DOCKETED	
Docket Number:	23-OPT-02
Project Title:	Darden Clean Energy Project
TN #:	255913
Document Title:	Data Response Set 3 Appendix B and Appendix C
Description:	Includes emissions calculations, provided in response to DR AQ-5 as Appendix B of Response Set 3 and supplementary technical approach information, provided in response to DR AQ-11 as Appendix C of Response Set 3
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Submitter Role:	Applicant Consultant
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Data Response Set 3 - Appendix B

DR AQ-5 Emissions Calculations

Darden Clean Energy Project

Equipment Summary

Engine Information

Engine No.	Make / Model	Location	# of Units	Size (ekW)	Size (bhp)	Fuel	Reference File Name
1A	Power Solutions Int'l (PSI) 8800CAC (LPG) Emergency Generator Set	Step Up Substation Option 1	1	150	262	LPG	Oberon MTU GS150 submittal file Rev. 1.pdf
1B		Step Up Substation Option 2	1	150	262		
2		Step Down Substation	1	150	262		
3A	CAT C18 Fire Pump Engine	Option 1	2	400	536	Diesel	C18FP_EM0067 Perf Data.pdf
3B		Option 2	2	400	536		
3C		Option 3	2	400	536		
4A	CAT C18 Diesel Emergency Generator Set	Option 1	2	600	805	Diesel	600kw C18_LEHE1581-02.pdf
4B		Option 2	2	600	805		
4C		Option 3	2	600	805		

Notes: ekW = electrical kilowatts; bhp = brake horsepower; LPG = liquified petroleum gas

Emission Rates

				NOx Emission Factor (g/bhp-hr)		VOC Emission Factor (g/bhp-hr)		CO Emission Factor (g/bhp-hr)		SOx Emission Factor (g/bhp-hr)		PM Emission Factor (g/bhp-hr)		NH3	CO2	CH4	N2O
Engine No.	Emission Factors Source	Max Daily Hours	Max Annual Hours	Uncontrolled	Controlled	Uncontrolled	Controlled	Uncontrolled	Controlled	Uncontrolled	Controlled	Uncontrolled	Controlled	Controlled		g/bhp-hr	
1A, 1B, 2	Spec Sheets	1	100	n/a	1	n/a	0.7	n/a	2	n/a	n/a	n/a	n/a	n/a	*	*	*
3A, 3B, 3C	US EPA Tier 3	1	100	2.85	2.85	0.15	0.15	2.6	2.6	2.05E-03	2.05E-03	0.15	0.15	n/a	568	0.023	0.005
4A, 4B, 4C	US EPA Tier 2 / Tier 4	1	100	4.56	0.5	0.24	0.14	2.6	2.6	2.05E-03	2.05E-03	0.15	0.022	n/a	568	0.023	0.005

Notes: US EPA = United States Environmental Protection Agency; NOx = oxides of nitrogen; VOC = volatile organic compounds; CO = carbon monoxide; SOx = sulfur oxides; PM = particulate matter; NH3 = ammonia; CO2 = carbon dioxide; CH4 = methane; N2O = nitrous oxides; g/bhp-hr = grams per brake horsepower-hour

* The LPG engine has emission factors based on fuel flow rates as provided by the US EPA's 2023 Emission Factor for Greenhouse Gas Inventories. The engine fuel consumption at 100% rating is 695 ft3/hr (or 19.7 m3/hr).

Per Table A of Appendix A of SCAQMD's *Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Threshold* s, for Electric Generation, PM10 is 96% of Total PM and PM2.5 is 93.7% of Total PM. For the Fire Pump Engines, PM10 is 97.6% of Total PM and PM2.5 is 96.7% of Total PM

SOx Factors from AP-42 Table 3.3-1

Stack Parameters

Engine No.	SJVAPCD Source ID	UTM X	UTM Y	Release Height (m)	Stack Diameter (m)	Temp (K)	Gas Velocity (m/s)	Gas Flow Rate (cfm)
1A	275_DE	749650	4040200	2.43	0.12	795.31	50.25	1204.2
1B	275_DE	746900	4036800	2.43	0.12	795.31	50.25	1204.2
2	275_DE	733300	4034400	2.43	0.12	795.31	50.25	1204.2
3A	600_DE	748500	4040200	3.71	0.16	793.56	92.45	3938.6
3B	600_DE	747100	4036100	3.71	0.16	793.56	92.45	3938.6
3C	600_DE	733300	4034100	3.71	0.16	793.56	92.45	3938.6
4A	825_DE	748500	4040200	6.07	0.19	784.00	87.68	5267.5
4B	825_DE	747100	4036100	6.07	0.19	784.00	87.68	5267.5
4C	825_DE	733300	4034100	6.07	0.19	784.00	87.68	5267.5

Notes: m = meters; m/s = meters per second; cfm = cubic feet per minute

SJVAPCD stack parameters provided via email on 2/15/2024.

