

**Appendix D:  
Energy Supporting Information**

THIS PAGE INTENTIONALLY LEFT BLANK

## **Canine Companions Canine Project—Energy Consumption Summary**

FCS Project Number: 5486.0001

Date of Last Revision: April 8, 2021

### **Summary of Energy Use During Construction**

(Annually)

Construction vehicle fuel	10,974 gallons (gasoline, diesel)
Construction office trailer electricity	15,018 kilowatt hours

### **Summary of Energy Use During Proposed Operations**

(Annually)

Operational vehicle fuel consumption	92,594 gallons (gasoline, diesel)
Operational natural gas consumption	901,601 kilo-British Thermal Units
Operational electricity consumption	357,634 kilowatt hours

**Construction Vehicle Fuel Calculations (Page 1 of 2)**

California Air Resource Board (ARB). 2021. EMFAC2014 Web Database. Website:  
<https://www.arb.ca.gov/emfac/2014/>. Accessed February 2021.

EMFAC2014 (v1.0.7) Emissions Inventory

Region Type: County

Region: Sonoma

Calendar Year: 2021

Season: Annual

Vehicle Classification: EMFAC2007 Categories

Units: miles/day for VMT, trips/day for Trips, tons/day for Emissions, 1000 gallons/day for Fuel Consumption

VMT = Vehicle Miles Traveled

FE = Fuel Economy

*Calculations*

Region	CalYr	VehClass	MdYr	Speed	Fuel	Population	VMT (mi/day)	Fuel Consumption (1000 gallons/day)	FE (mi/gallon)	VMT*FE
Sonoma	2021	HHDT	Aggregated	Aggregated	GAS	16.2357747	1901.58782	0.413152808	4.602625917	8752.2974
Sonoma	2021	HHDT	Aggregated	Aggregated	DSL	1990.657711	245931.739	43.4813758	5.656024779	1390996
Sonoma	2021	LDA	Aggregated	Aggregated	GAS	127800.6513	5124518.91	176.0277166	29.11200014	149184995
Sonoma	2021	LDA	Aggregated	Aggregated	DSL	1744.049132	66522.4195	1.85737646	35.81525929	2382517.7
Sonoma	2021	LDT1	Aggregated	Aggregated	GAS	10787.93283	366089.647	15.28725683	23.94737333	8766885.4
Sonoma	2021	LDT1	Aggregated	Aggregated	DSL	24.12086989	393.849078	0.015190621	25.92712109	10211.373
Sonoma	2021	LDT2	Aggregated	Aggregated	GAS	37609.02884	1576995.55	71.98203753	21.90818153	34549105
Sonoma	2021	LDT2	Aggregated	Aggregated	DSL	61.94278236	2947.49564	0.101025801	29.17567193	85995.166
Sonoma	2021	LHDT1	Aggregated	Aggregated	GAS	3740.693587	110465.203	11.55172881	9.562655508	1056340.7
Sonoma	2021	LHDT1	Aggregated	Aggregated	DSL	4692.502384	152622.895	8.910520906	17.12839199	2614184.8
Sonoma	2021	LHDT2	Aggregated	Aggregated	GAS	518.3351583	18866.9752	2.158259728	8.741753811	164930.45
Sonoma	2021	LHDT2	Aggregated	Aggregated	DSL	1142.216547	43547.786	2.801706884	15.5433055	676876.54
Sonoma	2021	MDV	Aggregated	Aggregated	GAS	30063.48209	995008.243	62.82762792	15.837113	15758058
Sonoma	2021	MDV	Aggregated	Aggregated	DSL	429.5000675	18671.0489	0.848846587	21.99578722	410684.42
Sonoma	2021	MHDT	Aggregated	Aggregated	GAS	329.7546429	15106.2266	2.391642459	6.31625624	95414.798
Sonoma	2021	MHDT	Aggregated	Aggregated	DSL	4906.573775	256968.217	30.90363593	8.315145104	2136728

**Worker**  
**Weighted Average FE 25.904139**

**Vendor**  
**Weighted Average FE 9.633453**

**Haul**  
**Weighted Average FE 5.6479422**

**Construction Vehicle Fuel Calculations (Page 2 of 2)**

**Construction Schedule**

Source: AQ/GHG Appendix, CalEEMod Output

Canine Companions Canine Project - Unmitigated Construction and Project Buildout - Sonoma-San Francisco County, Annual

