ZZZZ. The engine must be operated according to the manufacturer's emission-related instructions. Idle time must be minimized. An oil program may be utilized to extend oil change requirements found in Table 2d to this subpart. Initial compliance is required according to Table 5 to this subpart. No requirements in Table 5 apply to the pump engine.

391-3-1-.02(2)(b) – “Visible Emission”

Applicable to the generator turbines (ID No. GT1 and GT2) and the pump engine (ID No. PA1).

This rule limits the opacity of visible emission from any air containment source to 40 percent unless another standard provides a more stringent limit. This rule applies to the entire facility, including the proposed generator turbines and pump engines.

391-3-1-.02(2)(g) – “Sulfur Dioxide”

This rule limits the sulfur content of all fuels combusted in fuel burning sources less than 100 MMBtu/hr in capacity to 2.5 percent by weight. The generator turbines and pump engine will fire natural gas and thus are subject to this subpart.

391-3-1-.02(2)(yy) – “Emissions of Nitrogen Oxides from Major Sources”

Not applicable.

This rule applies to any source that exceed 25 tons-per-year in a listed county. The facility is located in Clayton County, one of the listed counties, and thus is subject to this rule and RACT.

LNG Pump Engine A1 (ID No. PA1) has potential NO<sub>x</sub> emissions less than 1 tpy and the Electric Generator Turbines (ID Nos. GT1 and GT2) are subject to Rule (mmm) and thus the implementation of RACT is not required for these sources.

391-3-1-.02(2)(mmm) – “NO<sub>x</sub> Emissions from Stationary Gas Turbines and Stationary Engines used to Generate Electricity”

Applicable to the Electric Generator Turbines (ID No. GT1 and GT2).

This rule applies to stationary gas turbines and stationary engine that generate electricity whose capacity is greater than or equal to 100 kW and less than 25 MW. It applies to gas turbines installed or modified after October 1, 1999.

The electric generator turbines will have been installed or modified after October 1, 1999 and thus are subject to this rule. The turbines must comply with 30 ppm @ 15% O<sub>2</sub>, dry basis. This requirement applies during the period May 1 through September 30 of each year. LNG Pump Engine A1 (ID No. PA1) does not generate electricity and thus is not subject to this rule.

**Permit Conditions**

LNG Pump Engine A (ID No. PA) was removed from all conditions as it is no longer in operation. LNG Pump Engine A1 (ID No. PA) was added to all conditions applicable to the LNG Pump Engines. There are no other modifications to the conditions affecting the LNG Pump Engines (ID No. PB through PF and PA1).

Any unmentioned conditions were not modified and were not affected by the modifications in this application.

Condition 2.1 was not modified. It limits the opacity of gases with visible emissions, per Rule(b) to LNG Pump Engine A1 (ID No. PA1) and the Electric Generator Turbines (ID No. GT1 and GT2) as written.

Condition 2.2 was modified to remove LNG Pump Engine A (ID No. PA), add LNG Pump Engine A1 (ID No. PA1), and add the Electric Generator Turbines (ID No. GT1 and GT2). This condition limits the firing of any fuel other than natural gas.

Condition 2.4 was modified to remove LNG Pump Engine A (ID No. PA), add LNG Pump Engine A1 (ID No. PA1), and add the Electric Generator Turbines (ID No. GT1 and GT2) to the operating limits table.

Condition 2.12 was modified to remove LNG Pump Engine A (ID No. PA) and add LNG Pump Engine A1 (ID No. PA1). This condition establishes the applicability of 40 CFR 60 Subpart A and ZZZZ to the sources.

Condition 2.13 was modified to remove LNG Pump Engine A (ID No. PA) and add LNG Pump Engine A1 (ID No. PA1). This condition lists the management practice standards, per 40 CFR 60 Subpart ZZZZ.

Condition 2.15 was modified to remove LNG Pump Engine A (ID No. PA) and add LNG Pump Engine A1 (ID No. PA1). This condition requires the compliance to the applicable requirements at all times, the minimization of idle time, and the operation and maintenance of the engines to minimize emissions, per 40 CFR Subpart ZZZZ.

Condition 2.17 was modified to remove LNG Pump Engine A (ID No. PA) and add LNG Pump Engine A1 (ID No. PA1). This condition limits the hours of operation for the LNG Pump Engines to not exceed 100 tpy of NO<sub>x</sub> or VOC, originally as NA NSR Avoidance but also functions as Title V Avoidance in order to maintain the synthetic minor source status.

Condition 2.18 was modified to remove LNG Pump Engine A (ID No. PA) and add LNG Pump Engine A1 (ID No. PA1). This condition requires the facility to operate and maintain the LNG Pump Engines according to the engine manufacturer's instruction, per 40 CFR 60 Subpart ZZZZ.

Condition 2.19 was not modified. It permits the utilization of an oil analysis program to extend oil change requirements specified in Condition 2.13, per 40 CFR 60 Subpart ZZZZ.

Condition 2.28 is new to the permit and establishes the applicability of 40 CFR 60 Subpart A and KKKK to the electric generator turbines (ID Nos. GT1 and GT2).

