

Southwest Clean Air Agency

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November 25, 2014

Mr. Tom Burns
Clark Regional Wastewater District
8000 NE 52nd Ct
Vancouver, WA 98668

Subject: Notification of Emergency Generator Engine Installation - Dunning Meadows (SUN-072)

Dear Mr. Burns:

The Southwest Clean Air Agency (SWCAA) received your Small Unit Notification (SUN) on November 10, 2014 for installation and operation of an emergency generator engine at the Dunning Meadows Wastewater Pump Station at approximately 10701 NW 152nd Avenue, Vancouver, WA. For administrative and tracking purposes SWCAA has assigned tracking number SUN-072 to this notification. This notification was filed in accordance with SWCAA 400-072 and applies to the installation of one emergency generator engine. The emergency generator engine was identified as:

- (1) 69 bhp (61 hp full generator set standby) diesel-fired Cummins model 4BT3.3-G5 engine to drive a 40 kW (standby) Cummins model 40 DGHCC generator set. The engine is EPA Tier 4 certified.

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(4)(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.]

(4) 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 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. Total engine operation shall not exceed 200 hours per year.
 - (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) Fuel sulfur certifications shall be recorded for each shipment of liquid fuel;
 - (C) Maintenance activities shall be recorded for each occurrence consistent with the provisions of 40 CFR 60.4214;
 - (D) Upset conditions that cause excess emissions shall be recorded for each occurrence; and
 - (E) All air quality related complaints received by the permittee and the results of any subsequent investigation or corrective action shall be recorded for each occurrence.
- (v) **Testing requirements.** None.

(vi) **Reporting requirements.**

- (A) All air quality related complaints received by the owner or operator shall be reported to SWCAA within three calendar days of receipt.
- (B) 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-072
Clark Regional Wastewater
Dunning Meadows Wastewater Pump Station Emergency Generator**

A 40 kW diesel-fired emergency generator set has been installed at the new Dunning Meadows Wastewater Pump Station to provide emergency power to the station. The following equipment details were available:

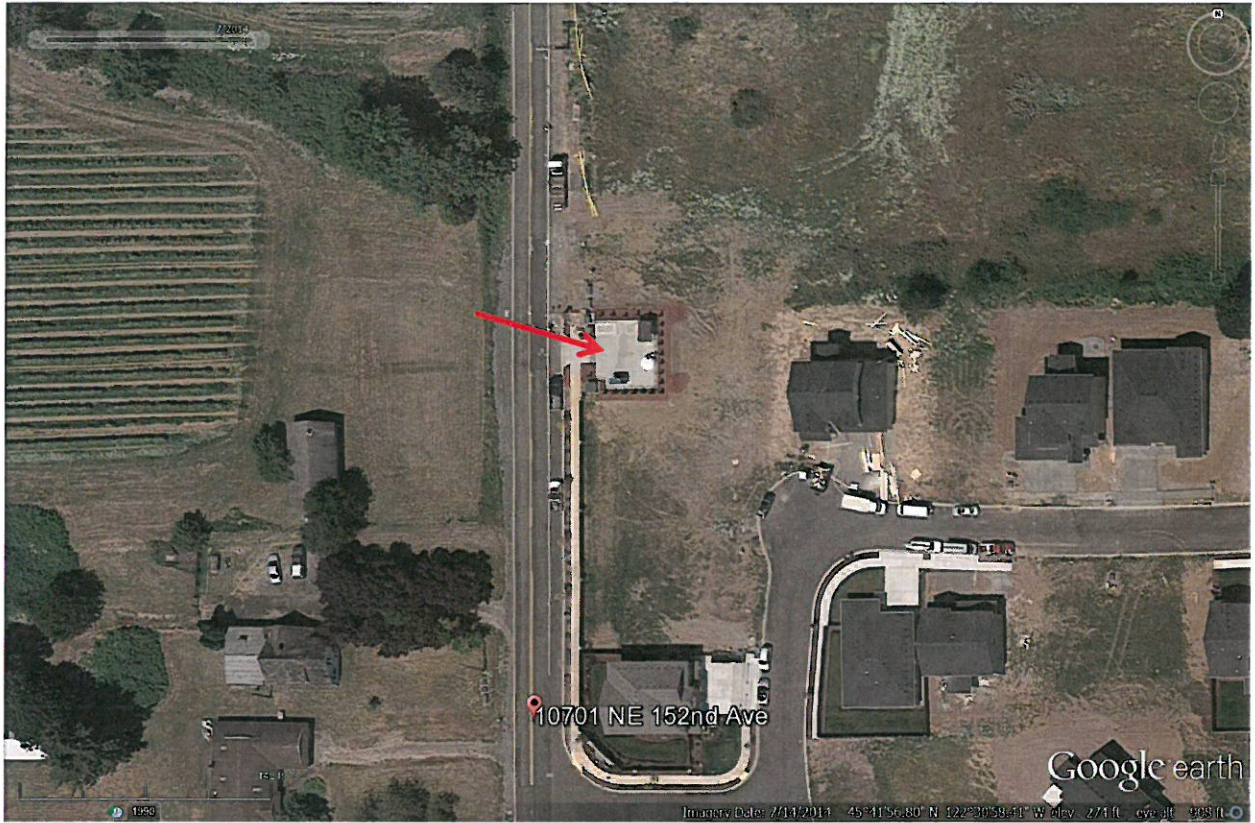
Location:	Dunning Meadows Wastewater Pump Station ~ 10701 NE 152 nd Ave, Vancouver, WA
Engine Make / Model:	Cummins / 4BT3.3G5
Engine Serial Number:	To be determined
Fuel:	Diesel
Fuel Consumption:	3.5 gallons per hour at full standby load
Horsepower Rating:	69 horsepower nameplate, 61 horsepower at full standby
Installed:	2014
Engine Built (Date):	To be determined
Engine Certification:	EPA Tier 4
Generator Set Make / Model:	Cummins / 40DGHCC
Generator Set Output:	40 kW
Stack Description:	~8' above grade, 3" diameter 339 cfm at 930°F
Applicable Federal Regulations:	40 CFR 60 Subpart IIII 40 CFR 63 Subpart ZZZZ



