Air Quality Technical Report for Burney Bioenergy

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1.0 INTRODUCTION

This document presents the Air Quality Technical Report associated with the proposed Burney Bioenergy (proposed project) in Burney, California. This document provides an overview of the existing air quality conditions at the project site, an analysis of potential air quality impacts that would result from implementation of the proposed project, and identification of applicable mitigation measures. A health risk assessment (HRA) was conducted to evaluate health impacts due to air toxics emissions from construction activities, the four dry kilns, biomass boiler, and operational equipment such as loaders and forklifts. Issues related to odor and greenhouse gas (GHG) emissions are also addressed.

The supporting information, methodology, and assumptions used in the construction air emissions inventory and operational air emissions inventory are provided in:

- **Attachment A: Construction Air Emissions Inventory**
- **Attachment B: Operational Air Emissions Inventory**
- **Attachment C: Biomass Boiler Emission Testing Data (Confidential)**
- **Attachment D: Health Risk Assessment Methodology and Assumptions**

Air quality impacts were determined for United States Environmental Protection Agency (USEPA) criteria air pollutants such as carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), particulate matter equal to or less than 10 micrometers (coarse particulate or PM_{10}), and particulate matter equal to or less than 2.5 micrometers (fine particulate or $PM_{2.5}$). When volatile organic compounds (VOC) such as reactive organic gases (ROG)[1] and nitrogen oxide (NO_x) accumulate in the atmosphere and are exposed to the ultraviolet component of sunlight, ozone (O_3) is formed. As such, the assessment of ozone was performed using emission estimates of ROG and NO_x, known as pollutant precursors. The air quality analysis is consistent with the methods described in the Shasta County Air Quality Management District (SCAQMD) *Protocol for Review, Land Use Permitting Activities, Procedures for Implementing the California Environmental Quality Act*.[2]

[1] VOC means any compound of carbon, excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate, which participates in atmospheric photochemical reactions and thus, a precursor of ozone formation. ROG are any reactive compounds of carbon, excluding methane, CO, CO_2 carbonic acid, metallic carbides or carbonates, ammonium carbonate, and other exempt compounds. The terms VOC and ROG are often used interchangeably.

[2] Shasta County Air Quality Management District, *Protocol for Review, Land Use Permitting Activities, Procedures for Implementing the California Environmental Quality Act*, November 2003, https://www.co.shasta.ca.us/docs/libraries/resource-management-docs/aq-docs/scaqmd-ceqa-land-use-protocol.pdf

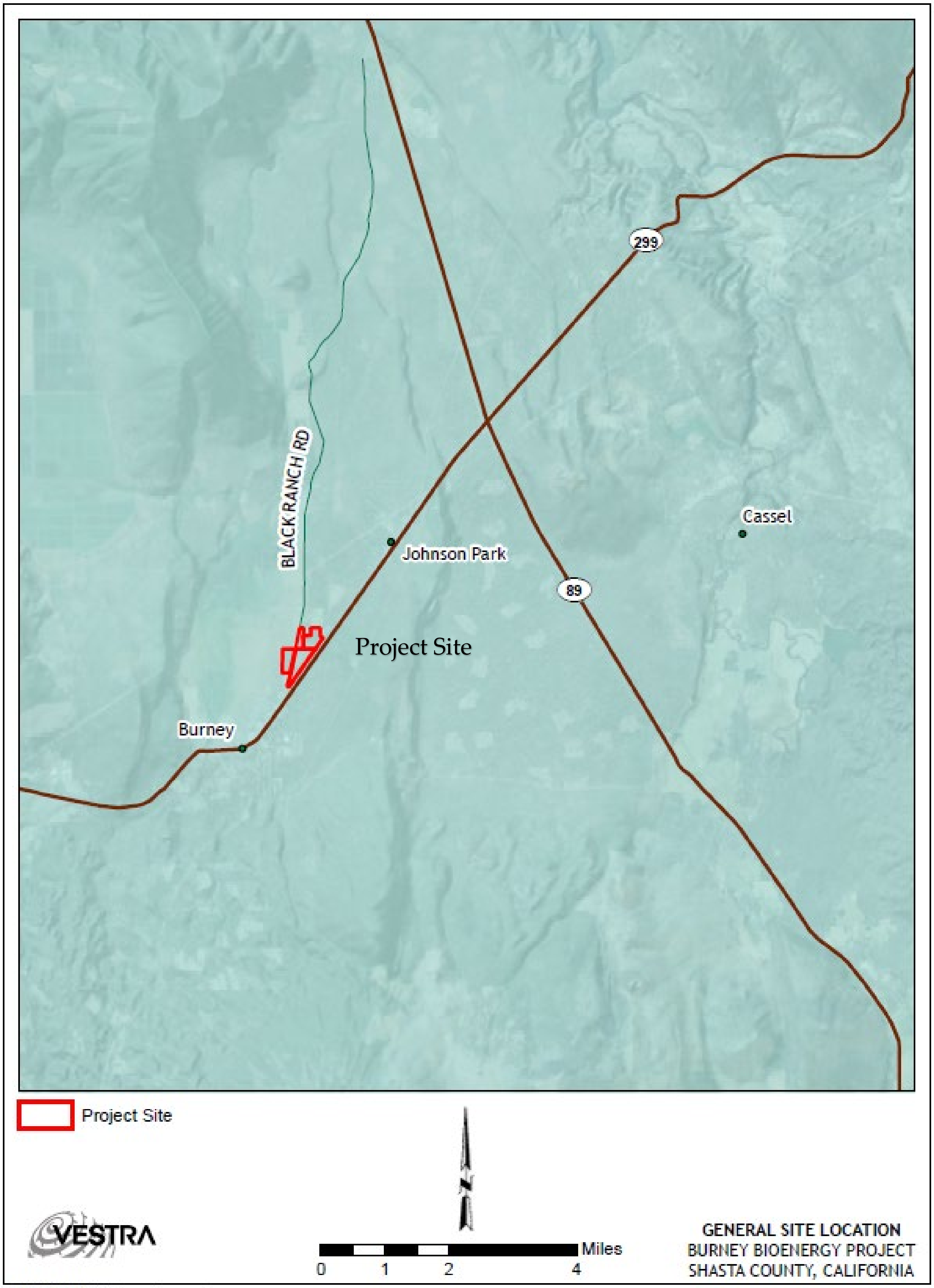
2.0 PROJECT OVERVIEW

The proposed project includes a five-megawatt Burney Bioenergy Facility, small specialty sawmill, dry kilns, chipping and grinding operation, firewood sales, and office, located west of Black Ranch Road and north of Burney in Shasta County. **Figure 1: Project Site and Surrounding Area** shows the project site and surrounding area. The facility will utilize sustainably harvested, forest-sourced biomass feedstock from nearby regions to supply its operations. The facility will process biomass using a gasification-fed boiler system to convert the woody biomass to electricity and a ceramic catalytic filter system to regulate its air emissions. The project site will have a small-scale biomass to electricity facility, fuel house to feed the biomass through the system, an outside fuel storage pile (approximately ¾ acre), in addition to a green lumber storage yard, dry kilns, and dry lumber storage shed. The facility will utilize approximately 12,500 pounds per hour (5,500 kilograms per hour) and 55,000 tons of woody biomass per year. The fuel feedstock assumptions include 25 percent moisture content, 3.8 percent ash content, and 20.2 megawatts thermal input (MWth). The electricity generation will be 43,800 MWh per year.

In addition to the biomass facility equipment, the following mobile equipment is anticipated to be used for operations including wood product finishing and production:

- Loader for feedstock handling
- Grinder to produce feedstock onsite
- Forklift for loading and unloading boards from trucks and storage
- Heel boom log loader decking logs for firewood and/or feedstock production
- Rubber tire wheel loader to move firewood and feedstock
- Water truck to water firewood and work areas
- Firewood processer
- Sawmill (inside building)

Figure 1. Project Site and Surrounding Area



P:\GIS\72110\Site Location.mxd

The wood product operation will include a small sawmill and four dry kilns that will produce specialty softwood products. Firewood processing and grinding of material to produce landscape products will also occur. The operation will accept residential fuel reduction materials including trees, brush, branches, clippings, needles, and leaves from the public. Public drop-off hours of fuel reduction material will correspond with the hours of the adjacent Burney Disposal transfer station (currently 8:00 a.m. to 4:30 p.m. on Mondays, Wednesdays, and Saturdays). This material will be used as feedstock for the bioenergy facility when feasible. Material not suitable for feedstock will be used to create landscape materials or diverted to the transfer station.

The feedstock will be delivered from forest conifer trees and/or juniper trees, including logs, tree boles and limbs, and incidental quantities of hardwood or woody brush species. Any other type of material is expressly excluded. Feedstock will be processed by a "whole tree" mechanical knife, drum chipper, and grinder with teeth on the rotor. Feedstock will only be pieces less than six inches in every dimension. Ninety-nine percent by weight of each delivery shall be pieces less than three inches in every dimension. Fine material (less than ½ inch in its largest dimension) shall comprise no more than three percent of each delivery by weight. The feedstock shall be of size, nature, and consistency compatible with buyer's feedstock receiving, handling, and combustion equipment. Additionally, feedstock will be free of foreign materials including but not limited to earth, stone, plastic, glass, metal, paper, rubber, non-combustible materials, paint, and any hazardous or toxic substances and defined by law and regulation.

The bioenergy facility will be located on a concrete pad and housed within an enclosed structure to protect the conversion system and associated equipment from the weather and to reduce noise. The building will be a composite aluminum/steel laminate standard cladding with insulation. The building will have automatic closing doors with high density plastic sheeting over the openings to cover the doors when they are open. The diesel standby generator(s), used during utility outages (for backup power to keep the essentials operating if the renewable energy system is down), will be housed in an enclosed structure within the main energy facility building for noise and safety considerations. The turbine will be inside a soundproof attenuated ventilated room within the main building. The bioenergy facility portion of the project site will be fenced and will not be accessible by the public.

A dry lumber storage shed building will be located south of the bioenergy facility buildings. The dry kilns building will be located east of the bioenergy building. The bioenergy facility will supply heat for the dry kilns building via overhead piping. Wood product production including the sawmill, firewood processing, and grinding will occur on the remainder of the project site.

Figure 2: Project Site Layout shows the project site layout including the bioenergy facility and wood product operation. The bioenergy facility is located on 10.7 acres and the wood products operation is located on 34 acres.

3.0 ANALYSIS METHODOLOGY

Intermittent, short-term construction emissions that occur from activities such as site-grading and construction are evaluated. Additionally, air emissions would occur during operation of the bioenergy facility and wood products operations. Regulatory models used to estimate air quality impacts include:

- California Air Pollution Officers Association (CAPCOA) CalEEMod (California Emissions Estimator Model Version 2020.4.0)[3] land use emissions model estimates emissions due to demolition and construction activities and operations for land use development.
- California Air Resources Board's (CARB) EMFAC2021[4] emissions inventory model. EMFAC2021 is the latest emission inventory model that calculates emission inventories and emission rates for motor vehicles operating on roads in California. This model reflects CARB's current understanding of how vehicles travel and how much they emit. EMFAC can be used to show how California motor vehicle emissions have changed over time and are projected to change in the future.
- CARB OFFROAD2021[5] emissions inventory model. OFFROAD is the latest emission inventory model that calculates emission inventories and emission rates for off-road equipment such as loaders, excavators, and off-road haul trucks operating in California. This model reflects CARB's current understanding of how equipment operates and how much it emits. OFFROAD can be used to show how California off-road equipment emissions have changed over time and are projected to change in the future.
- USEPA AP-42, Compilation of Air Pollutant Emission Factors, has been published since 1972 as the primary compilation of USEPA's emission factor information. It contains emission factors and process information for more than 200 air pollution source categories. A source category is a specific industry sector or group of similar emitting sources. The emission factors have been developed and compiled from source test data, material balance studies, and engineering estimates.[6]

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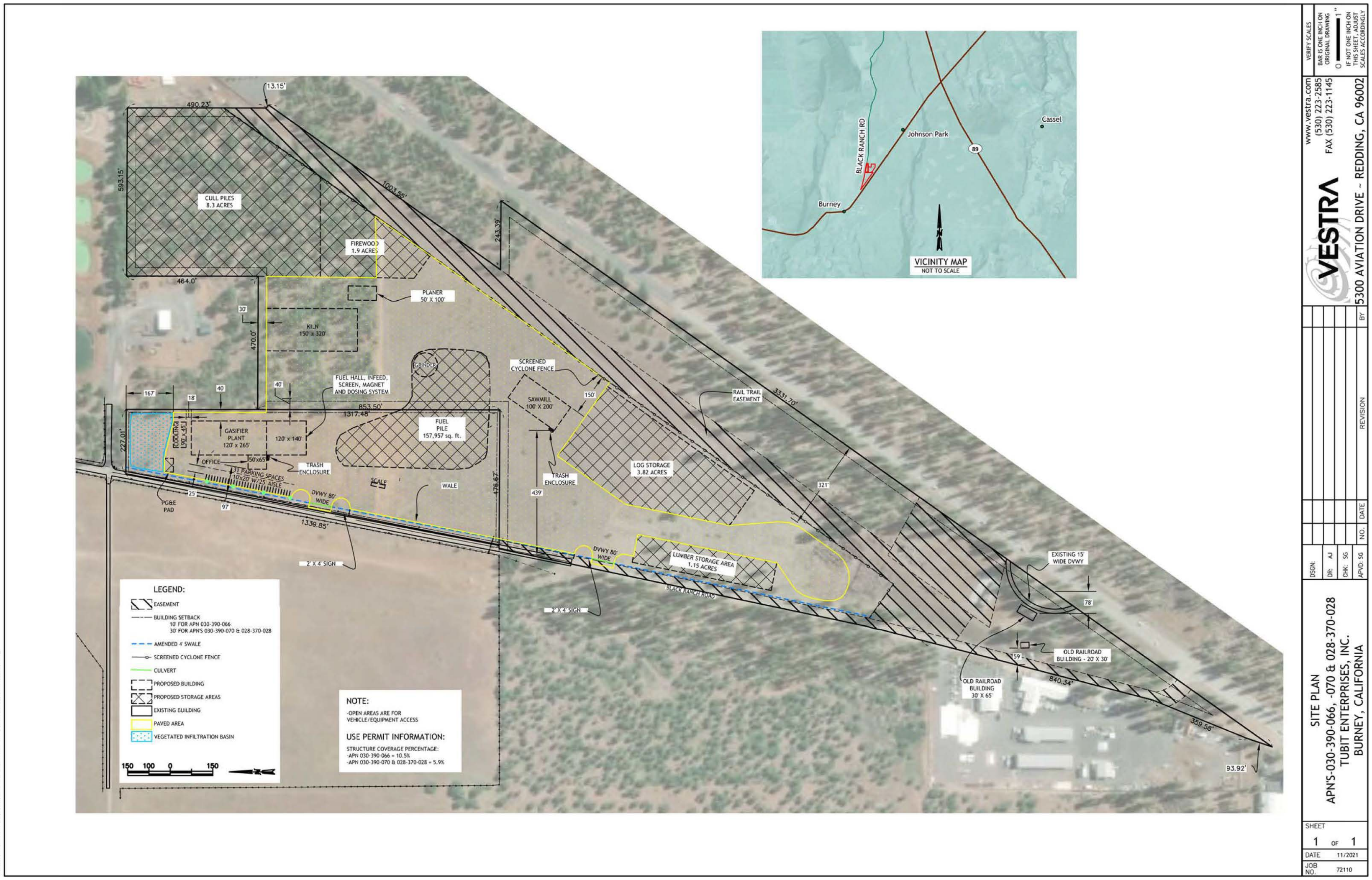
[3] California Air Pollution Officers Association, *California Emissions Estimator Model User's Guide*, May 2021, http://www.caleemod.com/

[4] California Air Resources Board, EMFAC2021 User's Guide, January 15, 2021, https://ww2.arb.ca.gov/sites/default/files/2021-01/EMFAC202x_Users_Guide_01112021_final.pdf

[5] California Air Resources Board, OFFROAD2021, https://ww2.arb.ca.gov/sites/default/files/offroadzone/offroadzone.html

[6] United States Environmental Protection Agency, AP 42, Compilation of Air Pollutant Emission Factors, Fifth Edition, Volume I, https://www.epa.gov/air-emissions-factors-and-quantification/ap-42-compilation-air-emissions-factors

Figure 2. Project Site Layout



- Argonne National Laboratory GREET Model Emission Factors for Coal- and Biomass-Fired Boilers. [7] Report providing boiler emission factors 2 for biomass and coal.

- USEPA Region 10 HAP and VOC Emission Factors for Lumber Drying.[8] A list of volatile organic compound and hazardous air pollutant emission factors in units of pounds of pollutant per thousand board feet of lumber dried for estimating emissions from lumber drying kilns.

- USEPA Particulate Matter Potential to Emit Emission Factors for Activities at Sawmills, Excluding Boilers, Located in Pacific Northwest Indian Country.[9] USEPA Region 10 has compiled particulate matter emission factors for use in determining the emissions for activities at sawmills, excluding boilers.

- USEPA, Emission Factors for Greenhouse Gas Inventories.[10] A list of GHG emission factors for a variety of fuel types.

4.0 EXISTING CONDITIONS

The proposed project is located approximately 40 miles to the northeast of the City of Redding, which is in Shasta County at the northern end of the Northern Sacramento Valley Air Basin (NSVAB). The NSVAB consists of a total of seven counties: Sutter, Yuba, Colusa, Butte, Glenn, Tehama, and Shasta. The NSVAB is bounded on the north and west by the Coastal Mountain Range and on the east by the southern portion of the Cascade Mountain Range and the northern portion of the Sierra Nevada range. These mountain ranges reach heights more than 6,000 feet above mean sea level, with individual peaks rising much higher. The mountains form a substantial physical barrier to locally created pollution as well as pollution transported northward on prevailing winds from the Sacramento metropolitan area.

The environmental conditions of Shasta County are conducive to potentially adverse air quality conditions. The basin area traps pollutants between two mountain ranges to the east and the west. This problem is exacerbated by a temperature inversion layer that traps air at lower levels below an overlying layer of warmer air. Prevailing winds in the area are from the south and southwest. Sea breezes flow over the San

[7] Argonne National Laboratory, GREET Model Emission Factors for Coal- and Biomass-Fired Boilers, September 24, 2014, https://greet.es.anl.gov/publication-em-coal-bio-boiler

[8] United States Environmental Protection Agency, Region 10 HAP and VOC Emission Factors for Lumber Drying, January 2021, https://www.epa.gov/system/files/documents/2021-07/epa-region-10-lumber-drying-ef-january-2021.pdf

[9] United States Environmental Protection Agency, Technical Memoranda for Sawmills, Region 10, https://www.epa.gov/caa-permitting/technical-memoranda-sawmills-region-10

[10] United States Environmental Protection Agency, Emission Factors for Greenhouse Gas Inventories, March 9, 2018, https://www.epa.gov/sites/default/files/2018-03/documents/emission-factors_mar_2018_0.pdf

Francisco Bay Area and into the Sacramento Valley, transporting pollutants from the large urban areas. Growth and urbanization in Shasta County have also contributed to an increase in emissions.

Regional Meteorology

Air quality is affected by the rate, amount, and location of pollutant emissions and the associated meteorological conditions that influence pollutant movement and dispersal. Atmospheric conditions, including wind speed, wind direction, stability, and air temperature, in combination with local surface topography (i.e., geographic features such as mountains, valleys, and the Pacific Ocean), determine the effect of air pollutant emissions on local air quality.

The climate in the vicinity of the project site provides average maximum and minimum winter (i.e., January) temperatures of 44 degrees Fahrenheit (ºF) and 19 ºF, respectively, while average summer (i.e., July) maximum and minimum temperatures are 88 ºF and 44 ºF, respectively. Rainfall averages approximately 67 inches per year and snowfall averages 79 inches per year, with an average winter snow depth of two inches. Average annual wind speeds are approximately 19 miles per hour (mph), with average monthly peak wind speed at approximately 29 mph during October, and average monthly minimum average wind speed at 11 mph in June.[11]

Nearby Sensitive Receptors

Land uses such as schools, children's daycare centers, hospitals, and convalescent homes are more sensitive than the public to poor air quality because the population groups associated with these uses have increased susceptibility to respiratory distress. Persons engaged in strenuous work or exercise also have increased sensitivity to poor air quality. CARB has identified the following people as most likely to be affected by air pollution: children less than 14 years of age, the elderly over 65 years of age, athletes, and those with cardiovascular and chronic respiratory diseases. These groups are classified as sensitive population groups.

Residential areas are considered more sensitive to air quality conditions than commercial and industrial areas, because people generally spend longer periods of time at their residences, resulting in greater exposure to ambient air quality conditions. Recreational uses are also considered sensitive, due to the greater exposure to ambient air quality conditions and because the presence of pollution detracts from the recreational experience. No schools, daycare facilities, or residential units are within 1,000 feet from

[11] Western Regional Climate Center, Burney, California, Period of Record Monthly Climate Summary: July 1, 1948 to September 17, 2015, https://wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca1214

the biomass boiler.[12] Even though, the nearest receptors are more than 3,000 feet from the project site, a health risk assessment was completed (see **Section 10**).

Local Air Quality

Ambient air quality in Shasta County, and thus at the project site, can be inferred from ambient air quality measurements conducted at air quality monitoring stations. Existing levels of ambient air quality and historical trends and projections in the region are documented by measurements made by the SCAQMD, which is the air pollution regulatory agency for the portion of the NSVAB in Shasta County. These measurements are affected by pollutants generated by the urbanized land uses in Shasta County as well as by land uses in the entire NSVAB and beyond.

CARB maintains a network of monitoring stations within the Air Basin that monitor air quality and compliance with applicable ambient standards. The monitoring station closest to the project site is located in Shasta Lake. Ozone, PM_{10}, and $PM_{2.5}$ are the primary pollutants affecting the NSVAB. **Table 1**: **Air Quality Data Summary (2018 – 2020)** summarizes the most recent three years of data (2018 through 2020) from the air monitoring station. Ozone data is measured at 13791 Lake Boulevard in Shasta Lake, 2220 North Street in Anderson, and at the Health Department in Redding. PM_{10} is measured at 4066 La Mesa Avenue in Shasta Lake, North Street in Anderson, and at the Health Department in Redding. $PM_{2.5}$ is measured at the Health Department in Redding. As of July of 2022, the CARB had not published air monitoring results for 2021.

Table 1
Air Quality Data Summary (2018 - 2020)

Pollutant	Monitoring Data by Year			
	Standard[s]	*2018*	*2019*	*2020*
Ozone				
Highest 1 Hour Average (ppm)	0.09	**0.111**	0.073	0.088
Highest 8 Hour Average (ppm)	0.070	**0.088**	0.070	**0.078**
Particulate Matter (PM10)				
Highest 24-Hour Average (mg/m^3)	50	**161**	42.3	**108**
State Annual Average (mg/m^3)	20	**24.3**	14.6	**23.6**
Particulate Matter (PM2.5)				
Highest 24-Hour Average (mg/m^3)	35	**131**	24.1	**68.3**
State Annual Average (mg/m^3)	12	**15.9**	6.7	10.2

[12] The nearest sensitive receptors (i.e., school, residence) are approximately 3,000 feet to the south of the project site and 4,300 feet to the north of the project site. Calvary Chapel-Burney Falls is approximately 3,500 feet to the south of the project site. Great Shasta Rail trail is located along the eastern boundary of the site.

*Notes: Values in **bold** are in excess of at least one applicable standard.*
Generally, State and national standards are not to be exceeded more than once per year.
ppm = parts per million; mg/m³ = micrograms per cubic meter.
PM_{10} is not measured every day of the year. Number of estimated days over the standard is based on 365 days per year.
Source: California Air Resources Board, Air Quality Data Statistics, https://www.arb.ca.gov/adam/index.html

The State one-hour ozone standard as well as State and National eight-hour ozone standards were exceeded in 2018 and 2020. The State 24-hour PM_{10} standard was exceeded in 2018 and 2020 and the State annual PM_{10} standard was exceeded in 2018 and 2020. The National 24-hour $PM_{2.5}$ standard was exceeded in 2018 and 2020 and the State annual $PM_{2.5}$ standard was exceeded in 2018. PM_{10} and $PM_{2.5}$ concentrations in 2018 and 2020 may have been adversely affected by wildfires.

Nearby Sensitive Receptors

Land uses such as schools, children's daycare centers, hospitals, and convalescent homes are more sensitive than the public to poor air quality because the population groups associated with these uses have increased susceptibility to respiratory distress. Persons engaged in strenuous work or exercise also have increased sensitivity to poor air quality. CARB has identified the following people as most likely to be affected by air pollution: children less than 14 years of age, the elderly over 65 years of age, athletes, and those with cardiovascular and chronic respiratory diseases. These groups are classified as sensitive population groups.

Residential areas are considered more sensitive to air quality conditions than commercial and industrial areas because people generally spend longer periods of time at their residences, resulting in greater exposure to ambient air quality conditions. Recreational uses are also considered sensitive, due to the greater exposure to ambient air quality conditions and because the presence of pollution detracts from the recreational experience. No schools, daycare facilities, or residential units are within 1,000 feet for the asphalt plant.

5.0 REGULATORY CONTEXT

USEPA has established the National Ambient Air Quality Standards (NAAQS) under the federal Clean Air Act (CAA) for six common air pollutants known as "criteria air pollutants."[13] These air pollutants consist of CO, NO_2, ozone (O_3), particulate matter (PM_{10} and $PM_{2.5}$), SO_2, and lead (Pb). An ambient air quality standard establishes the concentration above which the pollutant is known to cause adverse health effects to sensitive groups within the population such as children and the elderly. Ambient air quality standards are classified as either "primary" or "secondary" standards. Primary standards define levels of air quality,

[13] United States Environmental Protection Agency, Six Common Air Pollutants, https://www.epa.gov/criteria-air-pollutants

including an adequate margin of safety, necessary to protect the public health. Secondary ambient air quality standards define levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant. The ambient air quality standards are shown in **Table 2: State and National Criteria Air Pollutant Standards, Effects, and Sources**.

Under the federal CAA, USEPA designates air basins where NAAQS are exceeded as “non-attainment” areas. If standards are met, the area is designated as an “attainment” area. If there are inadequate or inconclusive data to make a definitive attainment designation, they are considered “unclassified.” Areas where air pollution levels persistently exceed the State or national ambient air quality standards are designated "non-attainment.” Federal non-attainment areas are further designated as marginal, moderate, serious, severe, or extreme as a function of deviation from standards.

In 1994, the air districts in the Northern Sacramento Valley Planning Area (NSVPA), which includes the SCAQMD jurisdiction, prepared an Air Quality Attainment Plan for ozone. This plan was updated in 1997, 2000, 2003, 2006, 2009, 2012, 2015 and again in 2018. Like the preceding plans, the 2018 plan focuses on the adoption and implementation of control measures for stationary sources, area-wide sources, indirect sources, and public information and education programs. The 2018 plan also addresses the effect that pollutant transport has on the NSVPA’s ability to meet and attain the state standards. The Air Quality Attainment Plan provides local guidance for air basins to achieve attainment of ambient air quality standards. Areas that meet ambient air quality standards are classified as attainment areas, while areas that do not meet these standards are classified as non-attainment areas. Areas for which there is insufficient data available are designated unclassified. The region is in non-attainment for the state ozone standard.

CARB manages air quality, regulates mobile emissions sources, and oversees the activities of county and regional Air Pollution Control Districts and Air Quality Management Districts. CARB regulates local air quality indirectly by establishing State ambient air quality standards and vehicle emissions and fuel standards; and by conducting research, planning and coordinating activities. California has adopted ambient standards (known as California Ambient Air Quality Standards or CAAQS) that are more stringent than the federal standards for some criteria air pollutants. Under the California CAA patterned after the federal CAA, areas have been designated as attainment or non-attainment with respect to the State standards.

Table 2
State and National Criteria Air Pollutant Standards, Effects, and Sources

Pollutant	Averaging Time	State Standard	National Standard	Pollutant Health and Atmospheric Effects	Major Pollutant Sources
Ozone	1 Hour 8 Hour	0.09 ppm 0.07 ppm	– 0.070 ppm	High concentrations can directly affect lungs, causing irritation. Long–term exposure may cause damage to lung tissue.	Formed when reactive organic gases and nitrogen oxides react in the presence of sunlight. Major sources include on–road motor vehicles, solvent evaporation, and commercial / industrial mobile equipment.
Carbon Monoxide (CO)	1 Hour 8 Hour	20 ppm 9.0 ppm	35 ppm 9.0 ppm	Classified as a chemical asphyxiant, carbon monoxide interferes with the transfer of fresh oxygen to the blood and deprives sensitive tissues of oxygen.	Internal combustion engines, primarily gasoline–powered motor vehicles.
Nitrogen Dioxide (NO_2)	1 Hour Annual	0.18 ppm 0.03 ppm	0.10 ppm 0.053 ppm	Irritating to eyes and respiratory tract. Colors atmosphere reddish–brown.	Motor vehicles, petroleum–refining operations, industrial sources, aircraft, ships, and railroads.
Sulfur Dioxide (SO_2)	1 Hour 3 Hour 24 Hour Annual	0.25 ppm – 0.04 ppm –	0.075 ppm 0.5 ppm 0.14 ppm 0.030 ppm	Irritates upper respiratory tract; injurious to lung tissue. Can yellow the leaves of plants, destructive to marble, iron, and steel. Limits visibility and reduces sunlight.	Fuel combustion, chemical plants, sulfur recovery plants, and metal processing.
Coarse Particulate Matter (PM_{10})	24 Hour Annual	50 µg/m^3 20 µg/m^3	150 µg/m^3 –	May irritate eyes and respiratory tract, decreases in lung capacity, cancer and increased mortality. Produces haze and limits visibility.	Dust and fume–producing industrial and agricultural operations, combustion, atmospheric photochemical reactions, and natural activities (e.g., wind–raised dust and ocean sprays).
Fine Particulate Matter ($PM_{2.5}$)	24 Hour Annual	– 12 µg/m^3	35.0 µg/m^3 12.0 µg/m^3	Increases respiratory disease, lung damage, cancer, and premature death. Reduces visibility and results in surface soiling.	Fuel combustion in motor vehicles, equipment, and industrial sources; residential and agricultural burning; Also, formed from photochemical reactions of other pollutants, including nitrogen oxides, sulfur oxides, and organics.
Lead (Pb)	Month Rolling 3 Month	1.5 µg/m^3 –	– 0.15 µg/m^3	Disturbs gastrointestinal system, and causes anemia, kidney disease, and neuromuscular and neurological dysfunction.	Present sources: lead smelters, battery manufacturing & recycling facilities. Past source: combustion of leaded gasoline.

Source: Air Quality Standards, https://ww2.arb.ca.gov/resources/background-air-quality-standards

Shasta County Air Quality Management District

The SCAQMD is designated by law to adopt and enforce regulations to achieve and maintain ambient air quality standards. The SCAQMD, along with other air districts in the NSVAB, has committed to jointly prepare the NSVAB Air Quality Attainment Plan for the purpose of achieving and maintaining healthful air quality throughout the air basin. In addition, the SCAQMD adopts and enforces controls on stationary sources of air pollutants through its permit and inspection programs, and it regulates agricultural burning. Other responsibilities include monitoring air quality, preparing clean air plans, and responding to citizen complaints concerning air quality. All projects in Shasta County are subject to applicable SCAQMD rules and regulations in effect at the time of construction. Descriptions of specific rules applicable to future construction resulting from implementation of the proposed project may include, but are not limited to:

- SCAQMD Rule 2:1A, Authorities to Construct/Permits to Operate, allows any person to use construction equipment for construction activities, and must obtain a permit to operate prior to installation activities. The purpose of this Rule is to establish pre-construction review requirements for new and modified stationary sources of air pollution for use of Best Available Control Technology (BACT), analysis of air quality impacts, and to ensure that the operation of such sources does not interfere with the attainment or maintenance of ambient air quality standards. This Rule shall apply to all new and modified stationary sources that are subject to District permit requirements, and after construction, emit or may emit any affected pollutants. An application would need to be submitted along with all pertinent information before a complete evaluation can be completed for this project.

- SCAQMD Rule 2:2, Emissions Reduction Credit and Banking Rule, provides for a mechanism for permitted and non-permitted emissions sources to deposit, transfer, and use emission reduction credits (ERCs) as offsets as allowed by applicable laws and regulations. The provisions of Rule 2:2 apply to the deposit, transfer, and use of ERCs from stationary sources and open biomass burning sources of air pollution emissions. ERCs are typically required when stationary source pollutants exceed 25 tons per year.

- SCAQMD Rule 3:2, Specific Air Contaminants, controls the amount of air contaminants allowed to be discharged into the atmosphere.

- SCAQMD Rule 3:15, Cutback and Emulsified Asphalt, requires cutback and emulsified asphalt application to be conducted in accordance with Rule 3:15.

- SCAQMD Rule 3:16, Fugitive, Indirect, or Non-Traditional Sources, controls the emission of fugitive dust during earth-moving, construction, demolition, bulk storage, and conditions resulting in wind erosion.

- SCAQMD Rule 3:28, Stationary Internal Combustion Engines, limits the emissions of NO_x and CO from stationary internal combustion engines.

- SCAQMD Rule 3:31, Architectural Coatings, controls the architectural coatings and solvents used at the project site.

- SCAQMD Rule 3:32, Adhesives and Sealants, limits the emissions of VOC from adhesives and sealants and associated primers, and from related surface preparation solvents, cleanup solvents, and strippers.

Shasta County General Plan

The Shasta County General Plan, as amended through September 2004, provides the following air quality objectives and policies relative to the proposed project:

> AQ-1. To protect and improve the County's air quality in accordance with Federal and State clean air laws in order to: (1) safeguard human health, and (2) minimize crop, plant, and property damage.
>
> AQ-2c. Land use decisions, where feasible, should contribute to the improvement of air quality. New projects shall be required to reduce their respective air quality impacts to below levels of significance or proceed as indicated in Policy AQ-2e.
>
> AQ-2d. Shasta County shall ensure that air quality impacts identified during CEQA review are: (1) consistently and fairly mitigated, and (2) mitigation measures are feasible.
>
> AQ-2e. Shasta County will cooperate with the AQMD in assuring that new projects with stationary sources of emissions of non-attainment pollutants or their precursors that exceed 25 tons per year shall provide appropriate emission offsets. A comparable program which offsets indirect emissions of these pollutants exceeding 25 tons per year from development projects shall also be utilized to mitigate air pollution impacts. An Environmental Impact Report will be required for all projects that have unmitigated emissions of non-attainment pollutants exceeding 25 tons per year.

AQ-2f. Shasta County shall require appropriate Standard Mitigation Measures and Best Available Mitigation Measures on all discretionary land use applications as recommended by the AQMD in order to mitigate both direct and indirect emissions of non-attainment pollutants.

AQ-2g. Significance thresholds as proposed by the AQMD for emissions shall be utilized when appropriate for: (1) ROG and NO_x, both of which are precursors of ozone, and (2) PM_{10} in determining mitigation of air quality impacts.

Criteria Air Pollutants

The following provides a summary of the potential health and welfare effects and typical sources of each of the criteria air pollutants and air toxics.

Ozone

Ozone is a respiratory irritant and an oxidant that increases susceptibility to respiratory infections and that can cause substantial damage to vegetation and other materials. O_3 is not emitted directly into the atmosphere but is a secondary air pollutant produced in the atmosphere through a complex series of photochemical reactions involving VOC and NO_x. VOC and NO_x are known as precursor compounds for O_3. Substantial ozone production generally requires O_3 precursors to be present in a stable atmosphere with strong sunlight for approximately three hours. O_3 is a regional air pollutant because it is not emitted directly by sources but is formed downwind of sources of VOC and NO_x under the influence of wind and sunlight. O_3 concentrations tend to be higher in the late spring, summer, and fall, when long sunny days combine with regional air subsidence inversions to create conditions conducive to the formation and accumulation of secondary photochemical compounds.

Ozone can also be transported long distances by wind. For this reason, even rural areas can experience high ozone levels. In the NSVPA, ozone is a seasonal problem typically occurring during the months of May through October. Sources of NO_x and ROG emissions include motor vehicles, power plants, factories, chemical solvents, combustion products from various fuels, and consumer products.

The NSVPA experiences transport ozone from the Sacramento Area. Emissions that were originally created in the Broader Sacramento Area can be transported northward via prevailing winds to affect the pollution levels of the NSVPA. On most summer days, the so-called “delta breeze” blows from the Carquinez Strait northeast towards Sacramento. Reaching Sacramento, the delta breeze turns northward and continues into the northern Sacramento Valley and the foothills of the northern Sierra Nevada. It is possible under the right conditions that Bay Area emissions could also be carried to the Northern Sacramento Valley and to the foothills of the northern Sierra Nevada. The impacts of transported Broader Sacramento Area air pollution to districts in the Upper Sacramento Valley are variable.

Transport from the Sacramento Area dominates the air quality in the Upper Sacramento Valley, as far north as Butte and Tehama counties. However, violations in Shasta County, at the northern end of the Sacramento Valley, are occasionally entirely due to local emissions, sometimes entirely due to transport, and sometimes a mixture of both.

Carbon Monoxide

CO is a nonreactive pollutant that is a product of incomplete combustion of organic material, and is mostly associated with motor vehicle traffic, and in wintertime, with wood–burning stoves and fireplaces. High CO concentrations develop primarily during winter when periods of light winds combine with the formation of ground–level temperature inversions (typically from the evening through early morning). These conditions result in reduced dispersion of vehicle emissions. Motor vehicles also exhibit increased CO emission rates at low air temperatures.

When inhaled at high concentrations, CO combines with hemoglobin in the blood and reduces its oxygen-carrying capacity, resulting in reduced levels of oxygen reaching the brain, heart, and other body tissues. This condition is especially critical for people with cardiovascular diseases, chronic lung disease, or anemia. CO measurements and modeling were important in the early 1980s when CO levels were regularly exceeded throughout California, but in more recent years, CO measurements and modeling are not a priority in most California air districts due to the retirement of older vehicles, fewer emissions from new vehicles, and improvements to fuels.

Nitrogen Oxides

When combustion temperatures are extremely high, as in aircraft, truck and automobile engines, atmospheric nitrogen combines with oxygen to form various oxides of nitrogen. Nitric oxide (NO) and NO_2 are the most significant air pollutants generally referred to as NO_x. Nitric oxide is a colorless and odorless gas that is relatively harmless to humans, quickly converts to NO_2 and can be measured. Nitrogen dioxide has been found to be a lung irritant capable of producing pulmonary edema. Inhaling NO_2 can lead to respiratory illnesses such as bronchitis and pneumonia.

Volatile Organic Compounds

VOC means any compound of carbon, excluding carbon monoxide, carbon dioxide (CO_2), carbonic acid, metallic carbides or carbonates, and ammonium carbonate, which participates in atmospheric photochemical reactions and thus, a precursor of ozone formation. VOC are any reactive compounds of carbon, excluding methane, CO, CO_2, carbonic acid, metallic carbides or carbonates, ammonium carbonate, and other exempt compounds.

VOC include a variety of chemicals, some of which may have short- and long-term adverse health effects. VOC are emitted by a wide array of products numbering in the thousands. Examples include paints and lacquers, paint strippers, cleaning supplies, building materials and furnishings, as well as fuel storage and use.

VOC can cause eye, nose, and throat irritation; headaches, loss of coordination, nausea; and damage to the liver, kidney, and central nervous system. Some organics can cause cancer in animals; some are suspected or known to cause cancer in humans. The ability of organic chemicals to cause health effects varies greatly from those that are highly toxic, to those with no known health effect. As with other pollutants, the extent and nature of the health effect will depend on many factors including level of exposure and length of time exposed. Eye and respiratory tract irritation, headaches, dizziness, visual disorders, and memory impairment are among the immediate symptoms that some people have experienced soon after exposure to some organics.

Particulate Matter

PM_{10} and $PM_{2.5}$ consist of airborne particles that measure 10 micrometers or less in diameter and 2.5 micrometers or less in diameter, respectively. PM_{10} and $PM_{2.5}$ represent fractions of particulate matter that can be inhaled into the air passages and the lungs, causing adverse health effects. Particulate matter in the atmosphere results from many kinds of dust- and fume-producing industrial and agricultural operations, fuel combustion, wood burning stoves and fireplaces, and atmospheric photochemical reactions. Some sources of particulate matter, such as demolition, construction activities and mining, are more local in nature, while others such as vehicular traffic and wood burning stoves and fireplaces, have a more regional effect.

Very small particles of certain substances (e.g., sulfates and nitrates) can cause lung damage directly, or can contain adsorbed gases (e.g., chlorides or ammonium) that may be injurious to health. Particulates can also damage materials and reduce visibility. Dust comprised of large particles (diameter greater than 10 micrometers) settles out rapidly and is easily filtered by human breathing passages. This dust is of concern more as a soiling nuisance rather than a health hazard. The remaining fractions, PM_{10} and $PM_{2.5}$, are a health concern particularly at levels above the federal and California ambient air quality standards. $PM_{2.5}$ (including diesel exhaust particles) is thought to have greater effects on health, because these particles are so small and thus penetrate to the deepest parts of the lungs.

Acute and chronic health effects associated with high particulate levels include the aggravation of chronic respiratory diseases, heart and lung disease, coughing, bronchitis, and respiratory illnesses in children. Mortality studies since the 1990s have shown a statistically significant direct association between mortality (premature deaths) and daily concentrations of particulate matter in the air. Despite important gaps in scientific knowledge and continued reasons for some skepticism, a comprehensive evaluation of the research findings provides persuasive evidence that exposure to fine particulate air pollution has adverse effects on cardiopulmonary health. The CARB has estimated that achieving the ambient air quality standards for PM_{10} could reduce premature mortality rates by 6,500 cases per year.

Sulfur Dioxide

SO_2 is a combustion product of sulfur or sulfur–containing fuels such as coal and diesel. SO_2 is also a precursor to the formation of atmospheric sulfate and particulate matter and contributes to potential atmospheric sulfuric acid formation that could precipitate downwind as acid rain.

Lead

Ambient lead concentrations meet both the federal and State standards in the Project area. Lead has a range of adverse neurotoxin health effects and was released into the atmosphere via leaded gasoline products. The phase-out of leaded gasoline in California has resulted in dramatically decreased levels of atmospheric lead. Metal processing is currently the primary source of lead emissions in the SCAB. The highest concentrations of lead in air are generally found near lead smelters and general aviation airports, where piston aircraft use leaded fuel. Other stationary sources that generate lead emissions include waste incinerators, utilities, and lead-acid battery manufacturers. The maximum lead concentrations recorded in the Project area are below federal and California standards. Notably, diesel fuel does not contain lead emissions and gasoline fuel is unleaded.

Toxic Air Contaminants

Non-criteria air pollutants or toxic air contaminants are airborne substances that can cause short-term (acute) and/or long-term (chronic or carcinogenic, i.e., cancer causing) adverse human health effects (i.e., injury or illness). TAC includes both organic and inorganic chemical substances. They may be emitted from a variety of common sources including gasoline stations, automobiles, dry cleaners, industrial operations, and painting operations. The current California list of TAC includes approximately 240 compounds, including particulate emissions from diesel-fueled engines and asbestos.

In August of 1998, CARB identified particulate emissions from diesel-fueled engines as TAC. CARB developed the *Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles*[14]

[14] California Air Resources Board, Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles, October 2000, Report: 2000-10-00 Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles (ca.gov)

and *Risk Management Guidance for the Permitting of New Stationary Diesel-Fueled Engines.*[15] The document represents a proposal to reduce diesel particulate emissions, with the goal to reduce emissions and the associated health risk by 75 percent in 2010 and 85 percent in 2020. The program aims to require the use of state-of-the-art catalyzed diesel particulate filters and ultra-low sulfur diesel fuel on diesel-fueled engines.

DPM is the most complex of diesel emissions. Diesel particulates, as defined by most emission standards, are sampled from diluted and cooled exhaust gases. This definition includes both solid and liquid material that condenses during the dilution process. The basic fractions of DPM are elemental carbon; heavy hydrocarbons derived from the fuel and lubricating oil and hydrated sulfuric acid derived from the fuel sulfur. DPM contains a large portion of the polycyclic aromatic hydrocarbons (PAH) found in diesel exhaust. Diesel particulates include small nuclei particles of diameters below 0.04 micrometers (µm) and their agglomerates of diameters up to 1 µm. DPM is a major factor in total TAC exposure in California.

California State law defines TAC as air pollutants having carcinogenic effects. A total of 243 substances have been designated as TAC under California law; they include the 187 (federal) hazardous air pollutants (HAP) adopted in accordance with AB 2728. The Air Toxics "Hot Spots" Information and Assessment Act of 1987 (AB 2588) seeks to identify and evaluate risk from air toxics sources, but AB 2588 does not regulate air toxics emissions. TAC emissions from individual facilities are quantified and prioritized. Depending on the risk levels, emitting facilities are required to implement varying levels of risk reduction measures.

6.0 THRESHOLDS OF SIGNIFICANCE

The significance of potential impacts was determined based on State CEQA Guidelines, Appendix G, and the SCAQMD's *Protocol for Review, Land Use Permitting Activities, Procedures for Implementing the California Environmental Quality Act*.[16] Using Appendix G evaluation thresholds, the proposed project would be considered to have significant air quality impacts if it were to:

A. Conflict with or obstruct implementation of the applicable air quality plan;

B. Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard;

[15] California Air Resources Board, Risk Management Guidance for the Permitting of New Stationary Diesel-Fueled Engines, October 2000, https://ww2.arb.ca.gov/sites/default/files/classic/diesel/documents/rmgfinal.pdf

[16] Shasta County Air Quality Management District, *Protocol for Review, Land Use Permitting Activities, Procedures for Implementing the California Environmental Quality Act*, November 2003, https://www.co.shasta.ca.us/docs/libraries/resource-management-docs/aq-docs/scaqmd-ceqa-land-use-protocol.pdf

C. Expose sensitive receptors to substantial pollutant concentrations; or

D. Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people.

The thresholds of significance applied to assess project-level air quality impacts are:

- Daily emissions of 25 pounds per day of ROG and NO_x and 80 pounds per day of PM_{10} (Level A)
- Daily emissions of greater than 137 pounds per day of ROG, NO_x, and PM_{10} (Level B)
- Exposure of persons by siting a new source or a new sensitive receptor to substantial levels of TAC resulting in (a) a cancer risk level greater than 10 in one million and (b) a noncancerous risk (chronic or acute) hazard index greater than 1.0. For this threshold, sensitive receptors include residential uses, schools, parks, daycare centers, nursing homes, medical centers, and offsite workers
- Frequently and for a substantial duration, create or expose sensitive receptors to substantial objectionable odors affecting a substantial number of people

These thresholds are consistent with New Source Review Rule 2:1 adopted by the SCAQMD Board in 1993 as required by the California CAA. If the project's indirect and area wide emissions are greater than the Level A thresholds but less than Level B thresholds, appropriate Level A mitigation is required to be implemented by the project applicant. If the project's indirect and area wide emissions are above the Level B threshold of 137 pounds per day after applying all feasible mitigation measures, the project would be considered to have a significant impact from an air quality perspective.

The SCAQMD and the Shasta County General Plan recommend that projects apply Standard Mitigation Measures (SMM) and appropriate Best Available Mitigation Measures (BAMM) when a project exceeds Level A thresholds and that projects apply SMM, BAMM, and special BAMM when a project exceeds Level B thresholds. Projects that cannot mitigate emissions to levels below the Level B thresholds are considered significant.