UTM = Universal Transvers Mercator Coordinate; coordinate locations are based on assumed equipment locations.

Darden Clean Energy Project

Criteria Pollutant Emissions Summary

Emission Calculations, Hourly

Engine No.	Emission Factors Source	Max Daily Hours	Max Annual Hours	NOx lb/hr	VOC lb/hr	CO lb/hr	SOx lb/hr	PM lb/hr
1A	Spec sheets	1	100	0.578	0.404	1.155	0	0
1B	Spec sheets	1	100	0.578	0.404	1.155	0	0
2	Spec sheets	1	100	0.578	0.404	1.155	0	0
3A	US EPA Tier 3	1	100	6.741	0.355	6.149	0.005	0.355
3B	US EPA Tier 3	1	100	6.741	0.355	6.149	0.005	0.355
3C	US EPA Tier 3	1	100	6.741	0.355	6.149	0.005	0.355
4A	US EPA Tier 2 / Tier 4	1	100	5.375	0.585	9.224	2.311	0.078
4B	US EPA Tier 2 / Tier 4	1	100	5.375	0.585	9.224	2.311	0.078
4C	US EPA Tier 2 / Tier 4	1	100	5.375	0.585	9.224	2.311	0.078

Note: Assuming 0.25 hr uncontrolled and 0.75 hr controlled for Tier 4 equipment. Except for PM, assuming no startup time required and 100% emissions controlled through DPF.

Emission Calculations, Annual

Engine No.	Emission Factors Source	Max Daily Hours	Max Annual Hours	NOx lb/yr	VOC lb/yr	CO lb/yr	SOx lb/yr	PM lb/yr
1A	Spec sheets	1	100	57.8	40.4	115.5	0	0
1B	Spec sheets	1	100	57.8	40.4	115.5	0	0
2	Spec sheets	1	100	57.8	40.4	115.5	0	0
3A	US EPA Tier 3	1	100	674.1	35.5	614.9	0.5	35.5
3B	US EPA Tier 3	1	100	674.1	35.5	614.9	0.5	35.5
3C	US EPA Tier 3	1	100	674.1	35.5	614.9	0.5	35.5
4A	US EPA Tier 2 / Tier 4	1	100	207.0	35.9	627.2	56.2	7.8
4B	US EPA Tier 2 / Tier 4	1	100	207.0	35.9	627.2	56.2	7.8
4C	US EPA Tier 2 / Tier 4	1	100	207.0	35.9	627.2	56.2	7.8
		Total Emissions Per Project Option:		**996.6**	**152.2**	**1473.2**	**56.7**	**43.3**

Note: Assuming 12 startup events for T&M, the remaining 88 hours assumed controlled for the Tier 4 equipment.

Darden Clean Energy Project

Greenhouse Gas Emissions Summary

Emission Calculations, Hourly

Engine No.	Emission Factors Source	Max Daily Hours	Max Annual Hours	CO2 lb/hr	CH4 lb/hr	N2O lb/hr	CO2e lb/hr
1A	Spec sheets	1	100	89.3165	0.0044	0.0009	89.69
1B	Spec sheets	1	100	89.3165	0.0044	0.0009	89.69
2	Spec sheets	1	100	89.3165	0.0044	0.0009	89.69
3A	US EPA Tier 3	1	100	1343.4168	0.0544	0.0118	1348.30
3B	US EPA Tier 3	1	100	1343.4168	0.0544	0.0118	1348.30
3C	US EPA Tier 3	1	100	1343.4168	0.0544	0.0118	1348.30
4A	US EPA Tier 2 / Tier 4	1	100	2015.1252	0.0816	0.0177	2022.45
4B	US EPA Tier 2 / Tier 4	1	100	2015.1252	0.0816	0.0177	2022.45
4C	US EPA Tier 2 / Tier 4	1	100	2015.1252	0.0816	0.0177	2022.45
Notes:	CO2 = carbon dioxide; CH4 = methane; N2O = nitrous oxide; CO2e = carbon dioxide equivalents						

