Technical Support Document
Notice of Construction Approval Order No. Preliminary Determination
Microsoft Corporation – Columbia Data Center
AQPID No. A0250278
Quincy, WA

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1. Project Summary

Microsoft Corporation – Columbia Data Center (the source) is a data center classified as a synthetic minor source for nitrogen oxides with multiple existing emissions units. This review is for updates to approval conditions to allow for five generators to operate at one time during bypass for four hours a day and update language to add more flexibility to run the generators less often and emit less emissions if an average load rate is not reached over a year. Tier 4 Nonroad engines modeling was also evaluated with this project. Nonroad engines are exempt from New Source Review and follow WAC 173-400-035. Nonroad engines will only be used for temporary replacement of an existing engine that needs repair or replacement.

An initial Notice of Construction (NOC) application was submitted on July 26, 2023, by Microsoft Corporation – Columbia Data Center for the Approval Order Update project. The Washington State Department of Ecology (Ecology) reviewed the initial application and found it incomplete per Washington Administrative Code (WAC) 173-400-111 on August 25, 2023. Amended NOC applications were received by Ecology on September 19, 2023, through October 1, 2024, and found to be complete on October 24, 2024.

2. Application Processing

a. Public Notice

Due to anticipated public interest, Ecology scheduled a 30-day comment period December 30, 2024, through February 3, 2025. Legal notices were posted in English and Spanish on Ecology's website and The Quincy Valley Post Register. Response to comments is attached as appendix B.

Resources used to determine outreach:

Environmental Protection Agency: EJScreen (epa.gov)

Department Of Health Disparities map: Information by Location | Washington Tracking Network (WTN)

Washington GIS map: Limited English Proficiency Application (arcgis.com)

b. State Environmental Policy Act (SEPA)

City of Quincy issued a determination of nonsignificance (DNS) on September 15, 2021.

3. Applicable Regulations

a. State Regulations

i. Minor New Source Review Applicability

Per WAC 173-400-110, an NOC application and an order of approval must be issued by the permitting authority prior to the establishment of a new source or modification.

As stated in the NOC application and consistent with Ecology's review, the project proposes changes to approval conditions and increase in short term emissions from five generators running in bypass mode for four hours versus what was previously permitted of two generators running in bypass mode for 44 hours. These project changes are not subject to minor new source review (NSR). However, modeling of the short-term emission changes has been completed to show compliance with the National Ambient Air Quality Standards. Modeling is also required for the Nonroad engines as their total capacity is over 2000 bhp. Nonroad engines are not subject to New Source Review but do follow requirements of WAC 173-400-035.

A. Actual Emissions

The actual emissions from the bypass project over short-term averaging periods are shown below in Tables 1 and 2 and emissions from nonroad engines are included in Table 1. Annual emissions did not increase for the bypass project as there were no increases to fuel or hourly limits for the permitted generators. The Tier 4 nonroad engines are exempt from toxic air pollutant review per WAC 173-400-035(2)(d).

Table 1. Actual emissions increase for pollutants pounds per averaging period

Pollutant	Bypass project Emissions (pounds/Ave Period)	Emissions from Nonroad engines (pounds/Ave Period)	NAAQS Averaging Period
Carbon Monoxide (CO)	62.32	6.4	8-hour
CO	15.58	0.80	1-hour
Nitrogen dioxides (NO_2)	--	84	Annual
NO_2	15.7	1.76	1-hour
Particulate Matter, PM_{10}	28.76	13.92	24-hour
$PM_{2.5}$	--	58	Annual

Pollutant	Bypass project Emissions (pounds/Ave Period)	Emissions from Nonroad engines (pounds/Ave Period)	NAAQS Averaging Period
$PM_{2.5}$	28.76	13.92	24-hour
Sulfur Dioxide (SO_2)	0.54	0.153	3-hour
SO_2	0.18	0.051	1-hour

Table 2. Actual Toxic Air Pollutant (TAP) emissions increase and de minimis emission values

Pollutant	bypass Emissions Project	De Minimis Emission Values	Averaging Period
CO	**15.58**	1.10	1-hour
SO_2	0.18	0.46	1-hour
NO_2	**15.67**	0.46	1-hour
Acrolein	**9.4E-02**	1.3E-03	24-hour
Chlorobenzene	5.54E-04	3.70	24-hour
n-Hexane	7.46E-02	2.60	24-hour
Hydrogen chloride	**0.52**	3.3E-02	24-hour
Manganese and compounds	**8.59E-03**	1.1E-03	24-hour
Mercury, elemental	**5.54E-03**	1.1E-04	24-hour
Propylene	1.29	11.00	24-hour
Selenium and compounds	6.10E-03	7.4E-02	24-hour
Toluene	0.29	19.00	24-hour
Xylenes	0.12	0.82	24-hour

ii. Prevention of Significant Deterioration (PSD)

