Northwest Clean Air Agency

Hi Diane,

Thank you for the opportunity to provide comments. We appreciate and support the work you're doing to reach the governor's goals for reducing Washington's contribution to global warming. This email provides questions and technical comments that we hope you'll find useful as you move through the GAP rule development. We provide these comments in the spirit of collaboration and to help achieve our common goal of reducing global warming impacts. Please feel free to contact NWCAA at any time should you have questions about anything in this email.

Applicability:

- For projects with little or no onsite combustion (such as some stores, schools, and offices), consider adding an exemption based on building square footage instead of requiring GHG calculations. Such calculations may be simple for environmental professionals but difficult for applicants unused to performing them. The attached spreadsheet demonstrates some of that complexity. An exemption based on square footage seems appropriate for projects where the majority of GHGs come from onsite electric use.
- Emergency generators – Emergency generators are ubiquitous throughout Washington. We understand the need to cover larger generators in the rule However, smaller units would likely be exempt based on their emissions. For smaller units like those in retail stores, gas stations, and cell phone towers, consider an exemption based on engine horsepower to make it easier for applicants. The attached spreadsheet demonstrates some of the complexity applicants may run into.
  - o Please also consider whether there are any categories of emergency generators that would be exempt due to their essential nature. Potential examples include engines to power pumps for fire suppression and sewage lift stations.
  - o For other, larger, units consider additional guidance on how to calculate GHGs. Since many emergency generators don't have permitted usage limits, it would be helpful to specify the hours/year of operation and engine load to use in calculations. (The attached spreadsheet for the Fred Meyer generator assumes 500 hr/yr operation since that's what we traditionally think of as a realistic upper bound for emergency use.)
- Gas stations are some of the most commonly permitted facilities by air agencies like NWCAA. There are more than 200 stations in our jurisdiction alone. Each permit application requires SEPA review and would therefore require the corresponding GAP rule applicability review.
  - o Consider providing more information about how to calculate applicability (what's considered and input and output) and mitigation. More specifically, since the output from the gas station is gasoline that enters a fuel tank, would a gas station need to calculate emissions from the fuel burned by on-road vehicles that filled up at the station? If yes, how should a new gas station estimate the amount of fuel it may sell in the future? For inputs, do the emissions from transporting fuel from the refinery to the gas station count? What about the emissions from refining the fuel? The attached spreadsheet demonstrates the complexity and summarizes emissions from both an average gas station in our area as well as a large (Fred Meyer) station.
  - o Some independent gas stations don't have the technical knowledge to do applicability calculations, nor the financial backing to hire a consultant. In addition, English may be a second language, which provides an additional barrier. Consider building a workbook that station owners

could fill out that would automatically calculate their emissions to ease the compliance burden.
- Consider a technical assistance program to provide small businesses like independent gas stations with hands-on help with GAP rule calculations. Numerous small businesses go through SEPA review each year and may benefit greatly from technical assistance.
- In general, and as noted for the gas station example, consider providing more information about what is (and isn't) an "input" and an "output" for rule applicability.

Funding:
- SEPA lead agencies are frequently Cities and Counties without GHG expertise. In our experience, lead agencies may reach out to technical experts like NWCAA to help review GHG calculations. NWCAA agrees with our City and County partners that we are the obvious technical expert to ask and we are certainly willing to assist. Each local Clean Air Agency in this position will likely need to identify the appropriate funding source for this work – which may take the form of a fee. Similar comments apply to the GHG mitigation verification should that fall to the local CAAs. We are happy to do the work, but know that it has to be funded through an adequate and appropriate mechanism.

Mitigation:
- Mitigation - As noted in Table 2 of the Framework, the 10,000 metric ton threshold will capture projects with gas-fired boilers and heaters that meet or exceed 21.2 MMBtu/hr. Units in this size range are used in a variety of operations throughout Washington. Examples include wood products, milk processing, and hospitals. Applicants for some of these projects may not have the level of GHG expertise that's available for larger projects like the Tacoma LNG facility. For small to medium projects, consider providing a simplified formula based on the size of the boiler/heater to determine how much to mitigate instead of the full mitigation calculations required for larger projects.
- Mitigation cost - The GAP rule encourages mitigation within Washington. However, GHG is a global pollutant and in-state mitigation may be more costly than out-of-state mitigation. Consider adding a mechanism to evaluate the cost of mitigation to encourage projects that provide the greatest reductions for the lowest cost.
- Mitigation baseline emission calculations – As seen in major source (PSD) permit reviews, there are many different ways to calculate baselines. Consider providing more specificity on how to perform calculations to avoid questions down the road.
- Mitigation Verification – Consider adding a mechanism for how multi-year mitigation will be verified, including who will perform the verification. Verification may be outside the technical expertise of many SEPA lead agencies.

