
APPENDIX C

Air Pollutant and Greenhouse Gas Emissions -
Technical Calculations

VOC

Emission Source	Existing VOC/ ROG Emissions (lbs/yr)	Proposed VOC/ROG Emissions (lbs/yr)	Increment of Increase with Proposed Expansion
Feed and Manure Management	28,450	46,846	
Tons/Year	14.23	23.42	9.20

VOC emissions from feed and manure management (including cow housing, liquid manure, and solid manure) were estimated using the SJVAPCD dairy emissions calculator. See HRA Appendix A for calculator emissions.

PM 10 Emissions from Animal Mvmt

Type of Cow	Existing Total Emissions (lbs/yr)	Proposed Total Emissions (lbs/yr)	
Animal Movement	19,387	3,011	
Tons/Year	9.69	1.51	-8.19

See HRA Appendix A for calculator emissions.

Greenhouse Gas Emission Rates for Electricity Use

eGrid State	Average Output Emission Rate (lb CO ₂ e/MWh)	Average Output Emission Rate (lb CO ₂ e/kWh)
California	422.029	0.422029

Source: eGRID2018. Released 1/28/2020. Accessed at: <<https://www.epa.gov/energy/emissions-generation-resource-integrated-database-egrid>>

GHG Emissions from Energy Consumption

	Herd Count	Average Electricity Use (kWh/yr)	GHG Emission Rate (lbs CO ₂ e/kWh)	GHG Emissions (lbs CO ₂ e/yr)	GHG Emissions (metric tons CO ₂ e/yr)
2018/2019 average PG&E	2,004	40,461	0.4220	17,076	7.75
Expansion Projection	3,501	70,686	0.4220	29,831	13.53
Increment of Increase	1,497	30,225	-	12,756	5.79

Electricity use provided by the project applicant. The Expansion Projection conservatively assumes the same electricity use per cow.

Source: eGRID2018. Released 1/28/2020. Accessed at: <<https://www.epa.gov/energy/emissions-generation-resource-integrated-database-egrid>>

Total Greenhouse Gas Emissions

	Increased Herd (metric tons CO ₂ e/yr)	Increased Mobile Source (metric tons CO ₂ e/yr)	Increased Electricity (metric tons CO ₂ e/yr)	GHG Emissions (metric tons CO ₂ /yr)
Godinho Heifer Ranch Expansion	4,525	49	6	4,580

Conversion Factors			
1 megawatt-hour (MWh)		1,000 kilowatt-hour (kWh)	
1 short ton		2,000 pounds (lb)	
1.10231 short ton		1 metric ton	
2.2046 lb		1 kilogram (kg)	

“Remarks” for the Godinho Heifer Ranch Expansion Project CalEEMod (v.2016.3.2) Model Run

“Remarks” are typically used in California Emissions Estimator Model (CalEEMod) to explain non-default inputs. For the current modeling, this document replaces the “remarks” section of the referenced CalEEMod model to provide more space to both identify non-default inputs and to explain how CalEEMod is used to calculate emissions for the current project. When defaults were retained and no further explanation was necessary, no “remarks” are recorded below.

The proposed project construction emissions and increment of increase of operational emissions were estimated as set forth below.

Godinho Heifer Ranch Model Run – Construction (2025) and Operation (2026)

Land Use

- The General Light Industrial land use subtype was used to represent the heifer ranch project, an industrial agriculture project. The proposed expansion would include the construction of 314,200¹ square-feet of new structures.

Construction Phase

- Construction of Phase 1 would occur 3-5 years following project approval. This analysis assumes early 2025. Phase 2 would likely occur within 10 years. To calculate the worst-case scenario, all project components were constructed in one phase.
- Off-road Equipment - While there would likely be a small construction crew, default equipment was used since construction details are unknown at this time.

Vehicle Trips

- Since the residential dwellings and employees would not change, these trips were not included in the model as an increment of increase. Animal Confinement Facilities operate 7 days a week. The proposed expanded operations would generate an increase of approximately 0.6 average daily trips (ADTs) (or 0.002 trips per 1,000 square feet²).

Operational Off-Road Equipment

- The increase in the number of hours for bedding deliver and feed delivery was used based on estimates from the project applicant.

Area Sources, Energy Use, Water and Wastewater, Solid Waste

- These rates are not applicable to the Godinho Heifer Ranch, and were not included.

¹ Following completion of the Air Quality Emissions analysis, the site plan was revised and the overall area of new structures was decreased from 314,200 square feet to 298,200 square feet. While the CalEEMod files reflect 314,200 square feet, the results would represent a more conservative estimate of air pollutant emissions, and no additional analysis would be required.

² Since this trip rate is below what could be entered in the model, 0.01 trips per 1,000 square feet was used.

