STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
Eastern Region Office
4601 North Monroe St., Spokane, WA 99205-1295 • 509-329-3400

September 27, 2022

Hichem Garnaoui
Campus Director
Microsoft Corporation
Columbia Data Center
501 Port Industrial Parkway,
Quincy, WA 98848

Re: Microsoft Columbia Data Center
Approval Order No. 22AQ-E006
AQPID No. A0250278

Dear Hichem Garnaoui:

The Department of Ecology's Air Quality Program (Ecology) approves the installation of six new emergency backup engines at Microsoft Columbia Data Center. The Data Center is located at 501 Port Industrial Parkway, Quincy, Washington in Grant County.

Ecology's approval is based on the Notice of Construction application and supplemental information submitted on October 7, 2021 through April 8, 2022. The 30-day comment period required per Washington Administrative Code (WAC) 173-400-171, was completed. Comments were received and are included in Appendix B of the Technical Support Document.

Enclosed is Approval Order No. 22AQ-E006 for Microsoft Columbia Data Center.

Thank you for your patience while we processed your application. If you have any questions, please contact me at jenny.filipy@ecy.wa.gov or 509-405-2487.

Sincerely,

Jenny Filipy, P.E.
Commercial/Industrial Unit
Regional Air Quality Program

JF:sg

Enclosures: Approval Order No. 22AQ-E006
Technical Support Document

Certified Mail: 7019 0140 0000 6495 6453

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STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

In the matter of approving a new	)	**Approval Order No. 22AQ-E006**
AIR CONTAMINANT SOURCE for	)	AQPID No. A0250278
MICROSOFT CORPORATION	)	
COLUMBIA DATA CENTER	)	

Project Summary

Microsoft Corporation – Columbia Data Center, herein referred to as the Permittee, is an existing data center located at 501 Port Industrial Parkway, Quincy, Washington, in Grant County.

The Permittee is classified as a Synthetic Minor source.

Equipment

1. A list of equipment that was evaluated for this order of approval is contained in Tables 1.a through 1.c**.**

Table 1.a: Engine & Generator Serial Numbers

Phase	Unit ID	Engine SN	Generator SN	Build date
CO1/1	1	SBK000170	G4B00130	8/14/2006
"	2	SBK000179	G4B00132	8/25/2006
"	3	SBK000169	G4B00128	8/10/2006
"	4	SBK000181	G4B00133	8/28/2006
"	5	SBK000176	G4B00131	8/25/2006
"	6	SBK000168	G4B00129	8/10/2006
"	7	SBK000160	G4B00125	7/21/2006
"	8	SBK000159	G4B00127	7/19/2006
"	9	SBK000162	G4B00126	7/24/2006
"	10	SBK000158	G4B00124	7/19/2006
"	11	SBK000172	G4B00113	8/18/2006
"	12	SBK00990	KHD00231	8/15/2010
CO1/2	1	SBK000208	G4B00173	11/1/2006
"	2	SBK000214	G4B00171	11/6/2006
"	3	SBK000211	G4B00176	11/3/2006
"	4	SBK000213	G4B00177	11/6/2006
"	5	SBK000201	G4B00178	10/20/2006
"	6	SBK000171	G4B00112	8/17/2006
"	7	SBK000212	G4B00175	11/6/2006
"	8	SBK000205	G4B00170	10/30/2006
"	9	SBK000210	G4B00172	11/3/2006
"	10	SBK000200	G4B00179	10/20/2006
"	11	SBK000209	G4B00174	11/2/2006
"	12	SBK00989	KHD00230	8/14/2010

Phase	Unit ID	Engine SN	Generator SN	Build date
CO3.2	25	SBK00949	G8D00117	7/25/2010
"	26	SBK00947	G8D00116	7/16/2010
"	27	SBK00945	G8D00115	7/15/2010
"	28	SBK00953	G8D00119	7/28/2010
"	29	SBK00951	G8D00118	7/28/2010
CO3.1	30	SBK01014	G8D00142	10/6/2010
"	31	SBK01012	G8D00141	10/5/2010
"	32	SBK01030	G8D00146	10/14/2010
"	33	SBK01027	G8D00145	10/13/2010
CO3.3	34	SBK01013	G8D00140	9/30/2010
"	35	SBK01015	G8D00144	10/7/2010
CO6	1	LYM00715	G7J06261	5/27/2020
"	2	LYM01199	G7J06262	5/27/2020
"	3	LYM00713	G7J06249	5/27/2020
"	4	LYM01195	G7J06263	5/27/2020
"	5	LYM01200	G7J06260	5/27/2020
CO7	1			
"	2			
"	3			
CO8	1			
"	2			
"	3			

Table 1.b: Fire Pump Engine Serial Number

Unit ID	Engine SN	Engine Size	Build Year
CO1	Pe6068t602182	149 bhp	2006
CO2	Pe6068t679482	149 bhp	2007

Table 1.c: Cooling Towers

Unit ID	# Cooling Tower Banks	# Cooling Tower Units per Bank	Total # Cooling Tower Units
CO1	1	18	18
CO2	1	18	18
Total	2	na	36

Legal Authority

The emissions from the proposed project have been reviewed under the legal authority of RCW 70A.15.2210 and the applicable rules and regulations adopted thereunder. The proposed project, if operated as specified, will be in accordance with applicable rules and regulations, as set forth in Chapters 173-400 WAC and 173-460 WAC and the operation thereof, at the location proposed, will not result in ambient air quality standards being exceeded.

This Notice of Construction (NOC) Approval Order rescinds and replaces NOC Approval Order No. 20AQ-E002; NOC Approval Order No. 20AQ-E002 is no longer in effect.

Therefore, it is ordered that the project as described in the NOC application and more specifically detailed in plans, specifications, and other information submitted to the Washington State Department of Ecology, (Ecology) is approved for construction and operation, provided the following conditions are satisfied:

Approval Conditions

1. **Administrative Conditions**

a. The emergency engine generators approved for operation by this Order are to be used solely for those purposes authorized for emergency generators under 40 C.F.R. 60, Subpart IIII. This includes the hourly operation requirements described in 40 C.F.R. 60.4211(f), except that there must be no operation of this equipment to produce power for demand-response arrangements, peak shaving arrangements, nor to provide power as part of a financial arrangement with another entity, nor to supply power to the grid.

b. Mountain View Elementary School administrators must be provided a maintenance testing schedule as contained in the permit, and the Permittee must update the school whenever Ecology-approved changes occur in the maintenance testing schedule. As decided by the school administrators and the Permittee, an ongoing relationship between the school and the Permittee should be established.

2. **Equipment Restrictions**

a. All engines identified in Tables 1.a and 2 used to power the electrical generators must be operated in accordance with applicable 40 C.F.R. 60, Subpart IIII requirements including but not limited to: certification by the manufacturer to meet the 40 C.F.R. 89 EPA Tier 2 or Tier 3 (for support engines) emissions levels as required by 40 C.F.R. 60.4202; and installed and operated as emergency engines, as defined in 40 C.F.R. 60.4219.

   i. At the time of the effective date of this permit, Tier 4 interim and Tier 4 final certified engines (as specified in 40 C.F.R. 1039.102 Table 7 and 40 C.F.R. 1039.101 Table 1, respectively), are not required for 2.5 MWe (3633 bhp), 1.5 MWe (2,206 bhp), 350 kWe (539 bhp) electrical generators used for emergency purposes as defined in 40 C.F.R. 60.4219 in attainment areas in Washington State. Any engines installed at the facility after Tier 4 or other limits are implemented by EPA for emergency generators, must meet the applicable specifications as required by EPA at the time the emergency engines are installed.

b. Only Caterpillar Model 3516C 2.5 MWe (3633 bhp), Model 3512C 1.5 MWe (2,206 bhp), and Model C13 350 kWe (539 bhp) engines and electrical generating units are approved for operation at the facility and are listed in Table 1.a above.

c. Manufacture and installation of the CO7 and CO8 engine generator sets identified in Table 1.a must take place by January 30, 2024. If the manufacture and installation of these engines has not been completed by January 30, 2024, a NOC application may be required prior to installation.

d. Engines associated with buildings CO7 and CO8 must be equipped with Selective Catalytic Reduction (SCR) and Diesel Particulate Filter (DPF) controls to meet emission limits listed in Condition 5, Table 3.

e. The installation of any new or replacement engines 18 months after issuance of this Approval Order, will require notification to Ecology that includes engine manufacturer's specification sheets. Ecology will decide whether new source review is required based on various factors including whether the new engines will have either an increased emission rate, or result in an emission concentration that may increase community impacts over those evaluated for this Approval Order, or if an update to Best Available Control Technology, analysis is necessary.

Table 2 – Emergency Generator Exhaust Stack Height Requirements

Quantity	Location	Minimum Height (feet)	Stack Diameter (inches)	Height Above Roof (feet)
20	CO1 and CO2 Building	38'	18"	8'
4	CO1 and CO2 Ground Level	20'	18"	
11	CO3.1, CO3.2, CO3.3 Ground Level	31'	18"	
5	CO6 Building	38'	24"	12.5'
4	CO7 and CO8 Buildings 1.5 MWe (2,206 bhp)	46	16"	20.5'
2	CO7 and CO8 Buildings 350 kWe (539 bhp)	46	12"	20.5'

3. **Operating Limitations**

a. Facility fuel consumption must be limited to a combined total of 467,485 gallons per year and 95,016 gallons per day of renewable diesel (including renewable hydrocarbon diesel and hydro-treated vegetable oil) and/or on-road specification No. 2 distillate fuel oil. All fuels used must be less than 0.00150 weight percent sulfur.

b. The 35 CO1, CO2, and CO3 generators must not operate more than 100 hours per year per engine at an average capacity of 53 percent of full standby capacity. Individual units may be operated at a higher load than 53 percent of full standby capacity as long as no emission limit is exceeded. Annual operating hours may be averaged over all 35 CO1, CO2, and CO3 generators.

c. Operation of the 11 CO3.1, CO3.2, and CO3.3 generators for electrical bypass must be limited to approximately 44 hours per year each at an average electrical load of 40 percent of the standby rating. No more than two engines will operate at the same time during any electrical bypass operation.

d. Each of the 35 CO1, CO2 and CO3 generator engines require maintenance and testing for approximately one hour per month. To mitigate engine emission impacts, the Permittee will perform at least 80 percent of all maintenance testing from 7:00 AM until 5:00 PM on Monday through Friday with no more than three engines tested concurrently. Engine maintenance and testing may take place outside of these restrictions upon coordination by the Permittee with the other data centers in Quincy to minimize engine emission impacts to the community. The Permittee must maintain records of the coordination communications with the other data centers, and those communications must be available for review by Ecology. This schedule can be re-negotiated at any time as approved in writing by Ecology, and will not trigger revision or amendment of this Order.

e. CO1 and CO2 each have one bank of six cooling units with a total of 18 cooling towers, for a facility total of 36 cooling towers. Each individual unit must have a mist eliminator that will maintain the maximum drift rate to no more than 0.0005 percent of the circulating water rate.

f. Operation of the 11 CO3 generators for power outage emergencies must be limited to a maximum of 48 hours per engine per calendar year at a maximum average electrical load of 85 percent.

g. The five CO6 generators must not operate more than 80 hours per year per engine. Annual operating hours may be averaged over all CO6 generators in service. The five CO6 generators must not operate more than 94 hours per engine for the first year of operation to include commissioning.

h. Operation of more than one CO6 generator for more than 15 hours per generator in any 24-hour period must not occur more than three times in any three calendar year period.

i. The operation of more than one CO6 generator, operating concurrently at any one time, must not occur on more than 21 calendar days in any three calendar year period.

j. There is no limit on the number of days that operation of one CO6 generator at a time can occur, but operation under this scenario is limited to daytime hours only (7:00 am to 7:00 pm).

k. The four 1.5 MWe (2,206 bhp) generators located at buildings CO7 and CO8 must not operate more than a combined total 220 hours per year.

l. The two 350 kWe (539 bhp) generators located at building CO7 and CO8 must not operate more than a combined total of 200 hours per year.

