

APPENDIX B

Air Quality, Greenhouse Gas,
and Energy Impact Study

March 6, 2024

Mr. Eric Turner
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Subject: Ginkgo Stonehouse Residential Air Quality, Greenhouse Gas, and Energy Impact Study, City of Sierra Madre

Dear Mr. Turner:

1.0 Introduction

RK ENGINEERING GROUP, INC. (RK) is pleased to provide this air quality, greenhouse gas, and energy analysis for the proposed Ginkgo Stonehouse Residential Project (hereinafter referred to as “project”). The proposed project site is located at 935 East Grand View Avenue and 965 East Grand View Avenue, in the City of Sierra Madre.

The purpose of this study is to calculate the criteria air pollutant and greenhouse gas emissions associated with the operation of the proposed project and compare the results to the established thresholds used by the South Coast Air Quality Management District (SCAQMD). This assessment was conducted within the context of the California Environmental Quality Act (CEQA) and the methodology and emission factors used in this analysis are endorsed by the SCAQMD and the California Air Resource Board (CARB).

This analysis also quantifies the project’s energy usage and provides an energy conservation analysis based on the CEQA Guidelines, Appendix F, Energy Conservation requirements.

1.1 Project Description

The proposed project consists of developing up to nine (9) single-family residential homes on approximately 9 acres of land. Approximately four (4) of the 9 acres within the project boundary are proposed as a non-buildable area that would prohibit construction of vertical structures but would allow for landscaping, hardscaping, and fencing in the future.

The project site is currently occupied by 4 existing residential structures with accessory gazebos and sheds that will be demolished during project construction.

Construction of the project is expected to consist of demolition, site preparation, grading, building construction, paving, and architectural coating. The project will have a balanced site and is not expected to require the import or export of any earthwork material.

A project site location map is provided in Exhibit A. The project’s site plan is provided in Exhibit B.

Table 1 summarizes the proposed project land use.

Table 1
Proposed Project Land Use Summary

Project Land Use	CalEEMod Land Use Category	Amount	Units¹
Single Family Homes	Single Family Housing	9	DU
On-Site Paved Surfaces	Parking Lot	24.133	TSF

¹ DU = Dwelling Units; TSF = Thousand Square Feet.

1.2 Sensitive Receptors

Sensitive receptors are considered land uses or other types of population groups that are more sensitive to air pollution exposure. Sensitive population groups include children, the elderly, the acutely and chronically ill, and those with cardio-respiratory diseases. For CEQA purposes, the SCAQMD considers a sensitive receptor to be a location where a sensitive individual could remain for 24 hours or longer, such as residences, hospitals, and schools, as described in the Localized Significance Threshold Methodology (SCAQMD 2008a, page 3-2).

The nearest sensitive land uses to the project site include the following:

Western Receptors Existing residential land uses located along the western boundary of the project site, approximately 30 feet north of the centerline of East Grand View Avenue.

Southern Receptors Existing residential land uses located approximately 48 feet (~14 meters) south of the project site’s southern boundary, approximately 23 feet south of the centerline of East Grand View Avenue.

Eastern Receptors Existing residential land uses located along the eastern boundary of the project site, approximately 22 feet north of the centerline of East Grand Avenue.

For conservative localized analysis purposes, sensitive receptors are considered to be less than 25 meters from the project site. A project site location map, including sensitive receptor locations, is provided in Exhibit A.

1.3 Environmental Setting

The project is located in the SCAQMD San Gabriel Valley general forecasting area and the East San Gabriel Valley Source Receptor Area (SRA-9). The project site is bound by the San Gabriel Mountains to the north, residential land uses to the east and west, and East Grand View Avenue to the south.

1.4 Standard Conditions and Requirements

The construction and operation of the proposed project will incorporate the following standard conditions and requirements. These are also included as assumptions for the air quality, GHG, and energy modeling and analyses presented in this report.

Construction:

- The project must follow the standard SCAQMD rules and requirements with regards to fugitive dust control, which include, but are not limited to the following:
 - All active construction areas shall be watered two (2) times daily.
 - Speed on unpaved roads shall be reduced to less than 15 mph.
 - Any visible dirt deposition on any public roadway shall be swept or washed at the site access points within 30 minutes.
 - Any on-site stockpiles of debris, dirt or other dusty material shall be covered or watered twice daily.
 - All operations on any unpaved surface shall be suspended if winds exceed 15 mph.
 - Access points shall be washed or swept daily.
 - Construction sites shall be sandbagged for erosion control.
 - Apply nontoxic chemical soil stabilizers according to manufacturers' specifications to all inactive construction areas (previously graded areas inactive for 10 days or more).

- Cover all trucks hauling dirt, sand, soil, or other loose materials, and maintain at least 2 feet of freeboard space in accordance with the requirements of California Vehicle Code (CVC) section 23114.
- Use gravel aprons and track out grates at all truck exits
- Replace the ground cover of disturbed areas as quickly as possible.
- Construction equipment should be maintained in proper tune.
- All construction vehicles should be prohibited from excessive idling. Excessive idling is defined as five (5) minutes or longer.

Operations:

- The project must comply with the mandatory requirements of the California Building Standards Code, Title 24, Part 6 (Energy Code) and Part 11 (CALGreen), including, but not limited to:
 - Install low-flow fixtures and toilets, water-efficient irrigation systems, drought tolerant/native landscaping, and reduce the amount of turf.
 - Provide the necessary infrastructure to support electric vehicle charging.
- Provide solar installations (or other sources of on-site renewable energy) per the prescribed Energy Design Ratings.
- Participate in the local waste management recycling and composting programs.

2.0 Modeling Parameters and Assumptions

The California Emissions Estimator Model Version 2022.1.1 (CalEEMod) was used to calculate criteria air pollutants and GHG emissions from the operation of the project. Operational energy usage for the project is also calculated within CalEEMod.

2.1 Construction Assumptions

Construction of the project is expected to consist of demolition, site preparation, grading, building construction, paving, and architectural coating and is expected to take three (3) years to complete. For the purposes of this analysis, construction phases are not expected to overlap.

The project will have a balanced site and is not expected to require the import or export of any earthwork material.

The CalEEMod default construction equipment list is based on survey data and the size of the site. The parameters used to estimate construction emissions, such as the worker and vendor trips and trip lengths, utilize the CalEEMod defaults. The construction equipment list is shown in Table 2.

The project will be required to comply with several standard fugitive dust control measures, per SCAQMD Rule 403. The following key inputs are utilized in CalEEMod and are based upon data provided from SCAQMD¹. It should be noted that, despite the SCAQMD mandating vehicle speeds of 15 m.p.h. or less on unpaved roads and requiring daily sweeping/washing of deposition on paved public roadways, the following inputs are the CalEEMod defaults and are used for a conservative analysis of construction impacts.

- Water exposed area – 61% PM₁₀ and PM_{2.5} reduction.
- Water unpaved roads twice daily – 55% PM₁₀ and PM_{2.5} reduction.
- Limit vehicle speeds on unpaved roads to 25 mph – 44% PM₁₀ and PM_{2.5} reduction.
- Sweep paved roads once per month – 9% PM₁₀ and PM_{2.5} reduction.

¹ SCAQMD. Fugitive Dust Mitigation Measures. <http://www.aqmd.gov/home/rules-compliance/ceqa/air-quality-analysis-handbook/mitigation-measures-and-control-efficiencies/fugitive-dust>

**Table 2
Construction Equipment Assumptions¹**

Phase	Equipment	Number	Hours Per Day	Soil Disturbance Rate (Acres/8hr-Day) ²	Off-Road Equipment Daily Disturbance Footprint (Acres)	Total Daily Disturbance Footprint (Acres)
Demolition	Concrete/Industrial Saws	1	8	0.00	0.00	2.50
	Excavators	3	8	0.50	1.50	
	Rubber Tired Dozers	2	8	0.50	1.00	
Site Preparation	Rubber Tired Dozers	3	8	0.50	1.50	3.5
	Tractors/Loaders/Backhoes	4	8	0.50	2.00	
Grading	Excavators	1	8	0.50	0.50	3.00
	Graders	1	8	0.50	0.50	
	Rubber Tired Dozers	1	8	0.50	0.50	
	Tractors/Loaders/Backhoes	3	8	0.50	1.50	
Building Construction	Cranes	1	7	0.00	0.00	1.31
	Forklifts	3	8	0.00	0.00	
	Generator Sets	1	8	0.00	0.00	
	Tractors/Loaders/Backhoes	3	7	0.50	1.31	
	Welders	1	8	0.00	0.00	
Paving	Pavers	2	8	0.00	0.00	0.00
	Paving Equipment	2	8	0.00	0.00	
	Rollers	2	8	0.00	0.00	
Architectural Coating	Air Compressors	1	6	0.0	0.00	0.0

¹ CalEEMod Defaults

2.2 Mobile Source Emissions

Estimates of mobile source emissions associated with the project are based on trip generation information provided by the *Ginkgo Stonehouse Residential Trip Generation & Vehicle Miles Traveled (VMT) Screening Analysis, City of Sierra Madre, CA* (TIA Screening) performed by RK Engineering Group in September 2023.

The TIA Screening estimates that the project will generate approximately 47 net trips per day. To be conservative, this analysis assumes that 2% of the total trips associated with the project will be heavy trucks with a gross vehicle weight rating (GVWR) of 10,000 pounds or

greater. This includes LHD2, MHD, HHD, OBUS, UBUS, and SBUS vehicles. The adjusted vehicle mix is proportioned according to the default CalEEMod vehicle mix.

