northwest Clean Air agency
1600 South Second Street
Mount Vernon, WA 98273-5202
ph 360.428.1617
fax 360.428.1620
www.nwcleanair.org

Notice of Construction Worksheet (3/7/17)

NOC No. **1338**	Source: **Mt. Baker Ski Area** Mile Marker 52, Mount Baker Hwy Mount Baker, WA 98244
Permit Engineer: **Agata McIntyre**	NOC Contact: Gwyn Howat
NOC Received: **8/30/2019**	NWCAA No.:

A. Project Description

Mount Baker is an off-grid ski area which operates diesel and propane fired stationary engines to provide electricity and heat for use at the ski area. The ski area has been operating since the 1960's off-grid. NWCAA registered this facility only recently, and we are now working to permit existing as well as new equipment. Per NWCAA policy, equipment installed before 6/20/2009 is considered grandfathered and a permit is not required.

This permit approves numerous existing engines and two new engines, one installed summer of 2020, one to be installed summer of 2021. The permit also includes the new Sewage Treatment Plant engine 1 that was installed under OAC 1344 in Jan. 2020. Upon issuance of OAC 1338, OAC 1344 will be cancelled/superseded by OAC 1338.

Location	Engine Info	Fuel
White Salmon Gen Room #1	172 hp; manufactured 2017; installed 2017; also used for Hydronic Heating	Diesel
White Salmon #3 aka "Big Gen"	569 hp; manufactured 2013; installed 2017; also used for Hydronic Heating	Diesel
Raven Lodge 1	79 hp; manufactured 2011; installed 2011; also used for Hydronic Heating	Diesel
Raven Lodge 2	79 hp; manufactured 2015; installed 2016; also used for Hydronic Heating	Diesel
Sewage Treatment Plant 1	74 hp; manufactured 2015; installed 2020	Diesel
Sewage Treatment Plant 2	86 hp; manufactured 2015; installed 2016	Diesel
HM Maint. 1 S# 66606222	188 hp; manufactured 2007; installed 2012	Diesel

HM Maint. 2 S# 66606221	190 hp; manufactured 2007; installed 2012	Diesel
HM Maint. 3	134 hp; manufactured 2017; installed 2018	Diesel
Chair 3/4 #1	275 hp; manufactured 2011; installed 2012	Diesel
Chair 5 #1	475 hp; manufacture and install 2020	Diesel
NEW Chair 6 #2	475 hp; *manufacture 2019; expected to be installed in 2021; will replace existing 450 hp CAT C16 engine installed at Chair 6 in 2004 (existing engine exempt from NSR due to install date)*	Diesel
Chair 8 #1	475 hp; manufactured 2010; installed 2010	Diesel
Pandome Hut A	31 hp; manufactured 2016; installed 2018	Propane
Pandome Hut B	31 hp; manufactured 2016; installed 2018	Propane

The facility also operates the following engines that are exempt from NSR review:

Location	**Reason for NSR Exemption**	**Fuel**
White Salmon Gen Room #2	Exempt - emergency stationary	Diesel
Chair 1	Exempt - installed before 2009	Diesel
Chair 2 #1	Exempt - installed before 2009	Diesel
Chair 2 #2	Exempt - emergency stationary	Diesel
Chair 3/4 #2	Exempt - emergency stationary	Diesel
Chair 5 #2	Exempt - emergency stationary	Diesel
Existing Chair 6 #2	Exempt - installed before 2009	Diesel
Chair 6 #1	Exempt - emergency stationary	Diesel
Chair 7	Exempt - emergency stationary	Diesel
Chair 8 #2	Exempt - emergency stationary	Diesel
Concrete Hut	Exempt - emergency stationary	Diesel

Diesel fuel characteristics - The diesel fuel that the facility uses is blended specially for low-temperature operation. Per a 10/3/19 email from Duncan Howat, it's a blend of #1 with #2 diesel. Duncan confirmed that the sulfur content meets ULSD sulfur requirements (15 ppm). Per AP-42 App. A, this blend has a Btu content of 136,000 Btu/gal.

B. New Source Review (NSR) Fees

NWCAA NSR fees were assessed in accordance with the fee schedule effective January 1, 2019. The NSR fees assessed and PAID are listed in the NSR Fee Worksheet, also posted on the OAC Whiteboard.

C. Public Notice

In accordance with NWCAA Section 305.1, an internet notice that the NWCAA received this application was posted on the NWCAA website for a minimum of 15 consecutive days ending on September 14, 2019. No comments or requests for further review were received from the public.

In accordance with NWCAA 305.2, a formal public involvement and notification **is required** for this project because:

- this permit will include a facility-wide NOx limit to limit emissions below Title V levels (NWCAA 305.2(7)); and
- this permit will authorize emissions of more than 40 tons of NOx (NWCAA 305.2(9)).

Notice of the 30-day public comment period for this permit was posted on the NWCAA website on 11/7/20 along with the notice for Mount Baker Compliance Order No. 1743-2020-30. See ___ for more information.

In accordance with NWCAA 305.3(E), notice of this permit was also sent to the Regional administrator. Per email from Doug Hardesty, EPA Region 10, Doug is the person who can receive the notice on the Administrator's behalf. It's ok to send the notice via email.

D. SEPA Review

State Environmental Policy Act (SEPA) review under NWCAA Section 155 is addressed as follows.

During the pre-application meeting, Gwen Howat indicated that the Forest Service has performed several NEPA reviews for projects at Mount Baker Ski Area. Unfortunately, Gwen was unable to provide us with copies of these determinations, so we are unable to determine whether they are sufficient and cover the scope of this permit. Gwen provided a SEPA checklist along with the NOC application, so we are moving forward with a SEPA review.

The NWCAA is the SEPA lead agency for this project. Gwyn Howat submitted a SEPA checklist that was signed on 8/30/19. On 12/27/19, the NWCAA issued a DNS to cover diesel engines and propane engines (all stationary) to in this OAC.

On 12/27/19, the DNS and SEPA Checklist were sent to the following SEPA contacts.

- WA Department of Ecology SEPA Register: separegister@ecy.wa.gov
- Whatcom County: mpersoni@whatcomcounty.us

The SEPA Checklist and the DNS issued by the NWCAA are included in the NOC file.

GHG Disclosure and Mitigation

Table 1: GHGs

tons NOx/yr	80
lb NOx/yr	160,000
MMBtu/yr	36,281
metric tons CO2/yr	**2,705**

Emission Factors table 1:

NOx	*4.41*	*lb/MMBtu (fuel input)*	*AP-42 Tables 3.3-1 & 3.4-1/5th Ed.*
CO2	*164.00*	*lb/MMBtu (fuel input)*	*AP-42 Tables 3.3-1 & 3.4-1/5th Ed.*

GHG emissions were calculated based on direct emissions from the Mount Baker Ski Area. Emission estimates take into account the facility-wide stationary equipment limit on NOx, which restricts NOx emissions to less than 80 tons/yr.

To find the CO2 emissions at the NOx limit, I used the AP-42 NOx emission factor to back-calculate the total MMBtu/yr the engines can produce at the facility-wide limit. I then multiplied this number by the corresponding CO2 emission factor from AP-42 to obtain the amount of CO2 emitted per year while staying in compliance with the facility-wide NOx limit. NWCAA will not require GHG mitigation under SEPA at this level for this fleet of equipment.

