

## **NARRATIVE**

TO: Cynthia Dorrough

FROM: Jada Levers

DATE: March 20, 2025

Facility Name: **Microsoft Corporation – CCO06 Facility**  
AIRS No.: 121-00968  
Location: Palmetto, GA (Fulton County)  
Application #: 29582  
Date of Application: January 31, 2025

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### **Background Information**

Microsoft Corporation was issued Permit No. 7376-121-0968-S-01-0 on October 26, 2022, to install and operate twenty-one [21] emergency generators at CCO06 Facility, located at 0 Williams Road, Palmetto, Georgia 30268. Permit No 7376-121-0968-S-01-1 was issued on July 10, 2024, for the installation and operation of sixteen [16] additional 3,000 kW emergency generators each with a heat capacity of 28.23 MMBtu/hr and one [1] additional 500 kW emergency generator with a heat capacity of 4.80 MMBtu/hr. Each generator is diesel fueled with renewable hydrocarbon diesel used as an alternative fuel and provides backup power to servers and other electronic equipment in the event of a power outage in buildings 1 and 2.

The facility is located in Fulton County, which is in attainment status for all criteria air pollutants under the National Ambient Air Quality Standards (NAAQS). The facility has a sitewide NO<sub>x</sub> emission limit of 99 tons per year to limit the annual fuel usage and remains a synthetic minor source with respect to provisions of 391-3-1-.03(10)(b)1(i) until the startup of new emergency generators in buildings 3 through 5.

### **Purpose of Application**

Application No. 29582 was dated January 31, 2025, and received on February 3, 2025, requesting the installation and operation of eighty [80] 3,000 kW emergency generators each with a heat capacity of 28.22 MMBtu/hr and three [3] 500 kW emergency generator with a heat capacity of 4.66 MMBtu/hr. All generators will be diesel fueled with renewable hydrocarbon diesel used as an alternative fuel and they will provide backup power to servers and other electronic equipment in the event of a power outage in buildings 3 through 5. In this modification, the Permittee has also requested to limit facility wide NO<sub>x</sub> emissions from the CCO06 Facility to less than 249 tons per year. Data centers are not part of the 28 listed source categories where the PSD major source threshold is 100 tpy, therefore they have requested a NO<sub>x</sub> limit of 249 tons per year to remain a minor source under PSD. The 249 ton per year NO<sub>x</sub> limit however will make the CCO06 facility a major source under Title V. The public advisory expired on March 7, 2025, and comments from Sierra Club were received by the Division. Comments on the application received during the Public Advisory period were considered during the drafting of the permit and associated narrative.

## **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	2023	2023
GN2 – GN21	28.23	3,000 kW Diesel-Fueled Emergency Generators	2023	2023
Building 2				
GN22	4.80	500 kW Diesel-Fueled Emergency Generator	2025	2025
GN23 – GN38	28.23	3,000 kW Diesel-Fueled Emergency Generators	2025	2025
Building 3				
GN39	4.66	500 kW Diesel-Fueled Emergency Generator	2025	2025
GN40-GN59	28.22	3,000 kW Diesel-Fueled Emergency Generators	2025	2025
Building 4				
GN60	4.66	500 kW Diesel-Fueled Emergency Generator	2025	2025
GN61-GN90	28.22	3,000 kW Diesel-Fueled Emergency Generators	2025	2025
Building 5				
GN91	4.66	500 kW Diesel-Fueled Emergency Generator	2025	2025
GN92-121	28.22	3,000 kW Diesel-Fueled Emergency Generators	2025	2025

## **Emissions Summary**

The facility will limit their annual fuel usage to ensure that NO<sub>x</sub> emissions are below the PSD major source threshold. Sitewide emissions are included in Appendix C of Application No. 29582. The facility would like to include Renewable Hydrocarbon Diesel as an alternative fuel for the expansion of the datacenter. Testing data from another Microsoft data center shows that Renewable Hydrocarbon Diesel has lower emission rates than ultra-low sulfur diesel (ULSD) at worst-case emission rates based on manufacturer data. Therefore, the USLD emission rates were used as the worst-case scenario at the facility.