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1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	314.20	1000sqft	7.21	314,200.00	0

1.2 Other Project Characteristics

Urbanization	Rural	Wind Speed (m/s)	2.2	Precipitation Freq (Days)	49
Climate Zone	3			Operational Year	2026
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MW hr)	641.35	CH4 Intensity (lb/MW hr)	0.029	N2O Intensity (lb/MW hr)	0.006

1.3 User Entered Comments & Non-Default Data

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Project Characteristics -

Land Use -

Construction Phase -

Vehicle Trips - See notes

Area Coating - See notes

Landscape Equipment - See notes

Water And Wastewater - n/a

Consumer Products - See notes

Energy Use - See notes

Solid Waste - See notes

Operational Off-Road Equipment - Bedding delivery and feed delivery from HRA

Table Name	Column Name	Default Value	New Value
tblAreaCoating	Area_Nonresidential_Exterior	157100	0
tblAreaCoating	Area_Nonresidential_Interior	471300	0
tblAreaCoating	ReapplicationRatePercent	10	0
tblEnergyUse	LightingElect	2.70	0.00
tblEnergyUse	NT24E	4.16	0.00
tblEnergyUse	NT24NG	3.84	0.00
tblEnergyUse	T24E	1.96	0.00
tblEnergyUse	T24NG	17.03	0.00
tblOperationalOffRoadEquipment	OperDaysPerYear	260.00	365.00
tblOperationalOffRoadEquipment	OperDaysPerYear	260.00	365.00
tblOperationalOffRoadEquipment	OperHorsePower	124.00	135.00
tblOperationalOffRoadEquipment	OperHorsePower	124.00	340.00
tblOperationalOffRoadEquipment	OperHoursPerDay	8.00	5.00
tblOperationalOffRoadEquipment	OperHoursPerDay	8.00	1.00

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tblOperationalOffRoadEquipment	OperLoadFactor	0.44	0.37
tblOperationalOffRoadEquipment	OperLoadFactor	0.44	0.37
tblOperationalOffRoadEquipment	OperOffRoadEquipmentNumber	0.00	1.00
tblOperationalOffRoadEquipment	OperOffRoadEquipmentNumber	0.00	1.00
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblSolidWaste	SolidWasteGenerationRate	389.61	0.00
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblVehicleTrips	CC_TL	6.60	7.30
tblVehicleTrips	CNW_TL	6.60	7.30
tblVehicleTrips	CW_TL	14.70	9.50
tblVehicleTrips	ST_TR	1.32	0.01
tblVehicleTrips	SU_TR	0.68	0.01
tblVehicleTrips	WD_TR	6.97	0.01
tblWater	IndoorWaterUseRate	72,658,750.00	0.00

2.0 Emissions Summary

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Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	1-6-2025	4-5-2025	0.5921	0.5921
2	4-6-2025	7-5-2025	0.6062	0.6062
3	7-6-2025	10-5-2025	0.6129	0.6129
4	10-6-2025	1-5-2026	0.5937	0.5937
5	1-6-2026	4-5-2026	0.0957	0.0957
		Highest	0.6129	0.6129

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	9.2000e-004	0.0113	9.3500e-003	6.0000e-005	3.5100e-003	3.0000e-005	3.5400e-003	9.4000e-004	3.0000e-005	9.8000e-004	0.0000	5.5084	5.5084	4.1000e-004	0.0000	5.5187
Offroad	0.0176	0.1355	0.3158	4.9000e-004		6.5000e-003	6.5000e-003		5.9800e-003	5.9800e-003	0.0000	43.1456	43.1456	0.0140	0.0000	43.4945
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0185	0.1468	0.3251	5.5000e-004	3.5100e-003	6.5300e-003	0.0100	9.4000e-004	6.0100e-003	6.9600e-003	0.0000	48.6540	48.6540	0.0144	0.0000	49.0132

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2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	9.2000e-004	0.0113	9.3500e-003	6.0000e-005	3.5100e-003	3.0000e-005	3.5400e-003	9.4000e-004	3.0000e-005	9.8000e-004	0.0000	5.5084	5.5084	4.1000e-004	0.0000	5.5187
Offroad	0.0176	0.1355	0.3158	4.9000e-004		6.5000e-003	6.5000e-003		5.9800e-003	5.9800e-003	0.0000	43.1456	43.1456	0.0140	0.0000	43.4945
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0185	0.1468	0.3251	5.5000e-004	3.5100e-003	6.5300e-003	0.0100	9.4000e-004	6.0100e-003	6.9600e-003	0.0000	48.6540	48.6540	0.0144	0.0000	49.0132

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

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Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	1/1/2025	1/14/2025	5	10	
2	Grading	Grading	1/15/2025	2/11/2025	5	20	
3	Building Construction	Building Construction	2/15/2025	1/2/2026	5	230	
4	Paving	Paving	1/31/2026	2/27/2026	5	20	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 10

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

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Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	1	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	7	18.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	132.00	51.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

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3.2 Site Preparation - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0903	0.0000	0.0903	0.0497	0.0000	0.0497	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0124	0.1262	0.0896	1.9000e-004		5.4300e-003	5.4300e-003		5.0000e-003	5.0000e-003	0.0000	16.7335	16.7335	5.4100e-003	0.0000	16.8688
Total	0.0124	0.1262	0.0896	1.9000e-004	0.0903	5.4300e-003	0.0958	0.0497	5.0000e-003	0.0547	0.0000	16.7335	16.7335	5.4100e-003	0.0000	16.8688

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.8000e-004	1.7000e-004	1.9000e-003	1.0000e-005	7.2000e-004	0.0000	7.2000e-004	1.9000e-004	0.0000	2.0000e-004	0.0000	0.5450	0.5450	1.0000e-005	0.0000	0.5453
Total	2.8000e-004	1.7000e-004	1.9000e-003	1.0000e-005	7.2000e-004	0.0000	7.2000e-004	1.9000e-004	0.0000	2.0000e-004	0.0000	0.5450	0.5450	1.0000e-005	0.0000	0.5453