4. **General Testing and Maintenance Requirements**

a. The Permittee will follow engine-manufacturer's recommended diagnostic testing and maintenance procedures to ensure that each of the 40 2.5 MWe (3633 bhp) engines, four 1.5 MWe (2,206 bhp) engines, and two 350 kWe (539 bhp) engines will conform to applicable engine specifications in Conditions 2.a, 2.b, and applicable emission specifications in Condition 5, Table 3 throughout the life of each engine.

b. Following installation and commissioning, or concurrent with commissioning, of the first generator, but prior to the transfer of a batch of engines to the Permittee's ownership, one of each of the 2.5 MWe (3,633 bhp) and 1.5 MWe (2,206 bhp) engines must be source tested. To demonstrate the engines are commissioned and programmed to run within the emission limits in Condition 5, Table 3, for Particulate Matter (PM) (filterable only), Nitrogen Oxides (NOx), Non-Methane Hydrocarbons (NMHC), and Carbon Monoxide (CO) emissions measurement must be conducted for one engine from each batch or control generation. Testing must be conducted at the loads of 100 percent, 75 percent, 50 percent, 25 percent and 10 percent using weighted averaging according to Table 2 of Appendix B to Subpart E of 40 C.F.R. 89. Testing may be conducted using 40 C.F.R. 1065.

c. Within 60 months of the first engine installation of each phase of installation, and every 60 months thereafter, the Permittee must measure emissions of PM (filterable), NMHC, NOx, CO, and oxygen (O_2) from at least one representative engine from each batch of engines installed, in accordance with Condition 4.d. This testing will serve to demonstrate compliance with the emission limits contained in Condition 5, Table 3; and as an indicator of proper operation of the engines. The selection of the engine(s) to be tested must be subject to prior approval by Ecology and must be defined in the source test protocol submitted to Ecology no less than 30 days in advance of any compliance-related stack sampling conducted by the Permittee. The representative engine to be tested from each batch of engines installed must have the most operating hours since an engine of that batch was last tested.

d. The following procedures must be used for each test for the engines required by Condition 4.b and 4.c unless an alternate method is proposed by the Permittee and approved in writing by Ecology prior to the test:

   i. Periodic emissions testing should be combined with pre-scheduled maintenance testing and annual load bank testing. Additional operation of the engines for the purpose of emissions testing beyond the operating hour and fuel consumptions limits authorized by this Order may be allowed by Ecology upon request.

   ii. For the five load tests, testing must be performed at each of the five engine torque load levels described in Table 2 of Appendix B to Subpart E of 40 C.F.R. Part 89, and data must be reduced to a single-weighted average value using the weighting factors specified in Table 2. The Permittee may replace the dynamometer requirement in

Subpart E of 40 C.F.R. Part 89 with corresponding measurement of gen-set electrical output to derive torque output.

iii. For all tests, the F-factor described in Method 19 must be used to calculate exhaust flow rate through the exhaust stack, except that EPA Method 2 must be used to calculate the flow rate for purposes of particulate testing (Method 2 is not required if 40 C.F.R. 1065 is used). Fuel meter data measured according to Condition 4.f must be included in the test report, along with the emissions calculations.

iv. Three test runs must be conducted for each engine, except as allowed by the sampling protocol from 40 C.F.R. 1065. Each run must last at least 60 minutes except as allowed by the sampling protocol from 40 C.F.R. 1065. Source test analyzers and engine control unit data must be recorded at least once every minute during the test. Engine run time and torque output (measured kWe to convert to torque) and fuel usage must be recorded during each test run for each load and must be included in the test report.

v. In the event that any stack test indicates non-compliance with the emission limits in Condition 5, Table 3 the Permittee must repair or replace the engine and repeat the test on the same engine plus two additional engines from the same phase of installation as the engine showing non-compliance. Test reports must be submitted to Ecology within 60 days of the final day of testing. Test reports must be submitted to the address in Condition 7.

vi. For the gaseous pollutants (NO_x, CO, and NMHC), the Permittee may propose using a portable emissions instrument analyzer for subsequent rounds of periodic source testing if initial testing of engines show compliance with each of the emission limits referenced in Condition 5, Table 3. The use of an analyzer and the analyzer model must be approved in writing by Ecology prior to testing. The analyzer must be calibrated using EPA Protocol 1 gases according to the procedures for drift and bias limits outlined in EPA Methods 7E and Method 10. Alternate calibration procedures may be approved in advance by Ecology.

e. Each engine must be equipped with a properly installed and maintained non-resettable meter that records total operating hours.

f. Each engine must be connected to a properly installed and maintained fuel flow monitoring system that records the amount of fuel consumed by the engine during each operation.

5. **Emission Limits**

The 40 2.5 MWe (3633 bhp) engines, four 1.5 MWe (2,206 bhp) engines, and two 350 kWe (539 bhp) engines must meet the follow emission rate limitations:

a. To demonstrate compliance with the following emission limits through stack testing, the Permittee must conduct exhaust stack testing and averaging of emission rates for five individual operating loads (10 percent, 25 percent, 50 percent, 75 percent, and 100 percent) according to 40 C.F.R. §89.410, Table 2 of Appendix B, 40 C.F.R. Part 89, Subpart E, and/or 40 C.F.R. Part 60, Subpart IIII, or any other applicable EPA requirement in effect at the time the engines are installed.

Table 3: Emission Limitations and Testing Requirements

Generator Engines	Pollutant	Test Method*	Emission Limits
2.5 MWe (2.709 MWm; 3,633 bhp)	PM (filterable)	EPA Method 5 or alternative method from 40 C.F.R. 1065	0.20 g/kWm-hr
2.5 MWe (2.709 MWm; 3,633 bhp)	NMHC and NOx	EPA Method 7E, 25A and 18 or alternative method from 40 C.F.R 1065	6.4 g/kWm-hr
2.5 MWe (2.709 MWm; 3,633 bhp)	CO	EPA Method 10, or alternative method from 40 C.F.R. 1065	3.5 g/kWm-hr
1.5 MWe (1.645 MWm; 2,206 bhp); **350 kWe** (402 kWm; 539 bhp)	PM (filterable)	EPA Method 5 or alternative method from 40 C.F.R. 1065	0.03 g/kWm-hr
1.5 MWe (1.645 MWm; 2,206 bhp); **350 kWe** (402 kWm; 539 bhp)	NOx	EPA Method 7E or alternative method from 40 C.F.R 1065	0.67 g/kWm-hr
1.5 MWe (1.645 MWm; 2,206 bhp); **350 kWe** (402 kWm; 539 bhp)	NMHC	EPA Method 25A and 18 or alternative method from 40 C.F.R 1065	0.70 g/kWm-hr
1.5 MWe (1.645 MWm; 2,206 bhp); **350 kWe** (402 kWm; 539 bhp)	CO	EPA Method 10, or alternative method from 40 C.F.R. 1065	3.5 g/kWm-hr
1.5 MWe (1.645 MWm; 2,206 bhp)	Ammonia	BAAQMD Method ST-1B or EPA CTM-027; or alternative method suitable for use with 40 C.F.R. 1065 (100% -load +/- 2%)	0.17 lb/hr

Generator Engines	Pollutant	Test Method*	Emission Limits
350 kWe (402 kWm; 539 bhp)	Ammonia	BAAQMD Method ST-1B or EPA CTM-027; or alternative method suitable for use with 40 C.F.R. 1065 (100% -load +/- 2%)	0.05 lb/hr

*In lieu of these requirements, the Permittee may propose an alternative test protocol to Ecology in writing for approval.

b. Total annual facility-wide emissions must not exceed the 12-month rolling average emissions for PM_{10}, $PM_{2.5}$, CO, NO_X, NMHC, SO_2, DEEP, and NO_2 as listed in Table 3.

Table 4: Criteria Pollutant and Toxic Air Pollutant Emission Limits for Total Facility CO1, CO2, CO3, CO6, CO7, CO8 (Tons/Year)

Pollutant	Annual Emissions
PM smaller than 10 microns in diameter (PM_{10})	14.29
PM smaller than 2.5 microns in diameter ($PM_{2.5}$)[(a)]	6.49
PM2.5/PM10 (Gens Only)	2.99
Carbon monoxide (CO)	6.49
Nitrogen oxides (NO_X)	37.60
NMHC, Volatile organic compound (VOC)	2.42
Sulfur dioxide (SO_2)	0.05
Diesel Engine Exhaust Particulate (DEEP)*	0.61
Nitrogen Dioxide (NO_2)**	3.76
Ammonia	0.023

*All PM emissions from the generator engines are $PM_{2.5}$, and all filterable $PM_{2.5}$ from the generator engines is considered Diesel Engine Exhaust Particulate (DEEP).
** NO_2 is assumed to be equal to 10 percent of the total NOx emitted.

c. Visual emissions from each diesel electric generator exhaust stack must be no more than ten percent, with the exception of a 10 minute period after unit start-up. Visual emissions must be measured by using the procedures contained in 40 C.F.R. 60, Appendix A, Method 9.

6. **Operation and Maintenance (O&M) Manuals**

A site-specific O&M manual for the facility equipment must be developed and followed. Manufacturers' operating instructions and design specifications for the engines, generators, cooling towers, and associated equipment must be included in the manual. The O&M manual must be reviewed annually and be updated to reflect any modifications of the

equipment or its operating procedures. Emissions that result from failure to follow the operating procedures contained in the O&M manual or manufacturer's operating instructions may be considered proof that the equipment was not properly installed, operated, and/or maintained. The O&M manual for the diesel engines and associated equipment must at a minimum include:

a. Manufacturer's testing and maintenance procedures that will ensure that each individual engine will conform to the EPA Tiered Emission Standards appropriate for that engine throughout the life of the engine.

b. Normal operating parameters and design specifications.

c. Operating maintenance schedule.

7. **Submittals**

All notifications, reports, and other submittals must be sent to:

Washington State Department of Ecology
Air Quality Program
4601 N. Monroe Street
Spokane, WA 99205-1295

Annual reports may also be submitted electronically to: emissions.inventory@ecy.wa.gov

OR AS DIRECTED.

8. **Recordkeeping**

All records, O&M Manual, and procedures developed under this Order must be organized in a readily accessible manner and cover a minimum of the most recent 60-month period. The following records are required to be collected and maintained.

a. Fuel receipts with amount of diesel and sulfur content for each delivery to the facility.

b. Annual hours of operation for each diesel engine.

c. Annual number of start-ups for each diesel engine.

d. Annual gross power generated by facility-wide operation of the emergency backup electrical generators.

e. Upset condition log for each engine and generator that includes date, time, duration of upset, cause, and corrective action.

f. Recordkeeping required by 40 C.F.R. Part 60 Subpart IIII.

g. Air quality complaints received from the public or other entity, and the affected emissions units.

9. **Reporting**

a. The serial number, manufacturer make and model, and standby capacity for each engine and the generator, and the engine build date must be submitted prior to installation of each engine.

b. The following information will be submitted to Ecology at the address in Condition 7 above by January 31 of each calendar year.

   i. Monthly rolling annual total summary of air contaminant emissions, monthly rolling hours of operation with annual total, and monthly rolling gross power generation with annual total.

   ii. Written notification that the O&M manual has been developed and updated within 60 days after the issuance of this Order.

c. Any air quality complaints resulting from operation of the emissions units or activities must be promptly assessed and addressed. A record must be maintained of the Permittee's action to investigate the validity of the complaint and what, if any, corrective action was taken in response to the complaint. Ecology must be notified within three days of receipt of any such complaint.

10. **Stack Testing**

Any emission testing performed to verify conditions of this Approval Order or for submittal to Ecology in support of this facility's operations must be conducted as follows:

a. At least 30 days in advance of such testing, the Permittee must submit a testing protocol for Ecology approval that includes the following information:

   i. The location and Unit ID of the equipment proposed to be tested.

   ii. The operating parameters to be monitored during the test and the personnel assigned to monitor the parameters during the test.

   iii. A description of the source including manufacturer, model number and design capacity of the equipment, and the location of the sample ports or test locations.

   iv. Time and date of the test and identification and qualifications of the personnel involved.

   v. A description of the test methods or procedures to be used.

b. Test Reporting: test reports must be submitted to Ecology within 60 days of completion of the test and must include, at a minimum, the following information:

i. A description of the source including manufacturer, model number and design capacity of the equipment, and the location of the sample ports or test locations.

ii. Time and date of the test and identification and qualifications of the personnel involved.

iii. A summary of results, reported in units and averaging periods consistent with the applicable emission standard or limit.

iv. A summary of control system or equipment operating conditions.

v. A summary of production related parameters.

vi. A description of the test methods or procedures used including all field data, quality assurance/quality control procedures and documentation.

vii. A description of the analytical procedures used including all laboratory data, quality assurance/quality control procedures and documentation.

viii. Copies of field data and example calculations.

ix. Chain of custody information.

x. Calibration documentation.

xi. Discussion of any abnormalities associated with the results.

xii. A statement signed by the senior management official of the testing firm certifying the validity of the source test report.

11. **General Conditions**

a. **Activities Inconsistent with this Order** – Any activity undertaken by the Permittee, or others, in a manner that is inconsistent with the data and specifications submitted as part of the NOC application or this NOC Approval Order, must be subject to Ecology enforcement under applicable regulations.

b. **Availability of Order** – Legible copies of this NOC Approval Order and any O&M manual(s) must be available to employees in direct operation of the equipment described in the NOC application and must be available for review upon request by Ecology.

c. **Compliance Assurance Access** – Access to the source by representatives of Ecology or the United States Environmental Protection Agency (EPA) must be permitted upon request. Failure to allow access is grounds for enforcement action under the federal Clean Air Act or the Washington State Clean Air Act, and may result in revocation of this NOC Approval Order.

d. **Discontinuing Construction or Operation** – This NOC Approval Order will become invalid if construction of the equipment described in the NOC application and this NOC Approval Order does not commence within 18 months after receipt of this NOC Approval Order.

