

**Appendix D:  
Energy Supporting Information**

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# Appendix D: Energy Supporting Information

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**10X Genomics Project Energy Use Summary**

**Summary of Energy Use During Construction**

(Annually)

Construction vehicle fuel	31,078 gallons (gasoline, diesel)
Construction equipment fuel	54,533 gallons (diesel)
Total construction fuel	85,611 gallons (gasoline, diesel)
Construction office electricity	27,966 kilowatt hours

**Summary of Energy Use During Operations**

(Annually)

Operation vehicle fuel	419,815 gallons (gasoline, diesel)
Operation natural gas	884,064 kilo-British Thermal Units
Operation electricity	12,546,580 kilowatt hours

**Construction Vehicle Fuel Calculations**

California Air Resource Board (ARB). 2021. EMFAC2021 Web Database. Website: https://www.arb.ca.gov/emfac/emissions-inventory. Accessed February 18, 2021.

VMT = Vehicle Miles Traveled  
FE = Fuel Economy

Source: EMFAC2021 (v1.0.0) Emissions Inventory

Region Type: County

Region: Alameda

Calendar Year: 2021

Season: Annual

Vehicle Classification: EMFAC2007 Categories

Units: miles/day for CVMT and EVMT, trips/day for Trips, kWh/day for Energy Consumption, tons/day for Emissions, 1000 gallons/day for Fuel Consumption

Region	CalYr	VehClass	MdlYr	Speed	Fuel	Population	VMT (mi/day)	Fuel_Consumption (1000 gallons/day)	Calculations	
									FE (mi/gallon)	VMT*FE
Alameda	2021	HHDT	Aggregate	Aggregate	Gasoline	9.245674457	1022.322212	0.260597171	3.922998	4010.568118
Alameda	2021	HHDT	Aggregate	Aggregate	Diesel	14388.37211	1874628.441	291.9522284	6.421011	12037009.66
Alameda	2021	LDA	Aggregate	Aggregate	Gasoline	643846.3374	23456818.81	759.1663212	30.89813	724771809.7
Alameda	2021	LDA	Aggregate	Aggregate	Diesel	7140.126338	264939.2969	5.637479255	46.99606	12451102.32
Alameda	2021	LDA	Aggregate	Aggregate	Electricity	17125.09962	649064.5741	0	0	0
Alameda	2021	LDT1	Aggregate	Aggregate	Gasoline	66399.00239	2359124.586	88.60449258	26.62534	62812490.07
Alameda	2021	LDT1	Aggregate	Aggregate	Diesel	46.09620831	741.5650287	0.030880027	24.01439	17808.23245
Alameda	2021	LDT1	Aggregate	Aggregate	Electricity	321.7501352	12861.11964	0	0	0
Alameda	2021	LDT2	Aggregate	Aggregate	Gasoline	212628.2735	7710662.839	316.4944952	24.36271	187852624
Alameda	2021	LDT2	Aggregate	Aggregate	Diesel	1221.379149	52545.30417	1.500472498	35.01917	1840093.034
Alameda	2021	LDT2	Aggregate	Aggregate	Electricity	1502.598541	49387.54886	0	0	0
Alameda	2021	LHDT1	Aggregate	Aggregate	Gasoline	15865.61551	562596.9286	67.6055417	8.321758	4681795.252
Alameda	2021	LHDT1	Aggregate	Aggregate	Diesel	9438.927572	371117.3669	20.35515233	18.23211	6766252.483
Alameda	2021	LHDT2	Aggregate	Aggregate	Gasoline	2411.063705	84654.65559	11.65403145	7.26398	614929.756
Alameda	2021	LHDT2	Aggregate	Aggregate	Diesel	3486.926719	137555.6535	8.471816193	16.23686	2233471.238
Alameda	2021	MCY	Aggregate	Aggregate	Gasoline	29044.71157	225392.8512	6.081575702	37.06159	8353416.918
Alameda	2021	MDV	Aggregate	Aggregate	Gasoline	130301.2045	4523860.577	223.9353519	20.20164	91389386.93
Alameda	2021	MDV	Aggregate	Aggregate	Diesel	2697.743001	113530.8496	4.220137505	26.90217	3054226.027
Alameda	2021	MDV	Aggregate	Aggregate	Electricity	564.5400124	19409.87162	0	0	0
Alameda	2021	MH	Aggregate	Aggregate	Gasoline	2306.198331	22007.17154	4.555516808	4.830684	106314.0845
Alameda	2021	MH	Aggregate	Aggregate	Diesel	708.4043932	7263.472715	0.733190001	9.906672	71956.84041
Alameda	2021	MHDT	Aggregate	Aggregate	Gasoline	1608.989112	86820.78051	18.18197973	4.775101	414577.9525
Alameda	2021	MHDT	Aggregate	Aggregate	Diesel	14124.7368	906519.7672	96.1285596	9.430286	8548740.267
<b>Worker</b>										
Sum of VMT*FE (Column BI)									<b>1084189540</b>	
Total VMT									<b>39212946.94</b>	
Weighted Average FE									<b>27.64876463</b>	
<b>Vendor</b>										
Sum of VMT*FE (Column BI)									<b>43832475.02</b>	
Total VMT									<b>4279579.411</b>	
Weighted Average FE									<b>10.24223897</b>	
<b>Haul</b>										
Sum of VMT*FE (Column BI)									<b>12041020.23</b>	
Total VMT									<b>1875650.764</b>	
Weighted Average FE									<b>6.419649361</b>	