E. Permit History

OAC 1344 was issued in January 2020 for Sewage Treatment Plant Engine 2. This engine will be incorporated into OAC 1338, and OAC 1344 will be cancelled/superseded.

F. Basis for New Source Review Applicability

NSR applicability is based on potential emissions, 8,760 hr/yr, for each piece of equipment. The seasonal nature of operations at this facility was not taken into account in determining NSR applicability for each engine because this is not a federally-enforceable limitation on each engine. Table 2 below summarizes

conclusions for criteria pollutants. NSR can (and is) also triggered for toxics. However, the list of toxics is quite lengthy and difficult to summarize here. See the "Equip and Emiss Final for OAC" spreadsheet for details.

Table 2: Emission Units under NSR for criteria pollutants

	PM (TSP)	PM10	PM2.5	SO2	NOx	CO	VOC	TAPs
White Salmon #1	Yes	Yes	Yes	No	Yes	Yes	Yes	*
White Salmon #3 "Big Gen"	No	No	No	Yes	Yes	Yes	Yes	*
Raven Lodge #1	No	No	No	No	Yes	No	No	*
Raven Lodge #2	No	Yes	Yes	No	Yes	No	No	*
Sewage Treatment #1	Permitted under OAC 1344, and moved to this OAC to combine all permits into one. See discussion in OAC 1344.							
Sewage Treatment #2	No	Yes	Yes	No	Yes	No	No	*
HM Maint #1	No	No	No	No	Yes	No	Yes	*
HM Maint #2	No	No	No	No	Yes	No	Yes	*
HM Maint #3	Yes	Yes	Yes	No	Yes	No	No	*
Chair 3/4 #1	No	No	No	Yes	Yes	Yes	Yes	*
Chair 5 #1	No	No	No	Yes	No	Yes	Yes	*
Chair 6 #2	No	No	No	Yes	No	Yes	Yes	*
Chair 8 #1	No	No	Yes	Yes	Yes	Yes	Yes	*
Pandome Hut A	No	No	No	No	Yes	No	No	*
Pandome Hut B	No	No	No	No	Yes	No	No	*

* Due to space constraints, NSR applicability for toxics is not listed in the table, but is presented in the "Equip and Emiss Final for OAC" spreadsheet. See the spreadsheet for further information about toxics.

Emission factors for criteria pollutants were obtained from EPA's Tier standards tables, https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P100OA05.pdf, for engines that were Tier 3 or Tier 4 certified. For engines that weren't Tier 3 or Tier 4 certified, emission factors from AP-42 Tables 3.3-1 & 3.4-2/5th edition were used.

Emission factors for toxics were obtained from Antelope Valley Air Quality Management District, http://www.avaqmd.ca.gov/, and AP-42 Tables 3.3-1 & 3.4-2/5th edition.

See "Equip and Emiss Final for OAC for additional details about the calculations and emission factors.

G. Criteria Air Pollutant Emissions and Impacts

Section F, NSR applicability for equipment, does not take into account seasonal operation nor operation of engines that are paired (where only one of the paired engines is operated at a given time). These factors are taken into account in Section G.

1. Seasonal Operation

Mount Baker is a seasonal facility, with operations limited to wintertime (5 months per year) based on a contract with the US Forest Service. The lodges and ski lifts, where the majority of the equipment is located, only operate seasonally. However, the facility isn't entirely shut down for the year. Maintenance is performed outside of the 5-month seasonal operations window and telecommunications equipment continues to operate year round. For this reason, the 5-month operation limitation is only applied to engines at the lodges and ski lifts.

For the reasons discussed in Section F, the seasonal limit on operations wasn't taken into account for determining whether individual pieces of equipment require a permit. However, it's appropriate to take the seasonal limit into account when calculating the reasonable upper bound of emissions from the facility. Without taking this seasonal limitation into account, total emissions from the equipment in this OAC would also exceed the synthetic minor limit placed by this OAC. This is unreasonable as the synthetic minor limit WILL be federally enforceable and WILL limit operations.

2. Paired Engines

The following engines operate in pairs, with only one of the pair operating at any given time. This limitation is taken into account in calculating facility emissions:

- Sewage treatment plant (#1 & #2)
- Raven Lodge (#1 & #2)
- Heather Meadows Maintenance (#1 & #2)

3. Criteria Pollutant Emissions

The emissions listed in Table 3 below take into account both seasonal operation and limited operation for those engines that are paired (only one of the engine pair running at any given time). In some cases, emissions from one of the paired engines may be higher. To be conservative, emissions are estimated based on the higher-emitting engine in each pair.

Table 3: Total Emissions From Equipment In OAC 1338

PM-10	tons/yr	4.2
PM-2.5	tons/yr	4.2
SO2	tons/yr	14
NOx	tons/yr	75
CO	tons/yr	39
VOC	tons/yr	18

The following tables summarize the emissions from each piece of equipment and take the seasonal operation limit into account in how many hours per year equipment operates. As noted earlier, some equipment is seasonal, while some isn't. For seasonal equipment, emissions are calculated based on 3,650 hr/yr (5 months of continuous operation). For equipment that can operate year round, emissions are calculated based on 8,760 hr/yr. The Equip and Emiss Final for OAC spreadsheet includes further details, including information about emission factors.

Table 4: Criteria Pollutant Emissions from Engines at White Salmon Lodge

	White Salmon Gen Room #1			White Salmon #3 aka "Big Gen"		
Engine kW	129 kW			424	kW	
hr/yr		3650			3650	
	lb/hr emiss	ton/yr emiss		lb/hr emiss	ton/yr emiss	
Particulate (TSP)	4.07E-01	7.43E-01		1.87E-02	3.41E-02	
PM-10	4.07E-01	7.43E-01		1.87E-02	3.41E-02	
PM-2.5	4.07E-01	7.43E-01		1.87E-02	3.41E-02	
SO2	3.81E-01	6.95E-01		1.26E+00	2.30E+00	
NOx	5.79E+00	1.06E+01		3.74E+00	6.82E+00	
CO	1.25E+00	2.28E+00		3.27E+00	5.97E+00	
VOC	4.73E-01	8.63E-01		1.57E+00	2.86E+00	

Table 5: Criteria Pollutant Emissions from Engines at Raven Lodge

	Raven Lodge 1			Raven Lodge 2		
Engine kW	58	kW Est.		58 kW Est.		
hr/yr		3650			3650	
	lb/hr emiss	ton/yr emiss		lb/hr emiss	ton/yr emiss	
Particulate (TSP)	3.84E-02	7.00E-02		1.85E-01	3.37E-01	
PM-10	3.84E-02	7.00E-02		1.85E-01	3.37E-01	
PM-2.5	3.84E-02	7.00E-02		1.85E-01	3.37E-01	
SO2	1.73E-01	3.16E-01		1.73E-01	3.16E-01	
NOx	5.11E-01	9.33E-01		2.63E+00	4.80E+00	
CO	6.39E-01	1.17E+00		5.66E-01	1.03E+00	
VOC	2.15E-01	3.92E-01		2.15E-01	3.92E-01	

Table 6: Criteria Pollutant Emissions from Engines at the Sewage Treatment Plant

	Sewage Treatment Plant 1			Sewage Treatment Plant 2		
Engine kW	55	kW		64 kW Est.		
hr/yr		8760			8760	
	lb/hr emiss	ton/yr emiss		lb/hr emiss	ton/yr emiss	
Particulate (TSP)	2.43E-03	1.06E-02		2.03E-01	8.90E-01	
PM-10	2.43E-03	1.06E-02		2.03E-01	8.90E-01	
PM-2.5	2.43E-03	1.06E-02		2.03E-01	8.90E-01	
SO2	1.65E-01	7.22E-01		1.90E-01	8.33E-01	
NOx	4.85E-02	2.12E-01		2.89E+00	1.27E+01	
CO	2.43E-03	1.06E-02		6.23E-01	2.73E+00	
VOC	2.05E-01	8.96E-01		2.36E-01	1.03E+00	

Table 7: Criteria Pollutant Emissions from Engines at Heather Meadows Maintenance Bldg.

