

NARRATIVE

TO: Cynthia Dorrough

FROM: Jada Levers

DATE: February 11, 2025

Facility Name: **Microsoft Corporation – FTY01 Facility**
AIRS No.: 097-00097
Location: Douglasville, GA (Douglas County)
Application #: 29541
Date of Application: December 19, 2024

Background Information

Microsoft Corporation – FTY01 Facility was issued Permit No. 7376-097-0097-S-01-0 on October 13, 2022, to construct and operate twenty-one [21] emergency generators (GN1 through GN21). On June 28, 2024, Permit No. 7376-097-0097-S-0-1-1 was issued to the facility for the installation and operation of twenty-one [21] additional emergency generators at the building 2 expansion (GN22 through GN42).

The facility is located in Douglas County, which is designated an attainment area for all criteria air pollutants regulated under the National Ambient Air Quality Standards (NAAQS). The facility has a sitewide NO_x limit of 99 tons per year to limit the annual fuel usage and remain a synthetic minor source with respect to provisions of 391-3-1-.03(10)(b)1(i) which establishes the Title V major source threshold for each criteria pollutant as 100 tons per year.

Purpose of Application

Application No. 29541 was dated December 19, 2024, and received December 26, 2024, for the installation and operation of twenty [20] 3,000 kW emergency generators each with a rated capacity of 28.23 MMBtu/hr and one [1] 500 kW emergency generator with a rated capacity of 4.80 MMBtu/hr at the building 3 expansion (GN43 through GN63). The datacenter expansion will be located on the same property, adjacent to the previously permitted FTY01 datacenter and expansion. Appendix B of Application No. 29541 illustrates the location of the facility and the proposed site layout. Public Advisory was issued and expired on February 7, 2025, with no comments received by the Division.

Updated Equipment List

Table 1. Equipment List

Source Code	Input Heat Capacity (MMBtu/hr)	Description	Installation Date	Construction Date
Building 1				
GN1	4.80	500 kW Diesel-Fueled Emergency Generator	January 2023	August 2022

Source Code	Input Heat Capacity (MMBtu/hr)	Description	Installation Date	Construction Date
GN2 – GN21	28.23	3,000 kW Diesel-Fueled Emergency Generators	January 2023	August 2022
Building 2				
GN22	4.80	500 kW Diesel-Fueled Emergency Generator	2025	2025
GN23 – GN42	28.23	3,000 kW Diesel-Fueled Emergency Generators	2025	2025
Building 3				
GN43	4.80	500 kW Diesel-Fueled Emergency Generator	2026	2026
GN43 – GN63	28.23	3,000 kW Diesel-Fueled Emergency Generators	2026	2026

Emissions Summary

FTY01 Facility will continue to operate under a Synthetic Minor Permit. The facility will limit their annual fuel usage to ensure that NOx emissions stay below 99 tpy. Sitewide emission calculations are included in Appendix C of Application No. 29541. The facility would like to include Renewable Hydrocarbon Diesel as an alternative fuel for the expansion of the datacenter. Any Renewable Diesel used at the FTY01 Facility would meet ASTM D975, the same ASTM for traditional ULSD. The USLD emission rates were used as the worst-case scenario at the facility.

Emissions from the emergency generators were calculated using emission rates provided by the generator manufacturer, except for sulfur dioxide, which was calculated using the SO₂ emission rate from AP-42 Chapter 3.4 – “Large Stationary Diesel and All Stationary Dual-fuel Engines”.