**Dunning Meadows Wastewater Pump Station Emergency Generator Engine
November 25, 2014**

Dunning Meadows Wastewater Pump Station Emergency Generator Engine. Potential annual emissions from the combustion of ultra-low sulfur diesel (<0.0015% sulfur by weight) were calculated with the assumption that the equipment will operate at full load for up to 200 hours per year.

Dunning Meadows Wastewater Pump Station Emergency Generator Engine						
Hours of Operation =	200 hours					
Power Output =	61 horsepower					
Diesel Density =	7.206 pounds per gallon					
Fuel Sulfur Content =	0.0015 % by weight					
Fuel Consumption Rate =	3.5 gal/hr					
Fuel Heat Content =	0.138 MMBtu/gal (for use with GHG factors from 40 CFR 98)					
Pollutant	Emission Factor g/(hp-hr)	Emissions lb/hr	Emissions tpy	Emission Factor Source		
NO _x	2.81	0.38	0.04	Cummins		
CO	0.49	0.07	0.007	Cummins		
VOC	0.04	0.01	0.001	Cummins		
SO _x as SO ₂		0.0008	0.0001	Mass Balance		
PM	0.07	0.01	0.0009	Cummins		
PM ₁₀	0.07	0.01	0.0009	Cummins		
PM _{2.5}	0.07	0.01	0.0009	Cummins		
Greenhouse Gases	kg/MMBtu	GWP	CO ₂ e lb/MMBtu	CO ₂ e lb/gallon	tpy, CO ₂ e	Emission Factor Source
CO ₂	73.96	1	163.05	23	8	40 CFR 98
CH ₄	0.003	25	0.165	0.023	0.01	40 CFR 98
N ₂ O	0.0006	298	0.394	0.054	0.02	40 CFR 98
Total GHG - CO₂e	74.0		163.6	23	8	



Google Earth Image of Dunning Meadows Wastewater Pump Station – July 14, 2014



**Power
Generation**

Exhaust Emission Data Sheet 40DGHCC 60 Hz Diesel Generator Set EPA Emission

Engine Information:

Model:	Cummins Inc. 4BT3.3-G5 NR4I	Bore:	3.74 in. (95 mm)
Type:	4 Cycle. In-line. 4 Cylinder Diesel	Stroke:	4.53 in. (115 mm)
Aspiration:	Turbocharged	Displacement:	199 cu. In. (3.3 liters)
Compression Ratio:	20.8:1		
Emission Control Device:	Turbocharged with Charge Air Cooled		

	<u>1/4</u>	<u>1/2</u>	<u>3/4</u>	<u>Full</u>	<u>Full</u>
PERFORMANCE DATA	Standby	Standby	Standby	Standby	Prime
BHP @ 1800 RPM (60 Hz)	17	35	52	61	69
Fuel Consumption (gal/Hr)	1.2	2.1	3.1	3.5	3.9
Exhaust Gas Flow (CFM)	161	229	309	339	369
Exhaust Gas Temperature (°F)	431	667	873	930	987
EXHAUST EMISSION DATA					
HC (Total Unburned Hydrocarbons)	0.60	0.25	0.07	0.04	0.02
NOx (Oxides of Nitrogen as NO2)	3.71	2.74	2.68	2.81	3.03
CO (carbon Monoxide)	2.02	1.14	0.57	0.49	0.49
PM (Particular Matter)	0.13	0.09	0.06	0.07	0.09
SO2 (Sulfur Dioxide)	0.20	0.17	0.17	0.17	0.16
Smoke (Bosch)	0.20	0.40	0.55	0.70	0.97
All values are Grams per HP-Hour					

TEST CONDITIONS

Data is representative of steady-state engine speed (± 25 RPM) at designated genset loads. Pressures, temperatures, and emission rates were stabilized.

Fuel Specification:	ASTM D975 No. 2-D diesel fuel with 0.03-0.05% sulfur content (by weight), and 40-48 cetane number.
Fuel Temperature:	99 \pm 9 °F (at fuel pump inlet)
Intake Air Temperature:	77 \pm 9 °F
Barometric Pressure:	29.6 \pm 1 in. Hg
Humidity:	NOx measurement corrected to 75 grains H2O/lb dry air
Reference Standard:	ISO 8178

The NOx, HC, CO and PM emission data tabulated here are representative of test data taken from a single engine under the test conditions shown above. Data for the other components are estimated. These data are subjected to instrumentation and engine-to-engine variability. Field emission test data are not guaranteed to these levels. Actual field test results may vary due to test site conditions, installation, fuel specification, test procedures and instrumentation. Engine operation with excessive air intake or exhaust restriction beyond published maximum limits, or with improper maintenance, may result in elevated emission levels.