   If construction or operation is discontinued for 18 months or longer on a portion or all of the equipment described in the NOC application and this NOC Approval Order, the portion of the NOC Approval Order regulating the inactive equipment will become invalid. Ecology may extend the 18 month period upon request by the Permittee and a satisfactory showing that an extension is justified.

e. **Equipment Operation –** Operation of the facility must be conducted in compliance with all data and specifications submitted as part of the NOC application and in accordance with O&M manuals, unless otherwise approved in writing by Ecology.

f. **Registration** – Periodic emissions inventory and other information may be requested by Ecology. The requested information must be submitted within 30 days of receiving the request, unless otherwise specified. All fees must be paid by the date specified.

g. **Testing** – When information obtained by Ecology indicates the need to quantify emissions, Ecology may require the Permittee to conduct material analysis or air emissions testing under WAC 173-400-105. This testing requirements is in addition to any testing required by Ecology in this Order, other permits, or other state or federal requirements.

h. **Violation Duration** – If the Permittee violates a condition in this NOC Approval Order, testing, recordkeeping, monitoring, or credible evidence will be used to establish the starting date of the violation. The violation will be presumed to continue until testing, recordkeeping, monitoring, or other credible evidence indicates compliance. A violation of a condition includes, but is not limited to, failure of air pollution control equipment, failure of other equipment resulting in increased emissions, or a failed source test indicating an exceedance of an emission limit.

i. **Obligations Under Other Laws or Regulations** – Nothing in this NOC Approval Order will be construed so as to relieve the Permittee of its obligations under any state, local, or federal laws or regulations.

j. **Maintaining Compliance** – It must not be a defense for the Permittee in an enforcement action that it would have been necessary to halt or reduce the operation in order to maintain compliance with the conditions of this NOC Approval Order.

k. **Visible Emissions** – No visible emissions from the source are allowed beyond the property line, as determined by 40 C.F.R. Part 60, Appendix A, Test Method 22.

l. **Changes in Operations** – Any changes in operation contrary to information submitted in the NOC application must be reported to Ecology at least 60 days before the changes are implemented. Such changes in operation may require a new or amended NOC Approval Order.

Authorization may be modified, suspended, or revoked in whole or part for cause, including, but not limited to, the following:

- Violation of any terms or conditions of this authorization.
- Obtaining this authorization by misrepresentation or failure to disclose full all relevant facts.

The provisions of this authorization are severable and, if any provision of this authorization or application of any provision to any circumstance is held invalid, the application of such provision to other circumstances, and the remainder of this authorization, must not be affected thereby.

Your Right to Appeal

You have a right to appeal this Approval Order to the Pollution Control Hearing Board (PCHB) within 30 days of the date of receipt of this Approval Order. The appeal process is governed by Chapter 43.21B RCW and Chapter 371-08 WAC. "Date of receipt" is defined in RCW 43.21B.001(2).

To appeal you must do the following within 30 days of the date of receipt of this Approval Order:

- File your appeal and a copy of this Approval Order with the PCHB (see addresses below). Filing means actual receipt by the PCHB during regular business hours.
- Serve a copy of your appeal and this Approval Order on Ecology in paper form - by mail or in person. (See addresses below.) E-mail is not accepted.

You must also comply with other applicable requirements in Chapter 43.21B RCW and Chapter 371-08 WAC.

Address and Location Information

Street Addresses	Mailing Addresses
Department of Ecology Attn: Appeals Processing Desk 300 Desmond Drive SE Lacey, WA 98503 **Pollution Control Hearings Board** 1111 Israel RD SW Ste 301 Tumwater, WA 98501	**Department of Ecology** Attn: Appeals Processing Desk PO Box 47608 Olympia, WA 98504-7608 **Pollution Control Hearings Board** PO Box 40903 Olympia, WA 98504-0903

Americans with Disabilities Act Information

Accommodation Requests
To request ADA accommodation including materials in a format for the visually impaired, call Ecology at 360-407-7668 or visit https://ecology.wa.gov/accessibility. People with impaired hearing may call Washington Relay Service at 711. People with speech disability may call TTY at 877-833-6341.

Dated this 27th day of September, 2022, at Spokane, Washington.

Prepared By:

_____
Jenny Filipy, P.E.
Eastern Regional Office
Department of Ecology
State of Washington

Approved By:

_____
David T. Knight, Section Supervisor
Eastern Regional Office
Department of Ecology
State of Washington

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Dated this 27th day of September, 2022, at Spokane, Washington.

Prepared By:

Jenny Filipy, P.E.
Eastern Regional Office
Department of Ecology
State of Washington

JENNY MAY FILIPY
STATE OF WASHINGTON
54393
REGISTERED
PROFESSIONAL ENGINEER

Approved By:

David T. Knight, Section Supervisor
Eastern Regional Office
Department of Ecology
State of Washington

Technical Support Document

Notice of Construction Approval Order No. 22AQ-E006

Microsoft Corporation – Columbia Data Center
AQPID No. A0250278
Quincy, WA

Prepared by: Jenny Filipy, P.E.

1. Project Summary

Microsoft Corporation – Columbia Data Center (the source) is classified as a Synthetic Minor with 40 existing generators and two cooling tower bank emissions units. This review is for a project to add six new emergency generators.

An initial Notice of Construction (NOC) application dated October 7, 2021, was submitted by Microsoft Corporation for the Columbia Data Center CO7 and CO8 project. The Washington State Department of Ecology (Ecology) reviewed the initial application and found it incomplete per WAC 173-400-111 on October 26, 2021, due to the source's request to add emission controls to the proposal. An amended NOC application was received by Ecology on December 8, 2021, and March 14, 2022, found to be complete on April 8, 2022.

2. Application Processing

a. Public Notice

Receipt of the application was posted on Ecology's Public Involvement Calendar from April 18, 2022 through May 4, 2022. A request for a public comment period was received. Ecology scheduled a 30-day comment period June 15 through July 20, 2022. Comments were received, Ecology's responses are attached as Appendix A.

b. State Environmental Policy Act

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, a 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 new generators are being constructed for this project and therefore are subject to minor New Source Review (NSR).

A. Potential to Emit (Potential Emissions)

The potential emissions from the project are greater than the exemption levels listed under WAC 173-400-110(5) as shown below in Tables 1 and 2 (in bold).

Table 1. Potential emissions for pollutants listed under WAC 173-400-110(5),NSR Exemption Levels

Pollutant	New Generators (tons/year)	Minor NSR Exemption (tons/year)
Carbon Monoxide (CO)	4.18	5.0
Lead (Pb)	0.000	0.005
Nitrogen Oxides (NOX)	**18.94**	2.0
Particulate Matter, PM10	0.77	0.75
PM2.5	**0.77**	0.5
Total Suspended Particulates (TSP)	0.77	1.25
Sulfur Dioxide (SO_2)	0.03	2.0
Volatile Organic Compounds, total (VOC)	0.54	2.0
Ozone Depleting Substances, total	0.000	1.0
Greenhouse Gases (GHG)	1,466	N/A

Table 2. Potential TAP emissions and de minimis emission values

Pollutant	Potential Emissions from Project (lb/Averaging Period)	De Minimis Emission Values	Averaging Period
Nitrogen Dioxide, (NO2)	**7.58**	0.46	1-hour
Carbon Monoxide (CO)	**16.7**	1.10	1-hour
Sulfur Dioxide (SO_2)	0.07	0.46	1-hour
Diesel Engine Exhaust Particulate (DEEP)	**665**	2.70E-02	Year
Acetaldehyde	**3.01**	3.00	Year
Acrolein	**2.08E-02**	1.30E-03	24-hour
Benz(a)anthracene	1.48E-02	4.50E-02	Year
Benzene	**14.5**	1.00	Year
Benzo(a)pyrene	4.37E-03	8.20E-03	Year
Benzo(b)fluoranthene	1.64E-02	4.50E-02	Year
Benzo(k)fluoranthene	3.69E-03	4.50E-02	Year
1,3-Butadiene	**7.00E-01**	0.27	Year
Chrysene	2.34E-02	0.45	Year
Dibenz(a,h)anthracene	**7.00E-03**	4.10E-03	Year
Formaldehyde	**5.20**	1.40	Year
Indeno(1,2,3-cd)pyrene	7.30E-03	4.50E-02	Year
Naphthalene	**2.18**	0.24	Year
Propylene	2.37	11.00	24-hour
Toluene	2.64E-01	19.00	24-hour
Xylenes	1.81E-01	0.82	24-hour

ii. Prevention of Significant Deterioration

PSD does not apply to this project, based on annual PTE.

iii. Other Applicable Requirements

In accordance with WAC 173-400-113, the proposed new 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 any hour, of an air contaminant from any emission unit.

B. WAC 173-400-050 and 060 Emission standards for combustion and incineration 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 proposed new source 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), and ammonia. The following was assumed for the emergency generators:

i. DEEP is assumed to be manufacturer-measured PM

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

iii. The sum of PM and HC (assumed to all condense) and be equivalent PM10 and PM2.5 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 emission 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 EPA's AP-42, Volume 1, Chapter 3.4, for the 1.5 MWe engines, which provides emission factors for HAPs from large internal combustion diesel engines (EPA 1995). For the 350 kWe engines, emission rates were derived using emission factors from EPA's AP-42, Volume 1, Chapter 3.3, which provides emission factors for diesel engines of up to 600 hp (EPA 1996).

Potential to Emit calculations were based on uncontrolled primary use generators running 500 hours per year. Allowable emissions are based on the CO7 and CO8 generators using controls and limited hours of operation.

b. Best Available Control Technology | Best Available Control Technology for Toxics

In the analysis, the consultant proposed and successfully demonstrated that Tier-4 engines are cost prohibitive. Therefore, the consultant proposed uncontrolled Tier-2 engines as BACT and tBACT. I agree that the proposal meets or exceeds: BACT for emissions of NOx, CO, VOC and PM; and tBACT for emissions listed in Table 2.

c. Additional Voluntary Emission Controls

The Permittee and applicant proposed voluntary installation of Selective Catalytic Reduction, and diesel particulate filter to control NOx and PM, respectively.

d. Allowable Emissions

The allowable emissions from the project, considering all emission and operational limits contained in the approval order, are shown in the tables below.

Table 3. Allowable emissions for pollutants listed under WAC 173-400-110(5)

Pollutant	New Generators (tons/year)
CO	0.78
NO_X	0.50
PM10	0.11
PM2.5	0.11
TSP	0.11
SO_2	0.004
VOC	0.11
GHG	317

Table 4. Allowable TAP emissions

Pollutant	New Generators (lbs/Averaging Period)	Averaging Period
NO_2	2.46	1-hour
CO	16.70	1-hour
SO_2	0.07	1-hour
DEEP	20.11	Year
Acetaldehyde	0.61	Year
Acrolein	2.08E-02	24-hour
Ammonia	10.34	24-hour
Benz(a)anthracene	3.14E-03	Year
Benzene	3.11	Year
Benzo(a)pyrene	9.48E-04	Year
Benzo(b)fluoranthene	3.60E-03	Year
Benzo(k)fluoranthene	8.01E-04	Year
1,3-Butadiene	0.15	Year
Chyrsene	5.12E-03	Year
Dibenz(a,h)anthracene	1.50E-03	Year
Formaldehyde	1.06	Year
Indeno(1,2,3-cd)pyrene	1.58E-03	Year
Naphthalene	0.47	Year
Propylene	2.37	24-hour
Toluene	0.26	24-hour
Xylenes	0.18	24-hour

The table below presents the potential emissions and allowable emissions for Microsoft Corporation - Columbia Data Center with the emissions from the project included. The facility is considered a synthetic minor as it has taken limits to stay under Title V thresholds.

Table 5. Potential and Allowable Emissions for Total Source

Pollutant	Total Source Potential Emissions (tons/year)	Total Source Allowable Emissions (tons/year)
CO	33.98	6.49
NO_X	213.94	37.60
PM10	18.92	14.29
PM2.5	15.42	6.49
TSP	26.72	14.29
SO_2	0.28	0.05
VOC	12.29	2.42
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, PM10, PM2.5, modeling was performed to satisfy the requirements of Chapter 173-476 WAC. The modeling demonstrates that the emissions increases as a result of the project will not exceed the ambient air quality standards. The modeling results are included in the table below.

Table 6. Criteria Pollutant Modeling Results.

Criteria Pollutant	Averaging Period	Maximum Modeled Concentration (µg/m3)	Modeled Concentration with Background (µg/m3)	Ambient Air Quality Standard (µg/m3)
NO_2	1-hr	80.7	139.45	188
NO_2	Annual	0.02	6.62	100
CO	1-hr	120.2	121.5	40,000
CO	8-hr	62.6	63.5	10,000
PM10	24-hr	12.5	90.1	150
PM2.5	24-hr	3.6	22.5	35
PM2.5	Annual	0.012	5.812	12

b. Toxic Air Pollutants

In accordance with WAC 173-460-040, new 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 2, minor NSR is required for the six new generators. As such, the new emission unit must comply with WAC 173-460-070 (ambient impact requirement). The facility 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 project and the applicable SQER.

Table 7. TAP Analysis

TAP	Allowable Emissions – Increase (lb/Averaging period)	SQER	Modeling Required?
NO_2	2.46	0.87	Yes
CO	16.70	43.00	No
DEEP	20.11	0.54	Yes
Acetaldehyde	0.61	60	No
Acrolein	2.08E-02	2.60E-02	No
Ammonia	10.34	37.00	No
Benzene	3.11	21.00	No
1-3-Butadiene	0.15	5.4	No
Dibenz(a,h)anthracene	1.50E-03	8.2E-02	No
Formaldehyde	1.06	27.0	No
Naphthalene	0.47	4.80	No

For NO_2 and DEEP 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 8. TAP Modeling Results.

TAP	Averaging Period	Maximum Modeled Concentration (µg/m3)	ASIL (µg/m3)	Percent of ASIL
NO_2	1-hour	110.9	470	23.6%
DEEP	1-Year	6.90E-04	0.0033	20.9%

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

Commenter: Danna Del Porto

Comment 1:

The location of the Columbia Data Center (Microsoft) has concerned Quincy residents from the beginning. This data center was the first such facility built in Quincy. Most everyone was excited to have this impressive multinational company choose to build in our small agricultural town. Columbia was built almost directly across the street from an elementary school. It took a while for citizens to learn of the dangers of the emissions from the generators. The data center is a complicated operation and there is much to learn to even discuss the various aspects of operation.