3.0 Air Quality Analysis

The following section summarizes the results of the daily air quality emissions analysis. Air quality emissions have been quantified using the California Emissions Estimator Model Version 2022.1.1 (CalEEMod). Project emissions during the construction and operation of the project are compared to thresholds of significance established by the SCAQMD.

3.1 SCAQMD Air Quality Significance Thresholds

The SCAQMD has established air quality emissions thresholds for criteria air pollutants for the purpose of determining whether a project may have a significant effect on the environment per Section 15002(g) of the Guidelines for implementing CEQA. By reducing emissions to be below the thresholds of significance, the project would be in compliance with the SCAQMD Air Quality Management Plan (AQMP) and the federal and state air quality standards.

Table 3 lists the air quality significance thresholds for the six criteria air pollutants analyzed in this report. Lead is not included as part of this analysis as the project is not expected to emit lead in any significant measurable quantity.

Table 3
SCAQMD Regional Air Quality Significance Thresholds

Mass Daily Thresholds ¹		
Pollutant	Construction (lbs/day)	Operation (lbs/day)
NO _x	100	55
VOC	75	55
PM ₁₀	150	150
PM _{2.5}	55	55
SO _x	150	150
CO	550	550

¹ Source: SCAQMD CEQA Handbook, 1993

Table 4 lists the Localized Significance Thresholds (LST) used to determine whether a project may generate significant adverse localized air quality impacts. LSTs represent the maximum emissions from a project that are not expected to cause or contribute to an

exceedance of the most stringent applicable federal or state ambient air quality standard. LSTs are developed based on the ambient concentrations of four applicable air pollutants for Source Receptor Area (SRA) 9 – East San Gabriel Valley for a 3.5-acre site at a distance of 25 meters to the nearest sensitive receptor. Although the nearest sensitive receptors are located approximately less than 25 meters from the project site, SCAQMD LST methodology states that projects with boundaries located closer than 25 meters to the nearest receptor should use the LSTs for receptors located at 25 meters.

Table 4
SCAQMD Localized Significance Thresholds¹ (LST)

Pollutant	Construction (lbs/day)	Operation (lbs/day)
NO _x	163.1	163.1
CO	1,330.9	1,330.9
PM ₁₀	10.6	3.1
PM _{2.5}	6.3	1.8

¹ Source: SCAQMD Mass Rate Localized Significance Thresholds for a 3.5-acre site in SRA-9 at 25 meters.

3.2 Air Quality Emissions (lbs/day) – Construction

Construction-related daily air quality emissions include both on-site and off-site emissions associated with the construction of the project.

Table 5 shows the project-related regional air quality emissions compared with the established SCAQMD thresholds of significance. As shown in Table 5, daily emissions of criteria pollutants are expected to be below the applicable thresholds.

CalEEMod emissions outputs are provided in Appendix A.

Table 5
Daily Construction Emissions

Maximum Daily Emissions (lbs/day) ¹						
Activity	VOC	NO _x	CO	SO ₂	PM ₁₀	PM _{2.5}
Demolition	2.69	25.45	23.06	0.04	1.65	1.10
Site Preparation	3.72	36.04	34.25	0.05	9.49	5.47
Grading	1.97	18.30	19.96	0.03	3.80	2.15
Building Construction	1.22	11.28	13.38	0.02	0.55	0.47
Paving	0.94	7.52	11.03	0.01	0.54	0.37
Architectural Coating	5.96	0.89	1.18	0.00	0.04	0.03
Maximum¹	5.96	36.04	34.25	0.05	9.49	5.47
SCAQMD Threshold	75	100	550	150	150	55
Exceeds Threshold (?)	No	No	No	No	No	No

¹ Maximum daily emission during summer or winter; includes both on-site and off-site project emissions.

Table 6 shows the project-related localized air quality emissions compared with the established SCAQMD thresholds of significance. As shown in Table 6, daily localized emissions of criteria pollutants are expected to be below the applicable thresholds.

Table 6
Localized Construction Emissions

Maximum Daily Emissions (lbs/day) ¹				
Activity	NO _x	CO	PM ₁₀	PM _{2.5}
On-site Emissions	35.95	32.93	9.27	5.41
SCAQMD Construction Threshold ²	163.1	1,330.9	10.6	6.3
Exceeds Threshold (?)	No	No	No	No

¹ Maximum daily emission during summer or winter; includes on-site project emissions only.

² Reference: 2006-2008 SCAQMD Mass Rate Localized Significant Thresholds for construction and operation. SRA-9, East San Gabriel Valley, 3.5-acre site, receptor distance 25 meters.

The project must follow mandatory SCAQMD rules and requirements with regard to fugitive dust control. Compliance with the standard dust control measures is considered to be part of the conditions of approval for the project and is reflected in the emissions shown in Tables 5 and 6 above.

Tables 5 and 6 show that the project's regional and localized construction emissions will be below the applicable SCAQMD standards and thresholds of significance. As a result, the project would not contribute substantially to an existing or projected air quality violation.

Furthermore, by complying with the SCAQMD standards, the project would not contribute to a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment under an applicable Federal or State ambient air quality standard (including releasing emissions that exceed quantitative thresholds for ozone precursors).

Therefore, the project's short-term impact from construction-related air quality emissions will be less than significant.

3.3 Air Quality Emissions (lbs/day) – Operations

Operational daily air quality emissions include both on-site and off-site emissions and represent the worst-case daily emissions levels during summer or winter.

Table 7 shows the project-related regional air quality emissions compared with the established SCAQMD thresholds of significance. As shown in Table 7, daily emissions of criteria pollutants are expected to be below the applicable thresholds.

CalEEMod emissions outputs are provided in Appendix A.

**Table 7
Regional Operational Emissions**

Activity	Air Pollutant Emissions (lbs/day) ¹					
	VOC	NO _x	CO	SO _x	PM ₁₀	PM _{2.5}
Mobile Sources	0.31	0.27	3.01	0.01	0.61	0.16
Area Sources	0.46	0.15	0.57	0.00	0.01	0.01
Energy Sources	0.01	0.09	0.04	0.00	0.01	0.01
Total	0.78	0.51	3.62	0.01	0.64	0.18
SCAQMD Threshold	55	55	550	150	150	55
Exceeds Threshold (?)	No	No	No	No	No	No

¹ Air pollutant emissions include both on-site and off-site activities and represent the worst-case daily emissions during either summer or winter.

Table 8 shows the project's operational emissions at the local level compared with the established SCAQMD thresholds of significance. Localized emissions include on-site emissions only and represent the worst-case daily emissions levels during summer or winter. As shown in Table 8, daily localized emissions of criteria pollutants are expected to be below the applicable thresholds.

**Table 8
Localized Operational Emissions**

Activity	Air Pollutant Emissions (lbs/day)			
	NO _x	CO	PM ₁₀	PM _{2.5}
On-site Emissions ¹	0.49	0.76	0.0	0.0
SCAQMD Threshold ²	163.1	1,330.9	3.1	1.8
Exceeds Threshold (?)	No	No	No	No

¹ Localized emissions include the maximum daily on-site emissions during summer or winter. It is estimated that 5% of mobile emissions will occur on-site.

² Reference: 2006-2008 SCAQMD Mass Rate Localized Significant Thresholds for construction and operation. SRA-9, East San Gabriel Valley, 3.5-acre site, receptor distance 25 meters.

As shown in Tables 7 and 8, the project's operational emissions will be below the applicable SCAQMD air quality thresholds of significance, and the project would not contribute substantially to an existing or projected air quality violation. Furthermore, by

complying with SCAQMD standards, the project would not contribute to a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment under an applicable Federal or State ambient air quality standard (including releasing emissions that exceed quantitative thresholds for ozone precursors).

Therefore, the project's long-term impact from construction-related air quality emissions will be less than significant.

3.3 Air Toxics Analysis

The SCAQMD does not consider residential land uses to be a major source of toxic air contaminants (TAC) that may result in exposure of sensitive receptors to significant pollutant concentrations. Examples of land uses that are major sources of TACs include distribution centers with heavy truck traffic, rail yards, ports, refineries, chrome plating facilities, dry cleaners, and gasoline dispensing stations.

The project will generate diesel particulate matter (DPM), a known source of TACs, during construction from off-road diesel equipment and trucks. However, the proposed project's construction activity is not expected to be a long-term (i.e., 30 years) source of toxic air contaminant emissions. Due to the significantly reduced risk from short-term exposure, SCAQMD does not typically require the evaluation of long-term cancer risk or chronic health impacts for construction operations for a project of this size.

Given the minimal amount of earthwork and heavy construction equipment expected to be needed for this project, the potential DPM exposure to adjacent sensitive receptors is considered less than significant.

3.4 Summary of Air Quality Findings

As shown in Tables 5 through 8, the project-related construction and operational emissions will be below the applicable SCAQMD thresholds of significance at the regional and local levels. The project will not violate any air quality standard or contribute substantially to an existing or projected air quality violation, and the project is not considered a major source of TACs that may expose sensitive receptors to substantial pollution constructions. As a result, the project impacts on air quality is less than significant.

4.0 Greenhouse Gas Analysis

The following section describes the results of the GHG analysis. GHG emissions are quantified for on-site and off-site operational activity using CalEEMod.

4.1 SCAQMD Greenhouse Gas (GHG) Interim Significance Thresholds

The SCAQMD has published the *Interim CEQA Greenhouse Gas (GHG) Significance Thresholds, December 2008*, to assist local agencies with determining the impact of a project's GHG emissions. SCAQMD's objective in providing the GHG guidelines is to establish a performance standard that will ultimately contribute to reducing GHG emissions below 1990 levels, and thus achieve the requirements of the California Global Warming Solutions Act (AB 32).