Date: 4/8/2021 12:36 AM

Phase Name	Phase Type	Start Date	End Date	Num Days	
				Week	Num Days
Site Preparation	Site Preparation	7/1/2021	7/5/2021	5	3
Grading	Grading	7/6/2021	7/13/2021	5	6
Building Construction	Building Construction	7/14/2021	8/4/2022	5	277
Paving	Paving	8/5/2022	8/18/2022	5	10
Architectural Coating	Architectural Coating	8/19/2022	9/1/2022	5	10

**Construction Trips and VMT**

Phase Name	Trips per Day			Construction Trip Length in Miles			Number of Days per Phase	Trips per Phase			VMT per Phase			Fuel Consumption (gallons)		
	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length		Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trips	Vendor Trips	Hauling Trips	Worker Trips	Vendor Trips	Hauling Trips
Site Preparation	8	0	6	10.8	7.3	20	3	24	0	6	259	0	120	10.01	0.00	21.25
Grading	10	0	8	10.8	7.3	20	6	60	0	8	648	0	160	25.02	0.00	28.33
Building Construction	54	21	16	10.8	7.3	20	277	14,958	5,817	16	161,546	42,464	320	6,236.32	4,407.98	56.66
Paving	15	4	12	10.8	7.3	20	10	150	40	12	1,620	292	240	62.54	30.31	42.49
Architectural Coating	11	0	2	10.8	7.3	20	10	110	0	2	1,188	0	40	45.86	0.00	7.08

Total Project Construction VMT (miles)

**208,898**

Total Project Fuel Consumption (gallons)

**10,974**

**Construction Office Electricity Calculation**

Energy Appendix: CalEEMod Typical Construction Trailer

Typical Construction Trailer - Sonoma-San Francisco County, Annual

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	Mt/yr			
General Office Building	12837.6	2.2748	1.7000e-004	3.0000e-005	2.2894
<b>Total</b>		<b>2.2748</b>	<b>1.7000e-004</b>	<b>3.0000e-005</b>	<b>2.2894</b>

kWh/yr = kilowatt hours per year

**Energy by Land Use - Electricity**

Annual 12,838 kWh/yr

**Total Over Construction 15,018 kWh**

Total Construction Schedule

Start 7/1/2021

End 9/1/2022

Total Calendar Days 427

Years 1.17

**Operational Fuel Calculation (Page 1 of 2)**

California Air Resource Board (ARB). 2021. EMFAC2014 Web Database. Website: <https://www.arb.ca.gov/emfac/2014/>. Accessed April 8, 2021.

EMFAC2014 (v1.0.7) Emissions Inventory

Region Type: County

Region: Sonoma

Calendar Year: 2022

Season: Annual

Vehicle Classification: EMFAC2007 Categories

Units: miles/day for VMT, trips/day for Trips, tons/day for Emissions, 1000 gallons/day for Fuel Consumption