**10X Genomics Project Construction Assumptions - Phase 1**

**On-site Construction**

Source: AQ/GHG Appendix, CalEEMod Output

CalEEMod output file: 10X Genomics Project Phase 1 - Unmitigated Construction Only - Alameda County, Annual

Time stamp: Date: 2/18/2021

Construction Schedule	Phase Name	Phase Type	Start Date	End Date	Num Days		Num Days	Total VMT	Weighted Average FE
					Week	Week			
Site Preparation	Site Preparation		1/18/2021	4/1/2021	5	5	54		
Grading	Grading		4/30/2021	6/30/2021	5	5	44		
Building Construction	Building Construction		7/1/2021	11/8/2021	5	5	93		
Paving	Paving		7/26/2021	9/3/2021	5	5	30		
Architectural Coating	Architectural Coating		7/26/2021	11/8/2021	5	5	76		

Trips and VMT	Phase Name	Trips per Day			Total Trips			Hauling Vehicle Class	Hauling Vehicle Class	Worker Vehicle Class	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				Vendor Vehicle Class	Num Days	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trips	Vendor Trips	Hauling Trips	Worker Trips	Vendor Trips
Site Preparation		13	0	25	10.8	7.3	20	HDT_Mix	HHDT	LD_Mix+MDV	54	702	0	25	7,582	0	500	274.21	0.00	3.89
Grading		13	0	188	10.8	7.3	20	HDT_Mix	HHDT	LD_Mix+MDV	44	572	0	188	6,178	0	3,760	223.43	0.00	29.29
Building Construction		185	77	0	10.8	7.3	20	HDT_Mix	HHDT	LD_Mix+MDV	93	17,205	7,161	0	185,814	52,275	0	6,720.52	5,103.89	0.00
Paving		10	0	0	10.8	7.3	20	HDT_Mix	HHDT	LD_Mix+MDV	30	300	0	0	3,240	0	0	117.18	0.00	0.00
Architectural Coating		37	0	0	10.8	7.3	20	HDT_Mix	HHDT	LD_Mix+MDV	76	2,812	0	0	30,370	0	0	1,098.41	0.00	0.00

Total Construction VMT (miles) - Phase 1  
**289,718**

On-Site Total Fuel Consumption (gallons) - Phase 1  
**13,571**

**10X Genomics Project Construction Assumptions - Phase 2**

**On-site Construction**

Source: AQ/GHG Appendix, CalEEMod Output  
 CalEEMod output file: 10X Genomics Project Phase 2 - Unmitigated Construction Only - Alameda County, Annual  
 Time stamp: Date: 2/18/2021

Construction Schedule	Phase Name	Phase Type	Start Date	End Date	Num Days	
					Week	Num Days
	Demolition	Demolition	11/9/2021	12/10/2021	5	24
	Building Construction	Building Construction	12/11/2021	5/13/2022	5	110
	Paving	Paving	1/10/2022	2/25/2022	5	35
	Architectural Coating	Architectural Coating	1/10/2022	5/13/2022	5	90