In the absence of a formal threshold established by the State, SCAQMD's interim GHG threshold has been established for use by lead agencies in determining significance of GHG emissions in CEQA. SCAQMD guidance describes a five-tiered approach for determining significance. Tier 3 is the primary method used for development projects of this size and is the approach used in this analysis. The Tier 3 approach limits the amount of GHG emissions from residential and commercial development projects to 3,000 metric tons of CO₂ equivalents per year (MTCO₂e/yr).

If the project exceeds 3,000 MTCO₂e/yr, then the impact is considered significant, and mitigation measures would be required to reduce emissions below the threshold.

4.2 GHG Emissions (MTCO₂e/yr) – Construction

Greenhouse gas (GHG) emissions are estimated for on-site off-site construction activity using CalEEMod.

Table 9 shows the project's construction related GHG emissions, including equipment and worker vehicle emissions for all phases of construction. Construction emissions are amortized over 30 years and added to the long-term operational emissions, pursuant to SCAQMD recommendations.

**Table 9
Construction Greenhouse Gas Emissions**

Activity	Emissions (MTCO ₂ e) ¹		
	On-site	Off-site	Total
Demolition	31.18	5.57	36.75
Site Preparation	24.10	1.09	25.20
Grading	26.93	1.87	28.80
Building Construction	251.78	8.00	259.78
Paving	13.76	1.83	15.59
Architectural Coating	1.22	0.08	1.29
Total	348.97	18.44	367.41
Amortized over 30 years²	11.63	0.61	12.25

¹ MTCO₂e = metric tons of carbon dioxide equivalents (includes carbon dioxide, methane, nitrous oxide, and/or hydrofluorocarbon).

² The emissions are amortized over 30 years and added to the operational emissions, pursuant to SCAQMD recommendations.

Because impacts from construction-related activities occur over a relatively short period of time, they contribute to a relatively small portion of the overall lifetime project GHG emissions, and GHG emissions reduction measures for construction equipment are relatively limited. Therefore, the SCAQMD recommends that construction emissions be amortized over a 30-year project lifetime and added to the overall project operational emissions². In doing so, construction GHG emissions are included in the overall contribution of the project, as further discussed in the following section.

4.3 GHG Emissions (MTCO₂e/yr) – Operation

GHG emissions are estimated for on-site and off-site operational activity using CalEEMod. Table 10 shows the project’s operational GHG emissions, including those resulting from mobile, area, energy, water, waste, and refrigerant sources. Operational emissions include amortized construction emissions, pursuant to SCAQMD recommendations.

CalEEMod emissions outputs are provided in Appendix A.

² SCAQMD. Interim CEQA GHG Significance Thresholds. Page 3-10. 2008

**Table 10
Operational Greenhouse Gas Emissions**

Activity	Annual GHG Emissions (MTCO₂e)¹
Mobile Source	107.84
Area Source	2.31
Energy Source	38.51
Water	3.33
Waste	2.24
Refrigerant	0.02
Construction (30-year amortization)	12.25
Total Annual Emissions	166.50
SCAQMD Tier 3 Significance Threshold	3,000 MTCO ₂ e/year
Exceed Tier 3 Threshold?	No

¹ MTCO₂e = metric tons of carbon dioxide equivalents

As shown in Table 10, the proposed project's GHG emissions are not expected to exceed the SCAQMD GHG emissions threshold of 3,000 MTCO₂e. Therefore, the project impact from GHG emissions would be less than significant.

5.0 Energy Analysis

An energy conservation analysis has been performed in order to review the energy implications of the proposed project and ensure that wasteful, inefficient, and unnecessary consumption of energy is avoided. This analysis has been prepared within the context of the California Environmental Quality Act (CEQA, California Public Resources Code Sections 21000, et seq.).

The three (3) main types of energy expected to be consumed by the project include electricity, natural gas, and petroleum products in the form of gasoline and diesel fuel.

Energy usage associated with the construction and operation of the project is estimated using CalEEMod. CalEEMod outputs are provided in Appendix A.

5.1 Electricity Consumption

The project will use electricity for operational activities including, but not limited to, building heating and cooling, lighting, appliances, electronics, and mechanical equipment.

Indirect electricity usage will also be required to supply, distribute, and treat water and wastewater. Electricity will be provided to the site by Southern California Edison.

Temporary electricity usage for construction activities is not calculated by CalEEMod. Electricity usage during construction is expected to be short-term and relatively minor compared to the operational demand, and therefore electricity usage during construction is not included in this analysis.

Table 11 shows the project’s estimated electricity consumption in kilowatt-hours per year (kWh/yr) and millions of British Thermal Units per year (MBtu/yr).

Table 11
Project Electricity Consumption

Land Use/Activity	Electricity Consumption ¹	
	(kWhr/yr) ²	(MBtu/yr) ²
Single Family Housing	62,056.31	211.74
Onsite Paved Surfaces	21,140.51	72.13
Water Supply and Treatment	14,583.43	49.76
Total	97,780.25	333.63

¹ Source: CalEEMod Unmitigated Default.

² kWhr/yr = Kilowatt Hours per Year

MBtu/yr = Million British Thermal Units per Year

5.2 Natural Gas Consumption

The project will use natural gas for things such as building heating and cooling and gas water heaters. Natural gas is not expected to be used during construction in any significant quantities and is not included in the overall calculation of the project’s natural gas consumption.

Table 12 shows the project’s estimated natural gas consumption in millions of British Thermal Units per year (MBtu/yr).

Table 12
Project Natural Gas Consumption

Land Use/Activity	Natural Gas Consumption¹ (MBtu/yr)²
Single Family Housing	345,018.12
Onsite Paved Surfaces	-
Total	345,018.12

¹ Source: CalEEMod Unmitigated Default.

² MBtu/yr = Millions of British Thermal Units per Year

5.3 Petroleum Consumption

The project's energy consumption from petroleum products is primarily associated with transportation-related activities. This includes gasoline and diesel fuel usage for auto and truck trips during construction and operation and off-road equipment used during construction.

5.3.1 Petroleum Consumption - Construction

Construction of the project is expected to consist of demolition, site preparation, grading building construction, paving, and architectural coating phases. Construction activities will consume energy in the form of motor vehicle fuel (gasoline and diesel) for off-road construction equipment and on-road vehicle trips. Vehicle trips include workers and vendors traveling to and from the project site.

Table 13 shows the project's energy consumption for all off-road equipment during construction. For the purposes of this analysis, all off-road equipment is assumed to run on diesel fuel. Table 14 shows the project's energy consumption from on-road vehicle trips during construction.

**Table 13
Construction Off-Road Equipment Energy Consumption**

Phase ¹	Phase Duration (Days) ¹	Equipment ¹	Amount ¹	Hours/Day ¹	Horsepower (HP) ¹	Load Factor ¹	HP-hrs ²	Fuel Consumption Rate ³ (hp-hr/gal)	Diesel Fuel Consumption (gal.)	Diesel Fuel Consumption by Phase (gal.)	MBtu ⁴
Demolition	20	Concrete/Industrial Saws	1	8	33	0.73	3,854.40	18.50	208.35	3,102.53	426.23
		Excavators	3	8	36	0.38	6,566.40		354.94		
		Rubber Tired Dozers	2	8	367	0.40	46,976.00		2,539.24		
Site Preparation	10	Rubber Tired Dozers	3	8	367	0.40	35,232.00		1,904.43	2,442.03	335.49
		Tractors/Loaders/Backhoes	4	8	84	0.37	9,945.60		537.60		
Grading	20	Excavators	1	8	36	0.38	2,188.80		118.31	2,719.14	373.56
		Graders	1	8	148	0.41	9,708.80		524.80		
		Rubber Tired Dozers	1	8	367	0.40	23,488.00		1,269.62		
		Tractors/Loaders/Backhoes	3	8	84	0.37	14,918.40		806.40		
Building Construction	230	Cranes	1	7	367	0.29	171,352.30		9,262.29	25,359.30	3,483.89
		Forklifts	3	8	82	0.20	90,528.00		4,893.41		
		Generator Sets	1	8	14	0.74	19,062.40		1,030.40		
		Tractors/Loaders/Backhoes	3	7	84	0.37	150,116.40	8,114.40			
		Welders	1	8	46	0.45	38,088.00	2,058.81			
Paving	20	Pavers	2	8	81	0.42	10,886.40	588.45	1,379.29	189.49	
		Paving Equipment	2	8	89	0.36	10,252.80	554.21			
		Rollers	2	8	36	0.38	4,377.60	236.63			
Architectural Coating	20	Air Compressors	1	6	37	0.48	2,131.20	115.20	115.20	15.83	
Total Energy Requirements									35,117.49	4,824.48	

¹ Source: CalEEMod Defaults (CalEEMod v.2022.1.1)

² HP-hrs = Horsepower Hours.

³ Source: Carl Moyer Program Guidelines. 2017 Revisions. Table D-21. <https://www.arb.ca.gov/msprog/moyer/guidelines/current.htm>

⁴ Mbtu = Millions of Btu; assuming 1 gallon of diesel fuel = 137,381 Btu.