Emission Calculations, Annual

Engine No.	Emission Factors Source	Max Daily Hours	Max Annual Hours	CO2 MT/yr	CH4 MT/yr	N2O MT/yr	CO2e MT/yr
1A	Spec sheets	1	100	4.05	1.14E-04	1.60E-05	4.06
1B	Spec sheets	1	100	4.05	1.14E-04	1.60E-05	4.06
2	Spec sheets	1	100	4.05	1.14E-04	1.60E-05	4.06
3A	US EPA Tier 3	1	100	60.94	1.66E-02	1.90E-04	61.41
3B	US EPA Tier 3	1	100	60.94	1.66E-02	1.90E-04	61.41
3C	US EPA Tier 3	1	100	60.94	1.66E-02	1.90E-04	61.41
4A	US EPA Tier 2 / Tier 4	1	100	91.40	7.66E-03	2.89E-04	91.68
4B	US EPA Tier 2 / Tier 4	1	100	91.40	7.66E-03	2.89E-04	91.68
4C	US EPA Tier 2 / Tier 4	1	100	91.40	7.66E-03	2.89E-04	91.68
		Total Emissions Per Project Option:		**160.4**	**0.02**	**0.001**	**161.2**

Darden Clean Energy Project

Speciated Toxic Air Contaminant (TAC) Calculations

TAC Speciation Factors

Source	Emission Type	Fraction	Chemical
LPG Engines	**Exhaust VOC**	0.000357	1,3-Butadiene
		0.004466	Acetaldehyde
		0.001189	Acetylene
		0.004924	Acrolein
		0.05549	Ethane
		0.038902	Ethylene
		0.024523	Formaldehyde
		0.176432	Methane
		0.001402	N-Butane
		0.658555	Propane
		0.017313	Propylene
		0.016448	Unknown
Diesel Engines	**Exhaust PM**	1	Diesel PM
	Exhaust VOC	0.0019	1,3-Butadiene
		0.074	Acetaldehyde
		0.02	Benzene
		0.0031	Ethylbenzene
		0.15	Formaldehyde
		0.0016	n-Hexane
		3.00E-04	Methanol
		0.015	Methyl Ethyl Ketone
		9.00E-04	Naphthalene
		0.026	Propylene
		6.00E-04	Styrene
		0.015	Toluene
		6.10E-03	m-Xylene
		0.0034	o-Xylene
		1.00E-03	p-Xylene

Sources:

Diesel engine speciation factors were provided to Rincon by the CEC, which are based on CARB speciation factors.

LPG engine speciation factors were obtained from the US EPA Speciation Profiles and Toxic Emission Factors for Non-road Engines. EPA-420-R-15-019.

Notes:

LPG = liquified petroleum gas; VOC = volatile organic compounds; PM = particulate matter

