

**Queens Fresh Meadows
ASF Application
Application ID# 2-6306-00071/00004**

CLCPA Analysis

References:

- **NYSDEC NOIA Batch No. 748223 dated 6/8/2022**
- **NYSDEC E-mail dated 6/21/2022**
- **NYSDEC CP-49 / Climate Change and DEC Action**
- **NYSDEC DAR -21**

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INTRODUCTION

The Queens Fresh Meadows Facility [QFM], DEC ID# 2-6306-00071, currently operates it eight [8] boilers under a NYSDEC Air Title V permit [ATV], which expires 8/28/2022. The facility fires natural gas as its primary fuel with distillate #2-oil as a backup fuel. QFM has reviewed its annual fuel consumption for years 2011 through 2021. Based upon this review, it has been concluded that QFM qualifies to operate under an Air State Facility [ASF] permit instead of an ATV permit. QFM submitted an application for an ASF permit dated May 23, 2022.

In review of the ASF permit application, NYSDEC has issued a Notice of Incomplete Application [NOIA] dated June 8, 2022; and a clarification e-mail dated June 21, 2022. The NOIA with clarification demands that CLCPA¹ analysis be conducted and submitted to enable the application attain complete status. This document presents the CPCLA analysis for the QFM's ASF permit application.

6NYCRR Part 496 addresses Statewide Greenhouse Gas [GHG] emission limits. §496.4 (a) states the estimated level of statewide GHG emissions in 1990 as 409.48 million tons of carbon dioxide equivalent [CO_{2e}]. §496.4 (b) states the objective statewide GHG emission levels in years 2030 and 2050 as a percentage of the 1990 level, respectively, 60 percent and 15 percent; or 245.87 and 61.47 million tons of carbon dioxide equivalent [CO_{2e}].

NYSDEC DAR-21, Climate Leadership and Community Protection Act and Air Permit Applications [Draft] states that when issuing permits, Section 7 (2) of CLCPA requires all state agencies to consider “whether such decisions are inconsistent with, or will interfere with, the attainment of the statewide GHG emission limits...” It also states that:

- It is important that each CLCPA analysis include potential GHG emissions from each porting of the project.
- A permit renewal that does not include a significant modification and would not lead to an increase in actual or potential GHG emissions would in most circumstances be considered consistent with the CLCPA pending finalization of the scoping plan and future regulations.
- Calculations describing the project's direct GHG emissions on PTE and actual emissions bases, using appropriate emission factors such as those found in USEPA's AP-42, et cetera in units of CO_{2e} based on GWP-20 years are required.

¹ CLCPA – Climate Leadership and Community Protection Act

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PROJECT SCOPE

The project scope is solely an application to operate the QFM facility under an ASF permit instead of an ATV permit. The project scope does not include additional emission sources, changes to the existing emission sources in terms of capacity or types of fuel usage. The designation of emission units, emission sources and emission points for the ASF permit is identical to the designations in the ATV permit.

The project scope consists of opting out of the ATV permit in accordance with 6NYCRR Part 201-7.1, emission capping in facility permits. The project essentially is the commitment of the QFM facility to limit annual NOx emissions to less than or a maximum of 24.9 tons [49,800 lbs.].

CLCPA ANALYSIS

The current ATV permit is associated with a NOx PTE rate of 198,120 lbs./yr.². The above project action will reduce the NOx PTE rate to 49,800 lbs. /yr. Table 1 of the ASF application lists the eight boiler capacities – four boilers rated at 16.7 million Btu heat input per hour and four boilers rated at 23.4 million Btu heat input per hour. Table 1 also lists the facility’s annual fuel consumption for the years 2011 through 2021 with associated capacity factor. Table 7 of the ASF application lists the annual fuel consumption as recorded in therms for natural gas and gallons for #2 oil with the associated annual NOx emission rates in tons per year. Tables 1 and 7 are included with this analysis. As shown by these tables:

1. The maximum annual NOx emission rate for rate during this eleven-year period is 15.7 tons. The average annual NOx emission rate is 13.7 tons.
2. The highest capacity factor for firing natural gas during this eleven-year period is 21 percent.

Table 9 presents the calculation of GHG emission rates associated with this project [application for a ASF permit] relative to the GHG emission rates associated with the ATV permit.