Trips and VMT	Phase Name	Trips per Day				Total Trips				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	Vendor Vehicle Class	Hauling Vehicle Class	Worker Vehicle Class	Num Days	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trips	Vendor Trips	Hauling Trips	Worker Trips	Vendor Trips	Hauling Trips
		Demolition	40	0	0	890	10.8	7.3	20 HDT_Mix	HHDT	LD_Mix+MDV	24	960	0	890	10,368	0	17,800	374.99	0.00	138.64
Building Construction	185	77	0	0	10.8	7.3	20 HDT_Mix	HHDT	LD_Mix+MDV	110	20,350	8,470	0	219,780	61,831	0	7,949.00	6,036.86	0.00		
Paving	13	0	0	0	10.8	7.3	20 HDT_Mix	HHDT	LD_Mix+MDV	35	455	0	0	4,914	0	0	177.73	0.00	0.00		
Architectural Coating	37	0	0	0	10.8	7.3	20 HDT_Mix	HHDT	LD_Mix+MDV	90	3,330	0	0	35,964	0	0	1,300.75	0.00	0.00		

Total Construction VMT (miles) - Phase 2  
350,657

On-Site Total Fuel Consumption (gallons) - Phase 2  
15,978

**10X Genomics Project Construction Assumptions - Phase 3**

**On-site Construction**

Source: AQ/GHG Appendix, CalEEMod Output  
 CalEEMod output file: 10X Genomics Project Phase 2 - Unmitigated Construction Only - Alameda County, Annual  
 Time stamp: Date: 2/18/2021

Construction Schedule	Phase Name	Phase Type	Start Date	End Date	Num Days	
					Week	Num Days
	Building Construction	Building Construction	5/16/2022	7/4/2022	5	36
	Paving	Paving	5/25/2022	6/8/2022	5	11
	Architectural Coating	Architectural Coating	5/25/2022	7/4/2022	5	29

Trips and VMT	Phase Name	Trips per Day				Total Trips				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	Vendor Vehicle Class	Hauling Vehicle Class	Worker Vehicle Class	Num Days	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trips	Vendor Trips	Hauling Trips	Worker Trips	Vendor Trips	Hauling Trips
		Building Construction	52	25	0	0	10.8	7.3	20 HDT_Mix	HHDT	LD_Mix+MDV	36	1,872	900	0	20,218	6,570	0	731.23	641.46	0.00
Paving	10	0	0	0	10.8	7.3	20 HDT_Mix	HHDT	LD_Mix+MDV	11	110	0	0	1,188	0	0	42.97	0.00	0.00		
Architectural Coating	10	0	0	0	10.8	7.3	20 HDT_Mix	HHDT	LD_Mix+MDV	29	290	0	0	3,132	0	0	113.28	0.00	0.00		

Total Construction VMT (miles) - Phase 3  
31,108

Total VMT - all phases 671,483

Total On-Site Fuel Consumption - All Phases 31,078

On-Site Total Fuel Consumption (gallons) - Phase 3  
1,529

**Construction Equipment Fuel Calculation - Phase 1**

**On-site**

Source: AQ/GHG Appendix, CalEEMod Output

CalEEMod output file: 10x Genomics Redevelopment Project - Phase 1 Construction - Alameda County, Annual

Time stamp: Date: 2/18/2021

Construction Schedule	Phase Name	Phase Type	Start Date	End Date	Num Days	
					Week	Num Days
	Site Preparation	Site Preparation	1/18/2021	4/1/2021	5	54
	Grading	Grading	4/30/2021	6/30/2021	5	44
	Building Construction	Building Construction	7/1/2021	11/8/2021	5	93
	Paving	Paving	7/26/2021	9/3/2021	5	30
	Architectural Coating	Architectural Coating	7/26/2021	11/8/2021	5	76

  