7.0 MITIGATION MEASURES

The following mitigation measures describe several specific actions to reduce construction combustion and fugitive dust emissions. Application of SMM is required in order to strive toward the General Plan policy of a 20 percent reduction in emissions to address small-scale cumulative effects. SMM applicable to this proposed project address primarily short-term impacts related to construction and are standard development regulations promulgated in California Building Code.

1. Nontoxic soil stabilizers shall be applied according to manufacturer's specification to all inactive construction areas (previously graded areas inactive for ten days or more).

2. All grading operations shall be suspended when winds (as instantaneous gusts) exceed 20 miles per hour.

3. Temporary traffic control shall be provided as appropriate during all phases of construction to improve traffic flow (e.g., flag person).

4. Construction activities that could affect traffic flow shall be scheduled in off-peak hours.

5. Active construction areas, haul roads, etc., shall be watered at least twice daily or more as needed to limit dust.

6. Exposed stockpiles of soil and other backfill material shall either be covered, watered, or have soil binders added to inhibit dust and wind erosion.

7. All truck hauling solid and other loose material shall be covered or should maintain at least two feet of freeboard (i.e., minimum vertical distance between top of the load and the trailer). This provision is enforced by local law enforcement agencies.

8. All public roadways used by the project contractor shall be maintained free from dust, dirt, and debris caused by construction activities. Streets shall be swept at the end of the day if visible soil materials are carried onto adjacent public paved roads. Wheel washers shall be used where vehicles enter and exit unpaved roads onto paved roads, or trucks and any equipment shall be washed off leaving the site with each trip.

9. All vehicle speeds on unpaved surfaces shall be limited to 15 miles per hour.

10. All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible. Building pads shall be laid as soon as possible after grading unless seeding or soil binders are used.

11. A publicly visible sign shall be posted with the telephone number and person to contact at the Lead Agency regarding dust complaints. This person shall respond and take corrective action with 48 hours. The Air District’s phone number shall also be visible to ensure compliance with applicable regulations.

12. Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to five minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations). Clear signage shall be provided for construction workers at all access points.

13. All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified mechanic and determined to be running in proper condition prior to operation.

14. Where access to alternative sources of power are available, portable diesel engines shall be prohibited.

15. All off-road equipment larger than 50 horsepower shall have engines that meet or exceed USEPA or CARB Tier 3 off-road emission standards and Level 3 Diesel Particulate Filters. Other measures may be the use of added exhaust devices, or a combination of measures, provided that these measures are approved by the agency and demonstrated to reduce community risk impacts to less than significant.

16. Haul truck shall be 2010 model year trucks or newer (a gross vehicle weight rating of at least 14,001 pounds), or best commercially available equipment, which meet CARB's 2010 engine emissions standards at 0.01 g/hp-hour of particulate matter and 0.20 g/hp-hour of NO_x emissions or newer, cleaner trucks.

17. The VOC architectural coating limits specify that the use paints and solvents with a VOC content of 100 grams per liter or less for interior and 150 grams per liter or less for exterior surfaces shall be required.

8.0 CONSTRUCTION AIR EMISSIONS INVENTORY

Intermittent (short-term construction emissions that occur from activities, such as site-grading, paving, and building construction) air quality impacts related to the proposed project were evaluated. The emissions generated from these construction activities include:

- Dust (including PM_{10} and $PM_{2.5}$) primarily from "fugitive" sources (i.e., emissions released through means other than through a stack or tailpipe) such as material handling and travel on unpaved surfaces; and

- Combustion exhaust emissions of criteria air pollutants (ROG, NO_x, CO, PM_{10}, and $PM_{2.5}$) primarily from operation of heavy off-road construction equipment, haul trucks, (primarily diesel-operated), and construction worker automobile trips (primarily gasoline-operated).
- VOC as ROG primarily from “fugitive” sources such as architectural coating and paving.

Construction-related fugitive dust emissions would vary from day to day, depending on the level and type of activity, silt content of the soil, and the weather. High winds (greater than 10 miles per hour) occur infrequently in the area, less than two percent of the time. In the absence of mitigation, construction activities may result in significant quantities of dust, and as a result, local visibility and PM_{10} concentrations may be adversely affected on a temporary and intermittent basis during construction. In addition, the fugitive dust generated by construction would include not only PM_{10}, but also larger particles, which would fall out of the atmosphere within several hundred feet of the site and could result in nuisance-type impacts.

Erosion control measures and water programs are typically undertaken to minimize these fugitive dust and particulate emissions. A dust control efficiency of over 50 percent due to daily watering and other measures (e.g., limiting vehicle speed to 15 mph, management of stockpiles, screening process controls, etc.) was used. One water application per day reduces fugitive dust by 34 percent, two water applications per day reduces fugitive dust by 55 percent, and three water applications per day reduces fugitive dust by 61 percent.

Construction of the bioenergy facility is anticipated to occur over 18 months to two years. Construction is expected to commence with excavation, foundation, and substructure activities from April of 2023 through June of 2023, followed by creation of superstructure frame and external envelope from June of 2023 through September of 2023. The installation of gasifier and combustion chamber would occur from October of 2023 through June of 2024, followed by plant, process pipework, and electrical (as well as drainage, control room, and office) from April of 2024 through September of 2024. Plant commissioning would occur from September of 2024 through March of 2025. Typically, for the bioenergy facility, construction activities would occur between 6 a.m. and 10 p.m. (14 hours per day), on Monday through Saturday. Construction would include 24 onsite employees each day; each traveling 12 miles per one-way trip.

Construction of the wood products operation would require mainly grading and paving and is anticipated to take six months (April of 2023 through August of 2023). Typically, for the wood products operations, construction activities would occur for 12 hours per day on Monday through Friday. Construction would include 24 onsite employees each day; each traveling 12 miles per one-way trip.

Table 3: Daily Unmitigated Construction Emissions for Proposed Project shows the estimated daily unmitigated emissions for construction related emissions (including combustion engine and fugitive dust emissions) for the proposed project. The total construction emissions as well as the contribution from employee vehicle trips, pickup/delivery trucks, haul trucks, and off-road equipment are presented. The off-road equipment represents the largest contribution to the total construction emissions. The daily unmitigated NO_x construction emissions would potentially exceed the SCAQMD thresholds of significance (Level A) during 2023. The daily unmitigated PM_{10} construction emissions would potentially exceed the SCAQMD thresholds of significance (Level B) during 2023. Therefore, appropriate mitigation measures are required (such as USEPA and CARB Tier 3 or better engine emissions standards for off-road diesel-powered construction equipment with more than 50 horsepower and periodic watering).

Table 3
Daily Unmitigated Construction Emissions (pounds) for Proposed Project

Emission Source	ROG	CO	NO_x	PM_{10}	$PM_{2.5}$
2023					
Employee Vehicles	0.04	2.45	0.19	0.04	0.01
Off-road Equipment Onsite	3.36	28.6	31.2	1.08	0.99
Offsite Haul Trucks	0.02	0.09	1.18	0.16	0.07
Onsite Paving	3.42	29.0	34.6	10.9	5.03
Fugitive Dust				140	29.4
Total	**6.83**	**60.1**	**67.1**	**152**	**35.5**
Significance Thresholds (Level A)	25	-	25	80	-
Significance Thresholds (Level B)	137	-	137	137	-
2024					
Employee Vehicles	0.02	1.23	0.09	0.02	0.01
Off-road Equipment Onsite	2.57	21.9	22.5	0.75	0.69
Offsite Haul Trucks	0.02	0.09	1.18	0.16	0.07
Total	**2.60**	**23.2**	**23.8**	**0.94**	**0.77**
Significance Thresholds (Level A)	25	-	25	80	-
Significance Thresholds (Level B)	137	-	137	137	-

Source: RCH Group, 2021

Table 4: Daily Mitigated Construction Emissions for Proposed Project shows the estimated daily mitigated emissions for construction related emissions (including combustion engine and fugitive dust emissions) for the proposed project. Despite mitigation, the NOx emissions would be above the SCAQMD Level "A" threshold (Level A) during 2023. However, while an exceedance of the level "A" threshold must be addressed through the application of appropriate Standard Mitigation Measures (SMM) and Best Available Mitigation Measures (BAMM) in accordance with the Shasta County General Plan, the level "A" threshold is not used to determine whether the impact is significant or adequately mitigated to a less-than-significant level.

In accordance with the General Plan projects can be determined to have been adequately mitigated to a less-than-significant level provided that after SMM, BAMM, and, if the level "B" thresholds are exceeded, special BAMM have been appropriately applied and as a result project emissions levels are reduced below the level "B" thresholds. After mitigation, PM_{10} emissions are reduced below the level "B" threshold and therefore, are also less than significant.

Table 4

Daily Mitigated Construction Emissions (pounds) for Proposed Project

Emission Source	ROG	CO	NO_x	PM_{10}	$PM_{2.5}$
2023					
Employee Vehicles	0.04	2.45	0.19	0.04	0.01
Off-road Equipment Onsite	1.85	37.2	29.6	0.22	0.20
Offsite Haul Trucks	0.02	0.09	1.18	0.16	0.07
Onsite Paving	2.30	37.4	30.0	4.04	1.69
Fugitive Dust				35.0	7.35
Total	**4.20**	**77.2**	**61.0**	**39.5**	**9.32**
Significance Thresholds (Level A)	25	-	25	80	-
Significance Thresholds (Level B)	137	-	137	137	-
2024					
Employee Vehicles	0.02	1.23	0.09	0.02	0.01
Off-road Equipment Onsite	1.41	28.5	21.4	0.15	0.14
Offsite Haul Trucks	0.02	0.09	1.18	0.16	0.07
Total	**1.45**	**29.8**	**22.7**	**0.33**	**0.21**
Significance Thresholds (Level A)	25	-	25	80	-
Significance Thresholds (Level B)	137	-	137	137	-

Source: RCH Group, 2021

Using standard fuel consumption estimates, construction activities associated with employee trips would require approximately 14,985 gallons of gasoline fuel.[17] Construction activities associated with off-road equipment would require approximately 211,285 gallons of diesel fuel.[18] Construction activities associated with haul truck trips would require approximately 82,380 gallons of diesel fuel.[19]

Supporting information for the construction emissions inventory are found in **Attachment A: Construction Air Emissions Inventory**.

[17] Fuel usage is estimated using the CO2 emission estimate and a 8.91 kgCO2/gallon conversion factor for gasoline fuel,, https://www.epa.gov/sites/production/files/2018-03/documents/emission-factors_mar_2018_0.pdf

[18] Fuel usage is estimated using the CO2 emission estimate and a 10.15 kgCO2/gallon conversion factor for diesel fuel,, https://www.epa.gov/sites/production/files/2018-03/documents/emission-factors_mar_2018_0.pdf

[19] Fuel usage is estimated using the CO2 emission estimate and a 10.15 kgCO2/gallon conversion factor for diesel fuel,, https://www.epa.gov/sites/production/files/2018-03/documents/emission-factors_mar_2018_0.pdf

Air Emission Calculation Methodology

Air emission sources include combustion exhaust from on-road vehicles such as construction worker vehicles, pickup/delivery trucks, haul trucks, and construction equipment such as backhoes, loaders, and graders.

On-Road Vehicles

Vehicular emissions were computed using the CARB's emission factor model, EMFAC, to estimate on-road emissions. Haul trucks were modeled using the T6 single construction haul truck classification, which is a heavy-heavy duty truck emission factor for public vehicles. Criteria pollutant emissions associated with on-road vehicles were calculated by combining the activity information with emissions factors, in grams per mile, derived using the EMFAC emissions model. Emissions calculations were based on **Equation 1**. The EMFAC emissions factors were developed for employee vehicles and haul trucks and include exhaust, as well as brake and tire wear.

Equation 1

*Emission Rate (tons/year) = Emission Factor (gram/mile) * trips per day * miles per trip * days/year * (453.59/2000 tons/gram)*

*Emission Rate (pounds/day) = Emission Factor (gram/mile) * trips per day * miles per trip * (1/453.59 pounds/gram)*

Table 5: Emissions Factors (gram/mile) For On-Road Vehicles displays the emission factors for employee vehicles and haul trucks. The facility construction would include six haul truck trips per day; each traveling 100 miles per one-way trip (occurring 312 days per year). Construction would include 24 onsite employees for each facility: each traveling 12 miles per one-way trip (occurring 312 days per year for the bioenergy facility and 130 days during the first six months of construction for the wood products operation.

Table 5
Emissions Factors (gram/mile) For Construction On-Road Vehicles

Vehicle Type	ROG	CO	NO_x	CO_2	CH_4	N_2O	PM_{10}	$PM_{2.5}$
Employee Vehicles	0.01	0.97	0.07	306	0.003	0.006	0.02	0.01
Haul Trucks	0.01	0.03	0.45	1,072	0.001	0.169	0.06	0.02

Source: CARB EMFAC Emissions Model.

Off-Road Equipment

Construction of the proposed project would require the use of heavy-duty equipment, such as aerial lifts, cranes, excavators, and pavers. Emission factors from the OFFROAD emissions model were used. Emissions from off-road equipment activities were estimated based on the projected activity schedule, the number of pieces of equipment, the types of equipment, equipment utilization rates, equipment horsepower, and load factor (i.e., percent of full throttle).

This information was applied to criteria air pollutant emissions factors, in grams per horsepower-hour, primarily derived using the OFFROAD emissions model. **Equation 2** outlines how off-road construction equipment emissions were computed.

Equation 2

*Emission Rate (tons/year) = Emission Factor (gram/hp-hour) * size (hp) * hours of operation per year * Load Factor * usage factor * (453.59/2000 tons/gram)*

*Emission Rate (pounds/day) = Emission Factor (gram/hp-hour) * size (hp) * hours of operation per day * Load Factor * usage factor * (1/453.59 pounds/gram)*

The emissions factors are summarized, by equipment type, within **Table 6: Emissions Factors (g/hp-hour) For Construction Off-road Equipment.** For the bioenergy facility, off-road equipment was assumed to operate 14 hours per day (occurring 274 days per year). For the wood products, off-road equipment was assumed to operate 12 hours per day (occurring 120 days within the first year of construction).

Table 6
Emissions Factors (g/hp-hour) For Construction Off-road Equipment

Project	Equipment Type	HP	Units	LF	ROG	CO	NO_x	CO_2	CH_4	PM_{10}	$PM_{2.5}$
Bioenergy	Auger	163	1	0.50	0.05	0.49	0.40	262	0.002	0.01	0.01
Bioenergy	Cranes	367	1	0.29	0.06	0.49	0.64	152	0.001	0.03	0.02
Bioenergy	Excavator	339	3	0.38	0.05	0.40	0.34	201	0.002	0.01	0.01
Bioenergy	Grader	215	2	0.41	0.12	0.53	1.32	216	0.002	0.04	0.04
Bioenergy	Off-Highway Tractor	200	1	0.44	0.06	0.46	0.41	229	0.002	0.01	0.01
Bioenergy	Off-Highway Trucks	376	2	0.38	0.07	0.46	0.51	202	0.002	0.02	0.02
Bioenergy	Aerial Lift	90	2	0.31	0.05	0.96	0.89	181	0.001	0.01	0.01
Bioenergy	Aerial Lift	93	2	0.31	0.03	0.98	0.44	163	0.001	0.01	0.01
Bioenergy	Forklift	60	1	0.20	0.06	0.73	0.60	106	0.001	0.04	0.03
Bioenergy	Paver	158	1	0.42	0.08	1.25	0.83	220	0.002	0.04	0.04
Wood Products	Grader	215	1	0.41	0.12	0.53	1.32	216	0.002	0.04	0.04
Wood Products	Paver	158	1	0.42	0.08	1.25	0.83	220	0.002	0.04	0.04
Wood Products	Roller	150	1	0.38	0.06	1.09	0.56	198	0.002	0.03	0.02
Wood Products	Water Trucks	300	1	0.38	0.07	0.46	0.51	202	0.002	0.02	0.02

Source: CARB OFFROAD Emissions Model.

Table 7: Emissions Factors for Off-Road Equipment by Engine Tier presents the mitigated emission factors for off-road diesel construction equipment.

Table 7
Emissions Factors (g/hp-hour) for Off-Road Equipment by Engine Tier

Tier	Low HP	High HP	CO	NO_X	PM_{10}	$PM_{2.5}$	ROG
Tier 3	25	49	4.1	4.63	0.28	0.28	0.29
	50	74	3.7	2.74	0.192	0.192	0.12
	75	119	3.7	2.74	0.192	0.192	0.12
	120	174	3.7	2.32	0.112	0.112	0.12
	175	299	2.6	2.32	0.088	0.088	0.12
	300	599	2.6	2.32	0.088	0.088	0.12
	600	750	2.6	2.32	0.088	0.088	0.12
	751	2000	2.6	2.32	0.088	0.088	0.12
Tier 4 Interim	25	49	4.1	4.55	0.128	0.128	0.12
	50	74	3.7	2.74	0.112	0.112	0.12
	75	119	3.7	2.14	0.008	0.008	0.11
	120	174	3.7	2.15	0.008	0.008	0.06
	175	299	2.6	1.29	0.008	0.008	0.08
	300	599	2.6	1.29	0.008	0.008	0.08
	600	750	2.6	1.29	0.008	0.008	0.08
	751	2000	2.6	2.24	0.048	0.048	0.12
Tier 4 Final	25	49	4.1	2.75	0.008	0.008	0.12
	50	74	3.7	2.74	0.008	0.008	0.12
	75	119	3.7	0.26	0.008	0.008	0.06
	120	174	3.7	0.26	0.008	0.008	0.06
	175	299	2.2	0.26	0.008	0.008	0.06
	300	599	2.2	0.26	0.008	0.008	0.06
	600	750	2.2	0.26	0.008	0.008	0.06
	751	2000	2.6	2.24	0.016	0.016	0.06

Source: CARB OFFROAD Emissions Model.

Fugitive Dust from Construction Activities

Fugitive dust emissions from site preparation, grading equipment passes, soil movement, unloading/loading of materials, and other construction-related activities is based on work performed by Midwest Research Institute. An emission factor for worst-case conditions of 0.42-ton PM_{10} per acre-month was used. Worst-case refers to construction sites with active large-scale earth moving operations appropriate for large-scale construction operations which involve substantial earthmoving operations without control measures.

Given the size of the proposed project, the emission factor for worst-case conditions of 0.42-ton PM_{10} per acre-month was used for the unmitigated condition. An emission factor of 0.11-ton PM_{10} per acre-month was used assuming a dust control effectiveness of 75 percent, which is based on the estimated control effectiveness of watering, reducing vehicle speed on unpaved surface, and other measures. The ratio of $PM_{2.5}$ to PM_{10} was assumed to be 21 percent for construction activities.[20] The bioenergy facility will be located on 10.7 acres and the wood products operation will be located on 34.0 acres. The project site will be mostly paved (asphalt or concrete) after construction. The total project site will be 0.7 acres of unpaved surfaces, 34.5 acres of paved surfaces, and 10.2 acres of gravel surfaces. Grading would produce fugitive dust during a six-month period (0.42-ton PM_{10} per acre-month times 45 acres times six months) and it was assumed that no more than five acres would be disturbed per day (0.42-ton PM_{10} per acre-month times five acres divided by 30 days).

9.0 OPERATIONAL AIR EMISSIONS INVENTORY

The air quality analysis of operations includes a review of criteria air pollutant emissions such as CO, NO_x, SO_2, VOC as ROG, coarse particulate or PM_{10}, and fine particulate or $PM_{2.5}$.

Supporting information for the operational emissions inventory is found in **Attachment B: Operational Air Emissions Inventory**. Emission sources associated with the proposed project include the bioenergy facility and wood products operation including off-road equipment and motor vehicles (employee trips, deliveries, and haul trucks).

Once construction is completed the bioenergy plant will operate 24 hours per day, seven days per week. For the bioenergy facility, approximately 12 employees will be onsite seven days per week, working 12-hour shifts. Feedstock truck deliveries will occur Monday through Friday between the hours of 6:00 a.m. and 6:00 p.m.

Wood product finishing and production operations will occur at the project site from 6:00 a.m. to 4:00 p.m. on Monday through Saturday. Approximately 2 to 4 employees will be onsite. Public drop-off hours of fuel reduction material will correspond with the public hours of the Burney Disposal Transfer Station (currently 8:00 a.m. to 4:30 p.m. on Monday, Wednesday, and Saturday).

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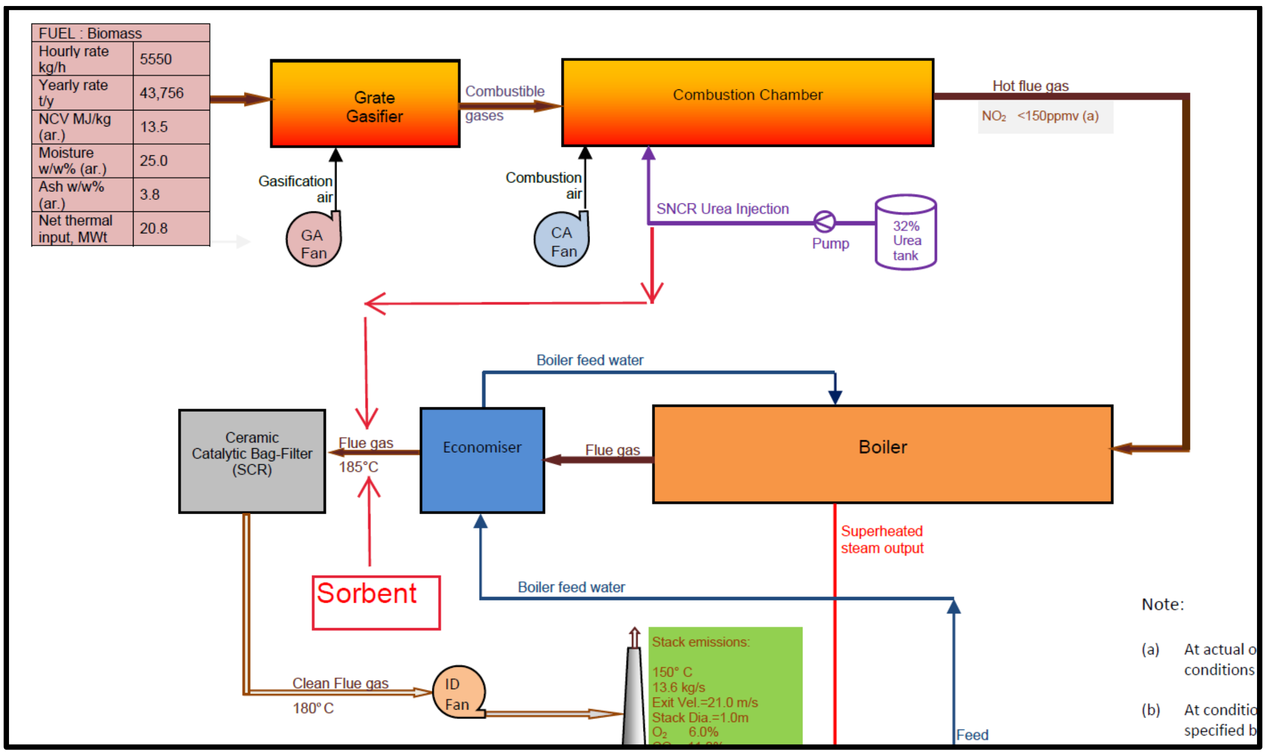
[20] Western Regional Air Partnership, *WRAP Fugitive Dust Handbook*, September 7, 2006, https://www.wrapair.org/forums/dejf/fdh/content/FDHandbook_Rev_06.pdf

Biomass Boiler

Gasification is the thermochemical conversion of woody biomass into a gas under controlled temperature and oxygen conditions; woody biomass materials are not "burned" in a gasification system. Biomass feedstock will be converted to a high calorific value wood gas in the gasifier by using clean re-circulated flue gases and the gas will then be cleaned further with Selective Non-Catalytic Reduction (SNCR), an emission control method for NOx,[21] in a thermal oxidizer to create a clean green source of heat. This gas then heats the boiler system, and its energy is exchanged for high quality steam and then the cooled gas flow is further filtered through the Ceramic Catalytic Bag Filter, which significantly reduces emissions to air. **Figure 3: Bioenergy Process Flow Diagram** shows the bioenergy process flow diagram.

Figure 3
Bioenergy Process Flow Diagram



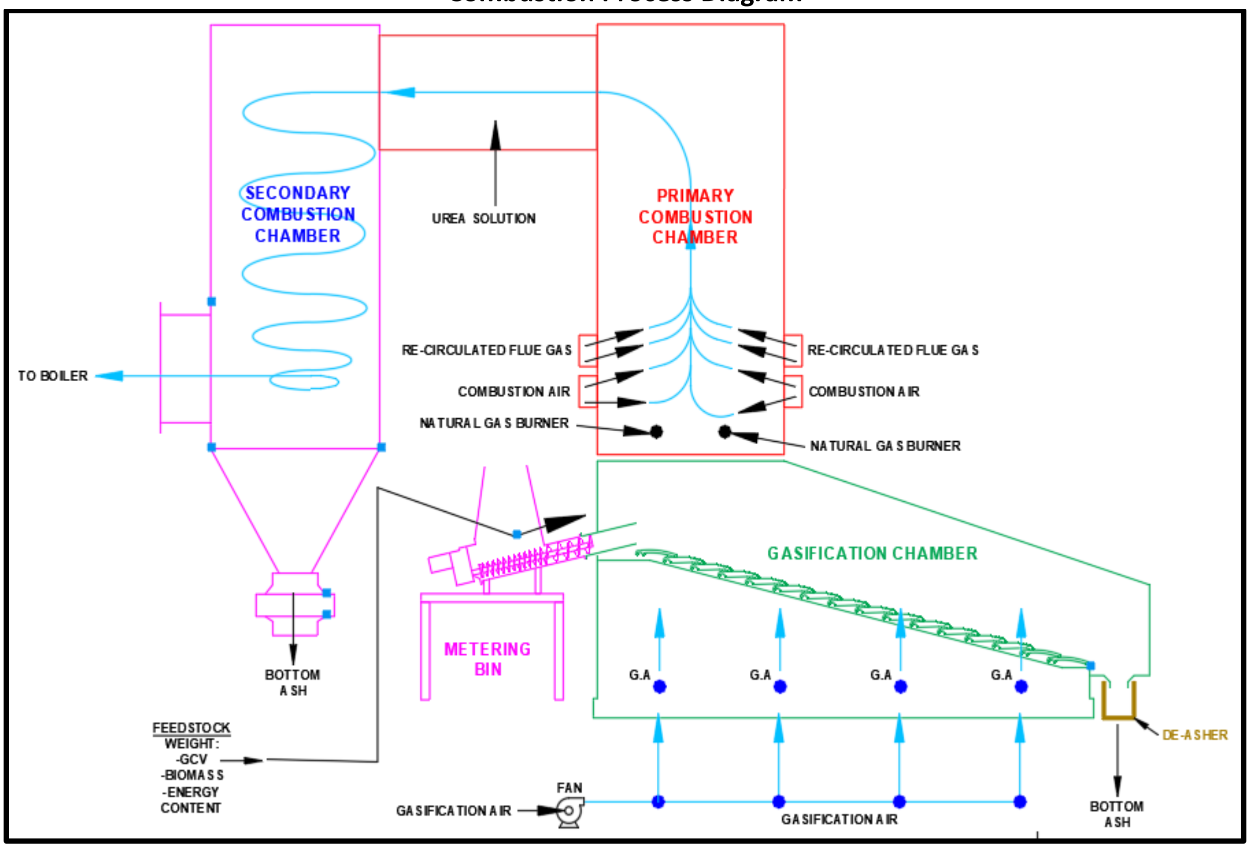
The Ceramic Catalytic Bag Filter will be located directly downstream of the boiler. A second urea injection lance will be installed, to reduce NOx emissions by 95 percent. The catalyst impregnated within the filter candle will vastly enhance the breakdown of NOx to N_2 and H_2O. The connecting ductwork between the boiler and Ceramic Catalytic Bag Filter will contain a sorbent injection port. Sorbent will be introduced to remove any acid gases present in the air stream. Furthermore, the Ceramic Catalytic Bag Filter will filter

[21] Direct urea injection inside the combustion chamber will breakdown NOx into nitrogen and water without a catalyst. The efficiency can be up to 60-70 percent depending on mixing and the temperature window.

particulate matter, unreacted sorbent and ash leaving the outlet gas stream with less than 5 mg/Nm^3 of emissions. As a result, the system is effectively a 3 in 1 device capable of removing NOx, SOx, and PM in single step.

The high-quality steam is used in a vacuum condensing turbine to produce clean and efficient power. The turbine condenses the steam to water via an air-cooled condenser which then returns the cooled water to the boiler to be reheated by the biomass gas once again into high quality steam which then repeats this closed cycle. **Figure 4: Combustion Process Diagram** shows the combustion process diagram.

Figure 4
Combustion Process Diagram



Cooling the gas and maintaining appropriate engine temperatures will be required and the facility expects to use chillers and cooling towers, as necessary. A cooling tower system will be located outside of the main energy facility building to help maintain appropriate engine temperatures. A standby diesel generator (or coupling of several smaller generators) will be allocated to the project on a centrifugal clutch and used to sustain the electrical power generation during plant downtime (for backup power to keep the essential things operating if the renewable energy system is down). Electricity produced by the facility will be sold to PG&E and nearby property owners. Ash left over from the gasification process will be transported from the site. Emissions from the boiler would be reduced using a selective catalytic reduction (SCR) converter.[22]

No flare stack is required as the process is heated with support fuel (propane) prior to start up so everything is kept at the optimum operational temperature prior to the start of gasification. A natural gas pipeline will not be required. Portable propane tanks will suffice for the start up.

Bioenergy facility equipment will include generator, hoppers, conveyers, boiler, turbine, economizer, condenser, ceramic bag filter, fan, and steam air cooling system. Bioenergy facility equipment will be located inside of a building with exception of the draft fan on the boiler. The bioenergy facility is planned to be located on a concrete pad and housed in an enclosed structure to protect the conversion system and associated equipment. The exhaust gas from the ceramic filter will be ducted to a free-standing stack at approximately 35 meters in height and one meter in diameter.

The proposed bioenergy emissions are based on continuous emissions monitoring (CEM) encompassing the period from September 2018 through September 2019 and from September 2019 through September 2021 for an existing facility in Bagnolo, Italy. The proposed project is similar to the existing facility in Italy.

(Confidential)

(Confidential)

The combustion process would also release a variety of air toxics, such as, cadmium, mercury, antimony, arsenic, lead, chromium, cobalt, copper, manganese, nickel, vanadium, dioxins, and hydrogen chloride Majority of these pollutants are released as particulate and therefore would be captured by ceramic filters. Therefore, a health risk assessment was completed.[23] The air toxics emissions are displayed within **Attachment D: Health Risk Assessment Methodology and Assumptions**.

Table 8: Hourly Emissions Rates (pounds) from Bagnolo Plant Biomass Boiler Using Continuous Emissions Monitoring Data presents the hourly emission rates (in pounds) for the proposed project

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[22] SCR is a means of converting NO_x with the aid of a catalyst into nitrogen and water. SCR are typically found on large utility boilers, industrial boilers, and municipal solid waste boilers and have been shown to reduce NO_x by up to 98 percent.

[23] The nearest sensitive receptors (i.e., school, residence) are approximately 3,000 feet to the south of the project site and 4,300 feet to the north of the project site.

biomass boiler using CEM data from the Bagnolo facility. The proposed biomass boiler would be required to acquire an Authority to Construct/Permit to Operate which may include source testing prior to startup and annually afterwards. As shown, NOx control efficiency (CE) ranged from 70 to 90 percent.[24] The reported emissions are based on CEM data from 2019 through 2021 except VOC and SO_x emissions which used annual test data (see **Table 9**).

Table 8

Hourly Emissions Rates (pounds) from Bagnolo Plant Biomass Boiler Using Continuous Emissions Monitoring Data (Confidential)

Pollutant	CEM 2018/2019	CEM 2019-2021
VOC	-	-
CO		
NO_x		
PM_{10}		
$PM_{2.5}$		
SOx	-	-

Source: Bagnolo, Italy Biomass Facility Continuous Emissions Monitoring during September 2018 through September 2019 and September 2019 through 2021. NOx emission shown as uncontrolled and controlled values.

Annual emission testing data during 2018, 2019, and 2020 for an existing facility in Bagnolo, Italy is also available. The emission rates based on the annual emissions testing data during 2018, 2019, and 2020 are found in **Table 9: Hourly Emissions Rates (pounds) from Bagnolo Plant Biomass Boiler Using Annual Emission Testing**. The emission measurement methods are similar to those required by the USEPA.

[24] The SNCR is used during the combustion process when gas temperature is high. That typically reduces NOx emissions by 30 to 70 percent. Following the heat exchange in the boiler to create steam, the gas temperature is reduced and is then treated with SCR as part of the Ceramic Catalytic Bag Filtration System. This system can reduce NOx emissions by up to 95 percent. The Ceramic Catalytic Bag Filtration System also reduces other pollutants, such as particulate matter and acidic gases.

Table 9
Hourly Emissions Rates (pounds) from Bagnolo Plant Biomass Boiler Using Annual Emission Test Data
(Confidential)

Pollutant	2018 Annual Test	2019 Annual Test	2020 Annual Test
VOC			
CO			
NO_x			
PM_{10}			
$PM_{2.5}$			
SOx			

Source: Bagnolo, Italy Biomass Facility Annual Emissions Testing from 2018, 2019, and 2020. NOx emission shown as uncontrolled and controlled values.

The similarities of the Bagnolo facility and Burney proposed project include that:

- Bagnolo plant is a 4.1 MWe turnkey plant with a thermal input to gasifier of 18.3 MWth, Burney plant is planned as 5.0 MWe project with 3 MWe to the PG&E grid with a thermal input to gasifier 20.2 MWth.
- The flue gas exit temperature for the Bagnolo plant is 175ºC and the 150ºC for the proposed project. Proposed boiler has a higher efficiency due to decreased flue-gas exit temperature. The boiler steam production rate for the Bagnolo plant is 18,500 kilograms per hour and 20,800 kilograms per hour for the proposed project
- Both facilities have an Inclined reciprocating grate in the gasification chamber, secondary combustion, water-tube steam boiler feeding a vacuum condensing steam turbine.
- Both facilities have feedstock fuel as forestry and agricultural residues, and woodchips. The woodchips are wet in a range of 25 to 50 percent moisture and works well on both as the feedstock changes in moisture according to the seasons. The feed rate at Bagnolo plant is 40,000 tons per year and 55,000 tons per year for the proposed project.
- The main difference between the Bagnolo plant and the Burney proposed project is that Burney will have the additional filtration of SNCR and SCR filtration and Ceramic filters which will substantially reduce NO_x emissions.

Table 10: Hourly Emissions Rates (pounds) for Proposed Biomass Boiler presents the estimated emission rates for the proposed biomass based on the maximum values for the Bagnolo plant adjusted to account for difference in fuel consumption rates.

Table 10

Estimated Hourly Emissions Rates (pounds) for Proposed Biomass Boiler (Confidential)

Pollutant	Project
VOC	
CO	
NO_x	
PM_{10}	
$PM_{2.5}$	
SOx	

Supporting information for the CEM and annual emission testing data are found in **Attachment C: Biomass Boiler Emission Testing Data**.

In 2014, Argonne National Laboratory published criteria air pollutant emission factors for biomass boilers of various sizes (in million BTU) and biomass type (including cellulosic ethanol plants, bagasse, and wood).[25] **Table 11: Argonne Emissions Factors and Daily Rates (pounds) for Biomass Boiler compared to Proposed Project** presents the Argonne emission factors (in grams per million BTU) and emission rates (in pounds and based on a proposed facility size of 68.9 million BTU compared to the proposed project biomass boiler emission rates. The Argonne $PM_{2.5}$ emission rate is 83 percent of the PM_{10} value; while the proposed project assumes PM_{10} equals $PM_{2.5}$ emissions. The proposed project biomass boiler emission rates are less than the Argonne-derived emission rates showing the cleaner, more efficient, newer technology associated with the proposed project.

Table 11

Argonne Emissions Factors and Hourly Emission Rates (pounds) for Biomass Boiler compared to Proposed Project (Confidential)

Pollutant	Emission Factor	Units	GREET	Proposed Project
VOC				
CO				
NO_x				
PM_{10}				
$PM_{2.5}$				
SOx				

[25] Argonne National Laboratory, GREET Model Emission Factors for Coal- and Biomass-Fired Boilers, September 24, 2014, https://greet.es.anl.gov/publication-em-coal-bio-boiler

Source: Argonne National Laboratory, GREET Model Emission Factors for Coal- and Biomass-Fired Boilers, September 24, 2014, https://greet.es.anl.gov/publication-em-coal-bio-boiler and *Bagnolo, Italy Biomass Facility Annual Emissions Testing from 2018, 2019, and 2020. NOx emission shown as uncontrolled and controlled values.*

Wood Products Operation

Up to 104,000 tons per year of logs will be received based on 400 tons per day and five operating days per week (eight to ten hours per day). The logs will be scaled and inspected upon receipt. Logs that do not meet board feet requirements or have rot or are crooked will be rooted to the cull pile and will be processed into firewood or ground for feedstock. Logs that meet lumber criteria will be stored in the log deck and then processed in the sawmill.

The sawmill will be located within a building without negative air. Exhaust through a recovery cyclone/baghouse is not anticipated.[26] Up to 104,000 tons of logs each year can be processed in the sawmill and 400 tons of logs per day. Lumber is then dried in the four dry kilns which have the capacity to dry a total of 250,000 board feet at one time. Drying time depends on species and can range between 65 to 240 hours. Assuming two days off between batches for loading and unloading, up to 18,250,000 board feet can be dried in the kilns annually. The maximum kiln temperature will be 200ºF. The sawmill will operate for 260 days per year and eight hours per day. The dry kilns will operate for 330 days per year and 24 hours per day.

After drying the lumber is further processed in the mill. Finished lumber will be stored in the lumber storage area. Sawdust from the sawmill will be mixed into the feedstock pile for the bioenergy facility. Sawdust will be transported to the feedstock pile via conveyor or other means. Scrap from the mill will be processed in the grinder for bioenergy facility feedstock.

Residential fuel reduction materials accepted at the site will be processed in the grinder and suitable material used for feedstock. A maximum of 30,000 tons of material will be processed in the grinder annually (including scraps from mill, fuel reduction materials, and logs not suitable for lumber).

Grinding, using a single grinder, will occur during an estimated 40 days per year to produce 30,000 tons of material annually. The grinder will be outdoors and will not exhaust via a recovery cyclone or baghouse. The expected species of wood to be processed are 70 percent of pine, 10 percent of white fir, 10 percent of incense cedar, 5 percent of Douglass fir, and 5 percent oak.

[26] Enclosures can range from windbreaks consisting of fabric walls to fully enclosed buildings. Depending on the amount of enclosure, a typical control efficiency of 50 to 90 percent, may be applied. The level of control is dependent on the ratio of openings in the enclosure, such as open sides, doors, and windows. A value of 75 percent was used for this analysis based on the ratio of open spaces in the enclosure.

Up to 750 tons of feedstock can be produced in one day. There will be two 100-hp diesel generators for emergency use. Water use will be approximately 10,000 gallons per day for dust suppression and sawmill.

On-Road Vehicles

Operational-related vehicular emissions were computed using the CARB's emission factor model, EMFAC, to estimate on-road emissions. Haul trucks were modeled using the T6 single construction haul truck classification, which is a heavy-heavy duty truck emission factor for public vehicles. Criteria air pollutant emissions associated with on-road vehicles were calculated by combining the activity information with emissions factors, in grams per mile, derived using the EMFAC emissions model. Emissions calculations were based on **Equation 1**. The EMFAC emissions factors were developed for employee vehicles and haul trucks and include exhaust, as well as brake and tire wear. **Table 12: Emissions Factors (gram/mile) For Operational On-Road Vehicles** displays the emission factors for employee vehicles and haul trucks.

Operational activities associated with haul truck trips annually would require approximately 192,756 gallons of diesel fuel[27] and 32,000 gallons of gasoline[28].

Table 12
Emissions Factors (gram/mile) For Operational On-Road Vehicles

Vehicle Type	ROG	CO	NO_x	CO_2	CH_4	N_2O	PM_{10}	$PM_{2.5}$
Employee Vehicles	0.01	0.97	0.07	306	0.003	0.006	0.02	0.01
Haul Trucks	0.01	0.03	0.45	1,072	0.000	0.169	0.06	0.02
Pickup Trucks	0.02	1.23	0.11	357	0.005	0.009	0.02	0.01

Source: CARB EMFAC Emissions Model.

Traffic into and out of the bioenergy facility will primarily consist of biomass feedstock delivery (12.5 tons per truckload). This activity will average at eight trips per day over a year (220 trips per month and 2,640 trips per year) to supply the facility the required feedstock with a maximum estimate of 50 trucks per day in circumstances of forest fire recovery or log market volatility. With feedstock receipt occurring five days per week, an average of 10 feedstock trucks be delivered each day. An additional truck could be required each day to transport ash from the site, leave for repairs, transport supplies or fuel, or transport ash from the site. A total of twelve employee trips are estimated at 12 miles per one-way trip. Heavy truck trips are estimated at 100 miles per one-way trip.

[27] Fuel usage is estimated using the CO2 emission estimate and a 10.15 kgCO2/gallon conversion factor for diesel fuel,, https://www.epa.gov/sites/production/files/2018-03/documents/emission-factors_mar_2018_0.pdf
[28] Fuel usage is estimated using the CO2 emission estimate and a 8.91 kgCO2/gallon conversion factor for gasoline fuel,, https://www.epa.gov/sites/production/files/2018-03/documents/emission-factors_mar_2018_0.pdf

Additional traffic will be generated by wood product operations. The operation will include two to four employees entering and exiting the project site each operating day. Up to 15 trucks per day will deliver logs to the project site for the sawmill operation. An average of four pickup truck loads of firewood from the site will be delivered to customers each day. Up to ten pickup truck loads are anticipated on Wednesday and 40 loads on Saturday during public drop-off of fuel reduction material.

Round trip distance is estimated at 100 miles for log trucks delivering logs to the sawmill operation. Firewood will be delivered within half-ton pickup with a 14-foot dump trailer. Round trip distance for firewood delivery is estimated at 20 miles. Public drop-off vehicles consist of pickup trucks with 40 loads each day occurring on Mondays, Wednesdays, and Saturdays. The average round trip distance is estimated at 10 miles.

The majority of traffic to and from the facility would use Black Ranch Road south of the project site to connect to SR-299. Feedstock trucks will use Black Ranch Road north of the project site only if there is a feedstock-supplying project located north of the project site on Black Ranch Road.

Off-Road Equipment

Operation of the proposed project would require the use of heavy-duty equipment, such as loaders and forklifts. Emission factors from the OFFROAD emissions model were used. Emissions from off-road equipment activities were estimated based on the projected activity schedule, the number of pieces of equipment, the types of equipment, equipment utilization rates, equipment horsepower, and load factor (i.e., percent of full throttle).

This information was applied to criteria air pollutant emissions factors, in grams per horsepower-hour, primarily derived using the OFFROAD emissions model. **Equation 2** outlines how off-road operational equipment emissions were computed, and the emissions factors used in this assessment are summarized, by equipment type within **Table 13: Emissions Factors (g/hp-hour) For Operational Off-road Equipment.**

Table 13
Emissions Factors (g/hp-hour) For Operational Off-road Equipment

Equipment Type	HP	Daily Hours	Annual Days	LF	ROG	CO	NO_x	CO_2	CH_4	PM_{10}	$PM_{2.5}$
Feedstock Loader	225	8	312	0.37	0.06	0.45	0.52	194	0.002	0.02	0.02
Forklift	150	10	312	0.20	0.04	0.64	0.33	106	0.001	0.02	0.02
Heel Boom Log Loader	200	10	30	0.50	0.10	0.78	0.29	403	0.003	0.01	0.01
Rubber Tire Loader	200	10	30	0.36	0.06	0.42	0.54	191	0.002	0.02	0.02
Water Truck	158	5	40	0.38	0.08	1.28	0.52	201	0.002	0.03	0.02
Firewood Processer	90	4	312	0.38	0.12	2.42	0.36	421	0.004	0.01	0.01
Firewood Pickup	93	4	300	0.50	0.07	1.37	0.77	209	0.002	0.03	0.02

Source: CARB OFFROAD Emissions Model.

Standby Generators

Additionally, the bioenergy facility would include a five MW standby generator (or coupling of several smaller generators) to provide standby power. The wood products operation would include two 100-hp standby generators for emergency use.

Standby generator emissions were calculated based on compliance with applicable federal and state emissions standards and compliance with mandated emission limits and operating hour constraints. This analysis assumed that the standby generators would operate up to two hours per day and a total of 50 hours per year for testing and maintenance. All standby generators greater than 50 hp (37.3 kilowatts) are subject to SCAQMD permitting requirements, emission limits, and operational restrictions. The internal combustion engines would meet BACT requirements.

The standby generators for proposed project operations shall be selected from the CARB certified generators list and meet applicable federal standards for diesel emissions. For after-treatment of engine exhaust air, a diesel particulate filter shall be provided to meet the emission level requirements. Therefore, the standby generators would operate for two hours per day during 25 days per year for a total of 50 hours per year. Given their limited and irregular use, the standby generators were not included in the HRA.

Dry Kilns

Lumber is dried in the four dry kilns which have the capacity to dry a total of 250,000 board feet at one time. Drying time depends on species and can range between 65 to 240 hours. Assuming two days off between batches for loading and unloading, up to 18,250,000 board feet can be dried in the kilns annually.

The maximum kiln temperature would be 200ºF and thus, the appropriate emission factors were used. VOC emission factors within *USEPA's Region 10 HAP and VOC Emission Factors for Lumber Drying*[29] were used. The expected species of wood to be processed are 70 percent of pine, 10 percent of white fir, 10 percent of incense cedar, 5 percent of Douglass fir, and 5 percent oak. **Table 14: Emissions Factors (pounds/1,000 board feet) For Dry Kilns** provides the VOC and HAP emission factors for various wood species**.**

Table 14

Emissions Factors (pounds/1,000 board feet) For Dry Kilns

Species	VOC	Methanol	Formaldehyde	Acetaldehyde	Propionaldehyde	Acrolein
Ponderosa Pine	2.86571	0.08421	0.004343	0.0340	0.0010	0.0026
White Fir	0.61267	0.1964	0.00436	0.0550	0.0003	0.0009
Incense Cedar	0.61267	0.1964	0.00436	0.0677	0.0004	0.0012
Douglas Fir	1.1487	0.0671	0.0018	0.0275	0.0003	0.0005
Oak	0.3580	--	--	--	--	--

Source: United States Environmental Protection Agency, Region 10 HAP and VOC Emission Factors for Lumber Drying, January 2021, https://www.epa.gov/system/files/documents/2021-07/epa-region-10-lumber-drying-ef-january-2021.pdf

United States Department of Agriculture, Effects of Drying Parameters on Hardwood Lumber Drying Defects and VOC Emissions, June 2008, https://reeis.usda.gov/web/crisprojectpages/0192956-effects-of-drying-parameters-on-hardwood-lumber-drying-defects-and-voc-emissions.html

Equation 3 outlines how VOC and HAP emissions from the four dry kilns were computed. The dry kilns can only run along with the bioenergy facility which provides the thermal energy to run the dry kilns or approximately 330 days per year and 24 hours per day.