TAC Emissions Calculation Summary

Engine #:	1,2		3		4		
Compound	**lb/day**	**lb/yr**	**lb/day**	**lb/yr**	**lb/day**	**lb/yr**	
DieselExhPM	0.00E+00	0.00E+00	3.46E-01	3.46E+01	7.49E-02	7.49E+00	
1,3-Butadiene	1.44E-04	1.44E-02	6.74E-04	6.74E-02	1.11E-03	6.82E-02	
Acetaldehyde	1.81E-03	1.81E-01	2.63E-02	2.63E+00	4.33E-02	2.66E+00	
Acetylene	4.81E-04	4.81E-02	--	--	--	--	*
Acrolein	1.99E-03	1.99E-01	--	--	--	--	
Ethane	2.24E-02	2.24E+00	--	--	--	--	*
Ethylene	1.57E-02	1.57E+00	--	--	--	--	*
Formaldehyde	9.92E-03	9.92E-01	5.32E-02	5.32E+00	8.78E-02	5.39E+00	
Methane	7.13E-02	7.13E+00	--	--	--	--	
N-Butane	5.67E-04	5.67E-02	--	--	--	--	*
Propane	2.66E-01	2.66E+01	--	--	--	--	*
Propylene	7.00E-03	7.00E-01	9.22E-03	9.22E-01	1.52E-02	9.33E-01	
Unknown	6.65E-03	6.65E-01	--	--	--	--	*
Benzene	--	--	7.10E-03	7.10E-01	1.17E-02	7.18E-01	
Ethylbenzene	--	--	1.10E-03	1.10E-01	1.81E-03	1.11E-01	
n-Hexane	--	--	5.68E-04	5.68E-02	9.37E-04	5.74E-02	
Methanol	--	--	1.06E-04	1.06E-02	1.76E-04	1.08E-02	
Methyl Ethyl Ketone	--	--	5.32E-03	5.32E-01	8.78E-03	5.39E-01	
Naphthalene	--	--	3.19E-04	3.19E-02	5.27E-04	3.23E-02	
Styrene	--	--	2.13E-04	2.13E-02	3.51E-04	2.15E-02	
Toluene	--	--	5.32E-03	5.32E-01	8.78E-03	5.39E-01	
m-Xylene	--	--	2.16E-03	2.16E-01	3.57E-03	2.19E-01	
o-Xylene	--	--	1.21E-03	1.21E-01	1.99E-03	1.22E-01	
p-Xylene	--	--	3.55E-04	3.55E-02	5.85E-04	3.59E-02	

Note: * indicates chemical species that do not have a cancer potency factor or a reference exposure level.
These emission values were input into HARP to determine cancer, chronic and acute health risk.

Darden Renewable Energy Project
Construction CalEEMod - GHG Emissions
18- Month Construction Schedule

2,150	2026	PV Solar Emissions
2,222	2027	
4,372	Total	
20	2025	Site Prep
2,398	2026	
2,418	Total	

Ph1: Site Prep / Grading (2025) [3.11]

	CO_2e
Category	MT CO_2e
Off-Road	15.7
Dust	
On-Site Truck	2.580588
Worker	0.73
Vendor	0
Hauling	0.98
UTV	1.65E-03
Helicopter	
Total	**19.99223424**

Darden Renewable Energy Project
Construction CalEEMod - GHG Emissions
36-Month Construction Schedule

3,966	2026	PV Solar Emissions
551	2027	
4,517	Total	
17	2025	Site Prep
3,903	2026	
3,920	Total	

Ph1: Site Prep / Grading (2025) [Table 3.13]

	CO_2e
Category	MT CO_2e
Off-Road	13.9
Dust	
On-Site Truck	1.8677301
Worker	0.51
Vendor	0
Hauling	0.56
UTV	1.65E-03
Helicopter	
Total	**16.83937664**

Darden Renewable Energy Project
Construction CalEEMod - GHG Emissions
18- Month Construction Schedule

Ph1: Site Prep / Grading (2026) [3.13]

	CO_2e
Category	MT CO_2e
Off-Road	1958
Dust	
On-Site Truck	229.6723
Worker	89.9
Vendor	0
Hauling	120
UTV	1.47E-01
Helicopter	
Total	**2397.718847**

Ph2: PV Panel System / 1st Site Prep (2026) [3.1]

	CO_2e
Category	MT CO_2e
Off-Road	5821
Dust	
On-Site Truck	520.0744
Worker	883
Vendor	0
Hauling	295
UTV	3.38E+00
Helicopter	
Total	**7522.45009**

Darden Renewable Energy Project
Construction CalEEMod - GHG Emissions
36-Month Construction Schedule

Ph1: Site Prep / Grading (2026) [3.15]

	CO_2e
Category	MT CO_2e
Off-Road	3386
Dust	
On-Site Truck	259.61448
Worker	123
Vendor	0
Hauling	134
UTV	2.29E-01
Helicopter	
Total	**3902.843354**

Ph2: PV Panel System / 1st Site Prep (2026) [3.2]

	CO_2e
Category	MT CO_2e
Off-Road	2146
Dust	
On-Site Truck	263.34994
Worker	371
Vendor	0
Hauling	767
UTV	1.90E+00
Helicopter	
Total	**3549.251699**

Darden Renewable Energy Project
Construction CalEEMod - GHG Emissions
18- Month Construction Schedule

Ph2: PV Panel System / 1st Site Prep (2027) [3.3]