Construction Equipment	Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor	Number of Days	HP Hours	Diesel Fuel Usage
Site Preparation	Rubber Tired Dozers	0	8	247	0.4	54	0.00	0.00	
Site Preparation	Sweepers/Scrubbers	1	4	64	0.46	54	6,359.04	317.95	
Site Preparation	Tractors/Loaders/Backhoes	0	8	97	0.37	54	0.00	0.00	
Site Preparation	Trenchers	2	8	78	0.5	54	33,696.00	1,684.80	
Grading	Excavators	0	8	158	0.38	44	0.00	0.00	
Grading	Graders	2	8	187	0.41	44	53,975.68	2,698.78	
Grading	Rubber Tired Dozers	0	8	247	0.4	44	0.00	0.00	
Grading	Scrapers	2	8	367	0.48	44	124,016.64	6,200.83	
Grading	Sweepers/Scrubbers	1	4	64	0.46	44	5,181.44	259.07	
Grading	Tractors/Loaders/Backhoes	0	8	97	0.37	44	0.00	0.00	
Building Construction	Aerial Lifts	2	8	63	0.31	93	29,060.64	1,453.03	
Building Construction	Cement and Mortar Mixers	1	2	9	0.56	93	937.44	46.87	
Building Construction	Cranes	1	4	231	0.29	93	24,920.28	1,246.01	
Building Construction	Forklifts	0	8	89	0.2	93	0.00	0.00	
Building Construction	Generator Sets	0	8	84	0.74	93	0.00	0.00	
Building Construction	Sweepers/Scrubbers	1	4	64	0.46	93	10,951.68	547.58	
Building Construction	Tractors/Loaders/Backhoes	0	7	97	0.37	93	0.00	0.00	
Building Construction	Welders	4	8	46	0.45	93	61,603.20	3,080.16	
Paving	Cement and Mortar Mixers	1	2	9	0.56	30	302.40	15.12	
Paving	Pavers	1	8	130	0.42	30	13,104.00	655.20	
Paving	Paving Equipment	0	8	132	0.36	30	0.00	0.00	
Paving	Rollers	1	8	80	0.38	30	7,296.00	364.80	
Paving	Sweepers/Scrubbers	1	4	64	0.46	30	3,532.80	176.64	
Architectural Coating	Aerial Lifts	2	2	63	0.31	76	5,937.12	296.86	
Architectural Coating	Air Compressors	0	6	78	0.48	76	0.00	0.00	
Architectural Coating	Cranes	1	8	231	0.29	76	40,729.92	2,036.50	
Architectural Coating	Forklifts	1	4	89	0.2	76	5,411.20	270.56	
<b>Construction Equipment Fuel Consumption</b>									<b>23,944.50</b> gallons

**Construction Equipment Fuel Calculation - Phase 2**

**On-site**

Source: AQ/GHG Appendix, CalEEMod Output

CalEEMod output file: 10x Genomics Redevelopment Project - Phase 2 Construction - Alameda County, Annual

Time stamp: Date: 2/18/2021

Construction Schedule	Phase Name	Phase Type	Start Date	End Date	Num Days	
					Week	Num Days
	Demolition	Demolition	11/9/2021	12/10/2021	5	24
	Building Construction	Building Construction	12/11/2021	5/13/2022	5	110
	Paving	Paving	1/10/2022	2/25/2022	5	35
	Architectural Coating	Architectural Coating	1/10/2022	5/13/2022	5	90

Construction Equipment	Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor	Number of Days	HP Hours	Diesel Fuel Usage
Demolition	Excavators	0	8	158	0.38	24	0.00	0.00	
Demolition	Off-Highway Trucks	8	8	402	0.38	24	234,639.36	11,731.97	
Demolition	Other Construction Equipment	4	8	172	0.42	24	55,480.32	2,774.02	
Demolition	Rubber Tired Dozers	0	8	247	0.4	24	0.00	0.00	
Demolition	Sweepers/Scrubbers	1	4	64	0.46	24	2,826.24	141.31	
Demolition	Tractors/Loaders/Backhoes	0	8	97	0.37	24	0.00	0.00	
Building Construction	Aerial Lifts	2	8	63	0.31	110	34,372.80	1,718.64	
Building Construction	Cement and Mortar Mixers	1	2	9	0.56	110	1,108.80	55.44	
Building Construction	Cranes	1	4	231	0.29	110	29,475.60	1,473.78	
Building Construction	Forklifts	0	8	89	0.2	110	0.00	0.00	
Building Construction	Generator Sets	0	8	84	0.74	110	0.00	0.00	
Building Construction	Sweepers/Scrubbers	1	4	64	0.46	110	12,953.60	647.68	
Building Construction	Tractors/Loaders/Backhoes	0	7	97	0.37	110	0.00	0.00	
Building Construction	Welders	4	8	46	0.45	110	72,864.00	3,643.20	
Paving	Cement and Mortar Mixers	1	2	9	0.56	35	352.80	17.64	
Paving	Pavers	1	8	130	0.42	35	15,288.00	764.40	
Paving	Paving Equipment	0	8	132	0.36	35	0.00	0.00	
Paving	Rollers	1	8	80	0.38	35	8,512.00	425.60	
Paving	Sweepers/Scrubbers	1	4	64	0.46	35	4,121.60	206.08	
Paving	Tractors/Loaders/Backhoes	0	8	97	0.37	35	0.00	0.00	
Architectural Coating	Aerial Lifts	2	2	63	0.31	90	7,030.80	351.54	
Architectural Coating	Air Compressors	0	6	78	0.48	90	0.00	0.00	
Architectural Coating	Cranes	1	8	231	0.29	90	48,232.80	2,411.64	
Architectural Coating	Forklifts	1	4	89	0.2	90	6,408.00	320.40	
								<b>Construction Equipment Fuel Consumption</b>	<b>26,683.34</b> gallons



