Appendix E2

Air Quality Operational Emissions Data

ESA

RAMBOLL

ENVIRONMENT
& HEALTH

DRAFT MEMO

To **Jose Campos,**
Office of Community Investment and Infrastructure

From **Michael Keinath**
Sarah Manzano

Subject **OPERATIONAL AIR QUALITY AND GREENHOUSE GAS EMISSIONS AND $PM_{2.5}$ CONCENTRATION EVALUATIONS FOR CANDLESTICK POINT- HUNTERS POINT SHIPYARD PHASE II, SAN FRANCISCO, CALIFORNIA**

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Ramboll Americas Engineering Solutions Inc. (Ramboll) conducted an evaluation of criteria air pollutant (CAP) and greenhouse gas (GHG) emissions and $PM_{2.5}$ concentration associated with the operation of Candlestick Point – Hunters Point Shipyard Phase II, San Francisco, California (the "Project") in support of Addendum #7 to the Environmental Impact Report (EIR 2007.0946E) for the 2024 Modified Project Variant. This memorandum provides background, a description of the methodology and results for the operation of the Project. The results presented here support Impact Statements AQ-4, AQ-5, AQ-6, and AQ-7 of Addendum #7.

PROJECT BACKGROUND

The Candlestick Point (CP) – Hunters Points Shipyard II (HPS2) project is located along the southeastern waterfront in San Francisco and covers an area of approximately 702 acres. An EIR was certified for this area in 2010. Since then, there has been demolition work, minor earthwork and construction of the first phase of Alice Griffith apartments. The 2024 Modified Project Variant would include the transfer of 2,050,000 square feet of R&D/office land use from Hunters Point Shipyard Phase II (HPS2) to Candlestick Point (CP). Previous entitlements of the CP site include residences, office, retail/shared amenities, structured parking lots, a performance venue, and a hotel on approximately 281 acres of predominately undeveloped land and park space. The project land use summary for CP is presented in **Table 1**. We understand there are no current plans for a hotel or performance venue, but these land uses are analyzed as approved land uses.

This operational analysis does not analyze HPS2 because plans for this area are not known at this point and are not expected to occur in the near future. As such, the analysis documented herein focuses on the CP site.

OPERATIONAL EMISSIONS METHODOLOGY AND RESULTS

Ramboll primarily utilized the California Emission Estimator Model version 2022.1 (CalEEMod 2022)[1] to assist in quantifying the criteria pollutant and greenhouse gas emissions for Project operational phases. For the purposes of this analysis, the CP

[1] CAPCOA. 2022. California Emissions Estimator Model. Version 2022.1. Available at: http://www.caleemod.com/.

site is assumed to be operational by 2038.[2] Emissions associated with the construction phase for CP were estimated separately and described in a separate memorandum. CalEEMod 2022 provides a simple platform to calculate emissions from a land use project. It calculates both the daily maximum and annual average emissions for criteria air pollutants and greenhouse gases. The model also provides default values for water, wastewater, solid waste, energy use, refrigerant use, and mobile and area sources.

Criteria air pollutants and greenhouse gas emissions for Project operation were estimated from mobile sources, areas sources, and energy usage, while emissions of greenhouse gases were estimated for water use, solid waste, and refrigerant use in addition. Consistent with the FEIR, emissions of Reactive Organic Gases (ROG) and Nitrogen Oxides (NO_x) were calculated under summer conditions and emissions of Particulate Matter PM_{10} and $PM_{2.5}$ were calculated under winter conditions. CalEEMod does not calculate emissions for public lighting or transit service, so greenhouse gas emissions from these categories were added directly from the 2010 FEIR. This is conservative, as lighting and transit are likely to be more efficient than when the 2010 FEIR was published.

Operational emissions were based on land use specific CalEEMod 2022 default values for energy use, fleet mix, refrigerant usage, and architectural coatings. Building energy use defaults associated with CalEEMod 2022 use 2019 Title 24 standards, which conservatively estimate higher energy use and associated emissions than the newer and more efficient 2022 Title 24 standards. Title 24 standards are updated on an approximate three-year cycle as technology and methods evolve. Because the Project is not expected to be completed until 2038 or later, many Project buildings are expected to be constructed in compliance with further improved future energy standards.

Pacific Gas and Electric's (PG&E) estimated carbon intensity factors are shown in **Table 2** and are based on the criteria established in the California's Renewable Portfolio Standard. **Table 2** also summarizes emission factors for natural gas use from CalEEMod 2022. CAP and GHG emission factors were obtained from Appendix G of the CalEEMod 2022 User's Guide. All default woodstoves and wood-fired fireplaces in CalEEMod were assumed to be replaced by natural gas fireplaces.[3]

Daily weekday mobile trip rates by land use were obtained from a traffic study by Fehr & Peers[4] for CP. Total trip rates were allocated to specific land uses using the ratio of CalEEMod 2022 default trip rates for each land use. The Saturday and Sunday total trip rates were calculated from daily trip rates using the same ratio as CalEEMod 2022 default weekday to Saturday or Sunday trip rates. Trip rates are shown in **Table 3**. Trip lengths for CAP and GHG emissions for CP were consistent with the trip lengths and trip purpose in the 2010 FEIR for CAP emissions and GHG emissions, respectively.[5] CalEEMod 2022 land use specific default values were used for other mobile source parameters such as vehicle emission factors and fleet mix.

Indoor and outdoor water demand for each land use class was obtained from BKF Engineers, the Project's water resource engineers.[6] Water demand was allocated between indoor and outdoor usage

[2] The 2024 Modified Project Variant construction schedule ends in 2058. However, operational emissions are calculated for 2038 as a conservative assumption to evaluate maximum impacts of the project.

[3] BAAQMD. 2008. Regulation 6, Rule 3, Particulate Matter and Visible Emissions: Wood-Burning Devices. July. Available at: https://www.baaqmd.gov/rules-and-compliance/rules/reg-6-rule-3-woodburning-devices

[4] Trip generation rates are project specific and were provided by the Project Applicant. Total daily trips were calculated by summing the AM and PM peak trips and multiplying by 5, based on the methodology described by the Fehr and Peers.

[5] Trip lengths were obtained from the Candlestick Point-Hunters Point Shipyard Phase II Development Plan EIR, Appendix H1, PBS&J Air Quality Model Input/Output July 2009 for CAP emissions and from the Candlestick Point-Hunters Point Shipyard Phase II Development Plan EIR, GHG Appendix S (Table 3-20) for GHG emissions.

[6] Email communication from James Dallosta (BKF Engineers). "RE: CP Clarifications for Operational Emissions - water demand" March 11, 2024.

using information provided by BKF Engineers.[7] The solid waste generation rate for each land use was obtained from the 2010 FEIR, as shown in Attachment A. A refined consumer product emission factor of 1.46E-5 lbs/sqft-day was used based on draft Air Quality and Greenhouse Gas Analysis Guidelines from San Francisco Planning, dated January 2024.

The average daily emissions estimated due to Project operations for CAP and GHGs are summarized in **Table 4** and **Table 5**, respectively. The estimated emissions sources include area sources (landscaping equipment, hearths, consumer products, and architectural coatings), building energy use, mobile sources (vehicle trips from workers, customers, residents, hotel guests, and delivery vehicles), refrigerants, emissions from water usage and solid waste disposal, and emissions from transit and public lighting.

$PM_{2.5}$ CONCENTRATION FROM TRAFFIC

Ramboll also analyzed the change in $PM_{2.5}$ concentration from traffic for the 2024 Modified Project Variant by scaling results from the 2010 FEIR by the change in traffic volume and emission factor. Figure 4-3 of Attachment IV of Appendix H3 of the 2010 FEIR shows the roadways and receptors modeled.

Traffic volumes for the 2024 Modified Project Variant were provided by Fehr and Peers and compared against traffic volumes analysed in the 2010 FEIR for each roadway and intersection. Traffic turning volumes for the 2024 Modified Project Variant are shown in **Table 6**. Project AADT generally increased along Ingalls Street, Arelious Walker and Gilman Avenues, but generally decreased on Harney Way. $PM_{2.5}$ concentrations from the 2010 FEIR were scaled by the percent change in project traffic volumes at intersections using the maximum $PM_{2.5}$ concentration from receptors near the intersection.

$PM_{2.5}$ concentrations were also scaled by the changes in vehicle emission factors from ARB's EMission FACtor model (EMFAC). Fleet wide average emission rates for exhaust, tire wear and brake wear were obtained from EMFAC2021 for year 2038 and were compared against emission rates used in the 2010 FEIR, which used EMFAC2007. As mentioned above, the year 2038 was chosen for the analysis as an interim year; however, the 2024 Modified Project Variant is not expected to be built out until 2058. Emissions per mile travelled tend to decrease with time, especially with the increased penetration of electric vehicles around this time due to the Advanced Clean Cars II regulation,[8] which requires new passenger vehicles to be electrically powered after 2035. Compared to the 2010 FEIR, exhaust and non-exhaust emissions of $PM_{2.5}$ have decreased as a result of emissions control requirements and refinements to EMFAC. The $PM_{2.5}$ concentrations from the 2010 FEIR were scaled by this percent change in vehicle emission rates, which was a 67% reduction in $PM_{2.5}$ running emissions. **Table 7** provides the changes to vehicle emission factors used in this analysis.

Table 8 shows a summary of $PM_{2.5}$ concentrations after scaling for changes in traffic volumes and emissions changes. After scaling by changes to traffic volumes and emission factors, the maximum $PM_{2.5}$ concentration contributed by Project traffic was 0.085 $\mu g/m^3$. This maximum is located near the intersection of Gilman Avenue and Arelious Walker, which has the maximum percentage increase in AADT across the intersections.

CARBON MONOXIDE CONCENTRATION FROM TRAFFIC

Ramboll analyzed the change in carbon monoxide (CO) concentration from cumulative traffic for the 2024 Modified Project Variant by scaling results from the 2010 FEIR by the change in cumulative traffic volume. Traffic volumes for the 2024 Modified Project Variant were provided by Fehr and Peers

[7] Email communication from James Dallosta (BKF Engineers). "RE: CP Clarifications for Operational Emissions - water demand." March 15, 2024

[8] Final Regulation Order Adoption of new Section 1961.4, Title 13, California Code of Regulations. 2022. Available online at https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2022/accii/2acciifro1961.4.pdf

and compared against traffic volumes analysed in the 2010 FEIR for two major intersections in the Candlestick area (Arelious Walker Dr/Gilman Ave and Third St/Gilman Ave). These intersections were selected because they represent the locations where Project traffic would produce the greatest change in traffic level of service associated with the Project (and, therefore, the greatest change in congestion, which would produce the greatest increase in CO emissions) and/or the highest total traffic volumes of all intersections in the Project vicinity. The modelled CO concentrations from the 2010 FEIR were scaled based on the increase in cumulative traffic volumes at both of these intersections. **Table 9** summarizes the CO concentrations at these two main intersections for the 2024 Modified Project Variant. Actual CO concentrations are expected to be lower than estimated with this scaling approach because emission factors of CO are expected to have decreased since the 2010 FEIR, which was not taken into account.