The facility is proposing to track operational data (hours and load rate) measured and recorded to calculate monthly NO<sub>x</sub> emissions, each calendar month, from all emergency generators located onsite (buildings 1 and 2). Monthly NO<sub>x</sub> emissions from fuel combustion at the facility shall be determined using the following equation:

$$\text{Monthly NO}_x \text{ emissions } \left( \frac{\text{tons}}{\text{month}} \right) = \frac{\sum_{i=0\%}^{100\%} \text{NO}_x \text{ emission rate at load } \left( \frac{\text{lb}}{\text{hr}} \right) \times \text{Monthly Hours of Operation for all Generators at Load } \left( \frac{\text{hrs}}{\text{month}} \right)}{2000 \left( \frac{\text{lb}}{\text{ton}} \right)}$$

Where  $i$  = the engine load during the run

With the addition of emergency generators, the facility is still required to comply with the criteria in Georgia Rule (mmm)8 in order to avoid being subject to the NO<sub>x</sub> standard of 80 ppm @ 15% O<sub>2</sub>.

In order to ensure NO<sub>x</sub> emissions remain under 249 tpy to avoid subsection to PSD, the facility will be calculating NO<sub>x</sub> emissions based on corresponding operating and also maintaining a 12 month rolling total for NO<sub>x</sub> emissions. For runs at 10%, 25%, 50%, 75% or 100% load, the NO<sub>x</sub> Emission Rate at Load will be equal to the corresponding emission rate in the table below. For runs at other loads, the NO<sub>x</sub> 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. NO<sub>x</sub> emission rates based on corresponding load.

Load Rate	10%	25%	50%	75%	100%
Emission Rate for 500-kW Generator (lb/hr)	1.23	2.07	3.68	7.15	9.71
Emission Rate for 3,000-kW Generators using ULSD (lb/hr)	6.84	10.78	19.42	36.98	60.47

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. 29582.

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 <sub>10</sub> /PM <sub>2.5</sub>	9.61	12.37	+2.76	1.73	4.36	+3.63
NO <sub>x</sub>	549.08	706.30	+157.22	99*	249*	+150
SO <sub>2</sub>	2.07	2.67	+0.60	0.37	0.94	+0.57
CO	35.05	44.83	+9.78	6.32	15.80	+9.48
VOC	13.55	17.43	+3.88	2.44	6.15	+3.71
Max. Individual HAP	0.20	2.56E-01	5.60E-02	3.59E-02	9.02E-02	4.43E-02
Total HAP	0.38	4.92E-01	1.12E-01	6.90E-02	1.73E-01	1.66E-01
Total GHG (if applicable)	4.18E04	4.88E04	7.00E03	7.02E03	1.72E04	1.02E04

**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: GN1-GN121) 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: GN1-GN121) 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 III.

**Georgia Rule 391-3-1.02 (2)(mmm) – NO<sub>x</sub> emissions from Stationary Gas Turbines and Stationary Engines Used to Generate Electricity**

Rule (mmm) limits NO<sub>x</sub> 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-GN121) will limit annual operation to less than 500 hours per year per engine to maintain synthetic minor source status and to avoid being subject to the emission standard outlined in Georgia Rule (mmm)1.

**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: GN1-GN121) 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: GN1-GN121) 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 2.1 requires the Permittee to limit the opacity of visible emissions to 20% during acceleration mode, 15% during lugging mode, and 50% during peaks in either acceleration or lugging modes from emergency generators (Source IDs: GN1-GN121).

Condition 2.2 requires the Permittee to limit NO<sub>x</sub> emissions into the atmosphere to 249 tpy.

Condition 2.3 establishes operating standards and limitations for emergency generators (Source IDs: GN1-GN121) subject to 40 CFR 60 Subpart IIII.

Condition 2.4 establishes fuel sulfur limitations from 40 CFR 60 Subpart IIII and subsumed from Georgia Rule (g) in emergency generators (Source IDs: GN1-GN121).

Condition 2.5 outlines the criteria for emergency generators (Source IDs: GN1-GN121) at data centers to operate to be exempt from the NO<sub>x</sub> emission standard per Georgia Rule (mmm) during ozone season. In the event the engine(s) do not meet the criteria, they are subject to the NO<sub>x</sub> emission standard outlined in Georgia Rule (mmm).

Condition 2.6 requires the Permittee to comply with 40 CFR 60 Subpart A and 40 CFR 63 Subpart ZZZZ for internal combustion engines (Source IDs: GN1-GN121).

Condition 2.7 requires the Permittee to comply with 40 CFR 60 Subpart A and 40 CFR 60 Subpart IIII for the internal combustion engines (Source IDs: GN1-GN121).

Condition No. 2.8 requires the Permittee to use diesel fuel oil in all emergency generators and establishes ASTM D975-24 fuel standards for the diesel fuel used for combustion.

Condition 3.1 requires the Permittee comply with precautions to prevent fugitive emissions of air contaminants.

Condition 4.1 requires the Permittee to operate the emergency generators according to the manufacturer specifications.

Condition 5.1 establishes hours and load monitoring requirements for emergency generators (Source IDs: GN1-GN121).