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3.2 Site Preparation - 2025

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0903	0.0000	0.0903	0.0497	0.0000	0.0497	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0124	0.1262	0.0896	1.9000e-004		5.4300e-003	5.4300e-003		5.0000e-003	5.0000e-003	0.0000	16.7335	16.7335	5.4100e-003	0.0000	16.8688
Total	0.0124	0.1262	0.0896	1.9000e-004	0.0903	5.4300e-003	0.0958	0.0497	5.0000e-003	0.0547	0.0000	16.7335	16.7335	5.4100e-003	0.0000	16.8688

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.8000e-004	1.7000e-004	1.9000e-003	1.0000e-005	7.2000e-004	0.0000	7.2000e-004	1.9000e-004	0.0000	2.0000e-004	0.0000	0.5450	0.5450	1.0000e-005	0.0000	0.5453
Total	2.8000e-004	1.7000e-004	1.9000e-003	1.0000e-005	7.2000e-004	0.0000	7.2000e-004	1.9000e-004	0.0000	2.0000e-004	0.0000	0.5450	0.5450	1.0000e-005	0.0000	0.5453

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3.3 Grading - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0655	0.0000	0.0655	0.0337	0.0000	0.0337	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0152	0.1532	0.1454	3.0000e-004		6.2400e-003	6.2400e-003		5.7400e-003	5.7400e-003	0.0000	26.0698	26.0698	8.4300e-003	0.0000	26.2806
Total	0.0152	0.1532	0.1454	3.0000e-004	0.0655	6.2400e-003	0.0718	0.0337	5.7400e-003	0.0394	0.0000	26.0698	26.0698	8.4300e-003	0.0000	26.2806

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.6000e-004	2.8000e-004	3.1700e-003	1.0000e-005	1.2000e-003	1.0000e-005	1.2000e-003	3.2000e-004	1.0000e-005	3.3000e-004	0.0000	0.9084	0.9084	2.0000e-005	0.0000	0.9089
Total	4.6000e-004	2.8000e-004	3.1700e-003	1.0000e-005	1.2000e-003	1.0000e-005	1.2000e-003	3.2000e-004	1.0000e-005	3.3000e-004	0.0000	0.9084	0.9084	2.0000e-005	0.0000	0.9089

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3.3 Grading - 2025

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0655	0.0000	0.0655	0.0337	0.0000	0.0337	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0152	0.1532	0.1454	3.0000e-004		6.2400e-003	6.2400e-003		5.7400e-003	5.7400e-003	0.0000	26.0698	26.0698	8.4300e-003	0.0000	26.2806
Total	0.0152	0.1532	0.1454	3.0000e-004	0.0655	6.2400e-003	0.0718	0.0337	5.7400e-003	0.0394	0.0000	26.0698	26.0698	8.4300e-003	0.0000	26.2806

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.6000e-004	2.8000e-004	3.1700e-003	1.0000e-005	1.2000e-003	1.0000e-005	1.2000e-003	3.2000e-004	1.0000e-005	3.3000e-004	0.0000	0.9084	0.9084	2.0000e-005	0.0000	0.9089
Total	4.6000e-004	2.8000e-004	3.1700e-003	1.0000e-005	1.2000e-003	1.0000e-005	1.2000e-003	3.2000e-004	1.0000e-005	3.3000e-004	0.0000	0.9084	0.9084	2.0000e-005	0.0000	0.9089

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3.4 Building Construction - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1559	1.4215	1.8337	3.0700e-003		0.0601	0.0601		0.0566	0.0566	0.0000	264.3882	264.3882	0.0622	0.0000	265.9419
Total	0.1559	1.4215	1.8337	3.0700e-003		0.0601	0.0601		0.0566	0.0566	0.0000	264.3882	264.3882	0.0622	0.0000	265.9419

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0120	0.4616	0.0857	1.5700e-003	0.0385	4.5000e-004	0.0389	0.0111	4.3000e-004	0.0116	0.0000	149.3609	149.3609	0.0108	0.0000	149.6315
Worker	0.0465	0.0278	0.3181	1.0100e-003	0.1200	8.1000e-004	0.1208	0.0319	7.5000e-004	0.0327	0.0000	91.1262	91.1262	2.0800e-003	0.0000	91.1783
Total	0.0585	0.4893	0.4038	2.5800e-003	0.1585	1.2600e-003	0.1598	0.0430	1.1800e-003	0.0442	0.0000	240.4871	240.4871	0.0129	0.0000	240.8098

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3.4 Building Construction - 2025

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1559	1.4215	1.8337	3.0700e-003		0.0601	0.0601		0.0566	0.0566	0.0000	264.3879	264.3879	0.0622	0.0000	265.9416
Total	0.1559	1.4215	1.8337	3.0700e-003		0.0601	0.0601		0.0566	0.0566	0.0000	264.3879	264.3879	0.0622	0.0000	265.9416