The facility is proposing to track operational data (hours and load rate) measured and recorded to calculate monthly NOx emissions, each calendar month, from all emergency generators located onsite (buildings 1, 2, and 3). Monthly NOx emissions from fuel combustion at the facility shall be determined using the following equation:

$$\text{Monthly NOx emissions} \left(\frac{\text{tons}}{\text{month}} \right) = \frac{\sum_{i=0\%}^{100\%} \text{NOx emission rate at load} \left(\frac{\text{lb}}{\text{hr}} \right) \times \text{Monthly Hours of Operation for all Generators at Load} \left(\frac{\text{hrs}}{\text{month}} \right)}{2000 \left(\frac{\text{lb}}{\text{ton}} \right)}$$

Where i = the engine load during the run

The facility may only operate for up to 500 hours per year per Georgia Rule (mmm) and ensure NOx emissions remain under 99 tpy to avoid subjection to Title V requirements. For runs at 10%, 25%, 50%, 75% or 100% load, the NOx Emission Rate at Load will be equal to the corresponding emission rate in the table below. For runs at other loads, the NOx Emission Rate at Load will be equal to the emission rate listed in the table below that corresponds to the next highest load.

Table 2. NOx emission rates based on corresponding load.

Load Rate	10%	25%	50%	75%	100%
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Emission Rate for 500-kW Generator (lb/hr)	1.33	2.19	3.86	7.70	9.87
Emission Rate for 3,000-kW Generators using ULSD (lb/hr)	7.17	11.34	20.38	38.83	63.48

Emissions were calculated using emission rates provided by the generator manufacture for all criteria air pollutants, except for sulfur dioxide, which was calculated using emission factors from AP-42 Chapter 3.4 – “*Large Stationary Diesel and All Stationary Dual-fuel Engines*” for the 500-kW generator and emission testing data from another facility for the 3,000-kW generators. The manufacturer provided data is provided in Appendix D of Application No. 29541.

Emissions of toxic air pollutants (benzene, toluene, xylene, formaldehyde, acetaldehyde, acrolein, and naphthalene) from combustion in the emergency generators were also calculated using AP-42 Section 3.4 – “*Large Stationary Diesel and All Stationary Dual-Fuel Engines*”.

Facility-Wide Emissions

(in tons per year)

Pollutant	Potential Emissions			Actual Emissions		
	Before Mod.	After Mod.	Emissions Change	Before Mod.	After Mod.	Emissions Change
PM/PM ₁₀ /PM _{2.5}	13.46	20.20	+6.74	2.08	2.08	0
NO _x	639.62*	*959.42	+319.80	99*	99*	0
SO ₂	5.22E-01	7.83E-01	+2.61E-01	0.36*	0.36	0
CO	39.19	58.79	+19.60	6.07	6.07	0
VOC	15.07	22.61	+7.54	2.33	2.33	0
Max. Individual HAP	2.21E-01	3.31E-01	+1.10E-01	3.49E-02	3.49E-02	0
Total HAP	4.48E-01	6.72E-01	+2.24E-01	6.72E-02	6.72E-02	0
Total GHG (if applicable)	4.64E04	6.96E04	+2.32E04	7.20E03	7.20E03	0

Regulatory Applicability

Georgia Rule 391-3-1.02 (2)(b) – Visible Emissions

Rule (b) limits visible emissions from any air contaminant source to not exceed 40 percent opacity. Emergency generators (Source IDs: GN43-GN63) will be subject to this rule and the facility will comply with this limitation through the exclusive use of ultra-low sulfur diesel (ULSD) fuel and renewable diesel fuel in the proposed generator engines. The opacity standards of Georgia Rule (b) will be subsumed by Subpart III.

Georgia Rule 391-3-1.02 (2)(g) – Sulfur Dioxide

Rule (g) limits all fuel burning equipment below 100 MMBtu/hr to burn no more than 2.5% fuel sulfur, by weight. Emergency generators (Source IDs: GN43-GN63) will be subject to this rule and the facility will comply with this limitation through the exclusive use of ultra-low sulfur diesel (ULSD) fuel and renewable

diesel fuel in the proposed generator engines. The fuel sulfur standards of Georgia Rule (g) will be subsumed by Subpart IIII.