	HM Maint 1			HM Maint 2			HM Maint 3		
Engine kW	139	kW		139	kW		102 kW		
hr/yr		8760			8760			8760	
	lb/hr emiss	ton/yr emiss		lb/hr emiss	ton/yr emiss		lb/hr emiss	ton/yr emiss	
Particulate (TSP)	6.13E-02	2.68E-01		6.13E-02	2.68E-01		3.25E-01	1.42E+00	
PM-10	6.13E-02	2.68E-01		6.13E-02	2.68E-01		3.25E-01	1.42E+00	
PM-2.5	6.13E-02	2.68E-01		6.13E-02	2.68E-01		3.25E-01	1.42E+00	
SO2	4.14E-01	1.81E+00		4.14E-01	1.81E+00		3.04E-01	1.33E+00	
NOx	1.23E+00	5.37E+00		1.23E+00	5.37E+00		4.63E+00	2.03E+01	
CO	1.07E+00	4.70E+00		1.07E+00	4.70E+00		9.97E-01	4.37E+00	
VOC	5.14E-01	2.25E+00		5.14E-01	2.25E+00		3.78E-01	1.65E+00	

Table 8: Criteria Pollutant Emissions from Engines at Ski Lift Chair 3/4 #1 and Chair 5 #1

	Chair 3/4 #1			Chair 5 #1		
Engine kW	205	kW		336	kW	
hr/yr		3650			3650	
	lb/hr emiss	ton/yr emiss		lb/hr emiss	ton/yr emiss	
Particulate (TSP)	9.04E-02	1.65E-01		1.56E-02	2.85E-02	
PM-10	9.04E-02	1.65E-01		1.56E-02	2.85E-02	
PM-2.5	9.04E-02	1.65E-01		1.56E-02	2.85E-02	
SO2	6.11E-01	1.11E+00		1.05E+00	1.92E+00	
NOx	1.81E+00	3.30E+00		3.12E-01	5.70E-01	
CO	1.58E+00	2.89E+00		2.73E+00	4.98E+00	
VOC	7.58E-01	1.38E+00		1.31E+00	2.38E+00	

Table 9: Criteria Pollutant Emissions from Engines at Ski Lift Chair 6 #2 and Chair 8 #1

	Chair 6 #2			Chair 8 #1		
Engine kW	354	kW		350	kW	
hr/yr		3650			3650	
	lb/hr emiss	ton/yr emiss		lb/hr emiss	ton/yr emiss	
Particulate (TSP)	1.56E-02	2.85E-02		1.54E-01	2.82E-01	
PM-10	1.56E-02	2.85E-02		1.54E-01	2.82E-01	
PM-2.5	1.56E-02	2.85E-02		1.54E-01	2.82E-01	
SO2	1.05E+00	1.92E+00		1.04E+00	1.90E+00	
NOx	2.96E-01	5.41E-01		3.09E+00	5.63E+00	
CO	2.59E+00	4.73E+00		2.70E+00	4.93E+00	
VOC	1.31E+00	2.38E+00		1.29E+00	2.35E+00	

4. IMPACTS & NAAQS

As noted earlier, the impacts of all of the equipment in this OAC are limited based on the facility-wide NOx limit established in this OAC. Table 10 below compares impacts of criteria pollutants at this limit to thresholds that NWCAA uses (by policy) for deciding whether further dispersion modeling is needed to determine NAAQS compliance. Details about how these emissions were calculated are included in the Equip and Emiss Final for OAC spreadsheet.

Table 10: Review of Emissions for NAAQS Compliance

Pollutant	Emissions* (ton/yr)	Thresholds at which further review for NAAQS compliance is needed per NWCAA Policy (ton/yr)
PM_{10}	4.5	7.5
$PM_{2.5}$	4.5	5
NOx	<80	40
CO	42	100
SO_2	15	40
VOC	19	No ambient std

NOx emissions in Table 10 are above the threshold at which NWCAA requires further review of emission impacts for NAAQS compliance. Emissions of all other pollutants are below the listed thresholds.

NWCAA's policy is based on the assumption that NOx will be emitted from a single stack. This is not the case at the Mount Baker Ski Area. The exhaust stacks at the ski area are dispersed throughout the different buildings and ski lifts. There are more than 15 different stacks (each engine has its own stack). In addition, while NOx is the pollutant tracked, the NAAQS is actually for NO2, which is only a portion of the total NOx as NOx is a mix of NO and NO2.

NAAQS Standard:

Nitrogen Dioxide (NO_2)	primary	1 hour	100 ppb	98th percentile of 1-hour daily maximum concentrations, averaged over 3 years
	primary and secondary	1 year	53 ppb (2)	Annual Mean

Various scientific studies examine the amount of NO2 in NOx from engines. The proportion of NO2 to NO in NOx varies widely depending on engine operating temperature and exhaust treatment technologies, https://dieselnet.com/tech/emi_gas.php,

"In older, naturally aspirated diesel engines, approximately 95% of nitrogen oxides were composed of NO and only 5% of NO2. The proportion of NO2 in total NOx in turbocharged diesel engines (without aftertreatment) is typically higher, reaching up to about 15%. According to British data, the fraction of NO2 in vehicle NOx emissions (all fuels) increased from around 5-7% in 1996 to 15-16% in 2009 [Carslaw 2011]".

Other articles discuss the fact that aftertreatment (such as that present on the Tier 4 certified engines at Mount Baker) may increase the ratio of NO2 to 50% or

higher. However, only a portion of the engines at Mount Baker are equipped with aftertreatment. Many engines have no aftertreatment, so NO2 is expected to be lower from these engines.

Modeling to show NO2 NAAQS compliance was contemplated. However, the idea was rejected as unnecessary based on engineering judgement. Factors taken into account include:

- Emissions come from 15 different stacks that are widely dispersed throughout the ski area. Hence, NO2 impacts will be dispersed as well. Unlike the case where all emissions come from a single stack, no single ambient location will receive maximum impacts from all off the stacks at the same time.

- Only a portion (less than 50%) of the total NOx is expected to be NO2. So, NO2 from all engines under this OAC is expected to be less than 40 tons/yr, which is typically the threshold at which NWCAA requires modeling to show compliance with the NO2 NAAQS when emissions come from a single stack.

H. Toxic Air Pollutant Emissions and Impacts

The toxics review presented in this section includes the same operational limitations as for criteria pollutants, discussed above. The review is performed in accordance with WAC 173-460. WAC 173-460 requires that toxics be quantified and that impacts from toxics be reviewed.

