Appendix B:
Air Quality and Greenhouse Gas Calculations (B.1)
Health Risk Assessment Methodology (B.2)

H Cycle Pittsburg
Renewable Hydrogen Project

Appendix B.1
Air Quality and Greenhouse Gas Emissions Calculations

January 2024

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B.1.1 INTRODUCTION

This appendix contains details on the emissions of criteria air pollutants (CAPs), toxic air contaminants (TACs), and greenhouse gases (GHGs) for the proposed H Cycle Pittsburg Renewable Hydrogen Project. A discussion of CAP emissions methods is followed by a discussion of the TAC emissions methods. GHG emissions calculations methods are also described and include indirect GHG emissions sources. The methods of emissions analysis for operations were developed based on methods approved by the California Air Resources Board (CARB) and the Bay Area Quality Management District (BAAQMD), and United States Environmental Protection Agency (EPA) guidance. The BAAQMD will prepare an Engineering Evaluation (EE) of the Authority to Construct and Permit to Operate (ATC/PTO) application where they will verify the emissions estimates calculations that HC (Contra Costa), LLC (Applicant) submitted to the BAAQMD for the project. The following attachments contain the construction and operation CAP, TAC, and GHG emissions calculations for the project:

- Criterial Air Pollutants Emissions Summary
- Cumulative Increase
- Toxics Summary
- Operations Greenhous Gas Emissions Summary Table
- Facility Operating Schedule and Throughput
- S-1 Feedstock Preparation Building
- S-5 Wet Feedstock Silo
- S-10 Dryer
- S-15 Dried Feedstock Silo
- S-25 OMNI Conversion Unit SRM and Refiner NG Burners
- S-30 Ash and Slag Handling, Crushing and Storage
- S-36 Flare
- S-36 Flared Gas TAC Characterization
- S-40 Natural Gas and Pressure Swing Adsorption Offgas-fired Boiler
- S-75 Emergency Diesel Generator
- S-80 Firewater Pump
- S-85 Cooling Water Tower
- S-90 Wastewater Treatment Plant
- Piping Equipment Fugitive GHGs
- Stockpiling Fugitive GHGs
- CalEEMod Reports (CAP/TAC/GHG)
    - Construction On-road Mobile Transportation Sources
    - Constriction Off-road Mobile Equipment Sources
    - Operations On-road Mobile Transportation Sources
    - Operations Off-road Mobile Equipment Sources

These attachments are included at the end of this appendix.

B.1.2 PROJECT CONSTRUCTION EMISSIONS

Construction of the project is a temporary activity, requiring the use of different types of heavy construction equipment that will generate CAPs, TACs, and GHGs. Construction-related emissions sources include:

- On-road construction-related vehicles and equipment (including deliveries of construction-related materials, hauling of waste materials from the construction site)
- Off-road diesel-powered construction equipment (cranes, dump trucks, cement trucks, front end loaders, bulldozers, backhoes, and other heavy equipment)
- Fugitive dust emissions
- Construction worker commute trips

As recommended by the BAAQMD, construction emissions and operational mobile source emissions of CAPs, TACs, and GHGs were modeled and quantified using the California Emissions Estimator Model (CalEEMod) Version 2022.1.1.0. CalEEMod is a computer program that quantifies construction emissions associated with land use projects. It uses CARB-approved emission factors and models [OFFROAD for estimating off-road construction equipment; EMFAC for estimating on-road vehicle trip emissions; California Statewide Travel Demand Model (CSTDM) for providing default trip lengths)].

B.1.3 PROJECT OPERATION STATIONARY SOURCE EMISSIONS

Operation of the project will result in emissions from the stationary sources shown in Table B.1-1 with their BAAQMD source number.

Table B.1-1: Project Operation Stationary Source Emissions

BAAQMD Source No.	Emissions Source Description
S-1	Feedstock Preparation Bldg.
S-5	Wet Feedstock Storage Silo
S-10	Feedstock Dryer
S-15	Dry Feedstock Storage Silo
S-25	OMNI GPRS™ ICARS
S-30	Slag & Ash Handling, Crushing, & Storage
S-35	Hydrogen Production Unit
S-36	Flare
S-40	Boiler
S-75	Emergency Generator – Diesel

Table B.1-1: Project Operation Stationary Source Emissions

BAAQMD Source No.	Emissions Source Description
S-80	Firewater Pump - Diesel
S-85	Wet Cooling Tower
N/A	Fugitive Equipment (valves, flanges, pumps, etc.)
N/A = not applicable	

Emissions were calculated for each stationary source using standard, approved CARB and BAAQMD methodologies, and EPA guidance as follows:

B.1.3.1 S-1 Feedstock Preparation Building

S-1 will receive raw feedstock and particulate matter (PM) emissions occur when material is dropped from one transfer point to another. These emissions are from waste feedstock tipping, transfer, and sorting and were calculated using the maximum throughput of 110 tons/hour. The emission factor was calculated using Equation 1 in Chapter 13.2.4 of EPA's "AP-42: Compilation of Air Emissions Factors" and data for uncontrolled PM emissions factors. These factors were used to calculate shredder and fine screening emissions. The volatile organic compound (VOC) and TAC emission factors used are a weighted average of green and food waste stockpile emission factors obtained from Source Testing (NTV-2145) at Napa Recycling and Waste Services (BAAQMD Plant # 17403) weighted by the ratio of typical ratio food waste and green waste expected in the feedstock.

B.1.3.2 S-5 Wet Feedstock Storage Silo

S-5 will store biodegradable wet feedstock after sorting and processing in S-1. PM emissions from material transfer occur when material is dropped from one transfer point to another. PM transfer emissions were calculated using Equation 1 in Chapter 13.2.4 of EPA's "AP-42: Compilation of Air Emissions Factors" and data for uncontrolled PM emissions factors. The VOC and TAC emission factors used are a weighted average of green and food waste stockpile emission factors obtained from Source Testing (NTV-2145) at Napa Recycling and Waste Services (BAAQMD Plant # 17403) weighted by the ratio of typical ratio food waste and green waste expected in the feedstock.

B.1.3.3 S-10 Feedstock Dryer

S-10 uses warm air to remove moisture from the prepared wet feedstock in a low temperature belt dryer. PM emissions from material transfer occur when material is dropped from one transfer point to another. PM transfer emissions were calculated using Equation 1 in Chapter 13.2.4 of EPA's "AP-42: Compilation of Air Emissions Factors" and data for uncontrolled PM emissions factors. The VOC parameters used in the calculations were provided by the Dryer manufacturer. The TAC emission factors used are a weighted average of green and food waste stockpile emission factors obtained from Source Testing (NTV-2145) at Napa Recycling and Waste Services (BAAQMD Plant # 17403) weighted by the ratio of typical ratio food waste and green waste expected in the feedstock.

B.1.3.4 S-15 Dry Feedstock Storage Silo

S-15 will store prepared feedstock after sorting and processing in S-1, storage in S-5, and drying in S-10. PM emissions from material transfer occur when material is dropped from one transfer point to another. PM transfer emissions were calculated using Equation 1 in Chapter 13.2.4 of EPA's "AP-42: Compilation of Air Emissions Factors" and data for uncontrolled PM emissions factors. The VOC and TAC emission factors used are a weighted average of green and food waste stockpile emission factors obtained from Source Testing (NTV-2145) at Napa Recycling and Waste Services (BAAQMD Plant # 17403) weighted by the ratio of typical ratio food waste and green waste expected in the feedstock.

B.1.3.5 S-25 OMNI Conversion Unit Solid Residue Melter and Refiner Natural Gas Burners

S-25 is a Waste-to-Syngas conversion unit which includes a feeder, converter, carbon recovery vessel, Solid Residue Melter (SRM), cyclones, refining chamber, recuperator, slag removal unit, and natural gas-fired burners in SRM and refining chamber. Emissions during normal operation have been estimated along with the S-40 Boiler's emissions because the SRM and refining chamber burner combustion flue gas will be routed along with the syngas through the syngas treatment system and S-40 to the S-40 air pollution control system and then vented to atmosphere through a common stack. The S-40 Boiler's worksheet contains total emissions from S-40 and S-25 during normal operation. During startup and shutdown events, natural gas combustion emissions will be vented to the atmosphere through heat up stack or flare, depending on phase of the startup or shutdown. TAC emission factors for S-25 are from Table A-1.1 Boilers – Natural Gas Fuel, No Add-On Emission Control in the BAAQMD Toxic Air Contaminant (TAC) Emission Factor Guidelines, Appendix A, Default TAC Emission Factors for Specific Source Categories, August 2020.

B.1.3.6 S-30 Ash and Slag Handling, Crushing, and Storage

S-30 includes ash and slag conveying, cooling, crushing, storage and loading transfer processes. PM emissions from material transfer, crushing, and wind erosion were calculated using Equation 1 in Chapter 13.2.4 of EPA's "AP-42: Compilation of Air Emissions Factors" and data for uncontrolled PM emissions factors. The material moisture content of 3.6% was taken from AP-42 Chapter 13.2.4, Table 13.2.4-1, for slag at a municipal solid waste (MSW) landfill. TAC emissions are based on component concentration in slag on percent by weight basis as determined by HC (Contra Costa), LLC from the slag assay.

B.1.3.7 S-36 Flare

S-36 has a natural gas combustion pilot, and will be used to combust off-spec syngas during startups, shutdowns, and process upsets. CAP emission were calculated using emission factors for flared syngas from in Table 13.5-1 (nitrogen oxides [NO_x] emissions) for elevated flares, Table 13.5-2 (carbon monoxide [CO] emissions) for elevated flares, Table 13.5-1 (VOC emissions) for enclosed ground flares, Table 2.4-4 (PM_{10} and $PM_{2.5}$ emissions). CAP emissions were calculated for the natural gas pilot, flared syngas, total flare emissions excluding excess hydrogen flaring, excess hydrogen

flaring, and startup and shutdown flaring events. TAC emissions from the combustion of natural gas are from Table A-1.1 Boilers – Natural Gas Fuel, No Add-On Emission Control in the BAAQMD Toxic Air Contaminant (TAC) Emission Factor Guidelines, Appendix A, Default TAC Emission Factors for Specific Source Categories, August 2020. The TAC emission factors from low pressure and high pressure flare gas combustion are estimated using a flare gas speciation profile obtained from process simulation and assumed abatement efficiency of the flare.

B.1.3.8 S-40 Natural Gas and Pressure Swing Adsorption Offgas-Fired Boiler

S-40 is a boiler that uses natural gas and pressure swing adsorption (PSA) offgas as fuel. The boiler will provide steam to various users in the processing of the feedstock into product hydrogen. The maximum heat input during normal operation, which includes natural gas combustion in the SRM and refining chamber burners as mentioned above for S-25, is 45.0 million British thermal units per hour (MMBtu/hour) for natural gas and 20.0 MMBtu/hour for PSA offgas, for a combined firing rate of 65 MMBtu/hour. During startup and shutdown events, S-40 will combust 60.0 MMBtu/hour of only natural gas. The emissions factors in pounds (lb) pollutant/MMBtu were derived based on the molecular weights of NO_x, CO, VOC (as methane), sulfur, and SO_2. S-40 TAC emissions from the combustion of natural gas are from Table A-1.1 Boilers – Natural Gas Fuel, No Add-On Emission Control in the BAAQMD Toxic Air Contaminant (TAC) Emission Factor Guidelines, Appendix A, Default TAC Emission Factors for Specific Source Categories, August 2020. The TAC emission factors for PSA offgas combustion are estimated using a syngas speciation profile obtained from process simulation and the assumed abatement efficiency of a gas treatment system and the boiler.

B.1.3.9 S-75 Emergency Power Diesel Generator

S-75 is a diesel-fired internal combustion engine-generator set to provide electricity for emergency use. Abatement for engine emissions includes diesel particulate filter (DPF), oxidation catalyst, and selective catalytic reduction (SCR). Emissions factors used for NMHC+NO_x, NO_x, particulate organic carbon (POC), CO, PM_{10}/$PM_{2.5}$/DPM, and SO_2 are from CARB/EPA Certification of Tier 2 Certified Unabated Emission Rate and were used to calculate hourly, daily, and annual emissions. In addition to 50 hours per year of testing and maintenance, the emissions estimates include 100 hours per year of emergency operation in accordance with BAAQMD requirements.

B.1.3.10 S-80 Firewater Pump

S-80 is a diesel-fired internal combustion engine for emergency use to operate firewater pump. Abatement for engine emissions includes DPF, oxidation catalyst, and SCR. Emissions factors used for NMHC+NO_x, NO_x, POC, CO, PM_{10}/$PM_{2.5}$/DPM, and SO_2 are from CARB/EPA Certification of Tier 3 Certified Unabated Emission Rate and were used to calculate hourly, daily, and annual emissions.

B.1.3.11 S-85 Cooling Tower

S-85 will provide cooling water to be recirculated through heat exchangers to cool various process units and process streams. The cooling tower will not be used for evaporative cooling of process water. Pursuant to Regulation 2-1-128.4, S-85 is exempt from permitting. However, hourly, daily, and annual PM, PM_{10}, and $PM_{2.5}$ emissions were calculated.

B.1.3.12 Fugitive Equipment Emissions

Fugitive equipment includes valves, flanges, piping connections, pump seals, compressor seals, pressure relief devices, and process drains. VOC/POC emissions were calculated using the California Implementation Guidelines for Estimating Mass Emissions of Fugitive Hydrocarbon Leaks at Petroleum Facilities published by the California Air Pollution Control Officers Association and CARB.

B.1.4 PROJECT OPERATION MOBILE SOURCE EMISSIONS

In addition to stationary sources, project operation will also result in motor vehicle trips from the following activities:

- Motor vehicle (truck) deliveries of feedstock
- Motor vehicle (truck) shipments of return screened feedstock
- Motor vehicle (truck shipments of product hydrogen
- Motor vehicle (truck) shipments of outbound refuse, ash, slag, liquid fertilizer byproduct, plus deliveries of backup oxygen, water treatment chemicals, spare and replacement parts and other consumables or disposal materials
- Motor vehicles (pickup trucks) used onsite
- Off-road heavy equipment (front end loader) used onsite
- Worker motor vehicle commute round trips

As recommended by the BAAQMD, emissions from project operation mobile sources were modeled and quantified using the California Emissions Estimator Model (CalEEMod) Version 2022.1.1.0. CalEEMod is a computer program that quantifies construction emissions associated with land use projects. It uses CARB-approved emission factors and models (OFFROAD for estimating off-road construction equipment; EMFAC for estimating on-road vehicle trip emissions; CSTDM for providing default trip lengths).

B.1.5 GREENHOUSE GAS EMISSIONS

GHGs would be emitted during project construction from sources such as earth-moving equipment, cranes, and other heavy construction equipment. GHGs will also be emitted as a result of project operations, and from indirect operational emissions sources such as purchase of electricity generated offsite from the project location.

Construction-related GHG emissions were estimated using BAAQMD-approved methodologies. As recommended by the BAAQMD, construction emissions were modeled and quantified using the California CalEEMod Version 2022.1.1.0. GHG emissions from project operation stationary sources were calculated using CARB, BAAQMD, and EPA approved methodologies. GHG emissions from project operation mobile sources were calculated using CalEEMod. Operations estimates include maximum daily and annual carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), and carbon dioxide equivalent (CO_2e) emissions from operations-related activities.

B.1.6 AVOIDED LANDFILL METHANE EMISSIONS

When waste materials are landfilled, they undergo anaerobic digestion resulting in generation of methane biogas. Many landfills in the United States are fitted with landfill collection systems, which capture a portion of the biogas for either flaring or power generation. Methane that is not captured by the system is referred to as "leaked methane" and comprises the majority of GHG emissions resulting from landfilling of municipal solid waste given methane's high Global Warming Potential (with up to 25 to 84 times the impact of carbon dioxide).

Municipal solid waste materials have several components including food waste, yard waste, paper waste, lumber, and textiles. Each of these subtypes decomposes differently in a landfill and therefore provides a different quantity of methane emissions. Because of these different quantities of methane released from the subtypes of waste, different factors are used to determine the emission reduction factor on a CO_2 equivalent basis for the various subtypes of waste processed at the HC (Contra Costa), LLC facility.

Because the HC (Contra Costa), LLC facility diverts waste that would normally be landfilled, an Emission Reduction Factor (ERF) in the units of ton CO_2/ton MSW by waste subtype and quantity is used to determine overall avoided emissions.

The project will incorporate a Project Feedstock Design Feature (PFDF) that was used to offset a significant portion of the annual GHG emissions resulting from project operation. The PFDF is based on the SB1383 Article 2 Application that HC (Contra Costa), LLC submitted to CalRecycle in July 2023. In the application, HC (Contra Costa), LLC documents the methodology utilized to determine the ERF of its process utilizing a variety of feedstocks. This application laid out a methodology for how the ERF is calculated for a generic facility deploying the HC (Contra Costa), LLC technology. HC (Contra Costa), LLC developed three illustrative cases based on HC (Contra Costa), LLC's contracting efforts for waste, characterized as low, medium and high moisture.

There are four primary drivers of the Emission Reduction Factor (ERF):

- Process Emissions: determined by summing process energy emissions, chemical use emissions and fugitive emissions.

- Emission Avoidance: determined directly from the "Landfill Emission Reduction Factor Tool for Section 18983.2" produced by CARB.

- Product Displacement: Per SB1383 regulations, a baseline must be determined showcasing the GHG emissions resulting from "the manufacturing and use of the product(s) that your product could replace."

- Transportation Emissions: the process has three primary sources of emissions from transportation:

  - Transportation of hydrogen product to customer

  - Transportation of slag to a landfill (or customer)

  - Transportation of waste feedstock to the HC (Contra Costa), LLC facility – this is ignored as the distance traveled for waste to the landfill is similar to the distance traveled to a HC (Contra Costa), LLC facility

The calculations for the selected PFDF and the resulting ERF of 0.31 ton CO_2/ton MSW fed are shown in the table below:

Table B.1-2: Project Feedstock Emission Reduction Factor Calculation

Waste Material	Wt% as-fed	Carbon Intensity (ton CO_2/ton MSW as-fed) (Source: CARB T1 OW)
Food	24.0%	0.30
Paper	34.1%	0.51
Yard Waste	3.8%	0.15
Wood / C&D	18.1%	0.30
Plastic	2.9%	(2.62)
Fines / MO	4.1%	0.53
Textiles	11.9%	0.50
Inert	1.1%	
	100.0%	
Weighted average Emission Reduction Factor (ERF)	**0.31**	
As-received (wet) (TPD)	390	
Material removed (TPD)	74.1	
Material remaining (TPD)	315.9	
CO_2 emission reduction tonnes/day)	98.40	
Capacity factor	93%	
Days per year	365.25	
CO_2 reduction from methane avoidance tonnes /year	33,423.44	

B.1.7 INDIRECT PROJECT OPERATION EMISSIONS

The following are the indirect GHG emissions associated with the project:

- Purchased electricity for process operations
- Electricity consumption from purchased water for process operations
- Electricity consumption from offsite wastewater treatment plant processing

B.1.7.1 Purchased Electricity

Indirect greenhouse gas emissions from usage of purchased electricity from the Marin Clean Energy (MCE) portfolio were calculated as explained as follows. Carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O) are emitted to the atmosphere when fossil fuels are combusted to generate electricity. Guidance issued by the EPA Center for Corporate Climate Leadership provided the basic calculation methodology for estimating indirect GHG emissions from purchased electricity used in this analysis. Since the proposed Project will purchase electricity from the MCE portfolio, specific MCE emission factors were used.

Calculation Steps

Step 1: Determine the annual quantity of electricity purchased in megawatt-hours per year (MWh/yr).

- Annual Purchased Quantity = 94,000 MWh/yr

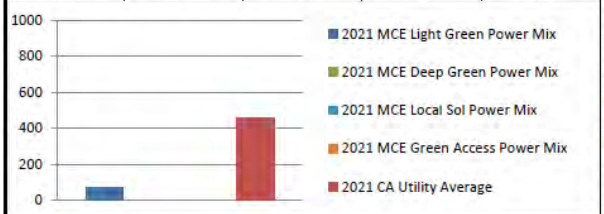
Step 2: Determine the appropriate emission factor to use.

- The CO_2 emission factor was obtained from data reported to the California Energy Commission under the Power Disclosure Program by MCE for 2021. This program requires retail suppliers of electricity to disclose the mix of sources used to provide electricity service during the previous calendar year. When a retail supplier of electricity offers more than one electricity portfolio for purchase, the retail supplier must provide information specific to each electricity portfolio offered. This information is provided on a Power Content Label, and the 2021 is presented below.

Table B.1-3: 2021 MCE Power Content Label

2021 POWER CONTENT LABEL
MCE
mceCleanEnergy.org/energy-sources

Greenhouse Gas Emissions Intensity (lbs CO_2e/MWh)				
2021 MCE Light Green Power Mix	2021 MCE Deep Green Power Mix	2021 MCE Local Sol Power Mix	2021 MCE Green Access Power Mix	2021 CA Utility Average
75	0	0	0	456



Energy Resources	2021 MCE Light Green Power Mix	2021 MCE Deep Green Power Mix	2021 MCE Local Sol Power Mix	2021 MCE Green Access Power Mix	2021 CA Power Mix
Eligible Renewable[1]	60.5%	100.0%	100.0%	100.0%	33.6%
Biomass & Biowaste	6.1%	0.0%	0.0%	0.0%	2.3%
Geothermal	5.6%	0.0%	0.0%	0.0%	4.8%
Eligible Hydroelectric	1.4%	0.0%	0.0%	0.0%	1.0%
Solar	31.3%	50.0%	100.0%	100.0%	14.2%
Wind	16.0%	50.0%	0.0%	0.0%	11.4%
Coal	0.0%	0.0%	0.0%	0.0%	3.0%
Large Hydroelectric	36.8%	0.0%	0.0%	0.0%	9.2%
Natural Gas	0.0%	0.0%	0.0%	0.0%	37.9%
Nuclear	0.9%	0.0%	0.0%	0.0%	9.3%
Other	0.1%	0.0%	0.0%	0.0%	0.2%
Unspecified Power[2]	1.7%	0.0%	0.0%	0.0%	6.8%
TOTAL	100.0%	100.0%	100.0%	100.0%	100.0%
Percentage of Retail Sales Covered by Retired Unbundled RECs[3]:	0%	0%	0%	0%	

[1]The eligible renewable percentage above does not reflect RPS compliance, which is determined using a different methodology.
[2]Unspecified power is electricity that has been purchased through open market transactions and is not traceable to a specific generation source.
[3]Renewable energy credits (RECs) are tracking instruments issued for renewable generation. Unbundled renewable energy credits (RECs) represent renewable generation that was not delivered to serve retail sales. Unbundled RECs are not reflected in the power mix or GHG emissions intensities above.

For specific information about this electricity portfolio, contact:	MCE 1 (888) 632-3674
For general information about the Power Content Label, visit:	http://www.energy.ca.gov/pcl/
For additional questions, please contact the California Energy Commission at:	Toll-free in California: 844-454-2906 Outside California: 916-653-0237

- The selected emission factor is based on the 2021 MCE Light Green Power Mix, which is 75 lb CO_2e/MWh. This is the most conservative emission factor in the MCE electricity portfolio.

Step 3: Calculate Estimated Emissions

- For CO_2e: Emissions = Electricity x Emission Factor = 94,000 MWh/yr x 75 lb CO_2e/MWh
  - CO_2e emissions = 7,050,000 lb/yr = 3,198 Metric tons of CO_2 equivalent per year ($MTCO_2e$/yr)

B.1.7.2 Purchased Municipal Water

Indirect GHG emissions resulting from usage of purchased water from Diablo Water District (DWD) were calculated as explained as follows. The extraction, conveyance, pretreatment, and distribution of water consumes electricity, resulting in the generation of GHG emissions. Energy intensity is a measure of the quantity of energy used to produce a unit of product or output.

For purchased municipal water, the energy intensity is the amount of electricity used in kWh per gallon of water purchased. The analysis data provided in Table 7-2 "Water Supply Energy Intensity by Water Supply Process" in the DWD 2020 Urban Water Management Plan states that the total amount of the energy expended to move water from its source to the point of delivery (extraction/conveyance, treatment, and distribution) is 2,636 kilo-watt hours per million gallons (kWh/MMgal). Note Table 7-2 uses kWH/MG to express kilo-watt hours per million gallons.

Table B.1-4: Water Supply Energy Intensity by Water Supply Process[1]

	Extract/ Conveyance	Treatment	Distribution	Total Utility
Volume of Water Entering Process (MG)	250	250	250	250
Energy Consumed (kWh)	425,049 [2]	12,241 [3]	221,690 [4]	658,980
Energy Intensity (kWh/MG)	**1,700**	**49**	**887**	**2,636**

Notes:

[1] Approximately 88% of the District's supply is from the Randall-Bold WTP operated by CCWD and not under the District's operational control. Energy consumed for surface water conveyance to Randall-Bold WTP, treatment at Randall-Bold WTP, and distribution from Randall-Bold WTP using high service pumps is not included.

[2] Includes energy consumed at Glen Park Well Station and Stonecreek Well Station in 2020.

[3] Includes energy consumed at the Blending Facility at Randall-Bold WTP in 2020.

[4] Includes energy consumed at the Corp Yard Pump Station in 2020.

Diablo Water District Wastewater Treatment Processing Purchased Electricity Emission Factor

The emissions factor (lb CO_2/MWh) for the indirect GHG emissions caused by usage of purchased electricity by DWD from Pacific Gas and Electric (PG&E) were calculated as follows. Since DWD purchases electricity from PG&E, specific PG&E emission factors were used.

The CO_2 emission factor was derived using data reported by PG&E to the California Air Resources Board from PG&E-owned power generation facilities for Reporting Years 2019, 2020, and 2021. GHG emission data for PG&E from Reporting Year 2021 shows that 99.9% of all PG&E GHG emissions were carbon dioxide. Therefore, this analysis assumes 100% of the GHG emissions from purchased electricity are carbon dioxide.

Table B.1-5: PG&E 2021 Reporting Year Greenhouse Gas Emissions

Greenhouse Gas	2021 Total Emissions (metric tons)	Percentage of Total Emissions
Carbon Dioxide	45,831,735	99.94%
Methane	25,527	< 0.01%
Nitrous Oxide	84	< 0.01%
TOTAL	**45,857,345**	~100%

The selected emission factor is the three-year average of the "All Plants" CO_2 emission rates shown in Table B.1-6 below:

- 2019 = 163 lb CO_2/MWh
- 2020 = 194 lb CO_2/MWh
- 2021 = 204 lb CO_2/MWh
- Average = (163 + 194 + 204) / 3 = 187 lb CO_2/MWh

Table B.1-6: PG&E Emissions Reported to CARB: CO_2e Emissions from Owned Power Generation

PG&E Emissions Reported to the California Air Resources Board: CO_2-e Emissions from Owned Power Generation[1] and Operations

	2019	2020	2021
Total CO_2-e Emissions (metric tons)	**2,484,127**	**2,550,622**	**2,485,379**
Humboldt Bay Generating Station	189,163	227,214	256,813
Gateway Generating Station	1,137,160	1,143,587	1,363,629
Colusa Generating Station	1,157,804	1,179,821	864,937
CO_2 Emissions Rates (lbs/MWh)			
Humboldt Bay Generating Station	1,028	1,033	1,035
Gateway Generating Station	872	882	875
Colusa Generating Station	842	855	866
Fossil Plants[2]	868	881	886
All Plants[3]	163	194	204
Other CO_2-e Emissions (metric tons)			
Natural Gas Compressor Stations[4]	344,810	315,802	322,044
Distribution Fugitive Natural Gas Emissions	496,789	497,512	589,342
Customer Natural Gas Use[5]	42,058,499	40,304,583	41,563,483

1. PG&E's owned net generation was 26.8 GWh in 2021. [1]
2. CO_2 emissions rate applies to fossil-fuel combustion generating stations only. [2]
3. Includes all PG&E-owned generation sources, including nuclear, hydroelectric, and renewable energy. [3]
4. Includes, but is not limited to, compressor stations and storage facilities emitting more than 25,000 metric tons of CO_2-e annually. [4]
5. Includes emissions from the combustion of natural gas delivered to all entities on PG&E's distribution system, with the exception of gas delivered to other natural gas local distribution companies. This figure does not represent PG&E's compliance obligation under AB 32, which is equivalent to the above-reported value less the emissions from fuel that is delivered to covered entities, as calculated by CARB. [5]

Calculation Steps

Step 1: Determine the annual quantity of water purchased in million gallons per year (MMgal/yr).

- Annual Purchased Water Quantity = 150 MMgal/yr

Step 2: Determine the appropriate emission factor to use.

- The emission factor of 2,636 kilowatt-hour (kWh) per million gallons used in this calculation was selected from Table B.1-6, above.

Step 3: Calculate Estimated Emissions

- For CO_2: Emissions = Water x Emission Factor

  = 150 MMGal/yr x 2,636 kWh/MMgal x 187 lb CO_2/MWh x 1 MW/1000 kW

  - CO_2 emissions = 73,940 lb/yr = **33.5 MTCO$_2$e/yr**

B.1.7.3 Purchased Wastewater Treatment from Diablo Water District

The conveyance and treatment of wastewater requires electricity resulting in the generation of GHG emissions. Indirect GHG emissions from usage of electricity to treat wastewater were calculated in the same manner as explained above for the "Purchased Municipal Water."

Since the electricity required for the wastewater treatment process is the same as the electricity purchased by DWD for the sale of municipal water, the emissions factor (lb CO_2/MWh) for the indirect GHG emissions caused by usage of purchased electricity by DWD from Pacific Gas and Electric (PG&E) calculated above were used.

Calculation Steps

Step 1: Determine the annual quantity of wastewater discharged to DWD in million gallons (MMgal) per year.

- Annual Quantity Discharged = 69.4 MMgal/yr

Step 2: Determine the appropriate emission factor to use.

- The emission factor of 2,636 kilowatt-hour (kWh) per million gallons used in this calculation was selected from the Table B.1-6 as discussed above.