**Construction Equipment Fuel Calculation - Phase 3**

**On-site**

Source: AQ/GHG Appendix, CalEEMod Output  
 CalEEMod output file: 10x Genomics Redevelopment Project - Phase 3 Construction - Alameda County, Annual  
 Time stamp: Date: 2/18/2021

Construction Schedule	Phase Name	Phase Type	Start Date	End Date	Num Days	
					Week	Num Days
	Building Construction	Building Construction	5/16/2022	7/4/2022	5	36
	Paving	Paving	5/25/2022	6/8/2022	5	11
	Architectural Coating	Architectural Coating	5/25/2022	7/4/2022	5	29

Construction Equipment	Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor	Number of Days	HP Hours	Diesel Fuel Usage
Building Construction	Cement and Mortar Mixers	1	2	9	0.56	36	362.88	18.14	
Building Construction	Cranes	1	4	231	0.29	36	9,646.56	482.33	
Building Construction	Forklifts	0	6	89	0.2	36	0.00	0.00	
Building Construction	Generator Sets	0	8	84	0.74	36	0.00	0.00	
Building Construction	Sweepers/Scrubbers	1	4	64	0.46	36	4,239.36	211.97	
Building Construction	Tractors/Loaders/Backhoes	0	6	97	0.37	36	0.00	0.00	
Building Construction	Welders	4	8	46	0.45	36	23,846.40	1,192.32	
Paving	Cement and Mortar Mixers	1	2	9	0.56	11	110.88	5.54	
Paving	Pavers	1	8	130	0.42	11	4,804.80	240.24	
Paving	Paving Equipment	0	8	132	0.36	11	0.00	0.00	
Paving	Rollers	1	8	80	0.38	11	2,675.20	133.76	
Paving	Sweepers/Scrubbers	1	4	64	0.46	11	1,295.36	64.77	
Paving	Tractors/Loaders/Backhoes	0	8	97	0.37	11	0.00	0.00	
Architectural Coating	Aerial Lifts	2	2	63	0.31	29	2,265.48	113.27	
Architectural Coating	Air Compressors	0	6	78	0.48	29	0.00	0.00	
Architectural Coating	Cranes	1	8	231	0.29	29	15,541.68	777.08	
Architectural Coating	Forklifts	1	4	89	0.2	29	2,064.80	103.24	

Construction Equipment Fuel Consumption **3,905.13** gallons  
 Total Construction Equipment Fuel Consumption (all Phases) **54,532.97**

Notes:  
 Equipment assumptions are provided in the CalEEMod output files.  
 Fuel usage estimate of 0.05 gallons of diesel fuel per horsepower-hour is from the SCAQMD CEQA Air Quality Handbook, Table A9-3E. South Coast Air Quality Management District. 1993. Air Quality Handbook, Table A9-3E.  
 Website: <http://www.aqmd.gov/home/rules-compliance/ceqa/air-quality-analysis-handbook>. Accessed October 30, 2020.

**Construction Office Electricity Calculation**

Energy Appendix: CalEEMod Typical Construction Trailer

Typical Construction Trailer - Alameda County, Annual

Date: 2/18/2021

**Mitigated**

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Office Building	6.43824e+006	613.2708	0.0847	0.0175	620.6096
Parking Lot	12600	1.2002	1.7000e-004	3.0000e-005	1.2146
Research & Development	4.78718e+006	455.9996	0.0630	0.0130	461.4564
Unenclosed Parking with Elevator	686760	65.4169	9.0300e-003	1.8700e-003	66.1997
Unrefrigerated Warehouse-No Pail	621800	59.2292	8.1800e-003	1.6900e-003	59.9380
<b>Total</b>		<b>1,195.1167</b>	<b>0.1650</b>	<b>0.0341</b>	<b>1,209.4183</b>

kWh/yr = kilowatt hours per year

Kwh per year for

General Office

Building is 6438240

Operational building

square footage is 207082

Kwh per year per square

foot of general office

31.09029273 building use

Max size of construction office trailer is 720 squa

**Energy by Land Use - Electricity**

Annual

22,385 kWh/yr

**Total Over Construction**

**27,966 kWh**

Total Construction Schedule

Start

4/1/2021

End

7/1/2022

Total Calendar Days

456

Years

1.25

**Proposed Operation Fuel Calculation**

California Air Resource Board (ARB). 2021. EMFAC2021 Web Database. Website: <https://www.arb.ca.gov/emfac/emissions-inventory>. Accessed February 18, 2021