HEALTH RISK FROM RESEARCH AND DEVELOPMENT

Ramboll conducted a prospective analysis to evaluate potential TAC sources that may be located within the Research and Development (R&D) portions of the Project in the future, consistent with Impact AQ-6 of the EIR. R&D/office use square footage is being transferred from HPS2 to CP and health impacts from R&D were only analyzed in HPS2 in the 2010 FEIR. Therefore, health impacts from R&D were evaluated at CP for the 2024 Modified Project Variant. Other than the modifications described herein, the analysis was performed using the same methodology that was used to evaluate R&D sources at HPS2 in the 2010 FEIR, as discussed in Appendix H3, Attachment III.

Consistent with the FEIR methodology, Phases 1 and 2 of the CP site was divided into approximately one-acre plots, the minimum size of a parcel based on expected R&D land uses, and a single R&D facility was assumed to be located on each one-acre plot. Because specific R&D land use areas are unknown at this time, the analysis was applied over Phase 1 and 2 to account for all potential R&D areas as a conservative assumption.[9] This is a conservative analysis as R&D uses are only planned for the area bounded by Ingerson Avenue, Harney Way and Jamestown Avenue and it is unlikely that this entire area would contain TAC emitting facilities. The source parameters used in this analysis are also consistent with the assumptions made in the 2010 FEIR. These assumptions were designed to result in conservative concentrations since actual release parameters are not known at this time. For example, the temperature at the exhaust is set to ambient and the velocity of the exhaust is low, which limits plume rise and mixing of the plume. The most recent American Meteorological Society/Environmental Protection Agency Regulatory Model (AERMOD) version (v23132) was used for the analysis and grid receptors were spaced at 20 meters for on-site receptors and 50 meters for off-site receptors, consistent with the 2010 FEIR. Elevations were assumed to be flat for this operational analysis since most of the sources of TACs and receptors would be on similar elevation after construction.

Consistent with the analysis in the FEIR, concentrations at boundary receptors for each one-acre plot were set to the project risk limits in Bay Area Air Quality Management District (BAAQMD) Regulation 2, Rule 5, Section 302. Then, health impacts at all onsite receptors were estimated at all onsite receptors using ratios of concentrations to the boundary receptor for each one-acre plot. Health impacts from all one-acre plots were added together for a conservative estimate of health impacts from the entire 2024 Modified Project Variant.

In the 2010 FEIR, receptors located at the boundary of each plot were set not to exceed 10 in a million cancer risk or 1.0 chronic noncancer HI, consistent with implementation of mitigation measures

[9] As discussed in Appendix F1 (Air Quality Construction Methods Memorandum), the phasing numbering was updated following completion of the analyses. As a result, the phase numbering described in this section corresponds with the initial phase numbering presented in Attachment A of Appendix F1.

MM AQ 6.1 and MM AQ-6.2. Since the 2010 FEIR, BAAQMD updated BAAQMD Regulation 2 Rule 5[10] to include a project risk limits for health impacts for new or modified projects applying for an air permit of 6.0 in a million for overburdened communities, as defined in BAAQMD 2-1-243. According to BAAQMD's Overburdened Areas Map,[11] CP is considered an overburdened community and therefore this limit applies to CP. The BAAQMD threshold for the chronic noncancer HI remains at 1.0 for overburdened communities. As a result, the maximally exposed boundary receptor for each R&D parcel was set to a chronic noncancer HI of 1.0 and an excess lifetime cancer risk of 6.0 in a million for this analysis.

Figure 1 shows the area of the site that exceeds the 6.0 in a million cancer risk and 1.0 noncancer chronic HI project risk limits from all one-acre sites combined. **Figure 1** also shows areas that exceed the 10 in a million cancer risk limit used in mitigation measures MM AQ 6.1 and 6.2.

This analysis is a conservative estimate of potential impacts in this area because it is assumed that each one-acre plot would release TACs to the maximally permittable level, which is unlikely with the type of R&D operations anticipated to be located within CP. It also assumes that every one-acre plot would contain R&D operations that release TACs, which is also unlikely considering residential and office land uses would also be considered for these areas. It also assumes R&D would be located throughout all of Phases 1 and 2, while R&D is only planned for the area bounded by Ingerson Avenue, Harney Way and Jamestown Avenue.

If receptors are placed in these areas, an analysis should be performed to show that actual health impacts would be below thresholds. Furthermore, if a source of TACs is to be placed in Phase 1 or Phase 2 when residential land uses are planned in the areas shown in Figure 1, an analysis should be completed to show that the health impact from this new source of TACs, in combination with the health impact from other sources of TACs in Phases 1 and 2 would not cause significant health impacts to the residential land uses in the shaded area.

[10] BAAQMD. 2022. Regulation 2 Rule 5: New Source Review of Toxic Air Contaminants - 2021 Amendment (Current). July. Available at: https://www.baaqmd.gov/rules-and-compliance/rules/reg-2-rule-5-new-source-review-of-toxic-air-contaminants?rule_version=2021%20Amendment

[11] BAAQMD. 2022. Interactive Data Maps. July. Available at: https://www.baaqmd.gov/about-air-quality/interactive-data-maps

TABLES

FIGURES

ATTACHMENT A
CalEEMod Output

TABLES

Table 1
Land Uses for Candlestick Point
Candlestick Point 2024 Modified Project Variant
San Francisco, CA

Actual Land Use[1]	Land Use Category	Land Use Subtype[2]	Unit Amount	Size Metric
R&D/Office	Commercial	Office Park	2,800	ksf
Residential	Residential	Apartments Mid Rise	7,218	DU
Community Uses	Recreational	Health Club	50	ksf
Film Arts Center	Recreational	Arena	64	ksf
Performance Venue	Recreational	Arena	5	ksf
Hotel	Recreational	Hotel	220	Rooms
Parks and Open Space	Recreational	City Park	106	Acres
Regional Retail	Retail	Regional Shopping Center	170	ksf
Neighborhood Retail	Retail	Strip Mall	135	ksf
Residential (Structured) Parking	Parking	Enclosed Parking Structure	7,218	Spaces
Commercial (Structured) Parking	Parking	Unenclosed Parking Structure	6,566	Spaces
On-street Parking	Parking	Parking lot	1,360	Spaces

Notes:

[1] Land uses associated with 2024 Modified Project Variant.

[2] Land uses as defined in CalEEMod. When an exact mapping of a land use was not available in CalEEMod relative to the project land use type, a category with similar emission characteristics was chosen.

Abbreviations:

CalEEMod - CALifornia Emissions Estimator MODel

DU - dwelling units

ksf - thousand square feet

References:

California Air Pollution Control Officers Association (CAPCOA). 2022. California Emissions Estimator Model (CalEEMod), Version 2022.1. Available online at http://www.caleemod.com/

Table 2
Energy Usage Emission Factors
Candlestick Point 2024 Modified Project Variant
San Francisco, CA

Historical Electricity Intensity

Electricity Data	Electricity Carbon Intensity Factor	Units
CO_2 Intensity Factor per Total Energy Delivered[1]	96	lbs CO_2/MWh delivered
CO_2e Intensity Factor per Total Energy Delivered[1]	98	lbs CO_2e/MWh delivered
CO_2 Intensity Factor per Total Fossil Fuel-Fired Energy[2]	895	lbs CO_2/MWh delivered
CO_2e Intensity Factor per Total Fossil Fuel-Fired Energy[2]	897	lbs CO_2e/MWh delivered

Estimated Intensity Factor for Total Energy Delivered

Year[3]	Electricity Carbon Intensity Factor[4,5]	Units
2030	96	lbs CO_2/MWh delivered
	98	lbs CO_2e/MWh delivered
2035 (90% Carbon-Free)	89	lbs CO_2/MWh delivered
	90	lbs CO_2e/MWh delivered
2038 (93% Carbon-Free)	63	lbs CO_2/MWh delivered
	63	lbs CO_2e/MWh delivered
2040 (95% Carbon-Free)	45	lbs CO_2/MWh delivered
	45	lbs CO_2e/MWh delivered

Natural Gas Emission Factors[6]

Greenhouse Gas	CO_2	CH_4	N_2O	CO_2e	Units
Global Warming Potential	1	25	298	-	-
Greenhouse Gas Emission Factor	117	1.0E-02	2.2E-04	117	lb/MMBTU
	5.3E-03	4.7E-07	1.0E-08	5.3E-03	MT/therm
Criteria Air Pollutant Emission Factor by Land Use Type	**ROG**	**NOx**	**PM_{10}**	**$PM_{2.5}$**	**Units**
Residential	0.011	0.092	7.5E-03	7.5E-03	lb/MMBtu
Nonresidential	0.011	0.10	7.5E-03	7.5E-03	lb/MMBtu

Notes:

1. This CO_2e intensity factor is the latest carbon intensity reported by PG&E, as reported in the 2021 Power Content Label. The intensity factor for CO_2 is conservatively calculated using CH_4 and N_2O emissions factors for PG&E from CalEEMod version 2022.1, as reported in Table G-3 in Appendix G of the CalEEMod User Guide.
2. This intensity factor is from the EPA's Emissions and Generation Resource Integrated Database (eGRID) for 2020. This CO_2 intensity factor is the output emission rate for fossil fuel sources of energy only in the California Independent System Operator's balancing authority area which includes PG&E and is assumed to remain constant. The intensity factor for CO_2e is conservatively calculated using CH_4 and N_2O emissions factors for PG&E from CalEEMod version 2022.1, as reported in Table G-3 in Appendix G of the CalEEMod User Guide.
3. The percentage of retail sales of electricity from carbon-free sources to California were assumed to be 90% by 2035, 95% by 2040, and 100% by 2045 are consistent with Senate Bill No. 1020. Consistent with the CPUC, a linear trend was assumed in between the target years. As a result, the carbon-free percentages for 2031-2034 and 2036-2039 were estimated by assuming a constant linear increase of 1% per year.
4. This intensity factor includes both fossil fuel and carbon-free sources of energy, such as nuclear. Diablo Canyon Nuclear Plant, which accounts for a portion of the carbon-free energy in this CO_2 intensity factor, is expected to be closed by 2024-2025 (https://www.pge.com/en_US/safety/how-the-system-works/diablo-canyon-power-plant/diablo-canyon-power-plant/engagement-panel.page). According to Senate Bill No. 1090 (approved 9/2018), "The [California Public Utilities] commission shall ensure that integrated resource plans are designed to avoid any increase in emissions of greenhouse gases as a result of the retirement of the Diablo Canyon Units 1 and 2 powerplant." This was incorporated into CPUC section 712.7(2)(b). Based on this information, the total CO_2 intensity factor was assumed to remain constant at the 2021 reported intensity factor for PG&E until 2031. The intensity factors for total energy delivered from 2035 and onwards were estimated by multiplying the percentage of energy delivered from fossil-fuel fired sources by the CO_2 emissions per total fossil-fuel fired energy presented above. The intensity factors between 2030 and 2035 were linearily interpolated.
5. Global Warming Potentials (GWP) are based on the IPCC Fourth Assessment Report. CH_4 and N_2O emission factors are from the CalEEMod version 2022.1 defaults for PG&E, and are conservatively assumed not to change from these estimates. As more renewable energy is integrated into the electricity grid, these intensity factors will also decrease.
6. Natural Gas Use emission factors are from Table G-4 of CalEEMod User's Guide Appendix G.