VMT = Vehicle Miles Traveled

FE = Fuel Economy

Given								Calculations		
Region	CalYr	VehClass	MdlYr	Speed	Fuel	Population	VMT	Fuel Consumption	FE	VMT*FE
Sonoma	2022	LDA	Aggregated	Aggregated	GAS	129762.049	5181495.694	172.7982382	29.98581321	155371362
Sonoma	2022	LDA	Aggregated	Aggregated	DSL	1790.575147	67918.1917	1.841196676	36.88806991	2505371
<b>LDA</b>										
<b>Weighted Average FE 30.0751163</b>										
Sonoma	2022	LDT1	Aggregated	Aggregated	GAS	10267.73656	353086.2841	14.22716333	24.81775712	8762809.64
Sonoma	2022	LDT1	Aggregated	Aggregated	DSL	22.55693192	366.4488365	0.013829619	26.49739125	9709.93819
<b>LDT1</b>										
<b>Weighted Average FE 24.8194985</b>										
Sonoma	2022	LDT2	Aggregated	Aggregated	GAS	37320.94836	1571258.794	69.06890282	22.74914947	35744801.1
Sonoma	2022	LDT2	Aggregated	Aggregated	DSL	65.3097779	3051.264165	0.10146854	30.07103655	91754.6762
<b>LDT2</b>										
<b>Weighted Average FE 22.7633405</b>										
Sonoma	2022	MDV	Aggregated	Aggregated	GAS	29235.76631	967735.1981	59.24591279	16.33421029	15807190.2
Sonoma	2022	MDV	Aggregated	Aggregated	DSL	452.9550496	19299.55142	0.851327825	22.66994082	437519.689
<b>MDV</b>										
<b>Weighted Average FE 16.4580932</b>										
Sonoma	2022	LHDT1	Aggregated	Aggregated	GAS	3488.624785	101413.189	10.58318969	9.582478634	971789.717
Sonoma	2022	LHDT1	Aggregated	Aggregated	DSL	4473.043501	143272.2753	8.327683612	17.204337	2464904.51
<b>LHDT1</b>										
<b>Weighted Average FE 14.0453551</b>										
Sonoma	2022	LHDT2	Aggregated	Aggregated	GAS	490.9106671	17874.06294	2.033675146	8.789045276	157095.948
Sonoma	2022	LHDT2	Aggregated	Aggregated	DSL	1103.692851	41879.0174	2.672712003	15.66910964	656206.915
<b>LHDT2</b>										
<b>Weighted Average FE 13.6110617</b>										
Sonoma	2022	MHDT	Aggregated	Aggregated	GAS	323.1311061	15060.20538	2.365350197	6.367008742	95888.4593
Sonoma	2022	MHDT	Aggregated	Aggregated	DSL	5161.59589	264991.876	31.7467638	8.347051613	2211900.87
<b>MHDT</b>										
<b>Weighted Average FE 8.24057195</b>										
Sonoma	2022	HHDT	Aggregated	Aggregated	GAS	15.81606326	1903.045624	0.407845158	4.666098362	8879.79807
Sonoma	2022	HHDT	Aggregated	Aggregated	DSL	2030.515986	254471.4988	44.31620321	5.742177361	1461220.48
<b>HHDT</b>										
<b>Weighted Average FE 5.73418972</b>										
Sonoma	2022	MCY	Aggregated	Aggregated	GAS	7359.370472	48258.37124	1.369874825	35.22830727	1700060.73
<b>MCY</b>										
<b>Weighted Average FE 35.2283073</b>										
Sonoma	2022	MH	Aggregated	Aggregated	GAS	882.5126045	7460.816298	1.134692676	6.575186792	49056.2608
Sonoma	2022	MH	Aggregated	Aggregated	DSL	252.7231295	2244.656354	0.234510848	9.571652526	21485.0707
<b>MH</b>										
<b>Weighted Average FE 7.26820156</b>										
Sonoma	2022	OBUS	Aggregated	Aggregated	GAS	149.4558999	7885.021106	1.201316346	6.563650891	51754.5258
Sonoma	2022	OBUS	Aggregated	Aggregated	DSL	269.5539629	21181.79085	2.907320218	7.285675213	154323.649
<b>OBUS</b>										
<b>Weighted Average FE 7.08981001</b>										
Sonoma	2022	SBUS	Aggregated	Aggregated	GAS	22.85642902	1175.339215	0.098380937	11.94681872	14041.5645
Sonoma	2022	SBUS	Aggregated	Aggregated	DSL	185.3811764	7039.516826	0.970259399	7.255293617	51073.7615
<b>SBUS</b>										
<b>Weighted Average FE 7.92653282</b>										
Sonoma	2022	UBUS	Aggregated	Aggregated	GAS	51.18753278	7479.901142	1.504529238	4.971589089	37186.9949
Sonoma	2022	UBUS	Aggregated	Aggregated	DSL	62.73049627	9052.207597	2.03754561	4.442701823	40216.2592
<b>UBUS</b>										
<b>Weighted Average FE 4.68199522</b>										

Operational Fuel Calculation (Page 2 of 2)

4.2 Trip Summary Information

Land Use	Average Daily Trip Rate			Unmitigated	Mitigated
	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Light Industry	472.79	472.79	472.79	1,380,301	1,380,301
General Light Industry	192.86	192.86	192.86	563,042	563,042
Medical Office Building	18.24	18.24	18.24	35,695	35,695
Other Asphalt Surfaces	0.00	0.00	0.00		
Other Non-Asphalt Surfaces	0.00	0.00	0.00		
Parking Lot	0.00	0.00	0.00		
<b>Total</b>	<b>683.88</b>	<b>683.88</b>	<b>683.88</b>	<b>1,979,038</b>	<b>1,979,038</b>

Annual VMT  
(miles)