Source: EMFAC2017 (v1.0.3) Emissions Inventory

VMT = Vehicle Miles Traveled

Region Type: County

FE = Fuel Economy

Region: Alameda

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

Given

Calculations

Region	CalYr	VehClass	MdlYr	Speed	Fuel	Population	VMT	Fuel Consumption	FE	VMT*FE
Alameda	2021	HHDT	Aggregate	Aggregate	Gasoline	9.24567446	1022.32221	0.260597171	3.922998	4010.568118
Alameda	2021	HHDT	Aggregate	Aggregate	Diesel	14388.3721	1874628.44	291.9522284	6.421011	12037009.66
Alameda	2021	LDA	Aggregate	Aggregate	Gasoline	643846.337	23456818.8	759.1663212	30.89813	724771809.7
Alameda	2021	LDA	Aggregate	Aggregate	Diesel	7140.12634	264939.297	5.637479255	46.99606	12451102.32
Alameda	2021	LDA	Aggregate	Aggregate	Electricity	17125.0996	649064.574	0	0	0
Alameda	2021	LDT1	Aggregate	Aggregate	Gasoline	66399.0024	2359124.59	88.60449258	26.62534	62812490.07
Alameda	2021	LDT1	Aggregate	Aggregate	Diesel	46.0962083	741.565029	0.030880027	24.01439	17808.23245
Alameda	2021	LDT1	Aggregate	Aggregate	Electricity	321.750135	12861.1196	0	0	0
Alameda	2021	LDT2	Aggregate	Aggregate	Gasoline	212628.274	7710662.84	316.4944952	24.36271	187852624
Alameda	2021	LDT2	Aggregate	Aggregate	Diesel	1221.37915	52545.3042	1.500472498	35.01917	1840093.034
Alameda	2021	LDT2	Aggregate	Aggregate	Electricity	1502.59854	49387.5489	0	0	0
Alameda	2021	LHDT1	Aggregate	Aggregate	Gasoline	15865.6155	562596.929	67.6055417	8.321758	4681795.252
Alameda	2021	LHDT1	Aggregate	Aggregate	Diesel	9438.92757	371117.367	20.35515233	18.23211	6766252.483
Alameda	2021	LHDT2	Aggregate	Aggregate	Gasoline	2411.06371	84654.6556	11.65403145	7.26398	614929.756
Alameda	2021	LHDT2	Aggregate	Aggregate	Diesel	3486.92672	137555.653	8.471816193	16.23686	2233471.238
Alameda	2021	MDY	Aggregate	Aggregate	Gasoline	29044.7116	225392.851	6.081575702	37.06159	8353416.918
Alameda	2021	MDV	Aggregate	Aggregate	Gasoline	130301.204	4523860.58	223.9353519	20.20164	91389386.93
Alameda	2021	MDV	Aggregate	Aggregate	Diesel	2697.743	113530.85	4.220137505	26.90217	3054226.027
Alameda	2021	MDV	Aggregate	Aggregate	Electricity	564.540012	19409.8716	0	0	0
Alameda	2021	MH	Aggregate	Aggregate	Gasoline	2306.19833	22007.1715	4.555516808	4.830884	106314.0845
Alameda	2021	MH	Aggregate	Aggregate	Diesel	708.404393	7263.47271	0.733190001	9.906672	71956.84041
Alameda	2021	MHDT	Aggregate	Aggregate	Gasoline	1608.98911	86820.7805	18.18197973	4.775101	414577.9525
Alameda	2021	MHDT	Aggregate	Aggregate	Diesel	14124.7368	906519.767	96.1285596	9.430286	8548740.267
Alameda	2021	OBUS	Aggregate	Aggregate	Gasoline	592.676208	30222.5819	6.416709217	4.709982	142347.8021
Alameda	2021	OBUS	Aggregate	Aggregate	Diesel	396.996117	29590.5175	3.823298455	7.739526	229016.5773
Alameda	2021	SBUS	Aggregate	Aggregate	Gasoline	79.4754385	4047.70383	0.420984971	9.614842	38918.03136
Alameda	2021	SBUS	Aggregate	Aggregate	Diesel	294.518342	9475.47562	1.135661634	8.343573	79059.32158
Alameda	2021	UBUS	Aggregate	Aggregate	Gasoline	8.84977111	522.974413	0.11495107	4.549539	2379.292643
Alameda	2021	UBUS	Aggregate	Aggregate	Diesel	577.203607	68223.7167	11.00011284	6.202092	423129.7978
Alameda	2021	UBUS	Aggregate	Aggregate	Electricity	12.0205933	1081.8767	0	0	0