Condition 2.29 is new to the permit and limits NO<sub>x</sub> emissions from the electric generator turbines (ID Nos. GT1 and GT2) to 25 ppmv @ 15% O<sub>2</sub>, per 40 CFR 60 Subpart KKKK.

Condition 2.30 is new to the permit and limits the sulfur content of natural gas combusted in the electric generator turbines (ID Nos. GT1 and GT2), per 40 CFR 60 Subpart KKKK.

Condition 2.31 is new to the permit and requires the facility to operate and maintain the electric generator turbines (ID Nos. GT1 and GT2) to minimize emissions at all times, per 40 CFR 60 Subpart KKKK.

Condition 2.32 is new to the permit and limits NO<sub>x</sub> emissions from the electric generator turbines (ID Nos. GT1 and GT2) to 30 ppmv @ 15% O<sub>2</sub> during the period of May 1 through September 30 of each year, per Rule (mmm). Condition 2.29 is more stringent and applies year-round.

Condition 5.2 was modified to remove LNG Pump Engine A (ID No. PA) and add LNG Pump Engine A1 (ID No. PA1). This condition requires a non-resettable hour meter to track hours of operation for the LNG Pump Engines.

Condition 5.8 is new to the permit and details the monitoring of NO<sub>x</sub> emissions from the electric generator turbines (ID Nos. GT1 and GT2) by performing a test measurement, per PTM 2.120 to satisfy Rule (mmm).

Condition 6.7 is new to the permit and requires annual performs tests to demonstrate continuous compliance with Condition 2.29, per 40 CFR 60 Subpart KKKK.

Condition 7.1 was modified to remove LNG Pump Engine A (ID No. PA) and add LNG Pump Engine A1 (ID No. PA1). This condition requires a report when the LNG Pump Engines (ID Nos. PB through PF and PA1) and the generators (ID Nos. G1 through G3) exceed 21.25 tpy.

Condition 7.2 was deleted. Annual emissions statements are no longer required.

Condition 7.3 was modified to remove LNG Pump Engine A (ID No. PA) and add LNG Pump Engine A1 (ID No. PA1). This condition requires the record of hours of operations for the LNG Pump Engines (ID Nos. PB through PF and PA1).

Condition 7.5 was modified to remove LNG Pump Engine A (ID No. PA) and add LNG Pump Engine A1 (ID No. PA1). This condition requires semiannual reports including hours of operation for each LNG Pump Engine.

Condition 7.12 was modified to remove LNG Pump Engine A (ID No. PA) and add LNG Pump Engine A1 (ID No. PA1). This condition requires the record of notification, malfunction, performance tests, maintenance, and corrective actions on the LNG Pump Engines (ID No. PB through PF and PA1).

Condition 7.14 was modified to remove LNG Pump Engine A (ID No. PA) and add LNG Pump Engine A1 (ID No. PA1). This condition requires the record of maintenance conducted on the LNG Pump Engines (ID Nos. PB through PF and PA1).

Condition 7.15 is new to the permit and requires notification of date of construction and actual startup of Electric Generator Turbines Nos. 1 and 2 (ID Nos. GT1 and GT2).

Condition 7.16 is new to the permit and requires a semiannual report of the fuel quality characteristics and representative fuel sampling data, per 40 CFR 60 Subpart KKKK.

### **Toxic Impact Assessment**

The Permittee included a toxic impact assessment (TIA) in Section 5 of Application 28830. Five toxic air pollutants (TAP) exceeded the Division's minimum emission rate (MER) and were included in the

modeling results. These TAPs are acrolein, benzene, 1,3-butadiene, ethylene dibromide, and formaldehyde. The AERMOD dispersion model was used in this TIA. The results of the TIA are summarized in the following table.

TAP	15-Minute		Annual	
	Max Impact ( $\mu\text{g}/\text{m}^3$ )	% of AAC	Max Impact ( $\mu\text{g}/\text{m}^3$ )	% of AAC
Acrolein	6.29	27.36%	7.99E-02	22.83%
Benzene	3.83	12.10%	2.53E-02	19.44%
1,3-butadiene	1.45	0.13%	1.84E-02	61.17%
Ethylene Dibromide	0.16	0.0007%	1.82E-03	10.90%
Formaldehyde	30.03	12.26%	6.60E-02	6.00%

The DMU conducted a modeling review of the TIA provided in the application. They concluded that all the maximum ground-level concentrations (MGLCs) for all TAPS were below the Acceptable Ambient Concentration (AAC).

### **Summary & Recommendations**

The facility proposes to install an LNG Pump Engine to replace an existing LNG Pump Engine and install two electric generator turbines. I recommend the issuance of Permit No. 4924-063-0083-S-05-1 to Atlanta Gas Light Company – Riverdale LNG Plant. The facility will remain a synthetic minor.

Public Advisory was issued on May 2, 2023 and expired on Jun 2, 2023. No comments were received by the Division.



**Addendum to Narrative**

The 30-day public review started on month day, year and ended on month day, year. Comments were/were not received by the Division.

//If comments were received, state the commenter, the date the comments were received in the above paragraph. All explanations of any changes should be addressed below.//