Georgia Rule 391-3-1.02 (2)(mmm) – NO_x emissions from Stationary Gas Turbines and Stationary Engines Used to Generate Electricity

Rule (mmm) limits NO_x emissions from any stationary engine used to generate electricity, whose capacity is greater than or equal to 100 kilowatts (kW) and is less than or equal to 25 megawatts (MW). Stationary engines at data centers that meet the criteria in 391-3-1-.02(2)(mmm)8 are not subject to the emission limits in this rule. Generators (Source IDs: GN1-GN63) will limit annual operation to less than 500 hours per year to maintain synthetic minor source status.

40 CFR 60 Subpart IIII – Standards of Performance for New Stationary Sources

Subpart IIII applies to manufacturers, owners, and operators of stationary compression ignition (CI) internal combustion engines (ICE) that commenced construction after July 11, 2005. Since the facility plans to commence construction of emergency generators (Source IDs: GN43-GN63) in the year 2025, they will be subject to the emission and operating limitations of this subpart.

40 CFR 63 Subpart ZZZZ – National Emission Standards for Hazardous Air Pollutants for Source Categories

Subpart ZZZZ establishes national emission limitations and operating limitations for hazardous air pollutants (HAP) emitted from stationary reciprocating internal combustion engines (RICE) located at major and area sources of HAP emissions. A stationary RICE is defined as any internal combustion engine which uses reciprocating motion to convert heat energy into mechanical work and which is not mobile. The facility is considered an area source of HAPs because potential HAP emissions are below 10 tpy for any individual HAP and below 25 tpy for combination of HAPs. Emergency generators (Source IDs: GN43-GN63) are considered new emergency stationary RICE under this subpart because a stationary RICE located at an area source of HAPs is considered new if construction of the stationary RICE commenced on or after June 12, 2006. Per 40 CFR 63.6590(c)(1), new emergency generators meet the requirements of Subpart ZZZZ by meeting the emission and operating limitations for stationary CI ICE in 40 CFR 60 Subpart IIII.

Permit Conditions

Condition No. 2.1 has been modified to include new emergency generators (Source IDs: GN43-GN63), in the opacity standards of 40 CFR 60 Subpart IIII and subsumed Georgia Rule (b).

Condition No. 2.3 has been modified to detail the operating standards of Subpart IIII and include new emergency generator (Source IDs: GN43-GN63).

Condition No. 2.4 has been modified to include new emergency generators (Source IDs: GN43-GN63) and establishes fuel sulfur limitations from Subpart IIII and subsume Georgia Rule (g).

Condition No. 2.5 has been modified to limit operational hours for all EGs, including new emergency generators (Source IDs: GN43-GN63), to 500 hours per year or less to be exempt from the NO_x emission standard per Georgia Rule (mmm).

Condition No. 2.6 has been modified to include new emergency generators (Source IDs: GN43-GN63) and establishes applicability for the RICE MACT (40 CFR 63 Subpart ZZZZ).

Condition No. 2.7 has been modified to include new emergency generators (Source IDs: GN43-GN63) and applicability to NSPS Subpart IIII.

Condition No. 5.2 contains maintenance and operational standards for the emergency generators and has been modified to include new emergency generators (Source IDs: GN43-GN63).

Condition No. 5.3 requires the Permittee to verify each shipment of diesel fuel oil received for combustion in the EG's complies with the requirements of Condition No. 2.8 and has been modified to include new emergency generators (Source IDs: GN43-GN63).

Condition No. 7.2 requires the Permittee to maintain monthly operating records for each emergency generator in both emergency and non-emergency service. This condition has been modified to include new emergency generators (Source IDs: GN43-GN63).

Condition No. 7.3 requires the Permittee to calculate the twelve-month rolling total of operating time for the emergency generators on a monthly basis, for each consecutive twelve-month period, and has been modified to include new emergency generators (Source IDs: GN43-GN63).