**Table 14
Construction On-Road Trips Energy Consumption**

Construction Phase ¹	Phase Duration (Days) ¹	Trips /Day ¹	Trip Length ¹	Phase VMT	Vehicle Class ¹	Vehicle Mix ¹	Average Fuel Economy (MPG) ²	Gasoline			Diesel			Total MBtu ³
								Fuel Split ²	Fuel Consumption by Veh. Class (gal.)	Fuel Consumption by Phase (gal.)	Fuel Split ²	Fuel Consumption by Veh. Class (gal.)	Fuel Consumption by Phase	
Worker Trips														
Demolition	20	15	18.5	5,550	LDA	0.50	29.33	0.9985	94.48		0.0015	0.14		25.22
					LDT1	0.25	24.42	0.9998	56.82	209.05	0.0002	0.01	0.30	
					LDT2	0.25	23.96	0.9974	57.75		0.0026	0.15		
Site Preparation	10	18	18.5	3,238	LDA	0.50	29.33	0.9985	55.11		0.0015	0.08		14.71
					LDT1	0.25	24.42	0.9998	33.14	121.95	0.0002	0.01	0.18	
					LDT2	0.25	23.96	0.9974	33.69		0.0026	0.09		
Grading	20	15	18.5	5,550	LDA	0.50	29.33	0.9985	94.48		0.0015	0.14		25.22
					LDT1	0.25	24.42	0.9998	56.82	209.05	0.0002	0.01	0.30	
					LDT2	0.25	23.96	0.9974	57.75		0.0026	0.15		
Building Construction	230	3	18.5	13,786	LDA	0.50	29.33	0.9985	234.69		0.0015	0.35		62.64
					LDT1	0.25	24.42	0.9998	141.14	519.29	0.0002	0.03	0.75	
					LDT2	0.25	23.96	0.9974	143.46		0.0026	0.37		
Paving	20	15	18.5	5,550	LDA	0.50	29.33	0.9985	94.48		0.0015	0.14		25.22
					LDT1	0.25	24.42	0.9998	56.82	209.05	0.0002	0.01	0.30	
					LDT2	0.25	23.96	0.9974	57.75		0.0026	0.15		
Architectural Coating	20	1	18.5	240	LDA	0.50	29.33	0.9985	4.08		0.0015	0.01		1.09
					LDT1	0.25	24.42	0.9998	2.45	9.03	0.0002	0.00	0.01	
					LDT2	0.25	23.96	0.9974	2.49		0.0026	0.01		
Sub-Total Worker Trips Energy Consumption								Gasoline (gal.)		1,277.42	Diesel (gal.)		1.85	154.09
Vendor Trips														
Building Construction	230	1	10.2	2,257	MHDT	0.50	7.71	0.3221	47.12		0.6779	99.18		44.91
					HHDT	0.50	6.05	0.0005	0.09	47.21	0.9995	186.35	285.53	
Hauling Trips														
Demolition	20	6	20.0	2200	HHDT	1.00	6.05	0.0005	0.18	0.18	0.9995	363.28	363.28	49.93
Total On-Road Construction Trips Energy Consumption								Gasoline (gal.)		1,324.82	Diesel (gal.)		650.66	248.93

¹ Source: CalEEMod Defaults (CalEEMod v.2022.1.1)

² Source: EMFAC2021 Web Database. <https://www.arb.ca.gov/emfac/2021/>. (See Appendix C for more details.)

³ Mbtu = Millions of Btu; assuming 1 gallon of gasoline fuel = 120,429 Btu and 1 gallon of diesel fuel = 137,381 Btu

5.1.2 Petroleum Consumption - Operations

The project is expected to consume energy from auto and truck trips generated by the proposed land uses. The Emission Factors 2021 (EMFAC2021) is used to estimate operational petroleum consumption. EMFAC2021 vehicle fuel consumption data is provided in Appendix B.

Table 15 shows the project's petroleum energy consumption for all annual operational trips generated by the project.

**Table 15
Operational Trips Energy Consumption - Annual**

Vehicle Class	Vehicle Mix	Average Fuel Economy (MPG)	Annual VMT	Gasoline		Diesel		MBtu
				Fuel Split	Fuel Consumption (gal.)	Fuel Split	Fuel Consumption (gal.)	
LDA	51.72%	29.33	304,272	0.9985	5,358.38	0.0015	8.00	646.40
LDT1	4.52%	24.42		0.9998	563.29	0.0002	0.11	67.85
LDT2	23.02%	23.96		0.9974	2,915.56	0.0026	7.57	352.16
MDV	14.02%	19.51		0.9895	2,162.90	0.0105	22.92	263.62
LHD1	2.60%	15.50		0.7295	371.90	0.2705	137.87	63.73
LHD2	0.42%	14.78		0.4652	39.74	0.5348	45.67	11.06
MHD	0.71%	7.71		0.3221	89.62	0.6779	188.66	36.71
HHD	0.55%	6.05		0.0005	0.14	0.9995	274.85	37.78
OBUS	0.06%	5.92		0.5603	16.56	0.4397	13.00	3.78
UBUS	0.04%	6.97		0.9817	17.68	0.0183	0.33	2.17
MCY	2.12%	41.53		1.0000	155.39	0.0000	0.00	18.71
SBUS	0.04%	8.30		0.6019	9.30	0.3981	6.15	1.96
MH	0.19%	5.74		0.8321	84.47	0.1679	17.04	12.51
Total Operational Trips Energy Usage				Gasoline Consumption (gal.)	11,784.93	Diesel Consumption (gal.)	722.17	1,518.44

5.2 Summary of Project Energy Consumption

Table 16 provides a summary of the project’s annual operational energy consumption.

Table 16
Annual Energy Consumption

Activity	Energy Consumption (MBtu/yr) ¹
Electricity	333.63
Natural Gas	345,018.12
Petroleum	1,518.46
Total Annual Operational Energy Consumption	346,870.20

¹ MBtu/yr = Millions of Btu per year. Operational activities only.

5.3 Energy Impacts

This analysis has been prepared within the context of the CEQA Guidelines, Appendix F, Energy Conservation, and Appendix G, Environmental Checklist Form. According to CEQA, the goal of conserving energy implies the wise and efficient use of energy through decreasing overall per capita energy consumption, decreasing reliance on fossil fuels (such as coal, natural gas, and oil), and increasing reliance on renewable energy sources.

A significant environmental impact would result if the project would;

- a) Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation, or;
- b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency.

5.3.1 Energy Impact – A

Would the project result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?

The project will implement the mandatory requirements of California’s Building Efficiency Standards (Title 24, Part 6) to reduce energy consumption. California’s building standards are some of the strictest in the nation and the project’s compliance with the Building Code

will ensure that wasteful, inefficient, or unnecessary consumption of energy is minimized. The California Building Code is designed to reduce the amount of energy needed to heat or cool a building, reduce energy usage for lighting and appliances and promote usage of energy from renewable sources.

In particular, the project will provide solar installations (or other sources of on-site renewable energy) to satisfy the prescribed Energy Design Ratings from the Energy Code. Thus, the project will significantly reduce its reliance on fossil fuels for building energy.

By providing renewable sources of energy, the project satisfies recent court rulings which indicate that when determining if a project would have a potentially significant impact to energy conservation, the analysis should discuss whether any renewable energy features could be incorporated into the project³.

Therefore, the project impact is considered less than significant under Criterion A.

5.3.2 Energy Impact – B

Would the project conflict with or obstruct a state or local plan for renewable energy or energy efficiency?

The project is not expected to conflict with or obstruct a state or local plan for renewable energy or energy efficiency. The project will purchase electricity through Southern California Edison which is subject to the requirements of California Senate Bill 100 (SB 100). SB 100 is the most stringent and current energy legislation in California; requiring that renewable energy resources and zero-carbon resources supply 100% of retail sales of electricity to California end-use customers and 100% of electricity procured to serve all state agencies by December 31, 2045⁴.

The project will also comply with the mandatory requirements of California's Green Building and Building Energy Efficiency standards that promote renewable energy and energy efficiency.

Therefore, the project impact is considered less than significant under Criterion B.

³ *League to Save Lake Tahoe Mountain Area Preservation Foundation, et al. v. County of Placer, et al.*

⁴ SB-100 California Renewables Portfolio Standard Program.

http://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201720180SB100

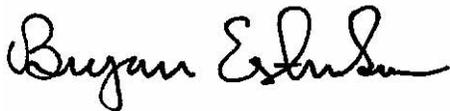
6.0 Conclusion

RK ENGINEERING GROUP, INC. has completed this Air Quality, Greenhouse Gas, and Energy Analysis for the proposed Ginkgo Stonehouse Residential Project. Based upon this review, **the proposed project's impact from air quality and GHG emissions and energy usage is considered less than significant.**

If you have any questions regarding this study, or would like further review, please do not hesitate to contact us at (949) 474-0809 or be@rkengineer.com.

Sincerely,

RK ENGINEERING GROUP, INC.