Step 3: Calculate Estimated Emissions

- For CO_2: Emissions = Water Discharged x Emission Factor

  = 69.4 MMGal/yr x 2,636 kWh/MMgal x 187 lb CO2/MWh x 1 MW/1000 kW

  - CO_2 emissions = 182,939 lb/yr = **83.0 $MTCO_2e$/yr**

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Criteria Pollutant Emissions Summary

Startups/Shutdowns	Uncontrolled Daily Emissions without BACT (lb/day)							
Source	**Nox**	**CO**	**PM**	**PM10**	**PM2.5**	**VOC/ POC**	**SOx**	**NPOC**
S-25 OMNI GPRS ICARS	255.00	665.00	7.20	7.20	7.20	5.21	0.57	
S-36 Flare - Startup/Shutdown	224.43	610.17	3.43	3.43	3.43	4.13	439.48	

Normal Operations	Uncontrolled Daily Emissions without BACT (lb/day)							
Source	**NOx**	**CO**	**PM**	**PM10**	**PM2.5**	**VOC/ POC**	**SOx**	**NPOC**
S-1 Feedstock Preparation Building			8.27	3.90	1.23	35.93		0.31
S-5 Wet Feedstock Storage Silo			0.03	0.01	0.00	29.11		0.25
S-10 Feedstock Dryer; Low-Temperature Belt Dryer			77.49	77.47	30.99	52.73		0.46
S-15 Dry Feedstock Storage Silo			0.06	0.03	0.00	38.65		0.34
S-30 Slag Handling Crushing, and Loading			0.52	0.24	0.04			
S-40 Boiler	239.94	76.88	7.80	7.80	7.80	8.78	7.03	
S-85 Wet Cooling Tower			0.31	0.22	0.13			
Equipment and Piping Components						14.44		
S-75 Emergency Diesel-fired ICE Generator	151.32	16.10	3.49	3.49	3.49	2.68	0.20	
S-80 Emergency Diesel-fired ICE Fire Water Pump	22.92	11.05	1.03	1.03	1.03	0.57	0.05	
S-36 Flare - Normal Operations - Hydrogen Flaring (500 Hours per Year)	119.32	1.53	0.14	0.14	0.14	0.10	0.01	
S-36 Flare - Normal Operations (No Hydrogen Flaring)	1.82	1.53	0.14	0.14	0.14	0.10	0.01	

Startups/Shutdowns	Controlled Daily Emissions with BACT (lb/day)							
Source	**NOx**	**CO**	**PM**	**PM10**	**PM2.5**	**VOC/ POC**	**SOx**	**NPOC**
S-25 OMNI GPRS ICARS	255.00	665.00	7.20	7.20	7.20	5.21	0.57	
S-36 Flare - Startup/Shutdown	224.43	610.17	3.43	3.43	3.43	4.13	439.48	

Normal Operations	Controlled Daily Emissions with BACT (lb/day)							
Source	**NOx**	**CO**	**PM**	**PM10**	**PM2.5**	**VOC/ POC**	**SOx**	**NPOC**
S-1 Feedstock Preparation Building			0.43	0.20	0.06	8.62		0.08
S-5 Wet Feedstock Storage Silo			0.00	0.00	0.00	5.82		0.05
S-10 Feedstock Dryer; Low-Temperature Belt Dryer			0.11	0.09	0.03	10.55		0.09
S-15 Dry Feedstock Storage Silo			0.00	0.00	0.00	7.73		0.07
S-30 Slag Handling, Crushing, and Loading			0.52	0.24	0.04			
S-40 Boiler	12.63	76.88	7.80	7.80	7.80	8.78	7.03	
S-85 Wet Cooling Tower			0.31	0.22	0.13			
Equipment and Piping Components						14.44		
S-75 Emergency Diesel-fired ICE Generator	17.99	16.10	3.49	3.49	3.49	2.68	0.20	
S-80 Emergency Diesel-fired ICE Fire Water Pump	2.78	11.05	1.03	1.03	1.03	0.57	0.05	
S-36 Flare - Normal Operations - Hydrogen Flaring (500 Hours per Year)	119.32	1.53	0.14	0.14	0.14	0.10	0.01	
S-36 Flare - Normal Operations (No Hydrogen Flaring)	1.82	1.53	0.14	0.14	0.14	0.10	0.01	0.00

	Controlled Daily Emissions with BACT (lb/day)							
	NOx	**CO**	**PM**	**PM10**	**PM2.5**	**VOC/ POC**	**SOx**	**NPOC**
Average Daily Emissions	26.5	90.4	9.1	8.5	8.1	52.8	6.6	0.3
BAAQMD CEQA Thresholds	54		82	82	54	54		

	Controlled Annual Emissions (lb/yr)							
Source	**NOx**	**CO**	**PM**	**PM10**	**PM2.5**	**VOC/ POC**	**SOx**	**NPOC**
S-1 Feedstock Preparation Building			135.5	63.9	20.06	2,744.0		23.9
S-5 Wet Feedstock Storage Silo			0.0	0.0	0.00	1,852.2		16.1
S-10 Feedstock Dryer; Low-Temperature Belt Dryer			36.2	31.0	11.28	3,603.2		31.4
S-15 Dry Feedstock Storage Silo			0.0	0.0	0.00	2,641.0		23.0
S-25 OMNI GPRS ICARS	2,120.0	5,520.0	60.0	60.0	60.04	43.5	4.7	
S-30 Slag Handling, Crushing, and Loading			176.4	80.9	13.6			
S-40 Boiler	4,413.8	26,870.1	2,746.6	2,746.6	2,746.6	3,069.8	2,410.3	
S-85 Wet Cooling Tower			106.2	74.3	44.6			
Equipment and Piping Components						5,269.5		
S-75 Emergency Diesel-fired ICE Generator	37.5	33.5	7.3	7.3	7.3	5.6	0.4	
S-80 Emergency Diesel-fired ICE Fire Water Pump	5.8	23.0	2.1	2.1	2.1	1.2	0.1	
S-36 Flare - Normal Operations - Hydrogen Flaring	2,485.9	31.8	2.9	2.9	2.9	2.1	0.2	
S-36 Flare - Normal Operations	605.5	508.6	46.0	46.0	46.0	33.3	3.6	
S-36 Flare - Startup/Shutdown	1,382.0	3,837.8	25.1	25.1	25.3	30.5	3,320.5	
Total	9,668.4	32,987.1	3,319.3	3,115.2	2,954.5	19,265.3	2,419.4	94.5

	Controlled Annual Emissions (ton/yr)							
Source	**NOx**	**CO**	**PM**	**PM10**	**PM2.5**	**VOC/ POC**	**SOx**	**NPOC**
S-1 Feedstock Preparation Building			0.068	0.032	0.010	1.37		0.012
S-5 Wet Feedstock Storage Silo			0.000	0.000	0.000	0.93		0.008
S-10 Feedstock Dryer; Low-Temperature Belt Dryer			0.018	0.016	0.006	1.80		0.016
S-15 Dry Feedstock Storage Silo			0.000	0.000	0.000	1.32		0.012
S-25 OMNI GPRS ICARS	1.06	2.76	0.030	0.030	0.030	0.02	0.00	
S-30 Slag Handling, Crushing, and Loading			0.088	0.040	0.007			
S-40 Boiler	2.21	13.44	1.37	1.37	1.37	1.53	1.21	
S-85 Wet Cooling Tower			0.05	0.04	0.02			
Equipment and Piping Components						2.63		
S-75 Emergency Diesel-fired ICE Generator	0.019	0.017	0.004	0.004	0.004	0.003	0.0002	
S-80 Emergency Diesel-fired ICE Fire Water Pump	0.003	0.012	0.001	0.001	0.001	0.001	0.0001	
S-36 Flare - Normal Operations - Hydrogen Flaring	1.24							
S-36 Flare - Normal Operations	0.30	0.25	0.02	0.02	0.02	0.02	0.002	
S-36 Flare - Startup/Shutdown	0.69	1.92	0.01	0.01	0.01	0.02	1.660	
Total	**4.83**	**16.48**	**1.66**	**1.56**	**1.48**	**9.63**	**1.21**	**0.05**

Cumulative Increase

Pollutant	Permitted Emissions (since Reg 2-2-209 Baseline Date)	Offsets Previously Provided, including from SFB (Reg 2-2-608.2.2)	Adjusted Actual Baseline (Reg 2-2-603)	Project PTE	Project Emissions Increase (Reg 2-2-606)	Contemporaneous Onsite Emissions Reduction (Reg. 2-2-605)	Project Cumulative Emissions Increase (Reg. 2-2-607)
	(TPY)	(TPY)	(TPY)	(TPY)	(TPY)	(TPY)	(TPY)
NO_x	0.000	0.000	0.000	4.834	4.834	0.000	4.834
CO	0.000	0.000	0.000	16.478	16.478	0.000	16.478
POC	0.000	0.000	0.000	9.632	9.632	0.000	9.632
PM_{10}	0.000	0.000	0.000	1.556	1.556	0.000	1.556
$PM_{2.5}$	0.000	0.000	0.000	1.476	1.476	0.000	1.476
SO_2	0.000	0.000	0.000	1.210	1.210	0.000	1.210

Pollutant	Facility-Wide Post Project PTE	Emissions Increase with This Application/ Project Cumulative Emissions Increase (Reg. 2-2-607)	Prior Cumulative Increase (Reg 2-2-608.2.1) TPY	Prior Offsets Provided, including from SFB (Reg 2-2-608.2.2) TPY	Prior Unoffset Cumulative Increase (Reg 2-2-608.2)	Total Facility Unoffset Cumulative Increase (Reg 2-2-608)	Regulation 2-2-302 and 2-2-303 Offset Triggers	Offsets Required
	(TPY)	(TPY)	(TPY)	(TPY)	(TPY)	(TPY)	(TPY)	
NO_x	4.872	4.834	0.000	0.000	0.000	4.834	Post-project Facility-wide PTE > 10	0
CO	16.511	16.478	0.000	0.000	0.000	16.478	NA	NA
POC	9.637	9.632	0.000	0.000	0.000	9.632	Post-project Facility-wide PTE > 10	-0.368
PM_{10}	1.563	1.556	0.000	0.000	0.000	1.556	> 1.0 CI and ≥100 tpy post-project facility-wide PTE	0
$PM_{2.5}$	1.483	1.476	0.000	0.000	0.000	1.476	> 1.0 CI and ≥100 tpy post-project facility-wide PTE	0
SO_2	1.210	1.210	0.000	0.000	0.000	1.210	> 1.0 CI and ≥100 tpy post-project facility-wide PTE	0

CAS	Pollutant	HAP	TAC	Maximum Controlled Hourly Emissions (lb/hr)													Acute Trigger Level (lb/hr)	Above Trigger Level - HRA Needed
				S-1	S-5	S-10	S-15	S-25	S-30	S-36	S-40	S-75	S-80	Fugitives	WWTP	Total		
71-55-6	1,1,1-Trichloroethane	Yes	Yes							0.00E+00						0.00E+00	3.00E+01	No
75-34-3	1,1-Dichloroethane	Yes	Yes							0.00E+00						0.00E+00	N/A	No
107-06-2	1,2-Dicholoroethane	Yes	Yes	2.02E-05	3.89E-06	4.74E-06	3.48E-06			0.00E+00					0.00E+00	3.23E-05	N/A	No
123-91-1	1,4-Dioxane	Yes	Yes							0.00E+00						0.00E+00	1.30E+00	No
78-93-3	2-Butanone (MEK)	No	Yes	1.27E-02	2.45E-03	2.99E-03	2.19E-03									2.04E-02	5.80E+00	No
75-07-0	Acetaldehyde	Yes	Yes	2.11E-02	4.07E-03	4.97E-03	3.64E-03	1.70E-04		1.73E-04	2.53E-04					3.44E-02	2.10E-01	No
75-05-8	Acetonitrile	Yes	No							0.00E+00						0.00E+00	N/A	No
107-02-8	Acrolein	Yes	Yes					1.07E-04		1.09E-04	1.59E-04					3.75E-04	1.10E-03	No
107-13-1	Acrylonitrile		Yes							0.00E+00						0.00E+00	N/A	No
107-05-1	Allyl chloride	Yes	Yes	1.27E-05	2.45E-06	2.99E-06	2.19E-06									2.03E-05	N/A	No
7664-41-7	Ammonia		Yes	8.53E-02	1.82E-02	2.22E-02	1.63E-02			9.74E-01	0.00E+00	6.15E-02	1.93E-02	3.00E-03		1.20E+00	1.40E+00	No
7440-36-0	Antimony Compounds	Yes	No						6.71E-07	1.44E-03	0.00E+00					1.44E-03	N/A	No
7440-38-2	Arsenic and compounds	Yes	Yes					7.90E-06		9.55E-04	1.18E-05					9.74E-04	8.80E-05	**Yes**
71-43-2	Benzene	Yes	Yes					3.16E-04		7.50E-03	4.70E-04			1.83E-04	6.00E-06	8.47E-03	1.20E-02	No
7440-41-7	Beryllium and compounds	Yes	Yes					2.37E-07	6.50E-08	2.41E-07	3.53E-07					8.96E-07	N/A	No
92-52-4	Biphenyl	Yes	No							2.06E-04	0.00E+00				0.00E+00	2.06E-04	N/A	No
7440-43-9	Cadmium and compounds	Yes	Yes					4.35E-05		1.51E-04	6.48E-05					2.60E-04	N/A	No
75-15-0	Carbon disulfide	Yes	Yes	1.34E-05	2.59E-06	3.16E-06	2.32E-06			2.20E-03	0.00E+00				0.00E+00	2.22E-03	2.70E+00	No
56-23-5	Carbon Tetrachloride	Yes	Yes							0.00E+00						0.00E+00	8.40E-01	No
463-58-1	Carbonyl sulfide	Yes	Yes							2.17E-02	2.15E-06			6.32E-05	0.00E+00	2.18E-02	2.90E-01	No
108-90-7	Chlorobenzene	Yes	Yes							0.00E+00					1.57E-08	1.57E-08	N/A	No
67-66-3	Chloroform	Yes	Yes							0.00E+00						0.00E+00	6.60E-02	No
1308-38-9	Chromium oxide (Cr2O3) (Chromium Compounds)	Yes							1.08E-05							1.08E-05	N/A	No
16065-83-1	Chromium, trivalent	Yes								4.73E-05	0.00E+00					4.73E-05	N/A	No
18540-29-9	Chromium, (hexavalent, 6+) (Chromium Compounds)	Yes	Yes													0.00E+00	N/A	No
7440-47-3	Chromium and compounds (combine all Chromium Compound	Yes		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.08E-05	0.00E+00		0.00E+00	0.00E+00		0.00E+00	1.08E-05	N/A	No
7440-48-4	Cobalt and compounds	Yes	Yes						6.50E-06	9.16E-04	0.00E+00					9.23E-04	N/A	No
7440-50-8	Copper and compounds		Yes					3.36E-05	1.56E-04	8.28E-04	5.00E-05					1.07E-03	4.40E-02	No
75-09-2	Dichloromethane	Yes	Yes							0.00E+00					0.00E+00	0.00E+00	6.20E+00	No
9901	Diesel Particulate Matter		Yes									1.45E-01	4.29E-02			1.88E-01	N/A	No
100-41-4	Ethylbenzene	Yes	Yes	4.46E-05	8.60E-06	1.05E-05	7.70E-06	3.75E-04		3.82E-04	5.59E-04					1.39E-03	N/A	No
118-74-1	Hexachlorobenzene	Yes	Yes												0.00E+00	0.00E+00	N/A	No
7647-01-0	Hydrogen Chloride	Yes	Yes							1.79E-02	0.00E+00			4.45E-07		1.79E-02	9.30E-01	No
74-90-8	Hydrogen Cyanide (Cyanide and compounds)	Yes	Yes							1.70E-01	0.00E+00			3.19E-04	0.00E+00	1.71E-01	1.50E-01	**Yes**
7664-39-3	Hydrogen Fluoride	Yes	Yes							0.00E+00						0.00E+00	1.10E-01	No
7783-06-4	Hydrogen Sulfide	Yes	Yes							2.36E-01	1.22E-06			7.74E-04		2.37E-01	1.90E-02	**Yes**
67-63-0	Isopropyl alcohol (2-Propanol)		Yes	1.19E-02	2.30E-03	2.80E-03	2.05E-03									1.91E-02	1.40E+00	No
7439-92-1	Lead and compounds (inorganic)	Yes	Yes					1.97E-05	1.73E-07	5.24E-03	2.94E-05					5.29E-03	N/A	No
7439-96-5	Manganese and compounds	Yes	Yes					1.50E-05	8.66E-06	7.64E-05	2.24E-05					1.22E-04	N/A	No
7439-97-6	Mercury and compounds	Yes	Yes					1.03E-05		5.63E-05	2.15E-05					8.80E-05	2.70E-04	No
67-56-1	Methyl alcohol (methanol)	Yes	Yes	2.58E-01	4.98E-02	6.08E-02	4.45E-02									4.13E-01	1.20E+01	No
91-20-3	Naphthalene	Yes	Yes	1.74E-04	3.35E-05	4.08E-05	2.99E-05	2.41E-05		8.57E-03	3.59E-05			1.59E-05	1.60E-05	8.94E-03	N/A	No
110-54-3	n-Hexane	Yes	Yes					2.49E-04		2.54E-04	3.71E-04					8.74E-04	N/A	No
7440-02-0	Nickel and compounds	Yes	Yes					8.30E-05	6.50E-06	1.78E-04	1.24E-04					3.91E-04	8.80E-05	**Yes**
108-95-2	Phenol	Yes	Yes												0.00E+00	0.00E+00	2.60E+00	No
1150/1151	PAH (as benzo(a)pyrene-equiv.)	Yes	Yes					2.66E-07		9.20E-04	3.96E-07			1.71E-06	1.66E-05	9.39E-04	N/A	No
	Polycyclic Organic Matter	Yes	No												8.53E-05	8.53E-05	N/A	No
1086/1080	PCDD/PCDF-eq[4]		Yes							0.00E+00	0.00E+00					0.00E+00	N/A	No
7723-14-0	Phosphorus	Yes								3.48E-03	0.00E+00					3.48E-03	N/A	No
115-07-1	Propylene (1-Propene)		Yes	1.70E-04	3.27E-05	4.00E-05	2.93E-05	2.89E-02		2.94E-02	4.30E-02					1.02E-01	N/A	No
7782-49-2	Selenium and compounds	Yes	Yes					4.75E-07		4.85E-07	7.08E-07					1.67E-06	N/A	No
7631-86-9	Silicon dioxide (assumes crystalline silica)		Yes						1.48E-02							1.48E-02	N/A	No
100-42-5	Styrene	Yes	Yes	1.32E-04	2.55E-05	3.11E-05	2.28E-05								7.83E-09	2.12E-04	9.30E+00	No
7446-11-9	Sulfur trioxide		Yes						1.44E-03							1.44E-03	5.30E-02	No
108-88-3	Toluene	Yes	Yes	8.44E-05	1.63E-05	1.99E-05	1.45E-05	1.45E-03		1.47E-03	2.15E-03				2.35E-08	5.21E-03	2.20E+00	No
79-01-6	Trichloroethene	Yes	Yes							0.00E+00						0.00E+00	N/A	No
7440-62-2	Vanadium (fume or dust)		Yes					9.07E-05		9.24E-05	1.35E-04					3.18E-04	1.30E-02	No
1314-62-1	Vanadium pentoxide		Yes						6.06E-07							6.06E-07	1.30E-02	No
108-05-4	Vinyl acetate	Yes	Yes	4.21E-04	8.11E-05	9.89E-05	7.25E-05									6.73E-04	N/A	No
75-01-4	Vinyl Chloride	Yes	Yes							0.00E+00						0.00E+00	8.00E+01	No
1330-20-7	Xylenes	Yes	Yes	9.55E-05	1.84E-05	2.25E-05	1.65E-05	1.08E-03		1.10E-03	1.60E-03					3.93E-03	9.70E+00	No

CAS	Pollutant	HAP	TAC	Controlled Annual Emissions (lb/yr)													Chronic Trigger Level (lb/yr)	Above Trigger Level - HRA Needed
				S-1	S-5	S-10	S-15	S-25	S-30	S-36	S-40	S-75	S-80	Fugitives	WWTP	Total		
71-55-6	1,1,1-Trichloroethane	Yes	Yes							0.00E+00						0.00E+00	3.90E+04	No
75-34-3	1,1-Dichloroethane	Yes	Yes							0.00E+00						0.00E+00	5.00E+01	No
107-06-2	1,2-Dicholoroethane	Yes	Yes	2.96E-02	2.00E-02	3.89E-02	2.85E-02			0.00E+00					0.00E+00	1.17E-01	4.00E+00	No
123-91-1	1,4-Dioxane	Yes	Yes							0.00E+00						0.00E+00	1.10E+01	No
78-93-3	2-Butanone (MEK)	No	Yes	1.87E+01	1.26E+01	2.45E+01	1.80E+01									7.38E+01	N/A	No
75-07-0	Acetaldehyde	Yes	Yes	3.10E+01	2.09E+01	4.07E+01	2.99E+01	3.40E-02		4.08E-02	1.63E-01					1.23E+02	2.90E+01	**Yes**
75-05-8	Acetonitrile	Yes								0.00E+00						0.00E+00	N/A	No
107-02-8	Acrolein	Yes	Yes					2.14E-02		2.56E-02	1.02E-01					1.49E-01	1.40E+01	No
107-13-1	Acrylonitrile		Yes							0.00E+00						0.00E+00	2.90E-01	No
107-05-1	Allyl chloride	Yes	Yes	1.87E-02	1.26E-02	2.45E-02	1.80E-02									7.37E-02	1.40E+01	No
7664-41-7	Ammonia		Yes	1.29E+02	9.36E+01	1.82E+02	1.33E+02			3.31E+01	0.00E+00	3.08E+00	9.66E-01	2.63E+01		6.01E+02	7.70E+03	No
7440-36-0	Antimony Compounds	Yes							2.51E-03	4.88E-02	0.00E+00					5.13E-02	N/A	No
7440-38-2	Arsenic and compounds	Yes	Yes					1.58E-03		3.41E-02	7.55E-02					1.11E-01	1.60E-03	**Yes**
71-43-2	Benzene	Yes	Yes					6.32E-02		3.20E-01	3.03E-01			1.60E+00	1.44E-04	2.29E+00	2.90E+00	No
7440-41-7	Beryllium and compounds	Yes	Yes					4.74E-05	2.43E-04	5.69E-05	2.27E-03					2.61E-03	3.40E-02	No
92-52-4	Biphenyl	Yes								7.01E-03	0.00E+00				0.00E+00	7.01E-03	N/A	No
7440-43-9	Cadmium and compounds	Yes	Yes					8.70E-03		1.41E-02	4.16E-01					4.39E-01	1.90E-02	**Yes**
75-15-0	Carbon disulfide	Yes	Yes	1.97E-02	1.33E-02	2.59E-02	1.90E-02			7.47E-02	0.00E+00				0.00E+00	1.53E-01	3.10E+04	No
56-23-5	Carbon Tetrachloride	Yes	Yes							0.00E+00						0.00E+00	1.90E+00	No
463-58-1	Carbonyl sulfide	Yes	Yes							7.39E-01	1.77E-02			5.53E-01	0.00E+00	1.31E+00	3.90E+02	No
108-90-7	Chlorobenzene	Yes	Yes							0.00E+00					3.76E-07	3.76E-07	3.90E+04	No
67-66-3	Chloroform	Yes	Yes							0.00E+00						0.00E+00	1.50E+01	No
1308-38-9	Chromium oxide (Cr2O3) (Chromium Compounds)	Yes							4.05E-02							4.05E-02	N/A	No
16065-83-1	Chromium, trivalent	Yes								1.61E-03	0.00E+00					1.61E-03	N/A	No
18540-29-9	Chromium, (hexavalent, 6+) (Chromium Compounds)	Yes	Yes													0.00E+00	5.10E-04	No
7440-47-3	Chromium and compounds	Yes		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.05E-02	0.00E+00		0.00E+00	0.00E+00		0.00E+00	4.05E-02	N/A	No
7440-48-4	Cobalt and compounds	Yes	Yes						2.43E-02	3.12E-02	0.00E+00					5.54E-02	1.10E-02	**Yes**
7440-50-8	Copper and compounds		Yes					6.71E-03	5.83E-01	3.51E-02	3.21E-01					9.45E-01	N/A	No
0	Cyanide and compounds	Yes														0.00E+00	3.50E+02	No
75-09-2	Dichloromethane	Yes	Yes							0.00E+00					0.00E+00	0.00E+00	8.20E+01	No
9901	Diesel Particulate Matter		Yes									7.27E+00	2.14E+00			9.41E+00	2.60E-01	**Yes**
100-41-4	Ethylbenzene	Yes	Yes	6.56E-02	4.43E-02	8.61E-02	6.31E-02	7.50E-02		9.01E-02	3.59E-01					7.83E-01	3.30E+01	No
118-74-1	Hexachlorobenzene	Yes	Yes												0.00E+00	0.00E+00	1.60E-01	No
7647-01-0	Hydrogen Chloride	Yes	Yes							6.09E-01	0.00E+00			3.90E-03		6.13E-01	3.50E+02	No
74-90-8	Hydrogen Cyanide (Cyanide and compounds)	Yes	Yes							5.79E+00	0.00E+00			2.79E+00	0.00E+00	8.58E+00	3.50E+02	No
7664-39-3	Hydrogen Fluoride	Yes	Yes							0.00E+00						0.00E+00	5.80E+01	No
7783-06-4	Hydrogen Sulfide	Yes	Yes							8.02E+00	1.00E-02			6.78E+00		1.48E+01	3.90E+02	No
67-63-0	Isopropyl alcohol (2-Propanol)		Yes	1.75E+01	1.18E+01	2.30E+01	1.68E+01									6.91E+01	2.70E+05	No
7439-92-1	Lead and compounds (inorganic)	Yes	Yes					3.95E-03	6.47E-04	1.82E-01	1.89E-01					3.76E-01	2.90E-01	**Yes**
7439-96-5	Manganese and compounds	Yes	Yes					3.01E-03	3.24E-02	5.69E-03	1.44E-01					1.85E-01	3.50E+00	No
7439-97-6	Mercury and compounds	Yes	Yes					2.05E-03		4.46E-03	1.80E-01					1.87E-01	2.10E-01	No
67-56-1	Methyl alcohol (methanol)	Yes	Yes	3.79E+02	2.56E+02	4.98E+02	3.65E+02									1.50E+03	1.50E+05	No
91-20-3	Naphthalene	Yes	Yes	2.55E-01	1.72E-01	3.35E-01	2.45E-01	4.82E-03		2.96E-01	2.30E-02			1.39E-01	3.83E-04	1.47E+00	2.40E+00	No
110-54-3	n-Hexane	Yes	Yes					4.98E-02		5.98E-02	2.38E-01					3.48E-01	2.70E+05	No
7440-02-0	Nickel and compounds	Yes	Yes					1.66E-02	2.43E-02	2.31E-02	7.94E-01					8.58E-01	3.10E-01	**Yes**
108-95-2	Phenol	Yes	Yes												0.00E+00	0.00E+00	7.70E+03	No
1150/1151	PAH (as benzo(a)pyrene-equiv.)	Yes	Yes					5.32E-05		3.13E-02	2.54E-04			1.49E-02	3.98E-04	4.70E-02	3.30E-03	**Yes**
1086/1080	PCDD/PCDF-eq[4]		Yes							0.00E+00	0.00E+00					0.00E+00	4.40E-08	No
7723-14-0	Phosphorus	Yes								1.18E-01	0.00E+00					1.18E-01	N/A	No
115-07-1	Propylene (1-Propene)		Yes	2.50E-01	1.68E-01	3.28E-01	2.40E-01	5.78E+00		6.94E+00	2.76E+01					4.13E+01	1.20E+05	No
7782-49-2	Selenium and compounds	Yes	Yes					9.51E-05		1.14E-04	4.55E-03					4.76E-03	8.00E+00	No
7631-86-9	Silicon dioxide (assumes crystalline silica)		Yes						5.52E+01							5.52E+01	1.20E+02	No
100-42-5	Styrene	Yes	Yes	1.94E-01	1.31E-01	2.55E-01	1.87E-01								1.88E-07	7.68E-01	3.50E+04	No
7446-11-9	Sulfur trioxide		Yes						5.37E+00							5.37E+00	3.90E+01	No
108-88-3	Toluene	Yes	Yes	1.24E-01	8.37E-02	1.63E-01	1.19E-01	2.89E-01		3.47E-01	1.38E+00				5.64E-07	2.51E+00	1.60E+04	No
79-01-6	Trichloroethene	Yes	Yes							0.00E+00						0.00E+00	4.10E+01	No
7440-62-2	Vanadium (fume or dust)		Yes					1.81E-02		2.18E-02	8.67E-01					9.07E-01	N/A	No
1314-62-1	Vanadium pentoxide		Yes						2.27E-03							2.27E-03	N/A	No
108-05-4	Vinyl acetate	Yes	Yes	6.18E-01	4.17E-01	8.11E-01	5.95E-01									2.44E+00	7.70E+03	No
75-01-4	Vinyl Chloride	Yes	Yes							0.00E+00						0.00E+00	1.10E+00	No
1330-20-7	Xylenes	Yes	Yes	1.40E-01	9.46E-02	1.84E-01	1.35E-01	2.15E-01		2.58E-01	1.03E+00					2.06E+00	2.70E+04	No

Operations Greenhouse Gas Emissions Summary Table

Source	CO_2 (tonnes/yr)	CH_4 (tonnes/yr)	N_2O (tonnes/yr)	CO_2e (tonnes/yr)
S-25 SRM & Refiner NG Burners	2,757	0.052	0.0052	2,760
S-36 Flare	336	0.006	0.0006	337
S-40 Boiler	28,985	0.91	0.14	29,050
S-75 Emergency Diesel-fired ICE Generator	47.8	0.0019	3.74E-04	47.9
S-80 Emergency Diesel-fired ICE Fire Water Pump	5.00	0.0002	3.92E-05	5.02
Fugitive Components	--	--	--	328.42
On-road and off-road mobile sources	1,649	0.07	0.01	1,655
Indirect Emissions	--	--	--	3,315
Total	33,780	1.04	0.16	**37,498**

Facility Operating Schedule and Throughput

Normal Operating Phase

Daily normal operating hours (hrs/day)	24	
Annual normal operating hours (hrs/year)	8200	[Based on 93% capacity factor or utilization, rounded to 8200]
Start-up time per start-up event (hrs/ event)	58	
Number of start-up events /year	4	
Shutdown time per shutdown event (hrs/ event)	10	

Startup Stage	Flue Characteristics	Vented from	Duration (hours)
1	Only NG combustion products flue	Heat-up stack	48
2	Only NG combustion products flue	LP Flare. Flare will be used as a stack and not as a flare	0.5
3	Low LHV Syngas	LP Gas Flaring. Flaring will occur.	4.5
4	High LHV Syngas	HP Gas Flaring. Flaring will occur	5
5	No flue - Normal Operation begins		0
Total			58

Shutdown Stage	Flue Characteristics	Vented from	Duration (hours)
1	High LHV Syngas	HP Gas Flaring. Flaring will occur	1
2	Low LHV Syngas	HP Gas Flaring. Flaring will occur	3
3	Slag deinventory gases and NG combustion products	LP Gas Flaring (assume LP flare syngas conditions)	4
4	Only NG combustion products flue	Heat-up stack	2
Total			10

Throughput by Source or Process Unit	Maximum Hourly (per hour)	Maximum Daily (per day)	Annual (per year)
Waste Material Accepted at Site or S-1 (tons)	110	550	175,000
Pre-processed Wet Feedstock to Wet Silo S-5 (tons)	28	446	141,750
Pre-processed Wet Feedstock to Dryer S-10 (tons) - Based on dryer's input capacity per manufacturer's specs	19	463	158,181
Dried Feedstock to Dry Silo S-15 (tons)	13	309	105,454
Dried Feedstock to OMNI Unit S-25 (tons)	11	250	95,000
Slag Handled in S-30 (tons)	2.0	48	16,294
Hydrogen Production Capacity by Facility (scf)	300,953	7,222,864	2,395,229,241
Additional Hydrogen Received from Offsite Routed to PSA (scf)	115,771	2778504	921,400,988
Total Hydrogen Production (Offsite and Facility-Produced, scf)	416,724	10,001,368	3,316,630,229

Quantity of syngas generated per ton of waste feed during normal operation in OMNI unit (S-25)	47,390	scf syngas/ton waste converted
Quantity of syngas generated per ton of waste feed during normal operation in OMNI unit (S-25)	2,705	lb of syngas/ton waste converted

S-1 Feedstock Preparation Building

Source Description: Feedstock (pre-sorted MSW) is tipped and processed/sorted through a shredder, magnetic separator, eddy current separator, fine screen, air classifier, and NIR. Inerts/ refuse material stored in bunkers

Throughput (tons)	Maximum Hourly (per hour)	Maximum Daily (per day)	Maximum Annual (per year)
Total MSW	110	550	175,000

Particulate Emissions from Waste Feedstock Tipping, Transfer, and Sorting

Emissions from material transfer occur when material is dropped from one transfer point to another

Material Transfer Emissions

Emission Factor	$E = k(0.0032)(U/5)^{1.3}/(M/2)^{1.4}$	[AP-42 Chapter 13.2.4, Equation 1]
Mean Wind Speed (U)	2.3 mph	Using an inbound windspeed of 200 feet/min required at natural draft openings in a permanent total enclosure per EPA Method 204
Material Moisture Content (M)	22 %	Moisture content in overall feedstock as received
Uncontrolled PM (TSP) Emissions Factor	0.000031 lb/ton per drop	k = 0.74 from AP-42 Chapter 13.2.4
Uncontrolled PM10 Emissions Factor	0.0000145 lb/ton per drop	k = 0.35 from AP-42 Chapter 13.2.4
Uncontrolled PM2.5 Emissions Factor	0.0000022 lb/ton per drop	k = 0.053 from AP-42 Chapter 13.2.4

Number of Transfer Points

Trucks to tipping floor	1
Tipping floor to shredder via loader	2
Shredder to magnetic separator	1
Magnetic separator to eddy current separator	1
Eddy current separator to fine screen	1
Fine screen to air classifier	1
Air classifier to NIR separator	1
Refuse material into bunkers and from bunkers to trucks via loaders	3
Number of Transfer Points for S-1	11

Material Transfer Emissions	Maximum Hourly (lb per hour)	Maximum Daily (lb per day)	Maximum Annual (lb per year)
PM Material Transfer Emissions	0.04	0.19	58.95
PM10 Material Transfer Emisisons	0.02	0.09	27.88
PM2.5 Material Transfer Emissions	0.00	0.01	4.22
Capture Efficiency (%) During Working Hours When Doors Are Open	92.5%	92.5%	92.5%
Fugitive PM Material Transfer Emissions	0.00	0.01	4.42
Fugitive PM10 Material Transfer Emisisons	0.00	0.01	2.09
Fugitive PM2.5 Material Transfer Emissions	0.00	0.00	0.32
PM Desctruction Efficiency (%) of Abatement Device	99.9%	99.9%	99.9%
Undestructed PM Emissions (lb)	0.00	0.00	0.05
Undestructed PM10 Emissions (lb)	0.00	0.00	0.03
Undestructed PM2.5 Emissions (lb)	0.00	0.00	0.00
Total Controlled PM Emissions	0.00	0.01	4.48
Total Controlled PM10 Emissions	0.00	0.01	2.12
Total Controlled PM2.5 Emissions	0.00	0.00	0.32

Shredder Emissions

Grinding EF

PM Grinding EF	0.02400 lb/ton	[BAAQMD Permit handbook Chapter 11.13, wood grinding]
PM10 Grinding EF	0.01440 lb/ton	
PM2.5 Grinding EF	0.00679 lb/ton	From CARB PMSIZE Profile #362
Inherent control due to high moisture content in waste [BAAQMD Permit handbook Chapter 11.13]	70%	Accounts for inherent control achieved due to high moisture content in the feedstock than in the typical wood feedstock. Accounts for grinding to a larger size.