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0120	0.4616	0.0857	1.5700e-003	0.0385	4.5000e-004	0.0389	0.0111	4.3000e-004	0.0116	0.0000	149.3609	149.3609	0.0108	0.0000	149.6315
Worker	0.0465	0.0278	0.3181	1.0100e-003	0.1200	8.1000e-004	0.1208	0.0319	7.5000e-004	0.0327	0.0000	91.1262	91.1262	2.0800e-003	0.0000	91.1783
Total	0.0585	0.4893	0.4038	2.5800e-003	0.1585	1.2600e-003	0.1598	0.0430	1.1800e-003	0.0442	0.0000	240.4871	240.4871	0.0129	0.0000	240.8098

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3.4 Building Construction - 2026

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.3700e-003	0.0125	0.0161	3.0000e-005		5.3000e-004	5.3000e-004		5.0000e-004	5.0000e-004	0.0000	2.3192	2.3192	5.5000e-004	0.0000	2.3328
Total	1.3700e-003	0.0125	0.0161	3.0000e-005		5.3000e-004	5.3000e-004		5.0000e-004	5.0000e-004	0.0000	2.3192	2.3192	5.5000e-004	0.0000	2.3328

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.0000e-004	4.0100e-003	7.1000e-004	1.0000e-005	3.4000e-004	0.0000	3.4000e-004	1.0000e-004	0.0000	1.0000e-004	0.0000	1.3016	1.3016	1.0000e-004	0.0000	1.3040
Worker	3.8000e-004	2.2000e-004	2.6000e-003	1.0000e-005	1.0500e-003	1.0000e-005	1.0600e-003	2.8000e-004	1.0000e-005	2.9000e-004	0.0000	0.7750	0.7750	2.0000e-005	0.0000	0.7755
Total	4.8000e-004	4.2300e-003	3.3100e-003	2.0000e-005	1.3900e-003	1.0000e-005	1.4000e-003	3.8000e-004	1.0000e-005	3.9000e-004	0.0000	2.0766	2.0766	1.2000e-004	0.0000	2.0795

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3.4 Building Construction - 2026

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.3700e-003	0.0125	0.0161	3.0000e-005		5.3000e-004	5.3000e-004		5.0000e-004	5.0000e-004	0.0000	2.3192	2.3192	5.5000e-004	0.0000	2.3328
Total	1.3700e-003	0.0125	0.0161	3.0000e-005		5.3000e-004	5.3000e-004		5.0000e-004	5.0000e-004	0.0000	2.3192	2.3192	5.5000e-004	0.0000	2.3328

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.0000e-004	4.0100e-003	7.1000e-004	1.0000e-005	3.4000e-004	0.0000	3.4000e-004	1.0000e-004	0.0000	1.0000e-004	0.0000	1.3016	1.3016	1.0000e-004	0.0000	1.3040
Worker	3.8000e-004	2.2000e-004	2.6000e-003	1.0000e-005	1.0500e-003	1.0000e-005	1.0600e-003	2.8000e-004	1.0000e-005	2.9000e-004	0.0000	0.7750	0.7750	2.0000e-005	0.0000	0.7755
Total	4.8000e-004	4.2300e-003	3.3100e-003	2.0000e-005	1.3900e-003	1.0000e-005	1.4000e-003	3.8000e-004	1.0000e-005	3.9000e-004	0.0000	2.0766	2.0766	1.2000e-004	0.0000	2.0795

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3.5 Paving - 2026

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	9.1500e-003	0.0858	0.1458	2.3000e-004		4.1900e-003	4.1900e-003		3.8500e-003	3.8500e-003	0.0000	20.0193	20.0193	6.4700e-003	0.0000	20.1811
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	9.1500e-003	0.0858	0.1458	2.3000e-004		4.1900e-003	4.1900e-003		3.8500e-003	3.8500e-003	0.0000	20.0193	20.0193	6.4700e-003	0.0000	20.1811

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.3000e-004	2.5000e-004	2.9600e-003	1.0000e-005	1.2000e-003	1.0000e-005	1.2000e-003	3.2000e-004	1.0000e-005	3.3000e-004	0.0000	0.8807	0.8807	2.0000e-005	0.0000	0.8812
Total	4.3000e-004	2.5000e-004	2.9600e-003	1.0000e-005	1.2000e-003	1.0000e-005	1.2000e-003	3.2000e-004	1.0000e-005	3.3000e-004	0.0000	0.8807	0.8807	2.0000e-005	0.0000	0.8812

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3.5 Paving - 2026

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	9.1500e-003	0.0858	0.1458	2.3000e-004		4.1900e-003	4.1900e-003		3.8500e-003	3.8500e-003	0.0000	20.0192	20.0192	6.4700e-003	0.0000	20.1811
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	9.1500e-003	0.0858	0.1458	2.3000e-004		4.1900e-003	4.1900e-003		3.8500e-003	3.8500e-003	0.0000	20.0192	20.0192	6.4700e-003	0.0000	20.1811

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.3000e-004	2.5000e-004	2.9600e-003	1.0000e-005	1.2000e-003	1.0000e-005	1.2000e-003	3.2000e-004	1.0000e-005	3.3000e-004	0.0000	0.8807	0.8807	2.0000e-005	0.0000	0.8812
Total	4.3000e-004	2.5000e-004	2.9600e-003	1.0000e-005	1.2000e-003	1.0000e-005	1.2000e-003	3.2000e-004	1.0000e-005	3.3000e-004	0.0000	0.8807	0.8807	2.0000e-005	0.0000	0.8812