Bryan Estrada, AICP, PTP
Principal



Becca Morrison
Environmental Specialist

Attachments:

Exhibits



Legend:

--- = Project Site Boundary

* = Project Site





Appendices

Appendix A

CalEEMod Emissions Outputs

Ginkgo Stonehouse Residential Project Custom Report

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1. Basic Project Information

1.1. Basic Project Information

Data Field	Value
Project Name	Ginkgo Stonehouse Residential Project
Construction Start Date	4/1/2024
Operational Year	2024
Lead Agency	—
Land Use Scale	Project/site
Analysis Level for Defaults	County
Windspeed (m/s)	0.50
Precipitation (days)	19.6
Location	935 E Grand View Ave, Sierra Madre, CA 91024, USA
County	Los Angeles-South Coast
City	Sierra Madre
Air District	South Coast AQMD
Air Basin	South Coast
TAZ	4903
EDFZ	7
Electric Utility	Southern California Edison
Gas Utility	Southern California Gas
App Version	2022.1.1.20

1.2. Land Use Types

Land Use Subtype	Size	Unit	Lot Acreage	Building Area (sq ft)	Landscape Area (sq ft)	Special Landscape Area (sq ft)	Population	Description
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Single Family Housing	9.00	Dwelling Unit	8.45	17,550	105,416	0.00	27.0	—
Parking Lot	24.1	1000sqft	0.55	0.00	0.00	0.00	—	—

1.3. User-Selected Emission Reduction Measures by Emissions Sector

No measures selected

2. Emissions Summary

2.1. Construction Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Un/Mit.	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	4.43	5.96	36.0	34.2	0.05	1.60	7.89	9.49	1.47	3.99	5.47	—	5,543	5,543	0.23	0.10	1.73	5,565
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	1.46	1.22	11.3	13.3	0.02	0.50	0.05	0.55	0.46	0.01	0.47	—	2,472	2,472	0.10	0.03	0.01	2,482
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	1.00	0.84	7.85	8.56	0.01	0.35	0.43	0.77	0.32	0.20	0.51	—	1,522	1,522	0.06	0.02	0.12	1,530
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.18	0.15	1.43	1.56	< 0.005	0.06	0.08	0.14	0.06	0.04	0.09	—	252	252	0.01	< 0.005	0.02	253

2.2. Construction Emissions by Year, Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Year	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily - Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	4.43	3.72	36.0	34.2	0.05	1.60	7.89	9.49	1.47	3.99	5.47	—	5,543	5,543	0.23	0.10	1.73	5,565
2025	1.36	5.96	10.5	13.3	0.02	0.43	0.20	0.54	0.40	0.05	0.41	—	2,473	2,473	0.10	0.03	0.76	2,483
Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	1.46	1.22	11.3	13.3	0.02	0.50	0.05	0.55	0.46	0.01	0.47	—	2,472	2,472	0.10	0.03	0.01	2,482
2025	1.36	1.14	10.5	13.2	0.02	0.43	0.05	0.48	0.40	0.01	0.41	—	2,471	2,471	0.10	0.03	0.01	2,481
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	1.00	0.84	7.85	8.56	0.01	0.35	0.43	0.77	0.32	0.20	0.51	—	1,522	1,522	0.06	0.02	0.12	1,530
2025	0.39	0.65	2.95	3.80	0.01	0.12	0.02	0.15	0.11	0.01	0.12	—	687	687	0.03	0.01	0.04	690
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	0.18	0.15	1.43	1.56	< 0.005	0.06	0.08	0.14	0.06	0.04	0.09	—	252	252	0.01	< 0.005	0.02	253
2025	0.07	0.12	0.54	0.69	< 0.005	0.02	< 0.005	0.03	0.02	< 0.005	0.02	—	114	114	< 0.005	< 0.005	0.01	114

2.4. Operations Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Un/Mit.	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.42	0.78	0.48	3.62	0.01	0.02	0.60	0.62	0.02	0.15	0.18	4.50	1,116	1,121	0.50	0.03	2.82	1,144
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.37	0.73	0.50	2.84	0.01	0.02	0.60	0.62	0.02	0.15	0.18	4.50	1,085	1,089	0.51	0.03	0.20	1,111

Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.38	0.75	0.37	3.16	0.01	0.01	0.58	0.59	0.01	0.15	0.16	4.50	905	909	0.50	0.03	1.27	932
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.07	0.14	0.07	0.58	< 0.005	< 0.005	0.11	0.11	< 0.005	0.03	0.03	0.75	150	151	0.08	< 0.005	0.21	154

2.5. Operations Emissions by Sector, Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Sector	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.34	0.31	0.24	3.01	0.01	< 0.005	0.60	0.61	< 0.005	0.15	0.16	—	676	676	0.03	0.02	2.70	687
Area	0.07	0.46	0.15	0.57	< 0.005	0.01	—	0.01	0.01	—	0.01	0.00	191	191	< 0.005	< 0.005	—	191
Energy	0.01	0.01	0.09	0.04	< 0.005	0.01	—	0.01	0.01	—	0.01	—	232	232	0.02	< 0.005	—	233
Water	—	—	—	—	—	—	—	—	—	—	—	0.64	17.3	17.9	0.07	< 0.005	—	20.1
Waste	—	—	—	—	—	—	—	—	—	—	—	3.86	0.00	3.86	0.39	0.00	—	13.5
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.13	0.13
Total	0.42	0.78	0.48	3.62	0.01	0.02	0.60	0.62	0.02	0.15	0.18	4.50	1,116	1,121	0.50	0.03	2.82	1,144
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.34	0.31	0.27	2.74	0.01	< 0.005	0.60	0.61	< 0.005	0.15	0.16	—	646	646	0.03	0.03	0.07	655
Area	0.02	0.42	0.15	0.06	< 0.005	0.01	—	0.01	0.01	—	0.01	0.00	190	190	< 0.005	< 0.005	—	190
Energy	0.01	0.01	0.09	0.04	< 0.005	0.01	—	0.01	0.01	—	0.01	—	232	232	0.02	< 0.005	—	233
Water	—	—	—	—	—	—	—	—	—	—	—	0.64	17.3	17.9	0.07	< 0.005	—	20.1
Waste	—	—	—	—	—	—	—	—	—	—	—	3.86	0.00	3.86	0.39	0.00	—	13.5
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.13	0.13

Total	0.37	0.73	0.50	2.84	0.01	0.02	0.60	0.62	0.02	0.15	0.18	4.50	1,085	1,089	0.51	0.03	0.20	1,111
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.33	0.30	0.27	2.77	0.01	< 0.005	0.58	0.59	< 0.005	0.15	0.15	—	642	642	0.03	0.03	1.14	651
Area	0.03	0.44	0.01	0.35	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	0.00	13.9	13.9	< 0.005	< 0.005	—	13.9
Energy	0.01	0.01	0.09	0.04	< 0.005	0.01	—	0.01	0.01	—	0.01	—	232	232	0.02	< 0.005	—	233
Water	—	—	—	—	—	—	—	—	—	—	—	0.64	17.3	17.9	0.07	< 0.005	—	20.1
Waste	—	—	—	—	—	—	—	—	—	—	—	3.86	0.00	3.86	0.39	0.00	—	13.5
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.13	0.13
Total	0.38	0.75	0.37	3.16	0.01	0.01	0.58	0.59	0.01	0.15	0.16	4.50	905	909	0.50	0.03	1.27	932
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.06	0.05	0.05	0.51	< 0.005	< 0.005	0.11	0.11	< 0.005	0.03	0.03	—	106	106	0.01	< 0.005	0.19	108
Area	0.01	0.08	< 0.005	0.06	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	0.00	2.30	2.30	< 0.005	< 0.005	—	2.31
Energy	< 0.005	< 0.005	0.02	0.01	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	38.4	38.4	< 0.005	< 0.005	—	38.5
Water	—	—	—	—	—	—	—	—	—	—	—	0.11	2.86	2.97	0.01	< 0.005	—	3.33
Waste	—	—	—	—	—	—	—	—	—	—	—	0.64	0.00	0.64	0.06	0.00	—	2.24
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.02	0.02
Total	0.07	0.14	0.07	0.58	< 0.005	< 0.005	0.11	0.11	< 0.005	0.03	0.03	0.75	150	151	0.08	< 0.005	0.21	154

3. Construction Emissions Details

3.1. Demolition (2024) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	3.12	2.62	24.9	21.7	0.03	1.06	—	1.06	0.98	—	0.98	—	3,425	3,425	0.14	0.03	—	3,437
Demolition	—	—	—	—	—	—	0.29	0.29	—	0.04	0.04	—	—	—	—	—	—	—
Onsite truck	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	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.17	0.14	1.36	1.19	< 0.005	0.06	—	0.06	0.05	—	0.05	—	188	188	0.01	< 0.005	—	188
Demolition	—	—	—	—	—	—	0.02	0.02	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	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	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.03	0.03	0.25	0.22	< 0.005	0.01	—	0.01	0.01	—	0.01	—	31.1	31.1	< 0.005	< 0.005	—	31.2
Demolition	—	—	—	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	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	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.07	0.07	0.07	1.13	0.00	0.00	0.20	0.20	0.00	0.05	0.05	—	212	212	0.01	0.01	0.84	215
Vendor	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	0.00
Hauling	0.03	0.01	0.49	0.19	< 0.005	< 0.005	0.10	0.11	< 0.005	0.03	0.03	—	388	388	0.02	0.06	0.89	408

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.06	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	11.2	11.2	< 0.005	< 0.005	0.02	11.3
Vendor	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	0.00
Hauling	< 0.005	< 0.005	0.03	0.01	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	21.3	21.3	< 0.005	< 0.005	0.02	22.3
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	1.85	1.85	< 0.005	< 0.005	< 0.005	1.87
Vendor	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	0.00
Hauling	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	3.52	3.52	< 0.005	< 0.005	< 0.005	3.69

3.3. Site Preparation (2024) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	4.34	3.65	36.0	32.9	0.05	1.60	—	1.60	1.47	—	1.47	—	5,296	5,296	0.21	0.04	—	5,314
Dust From Material Movement	—	—	—	—	—	—	7.67	7.67	—	3.94	3.94	—	—	—	—	—	—	—
Onsite truck	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	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.12	0.10	0.99	0.90	< 0.005	0.04	—	0.04	0.04	—	0.04	—	145	145	0.01	< 0.005	—	146
Dust From Material Movement:	—	—	—	—	—	—	0.21	0.21	—	0.11	0.11	—	—	—	—	—	—	—
Onsite truck	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	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.02	0.18	0.16	< 0.005	0.01	—	0.01	0.01	—	0.01	—	24.0	24.0	< 0.005	< 0.005	—	24.1
Dust From Material Movement:	—	—	—	—	—	—	0.04	0.04	—	0.02	0.02	—	—	—	—	—	—	—
Onsite truck	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	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.09	0.08	0.08	1.32	0.00	0.00	0.23	0.23	0.00	0.05	0.05	—	247	247	0.01	0.01	0.97	251
Vendor	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	0.00
Hauling	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	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.03	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	6.51	6.51	< 0.005	< 0.005	0.01	6.60
Vendor	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	0.00