PSD does not apply, based on allowable emissions.

iii. Other Applicable Requirements

In accordance with WAC 173-400-113, the generator emission sources must comply with all applicable emission standards adopted under Chapter 70A.15 RCW. The following applicable emission standards are associated with the proposed project:

A. WAC 173-400-040 General standards for maximum emissions: limits visible emissions from all sources to no more than three minutes of 20 percent opacity, in an hour, of an air contaminant from any emission unit.

B. WAC 173-400-050 and -060 Emission standards for combustion and incineration units and general process units: limits emissions of particulate matter from combustion and general process units to 0.23 gram per dry cubic

meter at standard conditions (0.10 grains per dry standard cubic foot) of exhaust gas.

C. WAC 173-400-115 Standards of performance for new sources: adopts by reference 40 C.F.R. Part 60, Subpart IIII. See more below.

b. Federal Regulations

In accordance with WAC 173-400-113, the generator emission sources must comply with all applicable new source performance standards (NSPS) included in 40 C.F.R. Part 60, national emission standards for hazardous air pollutants (NESHAPs) included in 40 C.F.R. Part 61, and NESHAPs for source categories included in 40 C.F.R. Part 63. The following applicable emission standards are associated with the proposed project:

i. Standards of Performance for New Stationary Sources

The ICE NSPS (40 C.F.R. Part 60, Subpart IIII) applies to each emergency generator. The regulation specifies: criteria for classification as emergency engines, Tier-2 or Tier 3 emission standards for the engines, depending on the power rating; and fuel, monitoring, compliance, and notification requirements for the Permittee.

ii. National Emission Standards for Hazardous Air Pollutants for Source Categories

The RICE NESHAP applies to each engine. However, each engine is also subject to the ICE NSPS (see above). At 40 C.F.R. 63.6590(c), the NESHAP specifies that compliance must be met by meeting the requirements of the NSPS; therefore no further requirements apply to the engines.

4. Emissions

a. Emission Factors

Emission factors for the emergency generator engines were provided as Not-to-Exceed-Limits by the manufacturer Caterpillar for NOx, CO, PM, hydrocarbons (HC). The following was assumed for the emergency generators:

i. HCs were assumed to be equivalent to VOC and non-methane HC.

ii. The sum of PM and HC (assumed to all condense) and be equivalent PM_{10} and $PM_{2.5}$ for the engines.

The emission factor for SO_2 was calculated based on sulfur content of the ultra-low sulfur fuel and an average heating value of diesel fuel. All sulfur was assumed to convert to SO_2.

An additional factor was added for cold-start emissions (PM, CO, total VOC, and volatile TAPs). These factors are based on short-term concentration trends for VOC and CO emissions observed immediately after startup of a large diesel backup generator. These

observations were documented in the California Energy Commission's report "Air Quality Implications of Backup Generators in California" (Lents et al. 2005).

All the remaining emission rates for toxic air pollutants from the generators were calculated using emission factors from the most conservative of Ventura County Air Pollution Control District AB 2588 Diesel Internal Combustion Factors and California Air Toxics Emission Factor (CATEF) database for ICE, diesel engines.

b. The table below presents the potential emissions and allowable emissions for entire facility. The facility is a synthetic minor for Nitrogen Oxides.

Table 3. Potential and Allowable Emissions for Total Source

Pollutant	Total Source Potential Emissions (tons/year)	Total Source Allowable Emissions (tons/year)
Carbon Monoxide (CO)	33.98	6.49
Nitrogen Oxides (NO_X)	213.94	37.60
PM_{10}	18.92	14.29
$PM_{2.5}$	15.42	6.49
Total Suspended Particulates (TSP)	26.72	14.29
Sulfur Dioxide (SO_2)	0.28	0.05
Volatile Organic Compounds, total (VOC)	12.29	2.42
Greenhouse Gases (GHG)	44,326	8,889

5. Ambient Air Quality Standards

As specified in WAC 173-400-113, the proposed new or modified source(s) must not cause or contribute to a violation of any ambient air quality standard. This includes the ambient air quality standards for both criteria and toxic air pollutants.

a. Pollutants Listed Under WAC 173-400-110 (Except TAPs)

For NO_2, CO, PM_{10}, $PM_{2.5}$, and SO_2, modeling was performed to satisfy the requirements of Chapter 173-400-113(3) WAC and 173-400-035 WAC. The modeling demonstrates that the emissions increase as a result of the bypass condition project and the nonroad engines will not exceed the ambient air quality standards. The modeling results are included in the table below.