Vehicles	
Sum of VMT*FE	1128936866
Total VMT	43635691.19
Weighted Average FE	25.87186854 miles/gallon

**Total VMT - Operations Year 2022**

Source: AQ/GHG Appendix, CalEEMod Output

10x Genomics Project - Project Operations Year 2022 - Alameda County, Annual

Date: 2/18/2021

**4.2 Trip Summary Information**

Land Use	Average Daily Trip Rate			Unmitigated	Mitigated
	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Office Building	4,520.56	4,520.56	4520.56	10,803,012	10,803,012
Parking Lot	0.00	0.00	0.00		
Research & Development	0.00	0.00	0.00		
Unenclosed Parking with Elevator	0.00	0.00	0.00		
Unrefrigerated Warehouse-No Rail	20.00	20.00	20.00	58,390	58,390
<b>Total</b>	<b>4,540.56</b>	<b>4,540.56</b>	<b>4,540.56</b>	<b>10,861,403</b>	<b>10,861,403</b>

**Total VMT - Project Operations Year 2030**

Source: AQ/GHG Appendix, CalEEMod Output

10x Genomics Project - Project Operations Year 2030 - Alameda County, Annual

Date: 2/18/2021

**4.2 Trip Summary Information**

Land Use	Average Daily Trip Rate			Unmitigated	Mitigated
	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Office Building	4,520.56	4,520.56	4520.56	10,803,012	10,803,012
Parking Lot	0.00	0.00	0.00		
Research & Development	0.00	0.00	0.00		
Unenclosed Parking with Elevator	0.00	0.00	0.00		
Unrefrigerated Warehouse-No Rail	20.00	20.00	20.00	58,390	58,390
<b>Total</b>	<b>4,540.56</b>	<b>4,540.56</b>	<b>4,540.56</b>	<b>10,861,403</b>	<b>10,861,403</b>

Annual VMT (miles)	10,861,403	Fuel Consumption	419,815 gallons per year
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**Operation Natural Gas Use - Year 2022**

Source: AQ/GHG Appendix, CalEEMod Output

10X Genomics Project, Project Operation Year 2022, Natural Gas Use by Land Use - Mitigated, Alameda County - Annual

Date: 2/18/2021

kBTU/yr = kilo-British Thermal Units/year

CF = cubic feet

Natural Gas Use

Land Use	
General Office Building	480435
Parking Lot	0
Research and Development	357229
Unenclosed parking with elevator	0
unrefrigerated warehouse - no rail	46,400
<b>Total</b>	<b>884064 kBTU/yr</b>

**Mitigated**

	Natural Gas Use	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
Land Use	kBTU/yr	tons/yr										Mt/yr					
General Office Building	480435	2.5900e-003	0.0236	0.0198	1.4000e-004		1.7900e-003	1.7900e-003		1.7900e-003	1.7900e-003	0.0000	25.6378	25.6378	4.9000e-004	4.7000e-004	25.7902
Parking Lot	0	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
Research & Development	357229	1.9300e-003	0.0175	0.0147	1.1000e-004		1.3300e-003	1.3300e-003		1.3300e-003	1.3300e-003	0.0000	19.0631	19.0631	3.7000e-004	3.5000e-004	19.1764
Unenclosed Parking with Elevator	0	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
Unrefrigerated Warehouse-No Rail	46400	2.5000e-004	2.2700e-003	1.9100e-003	1.0000e-005		1.7000e-004	1.7000e-004		1.7000e-004	1.7000e-004	0.0000	2.4761	2.4761	5.0000e-005	5.0000e-005	2.4908
<b>Total</b>		<b>4.7700e-003</b>	<b>0.0433</b>	<b>0.0364</b>	<b>2.6000e-004</b>		<b>3.2900e-003</b>	<b>3.2900e-003</b>		<b>3.2900e-003</b>	<b>3.2900e-003</b>	<b>0.0000</b>	<b>47.1770</b>	<b>47.1770</b>	<b>9.1000e-004</b>	<b>8.7000e-004</b>	<b>47.4574</b>

**Operation Natural Gas Use - Project Operations Year 2030**

Source: AQ/GHG Appendix, CalEEMod Output

10X Genomics Project, Project Operation Year 2022, Natural Gas Use by Land Use - Mitigated, Alameda County - Annual