Much later, citizens learned the data center business was not without specific needs to operate and these needs, electricity and water specifically, were not necessarily in line with our rural lifestyle. Because this town exists for the farm community, the increasing use of water by data centers could put pressure on the agricultural processing plants. Without adequate fresh water, the crops grown locally cannot be prepared for market. This sets up a clash of cultures between farming and technology we hope to avoid. A pending conflict over water is a subject starting to emerge as a building issue for the continued permitting of water using factories other than building to directly support agriculture.

Microsoft is remodeling Columbia and adding 6 new diesel generators. The total number of Columbia generators will be 46. My reading of the Columbia permit is that Microsoft is voluntarily adding Selective Catalytic Reduction (SCR) controls for NOx and Catalyzed Diesel Particulate Filters (DPF) to control PM to the six new generators. That leaves 40 Columbia generators without controls of any kind.

I am pleased that Microsoft recognizes the potential problems from the unfiltered engines but I am disappointed that only the 6 new generators will be controlled. Columbia continues to present a dangerous environment for young developing children. There are pages of guidelines to alter and spread out the operational times for testing but, with the proposed additions of a total 421 diesel generators in Quincy, there is not any schedule possible to avoid overlapping emissions. The overlapping emissions are one of my biggest concerns but Ecology looks at each data center separately and I have never seen a map or diagram of how these emission clouds intersect over town.

Response to Comment 1:

Comment noted. Ecology's Data Center web page (https://ecology.wa.gov/Air-Climate/Air-quality/Data-Centers) contains information about emissions in Quincy. To view the information, click on the aerial picture of Quincy. The Air Quality Program hopes to update this information within the next year.

Comment 2:

I noticed that the documents for the Columbia remodel were prepared by Burns & McDonnell. I am gratified to know there is an additional consultant for these projects other than Landau. I do, however, objects to their "maps" used to illustrate emissions. Document H-2 is offered to explain/describe the Annual No2 emissions. The purple amoeba might be useful to someone but, as an aid in understanding the Columbia document, it is useless. H-3 through H-9 are equally interesting purple designs but tell me nothing. As do H-14 and H-15. Without a scale, directional orientation markers, local landmarks or even a road or two, these maps were and exercise in technology but they did nothing to help understand the areas or dimensions of the emission drifts. I am interested that the new consultant did not use other data center documents as models for their descriptive blobs. I do wonder if the purple maps are intended to NOT show the plumes of TAPs over the school. I want to know why the emission maps are not useful to the public.

Response to Comment 2:

Thank you for your feedback. Indeed, the maps provided could be more visually useful with local sensitive receptors identified. This project, however, met the Acceptable Source Impact Level for NO2, Diesel Engine Exhaust Particulate (DEEP), and all other toxic air pollutants. This means all receptors outside of the facility property were below the 1 in a million cancer risk for all toxic air pollutants quantified for the additional six generators with add on controls.

Comment 3:

I reject the supporting documents presented for the Columbia expansion and I am requesting a set of illustrations/maps that provide me information (presented in an easily comprehensible form) regarding the extent of their emissions. I want to see a map with the schools identified, the hospital, Senior Center and Parks and Playgrounds. I want to be able to identify the impact of the remodeled Columbia on the City of Quincy.

Response to Comment 3:

Due to the low emissions, and impacts below Acceptable Source Impact Levels for this project, Ecology does not require pollutant impact plots/maps.

Comment 4:

I submit several older documents to show that the danger to children at Mt. View has existed from the first part of the project. The project maps for the new expansion at Columbia must show the public the facts about the spread of emissions.

Response to Comment 4:

Please see Exhibits at the end of these Response to Comments. The emails you provided are part of the permitting process. Rarely, does Ecology receive a complete application with an

initial submittal. Often times, Ecology will require more information and analysis, changes to proposed limits and parameters, and more mitigation to evaluate in order to get an approvable application. That is what happened with Microsoft Columbia Data Center during the permitting action you highlighted. Ecology has come a long way in understanding the complexities of data centers since our initial data center permitting efforts in Quincy. Generators installed today have restrictive hour and fuel limits due to the community-wide analysis for projects that trigger second tier analysis.

Generators do have more emissions during cold start-ups. Cold start-up emissions are factored into facility emission calculations and accounted for in permit conditions. Please see Table EC-6: Startup Emission Summary (page 90) in Microsoft Columbia Data Center's Notice of Construction application.

Comment 5:

I will continue my objection to the construction of data centers in Quincy.

Response to Comment 5:

Comment noted.

Comment 6:

I will repeat that Quincy is a low-income minority community. The promised jobs at the data centers does not appear to be happening except for the custodial and security jobs. The engineer types either come occasionally to those folks huddle around one another at the remote enclave of Crescent Bar.

Quincy Statistics:

City numbers from the US 2020 census

School numbers from the 2021 WA State office for Public Instruction

Population	8,033
City Hispanic	80.3%
Poverty level	21%
Per Capita Income	$18,952
No Health Insurance	20.6%
Quincy Students	3,171 (The school district draws from a large area.)
Minority	87.9%
Low-income	81.1%
Homeless	2.3%

Migrant 11.7%

As you can see, Quincy does qualify as a low-income minority community. This is the type of community that is the focus of Environmental Justice. The residents of Quincy should not be subject to environmental hazards because they live in Quincy. The various arms of the State and National environmental agencies should be protecting this community, but they do not. The Washington state Department of Ecology has or will be permitting 421 diesel engines to be placed inside the Quincy city limits, an area of 6.131 square miles. Ecology makes, in my opinion, little effort to protect the residents.

Response to Comment 6:

Part of our environmental justice considerations in our permitting process includes evaluating the demographic information about the local and affected populations, and understanding and being responsive to the diversity of interests and communities in Quincy. We take steps to demonstrate our commitment to connecting with and meaningfully engaging the Hispanic/Latino community, and delivering reliable data collection and scientific evaluation of the airshed.

- We strive to ensure our public participation opportunities are accessible to as many members of the community as possible; this includes reducing barriers to engagement for the Hispanic/Latino community. For example, we advertise comment periods in both English and Spanish in the local Quincy newspaper, translate information for online access, and provide interpretation services during our public meetings.

- We perform scientific analyses required by state and federal law in order to issue Notice of Construction permits for the Quincy community. As part of the permitting process, we review the application and local air quality data to ensure the project will meet ambient air quality standards that are intended to protect public health. We also make sure that the project complies with the air toxics rule, which minimizes increased risk to the community.

- We placed a monitor within Quincy at 330 3rd Avenue NE. This monitor is operational with data available 24 hours a day each day of the week. You can view the information from this monitoring site at: https://enviwa.ecology.wa.gov/home/map. Currently the site records weather and PM 2.5 data, and we measured NOx and black carbon from August 2017 through December 2018. Data show PM 2.5 and NO_2 levels meet the National Ambient Air Quality Standards. PM2.5 levels found in the Quincy area are similar to Moses Lake and the Wenatchee area.
- We performed an analysis of the data center impacts in the Quincy area and finalized the report – see Health Risks from Diesel Emissions in the Quincy Area (wa.gov). We translated and published the Executive Summary in Spanish. Riegos a la salud por emisiones de diésel en el área de Quincy (wa.gov)

- While the data centers potentially represent a sizable portion of the total diesel emissions in the Quincy area, the risks from these emergency engines is somewhat offset by:
    - Less frequent engine use than permitted.
    - Higher stacks (release points) than other diesel sources (i.e., farm equipment, trucks, locomotives, etc.) so emissions disperse before they enter the breathing zone.
    - Lower population density in areas immediately surrounding data centers.
- We developed a visual tool summarizing the information in the report that the community can access online. See Response to Comment #1 or https://ecology.wa.gov/Air-Climate/Air-quality/Data-Centers

If you want to learn more about Ecology's environmental justice efforts, you can visit our websites:

- Environmental Justice at Ecology: https://ecology.wa.gov/About-us/Who-we-are/Environmental-Justice
- Improving air quality in Overburdened Communities: https://ecology.wa.gov/Air-Climate/Climate-change/Reducing-greenhouse-gases/Climate-Commitment-Act/Overburdened-communities; Sign up for Initiative's email list at:https://public.govdelivery.com/accounts/WAECY/subscriber/new?topic_id=WAECY_15

Comment 7:

I want to point to a statement from the H5 Data Center documents. "Revised Second-tier Health Impact, H5 Data Center, Quincy, Washington, Landau, July 15, 2021, page 3-1."

> "In evaluating a second-tier petition, background concentration of the applicable TAPs must be considered. Ecology sets no numerical limit on cumulative impacts from a facility, local background and regional background levels."

This has always bothered me about the Ecology permitting process. Quincy will probably have 421 locomotive sized diesel engines. The many data centers built in the small footprint of Quincy are so close together that a person can stand in various places in town and see almost all of these industrial structures at ground level. Each facility is permitted but, as the statement above notices, Ecology has set no limits on the cumulative effects of these plumes as they overlap like a sandwich.

Response to Comment 7:

Our air toxics rule (WAC 173-460) allows a new source of emissions if the applicant demonstrates that:

- Emission controls for the new and modified emission units represent best available control technology for toxics.

- The increase in emissions of Toxic Air Pollutants (TAPs) is not likely to result in an increased cancer risk of more than one in one hundred thousand (10 in one million) and Ecology determines that the non-cancer hazard is found to be acceptable.

The rule also states that "Background concentrations of TAPs will be considered as part of a second tier review", but the rule does not specify a cumulative risk at or beyond which a project proposal should be denied. In past data center permitting efforts in Quincy, Ecology considered a cumulative diesel exhaust risk of over a hundred in one million to be a point at which we would consider additional reductions in diesel emissions from data center emergency engines.

In the case of the H5 Data Center expansion, increased emissions of diesel particulate matter result in a lifetime increased risk of cancer of about nine in one million for the maximally impacted residential receptor. So Ecology may recommend approval under our toxics rule since it is less than an increase of 10 in one million. As part of the second tier health impact assessment, Landau Associates also considered background exposures at the same location. The cumulative risk from exposure to diesel particulate emitted by all local and regional diesel engines was about 42 per million at the same location.

It is important to note that the location of maximally impacted receptor depends on the location of the new proposal, so the location of the maximally impacted receptor typically differs for each new data center project. To date, none of the residential receptors in Quincy exceeds a diesel exhaust – related risk of over 100 in one million.

In the case of Microsoft Columbia Data Center's addition of six generators, this project met the first tier review requirement of 1 in a million cancer risk and did not need to supply a second tier review.

Comment 8:

I offer more statistics.

2020 US Census Quincy Population	8,033
2022 Proposed total Diesel Engines	421
Number of Residents per Engine	19.08 for every town resident
2020 Quincy District Students	3,171
2022 Proposed total Diesel Engines	421
Number of Quincy Students/Engine	7.5 engines for every school student

To look at those numbers is to realize how the number of permitted locomotive sized engines has almost out-numbered local residents. The future looks about the same with continued development of data centers in Quincy. The conditions here are perfect for these international companies: cheap land, good electrical connectivity, almost free water and compliant officials at every level to continue this environmental invasion.

Response to Comment 8:

Facility locations are determined prior to Ecology receiving Notice of Construction permit applications. Please see responses to Comments 6 and 7.

Comment 9:

I notice the Columbia health effects focus on cancer. Although cancer is a terrifying prospect, earlier health assessments frequently mentioned increased heart attacks, strokes and respiratory problems. That is interesting to me as I know three people this year that have had strokes. A 28-year-old man, a 42-year-old man and, more normally, a 63-year-old man. I am not certain I can obtain good data on strokes and heart attacks but I do believe there has been an increase. I will follow through with my inquiry because I find it odd that the Ecology health discussions have subdued that facet of harm from emissions.

Response to Comment 9:

Emissions from this project, the six new generators, modeled below Acceptable Source Impact Levels (ASIL) for all pollutants including Diesel Engine Exhaust Particulate and Nitrogen Dioxide. Since, project impacts were below the respective ASILs for all toxic air pollutants, a Health Impact Assessment that evaluates cancer and other health impacts from the project, was not required.

Comment 10:

I want to know the projected level of Diesel particulate in relation to the ASIL at Mt. View Elementary School. The number should be for all 46 engines, not just the new ones.

Response to Comment 10:

DEEP impacts from this six generator project were below the ASIL, for ambient air beyond the property line of Microsoft Columbia Data Center. This project did not trigger second tier review per WAC 173-460-080, so evaluation of background sources of toxic air pollutants was not required. However, you can see background values (regional + local) of DEEP using Ecology's map on the Data Center website.

Comment 11:

I want to know the projected level of NO2 in relation to the ASIL at Mt. View Elementary School. The number should be for all 46 engines, not just the new ones

Response to Comment 11:

NO2 impacts from this six generator project were below the ASIL, for ambient air beyond the property line of Microsoft Columbia Data Center. This project did not trigger second tier review per WAC 173-460-080, so evaluation of background sources of toxic air pollutants was not required. However, you can see background values (regional + local) of NO2 using Ecology's map on the Data Center website.