4.0 Operational Detail - Mobile

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4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	9.2000e-004	0.0113	9.3500e-003	6.0000e-005	3.5100e-003	3.0000e-005	3.5400e-003	9.4000e-004	3.0000e-005	9.8000e-004	0.0000	5.5084	5.5084	4.1000e-004	0.0000	5.5187
Unmitigated	9.2000e-004	0.0113	9.3500e-003	6.0000e-005	3.5100e-003	3.0000e-005	3.5400e-003	9.4000e-004	3.0000e-005	9.8000e-004	0.0000	5.5084	5.5084	4.1000e-004	0.0000	5.5187

4.2 Trip Summary Information

Land Use	Average Daily Trip Rate			Unmitigated	Mitigated
	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Light Industry	3.14	3.14	3.14	9,173	9,173
Total	3.14	3.14	3.14	9,173	9,173

4.3 Trip Type Information

Land Use	Miles			Trip %			Trip Purpose %		
	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
General Light Industry	9.50	7.30	7.30	59.00	28.00	13.00	92	5	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
General Light Industry	0.520841	0.028100	0.157984	0.093872	0.013241	0.003819	0.015011	0.155169	0.002375	0.001828	0.005810	0.001441	0.000508

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5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

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5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Light Industry	0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Light Industry	0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

6.0 Area Detail

6.1 Mitigation Measures Area

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6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

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7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Light Industry	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Light Industry	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

8.0 Waste Detail

8.1 Mitigation Measures Waste

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Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Light Industry	0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

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8.2 Waste by Land Use

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Light Industry	0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type
Off-Highway Tractors	1	5.00	365	135	0.37	Diesel
Off-Highway Tractors	1	1.00	365	340	0.37	Diesel

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UnMitigated/Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Equipment Type	tons/yr										MT/yr					
Off-Highway Tractors	0.0176	0.1355	0.3158	4.9000e-004		6.5000e-003	6.5000e-003		5.9800e-003	5.9800e-003	0.0000	43.1456	43.1456	0.0140	0.0000	43.4945
Total	0.0176	0.1355	0.3158	4.9000e-004		6.5000e-003	6.5000e-003		5.9800e-003	5.9800e-003	0.0000	43.1456	43.1456	0.0140	0.0000	43.4945

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type
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Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type
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User Defined Equipment

Equipment Type	Number
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11.0 Vegetation

Pre-Project Facility Information

- Does this facility house Holstein or Jersey cows?
Most facilities house Holstein cows unless explicitly stated on the PTO or application.
- Does the facility have an anaerobic treatment lagoon?
- Does the facility land apply liquid manure?
Answering "yes" assumes worst case.
- Does the facility land apply solid manure?
Answering "yes" assumes worst case.
- Is any scraped manure sent to a lagoon/storage pond?
Answering "yes" assumes worst case.

Pre-Project Herd Size							
Herd	Flushed Freestalls	Scraped Freestalls	Flushed Corrals	Scraped Corrals	Total # of Animals		
Milk Cows					0		
Dry Cows					0		
Support Stock (Heifers, Calves, and Bulls)					0		
Large Heifers					0		
Medium Heifers				1,632	1,632		
Small Heifers				372	372		
Bulls					0		
	Calf Hutches				Calf Corrals		Total # of Calves
	Aboveground Flushed	Aboveground Scraped	On-Ground Flushed	On-Ground Scraped	Flushed	Scraped	
Calves							0

Total Herd Summary	
Total Milk Cows	0
Total Mature Cows	0
Support Stock (Heifers, Calves, and Bulls)	2,004
Total Calves	0
Total Dairy Head	2,004

Pre-Project Silage Information			
Feed Type	Max # Open Piles	Max Height (ft)	Max Width (ft)
Corn			
Alfalfa			
Wheat			

Post-Project Facility Information

- Does this facility house Holstein or Jersey cows?
Most facilities house Holstein cows unless explicitly stated on the PTO or application.
- Does the facility have an anaerobic treatment lagoon?
- Does the facility land apply liquid manure?
Answering "yes" assumes worst case.
- Does the facility land apply solid manure?
Answering "yes" assumes worst case.
- Is any scraped manure sent to a lagoon/storage pond?
Answering "yes" assumes worst case.
- Does this project result in an increase or relocation of uncovered surface area for any lagoon/storage pond?

Post-Project Herd Size							
Herd	Flushed Freestalls	Scraped Freestalls	Flushed Corrals	Scraped Corrals	Total # of Animals		
Milk Cows					0		
Dry Cows		471			471		
Support Stock (Heifers, Calves, and Bulls)					0		
Large Heifers		1,262			1,262		
Medium Heifers		354			354		
Small Heifers		882			882		
Bulls					0		
	Calf Hutches				Calf Corrals		Total # of Calves
	Aboveground Flushed	Aboveground Scraped	On-Ground Flushed	On-Ground Scraped	Flushed	Scraped	
Calves						532	532

Total Herd Summary	
Total Milk Cows	0
Total Mature Cows	471
Support Stock (Heifers, Calves, and Bulls)	2,498
Total Calves	532
Total Dairy Head	3,501

Post-Project Silage Information			
Feed Type	Max # Open Piles	Max Height (ft)	Max Width (ft)
Corn			
Alfalfa			
Wheat			

This spreadsheet serves only as a resource to calculate potential emissions from dairies, and may not reflect the final emissions used by the District due to parameters not addressed in this spreadsheet and/or omissions from the spreadsheet. Any other permissible equipment (e.g. IC engines, gasoline tanks, etc.) at a facility will need to be calculated separately. All final calculations used in permitting projects will be conducted by District staff.