Fred Meyer, Bakerview in Bellingham

grocery store size	164,655	sf
emergency generator size, **500 hr/yr**	2,021	kw
emergency generator fuel use	114.2	gal/hr
emergency generator CO2e	2,785	MT CO2e/yr
Electricty	3,598	MT CO2e/yr
NG	437	MT CO2e/yr
Total CO2e for store	**6,820**	MT CO2e/yr
fuel dispensing facility throughput, 2018	8,073,084	gal
Total CO2e for fuel dispensing facility	78,207	MT CO2e/yr
Total GHGs from facility	**85,027**	metric ton CO2e/yr

EMISSION CALCS 22,000 sf store:

Store size:	**22000**	**sf**	Grocery Outlet store addition, from SEPA register
kW needed:	**270**	**kw**	generator size est per : https://www.kompareit.com/business/industrial-equipment-generators-backup-cost-grocery-stores.html
Fuel use:	**19.4**	**gal/hr**	fuel use, per Diesel service/support table below
Diesel (#4)	**0.01096**	**MT CO2/gal**	https://www.epa.gov/sites/production/files/2015-07/documents/emission-factors_2014.pdf
	0.00044	**MT CH4/gal**	
	0.00009	**MT N2O/gal**	

GHG Emissions, 2 options depending on which hr/yr operation assumption we use:

500	**hr/yr ops**	**8760**	**hr/yr ops**
473	**MT CO2e/yr**	**1863**	**ton CO2e/yr**

REFERENCES:

How to Size a Grocery Store Generator

Start with an inventory of every item you want the generator to run in the event of a power outage. Then, determine the kilowatts (kW) of each item. The total is the amount of power you need.

You find the kW information listed directly on the item. However, a missing tag doesn't mean you can't find that magic number; it may be in the owner's manual or available online.

Some items list amperes instead of kW. In that case, you need to convert amperes to kW. Calculate resistive load kilowatts by multiplying the amperes by the volts. Calculate reactive loads by taking that product (amps X volts) and multiplying it by the load factor.

A less accurate calculation, though easier, requires using your store's square footage, using the formula 50kW plus 10 watts for each square foot. So, a 10,000 square foot store looks like this: 50 kW + 100,000 watts. There are 1,000 watts in a kilowatt, so that becomes 50 kW + 100 kW. Therefore, you need a 150 kW generator.

DIFFERENT INDUSTRIES AND **HOW THEY BENEFIT FROM A STANDBY GENERATOR**

Explore the many different business types Generac is knowledgeable about and how a business standby generator can benefit and protect them. With a standby generator business owners know their business is safe, secure, and has power. No need to check or worry about the generator. Generac's business standby generators turn on automatically whenever a power outage is detected.

Our national dealer network offers reliable support, service, and maintenance to all customers and businesses.

- Auto Repair Shops
- Banks
- Call Centers
- Doctor's Office
- Gas Stations
- Grocery Stores
- Hotels
- Manufacturing
- Restaurants

Diesel SERVICE & SUPPLY

INDUSTRIAL DIESEL ENGINES & POWER GENERATORS FOR OVER 30 YEARS

Approximate Fuel Consumption Chart

This chart approximates the fuel consumption of a diesel generator based on the size of the generator and the load at which the generator is operating at. Please note that this table is intended to be used as an estimate of how much fuel a generator uses during operation and is not an exact representation due to various factors that can increase or decrease the amount of fuel consumed.

Generator Size (kW)	1/4 Load (gal/hr)	1/2 Load (gal/hr)	3/4 Load (gal/hr)	Full Load (gal/hr)
20	0.6	0.9	1.3	1.6
30	1.3	1.8	2.4	2.9
40	1.6	2.3	3.2	4
60	1.8	2.9	3.8	4.8
75	2.4	3.4	4.6	6.1
100	2.6	4.1	5.8	7.4
125	3.1	5	7.1	9.1
135	3.3	5.4	7.6	9.8
150	3.6	5.9	8.4	10.9
175	4.1	6.8	9.7	12.7
200	4.7	7.7	11	14.4
230	5.3	8.8	12.5	16.6
250	5.7	9.5	13.6	18
300	6.8	11.3	16.1	21.5
350	7.9	13.1	18.7	25.1
400	8.9	14.9	21.3	28.6
500	11	18.5	26.4	35.7
600	13.2	22	31.5	42.8
750	16.3	27.4	39.3	53.4
1000	21.6	36.4	52.1	71.1

EMISSION CALCS 22,000 sf store:

Store size:	**22000**	**sf**	Grocery Outlet store addition, from SEPA register
Elec. Use:	**50**	**kWh/yr/sf**	Electrical use per Energy Star Website: https://www.google.com/search?q=how+much+electricity+does+grocery+store+use&rlz=1C1GCEA_enUS792US792&oq=how+much+electricity+does+grocery+store+use&aqs=chrome..69i57j0i22i30l2j0i390l2.7993j0j4&sourceid=chrome&ie=UTF-8
Elec. Use:	**1100000**	**kWh/yr**	
Unit convert:	**1100**	**MWh/yr**	1000 kWh=1MWh
GHG/yr:	**480.7**	**metric tons CO2e/yr**	calc based on equation from GAP rule

REFERENCES:

Energy Use in Supermarkets

On average, supermarkets in the United States use around 50 kilowatt-hours (kWh) of electricity and 50 cubic feet of natural gas per square foot per year — an average annual energy cost of more than $4 per square foot. For an average-size (50,000 square foot) store, this equates to more than $200,000 annually in energy costs and results in 1,900 tons of CO_2 being emitted into the atmosphere — equivalent to the emissions from 360 vehicles in one year!