Equation 3

*Emission Rate (tons/year) = Throughput (1,000 board feet/year) * Emission Factor (pounds/1,000 board feet) * ton/2,000 pounds*

*Emission Rate (pounds/day) = Throughput (1,000 board feet/day) * Emission Factor (pounds/1,000 board feet)*

[29] United States Environmental Protection Agency, Region 10 HAP and VOC Emission Factors for Lumber Drying, January 2021, https://www.epa.gov/system/files/documents/2021-07/epa-region-10-lumber-drying-ef-january-2021.pdf

The dry kilns process would also release a variety of air toxics, such as, acetaldehyde, acrolein, formaldehyde, and methanol. Therefore, a health risk assessment was completed.[30] The air toxics emissions are found in **Attachment B: Operational Air Emissions Inventory**.

Grinder

To approximate the particulate emissions for wood grinding, the emission factor for "Log Debarking" from USEPA's AP-42, Table 10.3-1 of 0.024 pounds of particulate matter per ton of material processed was used with the throughput quantity of wood processed. Approximately 60 percent of the particulate emissions are assumed to be PM_{10} and 50 percent of the PM_{10} emissions are assumed to be $PM_{2.5}$. Water suppression will also provide an estimated 50 percent abatement of particulate emissions. **Equation 4** outlines how grinder particulate matter emissions were computed. Grinding, using a single grinder, will occur during an estimated 40 days per year to produce 30,000 tons of material annually. The grinder will be outdoors and will not exhaust via a recovery cyclone or baghouse.

Equation 4

*PM_{10} Emission Rate (tons/year) = Throughput (tons of material/year) * Emission Factor (0.024 pounds PM/tons of material) * 0.6 pounds PM_{10}/pounds PM * ton/2,000 pounds*

*PM_{10} Emission Rate (pounds/day) = Throughput (pounds of material/day) * Emission Factor (0.024 pounds PM/tons of material) * 0.6 pounds PM_{10}/pounds PM*

As previously provided, **Equation 2** outlines how grinder engine combustion emissions were computed, and the emissions factors used in this assessment are summarized within **Table 15: Emissions Factors (g/hp-hour) For Operational Grinder Engine.** Grinder engine was assumed to operated 10 hours per day (occurring 40 days per year).

Table 15
Emissions Factors (g/hp-hour) For Operational Grinder Engine

Equipment Type	HP	Daily Hours	Annual Days	LF	ROG	CO	NO_x	CO_2	CH_4	PM_{10}	$PM_{2.5}$
Grinder	950	10	40	0.42	0.05	0.41	1.13	219	0.002	0.02	0.02

Source: CARB OFFROAD Emissions Model.

[30] The nearest sensitive receptors (i.e., school, residence) are approximately 3,000 feet to the south of the project site and 4,300 feet to the north of the project site.

Sawmill

The sawmill will be located within a building without negative air. Exhaust through a recovery cyclone/baghouse is not anticipated. Up to 104,000 tons of logs each year and 400 tons per day (or approximate 260 days per year and eight hours per day) can be processed in the sawmill. **Table 16: Emissions Factors for Operational Sawmill** provides the particulate matter emission factors (in pounds per ton-logs or pounds per bone dry tons) for the sawmill operations. Emission factors were based on the USEPA's *Particulate Matter Potential to Emit Emission Factors for Activities at Sawmills, Excluding Boilers, Located in Pacific Northwest Indian Country*.[31] It was assumed that ten material drops would occur per day.

Table 16
Emissions Factors (g/hp-hour) for Operational Sawmill

Equipment Type	PM	% PM_{10}	PM_{10}	% $PM_{2.5}$	$PM_{2.5}$	Units
Sawing (uncontrolled)	0.35	50	0.175	25	0.0875	lb/ton log
Sawing (enclosed)	0.0875	50	0.0438	25	0.0219	lb/ton log
Drop" of "wet" material	0.00075		0.00035		0.00005	lb/bdt material
Drop" of "dry" material	0.0015		0.0007		0.0001	lb/bdt material
Pneumatically convey material into target box	0.1	85	0.085	50	0.05	lb/bdt material

Source: United States Environmental Protection Agency, Particulate Matter Potential to Emit Emission Factors for Activities at Sawmills, Excluding Boilers, Located in Pacific Northwest Indian Country, https://www.epa.gov/caa-permitting/technical-memoranda-sawmills-region-10

"Drop" of "wet" material from one surface to another including, but not limited to, (a) each mechanical conveyance drop between point of generation and storage bin (but not including bin unless open to atmosphere) (b) loadout from storage bin into a truck bed or railcar and (c) drop onto a pile. Apply EF to each "drop."

"Drop" of "dry" material from one surface to another including, but not limited to, (a) each mechanical conveyance drop between point of generation and storage bin (but not including bin unless open to atmosphere) (b) loadout from storage bin into a truck bed or railcar and (c) drop onto a pile. Apply EF to each "drop."

The "material" in this entry refers to bark, hogged fuel, green chips, dry chips, green sawdust, dry sawdust, shavings and any other woody byproduct of lumber production.

Sawmill exhaust will be routed through ducting as part of the roof with vent tube. Sawdust collection will occur at three collection areas within the building to remove sawdust into collection bins. Sawmill building will contain ventilation/doors on each end of building to allow logs to enter mill and to allow finished lumber stacking for drying.

[31] United States Environmental Protection Agency, Technical Memoranda for Sawmills, Region 10 https://www.epa.gov/caa-permitting/technical-memoranda-sawmills-region-10

Equation 2 outlines how sawmill engine combustion emissions were computed, and the emissions factors used in this assessment are summarized within **Table 17: Emissions Factors (g/hp-hour) For Operational Sawmill Engine.** Sawmill engine was assumed to operated eight hours per day (occurring 260 days per year).

Table 17
Emissions Factors (g/hp-hour) For Operational Sawmill Engine

Equipment Type	HP	Daily Hours	Annual Days	LF	ROG	CO	NO_x	CO_2	CH_4	PM_{10}	$PM_{2.5}$
Sawmill	60	8	260	0.50	0.12	1.46	1.20	219	0.002	0.07	0.07

Source: CARB OFFROAD Emissions Model.

Operational Emissions Summary

The proposed project includes a five MW bioenergy facility, small specialty sawmill, four dry kilns, and chipping and grinding operation as well as employee trips and haul trucks, and a number of off-road equipment such as forklifts and loaders. The facility will use a gasification-fed boilers system to convert the woody biomass to electricity and a ceramic catalytic filter system to regulate its air emissions. In addition to the bioenergy facility, the proposed project includes a wood product operation. The operation will include a small sawmill, grinder, and dry kilns that will produce specialty softwood products

Emissions from the boiler would be reduced using a SCR converter. Air pollutant emissions of concern are primarily particulate matter from sawing and grinding, VOC/ROG emissions from drying, and NO_x from boilers and emergency diesel generators. For sources with available water, water sprays will be used to control particulate matter emissions.

Table 18: Daily Operational Emissions (pounds) for Proposed Project presents the uncontrolled and controlled[32] daily operational emissions. A majority of the NO_x emissions would be from the operation of the biomass boiler, a majority of the VOC/ROG emissions would be from the dry kilns, and a majority of the PM_{10} emissions would be from operation of the sawmill. As shown, the unmitigated daily NO_x emissions are greater than the significant thresholds (Level B). However, the mitigated daily NO_x emissions are less than the significant thresholds (Level B). The biomass boiler will use SCR and ceramic filter which is considered a Best Available Mitigation Measure. The VOC/ROG emissions are also less than the significant thresholds (Level B). Emissions of PM_{10} are less than the significant thresholds (Level A).

[32] Biomass Boiler emission reduction measures.

Table 18
Daily Operational Emissions (pounds) for Proposed Project

Emission Source/Year	ROG	CO	NO_x	PM_{10}	$PM_{2.5}$	SO_x
Uncontrolled						
Employee Vehicles	0.01	0.77	0.06	<0.01	<0.01	<0.01
Off-road Equipment Onsite	0.57	5.60	3.24	0.12	0.11	<0.01
Offsite Haul Trucks	0.22	6.49	8.61	1.20	0.48	0.20
Generators	5.78	79.2	15.2	0.91	0.91	55.9
Biomass Boiler	2.71	41.8	244	3.14	3.14	1.07
Dry Kilns	110					
Grinder	0.45	3.65	9.91	4.66	2.40	<0.01
Sawmill	0.07	0.77	0.64	68.3	31.2	<0.01
Total	**120**	**138**	**282**	**78.4**	**38.2**	**57.1**
Significance Thresholds (Level A)	25	-	25	80	-	-
Significance Thresholds (Level B)	137	-	137	137	-	-
Controlled						
Employee Vehicles	0.01	0.77	0.06	<0.01	<0.01	<0.01
Off-road Equipment Onsite	0.57	5.60	3.24	0.12	0.11	<0.01
Offsite Haul Trucks	0.22	6.49	8.61	1.20	0.48	0.20
Generators	5.78	79.2	15.2	0.91	0.91	55.9
Biomass Boiler	2.71	41.8	24.4	3.14	3.14	1.07
Dry Kilns	110					
Grinder	0.45	3.65	9.91	4.66	2.40	<0.01
Sawmill	0.07	0.77	0.64	68.3	31.2	<0.01
Total	**120**	**138**	**62.0**	**78.4**	**38.2**	**57.1**
Significance Thresholds (Level A)	25	-	25	80	-	-
Significance Thresholds (Level B)	137	-	137	137	-	-

Source: RCH Group, 2021

Supporting information for the operational emissions inventory are found in **Attachment B: Operational Air Emissions Inventory**.

This significance determination does not account for levels of emissions associated with the open burning of forest thinning debris and hazardous fuels in area forests that would be avoided by the operation of the proposed project. This is because the SCAQMD's respective mass emission thresholds are for maximum daily emission levels and the timing of open burning is unknown. In other words, it is likely that there would be days when all the emissions sources would be in operation, but open burning of forest refuse would not be taking place in area forests.

Odor Impacts

Though offensive odors from stationary and mobile sources rarely cause any physical harm, they remain unpleasant and can lead to public distress, generating citizen complaints to local governments. The occurrence and severity of odor impacts depend on the nature, frequency, and intensity of the source; wind speed and direction; and the sensitivity of receptors.

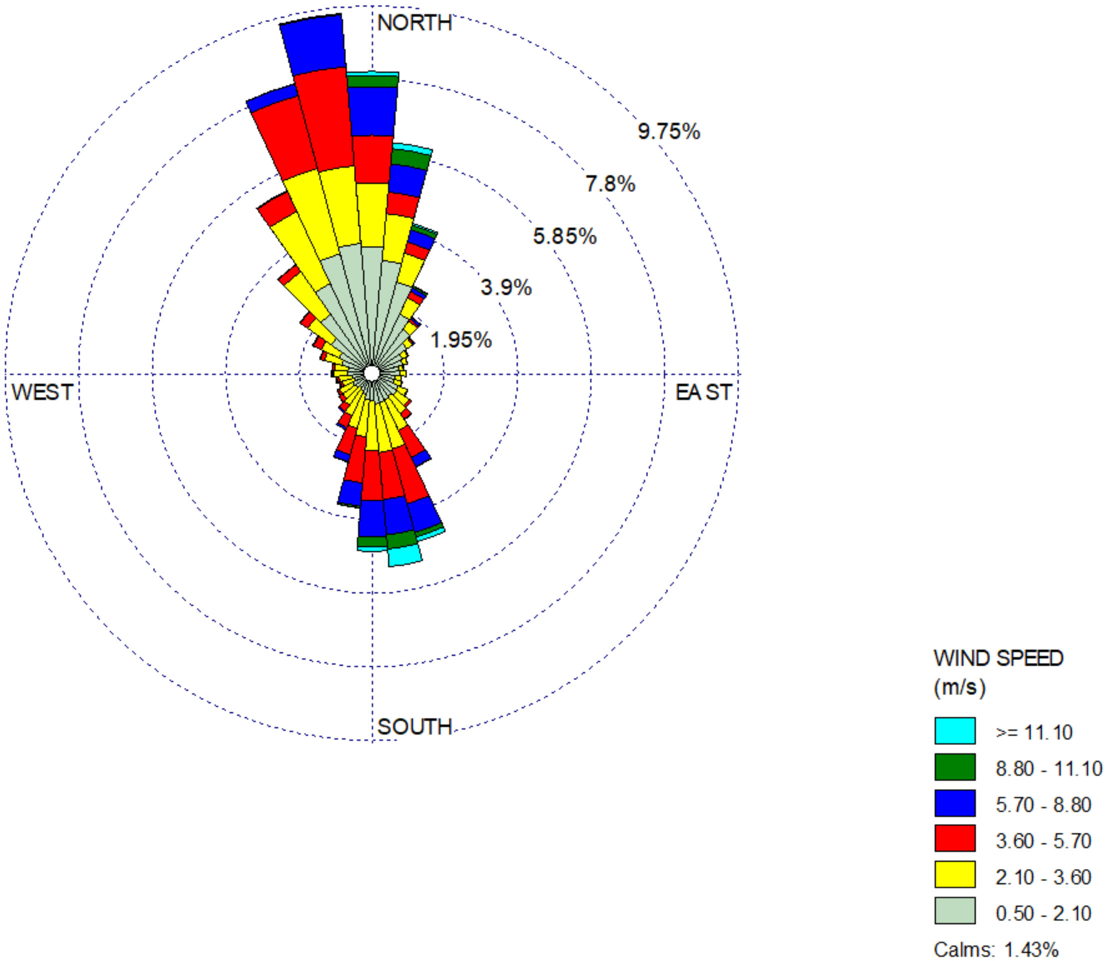
Potential localized odor sources associated with proposed project operation-related activities could originate from fumes from the bioenergy boiler, sawmill, diesel exhaust from off-road haul equipment, and diesel exhaust from incoming and out-going diesel-fueled heavy-duty transport vehicles.

Due to the subjective nature of odor impacts, the number of variables that can influence the potential for an odor impact, and the variety of odor sources, there are no quantitative or formulaic methodologies to determine the presence of a significant odor impact. Rather, often air districts recommend that odor analyses strive to fully disclose all pertinent information. The intensity of an odor source's operations and its proximity to sensitive receptors influences the potential significance of odor emissions. For example, San Joaquin Valley Unified Air Pollution Control District has identified some common types of facilities that have been known to produce odors, which includes facilities like wastewater treatment operations, sanitary landfills, composting facilities, and transfer stations.[33] Bioenergy facilities and wood products operations are not on the list of potential odor sources.

This screening level for potential odor sources can be used as a screening tool to qualitatively assess a project's potential to adversely affect area receptors. The project site is located in a generally rural area surrounded by open space; the nearest residential receptors are located approximately ½ mile to the south and north of the project site. Notably, the primary wind direction is from the south and north (see **Figure 5: Windrose**). Odor emissions are highly dispersive, especially in areas with higher average wind speeds. However, odors disperse less quickly during inversions or during calm conditions and air stagnation, which hamper vertical mixing and dispersion during early morning and wintertime. Generally, an odor source with five or more confirmed complaints per year averaged over three years could be considered to have a significant impact. However, it should be recognized that there is not one piece of information that can solely be used to determine the significance of an odor impact. Therefore, based on the previous information, the proposed project odor impacts would be expected to be less than significant.

[33] San Joaquin Valley Unified Air Pollution Control District, Final Draft Guidance for Assessing and Mitigating Air Quality Impacts, March 19, 2015, https://www.valleyair.org/transportation/GAMAQI-2015/FINAL-DRAFT-GAMAQI.PDF

Figure 5
Windrose for Redding Municipal Airport



10.0 HEALTH RISK ASSESSMENT

The proposed project is expected to emit a variety of air toxics (including diesel particulate matter) and an HRA was completed the evaluate the health impacts of the proposed project as required by the SCAQMD's *Policy Establishing Guidelines for Toxics Health Risk Assessment*. The proposed project would constitute a new emission source of air toxics during operational activities. Studies have demonstrated that certain pollutants are human carcinogens and that chronic (long-term) inhalation exposure poses a chronic health risk.[34]

Health effects from carcinogenic air toxics are usually described in terms of individual cancer risk. Individual cancer risk is the likelihood that a person exposed to air toxic concentrations over a 70-year lifetime will contract cancer, based on the use of standard risk-assessment methodology. The maximally exposed individual (MEI) represents the worst–case risk estimate, based on a theoretical person continuously exposed for a lifetime at the point of highest compound concentration in the air. This is a highly conservative assumption since most people do not remain at home all day and on average residents change residences every 11 to 12 years. In addition, this assumption assumes that residents are experiencing outdoor concentrations for the entire exposure period.

The HRA estimates the incremental cancer risks to sensitive receptors in the vicinity of the proposed project, using emission rates (in pounds per hour) from the construction emissions inventory detailed in **Section 8** and the operations emissions inventory detailed in **Section 9**. The operational emission sources within the HRA include the bioenergy boiler, dry kilns, offroad equipment such as loaders and grinder engine.[35] Air toxics emission rates were input into the USEPA's AERMOD atmospheric dispersion model to calculate ambient air concentrations at receptors in the project vicinity. The HRA is intended to provide a worst–case estimate of the increased exposure by employing a standard emission estimation program, an accepted pollutant dispersion model, approved toxicity factors, and conservative exposure parameters.

In accordance with California Office of Environmental Health Hazard Assessment (OEHHA) *Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments*[36]*,* the HRA was accomplished by applying the highest estimated concentrations of TAC at the receptors analyzed to the established

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[34] Toxic air contaminants are a broad class of compounds known to cause morbidity or mortality. TAC are found in ambient air, especially in urban areas, and are caused by industry, agriculture, fuel combustion, and commercial operations (e.g., gasoline service stations, dry cleaners). TAC are typically found in low concentrations, even near their source (e.g., diesel particulate matter near a freeway). Because chronic exposure can result in adverse health effects, TAC are regulated at the regional, state, and federal level.

[35] Given their limited and irregular use, the standby generators were not included in the HRA.

[36] Office of Environmental Health Hazard Assessment, *Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments*, February 2015, http://oehha.ca.gov/air/hot_spots/hotspots2015.html

cancer potency factors and acceptable reference concentrations for non-cancer health effects. Increased cancer risks were calculated using the modeled air toxics concentrations and OEHHA-recommended methodologies for both a child exposure (3rd trimester through two years of age) and adult exposure. The cancer risk calculations were based on applying the OEHHA-recommended age sensitivity factors and breathing rates, as well as fraction of time at home and an exposure duration of 30 years, to the air toxics concentration exposures. Age-sensitivity factors reflect the greater sensitivity of infants and small children to cancer causing air pollutants. The supporting methodology and assumptions used in this HRA are provided in **Attachment D: Health Risk Assessment Methodology and Assumptions**.

These conservative methodologies overestimate both non-carcinogenic and carcinogenic health risk, possibly by an order of magnitude or more. Therefore, for carcinogenic risks, the actual probabilities of cancer formation in the populations of concern due to exposure to carcinogenic pollutants are likely to be lower than the risks derived using the HRA methodology. The extrapolation of toxicity data in animals to humans, the estimation of concentration prediction methods within dispersion models; and the variability in lifestyles, fitness and other confounding factors of the human population also contribute to the overestimation of health impacts. Therefore, the results of the HRA are highly overstated.

The nearest sensitive receptors (i.e., residence) are approximately 3,000 feet to the south of the project site and 4,300 feet to the north of the project site. Calvary Chapel-Burney Falls is approximately 3,500 feet to the south of the project site. Great Shasta Rail trail is located along the eastern boundary of the site. There are also offsite worker receptors to the north and east of the project site.

Health Impacts at Existing Residences and Offsite Workers

The following describes the HRA results associated with existing senstive receptors (residences and offite workers) due to project construction activities and operations. As shown in **Table 19: Estimated Health Impacts at Existing Receptors**, the maximum cancer risk from project construction activities and operational emissions.

For a residential-receptors would be 2.87 per million (of which 0.76 per million is due to construction, 0.84 per million is due to operational onsite equipment (includng loaders, grinder and sawmill engines, etc), 1.20 per million is due to the biomass boiler with a 35 meter stack hieght, and 0.07 per million is due to the dry kilns). The maximum exposured individual residence is located to the south of the project site.

For a offsite worker receptors would be 2.13 per million (of which of which 0.11 per million is due to construction, 1.14 per million is due to the operational onsite equipment (includng loaders, grinder and sawmill engines, etc), 0.87 per million is due to the biomass boiler with a 35 meter stack hieght, and 0.01

per million is due to the dry kilns). The maximum exposured individual offsite worker is located to the northeast of the project site.

A majority of the cancer risk is due to construction activities, biomass boiler, and onsite operational equipment. A majority of the cancer risk from operation of the biomass boiler is due to the emissions of cadmium and arsenic while construction and onsite equipment cancer risk are due to DPM.

Thus, the cancer risk and health impacts due to construction and operational activities would be less than the threshold of 10 per million and would be less than significant.

Table 19

Table 18: Estimated Health Impacts at Existing Receptors and Offsite Worker

Source	Cancer Risk	Acute Impact	Chronic Impact
Proposed Project Construction (Residence)	0.76	-	0.01
Proposed Project Operations (Residence)	2.11	0.06	0.01
Proposed Project Total (Residence)	**2.87**	**0.06**	**0.02**
Significance Threshold	10	1.0	1.0
Potentially Significant (Yes or No)?	No	No	No
Proposed Project Construction (Offsite Worker)	0.11	-	0.01
Proposed Project Operations (Offsite Worker)	2.02	0.10	0.10
Proposed Project Total (Offsite Worker)	**2.13**	**0.10**	**0.11**
Significance Threshold	10	1.0	1.0
Potentially Significant (Yes or No)?	No	No	No

An analysis was conducted to examine the difference in cancer risks based on several biomass boiler stack heights (15, 25, and 35 meters). For the residence, the cancer risk varies from 1.91, 1.52, and 1.20 for increasing stack heights. For the offsite worker, the cancer risk varies from 2.57, 1.72, and 0.87 for increasing stack heights. As the manufacturer designed stack height of 35 meters results in lower health impacts, the proposed project would involve a biomass boiler stack height of 35 meters, although a stack height as low as 15 meters would not result in significant health impacts.

Non-Cancer Health Hazard at Existing Residences and Offsite Worker

Both acute (short-term) and chronic (long-term) adverse health impacts unrelated to cancer are measured against a hazard index (HI), which is defined as the ratio of the predicted incremental DPM exposure concentration from the Project to a reference exposure level (REL) that could cause adverse health effects. The REL are published by OEHHA based on epidemiological research. The ratio (referred to as the Hazard Quotient [HQ]) of each non-carcinogenic substance that affects a certain organ system is added to produce an overall HI for that organ system. The overall HI is calculated for each organ system. The impact is considered to be significant if the overall HI for the highest-impacted organ system is greater than 1.0.

The acute and chronic HI would be 0.06 and 0.02 for the residential receptors and 0.10 and 0.11 for the offsite worker receptors, respectively. The acute and chronic HI would be below the threshold of 1 and the health impact of the proposed project would therefore be less than significant.

11.0 GREENHOUSE GAS EMISSIONS

"Global warming" and "global climate change" are the terms used to describe the increase in the average temperature of the earth's near-surface air and oceans since the mid-20th century and its projected continuation. Warming of the climate system is now considered to be unequivocal (IPCC, 2007), with global surface temperature increasing approximately 1.33 degrees Fahrenheit (°F) over the last 100 years. Continued warming is projected to increase global average temperature between 2 and 11°F over the next 100 years.

Natural processes and human actions have been identified as the causes of this warming. The International Panel on Climate Change (IPCC) concludes that variations in natural phenomena such as solar radiation and volcanoes produced most of the warming from pre-industrial times to 1950 and had a small cooling effect afterward. After 1950, however, increasing GHG concentrations resulting from human activity such as fossil fuel burning, and deforestation have been responsible for most of the observed temperature increase. These basic conclusions have been endorsed by more than 45 scientific societies and academies of science, including all of the national academies of science of the major industrialized countries. Since 2007, no scientific body of national or international standing has maintained a dissenting opinion.

Increases in GHG concentrations in the earth's atmosphere are thought to be the main cause of human-induced climate change. GHG naturally trap heat by impeding the exit of solar radiation that has hit the earth and is reflected back into space. Some GHG occur naturally and are necessary for keeping the earth's surface inhabitable. However, increases in the concentrations of these gases in the atmosphere during the last 100 years have decreased the amount of solar radiation that is reflected back into space, intensifying the natural greenhouse effect and resulting in the increase of global average temperature.

Gases that trap heat in the atmosphere are referred to as GHG because they capture heat radiated from the sun as it is reflected back into the atmosphere, much like a greenhouse does. The accumulation of GHG has been implicated as the driving force for global climate change. The primary GHG are carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O), ozone, and water vapor.

CO_2 is primarily generated by fossil fuel combustion in stationary and mobile sources. CH_4 is emitted from biogenic sources, incomplete combustion in forest fires, landfills, manure management, and leaks in natural gas pipelines. In the United States, the top three sources of methane are landfills, natural gas systems, and enteric fermentation. CH_4 is the primary component of natural gas, which is used for space and water heating, steam production, and power generation. N_2O is produced by both natural and human related sources. Primary human related sources include agricultural soil management, animal manure management, sewage treatment, mobile and stationary combustion of fossil fuel, adipic acid production, and nitric acid production. T

While the presence of the primary GHG in the atmosphere are naturally occurring, CO_2, CH_4, and N_2O are also emitted from human activities, accelerating the rate at which these compounds occur within earth's atmosphere. Other GHG include hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride, and are generated in certain industrial processes. Greenhouse gases are typically reported in "carbon dioxide-equivalent" measures (CO_2e).[37]

There is international scientific consensus that human-caused increases in GHG have and will continue to contribute to global warming. Potential global warming impacts may include, but are not limited to, loss in snowpack, sea level rise, more extreme heat days per year, more high ozone days, more large forest fires, and more drought years. Secondary effects are likely to include a global rise in sea level, impacts to agriculture, changes in disease vectors, and changes in habitat and biodiversity.

California Green Building Standards Code

The California Green Building Standards Code or CALGreen is a regulatory code for all residential, commercial, and school buildings to meet uniform standards in building design intended to minimize impacts on climate change.

CALGreen does not prevent a local jurisdiction from adopting a more stringent code, as State law provides methods for local enhancements. CALGreen recognizes that many jurisdictions have developed existing construction and demolition ordinances, and defers to them as the ruling guidance provided, they provide a minimum 50-percent diversion requirement. CALGreen also provides exemptions for areas not served by construction and demolition recycling infrastructure. State building code provides the minimum standard, which buildings need to meet to be certified for occupancy. Enforcement is generally done by the local building official.

The development of CALGreen is intended to cause a reduction in GHG emissions from buildings; promote environmentally responsible, cost-effective, healthier places to live and work; reduce energy and water consumption; and respond to directives issued by the Governor, such as Assembly Bill 32, calling for the reduction of Statewide GHG emissions to 1990 levels by 2020. In short, CALGreen was established to

[37] Because of the differential heat absorption potential of various GHG, GHG emissions are frequently measured in "carbon dioxide-equivalents," which present a weighted average based on each gas's heat absorption (or "global warming") potential.

reduce construction waste; make buildings more efficient in the use of materials and energy; and reduce environmental impacts during and after project construction.

CALGreen contains requirements for construction site selection, storm water control during construction, construction waste reduction, indoor water use reduction, material selection, natural resource conservation, site irrigation conservation, and more. CALGreen provides for design options allowing a project designer to determine how best to achieve compliance for a given site or building condition. CALGreen also requires building commissioning, which is a process for verifying that all building systems, like heating and cooling equipment and lighting systems, are functioning at their maximum efficiency.

California Environmental Quality Act and Climate Change

Under CEQA, lead agencies are required to disclose the reasonably foreseeable adverse environmental effects of projects they are considering for approval. GHG emissions have the potential to affect the environment because they contribute to global climate change. In turn, global climate change has the potential to cause sea level rise, alter rainfall and snowfall patterns, and affect habitat.

Executive Order S-3-05

Governor Schwarzenegger established Executive Order S-3-05 in 2005, in recognition of California's vulnerability to the effects of climate change. Executive Order S-3-05 set forth a series of target dates by which Statewide emissions of GHG would be progressively reduced, as follows:

- By 2010, reduce GHG emissions to 2000 levels;
- By 2020, reduce GHG emissions to 1990 levels; and
- By 2050, reduce GHG emissions to 80 percent below 1990 levels.

The executive order directed the Secretary of the California Environmental Protection Agency (CalEPA) to coordinate a multiagency effort to reduce GHG emissions to the target levels. The Secretary will also submit biannual reports to the governor and California Legislature describing the progress made toward the emissions targets, the impacts of global climate change on California's resources, and mitigation and adaptation plans to combat these impacts. To comply with the executive order, the secretary of CalEPA created the California Climate Action Team, made up of members from various State agencies and commissions. The team released its first report in March 2006. The report proposed to achieve the targets by building on the voluntary actions of California businesses, local governments, and communities and through State incentive and regulatory programs.

Assembly Bill 32 (California Global Warming Solutions Act of 2006)

California passed the California Global Warming Solutions Act of 2006 (AB 32; California Health and Safety Code Division 25.5, Sections 38500 - 38599). AB 32 establishes regulatory, reporting, and market mechanisms to achieve quantifiable reductions in GHG emissions and establishes a cap on Statewide GHG emissions. AB 32 requires that Statewide GHG emissions be reduced to 1990 levels by 2020. This reduction will be accomplished by enforcing a Statewide cap on GHG emissions that will be phased in starting in 2012. To effectively implement the cap, AB 32 directs CARB to develop and implement regulations to reduce Statewide GHG emissions from stationary sources. AB 32 specifies that regulations adopted in response to AB 1493 should be used to address GHG emissions from vehicles. However, AB 32 also includes language stating that if the AB 1493 regulations cannot be implemented, then CARB should develop new regulations to control vehicle GHG emissions under the authorization of AB 32.

AB 32 requires CARB to adopt a quantified cap on GHG emissions representing 1990 emissions levels and disclose how it arrived at the cap; institute a schedule to meet the emissions cap; and develop tracking, reporting, and enforcement mechanisms to ensure that the State reduces GHG emissions enough to meet the cap. AB 32 also includes guidance on instituting emissions reductions in an economically efficient manner, along with conditions to ensure that businesses and consumers are not unfairly affected by the reductions. Using these criteria to reduce Statewide GHG emissions to 1990 levels by 2020 would represent an approximate 25 to 30 percent reduction in current emissions levels. However, CARB has discretionary authority to seek greater reductions in more significant and growing GHG sectors, such as transportation, as compared to other sectors that are not anticipated to significantly increase emissions. Under AB 32, CARB must adopt regulations to achieve reductions in GHG to meet the 1990 emissions cap by 2020.

Climate Change Scoping Plan

AB 32 required CARB to develop a Scoping Plan that describes the approach California will take to reduce GHG to achieve the goal of reducing emissions to 1990 levels by 2020. The Scoping Plan was first approved by CARB in 2008 and must be updated every five years. The initial AB 32 Scoping Plan contains the main strategies California will use to reduce the GHG that cause climate change. The initial Scoping Plan has a range of GHG reduction actions which include direct regulations, alternative compliance mechanisms, monetary and nonmonetary incentives, voluntary actions, market-based mechanisms such as a cap-and-trade system, and an AB 32 program implementation fee regulation to fund the program. In August 2011, the initial Scoping Plan was approved by CARB.

The 2013 Scoping Plan Update builds upon the initial Scoping Plan with new strategies and recommendations. The 2013 Update identifies opportunities to leverage existing and new funds to further drive GHG emission reductions through strategic planning and targeted low carbon investments. The 2013 Update defines CARB climate change priorities for the next five years and sets the groundwork to reach California's long-term climate goals set forth in Executive Orders S-3-05 and B-16-2012. The 2013 Update highlights California progress toward meeting the near-term 2020 GHG emission reduction goals defined in the initial Scoping Plan. In the 2013 Update, nine key focus areas were identified (energy, transportation, agriculture, water, waste management, and natural and working lands), along with short-lived climate pollutants, green buildings, and the cap-and-trade program. On May 22, 2014, the First Update to the Climate Change Scoping Plan was approved by the Board, along with the finalized environmental documents. The 2017 Scoping Plan, approved on December 14, 2017, outlines options to meet California's aggressive goals to reduce GHGs by 40 percent below 1990 levels by 2030.

Executive Order No. B-30-15

On April 29, 2015, Executive Order No. B-30-15 was issued to establish a California GHG reduction target of 40 percent below 1990 levels by 2030. Executive Order No. B-30-15 sets a new, interim, 2030 reduction goal intended to provide a smooth transition to the existing ultimate 2050 reduction goal set by Executive Order No. S-3-05 (signed by Governor Schwarzenegger in June 2005). It is designed so State agencies do not fall behind the pace of reductions necessary to reach the existing 2050 reduction goal. Executive Order No. B-30-15 orders "All State agencies with jurisdiction over sources of GHG emissions shall implement measures, pursuant to statutory authority, to achieve reductions of GHG emissions to meet the 2030 and 2050 targets." The Executive Order also states that "CARB shall update the Climate Change Scoping Plan to express the 2030 target in terms of million metric tons of carbon dioxide equivalent." The CARB is currently moving forward with a second update to the Climate Change Scoping Plan to reflect the 2030 reduction target. The updated Scoping Plan will provide a framework for achieving the 2030 target. In September of 2016, the AB 32 was extended to achieve reductions in GHG of 40 percent below 1990 levels by 2030. The new plan, outlined in SB 32, involves increasing renewable energy use, putting more electric cars on the road, improving energy efficiency, and curbing emissions from key industries.

Renewables Portfolio Standard

In 2002, a California State law established the basic policy framework for the increased use of renewable energy resources in California, known as the Renewables Portfolio Standard (RPS). RPS requires renewable energy resources serve a certain percentage of electricity sales by all electricity utilities in the state, including publicly owned utilities, investor-owned utilities, electricity service providers, and community choice aggregators. Major eligible renewable energy resources, as defined by the California Energy

Commission (CEC), include biomass, geothermal, solar, wind, and small hydroelectric facilities. CEC and the California Public Utilities Commission (CPUC) work collaboratively to implement RPS.[38]

CARB and the CEC treat biomass fueled electricity facilities as carbon neutral. Section 95802(a)(31) of the California Code of Regulations contains a definition of "biomass" as defined in the cap-and-trade regulations.

> "Biomass means non-fossilized and biodegradable organic material originating from plants, animals, and microorganisms, including products, by-products, residues, and waste from agriculture, forestry, and related industries as well as the non-fossilized and biodegradable organic fractions of industrial and municipal wastes, including gases and liquids recovered from the decomposition of non-fossilized and biodegradable organic material."

California State legislation have steadily increased the renewable energy target, most recently from SB 100 (September 2018) which increased the RPS targets to 60 percent of California's electricity by 2030 and 100 percent of all retail electricity sold in California by 2045.

Draft 2030 Natural and Working Lands Implementation Plan

In a joint, interagency effort, CalEPA, California Department of Food and Agriculture (CDFA), California Natural Resources Agency (CNRA), CARB, and SGC released the Draft California 2030 Natural and Working Lands Climate Change Implementation Plan in January 2019.[39] The draft plan is specific to the natural and working lands sector, which includes farmland, rangeland, forests, grasslands, wetlands, riparian areas, seagrass, and urban green space. The draft plan addresses the carbon flux from this sector, including the ever-dynamic changes in both GHG emissions and carbon sequestration associated with the management of these lands. It is estimated that California's natural and working lands lost approximately 170 million metric tons of carbon between 2001 and 2014. Most of these losses were due to wildfire. This loss of carbon is equivalent to cumulative emissions of 630 million metric tons of CO_2e of previously sequestered carbon removed from the land over the same period (applying the atomic weight ratio of 3.67 for carbon to CO_2). However, not all the carbon lost was emitted to the atmosphere as CO_2. Some carbon leaves the land but persists in durable wood products. Other carbon losses are part of normal ecosystem function. The draft plan serves as a multi-disciplinary approach to conserve and maintain a resilient natural and working lands sector that will gradually shift the natural and working lands sector from being a net carbon emitter to a net carbon sink, while also improving air quality, water quality, wildlife habitat, recreation,

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[38] California Air Resources Board, Enforcement of the Renewables Portfolio Standard, https://ww2.arb.ca.gov/enforcement-renewables-portfolio-standard

[39] California Air Resources Board, Draft 2030 Natural and Working Lands Implementation Plan, April 2019, https://ww2.arb.ca.gov/resources/documents/nwl-implementation-draft

and providing other benefits. The draft plan sets goals for, at a minimum, increasing the rate of state-funded soil conservation practices fivefold, doubling the rate of state-funded forest management and restoration efforts, tripling the rate of state funded oak woodland and riparian reforestation, and doubling the rate of state-funded wetland and seagrass restoration. The measures included in the draft plan are projected to result in cumulative emissions of 21.6 to 56.8 million metric tons of CO_2e by 2030 and cumulative emissions reduction of 36.6 to -11.7 million metric tons of CO_2e by 2045.

The draft plan indicates that these GHG reductions will be met through a variety of practices under four broad pathways: conservation, forestry, restoration, and agriculture. One suite of practices is called, "Forestry – Improved Forest Health and Reduced Wildfire Severity." This suite of practices includes prescribed fire, mechanical thinning, and understory treatment. It aims to "restore health and resilience to overstocked forests and prevent carbon losses from severe wildfire, disease, and pests.

The implementation goals for this practice includes 23,800 to 73,300 acres of prescribed fire per year, 59,000 to 73,000 acres of thinning per year, and 23,500 to 25,300 acres of understory treatment per year. The draft plan notes that, although fuel reduction treatments involve near-term carbon costs, they result in long-term net carbon benefits in California. Fuel reduction activities, such as mechanical thinning and prescribed fire, reduce stand densities and fuel loads, restore the structure and composition of forest ecosystems, and lower the potential for damaging, high severity fire, which is currently the primary cause of GHG emissions and carbon loss from the land sector. In the long term, these activities are expected to result in climate benefits and healthier, more stable, and more resilient.

California Forest Carbon Plan

The California Forest Carbon Plan aims to improve the health and resilience of California's forests, increase their carbon storage potential, and minimize their atmospheric emissions of GHG.[40] While the Forest Carbon Plan primarily targets carbon storage and emissions, it also emphasizes improving and safeguarding interrelated ecosystem services (co-benefits), as well as social and economic considerations.

In January 2017, CAL FIRE, in coordination with CNRA and CalEPA, released the California Forest Carbon Plan. The plan serves to implement policies to meet the forest carbon goals embodied in the 2017 Scoping Plan. Currently, much of California's forests are unhealthy, supporting unnatural density that lack resilience to drought, disease, insect and parasite infestation, and large, severe wildfire. The plan describes forest conditions across California; provides a projection of future conditions in consideration of climate change; and describes goals and related specific actions that may be taken to improve forest

[40] California Air Resources Board, California Forest Carbon Plan, May 2018*,* https://ww2.arb.ca.gov/resources/documents/forest-carbon-plan

health, including resilient carbon sequestration; and provides principles and policies to guide and support these actions. Specifically, the plan identifies the following targets for forest restoration and treatment activities on non-federal forest lands:

- by 2020, double the current rate of forest restoration and fuels reduction treatments, including prescribed fire, through the CAL FIRE Vegetation Treatment Program from the recent average of 17,500 acres to 35,000 acres per year;
- by 2030, increase forest restoration and fuels treatments, including mechanical thinning and prescribed burning, from the current rate of approximately 17,500 acres to 60,000 acres per year. This target is based on CAL FIRE's determination of an operationally feasible increase in activity through its Vegetation Treatment Program;
- through CAL FIRE's Forest Practice Program and the Timber Regulation and Forest Restoration Program, ensure that timber operations conducted under the Forest Practice Act and Rules contribute to the achievement of healthy and resilient forests that are net sinks of carbon, with due consideration given to all forest carbon pools; and
- promote increasing the acreage of forest carbon projects and remove barriers to their implementation; and to address forest health and resiliency needs identified statewide on nonfederal lands, CAL FIRE has estimated that the rate of treatment of all types would need to be increased to approximately 500,000 acres per year to make an ecologically meaningful difference at a landscape scale. This estimate is based on consideration of ecological need and predictions of capacity to implement treatments. It is an aspirational target to work toward. This goal is achievable with increased resources and expanded markets for woody materials. These treatments include those that generate revenue from harvest materials, such as commercial thinning and regeneration harvests

Shasta County Regional Climate Action Plan

In 2010, the SCAQMD initiated the regional climate action planning process. The primary objectives of the Shasta Couty Regional Climate Action Plan (RCAP) process are to contribute to the State's climate protection efforts and to provide CEQA review streamlining benefits for development projects within the region's four jurisdictions: the City of Anderson, the City of Redding, the City of Shasta Lake, and the unincorporated areas of Shasta County. To facilitate these objectives, the SCAQMD worked with the four jurisdictions to prepare community-specific, independent climate action plans that contain GHG emission inventories and forecasts, emission reduction measures, and implementation and monitoring programs. The Climate Action Plan provide a summary of jurisdictional GHG inventories and describe how each jurisdiction will achieve GHG reductions through local actions that contribute to the statewide GHG emissions reduction target defined in AB 32, the California Global Warming Solutions Act of 2006, CEQA guidelines, and other State guidance. The RCAP document serves as a collection of the individual climate action plans and demonstrates the region's commitment to the State's GHG reduction efforts. The RCAP was finalized in 2012, although not adopted by the SCAQMD.

Greenhouse Gas Regional Emission Estimates

Worldwide emissions of GHG in 2017 were estimated at 48.40 billion metric tons of CO_2e.[41] This value includes ongoing emissions from industrial and agricultural sources but excludes emissions from land use changes.

In 2019, the United States emitted about 6,558 million metric tons of CO_2e. Emissions decreased from 2018 to 2019 by 1.7 percent. This decrease was driven largely by a decrease in emissions from fossil fuel combustion resulting from a decrease in total energy use in 2019 compared to 2018 and a continued shift from coal to natural gas and renewables in the electric power sector.[42] GHG emissions in 2018 (after accounting for sequestration from the land sector) were 10.2 percent below 2005 levels. GHG emissions in 2019 (after accounting for sequestration from the land sector) were 13 percent below 2005 levels.

In 2018, California emitted approximately 425 million metric tons of CO_2e, 0.8 million metric tons of CO_2e higher than 2017 levels and six million metric tons of CO_2e below the 2020 GHG Limit of 431 million metric tons of CO_2e).[43] Consistent with recent years, these reductions have occurred while California's economy has continued to grow and generate jobs. The transportation sector remains the largest source of GHG emissions in the state with 40 percent of the emissions in 2018 but there was a decrease in emissions compared to 2017.[44]

Emissions from the electricity sector account for 15 percent of the inventory and showed a slight increase in 2018 due to less hydropower. California in 2018 used more electricity from zero-GHG sources (for the purpose of the GHG inventory, these include hydro, solar, wind, and nuclear energy) than from GHG-emitting sources for both in-state generation and total (in-state plus imports) generation. The industrial

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[41] World Resources Institute, *Climate Analysis Indicator Tool – Global Historical GHG Emissions*, https://www.climatewatchdata.org/ghg-emissions?end_year=2017&start_year=1990

[42] United States Environmental Protection Agency, *Inventory of U.S. Greenhouse Gas Emissions and Sinks*, April 2021, https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks-1990-2019

[43] California Air Resources Board, *Emissions Trends Report 2000-2018 (2020 Edition)*, https://ww3.arb.ca.gov/cc/inventory/pubs/reports/2000_2018/ghg_inventory_trends_00-18.pdf

[44] California Air Resources Board, *Emissions Trends Report 2000-2018 (2020 Edition)*, https://ww3.arb.ca.gov/cc/inventory/pubs/reports/2000_2018/ghg_inventory_trends_00-18.pdf

sector has seen steady emissions in the past few years and remains at 21 percent of the inventory.[45] The composition of GHG emissions in California (expressed as CO_2e) were as follows:

- CO_2 accounted for 83 percent;
- CH_4 accounted for nine percent;
- N_2O accounted for three percent; and
- Fluorinated gases (hydrofluorocarbons (HFCs), perfluorinated compounds (PFCs), and sulfur hexafluoride (SF_6)) accounted for five percent.

In 2008, unincorporated Shasta County's total baseline emissions included 3,131,054 metric tons of CO_2e. Stationary sources generated the largest portion of emissions at approximately 2,271,000 metric tons of CO_2e (73 percent of the total emissions). The transportation sector generated the second highest amount of emissions in the unincorporated County at approximately 243,700 metric tons of CO_2e (8 percent of the total emissions), followed by energy consumption emissions at approximately 206,300 metric tons of CO_2e (7 percent of the total emissions). The forestry sector contributed approximately 156,500 metric tons of CO_2e (5 percent of total emissions), and the agriculture sector generated approximately 132,200 metric tons of CO_2e (4 percent of total emissions). The off-road vehicle/recreation, solid waste, and water (including water and wastewater) sectors comprise the remaining 4 percent of the emissions inventory.[46]

Thresholds of Significance

The standards of significance applied to the analysis of potential GHG impacts are based on Appendix G of the *CEQA Guidelines.* According to Appendix G evaluation thresholds, the proposed Project would be considered to have significant air quality impacts if it were to:

- Generate greenhouse gas emissions, either directly or indirectly, that may have a significant effect on the environment; or
- Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases.

At this time, neither the SCAQMD nor the County has adopted numerical thresholds of significance for GHG emissions that would apply to the proposed project. The SCAQMD, however, recommends that all projects subject to CEQA review be considered in the context of GHG emissions and climate change

[45] California Air Resources Board, *Emissions Trends Report 2000-2018 (2020 Edition)*, https://ww3.arb.ca.gov/cc/inventory/pubs/reports/2000_2018/ghg_inventory_trends_00-18.pdf

[46] County of Shasta, Draft Shasta Regional Climate Action Plan, November 2012, https://www.co.shasta.ca.us/docs/libraries/resource-management-docs/docs/RCAP_011811.pdf?sfvrsn=0

impacts, and that CEQA documents include a quantification of GHG emissions from all project sources, as well as minimize and mitigate GHG emissions as feasible. The project would generate GHG emissions through long-term operational activities.