Abbreviations:

CalEEMod - California Emissions Estimator Model
CH_4 - methane
CO_2 - carbon dioxide
CO_2e - carbon dioxide equivalents
N_2O - nitrous oxide
CPUC - California Public Utilities Commission
EPA - Environmental Protection Agency
ROG - reactive organic gases
NO_X - nitrogen oxides
GWP - global warming potential
lb(s) - pound(s)
MMBtu - million British Thermal Units
MT - metric ton(s)
PG&E - Pacific Gas & Electric Company
MWh - megawatt hour
IPCC - Intergovernmental Panel on Climate Change
$PM_{2.5}$ - particulate matter less than 2.5 micrometers in diameter
PM_{10} - particulate matter less than 10 micrometers in diameter

References:

California Air Pollution Control Officers Association (CAPCOA). 2022. California Emissions Estimator Model (CalEEMod), Version 2022.1. Available online at http://www.caleemod.com/

IPCC. 2007. AR4 Climate Change 2007: The Physical Science Basis. Available online at: https://www.ipcc.ch/report/ar4/wg1/

SB-1020 Clean Energy, Jobs, and Affordability Act of 2022. Available at: https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=202120220SB1020

CPUC. 2020. California Public Utilities Commission RPS Compliance Frequently Asked Questions (FAQs). Available at: https://www.cpuc.ca.gov/-/media/cpuc-website/industries-and-topics/documents/energy/rps/rps-compliance-faq_2020.pdf. Accessed October 2022.

EPA. 2022. Emissions & Generation Resource Integrated Database (eGRID). Available at: https://www.epa.gov/egrid/download-data

PG&E 2021 Power Content Label. Available at: https://www.pge.com/pge_global/common/pdfs/your-account/your-bill/understand-your-bill/bill-inserts/2022/1022-Power-Content-Label.pdf. Accessed: October 2022.

Table 3
Project Daily Trip Rates
Candlestick Point 2024 Modified Project Variant
San Francisco, CA

Actual Land Use	CalEEMod Land Use Subtype[1]	Unit Amount	Size Metric	Project Trip Rates - from Transportation Engineer[2]	Project Trip Rates for CalEEMod[3]		
				[trips/day]	[trips/day/size metric]		
				Weekday	Weekday	Satuday	Sunday
R&D/Office	Office Park	2,800	ksf	11,151	3.98	0.59	0.27
Residential	Apartments Mid Rise	7,218	DU	17,444	2.42	2.18	1.82
Community Uses	Health Club	50	ksf	629	12.59	7.98	10.22
Film Arts Center	Arena	64	ksf	364	5.69	5.69	5.69
Performance Venue	Arena	5	ksf	240	48.01	48.01	48.01
Hotel	Hotel	220	Rooms	629	2.86	2.80	2.04
Parks and Open Space	City Park	106	Acres	23	0.22	0.56	0.62
Regional Retail	Regional Shopping Center	170	ksf	5,551	32.65	39.89	18.25
Neighborhood Retail	Strip Mall	135	ksf	2,193	16.30	15.47	7.52

Notes:

[1] CalEEMod default weekday trip generation rates for each land use were used to allocate the Project-specific total trips among each land use for modeling.

[2] Trip generation rates by land use were provided by the transportation engineer. Total daily trips were calculated by summing the AM and PM peak trips and multiplying by 5.

[3] Saturday and Sunday trip rates are adjusted based on the ratio of default Saturday and Sunday to default weekday trips from CalEEMod Appendix G-20.

Abbreviations:

CalEEMod - CALifornia Emissions Estimator MODel
DU - dwelling units
ksf - thousand square feet

References:

California Air Pollution Control Officers Association (CAPCOA). 2022. California Emissions Estimator Model (CalEEMod), Version 2022.1. Available online at http://www.caleemod.com/

Table 4
Operational CAP Emissions
Candlestick Point 2024 Modified Project Variant
San Francisco, CA

Category[1]	Candlestick Point[2]				
	ROG	NOx	CO	PM_{10}	$PM_{2.5}$
	(lb/day)				
Area Sources[3,6]	286	7.0	102	5.84	5.82
Architectural Coatings	*37*	--	--	--	--
Consumer Products	*150*	--	--	--	--
Hearths	--	--	*30*	*5.76*	*5.76*
Landscaping	*99*	*7.0*	*72*	*0.08*	*0.06*
Natural Gas Use	2.1	37	24	2.9	2.9
Mobile[4]	107	68	1009	306	79
Total	**395**	**112**	**1,135**	**315**	**87**
Emissions from EIR from CP[5]	666	265	2,276	1,029	197
Exceeds EIR?	**No**	**No**	**No**	**No**	**No**

Notes:

[1] Operational emissions calculated with CalEEMod version 2022.1.1.22.

[2] Daily ROG and NO_x emissions are reported under summer conditions and daily PM_{10} and $PM_{2.5}$ emissions are reported under winter conditions. Emissions from fireplaces during summer are not included for ROG and NOx emissions since the EIR does not report hearth emissions in summer.

[3] For consumer products, ROG emissions were calculated based an emissions factor of 1.46E-5 lb VOC/sqft-day from San Francisco planning's draft Air Quality and Greenhouse Gas Analysis Guidelines.

[4] Trip rates for Candlestick Point are based on a study by F&P. The total Saturday and Sunday daily trip rates were calculated based on CalEEMod default trip generation rates. Trip lengths for CAP emissions are from the EIR AQ section (Appendix H1).

[5] Emissions from Candlestick Point-Hunters Point Shipyard Phase II Development Plan EIR, Section III.H Air Quality, Table III.H-5 (2009).

[6] The italicized sources below are summed in this row. Totals may not be exactly equal to the sum due to rounding.

Abbreviations:

CalEEMod - CALifornia Emissions Estimator MODel
CAP - criteria air pollutant
CO - Carbon monoxide
EIR- Environmental Impact Report
F&P - Fehr and Peers
CP - Candlestick Point
lb/day - pounds per day
NOx - nitrogen oxides
PM_{10} - particulate matter less than 10 micrometers in diameter
$PM_{2.5}$ - particulate matter less than 2.5 micrometers in diameter
ROG - reactive organic gases

References:

California Air Pollution Control Officers Association (CAPCOA). 2022. California Emissions Estimator Model (CalEEMod), Version 2022.1. Available online at http://www.caleemod.com/

Table 5
Operational GHG Emissions
Candlestick Point 2024 Modified Project Variant
San Francisco, CA

Operational Emissions for Project, Buildout (2038)

GHG Emissions Source[1]	Candlestick Point CO_2e (MT/yr)
Area Sources[4]	589
Hearths	*370*
Landscaping	*220*
Energy	10,619
Electricity	*3,122*
Natural Gas Use	*7,497*
Water	481
Waste	3,205
Mobile	40,822
Refrigerants	17
Public Lighting[2]	651
Transit Service[2]	865
Total	**57,249**
GHG Emissions from EIR for CP[3]	101,798
Exceeds EIR?	**No**

Notes:

[1] Operational emissions calculated with CalEEMod version 2022.1.1.22.

[2] Emissions from public lighting and transit service are not calculated in CalEEMod. These emissions were conservatively included from the Candlestick Point-Hunters Point Shipyard Phase II Development Plan EIR, GHG Appendix S. Public lighting emissions are from Table 3-28 therein, while transit service emissions are from Table 3-36.

[3] GHG emissions from Candlestick Point-Hunters Point Shipyard Phase II Development Plan EIR, Section III.S Greenhouse Gas Emissions, Table III.S-4 (2009) and from GHG Appendix S, Table 3-36.

[4] The italicized sources below are summed in this row. Totals may not be exactly equal to the sum due to rounding.