Condition No. 7.4 requires the Permittee to calculate the twelve-month rolling total of non-emergency service operating time for the emergency generators on a monthly basis, for each consecutive twelve-month period, and has been modified to include new emergency generators (Source IDs: GN43-GN63).

Condition No. 7.5 has been modified to include new emergency generators (Source IDs: GN43-GN63) when calculating and recording the monthly NOx emissions from fuel combustion.

Condition No. 7.6 has been modified to include new emergency generators (Source IDs: GN43-GN63) when calculating the 12-month rolling total of NOx emissions from all emergency generators to ensure NOx emissions do not equal or exceed 99 tpy.

Condition No. 7.7 requires the Permittee to demonstrate compliance with emission standards in 40 CFR 60 Subpart IIII and has been modified to include new emergency generators (Source IDs: GN43-GN63).

Condition No. 7.8 requires the Permittee to maintain a copy of the manufacturer's written operating and maintenance instructions or operating and maintenance procedures approved by the manufacturer for all emergency generators, including new emergency generators (Source IDs: GN43-GN63).

Condition No. 7.10 requires the Permittee to submit an annual report according to the requirements of 40 CFR 63.6650(h) and (i) if the Permittee operates the emergency generators according to Condition No. 2.3.c.i. This condition has been modified to include reference to 40 CFR 63.6650(i) and include new emergency generators (Source IDs: GN43-GN63).

Toxic Impact Assessment

The GEPD's Guideline for Ambient Impact Assessment of Toxic Air Pollutant Emissions (hereinafter referred to as "the Guideline") provides requirements for assessing the impacts of toxic air pollutant (TAP) emissions from a proposed project. If a facility's emissions of a specific TAP are less than the minimum emission rate (MER) provided for that TAP in Appendix A of the Guideline, no further analysis is required for that TAP. Otherwise, an air dispersion modeling analysis is required to demonstrate that the facility's emissions of that TAP will not exceed the acceptable ambient concentration (AAC) provided for that TAP

in Appendix A of the Guideline. A comparison of each potential TAP emission expected to be emitted by the Facility to the applicable MERs is provided in Table 3, which indicates that a Toxic Impact Assessment (TIA) was required only for benzene.

Table 3. Comparison of Facility-Wide TAP Emissions to Georgia MERs

Pollutants	Facility-Wide Potential Emissions (lb/yr)	Georgia MER (lb/yr)	Toxic Impact Analysis (TIA) Required?
Benzene	270.84	31.63	Yes
Toluene	98.07	1,216,650	No
Xylenes	67.36	24,333	No
Formaldehyde	27.54	267	No
Acetaldehyde	8.80	1,107	No
Acrolein	2.75	4.87	No
Naphthalene	45.37	729.99	No

A TIA was conducted for benzene using the USEPA's SCREEN3 modeling software (version 13043), which calculates maximum 1-hour average impacts. A model run was prepared for a single emergency generator engine from each group, based on the engine at the site in that group located nearest the fence line and an emission rate of 1 g/s for each engine.

Per Appendix A of the Guideline, benzene has both a short-term (i.e., 15-minute average) AAC and a long-term (i.e., annual average) AAC. As such, separate short-term and long-term modeled benzene emission rates were developed since the generators will not operate continuously throughout the year. The short-term average emission rate provided to the model was the maximum potential hourly emission rate for a single generator (lb/hr/gen). The long-term average emission rate was calculated based on the assumption that each generator will operate for a maximum of 200 hours per year using the following equation:

$$\text{Long - Term Modeled Emission Rate per generator} \left(\frac{\text{lb}}{\text{hr}} \right) = \frac{\text{Short - Term Emission Rate} \left(\frac{\text{lb}}{\text{hr - gen}} \right) \times 200 \left(\frac{\text{hr}}{\text{yr}} \right)}{8,760 \left(\frac{\text{hr}}{\text{yr}} \right)}$$