Comment 12:

I want to know of any projected TAPs that exceed the ASIL at Mt. View Elementary. The number should be for all 46 engines, not just the new ones.

Response to Comment 12:

All toxic air pollutant impacts from this project were below the ASIL, for ambient air beyond the property line of Microsoft Columbia Data Center. This project did not trigger second tier review per WAC 173-460-080, so evaluation of background sources of toxic air pollutants was not required. However, you can see background values (regional + local) of DEEP and NO_2 using Ecology's map on the Data Center website.

Comment 13:

In reading the Ecology document Response to Comments, H-5, page 10, I question a word used by Ecology. Ecology called the Quincy minority community "Latinx". I checked around with my Hispanic friends and asked about the acceptance of that word. Most of the people laughed and responded with distain. That might be a word used somewhere else but not here. To some it reeked of an elite mind-set, to some it was derogatory. I suggest that Ecology check with

Human Resources before using that word in eastern Washington. It is not a word I would ever use when I was a high school teacher here in Quincy

Response to Comment 13:

Thank you for the feedback. We strive to reach as broad an audience as possible, and use images and words that are inclusive and respectful. This includes using words that communities and people use to describe themselves – including Latinx. We will share your feedback with Ecology's communication team and our Office of Equity & Environmental Justice.

Comment 14:

I appreciate the controls added to the 6 new engines at Columbia. However, I think these controls are too little, too late. Controls should have been placed on all engines in all data centers Quincy from the beginning. These facilities will be operating for many years (50?) and must be controlled to protect citizens.

My recommendation is to have Microsoft build another elementary school to replace Mt. View and to move those young children out of harms way. The Columbia Data Center cannot be moved but the kids can be moved to do the right thing for the youth of Quincy. I believe moving the kids is the best solution to an improperly permitted data center. It was built at the wrong place.

Thank you for accepting and considering my comments.

Response to Comment 14:

Please see Response to Comment 4. Your comments will be shared with Microsoft.

Commenter: Patricia Martin

Please accept my comments regarding the permitting of 6 additional generators and the use of renewable diesel fuel at the Columbia Data Center. For the sake of simplicity I am going to comment as I make my way through the NOC first.

Comment 15:

Section 1.0: Regarding the use of "ultra-low sulfur diesel (ULSD) fuels, renewable diesel fuels, or a blend of both fuels", I would like to know if the most contaminated fuel was used during modeling. Also, will the ULSD be used in other engines at the Columbia Data Center that have underground storage tanks? If so, what plans does Ecology have to prevent, monitor and remediate storage tank leaks that are of increased risk using ULSD fuels, or ULSD plus bio-fuels?

"ultra-low sulfur diesel has a higher affinity to water than traditional diesel. Water is known to be one of the main contributors to tank corrosion while also fostering rapid microbial growth in diesel. It has been shown that mixing ULSD with small amounts of biofuel, such as ethanol, may accelerate tank corrosion. This is due to the microbes in the diesel fuel digesting trace amounts

of ethanol, creating high-enough levels of acetic acid to cause significant corrosion of the surrounding tank." http://axi-international.com/ultra-low-sulfur-diesel-ulsd/

Response to Comment 15:

The permit emission assumptions are based on the use of petroleum-based diesel fuel. Data submitted in the NOC application shows renewable diesel fuel produces lower or comparable emissions than that of the petroleum-based fuel already permitted. Microsoft Columbia is currently required to use ultra-low sulfur diesel fuel for all generators. Underground storage tanks at the Data Centers are regulated by Ecology's Toxic Cleanup Program. Microsoft Columbia is required to check and maintain their underground storage tanks and Ecology UST inspectors visit the site every three years for inspection and records review. If you have more questions regarding underground storage tanks at Data Centers, please contact Jason Cocke (509-202-5000; jason.cocke@ecy.wa.gov).

Comment 16:

Quincy relies on fairly shallow (~400 ft) wells for its drinking water that are geologically connected to a contaminated upper aquifer at 200 ft. Any leak that makes its way into the 200 ft aquifer will be sucked down into the 400 ft as a water is extracted for use by residents and industry. Does Microsoft have financial assurances in place to deal with a catastrophe of this nature, and if so, how much financial assurance has Microsoft set aside for this purpose?

Response to Comment 16:

This question is outside the scope of this air permitting action. Your comments will be shared with Microsoft.

Comment 17:

Section 2.0 Because "emergency" engines are prohibited from operating for more than 50 hours per calendar year, Columbia must identify the purpose for each time an engine is operated. I note in the footnote that "there is no intent to surpass the 40 CFR Part 60 Subpart IIII limits of 100 hr/yr for non-emergency use or 50 hr/yr for operations other than emergencies, maintenance, or testing", but intentional or not, the regulation limits non-emergency to 50 hours in a calendar year, and appropriate accounting for all uses is critical for assuring compliance. Please reject Microsoft's request "that annual fuel usage be incorporated into the permit conditions as the surrogate parameter for tracking annual generator engine operating hours." Because compliance for "emergency" engines is based on the type of operation, it is inappropriate and inconsistent with the intent of the law to base compliance on fuel usage. Microsoft must be required to track each engine's operation, including the purpose for its operation.

Response to Comment 17:

Conditions 3.l and 3.k in the Preliminary Determination for Microsoft Columbia Data Center place limits on hours of use for the proposed six generators. Condition 8: Recordkeeping requires the source to track generator hours of operation and follow all federal recordkeeping requirements.

Comment 18:

Section 3.1 Microsoft appears to be asking to violate the 100 hours allowed per "emergency" generator in the following scenarios:

- Operating Scenario A – 100 hours annually for each 350-kWe support generator engine, **110 hours annually for each primary 1,500-kWe generator engine**, and 0 hours annually for each reserve 1,500-kWe generator engine. [emphasis added]
- Operating Scenario B – 100 hours annually for each 350-kWe support generator engine, 0 hours annually for each primary 1,500-kWe generator engine, and **110 hours annually for each reserve 1,500-kWe generator engine.** [emphasis added]

The designation of "emergency" engine and limit of 100 hours (50 of which can be non-emergency) is per engine. It cannot be a combination of engines or an excess of hours. Microsoft built these scenarios into its modeling, but these scenarios are a violation of law. Microsoft again requests the use of fuel as a surrogate for tracking engine operations, which violates the intent of the law, i.e., limiting the operation of the engines to no more than 50 hours of non-emergency use. Without tracking the purpose for the engines' operation, Ecology and the residents of Quincy cannot hold them accountable under the law. Please do not accept Microsoft's request, especially in light of the Scenarios discussed above and the footnote noting that "reserve engines will not operate more than 110 hours during the annual period."

Response to Comment 18:

The EPA's NSPS Subpart IIII, does not limit the hours of emergency use for emergency engines. It allows 50 hours for maintenance and testing and 50 hours to supply power as part of a financial arrangement with another entity (Ecology does not allow this). The hours limits listed in the preliminary determination are for emergency operation, maintenance, and testing. Please see Conditions 3.l and 3.k of the Preliminary Determination for limits on hours for the proposed six generators and Condition 8 for Recordkeeping requirements.

Comment 19:

Microsoft has underestimated particulate matter "Diesel engine exhaust particulate matter (DEEP) was characterized as being equivalent to PM Filterable and was based on the filterable particulate matter emissions calculated for the criteria pollutant." Particulate matter includes both the filterable and condensable portion of diesel emissions.

Response to Comment 19:

Microsoft Columbia supplied in their Notice of Construction application a conservative estimate for condensable particulate matter as equaling the total volatile organic compounds produced from the engines and then added that to the filterable particulate matter to calculate particulate matter (PM2.5, PM10) emissions. Diesel Engine Exhaust Particulate (DEEP) is considered only the filterable portion of emission for comparison to the Acceptable Source Impact Levels.

Comment 20:

DEEP has been portrayed by Ecology as being more stringent than the previous TAP regulations that existed prior to 2009. The residents of Quincy deserve to see this assurance in numbers, i.e., using the calculations under the previous WAC 173-460-150.

Response to Comment 20:

Prior to 2009, DEEP was not regulated in WAC 173-460-150, so there was no limitation for DEEP as a toxic air pollutant prior to the 2009 update to the Toxic Air Pollutant list. Prior to 2009, DEEP was only evaluated as particulate matter (PM2.5, PM10).

Comment 21:

On page 3-4, Microsoft again indicates that they intend to operate engines in excess of the hours allowed for "emergency" designation:

> [1]For each combination of primary and reserve 1,500-kWe generator engines, 24 cold-start events (monthly startups for reliability testing and maintenance on each engine, accounting for approximately 20 of 110 operating hours) + 18 cold-start events (remaining 90 operating hours ÷ 5 hours per cold start) = 42 cold events per year.

Response to Comment 21:

Please see response to Comment 18.

Comment 22:

Section 4.1.2 As Ecology is aware, modeling using the NSPS for particulate matter underestimates emissions. The manufacturer's guarantee is based on ISO 8178, a weighted 5-load average, to meet the standard. During the engine certification process, the engine must be warmed up for 30 minutes prior to testing which is does not represent real-life emissions. Even the consultant acknowledges that if Microsoft is required to test using Method 5/202 for particulate matter that they will reduce the efficiency of the DPF to 85%.i The weighed 5-load average is the only way to manufacturers can meet the federally required NSPS.

Ecology should require that engines are tested at each operational load to assure compliance with the required NSPS and with modeling assumptions. To do otherwise may severely underestimate emissions, and therefore risk to our community.

> [1]15.2.17.B.2: Particulate Matter (PM) shall be measured using ISO 8178 as the engine data is measured using the ISO 8178 standard as well. **If EPA Method 5/202 must be used, Safety Power will limit the guarantee to an 85% reduction in PM.**

Response to Comment 22:

Testing to compare to certification does allow for warmup and is trying to capture long term emissions. The testing that is done uses Federal NSPS requirements. Also, when going through the permitting process manufacturers provide Not-to-Exceed values that are usually higher than the given certification standard. Those worst case values are then used in the modeling to compare to National Ambient Air Quality Standards and Ecology's Acceptable Source Impact Levels.

Comment 23:

It appears that the use of the SCRs will be of little use until an engine reaches 500 degrees Fahrenheit. Has this been factored into the emission calculations? Or is the assumption that there will be a 90% reduction without consideration to the delay in achieving the necessary temperature.

Response to Comment 23:

Yes, it was factored into the emission calculations that the SCR equipment to control NOx will not be at operation temperature for the initial 15 minutes after startup and will not operate at low loads (e.g. 10 percent load). Table EC-6: Startup Emissions Summary (page 90) of Microsoft Columbia Data Center's Notice of Construction application, mentions this in the footnotes.

Comment 24:

Was the secondary formation of particulate matter considered during modeling?

Response to Comment 24:

No, it was not. Emissions, after permitting limitations for this project were below New Source Review thresholds for PM2.5 and PM10, which is used as our trigger for modeling minor sources.

Comment 25:

Section 4.3.2 This is the first time that Microsoft has addressed VOCs from storage containers. Because there are other diesel storage containers onsite, I believe that modeling should include all of them just as modeling should include other area sources of HAPs, TAPs and criteria pollutants.

Response to Comment 25:

Diesel fuel has very low volatility. No additional modeling is required, after review of storage tank emissions for all the fuel that Microsoft Columbia Data Center is allowed in one year and emissions from this project. Most toxic air pollutant emissions were below De Minimis and there was only one compound above De Minimis, but it was well below the Small Quantity Emission Rate, which is the value that determines if additional modeling is required.

Comment 26:

Section 4.3.9 Ecology submitted comments as part of the SEPA process. Please include a copy of Ecology's comments in your response to me.

Response to Comment 26:

Ecology's comments as part of the SEPA process are included in Microsoft Columbia Data Center's Notice of Construction application on Page 210-211.

Comment 27:

Section 6.2 What are the on-site environmental factors that are associated with the 5% reduction in stack temperature and 10% reduction in velocity mentioned in the footnotes a and b on page 6-4?

Response to Comment 27:

Environmental factors include added stack height that can reduce flow and temperature from the top of the stack. The diesel particulate filters can also reduce stack temperature.

Comment 28:

Please convert the following chart from page 6-5 into relatable NSPS values to assure compliance:

Table 6-2: Criteria Pollutant Emission Rate Parameters (Single Engine)

Engine	Pollutant	Units[a]	100% Load	75% Load	50% Load	25% Load	10% Load
1,500-kWe Primary	$PM_{2.5}$	lb/hr	0.86	0.92	0.90	0.74	0.82
		tpy	0.044	0.048	0.047	0.038	0.042
	PM_{10}	lb/hr	0.86	0.92	0.90	0.74	0.82
	CO	lb/hr	4.81	3.21	4.30	4.94	4.80
	NO_2	lb/hr	10.40	9.21	8.81	8.61	8.47
		tpy	0.21	0.13	0.11	0.10	0.09
	SO_2	lb/hr	0.027	0.027	0.027	0.027	0.027
1,500-kWe Reserve	$PM_{2.5}$	lb/hr	0.86	0.92	0.90	0.74	0.82
		tpy	0.044	0.048	0.047	0.038	0.042
	PM_{10}	lb/hr	0.86	0.92	0.90	0.74	0.82
	CO	lb/hr	4.81	3.21	4.30	4.94	4.80
	NO_2	lb/hr	10.40	9.21	8.81	8.61	8.47
		tpy	0.21	0.13	0.11	0.10	0.09
	SO_2	lb/hr	0.027	0.027	0.027	0.027	0.027
350-kWe Support	$PM_{2.5}$	lb/hr	0.082	0.11	0.14	0.13	0.20
		tpy	3.51E-03	4.82E-03	6.34E-03	6.21E-03	9.31E-03
	PM_{10}	lb/hr	0.082	0.11	0.14	0.13	0.20
	CO	lb/hr	3.41	2.72	2.65	2.72	2.11
	NO_2	lb/hr	1.91	1.63	1.56	1.56	1.53
		tpy	0.03	0.02	0.01	0.01	0.01
	SO_2	lb/hr	6.54E-03	6.54E-03	6.54E-03	6.54E-03	6.54E-03

[a] Maximum tpy values for each engine are based on 110 hours per year for the 1,500-kWe primary and reserve engines and 100 hours per year for 350-kWe support engines.