Post-Project Potential to Emit (PE2)

Post-Project Herd Size							
Herd	Flushed Freestalls	Scraped Freestalls	Flushed Corrals	Scraped Corrals	Total # of Animals		
Milk Cows	0	0	0	0	0		
Dry Cows	0	471	0	0	471		
Support Stock (Heifers, Calves, and Bulls)	0	0	0	0	0		
Large Heifers	0	1,262	0	0	1,262		
Medium Heifers	0	354	0	0	354		
Small Heifers	0	882	0	0	882		
Bulls	0	0	0	0	0		
Calf Hutches				Calf Corrals		Total # of Calves	
Calves	Aboveground Flushed	Aboveground Scraped	On-Ground Flushed	On-Ground Scraped	Flushed		Scraped
Calves	0	0	0	0	0	532	532

Silage Information			
Feed Type	Maximum # Open Piles	Maximum Height (ft)	Open Face Area (ft ²)
Corn	0	0	0
Alfalfa	0	0	0
Wheat	0	0	0

Milking Parlor				
Cow	VOC		NH3	
	lb/day	lb/yr	lb/day	lb/yr
Milk Cows	0	0	0	0
Total	0.0	0	0.0	0

Cow Housing						
Total	VOC		NH3		PM10	
	lb/day	lb/yr	lb/day	lb/yr	lb/day	lb/yr
Total	37.7	13,732	50	18,311	8	3,011

Liquid Manure Handling						
Cow	VOC		NH3		H2S	
	lb/day	lb/yr	lb/day	lb/yr	lb/day	lb/yr
Milk Cows	0.0	0	0.0	0	0	0
Dry Cows	2.0	725	8.1	2,948	0.4	142
Support Stock (Heifers, Calves, and Bulls)	0.0	0	0.0	0	0	0
Large Heifers	4.1	1,502	11.2	4,089	0.5	200
Medium Heifers	0.8	287	2.2	814	0.1	38
Small Heifers	1.1	406	4.3	1,588	0.2	76
Calves	0.3	112	0.8	277	0	13
Bulls	0.0	0	0.0	0	0	0
Total	8.3	3,031	26.6	9,716	1.2	470

Solid Manure Handling				
Cow	VOC		NH3	
	lb/day	lb/yr	lb/day	lb/yr
Milk Cows	0.0	0	0.0	0
Dry Cows	0.4	141	1.8	674
Support Stock (Heifers, Calves, and Bulls)	0.0	0	0.0	0
Large Heifers	0.8	290	2.6	947
Medium Heifers	0.2	57	0.5	188
Small Heifers	0.2	79	1.0	353
Calves	0.1	21	0.2	64
Bulls	0.0	0	0.0	0
Total	1.7	589	6.1	2,224

Feed Handling and Storage		
	Daily PE (lb-VOC/day)	Annual PE (lb-VOC/yr)
Corn Emissions	0.0	0
Alfalfa Emissions	0.0	0
Wheat Emissions	0.0	0
TMR	80.8	29,493
Total	80.8	29,493

Total Daily Post-Project Potential to Emit (lb/day)							
Permit	NOx	SOx	PM10	CO	VOC	NH3	H2S
Milking Parlor	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cow Housing	0.0	0.0	8.3	0.0	37.7	50.2	0.0
Liquid Manure	0.0	0.0	0.0	0.0	8.3	26.6	1.2
Solid Manure	0.0	0.0	0.0	0.0	1.7	6.1	0.0
Feed Handling	0.0	0.0	0.0	0.0	80.8	0.0	0.0
Total	0.0	0.0	8.3	0.0	128.5	82.9	1.2

Total Annual Post-Project Potential to Emit (lb/yr)							
Permit	NOx	SOx	PM10	CO	VOC	NH3	H2S
Milking Parlor	0	0	0	0	0	0	0
Cow Housing	0	0	3,011	0	13,732	18,311	0
Liquid Manure	0	0	0	0	3,031	9,716	470
Solid Manure	0	0	0	0	589	2,224	0
Feed Handling	0	0	0	0	29,493	0	0
Total	0	0	3,011	0	46,846	30,251	470

Calculations for milking parlor:

Annual PE = (# milk cows) x (EF2 lb-pollutant/hd-yr)

Daily PE = (Annual PE lb/yr) ÷ (365 day/yr)

Calculations for cow housing:

See detailed calculations under Cow Housing Calculations worksheet.

Calculations for liquid manure and solid manure handling:

Annual PE = [(# milk cows) x (EF1 lb-pollutant/hd-yr)] + [(# dry cows) x (EF2 lb-pollutant/hd-yr)] + [(# large heifers) x (EF2 lb-pollutant/hd-yr)] + [(# medium heifers) x (EF2 lb-pollutant/hd-yr)] + [(# small heifers) x (EF2 lb-pollutant/hd-yr)] + [(# calves) x (EF2 lb-pollutant/hd-yr)] + [(# bulls) x (EF2 lb-pollutant/hd-yr)]

Daily PE = (Annual PE lb/yr) ÷ (365 day/yr)

The H2S emission factor is assumed to be 10% of the NH3 lagoon/storage pond(s) emission factor, for each respective herd size.