Shredding Emissions (lbs)	Maximum Hourly (lb per hour)	Maximum Daily (lb per day)	Maximum Annual (lb per year)
PM Shredding Emissions	0.79	3.96	1260.00
PM10 Shredding Emisisons	0.48	2.38	756.00
PM2.5 Shredding Emissions	0.22	1.12	356.58
Capture Efficiency (%) During Working Hours When Doors Are Open	92.5%	92.5%	92.5%
Capture Efficiency (%) During Non-Working Hours When Doors are Closed	100%	100%	100%
Fugitive PM Shredding Emissions	0.06	0.20	63.00
Fugitive PM10 Shredding Emisisons	0.04	0.12	37.80
Fugitive PM2.5 Shredding Emissions	0.0168	0.06	17.83

PM Destruction Efficiency (%) of Abatement Device	99.9%	99.9%	99.9%
Undestructed PM Emissions (lb)	0.00	0.00	1.20
Undestructed PM10 Emissions (lb)	0.00	0.00	0.72
Undestructed PM2.5 Emissions (lb)	0.00	0.00	0.34
Total Controlled PM Emissions	0.06	0.20	64.20
Total Controlled PM10 Emissions	0.04	0.12	38.52
Total Controlled PM2.5 Emissions	0.02	0.06	18.17

Fine Screen Emissions

Screening EF

PM Screening EF	0.02500 lb/ton	[AP-42, 5th Edition, Chapter 11.19.2, Crushed Stone Procesing, Table 11.19.2-2]
PM10 Screening EF	0.00870 lb/ton	
PM2.5 Screening EF	0.00059 lb/ton	The ratio of PM2.5 to PM10 emission factors for controlled screening in AP-42, 5th Edition, Chapter 11.19.2, Crushed Stone Procesing, Table 11.19.2-2 was applied to uncontrolled screening PM10 to obtain the uncontrolled screening PM2.5
Inherent control due to high moisture content in waste	70%	Accounts for inherent control achieved due to high moisture content in the feedstock than in typical sand/crushed stone.

Screening Emissions (lbs)	**Maximum Hourly (per hour)**	**Maximum Daily (per day)**	**Maximum Annual (per year)**
PM Screening Emissions	0.83	4.13	1312.50
PM10 Screening Emisisons	0.29	1.44	456.75
PM2.5 Screening Emissions	0.02	0.10	30.86
Capture Efficiency (%) During Working Hours When Doors Are Open	92.5%	92.5%	92.5%
Capture Efficiency (%) During Non-Working Hours When Doors are Closed	100%	100%	100%
PM Destruction Efficiency (%) of Abatement Device	99.9%	99.9%	99.9%
Fugitive PM Screening Emissions	0.06	0.21	65.63
Fugitive PM10 Screening Emisisons	0.02	0.07	22.84
Fugitive PM2.5 Screening Emissions	0.00	0.00	1.54
Undestructed PM Emissions (lb)	0.00	0.00	1.25
Undestructed PM10 Emissions (lb)	0.00	0.00	0.43
Undestructed PM2.5 Emissions (lb)	0.00	0.00	0.03
Total Controlled PM Emissions	0.06	0.21	66.87
Total Controlled PM10 Emissions	0.02	0.07	23.27
Total Controlled PM2.5 Emissions	0.00	0.00	1.57

Total Uncontrolled PM Emissions (lb)	**Maximum Hourly (lb/hour)**	**Maximum Daily (lb/day)**	**Annual (lb/year)**
Total PM Emissions	1.654	8.270	2631
Total PM10 Emissions	0.780	3.899	1241
Total PM2.5 Emissions	0.246	1.231	392
Total Controlled PM Emissions (lb)	**Maximum Hourly (lb/hour)**	**Maximum Daily (lb/day)**	**Annual (lb/year)**
Total PM Emissions	0.13	0.43	135.54
Total PM10 Emissions	0.06	0.20	63.91
Total PM2.5 Emissions	0.01869	0.06	20.06

VOC Emissions from Decomposable Organic Waste

VOC Emissions Factor	0.13 lb VOC/ wet ton.day	VOC EF is a weighted average of green and food waste stockpile emission factors obtained from Source Testing (NTV-2145) at Napa Recycling and Waste Services, BAAQMD Plant # 17403; weighted by the ratio of typical ratio food waste:green waste expected in H-Cycle's feedstock
Ammonia Emissions Factor[1]	0.004 lb NH3/ wet ton.day	https://www.valleyair.org/busind/pto/emission_factors/Criteria/Criteria/Composting/Compost%20EF.pdf

1. Ammonia EF from SJVAPCD was scaled since 22% of the feed for the project will be comprised of the feed stream used to determine the NH3 EF.

Throughput-Time	**Maximum Hourly (per hour)**	**Maximum Daily (per day)**	**Maximum Annual (per year)**
Residence Time at Source (days)	0.5	0.5	0.5
Total Waste-Time (Wet Ton.days)	55	275	87,500

S-1 VOC Emissions (lbs)	**Maximum Hourly (lb/hour)**	**Maximum Daily (lb/day)**	**Annual (lb/year)**
Uncontrolled VOC Emissions (lb)	7.19	35.93	11433.33
Uncontrolled NH3 Emisisons (lb)	0.24	1.21	385.00
Capture Efficiency (%) During Working Hours When Doors Are Open	92.5%	92.5%	92.5%
Capture Efficiency (%) During Non-Working Hours When Doors are Closed	100%	100%	100%

VOC Destruction Efficiency (%) of Abatement Device[1]	80%	80%	80%
Fugitive VOC Emissions (lb)	0.54	1.80	571.67
Undestructed VOC Emissions (lb)	1.33	6.83	2172.33
Total Controlled VOC Emissions (lb)	**1.87**	**8.62**	**2744**

1. VOC abatement efficiency taken from Table III-3: Control Technologies for Composting Operations, https://ww3.arb.ca.gov/ei/areasrc/composting_emissions_inventory_methodology_final_combined.pdf

NH3 Destruction Efficiency (%) of Abatement Device[1]	70%	70%	70%
Fugitive NH3 Emissions (lb)	0.02	0.06	19.25
Undestructed NH3 Emissions (lb)	0.07	0.34	109.73
Total Ammonia Emissions (lb)	**0.09**	**0.41**	**128.98**

1. Ammonia abatement efficiency taken from Table III-3: Control Technologies for Composting Operations, https://ww3.arb.ca.gov/ei/areasrc/composting_emissions_inventory_methodology_final_combined.pdf

TAC Emissions from Decomposable Organic Waste

CAS #	Toxic Air Contaminant (TAC)	Weighted Average Weight % in VOC	Fugitive Hourly Emissions (lb/hr)	Fugitive Annual Emissions (lb/yr)	Undestructed Hourly Emissions (lb/hr)	Undestructed Annual Emissions (lb/yr)	Total Controlled Hourly Emissions (lb/hr)	Above Acute Trigger Level	Total Controlled Annual Emissions (lb/yr)
75-07-0	Acetaldehyde	1.13E+00	6.09E-03	6.46E+00	1.50E-02	2.46E+01	2.11E-02	No	3.10E+01
67-63-0	Isopropyl alcohol (2-Propanol)	6.38E-01	3.44E-03	3.65E+00	8.48E-03	1.39E+01	1.19E-02	No	1.75E+01
67-56-1	Methyl alcohol (methanol)	1.38E+01	7.45E-02	7.91E+01	1.84E-01	3.00E+02	2.58E-01	No	3.79E+02
91-20-3	Naphthalene	9.30E-03	5.01E-05	5.31E-02	1.24E-04	2.02E-01	1.74E-04	No	2.55E-01
115-07-1	Propylene (1-Propene)	9.09E-03	4.90E-05	5.20E-02	1.21E-04	1.98E-01	1.70E-04	No	2.50E-01
107-05-1	Allyl chloride	6.80E-04	3.67E-06	3.89E-03	9.04E-06	1.48E-02	1.27E-05	No	1.87E-02
75-15-0	Carbon disulfide	7.19E-04	3.88E-06	4.11E-03	9.56E-06	1.56E-02	1.34E-05	No	1.97E-02
108-05-4	Vinyl acetate	2.25E-02	1.21E-04	1.29E-01	2.99E-04	4.89E-01	4.21E-04	No	6.18E-01
78-93-3	2-Butanone (MEK)	6.81E-01	3.67E-03	3.89E+00	9.05E-03	1.48E+01	1.27E-02	No	1.87E+01
107-06-2	1,2-Dicholoroethane	1.08E-03	5.82E-06	6.17E-03	1.43E-05	2.34E-02	2.02E-05	No	2.96E-02
108-88-3	Toluene	4.52E-03	2.43E-05	2.58E-02	6.01E-05	9.81E-02	8.44E-05	No	1.24E-01
100-41-4	Ethylbenzene	2.39E-03	1.29E-05	1.37E-02	3.18E-05	5.19E-02	4.46E-05	No	6.56E-02
1330-20-7	m & p-Xylenes & o-Xylene	5.11E-03	2.75E-05	2.92E-02	6.79E-05	1.11E-01	9.55E-05	No	1.40E-01
100-42-5	Styrene	7.09E-03	3.82E-05	4.05E-02	9.42E-05	1.54E-01	1.32E-04	No	1.94E-01
7664-41-7	Ammonia		1.82E-02	1.93E+01	6.72E-02	1.10E+02	8.53E-02	No	1.29E+02
NPOC		**8.71E-01**	**4.70E-03**	**4.98E+00**	**1.16E-02**	**1.89E+01**	**1.63E-02**		**2.39E+01**

Note:
TAC EF is a weighted average of green and food waste stockpile emission factors obtained from Source Testing (NTV-2145) at Napa Recycling and Waste Services, BAAQMD Plant # 17403; weighted by the ratio of typical ratio food waste:green waste expected in H-Cycle's feedstock
Door sizes, air exchanges, etc. being worked by H Cycle/HDR - 200 fpm currently (engineering of building is lagging behind FEED)

S-5 Wet Feedstock Storage Silo

Source Description: Silo will store biodegradable wet feedstock after sorting and processing in S-1

Throughput (tons)	Maximum Hourly (per hour)	Maximum Daily (per day)	Annual (per year)
Wet feedstock to wet silo (tons)	28	446	141,750

Particulate Emissions from Waste Feedstock Transfer into wet silo

Emissions from material transfer occur when material is dropped from one transfer point to another

Emission Factor	$E = k(0.0032)(U/5)^{1.3}/(M/2)^{1.4}$	[AP-42 Chapter 13.2.4, Equation 1]
Mean Wind Speed	2.3 mph	Using an inbound windspeed of 200 feet/min required at natural draft openings in a permanent total enclosure per EPA Method 204
Material Moisture Content	22 %	Moisture content in overall feedstock as received
Uncontrolled PM (TSP) Emissions Factor	0.000031 lb/ton per drop	k = 0.74 from AP-42 Chapter 13.2.4
Uncontrolled PM10 Emissions Factor	0.000014 lb/ton per drop	k = 0.35 from AP-42 Chapter 13.2.4
Uncontrolled PM2.5 Emissions Factor	0.000002 lb/ton per drop	k = 0.053 from AP-42 Chapter 13.2.4

Number of Transfer Points

NIR separator to storage silo via loader/ conveyor	2

Material Transfer Emissions (lbs)	Maximum Hourly (lb/hour)	Maximum Daily (lb/day)	Annual (lb/year)
PM Material Transfer Emissions	0.00	0.03	8.68
PM10 Material Transfer Emisisons	0.00	0.01	4.11
PM2.5 Material Transfer Emissions	0.00	0.00	0.62
PM Desctruction Efficiency (%) of Abatement Device	99.9%	99.9%	99.9%
Controlled PM Material Transfer Emissions	0.00	0.00	0.01
Controlled PM10 Material Transfer Emisisons	0.00	0.00	0.00
Controlled PM2.5 Material Transfer Emissions	0.00	0.00	0.00

VOC Emissions from Decomposable Organic Waste

VOC Emissions Factor	0.13 lb VOC/ wet ton.day	VOC EF is a weighted average of green and food waste stockpile emission factors obtained from Source Testing (NTV-2145) at Napa Recycling and Waste Services, BAAQMD Plant # 17403; weighted by the ratio of typical ratio food waste:green waste expected in H-Cycle's feedstock
Ammonia Emissions Factor[1]	0.004 lb NH3/ wet ton.day	https://www.valleyair.org/busind/pto/emission_factors/Criteria/Criteria/Composting/Compost%20EF.pdf

1. Ammonia EF from SJVAPCD was scaled since 22% of the feed for the project will be comprised of the feed stream used to determine the NH3 EF.

Wet Decomposable Feedstock	Maximum Hourly (per hour)	Maximum Daily (per day)	Annual (per year)
Throughput of wet feedstock (tons)	28	446	141,750
Residence Time at Source (days)	0.5	0.5	0.5
Total Waste-Time (Wet Ton.days)	14	223	70,875

S-5 VOC Emissions (lbs)	Maximum Hourly (lb/hour)	Maximum Daily (lb/day)	Annual (lb/year)
Uncontrolled VOC Emissions (lb)	1.80	29.11	9261.00
Uncontrolled NH3 Emissions (lb)	0.06	0.98	311.85
Capture Efficiency [Assumption]	100%	100%	100%

VOC Destruction Efficiency (%) of Abatement Device[1]	80%	80%	80%
Fugitive VOC Emissions (lb)	0.00	0.00	0.00
Undestructed VOC Emissions (lb)	0.36	5.82	1852.20
Total Controlled VOC Emissions (lb)	**0.36**	**5.82**	**1852.20**

1. VOC abatement efficiency taken from Table III-3: Control Technologies for Composting Operations, https://ww3.arb.ca.gov/ei/areasrc/composting_emissions_inventory_methodology_final_combined.pdf

NH3 Destruction Efficiency (%) of Abatement Device[1]	70%	70%	70%
Fugitive NH3 Emissions (lb)	0.00	0.00	0.00
Undestructed NH3 Emissions (lb)	0.02	0.29	93.56
Total Ammonia Emissions (lb)	**0.02**	**0.29**	**93.56**

1. Ammonia abatement efficiency taken from Table III-3: Control Technologies for Composting Operations, https://ww3.arb.ca.gov/ei/areasrc/composting_emissions_inventory_methodology_final_combined.pdf

TAC Emissions from Decomposable Organic Waste

CAS #	Toxic Air Contaminant (TAC)	Weighted Average Weight % in VOC	Fugitive Hourly Emissions (lb/hr)	Fugitive Annual Emissions (lb/yr)	Undestructed Hourly Emissions (lb/hr)	Undestructed Annual Emissions (lb/yr)	Total Controlled Hourly Emissions (lb/hr)	Above Acute Trigger Level	Total Controlled Annual Emissions (lb/yr)	Above Chronic Trigger Level
75-07-0	Acetaldehyde	1.13E+00	0.00E+00	0.00E+00	4.07E-03	2.09E+01	4.07E-03	No	2.09E+01	No
67-63-0	Isopropyl alcohol (2-Propanol)	6.38E-01	0.00E+00	0.00E+00	2.30E-03	1.18E+01	2.30E-03	No	1.18E+01	No
67-56-1	Methyl alcohol (methanol)	1.38E+01	0.00E+00	0.00E+00	4.98E-02	2.56E+02	4.98E-02	No	2.56E+02	No
91-20-3	Naphthalene	9.30E-03	0.00E+00	0.00E+00	3.35E-05	1.72E-01	3.35E-05	No	1.72E-01	No
115-07-1	Propylene (1-Propene)	9.09E-03	0.00E+00	0.00E+00	3.27E-05	1.68E-01	3.27E-05	No	1.68E-01	No
107-05-1	Allyl chloride	6.80E-04	0.00E+00	0.00E+00	2.45E-06	1.26E-02	2.45E-06	No	1.26E-02	No
75-15-0	Carbon disulfide	7.19E-04	0.00E+00	0.00E+00	2.59E-06	1.33E-02	2.59E-06	No	1.33E-02	No
108-05-4	Vinyl acetate	2.25E-02	0.00E+00	0.00E+00	8.11E-05	4.17E-01	8.11E-05	No	4.17E-01	No
78-93-3	2-Butanone (MEK)	6.81E-01	0.00E+00	0.00E+00	2.45E-03	1.26E+01	2.45E-03	No	1.26E+01	No
107-06-2	1,2-Dicholoroethane	1.08E-03	0.00E+00	0.00E+00	3.89E-06	2.00E-02	3.89E-06	No	2.00E-02	No
108-88-3	Toluene	4.52E-03	0.00E+00	0.00E+00	1.63E-05	8.37E-02	1.63E-05	No	8.37E-02	No
100-41-4	Ethylbenzene	2.39E-03	0.00E+00	0.00E+00	8.60E-06	4.43E-02	8.60E-06	No	4.43E-02	No
1330-20-7	m & p-Xylenes & o-Xylene	5.11E-03	0.00E+00	0.00E+00	1.84E-05	9.46E-02	1.84E-05	No	9.46E-02	No
100-42-5	Styrene	7.09E-03	0.00E+00	0.00E+00	2.55E-05	1.31E-01	2.55E-05	No	1.31E-01	No
7664-41-7	Ammonia		0.00E+00	0.00E+00	1.82E-02	9.36E+01	1.82E-02	No	9.36E+01	No
NPOC		**8.71E-01**	**0.00E+00**	**0.00E+00**	**3.14E-03**	**1.61E+01**	**3.14E-03**		**1.61E+01**	

Note:
TAC EF is a weighted average of green and food waste stockpile emission factors obtained from Source Testing (NTV-2145) at Napa Recycling and Waste Services, BAAQMD Plant # 17403; weighted by the ratio of typical ratio food waste:green waste expected in H-Cycle's feedstock

S-10 Feedstock Dryer

Source Description: Drying of prepared wet feedstock in low temperature belt dryer

Particulate Emissions from Waste Feedstock transfer into dryer

Emissions from material transfer occur when material is dropped from one transfer point to another

Throughput (tons)	Maximum Hourly (per hour)	Maximum Daily (per day)	Annual (per year)
Waste feedstock into dryer (tons) - Based on dryer's input capacity per manufacturer's specs	19	463	158,181

Material Transfer Emissions

Emission Factor	$E = k(0.0032)(U/5)^{1.3}/(M/2)^{1.4}$	[AP-42 Chapter 13.2.4, Equation 1]
Mean Wind Speed	2.3 mph	Using an inbound windspeed of 200 feet/min required at natural draft openings in a permanent total enclosure per EPA Metho
Material Moisture Content	22 %	Moisture content in overall feedstock as received
Uncontrolled PM (TSP) Emissions Factor	0.00003 lb/ton per drop	k = 0.74 from AP-42 Chapter 13.2.4
Uncontrolled PM10 Emissions Factor	0.00001 lb/ton per drop	k = 0.35 from AP-42 Chapter 13.2.4
Uncontrolled PM2.5 Emissions Factor	0.00000 lb/ton per drop	k = 0.053 from AP-42 Chapter 13.2.4

Number of Transfer Points

Wet waste silo to fully enclosed chain or screw conveyor	1
Fully enclosed chain or screw conveyor to dryer	1
Number of Transfer Points for S-10	2

Material Transfer Emissions (lbs)	Maximum Hourly (lb/hour)	Maximum Daily (lb/day)	Annual (lb/year)
PM Material Transfer Emissions	0.00	0.03	9.69
PM10 Material Transfer Emisisons	0.00	0.01	4.58
PM2.5 Material Transfer Emissions	0.00	0.00	0.69

Particulate and VOC Emissions from Waste Feedstock Drying - Using default wood drying emission factors

Infeed moisture content (% by weight) of wet feedstock - pre dryer	40.00%
Moisture content (% by weight) of dried feedstock - post dryer	10.00%

Particuate and VOC Emissions using Dryer's Outlet Concentrations

Exhaust Parameters

Exhaust gas temperature out of the dryer (F)	118.4	48 C according to H Cycle email dated 9-14-2023
Exhaust gas moisture content (% volume)	9%	[Based on 75% RH and using online moisture content calculator - https://www.dks-engineering.com/en/knowledge/humidity-moisture-calculator]
Maximum exhaust flow rate from the dryer (Nm3/hr dry)	88772	[H Cycle Provided/Manufacturer Specifications]
Maximum exhaust flow rate from the dryer (Nm3/hr wet)	97596	
Maximum exhaust flow rate from the dryer (dscfm)	56075	
Particulate Matter Parameters		
Unabated PM grain loading (mg/Nm3 wet)	15	[Stela - manufacturer specs]
Unabated PM grain loading (gr/ dscf)	0.0064	
PM10 Weight Fraction in PM	1.0000	
PM2.5 Weight Fraction in PM	0.4000	From CARB PMSIZE Profile #325
VOC & HAP Parameters		
Unabated TOC Loading (mg/NM3 wet, as Propane)	10.0000	[provided by Stela]
VOC Fraction in TOC	0.94	
Unabated VOC Loading (gr/dscf, as propane)	0.0040	

Uncontrolled Emissions from drying (lbs)	**Maximum Hourly (lb/hour)**	**Maximum Daily (lb/day)**	**Annual (lb/year)**
Uncontrolled PM Emissions	3.2	77	26465
Uncontrolled PM10 Emissions	3.2	77	26465
Uncontrolled PM2.5 Emissions	1.3	31	10586
Uncontrolled VOC Emissions (as methane)	2.20	53	18016

Particulate Abatement device

PM Abatement efficiency (%)	99.9%

VOC Abatement System

VOC Abatement efficiency (%)	**80%**

1. VOC abatement efficiency taken from Table III-3: Control Technologies for Composting Operations, https://ww3.arb.ca.gov/ei/areasrc/composting_emissions_inventory_methodology_final_combined.pdf

Ammonia Abatement (Biofilter)

NH3 Abatement efficiency (%)	**70%**

1. Ammonia abatement efficiency taken from Table III-3: Control Technologies for Composting Operations, https://ww3.arb.ca.gov/ei/areasrc/composting_emissions_inventory_methodology_final_combined.pdf

Controlled Emissions from S-10 (lbs)	**Maximum Hourly (lb/hour)**	**Maximum Daily (lb/day)**	**Annual (lb/year)**
Controlled PM	**0.004**	**0.106**	**36**
Controlled PM10	**0.004**	**0.091**	**31**
Controlled PM2.5	**0.001**	**0.033**	**11**
Controlled VOC Emissions (as methane)	**0.439**	**10.55**	**3603**

CAS #	Toxic Air Contaminant (TAC)	Weighted Average Weight % in VOC	Total Hourly Emissions (lb/hr)	Above Acute Trigger Level	Total Annual Emissions (lb/yr)	Above Chronic Trigger Level
75-07-0	Acetaldehyde	1.13E+00	4.97E-03	No	4.07E+01	**Yes**
67-63-0	Isopropyl alcohol (2-Propanol)	6.38E-01	2.80E-03	No	2.30E+01	No
67-56-1	Methyl alcohol (methanol)	1.38E+01	6.08E-02	No	4.98E+02	No
91-20-3	Naphthalene	9.30E-03	4.08E-05	No	3.35E-01	No
115-07-1	Propylene (1-Propene)	9.09E-03	4.00E-05	No	3.28E-01	No
107-05-1	Allyl chloride	6.80E-04	2.99E-06	No	2.45E-02	No
75-15-0	Carbon disulfide	7.19E-04	3.16E-06	No	2.59E-02	No
108-05-4	Vinyl acetate	2.25E-02	9.89E-05	No	8.11E-01	No
78-93-3	2-Butanone (MEK)	6.81E-01	2.99E-03	No	2.45E+01	No
107-06-2	1,2-Dicholoroethane	1.08E-03	4.74E-06	No	3.89E-02	No
108-88-3	Toluene	4.52E-03	1.99E-05	No	1.63E-01	No
100-41-4	Ethylbenzene	2.39E-03	1.05E-05	No	8.61E-02	No
1330-20-7	m & p-Xylenes & o-Xylene	5.11E-03	2.25E-05	No	1.84E-01	No
100-42-5	Styrene	7.09E-03	3.11E-05	No	2.55E-01	No
7664-41-7	Ammonia	3.37E+00	2.22E-02	No	1.82E+02	No
NPOC		**8.71E-01**	3.83E-03		3.14E+01	

Note:

TAC EF is a weighted average of green and food waste stockpile emission factors obtained from Source Testing (NTV-2145) at Napa Recycling and Waste Services, BAAQMD Plant # 17403; weighted by the ratio of typical ratio food wa

Test Data Provided by Dryer Manufacturer - Stela. Test conducted on European wood drying

TOC as Propane	44.097	3	15		19	15	19
Propane	44.097	3					
VOC fraction in TOC						0.94	0.94

S-15 Dry Feedstock Storage Silo

Source Description: Storage of dry organic material (prepared feedstock), after sorting and processing in S-1 and drying in S-10

Throughput (tons)	Maximum Hourly (per hour)	Maximum Daily (per day)	Annual (per year)
Dried feedstock to dry silo (tons)	13	309	105,454

Particulate Emissions from Waste Feedstock Transfer into dry silo

Emissions from material transfer occur when material is dropped from one transfer point to another

Material Transfer Emissions

Emission Factor	**$E = k(0.0032)(U/5)^{1.3}/(M/2)^{1.4}$**	[AP-42 Chapter 13.2.4, Equation 1]
Mean Wind Speed	2.3 mph	Using an inbound windspeed of 200 feet/min required at natural draft openings in a permanent total enclosure per EPA Method 204
Material Moisture Content	10.0%	Moisture content in dried feedstock
Uncontrolled PM (TSP) Emissions Factor	0.00009 lb/ton per drop	k = 0.74 from AP-42 Chapter 13.2.4
Uncontrolled PM10 Emissions Factor	0.00004 lb/ton per drop	k = 0.35 from AP-42 Chapter 13.2.4
Uncontrolled PM2.5 Emissions Factor	0.00001 lb/ton per drop	k = 0.053 from AP-42 Chapter 13.2.4

Number of Transfer Points

Dryer to fully enclosed chain or screw conveyor	1
Fully enclosed chain or screw conveyor to dry silo	1
Number of Transfer Points for EU-4	2

Material Transfer Emissions (lbs)	Maximum Hourly (lb/hour)	Maximum Daily (lb/day)	Annual (lb/year)
PM Material Transfer Emissions	0.00	0.06	19.12
PM10 Material Transfer Emisisons	0.00	0.03	9.04
PM2.5 Material Transfer Emissions	0.00	0.00	1.37
PM Desctruction Efficiency (%) of Abatement Device	99.9%	99.9%	99.9%
Controlled PM Material Transfer Emissions	0.00	0.00	0.02
Controlled PM10 Material Transfer Emisisons	0.00	0.00	0.01
Controlled PM2.5 Material Transfer Emissions	0.00	0.00	0.00

VOC Emissions from Dried Decomposable Feedstock Storage

VOC Emissions Factor	0.13 lb VOC/ wet ton.day	VOC EF is a weighted average of green and food waste stockpile emission factors obtained from Source Testing (NTV-2145) at Napa Recycling and Waste Services, BAAQMD Plant # 17403; weighted by the ratio of typical ratio food waste:green waste expected in H-Cycle's feedstock
Ammonia Emissions Factor[1]	0.004 lb NH3/ wet ton.day	https://www.valleyair.org/busind/pto/emission_factors/Criteria/Criteria/Composting/Compost%20EF.pdf

1. Ammonia EF from SJVAPCD was scaled since 22% of the feed for the project will be comprised of the feed stream used to determine the NH3 EF.

Feedstock Throughput and Storage time	Maximum Hourly (per hour)	Maximum Daily (per day)	Maximum Annual (per year)
Throughput of dried feedstock (tons)	13	309	105,454
Residence Time at Source (days)	0.96	0.96	0.96
Total Waste-Time (Wet Ton.days)	12	296	101,060

S-15 VOC Emissions (lbs)	Maximum Hourly (lb/hour)	Maximum Daily (lb/day)	Annual (lb/year)
Uncontrolled VOC Emissions (lb)	1.61	38.65	13205.22
Uncontrolled NH3 Emisisons (lb)	0.05	1.30	444.67
Capture Efficiency [Assumption]	100%	100%	100%
VOC Destruction Efficiency (%) of Abatement Device[1]	80%	80%	80%
Fugitive VOC Emissions (lb)	0.00	0.00	0.00
Undestructed VOC Emissions (lb)	0.32	7.73	2641.04
Total Controlled VOC Emissions (lb)	**0.32**	**7.73**	**2641.04**

1. VOC abatement efficiency taken from Table III-3: Control Technologies for Composting Operations, https://ww3.arb.ca.gov/ei/areasrc/composting_emissions_inventory_methodology_final_combined.pdf

NH3 Destruction Efficiency (%) of Abatement Device	70%	70%	70%
Fugitive NH3 Emissions (lb)	0.00	0.00	0.00
Undestructed NH3 Emisisons (lb)	0.02	0.39	133.40
Total Ammonia Emissions (lb)	**0.02**	**0.39**	**133.40**

1. Ammonia abatement efficiency taken from Table III-3: Control Technologies for Composting Operations, https://ww3.arb.ca.gov/ei/areasrc/composting_emissions_inventory_methodology_final_combined.pdf

TAC Emissions from Decomposable Organic Waste

CAS #	Toxic Air Contaminant (TAC)	Weighted Average Weight % in VOC	Fugitive Hourly Emissions (lb/hr)	Fugitive Annual Emissions (lb/yr)	Undestructed Hourly Emissions (lb/hr)	Undestructed Annual Emissions (lb/yr)	Total Controlled Hourly Emissions (lb/hr)	Above Acute Trigger Level	Total Controlled Annual Emissions (lb/yr)	Above Chronic Trigger Level
75-07-0	Acetaldehyde	1.13E+00	0.00E+00	0.00E+00	3.64E-03	2.99E+01	3.64E-03	No	2.99E+01	Yes
67-63-0	Isopropyl alcohol (2-Propanol)	6.38E-01	0.00E+00	0.00E+00	2.05E-03	1.68E+01	2.05E-03	No	1.68E+01	No
67-56-1	Methyl alcohol (methanol)	1.38E+01	0.00E+00	0.00E+00	4.45E-02	3.65E+02	4.45E-02	No	3.65E+02	No
91-20-3	Naphthalene	9.30E-03	0.00E+00	0.00E+00	2.99E-05	2.45E-01	2.99E-05	No	2.45E-01	No
115-07-1	Propylene (1-Propene)	9.09E-03	0.00E+00	0.00E+00	2.93E-05	2.40E-01	2.93E-05	No	2.40E-01	No
107-05-1	Allyl chloride	6.80E-04	0.00E+00	0.00E+00	2.19E-06	1.80E-02	2.19E-06	No	1.80E-02	No
75-15-0	Carbon disulfide	7.19E-04	0.00E+00	0.00E+00	2.32E-06	1.90E-02	2.32E-06	No	1.90E-02	No
108-05-4	Vinyl acetate	2.25E-02	0.00E+00	0.00E+00	7.25E-05	5.95E-01	7.25E-05	No	5.95E-01	No
78-93-3	2-Butanone (MEK)	6.81E-01	0.00E+00	0.00E+00	2.19E-03	1.80E+01	2.19E-03	No	1.80E+01	No
107-06-2	1,2-Dicholoroethane	1.08E-03	0.00E+00	0.00E+00	3.48E-06	2.85E-02	3.48E-06	No	2.85E-02	No
108-88-3	Toluene	4.52E-03	0.00E+00	0.00E+00	1.45E-05	1.19E-01	1.45E-05	No	1.19E-01	No
100-41-4	Ethylbenzene	2.39E-03	0.00E+00	0.00E+00	7.70E-06	6.31E-02	7.70E-06	No	6.31E-02	No
1330-20-7	m & p-Xylenes & o-Xylene	5.11E-03	0.00E+00	0.00E+00	1.65E-05	1.35E-01	1.65E-05	No	1.35E-01	No
100-42-5	Styrene	7.09E-03	0.00E+00	0.00E+00	2.28E-05	1.87E-01	2.28E-05	No	1.87E-01	No
7664-41-7	Ammonia		0.00	0.00	0.02	133.40	0.02	No	133.40	No
NPOC		**8.71E-01**	0.00E+00	0.00E+00	2.81E-03	2.30E+01	2.81E-03		2.30E+01	

S-25 OMNI Conversion Unit SRM and Refiner NG Burners

Source Description: Waste-to-Syngas conversion unit including feeder, converter, Carbon Recovery Vessel (CRV), Solid Residue Melter (SRM), cyclones, refining chamber, recuperator, slag removal unit, and natural gas-fired burners in SRM and refining chamber

Type of Fuel used: Natural gas	Normal Operation		Startup/ Shutdown
Max Heat input for SRM burners	5.00 MMBtu/hr		14.97 MMBtu/hr
Max Heat input for refiner burners	0.00 MMBtu/hr		25.32 MMBtu/hr

Operation Schedule	Heat-up Stack SU	Heat-up Stack SD	Flare SU	Flare SD
Hours per event	48.0 hrs/event	2.0 hrs/event	10.0 hrs/event	8.0 hrs/event
SU/SD Annual	192 hrs/year	8 hrs/year	40 hrs/year	32 hrs/year
Number of SU/SD Events	4 events/year	4 events/year	4 events/year	4 events/year

Fuel and Exhaust Default Properties:	Natural Gas
Fuel Heat Value (Btu/scf at 68 °F and 1 a	1020
Stoichiometric Fuel Factor Fd (DSCF exhaust per MMBtu heat input, at 68 °F, 1 atm, 0% excess O2)	8710

Normal Operation Emissions

Pollutant
NOx
CO
VOC as methane
PM10
PM2.5
SO2

Emissions During normal operation have been estimated along with boiler's emissions because the SRM and refining chamber burner combustion flue gas will be routed along with the syngas through the syngas treatment system and the boiler to the boiler's air pollution control system and then vented to atmosphere through a common stack. Please see Boiler's worksheet for total emissions from boiler and SRM and refining chamber burners during normal operation. During SU/SD, natural gas combustion emissions will be vented to the atmosphere through heat up stack or flare, depending on phase of SU/SD.