Equation from GAP rule

Equation 4

$$\text{unspecified} = UE \times UCO_2e$$

Where:

- Unspecified = Total of all GHG emissions calculated using the unspecified electricity methodology, metric tons CO_2e/year.
- UE = Total electricity subject to this method, MWh/ calendar year.
- UCO_2e = 0.437 metric tons CO_2e/MWh of electricity.

EMISSION CALCS 22,000 sf store:

Store size:	**22000**	**sf**
Gas per sf:	**50**	**cf gas/sf**
Gas/yr:	**1100**	**thousand cf/yr**
GHGs in Gas:	**117**	**lb CO2e/thousand cf**
GHGs/yr:	**64**	**tons CO2e/yr**
GHGs/yr:	**58**	**metric tons CO2e/yr**

Grocery Outlet store addition, from SEPA register

Usage based on Energy Star Website: https://www.google.com/search?q=how+much+electricity+does+grocery+store+use&rlz=1C1GCEA_enUS792US792&oq=how+much+electricity+does+grocery+store+use&aqs=chrome..69i57j0i22i30l2j0i390l2.7993j0j4&sourceid=chrome&ie=UTF-8

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EMISSION CALCS AVERAGE GAS STATION IN NWCAA's AREA:

GDF Througput	**1,000,000**	**gal/yr**	minimum per GO 003R1, 201 gas stations in NWCAA district
Input - Refining	*345*	*MT CO2e*	*Not included - see note below*
Input - Transfer	**529**	**MT CO2e**	
Output - combustion of product	**8,813**	**MT CO2e**	
GHG/ yr	**9,687**	**MT CO2e/yr**	

REFERENCES:

Througput assumption

NWCAA Technical Support Document for GO 003R1: Gasoline Dispensing Facilities, March 22, 2021

The annual throughput of gasoline at GDF varies considerably. According to 2018 data in the NWCAA jurisdiction, the average annual throughput was a little less than 1 million gallons, and the maximum was 17 million gallons.

Inputs: Emissions from Refining of Gasoline - NOT INCLUDED in emissions as reported on 40 CFR 98 Subpart MM by refineries

published studies not found for GHG emissions from refining, as GHG vary considerably depending on the process units at the refinery

Direct emissions downloaded from Ecology at https://data.wa.gov/Natural-Resources-Environment/GHG-Reporting-Program-Publication/idhm-59de

Average throughput and proportion of gasoline from public websites

Refinery	Direct MT CO2e	Crude bbls	% Gasoline	**Gasoline CO2e**		
BP Cherry Point	2,345,530	82,125,000	37%	0.0106	https://www.bp.com/content/dam/bp/country-sites/en_us/united-states/home/documents/eir-2019/cherry-point-refinery-factsheet.pdf	http://abarrelfull.wikidot.com/cherry-point-refinery
Phillips 66 Ferndale	834,697	38,325,000	62%	0.0135	https://www.phillips66.com/refining/ferndale-refinery	https://ecology.wa.gov/Regulations-Permits/Permits-certifications/Industrial-facilities-permits/Phillips-66-Refinery
Marathon Anacortes	1,421,127	43,435,000	50%	0.0164	https://www.marathonpetroleum.com/Operations/Refining/Anacortes-Refinery/	
Shell Puget Sound Refinery	1,859,261	52,925,000	50%	0.0176	https://ecology.wa.gov/Regulations-Permits/Permits-certifications/Industrial-facilities-permits/Shell-Puget-Sound-Refinery	https://en.wikipedia.org/wiki/Shell_Anacortes_Refinery
Average				**0.0145**	**MT CO2e/bbl**	

Emissions from Transport of Product

https://www.sciencedirect.com/science/article/pii/S1352231017305794

assume heavy duty vehicles fueled by diesel, certified to MY 2010 emissions standards

diesel truck, regional route	1755	g CO2e/mi
average miles per load	904	miles
gals per load	3000	gals
Total CO2e per load	**1.17**	**lbs CO2e/gal**

Outputs: Emissions from Combustion of Gasoline

https://www.epa.gov/sites/production/files/2015-07/documents/emission-factors_2014.pdf

Gasoline	**kg/gal**	**MT/gal**
CO2	8.78	0.00878
CH4	0.00038	0.00000038
N2O	0.00008	0.00000008

Global Warming Potential for 100-yr

https://apps.leg.wa.gov/WAC/default.aspx?cite=173-441-040

CO2	**1**
CH4	**25**
NO2	**298**