1. Toxics Quantified

As required by WAC 173-460-050, emissions of toxic air pollutants (TAPs) were quantified (see tables below). Emission factors were obtained from Antelope Valley Air Quality Management District, http://www.avaqmd.ca.gov/, and AP-42 Tables 3.3-1 & 3.4-2/5th Ed. See the Equip and Emiss Final for OAC spreadsheet for additional details about the emission factors and methods used to calculate emissions.

Table 11: TAPs from Engines at White Salmon Lodge

	White Salmon Gen Room #1			White Salmon #3 aka "Big Gen"		
	lb/hr emiss	ton/yr emiss		lb/hr emiss	ton/yr emiss	
1,3-Butadiene	2.10E-03	3.83E-03		6.95E-03	1.27E-02	
Acetaldehyde	1.01E-03	1.84E-03		3.34E-03	6.09E-03	
Acrolein	1.22E-04	2.22E-04		4.03E-04	7.35E-04	
Benzene	1.23E-03	2.24E-03		4.06E-03	7.41E-03	
Benzo(a)anthracene	2.21E-06	4.03E-06		7.31E-06	1.33E-05	
Benzo(a)pyrene	1.25E-07	2.27E-07		4.13E-07	7.54E-07	
Benzo(b)fluoranthene	6.56E-08	1.20E-07		2.17E-07	3.97E-07	
Benzo(k)fluoranthene	1.02E-07	1.87E-07		3.39E-07	6.19E-07	
Chrysene	4.64E-07	8.46E-07		1.54E-06	2.80E-06	
Dibenzo(a,h)anthracene	3.85E-07	7.03E-07		1.28E-06	2.33E-06	
Formaldehyde	1.55E-03	2.83E-03		5.14E-03	9.38E-03	
Indeno(1,2,3-cd)pyrene	2.48E-07	4.53E-07		8.23E-07	1.50E-06	
m-Xylene	1.25E-04	2.28E-04		4.14E-04	7.55E-04	
Naphthalene	1.11E-04	2.03E-04		3.69E-04	6.74E-04	
o-Xylene	1.25E-04	2.28E-04		4.14E-04	7.55E-04	
Propylene	3.39E-03	6.19E-03		1.12E-02	2.05E-02	
p-Xylene	1.25E-04	2.28E-04		4.14E-04	7.55E-04	
Toluene	5.37E-04	9.81E-04		1.78E-03	3.25E-03	
Nitrogen Dioxide	2.90E+00	5.29E+00		1.87E+00	3.41E+00	
Sulfur Dioxide	3.81E-01	6.95E-01		1.26E+00	2.30E+00	
Diesel Engine PM	4.07E-01	7.43E-01		1.87E-02	3.41E-02	

Table 12: TAPs from Engines at Raven Lodge

	Raven Lodge 1			Raven Lodge 2		
	lb/hr emiss	ton/yr emiss		lb/hr emiss	ton/yr emiss	
1,3-Butadiene	9.51E-04	1.74E-03		9.51E-04	1.74E-03	
Acetaldehyde	4.57E-04	8.34E-04		4.57E-04	8.34E-04	
Acrolein	5.51E-05	1.01E-04		5.51E-05	1.01E-04	
Benzene	5.56E-04	1.02E-03		5.56E-04	1.02E-03	
Benzo(a)anthracene	1.00E-06	1.83E-06		1.00E-06	1.83E-06	
Benzo(a)pyrene	5.65E-08	1.03E-07		5.65E-08	1.03E-07	
Benzo(b)fluoranthene	2.98E-08	5.43E-08		2.98E-08	5.43E-08	
Benzo(k)fluoranthene	4.65E-08	8.48E-08		4.65E-08	8.48E-08	
Chrysene	2.10E-07	3.84E-07		2.10E-07	3.84E-07	
Dibenzo(a,h)anthracene	1.75E-07	3.19E-07		1.75E-07	3.19E-07	
Formaldehyde	7.03E-04	1.28E-03		7.03E-04	1.28E-03	
Indeno(1,2,3-cd)pyrene	1.13E-07	2.06E-07		1.13E-07	2.06E-07	
m-Xylene	5.66E-05	1.03E-04		5.66E-05	1.03E-04	
Naphthalene	5.06E-05	9.23E-05		5.06E-05	9.23E-05	
o-Xylene	5.66E-05	1.03E-04		5.66E-05	1.03E-04	
Propylene	1.54E-03	2.81E-03		1.54E-03	2.81E-03	
p-Xylene	5.66E-05	1.03E-04		5.66E-05	1.03E-04	
Toluene	2.44E-04	4.45E-04		2.44E-04	4.45E-04	
Nitrogen Dioxide	2.56E-01	4.67E-01		1.31E+00	2.40E+00	
Sulfur Dioxide	1.73E-01	3.16E-01		1.73E-01	3.16E-01	
Diesel Engine PM	3.84E-02	7.00E-02		1.85E-01	3.37E-01	

Table 13: TAPs from Engines at the Sewage Treatment Plant

	Sewage Treatment Plant 1			Sewage Treatment Plant 2		
	lb/hr emiss	ton/yr emiss		lb/hr emiss	ton/yr emiss	
1,3-Butadiene	9.07E-04	3.97E-03		1.05E-03	4.58E-03	
Acetaldehyde	4.36E-04	1.91E-03		5.03E-04	2.20E-03	
Acrolein	5.26E-05	2.30E-04		6.07E-05	2.66E-04	
Benzene	5.30E-04	2.32E-03		6.12E-04	2.68E-03	
Benzo(a)anthracene	9.55E-07	4.18E-06		1.10E-06	4.83E-06	
Benzo(a)pyrene	5.39E-08	2.36E-07		6.22E-08	2.72E-07	
Benzo(b)fluoranthene	2.84E-08	1.24E-07		3.27E-08	1.43E-07	
Benzo(k)fluoranthene	4.43E-08	1.94E-07		5.11E-08	2.24E-07	
Chrysene	2.01E-07	8.79E-07		2.32E-07	1.01E-06	
Dibenzo(a,h)anthracene	1.67E-07	7.30E-07		1.92E-07	8.43E-07	
Formaldehyde	6.71E-04	2.94E-03		7.74E-04	3.39E-03	
Indeno(1,2,3-cd)pyrene	1.07E-07	4.70E-07		1.24E-07	5.43E-07	
m-Xylene	5.40E-05	2.36E-04		6.23E-05	2.73E-04	
Naphthalene	4.82E-05	2.11E-04		5.56E-05	2.44E-04	
o-Xylene	5.40E-05	2.36E-04		6.23E-05	2.73E-04	
Propylene	1.47E-03	6.42E-03		1.69E-03	7.41E-03	
p-Xylene	5.40E-05	2.36E-04		6.23E-05	2.73E-04	
Toluene	2.32E-04	1.02E-03		2.68E-04	1.17E-03	
Nitrogen Dioxide	2.43E-02	1.06E-01		1.45E+00	6.33E+00	
Sulfur Dioxide	1.65E-01	7.22E-01		1.90E-01	8.33E-01	
Diesel Engine PM	2.43E-03	1.06E-02		2.03E-01	8.90E-01	

Table 14: TAPs from Engines at Heather Meadows Maintenance Bldg.