Pollutant	Emission Factor During SU & SD Venting through Heat-up Stack			SU/SD Emissions Vented through Heat-up Stack		
	SU Emissions Factor	SD Emissions Factor	Reference	Max Hourly (lb/hour)	Max Daily (lb/day)	Annual (lb/year)
NOx	510 lb/SU event	20 lb/SD event	A	10.63	255.00	2120.00
CO	1,330 lb/SU event	50 lb/SD event	A	27.71	665.00	5520.00
VOC as methane	0.0054 lb/MMBtu fuel input		B	0.22	5.21	43.45
PM10	0.0075 lb/MMBtu fuel input		B	0.30	7.20	60.04
PM2.5	0.0075 lb/MMBtu fuel input		B	0.30	7.20	60.04
SO2	0.0006 lb/MMBtu fuel input		B	0.02	0.57	4.74

Pollutant	Emission Factor During SU & SD Venting through Flare			SU/SD Emissions Vented through Flare		
	SU Emissions Factor	SD Emissions Factor	Reference	Max Hourly (lb/hour)	Max Daily (lb/day)	Annual (lb/year)
NOx	190 lb/SU event	90 lb/SD event	A	19.00	190.00	1120.00
CO	460 lb/SU event	220 lb/SD event	A	46.00	460.00	2720.00
VOC as methane	0.0054 lb/MMBtu fuel input		B	0.22	2.17	15.64
PM10	0.0075 lb/MMBtu fuel input		B	0.30	3.00	21.61
PM2.5	0.0075 lb/MMBtu fuel input		B	0.30	3.00	21.61
SO2	0.0006 lb/MMBtu fuel input		B	0.02	0.24	1.71

Reference: A Applicant/ Vendor Specification
B AP-42, 5th Edition, Chapter 1.4
Notes: Emission factor in lb/MMBtu derived either by dividing Emission factor in lb/MM cu. Ft. by Fuel Heat Value

TAC Emissions From External Natural Gas Combustion During SU/SD: During SU/SD natural gas combustion emissions will be vented to the atmosphere through heat up stack or flare (S-36/A-35)

			SU/SD Emissions Vented through Heat-up Stack				SU/SD Emissions Vented through Flare	
CAS #	Toxic Air Contaminant (TAC)	Default Emission Factor	Max Hourly Emissions	Above Acute Trigger Level	Annual Emissions	Above Chronic Trigger Level	Max Hourly Emissions	Annual Emissions
		lb/MMBtu fuel input	lb/hr		lb/yr		lb/hr	lb/yr
75-07-0	ACETALDEHYDE	4.22E-06	1.70E-04	No	3.40E-02	No	1.70E-04	1.22E-02
107-02-8	ACROLEIN	2.65E-06	1.07E-04	No	2.14E-02	No	1.07E-04	7.69E-03
7440-38-2	ARSENIC	1.96E-07	7.90E-06	No	1.58E-03	No	7.90E-06	5.69E-04
71-43-2	BENZENE	7.84E-06	3.16E-04	No	6.32E-02	No	3.16E-04	2.27E-02
7440-41-7	BERYLLIUM	5.88E-09	2.37E-07	No	4.74E-05	No	2.37E-07	1.71E-05
7440-43-9	CADMIUM	1.08E-06	4.35E-05	No	8.70E-03	No	4.35E-05	3.13E-03
7440-50-8	COPPER	8.33E-07	3.36E-05	No	6.71E-03	No	3.36E-05	2.42E-03
100-41-4	ETHYLBENZENE	9.31E-06	3.75E-04	No	7.50E-02	No	3.75E-04	2.70E-02
110-54-3	n-HEXANE	6.18E-06	2.49E-04	No	4.98E-02	No	2.49E-04	1.79E-02
7439-92-1	LEAD	4.90E-07	1.97E-05	No	3.95E-03	No	1.97E-05	1.42E-03
7439-96-5	MANGANESE	3.73E-07	1.50E-05	No	3.01E-03	No	1.50E-05	1.08E-03
7439-97-6	MERCURY	2.55E-07	1.03E-05	No	2.05E-03	No	1.03E-05	7.40E-04
91-20-3	NAPHTHALENE	5.98E-07	2.41E-05	No	4.82E-03	No	2.41E-05	1.73E-03
7440-02-0	NICKEL	2.06E-06	8.30E-05	No	1.66E-02	No	8.30E-05	5.98E-03
1150/1151	PAH (as benzo(a)pyrene-equiv.)	6.60E-09	2.66E-07	No	5.32E-05	No	2.66E-07	1.91E-05
115-07-1	PROPYLENE	7.17E-04	2.89E-02	No	5.78E+00	No	2.89E-02	2.08E+00
7782-49-2	SELENIUM	1.18E-08	4.75E-07	No	9.51E-05	No	4.75E-07	3.42E-05
108-88-3	TOLUENE	3.59E-05	1.45E-03	No	2.89E-01	No	1.45E-03	1.04E-01
7440-62-2	VANADIUM	2.25E-06	9.07E-05	No	1.81E-02	No	9.07E-05	6.53E-03
1330-20-7	XYLENES	2.67E-05	1.08E-03	No	2.15E-01	No	1.08E-03	7.75E-02

Reference:BAAQMD Toxic Air Contaminant (TAC) Emission Factor Guidelines, Appendix A, Default TAC Emission Factors for Specific Source Categories, August 2020
https://www.baaqmd.gov/~/media/files/ab617-community-health/facility-risk-reduction/documents/tac_emission_factor_guidance_appendixa_august_2020-pdf.pdf?la=en

GHG Emissions

SU/SD

Pollutant	Emission Factor	Units	Emissions (kg/hr)	Emissions (Mton/year)	GWP	Emissions (Mton CO2e/year)
CO2	53.06	kg CO2/mmBtu	2,137.79	581.48	1	581.48
CH4	1	g CH4/mmBtu	0.040	0.0110	25	0.27
N2O	0.1	g N2O/mmBtu	0.004	0.0011	298	0.33
					Total CO2e =	**582.08** **metric tons**

Normal Operation

Pollutant	Emission Factor	Units	Emissions (kg/hr)	Emissions (Mton/year)	GWP	Emissions (Mton CO2e/year)
CO2	53.06	kg CO2/mmBtu	265.30	2,175.46	1	2,175.46
CH4	1	g CH4/mmBtu	0.005	0.041	25	1.03
N2O	0.1	g N2O/mmBtu	0.001	0.004	298	1.22
					Total CO2e =	**2,177.71** **metric tons**
					Total CO2e =	**2,759.79** **metric tons**

Notes:

Method for calculating GHGs as described in 40 CFR Part 98. Guidance: https://www.epa.gov/sites/default/files/2020-12/documents/stationaryemissions.pdf

Emission factors for natural gas are from Federal Register EPA; 40 CFR Part 98; e-CFR, (see link below). Table C-1 and Table C-2 (78 FR 71950, Nov. 29, 2013, as amended at 81 FR 89252, Dec. 9, 2016), Table AA-1 (78 FR 71965, Nov. 29, 2013).

eCFR :: 40 CFR Part 98 -- Mandatory Greenhouse Gas Reporting

S-30 Slag Handling, Crushing, and Storage

Source Description: Slag conveying, cooling, crushing, storage and loading processes

Throughput	Maximum Hourly (per hour)	Maximum Daily (per day)	Annual (per year)
Slag Throughput (tons)	2.0	48.0	16,294.0

8.147

Material Transfer Emissions

Emission Factor	$E = k(0.0032)(U/5)^{1.3}/(M/2)^{1.4}$	[AP-42 Chapter 13.2.4, Equation 1]
Mean Wind Speed	3.6 mph	For Concord-Buchanan FIELD (KCCR) [https://wrcc.dri.edu/Climate/comp_table_show.php?stype=wind_speed_avg.2001-2011] Note: The transfer operations will be conducted via covered conyevors, where mean wind speed is typically lower than ambient wind speed. Therefore, half the ambient wind speed was used.
Material Moisture Content	3.6%	From AP-42 Chapter 13.2.4, Table 13.2.4-1, for slag at MSW landfill
Uncontrolled PM (TSP) Emissions Factor	0.00068 lb/ton per drop	
Uncontrolled PM10 Emissions Factor	0.00032 lb/ton per drop	
Uncontrolled PM2.5 Emissions Factor	0.00005 lb/ton per drop	

Number of Transfer Points

From SRM to Drag Chain Conveyor	1
From Chain Conveyor to Wet Quench/Cooling	1
From Wet Quench/Cooling to Chain Conveyor	1
From Chain Conveyor to Crusher	1
From Crusher to Chain Conveyor	1
From Chain Conveyor to Roll-up containers/ bunkers	1
From Bunkers to Loader	1
From Loader to Trucks	1
Total	8

Material Transfer Emissions (lbs)	Maximum Hourly (lb/hour)	Maximum Daily (lb/day)	Annual (lb/year)
Uncontrolled Material Transfer PM	0.01	0.26	88.44
Uncontrolled Material Transfer PM10	0.01	0.12	41.83
Uncontrolled Material TransferPM2.5	0.00	0.02	6.33
Control Efficiency	0%	0%	0%
Controlled Material Transfer PM	**0.01**	**0.26**	**88.44**
Controlled Material Transfer PM10	**0.01**	**0.12**	**41.83**
Controlled Material Transfer PM2.5	**0.00**	**0.02**	**6.33**

Crusher Emissions

Pollutant	PM	PM10	PM2.5
Emissions Factor (lb/ton) [From AP-42 Chapter 11.19.2, Table 11.19.2-2]	**Uncontrolled**	**Uncontrolled**	**Uncontrolled**
	0.0054	0.0024	0.00044
Hourly Emissions (lb/hr)	0.01	0.00	0.00
Daily Emissions (lb/day)	0.26	0.12	0.02
Annual Emissions (lb/year)	87.99	39.11	7.24

Wind Erosion Emissions

Slag will be stored either in a closed roll-up container/ closed bunkers and will not be stored in open stockpiles (per solid waste permit). Therefore, there will be no emission from wind erosion

Total Emissions (lb)	Maximum Hourly (lb/hour)	Maximum Daily (lb/day)	Annual (lb/year)
Total PM Emissions	**0.022**	**0.520**	**176.428**
Total PM10 Emissions	**0.010**	**0.238**	**80.935**
Total PM2.5 Emissions	**0.002**	**0.040**	**13.576**

CAS #	Component	Slag generated from Feedstock #1	Slag generated from Feedstock #2	Slag generated from Feedstock #3	Max Component Concentration	Total Hourly Emissions[2]	Above Acute Trigger Level	Total Annual Emissions[3]	Above Chronic Trigger Level
		% by Weight[1]	% by Weight[1]	% by Weight[1]	% by Weight	lb/hr		lb/yr	
7631-86-9	Silicon dioxide (assumes crystalline silica)	68.20%	34.86%	40.39%	68.2000%	1.48E-02	No	5.52E+01	No
7429-90-5	Aluminium oxide	5.34000%	11.99000%	9.6700%	11.9900%	2.60E-03	Yes	9.70E+00	Yes
13463-67-7	Titanium dioxide	0.58000%	0.80000%	0.3800%	0.8000%	1.73E-04	Yes	6.47E-01	Yes
1345-25-1	Ferrous oxide	3.60000%	15.43000%	9.7300%	15.4300%	3.34E-03	Yes	1.25E+01	Yes
7440-70-2	Calcium oxide	10.42000%	17.73000%	18.7600%	18.7600%	4.06E-03	Yes	1.52E+01	Yes
1309-48-4	Magnesium oxide	0.31000%	7.56000%	2.1400%	7.5600%	1.64E-03	Yes	6.12E+00	Yes
1313-59-3	Sodium oxide	10.92000%	2.47000%	7.7300%	10.9200%	2.36E-03	Yes	8.84E+00	Yes
12136-45-7	Potassium oxide	0.50000%	0.95000%	5.2600%	5.2600%	1.14E-03	Yes	4.26E+00	Yes
1314-56-3	Phosphorous pentoxide	0.04960%	0.69000%	3.3100%	3.3100%	7.17E-04	Yes	2.68E+00	Yes
7446-11-9	Sulfur trioxide	0.00980%	6.64000%	2.4000%	6.6400%	1.44E-03	No	5.37E+00	No
7440-36-0	Antimony trioxide	0.00120%	0.00310%	0.0005%	0.0031%	6.71E-07	No	2.51E-03	No
7440-39-3	Barium oxide	0.00320%	0.01000%	0.0100%	0.0100%	2.17E-06	Yes	8.09E-03	Yes
7440-41-7	Beryllium oxide	0.00010%	0.00030%	0.0003%	0.0003%	6.50E-08	No	2.43E-04	No
7440-48-4	Cobalt oxide	0.00050%	0.03000%	0.0300%	0.0300%	6.50E-06	No	2.43E-02	Yes
1308-38-9	Chromium oxide (Cr2O3)	0.00520%	0.05000%	0.0200%	0.0500%	1.08E-05	No	4.05E-02	No
7440-50-8	Copper oxide	0.05120%	0.72000%	0.1100%	0.7200%	1.56E-04	No	5.83E-01	No
7439-92-1	Lead oxide	0.00010%	0.00080%	0.0002%	0.0008%	1.73E-07	No	6.47E-04	No
7439-96-5	Manganese oxide	0.00260%	0.04000%	0.0300%	0.0400%	8.66E-06	No	3.24E-02	No
1313-27-5	Molybdenum trioxide	0.00010%	0.00020%	0.0001%	0.0002%	4.33E-08	Yes	1.62E-04	Yes
7440-02-0	Nickel oxide	0.00210%	0.03000%	0.0200%	0.0300%	6.50E-06	No	2.43E-02	No
11113-88-5	Disilver oxide	0.00000%	0.00020%	0.0001%	0.0002%	4.33E-08	Yes	1.62E-04	Yes
1314-62-1	Vanadium pentoxide	0.00060%	0.00280%	0.0017%	0.0028%	6.06E-07	No	2.27E-03	No
18282-10-5	Tin oxide	0.00010%	0.00080%	0.0003%	0.0008%	1.73E-07	Yes	6.47E-04	Yes

Notes:

[1] Component concentration in slag on % by weight basis was provided by HCycle from the slag assay.

[2] Hourly TAC Emissions = Fraction of hourly PM Emissions

[3] Annual TAC Emissions = Fraction of Annual PM10 Emissions

S-36 Flare

Description: Natural gas combustion in pilot; off-spec syngas combustion during startup/shutdown and process upsets

Flared Gas	LP Gas Flaring	HP Gas Flaring	Surplus H2 Flaring
Type of Flare	Enclosed ground	Enclosed ground	Enclosed ground
Higher Heating Value of gas flared (Btu/scf)	232.94	122.15	319
Flow rate of gas burned/ flared (scfm)	4375	5571	3762
Flared gas heat input (MMBtu/hr)	61	41	72
Stoichiometric Fuel Factor Fd (DSCF exhaust per MMBtu heat input, at 68 °F, 1 atm, 0% excess O2)	8521.56	8445.55	
% by volume methane in gas flared	0.78%	0.61%	0.00%
Total Sulfur Content (ppmv)	2244	0.003175	0.000000

Pilot Gas	LP Gas Flaring	HP Gas Flaring	Surplus H2 Flaring
Pilot fuel type	Natural Gas	Natural Gas	Natural Gas
Higher Heating value of pilot fuel (Btu/scf)	1020	1020	1020
Flow rate of pilot fuel (scfm)	**12.63**	**12.63**	**12.63**
Pilot fuel heat input (MMBtu/hr)	**0.773**	**0.773**	**0.773**

Flare Operating hours	LP Gas Flaring	HP Gas Flaring	Surplus H2 Flaring
Daily (hr/day) per SU	4.5	5	24
Daily (hr/day) per SD	4.0	4	24
Annual (hr/year)	34.0	36	500

Criteria Pollutants - Flared Syngas[1]	Emission Factor (lb/MMBtu)	Reference	Flaring Emissions		
			max lb/hr	max lb/day	lb/yr
NOx	0.0680 lb/MMBtu fuel input	AP-42 Chapter 13.5 Table 13.5-1 for elevated flares	4.15	32.61	241.40
CO	0.3100 lb/MMBtu fuel input	AP-42 Chapter 13.5 Table 13.5-2 for elevated flares	18.91	148.65	1,100.50
VOC as methane	0.0039 lb/MMBtu fuel input	AP-42 Chapter 13.5 Table 13.5-1 for enclosed ground	0.24	1.86	13.77
PM10	15.00000 lb/MMscf methane	AP-42 Chapter 2.4, Table 2.4-4	0.03	0.29	2.15
PM2.5	15.00000 lb/MMscf methane	AP-42 Chapter 2.4, Table 2.4-4	0.03	0.29	2.15
SO2		100% oxidation of Total Sulfur in flared gas	97.61	439.23	3,318.66

[1]Excludes excess hydrogen flaring

Criteria Pollutants - Natural Gas Pilot	Emission Factor	Pilot Emissions		
	(lb/MMBtu)[1]	max lb/hr	max lb/day	lb/yr
NOx	9.80E-02	7.58E-02	1.82E+00	6.64E+02
CO	8.24E-02	6.37E-02	1.53E+00	5.58E+02
VOC as methane	5.39E-03	4.17E-03	1.00E-01	3.65E+01
PM10	7.45E-03	5.76E-03	1.38E-01	5.05E+01
PM2.5	7.45E-03	5.76E-03	1.38E-01	5.05E+01
SO2	5.88E-04	4.55E-04	1.09E-02	3.98E+00

[1]AP-42, 5th Edition, Chapter 1.4, Uncontrolled small boiler factors

Total Flare Criteria Pollutant Emissions[1]	Total Flaring Criteria Pollutant Emissions (Normal Operation)		
	max lb/hr	max lb/day	lb/yr
NOx	7.58E-02	1.82E+00	6.05E+02
CO	6.37E-02	1.53E+00	5.09E+02
VOC as methane	4.17E-03	1.00E-01	3.33E+01
PM10	5.76E-03	1.38E-01	4.60E+01
PM2.5	5.76E-03	1.38E-01	4.60E+01
SO2	4.55E-04	1.09E-02	3.63E+00

[1]Excludes excess hydrogen flaring

Total Flare Criteria Pollutant Emissions (SU/SD)[1]	Total Flaring Criteria Pollutant Emissions (SU/SD)		
	max lb/hr	max lb/day	lb/yr
NOx	2.32E+01	2.24E+02	1.38E+03
CO	6.50E+01	6.10E+02	3.84E+03
VOC as methane	4.58E-01	4.13E+00	3.05E+01
PM10	3.37E-01	3.43E+00	2.51E+01
PM2.5	3.37E-01	3.43E+00	2.53E+01
SO2	9.76E+01	4.39E+02	3.32E+03

[1]Excludes excess hydrogen flaring

CAS #	Toxic Air Contaminant (TAC)	Emission Factor - SRM and Refiner Burners and Natural Gas Combustion[1]	Flared Gas Contaminant Loading in LP Flare[2]	Flared Gas Contaminant Loading in HP Flare[2]	Post-Flaring Contaminant Loading in LP Flare Exhaust[2]	Post-Flaring Contaminant Loading in HP Flare Exhaust[2]	Maximum Flaring Emissions	Above Acute Trigger Level	Annual Flaring Emissions	Above Chronic Trigger Level
		lb/MMBtu fuel input	lb/MMscf	lb/MMscf	lb/MMscf	lb/MMscf	lb/hr		lb/yr	
75-34-3	1,1-Dichloroethane	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	No	0.00E+00	No
107-06-2	1,2-Dichloroethane	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	No	0.00E+00	No
123-91-1	1,4-Dioxane	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	No	0.00E+00	No
90-12-0	1-Methylnaphthalene	0.00E+00	1.75E-02	0.00E+00	2.62E-04	0.00E+00	6.87E-05	Yes	2.34E-03	Yes
91-57-6	2-Methylnaphthalene	0.00E+00	1.75E-02	0.00E+00	2.62E-04	0.00E+00	6.87E-05	Yes	2.34E-03	Yes
71-55-6	1,1,1-Trichloroethane	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	No	0.00E+00	No
83-32-9	Acenaphthene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	Yes	0.00E+00	Yes
208-96-8	Acenaphthylene	0.00E+00	1.08E+00	0.00E+00	1.61E-02	0.00E+00	4.24E-03	Yes	1.44E-01	Yes
75-07-0	Acetaldehyde	4.22E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.73E-04	No	4.08E-02	No
75-05-8	Acetonitrile	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	No	0.00E+00	No
107-02-8	Acrolein	2.65E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.09E-04	No	2.56E-02	No
107-13-1	Acrylonitrile	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	No	0.00E+00	No
7429-90-5	Aluminum	0.00E+00	4.25E-04	0.00E+00	4.25E-04	0.00E+00	1.11E-04	Yes	3.79E-03	Yes
7664-41-7	Ammonia	0.00E+00	2.47E+02	0.00E+00	3.71E+00	0.00E+00	9.74E-01	No	3.31E+01	No
120-12-7	Anthracene	0.00E+00	6.40E-02	0.00E+00	9.60E-04	0.00E+00	2.52E-04	Yes	8.57E-03	Yes
7440-36-0	Antimony	0.00E+00	5.47E-03	0.00E+00	5.47E-03	0.00E+00	1.44E-03	No	4.88E-02	No
7440-38-2	Arsenic	1.96E-07	3.61E-03	0.00E+00	3.61E-03	0.00E+00	9.55E-04	Yes	3.41E-02	Yes
71-43-2	Benzene	7.84E-06	1.82E+00	2.51E-04	2.73E-02	3.77E-06	7.50E-03	No	3.20E-01	No
192-97-2	Benzo[e] pyrene	0.00E+00	1.34E-01	0.00E+00	2.01E-03	0.00E+00	5.27E-04	Yes	1.79E-02	Yes
191-24-2	Benzo(g,h,i)perylene	0.00E+00	4.42E-01	0.00E+00	6.63E-03	0.00E+00	1.74E-03	Yes	5.92E-02	Yes
7440-41-7	Beryllium	5.88E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.41E-07	No	5.69E-05	No
92-52-4	Biphenyl	0.00E+00	5.24E-02	0.00E+00	7.85E-04	0.00E+00	2.06E-04	No	7.01E-03	No
7440-42-8	Boron	0.00E+00	2.09E-04	0.00E+00	2.09E-04	0.00E+00	5.50E-05	Yes	1.87E-03	Yes
7440-43-9	Cadmium	1.08E-06	4.07E-04	0.00E+00	4.07E-04	0.00E+00	1.51E-04	No	1.41E-02	No
7440-70-2	Calcium	0.00E+00	2.29E-02	0.00E+00	2.29E-02	0.00E+00	6.02E-03	Yes	2.05E-01	Yes
75-15-0	Carbon disulfide	0.00E+00	1.67E+00	0.00E+00	8.37E-03	0.00E+00	2.20E-03	No	7.47E-02	No
56-23-5	Carbon Tetrachloride	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	No	0.00E+00	No
463-58-1	Carbonyl sulfide	0.00E+00	1.66E+01	1.56E-04	8.28E-02	7.79E-07	2.17E-02	No	7.39E-01	No
108-90-7	Chlorobenzene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	No	0.00E+00	No
67-66-3	Chloroform	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	No	0.00E+00	No
16065-83-1	Chromium	0.00E+00	1.80E-04	0.00E+00	1.80E-04	0.00E+00	4.73E-05	No	1.61E-03	No
7440-48-4	Cobalt	0.00E+00	3.49E-03	0.00E+00	3.49E-03	0.00E+00	9.16E-04	No	3.12E-02	Yes
7440-50-8	Copper	8.33E-07	3.02E-03	0.00E+00	3.02E-03	0.00E+00	8.28E-04	No	3.51E-02	No
191-07-1	Coronene	0.00E+00	2.39E-01	0.00E+00	3.58E-03	0.00E+00	9.39E-04	Yes	3.19E-02	Yes
75-09-2	Dichloromethane	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	No	0.00E+00	No
100-41-4	Ethylbenzene	9.31E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.82E-04	No	9.01E-02	No
206-44-0	Fluoranthene	0.00E+00	4.42E-01	0.00E+00	6.63E-03	0.00E+00	1.74E-03	Yes	5.92E-02	Yes
86-73-7	Fluorene	0.00E+00	5.24E-02	0.00E+00	7.85E-04	0.00E+00	2.06E-04	Yes	7.01E-03	Yes
50-00-0	Formaldehyde	2.17E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.91E-03	No	2.10E+00	No
110-54-3	n-Hexane	6.18E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.54E-04	No	5.98E-02	No
7647-01-0	Hydrogen Chloride	0.00E+00	6.82E-02	0.00E+00	6.82E-02	0.00E+00	1.79E-02	No	6.09E-01	No
74-90-8	Hydrogen Cyanide	0.00E+00	4.33E+01	0.00E+00	6.49E-01	0.00E+00	1.70E-01	Yes	5.79E+00	No
7664-39-3	Hydrogen Fluoride	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	No	0.00E+00	No
7783-06-4	Hydrogen Sulfide	0.00E+00	1.80E+02	8.83E-05	8.98E-01	4.41E-07	2.36E-01	Yes	8.02E+00	No
7439-89-6	Iron	0.00E+00	7.55E-02	0.00E+00	7.55E-02	0.00E+00	1.98E-02	Yes	6.74E-01	Yes
7439-92-1	Lead	4.90E-07	1.99E-02	0.00E+00	1.99E-02	0.00E+00	5.24E-03	No	1.82E-01	No
7439-95-4	Magnesium	0.00E+00	2.15E-03	0.00E+00	2.15E-03	0.00E+00	5.65E-04	No	1.92E-02	No
7439-96-5	Manganese	3.73E-07	2.33E-04	0.00E+00	2.33E-04	0.00E+00	7.64E-05	No	5.69E-03	No
7439-97-6	Mercury	2.55E-07	1.75E-04	3.61E-05	1.75E-04	3.61E-05	5.63E-05	No	4.46E-03	No
91-20-3	Napthalene	5.98E-07	2.17E+00	0.00E+00	3.25E-02	0.00E+00	8.57E-03	No	2.96E-01	No
7440-02-0	Nickel	2.06E-06	3.55E-04	0.00E+00	3.55E-04	0.00E+00	1.78E-04	Yes	2.31E-02	No
1150/1151	PAH B(a)P- eq	6.60E-09	2.34E-01	0.00E+00	3.50E-03	0.00E+00	9.20E-04	No	3.13E-02	Yes
1086/1080	PCDD/PCDF-eq[3]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	No	0.00E+00	No
198-55-0	Perylene	0.00E+00	4.07E-02	0.00E+00	6.11E-04	0.00E+00	1.60E-04	Yes	5.45E-03	Yes
85-01-8	Phenanthrene	0.00E+00	5.53E-01	0.00E+00	8.29E-03	0.00E+00	2.18E-03	Yes	7.40E-02	Yes
7723-14-0	Phosphorus	0.00E+00	1.33E-02	0.00E+00	1.33E-02	0.00E+00	3.48E-03	No	1.18E-01	No
7440-09-7	Potassium	0.00E+00	7.40E-02	0.00E+00	7.40E-02	0.00E+00	1.94E-02	Yes	6.60E-01	Yes
115-07-1	Propylene	7.17E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.94E-02	No	6.94E+00	No
129-00-0	Pyrene	0.00E+00	6.75E-01	0.00E+00	1.01E-02	0.00E+00	2.66E-03	Yes	9.03E-02	Yes
7782-49-2	Selenium	1.18E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.85E-07	No	1.14E-04	No
7440-21-3	Silicon	0.00E+00	3.47E-02	0.00E+00	3.47E-02	0.00E+00	9.12E-03	Yes	3.10E-01	No
7440-23-5	Sodium	0.00E+00	3.01E-02	0.00E+00	3.01E-02	0.00E+00	7.91E-03	Yes	2.69E-01	Yes
7440-31-5	Tin	0.00E+00	3.60E-02	0.00E+00	3.60E-02	0.00E+00	9.45E-03	Yes	3.21E-01	Yes
7440-32-6	Titanium	0.00E+00	1.28E-03	0.00E+00	1.28E-03	0.00E+00	3.36E-04	Yes	1.14E-02	Yes
108-88-3	Toluene	3.59E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.47E-03	No	3.47E-01	No
79-01-6	Trichloroethene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	No	0.00E+00	No
7440-62-2	Vanadium	2.25E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.24E-05	No	2.18E-02	No
75-01-4	Vinyl Chloride	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	No	0.00E+00	No
1330-20-7	Xylenes	2.67E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.10E-03	No	2.58E-01	No

Notes

[1.] BAAQMD Toxic Air Contaminant (TAC) Emission Factor Guidelines, Appendix A, Default TAC Emission Factors for Specific Source Categories, August 2020
https://www.baaqmd.gov/~/media/files/ab617-community-health/facility-risk-reduction/documents/tac_emission_factor_guidance_appendixa_august_2020-pdf.pdf?la=en

[2.] TAC emission factors from LP Flare gas combustion estimated using the flare gas speciation profile obtained from process simulation and assumed abatement efficiency of the flare

[2.] Flared gas emission factors are based off of process simulation numbers.