Calculation #1:

The ATV PTE NOx emission limit is 198,120 lbs. per year as reported in NYSDEC’s ATV Permit Review Report page 6. Utilizing USEPA AP-42 emission factor [E.F.] for NOx emissions, 100 lbs. per million SCF NG³, limits the annual natural gas fuel consumption under ATV at 1981.2 million SCF.

² NYSDEC Permit Review Report ID:2-6306-00071/00003, dated 8/29/2017, page 6 of 17.

³ Standard Cubic Feet Natural Gas; EPA AP-42 Table 1.4-1 NOx emission factor for small boilers

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Calculation #2:

Utilizing the natural gas high heating value [NG HHV] of 1026 Btu per SCF NG and the maximum natural gas annual consumption from “calculation #1”, the total annual heat input is calculated at 2,032,711 million Btu. Utilizing the GHG emission factor for CO₂ for firing natural gas [kg CO₂ per million Btu] and converting from kg to pounds to metric tons, the annual GHG CO₂ emission rate is 107,856 metric tons [calculation 2.4]. The associated calculations for GHG CH₄ and N₂O are, respectively, 1 and 0.1 metric tons [calculations 2.5 and 2.6]. Utilizing the GWP-20 factors, the CO_{2e} for CO₂, CH₄, and N₂O emissions totals at 107,957 metric tons.

Calculation #1:

The ASF Permit PTE NOx emission limit is 49,800 lbs. per year as stated in NYSDEC’s Draft ASF Permit Working Copy dated 6/2/2022. Utilizing USEPA AP-42 emission factor [E.F.] for NOx emissions, 100 lbs. per million SCF NG⁴, limits the annual natural gas fuel consumption under ATV at 498 million SCF.

Calculation #2:

Utilizing the natural gas high heating value [NG HHV] of 1026 Btu per SCF NG and the maximum natural gas annual consumption from “calculation #1”, the total annual heat input is calculated at 510,948 million Btu. Utilizing the GHG emission factor for CO₂ for firing natural gas [kg CO₂ per million Btu] and converting from kg to pounds to metric tons, the annual GHG CO₂ emission rate is 27,111 metric tons [calculation 2.4]. The associated calculations for GHG CH₄ and N₂O are, respectively, 1 and 0.1 metric tons [calculations 2.5 and 2.6]. Utilizing the GWP-20 factors, the CO_{2e} for CO₂, CH₄, and N₂O emissions totals at 27,136 metric tons

The project [ASF Permit Application] is associated with a 75% reduction in PTE GHG emissions compared to renewing the current ATV permit.

The project GHG reduction, 75%, is almost twice NYS’s 40% reduction for year 2030 and is 10% less than NYS’s 85% reduction for year 2050.

The current ATV permit PTE GHG annual emission rate, 107957 metric tons, is 0.026% of NYS’s estimated GHG emissions for year 1990. The project’s [ASF permit application’s] PTE GHG annual rate, 27136 metric tons, is 0.011% of NYS’s objective annual GHG emission rate for year 2030.

Concerning year 2050, the boilers would be 50 years in operation. It is questionable if they would still be active.

⁴ Standard Cubic Feet Natural Gas; EPA AP-42 Table 1.4-1 NOx emission factor for small boilers

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The average actual GHG emissions for the eleven-year period is presented in Table 9A. It is about 52% of the project's PTE GHG CO_{2e} rate.

It is concluded that this project, ASF permit application instead of ATV permit renewal, is in alignment with NYS's CLCPA objectives.

Attachments:

Table 1 of ASP Permit Application – Combustion Equipment Ratings

Table 7 of ASP Permit Application – Actual Annual Fuel Consumption
Years 2011 – 2021