Date: 1/28/2021 5:17 PM

kBTU/yr = kilo-British Thermal Units/year  
CF = cubic feet

Land Use	Natural Gas Use
General Office Building	480435
Parking Lot	0
Research and Development	357229
Unenclosed parking with elevator	0
unrefrigerated warehouse - no rail	46400

**Total** **884,064** kBTU/yr

**Mitigated**

	Natural Gas Use	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
Land Use	kBTU/yr	tons/yr										Mt/yr					
General Office Building	480435	2.5900e-003	0.0236	0.0198	1.4000e-004		1.7900e-003	1.7900e-003		1.7900e-003	1.7900e-003	0.0000	25.6378	25.6378	4.9000e-004	4.7000e-004	25.7902
Parking Lot	0	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
Research & Development	357229	1.9300e-003	0.0175	0.0147	1.1000e-004		1.3300e-003	1.3300e-003		1.3300e-003	1.3300e-003	0.0000	19.0631	19.0631	3.7000e-004	3.5000e-004	19.1764
Unenclosed Parking with Elevator	0	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
Unrefrigerated Warehouse-No Rail	46400	2.5000e-004	2.2700e-003	1.9100e-003	1.0000e-005		1.7000e-004	1.7000e-004		1.7000e-004	1.7000e-004	0.0000	2.4761	2.4761	5.0000e-005	5.0000e-005	2.4908
<b>Total</b>		<b>4.7700e-003</b>	<b>0.0433</b>	<b>0.0364</b>	<b>2.6000e-004</b>		<b>3.2900e-003</b>	<b>3.2900e-003</b>		<b>3.2900e-003</b>	<b>3.2900e-003</b>	<b>0.0000</b>	<b>47.1770</b>	<b>47.1770</b>	<b>9.1000e-004</b>	<b>8.7000e-004</b>	<b>47.4574</b>

**Operation Electricity Use - Operation Year 2022**

Source: AQ/GHG Appendix, CalEEMod Output

10X Genomics Project - Project Operations Year 2022, Electricity Use by Land Use - Mitigated, Alameda County

Date: 2/18/2021

*Project Electricity Use*

kWh/yr = kilowatt hours per year

Land Use	Electricity Use (kWh/yr)
General Office Building	6438240
Parking Lot	12600
Research and Development	4787180
Unenclosed parking with elevator	686760
unrefrigerated warehouse - no rail	621800
<b>Total</b>	<b>12,546,580 kWh/yr</b>

**Mitigated**

Land Use	Electricity Use kWh/yr	Total CO2	CH4	N2O	CO2e
General Office Building	6.43824e+006	613.2708	0.0847	0.0175	620.6096
Parking Lot	12600	1.2002	1.7000e-004	3.0000e-005	1.2146
Research & Development	4.78718e+006	455.9996	0.0630	0.0130	461.4564
Unenclosed Parking with Elevator	686760	65.4169	9.0300e-003	1.8700e-003	66.1997
Unrefrigerated Warehouse-No Rail	621800	59.2292	8.1800e-003	1.6900e-003	59.9380
<b>Total</b>		<b>1,195.1167</b>	<b>0.1650</b>	<b>0.0341</b>	<b>1,209.4183</b>

**Operation Electricity Use - Operation Year 2030**

Source: AQ/GHG Appendix, CalEEMod Output

10X Genomics Project - Project Operations Year 2030, Electricity Use by Land Use - Mitigated, Alameda County

Date: 2/18/2021

*Project Electricity Use*

kWh/yr = kilowatt hours per year

Land Use	Electricity Use (kWh/yr)
General Office Building	6438240
Parking Lot	12600
Research Development	4787180
Unenclosed parking with elevator	686760
unrefrigerated warehouse - no rail	621800
<b>Total</b>	<b>12,546,580 kWh/yr</b>

**Mitigated**

Land Use	Electricity Use kWh/yr	Total CO2	CH4	N2O	CO2e
General Office Building	6.43824e+006	537.3421	0.0847	0.0175	544.6809
Parking Lot	12600	1.0516	1.7000e-004	3.0000e-005	1.0660
Research & Development	4.78718e+006	399.5425	0.0630	0.0130	404.9993
Unenclosed Parking with Elevator	686760	57.3177	9.0300e-003	1.8700e-003	58.1005
Unrefrigerated Warehouse-No Rail	621800	51.8961	8.1800e-003	1.6900e-003	52.6048
<b>Total</b>		<b>1,047.1499</b>	<b>0.1650</b>	<b>0.0341</b>	<b>1,061.4514</b>