Considering the lack of established GHG emissions thresholds that would apply to the proposed project, CEQA allows lead agencies to identify thresholds of significance applicable to a project that are supported by substantial evidence. Substantial evidence is defined in the CEQA statute to mean "facts, reasonable assumptions predicated on facts, and expert opinion supported by facts" (14 CCR 15384(b)).[47] Substantial evidence can be in the form of technical studies, agency staff reports or opinions, expert opinions supported by facts, and prior CEQA assessments and planning documents. Therefore, to establish additional context in which to consider the order of magnitude of the proposed project's GHG emissions, this analysis accounts for the following considerations by other government agencies and associations about what levels of GHG emissions constitute a cumulatively considerable incremental contribution to climate change:

- Sacramento Metropolitan Air Quality Management District (SMAQMD) established thresholds, including 1,100 metric tons of CO_2e per year for the construction or operational phase of land use development projects, or 10,000 direct metric tons of CO_2e per year from stationary source projects.[48]

- Placer County Air Pollution Control District (PCAPCD) recommends a tiered approach to determine if a project's GHG emissions would result in a significant impact. First, project GHG emissions are compared to the de minimis level of 1,100 metric tons of CO_2e per year. If a project does not exceed this threshold, it does not have significant GHG emissions. If the project exceeds the de minimis level and does not exceed the 10,000 metric tons of CO_2e per year bright line threshold, then the project's GHG emissions can be compared to the efficiency thresholds. These thresholds are 4.5 metric tons of CO_2e per-capita for residential projects in an urban area, and 5.5 metric tons of CO_2e per-capita for residential projects in a rural area. For nonresidential development, the thresholds are 26.5 metric tons of CO_2e per 1,000 square feet for projects in urban areas, and

[47] 14 CCR 15384 provides the following discussion: "Substantial evidence" as used in the Guidelines is the same as the standard of review used by courts in reviewing agency decisions. Some cases suggest that a higher standard, the so called "fair argument standard" applies when a court is reviewing an agency's decision whether or not to prepare an EIR. Public Resources Code section 21082.2 was amended in 1993 (Chapter 1131) to provide that substantial evidence shall include "facts, reasonable assumptions predicated upon facts, and expert opinion supported by facts." The statute further provides that "argument, speculation, unsubstantiated opinion or narrative, evidence which is clearly inaccurate or erroneous, or evidence of social or economic impacts which do not contribute to, or are not caused by, physical impacts on the environment, is not substantial evidence."

[48] Sacramento Metropolitan Air Quality Management District, Guide to Air Quality Assessment in Sacramento County, May 2018, http://www.airquality.org/Residents/CEQA-Land-Use-Planning/CEQA-Guidance-Tools

27.3 metric tons of CO_2e per 1,000 square feet for projects in rural areas. The PCAPCD bright-line GHG threshold of 10,000 metric tons of CO_2e per year is also applied to land use projects' construction phase and stationary source projects' construction and operational phases. Generally, GHG emissions from a project that exceed 10,000 metric tons of CO_2e per year would be deemed to have a cumulatively considerable contribution to global climate change.[49]

- Bay Area Air Quality Management District (BAAQMD) has adopted 1,100 metric tons of CO_2e per year as a project-level bright-line GHG significance threshold that would apply to operational emissions from mixed land-use development projects, a threshold of 10,000 metric tons of CO_2e per year as the significance threshold for operational GHG emissions from stationary-source projects, and an efficiency threshold of 4.6 metric tons of CO_2e per service population per year.[50]

- South Coast Air Quality Management District formed a GHG CEQA Significance Threshold Working Group to work with South Coast Air District staff on developing GHG CEQA significance thresholds until statewide significance thresholds or guidelines are established. In December 2008, the South Coast Air Quality Management District adopted an interim 10,000 metric tons of CO_2e per-year screening level threshold for stationary source/industrial projects for which the South Coast Air Quality Management District is the lead agency (South Coast Air Quality Management District Resolution No. 08-35, December 5, 2008).

Shasta County recommends the use of SMAQMD GHG thresholds of CO_2e -(1,100 metric tons of CO_2e per year for construction or 10,000 metric tons of CO_2e per year from stationary source projects.

As described, the 10,000 metric tons of CO_2e per year threshold is used by other air districts for industrial and/or stationary source emissions of GHG. Since the proposed project is an industrial project that includes stationary sources (i.e., diesel generators used for emergency power), the proposed project's GHG emissions were compared to the 10,000 metric tons of CO_2e per year quantitative threshold. The substantial evidence for this GHG emissions threshold is based on the expert opinion of various California air districts, which have applied the 10,000 metric tons of CO_2e per year threshold in numerous CEQA documents where those air districts were the lead agency.

The estimated construction GHG emissions for the proposed project are 3,334 metric tons of CO_2e. Given the two-year construction period, the annual construction GHG emissions for the proposed project are

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[49] Placer County Air Pollution Control District, 2017 CEQA Handbook – Chapter 2, Thresholds of Significance. https://placerair.org/DocumentCenter/View/2047/Chapter-2-Thresholds-of-Significance-PDf

[50] Bay Area Air Quality Management District, CEQA Air Quality Guidelines, May 2017, http://www.baaqmd.gov/~/media/files/planning-and-research/ceqa/ceqa_guidelines_may2017-pdf.pdf?la=en

1,666 metric tons of CO_2e. As indicated, the 30-year amortized construction related GHG emissions would be approximately 111 metric tons of CO_2e per year. The results of the comparison are presented in **Table 20: Estimated Construction Greenhouse Gas Emissions for the Proposed Project**.

Table 20
Estimated Construction Greenhouse Gas Emissions

Construction Year	CO_2e Metric Tons
2023	1,838
2024	1,496
Total Construction Emissions	**3,334**
Total 30-Year Amortized Construction Emissions	**111**

Source: RCH Group, 2021

In 2014, the USEPA published GHG emission factors for biomass.[51] **Table 21: GHG Emissions Factors for Biomass** provides GHG emission factors for the processing of biomass. The estimated capacity rating is 111 MMBtu.

Table 21
GHG Emissions Factors for Biomass

Pollutant	Emission Factor	Units
CO_2	93.8	kg per MMBtu
CH_4	7.2	gram per MMBtu
N_2O	3.6	gram per MMBtu

Source: United States Environmental Protection Agency, Emission Factors for Greenhouse Gas Inventories, April 4, 2014, https://www.epa.gov/sites/default/files/2015-07/documents/emission-factors_2014.pdf

The estimated operational GHG emissions are presented in **Table 22: Estimated Operational Greenhouse Gas Emissions for the Proposed Project**. The estimated operational GHG emissions for the proposed project are 4,982 metric tons of CO_2e. When including the 30-year amortized construction related GHG emissions, the total estimated construction and operational GHG emissions are 5,093 metric tons of CO_2e per year.

[51] United States Environmental Protection Agency, Emission Factors for Greenhouse Gas Inventories, April4, 2014, https://www.epa.gov/sites/default/files/2015-07/documents/emission-factors_2014.pdf

Table 22
Estimated Operational Greenhouse Gas Emissions

Emission Source	CO_2e Metric Tons
Employee Vehicles	40
Off-road Equipment Onsite	104
Offsite Haul Trucks	2,242
Standby Generators	182
Biomass Boiler	2,366
Dry Kilns	-
Grinder	35
Sawmill	14
Total Operational Emissions	**4,982**
Total Construction and Operational Emissions	**5,093**
Total Emissions Avoided	**4,098**
Net Emissions	**995**
Significance Threshold	10,000
Significant?	No

Source: RCH Group, 2021

This significance determination does not account for the fact that operation of the biomass plant would result in a reduction in the open burning of forest-sourced biomass and associated emissions. While the level of open burning that would occur on any day is unknown, the quantity of biomass that would be consumed by the proposed project and, thus, not open burned in the forests, is known. Thus, annual level of "avoided emissions" generated by the open burning of biomass would reduce the overall impacts on GHG emissions. The PG&E carbon intensity factor for 2018 was 206.29 pounds of CO2e per MWh. Therefore, the estimated GHG emissions avoided is 4,098 metric tons of CO_2e. The result is a net increase in GHG emissions of 995 metric tons of CO_2e, which is below the significance threshold of 10,000 metric tons of CO_2e.

The proposed project would be subject to all applicable permit and planning requirements in place or adopted by the County and the State of California at the time that building permits are issued. The proposed project would be consistent with County plans, policies, and regulations for reduction of GHG. CARB's 2017 Scoping Plan, which details the State's strategy for achieving the 2030 GHG target (EO B-30-15 and SB 32 extended the goals of AB 32 and set a 2030 goal of reducing emissions 40 percent from 1990 levels), states the following regarding biomass utilization:

> "Innovate biomass utilization such that harvested wood and excess agricultural and forest biomass can be used to advance statewide objectives for renewable energy and fuels, wood

product manufacturing, agricultural markets, and soil health, resulting in avoided GHG emissions relative to traditional utilization pathways. Associated activities should increase the resilience of rural communities and economies."

The proposed project would be consistent with CARB's 2017 Scoping Plan by avoiding GHG emissions associated with open burning and utilizing biomass to advance statewide objectives for renewable energy. Thus, the proposed project would have a *less-than-significant impact* related to a conflict with a GHG reduction plan.

12.0 CUMULATIVE IMPACTS

Cumulative impacts are defined in CEQA as "two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts" (CEQA Guidelines Section 15355). Stated in another way, "a cumulative impact consists of an impact which is created as a result of the combination of the project evaluated together with other projects causing relating impacts" (CEQA Guidelines Section 15130 [a][1]).

Cumulative impacts would exist when either direct air quality impacts or multiple construction projects occur within the same area simultaneously. If a project were to produce air quality emissions simultaneously to a nearby construction project, the addition of both project emissions to the environment could exceed significance thresholds. For this project, the construction emissions were found to be less than significant. If a nearby project was to be under construction at the same time, that project would need to produce an additive amount of emissions close to the project site such that emissions would exceed thresholds. No cumulatively considerable construction projects are within at least 0.5 mile of the project site. Given this, a less than significant cumulative air quality impact would be expected during construction.

The Project site is zoned industrial, and the project has been designed to be consistent with this zoning designation. The project would generate less than significant direct and cumulative air quality impacts.

13.0 SUMMARY

Mitigation Measures are presented in **Section 7**. Daily mitigated construction emissions would not exceed the SCAQMD significance thresholds (Level B), as described in **Section 8**. These impacts are largely due to off-road construction equipment and to a much lesser degree due to off-site construction haul trucks. Daily mitigated operational emissions would not exceed the SCAQMD significance thresholds (Level B), as described in **Section 9**. Health impacts would be less than significant (**Section 10**). As shown in **Section 11**, the GHG emissions associated with construction activities and operations would not exceed the significance threshold.

Attachment A

Construction Emissions

- Summary
- Employee Trips
- Offroad Onsite
- Haul Trucks
- Fugitive Dust
- Onsite Paving

Summary of Construction Mitigated Emissions (2023)

	Daily Emissions (pounds/day)					Annual Emissions (tons/year)					Annual Emissions (metric tons/year)
	ROG	CO	NOX	PM10	PM2.5	ROG	CO	NOX	PM10	PM2.5	CO2e
Employees	0.04	2.45	0.19	0.04	0.01	0.00	0.27	0.02	0.00	0.00	78.3
Offroad Onsite	1.85	37.2	29.6	0.22	0.20	0.22	4.44	3.55	0.03	0.02	1,122
Offsite Haul Trucks	0.02	0.09	1.18	0.16	0.07	0.00	0.01	0.18	0.03	0.01	418
Onsite Paving	2.30	37.4	30.0	4.04	1.69	0.13	1.58	1.14	0.10	0.04	219
Fugitive Dust				35.0	7.35				28.1	5.91	
Total	4.20	77.2	61.0	39.5	9.32	0.36	6.31	4.90	28.3	5.98	1,838

Summary of Construction Mitigated Emissions (2024)

	Daily Emissions (pounds/day)					Annual Emissions (tons/year)					Annual Emissions (metric tons/year)
Employees	0.02	1.23	0.09	0.02	0.01	0.00	0.19	0.01	0.00	0.00	55.2
Offroad Onsite	1.41	28.5	21.4	0.15	0.14	0.19	3.90	2.93	0.02	0.02	1,022
Offsite Haul Trucks	0.02	0.09	1.18	0.16	0.07	0.00	0.01	0.18	0.03	0.01	418
Total	1.45	29.8	22.7	0.33	0.21	0.20	4.11	3.13	0.05	0.03	1,496

Significance Thresholds	ROG		NOx	PM10
Level A	25		25	80
Level B	137		137	137

Offroad Construction Equipment Emissions (2023)

				Daily	Days	Load	Emission Factor (g/hp-hour)							Daily Emissions (pounds/day)					Annual Emissions (tons/year)							Annual Emissions (metric tons/year)			
	Equipment	HP	Units	Hours	Per Year	Factor	ROG	CO	NOX	PM10	PM2.5	CO2	CH4	ROG	CO	NOX	PM10	PM2.5	ROG	CO	NOX	PM10	PM2.5	CO2	CH4	CO2	CH4	CO2e	gals Diesel
Bioenergy	Auger	163	1	14	274	0.50	0.05	0.49	0.40	0.01	0.01	262	0.002	0.12	1.23	1.02	0.04	0.03	0.02	0.17	0.14	0.00	0.00	90	0.00	82	0.00	82	8,064
Bioenergy	Cranes	367	1	14	274	0.29	0.06	0.49	0.64	0.03	0.02	152	0.001	0.20	1.61	2.11	0.08	0.08	0.03	0.22	0.29	0.01	0.01	68	0.00	62	0.00	62	6,114
Bioenergy	Excavator	339	3	14	274	0.38	0.05	0.40	0.34	0.01	0.01	201	0.002	0.56	4.75	4.04	0.14	0.13	0.08	0.65	0.55	0.02	0.02	329	0.00	298	0.00	298	29,390
Bioenergy	Grader	215	2	14	274	0.41	0.12	0.53	1.32	0.04	0.04	216	0.002	0.63	2.86	7.2	0.24	0.22	0.09	0.39	0.99	0.03	0.03	161	0.00	146	0.00	146	14,391
Bioenergy	Off-Highway Tractor	200	1	14	274	0.44	0.06	0.46	0.41	0.01	0.01	229	0.002	0.16	1.25	1.11	0.04	0.04	0.02	0.17	0.15	0.01	0.00	85	0.00	77	0.00	77	7,630
Bioenergy	Off-Highway Trucks	376	2	14	274	0.38	0.07	0.46	0.51	0.02	0.02	202	0.002	0.63	4.08	4.46	0.16	0.15	0.09	0.56	0.61	0.02	0.02	244	0.00	221	0.00	221	21,805
Bioenergy	Aerial Lift	90	2	14	274	0.31	0.05	0.96	0.89	0.01	0.01	181	0.001	0.09	1.66	1.54	0.01	0.01	0.01	0.23	0.21	0.00	0.00	42.7	0.00	39	0.00	39	3,816
Bioenergy	Aerial Lift	93	2	14	274	0.31	0.03	0.98	0.44	0.01	0.01	163	0.001	0.05	1.75	0.79	0.01	0.01	0.01	0.24	0.11	0.00	0.00	39.7	0.00	36	0.00	36	3,547
Bioenergy	Forklift	60	1	14	274	0.20	0.06	0.73	0.60	0.04	0.03	106	0.001	0.02	0.27	0.22	0.01	0.01	0.00	0.04	0.03	0.00	0.00	5.4	0.00	5	0.00	4.9	481
Bioenergy	Paver	158	1	14	274	0.42	0.08	1.25	0.83	0.04	0.04	220	0.002	0.17	2.55	1.69	0.08	0.07	0.02	0.35	0.23	0.01	0.01	62	0.00	56	0.00	56	5,512
WPO	Grader	215	1	12	120	0.41	0.12	0.53	1.32	0.04	0.04	216	0.002	0.27	1.23	3.09	0.10	0.09	0.02	0.07	0.19	0.01	0.01	30.2	0.00	27	0.00	27	2,701
WPO	Paver	158	1	12	120	0.42	0.08	1.25	0.83	0.04	0.04	220	0.002	0.15	2.19	1.45	0.07	0.06	0.01	0.13	0.09	0.00	0.00	23.1	0.00	21	0.00	21	2,069
WPO	Roller	150	1	12	120	0.42	0.06	1.09	0.56	0.03	0.02	198	0.002	0.09	1.82	0.93	0.04	0.04	0.01	0.11	0.06	0.00	0.00	19.8	0.00	18	0.00	18	1,769
WPO	Water Trucks	300	1	12	120	0.38	0.07	0.46	0.51	0.02	0.02	202	0.002	0.21	1.39	1.53	0.05	0.05	0.01	0.08	0.09	0.00	0.00	36.5	0.00	33	0.00	33	3,266
													Total	3.36	28.6	31.2	1.08	0.99	0.40	3.41	3.73	0.13	0.12	1,237	0.01	1,122	0.01	1,122	110,554

Offroad Construction Equipment Emissions (2024)

				Daily	Days	Load	Emission Factor (g/hp-hour)							Daily Emissions (pounds/day)					Annual Emissions (tons/year)							Annual Emissions (metric tons/year)			
	Equipment	HP	Units	Hours	Per Year	Factor	ROG	CO	NOX	PM10	PM2.5	CO2	CH4	ROG	CO	NOX	PM10	PM2.5	ROG	CO	NOX	PM10	PM2.5	CO2	CH4	CO2	CH4	CO2e	gals Diesel
Bioenergy	Auger	163	1	14	274	0.50	0.05	0.49	0.39	0.01	0.01	262	0.00	0.13	1.24	0.97	0.03	0.03	0.02	0.17	0.13	0.00	0.00	90	0.00	82	0.00	82	8,086
Bioenergy	Cranes	367	1	14	274	0.29	0.06	0.48	0.61	0.02	0.02	152	0.00	0.20	1.59	2.02	0.08	0.07	0.03	0.22	0.28	0.01	0.01	68	0.00	62	0.00	62	6,115
Bioenergy	Excavator	339	3	14	274	0.38	0.05	0.40	0.32	0.01	0.01	201	0.00	0.55	4.77	3.76	0.13	0.12	0.08	0.65	0.51	0.02	0.02	329	0.00	298	0.00	298	29,402
Bioenergy	Grader	215	2	14	274	0.41	0.11	0.52	1.19	0.04	0.04	216	0.00	0.59	2.81	6.5	0.22	0.20	0.08	0.38	0.89	0.03	0.03	161	0.00	146	0.00	146	14,379
Bioenergy	Off-Highway Tractor	200	1	14	274	0.44	0.06	0.46	0.38	0.01	0.01	229	0.00	0.16	1.26	1.03	0.04	0.03	0.02	0.17	0.14	0.00	0.00	85	0.00	77	0.00	77	7,624
Bioenergy	Off-Highway Trucks	376	2	14	274	0.38	0.07	0.46	0.47	0.02	0.02	202	0.00	0.62	4.02	4.16	0.15	0.14	0.08	0.55	0.57	0.02	0.02	244	0.00	221	0.00	221	21,772
Bioenergy	Aerial Lift	90	2	14	274	0.31	0.05	0.96	0.89	0.01	0.01	181	0.00	0.08	1.65	1.53	0.01	0.01	0.01	0.23	0.21	0.00	0.00	42.7	0.00	39	0.00	39	3,815
Bioenergy	Aerial Lift	93	2	14	274	0.31	0.03	0.98	0.44	0.01	0.01	163	0.00	0.05	1.74	0.79	0.01	0.01	0.01	0.24	0.11	0.00	0.00	39.7	0.00	36	0.00	36	3,547
Bioenergy	Forklift	60	1	14	274	0.20	0.06	0.73	0.55	0.03	0.03	106	0.00	0.02	0.27	0.20	0.01	0.01	0.00	0.04	0.03	0.00	0.00	5.4	0.00	5	0.00	5	481
Bioenergy	Paver	158	1	14	274	0.42	0.08	1.25	0.77	0.04	0.03	220	0.00	0.17	2.56	1.58	0.08	0.07	0.02	0.35	0.22	0.01	0.01	62	0.00	56	0.00	56	5,511
													Total	2.57	21.9	22.5	0.75	0.69	0.35	3.00	3.08	0.10	0.10	1,127	0.01	1,022	0.01	1,022	100,731

Construction Employee Vehicle Emissions

		Daily		Emission Factor (g/mile)									Daily Emissions (pounds/day)						Annual Emissions (tons/year)						Annual Emissions (metric tons/year)	
	Year	Miles	Days	ROG	CO	NOX	CO2	CH4	N2O	PM10	PM2.5	SO2	ROG	CO	NOX	PM10	PM2.5	SO2	ROG	CO	NOX	PM10	PM2.5	SO2	CO2e	gals Gas
Bioenergy	2023	576	312	0.01	0.97	0.07	306	0.003	0.006	0.02	0.01	0.003	0.02	1.23	0.09	0.02	0.01	0.00	0.00	0.19	0.01	0.00	0.00	0.00	55.2	6,201
Bioenergy	2024	576	312	0.01	0.97	0.07	306	0.003	0.006	0.02	0.01	0.003	0.02	1.23	0.09	0.02	0.01	0.00	0.00	0.19	0.01	0.00	0.00	0.00	55.2	6,201
WPO	2023	576	130	0.01	0.97	0.07	306	0.003	0.006	0.02	0.01	0.003	0.02	1.23	0.09	0.02	0.01	0.00	0.00	0.08	0.01	0.00	0.00	0.00	23.0	2,584
Total	2023	1152		0.01	0.97	0.07	306	0.003	0.006	0.02	0.01	0.003	0.04	2.45	0.19	0.04	0.01	0.01	0.00	0.27	0.02	0.00	0.00	0.00	78.3	8,784
Total	2024	576		0.01	0.97	0.07	306	0.003	0.006	0.02	0.01	0.003	0.02	1.23	0.09	0.02	0.01	0.00	0.00	0.19	0.01	0.00	0.00	0.00	55.2	6,201

Bioenergy 24 Construction Employees

WPO 24 Construction Employees

12 miles per one way trip

Onroad Construction Haul Truck Emissions (2023)

	Daily	Days	Emission Factor (g/mile)									Daily Emissions (pounds/day)						Annual Emissions (tons/year)						Annual Emissions (metric tons/year)	
	Trips	per Year	ROG	CO	NOX	CO2	CH4	N2O	PM10	PM2.5	SO2	ROG	CO	NOX	PM10	PM2.5	SO2	ROG	CO	NOX	PM10	PM2.5	SO2	CO2e	gals Diesel
Bioenergy Stone Lorry	200	312	0.01	0.03	0.45	1,072	0.000	0.169	0.06	0.02	0.010	0.00	0.02	0.20	0.03	0.01	0.00	0.00	0.00	0.03	0.00	0.00	0.00	70	6,865
Bioenergy Concrete Lorry	200	312	0.01	0.03	0.45	1,072	0.000	0.169	0.06	0.02	0.010	0.00	0.02	0.20	0.03	0.01	0.00	0.00	0.00	0.03	0.00	0.00	0.00	70	6,865
Bioenergy Articulated Lorry	200	312	0.01	0.03	0.45	1,072	0.000	0.169	0.06	0.02	0.010	0.00	0.02	0.20	0.03	0.01	0.00	0.00	0.00	0.03	0.00	0.00	0.00	70	6,865
Bioenergy Articulated Lorry	200	312	0.01	0.03	0.45	1,072	0.000	0.169	0.06	0.02	0.010	0.00	0.02	0.20	0.03	0.01	0.00	0.00	0.00	0.03	0.00	0.00	0.00	70	6,865
Bioenergy Articulated Lorry	200	312	0.01	0.03	0.45	1,072	0.000	0.169	0.06	0.02	0.010	0.00	0.02	0.20	0.03	0.01	0.00	0.00	0.00	0.03	0.00	0.00	0.00	70	6,865
Bioenergy Rigid Lorry	200	312	0.01	0.03	0.45	1,072	0.000	0.169	0.06	0.02	0.010	0.00	0.02	0.20	0.03	0.01	0.00	0.00	0.00	0.03	0.00	0.00	0.00	70	6,865
												0.02	0.09	1.18	0.16	0.07	0.03	0.00	0.01	0.18	0.03	0.01	0.00	418	41,192

Onroad Construction Haul Truck Emissions (2024)

	Daily	Days	Emission Factor (g/mile)									Daily Emissions (pounds/day)						Annual Emissions (tons/year)						Annual Emissions (metric tons/year)	
	Trips	per Year	ROG	CO	NOX	CO2	CH4	N2O	PM10	PM2.5	SO2	ROG	CO	NOX	PM10	PM2.5	SO2	ROG	CO	NOX	PM10	PM2.5	SO2	CO2e	gals Diesel
Bioenergy Stone Lorry	200	312	0.01	0.03	0.45	1,072	0.000	0.169	0.06	0.02	0.010	0.00	0.02	0.20	0.03	0.01	0.00	0.00	0.00	0.03	0.00	0.00	0.00	70	6,865
Bioenergy Concrete Lorry	200	312	0.01	0.03	0.45	1,072	0.000	0.169	0.06	0.02	0.010	0.00	0.02	0.20	0.03	0.01	0.00	0.00	0.00	0.03	0.00	0.00	0.00	70	6,865
Bioenergy Articulated Lorry	200	312	0.01	0.03	0.45	1,072	0.000	0.169	0.06	0.02	0.010	0.00	0.02	0.20	0.03	0.01	0.00	0.00	0.00	0.03	0.00	0.00	0.00	70	6,865
Bioenergy Articulated Lorry	200	312	0.01	0.03	0.45	1,072	0.000	0.169	0.06	0.02	0.010	0.00	0.02	0.20	0.03	0.01	0.00	0.00	0.00	0.03	0.00	0.00	0.00	70	6,865
Bioenergy Articulated Lorry	200	312	0.01	0.03	0.45	1,072	0.000	0.169	0.06	0.02	0.010	0.00	0.02	0.20	0.03	0.01	0.00	0.00	0.00	0.03	0.00	0.00	0.00	70	6,865
Bioenergy Rigid Lorry	200	312	0.01	0.03	0.45	1,072	0.000	0.169	0.06	0.02	0.010	0.00	0.02	0.20	0.03	0.01	0.00	0.00	0.00	0.03	0.00	0.00	0.00	70	6,865
												0.02	0.09	1.18	0.16	0.07	0.03	0.00	0.01	0.18	0.03	0.01	0.00	418	41,192

100 miles per one way trip

0.25	Fugitive dust control efficiency factor		
0.21	PM2.5 fugitive dust factor		
1.2	tons per acre-month	AP42 PM10 EF	
0.42	tons per acre-month	MRI PM10 EF	
45	acres	Bioenergy + WPO	
11	acres	Bioenergy	

PM10	PM2.5		
112	23.6	tons/year	Umitigated
28.1	5.91	tons/year	Mitigated
140	29.4	pounds/day	Umitigated
35.0	7.35	pounds/day	Mitigated

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Burney Bioenergy

Shasta County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Asphalt Surfaces	35.00	Acre	35.00	1,524,600.00	0

1.2 Other Project Characteristics

Urbanization Rural **Wind Speed (m/s)** 2.7 **Precipitation Freq (Days)** 82

Climate Zone 3 **Operational Year** 2026

Utility Company Pacific Gas and Electric Company

CO2 Intensity (lb/MWhr) 203.98 **CH4 Intensity (lb/MWhr)** 0.033 **N2O Intensity (lb/MWhr)** 0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use -

Construction Phase - Project Description

Grading - Project Description

Trips and VMT - Project Description

Construction Off-road Equipment Mitigation - Basic and Enhanced Emission Reduction Measures

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3

tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstructionPhase	PhaseEndDate	11/20/2026	9/30/2023
tblConstructionPhase	PhaseStartDate	9/5/2026	6/1/2023
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	HaulingTripNumber	0.00	50.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2023	0.1934	1.1943	1.2787	2.4700e-003	0.2117	0.0529	0.2646	0.0822	0.0487	0.1310	0.0000	217.5218	217.5218	0.0664	6.4000e-004	219.3729
Maximum	**0.1934**	**1.1943**	**1.2787**	**2.4700e-003**	**0.2117**	**0.0529**	**0.2646**	**0.0822**	**0.0487**	**0.1310**	**0.0000**	**217.5218**	**217.5218**	**0.0664**	**6.4000e-004**	**219.3729**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2023	0.1342	1.1447	1.5830	2.4700e-003	0.0910	8.2900e-003	0.0993	0.0343	8.2800e-003	0.0426	0.0000	217.5216	217.5216	0.0664	6.4000e-004	219.3727
Maximum	**0.1342**	**1.1447**	**1.5830**	**2.4700e-003**	**0.0910**	**8.2900e-003**	**0.0993**	**0.0343**	**8.2800e-003**	**0.0426**	**0.0000**	**217.5216**	**217.5216**	**0.0664**	**6.4000e-004**	**219.3727**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**30.60**	**4.15**	**-23.80**	**0.00**	**57.02**	**84.34**	**62.48**	**58.27**	**83.00**	**67.47**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	4-1-2023	6-30-2023	0.9684	0.8371
2	7-1-2023	9-30-2023	0.4315	0.4522
		Highest	0.9684	0.8371

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.1516	0.0000	3.2000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	6.3000e-004	6.3000e-004	0.0000	0.0000	6.7000e-004
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.1516**	**0.0000**	**3.2000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**6.3000e-004**	**6.3000e-004**	**0.0000**	**0.0000**	**6.7000e-004**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.1516	0.0000	3.2000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	6.3000e-004	6.3000e-004	0.0000	0.0000	6.7000e-004
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.1516**	**0.0000**	**3.2000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**6.3000e-004**	**6.3000e-004**	**0.0000**	**0.0000**	**6.7000e-004**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Paving	Paving	6/1/2023	9/30/2023	5	55	
2	Grading	Grading	4/1/2023	5/31/2023	5	75	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 225

Acres of Paving: 35

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Grading	Excavators	2	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Scrapers	2	8.00	367	0.48
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Grading	8	20.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	50.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Use DPF for Construction Equipment

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

3.2 Paving - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0449	0.4433	0.6344	9.9000e-004		0.0222	0.0222		0.0204	0.0204	0.0000	87.1169	87.1169	0.0282	0.0000	87.8213
Paving	0.0725					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.1175**	**0.4433**	**0.6344**	**9.9000e-004**		**0.0222**	**0.0222**		**0.0204**	**0.0204**	**0.0000**	**87.1169**	**87.1169**	**0.0282**	**0.0000**	**87.8213**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.0000e-004	5.5400e-003	1.1300e-003	2.0000e-005	6.6000e-004	5.0000e-005	7.1000e-004	1.8000e-004	5.0000e-005	2.3000e-004	0.0000	2.2650	2.2650	0.0000	3.6000e-004	2.3712
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.7000e-003	2.0100e-003	0.0241	7.0000e-005	7.9300e-003	4.0000e-005	7.9700e-003	2.1100e-003	4.0000e-005	2.1500e-003	0.0000	6.5637	6.5637	1.7000e-004	1.7000e-004	6.6195
Total	**2.8000e-003**	**7.5500e-003**	**0.0253**	**9.0000e-005**	**8.5900e-003**	**9.0000e-005**	**8.6800e-003**	**2.2900e-003**	**9.0000e-005**	**2.3800e-003**	**0.0000**	**8.8287**	**8.8287**	**1.7000e-004**	**5.3000e-004**	**8.9907**

3.2 Paving - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0244	0.4913	0.7524	9.9000e-004		3.9800e-003	3.9800e-003		3.9800e-003	3.9800e-003	0.0000	87.1168	87.1168	0.0282	0.0000	87.8212
Paving	0.0725					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0969**	**0.4913**	**0.7524**	**9.9000e-004**		**3.9800e-003**	**3.9800e-003**		**3.9800e-003**	**3.9800e-003**	**0.0000**	**87.1168**	**87.1168**	**0.0282**	**0.0000**	**87.8212**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.0000e-004	5.5400e-003	1.1300e-003	2.0000e-005	6.6000e-004	5.0000e-005	7.1000e-004	1.8000e-004	5.0000e-005	2.3000e-004	0.0000	2.2650	2.2650	0.0000	3.6000e-004	2.3712
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.7000e-003	2.0100e-003	0.0241	7.0000e-005	7.9300e-003	4.0000e-005	7.9700e-003	2.1100e-003	4.0000e-005	2.1500e-003	0.0000	6.5637	6.5637	1.7000e-004	1.7000e-004	6.6195
Total	**2.8000e-003**	**7.5500e-003**	**0.0253**	**9.0000e-005**	**8.5900e-003**	**9.0000e-005**	**8.6800e-003**	**2.2900e-003**	**9.0000e-005**	**2.3800e-003**	**0.0000**	**8.8287**	**8.8287**	**1.7000e-004**	**5.3000e-004**	**8.9907**

3.3 Grading - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1979	0.0000	0.1979	0.0786	0.0000	0.0786	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0714	0.7421	0.6031	1.3300e-003		0.0306	0.0306		0.0282	0.0282	0.0000	117.2507	117.2507	0.0379	0.0000	118.1987
Total	**0.0714**	**0.7421**	**0.6031**	**1.3300e-003**	**0.1979**	**0.0306**	**0.2285**	**0.0786**	**0.0282**	**0.1067**	**0.0000**	**117.2507**	**117.2507**	**0.0379**	**0.0000**	**118.1987**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.7800e-003	1.3200e-003	0.0159	5.0000e-005	5.2200e-003	3.0000e-005	5.2500e-003	1.3900e-003	3.0000e-005	1.4200e-003	0.0000	4.3255	4.3255	1.1000e-004	1.1000e-004	4.3623
Total	**1.7800e-003**	**1.3200e-003**	**0.0159**	**5.0000e-005**	**5.2200e-003**	**3.0000e-005**	**5.2500e-003**	**1.3900e-003**	**3.0000e-005**	**1.4200e-003**	**0.0000**	**4.3255**	**4.3255**	**1.1000e-004**	**1.1000e-004**	**4.3623**

3.3 Grading - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0772	0.0000	0.0772	0.0306	0.0000	0.0306	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0328	0.6445	0.7895	1.3300e-003		4.1900e-003	4.1900e-003		4.1900e-003	4.1900e-003	0.0000	117.2506	117.2506	0.0379	0.0000	118.1986
Total	**0.0328**	**0.6445**	**0.7895**	**1.3300e-003**	**0.0772**	**4.1900e-003**	**0.0814**	**0.0306**	**4.1900e-003**	**0.0348**	**0.0000**	**117.2506**	**117.2506**	**0.0379**	**0.0000**	**118.1986**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.7800e-003	1.3200e-003	0.0159	5.0000e-005	5.2200e-003	3.0000e-005	5.2500e-003	1.3900e-003	3.0000e-005	1.4200e-003	0.0000	4.3255	4.3255	1.1000e-004	1.1000e-004	4.3623
Total	**1.7800e-003**	**1.3200e-003**	**0.0159**	**5.0000e-005**	**5.2200e-003**	**3.0000e-005**	**5.2500e-003**	**1.3900e-003**	**3.0000e-005**	**1.4200e-003**	**0.0000**	**4.3255**	**4.3255**	**1.1000e-004**	**1.1000e-004**	**4.3623**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Other Asphalt Surfaces	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Other Asphalt Surfaces	14.70	6.60	6.60	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Other Asphalt Surfaces	0.496817	0.053869	0.185478	0.139329	0.040637	0.008838	0.009512	0.023153	0.000626	0.000165	0.034569	0.001403	0.005605

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.1516	0.0000	3.2000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	6.3000e-004	6.3000e-004	0.0000	0.0000	6.7000e-004
Unmitigated	0.1516	0.0000	3.2000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	6.3000e-004	6.3000e-004	0.0000	0.0000	6.7000e-004

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0530					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0986					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	3.0000e-005	0.0000	3.2000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	6.3000e-004	6.3000e-004	0.0000	0.0000	6.7000e-004
Total	**0.1516**	**0.0000**	**3.2000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**6.3000e-004**	**6.3000e-004**	**0.0000**	**0.0000**	**6.7000e-004**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0530					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0986					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	3.0000e-005	0.0000	3.2000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	6.3000e-004	6.3000e-004	0.0000	0.0000	6.7000e-004
Total	**0.1516**	**0.0000**	**3.2000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**6.3000e-004**	**6.3000e-004**	**0.0000**	**0.0000**	**6.7000e-004**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Other Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Other Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Burney Bioenergy

Shasta County, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Asphalt Surfaces	35.00	Acre	35.00	1,524,600.00	0

1.2 Other Project Characteristics

Urbanization Rural **Wind Speed (m/s)** 2.7 **Precipitation Freq (Days)** 82

Climate Zone 3 **Operational Year** 2026

Utility Company Pacific Gas and Electric Company

CO2 Intensity (lb/MWhr) 203.98 **CH4 Intensity (lb/MWhr)** 0.033 **N2O Intensity (lb/MWhr)** 0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use -

Construction Phase - Project Description

Grading - Project Description

Trips and VMT - Project Description

Construction Off-road Equipment Mitigation - Basic and Enhanced Emission Reduction Measures

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstructionPhase	PhaseEndDate	11/20/2026	9/30/2023
tblConstructionPhase	PhaseStartDate	9/5/2026	6/1/2023
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	HaulingTripNumber	0.00	50.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2023	3.4094	34.5841	28.7772	0.0642	9.4591	1.4259	10.8849	3.7215	1.3118	5.0333	0.0000	6,226.8169	6,226.8169	1.9501	0.0138	6,277.4443
Maximum	**3.4094**	**34.5841**	**28.7772**	**0.0642**	**9.4591**	**1.4259**	**10.8849**	**3.7215**	**1.3118**	**5.0333**	**0.0000**	**6,226.8169**	**6,226.8169**	**1.9501**	**0.0138**	**6,277.4443**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2023	2.2961	30.0467	37.4486	0.0642	3.8449	0.1963	4.0411	1.4927	0.1962	1.6889	0.0000	6,226.8169	6,226.8169	1.9501	0.0138	6,277.4443
Maximum	**2.2961**	**30.0467**	**37.4486**	**0.0642**	**3.8449**	**0.1963**	**4.0411**	**1.4927**	**0.1962**	**1.6889**	**0.0000**	**6,226.8169**	**6,226.8169**	**1.9501**	**0.0138**	**6,277.4443**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**32.65**	**13.12**	**-30.13**	**0.00**	**59.35**	**86.23**	**62.87**	**59.89**	**85.05**	**66.45**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.8308	3.0000e-005	3.5600e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		7.6600e-003	7.6600e-003	2.0000e-005		8.1600e-003
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.8308**	**3.0000e-005**	**3.5600e-003**	**0.0000**	**0.0000**	**1.0000e-005**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**1.0000e-005**		**7.6600e-003**	**7.6600e-003**	**2.0000e-005**	**0.0000**	**8.1600e-003**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.8308	3.0000e-005	3.5600e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		7.6600e-003	7.6600e-003	2.0000e-005		8.1600e-003
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.8308**	**3.0000e-005**	**3.5600e-003**	**0.0000**	**0.0000**	**1.0000e-005**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**1.0000e-005**		**7.6600e-003**	**7.6600e-003**	**2.0000e-005**	**0.0000**	**8.1600e-003**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Paving	Paving	6/1/2023	9/30/2023	5	55	
2	Grading	Grading	4/1/2023	5/31/2023	5	75	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 225

Acres of Paving: 35

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Grading	Excavators	2	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Scrapers	2	8.00	367	0.48
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37

Trips and VMT

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Grading	8	20.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	50.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Use DPF for Construction Equipment

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

3.2 Paving - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.0327	10.1917	14.5842	0.0228		0.5102	0.5102		0.4694	0.4694		2,207.5841	2,207.5841	0.7140		2,225.4336
Paving	1.6673					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**2.7000**	**10.1917**	**14.5842**	**0.0228**		**0.5102**	**0.5102**		**0.4694**	**0.4694**		**2,207.5841**	**2,207.5841**	**0.7140**		**2,225.4336**

3.2 Paving - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	2.1400e-003	0.1307	0.0263	5.4000e-004	0.0159	1.1600e-003	0.0171	4.3700e-003	1.1100e-003	5.4800e-003		57.4433	57.4433	1.0000e-004	9.0300e-003	60.1363
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0657	0.0514	0.5445	1.5800e-003	0.1916	1.0200e-003	0.1926	0.0508	9.4000e-004	0.0518		161.5044	161.5044	4.4000e-003	4.7200e-003	163.0206
Total	**0.0679**	**0.1820**	**0.5708**	**2.1200e-003**	**0.2075**	**2.1800e-003**	**0.2097**	**0.0552**	**2.0500e-003**	**0.0572**		**218.9477**	**218.9477**	**4.5000e-003**	**0.0138**	**223.1569**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.5609	11.2952	17.2957	0.0228		0.0914	0.0914		0.0914	0.0914	0.0000	2,207.5841	2,207.5841	0.7140		2,225.4336
Paving	1.6673					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**2.2282**	**11.2952**	**17.2957**	**0.0228**		**0.0914**	**0.0914**		**0.0914**	**0.0914**	**0.0000**	**2,207.5841**	**2,207.5841**	**0.7140**		**2,225.4336**

3.2 Paving - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	2.1400e-003	0.1307	0.0263	5.4000e-004	0.0159	1.1600e-003	0.0171	4.3700e-003	1.1100e-003	5.4800e-003		57.4433	57.4433	1.0000e-004	9.0300e-003	60.1363
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0657	0.0514	0.5445	1.5800e-003	0.1916	1.0200e-003	0.1926	0.0508	9.4000e-004	0.0518		161.5044	161.5044	4.4000e-003	4.7200e-003	163.0206
Total	**0.0679**	**0.1820**	**0.5708**	**2.1200e-003**	**0.2075**	**2.1800e-003**	**0.2097**	**0.0552**	**2.0500e-003**	**0.0572**		**218.9477**	**218.9477**	**4.5000e-003**	**0.0138**	**223.1569**

3.3 Grading - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.2036	0.0000	9.2036	3.6538	0.0000	3.6538			0.0000			0.0000
Off-Road	3.3217	34.5156	28.0512	0.0621		1.4245	1.4245		1.3105	1.3105		6,011.4777	6,011.4777	1.9442		6,060.0836
Total	**3.3217**	**34.5156**	**28.0512**	**0.0621**	**9.2036**	**1.4245**	**10.6281**	**3.6538**	**1.3105**	**4.9643**		**6,011.4777**	**6,011.4777**	**1.9442**		**6,060.0836**

3.3 Grading - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0876	0.0685	0.7261	2.1000e-003	0.2555	1.3600e-003	0.2568	0.0678	1.2500e-003	0.0690		215.3392	215.3392	5.8700e-003	6.2900e-003	217.3607
Total	**0.0876**	**0.0685**	**0.7261**	**2.1000e-003**	**0.2555**	**1.3600e-003**	**0.2568**	**0.0678**	**1.2500e-003**	**0.0690**		**215.3392**	**215.3392**	**5.8700e-003**	**6.2900e-003**	**217.3607**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					3.5894	0.0000	3.5894	1.4250	0.0000	1.4250			0.0000			0.0000
Off-Road	1.5231	29.9782	36.7226	0.0621		0.1949	0.1949		0.1949	0.1949	0.0000	6,011.4777	6,011.4777	1.9442		6,060.0836
Total	**1.5231**	**29.9782**	**36.7226**	**0.0621**	**3.5894**	**0.1949**	**3.7843**	**1.4250**	**0.1949**	**1.6199**	**0.0000**	**6,011.4777**	**6,011.4777**	**1.9442**		**6,060.0836**

3.3 Grading - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0876	0.0685	0.7261	2.1000e-003	0.2555	1.3600e-003	0.2568	0.0678	1.2500e-003	0.0690		215.3392	215.3392	5.8700e-003	6.2900e-003	217.3607
Total	**0.0876**	**0.0685**	**0.7261**	**2.1000e-003**	**0.2555**	**1.3600e-003**	**0.2568**	**0.0678**	**1.2500e-003**	**0.0690**		**215.3392**	**215.3392**	**5.8700e-003**	**6.2900e-003**	**217.3607**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Other Asphalt Surfaces	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Other Asphalt Surfaces	14.70	6.60	6.60	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Other Asphalt Surfaces	0.496817	0.053869	0.185478	0.139329	0.040637	0.008838	0.009512	0.023153	0.000626	0.000165	0.034569	0.001403	0.005605

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.8308	3.0000e-005	3.5600e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		7.6600e-003	7.6600e-003	2.0000e-005		8.1600e-003
Unmitigated	0.8308	3.0000e-005	3.5600e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		7.6600e-003	7.6600e-003	2.0000e-005		8.1600e-003

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.2904					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.5400					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	3.3000e-004	3.0000e-005	3.5600e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		7.6600e-003	7.6600e-003	2.0000e-005		8.1600e-003
Total	**0.8307**	**3.0000e-005**	**3.5600e-003**	**0.0000**		**1.0000e-005**	**1.0000e-005**		**1.0000e-005**	**1.0000e-005**		**7.6600e-003**	**7.6600e-003**	**2.0000e-005**		**8.1600e-003**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.2904					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.5400					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	3.3000e-004	3.0000e-005	3.5600e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		7.6600e-003	7.6600e-003	2.0000e-005		8.1600e-003
Total	**0.8307**	**3.0000e-005**	**3.5600e-003**	**0.0000**		**1.0000e-005**	**1.0000e-005**		**1.0000e-005**	**1.0000e-005**		**7.6600e-003**	**7.6600e-003**	**2.0000e-005**		**8.1600e-003**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Burney Bioenergy

Shasta County, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Asphalt Surfaces	35.00	Acre	35.00	1,524,600.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.7	**Precipitation Freq (Days)**	82
Climate Zone	3			**Operational Year**	2026
Utility Company	Pacific Gas and Electric Company				
CO2 Intensity (lb/MWhr)	203.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use -

Construction Phase - Project Description

Grading - Project Description

Trips and VMT - Project Description

Construction Off-road Equipment Mitigation - Basic and Enhanced Emission Reduction Measures

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3

tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstructionPhase	PhaseEndDate	11/20/2026	9/30/2023
tblConstructionPhase	PhaseStartDate	9/5/2026	6/1/2023
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	HaulingTripNumber	0.00	50.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2023	3.4198	34.5731	28.9602	0.0645	9.4591	1.4259	10.8849	3.7215	1.3118	5.0333	0.0000	6,256.6580	6,256.6580	1.9498	0.0132	6,307.0740
Maximum	**3.4198**	**34.5731**	**28.9602**	**0.0645**	**9.4591**	**1.4259**	**10.8849**	**3.7215**	**1.3118**	**5.0333**	**0.0000**	**6,256.6580**	**6,256.6580**	**1.9498**	**0.0132**	**6,307.0740**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2023	2.3040	30.0357	37.6316	0.0645	3.8449	0.1963	4.0411	1.4927	0.1962	1.6889	0.0000	6,256.6580	6,256.6580	1.9498	0.0132	6,307.0740
Maximum	**2.3040**	**30.0357**	**37.6316**	**0.0645**	**3.8449**	**0.1963**	**4.0411**	**1.4927**	**0.1962**	**1.6889**	**0.0000**	**6,256.6580**	**6,256.6580**	**1.9498**	**0.0132**	**6,307.0740**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**32.63**	**13.12**	**-29.94**	**0.00**	**59.35**	**86.23**	**62.87**	**59.89**	**85.05**	**66.45**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.8308	3.0000e-005	3.5600e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		7.6600e-003	7.6600e-003	2.0000e-005		8.1600e-003
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.8308**	**3.0000e-005**	**3.5600e-003**	**0.0000**	**0.0000**	**1.0000e-005**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**1.0000e-005**		**7.6600e-003**	**7.6600e-003**	**2.0000e-005**	**0.0000**	**8.1600e-003**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.8308	3.0000e-005	3.5600e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		7.6600e-003	7.6600e-003	2.0000e-005		8.1600e-003
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.8308**	**3.0000e-005**	**3.5600e-003**	**0.0000**	**0.0000**	**1.0000e-005**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**1.0000e-005**		**7.6600e-003**	**7.6600e-003**	**2.0000e-005**	**0.0000**	**8.1600e-003**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Paving	Paving	6/1/2023	9/30/2023	5	55	
2	Grading	Grading	4/1/2023	5/31/2023	5	75	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 225

Acres of Paving: 35

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Grading	Excavators	2	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Scrapers	2	8.00	367	0.48
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37