[3.] CATEF does not provide default factors for CDD/CDF for LFG flaring. These factors were obtained from AP-42 Chapter 2.4

Total Flare Criteria Pollutant Emissions (Hydrogen Flar	**Total Flaring Criteria Pollutant Emissions (Hydrogen Flaring)**		
	max lb/hr	**max lb/day**	**lb/yr**
NOx	4.97E+00	1.19E+02	2.49E+03
CO	6.37E-02	1.53E+00	3.18E+01
VOC as methane	4.17E-03	1.00E-01	2.08E+00
PM10	5.76E-03	1.38E-01	2.88E+00
PM2.5	5.76E-03	1.38E-01	2.88E+00
SO2	4.55E-04	1.09E-02	2.27E-01

[1]Is only representative of periods of excess hydrogen flaring (500 hours per year)

GHG
Pilot/Normal Operations

Pollutant	Emission Factor	Units	Emissions (kg/hr)	Emissions (Mton/year)	GWP	Emissions (Mton CO2e/year)	
CO2	53.06	kg CO2/mmBtu	41.02	336.40	1	336.40	
CH4	1	g CH4/mmBtu	0.0008	0.0063	25	0.16	
N2O	0.1	g N2O/mmBtu	0.0001	0.0006	298	0.19	
					Total CO2e =	**336.75**	**metric tons**

Notes:
Method for calculating GHGs as described in 40 CFR Part 98. Guidance: https://www.epa.gov/sites/default/files/2020-12/documents/stationaryemissions.pdf
Emission factors for natural gas are from Federal Register EPA; 40 CFR Part 98; e-CFR, (see link below). Table C-1 and
Table C-2 (78 FR 71950, Nov. 29, 2013, as amended at 81 FR 89252, Dec. 9, 2016), Table AA-1 (78 FR 71965, Nov. 29, 2013).
eCFR :: 40 CFR Part 98 -- Mandatory Greenhouse Gas Reporting

S-40 Natural Gas and PSA Offgas-fired Boiler

Source Description: Boiler that uses natural gas and PSA offgas as fuel

Type of Fuel used:	Natural Gas and PSA Offgas	Normal Operation [Includes Natural Gas Combustion in SRM and Refining Chamber Burners]	Startup/ Shutdown
Max heat input by fuel type[1]	Natural gas	45.00 MMBtu/hr	60.00 MMBtu/hr
	PSA Offgas	20.00 MMBtu/hr	0.00 MMBtu/hr
	Combined NG + PSA Offgas	65.00 MMBtu/hr	

1. Based on PTE

Operation Schedule	Normal Operation of OMNI Unit	Startup/ Shutdown of OMNI Unit
Daily	24.0 hrs/day	24.0 hrs/day
Annual	8,200 hrs/year	272.0 hrs/year

NOx Vendor Guarantee	5.0 ppmv at	3.0 % O2
CO Vendor Guarantee	50.0 ppmv at	3.0 % O2
VOC Vendor Guarantee	10.0 ppmv at	3.0 % O2
SOx Vendor Guarantee	2.0 ppmv at	3.0 % O2
PM10/PM2.5 Vendor Guarantee	0.005 lb/MMBtu HHV	
NH3 Vendor Guarantee	5.0 ppmv at	3.0 % O2

Fuel and Exhaust Default Properties:	Natural Gas	Combined NG + PSA Offgas	PSA Offgas Only
Fuel Heat Value (BTU/SCF at 68 °F and	1020	203.13	72.29
Stoichiometric Fuel Factor Fd (DSCF exhaust per MMBtu heat input, at 68 °F, 1 atm, 0% excess O2)	8710	11612	17653

Pollutant	Emission Factor (lb/MMBtu fuel input)		Controlled Boiler Emissions		
	Only Natural Gas	Combined NG + PSA Offgas	Maximum Hourly (lb/hour)	Maximum Daily (lb/day)	Annual (lb/year)
NOx	0.0061	0.0081	0.53	12.63	4414
CO	0.0370	0.0493	3.20	76.88	26870
VOC as methane	0.0042	0.0056	0.37	8.78	3070
PM10	0.0050	0.0050	0.33	7.80	2747
PM2.5	0.0050	0.0050	0.325	7.80	2747
SO2	0.0006	0.0045	0.29	7.03	2410

Notes: Emission factor in lb/MMBtu derived using this equation:

$$EF\left(\frac{lb}{MMBtu}\right) = \frac{ppm}{10^6} \times F_d \times \left(\frac{20.9}{20.9 - \%O_2}\right) \times \frac{MW}{M_v}$$

Molar Volume (Mv) =	385.3 scf/mole at 68 °F and 1 atm	r Weight of VOC as methane =	16.0 lb/mole
Molecular Weight of NOx =	46.0 lb/mole	Molecular Weight of Sulfur =	32.0 lb/mole
Molecular Weight of CO =	28.0 lb/mole	Molecular Weight of SO2 =	64.0 lb/mole

Oxidation Catalyst (A-40) organics effi 90% Manufacturer's specification

CAS #	Toxic Air Contaminant (TAC)	Method -1						
		Default Emission Factor For Natural Gas Combustion[1]	Estimated Emission Factor For PSA Offgas Combustion[2]	Max Hourly Emissions - NG & PSA Offgas	Annual Emissions - NG & PSA Offgas (pre-abatement)	Max Hourly Emissions (pre-abatement)	Annual Emissions - NG & PSA Offgas (post-abatement)	Max Hourly Emissions (post-abatement)
		lb/MMBtu fuel input	lb/MMBtu fuel input	lb/hr	lb/yr	lb/hr	lb/yr	lb/hr
90-12-0	1-Methylnaphthalene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
91-57-6	2-Methylnaphthalene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
83-32-9	Acenaphthene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
208-96-8	Acenaphthylene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
75-07-0	Acetaldehyde	4.22E-06	0.00E+00	2.53E-04	1.63E+00	2.53E-04	1.63E-01	2.53E-05
107-02-8	Acrolein	2.65E-06	0.00E+00	1.59E-04	1.02E+00	1.59E-04	1.02E-01	1.59E-05
7429-90-5	Aluminum	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
7664-41-7	Ammonia	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
120-12-7	Anthracene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
7440-36-0	Antimony	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
7440-38-2	Arsenic	1.96E-07	0.00E+00	1.18E-05	7.55E-02	1.18E-05	7.55E-02	1.18E-05
71-43-2	Benzene	7.84E-06	4.86E-08	4.70E-04	3.03E+00	4.70E-04	3.03E-01	4.70E-05
192-97-2	Benzo[e] pyrene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
191-24-2	Benzo(g,h,i)perylene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
7440-41-7	Beryllium	5.88E-09	0.00E+00	3.53E-07	2.27E-03	3.53E-07	2.27E-03	3.53E-07
92-52-4	Biphenyl	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
7440-42-8	Boron	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
7440-43-9	Cadmium	1.08E-06	0.00E+00	6.48E-05	4.16E-01	6.48E-05	4.16E-01	6.48E-05
7440-70-2	Calcium	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
75-15-0	Carbon disulfide	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
463-58-1	Carbonyl sulfide	0.00E+00	1.08E-07	2.15E-06	1.77E-02	2.15E-06	1.77E-02	2.15E-06
16065-83-1	Chromium (trivalent)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
7440-48-4	Cobalt	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
7440-50-8	Copper	8.33E-07	0.00E+00	5.00E-05	3.21E-01	5.00E-05	3.21E-01	5.00E-05
191-07-1	Coronene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
100-41-4	Ethylbenzene	9.31E-06	0.00E+00	5.59E-04	3.59E+00	5.59E-04	3.59E-01	5.59E-05
206-44-0	Fluoranthene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
86-73-7	Fluorene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
50-00-0	Formaldehyde	2.17E-04	0.00E+00	1.30E-02	8.36E+01	1.30E-02	8.36E+00	1.30E-03
110-54-3	n-Hexane	6.18E-06	0.00E+00	3.71E-04	2.38E+00	3.71E-04	2.38E-01	3.71E-05
7647-01-0	Hydrogen Chloride	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
74-90-8	Hydrogen Cyanide	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
7783-06-4	Hydrogen Sulfide	0.00E+00	6.10E-08	1.22E-06	1.00E-02	1.22E-06	1.00E-02	1.22E-06
7439-89-6	Iron	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
7439-92-1	Lead	4.90E-07	0.00E+00	2.94E-05	1.89E-01	2.94E-05	1.89E-01	2.94E-05
7439-95-4	Magnesium	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
7439-96-5	Manganese	3.73E-07	0.00E+00	2.24E-05	1.44E-01	2.24E-05	1.44E-01	2.24E-05
7439-97-6	Mercury	2.55E-07	5.00E-07	2.15E-05	1.80E-01	2.15E-05	1.80E-01	2.15E-05
91-20-3	Napthalene	5.98E-07	0.00E+00	3.59E-05	2.30E-01	3.59E-05	2.30E-02	3.59E-06
7440-02-0	Nickel	2.06E-06	0.00E+00	1.24E-04	7.94E-01	1.24E-04	7.94E-01	1.24E-04
1150/1151	PAH B(a)P- eq	6.60E-09	0.00E+00	3.96E-07	2.54E-03	3.96E-07	2.54E-04	3.96E-08
1086/1080	PCDD/PCDF-eq	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

198-55-0	Perylene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
85-01-8	Phenanthrene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
7723-14-0	Phosphorus	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
7440-09-7	Potassium	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
115-07-1	Propylene	7.17E-04	0.00E+00	4.30E-02	2.76E+02	4.30E-02	2.76E+01	4.30E-03
129-00-0	Pyrene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
7782-49-2	Selenium	1.18E-08	0.00E+00	7.08E-07	4.55E-03	7.08E-07	4.55E-03	7.08E-07
7440-21-3	Silicon	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
7440-23-5	Sodium	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
7440-31-5	Tin	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
7440-32-6	Titanium	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
108-88-3	Toluene	3.59E-05	0.00E+00	2.15E-03	1.38E+01	2.15E-03	1.38E+00	2.15E-04
7440-62-2	Vanadium	2.25E-06	0.00E+00	1.35E-04	8.67E-01	1.35E-04	8.67E-01	1.35E-04
1330-20-7	Xylenes	2.67E-05	0.00E+00	1.60E-03	1.03E+01	1.60E-03	1.03E+00	1.60E-04

Notes

[1.] BAAQMD Toxic Air Contaminant (TAC) Emission Factor Guidelines, Appendix A, Default TAC Emission Factors for Specific Source Categories, August 2020
https://www.baaqmd.gov/~/media/files/ab617-community-health/facility-risk-reduction/documents/tac_emission_factor_guidance_appendixa_august_2020-pdf.pdf?la=en

[2.] TAC emission factors from PSA offgas combustion estimated using the syngas speciation profile obtained from process simulation and assumed abatement efficiency of gas treatment system and boiler

GHG

SU/SD - Natural Gas Only

Pollutant	Emission Factor	Units	Emissions (kg/hr)	Emissions (Mton/year)	GWP	Emissions (Mton CO2e/year)
CO2	53.06	kg CO2/mmBtu	3,183.60	865.94	1	865.94
CH4	1	g CH4/mmBtu	0.06	0.016	25	0.41
N2O	0.1	g N2O/mmBtu	0.01	0.002	298	0.49
					Total CO2e =	**866.83** **metric tons**

Normal Operation - Natural Gas Only

Pollutant	Emission Factor	Units	Emissions (kg/hr)	Emissions (Mton/year)	GWP	Emissions (Mton CO2e/year)
CO2	53.06	kg CO2/mmBtu	2,387.70	19,579.14	1	19,579.14
CH4	1	g CH4/mmBtu	0.05	0.369	25	9.23
N2O	0.1	g N2O/mmBtu	0.00	0.037	298	11.00
					Total CO2e =	**19,599.36** **metric tons**

Normal Operation - PSA Only

Pollutant	Emission Factor	Units	Emissions (kg/hr)	Emissions (Mton/year)	GWP	Emissions (Mton CO2e/year)
CO2	52.07	kg CO2/mmBtu	1,041.40	8,539.48	1	8,539.48
CH4	3.2	g CH4/mmBtu	0.06	0.52	25	13.12
N2O	0.63	g N2O/mmBtu	0.01	0.10	298	30.79
					Total CO2e =	**8,583.39** **metric tons**

Notes:

Method for calculating GHGs as described in 40 CFR Part 98. Guidance: https://www.epa.gov/sites/default/files/2020-12/documents/stationaryemissions.pdf

Emission factors for natural gas and other biomass gas are from Federal Register EPA; 40 CFR Part 98; e-CFR, (see link below). Table C-1 and Table C-2 (78 FR 71950, Nov. 29, 2013, as amended at 81 FR 89252, Dec. 9, 2016), Table AA-1 (78 FR 71965, Nov. 29, 2013).

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S-75 Emergency Diesel-fired ICE - Generator Se

Source Description: Diesel-fired engine-generator set to generate electricity for emergency use. Abatement for the engine includes DPF, oxidation catalyst, and SCR.

Non-Emergency Operating Hours Per Year (hr/y	50
Emergency Use Operating Hours (hr/yr)	100

From Manufacturer's Data

Fuel Consumption Rate (gal/hr)	31	H Cycle Data	Calc MMBTU/hr =	4.27
Brake Horsepower of Engine (HP)	680			

Pollutant	From CARB/EPA Certification Tier 2 Certified Emission Rate, (Unabated Emission Factor)	Abatement Efficiency	Abated Emission Factor	Hourly Emissions	Annual Emissions	Annual Emissions	Max. Daily Emissions	Annual PTE; Per BAAQMD Emergency Engine Policy
	(g/kw-hr)	(%)	(g/hp-hr)	(lb/hr)	(lb/yr)	(TPY)	(lb/day)	TPY
NMHC+NOx	5.74		4.28					
NOx	5.64	88%	0.50	0.75	37.48	0.019	17.99	0.056
POC	0.10		0.07	0.11	5.59	0.003	2.68	0.008
CO	0.60		0.45	0.67	33.54	0.017	16.10	0.050
PM_{10}/ PM2.5/ DPM	0.13		0.10	0.15	7.27	0.004	3.49	0.011
SO_2*			0.006	0.01	0.41	0.000	0.20	0.001

15ppm ULSD; Heating Value of Diesel = 19300 Btu/lb or 137000 Btu/gal; Heating value of diesel from footnote to Table 3.3-1 of AP-42

Note: The SO2 emission factor was derived from EPA AP-42, Table 3.4-1.

$$SO_2(15ppm): \{0.00809 * 0.0015 \frac{lb\ SO_2}{bhp\ hr} * 453.592\ \frac{g}{lb} = 0.006 \frac{g}{bhp\ hr}$$

Only for engines with SCR

Ammonia Slip Concentration (ppmv @15% O2)	10
Stoichiometric Fuel Factor Fd (DSCF exhaust per MMBtu heat input, at 68 °F and 1 atm)	9190
Molar Volume @ 68°F (dscf/mol-lb)	385.3
Ammonia Emission Factor (lb/MMBtu)	1.44E-02

CAS#	Pollutant	Hourly Emission Rate (lb/hr)	Above Acute Trigger Level	Annual Emission Rate (lb/yr)	Above Chronic Trigger Level
7664-41-7	Ammonia (NH3)	6.15E-02	No	3.08E+00	No
9901	DPM	1.45E-01	No	7.27E+00	**Yes**

GHG

Distillate Fuel Oil 2

Pollutant	Emission Factor	Units	Emissions (kg/hr)	Emissions (Mton/year)	GWP	Emissions (Mton CO2e/year)
CO2	10.21	kg CO2/gal	318.55	47.78	1	47.78
CH4	0.41	g CH4/gal	0.01	0.0019	25	0.05
N2O	0.08	g N2O/gal	0.00	0.0004	298	0.11
					Total CO2e =	**47.94** **metric tons**

Notes:

Method for calculating GHGs as described in 40 CFR Part 98. Guidance: https://www.epa.gov/sites/default/files/2020-12/documents/stationaryemissions.pdf

Emission factors for distillate fuel oil # 2 are from Federal Register EPA; 40 CFR Part 98; e-CFR, (see link below). Table C-1 and Table C-2 (78 FR 71950, Nov. 29, 2013, as amended at 81 FR 89252, Dec. 9, 2016), Table AA-1 (78 FR 71965, Nov. 29, 2013).

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S-80 Emergency Diesel-fired ICE for Fire Water Pump

Source Description: Diesel-fired engine for emergency use to operate firewater pump. Abatement for the engine includes DPF, oxidation catalyst, and SCR.

Non-Emergency Operating Hours Per Year (hr/yr) 50

From Manufacturer's Data

Fuel Consumption Rate (gal/hr)	10	H Cycle Data	Calc MMBTU/hr =	1.34
Brake Horsepower of Engine (HP)	175			

Pollutant	From CARB/EPA Certification Tier 3 Certified Emission Rate, (Unabated Emission Factor)	Abatement Efficiency	Abated Emission Factor	Hourly Emissions	Annual Emissions	Annual Emissions	Max. Daily Emissions	Annual PTE; Per BAAQMD Emergency Engine Policy
	(g/kw-hr)	(%)	(g/hp-hr)	(lb/hr)	(lb/yr)	(TPY)	(lb/day)	TPY
NMHC+NOx	3.40		2.54					
NOx	3.32	88%	0.30	0.116	5.79	0.0029	2.78	0.003
POC	0.08		0.06	0.024	1.19	0.0006	0.57	0.001
CO	1.60		1.19	0.460	23.02	0.0115	11.05	0.012
PM_{10}/ PM2.5/ DPM	0.15		0.11	0.043	2.14	0.0011	1.03	0.001
SO_2*			0.006	0.002	0.11	0.0001	0.05	0.000

15ppm ULSD; Heating Value of Diesel = 19300 Btu/lb or 137000 Btu/gal; Heating value of diesel from footnote to Table 3.3-1 of AP-42

Note: The SO2 emission factor was derived from EPA AP-42, Table 3.4-1.

$$SO_2(15ppm): \{0.00809 * 0.0015 \frac{lb\ SO_2}{bhp\ hr} * 453.592\ \frac{g}{lb} = 0.006 \frac{g}{bhp\ hr}$$

Only for engines with SCR

Ammonia Slip Concentration (ppmv @15% O2)	10
Stoichiometric Fuel Factor Fd (DSCF exhaust per MMBtu heat input, at 68 °F and 1 atm)	9190
Molar Volume @ 68°F (dscf/mol-lb)	385.3
Ammonia Emission Factor (lb/MMBtu)	1.44E-02

CAS#	Pollutant	Hourly Emission Rate (lb/hr)	Above Acute Trigger Level	Annual Emission Rate (lb/yr)	Above Chronic Trigger Level
7664-41-7	Ammonia (NH3)	1.93E-02	No	9.66E-01	No
9901	DPM	4.29E-02	No	2.14E+00	Yes

GHG

Distillate Fuel Oil 2

Pollutant	Emission Factor	Units	Emissions (kg/hr)	Emissions (Mton/year)	GWP	Emissions (Mton CO2e/year)	
CO2	10.21	kg CO2/gal	100.04	5.00	1	5.00	
CH4	0.41	g CH4/gal	0.004	2.01E-04	25	0.01	
N2O	0.08	g N2O/gal	0.001	3.92E-05	298	0.01	
					Total CO2e =	**5.02**	**metric tons**

Notes:

Method for calculating GHGs as described in 40 CFR Part 98. Guidance: https://www.epa.gov/sites/default/files/2020-12/documents/stationaryemissions.pdf

Emission factors for distillate fuel oil # 2 are from Federal Register EPA; 40 CFR Part 98; e-CFR, (see link below). Table C-1 and Table C-2 (78 FR 71950, Nov. 29, 2013, as amended at 81 FR 89252, Dec. 9, 2016), Table AA-1 (78 FR 71965, Nov. 29, 2013).

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S-85 Cooling Tower [EXEMPT]

Source Description: Cooling water will be circulated through heat exchangers and does not come in contact with process streams. Cooling tower will not be used for evaporative cooling of process water.

Type of cooling tower	TBD
Please specify the type and concentration in ppm by weight of any water treatment chemical used	TBD

Capacity of cooling tower (gpm)	2975
Total Dissolved solids in circulating water (ppm by weight)	870
Drift loss (%)	0.001
Daily Operating hours	24
Annual Operating Hours	8200

Hourly PM Emissions (lb/hr)	0.0130
Daily PM Emissions (lb/day)	0.311
Annual PM Emissions (lb/yr)	106.2
Hourly PM10 Emissions (lb/hr)	0.009
Daily PM10 Emissions (lb/day)	0.218
Annual PM10 Emissions (lb/yr)	74.342
Hourly PM2.5 Emissions (lb/hr)	**0.005**
Daily PM2.5 Emissions (lb/day)	**0.131**
Annual PM2.5 Emissions (lb/yr)	**44.605**

Notes:

AQMD CEIDARS Table with PM2.5 Fractions used to calculate PM10 and PM2.5 from total PM:
Microsoft Word - final-methodology-to-calculate-pm2-5-and-pm2-5-significance-thresholds (aqmd.gov)

S-90 Wastewater Treatment Plant

Source Description: Wastewater from various process units is treated.

Total Volumetric Flow Rate	4,702 gal/hr

	Total Volumetric Flow Rate	Total Emissions[1]					
CAS No.	**Pollutant**	**Maximum Hourly (lb/hour)**	**Above Acute Trigger Level**	**Maximum Daily (lb/day)**	**Annual (lb/year)**	**Above Chronic Trigger Level**	**PEF (PAHs)**
107-06-2	1,2-Dichloroethane	0.00000	No	0.00000	0.00000	No	
56-55-3	Benzo[a]anthracene	0.00000	See PAH B(a)P-eq	0.00005	0.01750	See PAH B(a)P-eq	0.1
50-32-8	Benzo[a]pyrene	0.00001	See PAH B(a)P-eq	0.00035	0.11913	See PAH B(a)P-eq	1
205-99-2	Benzo[b]fluoranthene	0.00000	See PAH B(a)P-eq	0.00011	0.03849	See PAH B(a)P-eq	0.1
191-24-2	Benzo(g,h,i)perylene	0.00007	No	0.00165	0.56312	No	
207-08-9	Benzo[k]fluoranthene	0.00000	See PAH B(a)P-eq	0.00005	0.01734	See PAH B(a)P-eq	0.1
92-52-4	Biphenyl	0.00000	No	0.00000	0.00000	No	
108-90-7	Chlorobenzene	0.00000	No	0.00000	0.00013	No	
218-01-9	Chrysene	0.00000	See PAH B(a)P-eq	0.00008	0.02607	See PAH B(a)P-eq	0.01
75-09-2	Dichloromethane	0.00000	No	0.00000	0.00000	No	
118-74-1	Hexachlorobenzene	0.00000	No	0.00000	0.00000	No	
193-39-5	Indeno(1,2,3-cd)pyrene	0.00001	See PAH B(a)P-eq	0.00027	0.09355	See PAH B(a)P-eq	0.1

91-20-3	Naphthalene	0.00002	No	0.00038	0.13098	No
100-42-5	Styrene	0.00000	No	0.00000	0.00006	No
108-88-3	Toluene	0.00000	No	0.00000	0.00019	No
463-58-1	Carbonyl Sulfide	0.00000	No	0.00000	0.00000	No
75-15-0	Carbon Disulfide	0.00000	No	0.00000	0.00000	No
74-90-8	Hydrogen Cyanide (Ionizes in wate	0.00000	No	0.00000	0.00000	No
71-43-2	Benzene	0.00001	No	0.00014	0.04923	No
108-95-2	Phenols (4AAP)	0.00000	No	0.00000	0.00000	No
	Total VOCs (mg/l)	0.00322		0.07729	26.40787	
	Total VOCs as methane	0.00179		0.04291	14.66164	
1150/1151	PAH B(a)P- eq	0.00002	No	0.00040	0.13608	**Yes**

1. Assumption that because of counting emissions in fugitives and high solubility of compounds in water, that 0.1% of compound loss between pretreatment and pretreatment effluent is reasonable. Also assumes no breakthrough of GAC column.

Pollutant	**Total CAP Emissions**
	Maximum Hourly (lb/hour)
Total VOCs as methane	0.00
NOx[1]	0.00
CO[2]	0.00
SO2[3]	0.00
PM10	0.00
PM2.5	0.00

H Cycle Renewable Hydrogen Project - Fugitive VOC Emissions Estimate								
Component	**Total Count**	**100 ppm**	**Pegged**	**100 ppm Emission Factor (lbs/day/source)**	**Pegged Emission Factor (lbs/day/source)**	**Emissions (lbs/day)**	**Emissions (lbs/yr)**	
Pumps	10	10		0.04711		0.47	171.95	
			0.05		0.2	0.01	3.65	0.5% total pumps
Valves	725	725		0.00375		2.72	992.34	
			1.0875		0.1	0.11	39.69	0.15% total valves
Flanges	1775	1775		0.00619		10.99	4010.35	
			0		N/A	0.00	0.00	
Connectors	0	0		0.0024		0.00	0.00	
			0		N/A	0.00	0.00	
PRD's	15	10		0.0084		0.08	30.66	
			0.05		0.2	0.01	3.65	0.5% total PRDs
Compressors	5	5		0.0084		0.04	15.33	
			0.025		0.2	0.01	1.83	0.5% total compressors
Totals	**2530**	**2520**	**1.1875**			**14.44**	**5269.45**	

Reg. 8-18-306.2 The number of individual pieces of equipment awaiting repair does not exceed that portion of the total population for each equipment type expressed in the table below, rounded to the next higher whole number.

Total Number of Non-repairable Equipment Allowed (%)	
Valves and Connections as allowed by Section 8-18-306.3	0.15% of total number of valves
Pressure Relief Devices	0.5% of total number of pressure relief devices
Pumps and Compressors	0.5% of total number of pumps and

Reg. 8-18-306.3 A connection can be considered non-repairable equipment pursuant to Section 8-18-306 provided each non-repairable connection is counted as two valves toward the total number of non-repairable valves allowed.

CAS #	Pollutant	PPM	weight %	Emissions (lb/hr)	Above Acute Trigger Level	Emissions (lb/yr)	Above Chronic Trigger Level
71-43-2	Benzene	304	0.0304%	1.83E-04	No	1.60E+00	No
7664-41-7	Ammonia	4983	0.4983%	3.00E-03	No	2.63E+01	No
74-90-8	Hydrogen cyanide	530	0.0530%	3.19E-04	No	2.79E+00	No
7783-06-4	Hydrogen Sulfide	1286	0.1286%	7.74E-04	No	6.78E+00	No
463-58-1	Carbon oxide sulfide	105	0.0105%	6.32E-05	No	5.53E-01	No
7647-01-0	Hydrochloric acid	0.74	0.0001%	4.45E-07	No	3.90E-03	No
91-20-3	Naphthalene	26.36	0.0026%	1.59E-05	No	1.39E-01	No
56-55-3	Benzo(a)anthracene	0.28	0.0000%	1.70E-08	#N/A	1.49E-04	#N/A
218-01-9	Chrysene	0.35	0.0000%	2.13E-09	#N/A	1.86E-05	#N/A
207-08-9	Benzo(b,j,k)fluoranthene	1.13	0.0001%	6.80E-08	#N/A	5.96E-04	#N/A
50-32-8	Benzo(a)pyrene	2.47	0.0002%	1.49E-06	#N/A	1.30E-02	#N/A
193-39-5	Indeno(1,2,3,-c,d)pyrene	2.19	0.0002%	1.32E-07	#N/A	1.15E-03	#N/A
1150/1151	PAH B(a)P- eq			1.71E-06	No	1.49E-02	**Yes**

Notes:

Uses PPM provided by Rob B for raw syngas from OMNI gasifier.

From EPA guidance (https://www.epa.gov/sites/default/files/2015-08/documents/ii04.pdf)

"N/A" is presented in trigger level assessments for compounds which are included in PAH totals

2.2.2 Speciated Organics/Hazardous and Toxic Air Pollutants

Because material in equipment within a process unit is often a mixture of several chemicals, equipment leak emission estimates for specific volatile organic compounds (VOCs), hazardous air pollutants (HAPs), and/or pollutants under Section 112(r) of the Clean Air Act, as amended can be obtained by multiplying the TOC emissions from a particular equipment times the ratio of the concentration of the specific VOC/pollutant to the TOC concentration, both in weight percent. An assumption in the above estimation is that the weight percent of the chemicals in the mixture contained in the equipment will equal the weight percent of the chemicals in the leaking material. In general, this assumption should be accurate for single-phase streams containing any gas/vapor material or liquid mixtures containing constituents of similar volatilities. Engineering judgement should be used to estimate emissions of individual chemical species, in cases when:

- The material in the equipment piece is a liquid mixture of constituents with varying volatilities; or
- It is suspected that the leaking vapor will have different concentrations than the liquid.

Piping Equipment GHGs

Pollutant	Emissions (lbs/day)	Emissions (lbs/year)	Emissions (Mton/yr)	GWP	Emissions (Mton CO2e/year)
Methane	14.44	5269.45	2.40	25	59.88

Notes:
Assume all VOC is methane for the purposes of calculating fugitive GHGs from piping equipment.

Stockpiling

GHG = SEF*SD*TP

where SEF = stockpile emission factor
SD = avg # days stockpiled
TP = total annual facility throughput (tons)

SEF = 0.0032 tCO2e/ton-day
SD = 0.5 days
TP = 141,750 short ton/year

tCO2e = 227 tonnes of CO2 equivalent

Notes:

SD = residence time of wet silo

The second approach assumes that stored material undergoes composting. Composting emissions from CERF (0.07 tCO2eq/short ton) are utilized for this assessment. We assume a standard composting duration of 22 days, thereby determining an SEF of 0.0032 tCO2/ton-day (or 7 lbs. CO2eq/ton-day). Therefore, the previous equation is re-utilized but amended to the following:

GHG from Stockpiling (tCO2eq/year) = SEF x SD x TP

Where:

- SEF is Stockpile emission factor (lb,CO2eq/ton-day)

Hydrogen production process fugitives

0.201 g CH4/kg H2 product
0.029 gCO/kg CO

Pollutant	Emission Factor	Units	GWP	Emissions (Mton CO2e/year)
CH4	0.201	g CH4/kg H2	25	41.11
CO	0.029	gCO/kg H2	2.65	0.63
			Total =	41.74

Notes:

9000 tpy of hydrogen capacity
8181.818 tonnes/yr

The second approach entailed utilizing published fugitive factors from a literature review of the steam methane reforming (SMR) process, in which natural gas is converted to syngas prior to final production of hydrogen. The process is similar to H Cycle's with the primary exception being that the source of energy for the production of syngas is natural gas instead of MSW organics. The paper title "The estimation of fugitive gas emissions from hydrogen production by natural gas steam reforming" by Alhamdani et al. produced fugitive factors as follows:

- CH4 Factor = 0.201 gCH4 / kg H2 product
- CO Factor = 0.029 gCO / kg CO

Therefore, fugitive emissions are determined as follows:

Fugitive emissions (tCO2eq/year) = CH4 Factor x TPH2 x GWP CH4 (=25) + CO Factor x TPH2 x GWP CO (=2.65)

Where:

- TPH2 is the maximum annual hydrogen production (tonne per year); the maximum value is assumed for conservatism

H Cycle Pittsburg v2 Detailed Report

Table of Contents

1. Basic Project Information

1.1. Basic Project Information

Data Field	Value
Project Name	H Cycle Pittsburg v2
Construction Start Date	1/1/2024
Operational Year	2026
Lead Agency	—
Land Use Scale	Project/site
Analysis Level for Defaults	County
Windspeed (m/s)	3.60
Precipitation (days)	0.80
Location	901 Loveridge Rd, Pittsburg, CA 94565, USA
County	Contra Costa
City	Pittsburg
Air District	Bay Area AQMD
Air Basin	San Francisco Bay Area
TAZ	1347
EDFZ	1
Electric Utility	MCE
Gas Utility	Pacific Gas & Electric
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

Industrial Park	594	1000sqft	13.6	594,000	0.00	—	—	—

1.3. User-Selected Emission Reduction Measures by Emissions Sector

Sector	#	Measure Title
Transportation	T-30*	Use Cleaner-Fuel Vehicles
Transportation	T-32*	Orient Project Toward Transit, Bicycle, or Pedestrian Facility
Transportation	T-34*	Provide Bike Parking
Transportation	T-42*	Implement Telecommute and/or Alternative Work Schedule Program
Transportation	T-46*	Improve Transit Access, Safety, and Comfort

* Qualitative or supporting measure. Emission reductions not included in the mitigated emissions results.