Total VMT 1,979,038

Vehicle Class	FE	Vehicle Type Classification	Fuel	
			Vehicle VMT (miles)	Consumption (gallons/year)
LDA	30.07511629	0.586631	1,160,965	38,602.18
LDT1	24.81949851	0.037797	74,802	3,013.83
LDT2	22.76334045	0.168261	332,995	14,628.56
MDV	16.45809322	0.105494	208,777	12,685.35
LHD1	14.04535506	0.026152	51,756	3,684.91
LHD2	13.61106171	0.006386	12,638	928.52
MHD	8.240571946	0.029932	59,237	7,188.40
HHD	5.734189722	0.027401	54,228	9,456.89
OBUS	7.08981001	0.003107	6,149	867.28
UBUS	4.681995221	0.001767	3,497	746.90
MCY	35.22830727	0.005158	10,208	289.76
SBUS	7.926532821	0.000878	1,738	219.21
MH	7.268201557	0.001037	2,052	282.36
<b>Total</b>			<b>1,979,038</b>	<b>92,594</b>



## **Project Operations Natural Gas Use**

Source: AQ/GHG Appendix, CalEEMod Output

Canine Companions Canine Project - Unmitigated Construction and Project Buildout  
Sonoma-San Francisco County, Annual

kBTU/yr = kilo-British Thermal Units/year

	Natural Gas Use (kBTU/yr)
General Light Industry	236,681
General Light Industry	580,123
Medical Office Building	84,797
Other Asphalt Surfaces	0
Other Non-Asphalt Surfaces	0
Parking Lot	0
<b>Total</b>	<b>901,601 kBTU/yr</b>

## **Project Operations Electricity Use**

Source: AQ/GHG Appendix, CalEEMod Output

Canine Companions Canine Project - Unmitigated Construction and Project Buildout  
Sonoma-San Francisco County, Annual

### *Project Electricity Use*

kWh/yr = kilowatt hours per year

	Electricity Use (kWh/yr)	
General Light Industry	181646	
General Light Industry	74108.7	
Medical Office Building	92,359	
Other Asphalt Surfaces	0	
Other Non-Asphalt Surfaces	0	
Parking Lot	9,520	
<b>Total</b>	<b>357,634</b>	<b>kWh/yr</b>

Typical Construction Trailer - Sonoma-San Francisco County, Annual

**Typical Construction Trailer  
Sonoma-San Francisco County, Annual**

**1.0 Project Characteristics**

**1.1 Land Usage**

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Office Building	0.72	1000sqft	0.02	720.00	0

**1.2 Other Project Characteristics**

<b>Urbanization</b>	Urban	<b>Wind Speed (m/s)</b>	2.2	<b>Precipitation Freq (Days)</b>	75
<b>Climate Zone</b>	4			<b>Operational Year</b>	2021
<b>Utility Company</b>	Pacific Gas & Electric Company				
<b>CO2 Intensity (lb/MW hr)</b>	390.65	<b>CH4 Intensity (lb/MW hr)</b>	0.029	<b>N2O Intensity (lb/MW hr)</b>	0.006

**1.3 User Entered Comments & Non-Default Data**

Project Characteristics - Typical construction trailer for estimate of energy usage  
CO2 intensity factor adjusted based on Renewable Portfolio Standard

Land Use - 12'x60' single-wide unit (720 sq ft)

Construction Phase - Typical construction trailer for energy use estimates - estimates would be included in the operational component of the results

Off-road Equipment - Zeroed out construction equipment

Vehicle Trips - Zeroed out off-site trips

Table Name	Column Name	Default Value	New Value
tblProjectCharacteristics	CO2IntensityFactor	641.35	390.65

## 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	2.2748	2.2748	1.7000e-004	3.0000e-005	2.2894
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	2.2748	2.2748	1.7000e-004	3.0000e-005	2.2894
NaturalGas Mitigated	6.0000e-005	5.8000e-004	4.9000e-004	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005	0.0000	0.6290	0.6290	1.0000e-005	1.0000e-005	0.6327
NaturalGas Unmitigated	6.0000e-005	5.8000e-004	4.9000e-004	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005	0.0000	0.6290	0.6290	1.0000e-005	1.0000e-005	0.6327

### 5.3 Energy by Land Use - Electricity

#### Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Office Building	12837.6	2.2748	1.7000e-004	3.0000e-005	2.2894
<b>Total</b>		<b>2.2748</b>	<b>1.7000e-004</b>	<b>3.0000e-005</b>	<b>2.2894</b>

#### Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Office Building	12837.6	2.2748	1.7000e-004	3.0000e-005	2.2894
<b>Total</b>		<b>2.2748</b>	<b>1.7000e-004</b>	<b>3.0000e-005</b>	<b>2.2894</b>