These calculated emission rates were converted from units of lb/hr to g/s for entry to the model. The maximum 1-hour average ambient impact attributable to the Facility was calculated for benzene using the single-generator 1-hour average concentration predicted by the model as follows:

$$\text{Facility - wide Maximum 1 hour impact} \left(\frac{\mu\text{g}}{\text{m}^3} \right) =$$

$$\text{Max. 1 - hr from a single generator at } 1_s \left(\frac{\mu\text{g}}{\text{m}^3} \right) \times \text{Number of generators} \times \text{Emission rate per generator} \left(\frac{\text{g}}{\text{s}} \right)$$

Maximum predicted 1-hour concentrations were developed for both the short-term and long-term averaging periods, and individual model runs were conducted for each Group of engine type, respectively. In accordance with the Guideline, the concentration predicted by the model for the short-term averaging period was summed for the two engine types and converted to a 15-minute average concentration by multiplying the 1-hour concentration by a factor of 1.32. A similar procedure was used for the long-term averaging period, except that a factor of 0.08 was used to convert the 1-hour average concentration to an annual average.

SCREEN3 modeling was performed for benzene to determine that the Maximum Ground-Level Concentration (MGLC) was less than the Acceptable Ambient Concentration (AAC). Further discussion for the Toxic Impact Analysis (TIA) is provided in Section 4.0 of Application No. 29541. The results of the TIA are presented in Table 4 below and demonstrate that the benzene impacts from the facility will be less than the AACs. Results and documentation for the TIA are also provided in Appendix E of Application No. 29541.

Table 4. Comparison of Modeled TAP Impacts with the AACs

Pollutant	Averaging Period	Modeled Impact (µg/m3)	AAC (µg/m3)	Exceeds AAC?
Benzene	15-minute	16.58	1,600	No
	Annual	0.02	0.13	No

Summary & Recommendations

Based on the above considerations, I recommend issuing Permit 7376-097-0097-S-01-2 to Microsoft Corporation – FTY01 Facility for the installation and operation of twenty-one [21] new emergency generators (Source IDs: GN43-GN63). The facility will maintain a synthetic minor source and the Mountain District (Atlanta) office will continue compliance responsibility and receiving report submittals.

Addendum to Narrative

The 30-day public review started on February 26, 2025 and ended on March 29, 2025. Comments were received by the Division.

Sierra Club Comments, Part One

Comments were received from the Sierra Club on behalf of itself, and it's 9,000 Georgia members. The first letter was received during the Public Advisory on February 7, 2025 and was signed by Isabella Ariza, Staff Attorney.

Please refer to Appendix A to view the entire comments. EPD will only address the comments relevant to the draft permit and application below.

Comment 1: The Application, if approved, will allow local air quality to be degraded.**EPD Response to Comment 1**

The Division regulates toxic air pollutant (TAP) emissions to protect public health under the provisions of Georgia Air Quality Rule 391-3-1-.02(2)(a)3(ii). Procedures governing the Division's review of TAP emissions as part of air permit reviews are contained in EPD's *Guideline for Ambient Impact Assessment of Toxic Air Pollutant Emissions*. The facility performed a Toxic Impact Analysis (TIA) assessment, and the results were well below the acceptable ambient concentrations (AACs); therefore, there is no concern with TAP emissions from the project.

The Division issues an enforceable permit that adheres to the requirements of the Clean Air Act, federal regulations, and Georgia air quality regulations to assure that the facility will maintain its emissions to the standards required by federal and state regulations, and which will protect public health and the environment.

Comment No. 2: Batteries are a better, cleaner alternative that should be considered before the Application is granted.**EPD Response to Comment 2**

The Division is responsible for protecting Georgia's air quality through the regulation of emissions from industrial and mobile sources according to state and federal regulations. The Division cannot dictate to the facility how to design or build the facility.