Table 9 – ASF Permit Application CLCPA Analysis GHG PTE Emission Rates

Table 9A – ASF Permit Application CLCPA Analysis GHG Actual Rates

**Table 9
Fresh Meadows
ASF Permit Application
CLCPA Analysis
GHG PTE Emission Rates**

Facility ID# 2-6306-00071/00003

1	Title V PTE NOx emission limit	lbs./yr	198120	Note 1	1	ASF Permit Appl. PTE NOx Limit	lbs./yr	49800	Note 1
1.1	NOx emission factor [EPA AP-42]	lbs./10 ⁶ SCF	100	Note 2	1.1	NOx emission factor [EPA AP-42]	lbs./10 ⁶ SCF	100	Note 2
1.2	Max. Nat'l Gas Annual consumption	10 ⁶ SCF /yr	1981.2		1.2	Max. Nat'l Gas Annual consumption	10 ⁶ SCF /yr	498	
2	GHG emissions annual rate				2	GHG emissions annual rate			
2.1	NG HHV	10 ⁶ Btu / scf	0.001026		2.1	NG HHV	10 ⁶ Btu / scf	0.001026	
2.2	NG Heat Input /yr	NG 10 ⁶ Btu/yr	2032711		2.2	NG Heat Input /yr	NG 10 ⁶ Btu/yr	510948	
2.3	E.F. CO ₂	kg CO ₂ per 10 ⁶ Btu	53.06	Note 3	2.3	E.F. CO ₂	kg CO ₂ per 10 ⁶ Btu	53.06	Note 3
2.4	CO ₂ Annual emission rate	kg CO ₂ per yr	107855656		2.4	CO ₂ Annual emission rate	kg CO ₂ per yr	27110901	
	kg to lbs.		2.2046			kg to lbs.		2.2046	
		lbs CO ₂ per yr	237778579.8				lbs CO ₂ per yr	59768692	
		lbs. to metric tons	2204.6				lbs. to metric tons	2204.6	
		metric tons CO ₂ per yr	107856				metric tons CO ₂ per yr	27111	
2.5	E.F. CH ₄	kg CH ₄ per 10 ⁶ Btu	0.001	Note 4	2.5	E.F. CH ₄	kg CH ₄ per 10 ⁶ Btu	0.001	Note 4
	CH ₄ Annual emission rate	kg CH ₄ per yr	2033			CH ₄ Annual emission rate	kg CH ₄ per yr	511	
		metric tons CH ₄ per yr	1				metric tons CH ₄ per yr	0.2	
2.6	E.F. N ₂ O	kg N ₂ O per 10 ⁶ Btu	0.0001	Note 4	2.6	E.F. N ₂ O	kg N ₂ O per 10 ⁶ Btu	0.0001	Note 4
	N ₂ O Annual emission rate	kg N ₂ O per yr	203.3			N ₂ O Annual emission rate	kg N ₂ O per yr	51.1	
		metric tons N ₂ O per yr	0.1				metric tons N ₂ O per yr	0.02	
2.7	Carbon dioxide equivalent value [CO _{2e}]				2.7	Carbon dioxide equivalent value [CO _{2e}]			
	GWP20			Note 5		GWP20			Note 5
	CO ₂		1			CO ₂		1	
	CH ₄		84			CH ₄		84	
	N ₂ O		264			N ₂ O		264	
	CO ₂	[CO _{2e}]	metric tons			CO ₂	[CO _{2e}]	metric tons	27111
	CH ₄	[CO _{2e}]	metric tons			CH ₄	[CO _{2e}]	metric tons	19
	N ₂ O	[CO _{2e}]	metric tons			N ₂ O	[CO _{2e}]	metric tons	6
	Total	[CO_{2e}]	metric tons			Total	[CO_{2e}]	metric tons	27136

GHG Emissions:		[CO_{2e}] metric tons
ATV Permit		107957
ASF Permit		27136
% Reduction - ASF Permit vs ATV Permit		-75%
1990 NYS		409480000
ATV Permit Percent		0.026%
2030 NYS		245870000
ASF Permit Percent		0.011%

- Notes:
- 1 NYSDEC ATV Permit Review Report page 6, or, NYSDEC Draft ASF Working Copy 6/2/2022; PC2
 - 2 EPA AP-42 Table 1.4-1 NOx Emission Factor, small boilers, uncontrolled
 - 3 40 CFR Part 98 Table C-1 updated 12/9/2016
 - 4 40 CFR Part 98 Table C-2 updated 12/9/2016
 - 5 NYSDEC Part 496.5