Calculations for silage emissions:

Annual PE = (EF2) x (area ft²) x (0.0929 m²/ft²) x (8,760 hr/yr) x (60 min/hr) x 2.20E-9 lb/μg

Daily PE = (Annual PE lb/yr) ÷ (365 day/yr)

Calculation for TMR emissions:

Annual PE = (# cows) x (EF2) x (0.658 m³) x (525,600 min/yr) x (2.20E-9 lb/μg)

Daily PE = (Annual PE lb/yr) ÷ (365 day/yr)

Calves are not included in TMR calculation.

Major Source Emissions (lb/yr)					
Permit	NOx	SOx	PM10	CO	VOC
Milking Parlor	0	0	0	0	0
Cow Housing	0	0	0	0	0
Liquid Manure	0	0	0	0	1,459
Solid Manure	0	0	0	0	0
Feed Handling	0	0	0	0	0
Total	0	0	0	0	1,459

Greenhouse Gas Emissions - CEQA

Uncontrolled GHG Emission Factors (lbs/hd-yr)						
Animal Type	CH4 (Anaerobic Treatment Lagoon)	CH4 (Lagoon)	CH4 (Manure Spreading)	CH4 (Solid Manure Storage)	CH4 (Enteric)	CO2 Equivalent Multiplier for CH4
Milk Cows	513	307.8	3.5	27.7	271.5	21
Dry Cows	513	307.8	3.5	27.7	271.5	21
Support Stock*	110.4	110.4	1.6	--	151.6	21
Large Heifers	110.4	110.4	1.6	--	151.6	21
Medium Heifers	110.4	110.4	1.6	--	100.5	21
Small Heifers	110.4	110.4	1.6	--	100.5	21
Calves	--	--	--	--	--	--
Bulls*	110.4	110.4	1.6	--	151.6	21

Uncontrolled GHG Emission Factors (lbs/hd-yr)					
Animal Type	N2O (Anaerobic Treatment Lagoon)	N2O (Manure Spreading)	N2O (Solid Manure Storage)	N2O (Enteric)	CO2 Equivalent Multiplier for N2O
Milk Cows	1.5	0	2.6	0	310
Dry Cows	1.5	0	2.6	0	310
Support Stock*	1.4	0	--	0	310
Large Heifers	1.4	0	--	0	310
Medium Heifers	1.4	0	--	0	310
Small Heifers	1.4	0	--	0	310
Calves	--	0	--	0	--
Bulls*	1.4	0	--	0	310

*Emission factors for Support Stock and Bulls assumed to be the same as Large Heifers.

1 short ton = 0.9072 metric ton

CO2e from CH4 = [CH4 (anaerobic treatment) lagoon + CH4 manure spreading + CH4 solid manure storage + CH4 enteric] x 21 x 0.9072 metric tons/short tons + 2000 lb/ton

CO2e from N2O = [N2O anaerobic treatment lagoon + N2O manure spreading + N2O solid manure storage + N2O enteric] x 310 x 0.9072 metric tons/short tons + 2000 lb/ton

Pre-Project CO2e Emissions

Pre-Project Lagoon CO2e Emissions from CH4 (metric tons/yr)				
Animal Type	Number of Cows	CH4 Lagoons (lb/hd-yr)	CO2e Multiplier	CO2e Lagoons (metric tons/yr)
Milk Cows	0	307.8	21.0	0
Dry Cows	0	307.8	21.0	0
Support Stock	0	110.4	21.0	0
Large Heifers	0	110.4	21.0	0
Medium Heifers	1,632	110.4	21.0	1,716
Small Heifers	372	110.4	21.0	391
Calves	0	--	--	0
Bulls	0	110.4	21.0	0

Pre-Project Non-Lagoons CO2e Emissions from CH4 (metric tons/yr)						
Animal Type	Number of Cows	CH4 Manure Spreading (lbs/hd-yr)	CH4 Solid Manure Storage (lbs/hd-yr)	CH4 Enteric (lbs/hd-yr)	Multiplier	CO2e Non-Lagoons (metric tons/yr)
Milk Cows	0	3.5	27.7	271.5	21.0	0
Dry Cows	0	3.5	27.7	271.5	21.0	0
Support Stock	0	1.6	--	151.6	21.0	0
Large Heifers	0	1.6	--	151.6	21.0	0
Medium Heifers	1,632	1.6	--	100.5	21.0	1,587
Small Heifers	372	1.6	--	100.5	21.0	362
Calves	0	--	--	--	--	0
Bulls	0	1.6	--	151.6	21.0	0

Pre-Project Lagoon CO2e Emissions from N2O (metric tons/yr)				
Animal Type	Number of Cows	N2O Lagoons (lb/hd-yr)	CO2e Multiplier	CO2e Lagoons (metric tons/yr)
Milk Cows	0	0.0	310.0	0
Dry Cows	0	0.0	310.0	0
Support Stock	0	0.0	310.0	0
Large Heifers	0	0.0	310.0	0
Medium Heifers	1,632	0.0	310.0	0
Small Heifers	372	0.0	310.0	0
Calves	0	0.0	--	0
Bulls	0	0.0	310.0	0