Abbreviations:

CO_2e - Carbon dioxide equivalent

EIR - Environmental Impact Report

GHG - greenhouse gas

MT/yr - metric ton(s) per year

CP - Candlestick Point

References:

California Air Pollution Control Officers Association (CAPCOA). 2022. California Emissions Estimator Model (CalEEMod), Version 2022.1. Available online at http://www.caleemod.com/

Table 6
Traffic Turning Volumes for Candlestick Point Hunters Point Shipyard
Candlestick Point 2024 Modified Project Variant
San Francisco, CA

Intersection Number	Intersection	Project Added Turning Volumes[1]																							
		AM Peak Hour												PM Peak Hour											
		NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
9	Gilman Avenue/Third Street	13	124	6.0	134	137	22	12	412	7.0	37	482	162	98	196	18	222	195	21	30	625	9.0	25	594	233
27	Harney Way / US-101 SB Ramps	--	--	--	414	--	74	135	--	--	--	--	145	--	--	--	745	--	176	112	--	--	--	--	201
28	Harney Way / US-101 NB Ramps	--	--	--	280	--	--	--	440	--	--	111	488	--	--	--	313	--	--	--	598	--	--	244	921
29	Harney Way / Arelious Walker	233	507	--	--	426	--	--	--	193	--	--	--	225	717	--	--	817	--	--	--	380	--	--	--
32	Ingalls Street / Carroll Avenue	--	22	--	284	17	--	--	143	--	25	218	354	--	29	--	542	27	--	--	263	--	15	245	414
33	Ingalls Street / Egbert Avenue	--	22	17	--	42	--	--	--	--	21	--	--	--	29	43	--	42	--	--	--	--	13	--	--
34	Gilman Avenue / Arelious Walker	200	355	--	39	339	422	124	51	376	--	35	20	568	516	--	47	590	233	279	118	467	--	30	60
59	Harney Way / Executive Park Boulevard	--	--	--	--	--	--	--	440	--	--	111	--	--	--	--	--	--	--	--	598	--	--	0,244	--

Intersection Number	Intersection	Cumulative Traffic Turning Volumes[1]																							
		AM Peak Hour												PM Peak Hour											
		NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
9	Gilman Avenue/Third Street	40	1,451	63	162	904	182	135	941	23	51	540	154	87	1,318	56	226	1,762	225	167	845	128	61	690	235
27	Harney Way / US-101 SB Ramps	--	--	--	475	--	2,025	--	1,590	860	920	850	67	--	--	--	1,232	--	2,048	15	2,110	1,040	1,070	1,310	--
28	Harney Way / US-101 NB Ramps	640	--	670	19.0	--	--	1,360	762	--	--	1,133	960	870	--	1,190	--	--	--	1,740	1,404	--	--	1,527	690
29	Harney Way / Arelious Walker	445	595	--	--	498	70	90	--	395	--	--	--	495	827	--	--	1024	60	90	--	615	--	--	--
32	Ingalls Street / Carroll Avenue	20	160	30	383	148	10	20	266	10	50	296	458	20	181	20	647	164	10	10	348	20	51	386	493
33	Ingalls Street / Egbert Avenue	10	170	38	10	178	10	10	20	10	41	10	30	10	191	51	20	215	10	10	20	30	21	10	20
34	Gilman Avenue / Arelious Walker	273	282	10	135	391	369	308	183	494	10	91	142	368	528	10	210	583	215	175	416	337	10	232	186
59	Harney Way / Executive Park Boulevard	--	--	--	130	--	430	170	1002	--	--	843	200	--	--	--	200	--	210	540	1,534	--	--	1,397	380

Notes:

1. Traffic volumes for the 2024 Modified Project Variant were provided by Fehr and Peers. Traffic volumes include both Candlestick Point and Hunters Point Shipyard.

Abbreviations:

EBL - East Bound Left
EBT - East Bound Through
EBR - East Bound Right
NBL - North Bound Left
NBT - North Bound Through
NBR - North Bound Right
SBL - South Bound Left
SBT - South Bound Through
SBR - South Bound Right
WBL - West Bound Left
WBT - West Bound Through
WBR - West Bound Right

Table 7
PM2.5 Emission Factor Analysis
Candlestick Point 2024 Modified Project Variant
San Francisco, CA

Source[1]	$PM_{2.5}$ Emission Factor		Difference
	2010 FEIR Emission Factor[2]	2024 Modified Project Variant Emission Factor[3]	
	g/mile		%
Running Exhaust	0.016	0.0011	-93%
Running Non-Exhaust	0.0071	0.0068	-5%
Total Running	0.023	0.0078	-67%

Notes:

1. Running exhaust includes running exhaust. Running Non-Exhaust includes tire wear and brake wear.
2. The values shown are from the queuing analysis completed for the 2010 FEIR for arterial roads.
3. The values shown reflect a default fleet mix from EMFAC2021 for San Francisco in 2038.

Abbreviations:

g - grams

EMFAC - EMission FACtor model

$PM_{2.5}$ - particulate matter less than 2.5 micrometers in diameter

FEIR - Final Environmental Impact Report

Table 8
PM2.5 Analysis for Future Project Scenario
Candlestick Point 2024 Modified Project Variant
San Francisco, CA

Intersection Number	Intersection	2010 FEIR Intersection Traffic	2024 Modified Project Variant Traffic[1]	Change	Maximum $PM_{2.5}$ Concentration Near Intersection in FEIR	2024 Modified Project Variant $PM_{2.5}$ Concentration[2]	Threshold
		vehicles/day		%	$\mu g/m^3$		
9	Gilman Avenue/Third Street	14,645	19,070	0.30	0.19	0.083	0.2 Project Concentration
27	Harney Way/US-101 SB Ramps	8,920	10,010	0.12	0.11	0.041	
28	Harney Way/US-101 NB Ramps	15,200	16,975	0.12	0.11	0.041	
29	Harney Way/Arelious Walker	16,350	17,490	0.070	0.11	0.039	
59	Harney Way/Executive Park Boulevard	15,400	6,965	-0.55	0.11	0.017	
32	Ingalls Street/Carroll Avenue	11,885	12,990	0.093	0.055	0.020	
33	Ingalls Street/Egbert Avenue	1,095	1,145	0.046	0.055	0.019	
34	Gilman Avenue/Arelious Walker	17,735	24,345	0.37	0.18	0.085	

Notes:

1. Traffic volumes for the 2024 Modified Project Variant were provided by Fehr and Peers and are shown in Table 6. Traffic volumes were calculated by summing AM and PM peak hour volumes and multiplying this sum by 5.
2. Fleet wide average emission rates for exhaust, tirewear and brakewear were obtained from ARB's EMission FACtor model, EMFAC2021, for year 2038 and compared against emission rates used in the 2010 FEIR. The $PM_{2.5}$ concentrations from the 2010 FEIR were also scaled by this percent change in emission rates, which was a 67% reduction in emissions. Reduction calculations are shown in Table 7.
3. Background $PM_{2.5}$ concentrations are from the San Francisco Citywide Health Risk Assessment: Technical Support Documentation from February 2020.

Abbreviations:

APEZ - air pollution exposure zone
$PM_{2.5}$ - particulate matter less than 2.5 micrometers in diameter
$\mu g/m^3$ - micrograms per cubic meter
FEIR - Final Environmental Impact Report
N/A - not applicable

Table 9
Carbon Monoxide Analysis for Future Project Scenario
Candlestick Point 2024 Modified Project Variant
San Francisco, CA

Intersection[1]	Intersection #	Average Peak Hour Cumulative Traffic Volume[2]			2010 FEIR CO Concentrations		2024 Modified Project Variant CO Concentrations		2024 Modified Project Variant Cumulative CO Concentrations[3]	
		2010 FEIR	2024 Modified Project Variant	Change	One-Hour Average	Eight-Hour Average	One-Hour Average	Eight-Hour Average	One-Hour Average	Eight-Hour Average
		vehicles/peak hour		%	ppm					
Arelious Walker Dr/Gilman Ave	34	2,755	2,979	8.1%	0.60	0.40	0.65	0.43	3.1	2.0
Third St/Gilman Ave	9	5,060	5,223	3.2%	0.70	0.50	0.72	0.52	3.2	2.1
								Thresholds:	35 ppm Federal 20 ppm State	9 ppm Federal 9 ppm State

Notes:

1. The concentrations for the other two intersections analyzed in the 2010 Project (Griffith Street/Palou Avenue and Evans Avenue/Jennings Street) are calculated in the 2018 Modified Project Variant. These intersections are off-site near HPS2 and are not expected to be affected by the 2024 Modified Project Variant, which does not change the HPS2 land uses.
2. Average peak hour is calculated by taking the average of the AM and PM cumulative peak hour traffic data provided by Fehr and Peers shown in Table 6 for the intersections above.
3. Cumulative impacts are project impacts plus the background CO concentration. Background CO concentration is from the 2010 FEIR and is 2.5 ppm for the one-hour average and 1.6 ppm for the eight-hour average.

Abbreviations:

CO - carbon monoxide
ppm - parts per million
FEIR - Final Environmental Impact Report
HPS2 - Hunters Point Shipyard Phase II

FIGURES

LEGEND

- Cancer Risk > 10 in a million
- Cancer Risk > 6 in a million; HI > 1.0
- R&D Sources
- R&D Parcels
- CP Project Boundary

0 250 500 Feet

OPERATIONAL ANALYSIS
RESEARCH & DEVELOPMENT CANCER RISK

Candlestick Point - Hunters Point Shipyard Phase II
San Francisco, California

FIGURE 01

RAMBOLL AMERICAS ENGINEERING SOLUTIONS, INC.

RAMBOLL

ATTACHMENT A
CalEEMod Output

Candlestick Detailed Report

Table of Contents

1. Basic Project Information

1.1. Basic Project Information

Data Field	Value
Project Name	Candlestick
Operational Year	2038
Lead Agency	—
Land Use Scale	Project/site
Analysis Level for Defaults	County
Windspeed (m/s)	4.60
Precipitation (days)	2.60
Location	Candlestick Point State Recreation Area, 500 Hunters Point Expy, San Francisco, CA 94124, USA
County	San Francisco
City	San Francisco
Air District	Bay Area AQMD
Air Basin	San Francisco Bay Area
TAZ	1153
EDFZ	1
Electric Utility	Pacific Gas & Electric Company
Gas Utility	Pacific Gas & Electric
App Version	2022.1.1.22

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
Parking Lot	1,360	Space	5.00	0.00	0.00	0.00	—	On-street Parking

Health Club	50.0	1000sqft	0.47	50,000	0.00	0.00	—	Community Use
Arena	5.00	1000sqft	0.66	5,000	0.00	0.00	—	Performance Venue
Arena	64.0	1000sqft	8.41	64,000	0.00	0.00	—	Film Arts Center
Hotel	220	Room	3.00	130,000	0.00	0.00	—	Hotel
Strip Mall	135	1000sqft	1.26	134,500	0.00	0.00	—	Neighborhood Retail
Unenclosed Parking Structure	6,566	Space	24.2	2,626,400	0.00	0.00	—	Commercial (Structured) Parking
Enclosed Parking Structure	7,218	Space	26.6	2,887,200	0.00	0.00	—	Residential (Structured) Parking
City Park	106	Acre	106	0.00	0.00	0.00	—	Parks and Open Space
Regional Shopping Center	170	1000sqft	1.60	170,000	0.00	0.00	—	Regional Retail
Office Park	2,800	1000sqft	26.3	2,800,000	0.00	0.00	—	R&D/Innovation District
Apartments Mid Rise	7,218	Dwelling Unit	77.6	6,929,280	0.00	0.00	16,818	Residential