**Table 9A
Fresh Meadows
ASF Permit Application
CLCPA Analysis
GHG Average Actual Rate**

Facility ID# 2-6306-00071/00003

1	Title V PTE NOx emission limit	lbs./yr	198120	Note 1	1	ASF Permit Appl. PTE NOx Limit	lbs./yr	N. A.	Note 1
1.1	NOx emission factor [EPA AP-42]	lbs./10 ⁶ SCF	100	Note 2	1.1	NOx emission factor [EPA AP-42]	lbs./10 ⁶ SCF	100	Note 2
1.2	Max. Nat'l Gas Annual consumption	10 ⁶ SCF /yr	1981.2		1.2	Average Nat'l Gas Annual consumption - 2011-2021	10⁶ SCF /yr	258	Note 6
2	GHG emissions annual rate				2	GHG emissions annual rate			
2.1	NG HHV	10 ⁶ Btu / scf	0.001026		2.1	NG HHV	10 ⁶ Btu / scf	0.001026	
2.2	NG Heat Input /yr	NG 10 ⁶ Btu/yr	2032711		2.2	NG Heat Input /yr	NG 10 ⁶ Btu/yr	264853	
2.3	E.F. CO ₂	kg CO ₂ per 10 ⁶ Btu	53.06	Note 3	2.3	E.F. CO ₂	kg CO ₂ per 10 ⁶ Btu	53.06	Note 3
2.4	CO ₂ Annual emission rate	kg CO ₂ per yr	107855656		2.4	CO ₂ Annual emission rate	kg CO ₂ per yr	14053107	
	kg to lbs.		2.2046			kg to lbs.		2.2046	
		lbs CO ₂ per yr	237778579.8				lbs CO ₂ per yr	30981479	
		lbs. to metric tons	2204.6				lbs. to metric tons	2204.6	
		metric tons CO ₂ per yr	107856				metric tons CO ₂ per yr	14053	
2.5	E.F. CH ₄	kg CH ₄ per 10 ⁶ Btu	0.001	Note 4	2.5	E.F. CH ₄	kg CH ₄ per 10 ⁶ Btu	0.001	Note 4
	CH ₄ Annual emission rate	kg CH ₄ per yr	2033			CH ₄ Annual emission rate	kg CH ₄ per yr	265	
		metric tons CH ₄ per yr	1				metric tons CH ₄ per yr	0.1	
2.6	E.F. N ₂ O	kg N ₂ O per 10 ⁶ Btu	0.0001	Note 4	2.6	E.F. N ₂ O	kg N ₂ O per 10 ⁶ Btu	0.0001	Note 4
	N ₂ O Annual emission rate	kg N ₂ O per yr	203.3			N ₂ O Annual emission rate	kg N ₂ O per yr	26.5	
		metric tons N ₂ O per yr	0.1				metric tons N ₂ O per yr	0.01	
2.7	Carbon dioxide equivalent value [CO _{2e}]				2.7	Carbon dioxide equivalent value [CO _{2e}]			
	GWP20			Note 5		GWP20			Note 5
	CO ₂		1			CO ₂		1	
	CH ₄		84			CH ₄		84	
	N ₂ O		264			N ₂ O		264	
	CO ₂	[CO _{2e}]	metric tons			CO ₂	[CO _{2e}]	metric tons	14053
	CH ₄	[CO _{2e}]	metric tons			CH ₄	[CO _{2e}]	metric tons	10
	N ₂ O	[CO _{2e}]	metric tons			N ₂ O	[CO _{2e}]	metric tons	3
	Total	[CO_{2e}]	metric tons			Total	[CO_{2e}]	metric tons	14066

GHG Emissions:

ATV Permit	[CO_{2e}] metric tons	107957
ASF Permit		14066
% Reduction - ASF Permit vs ATV Permit		-87%
ASF Permit PTE		27136
ASF Permit Actual		14066
% Actual vs PTE		52%

Notes:

- 1 NYSDEC ATV Permit Review Report page 6, or, NYSDEC Draft ASF Working Copy 6/2/2022; PC2
- 2 EPA AP-42 Table 1.4-1 NOx Emission Factor, small boilers, uncontrolled
- 3 40 CFR Part 98 Table C-1 updated 12/9/2016
- 4 40 CFR Part 98 Table C-2 updated 12/9/2016
- 5 NYSDEC Part 496.5
- 6