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.	2.73	310	15.6	26.1	0.04	0.53	2.75	3.28	0.49	0.67	1.17	—	7,310	7,310	0.29	0.50	16.5	7,481
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	4.92	3.81	42.8	36.7	0.08	1.69	13.0	14.7	1.53	4.91	6.45	—	10,428	10,428	0.70	1.13	0.43	10,742
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	2.17	17.6	14.7	18.3	0.03	0.52	2.70	3.23	0.48	0.72	1.20	—	5,446	5,446	0.25	0.39	4.54	5,572

Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.40	3.21	2.67	3.33	0.01	0.10	0.49	0.59	0.09	0.13	0.22	—	902	902	0.04	0.06	0.75	923

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	2.73	2.24	15.6	26.1	0.04	0.53	2.75	3.28	0.49	0.67	1.17	—	7,310	7,310	0.29	0.50	16.5	7,481
2025	2.52	310	14.5	25.2	0.04	0.47	2.75	3.22	0.43	0.67	1.11	—	7,224	7,224	0.28	0.48	15.7	7,389
Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	4.92	3.81	42.8	36.7	0.08	1.69	13.0	14.7	1.53	4.91	6.45	—	10,428	10,428	0.70	1.13	0.43	10,742
2025	2.46	2.07	14.9	23.6	0.04	0.47	2.75	3.22	0.43	0.67	1.11	—	7,037	7,037	0.30	0.48	0.41	7,189
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	2.17	1.75	14.7	18.3	0.03	0.52	2.70	3.23	0.48	0.72	1.20	—	5,446	5,446	0.25	0.39	4.54	5,572
2025	0.75	17.6	4.56	7.23	0.01	0.15	0.79	0.94	0.14	0.19	0.33	—	2,081	2,081	0.09	0.14	1.94	2,125
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	0.40	0.32	2.67	3.33	0.01	0.10	0.49	0.59	0.09	0.13	0.22	—	902	902	0.04	0.06	0.75	923
2025	0.14	3.21	0.83	1.32	< 0.005	0.03	0.14	0.17	0.03	0.04	0.06	—	344	344	0.01	0.02	0.32	352

2.3. Construction Emissions by Year, Mitigated

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	2.73	2.24	15.6	26.1	0.04	0.53	2.75	3.28	0.49	0.67	1.17	—	7,310	7,310	0.29	0.50	16.5	7,481
2025	2.52	310	14.5	25.2	0.04	0.47	2.75	3.22	0.43	0.67	1.11	—	7,224	7,224	0.28	0.48	15.7	7,389
Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	4.92	3.81	42.8	36.7	0.08	1.69	13.0	14.7	1.53	4.91	6.45	—	10,428	10,428	0.70	1.13	0.43	10,742
2025	2.46	2.07	14.9	23.6	0.04	0.47	2.75	3.22	0.43	0.67	1.11	—	7,037	7,037	0.30	0.48	0.41	7,189
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	2.17	1.75	14.7	18.3	0.03	0.52	2.70	3.23	0.48	0.72	1.20	—	5,446	5,446	0.25	0.39	4.54	5,572
2025	0.75	17.6	4.56	7.23	0.01	0.15	0.79	0.94	0.14	0.19	0.33	—	2,081	2,081	0.09	0.14	1.94	2,125
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	0.40	0.32	2.67	3.33	0.01	0.10	0.49	0.59	0.09	0.13	0.22	—	902	902	0.04	0.06	0.75	923
2025	0.14	3.21	0.83	1.32	< 0.005	0.03	0.14	0.17	0.03	0.04	0.06	—	344	344	0.01	0.02	0.32	352

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.	8.84	10.0	10.2	128	0.22	0.29	10.9	11.2	0.28	2.77	3.05	684	71,845	72,530	78.7	2.32	199	75,388
Mit.	8.84	10.0	10.2	128	0.22	0.29	10.9	11.2	0.28	2.77	3.05	684	71,845	72,530	78.7	2.32	199	75,388
% Reduced	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Unmit.	8.42	9.57	11.1	125	0.21	0.29	10.9	11.2	0.28	2.77	3.05	684	71,005	71,689	78.8	2.38	156	74,523
Mit.	8.42	9.57	11.1	125	0.21	0.29	10.9	11.2	0.28	2.77	3.05	684	71,005	71,689	78.8	2.38	156	74,523
% Reduced	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	7.35	8.58	9.69	112	0.19	0.26	9.56	9.82	0.26	2.42	2.68	684	68,906	69,590	78.6	2.28	171	72,408
Mit.	7.35	8.58	9.69	112	0.19	0.26	9.56	9.82	0.26	2.42	2.68	684	68,906	69,590	78.6	2.28	171	72,408
% Reduced	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	1.34	1.57	1.77	20.4	0.04	0.05	1.74	1.79	0.05	0.44	0.49	113	11,408	11,522	13.0	0.38	28.3	11,988
Mit.	1.34	1.57	1.77	20.4	0.04	0.05	1.74	1.79	0.05	0.44	0.49	113	11,408	11,522	13.0	0.38	28.3	11,988
% Reduced	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

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	7.83	7.31	4.97	53.2	0.12	0.08	10.9	11.0	0.08	2.77	2.85	—	12,399	12,399	0.54	0.50	43.9	12,606
Area	—	1.70	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Energy	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	48,252	48,252	8.47	1.03	—	48,769
Water	—	—	—	—	—	—	—	—	—	—	—	287	500	788	29.6	0.71	—	1,739
Waste	—	—	—	—	—	—	—	—	—	—	—	397	0.00	397	39.7	0.00	—	1,389
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	155	155

Off-Road	1.01	1.01	5.25	74.7	0.10	0.20	—	0.20	0.20	—	0.20	—	10,694	10,694	0.43	0.09	—	10,731
Total	8.84	10.0	10.2	128	0.22	0.29	10.9	11.2	0.28	2.77	3.05	684	71,845	72,530	78.7	2.32	199	75,388
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	7.41	6.86	5.86	50.3	0.11	0.08	10.9	11.0	0.08	2.77	2.85	—	11,559	11,559	0.63	0.56	1.14	11,741
Area	—	1.70	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Energy	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	48,252	48,252	8.47	1.03	—	48,769
Water	—	—	—	—	—	—	—	—	—	—	—	287	500	788	29.6	0.71	—	1,739
Waste	—	—	—	—	—	—	—	—	—	—	—	397	0.00	397	39.7	0.00	—	1,389
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	155	155
Off-Road	1.01	1.01	5.25	74.7	0.10	0.20	—	0.20	0.20	—	0.20	—	10,694	10,694	0.43	0.09	—	10,731
Total	8.42	9.57	11.1	125	0.21	0.29	10.9	11.2	0.28	2.77	3.05	684	71,005	71,689	78.8	2.38	156	74,523
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	6.41	5.94	4.80	42.1	0.10	0.07	9.56	9.63	0.07	2.42	2.49	—	10,193	10,193	0.52	0.47	16.6	10,361
Area	—	1.70	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Energy	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	48,252	48,252	8.47	1.03	—	48,769
Water	—	—	—	—	—	—	—	—	—	—	—	287	500	788	29.6	0.71	—	1,739
Waste	—	—	—	—	—	—	—	—	—	—	—	397	0.00	397	39.7	0.00	—	1,389
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	155	155
Off-Road	0.94	0.94	4.89	69.6	0.09	0.19	—	0.19	0.19	—	0.19	—	9,962	9,962	0.40	0.08	—	9,996
Total	7.35	8.58	9.69	112	0.19	0.26	9.56	9.82	0.26	2.42	2.68	684	68,906	69,590	78.6	2.28	171	72,408
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	1.17	1.08	0.88	7.69	0.02	0.01	1.74	1.76	0.01	0.44	0.45	—	1,687	1,687	0.09	0.08	2.75	1,715
Area	—	0.31	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Energy	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	7,989	7,989	1.40	0.17	—	8,074
Water	—	—	—	—	—	—	—	—	—	—	—	47.6	82.8	130	4.89	0.12	—	288
Waste	—	—	—	—	—	—	—	—	—	—	—	65.7	0.00	65.7	6.57	0.00	—	230

Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	25.6	25.6
Off-Road	0.17	0.17	0.89	12.7	0.02	0.03	—	0.03	0.03	—	0.03	—	1,649	1,649	0.07	0.01	—	1,655
Total	1.34	1.57	1.77	20.4	0.04	0.05	1.74	1.79	0.05	0.44	0.49	113	11,408	11,522	13.0	0.38	28.3	11,988

2.6. Operations Emissions by Sector, Mitigated

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	7.83	7.31	4.97	53.2	0.12	0.08	10.9	11.0	0.08	2.77	2.85	—	12,399	12,399	0.54	0.50	43.9	12,606
Area	—	1.70	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Energy	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	48,252	48,252	8.47	1.03	—	48,769
Water	—	—	—	—	—	—	—	—	—	—	—	287	500	788	29.6	0.71	—	1,739
Waste	—	—	—	—	—	—	—	—	—	—	—	397	0.00	397	39.7	0.00	—	1,389
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	155	155
Off-Road	1.01	1.01	5.25	74.7	0.10	0.20	—	0.20	0.20	—	0.20	—	10,694	10,694	0.43	0.09	—	10,731
Total	8.84	10.0	10.2	128	0.22	0.29	10.9	11.2	0.28	2.77	3.05	684	71,845	72,530	78.7	2.32	199	75,388
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	7.41	6.86	5.86	50.3	0.11	0.08	10.9	11.0	0.08	2.77	2.85	—	11,559	11,559	0.63	0.56	1.14	11,741
Area	—	1.70	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Energy	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	48,252	48,252	8.47	1.03	—	48,769
Water	—	—	—	—	—	—	—	—	—	—	—	287	500	788	29.6	0.71	—	1,739
Waste	—	—	—	—	—	—	—	—	—	—	—	397	0.00	397	39.7	0.00	—	1,389
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	155	155
Off-Road	1.01	1.01	5.25	74.7	0.10	0.20	—	0.20	0.20	—	0.20	—	10,694	10,694	0.43	0.09	—	10,731
Total	8.42	9.57	11.1	125	0.21	0.29	10.9	11.2	0.28	2.77	3.05	684	71,005	71,689	78.8	2.38	156	74,523

Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	6.41	5.94	4.80	42.1	0.10	0.07	9.56	9.63	0.07	2.42	2.49	—	10,193	10,193	0.52	0.47	16.6	10,361
Area	—	1.70	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Energy	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	48,252	48,252	8.47	1.03	—	48,769
Water	—	—	—	—	—	—	—	—	—	—	—	287	500	788	29.6	0.71	—	1,739
Waste	—	—	—	—	—	—	—	—	—	—	—	397	0.00	397	39.7	0.00	—	1,389
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	155	155
Off-Road	0.94	0.94	4.89	69.6	0.09	0.19	—	0.19	0.19	—	0.19	—	9,962	9,962	0.40	0.08	—	9,996
Total	7.35	8.58	9.69	112	0.19	0.26	9.56	9.82	0.26	2.42	2.68	684	68,906	69,590	78.6	2.28	171	72,408
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	1.17	1.08	0.88	7.69	0.02	0.01	1.74	1.76	0.01	0.44	0.45	—	1,687	1,687	0.09	0.08	2.75	1,715
Area	—	0.31	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Energy	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	7,989	7,989	1.40	0.17	—	8,074
Water	—	—	—	—	—	—	—	—	—	—	—	47.6	82.8	130	4.89	0.12	—	288
Waste	—	—	—	—	—	—	—	—	—	—	—	65.7	0.00	65.7	6.57	0.00	—	230
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	25.6	25.6
Off-Road	0.17	0.17	0.89	12.7	0.02	0.03	—	0.03	0.03	—	0.03	—	1,649	1,649	0.07	0.01	—	1,655
Total	1.34	1.57	1.77	20.4	0.04	0.05	1.74	1.79	0.05	0.44	0.49	113	11,408	11,522	13.0	0.38	28.3	11,988

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)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (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	—	—	—	—	—	—	5.37	5.37	—	0.81	0.81	—	—	—	—	—	—	—
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	0.17	0.14	1.36	1.19	< 0.005	0.06	—	0.06	0.05	—	0.05	—	188	188	0.01	< 0.005	—	188
Demolition	—	—	—	—	—	—	0.29	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
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	—	—	—	—	—	—	0.05	0.05	—	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)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Worker	0.06	0.05	0.05	0.57	0.00	0.00	0.12	0.12	0.00	0.03	0.03	—	123	123	< 0.005	0.01	0.01	125
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	0.70	0.14	9.29	4.21	0.04	0.12	1.74	1.86	0.08	0.48	0.56	—	6,837	6,837	0.56	1.10	0.38	7,179
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	—	6.83	6.83	< 0.005	< 0.005	0.01	6.94
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	0.04	0.01	0.50	0.23	< 0.005	0.01	0.10	0.10	< 0.005	0.03	0.03	—	375	375	0.03	0.06	0.35	394
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	1.13	1.13	< 0.005	< 0.005	< 0.005	1.15
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	0.01	< 0.005	0.09	0.04	< 0.005	< 0.005	0.02	0.02	< 0.005	< 0.005	0.01	—	62.0	62.0	0.01	0.01	0.06	65.2

3.2. Demolition (2024) - Mitigated

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)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (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	—	—	—	—	—	—	5.37	5.37	—	0.81	0.81	—	—	—	—	—	—	—
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	0.17	0.14	1.36	1.19	< 0.005	0.06	—	0.06	0.05	—	0.05	—	188	188	0.01	< 0.005	—	188
Demolition	—	—	—	—	—	—	0.29	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
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	—	—	—	—	—	—	0.05	0.05	—	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)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.06	0.05	0.05	0.57	0.00	0.00	0.12	0.12	0.00	0.03	0.03	—	123	123	< 0.005	0.01	0.01	125
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	0.70	0.14	9.29	4.21	0.04	0.12	1.74	1.86	0.08	0.48	0.56	—	6,837	6,837	0.56	1.10	0.38	7,179
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	—	6.83	6.83	< 0.005	< 0.005	0.01	6.94
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	0.04	0.01	0.50	0.23	< 0.005	0.01	0.10	0.10	< 0.005	0.03	0.03	—	375	375	0.03	0.06	0.35	394
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	1.13	1.13	< 0.005	< 0.005	< 0.005	1.15

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	0.01	< 0.005	0.09	0.04	< 0.005	< 0.005	0.02	0.02	< 0.005	< 0.005	0.01	—	62.0	62.0	0.01	0.01	0.06	65.2

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)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (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	—	—	—	—	—	—	—
Demolition	—	—	—	—	—	—	3.91	3.91	—	0.59	0.59	—	—	—	—	—	—	—
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	0.12	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	—	—	—	—	—	—	—
Demolition	—	—	—	—	—	—	0.11	0.11	—	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
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	—	—	—	—	—	—	—
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
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.07	0.06	0.06	0.67	0.00	0.00	0.14	0.14	0.00	0.03	0.03	—	144	144	< 0.005	0.01	0.02	146
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	0.51	0.10	6.78	3.07	0.03	0.09	1.27	1.36	0.06	0.35	0.41	—	4,988	4,988	0.41	0.80	0.28	5,238
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.02	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	3.99	3.99	< 0.005	< 0.005	0.01	4.05
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	0.01	< 0.005	0.18	0.08	< 0.005	< 0.005	0.03	0.04	< 0.005	0.01	0.01	—	137	137	0.01	0.02	0.13	144
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.66	0.66	< 0.005	< 0.005	< 0.005	0.67
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	0.02	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	22.6	22.6	< 0.005	< 0.005	0.02	23.8

3.4. Site Preparation (2024) - Mitigated

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)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (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	—	—	—	—	—	—	—
Demolition	—	—	—	—	—	—	3.91	3.91	—	0.59	0.59	—	—	—	—	—	—	—
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	0.12	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	—	—	—	—	—	—	—
Demolition	—	—	—	—	—	—	0.11	0.11	—	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
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	—	—	—	—	—	—	—
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
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.07	0.06	0.06	0.67	0.00	0.00	0.14	0.14	0.00	0.03	0.03	—	144	144	< 0.005	0.01	0.02	146
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	0.51	0.10	6.78	3.07	0.03	0.09	1.27	1.36	0.06	0.35	0.41	—	4,988	4,988	0.41	0.80	0.28	5,238
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.02	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	3.99	3.99	< 0.005	< 0.005	0.01	4.05
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	0.01	< 0.005	0.18	0.08	< 0.005	< 0.005	0.03	0.04	< 0.005	0.01	0.01	—	137	137	0.01	0.02	0.13	144
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.66	0.66	< 0.005	< 0.005	< 0.005	0.67
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	0.02	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	22.6	22.6	< 0.005	< 0.005	0.02	23.8

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)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	4.19	3.52	34.3	30.2	0.06	1.45	—	1.45	1.33	—	1.33	—	6,598	6,598	0.27	0.05	—	6,621
Dust From Material Movement	—	—	—	—	—	—	3.59	3.59	—	1.42	1.42	—	—	—	—	—	—	—
Demolition	—	—	—	—	—	—	1.30	1.30	—	0.20	0.20	—	—	—	—	—	—	—
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	0.34	0.29	2.82	2.48	0.01	0.12	—	0.12	0.11	—	0.11	—	542	542	0.02	< 0.005	—	544
Dust From Material Movement	—	—	—	—	—	—	0.30	0.30	—	0.12	0.12	—	—	—	—	—	—	—
Demolition	—	—	—	—	—	—	0.11	0.11	—	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
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.06	0.05	0.51	0.45	< 0.005	0.02	—	0.02	0.02	—	0.02	—	89.8	89.8	< 0.005	< 0.005	—	90.1

Dust From Material Movement	—	—	—	—	—	—	0.05	0.05	—	0.02	0.02	—	—	—	—	—	—	—
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
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.08	0.07	0.07	0.76	0.00	0.00	0.17	0.17	0.00	0.04	0.04	—	164	164	< 0.005	0.01	0.02	167
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	0.17	0.03	2.26	1.02	0.01	0.03	0.42	0.45	0.02	0.12	0.14	—	1,663	1,663	0.14	0.27	0.09	1,746
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.01	0.06	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	13.7	13.7	< 0.005	< 0.005	0.03	13.9
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	0.01	< 0.005	0.18	0.08	< 0.005	< 0.005	0.03	0.04	< 0.005	0.01	0.01	—	137	137	0.01	0.02	0.13	144
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	2.26	2.26	< 0.005	< 0.005	< 0.005	2.30
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	0.02	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	22.6	22.6	< 0.005	< 0.005	0.02	23.8

3.6. Grading (2024) - Mitigated

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)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	4.19	3.52	34.3	30.2	0.06	1.45	—	1.45	1.33	—	1.33	—	6,598	6,598	0.27	0.05	—	6,621
Dust From Material Movement	—	—	—	—	—	—	3.59	3.59	—	1.42	1.42	—	—	—	—	—	—	—
Demolition	—	—	—	—	—	—	1.30	1.30	—	0.20	0.20	—	—	—	—	—	—	—
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	0.34	0.29	2.82	2.48	0.01	0.12	—	0.12	0.11	—	0.11	—	542	542	0.02	< 0.005	—	544
Dust From Material Movement	—	—	—	—	—	—	0.30	0.30	—	0.12	0.12	—	—	—	—	—	—	—
Demolition	—	—	—	—	—	—	0.11	0.11	—	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
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.06	0.05	0.51	0.45	< 0.005	0.02	—	0.02	0.02	—	0.02	—	89.8	89.8	< 0.005	< 0.005	—	90.1

Dust From Material Movement	—	—	—	—	—	—	0.05	0.05	—	0.02	0.02	—	—	—	—	—	—	—
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
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.08	0.07	0.07	0.76	0.00	0.00	0.17	0.17	0.00	0.04	0.04	—	164	164	< 0.005	0.01	0.02	167
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	0.17	0.03	2.26	1.02	0.01	0.03	0.42	0.45	0.02	0.12	0.14	—	1,663	1,663	0.14	0.27	0.09	1,746
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.01	0.06	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	13.7	13.7	< 0.005	< 0.005	0.03	13.9
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	0.01	< 0.005	0.18	0.08	< 0.005	< 0.005	0.03	0.04	< 0.005	0.01	0.01	—	137	137	0.01	0.02	0.13	144
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	2.26	2.26	< 0.005	< 0.005	< 0.005	2.30
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	0.02	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	22.6	22.6	< 0.005	< 0.005	0.02	23.8

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	0.78	0.66	6.13	7.16	0.01	0.27	—	0.27	0.25	—	0.25	—	1,309	1,309	0.05	0.01	—	1,314
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	0.14	0.12	1.12	1.31	< 0.005	0.05	—	0.05	0.05	—	0.05	—	217	217	0.01	< 0.005	—	217
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	1.03	0.94	0.69	11.2	0.00	0.00	2.06	2.06	0.00	0.48	0.48	—	2,243	2,243	0.04	0.08	9.48	2,278
Vendor	0.27	0.10	3.66	1.75	0.02	0.04	0.69	0.72	0.04	0.19	0.23	—	2,669	2,669	0.14	0.40	7.01	2,797
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	0.98	0.89	0.86	9.51	0.00	0.00	2.06	2.06	0.00	0.48	0.48	—	2,052	2,052	0.06	0.09	0.25	2,079
Vendor	0.26	0.09	3.86	1.78	0.02	0.04	0.69	0.72	0.04	0.19	0.23	—	2,670	2,670	0.14	0.40	0.18	2,792
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	0.53	0.48	0.42	5.06	0.00	0.00	1.13	1.13	0.00	0.26	0.26	—	1,132	1,132	0.03	0.05	2.24	1,149
Vendor	0.15	0.05	2.07	0.97	0.01	0.02	0.37	0.39	0.02	0.10	0.12	—	1,457	1,457	0.08	0.22	1.65	1,525
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	0.10	0.09	0.08	0.92	0.00	0.00	0.21	0.21	0.00	0.05	0.05	—	187	187	< 0.005	0.01	0.37	190
Vendor	0.03	0.01	0.38	0.18	< 0.005	< 0.005	0.07	0.07	< 0.005	0.02	0.02	—	241	241	0.01	0.04	0.27	253
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

3.8. Building Construction (2024) - Mitigated

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	0.78	0.66	6.13	7.16	0.01	0.27	—	0.27	0.25	—	0.25	—	1,309	1,309	0.05	0.01	—	1,314
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	0.14	0.12	1.12	1.31	< 0.005	0.05	—	0.05	0.05	—	0.05	—	217	217	0.01	< 0.005	—	217
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	1.03	0.94	0.69	11.2	0.00	0.00	2.06	2.06	0.00	0.48	0.48	—	2,243	2,243	0.04	0.08	9.48	2,278
Vendor	0.27	0.10	3.66	1.75	0.02	0.04	0.69	0.72	0.04	0.19	0.23	—	2,669	2,669	0.14	0.40	7.01	2,797
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	0.98	0.89	0.86	9.51	0.00	0.00	2.06	2.06	0.00	0.48	0.48	—	2,052	2,052	0.06	0.09	0.25	2,079
Vendor	0.26	0.09	3.86	1.78	0.02	0.04	0.69	0.72	0.04	0.19	0.23	—	2,670	2,670	0.14	0.40	0.18	2,792
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	0.53	0.48	0.42	5.06	0.00	0.00	1.13	1.13	0.00	0.26	0.26	—	1,132	1,132	0.03	0.05	2.24	1,149
Vendor	0.15	0.05	2.07	0.97	0.01	0.02	0.37	0.39	0.02	0.10	0.12	—	1,457	1,457	0.08	0.22	1.65	1,525

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	0.10	0.09	0.08	0.92	0.00	0.00	0.21	0.21	0.00	0.05	0.05	—	187	187	< 0.005	0.01	0.37	190
Vendor	0.03	0.01	0.38	0.18	< 0.005	< 0.005	0.07	0.07	< 0.005	0.02	0.02	—	241	241	0.01	0.04	0.27	253
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	0.37	0.31	2.90	3.62	0.01	0.12	—	0.12	0.11	—	0.11	—	666	666	0.03	0.01	—	669
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	0.07	0.06	0.53	0.66	< 0.005	0.02	—	0.02	0.02	—	0.02	—	110	110	< 0.005	< 0.005	—	111
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	0.92	0.90	0.61	10.5	0.00	0.00	2.06	2.06	0.00	0.48	0.48	—	2,199	2,199	0.04	0.08	8.71	2,233
Vendor	0.25	0.10	3.48	1.67	0.02	0.04	0.69	0.72	0.04	0.19	0.23	—	2,626	2,626	0.14	0.38	6.96	2,749
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	0.87	0.84	0.78	8.87	0.00	0.00	2.06	2.06	0.00	0.48	0.48	—	2,012	2,012	0.06	0.09	0.23	2,039
Vendor	0.24	0.09	3.67	1.72	0.02	0.04	0.69	0.72	0.04	0.19	0.23	—	2,628	2,628	0.14	0.38	0.18	2,744
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	0.24	0.23	0.19	2.41	0.00	0.00	0.57	0.57	0.00	0.13	0.13	—	565	565	0.01	0.02	1.05	574
Vendor	0.07	0.03	1.00	0.47	0.01	0.01	0.19	0.20	0.01	0.05	0.06	—	730	730	0.04	0.10	0.84	763
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	0.04	0.04	0.04	0.44	0.00	0.00	0.10	0.10	0.00	0.02	0.02	—	93.6	93.6	< 0.005	< 0.005	0.17	95.0
Vendor	0.01	< 0.005	0.18	0.09	< 0.005	< 0.005	0.03	0.04	< 0.005	0.01	0.01	—	121	121	0.01	0.02	0.14	126
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

3.10. Building Construction (2025) - Mitigated

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	0.37	0.31	2.90	3.62	0.01	0.12	—	0.12	0.11	—	0.11	—	666	666	0.03	0.01	—	669
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	0.07	0.06	0.53	0.66	< 0.005	0.02	—	0.02	0.02	—	0.02	—	110	110	< 0.005	< 0.005	—	111
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	0.92	0.90	0.61	10.5	0.00	0.00	2.06	2.06	0.00	0.48	0.48	—	2,199	2,199	0.04	0.08	8.71	2,233
Vendor	0.25	0.10	3.48	1.67	0.02	0.04	0.69	0.72	0.04	0.19	0.23	—	2,626	2,626	0.14	0.38	6.96	2,749
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	0.87	0.84	0.78	8.87	0.00	0.00	2.06	2.06	0.00	0.48	0.48	—	2,012	2,012	0.06	0.09	0.23	2,039
Vendor	0.24	0.09	3.67	1.72	0.02	0.04	0.69	0.72	0.04	0.19	0.23	—	2,628	2,628	0.14	0.38	0.18	2,744
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	0.24	0.23	0.19	2.41	0.00	0.00	0.57	0.57	0.00	0.13	0.13	—	565	565	0.01	0.02	1.05	574
Vendor	0.07	0.03	1.00	0.47	0.01	0.01	0.19	0.20	0.01	0.05	0.06	—	730	730	0.04	0.10	0.84	763
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	0.04	0.04	0.04	0.44	0.00	0.00	0.10	0.10	0.00	0.02	0.02	—	93.6	93.6	< 0.005	< 0.005	0.17	95.0
Vendor	0.01	< 0.005	0.18	0.09	< 0.005	< 0.005	0.03	0.04	< 0.005	0.01	0.01	—	121	121	0.01	0.02	0.14	126
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	—	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
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	—	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
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	—	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
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	0.06	0.05	0.04	0.63	0.00	0.00	0.12	0.12	0.00	0.03	0.03	—	132	132	< 0.005	< 0.005	0.52	134
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	—	6.70	6.70	< 0.005	< 0.005	0.01	6.80
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	—	1.11	1.11	< 0.005	< 0.005	< 0.005	1.13
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

3.12. Paving (2025) - Mitigated

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	—	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
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	—	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
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	—	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

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	0.06	0.05	0.04	0.63	0.00	0.00	0.12	0.12	0.00	0.03	0.03	—	132	132	< 0.005	< 0.005	0.52	134
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	—	6.70	6.70	< 0.005	< 0.005	0.01	6.80
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	—	1.11	1.11	< 0.005	< 0.005	< 0.005	1.13
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
Architectural Coatings	—	310	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
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
Architectural Coatings	—	17.0	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
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
Architectural Coatings	—	3.10	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
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	0.18	0.18	0.12	2.09	0.00	0.00	0.41	0.41	0.00	0.10	0.10	—	440	440	0.01	0.02	1.74	447
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	0.01	0.01	0.01	0.09	0.00	0.00	0.02	0.02	0.00	0.01	0.01	—	22.3	22.3	< 0.005	< 0.005	0.04	22.6
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	0.02	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	3.69	3.69	< 0.005	< 0.005	0.01	3.75
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

3.14. Architectural Coating (2025) - Mitigated

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
Architectural Coatings	—	310	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
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
Architectural Coatings	—	17.0	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
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
Architectural Coatings	—	3.10	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
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	0.18	0.18	0.12	2.09	0.00	0.00	0.41	0.41	0.00	0.10	0.10	—	440	440	0.01	0.02	1.74	447
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	0.01	0.01	0.01	0.09	0.00	0.00	0.02	0.02	0.00	0.01	0.01	—	22.3	22.3	< 0.005	< 0.005	0.04	22.6
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	0.02	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	3.69	3.69	< 0.005	< 0.005	0.01	3.75

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
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Industrial Park	7.83	7.31	4.97	53.2	0.12	0.08	10.9	11.0	0.08	2.77	2.85	—	12,399	12,399	0.54	0.50	43.9	12,606
Total	7.83	7.31	4.97	53.2	0.12	0.08	10.9	11.0	0.08	2.77	2.85	—	12,399	12,399	0.54	0.50	43.9	12,606
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Industrial Park	7.41	6.86	5.86	50.3	0.11	0.08	10.9	11.0	0.08	2.77	2.85	—	11,559	11,559	0.63	0.56	1.14	11,741
Total	7.41	6.86	5.86	50.3	0.11	0.08	10.9	11.0	0.08	2.77	2.85	—	11,559	11,559	0.63	0.56	1.14	11,741
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Industrial Park	1.17	1.08	0.88	7.69	0.02	0.01	1.74	1.76	0.01	0.44	0.45	—	1,687	1,687	0.09	0.08	2.75	1,715
Total	1.17	1.08	0.88	7.69	0.02	0.01	1.74	1.76	0.01	0.44	0.45	—	1,687	1,687	0.09	0.08	2.75	1,715

4.1.2. Mitigated

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)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Industrial Park	7.83	7.31	4.97	53.2	0.12	0.08	10.9	11.0	0.08	2.77	2.85	—	12,399	12,399	0.54	0.50	43.9	12,606
Total	7.83	7.31	4.97	53.2	0.12	0.08	10.9	11.0	0.08	2.77	2.85	—	12,399	12,399	0.54	0.50	43.9	12,606
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Industrial Park	7.41	6.86	5.86	50.3	0.11	0.08	10.9	11.0	0.08	2.77	2.85	—	11,559	11,559	0.63	0.56	1.14	11,741
Total	7.41	6.86	5.86	50.3	0.11	0.08	10.9	11.0	0.08	2.77	2.85	—	11,559	11,559	0.63	0.56	1.14	11,741
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Industrial Park	1.17	1.08	0.88	7.69	0.02	0.01	1.74	1.76	0.01	0.44	0.45	—	1,687	1,687	0.09	0.08	2.75	1,715
Total	1.17	1.08	0.88	7.69	0.02	0.01	1.74	1.76	0.01	0.44	0.45	—	1,687	1,687	0.09	0.08	2.75	1,715

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)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Industrial Park	—	—	—	—	—	—	—	—	—	—	—	—	48,251	48,251	8.47	1.03	—	48,769
Total	—	—	—	—	—	—	—	—	—	—	—	—	48,251	48,251	8.47	1.03	—	48,769

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Industrial Park	—	—	—	—	—	—	—	—	—	—	—	—	48,251	48,251	8.47	1.03	—	48,769
Total	—	—	—	—	—	—	—	—	—	—	—	—	48,251	48,251	8.47	1.03	—	48,769
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Industrial Park	—	—	—	—	—	—	—	—	—	—	—	—	7,989	7,989	1.40	0.17	—	8,074
Total	—	—	—	—	—	—	—	—	—	—	—	—	7,989	7,989	1.40	0.17	—	8,074

4.2.2. Electricity Emissions By Land Use - Mitigated

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)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Industrial Park	—	—	—	—	—	—	—	—	—	—	—	—	48,251	48,251	8.47	1.03	—	48,769
Total	—	—	—	—	—	—	—	—	—	—	—	—	48,251	48,251	8.47	1.03	—	48,769
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Industrial Park	—	—	—	—	—	—	—	—	—	—	—	—	48,251	48,251	8.47	1.03	—	48,769
Total	—	—	—	—	—	—	—	—	—	—	—	—	48,251	48,251	8.47	1.03	—	48,769
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Industrial Park	—	—	—	—	—	—	—	—	—	—	—	—	7,989	7,989	1.40	0.17	—	8,074
Total	—	—	—	—	—	—	—	—	—	—	—	—	7,989	7,989	1.40	0.17	—	8,074

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)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Industrial Park	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.24	0.24	< 0.005	< 0.005	—	0.24
Total	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.24	0.24	< 0.005	< 0.005	—	0.24
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Industrial Park	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.24	0.24	< 0.005	< 0.005	—	0.24
Total	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.24	0.24	< 0.005	< 0.005	—	0.24
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Industrial Park	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.04	0.04	< 0.005	< 0.005	—	0.04
Total	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.04	0.04	< 0.005	< 0.005	—	0.04

4.2.4. Natural Gas Emissions By Land Use - Mitigated

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)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Industrial Park	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.24	0.24	< 0.005	< 0.005	—	0.24
Total	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.24	0.24	< 0.005	< 0.005	—	0.24

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Industrial Park	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.24	0.24	< 0.005	< 0.005	—	0.24
Total	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.24	0.24	< 0.005	< 0.005	—	0.24
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Industrial Park	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.04	0.04	< 0.005	< 0.005	—	0.04
Total	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.04	0.04	< 0.005	< 0.005	—	0.04

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)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	—	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	—	1.70	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	1.70	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	—	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Architectural	—	1.70	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	1.70	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	—	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	—	0.31	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	0.31	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.3.2. Mitigated

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)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	—	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	—	1.70	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	1.70	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	—	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	—	1.70	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Total	—	1.70	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	—	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	—	0.31	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	0.31	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

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)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Industrial Park	—	—	—	—	—	—	—	—	—	—	—	287	500	788	29.6	0.71	—	1,739
Total	—	—	—	—	—	—	—	—	—	—	—	287	500	788	29.6	0.71	—	1,739
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Industrial Park	—	—	—	—	—	—	—	—	—	—	—	287	500	788	29.6	0.71	—	1,739
Total	—	—	—	—	—	—	—	—	—	—	—	287	500	788	29.6	0.71	—	1,739
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Industrial Park	—	—	—	—	—	—	—	—	—	—	—	47.6	82.8	130	4.89	0.12	—	288
Total	—	—	—	—	—	—	—	—	—	—	—	47.6	82.8	130	4.89	0.12	—	288