	HM Maint 1			HM Maint 2			HM Maint 3	
	lb/hr emiss	ton/yr emiss		lb/hr emiss	ton/yr emiss		lb/hr emiss	ton/yr emiss
1,3-Butadiene	2.28E-03	9.97E-03		2.28E-03	9.97E-03		1.67E-03	7.33E-03
Acetaldehyde	1.09E-03	4.79E-03		1.09E-03	4.79E-03		8.05E-04	3.52E-03
Acrolein	1.32E-04	5.78E-04		1.32E-04	5.78E-04		9.71E-05	4.25E-04
Benzene	1.33E-03	5.83E-03		1.33E-03	5.83E-03		9.79E-04	4.29E-03
Benzo(a)anthracene	2.40E-06	1.05E-05		2.40E-06	1.05E-05		1.76E-06	7.72E-06
Benzo(a)pyrene	1.35E-07	5.93E-07		1.35E-07	5.93E-07		9.95E-08	4.36E-07
Benzo(b)fluoranthe.	7.12E-08	3.12E-07		7.12E-08	3.12E-07		5.24E-08	2.29E-07
Benzo(k)fluoranthe.	1.11E-07	4.87E-07		1.11E-07	4.87E-07		8.18E-08	3.58E-07
Chrysene	5.04E-07	2.21E-06		5.04E-07	2.21E-06		3.70E-07	1.62E-06
Dibenzo(a,h)anthra.	4.19E-07	1.83E-06		4.19E-07	1.83E-06		3.08E-07	1.35E-06
Formaldehyde	1.68E-03	7.37E-03		1.68E-03	7.37E-03		1.24E-03	5.42E-03
Indeno(1,2,3-cd) pyrene	2.70E-07	1.18E-06		2.70E-07	1.18E-06		1.98E-07	8.68E-07
m-Xylene	1.36E-04	5.94E-04		1.36E-04	5.94E-04		9.97E-05	4.37E-04
Naphthalene	1.21E-04	5.30E-04		1.21E-04	5.30E-04		8.90E-05	3.90E-04
o-Xylene	1.36E-04	5.94E-04		1.36E-04	5.94E-04		9.97E-05	4.37E-04
Propylene	3.68E-03	1.61E-02		3.68E-03	1.61E-02		2.71E-03	1.19E-02
p-Xylene	1.36E-04	5.94E-04		1.36E-04	5.94E-04		9.97E-05	4.37E-04
Toluene	5.83E-04	2.56E-03		5.83E-04	2.56E-03		4.29E-04	1.88E-03
Nitrogen Dioxide	6.13E-01	2.68E+00		6.13E-01	2.68E+00		2.31E+00	1.01E+01
Sulfur Dioxide	4.14E-01	1.81E+00		4.14E-01	1.81E+00		3.04E-01	1.33E+00
Diesel Engine PM	6.13E-02	2.68E-01		6.13E-02	2.68E-01		3.25E-01	1.42E+00

Table 15: TAPs from Engines at Ski Lift Chair 3/4 #1 and Ski Lift Chair 5 #1

	Chair 3/4 #1			Chair 5 #1		
	lb/hr emiss	ton/yr emiss		lb/hr emiss	ton/yr emiss	
1,3-Butadiene	3.36E-03	6.13E-03		5.78E-03	1.06E-02	
Acetaldehyde	1.62E-03	2.95E-03		2.78E-03	5.07E-03	
Acrolein	1.95E-04	3.56E-04		3.35E-04	6.12E-04	
Benzene	1.97E-03	3.59E-03		3.38E-03	6.17E-03	
Benzo(a)anthracene	3.54E-06	6.46E-06		6.09E-06	1.11E-05	
Benzo(a)pyrene	2.00E-07	3.65E-07		3.44E-07	6.28E-07	
Benzo(b)fluoranthene	1.05E-07	1.92E-07		1.81E-07	3.30E-07	
Benzo(k)fluoranthene	1.64E-07	3.00E-07		2.83E-07	5.16E-07	
Chrysene	7.44E-07	1.36E-06		1.28E-06	2.34E-06	
Dibenzo(a,h)anthracene	6.18E-07	1.13E-06		1.06E-06	1.94E-06	
Formaldehyde	2.49E-03	4.54E-03		4.28E-03	7.81E-03	
Indeno(1,2,3-cd)pyrene	3.98E-07	7.26E-07		6.85E-07	1.25E-06	
m-Xylene	2.00E-04	3.65E-04		3.44E-04	6.29E-04	
Naphthalene	1.79E-04	3.26E-04		3.07E-04	5.61E-04	
o-Xylene	2.00E-04	3.65E-04		3.44E-04	6.29E-04	
Propylene	5.43E-03	9.92E-03		9.35E-03	1.71E-02	
p-Xylene	2.00E-04	3.65E-04		3.44E-04	6.29E-04	
Toluene	8.61E-04	1.57E-03		1.48E-03	2.71E-03	
Nitrogen Dioxide	9.04E-01	1.65E+00		1.56E-01	2.85E-01	
Sulfur Dioxide	6.11E-01	1.11E+00		1.05E+00	1.92E+00	
Diesel Engine PM	9.04E-02	1.65E-01		1.56E-02	2.85E-02	

Table 16: TAPs from Engines at Ski Lift Chair 6 #2 and Ski Lift Chair 8 #1

	Chair 6 #2			Chair 8 #1		
1,3-Butadiene	5.78E-03	1.06E-02		5.72E-03	1.04E-02	
Acetaldehyde	2.78E-03	5.07E-03		2.75E-03	5.02E-03	
Acrolein	3.35E-04	6.12E-04		3.32E-04	6.05E-04	
Benzene	3.38E-03	6.17E-03		3.34E-03	6.10E-03	
Benzo(a)anthracene	6.09E-06	1.11E-05		6.02E-06	1.10E-05	
Benzo(a)pyrene	3.44E-07	6.28E-07		3.40E-07	6.20E-07	
Benzo(b)fluoranthene	1.81E-07	3.30E-07		1.79E-07	3.27E-07	
Benzo(k)fluoranthene	2.83E-07	5.16E-07		2.79E-07	5.10E-07	
Chrysene	1.28E-06	2.34E-06		1.27E-06	2.31E-06	
Dibenzo(a,h)anthracene	1.06E-06	1.94E-06		1.05E-06	1.92E-06	
Formaldehyde	4.28E-03	7.81E-03		4.23E-03	7.72E-03	
Indeno(1,2,3-cd)pyrene	6.85E-07	1.25E-06		6.77E-07	1.24E-06	
m-Xylene	3.44E-04	6.29E-04		3.40E-04	6.21E-04	
Naphthalene	3.07E-04	5.61E-04		3.04E-04	5.55E-04	
o-Xylene	3.44E-04	6.29E-04		3.40E-04	6.21E-04	
Propylene	9.35E-03	1.71E-02		9.25E-03	1.69E-02	
p-Xylene	3.44E-04	6.29E-04		3.40E-04	6.21E-04	
Toluene	1.48E-03	2.71E-03		1.47E-03	2.68E-03	
Nitrogen Dioxide	1.48E-01	2.70E-01		1.54E+00	2.82E+00	
Sulfur Dioxide	1.05E+00	1.92E+00		1.04E+00	1.90E+00	
Diesel Engine PM	1.56E-02	2.85E-02		1.54E-01	2.82E-01	

Table 17: TAPs from Pandome Hut A and B Engines (propane fired)