Table 4. Criteria Pollutant Modeling Results

Criteria Pollutant	Averaging Period	Maximum Modeled Concentration with background (µg/m³)	Ambient Air Quality Standard (µg/m³)
NO_2	Annual	6.8	100
NO_2	1-hour	186.52	188
CO	8-hour	1,373	10,800
CO	1-hour	1,008	40,000
PM_{10}	24-hour	79.5	150
$PM_{2.5}$	Annual	5.81	9
$PM_{2.5}$	24-hour	31.0	35
SO_2	3-hour	8.33	1,308
SO_2	1-hour	15.6	196

b. Toxic Air Pollutants (TAPs)

In accordance with WAC 173-460-040, TAP sources must meet the requirements of Chapter 173-460 WAC, unless they are exempt by WAC 173-400-110(5).

As shown in Table 5, modeling was required for short term emissions for the bypass condition changes. As such, the emission units must comply with WAC 173-460-070 (ambient impact requirement). The nonroad engines are exempt from TAP review per WAC 173-400-035(2)(d). The source may demonstrate compliance with the ambient impact requirement by either showing that the emissions increase is less than the small quantity emissions rates (SQER) or through dispersion modeling. The table below includes the estimated emissions increases associated with the bypass project and the applicable SQER.

Table 5. TAP Analysis

TAP	Estimated Increase	SQER	Modeling Required?
CO	15.58	43.0	No
NO_2	15.67	0.87	Yes
Acrolein	9.4E0-2	2.6E-02	Yes
Hydrogen chloride	0.52	0.67	No
Manganese and Compounds	8.59E-03	2.2E-02	No
Mercury, elemental	5.54E-03	2.2E-03	Yes

For the TAPs in Table 5 that require modeling, modeling was performed to satisfy the requirements of Washington's state toxics rule in Chapter 173-460 WAC. The modeling demonstrates that the emissions increases as a result of the project will not exceed the

acceptable source impact level (ASIL) screening thresholds. The modeling results are included in the table below.

Table 6. TAP Modeling Results

TAP	Averaging Period	Maximum Modeled Concentration (µg/m^3)	ASIL (µg/m^3)	Percent of ASIL
NO_2	1-hour	184.6	470	39%
Acrolein	24-hour	0.03	0.35	9%
Mercury, elemental	24-hour	0.002	0.03	7%

Appendix A – Federal Rule Applicability

1. 40 C.F.R. Part 60, Subpart IIII

The ICE NSPS (40 C.F.R. Part 60, Subpart IIII) applies to each engine. The applicable portions the rule appear to be:

Citation	Subject	Notes
60.4202(a)(2)	Manufacturer emission standards	Specifies that 2007 model year and later emergency stationary CI ICE with a maximum engine power ≥37 kW and ≤2,237 KW be certified to the emission standards specified in 40 C.F.R. 1039, Appendix I.
60.4205(b)	Owner/Operator emission standards	Directs owners and operators of 2007 model year and later emergency stationary CI ICE to comply with the emission standards for new nonroad CI engines in §60.4202.
60.4209(a)	Owner/Operator monitoring requirements	Requires installation install a non-resettable hour meter prior to startup of each engine, since the engines do not meet the standards applicable to non-emergency engines.
Table 8 to Subpart IIII of Part 60	Applicability of General Provisions to Subpart IIII	The table lists what portions of 40 C.F.R. 60 Subpart I are applicable, including notification and recordkeeping requirements.

2. 40 C.F.R. Part 63, Subpart ZZZZ

The RICE NESHAP applies to each engine. Condition 1 of the Order requires general compliance with this regulation. However, each engine is also subject to the ICE NSPS (see above). At 40 C.F.R. 63.6590(c), the NESHAP specifies that compliance must be met by meeting the requirements of the NSPS; therefore, no further requirements apply to the engines.

Appendix B – Response to Comments

This section will be updated following the public comment period.