Hauling	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	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	1.08	1.08	< 0.005	< 0.005	< 0.005	1.09	
Vendor	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	0.00	
Hauling	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	0.00	

3.5. Grading (2024) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	2.26	1.90	18.2	18.8	0.03	0.84	—	0.84	0.77	—	0.77	—	2,958	2,958	0.12	0.02	—	2,969
Dust From Material Movement	—	—	—	—	—	—	2.76	2.76	—	1.34	1.34	—	—	—	—	—	—	—
Onsite truck	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	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.12	0.10	1.00	1.03	< 0.005	0.05	—	0.05	0.04	—	0.04	—	162	162	0.01	< 0.005	—	163
Dust From Material Movement	—	—	—	—	—	—	0.15	0.15	—	0.07	0.07	—	—	—	—	—	—	—

Onsite truck	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	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.02	0.18	0.19	< 0.005	0.01	—	0.01	0.01	—	0.01	—	26.8	26.8	< 0.005	< 0.005	—	26.9	
Dust From Material Movement	—	—	—	—	—	—	0.03	0.03	—	0.01	0.01	—	—	—	—	—	—	—	
Onsite truck	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	0.00	
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Worker	0.07	0.07	0.07	1.13	0.00	0.00	0.20	0.20	0.00	0.05	0.05	—	212	212	0.01	0.01	0.84	215	
Vendor	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	0.00	
Hauling	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	0.00	
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Worker	< 0.005	< 0.005	< 0.005	0.06	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	11.2	11.2	< 0.005	< 0.005	0.02	11.3	
Vendor	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	0.00	
Hauling	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	0.00	
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	1.85	1.85	< 0.005	< 0.005	< 0.005	1.87	
Vendor	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	0.00	
Hauling	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	0.00	

3.7. Building Construction (2024) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.44	1.20	11.2	13.1	0.02	0.50	—	0.50	0.46	—	0.46	—	2,398	2,398	0.10	0.02	—	2,406
Onsite truck	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	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.44	1.20	11.2	13.1	0.02	0.50	—	0.50	0.46	—	0.46	—	2,398	2,398	0.10	0.02	—	2,406
Onsite truck	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	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.57	0.48	4.44	5.18	0.01	0.20	—	0.20	0.18	—	0.18	—	948	948	0.04	0.01	—	951
Onsite truck	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	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.10	0.09	0.81	0.95	< 0.005	0.04	—	0.04	0.03	—	0.03	—	157	157	0.01	< 0.005	—	157
Onsite truck	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	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.01	0.02	0.24	0.00	0.00	0.04	0.04	0.00	0.01	0.01	—	45.7	45.7	< 0.005	< 0.005	0.18	46.4
Vendor	< 0.005	< 0.005	0.04	0.02	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	31.0	31.0	< 0.005	< 0.005	0.08	32.4
Hauling	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	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.01	0.02	0.21	0.00	0.00	0.04	0.04	0.00	0.01	0.01	—	43.4	43.4	< 0.005	< 0.005	< 0.005	43.9
Vendor	< 0.005	< 0.005	0.04	0.02	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	31.1	31.1	< 0.005	< 0.005	< 0.005	32.4
Hauling	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	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.01	0.09	0.00	0.00	0.02	0.02	0.00	< 0.005	< 0.005	—	17.4	17.4	< 0.005	< 0.005	0.03	17.6
Vendor	< 0.005	< 0.005	0.02	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	12.3	12.3	< 0.005	< 0.005	0.01	12.8
Hauling	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	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.02	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	2.88	2.88	< 0.005	< 0.005	0.01	2.92
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	2.03	2.03	< 0.005	< 0.005	< 0.005	2.12
Hauling	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	0.00

3.9. Building Construction (2025) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	1.35	1.13	10.4	13.0	0.02	0.43	—	0.43	0.40	—	0.40	—	2,398	2,398	0.10	0.02	—	2,406
Onsite truck	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	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.35	1.13	10.4	13.0	0.02	0.43	—	0.43	0.40	—	0.40	—	2,398	2,398	0.10	0.02	—	2,406
Onsite truck	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	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.32	0.27	2.47	3.09	0.01	0.10	—	0.10	0.09	—	0.09	—	568	568	0.02	< 0.005	—	570
Onsite truck	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	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.06	0.05	0.45	0.56	< 0.005	0.02	—	0.02	0.02	—	0.02	—	94.0	94.0	< 0.005	< 0.005	—	94.3
Onsite truck	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	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.01	0.01	0.23	0.00	0.00	0.04	0.04	0.00	0.01	0.01	—	44.8	44.8	< 0.005	< 0.005	0.16	45.5
Vendor	< 0.005	< 0.005	0.03	0.02	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	30.5	30.5	< 0.005	< 0.005	0.08	31.9
Hauling	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	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.01	0.02	0.19	0.00	0.00	0.04	0.04	0.00	0.01	0.01	—	42.5	42.5	< 0.005	< 0.005	< 0.005	43.0

Vendor	< 0.005	< 0.005	0.04	0.02	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	30.5	30.5	< 0.005	< 0.005	< 0.005	31.8
Hauling	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	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.05	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	10.2	10.2	< 0.005	< 0.005	0.02	10.3
Vendor	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	7.23	7.23	< 0.005	< 0.005	0.01	7.55
Hauling	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	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	1.69	1.69	< 0.005	< 0.005	< 0.005	1.71
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	1.20	1.20	< 0.005	< 0.005	< 0.005	1.25
Hauling	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	0.00

3.11. Paving (2025) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.95	0.80	7.45	9.98	0.01	0.35	—	0.35	0.32	—	0.32	—	1,511	1,511	0.06	0.01	—	1,517
Paving	—	0.07	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	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	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	0.05	0.04	0.41	0.55	< 0.005	0.02	—	0.02	0.02	—	0.02	—	82.8	82.8	< 0.005	< 0.005	—	83.1
Paving	—	< 0.005	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	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	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.01	0.07	0.10	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	13.7	13.7	< 0.005	< 0.005	—	13.8
Paving	—	< 0.005	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	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	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.07	0.06	0.06	1.04	0.00	0.00	0.20	0.20	0.00	0.05	0.05	—	207	207	0.01	0.01	0.76	210
Vendor	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	0.00
Hauling	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	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.05	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	10.9	10.9	< 0.005	< 0.005	0.02	11.1
Vendor	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	0.00
Hauling	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	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	1.81	1.81	< 0.005	< 0.005	< 0.005	1.83
Vendor	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	0.00
Hauling	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	0.00

3.13. Architectural Coating (2025) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.15	0.13	0.88	1.14	< 0.005	0.03	—	0.03	0.03	—	0.03	—	134	134	0.01	< 0.005	—	134
Architect ural Coatings	—	5.83	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	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	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.01	0.05	0.06	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	7.32	7.32	< 0.005	< 0.005	—	7.34
Architect ural Coatings	—	0.32	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	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	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	1.21	1.21	< 0.005	< 0.005	—	1.22
Architect ural Coatings	—	0.06	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Onsite truck	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	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.05	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	8.96	8.96	< 0.005	< 0.005	0.03	9.09
Vendor	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	0.00
Hauling	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	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.47	0.47	< 0.005	< 0.005	< 0.005	0.48
Vendor	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	0.00
Hauling	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	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.08	0.08	< 0.005	< 0.005	< 0.005	0.08
Vendor	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	0.00
Hauling	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	0.00

4. Operations Emissions Details

4.1. Mobile Emissions by Land Use

4.1.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
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Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	0.34	0.31	0.24	3.01	0.01	< 0.005	0.60	0.61	< 0.005	0.15	0.16	—	676	676	0.03	0.02	2.70	687
Parking Lot	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	0.00
Total	0.34	0.31	0.24	3.01	0.01	< 0.005	0.60	0.61	< 0.005	0.15	0.16	—	676	676	0.03	0.02	2.70	687
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	0.34	0.31	0.27	2.74	0.01	< 0.005	0.60	0.61	< 0.005	0.15	0.16	—	646	646	0.03	0.03	0.07	655
Parking Lot	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	0.00
Total	0.34	0.31	0.27	2.74	0.01	< 0.005	0.60	0.61	< 0.005	0.15	0.16	—	646	646	0.03	0.03	0.07	655
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	0.06	0.05	0.05	0.51	< 0.005	< 0.005	0.11	0.11	< 0.005	0.03	0.03	—	106	106	0.01	< 0.005	0.19	108
Parking Lot	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	0.00
Total	0.06	0.05	0.05	0.51	< 0.005	< 0.005	0.11	0.11	< 0.005	0.03	0.03	—	106	106	0.01	< 0.005	0.19	108

4.2. Energy

4.2.1. Electricity Emissions By Land Use - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
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Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	90.4	90.4	0.01	< 0.005	—	90.8
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	—	30.8	30.8	< 0.005	< 0.005	—	30.9
Total	—	—	—	—	—	—	—	—	—	—	—	—	121	121	0.01	< 0.005	—	122
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	90.4	90.4	0.01	< 0.005	—	90.8
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	—	30.8	30.8	< 0.005	< 0.005	—	30.9
Total	—	—	—	—	—	—	—	—	—	—	—	—	121	121	0.01	< 0.005	—	122
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	15.0	15.0	< 0.005	< 0.005	—	15.0
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	—	5.10	5.10	< 0.005	< 0.005	—	5.12
Total	—	—	—	—	—	—	—	—	—	—	—	—	20.1	20.1	< 0.005	< 0.005	—	20.2