	Pandome Hut A			Pandome Hut B		
	lb/hr emiss	ton/yr emiss		lb/hr emiss	ton/yr emiss	
1,3-Butadiene	3.65E-05	1.60E-04		3.65E-05	1.60E-04	
Acetaldehyde	5.46E-04	2.39E-03		5.46E-04	2.39E-03	
Acrolein	2.23E-04	9.77E-04		2.23E-04	9.77E-04	
Benzene	1.66E-04	7.25E-04		1.66E-04	7.25E-04	
Benzo[a]pyrene	1.06E-08	4.66E-08		1.06E-08	4.66E-08	
Benzo[b]fluoranthene	4.47E-08	1.96E-07		4.47E-08	1.96E-07	
Benzo[k]fluoranthene	7.25E-08	3.18E-07		7.25E-08	3.18E-07	
Chrysene	1.32E-08	5.78E-08		1.32E-08	5.78E-08	
Dibenz[a,h]anthracene	1.49E-09	6.53E-09		1.49E-09	6.53E-09	
Formaldehyde	3.93E-03	1.72E-02		3.93E-03	1.72E-02	
Indeno[1,2,3-cd]pyrene	1.64E-08	7.19E-08		1.64E-08	7.19E-08	
Naphthalene	1.67E-05	7.31E-05		1.67E-05	7.31E-05	
o-Xylene	1.18E-05	5.17E-05		1.18E-05	5.17E-05	
Propylene	2.56E-03	1.12E-02		2.56E-03	1.12E-02	
Toluene	5.64E-05	2.47E-04		5.64E-05	2.47E-04	
1,1,2,2-Tetrachloroethane	5.47E-06	2.40E-05		5.47E-06	2.40E-05	
1,1,2-Trichloroethane	4.35E-06	1.91E-05		4.35E-06	1.91E-05	
1,1-Dichloroethane	3.23E-06	1.41E-05		3.23E-06	1.41E-05	
1,2-Dichloroethane	3.23E-06	1.41E-05		3.23E-06	1.41E-05	
1,2-Dichloropropane	3.68E-06	1.61E-05		3.68E-06	1.61E-05	
1,3-Dichloropropene	3.61E-06	1.58E-05		3.61E-06	1.58E-05	
Carbon Tetrachloride	5.02E-06	2.20E-05		5.02E-06	2.20E-05	
Cyclohexane	0.00E+00	0.00E+00		0.00E+00	0.00E+00	
Ethyl Chloride	2.56E-07	1.12E-06		2.56E-07	1.12E-06	
Ethylbenzene	5.43E-06	2.38E-05		5.43E-06	2.38E-05	
Chlorobenzene	4.16E-06	1.82E-05		4.16E-06	1.82E-05	
Chloroform	3.90E-06	1.71E-05		3.90E-06	1.71E-05	
Methyl Alcohol	3.42E-04	1.50E-03		3.42E-04	1.50E-03	
Nitrogen Dioxide	5.58E-01	2.45E+00		5.58E-01	2.45E+00	
Perchloroethylene	3.39E-07	1.49E-06		3.39E-07	1.49E-06	
Phenol	3.28E-06	1.44E-05		3.28E-06	1.44E-05	
Styrene	3.23E-06	1.41E-05		3.23E-06	1.41E-05	
Sulfur Dioxide	8.05E-05	3.52E-04		8.05E-05	3.52E-04	
Vinyl Chloride	2.04E-06	8.93E-06		2.04E-06	8.93E-06	

2. Toxics Impacts

In addition to quantifying TAPs, WAC 173-460 also includes an ambient impact analysis requirement. Note that WAC 173-460-080(3) allows a facility to take credit for enforceable reductions in toxics such as those due to the removal of old equipment.

The Mount Baker Ski Area has been operating since the 1960's and has been replacing/upgrading equipment throughout that time. EPA requirements have driven innovation and stationary engines like the ones at Mount Baker Ski area have become more efficient and lower emitting over the years. This resulted in a gradual decrease in emissions from the Mount Baker Ski Area as older engines are replaced by newer ones, which are generally lower emitting. The table below (obtained from EPA, https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P100OA05.pdf) demonstrates this for engines in the 130 to 225 kW size range.

Rated Power (kW)	Tier	Model Year	NMHC (g/kW-hr)	NMHC + NOx (g/kW-hr	NOx (g/kW-hr	PM (g/kW-hr	CO (g/kW-hr)
130 ≤ kW < 225	1	1996-2002	1.3 [j]	-	9.2	0.54	11.4
	2	2003-2005	-	6.6	-	0.20	3.5
	3	2006-2010	-	4.0	-	0.20	3.5
	4	2011-2013 [h]	-	4.0	-	0.02	3.5
		2014+ [i]	0.19	-	0.40	0.02	3.5

The trend (decreasing emissions for newer engines) holds true for other engine sizes as well.

EPA's Tier tables present emissions of NMHC, NOx, PM, and CO. However, this same trend applies to air toxics. Emission of certain air toxics from combustion equipment are correlated with PM (i.e., diesel particulate and metallic toxics), while emissions of others are correlated with and CO and/or NMHC (i.e., organic toxics like acrolein and formaldehyde). The correlations between PM and NMHC are intuitive, so not discussed in greater detail in this worksheet. The correlation with CO deserves a reference as it's less intuitive. EPA discusses the correlation for CO and organic substances in 75 FR 9647, pages 9647-9690, a federal register posting for 40 CFR 63 Subpart ZZZZ.

Per discussions with Gwyn Howat, all of the engines in this OAC were replaced at least once, and in most cases multiple times, by engines of equivalent size. As noted earlier, driven by EPA Tier standards, newer engines generally have lower emissions. Due to this engine change-out, we conclude that all of the air toxics from the equipment in this OAC are offset by the decreases in emissions when the older, dirtier, equipment was replaced. **After taking credit for the offset, there**

are no emissions that require modeling to show compliance with the ASILs.

I. Prevention of Significant Deterioration (PSD) Program

As noted in Section J, this OAC includes a facility-wide synthetic minor NOx limit to restrict emissions below 80 tons/yr of NOx, which is below Title V levels. Nearly all of the emission units at this facility are combustion units. Therefore, limiting NOx serves as a de-facto limit on emissions of all other pollutants as well. With this limit, the facility is also below the PSD thresholds.

J. Air Operating Permit (AOP) Program

Title V Air Operating Permit (AOP) program applicability was reviewed for the entire Mount Baker Ski Area. Without a federally enforceable limit, the facility's potential emissions would be high enough to be a Title V source.

The facility operates under an agreement with the US Forest Service, which limits ski operations to approximately 5 months per year. However, the contractual agreement with the Forest Service does not serve as a federally enforceable emission limit for Title V purposes. **A synthetic minor limit is needed and will be added to OAC 1338 to keep the facility out of Title V.**

The pollutant of greatest concern (closest to exceeding Title V levels) is NOx. Most of the equipment at this facility is combustion equipment. Therefore, placing a federally enforceable limit on NOx also restricts emissions of other pollutants. If the facility stays under the NOx limit, the facility's emissions of other pollutants will also be below Title V levels.

Several years of actual facility-wide emissions were reviewed. Actual emissions were well below (40% or less) of Title V thresholds. After discussion with NWCAA compliance staff, a NOx limit below 80 tpy was determined to be best for this facility. This limit is approximately twice what Mount Baker Ski Area has reported as their actual emissions. Hence, the limit won't pose undue restriction on facility operations. A restriction to limit NOx below 80 tpy limit will make the facility an SM-80 source per EPA policy. The level of reporting and EPA compliance oversight is lower for SM-80 sources than for sources that have higher emission limits. A limit of 99 tpy (just below the Title V threshold) was contemplated but rejected. The greater level of EPA oversight at the 99 tpy limit is deemed to bring unnecessary complexity in this case.