Trips and VMT

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Grading	8	20.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	50.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Use DPF for Construction Equipment

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

3.2 Paving - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.0327	10.1917	14.5842	0.0228		0.5102	0.5102		0.4694	0.4694		2,207.5841	2,207.5841	0.7140		2,225.4336
Paving	1.6673					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**2.7000**	**10.1917**	**14.5842**	**0.0228**		**0.5102**	**0.5102**		**0.4694**	**0.4694**		**2,207.5841**	**2,207.5841**	**0.7140**		**2,225.4336**

3.2 Paving - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	2.3000e-003	0.1210	0.0258	5.4000e-004	0.0159	1.1600e-003	0.0171	4.3700e-003	1.1100e-003	5.4800e-003		57.3625	57.3625	1.1000e-004	9.0200e-003	60.0519
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0735	0.0431	0.6817	1.8000e-003	0.1916	1.0200e-003	0.1926	0.0508	9.4000e-004	0.0518		183.8852	183.8852	4.1800e-003	4.2000e-003	185.2428
Total	**0.0758**	**0.1641**	**0.7075**	**2.3400e-003**	**0.2075**	**2.1800e-003**	**0.2097**	**0.0552**	**2.0500e-003**	**0.0572**		**241.2477**	**241.2477**	**4.2900e-003**	**0.0132**	**245.2947**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.5609	11.2952	17.2957	0.0228		0.0914	0.0914		0.0914	0.0914	0.0000	2,207.5841	2,207.5841	0.7140		2,225.4336
Paving	1.6673					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**2.2282**	**11.2952**	**17.2957**	**0.0228**		**0.0914**	**0.0914**		**0.0914**	**0.0914**	**0.0000**	**2,207.5841**	**2,207.5841**	**0.7140**		**2,225.4336**

3.2 Paving - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	2.3000e-003	0.1210	0.0258	5.4000e-004	0.0159	1.1600e-003	0.0171	4.3700e-003	1.1100e-003	5.4800e-003		57.3625	57.3625	1.1000e-004	9.0200e-003	60.0519
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0735	0.0431	0.6817	1.8000e-003	0.1916	1.0200e-003	0.1926	0.0508	9.4000e-004	0.0518		183.8852	183.8852	4.1800e-003	4.2000e-003	185.2428
Total	**0.0758**	**0.1641**	**0.7075**	**2.3400e-003**	**0.2075**	**2.1800e-003**	**0.2097**	**0.0552**	**2.0500e-003**	**0.0572**		**241.2477**	**241.2477**	**4.2900e-003**	**0.0132**	**245.2947**

3.3 Grading - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.2036	0.0000	9.2036	3.6538	0.0000	3.6538			0.0000			0.0000
Off-Road	3.3217	34.5156	28.0512	0.0621		1.4245	1.4245		1.3105	1.3105		6,011.4777	6,011.4777	1.9442		6,060.0836
Total	**3.3217**	**34.5156**	**28.0512**	**0.0621**	**9.2036**	**1.4245**	**10.6281**	**3.6538**	**1.3105**	**4.9643**		**6,011.4777**	**6,011.4777**	**1.9442**		**6,060.0836**

3.3 Grading - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0980	0.0575	0.9090	2.4000e-003	0.2555	1.3600e-003	0.2568	0.0678	1.2500e-003	0.0690		245.1803	245.1803	5.5700e-003	5.6100e-003	246.9904
Total	**0.0980**	**0.0575**	**0.9090**	**2.4000e-003**	**0.2555**	**1.3600e-003**	**0.2568**	**0.0678**	**1.2500e-003**	**0.0690**		**245.1803**	**245.1803**	**5.5700e-003**	**5.6100e-003**	**246.9904**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					3.5894	0.0000	3.5894	1.4250	0.0000	1.4250			0.0000			0.0000
Off-Road	1.5231	29.9782	36.7226	0.0621		0.1949	0.1949		0.1949	0.1949	0.0000	6,011.4777	6,011.4777	1.9442		6,060.0836
Total	**1.5231**	**29.9782**	**36.7226**	**0.0621**	**3.5894**	**0.1949**	**3.7843**	**1.4250**	**0.1949**	**1.6199**	**0.0000**	**6,011.4777**	**6,011.4777**	**1.9442**		**6,060.0836**

3.3 Grading - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0980	0.0575	0.9090	2.4000e-003	0.2555	1.3600e-003	0.2568	0.0678	1.2500e-003	0.0690		245.1803	245.1803	5.5700e-003	5.6100e-003	246.9904
Total	**0.0980**	**0.0575**	**0.9090**	**2.4000e-003**	**0.2555**	**1.3600e-003**	**0.2568**	**0.0678**	**1.2500e-003**	**0.0690**		**245.1803**	**245.1803**	**5.5700e-003**	**5.6100e-003**	**246.9904**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Other Asphalt Surfaces	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Other Asphalt Surfaces	14.70	6.60	6.60	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Other Asphalt Surfaces	0.496817	0.053869	0.185478	0.139329	0.040637	0.008838	0.009512	0.023153	0.000626	0.000165	0.034569	0.001403	0.005605

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.8308	3.0000e-005	3.5600e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		7.6600e-003	7.6600e-003	2.0000e-005		8.1600e-003
Unmitigated	0.8308	3.0000e-005	3.5600e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		7.6600e-003	7.6600e-003	2.0000e-005		8.1600e-003

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.2904					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.5400					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	3.3000e-004	3.0000e-005	3.5600e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		7.6600e-003	7.6600e-003	2.0000e-005		8.1600e-003
Total	**0.8307**	**3.0000e-005**	**3.5600e-003**	**0.0000**		**1.0000e-005**	**1.0000e-005**		**1.0000e-005**	**1.0000e-005**		**7.6600e-003**	**7.6600e-003**	**2.0000e-005**		**8.1600e-003**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.2904					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.5400					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	3.3000e-004	3.0000e-005	3.5600e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		7.6600e-003	7.6600e-003	2.0000e-005		8.1600e-003
Total	**0.8307**	**3.0000e-005**	**3.5600e-003**	**0.0000**		**1.0000e-005**	**1.0000e-005**		**1.0000e-005**	**1.0000e-005**		**7.6600e-003**	**7.6600e-003**	**2.0000e-005**		**8.1600e-003**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Attachment B

Operational Emissions

- Summary
- Employees Trips
- Generators
- Grinder
- Dry Kiln
- Offroad Onsite
- Onroad Hual Trucks
- Sawmill

	Uncontrolled Daily Emissions (pounds/day)						Uncontrolled Annual Emissions (tons/year)						Annual Emissions (metric tons/year)
	ROG	CO	NOx	PM10	PM2.5	SOx	ROG	CO	NOx	PM10	PM2.5	SOx	CO2e
Employees	0.01	0.77	0.06	0.00	0.00	0.00	0.00	0.14	0.01	0.00	0.00	0.00	40
Offroad Onsite	0.57	5.60	3.24	0.12	0.11		0.04	0.43	0.25	0.01	0.01		104
Offsite Haul Trucks	0.22	6.49	8.61	1.20	0.48	0.20	0.03	1.14	0.96	0.13	0.05	0.02	2,242
Generator	5.78	79.2	15.2	0.91	0.91	55.9	0.07	0.99	0.19	0.01	0.01	0.70	182
Biomass Boiler	2.71	41.8	244	3.14	3.14	1.07	0.49	7.62	44.5	0.57	0.57	0.20	2,366
Dry Kiln	110						20.1						
Grinder	0.45	3.65	9.91	4.66	2.40		0.01	0.07	0.20	0.09	0.05		35
Sawmill	0.07	0.77	0.64	68.3	31.2		0.01	0.10	0.08	8.88	4.05		14
Total	**120**	**138**	**282**	**78.4**	**38.2**	**57.1**	**20.8**	**10.5**	**46.2**	**9.71**	**4.75**	**0.92**	**4,982**

	Controlled Daily Emissions (pounds/day)						Controlled Annual Emissions (tons/year)						Annual Emissions (metric tons/year)
	ROG	CO	NOx	PM10	PM2.5	SOx	ROG	CO	NOx	PM10	PM2.5	SOx	CO2e
Employees	0.01	0.77	0.06	0.00	0.00	0.00	0.00	0.14	0.01	0.00	0.00	0.00	40
Offroad Onsite	0.57	5.60	3.24	0.12	0.11		0.04	0.43	0.25	0.01	0.01		104
Offsite Haul Trucks	0.22	6.49	8.61	1.20	0.48	0.20	0.03	1.14	0.96	0.13	0.05	0.02	2,242
Generators	5.78	79.2	15.2	0.91	0.91	55.9	0.07	0.99	0.19	0.01	0.01	0.70	182
Biomass Boiler	2.71	41.8	24.4	3.14	3.14	1.07	0.49	7.62	4.44	0.57	0.57	0.20	2,366
Dry Kiln	110						20.1						
Grinder	0.45	3.65	9.91	4.66	2.40		0.01	0.07	0.20	0.09	0.05		35
Sawmill	0.07	0.77	0.64	68.3	31.2		0.01	0.10	0.08	8.88	4.05		14
Total	**120**	**138**	**62.0**	**78.4**	**38.2**	**57.1**	**20.8**	**10.5**	**6.14**	**9.71**	**4.75**	**0.92**	**4,982**

Significance Thresholds	ROG	NOx	PM10	5,093
Level A	25	25	80	4,098
Level B	137	137	137	995

Operational Employee Vehicle Emissions

	Daily	Emission Factor (g/mile)									Daily Emissions (pounds/day)						Annual Emissions (tons/year)						Annual Emissions (metric tons/year)	
	VMT	ROG	CO	NOX	CO2	CH4	N2O	PM10	PM2.5	SO2	ROG	CO	NOX	PM10	PM2.5	SO2	ROG	CO	NOX	PM10	PM2.5	SO2	CO2e	gal gasoline
Bioenergy	288	0.01	0.97	0.07	306	0.003	0.006	0.02	0.01	0.003	0.01	0.61	0.05	0.01	0.00	0.00	0.00	0.11	0.01	0.00	0.00	0.00	32	3,627
WPO	72	0.01	0.97	0.07	306	0.003	0.006	0.02	0.01	0.003	0.00	0.15	0.01	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	8	907
Total											0.01	0.77	0.06	0.01	0.00	0.00	0.00	0.14	0.01	0.00	0.00	0.00	40	4,534

Bioenergy	12	Operational Employees
WPO	3	Operational Employees
	12	miles per one way trip

Standby Generator Emissions

Tier 4	EF (g/hp-hr)	HP	Annual Emissic	Daily Emissions (lbs)				
NOx	0.50	6,705	0.18	14.8	50	hours per year	5000	kw
CO	2.60	6,705	0.96	76.9	2	hours per day	6,705	hp
SOx	1.84	6,705	0.68	54.3	1	generator test per day		
PM10/PM2.5	0.03	6,705	0.01	0.89				
CO2	526	6,705	194	15,556	176	metric tons		
TOC (ROG)	0.19	6,705	0.07	5.62				
NOx	0.50	200	0.01	0.44	50	hours per year	74.5	kw
CO	2.60	200	0.03	2.29	2	hours per day	100	hp
SOx	1.84	200	0.02	1.62	2	generator test per day		
PM10/PM2.5	0.03	200	0.00	0.03				
CO2	526	200	5.79	464	5	metric tons		
TOC (ROG)	0.19	200	0.00	0.17				

Grinder Fugitive Dust Emissions

PM10 (lb/yr) = Throughput (tons/yr)(0.024 lb TSP/ton)(0.60 lb PM10/lb TSP)(0.50)
PM2.5 (lb/yr) = Throughput (tons/yr)(0.024 lb TSP/ton)(0.25 lb PM2.5/lb TSP)(0.50)

0.09	PM10 tons per year	30,000	throughput (tons/year
0.05	PM2.5 tons per year	40	days per year
4.50	PM10 pounds per day		
2.25	PM2.5 pounds per day		

To approximate the particulate emissions for wood grinding, the emission factor for “Log Debarking” from a previous edition of AP-42,
Approximately 60% of the particulate emissions are assumed to be PM10. Water suppression will also provide 50% abatement of particulate emissions.

Lumber Kiln Drying VOC and HAP Emission Factors

EPA Region 10 HAP and VOC Emission Factors for Lumber Drying, January 2021 ("x" in equation represents kiln temp in °F)						
Species	**VOC (lb/mbf)**	**Methanol (lb/mbf)**	**Formaldehyde (lb/mbf)**	**Acetaldehyde (lb/mbf)**	**Propionaldehyde (lb/mbf)**	**Acrolein (lb/mbf)**
Ponderosa Pine	0.02083x - 1.30029	0.00137x - 0.18979	0.000074x - 0.010457	0.0340	0.0010	0.0026
White Fir (Eastern True Firs)	0.00817x - 1.02133	0.00465x - 0.73360	0.00016x - 0.02764	0.0550	0.0003	0.0009
Incense Cedar (Western Red Cedar)	0.00817x - 1.02133	0.00465x - 0.73360	0.00016x - 0.02764	0.0677	0.0004	0.0012
Douglas Fir	0.01460x - 1.77130	0.00114x - 0.16090	0.000028x - 0.00380	0.0275	0.0003	0.0005
USDA Effects of Drying Parameters on Hardwood Lumber Drying Defects and VOC Emissions, June 2008						
Oak (Highest of Red and White Oak)	0.3580	--	--	--	--	--

Instructions

NOTE: Only edit cells highlighted in blue. Detailed pollutant emissions tables below will automatically update.

A - Enter lumber processing throughput in units of mbf (thousand board feet) per year - e.g. 18,250,00 board feet -> 18,250 mbf

B - Enter speciation details for each lumber species. These numbers must add up to 100%

C - Enter maximum kiln temperature in °F

D - The average daily VOC emissions are calculated here. If results are greater than Significance Threshold Level A, they will highlight in yellow. If results are greater than Significance Threshold Level B, they will highlight in red.

A. Lumber Processing Parameters

Annual Throughput (mbf)	**18,250**

C. Kiln Parameters

Maximum Drying Temperature (°F)	**200**

B. Lumber Speciation Parameters

Species	Distribution	Throughput (mbf)
Ponderosa Pine	**70%**	12,775
White Fir (Eastern True Firs)	**10.0%**	1,825
Incense Cedar (Western Red Cedar)	**10%**	1,825
Douglas Fir	**5%**	913
Oak (Highest of Red and White Oak)	**5.0%**	913
Total	**100%**	**18,250**

D. Average Daily VOC Emissions (lbs) @ 200 °F

110.19	
Significance Threshold A	**25 lbs/day**
Significance Threshold B	**137 lbs/day**

200 °F - Temperature Specific Emission Factors (lb/mbf)

Species	VOC	Methanol	Formaldehyde	Acetaldehyde	Propionaldehyde	Acrolein	HAPS
Ponderosa Pine	2.86571	0.08421	0.004343	0.0340	0.0010	0.0026	0.126153
White Fir (Eastern True Firs)	0.61267	0.1964	0.00436	0.0550	0.0003	0.0009	0.25696
Incense Cedar (Western Red Cedar)	0.61267	0.1964	0.00436	0.0677	0.0004	0.0012	0.27006
Douglas Fir	1.1487	0.0671	0.0018	0.0275	0.0003	0.0005	0.0972
Oak (Highest of Red and White Oak)	0.3580	--	--	--	--	--	--

200 °F - Annual Emissions (lbs)

Species	VOC	Methanol	Formaldehyde	Acetaldehyde	Propionaldehyde	Acrolein	HAPS
Ponderosa Pine	36,609	1,076	55	434	13	33	1,612
White Fir (Eastern True Firs)	1,118	358	8	100	1	2	469
Incense Cedar (Western Red Cedar)	1,118	358	8	124	1	2	493
Douglas Fir	1,048	61	2	25	0	0	89
Oak (Highest of Red and White Oak)	327	0	0	0	0	0	0
Total	**40,221**	**1,854**	**73**	**683**	**14**	**38**	**2,662**

200 °F - Annual Emissions (tons)

Species	VOC	Methanol	Formaldehyde	Acetaldehyde	Propionaldehyde	Acrolein	HAPS
Ponderosa Pine	18.30	0.54	0.03	0.22	0.01	0.02	0.81
White Fir (Eastern True Firs)	0.56	0.18	0.00	0.05	0.00	0.00	0.23
Incense Cedar (Western Red Cedar)	0.56	0.18	0.00	0.06	0.00	0.00	0.25
Douglas Fir	0.52	0.03	0.00	0.01	0.00	0.00	0.04
Oak (Highest of Red and White Oak)	0.16	0.00	0.00	0.00	0.00	0.00	0.00
Total	**20.11**	**0.93**	**0.04**	**0.34**	**0.01**	**0.02**	**1.33**

Offroad Operational Equipment Emissions (Unmitigated)

Equipment	HP	Units	Daily Hours	Days	Load Factor	Year	Emission Factor (g/hp-hour) ROG	CO	NOX	PM10	PM2.5	CO2	CH4
Feedstock Loader	225	1	8	312	0.37	2025	0.06	0.45	0.52	0.02	0.02	194	0.002
Grinder	950	1	10	40	0.42	2025	0.05	0.41	1.13	0.02	0.02	219	0.002
Forklift	150	1	10	312	0.20	2025	0.04	0.64	0.33	0.02	0.02	106	0.001
Heel Boom Log Loader	200	1	10	40	0.50	2025	0.10	0.78	0.29	0.01	0.01	403	0.003
Rubber Tire Loader	200	1	10	40	0.36	2025	0.06	0.42	0.54	0.02	0.02	191	0.002
Water Truck	158	1	5	40	0.38	2025	0.08	1.28	0.52	0.03	0.02	201	0.002
Firewood Processer	90	1	4	312	0.38	2025	0.12	2.42	0.36	0.01	0.01	421	0.004
Firewood Pickup	93	1	4	300	0.50	2025	0.07	1.37	0.77	0.03	0.02	209	0.002
Sawmill	60	1	8	260	0.50	2025	0.12	1.46	1.20	0.07	0.07	219	0.002

Equipment	Daily Emissions (pounds/day) ROG	CO	NOX	PM10	PM2.5	Annual Emissions (tons/year) ROG	CO	NOX	PM10	PM2.5	Annual Emissions (metric tons/year) CO2	CH4	CO2e	gals Diesel
Feedstock Loader	0.09	0.66	0.76	0.03	0.03	0.01	0.10	0.12	0.00	0.00	40.3	0.00	40.4	3,975
Grinder	0.45	3.65	9.91	0.16	0.15	0.01	0.07	0.20	0.00	0.00	35.0	0.00	35.0	3,447
Forklift	0.03	0.42	0.22	0.01	0.01	0.00	0.07	0.03	0.00	0.00	9.92	0.00	9.93	978
Heel Boom Log Loader	0.23	1.72	0.63	0.02	0.02	0.00	0.03	0.01	0.00	0.00	16.1	0.00	16.1	1,591
Rubber Tire Loader	0.10	0.67	0.86	0.03	0.03	0.00	0.01	0.02	0.00	0.00	5.49	0.00	5.49	541
Water Truck	0.06	0.84	0.35	0.02	0.02	0.00	0.02	0.01	0.00	0.00	2.42	0.00	2.42	238
Firewood Processer	0.04	0.73	0.11	0.00	0.00	0.01	0.11	0.02	0.00	0.00	17.9	0.00	18.0	1,769
Firewood Pickup	0.03	0.56	0.32	0.01	0.01	0.00	0.08	0.05	0.00	0.00	11.7	0.00	11.7	1,149
Sawmill	0.07	0.77	0.64	0.04	0.03	0.01	0.10	0.08	0.00	0.00	13.7	0.00	13.7	1,348
Total (minus grinder and sawmill)	0.57	5.60	3.24	0.12	0.11	0.04	0.43	0.25	0.01	0.01	104	0.00	104	10,241
Total	1.09	10.0	13.8	0.33	0.30	0.05	0.60	0.53	0.02	0.02	153	0.00	153	15,036

Operational Haul Truck Emissions

		Peak	Average	Emission Factor (g/mile)									Daily Emissions (pounds/day)						Annual Emissions (tons/year)						Annual Emissions (metric tons/year)		
		Daily VMT	Daily VMT	ROG	CO	NOX	CO2	CH4	N2O	PM10	PM2.5	SO2	ROG	CO	NOX	PM10	PM2.5	SO2	ROG	CO	NOX	PM10	PM2.5	SO2	CO2e	gals Diesel	gals Gasoline
Bioenergy	Chip vans	5000	1600	0.01	0.03	0.45	1,072	0.000	0.169	0.06	0.02	0.010	0.08	0.38	4.91	0.68	0.27	0.11	0.00	0.02	0.29	0.04	0.02	0.01	652	64,252	
Bioenergy	Ash Truck	200	200	0.01	0.03	0.45	1,072	0.000	0.169	0.06	0.02	0.010	0.00	0.02	0.20	0.03	0.01	0.00	0.00	0.00	0.04	0.00	0.00	0.00	82	8,031	
WPO	Log Truck	3000	3000	0.01	0.03	0.45	1,072	0.000	0.169	0.06	0.02	0.010	0.05	0.23	2.95	0.41	0.16	0.07	0.01	0.04	0.54	0.07	0.03	0.01	1,223	120,472	
WPO	Firewood	2000	2000	0.02	1.23	0.11	357	0.005	0.009	0.02	0.01	0.004	0.09	5.41	0.51	0.08	0.03	0.02	0.02	0.99	0.09	0.01	0.01	0.00	263		29,471
WPO	Public Pickup	171	171	0.02	1.23	0.11	357	0.005	0.009	0.02	0.01	0.004	0.01	0.46	0.04	0.01	0.00	0.00	0.00	0.08	0.01	0.00	0.00	0.00	23		2,526
													0.22	6.49	8.61	1.20	0.48	0.20	0.03	1.14	0.96	0.13	0.05	0.02	2,242	192,756	31,997

Bioenergy	25	Chip vans trips per peak day
Bioenergy	1	Ash truck trips per peak day
Bioenergy	8	Chip vans trips per average day
Bioenergy	1	Ash truck trips per average day
WPO	15	Log truck trips per day
WPO	10	Firewood Truck trip per day
WPO	40	Public pickup truck drop-off on Mondays, Wednesdays and Saturdays
WPO	100	miles per one way trip for chip van, ash truck, and log truck
WPO	10	miles per one way for firewood truck
WPO	5	miles per one way for public pickup truck drop-off

Emission Source	PM		PM10		PM2.5		Daily PM10	Daily PM2.5	Annual PM10	Annual PM2.5
Sawing (uncontrolled)	0.35	50	0.175	25	0.0875	lb/ton log	70.0	35.0	9.10	4.55
Sawing (enclosure)	0.0875		0.0438		0.0219		17.5	8.75	2.28	1.14
"Drop" of "wet" material from one surface to another including, but not limited to, (a) each mechanical conveyance drop between point of generation and storage bin (but not including bin unless open to atmosphere) (b) loadout from storage bin into a truck bed or railcar and (c) drop onto a pile. Apply EF to each "drop."	0.00075		0.00035		0.00005	lb/bdt material	1.40	0.20	0.18	0.03
"Drop" of "dry" material from one surface to another including, but not limited to, (a) each mechanical conveyance drop between point of generation and storage bin (but not including bin unless open to atmosphere) (b) loadout from storage bin into a truck bed or railcar and (c) drop onto a pile. Apply EF to each "drop."	0.0015		0.0007		0.0001	lb/bdt material	0.28	0.04	0.04	0.01
Pneumatically convey material into target box	0.1	85	0.085	50	0.05	lb/bdt material	34.0	20.0	4.42	2.60

Particulate Matter Potential to Emit Emission Factors for Activities at Sawmills, Excluding Boilers, Located in Pacific Northwest Indian Country, May 8, 2014

The "material" in this entry refers to bark, hogged fuel, green chips, dry chips, green sawdust, dry sawdust, shavings and any other woody by product of lumber production.

104,000 tons of logs each year

400 tons per day

Biomass Boiler Air Toxics Emission Estimates

34,560 Nm3/hr Flow Rate

Cadmium	Mercury	Antimony	Dioxins	Hydrogen Chloride
0.05	0.05	0.05	0.1	2
mg/Nm^3	mg/Nm^3	mg/Nm^3	ng/Nm3	mg/Nm^3
4.80E-04	4.80E-04	4.80E-04	9.60E-10	1.92E-02
g/s	g/s	g/s	g/s	g/s
3.81E-03	3.81E-03	3.81E-03	7.62E-09	1.52E-01
lb/hr	lb/hr	lb/hr	lb/hr	lb/hr

Antimony (Sb) + Arsenic (As) + Lead (Pb) + Chromium (Cr) + Cobalt (Co) + Copper (Cu) + Manganese (Mn) + Nickel (Ni) + Vanadium

Attachment D

Health Risk Assessment Methodology and Assumptions

A health risk assessment (HRA) is accomplished in four steps: 1) hazards identification, 2) exposure assessment, 3) toxicity assessment, and 4) risk characterization. These steps cover the estimation of air emissions, the estimation of the air concentrations resulting from a dispersion analysis, the incorporation of the toxicity of the pollutants emitted, and the characterization of the risk based on exposure parameters such as breathing rate, age adjustment factors, and exposure duration; each depending on receptor type (i.e., residence, school, daycare centers, hospitals, senior care facilities, recreational areas, offsite worker, adult, infant, child).

This HRA was conducted in accordance with technical guidelines developed by federal, state, and regional agencies, including United States Environmental Protection Agency (USEPA) *Guideline on Air Quality Models*[1] and California Office of Environmental Health Hazard Assessment (OEHHA) *Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments.*[2] This HRA addresses the emissions from construction and operation of the onsite equipment, biomass boiler, and dry kilns.

An HRA should not be interpreted as the expected rates of cancer or other potential human health effects, but rather as estimates of potential risk or likelihood of adverse effects based on current knowledge, under several highly conservative assumptions and the best assessment tools currently available.

TERMS AND DEFINITIONS

As the practice of conducting an HRA is particularly complex and involves concepts that are not altogether familiar to most people, several terms and definitions are provided that are considered essential to the understanding of the approach, methodology and results:

> *Acute effect* – a health effect (non-cancer) produced within a short period of time (few minutes to several days) following an exposure to toxic air contaminants (TAC).
>
> *Cancer risk* – the probability of an individual contracting cancer from a lifetime (i.e., 70 year) exposure to TAC such as DPM in the ambient air based on an exposure duration of 30 years.

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1 United States Environmental Protection Agency, *Guideline on Air Quality Models (Revised), 40 Code of Federal Regulations, Part 51, Appendix W,* November 2005.

2 Office of Environmental Health Hazard Assessment, *Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments*, March 6, 2015, http://oehha.ca.gov/air/hot_spots/hotspots2015.html

Chronic effect – a health effect (non-cancer) produced from a continuous exposure occurring over an extended period of time (weeks, months, years).

Hazard Index (HI) – the unitless ratio of an exposure level over the acceptable reference dose. The HI can be applied to multiple compounds in an additive manner.

Hazard Quotient (HQ) – the unitless ratio of an exposure level over the acceptable reference dose. The HQ is applied to individual compounds.

Toxic Air Contaminants – any air pollutant that can cause short-term (acute) and/or long-term (chronic or carcinogenic, i.e., cancer causing) adverse human health effects (i.e., injury or illness). The current California list of TAC identify approximately 200 compounds, including particulate emissions from diesel-fueled engines.

Human Health Effects - comprise disorders such as eye watering, respiratory or heart ailments, and other (i.e., non-cancer) related diseases.

Health Risk Assessment – an analysis designed to predict the generation and dispersion of TAC in the outdoor environment, evaluate the potential for exposure of human populations, and to assess and quantify both the individual and population-wide health risks associated with those levels of exposure.

Incremental – under CEQA, the net difference (or change) in conditions or impacts when comparing the baseline to future year project conditions.

Maximum exposed individual (MEI) – an individual assumed to be located at the point where the highest concentrations of TAC, and therefore, health risks are predicted to occur.

Non-cancer risks – health risks such as eye watering, respiratory or heart ailments, and other non-cancer related diseases.

Receptors – the locations where potential health impacts or risks are predicted (i.e., schools, residences, and recreational sites).

LIMITATIONS AND UNCERTAINTIES

There are several important limitations and uncertainties commonly associated with a HRA due to the wide variability of human exposures to TAC, the extended timeframes over which the exposures are evaluated, and the inability to verify the results. Limitations and uncertainties associated with a HRA include: (a.) lack of reliable monitoring data; (b.) extrapolation of toxicity data in animals to humans; (c.) estimation errors in calculating TAC emissions; (d.) concentration prediction errors with dispersion models; and (e.) the variability in lifestyles, fitness and other confounding factors of the human population. This HRA was performed in accordance with USEPA and OEHHA guidance and requirements, notwithstanding the following uncertainties:

- There are uncertainties associated with the estimation of emissions from project activities. Where project-specific data, such as emission factors, are not available, default assumptions in emission models were used.

- The limitations of the air dispersion model provide a source of uncertainty in the estimation of exposure concentrations. According to USEPA, errors due to the limitation of the algorithms implemented in the air dispersion model in the highest estimated concentrations of +/- 10 percent to 40 percent are typical.[3]

- The source parameters used to model emission sources add uncertainty. For all emission sources, the source parameters used source-specific, recommended as defaults, or expected to produce more conservative results. Discrepancies might exist in actual emissions characteristics of an emission source and its representation in the dispersion model.

- The exposure duration estimates do not consider that people do not usually reside at the same location for 30 years and that other exposures (i.e., school children) are also of much shorter durations than was assumed in this HRA. This exposure duration is a highly conservative assumption since most people do not remain at home all day and on average residents change residences every 11 to 12 years. In addition, this assumption assumes those residents are experiencing outdoor concentrations for the entire exposure period. A school child exposure duration is between ages 2 and 16 years old, which again is conservative because the elementary, middle, and high school are not often located at the same location.

- For the risk and hazards calculations as well as the cumulative health impact, numerous assumptions must be made to estimate human exposure to pollutants. These assumptions

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[3] United States Environmental Protection Agency, *Guideline on Air Quality Models (Revised), 40 Code of Federal Regulations, Part 51, Appendix W,* November 2005.

include parameters such as breathing rates, exposure time and frequency, exposure duration, and human activity patterns. While a mean value derived from scientifically defensible studies is the best estimate of central tendency, most of the exposure variables used in this HRA are high-end estimates. The combination of several high-end estimates used as exposure parameters may substantially overestimate pollutant intake. The excess lifetime cancer risks calculated in this HRA are therefore likely to be higher than may be required to be protective of public health.

- The OEHHA cancer potency factor for DPM was used to estimate cancer risks associated with exposure to DPM emissions from construction and operational equipment activities (as was also done for other air toxics). However, the cancer potency factor derived by OEHHA for DPM is highly uncertain in both the estimation of response and dose. In the past, due to inadequate animal test data and epidemiology data on diesel exhaust, the International Agency for Research on Cancer (IARC), a branch of the World Health Organization, had classified DPM as Probably Carcinogenic to Humans (Group 2); the USEPA had also concluded that the existing data did not provide an adequate basis for quantitative risk assessment.[4] However, based on two recent scientific studies,[5] IARC recently re-classified DPM as Carcinogenic to Humans to Group 1,[6] which means that the agency has determined that there is "sufficient evidence of carcinogenicity" of a substance in humans and represents the strongest weight-of-evidence rating in IARC's carcinogen classification scheme. This determination by the IARC may provide additional impetus for the USEPA to identify a quantitative dose-response relationship between exposure to DPM and cancer.

In summary, the estimated health impacts are based primarily on a series of conservative assumptions related to predicted environmental concentrations, exposure, and chemical toxicity. The use of conservative assumptions tends to produce upper-bound estimates of risk. The USEPA notes that the conservative assumptions used in a HRA are intended to assure that the estimated risks do not underestimate the actual risks posed by a site and that the estimated risks do not necessarily represent actual risks experienced by populations at or near a site.[7]

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4 United States Environmental Protection Agency, *Health Assessment Document for Diesel Engine Exhaust*, May 2002, https://cfpub.epa.gov/si/si_public_record_report.cfm?dirEntryId=29060

5 Attfield MD, Schleiff PL, Lubin JH, Blair A, Stewart PA, Vermeulen R, Coble JB, Silverman DT, *The Diesel Exhaust in Miners Study: A Nested Case-Control Study of Lung Cancer and Diesel Exhaust*, June 2012, https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3369553/

6 International Agency for Research on Cancer, *Diesel Engine Exhaust Carcinogenic*, June 2012, https://www.iarc.fr/en/media-centre/pr/2012/pdfs/pr213_E.pdf

7 United States Environmental Protection Agency, *Risk Assessment Guidance for Superfund Human Health Risk Assessment*, December 1989, https://www.epa.gov/sites/production/files/2015-09/documents/rags_a.pdf

HAZARDS IDENTIFICATION

Diesel emissions occur during construction activities and the result of operation of onsite equipment such as loaders, grinder, and haul trucks. Diesel exhaust is a complex mixture of numerous individual gaseous and particulate compounds emitted from diesel-fueled combustion engines. Diesel particulate matter is formed primarily through the incomplete combustion of diesel fuel. DPM is removed from the atmosphere through physical processes including atmospheric fall-out and washout by rain. Humans can be exposed to airborne DPM by deposition on water, soil, and vegetation; although the main pathway of exposure is inhalation. Cal/EPA has concluded that potential cancer risk from inhalation exposure to whole diesel exhaust outweigh the multi-pathway cancer risk from the speciated components.

In August 1998, the CARB identified DPM as an air toxic. CARB developed the *Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel- Fueled Engines and Vehicles* and *Risk Management Guidance for the Permitting of New Stationary Diesel-Fueled Engines* and approved these documents on September 28, 2000.[8,9] The documents represent proposals to reduce DPM emissions, with the goal of reducing emissions and the associated health risk by requiring the use of state-of-the-art catalyzed DPM filters and ultra-low-sulfur diesel fuel.

In 2001, CARB assessed the state-wide health risks from exposure to diesel exhaust and to other toxic air contaminants. It is difficult to distinguish the health risks of diesel emissions from those of other air toxics since diesel exhaust contains approximately 40 different TAC. The CARB study detected diesel exhaust by using ambient air carbon soot measurements as a surrogate for diesel emissions. The study reported that the state-wide cancer risk from exposure to diesel exhaust was about 540 per million population as compared to a total risk for exposure to all ambient air toxics of 760 per million. This estimate, which accounts for about 70 percent of the total risk from TAC, included both urban and rural areas in the state. The estimate can also be considered an average worst-case for the state, since it assumes constant exposure to outdoor concentrations of diesel exhaust and does not account for expected lower concentrations indoors, where most of time is spent. DPM is estimated to increase statewide cancer risk by 520 cancers per million residents exposed over a lifetime.[10]

Exposure to DPM results in a greater incidence of chronic non-cancer health effects, such as cough, labored breathing, chest tightness, wheezing, and bronchitis. Individuals particularly vulnerable to DPM are children, whose lung tissue is still developing, the elderly and people with illnesses who may have

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8 California Air Resources Board, *Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles,* October 2000, http://www.arb.ca.gov/diesel/documents/rrpfinal.pdf

9 California Air Resources Board, *Risk Management Guidance for the Permitting of New Stationary Diesel-Fueled Engines,* October 2000.

10 California Air Resources Board, *Summary: Diesel Particulate Matter Health Impacts*, April 12, 2016, https://www.arb.ca.gov/research/diesel/diesel-health_summ.htm

other serious health problems that can be aggravated by exposure to DPM. In general, children are more vulnerable than adults to air pollutants because they have higher inhalation rates, narrower airways, and less mature immune systems. In addition, children with allergies may have an enhanced allergic response when exposed to diesel exhaust.

Lastly, the operations of the biomass boiler and dry kilns would result in emissions of air toxics such as formaldehyde, arsenic cadmium, and acetaldehyde.

EXPOSURE ASSESSMENT

Dispersion is the process by which atmospheric pollutants disseminate due to wind and vertical stability. The results of a dispersion analysis are used to assess pollutant concentrations at or near an emission source. The results of an analysis allow predicted concentrations of pollutants to be compared directly to air quality standards and other criteria such as health risks based on modeled concentrations.

A rising pollutant plume reacts with the environment in several ways before it levels off. First, the plume's own turbulence interacts with atmospheric turbulence to entrain ambient air. This mixing process reduces and eventually eliminates the density and momentum differences that cause the plume to rise. Second, the wind transports the plume during its rise and entrainment process. Higher winds mix the plume more rapidly, resulting in a lower final rise. Third, the plume interacts with the vertical temperature stratification of the atmosphere, rising as a result of buoyancy in the unstable-to-neutrally stratified mixed layer. However, after the plume encounters the mixing lid and the stably stratified air above, its vertical motion is dampened.

Molecules of gas or small particles injected into the atmosphere will separate from each other as they are acted on by turbulent eddies. The Gaussian mathematical model such as AERMOD simulates the dispersion of the gas or particles within the atmosphere. The formulation of the Gaussian model is based on the following assumptions:

- The predictions are not time-dependent (all conditions remain unchanged with time)
- The wind speed and direction are uniform, both horizontally and vertically, throughout the region of concern
- The rate of diffusion is not a function of position
- Diffusion in the direction of the transporting wind is negligible when compared to the transport flow

Dispersion Modeling Approach

Air dispersion modeling was performed to estimate the downwind dispersion of air toxics from the construction and operation of the biomass boiler and dry kilns. The following sections present the fundamental components of an air dispersion modeling analysis including air dispersion model selection and options, receptor locations, meteorological data, building downwash, and source exhaust parameters.

Model Selection and Options

AERMOD (Version 21112)[11] was used for the dispersion analysis. AERMOD is the USEPA preferred atmospheric dispersion modeling system for general industrial sources. The model can simulate point, area, volume, and line sources. AERMOD is the appropriate model for this analysis based on the coverage of simple, intermediate, and complex terrain. It also predicts both short-term and long-term (annual) average concentrations. The model was executed using the regulatory default options (stack-tip downwash, buoyancy-induced dispersion, and final plume rise), default wind speed profile categories, default potential temperature gradients, and assuming no pollutant decay.

The selection of the appropriate dispersion coefficients depends on the land use within three kilometers (km) of the project site. The types of land use were based on the classification method defined by Auer (1978); using pertinent United States Geological Survey (USGS) 1:24,000 scale (7.5 minute) topographic maps of the area. If the Auer land use types of heavy industrial, light-to-moderate industrial, commercial, and compact residential account for 50 percent or more of the total area, the USEPA *Guideline on Air Quality Models*[12] recommends using urban dispersion coefficients; otherwise, the appropriate rural coefficients can be used. Based on observation of the area surrounding the project site, rural (urban is only designated within dense city centers such as downtown Redding) dispersion coefficients were applied within AERMOD.

Receptor Locations

Some receptors are considered more sensitive to air pollutants than others, because of preexisting health problems, proximity to the emissions source, or duration of exposure to air pollutants. Land uses such as primary and secondary schools, hospitals, and convalescent homes are considered to be relatively sensitive to poor air quality because the very young, the old, and the infirm are more

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[11] United States Environmental Protection Agency, AERMOD Modeling System, https://www.epa.gov/scram/air-quality-dispersion-modeling-preferred-and-recommended-models

[12] United States Environmental Protection Agency, *Guideline on Air Quality Models (Revised), 40 Code of Federal Regulations, Part 51, Appendix W,* November 2005.

susceptible to respiratory infections and other air quality-related health problems than the general public. Residential areas are also considered sensitive to poor air quality because people in residential areas are often at home for extended periods. Recreational land uses are moderately sensitive to air pollution because vigorous exercise associated with recreation places having a high demand on respiratory system function.

Sensitive receptors were placed at receptors to estimate health impacts due to proposed project construction and operation on existing residences. **Figure D-1** displays the location of the sensitive receptors (i.e., residences and offsite workers) used in this HRA. Receptors were placed at a height of 1.8 meters (typical breathing height). Terrain elevations for receptor locations were used based on available USGS information for the area.

Meteorological Data

Air quality is a function of both the rate and location of pollutant emissions under the influence of meteorological conditions and topographic features affecting pollutant movement and dispersal. Atmospheric conditions such as wind speed, wind direction, atmospheric stability, and air temperature gradients interact with the physical features of the landscape to determine the movement and dispersal of air pollutants, and consequently affect air quality.

Hourly meteorological data from Redding Municipal Airport, located approximately 50 miles to the southwest of the proposed project were used in the dispersion modeling analysis. Meteorological data from 2017 through 2021 were used.[13] **Figure D-2** displays the annual wind rose. Wind directions are predominately from the south and north with a low frequency of calm wind speed conditions (approximately 1.4 percent), as shown in **Figure D-3**. The average annual wind speed is 6.7 miles per hour (3.0 meters per second).

13 California Air Resources Board, Hotspots Analysis and Reporting Program Meteorological Files**,** October 5, 2015*,* https://www.arb.ca.gov/toxics/harp/metfiles2.htm

Figure D-1
Health Risk Assessment Receptors

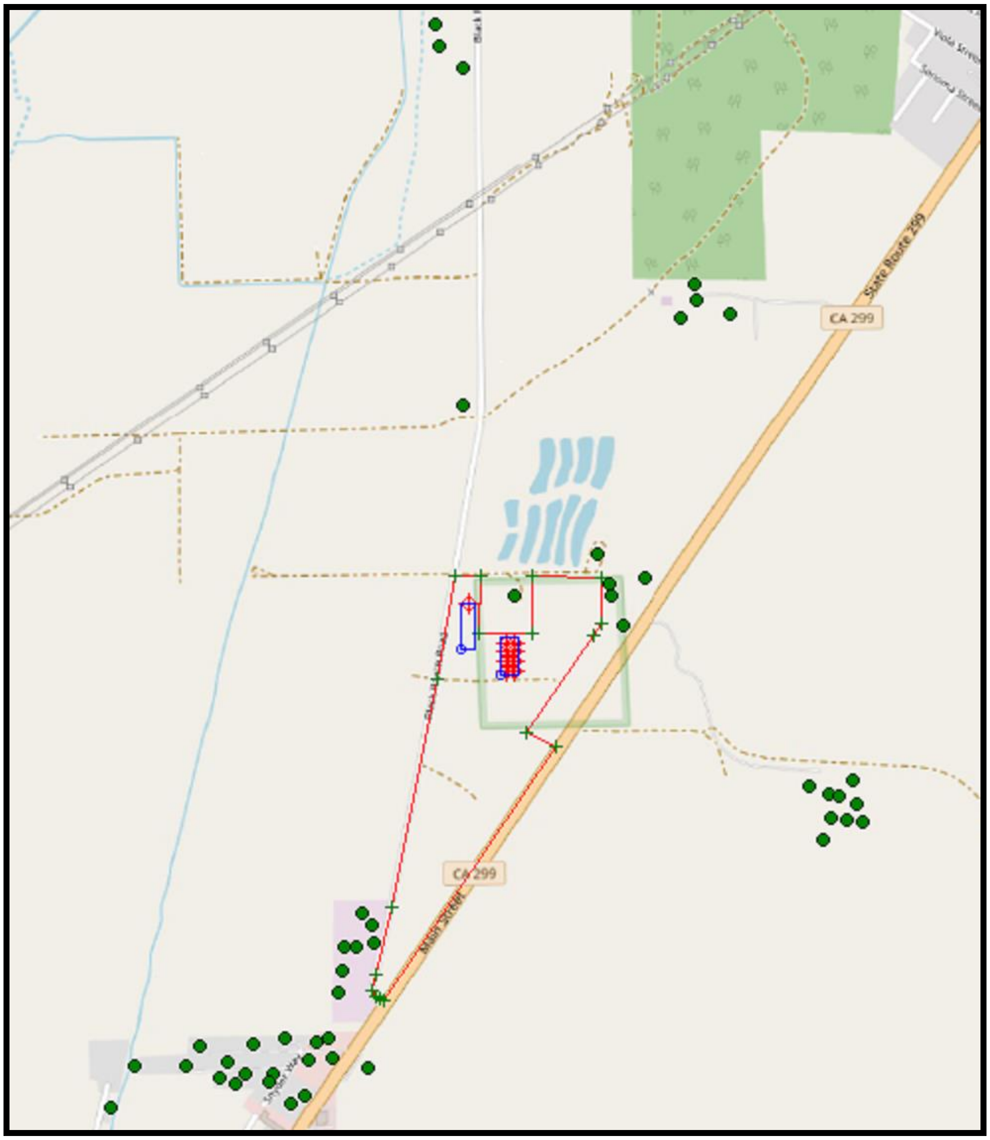


Figure D-2
Windrose for Redding Municipal Airport

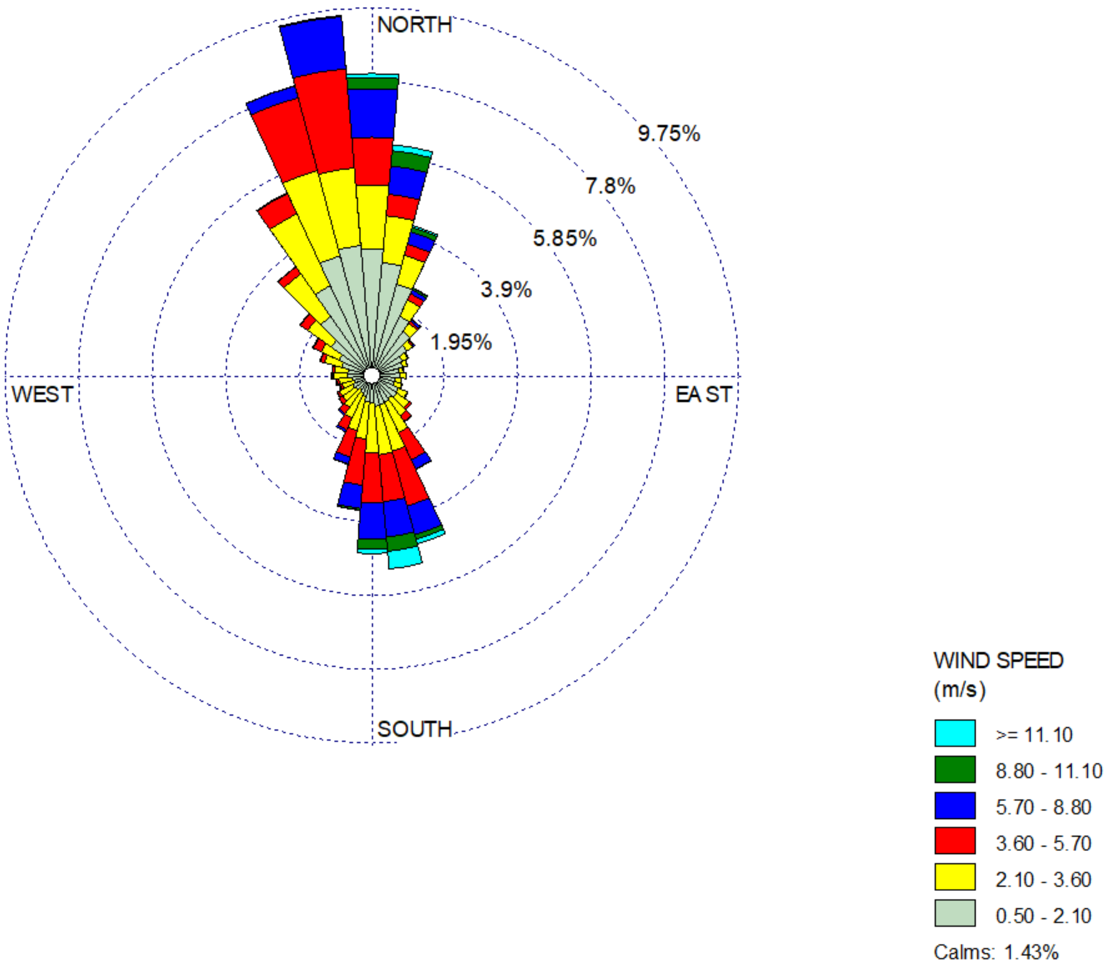
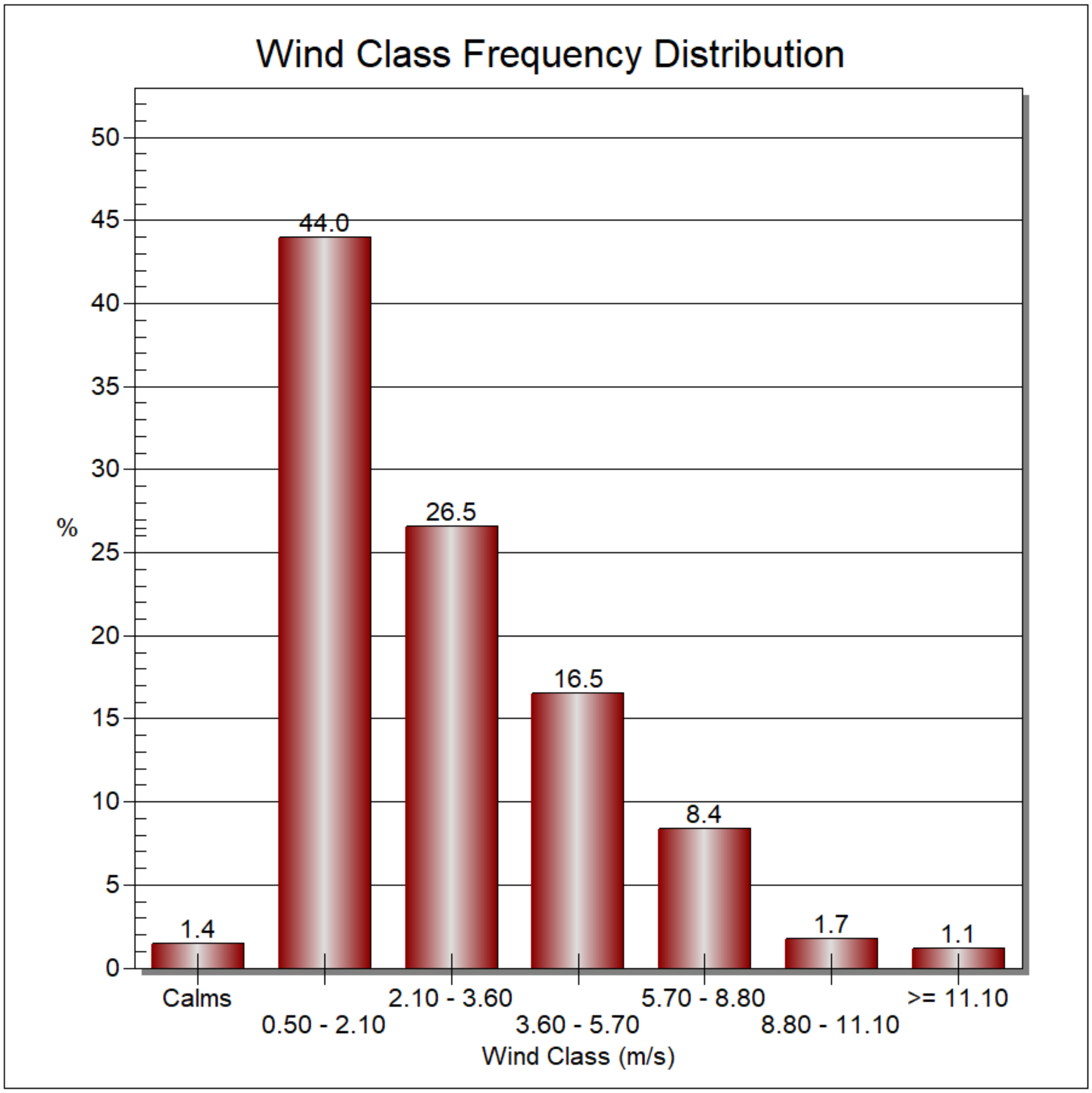


Figure D-3
Wind Speed Distribution for Redding Municipal Airport



Source Release Characteristics

Construction and operational equipment activities were treated as an area source. The release height of the off-road equipment exhaust was 5.0 meters (16.4 feet) and an initial vertical dimension of 1.4 meters 4.6 feet), which reflects the height of the equipment plus an additional height of the exhaust plume above the exhaust point to account for plume rise due to buoyancy and momentum. Haul trucks were treated as a line source (i.e., volume sources placed at regular intervals) located along an access road. The haul trucks were assigned a release height of 5.0 meters (16.4 feet) and an initial vertical dimension of 1.4 meters (4.6 feet), which accounts for dispersion from the movement of vehicles.[14] [15] Typical construction activities would occur between 8:00 a.m. to 5:00 p.m. Monday through Friday. If Saturday work is required, construction activities would occur between 10:00 a.m. to 5:00 p.m. Operational equipment was assumed to operate ten hours per day; seven days per week.