Response to Comment 28:

Table EC-5b in the Notice of Construction application (pages 85-88) for Microsoft Columbia Data Center shows the grams per brake horsepower hour values (NSPS units) for these generators along with pounds per hour values.

Comment 29:

Section 6.3.2 Why is the operational time from 7 am to 5 pm? Other permits are allowed to operate during daylight hours only. These limits on hours will fall outside of daylight hours for much of the year. The permit should specify daylight hours only.

Response to Comment 29:

Columbia Data Center proposed in previous permitting efforts, operation during daytime hours (on average) between 7 am to 5 pm for planned maintenance of the generators. This proposal was acceptable to Ecology. Operating during daylight hours, would allow for very long days in the summer months (e.g. 4 am to 9 pm). Operation hours 7 am to 5 pm are also more desirable from a noise and air dispersion perspective.

Comment 30:

Section 6.3.10 Compare the chart in this permit application (below) with the chart in MWH's application using WSU accessed in October 2017.

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Table 9
Estimated Project and Background Impacts Compared to National Ambient Air Quality Standards
MWH-03/04/05/06 Data Center
Quincy, Washington

Criteria Pollutant/ Hazardous Air Pollutant	National Standards Primary ($\mu g/m^3$)	National Standards Secondary ($\mu g/m^3$)	Washington State Standards ($\mu g/m^3$)	Modeled Operating Scenario	AERMOD Filename	Modeled Project	Modeled Project + Local Background[a]	Regional Background[b]	Estimated Cumulative Concentration
						Impact ($\mu g/m^3$)			
Carbon Monoxide (CO)									
8-hour average	10,000	--	10,000	Unplanned power outage	T4co_122117	154 [c]	--	3,308	3,462
1-hour average	40,000	--	40,000	Unplanned power outage		467 [c]	--	5,776	6,243
Sulfur Dioxide (SO_2)									
3-hour average	--	1,310	1,310	Unplanned power outage	T4so2_122117	5.1 [d]	--	2.1	7.2
1-hour average	200	--	200	Unplanned power outage		10 [d]	--	2.6	12.7
Particulate Matter (PM_{10})									
24-hour average	150	150	150	Unplanned power outage	T4pm10_011617	67 [d,e]	88	62	149.9
Particulate Matter ($PM_{2.5}$)									
Annual average	12	15	12	Theoretical Max. Year	T4pm25_122117	2.7 [e]	3.3	6.5	9.8
24-hour average	35	35	35	Non-emergency monthly operations (Ranked Day 8)	T4pm25_011718(a-e)	6.4 [f,g]	6.5	21	27.5
Nitrogen Oxides (NO_x)									
Annual average	100	100	100	Theoretical Max. Year	T4nox_122117	8.6 [e]	12	2.8	14.8
1-hour average	188	--	--	Concurrent generator operation	Refer to Monte Carlo Evaluation (Appendix F)	--	96 [h]	16	112

Notes:
[a] Modeled impact, including local background sources, at the project-related maximum impact location.
[b] Regional background level obtained from Ecology's Air Monitoring Network website (WSU; accessed October 30, 2017).
[c] Reported values represent the 2nd-highest modeled impacts.
[d] Reported values represent the 1st-highest modeled impacts.
[e] It was assumed that local data centers were concurrently operating in facility-wide power outage mode. The Con Agra facility was modeled as continuously operating at PTE rates. All cooling towers were modeled as continuously operating at PTE rates.
[f] Monthly maintenance operations are expected to occur on each engine for 20 minutes per engine per month. In the event that complications arise during testing, this duration may be greater. Multiple sequential tests may occur within the same day for up to 12 hours per day.
[g] This model conservatively assumes that two engines may be running at a time and that operations may occur any time during daytime hours (7 a.m. to 7 p.m.). In order to capture the worst-case emission impacts for this scenario, a test model was run with all project generators operating at full-variable load. The resultant emission impacts for each individual generator was ranked. The generator with the highest ranked impact was simulated to operate concurrently with a randomly chosen adjacent generator for this modeling demonstration. Local background modeling for this scenario assumed nearby data centers were operating generators in a maintenance run scenario.
[h] Reported value is based on the Monte Carlo assessment for NO_2. See the Monte Carlo Analysis (Appendix F) for further details.

Abbreviations and Acronyms:
$\mu g/m^3$ = Micrograms per cubic meter
NO_2 = Nitrogen dioxide
PTE = Potential-to-emit
$PM_{2.5}$ = Particulate matter with aerodynamic diameter less than or equal to 2.5 microns.
PM_{10} = Particulate matter with aerodynamic diameter less than or equal to 10 microns.

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Landau Associates

Table 6-9: Maximum Modeled Concentrations for NAAQS Modeling

Pollutant and Averaging Period		UTM Coordinates[a] Easting (meters)	UTM Coordinates[a] Northing (meters)	Year	Worse-Case Maximum Operating Load	Predicted Concentration	Background Concentration	Total Concentration	NAAQS[b]
						micrograms per cubic meter ($\mu g/m^3$)			
NO_2	1-hour	2,83,598.18	5,235,938.72	3 years	Reserve 10%	80.7[c]	58.75	139.45	188
PM_{10}	24-hour	283,702.01	5,235,743.36	2020	Primary 10%	12.5	77.6	90.1	150
$PM_{2.5}$	24-hour	283,275.00	5,235,150.00	3 years	Reserve 10%	3.6	18.9	22.5	35

[a] UTM = Universal Transverse Mercator: NAD83
[b] Source: Title 40 CFR Part 50
[c] PVMRM methodology was applied to the model.

Of great concern in comparing background levels is the 25% increase in PM10, and a 360% increase in NO2. Also, please note that use of a lower PM2.5 24-hr background level in this application, than in the earlier one, and the conveniently missing PM2.5 annual and PM10 background levels and emission estimates, which earlier documents suggest may be nearing the NAAQS limit.

Response to Comment 30:

You are comparing two different facilities with different background pollutant levels when accounting for regional and local emission sources. The NO_2 background used for Microsoft Columbia Data Center is from the map of Quincy NO_2 and DPM analyses that combines local and regional background sources. (To get to the map without the link, see Response to Comment 1.) You will notice on that map, that NO_2 can vary significantly from point to point, depending on how close you are to a roadway. Local source background values were included in the source impacts for the MWH Data Center values. Regional background of PM10 has gone up in most of Eastern Washington in the last 10 years, due to extreme events such as wildfires and windblown dusts storms, included in the background data.

There is no annual standard for PM10, and annual PM2.5 was not required to be modeled for this project due to low emissions and low maximum impact evaluation.

Comment 31:

PM2.5 is of great concern because it linked to bad health outcomes, including heart attacks and strokes. As EPA notes “Exposure to fine particle pollution can cause premature death and harmful cardiovascular effects such as heart attacks and strokes, and is linked to a variety of other significant health problems,” none of which is part of Ecology’s review during permitting. Cancer, which is a long term consequence of exposure to chemical compounds, is not, and has not been the greatest public health threat to the residents of Quincy – fine particulate is.

Response to Comment 31:

The emissions from this project were low and modeling of DEEP and NO2 were below their respective Acceptable Source Impact Levels. Second tier review, which analyzes health impacts for a source, was not required.

Comment 32:

Another take away from this section is the use of Idaho data for our regional background source. This is inappropriate. Past permitting applications have used data closer to the area, which is presumably more accurate. Please compare the data available from Ecology’s Air Quality Network (WSU?) against the data provided in this application from Idaho’s Department of Environmental Quality and use the data that represents the highest regional background levels for all the criteria pollutants. Please confirm after doing so, that PM2.5 annual and PM10 annual background levels and their emissions from Columbia are accounted for in this permit.

Response to Comment 32:

The regional background is determined with local monitoring data from Washington, Oregon, Idaho, and modeling data. This site has always been a collaboration effort. Currently, the Idaho Department of Environmental Quality, Washington State Department of Ecology, and Oregon Department of Environmental Quality worked together to provide this data and website. The website used to be on the Washington State University site, but it has now moved to the Idaho Department of Environmental Quality website. PM10 does not have an annual National Ambient Air Quality Standard. PM2.5 values were low enough that when comparing modeled impacts to its significant impact level (WAC 173-400-113) it was below the threshold and refined modeling was not required.

Comment 33:

Microsoft has also chosen to use Idaho Department of Environmental Quality's ozone data for modeling purposes. Again, this is inappropriate when Ecology has air monitoring data they collect. The use of 52 ug/m3 seems low, considering that during the permitting of Yahoo! In 2011 Landau was going to use a background level of over 65 ug/m3 until directed by Ecology's modeler Clint Bowman to use 40 ug/m3. The accuracy of the ozone data is important in modeling, and with the addition of so much more NO2 the ozone level must be rising since it is converted in the presence of sunlight into ozone.

Response to Comment 33:

The IDEQ background Design Values (DVs) used in a New Source Review (NSR) for minor source projects are gridded values prepared using model and monitor data from July 2014 to June 2017 based on EPA recognized calculation methods. Ozone value at 52 ppb DV for the area is representative and the secondary chemistry near emission sources generally tend to remain in precursors equilibrium.

Ozone levels decline in areas near sources that emit NOx, so we would not expect the diesel powered generator NOx emissions to cause an increase in ozone. That is because NOx (primarily emitted as NO) reacts with ozone to create NO_2. For the purposes of permit modeling, we estimate the conversion of NOx to NO_2 in the presence of ozone. The ozone concentration chosen to input into the AERMOD model using the PVMRM (Plume Volume Molar Ratio Method) is based on the modeled monthly maximum 75th percentile of the daily maximum running 8 hr average. In most cases, this assumption overestimates the amount of ozone available for reactions with NO in the air at any given time.

Comment 34:

Here's another example of how regional background has changed over time. Dell's application in 2012 shows a 1-hr NO2 background of 29 ug/m3, which is 50% lower than the background levels now. Considering we are talking about the air that this community breathes, perhaps additional monitoring is warranted and control retained by Ecology.

Multiple-Facility Results

For the multiple-facility analysis, the Monte-Carlo-based estimate of the three-year average 98th percentile 1-hour NO_2 value (for the receptor location with the maximum value) is 95.0 µg/m^3. This includes local background (from the Microsoft, Celite, and Con-Agra facilities). After accounting for regional background, the NO_2 impact at or beyond the project boundary is 124.0 µg/m^3, and is lower than the NAAQS:

Parameter	Concentration (µg/m^3)
Three-year average 98th percentile 1-hour NO_2 increment (no background)	95.0
Regional background	29.0
NO_2: Increment plus background	124.0
NAAQS Limit	188

Response to Comment 34:

The NO_2 background used for Microsoft Columbia Data Center is from the map of Quincy NO_2 and DPM analyses that combines local and regional background sources. The table provided shows regional background and the local background is accounted for with the multiple-facility value labeled "Three-year average 98th percentile 1-hour NO_2 increment.

Comment 35:

Below are a few of the World Health Organization's recommended air quality standards for your review. I would recommend that Ecology look at them and ask, "What kind of damage are we doing to the residents of Quincy so a select few can benefit?"

Here are the WHO's guideline values:

Fine particulate matter (PM2.5): 5 µg/m^3 annual mean/15 µg/m^3 24-hr mean

Coarse particulate matter (PM10): 15 µg/m^3 annual mean/45 µg/m^3 24-hour mean

Nitrogen dioxide (NO2): 10 µg/m^3 annual mean/25 µg/m^3 24-hr mean

In closing, I would like to remind Ecology that the NAAQS is not a protective standard; it isn't even professed to be. After 15 years of data center build-out in Quincy, I would like to know if Ecology has ever looked at our health data, both cancer and non-cancer, from over those years and compared them to years past? Have the increased background levels impacted our health?