4.4.2. Mitigated

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)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Industrial Park	—	—	—	—	—	—	—	—	—	—	—	287	500	788	29.6	0.71	—	1,739
Total	—	—	—	—	—	—	—	—	—	—	—	287	500	788	29.6	0.71	—	1,739
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Industrial Park	—	—	—	—	—	—	—	—	—	—	—	287	500	788	29.6	0.71	—	1,739
Total	—	—	—	—	—	—	—	—	—	—	—	287	500	788	29.6	0.71	—	1,739
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Industrial Park	—	—	—	—	—	—	—	—	—	—	—	47.6	82.8	130	4.89	0.12	—	288
Total	—	—	—	—	—	—	—	—	—	—	—	47.6	82.8	130	4.89	0.12	—	288

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)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Industrial Park	—	—	—	—	—	—	—	—	—	—	—	397	0.00	397	39.7	0.00	—	1,389
Total	—	—	—	—	—	—	—	—	—	—	—	397	0.00	397	39.7	0.00	—	1,389
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Industrial Park	—	—	—	—	—	—	—	—	—	—	—	397	0.00	397	39.7	0.00	—	1,389
Total	—	—	—	—	—	—	—	—	—	—	—	397	0.00	397	39.7	0.00	—	1,389
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Industrial Park	—	—	—	—	—	—	—	—	—	—	—	65.7	0.00	65.7	6.57	0.00	—	230
Total	—	—	—	—	—	—	—	—	—	—	—	65.7	0.00	65.7	6.57	0.00	—	230

4.5.2. Mitigated

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)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Industrial Park	—	—	—	—	—	—	—	—	—	—	—	397	0.00	397	39.7	0.00	—	1,389
Total	—	—	—	—	—	—	—	—	—	—	—	397	0.00	397	39.7	0.00	—	1,389
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Industrial Park	—	—	—	—	—	—	—	—	—	—	—	397	0.00	397	39.7	0.00	—	1,389
Total	—	—	—	—	—	—	—	—	—	—	—	397	0.00	397	39.7	0.00	—	1,389
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Industrial Park	—	—	—	—	—	—	—	—	—	—	—	65.7	0.00	65.7	6.57	0.00	—	230
Total	—	—	—	—	—	—	—	—	—	—	—	65.7	0.00	65.7	6.57	0.00	—	230

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)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Industrial Park	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	155	155
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	155	155
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Industrial Park	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	155	155
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	155	155
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Industrial Park	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	25.6	25.6
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	25.6	25.6

4.6.2. Mitigated

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)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Industrial Park	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	155	155
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	155	155
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Industrial Park	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	155	155
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	155	155
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Industrial Park	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	25.6	25.6
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	25.6	25.6

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)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Tractors/ Loaders/ Backhoes	1.01	1.01	5.25	74.7	0.10	0.20	—	0.20	0.20	—	0.20	—	10,694	10,694	0.43	0.09	—	10,731
Total	1.01	1.01	5.25	74.7	0.10	0.20	—	0.20	0.20	—	0.20	—	10,694	10,694	0.43	0.09	—	10,731

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Tractors/ Loaders/ Backhoes	1.01	1.01	5.25	74.7	0.10	0.20	—	0.20	0.20	—	0.20	—	10,694	10,694	0.43	0.09	—	10,731
Total	1.01	1.01	5.25	74.7	0.10	0.20	—	0.20	0.20	—	0.20	—	10,694	10,694	0.43	0.09	—	10,731
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Tractors/ Loaders/ Backhoes	0.17	0.17	0.89	12.7	0.02	0.03	—	0.03	0.03	—	0.03	—	1,649	1,649	0.07	0.01	—	1,655
Total	0.17	0.17	0.89	12.7	0.02	0.03	—	0.03	0.03	—	0.03	—	1,649	1,649	0.07	0.01	—	1,655

4.7.2. Mitigated

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)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Tractors/ Loaders/ Backhoes	1.01	1.01	5.25	74.7	0.10	0.20	—	0.20	0.20	—	0.20	—	10,694	10,694	0.43	0.09	—	10,731
Total	1.01	1.01	5.25	74.7	0.10	0.20	—	0.20	0.20	—	0.20	—	10,694	10,694	0.43	0.09	—	10,731
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Tractors/ Loaders/ Backhoes	1.01	1.01	5.25	74.7	0.10	0.20	—	0.20	0.20	—	0.20	—	10,694	10,694	0.43	0.09	—	10,731

Total	1.01	1.01	5.25	74.7	0.10	0.20	—	0.20	0.20	—	0.20	—	10,694	10,694	0.43	0.09	—	10,731
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Tractors/ Loaders/ Backhoes	0.17	0.17	0.89	12.7	0.02	0.03	—	0.03	0.03	—	0.03	—	1,649	1,649	0.07	0.01	—	1,655
Total	0.17	0.17	0.89	12.7	0.02	0.03	—	0.03	0.03	—	0.03	—	1,649	1,649	0.07	0.01	—	1,655

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	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.8.2. Mitigated

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	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.9.2. Mitigated

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

Equipme 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	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.4. Soil Carbon Accumulation By Vegetation Type - Mitigated

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	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.5. Above and Belowground Carbon Accumulation by Land Use Type - Mitigated

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	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.6. Avoided and Sequestered Emissions by Species - Mitigated

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	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Sequest	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
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	1/1/2024	1/29/2024	5.00	20.0	—
Site Preparation	Site Preparation	1/30/2024	2/13/2024	5.00	10.0	—
Grading	Grading	2/14/2024	3/27/2024	5.00	30.0	—
Building Construction	Building Construction	3/28/2024	5/22/2025	5.00	300	—
Paving	Paving	5/23/2025	6/20/2025	5.00	20.0	—
Architectural Coating	Architectural Coating	6/21/2025	7/19/2025	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	Rubber Tired Dozers	Diesel	Average	2.00	8.00	367	0.40
Demolition	Excavators	Diesel	Average	3.00	8.00	36.0	0.38
Demolition	Concrete/Industrial Saws	Diesel	Average	1.00	8.00	33.0	0.73
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	Graders	Diesel	Average	1.00	8.00	148	0.41
Grading	Excavators	Diesel	Average	2.00	8.00	36.0	0.38
Grading	Tractors/Loaders/Backhoes	Diesel	Average	2.00	8.00	84.0	0.37
Grading	Scrapers	Diesel	Average	2.00	8.00	423	0.48
Grading	Rubber Tired Dozers	Diesel	Average	1.00	8.00	367	0.40

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	Cranes	Diesel	Average	1.00	7.00	367	0.29
Building Construction	Welders	Diesel	Average	1.00	8.00	46.0	0.45
Building Construction	Tractors/Loaders/Backhoes	Diesel	Average	3.00	7.00	84.0	0.37
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

5.2.2. Mitigated

Phase Name	Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor
Demolition	Rubber Tired Dozers	Diesel	Average	2.00	8.00	367	0.40
Demolition	Excavators	Diesel	Average	3.00	8.00	36.0	0.38
Demolition	Concrete/Industrial Saws	Diesel	Average	1.00	8.00	33.0	0.73
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	Graders	Diesel	Average	1.00	8.00	148	0.41
Grading	Excavators	Diesel	Average	2.00	8.00	36.0	0.38
Grading	Tractors/Loaders/Backhoes	Diesel	Average	2.00	8.00	84.0	0.37
Grading	Scrapers	Diesel	Average	2.00	8.00	423	0.48
Grading	Rubber Tired Dozers	Diesel	Average	1.00	8.00	367	0.40
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	Cranes	Diesel	Average	1.00	7.00	367	0.29

Building Construction	Welders	Diesel	Average	1.00	8.00	46.0	0.45
Building Construction	Tractors/Loaders/Backhoes	Diesel	Average	3.00	7.00	84.0	0.37
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	11.7	LDA,LDT1,LDT2
Demolition	Vendor	—	8.40	HHDT,MHDT
Demolition	Hauling	93.8	20.0	HHDT
Demolition	Onsite truck	—	—	HHDT
Site Preparation	—	—	—	—
Site Preparation	Worker	17.5	11.7	LDA,LDT1,LDT2
Site Preparation	Vendor	—	8.40	HHDT,MHDT
Site Preparation	Hauling	68.4	20.0	HHDT
Site Preparation	Onsite truck	—	—	HHDT
Grading	—	—	—	—
Grading	Worker	20.0	11.7	LDA,LDT1,LDT2
Grading	Vendor	—	8.40	HHDT,MHDT
Grading	Hauling	22.8	20.0	HHDT
Grading	Onsite truck	—	—	HHDT
Building Construction	—	—	—	—

Building Construction	Worker	249	11.7	LDA,LDT1,LDT2
Building Construction	Vendor	97.4	8.40	HHDT,MHDT
Building Construction	Hauling	0.00	20.0	HHDT
Building Construction	Onsite truck	—	—	HHDT
Paving	—	—	—	—
Paving	Worker	15.0	11.7	LDA,LDT1,LDT2
Paving	Vendor	—	8.40	HHDT,MHDT
Paving	Hauling	0.00	20.0	HHDT
Paving	Onsite truck	—	—	HHDT
Architectural Coating	—	—	—	—
Architectural Coating	Worker	49.9	11.7	LDA,LDT1,LDT2
Architectural Coating	Vendor	—	8.40	HHDT,MHDT
Architectural Coating	Hauling	0.00	20.0	HHDT
Architectural Coating	Onsite truck	—	—	HHDT

5.3.2. Mitigated

Phase Name	Trip Type	One-Way Trips per Day	Miles per Trip	Vehicle Mix
Demolition	—	—	—	—
Demolition	Worker	15.0	11.7	LDA,LDT1,LDT2
Demolition	Vendor	—	8.40	HHDT,MHDT
Demolition	Hauling	93.8	20.0	HHDT
Demolition	Onsite truck	—	—	HHDT
Site Preparation	—	—	—	—
Site Preparation	Worker	17.5	11.7	LDA,LDT1,LDT2
Site Preparation	Vendor	—	8.40	HHDT,MHDT
Site Preparation	Hauling	68.4	20.0	HHDT
Site Preparation	Onsite truck	—	—	HHDT

Grading	—	—	—	—
Grading	Worker	20.0	11.7	LDA,LDT1,LDT2
Grading	Vendor	—	8.40	HHDT,MHDT
Grading	Hauling	22.8	20.0	HHDT
Grading	Onsite truck	—	—	HHDT
Building Construction	—	—	—	—
Building Construction	Worker	249	11.7	LDA,LDT1,LDT2
Building Construction	Vendor	97.4	8.40	HHDT,MHDT
Building Construction	Hauling	0.00	20.0	HHDT
Building Construction	Onsite truck	—	—	HHDT
Paving	—	—	—	—
Paving	Worker	15.0	11.7	LDA,LDT1,LDT2
Paving	Vendor	—	8.40	HHDT,MHDT
Paving	Hauling	0.00	20.0	HHDT
Paving	Onsite truck	—	—	HHDT
Architectural Coating	—	—	—	—
Architectural Coating	Worker	49.9	11.7	LDA,LDT1,LDT2
Architectural Coating	Vendor	—	8.40	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

Non-applicable. No control strategies activated by user.

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	0.00	0.00	891,000	297,000	—

5.6. Dust Mitigation

5.6.1. Construction Earthmoving Activities

Phase Name	Material Imported (cy)	Material Exported (cy)	Acres Graded (acres)	Material Demolished (Building Square Footage)	Acres Paved (acres)
Demolition	0.00	0.00	0.00	163,000	—
Site Preparation	—	—	13.6	59,400	—
Grading	—	—	13.6	59,400	—
Paving	0.00	0.00	0.00	0.00	0.00

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
Industrial Park	0.00	0%

5.8. Construction Electricity Consumption and Emissions Factors

kWh per Year and Emission Factor (lb/MWh)

Year	kWh per Year	CO2	CH4	N2O
2024	170	188	0.03	< 0.005

2025	510	188	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
Industrial Park	2,002	1,509	737	638,970	15,487	11,673	5,699	4,943,553

5.9.2. Mitigated

Land Use Type	Trips/Weekday	Trips/Saturday	Trips/Sunday	Trips/Year	VMT/Weekday	VMT/Saturday	VMT/Sunday	VMT/Year
Industrial Park	2,002	1,509	737	638,970	15,487	11,673	5,699	4,943,553

5.10. Operational Area Sources

5.10.1. Hearths

5.10.1.1. Unmitigated

5.10.1.2. Mitigated

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)
0	0.00	891,000	297,000	—

5.10.3. Landscape Equipment

Equipment Type	Fuel Type	Number Per Day	Hours per Day	Hours per Year	Horsepower	Load Factor

5.10.4. Landscape Equipment - Mitigated

Equipment Type	Fuel Type	Number Per Day	Hours per Day	Hours per Year	Horsepower	Load Factor

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)
Industrial Park	93,688,000	188	0.0330	0.0040	747

5.11.2. Mitigated

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)
Industrial Park	93,688,000	188	0.0330	0.0040	747

5.12. Operational Water and Wastewater Consumption

5.12.1. Unmitigated

Land Use	Indoor Water (gal/year)	Outdoor Water (gal/year)
Industrial Park	150,000,000	0.00

5.12.2. Mitigated

Land Use	Indoor Water (gal/year)	Outdoor Water (gal/year)
Industrial Park	150,000,000	0.00

5.13. Operational Waste Generation

5.13.1. Unmitigated

Land Use	Waste (ton/year)	Cogeneration (kWh/year)
Industrial Park	737	—

5.13.2. Mitigated

Land Use	Waste (ton/year)	Cogeneration (kWh/year)
Industrial Park	737	—

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
Industrial Park	Other commercial A/C and heat pumps	R-410A	2,088	0.30	4.00	4.00	18.0

5.14.2. Mitigated

Land Use Type	Equipment Type	Refrigerant	GWP	Quantity (kg)	Operations Leak Rate	Service Leak Rate	Times Serviced
Industrial Park	Other commercial A/C and heat pumps	R-410A	2,088	0.30	4.00	4.00	18.0

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
Tractors/Loaders/Backhoes	Diesel	Tier 4 Final	55.0	6.00	75.0	0.37

5.15.2. Mitigated

Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor
Tractors/Loaders/Backhoes	Diesel	Tier 4 Final	55.0	6.00	75.0	0.37

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

5.18.1.2. Mitigated

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

5.18.1.2. Mitigated

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)

5.18.2.2. Mitigated

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	18.8	annual days of extreme heat
Extreme Precipitation	2.20	annual days with precipitation above 20 mm
Sea Level Rise	—	meters of inundation depth
Wildfire	0.00	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	1	0	2	1
Sea Level Rise	1	0	2	1
Wildfire	1	0	2	1
Flooding	N/A	N/A	N/A	N/A
Drought	N/A	N/A	N/A	N/A
Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	0	0	2	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	1	1	2	1
Sea Level Rise	1	1	2	1

Wildfire	1	1	2	1
Flooding	N/A	N/A	N/A	N/A
Drought	N/A	N/A	N/A	N/A
Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	1	1	2	1

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	37.6
AQ-PM	30.7
AQ-DPM	55.5
Drinking Water	19.0
Lead Risk Housing	34.5
Pesticides	0.00
Toxic Releases	70.5
Traffic	15.7
Effect Indicators	—
CleanUp Sites	98.9

Groundwater	91.6
Haz Waste Facilities/Generators	99.5
Impaired Water Bodies	98.7
Solid Waste	88.9
Sensitive Population	—
Asthma	93.2
Cardio-vascular	72.2
Low Birth Weights	93.5
Socioeconomic Factor Indicators	—
Education	40.1
Housing	44.5
Linguistic	10.4
Poverty	54.8
Unemployment	94.3

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	61.92737072
Employed	28.26895932
Median HI	59.96407032
Education	—
Bachelor's or higher	44.02669062
High school enrollment	26.62645964
Preschool enrollment	89.60605672
Transportation	—

Auto Access	59.70742974
Active commuting	70.52482998
Social	—
2-parent households	8.674451431
Voting	68.98498653
Neighborhood	—
Alcohol availability	38.56024637
Park access	81.35506224
Retail density	17.37456692
Supermarket access	73.05273964
Tree canopy	50.69934557
Housing	—
Homeownership	53.70204029
Housing habitability	43.8855383
Low-inc homeowner severe housing cost burden	32.01591172
Low-inc renter severe housing cost burden	18.72192994
Uncrowded housing	45.96432696
Health Outcomes	—
Insured adults	52.48299756
Arthritis	0.0
Asthma ER Admissions	1.2
High Blood Pressure	0.0
Cancer (excluding skin)	0.0
Asthma	0.0
Coronary Heart Disease	0.0
Chronic Obstructive Pulmonary Disease	0.0
Diagnosed Diabetes	0.0

Life Expectancy at Birth	25.8
Cognitively Disabled	38.1
Physically Disabled	17.3
Heart Attack ER Admissions	3.0
Mental Health Not Good	0.0
Chronic Kidney Disease	0.0
Obesity	0.0
Pedestrian Injuries	19.6
Physical Health Not Good	0.0
Stroke	0.0
Health Risk Behaviors	—
Binge Drinking	0.0
Current Smoker	0.0
No Leisure Time for Physical Activity	0.0
Climate Change Exposures	—
Wildfire Risk	0.0
SLR Inundation Area	30.7
Children	20.9
Elderly	49.5
English Speaking	84.5
Foreign-born	38.5
Outdoor Workers	81.9
Climate Change Adaptive Capacity	—
Impervious Surface Cover	30.0
Traffic Density	11.7
Traffic Access	23.0
Other Indices	—

Hardship	49.9
Other Decision Support	—
2016 Voting	29.6

7.3. Overall Health & Equity Scores

Metric	Result for Project Census Tract
CalEnviroScreen 4.0 Score for Project Location (a)	83.0
Healthy Places Index Score for Project Location (b)	59.0
Project Located in a Designated Disadvantaged Community (Senate Bill 535)	Yes
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

Construction: Off-Road Equipment	demolition default equipment used Site prep equipment is month 0 in excel file provided by HCycle grading equipment is month 1 in excel file provided by H Cycle building construction equipment is max # of equipment in months 2-13 in excel file provided by H Cycle paving equipment is CalEEMod default and month 14 in excel file from H Cycle architectural coating is CalEEMod default equipment and month 15 in excel file from H Cycle H Cycle excel file has Heavy Duty and Light Duty Trucks - all are input as Off-Highway Trucks in CalEEMod
Construction: Dust From Material Movement	Adjustment
Construction: On-Road Fugitive Dust	BAAQMD Basic BMP - 15 mph unpaved travel speed
Operations: Off-Road Equipment	Provided by site.
Operations: Consumer Products	Per discussion
Operations: Energy Use	Electricity provided by site. Natural gas calculated based on operations units that combust natural gas.
Operations: Water and Waste Water	Provided by site.
Construction: Demolition	10% of site square footage for grading and site prep
Operations: Fleet Mix	Per provided info

H Cycle Pittsburg
Renewable Hydrogen Project

Appendix B.2
Health Risk Assessment Methodology

January 2024

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B.2.1 INTRODUCTION

This appendix describes the methods and results of the health risk assessment (HRA) that was performed to evaluate potential public health effects from toxic air contaminant (TAC) emissions generated by construction and operation of the H Cycle Pittsburg Renewable Hydrogen Project. TACs are compounds designated by the California's Environmental Protection Agency's (Cal/EPA) Office of Health Hazard Assessment (OEHHA) as known or suspected to cause adverse health effects after short-term (acute) or long-term (chronic) exposure. In addition to naming certain chemicals as TACs, OEHHA also provides information that allows the prediction of health impacts associated with public potential exposure to TACs. This information is used in the HRA as described in this section to estimate the potential public health impacts resulting from TAC emissions from the project.

Concentrations of TAC emissions are calculated using air dispersion modeling. This computer modeling is a mathematical estimation of air pollutant impacts from emissions sources within a project study area. Information on factors that impact the fate and transport of pollutants in the atmosphere including meteorological conditions, site and emission release characteristics, and surrounding terrain features are used as inputs to the dispersion model. Once concentrations are calculated, health risks are calculated using information the volume of air people breathe and the toxicity of the chemical being evaluated. The resulting cancer risks, chronic HI, and acute HI are compared to the BAAQMD CEQA thresholds to assess significance.

B.2.2 OVERVIEW OF HEALTH RISK ASSESSMENT

An HRA is a three-step analytical process to assess potential risk to public health from exposure to environmental contaminants emitted from emission sources. The steps include:

- **Hazard Identification**: This involves identifying and quantifying TACs of concern that would be emitted from project construction and operations sources. A description of the emissions calculation methodology and estimates of TACs emissions from various stationary and mobile sources associated with the project's construction and operation are provided in Appendix 4.2, Emissions Calculations.

- **Exposure assessment**: Concentrations of TACs resulting from the transport and dilution of these emissions through the atmosphere are evaluated at locations of predicted exposure to "receptors" by air dispersion modeling, using an EPA-approved computer air dispersion model and local meteorological data.

- **Risk characterization:** Potential human doses of these TACs resulting from the atmospheric transport are calculated, using procedures developed by California Office of Environmental Health Hazard Assessment (OEHHA). Potential cancer and non-cancer health impacts resulting from the calculated doses are estimated using dose-response relationships developed from toxicological data.

The procedures used in this HRA are consistent with the BAAQMD Health Risk Assessment Modeling Protocol, December 2020, BAAQMD Air Toxics Control Programs Health Risk Assessment Guidelines, December 2021 and Appendix E of the BAAQMD 2022 CEQA Guidelines.

BAAQMD's Guidelines conform to the "Health Risk Assessment Guidelines" adopted by OEHHA for use in the Air Toxics Hot Spots Program. In addition, these guidelines are in accordance with the "Risk Management Guidance for Stationary Sources of Air Toxics" developed by the California Air Resources Board (CARB) and the California Air Pollution Control Officers Association (CAPCOA).

The following sections discuss the HRA hazard identification, exposure assessment, and risk characterization steps in more detail.

B.2.3 HAZARD IDENTIFICATION - QUANTIFICATION OF TAC EMISSIONS

Project emissions of CAPs, TACs, and GHGs were estimated using standard methods approved by CARB and the BAAQMD, and reference information provided by EPA. The results of these estimates are provided in Chapter 3.3 in this EIR. In addition, Appendix B.1, Emissions Calculations, provides details on the calculations methodology for estimating CAP, TAC, and GHG emissions.

B.2.4 EXPOSURE ASSESSMENT

Dispersion modeling was performed using the American Meteorological Society/ Environmental Protection Agency Regional Modeling System (AERMOD, Version 22112) developed by the American Meteorological Society/ Environmental Protection Agency Regulatory Model Improvement Committee (AERMIC). AERMOD incorporates air dispersion for both surface and elevated sources and for areas with either simple and/or complex terrain. In addition to the dispersion portion, the AERMOD modeling system includes two additional regulatory components: a meteorological data preprocessor (AERMET) and a terrain data preprocessor (AERMAP). The AERMOD dispersion model is used simulate the transport of emissions from multiple sources including point sources, area sources, and volume sources. The model requires specific inputs for each source type as discussed below.

Attachment 1 contains electronic input and output files from the dispersion modeling runs.

B.2.4.1 Control Options

The regulatory default option was used in AERMOD to estimate concentrations of TAC and $PM_{2.5}$. This provides a reasonably conservative estimate. The model was run for a 1- hour averaging period to calculate maximum 1-hour concentrations for assessing acute non-cancer health effects from TACs. The model was run for Period averaging period to calculate annual concentrations averaged

over the entire period of meteorological data set for assessing cancer risk and chronic non-cancer health effects from TACs.

For $PM_{2.5}$ analyses, an annual averaging period was used and meteorological data for each year was modeled separately to determine maximum of the highest annual average concentration for each year.

In accordance with the urban/rural land use determination procedures specified *in BAAQMD Health Risk Assessment Modeling Protocol, December 2020*, the land use within 3 km of the project site's centroid was determined to be rural percentage of urban land use was determined to be 40 percent). Therefore, rural dispersion coefficients were selected for modeling.

B.2.4.2 Source Options

Depending on the dispersion/release characteristics of the physical release point openings/locations, project emissions sources were modeled as point sources, volume sources, or area sources. Table B.2-1 summarizes the modeled types for all emissions sources and provides the release parameters for sources modeled as area or volume sources during the project's construction phase. For sources modeled as point sources, please refer to the model input file for release parameters. Table B.2-2 summarizes the modeled types for the emissions sources and provides release parameters for sources modeled as area or volume sources during project operation. For sources modeled as point sources, refer to the model input file for release parameters. Figures B.2-1 and B.2-2 show the on-site and off-site emissions sources modeled for the project's construction phase, respectively. Figures B.2-3 and B.2-4 show the on-site and off-site emissions sources modeled for the project's operation phase.

For TACs, AERMOD was run with a unit emission rate (1 grams per second [g/sec]) for all sources and/or source groups to calculate normalized air concentrations, χ/Q (micrograms per cubic meter [$\mu g/m^3$] per g/sec emissions) at each receptor point. For the $PM_{2.5}$ analysis, AERMOD was run with $PM_{2.5}$ emission rates in g/sec, which were estimated by dividing the annual emission rate of each source by its annual operating time.

Table B.2-1: Source Types and Parameters of Construction Phase Emissions Sources

Source Group	Source Description	Source Type	Length of the Side/ Plume Width, W (m)	Plume Height, H (m)	Release Height (m)	Initial Horizontal Dimension σ_y (m)	Initial Vertical Dimension σ_z (m)
ONSTRK	On-site heavy duty diesel truck travel	Line of 18 adjacent, surface-based volume sources	W = Total width of traffic lanes (6m) + 6 m for wake effect = 12m	6.8 (Table 11, Appendix E BAAQMD CEQA Guidelines)	H/2 = 3.4	W/2.15 = 5.58	H/2.15 = 3.16

Table B.2-1: Source Types and Parameters of Construction Phase Emissions Sources

Source Group	Source Description	Source Type	Length of the Side/ Plume Width, W (m)	Plume Height, H (m)	Release Height (m)	Initial Horizontal Dimension σ_y (m)	Initial Vertical Dimension σ_z (m)
ONSWRK	On-site worker gasoline car and light duty truck travel	Line of 18 adjacent, surface-based volume sources	W = Total width of traffic lanes (6m) + 6 m for wake effect = 12m	2.6 (Table 11, Appendix E BAAQMD CEQA Guidelines)	H/2 = 1.3	W/2.15 = 5.58	H/2.15 1.21
OFSTRK	Off-site heavy duty diesel truck travel	Line of 8 surface-based area sources of variable length over a total road length of 758.6m from the nearest freeway exit to the project site	W = Total width of traffic lanes (8m) + 6 m for wake effect = 14m	6.8 (Table 11, Appendix E BAAQMD CEQA Guidelines)	H/2 = 3.4	Not applicable (N/A)	H/2.15 = 3.16
OFSWRK	Off-site worker gasoline car and light duty truck travel	Line of 8 surface-based area sources of variable length over a total road length of 758.6m from the nearest freeway exit to the project site	W = Total width of traffic lanes (8m) + 6 m for wake effect = 14m	2.6 (Table 11, Appendix E BAAQMD CEQA Guidelines)	H/2 = 1.3	N/A	H/2.15 1.21
OFRDEQP	Heavy duty diesel off-road equipment operation	Line of 250 elevated volume sources, not on or adjacent to a building and separated by twice plume width, placed across the entire project site	W = Width of the equipment (1.5m) + 6 m for wake effect = 7.5m	5 (SCAQMD Localized Significance Threshold Methodology, July 2008)	H = 5	2W/2.15 = 6.98	H/4.3 = 1.16

Table B.2-1: Source Types and Parameters of Construction Phase Emissions Sources

Source Group	Source Description	Source Type	Length of the Side/ Plume Width, W (m)	Plume Height, H (m)	Release Height (m)	Initial Horizontal Dimension σ_y (m)	Initial Vertical Dimension σ_z (m)
FUGDUST	Fugitive dust from construction activities	1 area source covering the entire project site			0	N/A	1

See Figure B.2-1: On-Site Emissions Sources for Construction Phase and Figure B.2-2: Off-Site Emissions Sources for Construction Phase, below.

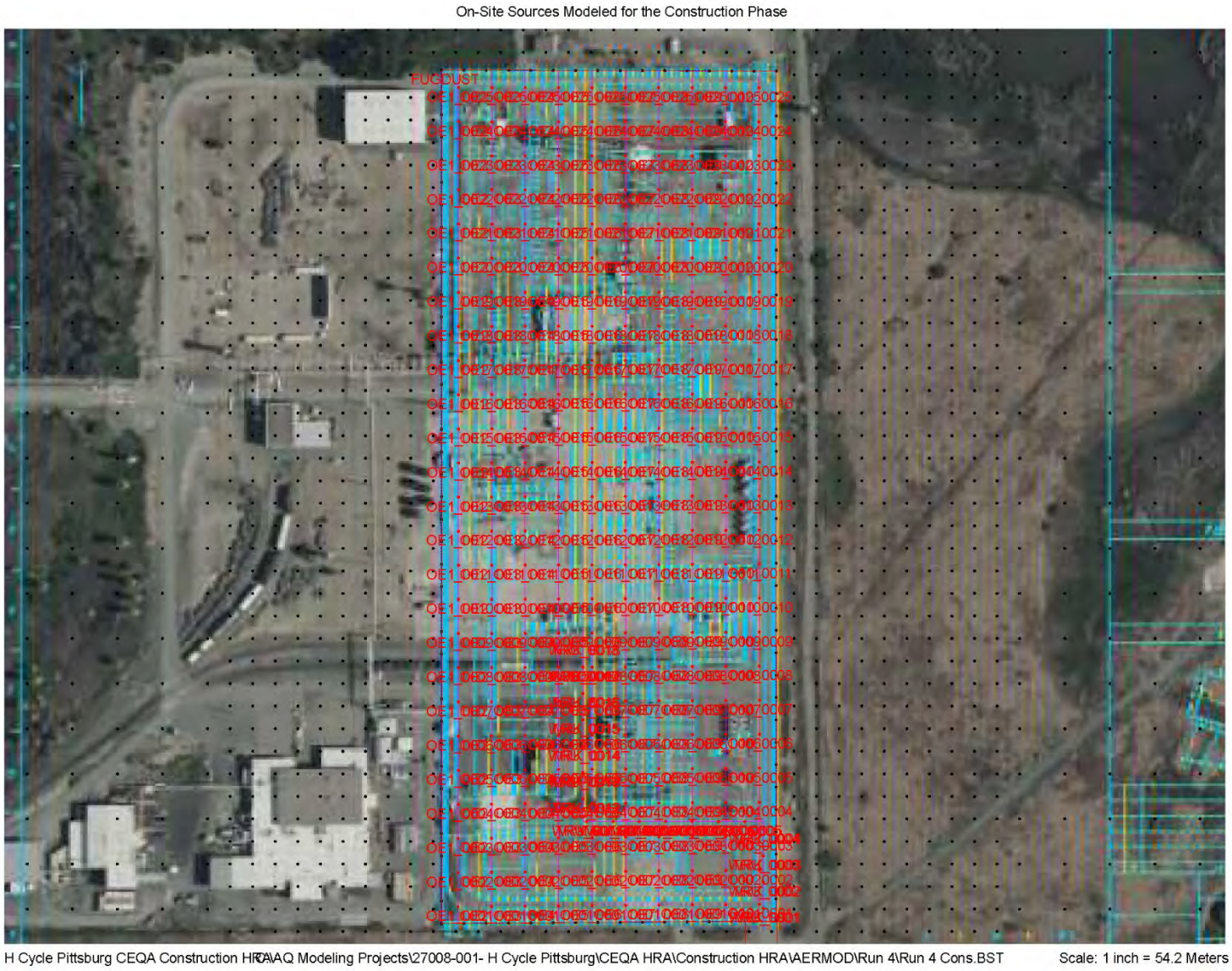

Figure B.2-1: On-Site Emissions Sources for Construction Phase

Figure B.2-2: Off-Site Emissions Sources for Construction Phase

Table B.2-2: Source Types and Release Parameters of Operation Phase Emissions Sources

Source Group	Source Description	Source Type	Length of the Side/ Plume Width, W (m)	Plume Height, H (m)	Release Height (m)	Initial Horizontal Dimension σ_y (m)	Initial Vertical Dimension σ_z (m)
ONSTRK	On-site heavy duty diesel truck travel	Line of 18 adjacent, surface-based volume sources	W = Total width of traffic lanes (6m) + 6 m for wake effect = 12m	6.8 (Table 11, Appendix E BAAQMD CEQA Guidelines)	H/2 = 3.4	W/2.15 = 5.58	H/2.15 = 3.16
ONSWRK	On-site worker gasoline car and light duty truck travel	Line of 18 adjacent, surface-based volume sources	W = Total width of traffic lanes (6m) + 6 m for wake effect = 12m	2.6 (Table 11, Appendix E BAAQMD CEQA Guidelines)	H/2 = 1.3	W/2.15 = 5.58	H/2.15 1.21
OFSTRK	Off-site heavy duty diesel truck travel	Line of eight surface based area sources of variable length over a total road length of 758.6m from the nearest freeway exit to the project site	W = Total width of traffic lanes (8m) + 6 m for wake effect = 14m	6.8 (Table 11, Appendix E BAAQMD CEQA Guidelines)	H/2 = 3.4	NA	H/2.15 = 3.16
OFSWRK	Off-site worker gasoline car and light duty truck travel	Line of eight surface based area sources of variable length over a total road length of 758.6m from the nearest freeway exit to the project site	W = Total width of traffic lanes (8m) + 6 m for wake effect = 14m	2.6 (Table 11, Appendix E BAAQMD CEQA Guidelines)	H/2 = 1.3	NA	H/2.15 = 1.21