4.2.3. Natural Gas Emissions By Land Use - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Single Family Housing	0.01	0.01	0.09	0.04	< 0.005	0.01	—	0.01	0.01	—	0.01	—	111	111	0.01	< 0.005	—	111
Parking Lot	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
Total	0.01	0.01	0.09	0.04	< 0.005	0.01	—	0.01	0.01	—	0.01	—	111	111	0.01	< 0.005	—	111
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	0.01	0.01	0.09	0.04	< 0.005	0.01	—	0.01	0.01	—	0.01	—	111	111	0.01	< 0.005	—	111
Parking Lot	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
Total	0.01	0.01	0.09	0.04	< 0.005	0.01	—	0.01	0.01	—	0.01	—	111	111	0.01	< 0.005	—	111
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	< 0.005	< 0.005	0.02	0.01	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	18.3	18.3	< 0.005	< 0.005	—	18.4
Parking Lot	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
Total	< 0.005	< 0.005	0.02	0.01	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	18.3	18.3	< 0.005	< 0.005	—	18.4

4.3. Area Emissions by Source

4.3.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Source	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hearths	0.02	0.01	0.15	0.06	< 0.005	0.01	—	0.01	0.01	—	0.01	0.00	190	190	< 0.005	< 0.005	—	190

Consum Products	—	0.38	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architect ural Coatings	—	0.03	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landsc ape Equipme nt	0.05	0.05	0.01	0.51	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	1.37	1.37	< 0.005	< 0.005	—	1.37
Total	0.07	0.46	0.15	0.57	< 0.005	0.01	—	0.01	0.01	—	0.01	0.00	191	191	< 0.005	< 0.005	—	191
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hearths	0.02	0.01	0.15	0.06	< 0.005	0.01	—	0.01	0.01	—	0.01	0.00	190	190	< 0.005	< 0.005	—	190
Consum er Products	—	0.38	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architect ural Coatings	—	0.03	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	0.02	0.42	0.15	0.06	< 0.005	0.01	—	0.01	0.01	—	0.01	0.00	190	190	< 0.005	< 0.005	—	190
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hearths	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	0.00	2.15	2.15	< 0.005	< 0.005	—	2.15
Consum er Products	—	0.07	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architect ural Coatings	—	0.01	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landsc ape Equipme nt	0.01	0.01	< 0.005	0.06	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.15	0.15	< 0.005	< 0.005	—	0.16
Total	0.01	0.08	< 0.005	0.06	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	0.00	2.30	2.30	< 0.005	< 0.005	—	2.31

4.4. Water Emissions by Land Use

4.4.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	0.64	17.3	17.9	0.07	< 0.005	—	20.1
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	0.64	17.3	17.9	0.07	< 0.005	—	20.1
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	0.64	17.3	17.9	0.07	< 0.005	—	20.1
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	0.64	17.3	17.9	0.07	< 0.005	—	20.1
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	0.11	2.86	2.97	0.01	< 0.005	—	3.33
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	0.11	2.86	2.97	0.01	< 0.005	—	3.33

4.5. Waste Emissions by Land Use

4.5.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	3.86	0.00	3.86	0.39	0.00	—	13.5
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	3.86	0.00	3.86	0.39	0.00	—	13.5
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	3.86	0.00	3.86	0.39	0.00	—	13.5
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	3.86	0.00	3.86	0.39	0.00	—	13.5
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	0.64	0.00	0.64	0.06	0.00	—	2.24
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	0.64	0.00	0.64	0.06	0.00	—	2.24

4.6. Refrigerant Emissions by Land Use

4.6.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.13	0.13
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.13	0.13
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.13	0.13
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.13	0.13
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.02	0.02
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.02	0.02

4.7. Offroad Emissions By Equipment Type

4.7.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.8. Stationary Emissions By Equipment Type

4.8.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.9. User Defined Emissions By Equipment Type

4.9.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10. Soil Carbon Accumulation By Vegetation Type

4.10.1. Soil Carbon Accumulation By Vegetation Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Vegetation	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.2. Above and Belowground Carbon Accumulation by Land Use Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.3. Avoided and Sequestered Emissions by Species - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Species	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Remove	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

5. Activity Data

5.1. Construction Schedule

Phase Name	Phase Type	Start Date	End Date	Days Per Week	Work Days per Phase	Phase Description
Demolition	Demolition	4/1/2024	4/29/2024	5.00	20.0	—
Site Preparation	Site Preparation	4/30/2024	5/14/2024	5.00	10.0	—
Grading	Grading	5/15/2024	6/12/2024	5.00	20.0	—
Building Construction	Building Construction	6/13/2024	5/1/2025	5.00	230	—
Paving	Paving	5/2/2025	5/30/2025	5.00	20.0	—
Architectural Coating	Architectural Coating	5/31/2025	6/28/2025	5.00	20.0	—

5.2. Off-Road Equipment

5.2.1. Unmitigated

Phase Name	Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor
Demolition	Concrete/Industrial Saws	Diesel	Average	1.00	8.00	33.0	0.73
Demolition	Excavators	Diesel	Average	3.00	8.00	36.0	0.38
Demolition	Rubber Tired Dozers	Diesel	Average	2.00	8.00	367	0.40
Site Preparation	Rubber Tired Dozers	Diesel	Average	3.00	8.00	367	0.40
Site Preparation	Tractors/Loaders/Backhoes	Diesel	Average	4.00	8.00	84.0	0.37
Grading	Excavators	Diesel	Average	1.00	8.00	36.0	0.38
Grading	Graders	Diesel	Average	1.00	8.00	148	0.41
Grading	Rubber Tired Dozers	Diesel	Average	1.00	8.00	367	0.40
Grading	Tractors/Loaders/Backhoes	Diesel	Average	3.00	8.00	84.0	0.37
Building Construction	Cranes	Diesel	Average	1.00	7.00	367	0.29
Building Construction	Forklifts	Diesel	Average	3.00	8.00	82.0	0.20
Building Construction	Generator Sets	Diesel	Average	1.00	8.00	14.0	0.74
Building Construction	Tractors/Loaders/Backhoes	Diesel	Average	3.00	7.00	84.0	0.37

Building Construction	Welders	Diesel	Average	1.00	8.00	46.0	0.45
Paving	Pavers	Diesel	Average	2.00	8.00	81.0	0.42
Paving	Paving Equipment	Diesel	Average	2.00	8.00	89.0	0.36
Paving	Rollers	Diesel	Average	2.00	8.00	36.0	0.38
Architectural Coating	Air Compressors	Diesel	Average	1.00	6.00	37.0	0.48

5.3. Construction Vehicles

5.3.1. Unmitigated

Phase Name	Trip Type	One-Way Trips per Day	Miles per Trip	Vehicle Mix
Demolition	—	—	—	—
Demolition	Worker	15.0	18.5	LDA,LDT1,LDT2
Demolition	Vendor	—	10.2	HHDT,MHDT
Demolition	Hauling	5.50	20.0	HHDT
Demolition	Onsite truck	—	—	HHDT
Site Preparation	—	—	—	—
Site Preparation	Worker	17.5	18.5	LDA,LDT1,LDT2
Site Preparation	Vendor	—	10.2	HHDT,MHDT
Site Preparation	Hauling	0.00	20.0	HHDT
Site Preparation	Onsite truck	—	—	HHDT
Grading	—	—	—	—
Grading	Worker	15.0	18.5	LDA,LDT1,LDT2
Grading	Vendor	—	10.2	HHDT,MHDT
Grading	Hauling	0.00	20.0	HHDT
Grading	Onsite truck	—	—	HHDT
Building Construction	—	—	—	—
Building Construction	Worker	3.24	18.5	LDA,LDT1,LDT2

Building Construction	Vendor	0.96	10.2	HHDT,MHDT
Building Construction	Hauling	0.00	20.0	HHDT
Building Construction	Onsite truck	—	—	HHDT
Paving	—	—	—	—
Paving	Worker	15.0	18.5	LDA,LDT1,LDT2
Paving	Vendor	—	10.2	HHDT,MHDT
Paving	Hauling	0.00	20.0	HHDT
Paving	Onsite truck	—	—	HHDT
Architectural Coating	—	—	—	—
Architectural Coating	Worker	0.65	18.5	LDA,LDT1,LDT2
Architectural Coating	Vendor	—	10.2	HHDT,MHDT
Architectural Coating	Hauling	0.00	20.0	HHDT
Architectural Coating	Onsite truck	—	—	HHDT

5.4. Vehicles

5.4.1. Construction Vehicle Control Strategies

Control Strategies Applied	PM10 Reduction	PM2.5 Reduction
Water unpaved roads twice daily	55%	55%
Limit vehicle speeds on unpaved roads to 25 mph	44%	44%
Sweep paved roads once per month	9%	9%

5.5. Architectural Coatings

Phase Name	Residential Interior Area Coated (sq ft)	Residential Exterior Area Coated (sq ft)	Non-Residential Interior Area Coated (sq ft)	Non-Residential Exterior Area Coated (sq ft)	Parking Area Coated (sq ft)
Architectural Coating	35,539	11,846	0.00	0.00	1,448

5.6. Dust Mitigation

5.6.1. Construction Earthmoving Activities

Phase Name	Material Imported (Cubic Yards)	Material Exported (Cubic Yards)	Acres Graded (acres)	Material Demolished (Building Square Footage)	Acres Paved (acres)
Demolition	0.00	0.00	0.00	9,500	—
Site Preparation	0.00	0.00	15.0	0.00	—
Grading	0.00	0.00	20.0	0.00	—
Paving	0.00	0.00	0.00	0.00	0.65