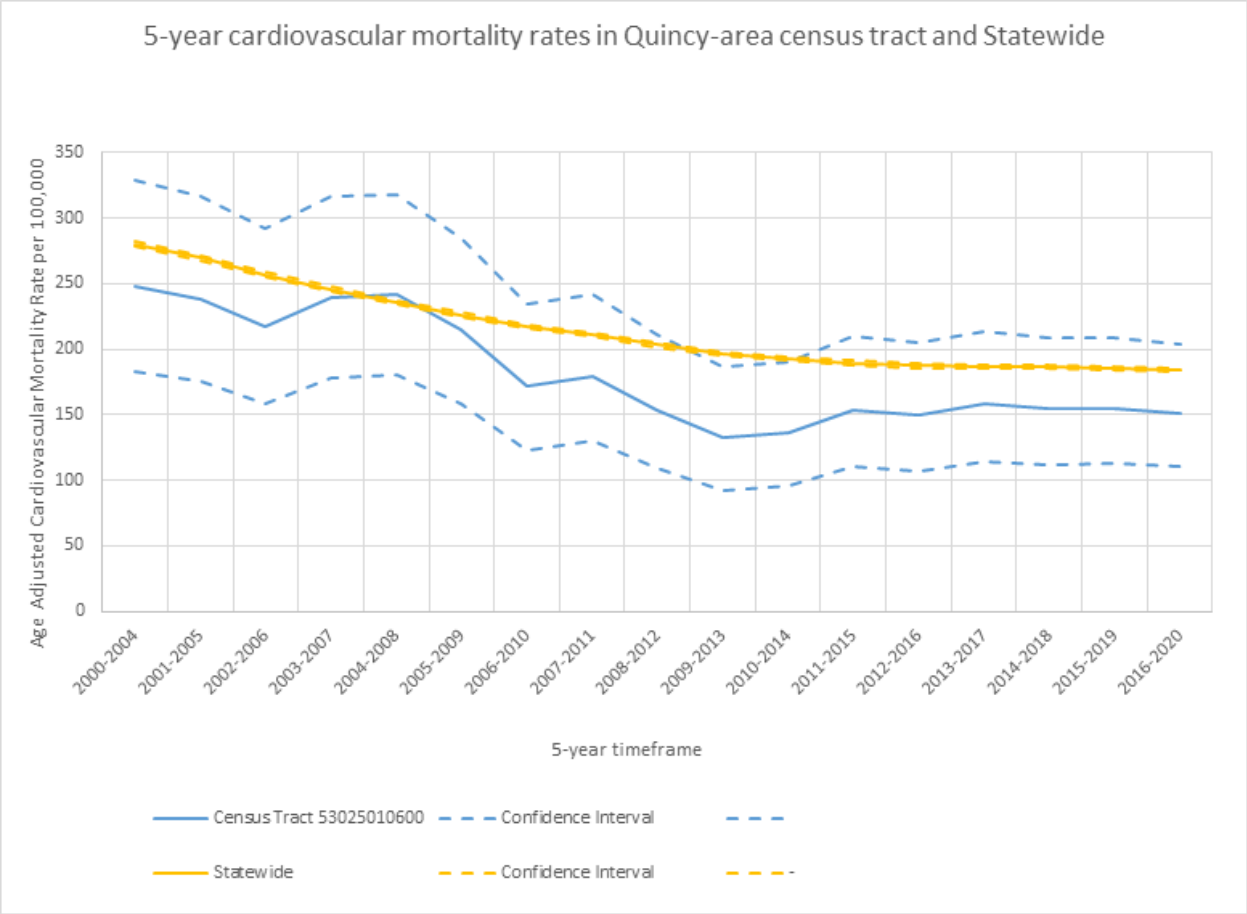
Thank you for providing an extension of time to review the permit.

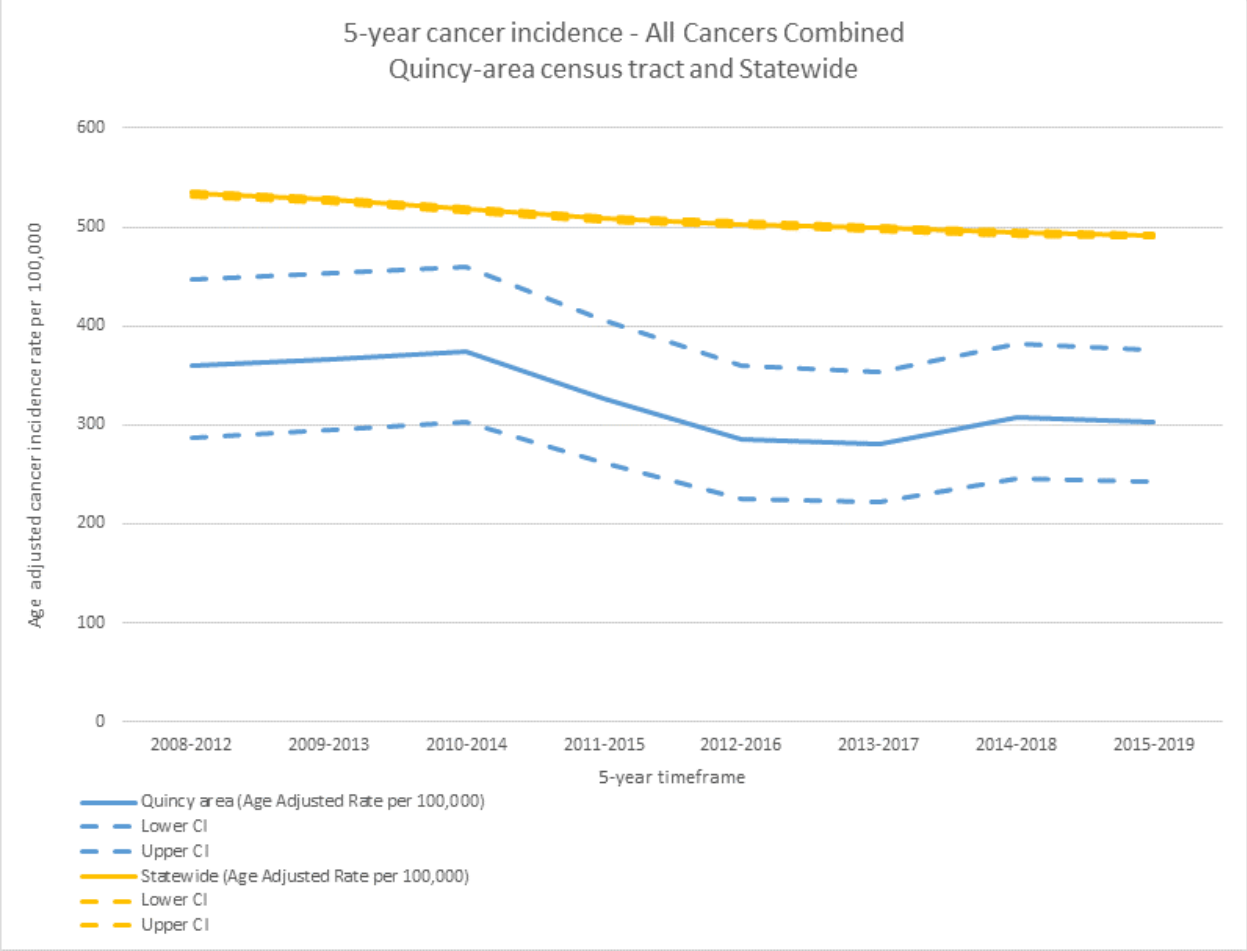
Response to Comment 35:

We are aware of the World Health Organization's air quality guidelines. As guidelines, they are not legal air quality standards on which we can base air permit decisions. As part of the notice of construction application process, applicants must demonstrate that their increase in criteria and toxic air pollutant emissions do not cause ambient impacts that exceed current NAAQS or pose an unacceptable health risk.

We use risk assessment as a tool to estimate individual and population health risks to determine if the ambient impacts from a proposed project meet the acceptable risk criteria. In the case of Microsoft Columbia's increased emissions did not cause ambient impacts that exceeded ASILs. Since ASILs are set at a risk level equal to a lifetime increased risk of 1 in one million, the risks from this project were determined to be sufficiently low, and no further review (i.e., second tier toxics review) was required. It is important to note that epidemiologists would not be able to discern this low rate of risk through an evaluation of health statistics.

That said, some relevant health data are available on WA DOH's Washington Tracking Network (WTN) portal. For example, the figures below are based on data obtained from the WTN portal, and display the rates of cardiovascular mortality and cancer incidence over time. The data show that these rates have declined statewide and in Quincy alike.


5-year cardiovascular mortality rates in Quincy-area census tract and Statewide
Age Adjusted Cardiovascular Mortality Rate per 100,000
350
300
250
200
150
100
50
0
2000-2004
2001-2005
2002-2006
2003-2007
2004-2008
2005-2009
2006-2010
2007-2011
2008-2012
2009-2013
2010-2014
2011-2015
2012-2016
2013-2017
2014-2018
2015-2019
2016-2020
5-year timeframe
Census Tract 53025010600
Confidence Interval
Statewide
Confidence Interval



Commenter: Microsoft Columbia Data Center

Comment 36:

Thank you for preparing the draft Notice of Construction Approval Order No. 22AQ – E006 based on your thorough review of the permit application submitted to Washington State Department of Ecology (Ecology) on October 19, 2021, and subsequent revisions submitted on December 7, 2021, and March 12, 2022. The Approval Order will authorize the installation of six (6) new diesel emergency generators to provide backup electrical power for two (2) new data center buildings (CO7 and CO8).

On behalf of the Microsoft Corporation (MSFT), Burns & McDonnel provides the following comments and requested changes to the draft permit. These have been included in the attached markup version of the draft permit and technical support document; requested additions, deletions, and comments have been indicated in the track changes. If you have any other questions or would like additional clarification, we would appreciate the opportunity to discuss them with you. A summary of our comments is detailed below.

General – MSFT recommends several minor edits related to grammar, format, consistency, and clarity as shown in the attached markup. Also, “Approval Condition” and “Condition” are used

interchangeably throughout the draft when referring to one of the approval conditions. For the purpose of clarity, MSFT request that reference to "approval conditions" consistently name them as such.

Response to Comment 36:

Ecology prefers to use "condition" throughout the Approval Order for consistency. The Approval Conditions header will remain the same.

Comment 37:

Approval Condition 2.d. – The new engines will not be installed within the CO7 and CO8 buildings but will be located in the vicinity. Therefore, MSFT requests that this approval condition be updated to reflect that the engines are "associated with" buildings CO7 and CO8 instead of "installed in".

Response to Comment 37:

Ecology agrees with this change and has updated the condition language.

Comment 38:

Approval Condition 2.e. – To clarify that new engines already identified in the Approval order will not require an additional notification to Ecology under this approval condition, MSFT requests that the first sentence be updated as follows: "The installation of any new or replacement engines (in addition to the engines identified in Tables 1.a and 2) 18 months after issuance of this Approval Order…

Response to Comment 38:

Condition 2.e applies to any generators installed after 18 months of issuance of the Approval Order. An extension to construction can be requested for the six generators evaluated with this project (Condition 11.d, WAC 173-400-111(7)).

Comment 39:

Approval Condition 3.a – The previous version of this approval condition contained a final sentence which has been removed in the current version. The sentence read "Total annual fuel consumption by the facility may be averaged over a three-year period using monthly rolling totals." MSFT requests that this sentence be reinserted.

Response to Comment 40:

This condition was originally written in a time when the facility's yearly potential emissions were low enough that if all three years-worth of fuel was used in one year, the facility would not trigger Title V thresholds for NOx. That is no longer the case. The condition will remain unchanged without the three year averaging.

Comment 41:

Approval Condition 4.b. – It may be preferred to complete source testing concurrent with commissioning tests, as this may reduce costs, test hours, and test-related emissions. Therefore, MSFT requests the first sentence of the approval condition be updated to add the qualifier "or concurrent with commissioning," to the first sentence.

Response to Comment 41:

Ecology agrees with this request, the additional language "or concurrent with commissioning" will be added to the condition.

Comment 42:

Approval Order - Table 3 – The metric mechanical engine power ratings for the 1.5 MWe and 350 kWe generator engines are incorrect and need to be recalculated. Sample calculations are included in the attached markup version. 1.5 MWe converts to 1.645 MWm and 350 kWe converts to 402 kWm.

Response to Comment 42:

Ecology agrees with the correction to the MWm values and Table 3 has been updated.

Comment 43:

Approval Condition 9.a – In the event that a binding agreement to purchase the new generator engines is in place, or will be in place by the date this order is approved, the 10-day time threshold may have already been exceeded by the time this Approval Order is finalized. Therefore, MSFT requests that the first sentence of this approval condition be edited to read as follows to provide an optional 10-day time period notification: "Within 10 business days of the date of this approval order or within 10 business days after entering into a binding agreement to purchase the engine/generator sets identified in Equipment Table 1.a above (whichever date is the later)…".

Response to Comment 43:

Ecology has update the condition language to…. "The serial number, manufacturer make and model, and standby capacity for each engine and generator, and the engine build date must be submitted prior to installation of each engine."

Comment 44:

PTE calculations in paragraphs 3.a.iB, 4.a., and 4.d of Technical Support Document - According to paragraph 4.a of the Technical Support Document (TSD), Potential to Emit (PTE) calculations were based on "uncontrolled primary use of generators running 500 hours per year." This definition has been explained as being representative of generator PTE prior to permit approval. The PTE calculations accomplished accordingly resulted in much higher tons/year and lb/averaging period values in Tables 1, 2, and 5 of Paragraphs 3.a.i.B and 4.d of the TSD than are shown in the permit application. The calculations employed in the application accounted for the effect of "air pollution control equipment and restrictions on hours of operation" anticipated in the permit according to the definition of PTE at WAC 173-400-030(76). If the values in Tables 1, 2, and 5 were to be updated according to the WAC definition of PTE, the values in these tables would reflect the values provided in Table 4-2 and Appendix C of the permit application.