1.3. User-Selected Emission Reduction Measures by Emissions Sector

No measures selected

2. Emissions Summary

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.	238	399	183	1,929	3.60	10.7	304	315	10.4	77.4	87.8	6,117	451,205	457,323	640	12.9	287	477,449

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	131	299	188	1,064	3.43	9.81	304	314	9.73	77.4	87.1	6,117	435,551	441,668	640	13.8	106	461,888
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	158	328	107	1,274	2.64	4.46	263	267	4.29	66.8	71.1	6,117	310,882	316,999	637	11.9	171	336,632
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	28.8	59.9	19.6	232	0.48	0.81	48.0	48.8	0.78	12.2	13.0	1,013	51,470	52,483	105	1.97	28.3	55,733

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	120	107	67.9	1,077	2.88	1.18	304	306	1.10	77.4	78.5	—	294,279	294,279	11.1	10.0	185	297,732
Area	115	290	78.3	828	0.50	6.63	—	6.63	6.42	—	6.42	0.00	93,110	93,110	1.82	0.19	—	93,213
Energy	4.16	2.08	36.8	24.3	0.23	2.88	—	2.88	2.88	—	2.88	—	63,430	63,430	13.6	1.25	—	64,140
Water	—	—	—	—	—	—	—	—	—	—	—	585	386	971	60.2	1.45	—	2,907
Waste	—	—	—	—	—	—	—	—	—	—	—	5,532	0.00	5,532	553	0.00	—	19,356
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	102	102
Total	238	399	183	1,929	3.60	10.7	304	315	10.4	77.4	87.8	6,117	451,205	457,323	640	12.9	287	477,449
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	118	106	79.5	1,009	2.75	1.18	304	306	1.10	77.4	78.5	—	281,306	281,306	11.6	10.9	4.81	284,860
Area	8.34	191	71.2	30.3	0.45	5.76	—	5.76	5.76	—	5.76	0.00	90,429	90,429	1.70	0.17	—	90,522

Energy	4.16	2.08	36.8	24.3	0.23	2.88	—	2.88	2.88	—	2.88	—	63,430	63,430	13.6	1.25	—	64,140
Water	—	—	—	—	—	—	—	—	—	—	—	585	386	971	60.2	1.45	—	2,907
Waste	—	—	—	—	—	—	—	—	—	—	—	5,532	0.00	5,532	553	0.00	—	19,356
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	102	102
Total	131	299	188	1,064	3.43	9.81	304	314	9.73	77.4	87.1	6,117	435,551	441,668	640	13.8	106	461,888
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	101	90.4	65.3	856	2.38	1.02	263	264	0.95	66.8	67.7	—	243,514	243,514	9.87	9.19	69.2	246,568
Area	52.6	236	5.22	394	0.03	0.57	—	0.57	0.47	—	0.47	0.00	3,552	3,552	0.10	0.02	—	3,559
Energy	4.16	2.08	36.8	24.3	0.23	2.88	—	2.88	2.88	—	2.88	—	63,430	63,430	13.6	1.25	—	64,140
Water	—	—	—	—	—	—	—	—	—	—	—	585	386	971	60.2	1.45	—	2,907
Waste	—	—	—	—	—	—	—	—	—	—	—	5,532	0.00	5,532	553	0.00	—	19,356
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	102	102
Total	158	328	107	1,274	2.64	4.46	263	267	4.29	66.8	71.1	6,117	310,882	316,999	637	11.9	171	336,632
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	18.5	16.5	11.9	156	0.43	0.19	48.0	48.1	0.17	12.2	12.4	—	40,316	40,316	1.63	1.52	11.5	40,822
Area	9.59	43.0	0.95	71.9	0.01	0.10	—	0.10	0.08	—	0.08	0.00	588	588	0.02	< 0.005	—	589
Energy	0.76	0.38	6.72	4.43	0.04	0.52	—	0.52	0.52	—	0.52	—	10,502	10,502	2.25	0.21	—	10,619
Water	—	—	—	—	—	—	—	—	—	—	—	96.8	64.0	161	9.96	0.24	—	481
Waste	—	—	—	—	—	—	—	—	—	—	—	916	0.00	916	91.5	0.00	—	3,205
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	16.8	16.8
Total	28.8	59.9	19.6	232	0.48	0.81	48.0	48.8	0.78	12.2	13.0	1,013	51,470	52,483	105	1.97	28.3	55,733

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
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
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
Health Club	1.90	1.70	1.07	17.0	0.05	0.02	4.78	4.80	0.02	1.22	1.23	—	4,625	4,625	0.18	0.16	2.91	4,679
Arena	1.82	1.63	1.03	16.3	0.04	0.02	4.59	4.61	0.02	1.17	1.18	—	4,439	4,439	0.17	0.15	2.79	4,491
Hotel	1.90	1.70	1.07	16.9	0.05	0.02	4.78	4.80	0.02	1.22	1.23	—	4,622	4,622	0.17	0.16	2.91	4,677
Strip Mall	6.60	5.91	3.73	59.0	0.16	0.06	16.7	16.7	0.06	4.23	4.29	—	16,106	16,106	0.61	0.55	10.1	16,296
Unenclosed Parking Structure	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Enclosed Parking Structure	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
City Park	0.20	0.18	0.11	1.77	< 0.005	< 0.005	0.50	0.50	< 0.005	0.13	0.13	—	483	483	0.02	0.02	0.30	488
Regional Shopping Center	20.4	18.3	11.5	183	0.49	0.20	51.5	51.7	0.19	13.1	13.3	—	49,819	49,819	1.89	1.70	31.4	50,405
Office Park	33.6	30.1	18.9	300	0.80	0.33	84.7	85.0	0.31	21.5	21.8	—	81,870	81,870	3.10	2.80	51.5	82,833
Apartments Mid Rise	53.3	47.6	30.4	483	1.29	0.53	137	137	0.49	34.8	35.3	—	132,314	132,314	4.97	4.50	83.4	133,862
Total	120	107	67.9	1,077	2.88	1.18	304	306	1.10	77.4	78.5	—	294,279	294,279	11.1	10.0	185	297,732
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

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
Health Club	1.88	1.68	1.25	15.9	0.04	0.02	4.78	4.80	0.02	1.22	1.23	—	4,421	4,421	0.18	0.17	0.08	4,477
Arena	1.80	1.61	1.20	15.3	0.04	0.02	4.59	4.61	0.02	1.17	1.18	—	4,243	4,243	0.18	0.17	0.07	4,297
Hotel	1.88	1.68	1.25	15.9	0.04	0.02	4.78	4.80	0.02	1.22	1.23	—	4,419	4,419	0.18	0.17	0.08	4,475
Strip Mall	6.54	5.85	4.37	55.4	0.15	0.06	16.7	16.7	0.06	4.23	4.29	—	15,397	15,397	0.64	0.60	0.26	15,592
Unenclosed Parking Structure	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Enclosed Parking Structure	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
City Park	0.20	0.18	0.13	1.66	< 0.005	< 0.005	0.50	0.50	< 0.005	0.13	0.13	—	462	462	0.02	0.02	0.01	467
Regional Shopping Center	20.2	18.1	13.5	171	0.47	0.20	51.5	51.7	0.19	13.1	13.3	—	47,624	47,624	1.98	1.86	0.81	48,228
Office Park	33.2	29.7	22.2	281	0.77	0.33	84.7	85.0	0.31	21.5	21.8	—	78,263	78,263	3.25	3.05	1.34	79,254
Apartments Mid Rise	52.7	47.1	35.6	452	1.24	0.53	137	137	0.49	34.8	35.3	—	126,478	126,478	5.21	4.90	2.16	128,071
Total	118	106	79.5	1,009	2.75	1.18	304	306	1.10	77.4	78.5	—	281,306	281,306	11.6	10.9	4.81	284,860
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
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
Health Club	0.31	0.28	0.20	2.62	0.01	< 0.005	0.80	0.81	< 0.005	0.20	0.21	—	675	675	0.03	0.03	0.19	683
Arena	0.33	0.29	0.21	2.73	0.01	< 0.005	0.84	0.84	< 0.005	0.21	0.22	—	704	704	0.03	0.03	0.20	712
Hotel	0.32	0.29	0.21	2.72	0.01	< 0.005	0.83	0.84	< 0.005	0.21	0.21	—	700	700	0.03	0.03	0.20	709
Strip Mall	1.08	0.97	0.69	9.08	0.03	0.01	2.78	2.79	0.01	0.71	0.72	—	2,338	2,338	0.10	0.09	0.66	2,367

Unenclosed	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Enclosed Parking Structure	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
City Park	0.02	0.02	0.01	0.16	< 0.005	< 0.005	0.05	0.05	< 0.005	0.01	0.01	—	40.2	40.2	< 0.005	< 0.005	0.01	40.7
Regional Shopping Center	2.90	2.59	1.86	24.3	0.07	0.03	7.44	7.47	0.03	1.89	1.92	—	6,260	6,260	0.26	0.24	1.78	6,339
Office Park	4.47	4.00	2.87	37.5	0.10	0.04	11.5	11.5	0.04	2.92	2.96	—	9,669	9,669	0.39	0.37	2.75	9,791
Apartments Mid Rise	9.05	8.07	5.87	77.0	0.21	0.09	23.7	23.8	0.09	6.03	6.11	—	19,930	19,930	0.80	0.75	5.66	20,179
Total	18.5	16.5	11.9	156	0.43	0.19	48.0	48.1	0.17	12.2	12.4	—	40,316	40,316	1.63	1.52	11.5	40,822

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
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	—	32.9	32.9	0.02	< 0.005	—	34.0
Health Club	—	—	—	—	—	—	—	—	—	—	—	—	94.2	94.2	0.05	0.01	—	97.2
Arena	—	—	—	—	—	—	—	—	—	—	—	—	130	130	0.07	0.01	—	134
Hotel	—	—	—	—	—	—	—	—	—	—	—	—	148	148	0.08	0.01	—	153
Strip Mall	—	—	—	—	—	—	—	—	—	—	—	—	198	198	0.10	0.01	—	205