5.6.2. Construction Earthmoving Control Strategies

Control Strategies Applied	Frequency (per day)	PM10 Reduction	PM2.5 Reduction
Water Exposed Area	2	61%	61%
Water Demolished Area	2	36%	36%

5.7. Construction Paving

Land Use	Area Paved (acres)	% Asphalt
Single Family Housing	0.10	0%
Parking Lot	0.55	100%

5.8. Construction Electricity Consumption and Emissions Factors

kWh per Year and Emission Factor (lb/MWh)

Year	kWh per Year	CO2	CH4	N2O
2024	0.00	532	0.03	< 0.005
2025	0.00	532	0.03	< 0.005

5.9. Operational Mobile Sources

5.9.1. Unmitigated

Land Use Type	Trips/Weekday	Trips/Saturday	Trips/Sunday	Trips/Year	VMT/Weekday	VMT/Saturday	VMT/Sunday	VMT/Year
Single Family Housing	84.9	85.3	76.3	30,555	845	850	760	304,272
Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

5.10. Operational Area Sources

5.10.1. Hearths

5.10.1.1. Unmitigated

Hearth Type	Unmitigated (number)
Single Family Housing	—
Wood Fireplaces	0
Gas Fireplaces	9
Propane Fireplaces	0
Electric Fireplaces	0
No Fireplaces	0
Conventional Wood Stoves	0
Catalytic Wood Stoves	0
Non-Catalytic Wood Stoves	0
Pellet Wood Stoves	0

5.10.2. Architectural Coatings

Residential Interior Area Coated (sq ft)	Residential Exterior Area Coated (sq ft)	Non-Residential Interior Area Coated (sq ft)	Non-Residential Exterior Area Coated (sq ft)	Parking Area Coated (sq ft)
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35538.75	11,846	0.00	0.00	1,448
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5.10.3. Landscape Equipment

Season	Unit	Value
Snow Days	day/yr	0.00
Summer Days	day/yr	250

5.11. Operational Energy Consumption

5.11.1. Unmitigated

Electricity (kWh/yr) and CO2 and CH4 and N2O and Natural Gas (kBTU/yr)

Land Use	Electricity (kWh/yr)	CO2	CH4	N2O	Natural Gas (kBTU/yr)
Single Family Housing	62,056	532	0.0330	0.0040	345,018
Parking Lot	21,141	532	0.0330	0.0040	0.00

5.12. Operational Water and Wastewater Consumption

5.12.1. Unmitigated

Land Use	Indoor Water (gal/year)	Outdoor Water (gal/year)
Single Family Housing	335,464	1,806,952
Parking Lot	0.00	0.00

5.13. Operational Waste Generation

5.13.1. Unmitigated

Land Use	Waste (ton/year)	Cogeneration (kWh/year)
Single Family Housing	7.16	—

Parking Lot	0.00	—
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5.14. Operational Refrigeration and Air Conditioning Equipment

5.14.1. Unmitigated

Land Use Type	Equipment Type	Refrigerant	GWP	Quantity (kg)	Operations Leak Rate	Service Leak Rate	Times Serviced
Single Family Housing	Average room A/C & Other residential A/C and heat pumps	R-410A	2,088	< 0.005	2.50	2.50	10.0
Single Family Housing	Household refrigerators and/or freezers	R-134a	1,430	0.12	0.60	0.00	1.00

5.15. Operational Off-Road Equipment

5.15.1. Unmitigated

Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor
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5.16. Stationary Sources

5.16.1. Emergency Generators and Fire Pumps

Equipment Type	Fuel Type	Number per Day	Hours per Day	Hours per Year	Horsepower	Load Factor
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5.16.2. Process Boilers

Equipment Type	Fuel Type	Number	Boiler Rating (MMBtu/hr)	Daily Heat Input (MMBtu/day)	Annual Heat Input (MMBtu/yr)
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5.17. User Defined

Equipment Type	Fuel Type
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5.18. Vegetation

5.18.1. Land Use Change

5.18.1.1. Unmitigated

Vegetation Land Use Type	Vegetation Soil Type	Initial Acres	Final Acres
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5.18.1. Biomass Cover Type

5.18.1.1. Unmitigated

Biomass Cover Type	Initial Acres	Final Acres
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5.18.2. Sequestration

5.18.2.1. Unmitigated

Tree Type	Number	Electricity Saved (kWh/year)	Natural Gas Saved (btu/year)
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8. User Changes to Default Data

Screen	Justification
Land Use	Project consists of nine (9) single family residential homes and approximately 24,133 square feet of street improvements on a 9-acre site.
Operations: Vehicle Data	Trip generation rates are referenced from the Ginkgo Stonehouse Residential Trip Generation & Vehicle Miles Traveled (VMT) Screening Analysis, City of Sierra Madre (September 2023) and the ITE Trip Generation Manual, 11th Edition.
Operations: Fleet Mix	Fleet mix is adjusted to reflect a total of 2% heavy trucks (GVWR > 10,000 lbs).
Operations: Hearths	Per SCAQMD Rule 445, no wood-burning devices will be allowed.

Appendix B

EMFAC2021 Vehicle Fuel Consumption Data

Source: EMFAC2021 (v1.0.2) Emissions Inventory

Region Type: Air District

Region: South Coast AQMD

Calendar Year: 2024

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	Calendar Year	Vehicle Category	Model Year	Speed	Fuel	Population	Total VMT	Fuel Consumption	Fuel Split (Gas:Diesel)	MPG, by Fuel Type	MPG, Average
South Coast AQMD	2024	HHDT	Aggregate	Aggregate	Gasoline	66.31370332	4424.268575	1.104328991	0.000499841	4.00629578	6.0529647
South Coast AQMD	2024	HHDT	Aggregate	Aggregate	Diesel	101734.5563	13368763.56	2208.257291	0.999500159	6.053988193	
South Coast AQMD	2024	LDA	Aggregate	Aggregate	Gasoline	5451205.278	218661478.4	7460.397566	0.998510023	29.30962813	29.327396
South Coast AQMD	2024	LDA	Aggregate	Aggregate	Diesel	15008.68815	459042.4639	11.13240853	0.001489977	41.23478424	
South Coast AQMD	2024	LDT1	Aggregate	Aggregate	Gasoline	505255.238	18293108.56	749.2484986	0.999800166	24.41527556	24.415072
South Coast AQMD	2024	LDT1	Aggregate	Aggregate	Diesel	185.8134065	3503.73515	0.149755232	0.000199834	23.39641234	
South Coast AQMD	2024	LDT2	Aggregate	Aggregate	Gasoline	2551917.339	105566684.3	4409.351871	0.997410069	23.94154228	23.962055
South Coast AQMD	2024	LDT2	Aggregate	Aggregate	Diesel	8408.841047	364804.3333	11.44957041	0.002589931	31.86183589	
South Coast AQMD	2024	LHDT1	Aggregate	Aggregate	Gasoline	205772.0104	8100729.199	593.9775896	0.729540754	13.63810578	15.503254
South Coast AQMD	2024	LHDT1	Aggregate	Aggregate	Diesel	107344.0588	4521712.5	220.2025457	0.270459246	20.53433345	
South Coast AQMD	2024	LHDT2	Aggregate	Aggregate	Gasoline	32210.08702	1194341.963	100.0584693	0.465234813	11.93644048	14.78431
South Coast AQMD	2024	LHDT2	Aggregate	Aggregate	Diesel	47493.71803	1985332.842	115.0124291	0.534765187	17.2618982	
South Coast AQMD	2024	MCY	Aggregate	Aggregate	Gasoline	248270.1833	1592938.199	38.35226982	1	41.53439174	41.534392
South Coast AQMD	2024	MDV	Aggregate	Aggregate	Gasoline	1622853.742	62814787.61	3226.774882	0.989515763	19.46673998	19.511253
South Coast AQMD	2024	MDV	Aggregate	Aggregate	Diesel	20419.82579	810698.8942	34.18871658	0.010484237	23.71246935	
South Coast AQMD	2024	MH	Aggregate	Aggregate	Gasoline	30227.21214	288427.2398	59.35698726	0.832099341	4.85919608	5.7411073
South Coast AQMD	2024	MH	Aggregate	Aggregate	Diesel	12282.43808	121108.9957	11.97702818	0.167900659	10.11177346	
South Coast AQMD	2024	MHDT	Aggregate	Aggregate	Gasoline	25495.89397	1374427.63	266.221199	0.322059494	5.16272797	7.7138466
South Coast AQMD	2024	MHDT	Aggregate	Aggregate	Diesel	117140.1358	5002001.319	560.3999821	0.677940506	8.925769948	
South Coast AQMD	2024	OBUS	Aggregate	Aggregate	Gasoline	5427.033371	219202.8229	43.22754277	0.560282203	5.070906391	5.924597
South Coast AQMD	2024	OBUS	Aggregate	Aggregate	Diesel	3049.481538	237898.5628	33.92561775	0.439717797	7.01235758	
South Coast AQMD	2024	SBUS	Aggregate	Aggregate	Gasoline	2859.390138	128765.1016	14.42080993	0.60189309	8.929117172	8.2955538
South Coast AQMD	2024	SBUS	Aggregate	Aggregate	Diesel	3435.827919	69988.80783	9.538278785	0.39810691	7.337676892	
South Coast AQMD	2024	UBUS	Aggregate	Aggregate	Gasoline	894.3284655	96953.45183	13.89822542	0.981667267	6.97595908	6.9696773
South Coast AQMD	2024	UBUS	Aggregate	Aggregate	Diesel	14.32857314	1721.679298	0.259550733	0.018332733	6.633305483	