

November 5, 2020

Mark Herceg
City of Battle Ground
109 SW 1st Street, STE 122
Battle Ground, WA 98604

Subject: Notification of Emergency Generator Installation - River Bend Pump Station
(SUN – 248)

Dear Mr. Herceg:

The Southwest Clean Air Agency (SWCAA) received your Small Unit Notification (SUN) on October 30, 2020 for installation and operation of an emergency generator engine at the River Bend Pump Station (anticipated address of 2520 NW 9th Ave., Battle Ground, WA). For administrative and tracking purposes SWCAA has assigned tracking number SUN-248 to this notification. This notification was filed in accordance with SWCAA 400-072 and applies to the installation of one emergency generator engine. The new unit was identified as:

- (1) 84.7 brake horsepower propane-fired Cummins model QSJ5.9G-G1 engine to drive a 50 kW Cummins generator set. The engine is approved for stationary emergency use.

SWCAA has completed a review of your notification and the associated support information and has determined that the notification meets the requirements of SWCAA 400-072(2). Once installed, affected equipment must maintain compliance with the requirements of SWCAA 400-072(5)(c) "**Emergency service internal combustion engines.**" A copy of the relevant SWCAA 400-072 section is attached for your information.

Be advised that emission units installed pursuant to SWCAA 400-072 are subject to source registration and periodic inspection. Registration fees for this equipment will be invoiced consistent with SWCAA 400-100.

If you need further assistance or have any questions regarding these matters, please contact me at (360) 574-3058 extension 130.

Sincerely,



Paul T. Mairose
Chief Engineer



SWCAA 400-072 Emission Standards for Selected Small Source Categories

[Statutory Authority: Chapter 70.94.141 RCW. Original adoption 09-21-056 filed 10/15/09, effective 11/15/09. 16-19-009 filed 9/8/16, effective 10/9/16. 17-11-078 filed 5/18/17, effective 6/18/17; 20-06-003 filed 2/19/20, effective 3/21/20]

(5) Source categories.

(c) Emergency service internal combustion engines.

- (i) **Applicability.** The provisions of this section apply to emergency service internal combustion engines with a rating of 50 or more, but less than 1,000 horsepower (e.g., emergency generators, fire pumps, sewer lift stations, etc.).
- (ii) **Emission limits and standards.**
 - (A) Visible emissions from diesel fired engine exhaust stacks shall not exceed ten percent opacity for more than 3 minutes in any one hour period as determined in accordance with SWCAA Method 9 (See SWCAA 400, Appendix A). This limitation shall not apply during periods of cold start-up.
- (iii) **General requirements.**
 - (A) Liquid fueled engines shall only be fired on #2 diesel or biodiesel. Fuel sulfur content of liquid fuels shall not exceed 0.0015% by weight (15 ppmw). A fuel certification from the fuel supplier may be used to demonstrate compliance with this requirement.
 - (B) Gaseous fueled engines shall only be fired on natural gas or propane.
 - (C) Each compression ignition engine shall be EPA Tier certified and manufactured no earlier than January 1, 2008.
 - (D) Engine operation shall be limited to maintenance checks, readiness testing, and actual emergency use.
 - (E) Engine operation for maintenance checks and readiness testing shall not exceed 100 hours per year. Actual emergency use is unrestricted.
 - (F) Each engine shall be equipped with a nonresettable hourmeter for the purpose of documenting hours of operation.
 - (G) Engine exhaust shall be discharged vertically. Any device that obstructs or prevents vertical discharge is prohibited.
- (iv) **Monitoring and recordkeeping requirements.** The information listed below shall be recorded at the specified intervals and maintained in a readily accessible form for a minimum of 3 years. With the exception of data logged by a computerized data acquisition system, each required record shall include the date and the name of the person making the record entry.
 - (A) Total hours of operation for each engine shall be recorded annually;
 - (B) Hours of emergency use for each engine shall be recorded annually;
 - (C) Fuel sulfur certifications shall be recorded for each shipment of liquid fuel;
 - (D) Maintenance activities shall be recorded for each occurrence consistent with the provisions of 40 CFR 60.4214;
 - (E) Upset conditions that cause excess emissions shall be recorded for each occurrence; and
 - (F) All air quality related complaints received by the permittee and the results of any subsequent investigation or corrective action shall be recorded promptly after each occurrence.
- (v) **Testing requirements.** None.

(vi) **Reporting requirements.**

- (A) The owner or operator of an affected emission unit shall provide written notification of initial operation to SWCAA within 10 days of occurrence.
- (B) All air quality related complaints received by the owner or operator shall be reported to SWCAA within three calendar days of receipt.
- (C) The owner or operator of an affected emergency engine shall report the following information to the Agency no later than March 15th for the preceding calendar year:
 - (I) Hours of engine operation; and
 - (II) Air emissions of criteria air pollutants, VOCs, and toxic air pollutants (TAPs).