Unenclos Parking Structure	—	—	—	—	—	—	—	—	—	—	—	—	1,191	1,191	0.62	0.08	—	1,229
Enclosed Parking Structure	—	—	—	—	—	—	—	—	—	—	—	—	1,745	1,745	0.91	0.11	—	1,801
City Park	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Regional Shopping Center	—	—	—	—	—	—	—	—	—	—	—	—	251	251	0.13	0.02	—	259
Office Park	—	—	—	—	—	—	—	—	—	—	—	—	10,231	10,231	5.36	0.65	—	10,558
Apartments Mid Rise	—	—	—	—	—	—	—	—	—	—	—	—	4,250	4,250	2.23	0.27	—	4,386
Total	—	—	—	—	—	—	—	—	—	—	—	—	18,271	18,271	9.57	1.16	—	18,856
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	—	32.9	32.9	0.02	< 0.005	—	34.0
Health Club	—	—	—	—	—	—	—	—	—	—	—	—	94.2	94.2	0.05	0.01	—	97.2
Arena	—	—	—	—	—	—	—	—	—	—	—	—	130	130	0.07	0.01	—	134
Hotel	—	—	—	—	—	—	—	—	—	—	—	—	148	148	0.08	0.01	—	153
Strip Mall	—	—	—	—	—	—	—	—	—	—	—	—	198	198	0.10	0.01	—	205
Unenclosed Parking Structure	—	—	—	—	—	—	—	—	—	—	—	—	1,191	1,191	0.62	0.08	—	1,229
Enclosed Parking Structure	—	—	—	—	—	—	—	—	—	—	—	—	1,745	1,745	0.91	0.11	—	1,801
City Park	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00

Regional Shopping Center	—	—	—	—	—	—	—	—	—	—	—	—	251	251	0.13	0.02	—	259
Office Park	—	—	—	—	—	—	—	—	—	—	—	—	10,231	10,231	5.36	0.65	—	10,558
Apartments Mid Rise	—	—	—	—	—	—	—	—	—	—	—	—	4,250	4,250	2.23	0.27	—	4,386
Total	—	—	—	—	—	—	—	—	—	—	—	—	18,271	18,271	9.57	1.16	—	18,856
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	—	5.46	5.46	< 0.005	< 0.005	—	5.63
Health Club	—	—	—	—	—	—	—	—	—	—	—	—	15.6	15.6	0.01	< 0.005	—	16.1
Arena	—	—	—	—	—	—	—	—	—	—	—	—	21.5	21.5	0.01	< 0.005	—	22.2
Hotel	—	—	—	—	—	—	—	—	—	—	—	—	24.6	24.6	0.01	< 0.005	—	25.3
Strip Mall	—	—	—	—	—	—	—	—	—	—	—	—	32.8	32.8	0.02	< 0.005	—	33.9
Unenclosed Parking Structure	—	—	—	—	—	—	—	—	—	—	—	—	197	197	0.10	0.01	—	204
Enclosed Parking Structure	—	—	—	—	—	—	—	—	—	—	—	—	289	289	0.15	0.02	—	298
City Park	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Regional Shopping Center	—	—	—	—	—	—	—	—	—	—	—	—	41.5	41.5	0.02	< 0.005	—	42.8
Office Park	—	—	—	—	—	—	—	—	—	—	—	—	1,694	1,694	0.89	0.11	—	1,748
Apartments Mid Rise	—	—	—	—	—	—	—	—	—	—	—	—	704	704	0.37	0.04	—	726
Total	—	—	—	—	—	—	—	—	—	—	—	—	3,025	3,025	1.58	0.19	—	3,122

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)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
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
Health Club	0.06	0.03	0.59	0.49	< 0.005	0.04	—	0.04	0.04	—	0.04	—	702	702	0.06	< 0.005	—	704
Arena	0.09	0.04	0.81	0.68	< 0.005	0.06	—	0.06	0.06	—	0.06	—	968	968	0.09	< 0.005	—	971
Hotel	0.12	0.06	1.05	0.88	0.01	0.08	—	0.08	0.08	—	0.08	—	1,254	1,254	0.11	< 0.005	—	1,257
Strip Mall	0.02	0.01	0.21	0.17	< 0.005	0.02	—	0.02	0.02	—	0.02	—	246	246	0.02	< 0.005	—	246
Unenclosed Parking Structure	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Enclosed Parking Structure	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
City Park	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Regional Shopping Center	0.03	0.01	0.26	0.22	< 0.005	0.02	—	0.02	0.02	—	0.02	—	310	310	0.03	< 0.005	—	311
Office Park	1.96	0.98	17.9	15.0	0.11	1.36	—	1.36	1.36	—	1.36	—	21,313	21,313	1.89	0.04	—	21,372
Apartments Mid Rise	1.88	0.94	16.0	6.83	0.10	1.30	—	1.30	1.30	—	1.30	—	20,366	20,366	1.80	0.04	—	20,423
Total	4.16	2.08	36.8	24.3	0.23	2.88	—	2.88	2.88	—	2.88	—	45,159	45,159	4.00	0.09	—	45,284

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
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
Health Club	0.06	0.03	0.59	0.49	< 0.005	0.04	—	0.04	0.04	—	0.04	—	702	702	0.06	< 0.005	—	704
Arena	0.09	0.04	0.81	0.68	< 0.005	0.06	—	0.06	0.06	—	0.06	—	968	968	0.09	< 0.005	—	971
Hotel	0.12	0.06	1.05	0.88	0.01	0.08	—	0.08	0.08	—	0.08	—	1,254	1,254	0.11	< 0.005	—	1,257
Strip Mall	0.02	0.01	0.21	0.17	< 0.005	0.02	—	0.02	0.02	—	0.02	—	246	246	0.02	< 0.005	—	246
Unenclosed Parking Structure	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Enclosed Parking Structure	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
City Park	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Regional Shopping Center	0.03	0.01	0.26	0.22	< 0.005	0.02	—	0.02	0.02	—	0.02	—	310	310	0.03	< 0.005	—	311
Office Park	1.96	0.98	17.9	15.0	0.11	1.36	—	1.36	1.36	—	1.36	—	21,313	21,313	1.89	0.04	—	21,372
Apartments Mid Rise	1.88	0.94	16.0	6.83	0.10	1.30	—	1.30	1.30	—	1.30	—	20,366	20,366	1.80	0.04	—	20,423
Total	4.16	2.08	36.8	24.3	0.23	2.88	—	2.88	2.88	—	2.88	—	45,159	45,159	4.00	0.09	—	45,284
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
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
Health Club	0.01	0.01	0.11	0.09	< 0.005	0.01	—	0.01	0.01	—	0.01	—	116	116	0.01	< 0.005	—	116
Arena	0.02	0.01	0.15	0.12	< 0.005	0.01	—	0.01	0.01	—	0.01	—	160	160	0.01	< 0.005	—	161

Hotel	0.02	0.01	0.19	0.16	< 0.005	0.01	—	0.01	0.01	—	0.01	—	208	208	0.02	< 0.005	—	208
Strip Mall	< 0.005	< 0.005	0.04	0.03	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	40.7	40.7	< 0.005	< 0.005	—	40.8
Unenclosed Parking Structure	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Enclosed Parking Structure	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
City Park	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Regional Shopping Center	0.01	< 0.005	0.05	0.04	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	51.4	51.4	< 0.005	< 0.005	—	51.5
Office Park	0.36	0.18	3.26	2.74	0.02	0.25	—	0.25	0.25	—	0.25	—	3,529	3,529	0.31	0.01	—	3,538
Apartments Mid Rise	0.34	0.17	2.93	1.25	0.02	0.24	—	0.24	0.24	—	0.24	—	3,372	3,372	0.30	0.01	—	3,381
Total	0.76	0.38	6.72	4.43	0.04	0.52	—	0.52	0.52	—	0.52	—	7,477	7,477	0.66	0.01	—	7,497

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	8.34	4.17	71.2	30.3	0.45	5.76	—	5.76	5.76	—	5.76	0.00	90,429	90,429	1.70	0.17	—	90,522
Consumer Products	—	150	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Architectural	—	36.7	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	106	98.9	7.02	797	0.04	0.87	—	0.87	0.66	—	0.66	—	2,681	2,681	0.11	0.02	—	2,690
Total	115	290	78.3	828	0.50	6.63	—	6.63	6.42	—	6.42	0.00	93,110	93,110	1.82	0.19	—	93,213
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hearths	8.34	4.17	71.2	30.3	0.45	5.76	—	5.76	5.76	—	5.76	0.00	90,429	90,429	1.70	0.17	—	90,522
Consumer Products	—	150	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	—	36.7	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	8.34	191	71.2	30.3	0.45	5.76	—	5.76	5.76	—	5.76	0.00	90,429	90,429	1.70	0.17	—	90,522
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hearths	0.04	0.02	0.32	0.14	< 0.005	0.03	—	0.03	0.03	—	0.03	0.00	369	369	0.01	< 0.005	—	370
Consumer Products	—	27.4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	—	6.69	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	9.56	8.90	0.63	71.8	< 0.005	0.08	—	0.08	0.06	—	0.06	—	219	219	0.01	< 0.005	—	220
Total	9.59	43.0	0.95	71.9	0.01	0.10	—	0.10	0.08	—	0.08	0.00	588	588	0.02	< 0.005	—	589

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)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Health Club	—	—	—	—	—	—	—	—	—	—	—	0.83	0.59	1.42	0.09	< 0.005	—	4.16
Arena	—	—	—	—	—	—	—	—	—	—	—	5.57	3.44	9.01	0.57	0.01	—	27.5
Hotel	—	—	—	—	—	—	—	—	—	—	—	16.5	10.7	27.1	1.69	0.04	—	81.6
Strip Mall	—	—	—	—	—	—	—	—	—	—	—	6.57	4.13	10.7	0.68	0.02	—	32.4
Unenclosed Parking Structure	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Enclosed Parking Structure	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
City Park	—	—	—	—	—	—	—	—	—	—	—	0.00	20.0	20.0	0.01	< 0.005	—	20.6
Regional Shopping Center	—	—	—	—	—	—	—	—	—	—	—	8.44	6.83	15.3	0.87	0.02	—	43.2
Office Park	—	—	—	—	—	—	—	—	—	—	—	59.9	42.8	103	6.17	0.15	—	301
Apartments Mid Rise	—	—	—	—	—	—	—	—	—	—	—	487	298	785	50.1	1.21	—	2,397
Total	—	—	—	—	—	—	—	—	—	—	—	585	386	971	60.2	1.45	—	2,907