Table 18: Facility-wide emissions back-calculated based on the NOx limit

PM-10	tons/yr	4.5
PM-2.5	tons/yr	4.5
SO2	tons/yr	15
NOx	tons/yr	80
CO	tons/yr	42
VOC	tons/yr	19

See the Equip and Emiss Final for OAC spreadsheet for details.

K. NWCAA Compliance Database (Stratus)

Update made.

L. Confidential Business Information (CBI)

The application doesn't contain any information deemed by the applicant to be CBI.

M. Applicable / Inapplicable Regulations

1. Northwest Clean Air Agency

NWCAA 300 – New Source Review (NSR); Applies.

NWCAA 304 – Nonroad Engine requirements don't apply to these stationary engines.

NWCAA 305 – Public involvement applies to this project, including 30-day pubic comment.

NWCAA 320 & 324 – Registration & registration fees apply to the facility.

NWCAA 342 – Maintain engine in good operation condition and repair. Applies.

NWCAA 451 – 20% opacity limit applies.

NWCAA 455 – 0.10 gr/dscf @ 7% oxygen; particulate matter limit applies to internal combustion engine (note that the engine doesn't qualify as a "fuel burning equipment" under NWCAA rules because it is not an external combustion device)

NWCAA 530 – General nuisance requirements apply.

2. State

WAC 173-400 - requirements similar to those listed above.

WAC 173-460 – NSR review for toxics applies. See Section H for further discussion.

3. Federal

NWCAA has delegation from EPA for 40 CFR Parts 60 Subparts IIII and JJJJ and 63 Subpart ZZZZ and these subparts apply to the stationary engines at the Mount

Baker Ski Area. As a delegated entity, NWCAA relies on EPA's guidance on how these standards should be applied.

The following EPA table summarizes the engine requirements applicable to the type/size of diesel fired engines in this OAC, based on engine model year: https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P100OA05.pdf.

Rated Power (kW)	Tier	Model Year	NMHC (g/kW-hr)	NMHC + NOx (g/kW-hr	NOx (g/kW-hr	PM (g/kW-hr	CO (g/kW-hr)
56 ≤ kW < 75	1	1998-2003	-	-	9.2	-	-
	2	2004-2007	-	7.5	-	0.40	5.0
	3	2008-2011	-	4.7	-	0.40	5.0
	4	2012-2013 [h]	-	4.7	-	0.02	5.0
		2014+ [i]	0.19	-	0.40	0.02	5.0
75 ≤ kW < 130	1	1997-2002	-	-	9.2	-	-
	2	2003-2006	-	6.6	-	0.30	5.0
	3	2007-2011	-	4.0	-	0.30	5.0
	4	2012-2013 [h]	-	4.0	-	0.02	5.0
		2014+	0.19	-	0.40	0.02	5.0

Rated Power (kW)	Tier	Model Year	NMHC (g/kW-hr)	NMHC + NOx (g/kW-hr	NOx (g/kW-hr	PM (g/kW-hr	CO (g/kW-hr)
130 ≤ kW < 225	1	1996-2002	1.3 [j]		9.2	0.54	11.4
	2	2003-2005	-	6.6	-	0.20	3.5
	3	2006-2010	-	4.0	-	0.20	3.5
	4	2011-2013 [h]	-	4.0	-	0.02	3.5
		2014+ [i]	0.19	-	0.40	0.02	3.5
225 ≤ kW < 450	1	1996-2000	1.3 [j]	-	9.2	0.54	11.4
	2	2001-2005	-	6.4	-	0.20	3.5
	3	2006-2010	-	4.0	-	0.20	3.5
	4	2011-2013 [h]	-	4.0	-	0.02	3.5
		2014+ [i]	0.19	-	0.40	0.02	3.5

As noted earlier, newer model year engines are required to meet more stringent emission guidelines than older engines. In general, by model year 2014, engines of the size range at Mount Baker were required to meet Tier 4 standards (the most stringent standard level).

However, 40 CFR Part 1068 provides exemptions from the above-mentioned Tier standards for certain engines. The regulation was written for nonroad engines but is cross referenced (and applies) through the MACT standards that apply to the stationary engines at Mount Baker Ski Area. During inspections NWCAA found that some of the existing engines at Mount Baker don't meet the above-mentioned Tier requirements based on their model year (see Equip and Emiss Final for OAC spreadsheet). Mount Baker requested to use the Part 1068 exemptions for their existing engines that don't meet Tier standards based on their model year.

There is a lack of clarity in EPA'S rule when it comes to exemptions like that in Part 1068. In its preamble to the non-technical amendments to 40 CFR Part 1068 (79 FR 25 page 7078), EPA states: *"EPA continues to believe that new exempt replacement engines should be used only cases where a currently certified engine cannot practically be installed to power the old equipment. EPA believes the proposed regulatory language in 1068.240 serves this purpose…"* However, the plain language reading of the exemptions in 40 CFR Part 1068.240 doesn't support EPA's stated objective in the preamble. NWCAA requested and received a determination from EPA about the use of the exemption in 40 CFR Part 1068.240 in a 4/15/20 letter (attached below).

ltr_NWCAA_2020-04-15.pdf

Letter summary - NWCAA Questions:

1. What language in 1068.240 limits replacement exemptions to situations where a stationary certified engine subject to 40 CFR Part 60/63 provisions cannot be "reasonably used"? What is the reasonability test, and who decides whether an engine can be "reasonably used"?

2. For stationary engines that rotate equipment, provide guidance on what qualifies as "equipment" under the subpart to which the age limits apply. The statement "uses an engine subject to the subpart" in 40 CFR 1068.30 is not clear without understanding of the limit of "uses." For example, engines rotate electrical generators that in turn provide power to a building or device; where is the box around "equipment" in these cases?

3. Does the 15-year equipment age limit in 60.4210(i) trump the 40-year equipment age limit in 1068.240(a)(3)? In other words, would the exemption in 1068.240 NOT apply to a situation where the engine that's being replaced is 20 years old – please provide citations. Is there a number of times that a given engine can be "replaced" under these provisions other than over a 15 or 40 year span?

4. If “equipment” age is unknown and cannot be determined, is the replacement provision available? What citation prohibits/allows?

5. While 1068.1(a) states that the provisions of this part apply to everyone, 1068.240 states that is applicable only to certificate holders, but the provisions of 60 Subpart IIII apply to the owner/operator of the engine. Engines purchased by stationary sources are generally sold by distributors to the owner/operator. What is the EPA’s intent for recourse if an illegal replacement (non-compliant tier) engine is installed at a facility? Is it an owner/operator failure or a manufacturer failure? How would the citations relate to each party?

Letter summary - EPA Answers:
1. New replacement engines may be exempted from current tier emission standards under 40 CFR 1068.240, either by meeting the requirements of paragraph (b), where use of an engine certified to a more recent tier is impracticable, or by being one of a limited number of replacement engines allowed by paragraph (c).

2. For stationary CI ICE, the equipment includes the CI ICE and the equipment powered by the CI ICE to generate electrical power, provide mechanical work, or perform some similar function. It is not limited to the CI ICE itself. In the examples you provide, the 15-year limit should be based on the installation of equipment used to generate electricity or perform line winding.