Pre-Project Non-Lagoons CO2e Emissions from N2O (metric tons/yr)						
Animal Type	Number of Cows	N2O Manure Spreading (lbs/hd-yr)	N2O Solid Manure Storage (lbs/hd-yr)	N2O Enteric (lbs/hd-yr)	Multiplier	CO2e Non-Lagoons (metric tons/yr)
Milk Cows	0	0.0	2.6	0.0	310.0	0
Dry Cows	0	0.0	2.6	0.0	310.0	0
Support Stock	0	0.0	--	0.0	310.0	0
Large Heifers	0	0.0	--	0.0	310.0	0
Medium Heifers	1,632	0.0	--	0.0	310.0	0
Small Heifers	372	0.0	--	0.0	310.0	0
Calves	0	0.0	--	0.0	--	0
Bulls	0	0.0	--	0.0	310.0	0

Total Pre-Project CO2e Emissions (metric tons/yr)			
Animal Type	CO2e from CH4	CO2e from N2O	Total
Milk Cows	0	0	0
Dry Cows	0	0	0
Support Stock	0	0	0
Large Heifers	0	0	0
Medium Heifers	3,303	0	3,303
Small Heifers	753	0	753
Calves	0	0	0
Bulls	0	0	0
Total	4,056		

Post-Project CO2e Emissions

Post-Project Lagoon CO2e Emissions from CH4 (metric tons/yr)				
Animal Type	Number of Cows	CH4 Lagoons (lb/hd-yr)	CO2e Multiplier	CO2e Lagoons (metric tons/yr)
Milk Cows	0	307.8	21.0	0
Dry Cows	471	307.8	21.0	1,381
Support Stock	0	110.4	21.0	0
Large Heifers	1,262	110.4	21.0	1,327
Medium Heifers	354	110.4	21.0	372
Small Heifers	832	110.4	21.0	928
Calves	532	--	--	0
Bulls	0	110.4	21.0	0

Post-Project Non-Lagoons CO2e Emissions from CH4 (metric tons/yr)						
Animal Type	Number of Cows	CH4 Manure Spreading (lbs/hd-yr)	CH4 Solid Manure Storage (lbs/hd-yr)	CH4 Enteric (lbs/hd-yr)	Multiplier	CO2e Non-Lagoons (metric tons/yr)
Milk Cows	0	3.5	27.7	271.5	21.0	0
Dry Cows	471	3.5	27.7	271.5	21.0	1,358
Support Stock	0	1.6	--	151.6	21.0	0
Large Heifers	1,262	1.6	--	151.6	21.0	1,842
Medium Heifers	354	1.6	--	100.5	21.0	344
Small Heifers	832	1.6	--	100.5	21.0	858
Calves	532	--	--	--	--	0
Bulls	0	1.6	--	151.6	21.0	0

Post-Project Lagoon CO2e Emissions from N2O (metric tons/yr)				
Animal Type	Number of Cows	N2O Lagoons (lb/hd-yr)	CO2e Multiplier	CO2e Lagoons (metric tons/yr)
Milk Cows	0	0.0	310.0	0
Dry Cows	471	0.0	310.0	0
Support Stock	0	0.0	310.0	0
Large Heifers	1,262	0.0	310.0	0
Medium Heifers	354	0.0	310.0	0
Small Heifers	832	0.0	310.0	0
Calves	532	0.0	--	0
Bulls	0	0.0	310.0	0

Post-Project Non-Lagoons CO2e Emissions from N2O (metric tons/yr)						
Animal Type	Number of Cows	N2O Manure Spreading (lbs/hd-yr)	N2O Solid Manure Storage (lbs/hd-yr)	N2O Enteric (lbs/hd-yr)	Multiplier	CO2e Non-Lagoons (metric tons/yr)
Milk Cows	0	0.0	2.6	0.0	310.0	0
Dry Cows	471	0.0	2.6	0.0	310.0	172
Support Stock	0	0.0	--	0.0	310.0	0
Large Heifers	1,262	0.0	--	0.0	310.0	0
Medium Heifers	354	0.0	--	0.0	310.0	0
Small Heifers	832	0.0	--	0.0	310.0	0
Calves	532	0.0	--	0.0	--	0
Bulls	0	0.0	--	0.0	310.0	0

Total Post-Project CO2e Emissions (metric tons/yr)			
Animal Type	CO2e from CH4	CO2e from N2O	Total
Milk Cows	0	0	0
Dry Cows	2,739	172	2,911
Support Stock	0	0	0
Large Heifers	3,169	0	3,169
Medium Heifers	717	0	717
Small Heifers	1,785	0	1,785
Calves	0	0	0
Bulls	0	0	0
Total	8,582		

Change in CO2e Emissions

Change in Project GHG Emissions			
Animal Type	Pre-Project CO2e (metric tons/yr)	Post-Project CO2e (metric tons/yr)	Change (metric tons/yr)
Milk Cows	0	0	0
Dry Cows	0	2,911	2,911
Support Stock	0	0	0
Large Heifers	0	3,169	3,169
Medium Heifers	3,303	717	-2,587
Small Heifers	753	1,785	1,032
Calves	0	0	0
Bulls	0	0	0
Total	4,056	4,525	4,525