Once construction is completed the bioenergy plant will operate 24 hours per day, seven days per week. For the bioenergy facility, approximately 12 employees will be onsite seven days per week, working 12-hour shifts. Feedstock truck deliveries will occur Monday through Friday between the hours of 6:00 a.m. and 6:00 p.m.

Wood product finishing and production operations will occur at the project site from 6:00 a.m. to 4:00 p.m. on Monday through Saturday. Approximately 2 to 4 employees will be onsite. Public drop-off hours of fuel reduction material will correspond with the public hours of the Burney Disposal Transfer Station (currently 8:00 a.m. to 4:30 p.m. on Monday, Wednesday, and Saturday).

As such, onsite equipment such as loaders, grinders, sawmill, and forklifts were assumed to operate from 7:00 a.m. to 5:00 p.m. on Monday through Saturday.

Table D-1 provides the estimated emission source release characteristics for the biomass boiler and dry kilns. The emission source release characteristics were based on input provided by the biomass boiler and dry kiln manufacturer.

Table D-1
Point Source Release Characteristics

Emission Source	Stack Height (ft)	Stack Diameter (ft)	Exit Temperature (F)	Exit Velocity (ft/s)
Biomass Boiler	115	2.95	266	73.5
Dry Kiln (each vent)	18	2.63	180	18.4

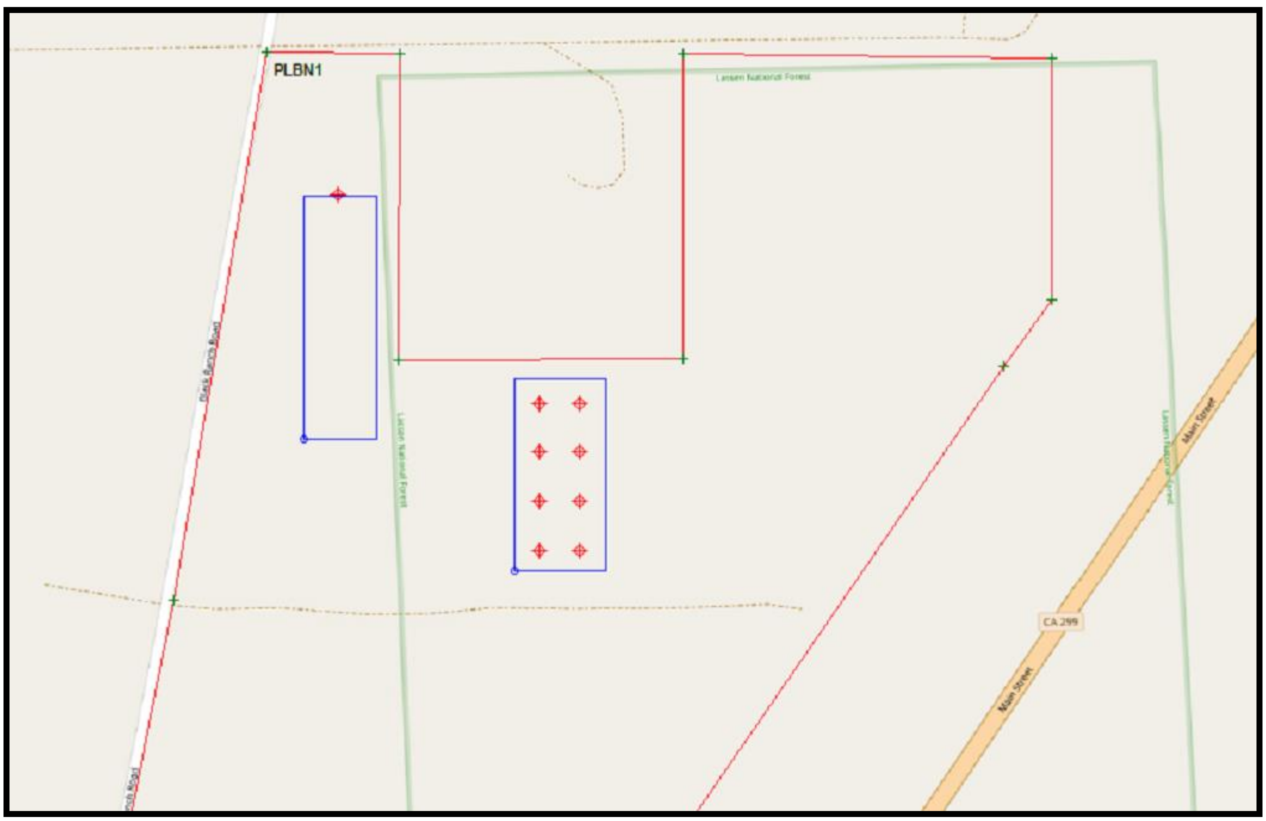
14 While haul truck emissions contribute substantially to overall project emissions, they are spread over many miles. Hence, the portion of trucking emissions that would impact one receptor is much smaller than the emissions that the clustered off-road activity at the project site would impact a receptor near the site. For example, the DPM emissions from truck travel within 1,000 feet of the project are less than 1 percent of the total off-road DPM emissions.

15 South Coast Air Quality Management District, Final Localized Significance Threshold Methodology. July 2008, http://www.aqmd.gov/docs/default-source/ceqa/handbook/localized-significance-thresholds/final-lst-methodology-document.pdf?sfvrsn=2

The kiln building has a gable-style sloped roof top which runs lengthwise. The peak of the roof is 21 feet. The vents are spaced along each of the roof halves at a height of 18 feet. Each roof half has eight vents in a line, 10 feet from center, for a total of sixteen vents. Only eight vents exhaust during operation and are dependent on kiln circulation air fan direction. The dry kiln vents have a square dimension of 28 inches by 28 inches (with an equivalent diameter of 2.63 feet). The total dry kilns exhaust flow rate is 48,000 cubic feet per minute; therefore, each of the eight vents would have an exhaust flow rate of 6,000 cubic feet per minute.

Figure D-4 displays the location of the boiler stack and the dry kilns vents along with the respective buildings.

Figure D-4
Stack Emission Source Locations



Note that the following emission rates are guarantees from the manufacturer when the biomass boiler is being utilized in a waste-to-energy project. Expected toxics emissions from wood feedstock are expected to be even lower, though the manufacturer may not have data readily available for wood boiler projects. The proposed project considers this a starting point and shall conduct a fuel analysis (if needed) to rule out the presence of metals in the exhaust stream. **Table D-2** displays the estimate air toxics emission rates for the biomass boiler and dry kilns.

For the dry kiln, air toxics emission factors within *USEPA's Region 10 HAP and VOC Emission Factors for Lumber Drying*[16] were used. The expected species of wood to be processed are 70 percent of pine, 10 percent of white fir, 10 percent of incense cedar, 5 percent of Douglass fir, and 5 percent oak.

Table D-2
Air Toxics Emission Rates (pounds/hour)

Compound	Biomass Boiler	Dry Kiln
Acetaldehyde	-	8.49E-02
Acrolein	-	4.83E-03
Formaldehyde	-	9.06E-03
Methyl alcohol	-	2.22E-01
Propionaldehyde	-	1.83E-03
Cadmium	3.81E-03	-
Mercury	3.81E-03	-
Antimony	3.81E-03	-
Arsenic	3.81E-03	-
Lead	3.81E-03	-
Chromium III	3.81E-03	-
Cobalt	3.81E-03	-
Copper	3.81E-03	-
Manganese	3.81E-03	-
Nickel	3.81E-03	-
Vanadium	3.81E-03	-
Dioxin	7.62E-09	-
Hydrogen Chloride	1.52E-01	-

Building Downwash

Building downwash is the influence building structures have on the wind flow and thus influence the emissions from point sources such as generators and fume hoods. The AERMOD required input of building heights and projected building widths for 36 wind directions. The USEPA Building Profile Input Program was used to determine the direction-specific building dimensions. Building downwash algorithms incorporated into AERMOD account for the plume dispersion effects of the aerodynamic wakes and eddies produced by buildings and structures. The Plume Rise Model Enhancements (PRIME) model was used to determine the direction-specific building downwash parameters. PRIME calculates fields of turbulence intensity, wind speed, and slopes of the mean streamlines as a function of projected building shape. Using a numerical plume rise model, PRIME determines the change in plume centerline location and the rate of plume dispersion with downwind distance. Concentrations are predicted in both

16 United States Environmental Protection Agency, Region 10 HAP and VOC Emission Factors for Lumber Drying, January 2021, https://www.epa.gov/system/files/documents/2021-07/epa-region-10-lumber-drying-ef-january-2021.pdf

the near and far wake regions, with the plume mass captured by the near wake treated separately from the uncaptured primary plume and re-emitted to the far wake as a volume source.

The kiln building is 84 feet by 34 feet by 21 feet (length, width, and height). The boiler building is 117 feet by 420 feet by 79.2 feet. The kiln building is situated in a north-south orientation and the boiler building is also situated in a north-south orientation. The biomass boiler stack is located on the north side of the boiler building.

EXPOSURE PARAMETERS

Exposure to airborne chemicals occurs through inhalation and subsequent absorption into the body, potentially resulting in adverse health effects depending on toxicological properties of the chemical and other exposure parameters. This HRA was conducted in accordance with technical guidelines developed by federal, state, and regional agencies, including USEPA, California Environmental Protection Agency (CalEPA), OEHHA *Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments.*[17] This was accomplished by applying the estimated concentrations at the receptors analyzed to the established cancer risk estimates and acceptable reference concentrations for non-cancer health effects.

OEHHA's revisions to its *Guidance Manual* were primarily designed to ensure that the greater sensitivity of children to cancer and other health risks is reflected in HRAs. For example, OEHHA now recommends that risks be analyzed separately for multiple age groups, focusing especially on young children and teenagers, rather than the past practice of analyzing risks to the general population, without distinction by age. OEHHA also now recommends that statistical "age sensitivity factors" be incorporated into a HRA, and that children's relatively high breathing rates be accounted for. On the other hand, the *Guidance Manual* revisions also include some changes that would reduce calculated health risks. For example, under the former guidance, OEHHA recommended that residential cancer risks be assessed by assuming 70 years of exposure at a residential receptor; under the *Guidance Manual*, this assumption is lessened to 30 years. This is based on studies showing that 30 years is a reasonable estimate of the 90th to 95th percentile of residency duration in the population. Therefore, the HRA provides that a receptor's exposure to a project's emissions for up to 30 years and that the cancer rick is then determined based on a 70-year lifetime for that receptor.

Scientific data have shown that young animals are more sensitive than adult animals to exposure to many carcinogens. Therefore, OEHHA developed age sensitivity factors (ASF) to consider the increased sensitivity to carcinogens during early-in-life exposures. OEHHA recommends that cancer risks be

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17 Office of Environmental Health Hazard Assessment, *Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments*, March 6, 2015, http://oehha.ca.gov/air/hot_spots/hotspots2015.html.

weighted by a factor of 10 for exposures that occur from the third trimester of pregnancy to 2 years of age, by a factor of 3 for exposures from 2 years through 16 years of age, and by a factor of 1 for exposures from 16 years through 30 years of age.

OEHHA has developed exposure factors (e.g., daily breathing rates) for four age groups including the third trimester to birth, birth to 2 years, 2 to 16 years, and 16 to 30 years. These age bins allow for more refined exposure information to be used when estimating exposure and the potential for developing cancer over a lifetime. This means that exposure variates are needed for the third trimester, ages zero to less than two, ages two to than 16, and ages 16 to 30. Residential receptors utilize the 95th percentile breathing rate values. The age-specific breathing rates for the four age groups are 361 liters per kilogram-day for third trimester, 1,060 liters per kilogram-day for ages less than 2 years, 745 liters per kilogram-day for ages 2 to 16 years, and 335 liters per kilogram-day for ages 16 to 30 years. A school child (age 2 to 9 years) breathing rate is 631 liters per kilogram-day and an offsite worker breathing rate is 230 liters per kilogram-day.[18]

Based on OEHHA recommendations, the cancer risk to residential receptors assumes exposure occurs 24 hours per day for 350 days per year while accounting for a percentage of time at home. OEHHA evaluated information from activity pattern databases to estimate the fraction of time at home (FAH) during the day.

This information is used to adjust cancer risk from a project's emissions, assuming that exposure to the project's emissions is not occurring away from home. A FAH factor of 1.0 applies for the offsite workers since the offsite worker is assumed to be present for a typical eight-hour workday which would correspond to the project construction and operation schedule. In general, the FAH factors are age-specific and are 0.85 for ages less than 2 years, 0.72 for ages 2 to 16 years, and 0.73 for ages 16 to 30 years.

Based on OEHHA recommendations, for children at school sites, exposure is assumed to occur 10 hours per day for 180 days (or 36 weeks) per year. Cancer risk estimates for children at school sites are calculated based on nine-year exposure duration. School sites also include teachers and other adult staff which are treated as offsite workers. For occupational receptors, OEHA guidance suggests that the exposure be based on 8 hours per day, 5 days per week, 250 working days per year, and a 25-year working lifetime. This is a conservative assumption since most people do not remain at the same job for 25 years. For offsite worker exposures, it is assumed that the working age begins at 16 years, and that exposures to project emissions occur during the work shift which is typically up to eight hours per day

[18] Office of Environmental Health Hazard Assessment, *Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments*, March 6, 2015, http://oehha.ca.gov/air/hot_spots/hotspots2015.html.

during workdays. Given the exposure durations of less than 24 hours, sensitive recreational receptors were evaluated for acute impacts only.[19] **Table D-3** presents a summary of the health risk assessment exposure factors.

Table D-3
Health Risk Assessment Exposure Factors

Receptor	Age	Age Specific Factor	Breathing Rate (L/kg-day)	Fraction of Time	Daily Exposure	Annual Exposure
Worker	16 to 41	1	230	1	8 hours	250 days
Residential	Third Trimester	10	361	0.85	24 hours	350 days
	0 to 2	10	1,090	0.85	24 hours	350 days
	2 to 16	3	745	0.72	24 hours	350 days
	16 to 30	1	335	0.73	24 hours	350 days
School Child	2 to 16	3	581	1	10 hours	180 days

Source: Office of Environmental Health Hazard Assessment, *Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments*, March 6, 2015, http://oehha.ca.gov/air/hot_spots/hotspots2015.html

RISK CHARACTERIZATION

Cancer risk is defined as the lifetime probability of developing cancer from exposure to carcinogenic substances. Cancer risks are expressed as the chance in one million of getting cancer (i.e., number of cancer cases among one million people exposed). The cancer risks are assumed to occur exclusively through the inhalation pathway. The cancer risk can be estimated by using the cancer potency factor (milligrams per kilogram of body weight per day [mg/kg-day]), the 70-year annual average concentration (microgram per cubic meter [µg/m^3]), and the lifetime exposure adjustment based on a 30-year exposure duration.

Following guidelines established by OEHHA, the incremental cancer risks attributable to the proposed project were calculated by applying exposure parameters to modeled DPM concentrations in order to determine the inhalation dose (mg/kg-day) or the amount of pollutants inhaled per body weight mass per day. The cancer risks occur exclusively through the inhalation pathway; therefore, the cancer risks can be estimated from the following equation:

$$\text{Dose-inh} = \frac{C_{air} * \{DBR\} * A * ASF * FAH * EF * ED * 10^{-6}}{AT}$$

where:

[19] Office of Environmental Health Hazard Assessment, *Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments*, March 6, 2015, http://oehha.ca.gov/air/hot_spots/hotspots2015.html.

Dose-inh = Dose of the toxic substance through inhalation in mg/kg-day

10^{-6} = Micrograms to milligrams conversion, Liters to cubic meters conversion

C_{air} = Concentration in air in microgram (μg)/cubic meter (m^3)

DBR = Daily breathing rate in liter (L)/kg body weight – day

A = Inhalation absorption factor, 1.0

ASF = Age Sensitivity Factor

EF = Exposure frequency (days/year)

ED = Exposure duration (years)

FAH = Fraction of Time at Home

AT = Averaging time period over which exposure is averaged in days (25,550 days for a 70-year lifetime based on a 30-year exposure duration)

To determine incremental cancer risk, the estimated inhalation dose attributed to the proposed project was multiplied by the cancer potency slope factor (cancer risk per mg/kg-day). The cancer potency slope factor is the upper bound on the increased cancer risk from a lifetime exposure to a pollutant. These slope factors are based on epidemiological studies and are different values for different pollutants. This allows the estimated inhalation dose to be equated to a cancer risk.

Non-cancer adverse health impacts, acute (short-term) and chronic (long-term), are measured against a hazard index (HI), which is defined as the ratio of the predicted incremental exposure concentration from the proposed project to a published reference exposure level (REL) that could cause adverse health effects as established by OEHHA. The ratio (referred to as the Hazard Quotient [HQ]) of each non-carcinogenic substance that affects a certain organ system is added to produce an overall HI for that organ system. The overall HI is calculated for each organ system. If the overall HI for the highest-impacted organ system is greater than one, then the impact is significant.

The HI is an expression used for the potential for non-cancer health effects. The relationship for the non-cancer health effects is given by the annual concentration (in μg/m^3) and the REL (in μg/m^3). The acute hazard index was determined using the “simple” concurrent maximum approach, which tends to be conservative (i.e., overpredicts).

The relationship for the non-cancer health effects is given by the following equation:

$$HI = C/REL$$

Where:

HI = Hazard index; an expression of the potential for non-cancer health effects.

C = Annual average concentration ($\mu g/m^3$) during the 70-year exposure period.

REL = Concentration at which no adverse health effects are anticipated.

The concentration level at or below which no adverse non-cancer health effects are anticipated for a specified exposure duration is termed the REL. REL are based on the most sensitive, relevant, adverse health effect reported in the medical and toxicological literature. REL are designed to protect the most sensitive individuals in the population by the inclusion of margins of safety. Since margins of safety are incorporated to address data gaps and uncertainties, exceeding the REL does not automatically indicate an adverse health impact.[20]

Table D-4 displays the toxicity values for the pollutants of concern associated with the proposed project construction (diesel particulate matter), onsite equipment (diesel particulate matter), dry kilns (other air toxics), and biomass boiler (other air toxics) operations.

Table D-4
Health Risk Assessment Toxicity Values

Compound	Inhalation Slope Factor $(mg/kg\text{-}day)^{-1}$	Acute REL ($\mu g/m^3$)	Chronic REL ($\mu g/m^3$)
DPM	1.1	-	5
Acetaldehyde	0.01	470	140
Acrolein	-	2.5	0.35
Formaldehyde	0.021	55	9
Methyl alcohol	-	28,000	4,000
Propionaldehyde	-	-	-
Cadmium	15	-	0.02
Mercury	-	0.6	0.03
Antimony	-	-	-
Arsenic	12	0.2	0.015
Lead	0.042	-	-
Chromium III	-	-	-

20 Office of Environmental Health Hazards Assessment - Consolidated Health Values Table, October 2, 2020, https://www.arb.ca.gov/toxics/healthval/contable.pdf

Cobalt	27	-	-
Copper	-	100	-
Manganese	-	0.17	0.09
Nickel	0.91	0.2	0.014
Vanadium	-	-	-
Dioxin	1,300	-	0.00004
Hydrogen Chloride	-	2,100	9

Source: Office of Environmental Health Hazards Assessment - – *Chemical Database,* https://oehha.ca.gov/chemicals

A brief description of the pollutants of concern is provided within the following:

Acetaldehyde

Acetaldehyde is a colorless, volatile liquid with a characteristic pungent, fruity odor. Acetaldehyde is used primarily as a chemical intermediate in the production of acetic acid and as a synthetic flavoring agent. Acetaldehyde is released to the environment in vehicle exhaust and as a product of open burning of gas, fuel oil, and coal. Acute exposure to acetaldehyde can cause eye, nose, and throat irritation and subsequent inflammation of the eyes and coughing.[21]

Acrolein

Acrolein is a clear or yellow liquid with a disagreeable odor. Acrolein is used as an intermediate in the production of acrylic acid, as well as a pesticide to control algae, weeds, bacteria, and mollusks. Small amounts of acrolein can be formed and emitted into the air when trees, tobacco, other plants, gasoline, and oil are burned. Acrolein may also be released into the environment in emissions and effluents from manufacturing and use facilities and in emissions from combustion. Exposure to high concentrations of acrolein may damage the lungs and could cause death. Breathing lower amounts may cause watery eyes, burning of the nose and throat, and decreased breathing rate.[22]

Formaldehyde

At room temperature, formaldehyde is a colorless, flammable gas with a distinct, pungent smell. Formaldehyde is a product of incomplete combustion and is emitted into the air by burning wood, coal, kerosene, and natural gas, by automobiles, and by cigarettes; it is also a naturally occurring substance. Formaldehyde can be released to soil, water, and air by industrial sources and can off-gas from materials made with it. Humans can be exposed to formaldehyde through inhalation of contaminated air and smog. Low levels of formaldehyde can cause irritation of the eyes, nose, throat, and skin. Some

21 National Center for Biotechnology Information, https://pubchem.ncbi.nlm.nih.gov/compound/Acetaldehyde

22 Agency for Toxic Substance and Disease Registry ToxFAQ for Acrolein, https://www.atsdr.cdc.gov/substances/indexAZ.asp

epidemiological studies found an increased incidence of nose and throat cancer in exposed individuals, but other studies could not confirm this finding.[23]

Methyl Alcohol

Methyl alcohol, or methanol, is a colorless, flammable liquid used to manufacture formaldehyde and acetic acid, in chemical synthesis, in antifreeze, and as a solvent. Methanol is released to the environment during industrial uses and naturally from volcanic gases, vegetation, and microbes. Acute (short-term) or chronic (long-term) exposure of humans to methanol by inhalation of ingestions may result in blurred vision, headache, dizziness, and nausea. Methyl Alcohol is used as a solvent and as an intermediate in chemical synthesis.[24]

Propionaldehyde

Propionaldehyde is a colorless liquid with a slightly irritating, fruity odor. It is principally used as a precursor to trimethylolethane through a condensation reaction with formaldehyde. Other applications include reduction to propanol and oxidation to propionic acid.[25]

Cadmium

Cadmium is a natural element in the earth's crust. It is usually found as a mineral combined with other elements such as oxygen (cadmium oxide), chlorine (cadmium chloride), or sulfur (cadmium sulfate, cadmium sulfide).

All soils and rocks, including coal and mineral fertilizers, contain some cadmium. Most cadmium used in the United States is extracted during the production of other metals like zinc, lead, and copper. Cadmium does not corrode easily and has many uses, including batteries, pigments, metal coatings, and plastics.[26]

Mercury

Mercury combines with other elements, such as chlorine, sulfur, or oxygen, to form inorganic mercury compounds or "salts", which are usually white powders or crystals. Mercury also combines with carbon

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23 Agency for Toxic Substance and Disease Registry ToxFAQ for Formaldehyde, https://www.atsdr.cdc.gov/substances/indexAZ.asp

24 United States Environmental Protection Agency, Hazard Summary for Methanol, https://www.epa.gov/sites/production/files/2016-09/documents/methanol.pdf

25 National Center for Biotechnology Information, https://pubchem.ncbi.nlm.nih.gov/compound/Propionaldehyde

26 Agency for Toxic Substance and Disease Registry ToxFAQ for Cadmium, https://www.atsdr.cdc.gov/substances/indexAZ.asp

to make organic mercury compounds. The most common one, methylmercury, is produced mainly by microscopic organisms in the water and soil. More mercury in the environment can increase the amounts of methylmercury that these small organisms make.

Metallic Mercury is a dense liquid that vaporizes easily at room temperature. Metallic mercury is not easily absorbed into unbroken skin. However, it vaporizes, even at room temperature. The higher the temperature, the more vapors are released. Mercury vapors are colorless and odorless, though they can be seen with the aid of an ultraviolet light.

Metallic mercury is used to produce chlorine gas and caustic soda, and is also used in thermometers, dental fillings, and batteries. Mercury salts are sometimes used in skin lightening creams and as antiseptic creams and ointments.[27]

Antimony

Antimony is a silvery-white metal that is found in the earth's crust. Antimony ores are mined and then mixed with other metals to form antimony alloys or combined with oxygen to form antimony oxide. Little antimony is currently mined in the United States. It is brought into this country from other countries for processing. However, there are companies in the United States that produce antimony as a by-product of smelting lead and other metals. Antimony isn't used alone because it breaks easily, but when mixed into alloys, it is used in lead storage batteries, solder, sheet and pipe metal, bearings, castings, and pewter. Antimony oxide is added to textiles and plastics to prevent them from catching fire. It is also used in paints, ceramics, and fireworks, and as enamels for plastics, metal, and glass.[28]

Arsenic

Arsenic is a naturally occurring element widely distributed in the earth's crust. In the environment, arsenic is combined with oxygen, chlorine, and sulfur to form inorganic arsenic compounds. Arsenic in animals and plants combines with carbon and hydrogen to form organic arsenic compounds. Inorganic arsenic compounds are mainly used to preserve wood. Copper chromated arsenic (CCA) is used to make "pressure-treated" lumber. CCA is no longer used in the U.S. for residential uses; it is still used in industrial applications. Organic arsenic compounds are used as pesticides, primarily on cotton plants.[29]

Lead

27 Agency for Toxic Substance and Disease Registry ToxFAQ for Mercury, https://www.atsdr.cdc.gov/substances/indexAZ.asp

28 Agency for Toxic Substance and Disease Registry ToxFAQ for Antimony, https://www.atsdr.cdc.gov/substances/indexAZ.asp

29 Agency for Toxic Substance and Disease Registry ToxFAQ for Arsenic, https://www.atsdr.cdc.gov/substances/indexAZ.asp

Lead is a naturally occurring bluish-gray metal found in small amounts in the earth's crust. Lead can be found in all parts of our environment. Much of it comes from human activities including burning fossil fuels, mining, and manufacturing. Lead has many different uses. It is used in the production of batteries, ammunition, metal products (solder and pipes), and devices to shield X-rays. Because of health concerns, lead from gasoline, paints and ceramic products, caulking, and pipe solder has been dramatically reduced in recent years.[30]

Chromium

Chromium is a naturally occurring element found in rocks, animals, plants, soil, and in volcanic dust and gases. Chromium is present in the environment in several different forms. The most common forms are chromium(0), chromium(III), and chromium(VI). No taste or odor is associated with chromium compounds. Chromium(III) occurs naturally in the environment and is an essential nutrient. Chromium(VI) and chromium(0) are generally produced by industrial processes. The metal chromium, which is the chromium(0) form, is used for making steel. Chromium(VI) and chromium(III) are used for chrome plating, dyes and pigments, leather tanning, and wood preserving.[31] The Bioenergy Boiler would potentially emit Chromium(III) but Chromium(VI) would be absent from the emissions.

Cobalt

Cobalt is a naturally occurring element found in rocks, soil, water, plants, and animals. Cobalt is used to produce alloys used in the manufacture of aircraft engines, magnets, grinding and cutting tools, artificial hip and knee joints. Cobalt compounds are also used to color glass, ceramics and paints, and used as a drier for porcelain enamel and paints. Radioactive cobalt is used for commercial and medical purposes.[32]

Copper

Copper is a metal that occurs naturally throughout the environment, in rocks, soil, water, and air. Copper is an essential element in plants and animals (including humans), which means it is necessary for us to live. Therefore, plants and animals must absorb some copper from eating, drinking, and breathing. Copper is used to make many kinds of products like wire, plumbing pipes, and sheet metal. U.S. pennies made before 1982 are made of copper, while those made after 1982 are only coated with copper. Copper is also combined with other metals to make brass and bronze pipes and faucets. Copper

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30 Agency for Toxic Substance and Disease Registry ToxFAQ for Lead, https://www.atsdr.cdc.gov/substances/indexAZ.asp

31 Agency for Toxic Substance and Disease Registry ToxFAQ for Chromium, https://www.atsdr.cdc.gov/substances/indexAZ.asp

32 Agency for Toxic Substance and Disease Registry ToxFAQ for Cobalt, https://www.atsdr.cdc.gov/substances/indexAZ.asp

compounds are commonly used in agriculture to treat plant diseases like mildew, for water treatment and, as preservatives for wood, leather, and fabrics.[33]

Manganese

Manganese is a naturally occurring metal that is found in many types of rocks. Pure manganese is silver-colored but does not occur naturally. It combines with other substances such as oxygen, sulfur, or chlorine. Manganese can also be combined with carbon to make organic manganese compounds. Common organic manganese compounds include pesticides, such as maneb or mancozeb, and methylcyclopentadienyl manganese tricarbonyl, a fuel additive in some gasolines. Manganese is an essential trace element and is necessary for good health. Manganese can be found in several food items, including grains and cereals, and is found in high amounts in other foods, such as tea.[34]

Nickel

Nickel is a very abundant natural element. Pure nickel is a hard, silvery-white metal. Nickel can be combined with other metals, such as iron, copper, chromium, and zinc, to form alloys. These alloys are used to make coins, jewelry, and items such as valves and heat exchangers. Most nickel is used to make stainless steel. Nickel can combine with other elements such as chlorine, sulfur, and oxygen to form nickel compounds. Many nickel compounds dissolve fairly easy in water and have a green color. Nickel compounds are used for nickel plating, to color ceramics, to make some batteries, and as substances known as catalysts that increase the rate of chemical reactions. Nickel is found in all soil and is emitted from volcanoes. Nickel is also found in meteorites and on the ocean floor. Nickel and its compounds have no characteristic odor or taste.[35]

Vanadium

Vanadium is a compound that occurs in nature as a white-to-gray metal and is often found as crystals. Pure vanadium has no smell. It usually combines with other elements such as oxygen, sodium, sulfur, or chloride. Vanadium and vanadium compounds can be found in the earth's crust and in rocks, some iron ores, and crude petroleum deposits. Vanadium is mostly combined with other metals to make special metal mixtures called alloys. Vanadium in the form of vanadium oxide is a component in special kinds of steel that is used for automobile parts, springs, and ball bearings. Most of the vanadium used in the United States is used to make steel. Vanadium oxide is a yellow-orange powder, dark-gray flakes, or

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33 Agency for Toxic Substance and Disease Registry ToxFAQ for Copper, https://www.atsdr.cdc.gov/substances/indexAZ.asp

34 Agency for Toxic Substance and Disease Registry ToxFAQ for Manganese, https://www.atsdr.cdc.gov/substances/indexAZ.asp

35 Agency for Toxic Substance and Disease Registry ToxFAQ for Nickel, https://www.atsdr.cdc.gov/substances/indexAZ.asp

yellow crystals. Vanadium is also mixed with iron to make important parts for aircraft engines. Small amounts of vanadium are used in making rubber, plastics, ceramics, and other chemicals.[36]

Dioxin

Dioxins refers to a group of toxic chemical compounds that share certain chemical structures and biological characteristics. Several hundred of these chemicals exist and are members of three closely related families:

- polychlorinated dibenzo-p-dioxins (PCDD)
- polychlorinated dibenzofurans (PCDF)
- certain polychlorinated biphenyls (PCB)

Although hundreds of PCDD, PCDF, and PCB exist, only some are toxic, those with the chlorine atoms in specific positions. Counting around the carbon rings, those with chlorines at positions 2, 3, 7, and 8 are toxic. The dioxin-like PCB have both biphenyl rings in the same plane (flat appearance), which allows them to act like dioxins in the body.

PCDD and PCDF are not created intentionally but are produced as a result of human activities like the backyard burning of trash. Natural processes like forest fires also produce PCDDs and PCDFs. PCBs are manufactured products, but they are no longer produced in the United States.

Dioxin is not produced or used commercially in the United States. It is a contaminant formed during the production of some chlorinated organic compounds, including a few herbicides such as Silvex. Over the past decade, USEPA and industry have been working together to dramatically reduce the production of dioxin and its release to the environment.

Although environmental levels of dioxins have decreased in the last 30 years, dioxins are extremely persistent compounds and break down very slowly. In fact, a large part of current exposures to dioxins in the United States is due to releases that occurred decades ago (e.g., pollution, fires).[37]

Hydrogen Chloride

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36 Agency for Toxic Substance and Disease Registry ToxFAQ for Vanadium, https://www.atsdr.cdc.gov/substances/indexAZ.asp

37 United States Environmental Protection Agency, Learn About Dioxin, https://www.epa.gov/dioxin/learn-about-dioxin#:~:text=Dioxins%20are%20called%20persistent%20organic,and%20can%20interfere%20with%20hormones.

At room temperature, hydrogen chloride is a colorless to slightly yellow, corrosive, nonflammable gas that is heavier than air and has a strong irritating odor. On exposure to air, hydrogen chloride forms dense white corrosive vapors. Hydrogen chloride can be released from volcanoes. Hydrogen chloride has many uses, including cleaning, pickling, electroplating metals, tanning leather, and refining and producing a wide variety of products. Hydrogen chloride can be formed during the burning of many plastics. Upon contact with water, it forms hydrochloric acid. Both hydrogen chloride and hydrochloric acid are corrosive.[38]

38 Agency for Toxic Substance and Disease Registry ToxFAQ for Hydrogen Chloride, https://www.atsdr.cdc.gov/substances/indexAZ.asp

The following provide the health risk assessment results for the following conditions:

- Construction Activities – Residences
- Construction Activities – Offsite Workers
- Dry Kilns – Residences
- Dry Kilns – Offsite Workers
- Biomass Boiler – 15-meter Stack – Residences
- Biomass Boiler – 15-meter Stack – Offsite Workers
- Biomass Boiler – 25-meter Stack – Residences
- Biomass Boiler – 25-meter Stack – Offsite Workers
- Biomass Boiler – 35-meter Stack – Residences
- Biomass Boiler – 35-meter Stack – Offsite Workers
- Operational Equipment – Residences
- Operational Equipment – Offsite Workers

Health Risk Assessment Assumptions

5	Chronic Reference Exposure Level (ug/m3) for DPM
1.1	Cancer Potency Slope Factor (cancer risk per mg/kg-day) for DPM
350	days per year
25,550	days per lifetime
230	80th Percentile Daily Breathing Rates (L/kg-day)
0.73	fraction of time at work

Project:	Burney Biomass
Date:	July 11, 2022
Condition:	Unmitigated
Receptor:	Existing Worker
Condition:	Construction

Exposure Year	Calender Year	Annual DPM Concentration (ug/m3)	Daily Breathing Rates (L/kg-day)	Exposure Factor	fraction of time at home	Cancer Risk
1	2023	4.33E-02	230	1.0	0.73	0.11
2	2024		230	1.0	0.73	
3	2025		230	1.0	0.73	
4	2026		230	1.0	0.73	
5	2027		230	1.0	0.73	
6	2028		230	1.0	0.73	
7	2029		230	1.0	0.73	
8	2030		230	1.0	0.73	
9	2031		230	1.0	0.73	
10	2032		230	1.0	0.73	
11	2033		230	1.0	0.73	
12	2034		230	1.0	0.73	
13	2035		230	1.0	0.73	
14	2036		230	1.0	0.73	
15	2037		230	1.0	0.73	
16	2038		230	1.0	0.73	
17	2039		230	1.0	0.73	
18	2040		230	1.0	0.73	
19	2041		230	1.0	0.73	
20	2042		230	1.0	0.73	
21	2043		230	1.0	0.73	
22	2044		230	1.0	0.73	
23	2045		230	1.0	0.73	
24	2046		230	1.0	0.73	
25	2047		230	1.0	0.73	

0.01	Chronic Hazard Impact
1	Significance Threshold
No	Significant?
0.11	Cancer Risk
10	Significance Threshold
No	Significant?

Health Risk Assessment Assumptions

5	Chronic Reference Exposure Level (ug/m3) for DPM
1.1	Cancer Potency Slope Factor (cancer risk per mg/kg-day) for DPM
350	days per year
25,550	days per lifetime
230	80th Percentile Daily Breathing Rates (L/kg-day)
0.73	fraction of time at work

Project:	Burney Biomass
Date:	July 11, 2022
Condition:	Mitigated
Receptor:	Existing Worker
Condition:	Construction

Exposure Year	Calender Year	Annual DPM Concentration (ug/m3)	Daily Breathing Rates (L/kg-day)	Exposure Factor	fraction of time at home	Cancer Risk
1	2023	7.37E-03	230	1.0	0.73	0.02
2	2024		230	1.0	0.73	
3	2025		230	1.0	0.73	
4	2026		230	1.0	0.73	
5	2027		230	1.0	0.73	
6	2028		230	1.0	0.73	
7	2029		230	1.0	0.73	
8	2030		230	1.0	0.73	
9	2031		230	1.0	0.73	
10	2032		230	1.0	0.73	
11	2033		230	1.0	0.73	
12	2034		230	1.0	0.73	
13	2035		230	1.0	0.73	
14	2036		230	1.0	0.73	
15	2037		230	1.0	0.73	
16	2038		230	1.0	0.73	
17	2039		230	1.0	0.73	
18	2040		230	1.0	0.73	
19	2041		230	1.0	0.73	
20	2042		230	1.0	0.73	
21	2043		230	1.0	0.73	
22	2044		230	1.0	0.73	
23	2045		230	1.0	0.73	
24	2046		230	1.0	0.73	
25	2047		230	1.0	0.73	

0.00	Chronic Hazard Impact
1	Significance Threshold
No	Significant?
0.02	Cancer Risk
10	Significance Threshold
No	Significant?

Health Risk Assessment Assumptions

5	Chronic Reference Exposure Level (ug/m3) for DPM
1.1	Cancer Potency Slope Factor (cancer risk per mg/kg-day) for DPM
350	days per year
25,550	days per lifetime
1,090	95th Percentile Daily Breathing Rates (L/kg-day) 0<2 Years
745	95th Percentile Daily Breathing Rates (L/kg-day) 2<16 Years
335	95th Percentile Daily Breathing Rates (L/kg-day) 16<30 Years
0.85	fraction of time at home 0<2 Years
0.72	fraction of time at home 2<16 Years
0.73	fraction of time at home 16<70 Years

Project: Burney Biomass
Date: July 11, 2022
Condition: Unmitigated
Receptor: Existing Residence
Condition: Construction

Exposure Year	Calender Year	Annual DPM Concentration (ug/m3)	Daily Breathing Rates (L/kg-day)	Exposure Factor	fraction of time at home	Cancer Risk
1	2023	5.47E-03	1,090	10.0	0.85	0.76
2	2024		1,090	10.0	0.85	
3	2025		745	4.75	0.72	
4	2026		745	3.00	0.72	
5	2027		745	3.00	0.72	
6	2028		745	3.00	0.72	
7	2029		745	3.00	0.72	
8	2030		745	3.00	0.72	
9	2031		745	3.00	0.72	
10	2032		745	3.00	0.72	
11	2033		745	3.00	0.72	
12	2034		745	3.00	0.72	
13	2035		745	3.00	0.72	
14	2036		745	3.00	0.72	
15	2037		745	3.00	0.72	
16	2038		745	3.00	0.72	
17	2039		335	1.70	0.73	
18	2040		335	1.00	0.73	
19	2041		335	1.00	0.73	
20	2042		335	1.00	0.73	
21	2043		335	1.00	0.73	
22	2044		335	1.00	0.73	
23	2045		335	1.00	0.73	
24	2046		335	1.00	0.73	
25	2047		335	1.00	0.73	
26	2048		335	1.00	0.73	
27	2049		335	1.00	0.73	
28	2050		335	1.00	0.73	
29	2051		335	1.00	0.73	
30	2052		335	1.00	0.73	

0.00	Chronic Hazard Impact
1	Significance Threshold
No	Significant?
0.76	Cancer Risk
10	Significance Threshold
No	Significant?

Health Risk Assessment Assumptions

5	Chronic Reference Exposure Level (ug/m3) for DPM
1.1	Cancer Potency Slope Factor (cancer risk per mg/kg-day) for DPM
350	days per year
25,550	days per lifetime
1,090	95th Percentile Daily Breathing Rates (L/kg-day) 0<2 Years
745	95th Percentile Daily Breathing Rates (L/kg-day) 2<16 Years
335	95th Percentile Daily Breathing Rates (L/kg-day) 16<30 Years
0.85	fraction of time at home 0<2 Years
0.72	fraction of time at home 2<16 Years
0.73	fraction of time at home 16<70 Years

Project: Burney Biomass
Date: July 11, 2022
Condition: Mitigated
Receptor: Existing Residence
Condition: Construction

Exposure Year	Calender Year	Annual DPM Concentration (ug/m3)	Daily Breathing Rates (L/kg-day)	Exposure Factor	fraction of time at home	Cancer Risk
1	2023	9.30E-04	1,090	10.0	0.85	0.13
2	2024		1,090	10.0	0.85	
3	2025		745	4.75	0.72	
4	2026		745	3.00	0.72	
5	2027		745	3.00	0.72	
6	2028		745	3.00	0.72	
7	2029		745	3.00	0.72	
8	2030		745	3.00	0.72	
9	2031		745	3.00	0.72	
10	2032		745	3.00	0.72	
11	2033		745	3.00	0.72	
12	2034		745	3.00	0.72	
13	2035		745	3.00	0.72	
14	2036		745	3.00	0.72	
15	2037		745	3.00	0.72	
16	2038		745	3.00	0.72	
17	2039		335	1.70	0.73	
18	2040		335	1.00	0.73	
19	2041		335	1.00	0.73	
20	2042		335	1.00	0.73	
21	2043		335	1.00	0.73	
22	2044		335	1.00	0.73	
23	2045		335	1.00	0.73	
24	2046		335	1.00	0.73	
25	2047		335	1.00	0.73	
26	2048		335	1.00	0.73	
27	2049		335	1.00	0.73	
28	2050		335	1.00	0.73	
29	2051		335	1.00	0.73	
30	2052		335	1.00	0.73	

0.00	Chronic Hazard Impact
1	Significance Threshold
No	Significant?
0.13	Cancer Risk
10	Significance Threshold
No	Significant?