	CO_2e
Category	MT CO_2e
Off-Road	2673
Dust	
On-Site Truck	307.9047
Worker	397
Vendor	0
Hauling	132
UTV	2.00E+00
Helicopter	
Total	**3511.903287**

Ph3: Substation (2026)

	CO_2e
Category	MT CO_2e
Off-Road	2283
Dust	54.23888
Worker	216
Vendor	0
Hauling	703
UTV	1.39E+00
Helicopter	
Total	**3257.633502**

Darden Renewable Energy Project
Construction CalEEMod - GHG Emissions
36-Month Construction Schedule

Ph2: PV Panel System / 1st Site Prep (2027) [3.3]

	CO_2e
Category	MT CO_2e
Off-Road	3642
Dust	
On-Site Truck	466.93253
Worker	617
Vendor	0
Hauling	1271
UTV	3.22E+00
Helicopter	
Total	**6000.155629**

Ph2: PV Panel System / 1st Site Prep (2028) [3.5]

	CO_2e
Category	MT CO_2e
Off-Road	2972
Dust	
On-Site Truck	203.58258
Worker	494
Vendor	0
Hauling	1012
UTV	3.22E+00
Helicopter	
Total	**4684.805685**

Darden Renewable Energy Project
Construction CalEEMod - GHG Emissions
18- Month Construction Schedule

Ph3: Substation (2027)

	CO_2e
Category	MT CO_2e
Off-Road	649
Dust	35.41216
Worker	60.1
Vendor	0
Hauling	195
UTV	2.02E+00
Helicopter	
Total	**941.5291752**

Ph4: Gen-tie / 2nd Building Construction (2026) [3.19]

	CO_2e
Category	MT CO_2e
Off-Road	718
Dust	0
Worker	50.3
Vendor	0
Hauling	279
UTV	9.88E-02
Helicopter	4.00
Total	**1051.395124**

Darden Renewable Energy Project
Construction CalEEMod - GHG Emissions
36-Month Construction Schedule

Ph3: Inverters, etc / 1st Building Construction (2027) [3.17]

	CO_2e
Category	MT CO_2e
Off-Road	1404
On-Site Truck	56.403372
Worker	152
Vendor	0
Hauling	463
UTV	2.30E+00
Helicopter	
Total	**2077.700296**

Ph4: Gen-tie / 2nd Building Construction (2027) [3.21]

	CO_2e
Category	MT CO_2e
Off-Road	98.8
On-Site Truck	0
Worker	9.02
Vendor	0
Hauling	42.9
UTV	0.00E+00
Helicopter	4.00
Total	**154.7163314**

Darden Renewable Energy Project
Construction CalEEMod - GHG Emissions
18- Month Construction Schedule

Ph5: Battery Storage / 3rd Building Construction (2026) [3.21]

	CO_2e
Category	MT CO_2e
Off-Road	641
Dust	0
Worker	35.1
Vendor	0
Hauling	281
UTV	4.35E-02
Helicopter	
Total	**957.1434687**

Ph5: Battery Storage / 3rd Building Construction (2027) [3.23]

	CO_2e
Category	MT CO_2e
Off-Road	1016
Dust	0
Worker	54.4
Vendor	0
Hauling	435
UTV	6.26E-02
Helicopter	
Total	**1505.462569**

Darden Renewable Energy Project
Construction CalEEMod - GHG Emissions
36-Month Construction Schedule

Ph4: Gen-tie / 2nd Building Construction (2028) [3.23]

	CO_2e
Category	MT CO_2e
Off-Road	549
On-Site Truck	0
Worker	49.1
Vendor	0
Hauling	233
UTV	
Helicopter	4.00
Total	**835.0963314**

Ph5: Battery Storage / 3rd Building Construction (2028) [3.25]

	CO_2e
Category	MT CO_2e
Off-Road	1529
On-Site Truck	0
Worker	78.3
Vendor	0
Hauling	741
UTV	1.32E-01
Helicopter	
Total	**2348.431723**

Darden Renewable Energy Project
Construction CalEEMod - GHG Emissions
18- Month Construction Schedule

Ph6: Hydrogen / 2nd Site Prep (2026) [3.5]

	CO_2e
Category	MT CO_2e
Off-Road	1210
Dust	
On-Site Truck	23.5334
Worker	68.3
Vendor	0
Hauling	848
UTV	1.35E-01
Helicopter	
Total	**2149.968251**