**Summary Information (by SWCAA) for SUN-248
City of Battle Ground – Public Works
River Bend Pump Station Emergency Generator Engine**

A 50 kW propane-fired emergency generator set will be installed at the new River Bend Pump Station. The following equipment details were available:

Location:	2520 NW 9 th Avenue, Battle Ground, WA (This is the expected address of the new parcel)
Engine Make / Model:	Cummins / QSJ5.9G-G1
Engine Serial Number:	To be determined
Fuel:	Propane
Fuel Consumption:	321.6 scfh at standby power rating
Engine Power Rating:	84.7 bhp
Installation Date:	Scheduled for January 2021
Engine Built (Date):	To be determined
Engine Certification:	Not applicable
Generator Set Make / Model:	Cummins / C50 N6
Generator Set Output:	50 kW
Stack Description:	4" diameter, exhausting ~ 4' 10" above grade. Stack flow 411.1 acfm at 1,383.5 ~ 45°47'57.68"N, 122°32'49.26"W
Applicable Federal Regulations:	40 CFR 60 Subpart JJJJ 40 CFR 63 Subpart ZZZZ

Model Results

Due to the relatively high emission rate of carbon monoxide, I modeled the ambient impact of criteria air pollutants from this engine using EPA's AERSCREEN version 16216. The results of the model indicate that no ambient air quality standard would be threatened at the closest distance modeled (20 feet, which is the distance to fenceline) with a "flagpole" receptor height of 1 meter, or at a greater distance of 25 meters with a "flagpole" receptor height of 7 meters. The closer receptor would represent the breathing zone of a person at the fenceline. The further receptor representing the potential impact on a window, deck, or HVAC intake on a two-story building.

River Bend Pump Station Emergency Generator Engine. Potential annual emissions from the combustion of propane were calculated with the assumption that the equipment will operate at full load for up to 200 hours per year. For the purposes of greenhouse gas calculations the conservative assumption was made that the fuel was propane rather than LPG which is typically a mixture containing both propane and butane. Particulate matter and toxic air pollutant emission factors are those for natural gas.

River Bend Pump Station Emergency Generator Engine				Rich-Burn		
Hours of Operation =	200 hours					
Power Output =	84.7 bhp					
Fuel Consumption Rate =	321.6 scfh (temperature standard was not listed)					
Propane Heat Content	2,516 Btu/scf (from 40 CFR 98 for GHG emission factors)					
Propane Sulfur Content =	185 ppmw					
Fuel Consumption Rate =	0.809 MMBtu/hr propane					
Pollutant	Emission Factor lb/MMBtu	Emission Factor g/bhp-hr	lb/hr	tpy	Emission Factor Source	
NO _x		4.83	0.90	0.09	Cummins	
CO		103.78	19.38	1.94	Cummins	
VOC		1.24	0.23	0.023	Cummins	
SO _x as SO ₂	0.01683		0.0136	0.00136	Mass Balance	
PM	0.01941		0.0157	0.00157	AP-42 Sec 3.2 (7/00)	
PM ₁₀	0.01941		0.0157	0.00157	AP-42 Sec 3.2 (7/00)	
PM _{2.5}	0.01941		0.0157	0.00157	AP-42 Sec 3.2 (7/00)	
Benzene	0.00158		0.00128	0.000128	AP-42 Sec 3.2 (7/00)	
Formaldehyde	0.0205		0.0166	0.00166	AP-42 Sec 3.2 (7/00)	
Toluene	0.000558		0.000452	0.0000452	AP-42 Sec 3.2 (7/00)	
Xylene	0.000195		0.000158	0.0000158	AP-42 Sec 3.2 (7/00)	
Greenhouse Gases	kg/MMBtu	GWP	CO ₂ e lb/MMBtu	CO ₂ e lb/MMscf	tpy, CO ₂ e	
CO ₂	62.87	1	138.605	348,729	11.22	40 CFR 98
CH ₄	0.003	25	0.165	416	0.013	40 CFR 98
N ₂ O	0.0006	298	0.394	992	0.032	40 CFR 98
Total GHG - CO₂e			139.164	350,137	11.26	

Based on the air:fuel ratio provided (15.7), which normally is expressed as a mass ratio, the excess O₂ would be 0%, therefore this is a rich-burn engine. Note that the exhaust flow provided (411.1 cfm @ 1,383.5°F) is lower than the exhaust flow I calculated as zero excess air (485 scfm at 1,383.5°F). Exhaust flow would be even higher if the butane content increases above 0%.