The Division believes that batteries alone are not yet a viable replacement for diesel generators. The facility must have an adequate footprint to install a battery. Batteries that remain fully charged waiting for an extended outage will result in accelerated degradation over time. It is complex and costly to maintain the grid infrastructure needed to charge these batteries after an extended outage while simultaneously powering a data center.

Comment No. 3: The Application should be considered in the larger context of Georgia's growing number of data centers.

EPD Response to Comment 3

The Division is aware of and monitoring the new developments in the Atlanta area. The Division required the performance of a TIA assessment of the project TAP emissions from the source. The applicant performed the TIA assessment, and the results were well below the AACs. The TIA analysis does not require a cumulative impact analysis. The Division issues enforceable air permits that adhere to the requirements of the Clean Air Act, federal regulations, and Georgia air quality regulations to ensure the facility will maintain its emissions to the standards required by federal and state regulations, and which will protect public health and the environment.

Sierra Club Comments, Part Two

Comments were received from the Sierra Club on behalf of itself, and it's 9,000 Georgia members. The second letter was received during the Draft Permit Public Notice on March 28, 2025, and was signed by Dori Jaffe, Managing Attorney.

Please refer to Appendix A to view the entire comments. EPD will only address the comments relevant to the draft permit and application below.

Comment No. 1: The Draft Permit fails to acknowledge or consider public comments.**EPD Response to Comment 1**

The Division experienced an issue resulting in a non-receipt of the letter dated February 7, 2025, that was sent at the end of the application public advisory period ending February 7, 2025, and thus the comments were erroneously noted as “no comments received” during the public advisory period in the narrative.

Comments from the public were also received during the draft public notice period ending March 28, 2025. The Division considers all public comments, and responses to the comments are addressed in the narrative addendum at the end of the public notice period. The Division addressed the Sierra Club comments submitted on the application during the public advisory period in “Part One” above.

Comment No. 2: The Draft Permit will allow local air quality to be degraded.**EPD Response to Comment 2**

The facility performed a Toxic Impact Analysis (TIA) assessment under the provisions of Georgia Air Quality Rule 391-3-1-.02(2)(a)3(ii) whereby the Division regulates the emissions of TAP to protect public health. The TIA assessment was performed and the results passed, therefore there is no concern with TAP emissions from the project.

The Division issues an enforceable permit that adheres to the requirements of the Clean Air Act, federal regulations, and Georgia air quality regulations to ensure that the facility will maintain its emissions to the standards required by federal and state regulations, and which will protect public health and the environment.

Comment No. 3: Batteries are a better, cleaner alternative that should be considered before the Draft Permit is issued.**EPD Response to Comment 3**

The Division cannot dictate how to design or build a facility. Additionally, the Division believes that batteries alone are not yet a viable replacement for diesel generators. The facility must have an adequate footprint to install a battery. Batteries that remain fully charged waiting for an extended outage will result in accelerated degradation over time. It is complex and costly to maintain the grid infrastructure needed to charge these batteries after an extended outage while simultaneously powering a data center.

Comment No. 4: In the alternative, the Draft Permit should require Microsoft to use diesel generators with the most stringent emissions control technology, as it has done in Virginia.

EPD Response to Comment 4

The Division cannot dictate to the facility how to design or build the facility but is responsible for protecting Georgia's air quality through the regulation of emissions from industrial and mobile sources according to State and Federal regulations.

Comment No. 5: The Draft Permit should be considered in the larger context of Georgia's growing number of data centers.

EPD Response to Comment 5

The Division is aware of and monitoring the new developments in the Atlanta area. Also, the Division requires the performance of a toxic impact analysis of the project to regulate toxic air pollutant (TAP) emissions from the source. The Division issues an enforceable permit that adheres to the requirements of the Clean Air Act, federal regulations, and Georgia air quality regulations to ensure that the facility will maintain its emissions to the standards required by federal and state regulations, and which will protect public health and the environment.

APPENDIX A

WRITTEN COMMENTS RECEIVED DURING COMMENT PERIOD