Condition 5.2 requires the Permittee to operate and maintain emergency generators (Source IDs: GN1-GN121), including air pollution control and monitoring equipment in accordance with 40 CFR 63.6605(b).

Condition 5.3 requires the Permittee to verify each shipment of diesel fuel oil received for combustion in each emergency generator (Source IDs: GN1-GN121) complies with the requirements of Condition No. 2.8.

Condition 6.1 requires the Permittee to conduct a performance test at any specified emission point when directed by the Division.

Condition 7.1 requires the Permittee to maintain monthly operating records for each emergency generator (Source IDs: GN1-GN121) in emergency and non-emergency service.

Condition 7.2 requires the Permittee calculate monthly the twelve-month rolling total of operating time for each of the emergency generators (Source IDs: GN1-GN121) and notify the Division if operating hours exceed 500 hours during a 12 consecutive month period.

Condition 7.3 requires the Permittee to calculate monthly the twelve-month rolling total of the non-emergency service operating time for the generators (Source IDs: GN1-GN121).

Condition 7.4 provides the equation to calculate the monthly total NO<sub>x</sub> emissions and requires the Permittee to notify the Division in writing if the monthly total NO<sub>x</sub> emissions equal or exceed **20.75** tons during any calendar month.

Condition 7.5 requires the Permittee to use monthly records to calculate the twelve-month rolling total of NO<sub>x</sub> emissions from generators (Source IDs: GN1-GN121) for each calendar month. The Division should be notified if any of the twelve-month rolling totals of the NO<sub>x</sub> emissions equals or exceeds **249** tons.

Condition 7.6 requires the Permittee to demonstrate compliance with emission standards in 40 CFR 60 Subpart IIII for emergency generators (Source IDs: GN1-GN121) by purchasing an engine certified to the emission standards of 40 CFR 60.4205(b).

Condition 7.7 requires the Permittee to maintain a copy of the manufacturer's written operating and maintenance instructions for emergency generators (Source IDs: GN1-GN121) per 40 CFR 60 Subpart IIII.

Condition 7.8 requires the Permittee to keep records verifying that the fuel oil received complies with Condition 2.4.

Condition 7.9 requires the Permittee to submit an annual report according to the requirements of 40 CFR 63.6650(h) if the Permittee operates the emergency generators (Source IDs: GN1-GN121) according to Condition No. 2.3.c.i.

Condition 8.1 establishes the Division reserves the right to amend the provisions of this Permit pursuant to the Division's authority as established in the Georgia Air Quality Act and the rules adopted pursuant to this Act.

Condition 8.2 requires the Permittee calculate and pay an annual Permit fee to the Division in accordance with the “Procedures for Calculating Air Permit Application & Annual Permit Fees.”

Condition 8.3 requires the Permittee to submit a Title V permit application within 12 months of startup of emergency generators (Source Codes: GN39 through GN121)

Condition 8.4 revokes all permits and associated permit amendments previously issued to facility.

### **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 and acrolein.

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	511.70	31.63	Yes
Toluene	185.29	1,216,650	No
Xylenes	127.27	24,333	No
Formaldehyde	52.03	267	No
Acetaldehyde	16.62	1,107	No
Acrolein	5.20	4.87	Yes
Naphthalene	85.72	729.99	No

A TIA was conducted for benzene and acrolein 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 and acrolein each have 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 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:

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

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 and acrolein using the single-generator 1-hour average concentration predicted by the model as follows:

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

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 and acrolein 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. 29582. The results of the TIA are presented in Table 4 below and demonstrate that benzene and acrolein 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. 29582.

*Table 4. Comparison of Modeled TAP Impacts with the AACs*

<b>Pollutant</b>	<b>Averaging Period</b>	<b>Modeled Impact (µg/m3)</b>	<b>AAC (µg/m3)</b>	<b>Exceeds AAC?</b>
Benzene	15-minute	41.94	1,600	No
	Annual	0.06	0.13	No
Acrolein	15-minute	0.43	23	No
	Annual	5.89E-04	0.02	No

### **Summary & Recommendations**

Based on the above considerations, I recommend issuing Permit 7376- 121-0968-E-02-0 for the installation and operation of one hundred and sixteen [116] 3,000 kW emergency generators and five [5] 500 kW emergency generators at CCO06 Facility, Buildings 1 through 5. The facility is a synthetic minor source for PSD (40 CFR 52.21) but will become a major source under Title V (40 CFR 70) and are required to submit an initial Title V Permit application within 12 months of the startup of generators (Source Codes: GN39 through GN121). The Mountain District (Atlanta) office will continue compliance responsibility and receiving report submittals.



**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.//