3. The 15-year limit on the exemption for new replacement engines in 40 CFR 60.4210(i) applies to CI ICE subject to NSPS IIII, superseding the 40-year limit in 40 CFR 1068.240. The definition of “equipment” includes both the CI ICE and the equipment powered by the CI ICE (i.e. the equipment powered by the CI ICE may not be more than 15 years old). There is no regulatory limit on the number of times that new replacement engines may be installed during this 15-year period.

4. As described above, pursuant to 40 CFR 60.4204(b) and 60.4211(c), it is the responsibility of the owner or operator of a stationary CI ICE to assure compliance with applicable emission standards in NSPS IIII by demonstrating that the CI ICE is repowering equipment that is less than 15 years old.

5. Although the new replacement engine exemption applies to manufacturers of CI ICE, it is the responsibility of the owner or operator of a CI ICE to assure that the exemption has been properly employed on a case-by-case basis. This includes the requirement to maintain adequate records. Regardless of any enforcement action taken or not taken by NWCAA, nothing prevents the EPA from conducting investigations or taking enforcement action either towards the manufacturers of CI ICE.

Conclusion: EPA’s 4/15/20 letter does not provide clear, definitive, guidance that would support EPA’s position in the preamble to 40 CFR Part 1068 (79 FR 25 page 7078). Without clear, definitive, guidance NWCAA cannot enforce the Tier requirements listed for each engine model year. Therefore, this permit approves the continuing operation of existing engines (until end of life) even if their model year does not meet the requirements in the above-mentioned Tier tables.

N. Best Available Control Technology (BACT) Technology Review

1. Similar NWCAA approved projects

OAC 1325 – WSDOT Shuksan Station generators: Tier 4 certified engines required as replacement units for the old Tier 3 units. Vertical exhaust required.

OAC 1344 – New Sewage Treatment Plant engine at Mount Baker Ski Area: Tier 4 certified engine required as replacement for old uncertified engine. Vertical exhaust required. *(Gwyn Howat informed us that after the vertical exhaust was installed, high winds and heavy snow caused problems. She requested that the sewage treatment plant engines be allowed to exhaust through previously installed (horizontal) stacks. These stacks exhaust out over a ravine. Follow-up discussion with Gwyn indicated that the existing stacks could be modified such that the exhaust would be at a 45 degree, upward, angle. This configuration is identified in the permit.)*

2. Case-By-Case BACT

During compliance inspections and follow-up conversations with the facility, NWCAA learned that only some of the diesel-fired engines at the Mount Baker Ski Area meet the EPA tier standards listed for each engine's model year. Further discussion with EPA (Section M.3 above) indicates that the exemption in 40 CFR 1068 may apply to these stationary engines. That exemption would make the engines exempt from the EPA Tier requirements that would otherwise apply to engines which are subject to 40 CFR 63 Subpart ZZZZ and 40 CFR 60 Subpart IIII. Because of the exemption in 40 CFR 1068, NWCAA cannot rely on MACT requirements in forming its BACT conclusion.

BACT is a case-by-case determination that can be informed by many factors. NWCAA is not held solely to requiring MACT as BACT. NWCAA's BACT decision can be different, and unique, based on the circumstances presented in a given case.

In this case, after extensive discussion with the facility and NWCAA compliance staff, NWCAA will allow the Mount Baker Ski Area to operate most (but not all) of the existing engines until the end of the engine's useful life. At that time, a permit will be required to replace prime powered engines and BACT for the engines will be re-evaluated. In the future, NWCAA expects that the Mount Baker Ski Area will replace old engines with Tier 4 certified engines unless the facility can provide a compelling reason why a Tier 4 engine can't be installed, or is too expensive for that particular installation. As noted in Section N.1, Tier 4 engines have been required for other installations in NWCAA's jurisdiction. Tier 4 engines are also widely used throughout the United States.

The engines powering Ski Lift 5 and 6 (called Chair 5 and 6) are the exception to NWCAA's allowance to continue to operate existing engines until the end of their useful life. As discussed in Mount Baker Ski Area's Compliance Order No. 1743-2020-30, these ski lift engines must be replaced with Tier 4 certified engines. The engine powering Chair 5 was replace during the summer of 2020 and the new engine is approved in this OAC. The new engine to power Chair 6 will be replaced during the summer of 2021. The new Chair 6 engine is also part of this OAC.

Exhaust stacks:

NWCAA normally requires that stationary engines exhaust through vertical, unrestricted, exhaust stacks that are 6 feet or more above the peak of the roof. However, facility contact Gwyn Howat explained that the unique combination of heavy, wet, snows and winds at the ski area cause problems with this exhaust stack configuration. Given these unique challenges, and after numerous discussions with Mount Baker Ski Area about what is possible, NWCAA settled on the following requirements for the Mount Baker Ski Area engine exhausts:

- For each engine except sewage treatment plant #1 and #2: Exhaust the engines through unrestricted vertical, upward exhausting, stacks that are at least 6 feet tall from where the exhaust stack exits the structure.
- For sewage treatment plant #1 and #2: Exhaust the engines through unrestricted stacks that have an angle of 45 degrees or less from vertical, in the upward direction.

The special allowance for the sewage treatment plant engines was made in part because the engines exhaust over an empty ravine. Mount Bake Ski Area has tried different stack configurations for this installation. The 45-degree exhaust appears to be the best solution given this unique situation.

Fuel sulfur:

Similar to other permits for diesel engines, NWCAA will require the fuel sulfur content to meet 15 ppm S (same as ULSD). As noted earlier, this facility uses a custom blended fuel because standard diesel is too viscous during cold weather conditions. Discussions with facility contact Duncan Howat indicate that the blended fuel meets the 15 ppm S limit. NWCAA added a condition to the permit to keep a cert of each batch of fuel so inspection staff can verify fuel sulfur content.

TBACT:

The conclusions cited above for BACT hold true for toxics BACT (TBACT) as well.

O. Basis for OAC conditions

1. Combine all permits for facility into 1 to make it easier for facility to work with.
2. Synthetic minor limit to keep facility out of Title V & limited as an SM-80 source.
3. Tracking for synthetic minor limit.
4. Notification if getting close to the synthetic minor limit.
5 & 6. Standard O&M requirements.
7. Hours of operation tracking to assist with knowing when required oil changes are needed & other maintenance needs to be done.
8. BACT – fuel sulfur content. Diesel sulfur content equivalent to ULSD.
9. BACT – exhaust stacks.
10. Standard recordkeeping.
11. Offset take for toxics for old engine. Discontinue use of old engine.

12. Standard startup notice.

P. Timeline and Review

Timeline		**Date**
NOC Received		8/30/19
NOC Incompleteness Determined (due 30 days from receipt)		9/30/19
NOC Completeness Determined		10/26/20 (Gwyn Howat's last update to equipment info, which influenced what's permitted)
30-day Public Comment Started		
Final OAC issued		
Review		**Date**
NWCAA Engineering	Christos Christoforou	11/2/20
NWCAA Compliance	Matt Holmquist	9/25/20
Source	Gwyn Howat	9/29/20 & 11/6/20

Q. Correspondence

Numerous emails were exchanged with Mount Baker Ski Area personnel. See the electronic NOC correspondence folder for copies of key communications.