Health Risk Assessment Assumptions

470	Acute Reference Exposure Level (ug/m3)	
140	Chronic Reference Exposure Level (ug/m3)	
0.01	Cancer Potency Slope Factor (cancer risk per mg/kg-day)	
350	days per year	
25,550	days per lifetime	
1,090	95th Percentile Daily Breathing Rates (L/kg-day)	0<2 Years
745	95th Percentile Daily Breathing Rates (L/kg-day)	2<16 Years
335	95th Percentile Daily Breathing Rates (L/kg-day)	16<30 Years
0.85	fraction of time at home	0<2 Years
0.72	fraction of time at home	2<16 Years
0.73	fraction of time at home	16<70 Years

Project: Burney Biomass
Date: July 25, 2022
Condition: Acetaldehyde
Receptor: Residence
Source: Kiln

Exposure Year	Calender Year	1-Hour Concentration (ug/m3)	Annual Concentration (ug/m3)	Daily Breathing Rates (L/kg-day)	Exposure Factor	fraction of time at home	Cancer Risk
1	2025	1.05	0.01	1,090	10.0	0.85	0.01
2	2026	1.05	0.01	1,090	10.0	0.85	0.01
3	2027	1.05	0.01	745	4.75	0.72	0.00
4	2028	1.05	0.01	745	3.00	0.72	0.00
5	2029	1.05	0.01	745	3.00	0.72	0.00
6	2030	1.05	0.01	745	3.00	0.72	0.00
7	2031	1.05	0.01	745	3.00	0.72	0.00
8	2032	1.05	0.01	745	3.00	0.72	0.00
9	2033	1.05	0.01	745	3.00	0.72	0.00
10	2034	1.05	0.01	745	3.00	0.72	0.00
11	2035	1.05	0.01	745	3.00	0.72	0.00
12	2036	1.05	0.01	745	3.00	0.72	0.00
13	2037	1.05	0.01	745	3.00	0.72	0.00
14	2038	1.05	0.01	745	3.00	0.72	0.00
15	2039	1.05	0.01	745	3.00	0.72	0.00
16	2040	1.05	0.01	745	3.00	0.72	0.00
17	2041	1.05	0.01	335	1.70	0.73	0.00
18	2042	1.05	0.01	335	1.00	0.73	0.00
19	2043	1.05	0.01	335	1.00	0.73	0.00
20	2044	1.05	0.01	335	1.00	0.73	0.00
21	2045	1.05	0.01	335	1.00	0.73	0.00
22	2046	1.05	0.01	335	1.00	0.73	0.00
23	2047	1.05	0.01	335	1.00	0.73	0.00
24	2048	1.05	0.01	335	1.00	0.73	0.00
25	2049	1.05	0.01	335	1.00	0.73	0.00
26	2050	1.05	0.01	335	1.00	0.73	0.00
27	2051	1.05	0.01	335	1.00	0.73	0.00
28	2052	1.05	0.01	335	1.00	0.73	0.00
29	2053	1.05	0.01	335	1.00	0.73	0.00
30	2054	1.05	0.01	335	1.00	0.73	0.00

0.00	Acute Hazard Impact
1	Significance Threshold
No	Significant?
0.00	Chronic Hazard Impact
1	Significance Threshold
No	Significant?
0.05	Cancer Risk
10	Significance Threshold
No	Significant?

Health Risk Assessment Assumptions

2.5	Acute Reference Exposure Level (ug/m3)	
0.35	Chronic Reference Exposure Level (ug/m3)	
	Cancer Potency Slope Factor (cancer risk per mg/kg-day)	
350	days per year	
25,550	days per lifetime	
1,090	95th Percentile Daily Breathing Rates (L/kg-day)	0<2 Years
745	95th Percentile Daily Breathing Rates (L/kg-day)	2<16 Years
335	95th Percentile Daily Breathing Rates (L/kg-day)	16<30 Years
0.85	fraction of time at home	0<2 Years
0.72	fraction of time at home	2<16 Years
0.73	fraction of time at home	16<70 Years

Project: Burney Biomass
Date: July 25, 2022
Condition: Acrolein
Receptor: Residence
Source: Kiln

Exposure Year	Calender Year	1-Hour Concentration (ug/m3)	Annual Concentration (ug/m3)	Daily Breathing Rates (L/kg-day)	Exposure Factor	fraction of time at home	Cancer Risk
1	2025	0.08	0.00	1,090	10.0	0.85	-
2	2026	0.08	0.00	1,090	10.0	0.85	-
3	2027	0.08	0.00	745	4.75	0.72	-
4	2028	0.08	0.00	745	3.00	0.72	-
5	2029	0.08	0.00	745	3.00	0.72	-
6	2030	0.08	0.00	745	3.00	0.72	-
7	2031	0.08	0.00	745	3.00	0.72	-
8	2032	0.08	0.00	745	3.00	0.72	-
9	2033	0.08	0.00	745	3.00	0.72	-
10	2034	0.08	0.00	745	3.00	0.72	-
11	2035	0.08	0.00	745	3.00	0.72	-
12	2036	0.08	0.00	745	3.00	0.72	-
13	2037	0.08	0.00	745	3.00	0.72	-
14	2038	0.08	0.00	745	3.00	0.72	-
15	2039	0.08	0.00	745	3.00	0.72	-
16	2040	0.08	0.00	745	3.00	0.72	-
17	2041	0.08	0.00	335	1.70	0.73	-
18	2042	0.08	0.00	335	1.00	0.73	-
19	2043	0.08	0.00	335	1.00	0.73	-
20	2044	0.08	0.00	335	1.00	0.73	-
21	2045	0.08	0.00	335	1.00	0.73	-
22	2046	0.08	0.00	335	1.00	0.73	-
23	2047	0.08	0.00	335	1.00	0.73	-
24	2048	0.08	0.00	335	1.00	0.73	-
25	2049	0.08	0.00	335	1.00	0.73	-
26	2050	0.08	0.00	335	1.00	0.73	-
27	2051	0.08	0.00	335	1.00	0.73	-
28	2052	0.08	0.00	335	1.00	0.73	-
29	2053	0.08	0.00	335	1.00	0.73	-
30	2054	0.08	0.00	335	1.00	0.73	-

0.03	Acute Hazard Impact
1	Significance Threshold
No	Significant?
0.00	Chronic Hazard Impact
1	Significance Threshold
No	Significant?
-	Cancer Risk
10	Significance Threshold
No	Significant?

Health Risk Assessment Assumptions

55	Acute Reference Exposure Level (ug/m3)	
9	Chronic Reference Exposure Level (ug/m3)	
0.021	Cancer Potency Slope Factor (cancer risk per mg/kg-day)	
350	days per year	
25,550	days per lifetime	
1,090	95th Percentile Daily Breathing Rates (L/kg-day)	0<2 Years
745	95th Percentile Daily Breathing Rates (L/kg-day)	2<16 Years
335	95th Percentile Daily Breathing Rates (L/kg-day)	16<30 Years
0.85	fraction of time at home	0<2 Years
0.72	fraction of time at home	2<16 Years
0.73	fraction of time at home	16<70 Years

Project: Burney Biomass
Date: July 25, 2022
Condition: Formaldehyde
Receptor: Residence
Source: Kiln

Exposure Year	Calender Year	1-Hour Concentration (ug/m3)	Annual Concentration (ug/m3)	Daily Breathing Rates (L/kg-day)	Exposure Factor	fraction of time at home	Cancer Risk
1	2025	0.13	0.00	1,090	10.0	0.85	0.00
2	2026	0.13	0.00	1,090	10.0	0.85	0.00
3	2027	0.13	0.00	745	4.75	0.72	0.00
4	2028	0.13	0.00	745	3.00	0.72	0.00
5	2029	0.13	0.00	745	3.00	0.72	0.00
6	2030	0.13	0.00	745	3.00	0.72	0.00
7	2031	0.13	0.00	745	3.00	0.72	0.00
8	2032	0.13	0.00	745	3.00	0.72	0.00
9	2033	0.13	0.00	745	3.00	0.72	0.00
10	2034	0.13	0.00	745	3.00	0.72	0.00
11	2035	0.13	0.00	745	3.00	0.72	0.00
12	2036	0.13	0.00	745	3.00	0.72	0.00
13	2037	0.13	0.00	745	3.00	0.72	0.00
14	2038	0.13	0.00	745	3.00	0.72	0.00
15	2039	0.13	0.00	745	3.00	0.72	0.00
16	2040	0.13	0.00	745	3.00	0.72	0.00
17	2041	0.13	0.00	335	1.70	0.73	0.00
18	2042	0.13	0.00	335	1.00	0.73	0.00
19	2043	0.13	0.00	335	1.00	0.73	0.00
20	2044	0.13	0.00	335	1.00	0.73	0.00
21	2045	0.13	0.00	335	1.00	0.73	0.00
22	2046	0.13	0.00	335	1.00	0.73	0.00
23	2047	0.13	0.00	335	1.00	0.73	0.00
24	2048	0.13	0.00	335	1.00	0.73	0.00
25	2049	0.13	0.00	335	1.00	0.73	0.00
26	2050	0.13	0.00	335	1.00	0.73	0.00
27	2051	0.13	0.00	335	1.00	0.73	0.00
28	2052	0.13	0.00	335	1.00	0.73	0.00
29	2053	0.13	0.00	335	1.00	0.73	0.00
30	2054	0.13	0.00	335	1.00	0.73	0.00

0.00	Acute Hazard Impact
1	Significance Threshold
No	Significant?
0.00	Chronic Hazard Impact
1	Significance Threshold
No	Significant?
0.01	Cancer Risk
10	Significance Threshold
No	Significant?

Health Risk Assessment Assumptions

28,000	Acute Reference Exposure Level (ug/m3)
4,000	Chronic Reference Exposure Level (ug/m3)
	Cancer Potency Slope Factor (cancer risk per mg/kg-day)
350	days per year
25,550	days per lifetime

1,090	95th Percentile Daily Breathing Rates (L/kg-day)	0<2 Years
745	95th Percentile Daily Breathing Rates (L/kg-day)	2<16 Years
335	95th Percentile Daily Breathing Rates (L/kg-day)	16<30 Years
0.85	fraction of time at home	0<2 Years
0.72	fraction of time at home	2<16 Years
0.73	fraction of time at home	16<70 Years

Project: Burney Biomass
Date: July 25, 2022
Condition: Methyl alcohol
Receptor: Residence
Source: Kiln

Exposure Year	Calender Year	1-Hour Concentration (ug/m3)	Annual Concentration (ug/m3)	Daily Breathing Rates (L/kg-day)	Exposure Factor	fraction of time at home	Cancer Risk
1	2025	2.59	0.02	1,090	10.0	0.85	-
2	2026	2.59	0.02	1,090	10.0	0.85	-
3	2027	2.59	0.02	745	4.75	0.72	-
4	2028	2.59	0.02	745	3.00	0.72	-
5	2029	2.59	0.02	745	3.00	0.72	-
6	2030	2.59	0.02	745	3.00	0.72	-
7	2031	2.59	0.02	745	3.00	0.72	-
8	2032	2.59	0.02	745	3.00	0.72	-
9	2033	2.59	0.02	745	3.00	0.72	-
10	2034	2.59	0.02	745	3.00	0.72	-
11	2035	2.59	0.02	745	3.00	0.72	-
12	2036	2.59	0.02	745	3.00	0.72	-
13	2037	2.59	0.02	745	3.00	0.72	-
14	2038	2.59	0.02	745	3.00	0.72	-
15	2039	2.59	0.02	745	3.00	0.72	-
16	2040	2.59	0.02	745	3.00	0.72	-
17	2041	2.59	0.02	335	1.70	0.73	-
18	2042	2.59	0.02	335	1.00	0.73	-
19	2043	2.59	0.02	335	1.00	0.73	-
20	2044	2.59	0.02	335	1.00	0.73	-
21	2045	2.59	0.02	335	1.00	0.73	-
22	2046	2.59	0.02	335	1.00	0.73	-
23	2047	2.59	0.02	335	1.00	0.73	-
24	2048	2.59	0.02	335	1.00	0.73	-
25	2049	2.59	0.02	335	1.00	0.73	-
26	2050	2.59	0.02	335	1.00	0.73	-
27	2051	2.59	0.02	335	1.00	0.73	-
28	2052	2.59	0.02	335	1.00	0.73	-
29	2053	2.59	0.02	335	1.00	0.73	-
30	2054	2.59	0.02	335	1.00	0.73	-

0.00	Acute Hazard Impact
1	Significance Threshold
No	Significant?
0.00	Chronic Hazard Impact
1	Significance Threshold
No	Significant?
-	Cancer Risk
10	Significance Threshold
No	Significant?

Health Risk Assessment Assumptions

	Acute Reference Exposure Level (ug/m3)
	Chronic Reference Exposure Level (ug/m3)
	Cancer Potency Slope Factor (cancer risk per mg/kg-day)
350	days per year
25,550	days per lifetime
1,090	95th Percentile Daily Breathing Rates (L/kg-day) 0<2 Years
745	95th Percentile Daily Breathing Rates (L/kg-day) 2<16 Years
335	95th Percentile Daily Breathing Rates (L/kg-day) 16<30 Years
0.85	fraction of time at home 0<2 Years
0.72	fraction of time at home 2<16 Years
0.73	fraction of time at home 16<70 Years

Project: Burney Biomass
Date: July 25, 2022
Condition: Propionaldehyde
Receptor: Residence
Source: Kiln

Exposure Year	Calender Year	1-Hour Concentration (ug/m3)	Annual Concentration (ug/m3)	Daily Breathing Rates (L/kg-day)	Exposure Factor	fraction of time at home	Cancer Risk
1	2025	2.59	0.02	1,090	10.0	0.85	-
2	2026	2.59	0.02	1,090	10.0	0.85	-
3	2027	2.59	0.02	745	4.75	0.72	-
4	2028	2.59	0.02	745	3.00	0.72	-
5	2029	2.59	0.02	745	3.00	0.72	-
6	2030	2.59	0.02	745	3.00	0.72	-
7	2031	2.59	0.02	745	3.00	0.72	-
8	2032	2.59	0.02	745	3.00	0.72	-
9	2033	2.59	0.02	745	3.00	0.72	-
10	2034	2.59	0.02	745	3.00	0.72	-
11	2035	2.59	0.02	745	3.00	0.72	-
12	2036	2.59	0.02	745	3.00	0.72	-
13	2037	2.59	0.02	745	3.00	0.72	-
14	2038	2.59	0.02	745	3.00	0.72	-
15	2039	2.59	0.02	745	3.00	0.72	-
16	2040	2.59	0.02	745	3.00	0.72	-
17	2041	2.59	0.02	335	1.70	0.73	-
18	2042	2.59	0.02	335	1.00	0.73	-
19	2043	2.59	0.02	335	1.00	0.73	-
20	2044	2.59	0.02	335	1.00	0.73	-
21	2045	2.59	0.02	335	1.00	0.73	-
22	2046	2.59	0.02	335	1.00	0.73	-
23	2047	2.59	0.02	335	1.00	0.73	-
24	2048	2.59	0.02	335	1.00	0.73	-
25	2049	2.59	0.02	335	1.00	0.73	-
26	2050	2.59	0.02	335	1.00	0.73	-
27	2051	2.59	0.02	335	1.00	0.73	-
28	2052	2.59	0.02	335	1.00	0.73	-
29	2053	2.59	0.02	335	1.00	0.73	-
30	2054	2.59	0.02	335	1.00	0.73	-

	Acute Hazard Impact
1	Significance Threshold
No	Significant?
	Chronic Hazard Impact
1	Significance Threshold
No	Significant?
-	Cancer Risk
10	Significance Threshold
No	Significant?

Health Risk Assessment Assumptions

470	Acute Reference Exposure Level (ug/m3)
140	Chronic Reference Exposure Level (ug/m3)
0.01	Cancer Potency Slope Factor (cancer risk per mg/kg-day)
250	days per year
25,550	days per lifetime
230	80th Percentile Daily Breathing Rates (L/kg-day)
0.73	fraction of time at work

Project: Burney Biomass
Date: July 25, 2022
Condition: Acetaldehyde
Receptor: Offsite Worker
Source: Kiln

Exposure Year	Calender Year	1-Hour Concentration (ug/m3)	Annual Concentration (ug/m3)	Daily Breathing Rates (L/kg-day)	Exposure Factor	fraction of time at work	Cancer Risk
1	2025	1.07	0.01	230	1.00	0.73	0.00
2	2026	1.07	0.01	230	1.00	0.73	0.00
3	2027	1.07	0.01	230	1.00	0.73	0.00
4	2028	1.07	0.01	230	1.00	0.73	0.00
5	2029	1.07	0.01	230	1.00	0.73	0.00
6	2030	1.07	0.01	230	1.00	0.73	0.00
7	2031	1.07	0.01	230	1.00	0.73	0.00
8	2032	1.07	0.01	230	1.00	0.73	0.00
9	2033	1.07	0.01	230	1.00	0.73	0.00
10	2034	1.07	0.01	230	1.00	0.73	0.00
11	2035	1.07	0.01	230	1.00	0.73	0.00
12	2036	1.07	0.01	230	1.00	0.73	0.00
13	2037	1.07	0.01	230	1.00	0.73	0.00
14	2038	1.07	0.01	230	1.00	0.73	0.00
15	2039	1.07	0.01	230	1.00	0.73	0.00
16	2040	1.07	0.01	230	1.00	0.73	0.00
17	2041	1.07	0.01	230	1.00	0.73	0.00
18	2042	1.07	0.01	230	1.00	0.73	0.00
19	2043	1.07	0.01	230	1.00	0.73	0.00
20	2044	1.07	0.01	230	1.00	0.73	0.00
21	2045	1.07	0.01	230	1.00	0.73	0.00
22	2046	1.07	0.01	230	1.00	0.73	0.00
23	2047	1.07	0.01	230	1.00	0.73	0.00
24	2048	1.07	0.01	230	1.00	0.73	0.00
25	2049	1.07	0.01	230	1.00	0.73	0.00

0.00	Acute Hazard Impact
1	Significance Threshold
No	Significant?
0.00	Chronic Hazard Impact
1	Significance Threshold
No	Significant?
0.00	Cancer Risk
10	Significance Threshold
No	Significant?

Health Risk Assessment Assumptions

2.5	Acute Reference Exposure Level (ug/m3)
0.35	Chronic Reference Exposure Level (ug/m3)
	Cancer Potency Slope Factor (cancer risk per mg/kg-day)
250	days per year
25,550	days per lifetime
230	80th Percentile Daily Breathing Rates (L/kg-day)
0.73	fraction of time at work

Project:	Burney Biomass
Date:	July 25, 2022
Condition:	Acrolein
Receptor:	Offsite Worker
Source:	Kiln

Exposure Year	Calender Year	1-Hour Concentration (ug/m3)	Annual Concentration (ug/m3)	Daily Breathing Rates (L/kg-day)	Exposure Factor	fraction of time at work	Cancer Risk
1	2025	0.08	0.00	230	1.00	0.73	-
2	2026	0.08	0.00	230	1.00	0.73	-
3	2027	0.08	0.00	230	1.00	0.73	-
4	2028	0.08	0.00	230	1.00	0.73	-
5	2029	0.08	0.00	230	1.00	0.73	-
6	2030	0.08	0.00	230	1.00	0.73	-
7	2031	0.08	0.00	230	1.00	0.73	-
8	2032	0.08	0.00	230	1.00	0.73	-
9	2033	0.08	0.00	230	1.00	0.73	-
10	2034	0.08	0.00	230	1.00	0.73	-
11	2035	0.08	0.00	230	1.00	0.73	-
12	2036	0.08	0.00	230	1.00	0.73	-
13	2037	0.08	0.00	230	1.00	0.73	-
14	2038	0.08	0.00	230	1.00	0.73	-
15	2039	0.08	0.00	230	1.00	0.73	-
16	2040	0.08	0.00	230	1.00	0.73	-
17	2041	0.08	0.00	230	1.00	0.73	-
18	2042	0.08	0.00	230	1.00	0.73	-
19	2043	0.08	0.00	230	1.00	0.73	-
20	2044	0.08	0.00	230	1.00	0.73	-
21	2045	0.08	0.00	230	1.00	0.73	-
22	2046	0.08	0.00	230	1.00	0.73	-
23	2047	0.08	0.00	230	1.00	0.73	-
24	2048	0.08	0.00	230	1.00	0.73	-
25	2049	0.08	0.00	230	1.00	0.73	-

0.03	Acute Hazard Impact
1	Significance Threshold
No	Significant?
0.00	Chronic Hazard Impact
1	Significance Threshold
No	Significant?
-	Cancer Risk
10	Significance Threshold
No	Significant?

Health Risk Assessment Assumptions

55	Acute Reference Exposure Level (ug/m3)
9	Chronic Reference Exposure Level (ug/m3)
0.021	Cancer Potency Slope Factor (cancer risk per mg/kg-day)
250	days per year
25,550	days per lifetime
230	80th Percentile Daily Breathing Rates (L/kg-day)
0.73	fraction of time at work

Project: Burney Biomass
Date: July 25, 2022
Condition: Formaldehyde
Receptor: Offsite Worker
Source: Kiln

Exposure Year	Calender Year	1-Hour Concentration (ug/m3)	Annual Concentration (ug/m3)	Daily Breathing Rates (L/kg-day)	Exposure Factor	fraction of time at work	Cancer Risk
1	2025	0.14	0.00	230	1.00	0.73	0.00
2	2026	0.14	0.00	230	1.00	0.73	0.00
3	2027	0.14	0.00	230	1.00	0.73	0.00
4	2028	0.14	0.00	230	1.00	0.73	0.00
5	2029	0.14	0.00	230	1.00	0.73	0.00
6	2030	0.14	0.00	230	1.00	0.73	0.00
7	2031	0.14	0.00	230	1.00	0.73	0.00
8	2032	0.14	0.00	230	1.00	0.73	0.00
9	2033	0.14	0.00	230	1.00	0.73	0.00
10	2034	0.14	0.00	230	1.00	0.73	0.00
11	2035	0.14	0.00	230	1.00	0.73	0.00
12	2036	0.14	0.00	230	1.00	0.73	0.00
13	2037	0.14	0.00	230	1.00	0.73	0.00
14	2038	0.14	0.00	230	1.00	0.73	0.00
15	2039	0.14	0.00	230	1.00	0.73	0.00
16	2040	0.14	0.00	230	1.00	0.73	0.00
17	2041	0.14	0.00	230	1.00	0.73	0.00
18	2042	0.14	0.00	230	1.00	0.73	0.00
19	2043	0.14	0.00	230	1.00	0.73	0.00
20	2044	0.14	0.00	230	1.00	0.73	0.00
21	2045	0.14	0.00	230	1.00	0.73	0.00
22	2046	0.14	0.00	230	1.00	0.73	0.00
23	2047	0.14	0.00	230	1.00	0.73	0.00
24	2048	0.14	0.00	230	1.00	0.73	0.00
25	2049	0.14	0.00	230	1.00	0.73	0.00

0.00	Acute Hazard Impact
1	Significance Threshold
No	Significant?
0.00	Chronic Hazard Impact
1	Significance Threshold
No	Significant?
0.00	Cancer Risk
10	Significance Threshold
No	Significant?

Health Risk Assessment Assumptions

28,000	Acute Reference Exposure Level (ug/m3)
4,000	Chronic Reference Exposure Level (ug/m3)
	Cancer Potency Slope Factor (cancer risk per mg/kg-day)
250	days per year
25,550	days per lifetime
230	80th Percentile Daily Breathing Rates (L/kg-day)
0.73	fraction of time at work

Project:	Burney Biomass
Date:	July 25, 2022
Condition:	Methyl alcohol
Receptor:	Offsite Worker
Source:	Kiln

Exposure Year	Calender Year	1-Hour Concentration (ug/m3)	Annual Concentration (ug/m3)	Daily Breathing Rates (L/kg-day)	Exposure Factor	fraction of time at work	Cancer Risk
1	2025	2.64	0.02	230	1.00	0.73	-
2	2026	2.64	0.02	230	1.00	0.73	-
3	2027	2.64	0.02	230	1.00	0.73	-
4	2028	2.64	0.02	230	1.00	0.73	-
5	2029	2.64	0.02	230	1.00	0.73	-
6	2030	2.64	0.02	230	1.00	0.73	-
7	2031	2.64	0.02	230	1.00	0.73	-
8	2032	2.64	0.02	230	1.00	0.73	-
9	2033	2.64	0.02	230	1.00	0.73	-
10	2034	2.64	0.02	230	1.00	0.73	-
11	2035	2.64	0.02	230	1.00	0.73	-
12	2036	2.64	0.02	230	1.00	0.73	-
13	2037	2.64	0.02	230	1.00	0.73	-
14	2038	2.64	0.02	230	1.00	0.73	-
15	2039	2.64	0.02	230	1.00	0.73	-
16	2040	2.64	0.02	230	1.00	0.73	-
17	2041	2.64	0.02	230	1.00	0.73	-
18	2042	2.64	0.02	230	1.00	0.73	-
19	2043	2.64	0.02	230	1.00	0.73	-
20	2044	2.64	0.02	230	1.00	0.73	-
21	2045	2.64	0.02	230	1.00	0.73	-
22	2046	2.64	0.02	230	1.00	0.73	-
23	2047	2.64	0.02	230	1.00	0.73	-
24	2048	2.64	0.02	230	1.00	0.73	-
25	2049	2.64	0.02	230	1.00	0.73	-

0.00	Acute Hazard Impact
1	Significance Threshold
No	Significant?
0.00	Chronic Hazard Impact
1	Significance Threshold
No	Significant?
-	Cancer Risk
10	Significance Threshold
No	Significant?

Health Risk Assessment Assumptions

	Acute Reference Exposure Level (ug/m3)
	Chronic Reference Exposure Level (ug/m3)
	Cancer Potency Slope Factor (cancer risk per mg/kg-day)
250	days per year
25,550	days per lifetime
230	80th Percentile Daily Breathing Rates (L/kg-day)
0.73	fraction of time at work

Project:	Burney Biomass
Date:	July 25, 2022
Condition:	Propionaldehyde
Receptor:	Offsite Worker
Source:	Kiln

Exposure Year	Calender Year	1-Hour Concentration (ug/m3)	Annual Concentration (ug/m3)	Daily Breathing Rates (L/kg-day)	Exposure Factor	fraction of time at work	Cancer Risk
1	2025	2.64	0.02	230	1.00	0.73	-
2	2026	2.64	0.02	230	1.00	0.73	-
3	2027	2.64	0.02	230	1.00	0.73	-
4	2028	2.64	0.02	230	1.00	0.73	-
5	2029	2.64	0.02	230	1.00	0.73	-
6	2030	2.64	0.02	230	1.00	0.73	-
7	2031	2.64	0.02	230	1.00	0.73	-
8	2032	2.64	0.02	230	1.00	0.73	-
9	2033	2.64	0.02	230	1.00	0.73	-
10	2034	2.64	0.02	230	1.00	0.73	-
11	2035	2.64	0.02	230	1.00	0.73	-
12	2036	2.64	0.02	230	1.00	0.73	-
13	2037	2.64	0.02	230	1.00	0.73	-
14	2038	2.64	0.02	230	1.00	0.73	-
15	2039	2.64	0.02	230	1.00	0.73	-
16	2040	2.64	0.02	230	1.00	0.73	-
17	2041	2.64	0.02	230	1.00	0.73	-
18	2042	2.64	0.02	230	1.00	0.73	-
19	2043	2.64	0.02	230	1.00	0.73	-
20	2044	2.64	0.02	230	1.00	0.73	-
21	2045	2.64	0.02	230	1.00	0.73	-
22	2046	2.64	0.02	230	1.00	0.73	-
23	2047	2.64	0.02	230	1.00	0.73	-
24	2048	2.64	0.02	230	1.00	0.73	-
25	2049	2.64	0.02	230	1.00	0.73	-

	Acute Hazard Impact
1	Significance Threshold
No	Significant?
	Chronic Hazard Impact
1	Significance Threshold
No	Significant?
-	Cancer Risk
10	Significance Threshold
No	Significant?

Health Risk Assessment Assumptions

	Acute Reference Exposure Level (ug/m3)	
0.02	Chronic Reference Exposure Level (ug/m3)	
15	Cancer Potency Slope Factor (cancer risk per mg/kg-day)	
350	days per year	
25,550	days per lifetime	
1,090	95th Percentile Daily Breathing Rates (L/kg-day)	0<2 Years
745	95th Percentile Daily Breathing Rates (L/kg-day)	2<16 Years
335	95th Percentile Daily Breathing Rates (L/kg-day)	16<30 Years
0.85	fraction of time at home	0<2 Years
0.72	fraction of time at home	2<16 Years
0.73	fraction of time at home	16<70 Years

Project:	Burney Biomass
Date:	July 25, 2022
Condition:	Cadmium
Receptor:	Residence
Source:	Boiler
Height:	15m

Exposure Year	Calender Year	1-Hour Concentration (ug/m3)	Annual Concentration (ug/m3)	Daily Breathing Rates (L/kg-day)	Exposure Factor	fraction of time at home	Cancer Risk
1	2025	0.00	0.00	1,090	10.0	0.85	0.11
2	2026	0.00	0.00	1,090	10.0	0.85	0.11
3	2027	0.00	0.00	745	4.75	0.72	0.03
4	2028	0.00	0.00	745	3.00	0.72	0.02
5	2029	0.00	0.00	745	3.00	0.72	0.02
6	2030	0.00	0.00	745	3.00	0.72	0.02
7	2031	0.00	0.00	745	3.00	0.72	0.02
8	2032	0.00	0.00	745	3.00	0.72	0.02
9	2033	0.00	0.00	745	3.00	0.72	0.02
10	2034	0.00	0.00	745	3.00	0.72	0.02
11	2035	0.00	0.00	745	3.00	0.72	0.02
12	2036	0.00	0.00	745	3.00	0.72	0.02
13	2037	0.00	0.00	745	3.00	0.72	0.02
14	2038	0.00	0.00	745	3.00	0.72	0.02
15	2039	0.00	0.00	745	3.00	0.72	0.02
16	2040	0.00	0.00	745	3.00	0.72	0.02
17	2041	0.00	0.00	335	1.70	0.73	0.00
18	2042	0.00	0.00	335	1.00	0.73	0.00
19	2043	0.00	0.00	335	1.00	0.73	0.00
20	2044	0.00	0.00	335	1.00	0.73	0.00
21	2045	0.00	0.00	335	1.00	0.73	0.00
22	2046	0.00	0.00	335	1.00	0.73	0.00
23	2047	0.00	0.00	335	1.00	0.73	0.00
24	2048	0.00	0.00	335	1.00	0.73	0.00
25	2049	0.00	0.00	335	1.00	0.73	0.00
26	2050	0.00	0.00	335	1.00	0.73	0.00
27	2051	0.00	0.00	335	1.00	0.73	0.00
28	2052	0.00	0.00	335	1.00	0.73	0.00
29	2053	0.00	0.00	335	1.00	0.73	0.00
30	2054	0.00	0.00	335	1.00	0.73	0.00

	Acute Hazard Impact
1	Significance Threshold
No	Significant?
0.00	Chronic Hazard Impact
1	Significance Threshold
No	Significant?
0.52	Cancer Risk
10	Significance Threshold
No	Significant?

Health Risk Assessment Assumptions

0.6	Acute Reference Exposure Level (ug/m3)	
0.03	Chronic Reference Exposure Level (ug/m3)	
	Cancer Potency Slope Factor (cancer risk per mg/kg-day)	
350	days per year	
25,550	days per lifetime	
1,090	95th Percentile Daily Breathing Rates (L/kg-day)	0<2 Years
745	95th Percentile Daily Breathing Rates (L/kg-day)	2<16 Years
335	95th Percentile Daily Breathing Rates (L/kg-day)	16<30 Years
0.85	fraction of time at home	0<2 Years
0.72	fraction of time at home	2<16 Years
0.73	fraction of time at home	16<70 Years

Project:	Burney Biomass
Date:	July 25, 2022
Condition:	Mercury
Receptor:	Residence
Source:	Boiler
Height:	15m

Exposure Year	Calender Year	1-Hour Concentration (ug/m3)	Annual Concentration (ug/m3)	Daily Breathing Rates (L/kg-day)	Exposure Factor	fraction of time at home	Cancer Risk
1	2025	0.00	0.00	1,090	10.0	0.85	-
2	2026	0.00	0.00	1,090	10.0	0.85	-
3	2027	0.00	0.00	745	4.75	0.72	-
4	2028	0.00	0.00	745	3.00	0.72	-
5	2029	0.00	0.00	745	3.00	0.72	-
6	2030	0.00	0.00	745	3.00	0.72	-
7	2031	0.00	0.00	745	3.00	0.72	-
8	2032	0.00	0.00	745	3.00	0.72	-
9	2033	0.00	0.00	745	3.00	0.72	-
10	2034	0.00	0.00	745	3.00	0.72	-
11	2035	0.00	0.00	745	3.00	0.72	-
12	2036	0.00	0.00	745	3.00	0.72	-
13	2037	0.00	0.00	745	3.00	0.72	-
14	2038	0.00	0.00	745	3.00	0.72	-
15	2039	0.00	0.00	745	3.00	0.72	-
16	2040	0.00	0.00	745	3.00	0.72	-
17	2041	0.00	0.00	335	1.70	0.73	-
18	2042	0.00	0.00	335	1.00	0.73	-
19	2043	0.00	0.00	335	1.00	0.73	-
20	2044	0.00	0.00	335	1.00	0.73	-
21	2045	0.00	0.00	335	1.00	0.73	-
22	2046	0.00	0.00	335	1.00	0.73	-
23	2047	0.00	0.00	335	1.00	0.73	-
24	2048	0.00	0.00	335	1.00	0.73	-
25	2049	0.00	0.00	335	1.00	0.73	-
26	2050	0.00	0.00	335	1.00	0.73	-
27	2051	0.00	0.00	335	1.00	0.73	-
28	2052	0.00	0.00	335	1.00	0.73	-
29	2053	0.00	0.00	335	1.00	0.73	-
30	2054	0.00	0.00	335	1.00	0.73	-

0.00	Acute Hazard Impact
1	Significance Threshold
No	Significant?
0.00	Chronic Hazard Impact
1	Significance Threshold
No	Significant?
-	Cancer Risk
10	Significance Threshold
No	Significant?

Health Risk Assessment Assumptions

	Acute Reference Exposure Level (ug/m3)	
	Chronic Reference Exposure Level (ug/m3)	
	Cancer Potency Slope Factor (cancer risk per mg/kg-day)	
350	days per year	
25,550	days per lifetime	
1,090	95th Percentile Daily Breathing Rates (L/kg-day)	0<2 Years
745	95th Percentile Daily Breathing Rates (L/kg-day)	2<16 Years
335	95th Percentile Daily Breathing Rates (L/kg-day)	16<30 Years
0.85	fraction of time at home	0<2 Years
0.72	fraction of time at home	2<16 Years
0.73	fraction of time at home	16<70 Years

Project:	Burney Biomass
Date:	July 25, 2022
Condition:	Antimony
Receptor:	Residence
Source:	Boiler
Height:	15m

Exposure Year	Calender Year	1-Hour Concentration (ug/m3)	Annual Concentration (ug/m3)	Daily Breathing Rates (L/kg-day)	Exposure Factor	fraction of time at home	Cancer Risk
1	2025	0.00	0.00	1,090	10.0	0.85	-
2	2026	0.00	0.00	1,090	10.0	0.85	-
3	2027	0.00	0.00	745	4.75	0.72	-
4	2028	0.00	0.00	745	3.00	0.72	-
5	2029	0.00	0.00	745	3.00	0.72	-
6	2030	0.00	0.00	745	3.00	0.72	-
7	2031	0.00	0.00	745	3.00	0.72	-
8	2032	0.00	0.00	745	3.00	0.72	-
9	2033	0.00	0.00	745	3.00	0.72	-
10	2034	0.00	0.00	745	3.00	0.72	-
11	2035	0.00	0.00	745	3.00	0.72	-
12	2036	0.00	0.00	745	3.00	0.72	-
13	2037	0.00	0.00	745	3.00	0.72	-
14	2038	0.00	0.00	745	3.00	0.72	-
15	2039	0.00	0.00	745	3.00	0.72	-
16	2040	0.00	0.00	745	3.00	0.72	-
17	2041	0.00	0.00	335	1.70	0.73	-
18	2042	0.00	0.00	335	1.00	0.73	-
19	2043	0.00	0.00	335	1.00	0.73	-
20	2044	0.00	0.00	335	1.00	0.73	-
21	2045	0.00	0.00	335	1.00	0.73	-
22	2046	0.00	0.00	335	1.00	0.73	-
23	2047	0.00	0.00	335	1.00	0.73	-
24	2048	0.00	0.00	335	1.00	0.73	-
25	2049	0.00	0.00	335	1.00	0.73	-
26	2050	0.00	0.00	335	1.00	0.73	-
27	2051	0.00	0.00	335	1.00	0.73	-
28	2052	0.00	0.00	335	1.00	0.73	-
29	2053	0.00	0.00	335	1.00	0.73	-
30	2054	0.00	0.00	335	1.00	0.73	-

	Acute Hazard Impact
1	Significance Threshold
No	Significant?
	Chronic Hazard Impact
1	Significance Threshold
No	Significant?
-	Cancer Risk
10	Significance Threshold
No	Significant?

Health Risk Assessment Assumptions

0.2	Acute Reference Exposure Level (ug/m3)
0.015	Chronic Reference Exposure Level (ug/m3)
12	Cancer Potency Slope Factor (cancer risk per mg/kg-day)
350	days per year
25,550	days per lifetime

1,090	95th Percentile Daily Breathing Rates (L/kg-day)	0<2 Years
745	95th Percentile Daily Breathing Rates (L/kg-day)	2<16 Years
335	95th Percentile Daily Breathing Rates (L/kg-day)	16<30 Years
0.85	fraction of time at home	0<2 Years
0.72	fraction of time at home	2<16 Years
0.73	fraction of time at home	16<70 Years

Project:	Burney Biomass
Date:	July 25, 2022
Condition:	Arsenic
Receptor:	Residence
Source:	Boiler
Height:	15m

Exposure Year	Calender Year	1-Hour Concentration (ug/m3)	Annual Concentration (ug/m3)	Daily Breathing Rates (L/kg-day)	Exposure Factor	fraction of time at home	Cancer Risk
1	2025	0.00	0.00	1,090	10.0	0.85	0.08
2	2026	0.00	0.00	1,090	10.0	0.85	0.08
3	2027	0.00	0.00	745	4.75	0.72	0.02
4	2028	0.00	0.00	745	3.00	0.72	0.01
5	2029	0.00	0.00	745	3.00	0.72	0.01
6	2030	0.00	0.00	745	3.00	0.72	0.01
7	2031	0.00	0.00	745	3.00	0.72	0.01
8	2032	0.00	0.00	745	3.00	0.72	0.01
9	2033	0.00	0.00	745	3.00	0.72	0.01
10	2034	0.00	0.00	745	3.00	0.72	0.01
11	2035	0.00	0.00	745	3.00	0.72	0.01
12	2036	0.00	0.00	745	3.00	0.72	0.01
13	2037	0.00	0.00	745	3.00	0.72	0.01
14	2038	0.00	0.00	745	3.00	0.72	0.01
15	2039	0.00	0.00	745	3.00	0.72	0.01
16	2040	0.00	0.00	745	3.00	0.72	0.01
17	2041	0.00	0.00	335	1.70	0.73	0.00
18	2042	0.00	0.00	335	1.00	0.73	0.00
19	2043	0.00	0.00	335	1.00	0.73	0.00
20	2044	0.00	0.00	335	1.00	0.73	0.00
21	2045	0.00	0.00	335	1.00	0.73	0.00
22	2046	0.00	0.00	335	1.00	0.73	0.00
23	2047	0.00	0.00	335	1.00	0.73	0.00
24	2048	0.00	0.00	335	1.00	0.73	0.00
25	2049	0.00	0.00	335	1.00	0.73	0.00
26	2050	0.00	0.00	335	1.00	0.73	0.00
27	2051	0.00	0.00	335	1.00	0.73	0.00
28	2052	0.00	0.00	335	1.00	0.73	0.00
29	2053	0.00	0.00	335	1.00	0.73	0.00
30	2054	0.00	0.00	335	1.00	0.73	0.00

0.01	Acute Hazard Impact
1	Significance Threshold
No	Significant?
0.00	Chronic Hazard Impact
1	Significance Threshold
No	Significant?
0.42	Cancer Risk
10	Significance Threshold
No	Significant?

Health Risk Assessment Assumptions

	Acute Reference Exposure Level (ug/m3)
	Chronic Reference Exposure Level (ug/m3)
0.042	Cancer Potency Slope Factor (cancer risk per mg/kg-day)
350	days per year
25,550	days per lifetime

1,090	95th Percentile Daily Breathing Rates (L/kg-day)	0<2 Years
745	95th Percentile Daily Breathing Rates (L/kg-day)	2<16 Years
335	95th Percentile Daily Breathing Rates (L/kg-day)	16<30 Years
0.85	fraction of time at home	0<2 Years
0.72	fraction of time at home	2<16 Years
0.73	fraction of time at home	16<70 Years

Project:	Burney Biomass
Date:	July 25, 2022
Condition:	Lead
Receptor:	Residence
Source:	Boiler
Height:	15m

Exposure Year	Calender Year	1-Hour Concentration (ug/m3)	Annual Concentration (ug/m3)	Daily Breathing Rates (L/kg-day)	Exposure Factor	fraction of time at home	Cancer Risk
1	2025	0.00	0.00	1,090	10.0	0.85	0.00
2	2026	0.00	0.00	1,090	10.0	0.85	0.00
3	2027	0.00	0.00	745	4.75	0.72	0.00
4	2028	0.00	0.00	745	3.00	0.72	0.00
5	2029	0.00	0.00	745	3.00	0.72	0.00
6	2030	0.00	0.00	745	3.00	0.72	0.00
7	2031	0.00	0.00	745	3.00	0.72	0.00
8	2032	0.00	0.00	745	3.00	0.72	0.00
9	2033	0.00	0.00	745	3.00	0.72	0.00
10	2034	0.00	0.00	745	3.00	0.72	0.00
11	2035	0.00	0.00	745	3.00	0.72	0.00
12	2036	0.00	0.00	745	3.00	0.72	0.00
13	2037	0.00	0.00	745	3.00	0.72	0.00
14	2038	0.00	0.00	745	3.00	0.72	0.00
15	2039	0.00	0.00	745	3.00	0.72	0.00
16	2040	0.00	0.00	745	3.00	0.72	0.00
17	2041	0.00	0.00	335	1.70	0.73	0.00
18	2042	0.00	0.00	335	1.00	0.73	0.00
19	2043	0.00	0.00	335	1.00	0.73	0.00
20	2044	0.00	0.00	335	1.00	0.73	0.00
21	2045	0.00	0.00	335	1.00	0.73	0.00
22	2046	0.00	0.00	335	1.00	0.73	0.00
23	2047	0.00	0.00	335	1.00	0.73	0.00
24	2048	0.00	0.00	335	1.00	0.73	0.00
25	2049	0.00	0.00	335	1.00	0.73	0.00
26	2050	0.00	0.00	335	1.00	0.73	0.00
27	2051	0.00	0.00	335	1.00	0.73	0.00
28	2052	0.00	0.00	335	1.00	0.73	0.00
29	2053	0.00	0.00	335	1.00	0.73	0.00
30	2054	0.00	0.00	335	1.00	0.73	0.00

	Acute Hazard Impact
1	Significance Threshold
No	Significant?
	Chronic Hazard Impact
1	Significance Threshold
No	Significant?
0.00	Cancer Risk
10	Significance Threshold
No	Significant?

Health Risk Assessment Assumptions

	Acute Reference Exposure Level (ug/m3)
	Chronic Reference Exposure Level (ug/m3)
	Cancer Potency Slope Factor (cancer risk per mg/kg-day)
350	days per year
25,550	days per lifetime

1,090	95th Percentile Daily Breathing Rates (L/kg-day)	0<2 Years
745	95th Percentile Daily Breathing Rates (L/kg-day)	2<16 Years
335	95th Percentile Daily Breathing Rates (L/kg-day)	16<30 Years
0.85	fraction of time at home	0<2 Years
0.72	fraction of time at home	2<16 Years
0.73	fraction of time at home	16<70 Years

Project:	Burney Biomass
Date:	July 25, 2022
Condition:	Chromium
Receptor:	Residence
Source:	Boiler
Height:	15m

Exposure Year	Calender Year	1-Hour Concentration (ug/m3)	Annual Concentration (ug/m3)	Daily Breathing Rates (L/kg-day)	Exposure Factor	fraction of time at home	Cancer Risk
1	2025	0.00	0.00	1,090	10.0	0.85	-
2	2026	0.00	0.00	1,090	10.0	0.85	-
3	2027	0.00	0.00	745	4.75	0.72	-
4	2028	0.00	0.00	745	3.00	0.72	-
5	2029	0.00	0.00	745	3.00	0.72	-
6	2030	0.00	0.00	745	3.00	0.72	-
7	2031	0.00	0.00	745	3.00	0.72	-
8	2032	0.00	0.00	745	3.00	0.72	-
9	2033	0.00	0.00	745	3.00	0.72	-
10	2034	0.00	0.00	745	3.00	0.72	-
11	2035	0.00	0.00	745	3.00	0.72	-
12	2036	0.00	0.00	745	3.00	0.72	-
13	2037	0.00	0.00	745	3.00	0.72	-
14	2038	0.00	0.00	745	3.00	0.72	-
15	2039	0.00	0.00	745	3.00	0.72	-
16	2040	0.00	0.00	745	3.00	0.72	-
17	2041	0.00	0.00	335	1.70	0.73	-
18	2042	0.00	0.00	335	1.00	0.73	-
19	2043	0.00	0.00	335	1.00	0.73	-
20	2044	0.00	0.00	335	1.00	0.73	-
21	2045	0.00	0.00	335	1.00	0.73	-
22	2046	0.00	0.00	335	1.00	0.73	-
23	2047	0.00	0.00	335	1.00	0.73	-
24	2048	0.00	0.00	335	1.00	0.73	-
25	2049	0.00	0.00	335	1.00	0.73	-
26	2050	0.00	0.00	335	1.00	0.73	-
27	2051	0.00	0.00	335	1.00	0.73	-
28	2052	0.00	0.00	335	1.00	0.73	-
29	2053	0.00	0.00	335	1.00	0.73	-
30	2054	0.00	0.00	335	1.00	0.73	-

	Acute Hazard Impact
1	Significance Threshold
No	Significant?
	Chronic Hazard Impact
1	Significance Threshold
No	Significant?
-	Cancer Risk
10	Significance Threshold
No	Significant?