Ph6: Hydrogen / 2nd Site Prep (2027) [3.9]

	CO_2e
Category	MT CO_2e
Off-Road	1261
Dust	
On-Site Truck	28.76304
Worker	69.7
Vendor	0
Hauling	862
UTV	1.27E-01
Helicopter	
Total	**2221.589827**

Darden Renewable Energy Project
Construction CalEEMod - GHG Emissions
36-Month Construction Schedule

Ph6: Hydrogen / 2nd Site Prep (2028) [3.7]

	CO_2e
Category	MT CO_2e
Off-Road	2184
Dust	
On-Site Truck	50.222268
Worker	127
Vendor	0
Hauling	1604
UTV	3.29E-01
Helicopter	
Total	**3965.551576**

Ph6: Hydrogen / 2nd Site Prep (2029) [3.7]

	CO_2e
Category	MT CO_2e
Off-Road	306
Dust	
On-Site Truck	8.175718
Worker	17.5
Vendor	0
Hauling	219
UTV	3.29E-01
Helicopter	
Total	**551.0050261**

Darden Renewable Energy Project
Construction CalEEMod - GHG Emissions
18- Month Construction Schedule

Ph7: Utility Switchyard / 3rd Site Prep (2026) [3.9]

	CO_2e
Category	MT CO_2e
Off-Road	1598
Dust	
On-Site Truck	73.96211
Worker	72.5
Vendor	0
Hauling	294
UTV	
Helicopter	
Total	**2038.462112**

Darden Renewable Energy Project
Construction CalEEMod - GHG Emissions
36-Month Construction Schedule

Ph7: Utility Switchyard / 3rd Site Prep (2026) [3.11]

	CO_2e
Category	MT CO_2e
Off-Road	896
Dust	
On-Site Truck	52.669989
Worker	49.5
Vendor	0
Hauling	177
UTV	
Helicopter	
Total	**1175.169989**

Ph7: Utility Switchyard / 3rd Site Prep (2027) [3.13]

	CO_2e
Category	MT CO_2e
Off-Road	575
Dust	
On-Site Truck	22
Worker	31.1
Vendor	0
Hauling	111
UTV	
Helicopter	
Total	**739.1392152**

Data Response Set 3 - Appendix C

DR AQ-11 Supplementary Technical Approach Information

DR AQ-11 Supplementary Technical Approach Information

As part of the data requests received from the California Energy Commission (CEC) on the Darden Clean Energy Project (Project) Opt-in Application, the CEC requested that an additional technical analysis be conducted for an ambient air quality analysis (AAQA). Rincon Consultants performed the AAQA pursuant to San Joaquin Valley Air Pollution Control District (SJVAPCD) APR 1925*, Policy for District Rule 2201 AAQA Modeling*.

During the AAQA process, the Applicant provided a series of technical refinements to the Project, including, but not limited to, changes to emergency backup generator quantity and size and construction equipment fleet. These refinements resulted in a general reduction of emissions compared to the original application submittal. Detailed information related to the emergency engines intended for Project operation is provided in the preliminary draft air permit application (Appendix A of Data Response Set #3). This document provides more information on the technical approach and methodologies related to calculating emissions and performing air dispersion modeling to calculate construction and operational impacts for the AAQA.

Emissions Methodology

Construction emissions were developed using the most recent version of the online California Emissions Estimator Model (CalEEMod) in conjunction with Project-specific construction information provided by the Applicant. Examples of Project-specific construction details include construction schedules, numbers and types of offroad construction equipment, and haul trips for material import or export. Emissions outputs from CalEEMod are provided in units of pounds per day (lb/day) and tons per year (tpy). The lb/day values were used for the short-term ambient air quality standards (AAQS) analyses and the tpy values were used for the annual AAQS analyses.

Operation emissions include emissions from stationary source equipment[1], mobile sources, and area sources associated with operation of the Project. The non-stationary source equipment emissions were quantified using CalEEMod based on Project-specific information provided by the Applicant. More information related to the emissions is provided in the technical reference materials included in Appendix D of Data Response Set #3.