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Health Club	—	—	—	—	—	—	—	—	—	—	—	0.83	0.59	1.42	0.09	< 0.005	—	4.16
Arena	—	—	—	—	—	—	—	—	—	—	—	5.57	3.44	9.01	0.57	0.01	—	27.5
Hotel	—	—	—	—	—	—	—	—	—	—	—	16.5	10.7	27.1	1.69	0.04	—	81.6
Strip Mall	—	—	—	—	—	—	—	—	—	—	—	6.57	4.13	10.7	0.68	0.02	—	32.4
Unenclosed Parking Structure	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Enclosed Parking Structure	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
City Park	—	—	—	—	—	—	—	—	—	—	—	0.00	20.0	20.0	0.01	< 0.005	—	20.6
Regional Shopping Center	—	—	—	—	—	—	—	—	—	—	—	8.44	6.83	15.3	0.87	0.02	—	43.2
Office Park	—	—	—	—	—	—	—	—	—	—	—	59.9	42.8	103	6.17	0.15	—	301
Apartments Mid Rise	—	—	—	—	—	—	—	—	—	—	—	487	298	785	50.1	1.21	—	2,397
Total	—	—	—	—	—	—	—	—	—	—	—	585	386	971	60.2	1.45	—	2,907
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Health Club	—	—	—	—	—	—	—	—	—	—	—	0.14	0.10	0.24	0.01	< 0.005	—	0.69
Arena	—	—	—	—	—	—	—	—	—	—	—	0.92	0.57	1.49	0.09	< 0.005	—	4.55

Hotel	—	—	—	—	—	—	—	—	—	—	—	2.72	1.76	4.49	0.28	0.01	—	13.5
Strip Mall	—	—	—	—	—	—	—	—	—	—	—	1.09	0.68	1.77	0.11	< 0.005	—	5.37
Unenclosed Parking Structure	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Enclosed Parking Structure	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
City Park	—	—	—	—	—	—	—	—	—	—	—	0.00	3.31	3.31	< 0.005	< 0.005	—	3.41
Regional Shopping Center	—	—	—	—	—	—	—	—	—	—	—	1.40	1.13	2.53	0.14	< 0.005	—	7.16
Office Park	—	—	—	—	—	—	—	—	—	—	—	9.92	7.09	17.0	1.02	0.02	—	49.9
Apartments Mid Rise	—	—	—	—	—	—	—	—	—	—	—	80.6	49.3	130	8.29	0.20	—	397
Total	—	—	—	—	—	—	—	—	—	—	—	96.8	64.0	161	9.96	0.24	—	481

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)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Health Club	—	—	—	—	—	—	—	—	—	—	—	25.3	0.00	25.3	2.53	0.00	—	88.6

Arena	—	—	—	—	—	—	—	—	—	—	—	0.37	0.00	0.37	0.04	0.00	—	1.30
Hotel	—	—	—	—	—	—	—	—	—	—	—	109	0.00	109	10.9	0.00	—	382
Strip Mall	—	—	—	—	—	—	—	—	—	—	—	76.1	0.00	76.1	7.61	0.00	—	266
Unenclosed Parking Structure	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Enclosed Parking Structure	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
City Park	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Regional Shopping Center	—	—	—	—	—	—	—	—	—	—	—	96.2	0.00	96.2	9.61	0.00	—	337
Office Park	—	—	—	—	—	—	—	—	—	—	—	1,418	0.00	1,418	142	0.00	—	4,963
Apartments Mid Rise	—	—	—	—	—	—	—	—	—	—	—	3,807	0.00	3,807	380	0.00	—	13,319
Total	—	—	—	—	—	—	—	—	—	—	—	5,532	0.00	5,532	553	0.00	—	19,356
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Health Club	—	—	—	—	—	—	—	—	—	—	—	25.3	0.00	25.3	2.53	0.00	—	88.6
Arena	—	—	—	—	—	—	—	—	—	—	—	0.37	0.00	0.37	0.04	0.00	—	1.30
Hotel	—	—	—	—	—	—	—	—	—	—	—	109	0.00	109	10.9	0.00	—	382
Strip Mall	—	—	—	—	—	—	—	—	—	—	—	76.1	0.00	76.1	7.61	0.00	—	266
Unenclosed Parking Structure	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00

Enclosed Parking Structure	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
City Park	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Regional Shopping Center	—	—	—	—	—	—	—	—	—	—	—	96.2	0.00	96.2	9.61	0.00	—	337
Office Park	—	—	—	—	—	—	—	—	—	—	—	1,418	0.00	1,418	142	0.00	—	4,963
Apartments Mid Rise	—	—	—	—	—	—	—	—	—	—	—	3,807	0.00	3,807	380	0.00	—	13,319
Total	—	—	—	—	—	—	—	—	—	—	—	5,532	0.00	5,532	553	0.00	—	19,356
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Health Club	—	—	—	—	—	—	—	—	—	—	—	4.19	0.00	4.19	0.42	0.00	—	14.7
Arena	—	—	—	—	—	—	—	—	—	—	—	0.06	0.00	0.06	0.01	0.00	—	0.22
Hotel	—	—	—	—	—	—	—	—	—	—	—	18.1	0.00	18.1	1.80	0.00	—	63.2
Strip Mall	—	—	—	—	—	—	—	—	—	—	—	12.6	0.00	12.6	1.26	0.00	—	44.1
Unenclosed Parking Structure	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Enclosed Parking Structure	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
City Park	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Regional Shopping Center	—	—	—	—	—	—	—	—	—	—	—	15.9	0.00	15.9	1.59	0.00	—	55.7
Office Park	—	—	—	—	—	—	—	—	—	—	—	235	0.00	235	23.5	0.00	—	822

Apartme Mid Rise	—	—	—	—	—	—	—	—	—	—	—	630	0.00	630	63.0	0.00	—	2,205
Total	—	—	—	—	—	—	—	—	—	—	—	916	0.00	916	91.5	0.00	—	3,205

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)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Health Club	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.11	0.11
Arena	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.17	0.17
Hotel	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	73.0	73.0
Strip Mall	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.34	0.34
City Park	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00
Regional Shopping Center	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.38	0.38
Office Park	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2.85	2.85
Apartments Mid Rise	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	24.7	24.7
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	102	102
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Health Club	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.11	0.11
Arena	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.17	0.17
Hotel	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	73.0	73.0
Strip Mall	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.34	0.34
City Park	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00
Regional Shopping Center	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.38	0.38
Office Park	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2.85	2.85
Apartments Mid Rise	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	24.7	24.7
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	102	102
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Health Club	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.02	0.02
Arena	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.03	0.03
Hotel	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	12.1	12.1
Strip Mall	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.06	0.06
City Park	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00
Regional Shopping Center	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.06	0.06
Office Park	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.47	0.47
Apartments Mid Rise	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4.09	4.09
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	16.8	16.8

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

5. Activity Data

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
Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Health Club	630	399	511	211,591	6,736	4,270	5,468	2,263,962
Arena	240	240	240	87,627	2,569	2,569	2,569	937,584
Arena	364	364	364	132,932	3,897	3,897	3,897	1,422,332
Hotel	629	616	449	219,585	6,733	6,592	4,803	2,349,499
Strip Mall	2,193	2,081	1,012	732,884	23,460	22,265	10,823	7,841,654
Unenclosed Parking Structure	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Enclosed Parking Structure	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
City Park	23.3	59.4	65.7	12,603	250	635	703	134,850
Regional Shopping Center	5,551	6,782	3,103	1,962,660	59,395	72,565	33,199	20,999,917
Office Park	11,145	1,652	756	3,031,263	119,250	17,678	8,090	32,433,666
Apartments Mid Rise	17,468	15,735	13,137	6,059,511	192,842	173,717	145,030	66,897,001

5.10. Operational Area Sources

5.10.1. Hearths

5.10.1.1. Unmitigated

Hearth Type	Unmitigated (number)

Apartments Mid Rise	—
Wood Fireplaces	0
Gas Fireplaces	3681
Propane Fireplaces	0
Electric Fireplaces	0
No Fireplaces	3537
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)
14031792	4,677,264	5,129,639	1,687,793	145,593

5.10.3. Landscape Equipment

Season	Unit	Value
Snow Days	day/yr	0.00
Summer Days	day/yr	180

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)
Parking Lot	190,896	63.0	0.0330	0.0040	0.00

Health Club	545,507	63.0	0.0330	0.0040	2,189,455
Arena	54,551	63.0	0.0330	0.0040	218,946
Arena	698,249	63.0	0.0330	0.0040	2,802,503
Hotel	859,278	63.0	0.0330	0.0040	3,912,618
Strip Mall	1,149,299	63.0	0.0330	0.0040	766,458
Unenclosed Parking Structure	6,902,179	63.0	0.0330	0.0040	0.00
Enclosed Parking Structure	10,109,333	63.0	0.0330	0.0040	0.00
City Park	0.00	63.0	0.0330	0.0040	0.00
Regional Shopping Center	1,452,645	63.0	0.0330	0.0040	968,758
Office Park	59,272,173	63.0	0.0330	0.0040	66,500,812
Apartments Mid Rise	24,623,852	63.0	0.0330	0.0040	63,547,785

5.12. Operational Water and Wastewater Consumption

5.12.1. Unmitigated

Land Use	Indoor Water (gal/year)	Outdoor Water (gal/year)
Parking Lot	0.00	0.00
Health Club	431,463	131,921
Arena	1,663,705	9,918
Arena	1,244,865	208,923
Hotel	8,588,017	1,243,371
Strip Mall	3,426,925	350,035
Unenclosed Parking Structure	0.00	0.00
Enclosed Parking Structure	0.00	0.00
City Park	0.00	23,451,705
Regional Shopping Center	4,402,321	2,240,460
Office Park	31,265,551	9,270,879

Apartments Mid Rise	254,185,733	16,173,311

5.13. Operational Waste Generation

5.13.1. Unmitigated

Land Use	Waste (ton/year)	Cogeneration (kWh/year)
Parking Lot	0.00	—
Health Club	47.0	—
Arena	0.05	—
Arena	0.64	—
Hotel	202	—
Strip Mall	141	—
Unenclosed Parking Structure	0.00	—
Enclosed Parking Structure	0.00	—
City Park	0.00	—
Regional Shopping Center	179	—
Office Park	2,632	—
Apartments Mid Rise	7,064	—

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
Health Club	Other commercial A/C and heat pumps	R-410A	750	< 0.005	4.00	4.00	18.0
Health Club	Stand-alone retail refrigerators and freezers	R-134a	750	0.04	1.00	0.00	1.00