Table B.2-2: Source Types and Release Parameters of Operation Phase Emissions Sources

Source Group	Source Description	Source Type	Length of the Side/ Plume Width, W (m)	Plume Height, H (m)	Release Height (m)	Initial Horizontal Dimension σ_y (m)	Initial Vertical Dimension σ_z (m)
S1FUG	Fugitive emissions from door openings of variable sizes in feed preparation building	Group of seven single, elevated volume sources on or adjacent to a building	Variable, depending upon opening width and distance of the opening to the edge of the building W = SQRT (opening width * distance-to-edge) – SJVAPCD, Volume Source Calculations EXCEL tool	H = Building height = 17.68	Variable, Opening Height/2	Variable, W/4.3	H/2.15 = 17.68/2.15 = 8.22m
S1BIOFIL	Biofilter abating emissions from Feed preparation building	Single surface based area source		Physical height of the equipment = 1.468	Physical height of the equipment = 1.468	NA	H/2.15 = 0.78
S5BIOFIL	Biofilter abating emissions from wet waste storage silo	Single surface based area source		Physical height of the equipment = 1.468	Physical height of the equipment = 1.468	NA	H/2.15 = 0.78
S10BIOFI	Biofilter abating emissions from waste dryer	Single surface based area source		Physical height of the equipment = 1.468	Physical height of the equipment = 1.468	NA	H/2.15 = 0.78
S15BIOFI	Biofilter abating emissions from dry waste storage silo	Single surface based area source		Physical height of the equipment = 1.468	Physical height of the equipment = 1.468	NA	H/2.15 = 0.78

Table B.2-2: Source Types and Release Parameters of Operation Phase Emissions Sources

Source Group	Source Description	Source Type	Length of the Side/ Plume Width, W (m)	Plume Height, H (m)	Release Height (m)	Initial Horizontal Dimension σ_y (m)	Initial Vertical Dimension σ_z (m)
SLAGHAND	Fugitive emissions from slag storage, handling and crushing activities	Single surface based area source		Physical height of the equipment = 2.01	Physical height of the equipment = 2.01	NA	0, as emissions are diffused and no plume generated
FUGLEAK	Fugitive emissions from piping component leaks in volatile organic compound (VOC) gas service	Line of 4 adjacent volume sources - three sources modeled as surface-based source and the 4th modeled as elevated source on or adjacent to a building	Width of the OMNI ICARS and GPRS sections = 17.5m	H = opening height for surface-based volume sources = 2.44 H = Building height for source located on or adjacent to the OMNI ICARS and GPRS units = 16.76	Height of the opening/ 2 = 1.22 for all 4 volume sources	W/2.15 = 8.14	H/2.15 = 1.13 for surface based volume sources = 7.79 for elevated volume source on or adjacent to the OMNI unit
P25OMNIH	Stack venting OMNI SRM and refining chamber burner exhaust during heat up stage	Single point source					
FLARE	Fully enclosed ground flare	Single point source					
BOILER	Stack venting combustion exhaust from boiler	Single point source					
EMEGENIC	Stack venting exhaust from emergency	Single point source					

Table B.2-2: Source Types and Release Parameters of Operation Phase Emissions Sources

Source Group	Source Description	Source Type	Length of the Side/ Plume Width, W (m)	Plume Height, H (m)	Release Height (m)	Initial Horizontal Dimension σ_y (m)	Initial Vertical Dimension σ_z (m)
	generator diesel-fired ICE						
FIREPUMP	Stack venting exhaust from emergency fire pump diesel-fired ICE	Single point source					
WWTP	Vent of the fixed roof equalization tank. Emissions from the entire wastewater treatment plant were modeled as if all emissions were released from the first treatment unit, which is a fixed roof equalization tank	Single point source					
TANKVENT	Horizontal diesel storage tank under the emergency generator diesel engine with single vent	Single point source					
COOLTOW	Exhaust from cooling tower cells	Group of 4 point sources, each representing one of the 4 cells of the cooling tower					
RAWTRIDL	On-site raw material and	Group of 3 point sources					

Table B.2-2: Source Types and Release Parameters of Operation Phase Emissions Sources

Source Group	Source Description	Source Type	Length of the Side/ Plume Width, W (m)	Plume Height, H (m)	Release Height (m)	Initial Horizontal Dimension σ_y (m)	Initial Vertical Dimension σ_z (m)
	byproduct carrying heavy duty diesel truck idling						
H2TRKIDL	On-site hydrogen gas carrying heavy duty diesel truck idling	Group of 8 point sources in the H2 truck loading bays					

See Figure B.2-3: On-Site Emissions Sources for Operation Phase and Figure B.2-4: Off-Site Emissions Sources for Operation Phase, below.

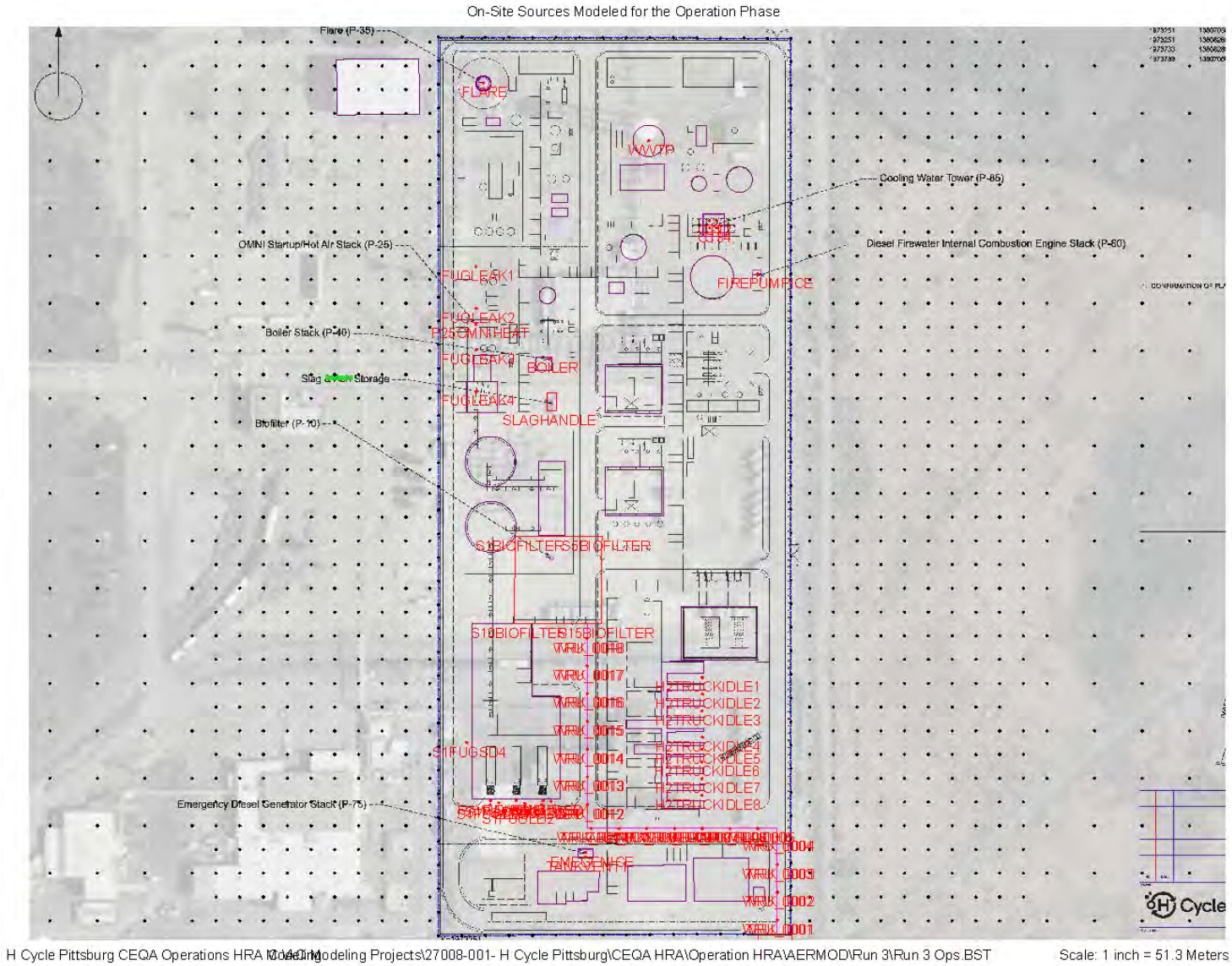

Figure B.2-3: On-Site Emissions Sources for Operation Phase

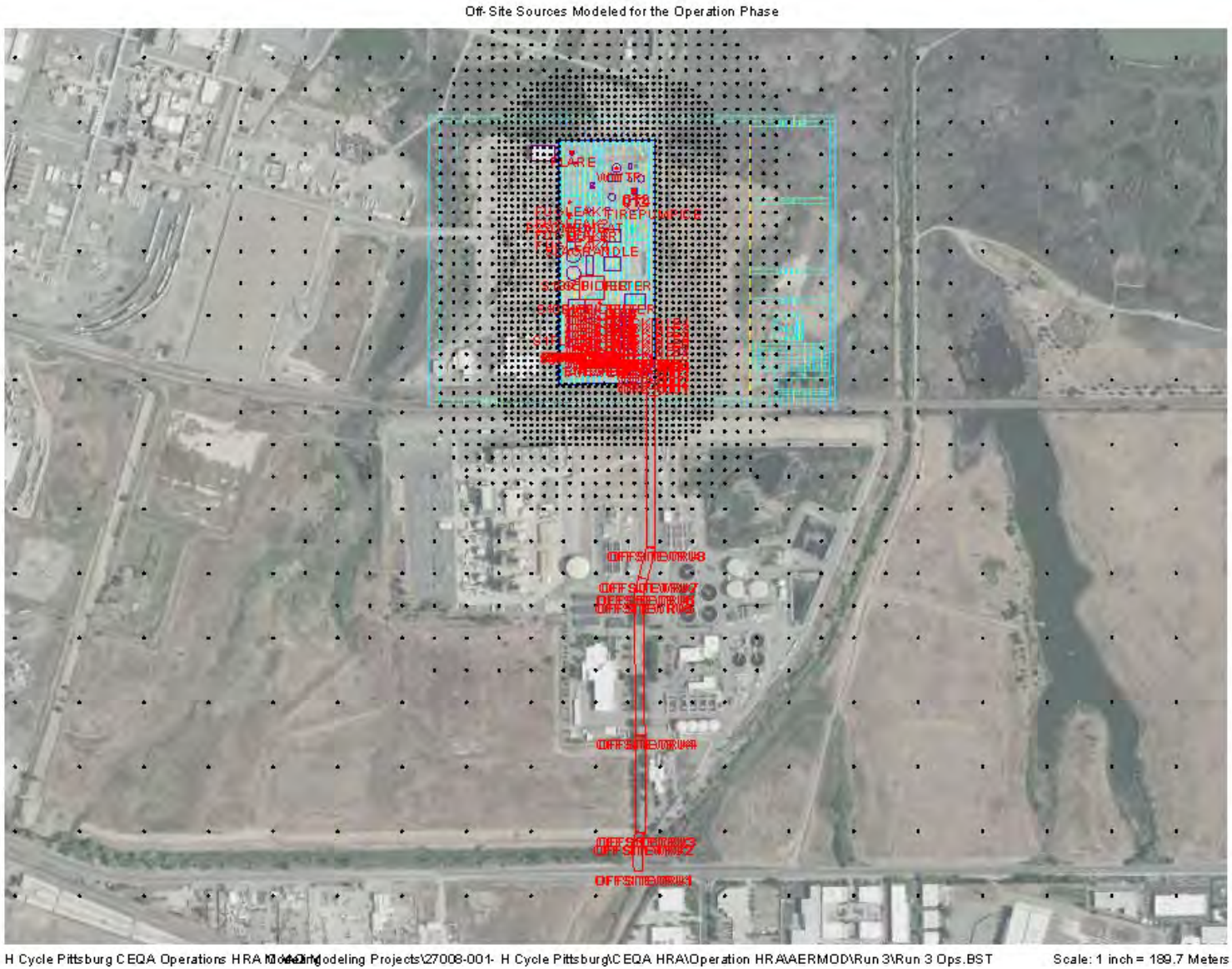

Figure B.2-4: Off-Site Emissions Sources for Operation Phase

B.2.4.3 Receptors

A discrete Cartesian grid of receptors was created in accordance with the BAAQMD guidance and included the following:

- Fence line receptors were placed along the facility's fence line at a spacing of 10 m
- 10-m spaced receptors out to 100 m from the facility boundary
- 20-m spaced receptors out to 200 m from the facility boundary
- 50-m spaced receptors out to 500 m from the facility boundary
- 100-m spaced receptors out to 3,000 m from the facility boundary

TAC concentration at each receptor location was estimated at a flagpole height of 1.5 meters, which represents the average human breathing zone. Ground-level $PM_{2.5}$ concentration at each receptor were estimated using a flagpole height of 0.0 meter.

B.2.4.4 Meteorological Data:

AERMOD requires a meteorological input file to characterize transport and dispersion of pollutants in the atmosphere. Model runs were conducted with 4 years of AERMOD ready meteorological data sets (2013-2015 and 2017) from the Dow Chemical meteorological station. The Dow Chemical meteorological station is located approximately 450 feet west of the project site and was determined to be the most representative met data for the modeled area. Upper air data was taken from the Oakland International Airport station. The pre-processed AERMOD-ready meteorological dataset was obtained from BAAQMD website. A wind rose showing a graphical distribution of wind speed and wind direction at the Dow Chemical meteorological station for the time period modeled is shown in Figure B.2-5, below.

B.2.4.5 Terrain Characterization

The model is referenced in NAD 83 UTM coordinates and uses terrain data from the United States Geological Survey (USGS) 10 m National Elevation Dataset (NED) files. Sources, buildings, and receptors were modeled with consideration of terrain elevations. The NED data were processed using AERMAP to obtain terrain elevations and hill heights for receptors and terrain elevations for sources and buildings.

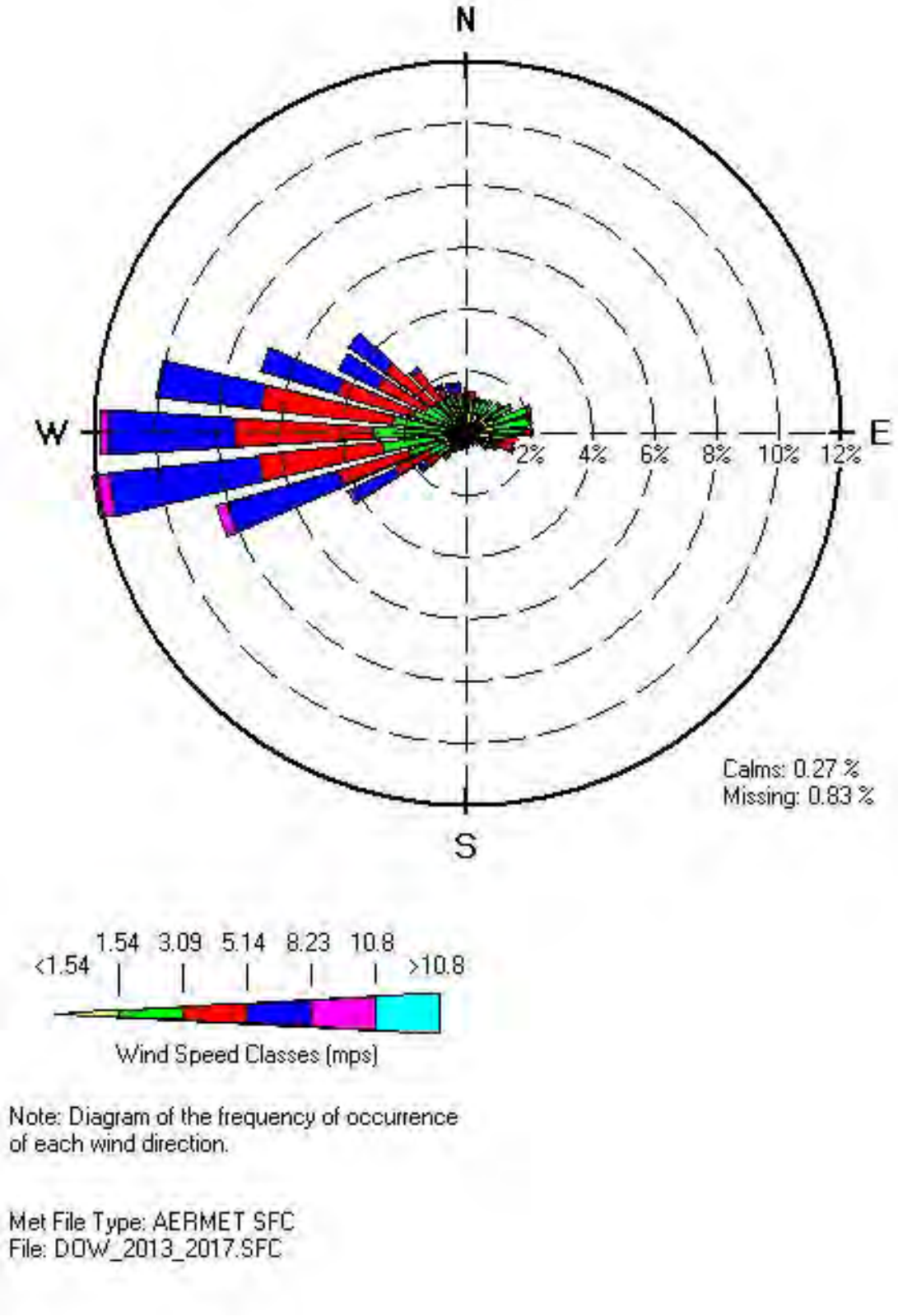

Figure B.2-5: Dow Chemical Meteorological Station Wind Speed Data

B.2.4.6 Building Downwash

When point sources are located near or on buildings or structures, dispersion of the emissions plume can be influenced. Under certain wind speeds the wake produced on the lee side of the building can cause the plume to be pulled toward the ground near the building, resulting in relatively higher concentrations close to the building. These effects are called building downwash.

The effects of building downwash have been considered in this modeling analysis. AERMOD uses the EPA-approved Building Profile Input Program with Plume Rise Model Enhancements (BPIP-PRIME) to provide input for the downwash analysis. This program calculates the Good Engineering Practice (GEP) formula stack heights and direction-specific building dimensions for input to the dispersion calculations. BPIP-PRIME requires the input of building coordinates and heights, and stack coordinates. Structures determined to have downwash potential were included in this analysis.

B.2.5 RISK CHARACTERIZATION

B.2.5.1 Cancer Risk

Cancer risk is expressed in terms of the chances or probability of developing cancer as a result of exposure to a carcinogen at any exposure level typically over a lifetime. Cancer risk is expressed as the increased chances of developing cancer in one million people. The calculation procedure for cancer risk assumes that cancer risk is proportional to concentration at any level of exposure; that is, there is no dose that would result in a zero probability of contracting cancer.

The CEQA threshold of significance is a potential cancer risk of 10 persons in one million or greater, except in overburdened communities, such as the location of the project site, where the significance threshold is 6 persons on one million or greater.

Cancer risk from carcinogens is calculated using their respective cancer potency slope factors and their dose. These slope factors, sometimes referred to as dose-response relationships, are developed from epidemiological studies. The cancer risk from each carcinogen is summed to arrive at a total cancer risk. The dose, which is the amount of exposure to a toxin, is estimated for each applicable exposure pathway using the modeled air concentration of the pollutant, the exposure duration, exposure frequency, and the daily intake rate.

B.2.5.2 Non-Cancer Health Effects

"Chronic toxicity" is defined as the adverse biological effects caused by prolonged chemical exposure. These exposures may be continuous or repeated. Chronic effects usually occur at lower exposure levels than acute effects, primarily because of chemical accumulation in the body. "Acute toxicity" is defined as adverse biological effects caused by brief chemical exposures of no more than 24 hours.

Non-cancer health effects of an inhaled air toxic are measured by the **hazard index**, the ratio of the reported concentration of an air toxic compound to an acceptable or "reference" exposure level (REL). For non- inhalation pathways, hazard indices are calculated as the ratio of calculated doses to acceptable or reference doses (RfDs). If the reported concentration or dose of a given chemical is less than its REL or RfD, then the hazard index will be less than 1.0.

If more than one chemical is considered, it is assumed that multiple sub- threshold exposures could result in an adverse health effect for a given target organ. Thus, chemical-specific hazard indices are summed for a given target organ. Typically, for a given set of chemicals, hazard indices are summed for each organ system. Hazard indices can be calculated both on a chronic toxicity and acute toxicity basis.

For any organ system, a total hazard index exceeding 1.0 indicates a potential significant health effect.

B.2.5.3 Health Risk Analysis Procedure

Cancer risk and non-cancer hazard indices calculations for this HRA were performed using the CARB-developed risk analysis tool "Hot Spots Analysis & Reporting Program (HARP2 Version 22118)" model's ADMRT module. The HARP2 model implements the methodologies described in the OEHHA Guidelines.

The dispersion model outputs in terms of normalized concentration χ/Q expressed in the unit of $\mu g/m^3$ per g/s emission are imported into HARP2 and used with source-specific emission rates for each TAC and toxicity factors to calculate potential health effects. Toxicity factors from the BAAQMD-approved health database were used for this HRA.

Ambient concentration of an air pollutant released from an emissions source is directly related to its emission rate. For the assessment of cancer risk and chronic non-cancer health effects, the annual-average emission rate of a TAC from each source is multiplied in HARP2 with the normalized concentration estimated by AERMOD for an averaging period for that source to obtain the annual-average ground-level concentration (GLC) for each TAC.

Similarly, for assessment of acute non-cancer health effects, maximum hourly emission rate of a TAC from each source is multiplied in HARP2 with the normalized concentration estimated by AERMOD for 1-hour averaging period for that source to obtain the maximum hourly GLC for each TAC. For the acute non-cancer health effect analysis, it is conservatively assumed that all maximum hourly emissions would occur in the same hour.

B.2.6 EXPOSURE DURATIONS AND EXPOSURE FREQUENCY

B.2.6.1 Exposure Duration

For long term projects such as operation of a facility, cancer risk to residential receptors is based on a 30-year exposure duration. For worker receptors, cancer risk calculations are based on an exposure

duration of 25 years. Cancer risk estimates for children at school sites are based on a 9-year exposure duration, such as for a K-8 school.

For short-term projects, such as construction of a facility, the exposure duration for all types of receptors is assumed to be equal to the duration of the construction phase. The duration of construction of the proposed facility will be approximately 1.5 years. A 2-year exposure period was assumed for assessing the cancer risks from the construction phase emissions. In accordance with Appendix E of BAAQMD's CEQA Air Quality Guidelines, cancer risk from the project's operation phase was prorated by a ratio of 28 to 30 years and 23 to 25 years for residential and worker receptors, respectively and added to the cancer risk from construction phase to evaluate the cancer risk over the entire 30 years' and 25 years' exposure duration for residential and worker receptors, respectively.

B.2.6.2 Exposure Frequency

Cancer risk to residential receptors is estimated by assuming that exposure occurs 24 hours per day for 350 days per year. A Fraction of Time at Home (FAH) adjustment factor of 0.73 is applied for age groups greater than or equal to 16 years. For a worker receptor, exposure is assumed to occur 8 hours per day for 250 days per year. For children at school sites, exposure is assumed to occur 180 days (or 36 weeks) per year.

Sensitive receptors refer to those segments of the population most susceptible to poor air quality (i.e., children, the elderly, and those with pre-existing serious health problems affected by air quality). These receptor locations include residential communities, schools, daycare centers, playgrounds, and medical facilities. The potential cancer risk for the non-working, off-site, sensitive populations assumes the standard 30-year residential exposure. Chronic and acute non-cancer health effects are assessed from annual-average and maximum hourly exposure estimates, respectively, without further adjustments from the standard Tier 1 assumptions. As stated above, it is assumed for the acute analysis that all maximum hourly emissions would occur within the same hour.

Furthermore, the non-cancer toxicity factors were established by the CARB and OEHHA to be protective of sensitive members of the population or those undergoing physiological change, which include children and the elderly. Therefore, it is believed that these analyses account for the protection of sensitive individuals.

B.2.6.3 Exposure Pathways

There are many exposure pathways by which humans may be exposed to airborne chemicals. The inhalation exposure pathway involves the direct inhalation of gaseous and particulate air pollutants. In addition, there is the potential for exposure via non-inhalation pathways due to the deposition of pollutants. Potential non-inhalation exposure pathways include soil ingestion, dermal absorption, mother's milk, and ingestion of homegrown produce.

For this HRA, which involves multipathway pollutants, Mandatory Minimum Pathways were used to assess health risks at residential receptors. Mandatory Minimum Pathways include inhalation, soil,

dermal, and mother's milk exposure pathways. Worker Pathways, which include inhalation, soil, and dermal exposure pathways were used for assessing potential exposure to offsite worker receptors during working hours.

As discussed above, to estimate airborne concentrations, HARP2 uses the normalized modeled concentration, χ/Q, for each receptor location from the AERMOD output and multiplies them by pollutant and source-specific emission rates. For estimating non-airborne pollutant concentrations from particulate emissions, HARP2 first estimates air concentrations for each pollutant (micrograms per cubic meter [$\mu g/m^3$]) by multiplying particulate pollutant emission rates (grams per second [g/s]) by the maximum normalized concentration, χ/Q, and then uses in the following equation to estimate pollutant deposition rates:

$$Dep = C_{air} \times Dep\text{-}rate \times 86{,}400 \text{ seconds/day}$$

Where:

Dep = Deposition on the affected soil area per day ($\mu g/m^2$/day)
C_{air} = Estimated air concentrations of TAC ($\mu g/m^3$)
Dep-rate = Vertical rate of deposition (meters per second [m/s])

OEHHA recommends a deposition rate of 0.05 m/s for uncontrolled sources and 0.02 m/s for controlled sources. Since most of the sources in the proposed project are controlled, a deposition rate of 0.02 m/s was used in this HRA. These deposition estimates are then used in algorithms contained in HARP2 for evaluation of health effects via soil ingestion, dermal absorption, mother's milk, and homegrown produce exposure pathways.

B.2.6.4 Intake Rate

The ***Intake Rate Percentile*** sets the intake rate at which a person is exposed to the air pollutant. For cancer risk assessment and non-cancer chronic effects assessment from multipathway pollutants at residential receptors for long term projects, intake rate percentiles specified in the Risk Management Policy were used. These intake rate percentiles were developed by CARB using the Derived Method. On July 23, 2015, CARB adopted "Risk Management Guidance for Stationary Sources of Air Toxics", which includes an updated Risk Management Policy for Inhalation Risk Assessments. This policy recommends using a combination of the 95th percentile and 80th percentile daily breathing rates as the minimum exposure inputs for risk management decisions. Specifically, the policy recommends using the 95th percentile rate for age groups less than 2-years old and the 80th percentile rate for age groups that are greater than or equal to 2-years old.

For cancer risk assessment and non-cancer chronic effects assessment from multipathway pollutants at offsite worker receptors for long term projects, intake rate percentiles specified and developed by OEHHA using the Derived Method were used. OEHHA recommends assuming a breathing rate of 230 L/kg-8 hours. This value represents the 95th percentile 8-hour breathing rate based on moderate activity of 16 to 70 years-old age range.

Tables B.2-3 and B.2-4 summarize the exposure pathways evaluated and the exposure duration, exposure frequency, and intake rates used in this HRA for the proposed Project's construction and operation phase respectively.

Table B.2-3: Parameter Selections in HARP2 for Risk Assessment of Construction Phase

Parameter	Residential Receptor	Worker Receptor
Exposure Duration	2 years starting at 3rd trimester	2 years starting at age of 16 years
Exposure Frequency	24 hours per day; 350 days per year	8 hours per day, 250 days per year
Intake Rate Percentile Selection	95th percentile (High End)	95th percentile (High End)
Exposure Pathways Evaluated	Mandatory Minimum Pathways, including inhalation, soil, dermal, and mother's milk	Worker Pathways, including inhalation, soil, and dermal
Deposition Rate	0.02 m/s	0.02 m/s
Fraction of Time at Home (FAH)	Applied for age bins ≥ 16 years	Not Applicable
8-hour Breathing Rate	Not Applicable	8-hour breathing rate with moderate intensity applied
Worker Adjustment Factor (WAF)	Not Applicable	WAF – 4.2 for non-continuous source. Construction schedule is 8 hours/day and 5 days/week.
Climate	Warm	Warm

Table B.2-4: Parameters Selections in HARP2 for Risk Assessment of Operation Phase

Parameter	Residential Receptor	Worker Receptor
Exposure Duration	30 years starting at 3rd trimester	25 years starting at age of 16 years
Exposure Frequency	24 hours per day; 350 days per year	8 hours per day, 250 days per year
Intake Rate Percentile Selection	RMP Derived Method	OEHHA Derived Method
Exposure Pathways Evaluated	Mandatory Minimum Pathways, including inhalation, soil, dermal, and mother's milk	Worker Pathways, including inhalation, soil, and dermal
Deposition Rate	0.02 m/s	0.02 m/s
Fraction of Time at Home (FAH)	Applied for age bins ≥ 16 years	Not Applicable
8-hour Breathing Rate	Not Applicable	8-hour breathing rate with moderate intensity applied
Worker Adjustment Factor (WAF)	Not Applicable	None
Climate	Warm	Warm

B.2.7 CUMULATIVE HRA

In accordance with BAAQMD CEQA guidelines, a cumulative HRA was conducted for cancer risk and chronic hazard index at maximally exposed individual residential and worker receptors and at point of maximum impact for $PM_{2.5}$ concentration. The assessment requires identification of all existing and near future stationary and mobile sources (roadways and railways) within 1,000 feet of the project boundary and aggregation of health impacts (cancer risk, chronic hazard index, $PM_{2.5}$ concentration) of these sources at the MEIR, MEIW, and PMI with the corresponding health impacts due to the proposed project at those receptor locations.

BAAQMD's Stationary Source Screening Maps and Mobile Source Screening Maps were used to identify sources within 1,000 feet of the Project's property boundary. Health risks values of identified sources were also obtained from these screening maps. The health risks provided in the screening maps are overly conservative. If more reliable sources of health risk information were available such as EIRs or California Energy Commission (CEC) Application for Certification, then those were used in lieu of the screening health risk values. Distances of MEIR, MEIW, and PMI from these sources were estimated using Google Earth and decay factors, provided in Appendix E of the BAAQMD 2022 CEQA Air Quality Guidelines, were applied to the health risk values for individual stationary sources/ facilities identified within 1,000 feet of the project boundary. These adjusted health risk values were added to the corresponding health risk values from mobile sources and from the project at MEIR and MEIW for cancer risk and CHI and at PMI for $PM_{2.5}$. Table B.2-5 lists the existing sources identified within 1,000 feet radius of the project's boundary and their respective health risks used for the cumulative risk analysis.

Table B.2-5: Sources within 1,000-feet of the Project Site

Facility ID	Facility Name	Address	NAICS Industry	Cancer Risk	Chronic Hazard Index	$PM_{2.5}$	x	y	Distance to MEIR (ft)	Distance to MEIW (ft)	Distance to $PM_{2.5}$ PMI	Distance Decay Multiplier for MEIR	Distance Decay Multiplier for MEIW	Distance Decay Multiplier for $PM_{2.5}$ PMI
14654	Generon IGS Inc.	992 Arcy Ln. Pittsburg, CA	Petrochem Mfg	0	0	0.223	-13563419.2	4582957	>1000	0	>1000	0.132	1	0.132
12095	Delta Energy Center[1]	1200 Arcy Ln Pittsburg, CA	Fossil Fuel Electric Power Generation	0.38	0.035	0.3	-13563586.2	4581558	>1000	>1000	>1000	0.132	0.132	0.132
11196	Cameron Process Systems	880 Arcy Ln. Pittsburg, CA	Industrial Gas Mfg		0	0	-13566379	4580994	>1000	444	>1000	0.132	0.389	0.132
	Railways[2]			59.32	0.003	0.013								
	Roadway[2]			20.77	0.014	0.101								

Notes:

1 Health risk values for BAAQMD Facility 12095 Delta Energy Center were obtained from the HRA and ambient air quality analysis conducted for the purposes of California Energy Commission's Application for Certification (98-AFC-3, September and November 1999).

2 BAAQMD screening maps for mobile sources provide a range of health risk values. Higher end of the applicable range was used in this cumulative analysis.

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