Air Dispersion Analysis Methodology

An air dispersion modeling analysis was performed to compare Project impacts to the corresponding California Ambient Air Quality Standards (CAAQS), the National Ambient Air Quality Standards (NAAQS), and Significant Impact Levels (SILs). Air dispersion modeling was conducted using the United States Environmental Protection Agency (US EPA) approved model, the AMS/EPA Regulatory Model (AERMOD), Version 21112 consistent with the SJVAPCD *Guidance for Air Dispersion Modeling* document.[2]

[1] Please refer to the preliminary draft air permit application (Appendix A of Data Response Set #3).
[2] SJVAPCD. 2022. Guidance for Air Dispersion Modeling. Available at https://ww2.valleyair.org/media/zlbhrg22/modeling_guidance.pdf. Accessed April 2024.

Meteorological data from the Mendota station for the years 2007 through 2011 were used in AERMOD. The Project site was assumed to be a rural location. A wide-ranging receptor grid was dispersed throughout the Project site, including fenceline receptors to capture hourly impacts.

The hourly emission rate for nitrogen oxides (NO_X) was incorporated into AERMOD to function with the Tier 2 ARM2 NO_X to nitrogen dioxide (NO_2) conversion option. The model assumed the default ARM2 options. The hourly NO_X emission rate was also applied to the annual analysis, which provides a worst case conservative analysis. A separate model run was used with a unitized 1 gram per second (g/s) emission rate to obtain unitized ground-level concentrations for each design value for each of the criteria air pollutants. The unitized concentration outputs, the X/Q in micrograms per cubic meter per gram per second ($\mu g/m^3/g/s$), are provided in Appendix E of Data Response Set #3. Actual ground level concentrations of the criteria air pollutants (besides NO_2), in $\mu g/m^3$, can be calculated by multiplying the X/Q by the corresponding pollutant emission rate, in g/s.

Modeled impacts are presented in DR AQ-11. The results are combined with the highest-value background concentration data obtained from nearby monitors, averaged over the most recently available three years. NO_2 and carbon monoxide background data were provided by the Fresno-Foundary monitor and SO_2 background data were provided by the Fresno-Garland Station monitor. Copies of the air dispersion models run for the construction and operations analysis are to be provided electronically to CEC.

Construction

Offroad equipment proposed for construction activities were modeled as polygon area sources in AERMOD and mobile sources were modeled as line-volume sources, consistent with SJVAPCD modeling guidance. There are two locations (Option 1 and 2 sites) being considered for the BESS, green hydrogen facility, and step-up substation. In addition, an alternate site is being considered for the green hydrogen facility, located west of Interstate 5 and adjacent to the proposed utility switchyard site (Option 3). AERMOD sources were set up to capture the potential construction activities for each of these three options, with sizes/areas of the sources based on site plans provided by the Applicant.

There were overlapping schedules associated with construction activities. Based on the construction schedule provided by the Applicant, there are a total of seven phases[3]; however, not all would be occurring simultaneously. There are two sets of identified overlapping phases. “Overlap A” – identified in the models and post-processing sheets – is the combination of Phases 1, 2 and 7. “Overlap B” is the combination of Phases 2, 3, 4, 5 and 6.

Impacts were analyzed for each of the Project Options 1 through 3 and for Overlap A and Overlap B.4 The maximum analyzed impacts from each of the Project options and overlapping construction schedules are presented in the results summary.

Operation

The stationary source equipment was modeled as point sources with stack parameters provided by the SJVAPCD. Although the sources were modeled as point sources, building downwash effects were not included. This is because Project designs are still preliminary, and locations of the emission sources and any potential structures have not yet been determined. The AERMOD point sources

[3] Phase 1 = Site Preparation; Phase 2 = PV Panel Setup; Phase 3 = Inverters, Transformers, Substation, Electrical; Phase 4 = Gen-Tie; Phase 5 = Battery Storage; Phase 6 = Hydrogen Facility; Phase 7 = Utility Switchyard

[4] Note that construction activities occurring under Overlap A are the same for each of the Project Options 1 through 3.

stack parameter assumptions, as provided by the SJVAPCD, are provided in more detail in the preliminary draft air permit application (Appendix A of Data Response Set #3). Mobile and offroad sources were modeled as line-volume sources.

Conclusion

An AAQA was performed in response to DR AQ-11. The technical studies demonstrated that construction and operation of the Project would not result in an exceedance of any standards, including NAAQS, CAAQS and SILs. Electronic copies of the files will be provided to CEC for review.

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