Response to Comment 44:

Potential to Emit (PTE) for a piece of equipment changes from before permitting to after, as the definition of PTE states, operation limitations must be "enforceable" for add on controls, fuel combustion limitations or limits on hours of operation in order for it to be accounted for in PTE. The TSD is capturing the source's potential to emit before permitting and after. After permitting potential to emit is shown in the TSD as "allowable emissions" defined in WAC 173-400-030(5).

Also, source PTE before any enforceable limits are in place in a permit demonstrates, which pollutants are above De Minimis and trigger permitting. Table 2 demonstrates which pollutants trigger permitting based on their potential before enforceable limitations are in place (WAC 173-460-040(1)). For modeling purposes and comparison to the Small Quantity Emission Rate we look at allowable emissions (WAC 173-460-070 and -080).

Tracking this before permitting PTE also helps Ecology track sources that have taken limits to stay out of Title V, and are Synthetic Minor sources.

Comment 45:

Paragraph 3.a.ii of TSD – The statement, "PSD does not apply to this project, based on uncontrolled 8,760 hr/yr PTE" does not match the definition for PTE according to WAC 173-400-030 (for which "controlled emissions at 420 hr/yr combined PTE for the new generators" would apply) or according to the definition in paragraph 4.a of the TSD (for which "uncontrolled 500 hr/yr PTE for each generator" would apply). To provide clarity, MSFT recommends that this

statement be reworded as follows: “PSD does not apply to this project, based on the annual PTE.”

Response to Comment 45:

Ecology agrees with the proposed language.

Comment 46:

Paragraph 3.b.i of TSD – Per NSPS Subpart IIII, Tier 2 emission standards apply to the 1.5 MWe generator engines and Tier 3 emission standards apply to the 350 kWe generator engines. The current language only reference Tier 2. Therefore, MSFT requests that the last sentence in this paragraph be updated to reflect that Tier 2 or Tier 3 emission standards apply, depending on the power rating.

Response to Comment 46:

Ecology agrees with the proposed language.

Comment 47:

Emission rates in Paragraph 4.a of TSD – Toxic air pollutant (TAP) emission rates for the 1.5 MWe generator engines were derived using emission factors from AP-42, Volume 1, Chapter 3.4. But for the 350 kWe engines, TAP emission rates were calculated using emission factors from AP-42, Volume 1, Chapter 3.3. MSFT requests edits, as shown in the attached markup, to correct the emission factor reference for the 350 kWe engines.

Response to Comment 47:

Ecology agrees to the updated reference for 350 kWe emission factors.

Comment 48:

Paragraph 4.c of TSD – The control technology to be employed for particulate matter (PM) emissions from the generator engines will be diesel particulate filters (DPF), as referenced in Sections 3.1, 5.5, 6.2, and 6.3 and Appendices A and E. of the application. Therefore, MSFT request that the word “catalyzed’ be removed from the description of PM controls.

Response to Comment 48:

Ecology agrees with the correction.

Comment 49:

Table 7 of TSD – Consistent with Table 2, the units for the "Allowable Emissions – Increase" column should be specified as "lb/Averaging Period" consistent with Table 2. Also, as referenced in the above comments of PTE calculations, the values in Table 2 are much higher than as shown in the permit application, which account for the effect of "air pollution control equipment and restrictions on hours of operation" as PTE is defined in at WAC 173-400-030(76). The TAP emissions depicted in Table 2 to be exceeding de minimis values are then compared in Table 7 against SQER thresholds. If the values in Table 2 were to be updated according to the WAC definition of PTE, Acetaldehyde, 1,3-Butadiene, Dibenz(a,h)anthracene, and Formaldehyde would no longer be depicted in Table 2 as exceeding de minimis values and would not be listed in Table 7.

Response to Comments 49:

Potential to Emit for a piece of equipment changes from before permitting to after, as the definition of PTE states operation limitations must be "enforceable" for add on controls, fuel combustion limitations or limits on hours of operation in order for it to be accounted for in PTE. The TSD is capturing the source's potential to emit before permitting and after. After permitting, potential to emit is shown in the TSD as "allowable emissions" defined in WAC 173-400-030(5).

Also, source PTE before any enforceable limits are in place in a permit demonstrates, which pollutants are above De Minimis and trigger permitting. Table 2 demonstrates which pollutants trigger permitting based on their potential before enforceable limitations are in place (WAC 173-460-040(1)). For modeling purposes and comparison to the Small Quantity Emission Rate we look at allowable emissions (WAC 173-460-070 and -080).

Comment 50:

Appendix B of TSD – The NSPS IIII citation in 40 CFR §60.4202(a)(2) has been updated to reference 40 CFR 1039, Appendix I in lieu of 40 CFR 89.112 and 89.113. Therefore, MSFT requests that the Notes column be corrected to reflect this change.

Response to Comment 50:

Ecology agrees with the corrected reference.

Exhibits included as part of Comment #4:

Pages 1 and 2 of email exchanges between Ecology staff. March 28-29, 2007. These letters are also identified by pervious numbers for presentation to Ecology. Exhibit Y and Exhibit N.d

DOE denial followed by apology to Microsoft

cheers
sarah

From: Clark, Stuart (ECY)
Sent: Wednesday, March 28, 2007 5:49 PM
To: Flibbert, Gregory S. (ECY); Wood, Karen K. (ECY); Rees, Sarah (ECY)
Cc: Pfeifer, Grant D. (ECY)
Subject: RE: Columbia Data Center Second Tier AQ - status of review?

Want does this mean? Did Matt vet his findings internally before telling the company rep?

From: Flibbert, Gregory S. (ECY)
Sent: Wednesday, March 28, 2007 5:13 PM
To: Wood, Karen K. (ECY); Clark, Stuart (ECY); Rees, Sarah (ECY)
Cc: Pfeifer, Grant D. (ECY)
Subject: FW: Columbia Data Center Second Tier AQ - status of review?

Heads up

From: Kadlec, Matthew (ECY)
Sent: Wednesday, March 28, 2007 9:51 AM
To: 'James Wilder'
Cc: Flibbert, Gregory S. (ECY); Bill Fetterley
Subject: RE: Columbia Data Center Second Tier AQ - status of review?

James,

Obtaining an air operating permit before construction begins is required by state law. I am denying approval of the project as built due to excessive risk of chemical injury to the occupants of neighboring properties.

Matt Kadlec, Ph.D.
Senior Toxicologist
Air Quality Program
Washington Department of Ecology
PO Box 47600
Olympia, WA 98504-7600
Voice 360 407-6817
Fax 360 407-7534
mkad461@ecy.wa.gov

From: James Wilder [mailto:JWilder@jsanet.com]
Sent: Wednesday, March 28, 2007 9:30 AM
To: Kadlec, Matthew (ECY)
Cc: James Wilder; Flibbert, Gregory S. (ECY); Bill Fetterley
Subject: Columbia Data Center Second Tier AQ - status of review?

Hello Matt -

EXHIBIT N.d

Exhibit Y

Flibbert, Gregory S. (ECY)

From: Flibbert, Gregory S. (ECY)
Sent: Thursday, March 29, 2007 10:31 AM
To: Rees, Sarah (ECY); Clark, Stuart (ECY); Wood, Karen K. (ECY); Todd, Tom (ECY)
Cc: Pfeifer, Grant D. (ECY); Vazquez, Michele (ORA); Flibbert, Gregory S. (ECY)
Subject: MSN Quincy Data Center Tier II status

Sarah, Stu, Karen, and Tom:

Grant, Michele, and I talked with Mike Manos at MSN at 9:30 this morning. Mike is the MSN decision maker for the Quincy Data Center project. We told him that Matt's findings were not conclusive, and were certainly not discussed with Ecology management before release. Mike was concerned by the e-mail because he believed that MSN had established a good working relationship with Ecology. He committed MSN to working with Ecology on difficult issues, and asked that Ecology maintain close communications with both MSN and their consultants whenever there are problems.

The Tier II was submitted using the worst case operating scenario of 24 hour operations at full generator capacity. This approach was decided in a call with Mike on January 5, 2007. Because of the worst case scenario approach to the Tier II, there is a lot of opportunity to either identify impact mitigations or find a different operating scenario that will work for both MSN and Ecology. I talked to Jim Wilder (MSN consultant) this morning and he certainly expected to discuss the Tier II before a decision was made.

Mike graciously accepted our apologies, and told us that the issue has been remedied by our quick response. However, Matt's message made it way throughout MSN, and you may expect calls from above.

If you have any questions or need any information please contact me.

Greg

From: Rees, Sarah (ECY)
Sent: Wednesday, March 28, 2007 9:08 PM
To: Clark, Stuart (ECY); Flibbert, Gregory S. (ECY); Wood, Karen K. (ECY); Todd, Tom (ECY)
Cc: Pfeifer, Grant D. (ECY)
Subject: RE: Columbia Data Center Second Tier AQ - status of review?

Matt did not vet this finding with me or Tom prior to sending. There are some problems with this Tier 2 - the project has apparently been built (without AQPs knowledge) prior to getting the air permit, and because of where they have chosen to locate the building, a plume of well above ASIL acrolein and formaldehyde envelops a neighboring school during prevailing wind conditions. Matt had talked to us about this, and I had talked briefly to Greg last week. Prior to leaving the office Monday I asked Matt to outline the options available for this Tier 2 given the fact that the building can't be moved (Matt's first recommendation), and to work with Lindsay to set up a call with me, Tom, Matt and Greg so we could all discuss how to proceed.

I don't know why Matt sent this email without first consulting us. I have asked Tom to talk with Matt about this tomorrow, and I will pick it up when I return to the office on Friday. In the interim, I can't defend Matt's finding as final, and Greg should notify the consultant and company rep appropriately - I believe there are still options available and I would still like to lay these out and discuss with Greg, Matt and Tom.

I will be on the road a good part of tomorrow and out of the office, but should be back online by mid afternoon. Tom Todd will be available in the office if you have further questions.

BTW - Tom Todd is Matt's direct supervisor and should be included in email chains pertaining to this matter.

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Photograph of black smoke plume from Columbia, May 2015

Data Centers and Quincy, Washington...May 2015

Quincy is home to 197 diesel engines.

421 as of July 2022

Microsoft Columbia...Summer 2011.

This is what an engine looks like when it starts. The plume of black material is the dangerous particulate that comes from the operation of the diesel engine without emissions controls.

6

Ecology image Figure 3 from the Third Tier Review Recommendation, August 20, 2010, page 16 of 33. My identification is Exhibit K.a.

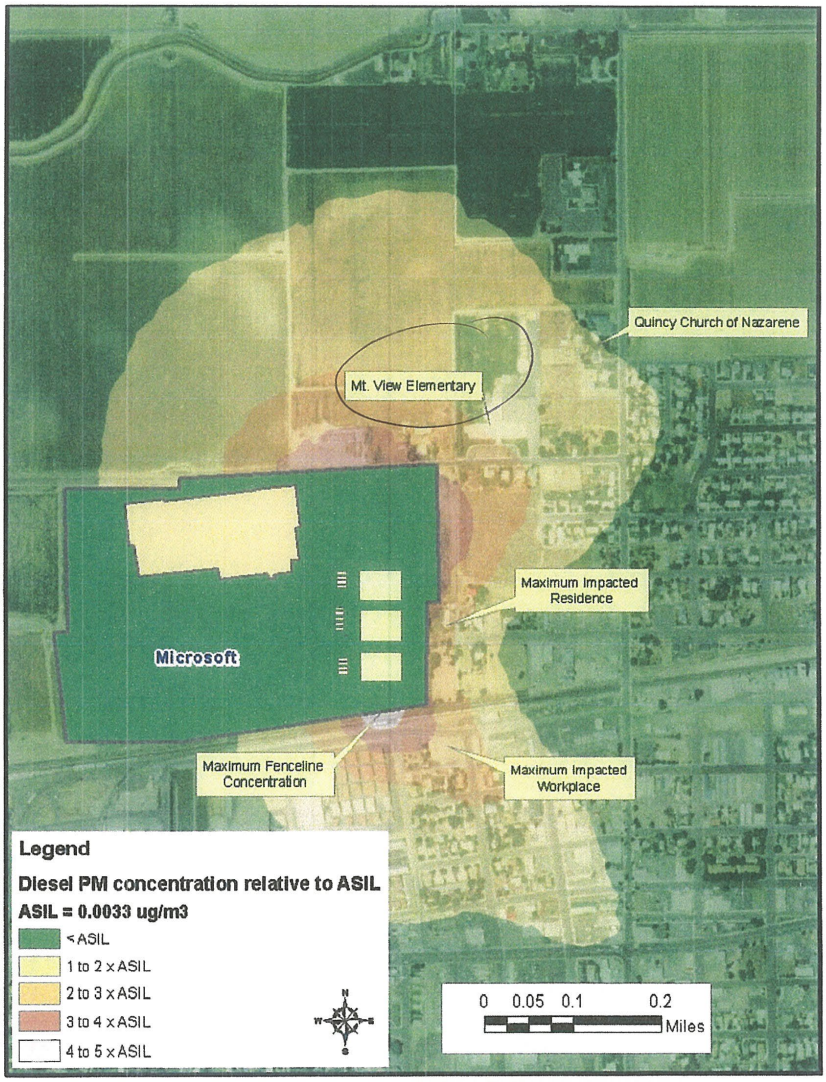

Figure 3. Estimated annual average off-site DEEP concentrations attributable to proposed Microsoft emissions (expansion project only).

EXHIBIT- K.a

This is the expansion only - not all the gens together

7