Arena	Other commercial A/C and heat pumps	R-410A	750	< 0.005	4.00	4.00	18.0
Arena	Stand-alone retail refrigerators and freezers	R-134a	750	0.04	1.00	0.00	1.00
Arena	Walk-in refrigerators and freezers	R-404A	750	< 0.005	7.50	7.50	20.0
Arena	Other commercial A/C and heat pumps	R-410A	750	< 0.005	4.00	4.00	18.0
Arena	Stand-alone retail refrigerators and freezers	R-134a	750	0.04	1.00	0.00	1.00
Arena	Walk-in refrigerators and freezers	R-404A	750	< 0.005	7.50	7.50	20.0
Hotel	Household refrigerators and/or freezers	R-134a	750	0.00	0.60	0.00	1.00
Hotel	Other commercial A/C and heat pumps	R-410A	750	1.80	4.00	4.00	18.0
Hotel	Walk-in refrigerators and freezers	R-404A	750	< 0.005	7.50	7.50	20.0
Strip Mall	Other commercial A/C and heat pumps	R-410A	750	< 0.005	4.00	4.00	18.0
Strip Mall	Stand-alone retail refrigerators and freezers	R-134a	750	0.04	1.00	0.00	1.00
Strip Mall	Walk-in refrigerators and freezers	R-404A	750	< 0.005	7.50	7.50	20.0
City Park	Other commercial A/C and heat pumps	R-410A	750	< 0.005	4.00	4.00	18.0
City Park	Stand-alone retail refrigerators and freezers	R-134a	750	0.04	1.00	0.00	1.00
Regional Shopping Center	Other commercial A/C and heat pumps	R-410A	750	< 0.005	4.00	4.00	18.0

Regional Shopping Center	Stand-alone retail refrigerators and freezers	R-134a	750	0.04	1.00	0.00	1.00
Office Park	Household refrigerators and/or freezers	R-134a	750	0.02	0.60	0.00	1.00
Office Park	Other commercial A/C and heat pumps	R-410A	750	< 0.005	4.00	4.00	18.0
Apartments Mid Rise	Average room A/C & Other residential A/C and heat pumps	R-410A	750	< 0.005	2.50	2.50	10.0
Apartments Mid Rise	Household refrigerators and/or freezers	R-134a	750	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

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

5.16.2. Process Boilers

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

5.17. User Defined

Equipment Type	Fuel Type

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

5.18.1. Biomass Cover Type

5.18.1.1. Unmitigated

Biomass Cover Type	Initial Acres	Final Acres

5.18.2. Sequestration

5.18.2.1. Unmitigated

Tree Type	Number	Electricity Saved (kWh/year)	Natural Gas Saved (btu/year)

6. Climate Risk Detailed Report

6.1. Climate Risk Summary

Cal-Adapt midcentury 2040–2059 average projections for four hazards are reported below for your project location. These are under Representation Concentration Pathway (RCP) 8.5 which assumes GHG emissions will continue to rise strongly through 2050 and then plateau around 2100.

Climate Hazard	Result for Project Location	Unit
Temperature and Extreme Heat	5.39	annual days of extreme heat
Extreme Precipitation	7.75	annual days with precipitation above 20 mm
Sea Level Rise	—	meters of inundation depth
Wildfire	7.98	annual hectares burned

Temperature and Extreme Heat data are for grid cell in which your project are located. The projection is based on the 98th historical percentile of daily maximum/minimum temperatures from observed historical data (32 climate model ensemble from Cal-Adapt, 2040–2059 average under RCP 8.5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.
Extreme Precipitation data are for the grid cell in which your project are located. The threshold of 20 mm is equivalent to about ¾ an inch of rain, which would be light to moderate rainfall if received over a full day or heavy rain if received over a period of 2 to 4 hours. Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.
Sea Level Rise data are for the grid cell in which your project are located. The projections are from Radke et al. (2017), as reported in Cal-Adapt (Radke et al., 2017, CEC-500-2017-008), and consider inundation location and depth for the San Francisco Bay, the Sacramento-San Joaquin River Delta and California coast resulting different increments of sea level rise coupled with extreme storm events. Users may select from four scenarios to view the range in potential inundation depth for the grid cell. The four scenarios are: No rise, 0.5 meter, 1.0 meter, 1.41 meters
Wildfire data are for the grid cell in which your project are located. The projections are from UC Davis, as reported in Cal-Adapt (2040–2059 average under RCP 8.5), and consider historical data of climate, vegetation, population density, and large (> 400 ha) fire history. Users may select from four model simulations to view the range in potential wildfire probabilities for the grid cell. The four simulations make different assumptions about expected rainfall and temperature are: Warmer/drier (HadGEM2-ES), Cooler/wetter (CNRM-CM5), Average conditions (CanESM2), Range of different rainfall and temperature possibilities (MIROC5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.

6.2. Initial Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	N/A	N/A	N/A	N/A
Extreme Precipitation	N/A	N/A	N/A	N/A
Sea Level Rise	N/A	N/A	N/A	N/A
Wildfire	N/A	N/A	N/A	N/A
Flooding	N/A	N/A	N/A	N/A
Drought	5	1	0	N/A
Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	N/A	N/A	N/A	N/A

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.
The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.
The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores do not include implementation of climate risk reduction measures.

6.3. Adjusted Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	N/A	N/A	N/A	N/A
Extreme Precipitation	N/A	N/A	N/A	N/A
Sea Level Rise	N/A	N/A	N/A	N/A

Wildfire	N/A	N/A	N/A	N/A
Flooding	N/A	N/A	N/A	N/A
Drought	5	1	1	4
Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	N/A	N/A	N/A	N/A

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.
The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.
The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores include implementation of climate risk reduction measures.

6.4. Climate Risk Reduction Measures

7. Health and Equity Details

7.1. CalEnviroScreen 4.0 Scores

The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.

Indicator	Result for Project Census Tract
Exposure Indicators	—
AQ-Ozone	6.38
AQ-PM	31.5
AQ-DPM	99.8
Drinking Water	15.0
Lead Risk Housing	45.7
Pesticides	24.9
Toxic Releases	42.2
Traffic	74.6
Effect Indicators	—
CleanUp Sites	97.8

Groundwater	96.4
Haz Waste Facilities/Generators	90.4
Impaired Water Bodies	87.0
Solid Waste	98.7
Sensitive Population	—
Asthma	77.3
Cardio-vascular	15.0
Low Birth Weights	58.8
Socioeconomic Factor Indicators	—
Education	52.3
Housing	36.7
Linguistic	74.4
Poverty	51.4
Unemployment	70.0

7.2. Healthy Places Index Scores

The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

Indicator	Result for Project Census Tract
Economic	—
Above Poverty	89.1954318
Employed	99.0632619
Median HI	89.3750802
Education	—
Bachelor's or higher	75.6704735
High school enrollment	6.685486975
Preschool enrollment	62.73578853
Transportation	—

Auto Access	36.49428975
Active commuting	89.45207237
Social	—
2-parent households	68.33055306
Voting	32.08007186
Neighborhood	—
Alcohol availability	41.37046067
Park access	81.35506224
Retail density	80.11035545
Supermarket access	41.40895676
Tree canopy	82.0094957
Housing	—
Homeownership	54.95957911
Housing habitability	57.35916848
Low-inc homeowner severe housing cost burden	85.268831
Low-inc renter severe housing cost burden	81.49621455
Uncrowded housing	36.04516874
Health Outcomes	—
Insured adults	83.98562813
Arthritis	91.8
Asthma ER Admissions	30.9
High Blood Pressure	84.3
Cancer (excluding skin)	71.8
Asthma	96.9
Coronary Heart Disease	91.8
Chronic Obstructive Pulmonary Disease	96.5
Diagnosed Diabetes	70.5

Life Expectancy at Birth	52.5
Cognitively Disabled	92.5
Physically Disabled	74.5
Heart Attack ER Admissions	77.7
Mental Health Not Good	91.8
Chronic Kidney Disease	90.3
Obesity	97.0
Pedestrian Injuries	64.8
Physical Health Not Good	92.3
Stroke	88.3
Health Risk Behaviors	—
Binge Drinking	71.2
Current Smoker	82.0
No Leisure Time for Physical Activity	65.2
Climate Change Exposures	—
Wildfire Risk	0.0
SLR Inundation Area	89.3
Children	13.5
Elderly	70.8
English Speaking	31.3
Foreign-born	81.2
Outdoor Workers	60.5
Climate Change Adaptive Capacity	—
Impervious Surface Cover	37.4
Traffic Density	89.4
Traffic Access	74.4
Other Indices	—

Hardship	26.7
Other Decision Support	—
2016 Voting	48.7

7.3. Overall Health & Equity Scores

Metric	Result for Project Census Tract
CalEnviroScreen 4.0 Score for Project Location (a)	76.0
Healthy Places Index Score for Project Location (b)	86.0
Project Located in a Designated Disadvantaged Community (Senate Bill 535)	No
Project Located in a Low-Income Community (Assembly Bill 1550)	No
Project Located in a Community Air Protection Program Community (Assembly Bill 617)	No

a: The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.
b: The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

7.4. Health & Equity Measures

No Health & Equity Measures selected.

7.5. Evaluation Scorecard

Health & Equity Evaluation Scorecard not completed.

7.6. Health & Equity Custom Measures

No Health & Equity Custom Measures created.

8. User Changes to Default Data

Screen	Justification
Land Use	Land uses amounts based on Candlestick Land Use Program dated 10/23/2024. Non-default land acreage is based on a total acreage of 281 acres from EIR. CalEEMod default acres (except acreage for Parks and Open Spaces) are scaled down so that total land acreage adds up to this number.
Construction: Off-Road Equipment	Test

Characteristics: Utility Information	Estimated 2038 carbon intensity based on CA carbon-free electricity requirements of 90% by 2035 and 95% by 2040, consistent with SB No.1020. Calculated in "Carbon Intensity" tab in Addendum 7 Operational -Candlestick Modeling Basis and Results.xlsx
Operations: Solid Waste	Solid waste generation rates based off of 2010 DEIR estimates from the California Integrated Waste Management Board. Calculated in "Solid Waste" tab in Addendum 7 Operational -Candlestick Modeling Basis and Results.xlsx
Operations: Vehicle Data	No pass-by or diverted trips assumed based on 2010 DEIR. Weekday trip rates based on information received by the Project's transportation analysis. Weekend trips were calculated based on the CalEEMod default ratio between weekday and Saturday or Sunday trip rates.
Operations: Consumer Products	General consumer product emission factor based draft Air Quality and Greenhouse Gas Analysis Guidelines from San Francisco Planning (January 2024)
Operations: Refrigerants	Refrigerants GWP capped at 750 per SB:1206 banning refrigerants with a GWP greater than 750 starting 1/1/2033
Operations: Water and Waste Water	Annual indoor and outdoor water usage based on estimated provided by project engineers.