Health Risk Assessment Assumptions

	Acute Reference Exposure Level (ug/m3)	
	Chronic Reference Exposure Level (ug/m3)	
27	Cancer Potency Slope Factor (cancer risk per mg/kg-day)	
350	days per year	
25,550	days per lifetime	
1,090	95th Percentile Daily Breathing Rates (L/kg-day)	0<2 Years
745	95th Percentile Daily Breathing Rates (L/kg-day)	2<16 Years
335	95th Percentile Daily Breathing Rates (L/kg-day)	16<30 Years
0.85	fraction of time at home	0<2 Years
0.72	fraction of time at home	2<16 Years
0.73	fraction of time at home	16<70 Years

Project: Burney Biomass
Date: July 25, 2022
Condition: Cobalt
Receptor: Residence
Source: Boiler
Height: 15m

Exposure Year	Calender Year	1-Hour Concentration (ug/m3)	Annual Concentration (ug/m3)	Daily Breathing Rates (L/kg-day)	Exposure Factor	fraction of time at home	Cancer Risk
1	2025	0.00	0.00	1,090	10.0	0.85	0.19
2	2026	0.00	0.00	1,090	10.0	0.85	0.19
3	2027	0.00	0.00	745	4.75	0.72	0.05
4	2028	0.00	0.00	745	3.00	0.72	0.03
5	2029	0.00	0.00	745	3.00	0.72	0.03
6	2030	0.00	0.00	745	3.00	0.72	0.03
7	2031	0.00	0.00	745	3.00	0.72	0.03
8	2032	0.00	0.00	745	3.00	0.72	0.03
9	2033	0.00	0.00	745	3.00	0.72	0.03
10	2034	0.00	0.00	745	3.00	0.72	0.03
11	2035	0.00	0.00	745	3.00	0.72	0.03
12	2036	0.00	0.00	745	3.00	0.72	0.03
13	2037	0.00	0.00	745	3.00	0.72	0.03
14	2038	0.00	0.00	745	3.00	0.72	0.03
15	2039	0.00	0.00	745	3.00	0.72	0.03
16	2040	0.00	0.00	745	3.00	0.72	0.03
17	2041	0.00	0.00	335	1.70	0.73	0.01
18	2042	0.00	0.00	335	1.00	0.73	0.01
19	2043	0.00	0.00	335	1.00	0.73	0.01
20	2044	0.00	0.00	335	1.00	0.73	0.01
21	2045	0.00	0.00	335	1.00	0.73	0.01
22	2046	0.00	0.00	335	1.00	0.73	0.01
23	2047	0.00	0.00	335	1.00	0.73	0.01
24	2048	0.00	0.00	335	1.00	0.73	0.01
25	2049	0.00	0.00	335	1.00	0.73	0.01
26	2050	0.00	0.00	335	1.00	0.73	0.01
27	2051	0.00	0.00	335	1.00	0.73	0.01
28	2052	0.00	0.00	335	1.00	0.73	0.01
29	2053	0.00	0.00	335	1.00	0.73	0.01
30	2054	0.00	0.00	335	1.00	0.73	0.01

	Acute Hazard Impact
1	Significance Threshold
No	Significant?
	Chronic Hazard Impact
1	Significance Threshold
No	Significant?
0.94	Cancer Risk
10	Significance Threshold
No	Significant?

Health Risk Assessment Assumptions

100	Acute Reference Exposure Level (ug/m3)	
	Chronic Reference Exposure Level (ug/m3)	
	Cancer Potency Slope Factor (cancer risk per mg/kg-day)	
350	days per year	
25,550	days per lifetime	
1,090	95th Percentile Daily Breathing Rates (L/kg-day)	0<2 Years
745	95th Percentile Daily Breathing Rates (L/kg-day)	2<16 Years
335	95th Percentile Daily Breathing Rates (L/kg-day)	16<30 Years
0.85	fraction of time at home	0<2 Years
0.72	fraction of time at home	2<16 Years
0.73	fraction of time at home	16<70 Years

Project: Burney Biomass
Date: July 25, 2022
Condition: Copper
Receptor: Residence
Source: Boiler
Height: 15m

Exposure Year	Calender Year	1-Hour Concentration (ug/m3)	Annual Concentration (ug/m3)	Daily Breathing Rates (L/kg-day)	Exposure Factor	fraction of time at home	Cancer Risk
1	2025	0.00	0.00	1,090	10.0	0.85	-
2	2026	0.00	0.00	1,090	10.0	0.85	-
3	2027	0.00	0.00	745	4.75	0.72	-
4	2028	0.00	0.00	745	3.00	0.72	-
5	2029	0.00	0.00	745	3.00	0.72	-
6	2030	0.00	0.00	745	3.00	0.72	-
7	2031	0.00	0.00	745	3.00	0.72	-
8	2032	0.00	0.00	745	3.00	0.72	-
9	2033	0.00	0.00	745	3.00	0.72	-
10	2034	0.00	0.00	745	3.00	0.72	-
11	2035	0.00	0.00	745	3.00	0.72	-
12	2036	0.00	0.00	745	3.00	0.72	-
13	2037	0.00	0.00	745	3.00	0.72	-
14	2038	0.00	0.00	745	3.00	0.72	-
15	2039	0.00	0.00	745	3.00	0.72	-
16	2040	0.00	0.00	745	3.00	0.72	-
17	2041	0.00	0.00	335	1.70	0.73	-
18	2042	0.00	0.00	335	1.00	0.73	-
19	2043	0.00	0.00	335	1.00	0.73	-
20	2044	0.00	0.00	335	1.00	0.73	-
21	2045	0.00	0.00	335	1.00	0.73	-
22	2046	0.00	0.00	335	1.00	0.73	-
23	2047	0.00	0.00	335	1.00	0.73	-
24	2048	0.00	0.00	335	1.00	0.73	-
25	2049	0.00	0.00	335	1.00	0.73	-
26	2050	0.00	0.00	335	1.00	0.73	-
27	2051	0.00	0.00	335	1.00	0.73	-
28	2052	0.00	0.00	335	1.00	0.73	-
29	2053	0.00	0.00	335	1.00	0.73	-
30	2054	0.00	0.00	335	1.00	0.73	-

0.00	Acute Hazard Impact
1	Significance Threshold
No	Significant?
	Chronic Hazard Impact
1	Significance Threshold
No	Significant?
-	Cancer Risk
10	Significance Threshold
No	Significant?

Health Risk Assessment Assumptions

0.17	Acute Reference Exposure Level (ug/m3)	
0.09	Chronic Reference Exposure Level (ug/m3)	
	Cancer Potency Slope Factor (cancer risk per mg/kg-day)	
350	days per year	
25,550	days per lifetime	
1,090	95th Percentile Daily Breathing Rates (L/kg-day)	0<2 Years
745	95th Percentile Daily Breathing Rates (L/kg-day)	2<16 Years
335	95th Percentile Daily Breathing Rates (L/kg-day)	16<30 Years
0.85	fraction of time at home	0<2 Years
0.72	fraction of time at home	2<16 Years
0.73	fraction of time at home	16<70 Years

Project: Burney Biomass
Date: July 25, 2022
Condition: Manganese
Receptor: Residence
Source: Boiler
Height: 15m

Exposure Year	Calender Year	1-Hour Concentration (ug/m3)	Annual Concentration (ug/m3)	Daily Breathing Rates (L/kg-day)	Exposure Factor	fraction of time at home	Cancer Risk
1	2025	0.00	0.00	1,090	10.0	0.85	-
2	2026	0.00	0.00	1,090	10.0	0.85	-
3	2027	0.00	0.00	745	4.75	0.72	-
4	2028	0.00	0.00	745	3.00	0.72	-
5	2029	0.00	0.00	745	3.00	0.72	-
6	2030	0.00	0.00	745	3.00	0.72	-
7	2031	0.00	0.00	745	3.00	0.72	-
8	2032	0.00	0.00	745	3.00	0.72	-
9	2033	0.00	0.00	745	3.00	0.72	-
10	2034	0.00	0.00	745	3.00	0.72	-
11	2035	0.00	0.00	745	3.00	0.72	-
12	2036	0.00	0.00	745	3.00	0.72	-
13	2037	0.00	0.00	745	3.00	0.72	-
14	2038	0.00	0.00	745	3.00	0.72	-
15	2039	0.00	0.00	745	3.00	0.72	-
16	2040	0.00	0.00	745	3.00	0.72	-
17	2041	0.00	0.00	335	1.70	0.73	-
18	2042	0.00	0.00	335	1.00	0.73	-
19	2043	0.00	0.00	335	1.00	0.73	-
20	2044	0.00	0.00	335	1.00	0.73	-
21	2045	0.00	0.00	335	1.00	0.73	-
22	2046	0.00	0.00	335	1.00	0.73	-
23	2047	0.00	0.00	335	1.00	0.73	-
24	2048	0.00	0.00	335	1.00	0.73	-
25	2049	0.00	0.00	335	1.00	0.73	-
26	2050	0.00	0.00	335	1.00	0.73	-
27	2051	0.00	0.00	335	1.00	0.73	-
28	2052	0.00	0.00	335	1.00	0.73	-
29	2053	0.00	0.00	335	1.00	0.73	-
30	2054	0.00	0.00	335	1.00	0.73	-

0.02	Acute Hazard Impact
1	Significance Threshold
No	Significant?
0.00	Chronic Hazard Impact
1	Significance Threshold
No	Significant?
-	Cancer Risk
10	Significance Threshold
No	Significant?

Health Risk Assessment Assumptions

0.2	Acute Reference Exposure Level (ug/m3)	
0.014	Chronic Reference Exposure Level (ug/m3)	
0.91	Cancer Potency Slope Factor (cancer risk per mg/kg-day)	
350	days per year	
25,550	days per lifetime	
1,090	95th Percentile Daily Breathing Rates (L/kg-day)	0<2 Years
745	95th Percentile Daily Breathing Rates (L/kg-day)	2<16 Years
335	95th Percentile Daily Breathing Rates (L/kg-day)	16<30 Years
0.85	fraction of time at home	0<2 Years
0.72	fraction of time at home	2<16 Years
0.73	fraction of time at home	16<70 Years

Project:	Burney Biomass
Date:	July 25, 2022
Condition:	Nickel
Receptor:	Residence
Source:	Boiler
Height:	15m

Exposure Year	Calender Year	1-Hour Concentration (ug/m3)	Annual Concentration (ug/m3)	Daily Breathing Rates (L/kg-day)	Exposure Factor	fraction of time at home	Cancer Risk
1	2025	0.00	0.00	1,090	10.0	0.85	0.01
2	2026	0.00	0.00	1,090	10.0	0.85	0.01
3	2027	0.00	0.00	745	4.75	0.72	0.00
4	2028	0.00	0.00	745	3.00	0.72	0.00
5	2029	0.00	0.00	745	3.00	0.72	0.00
6	2030	0.00	0.00	745	3.00	0.72	0.00
7	2031	0.00	0.00	745	3.00	0.72	0.00
8	2032	0.00	0.00	745	3.00	0.72	0.00
9	2033	0.00	0.00	745	3.00	0.72	0.00
10	2034	0.00	0.00	745	3.00	0.72	0.00
11	2035	0.00	0.00	745	3.00	0.72	0.00
12	2036	0.00	0.00	745	3.00	0.72	0.00
13	2037	0.00	0.00	745	3.00	0.72	0.00
14	2038	0.00	0.00	745	3.00	0.72	0.00
15	2039	0.00	0.00	745	3.00	0.72	0.00
16	2040	0.00	0.00	745	3.00	0.72	0.00
17	2041	0.00	0.00	335	1.70	0.73	0.00
18	2042	0.00	0.00	335	1.00	0.73	0.00
19	2043	0.00	0.00	335	1.00	0.73	0.00
20	2044	0.00	0.00	335	1.00	0.73	0.00
21	2045	0.00	0.00	335	1.00	0.73	0.00
22	2046	0.00	0.00	335	1.00	0.73	0.00
23	2047	0.00	0.00	335	1.00	0.73	0.00
24	2048	0.00	0.00	335	1.00	0.73	0.00
25	2049	0.00	0.00	335	1.00	0.73	0.00
26	2050	0.00	0.00	335	1.00	0.73	0.00
27	2051	0.00	0.00	335	1.00	0.73	0.00
28	2052	0.00	0.00	335	1.00	0.73	0.00
29	2053	0.00	0.00	335	1.00	0.73	0.00
30	2054	0.00	0.00	335	1.00	0.73	0.00

0.01	Acute Hazard Impact
1	Significance Threshold
No	Significant?
0.00	Chronic Hazard Impact
1	Significance Threshold
No	Significant?
0.03	Cancer Risk
10	Significance Threshold
No	Significant?

Health Risk Assessment Assumptions

	Acute Reference Exposure Level (ug/m3)	
	Chronic Reference Exposure Level (ug/m3)	
	Cancer Potency Slope Factor (cancer risk per mg/kg-day)	
350	days per year	
25,550	days per lifetime	
1,090	95th Percentile Daily Breathing Rates (L/kg-day)	0<2 Years
745	95th Percentile Daily Breathing Rates (L/kg-day)	2<16 Years
335	95th Percentile Daily Breathing Rates (L/kg-day)	16<30 Years
0.85	fraction of time at home	0<2 Years
0.72	fraction of time at home	2<16 Years
0.73	fraction of time at home	16<70 Years

Project:	Burney Biomass
Date:	July 25, 2022
Condition:	Vanadium
Receptor:	Residence
Source:	Boiler
Height:	15m

Exposure Year	Calender Year	1-Hour Concentration (ug/m3)	Annual Concentration (ug/m3)	Daily Breathing Rates (L/kg-day)	Exposure Factor	fraction of time at home	Cancer Risk
1	2025	0.00	0.00	1,090	10.0	0.85	-
2	2026	0.00	0.00	1,090	10.0	0.85	-
3	2027	0.00	0.00	745	4.75	0.72	-
4	2028	0.00	0.00	745	3.00	0.72	-
5	2029	0.00	0.00	745	3.00	0.72	-
6	2030	0.00	0.00	745	3.00	0.72	-
7	2031	0.00	0.00	745	3.00	0.72	-
8	2032	0.00	0.00	745	3.00	0.72	-
9	2033	0.00	0.00	745	3.00	0.72	-
10	2034	0.00	0.00	745	3.00	0.72	-
11	2035	0.00	0.00	745	3.00	0.72	-
12	2036	0.00	0.00	745	3.00	0.72	-
13	2037	0.00	0.00	745	3.00	0.72	-
14	2038	0.00	0.00	745	3.00	0.72	-
15	2039	0.00	0.00	745	3.00	0.72	-
16	2040	0.00	0.00	745	3.00	0.72	-
17	2041	0.00	0.00	335	1.70	0.73	-
18	2042	0.00	0.00	335	1.00	0.73	-
19	2043	0.00	0.00	335	1.00	0.73	-
20	2044	0.00	0.00	335	1.00	0.73	-
21	2045	0.00	0.00	335	1.00	0.73	-
22	2046	0.00	0.00	335	1.00	0.73	-
23	2047	0.00	0.00	335	1.00	0.73	-
24	2048	0.00	0.00	335	1.00	0.73	-
25	2049	0.00	0.00	335	1.00	0.73	-
26	2050	0.00	0.00	335	1.00	0.73	-
27	2051	0.00	0.00	335	1.00	0.73	-
28	2052	0.00	0.00	335	1.00	0.73	-
29	2053	0.00	0.00	335	1.00	0.73	-
30	2054	0.00	0.00	335	1.00	0.73	-

	Acute Hazard Impact
1	Significance Threshold
No	Significant?
	Chronic Hazard Impact
1	Significance Threshold
No	Significant?
-	Cancer Risk
10	Significance Threshold
No	Significant?

Health Risk Assessment Assumptions

	Acute Reference Exposure Level (ug/m3)	
0.00004	Chronic Reference Exposure Level (ug/m3)	
1,300	Cancer Potency Slope Factor (cancer risk per mg/kg-day)	
350	days per year	
25,550	days per lifetime	
1,090	95th Percentile Daily Breathing Rates (L/kg-day)	0<2 Years
745	95th Percentile Daily Breathing Rates (L/kg-day)	2<16 Years
335	95th Percentile Daily Breathing Rates (L/kg-day)	16<30 Years
0.85	fraction of time at home	0<2 Years
0.72	fraction of time at home	2<16 Years
0.73	fraction of time at home	16<70 Years

Project:	Burney Biomass
Date:	July 25, 2022
Condition:	Dioxin
Receptor:	Residence
Source:	Boiler
Height:	15m

Exposure Year	Calender Year	1-Hour Concentration (ug/m3)	Annual Concentration (ug/m3)	Daily Breathing Rates (L/kg-day)	Exposure Factor	fraction of time at home	Cancer Risk
1	2025	0.00	0.00	1,090	10.0	0.85	0.00
2	2026	0.00	0.00	1,090	10.0	0.85	0.00
3	2027	0.00	0.00	745	4.75	0.72	0.00
4	2028	0.00	0.00	745	3.00	0.72	0.00
5	2029	0.00	0.00	745	3.00	0.72	0.00
6	2030	0.00	0.00	745	3.00	0.72	0.00
7	2031	0.00	0.00	745	3.00	0.72	0.00
8	2032	0.00	0.00	745	3.00	0.72	0.00
9	2033	0.00	0.00	745	3.00	0.72	0.00
10	2034	0.00	0.00	745	3.00	0.72	0.00
11	2035	0.00	0.00	745	3.00	0.72	0.00
12	2036	0.00	0.00	745	3.00	0.72	0.00
13	2037	0.00	0.00	745	3.00	0.72	0.00
14	2038	0.00	0.00	745	3.00	0.72	0.00
15	2039	0.00	0.00	745	3.00	0.72	0.00
16	2040	0.00	0.00	745	3.00	0.72	0.00
17	2041	0.00	0.00	335	1.70	0.73	0.00
18	2042	0.00	0.00	335	1.00	0.73	0.00
19	2043	0.00	0.00	335	1.00	0.73	0.00
20	2044	0.00	0.00	335	1.00	0.73	0.00
21	2045	0.00	0.00	335	1.00	0.73	0.00
22	2046	0.00	0.00	335	1.00	0.73	0.00
23	2047	0.00	0.00	335	1.00	0.73	0.00
24	2048	0.00	0.00	335	1.00	0.73	0.00
25	2049	0.00	0.00	335	1.00	0.73	0.00
26	2050	0.00	0.00	335	1.00	0.73	0.00
27	2051	0.00	0.00	335	1.00	0.73	0.00
28	2052	0.00	0.00	335	1.00	0.73	0.00
29	2053	0.00	0.00	335	1.00	0.73	0.00
30	2054	0.00	0.00	335	1.00	0.73	0.00

	Acute Hazard Impact
1	Significance Threshold
No	Significant?
0.00	Chronic Hazard Impact
1	Significance Threshold
No	Significant?
0.00	Cancer Risk
10	Significance Threshold
No	Significant?

Health Risk Assessment Assumptions

2100	Acute Reference Exposure Level (ug/m3)	
9	Chronic Reference Exposure Level (ug/m3)	
	Cancer Potency Slope Factor (cancer risk per mg/kg-day)	
350	days per year	
25,550	days per lifetime	
1,090	95th Percentile Daily Breathing Rates (L/kg-day)	0<2 Years
745	95th Percentile Daily Breathing Rates (L/kg-day)	2<16 Years
335	95th Percentile Daily Breathing Rates (L/kg-day)	16<30 Years
0.85	fraction of time at home	0<2 Years
0.72	fraction of time at home	2<16 Years
0.73	fraction of time at home	16<70 Years

Project:	Burney Biomass
Date:	July 25, 2022
Condition:	HCL
Receptor:	Residence
Source:	Boiler
Height:	15m

Exposure Year	Calender Year	1-Hour Concentration (ug/m3)	Annual Concentration (ug/m3)	Daily Breathing Rates (L/kg-day)	Exposure Factor	fraction of time at home	Cancer Risk
1	2025	0.11	0.00	1,090	10.0	0.85	-
2	2026	0.11	0.00	1,090	10.0	0.85	-
3	2027	0.11	0.00	745	4.75	0.72	-
4	2028	0.11	0.00	745	3.00	0.72	-
5	2029	0.11	0.00	745	3.00	0.72	-
6	2030	0.11	0.00	745	3.00	0.72	-
7	2031	0.11	0.00	745	3.00	0.72	-
8	2032	0.11	0.00	745	3.00	0.72	-
9	2033	0.11	0.00	745	3.00	0.72	-
10	2034	0.11	0.00	745	3.00	0.72	-
11	2035	0.11	0.00	745	3.00	0.72	-
12	2036	0.11	0.00	745	3.00	0.72	-
13	2037	0.11	0.00	745	3.00	0.72	-
14	2038	0.11	0.00	745	3.00	0.72	-
15	2039	0.11	0.00	745	3.00	0.72	-
16	2040	0.11	0.00	745	3.00	0.72	-
17	2041	0.11	0.00	335	1.70	0.73	-
18	2042	0.11	0.00	335	1.00	0.73	-
19	2043	0.11	0.00	335	1.00	0.73	-
20	2044	0.11	0.00	335	1.00	0.73	-
21	2045	0.11	0.00	335	1.00	0.73	-
22	2046	0.11	0.00	335	1.00	0.73	-
23	2047	0.11	0.00	335	1.00	0.73	-
24	2048	0.11	0.00	335	1.00	0.73	-
25	2049	0.11	0.00	335	1.00	0.73	-
10	2034	0.11	0.00	335	1.00	0.73	-
11	2035	0.11	0.00	335	1.00	0.73	-
12	2036	0.11	0.00	335	1.00	0.73	-
13	2037	0.11	0.00	335	1.00	0.73	-
14	2038	0.11	0.00	335	1.00	0.73	-

0.00	Acute Hazard Impact
1	Significance Threshold
No	Significant?
0.00	Chronic Hazard Impact
1	Significance Threshold
No	Significant?
-	Cancer Risk
10	Significance Threshold
No	Significant?

Health Risk Assessment Assumptions

	Acute Reference Exposure Level (ug/m3)
0.02	Chronic Reference Exposure Level (ug/m3)
15	Cancer Potency Slope Factor (cancer risk per mg/kg-day)
250	days per year
25,550	days per lifetime
230	80th Percentile Daily Breathing Rates (L/kg-day)
0.73	fraction of time at work

Project:	Burney Biomass
Date:	July 25, 2022
Condition:	Cadmium
Receptor:	Offsite Worker
Source:	Boiler
Height:	35m

Exposure Year	Calender Year	1-Hour Concentration (ug/m3)	Annual Concentration (ug/m3)	Daily Breathing Rates (L/kg-day)	Exposure Factor	fraction of time at work	Cancer Risk
1	2025	0.00	0.00	230	1.00	0.73	0.01
2	2026	0.00	0.00	230	1.00	0.73	0.01
3	2027	0.00	0.00	230	1.00	0.73	0.01
4	2028	0.00	0.00	230	1.00	0.73	0.01
5	2029	0.00	0.00	230	1.00	0.73	0.01
6	2030	0.00	0.00	230	1.00	0.73	0.01
7	2031	0.00	0.00	230	1.00	0.73	0.01
8	2032	0.00	0.00	230	1.00	0.73	0.01
9	2033	0.00	0.00	230	1.00	0.73	0.01
10	2034	0.00	0.00	230	1.00	0.73	0.01
11	2035	0.00	0.00	230	1.00	0.73	0.01
12	2036	0.00	0.00	230	1.00	0.73	0.01
13	2037	0.00	0.00	230	1.00	0.73	0.01
14	2038	0.00	0.00	230	1.00	0.73	0.01
15	2039	0.00	0.00	230	1.00	0.73	0.01
16	2040	0.00	0.00	230	1.00	0.73	0.01
17	2041	0.00	0.00	230	1.00	0.73	0.01
18	2042	0.00	0.00	230	1.00	0.73	0.01
19	2043	0.00	0.00	230	1.00	0.73	0.01
20	2044	0.00	0.00	230	1.00	0.73	0.01
21	2045	0.00	0.00	230	1.00	0.73	0.01
22	2046	0.00	0.00	230	1.00	0.73	0.01
23	2047	0.00	0.00	230	1.00	0.73	0.01
24	2048	0.00	0.00	230	1.00	0.73	0.01
25	2049	0.00	0.00	230	1.00	0.73	0.01

	Acute Hazard Impact
1	Significance Threshold
No	Significant?
0.02	Chronic Hazard Impact
1	Significance Threshold
No	Significant?
0.24	Cancer Risk
10	Significance Threshold
No	Significant?

Health Risk Assessment Assumptions

0.6	Acute Reference Exposure Level (ug/m3)
0.03	Chronic Reference Exposure Level (ug/m3)
	Cancer Potency Slope Factor (cancer risk per mg/kg-day)
250	days per year
25,550	days per lifetime
230	80th Percentile Daily Breathing Rates (L/kg-day)
0.73	fraction of time at work

Project: Burney Biomass
Date: July 25, 2022
Condition: Mercury
Receptor: Offsite Worker
Source: Boiler
Height: 35m

Exposure Year	Calender Year	1-Hour Concentration (ug/m3)	Annual Concentration (ug/m3)	Daily Breathing Rates (L/kg-day)	Exposure Factor	fraction of time at work	Cancer Risk
1	2025	0.00	0.00	230	1.00	0.73	-
2	2026	0.00	0.00	230	1.00	0.73	-
3	2027	0.00	0.00	230	1.00	0.73	-
4	2028	0.00	0.00	230	1.00	0.73	-
5	2029	0.00	0.00	230	1.00	0.73	-
6	2030	0.00	0.00	230	1.00	0.73	-
7	2031	0.00	0.00	230	1.00	0.73	-
8	2032	0.00	0.00	230	1.00	0.73	-
9	2033	0.00	0.00	230	1.00	0.73	-
10	2034	0.00	0.00	230	1.00	0.73	-
11	2035	0.00	0.00	230	1.00	0.73	-
12	2036	0.00	0.00	230	1.00	0.73	-
13	2037	0.00	0.00	230	1.00	0.73	-
14	2038	0.00	0.00	230	1.00	0.73	-
15	2039	0.00	0.00	230	1.00	0.73	-
16	2040	0.00	0.00	230	1.00	0.73	-
17	2041	0.00	0.00	230	1.00	0.73	-
18	2042	0.00	0.00	230	1.00	0.73	-
19	2043	0.00	0.00	230	1.00	0.73	-
20	2044	0.00	0.00	230	1.00	0.73	-
21	2045	0.00	0.00	230	1.00	0.73	-
22	2046	0.00	0.00	230	1.00	0.73	-
23	2047	0.00	0.00	230	1.00	0.73	-
24	2048	0.00	0.00	230	1.00	0.73	-
25	2049	0.00	0.00	230	1.00	0.73	-

0.01	Acute Hazard Impact
1	Significance Threshold
No	Significant?
0.01	Chronic Hazard Impact
1	Significance Threshold
No	Significant?
-	Cancer Risk
10	Significance Threshold
No	Significant?

Health Risk Assessment Assumptions

	Acute Reference Exposure Level (ug/m3)
	Chronic Reference Exposure Level (ug/m3)
	Cancer Potency Slope Factor (cancer risk per mg/kg-day)
250	days per year
25,550	days per lifetime
230	80th Percentile Daily Breathing Rates (L/kg-day)
0.73	fraction of time at work

Project:	Burney Biomass
Date:	July 25, 2022
Condition:	Antimony
Receptor:	Offsite Worker
Source:	Boiler
Height:	35m

Exposure Year	Calender Year	1-Hour Concentration (ug/m3)	Annual Concentration (ug/m3)	Daily Breathing Rates (L/kg-day)	Exposure Factor	fraction of time at work	Cancer Risk
1	2025	0.00	0.00	230	1.00	0.73	-
2	2026	0.00	0.00	230	1.00	0.73	-
3	2027	0.00	0.00	230	1.00	0.73	-
4	2028	0.00	0.00	230	1.00	0.73	-
5	2029	0.00	0.00	230	1.00	0.73	-
6	2030	0.00	0.00	230	1.00	0.73	-
7	2031	0.00	0.00	230	1.00	0.73	-
8	2032	0.00	0.00	230	1.00	0.73	-
9	2033	0.00	0.00	230	1.00	0.73	-
10	2034	0.00	0.00	230	1.00	0.73	-
11	2035	0.00	0.00	230	1.00	0.73	-
12	2036	0.00	0.00	230	1.00	0.73	-
13	2037	0.00	0.00	230	1.00	0.73	-
14	2038	0.00	0.00	230	1.00	0.73	-
15	2039	0.00	0.00	230	1.00	0.73	-
16	2040	0.00	0.00	230	1.00	0.73	-
17	2041	0.00	0.00	230	1.00	0.73	-
18	2042	0.00	0.00	230	1.00	0.73	-
19	2043	0.00	0.00	230	1.00	0.73	-
20	2044	0.00	0.00	230	1.00	0.73	-
21	2045	0.00	0.00	230	1.00	0.73	-
22	2046	0.00	0.00	230	1.00	0.73	-
23	2047	0.00	0.00	230	1.00	0.73	-
24	2048	0.00	0.00	230	1.00	0.73	-
25	2049	0.00	0.00	230	1.00	0.73	-

	Acute Hazard Impact
1	Significance Threshold
No	Significant?
	Chronic Hazard Impact
1	Significance Threshold
No	Significant?
-	Cancer Risk
10	Significance Threshold
No	Significant?

Health Risk Assessment Assumptions

0.2	Acute Reference Exposure Level (ug/m3)
0.015	Chronic Reference Exposure Level (ug/m3)
12	Cancer Potency Slope Factor (cancer risk per mg/kg-day)
250	days per year
25,550	days per lifetime
230	80th Percentile Daily Breathing Rates (L/kg-day)
0.73	fraction of time at work

Project:	Burney Biomass
Date:	July 25, 2022
Condition:	Arsenic
Receptor:	Offsite Worker
Source:	Boiler
Height:	35m

Exposure Year	Calender Year	1-Hour Concentration (ug/m3)	Annual Concentration (ug/m3)	Daily Breathing Rates (L/kg-day)	Exposure Factor	fraction of time at work	Cancer Risk
1	2025	0.00	0.00	230	1.00	0.73	0.01
2	2026	0.00	0.00	230	1.00	0.73	0.01
3	2027	0.00	0.00	230	1.00	0.73	0.01
4	2028	0.00	0.00	230	1.00	0.73	0.01
5	2029	0.00	0.00	230	1.00	0.73	0.01
6	2030	0.00	0.00	230	1.00	0.73	0.01
7	2031	0.00	0.00	230	1.00	0.73	0.01
8	2032	0.00	0.00	230	1.00	0.73	0.01
9	2033	0.00	0.00	230	1.00	0.73	0.01
10	2034	0.00	0.00	230	1.00	0.73	0.01
11	2035	0.00	0.00	230	1.00	0.73	0.01
12	2036	0.00	0.00	230	1.00	0.73	0.01
13	2037	0.00	0.00	230	1.00	0.73	0.01
14	2038	0.00	0.00	230	1.00	0.73	0.01
15	2039	0.00	0.00	230	1.00	0.73	0.01
16	2040	0.00	0.00	230	1.00	0.73	0.01
17	2041	0.00	0.00	230	1.00	0.73	0.01
18	2042	0.00	0.00	230	1.00	0.73	0.01
19	2043	0.00	0.00	230	1.00	0.73	0.01
20	2044	0.00	0.00	230	1.00	0.73	0.01
21	2045	0.00	0.00	230	1.00	0.73	0.01
22	2046	0.00	0.00	230	1.00	0.73	0.01
23	2047	0.00	0.00	230	1.00	0.73	0.01
24	2048	0.00	0.00	230	1.00	0.73	0.01
25	2049	0.00	0.00	230	1.00	0.73	0.01

0.02	Acute Hazard Impact
1	Significance Threshold
No	Significant?
0.03	Chronic Hazard Impact
1	Significance Threshold
No	Significant?
0.19	Cancer Risk
10	Significance Threshold
No	Significant?

Health Risk Assessment Assumptions

	Acute Reference Exposure Level (ug/m3)
	Chronic Reference Exposure Level (ug/m3)
0.042	Cancer Potency Slope Factor (cancer risk per mg/kg-day)
250	days per year
25,550	days per lifetime
230	80th Percentile Daily Breathing Rates (L/kg-day)
0.73	fraction of time at work

Project:	Burney Biomass
Date:	July 25, 2022
Condition:	Lead
Receptor:	Offsite Worker
Source:	Boiler
Height:	35m

Exposure Year	Calender Year	1-Hour Concentration (ug/m3)	Annual Concentration (ug/m3)	Daily Breathing Rates (L/kg-day)	Exposure Factor	fraction of time at work	Cancer Risk
1	2025	0.00	0.00	230	1.00	0.73	0.00
2	2026	0.00	0.00	230	1.00	0.73	0.00
3	2027	0.00	0.00	230	1.00	0.73	0.00
4	2028	0.00	0.00	230	1.00	0.73	0.00
5	2029	0.00	0.00	230	1.00	0.73	0.00
6	2030	0.00	0.00	230	1.00	0.73	0.00
7	2031	0.00	0.00	230	1.00	0.73	0.00
8	2032	0.00	0.00	230	1.00	0.73	0.00
9	2033	0.00	0.00	230	1.00	0.73	0.00
10	2034	0.00	0.00	230	1.00	0.73	0.00
11	2035	0.00	0.00	230	1.00	0.73	0.00
12	2036	0.00	0.00	230	1.00	0.73	0.00
13	2037	0.00	0.00	230	1.00	0.73	0.00
14	2038	0.00	0.00	230	1.00	0.73	0.00
15	2039	0.00	0.00	230	1.00	0.73	0.00
16	2040	0.00	0.00	230	1.00	0.73	0.00
17	2041	0.00	0.00	230	1.00	0.73	0.00
18	2042	0.00	0.00	230	1.00	0.73	0.00
19	2043	0.00	0.00	230	1.00	0.73	0.00
20	2044	0.00	0.00	230	1.00	0.73	0.00
21	2045	0.00	0.00	230	1.00	0.73	0.00
22	2046	0.00	0.00	230	1.00	0.73	0.00
23	2047	0.00	0.00	230	1.00	0.73	0.00
24	2048	0.00	0.00	230	1.00	0.73	0.00
25	2049	0.00	0.00	230	1.00	0.73	0.00

	Acute Hazard Impact
1	Significance Threshold
No	Significant?
	Chronic Hazard Impact
1	Significance Threshold
No	Significant?
0.00	Cancer Risk
10	Significance Threshold
No	Significant?

Health Risk Assessment Assumptions

	Acute Reference Exposure Level (ug/m3)
	Chronic Reference Exposure Level (ug/m3)
	Cancer Potency Slope Factor (cancer risk per mg/kg-day)
250	days per year
25,550	days per lifetime
230	80th Percentile Daily Breathing Rates (L/kg-day)
0.73	fraction of time at work

Project:	Burney Biomass
Date:	July 25, 2022
Condition:	Chromium
Receptor:	Offsite Worker
Source:	Boiler
Height:	35m

Exposure Year	Calender Year	1-Hour Concentration (ug/m3)	Annual Concentration (ug/m3)	Daily Breathing Rates (L/kg-day)	Exposure Factor	fraction of time at work	Cancer Risk
1	2025	0.00	0.00	230	1.00	0.73	-
2	2026	0.00	0.00	230	1.00	0.73	-
3	2027	0.00	0.00	230	1.00	0.73	-
4	2028	0.00	0.00	230	1.00	0.73	-
5	2029	0.00	0.00	230	1.00	0.73	-
6	2030	0.00	0.00	230	1.00	0.73	-
7	2031	0.00	0.00	230	1.00	0.73	-
8	2032	0.00	0.00	230	1.00	0.73	-
9	2033	0.00	0.00	230	1.00	0.73	-
10	2034	0.00	0.00	230	1.00	0.73	-
11	2035	0.00	0.00	230	1.00	0.73	-
12	2036	0.00	0.00	230	1.00	0.73	-
13	2037	0.00	0.00	230	1.00	0.73	-
14	2038	0.00	0.00	230	1.00	0.73	-
15	2039	0.00	0.00	230	1.00	0.73	-
16	2040	0.00	0.00	230	1.00	0.73	-
17	2041	0.00	0.00	230	1.00	0.73	-
18	2042	0.00	0.00	230	1.00	0.73	-
19	2043	0.00	0.00	230	1.00	0.73	-
20	2044	0.00	0.00	230	1.00	0.73	-
21	2045	0.00	0.00	230	1.00	0.73	-
22	2046	0.00	0.00	230	1.00	0.73	-
23	2047	0.00	0.00	230	1.00	0.73	-
24	2048	0.00	0.00	230	1.00	0.73	-
25	2049	0.00	0.00	230	1.00	0.73	-

	Acute Hazard Impact
1	Significance Threshold
No	Significant?
	Chronic Hazard Impact
1	Significance Threshold
No	Significant?
-	Cancer Risk
10	Significance Threshold
No	Significant?

Health Risk Assessment Assumptions

	Acute Reference Exposure Level (ug/m3)
	Chronic Reference Exposure Level (ug/m3)
27	Cancer Potency Slope Factor (cancer risk per mg/kg-day)
250	days per year
25,550	days per lifetime
230	80th Percentile Daily Breathing Rates (L/kg-day)
0.73	fraction of time at work

Project:	Burney Biomass
Date:	July 25, 2022
Condition:	Cobalt
Receptor:	Offsite Worker
Source:	Boiler
Height:	35m

Exposure Year	Calender Year	1-Hour Concentration (ug/m3)	Annual Concentration (ug/m3)	Daily Breathing Rates (L/kg-day)	Exposure Factor	fraction of time at work	Cancer Risk
1	2025	0.00	0.00	230	1.00	0.73	0.02
2	2026	0.00	0.00	230	1.00	0.73	0.02
3	2027	0.00	0.00	230	1.00	0.73	0.02
4	2028	0.00	0.00	230	1.00	0.73	0.02
5	2029	0.00	0.00	230	1.00	0.73	0.02
6	2030	0.00	0.00	230	1.00	0.73	0.02
7	2031	0.00	0.00	230	1.00	0.73	0.02
8	2032	0.00	0.00	230	1.00	0.73	0.02
9	2033	0.00	0.00	230	1.00	0.73	0.02
10	2034	0.00	0.00	230	1.00	0.73	0.02
11	2035	0.00	0.00	230	1.00	0.73	0.02
12	2036	0.00	0.00	230	1.00	0.73	0.02
13	2037	0.00	0.00	230	1.00	0.73	0.02
14	2038	0.00	0.00	230	1.00	0.73	0.02
15	2039	0.00	0.00	230	1.00	0.73	0.02
16	2040	0.00	0.00	230	1.00	0.73	0.02
17	2041	0.00	0.00	230	1.00	0.73	0.02
18	2042	0.00	0.00	230	1.00	0.73	0.02
19	2043	0.00	0.00	230	1.00	0.73	0.02
20	2044	0.00	0.00	230	1.00	0.73	0.02
21	2045	0.00	0.00	230	1.00	0.73	0.02
22	2046	0.00	0.00	230	1.00	0.73	0.02
23	2047	0.00	0.00	230	1.00	0.73	0.02
24	2048	0.00	0.00	230	1.00	0.73	0.02
25	2049	0.00	0.00	230	1.00	0.73	0.02

	Acute Hazard Impact
1	Significance Threshold
No	Significant?
	Chronic Hazard Impact
1	Significance Threshold
No	Significant?
0.43	Cancer Risk
10	Significance Threshold
No	Significant?

Health Risk Assessment Assumptions

100	Acute Reference Exposure Level (ug/m3)
	Chronic Reference Exposure Level (ug/m3)
	Cancer Potency Slope Factor (cancer risk per mg/kg-day)
250	days per year
25,550	days per lifetime
230	80th Percentile Daily Breathing Rates (L/kg-day)
0.73	fraction of time at work

Project:	Burney Biomass
Date:	July 25, 2022
Condition:	Copper
Receptor:	Offsite Worker
Source:	Boiler
Height:	35m

Exposure Year	Calender Year	1-Hour Concentration (ug/m3)	Annual Concentration (ug/m3)	Daily Breathing Rates (L/kg-day)	Exposure Factor	fraction of time at work	Cancer Risk
1	2025	0.00	0.00	230	1.00	0.73	-
2	2026	0.00	0.00	230	1.00	0.73	-
3	2027	0.00	0.00	230	1.00	0.73	-
4	2028	0.00	0.00	230	1.00	0.73	-
5	2029	0.00	0.00	230	1.00	0.73	-
6	2030	0.00	0.00	230	1.00	0.73	-
7	2031	0.00	0.00	230	1.00	0.73	-
8	2032	0.00	0.00	230	1.00	0.73	-
9	2033	0.00	0.00	230	1.00	0.73	-
10	2034	0.00	0.00	230	1.00	0.73	-
11	2035	0.00	0.00	230	1.00	0.73	-
12	2036	0.00	0.00	230	1.00	0.73	-
13	2037	0.00	0.00	230	1.00	0.73	-
14	2038	0.00	0.00	230	1.00	0.73	-
15	2039	0.00	0.00	230	1.00	0.73	-
16	2040	0.00	0.00	230	1.00	0.73	-
17	2041	0.00	0.00	230	1.00	0.73	-
18	2042	0.00	0.00	230	1.00	0.73	-
19	2043	0.00	0.00	230	1.00	0.73	-
20	2044	0.00	0.00	230	1.00	0.73	-
21	2045	0.00	0.00	230	1.00	0.73	-
22	2046	0.00	0.00	230	1.00	0.73	-
23	2047	0.00	0.00	230	1.00	0.73	-
24	2048	0.00	0.00	230	1.00	0.73	-
25	2049	0.00	0.00	230	1.00	0.73	-

0.00	Acute Hazard Impact
1	Significance Threshold
No	Significant?
	Chronic Hazard Impact
1	Significance Threshold
No	Significant?
-	Cancer Risk
10	Significance Threshold
No	Significant?

Health Risk Assessment Assumptions

0.17	Acute Reference Exposure Level (ug/m3)
0.09	Chronic Reference Exposure Level (ug/m3)
	Cancer Potency Slope Factor (cancer risk per mg/kg-day)
250	days per year
25,550	days per lifetime
230	80th Percentile Daily Breathing Rates (L/kg-day)
0.73	fraction of time at work

Project:	Burney Biomass
Date:	July 25, 2022
Condition:	Manganese
Receptor:	Offsite Worker
Source:	Boiler
Height:	35m

Exposure Year	Calender Year	1-Hour Concentration (ug/m3)	Annual Concentration (ug/m3)	Daily Breathing Rates (L/kg-day)	Exposure Factor	fraction of time at work	Cancer Risk
1	2025	0.00	0.00	230	1.00	0.73	-
2	2026	0.00	0.00	230	1.00	0.73	-
3	2027	0.00	0.00	230	1.00	0.73	-
4	2028	0.00	0.00	230	1.00	0.73	-
5	2029	0.00	0.00	230	1.00	0.73	-
6	2030	0.00	0.00	230	1.00	0.73	-
7	2031	0.00	0.00	230	1.00	0.73	-
8	2032	0.00	0.00	230	1.00	0.73	-
9	2033	0.00	0.00	230	1.00	0.73	-
10	2034	0.00	0.00	230	1.00	0.73	-
11	2035	0.00	0.00	230	1.00	0.73	-
12	2036	0.00	0.00	230	1.00	0.73	-
13	2037	0.00	0.00	230	1.00	0.73	-
14	2038	0.00	0.00	230	1.00	0.73	-
15	2039	0.00	0.00	230	1.00	0.73	-
16	2040	0.00	0.00	230	1.00	0.73	-
17	2041	0.00	0.00	230	1.00	0.73	-
18	2042	0.00	0.00	230	1.00	0.73	-
19	2043	0.00	0.00	230	1.00	0.73	-
20	2044	0.00	0.00	230	1.00	0.73	-
21	2045	0.00	0.00	230	1.00	0.73	-
22	2046	0.00	0.00	230	1.00	0.73	-
23	2047	0.00	0.00	230	1.00	0.73	-
24	2048	0.00	0.00	230	1.00	0.73	-
25	2049	0.00	0.00	230	1.00	0.73	-

0.02	Acute Hazard Impact
1	Significance Threshold
No	Significant?
0.00	Chronic Hazard Impact
1	Significance Threshold
No	Significant?
-	Cancer Risk
10	Significance Threshold
No	Significant?

Health Risk Assessment Assumptions

0.2	Acute Reference Exposure Level (ug/m3)
0.014	Chronic Reference Exposure Level (ug/m3)
0.91	Cancer Potency Slope Factor (cancer risk per mg/kg-day)
250	days per year
25,550	days per lifetime
230	80th Percentile Daily Breathing Rates (L/kg-day)
0.73	fraction of time at work

Project:	Burney Biomass
Date:	July 25, 2022
Condition:	Nickel
Receptor:	Offsite Worker
Source:	Boiler
Height:	35m

Exposure Year	Calender Year	1-Hour Concentration (ug/m3)	Annual Concentration (ug/m3)	Daily Breathing Rates (L/kg-day)	Exposure Factor	fraction of time at work	Cancer Risk
1	2025	0.00	0.00	230	1.00	0.73	0.00
2	2026	0.00	0.00	230	1.00	0.73	0.00
3	2027	0.00	0.00	230	1.00	0.73	0.00
4	2028	0.00	0.00	230	1.00	0.73	0.00
5	2029	0.00	0.00	230	1.00	0.73	0.00
6	2030	0.00	0.00	230	1.00	0.73	0.00
7	2031	0.00	0.00	230	1.00	0.73	0.00
8	2032	0.00	0.00	230	1.00	0.73	0.00
9	2033	0.00	0.00	230	1.00	0.73	0.00
10	2034	0.00	0.00	230	1.00	0.73	0.00
11	2035	0.00	0.00	230	1.00	0.73	0.00
12	2036	0.00	0.00	230	1.00	0.73	0.00
13	2037	0.00	0.00	230	1.00	0.73	0.00
14	2038	0.00	0.00	230	1.00	0.73	0.00
15	2039	0.00	0.00	230	1.00	0.73	0.00
16	2040	0.00	0.00	230	1.00	0.73	0.00
17	2041	0.00	0.00	230	1.00	0.73	0.00
18	2042	0.00	0.00	230	1.00	0.73	0.00
19	2043	0.00	0.00	230	1.00	0.73	0.00
20	2044	0.00	0.00	230	1.00	0.73	0.00
21	2045	0.00	0.00	230	1.00	0.73	0.00
22	2046	0.00	0.00	230	1.00	0.73	0.00
23	2047	0.00	0.00	230	1.00	0.73	0.00
24	2048	0.00	0.00	230	1.00	0.73	0.00
25	2049	0.00	0.00	230	1.00	0.73	0.00

0.02	Acute Hazard Impact
1	Significance Threshold
No	Significant?
0.03	Chronic Hazard Impact
1	Significance Threshold
No	Significant?
0.01	Cancer Risk
10	Significance Threshold
No	Significant?

Health Risk Assessment Assumptions

	Acute Reference Exposure Level (ug/m3)
	Chronic Reference Exposure Level (ug/m3)
	Cancer Potency Slope Factor (cancer risk per mg/kg-day)
250	days per year
25,550	days per lifetime
230	80th Percentile Daily Breathing Rates (L/kg-day)
0.73	fraction of time at work

Project:	Burney Biomass
Date:	July 25, 2022
Condition:	Vanadium
Receptor:	Offsite Worker
Source:	Boiler
Height:	35m

Exposure Year	Calender Year	1-Hour Concentration (ug/m3)	Annual Concentration (ug/m3)	Daily Breathing Rates (L/kg-day)	Exposure Factor	fraction of time at work	Cancer Risk
1	2025	0.00	0.00	230	1.00	0.73	-
2	2026	0.00	0.00	230	1.00	0.73	-
3	2027	0.00	0.00	230	1.00	0.73	-
4	2028	0.00	0.00	230	1.00	0.73	-
5	2029	0.00	0.00	230	1.00	0.73	-
6	2030	0.00	0.00	230	1.00	0.73	-
7	2031	0.00	0.00	230	1.00	0.73	-
8	2032	0.00	0.00	230	1.00	0.73	-
9	2033	0.00	0.00	230	1.00	0.73	-
10	2034	0.00	0.00	230	1.00	0.73	-
11	2035	0.00	0.00	230	1.00	0.73	-
12	2036	0.00	0.00	230	1.00	0.73	-
13	2037	0.00	0.00	230	1.00	0.73	-
14	2038	0.00	0.00	230	1.00	0.73	-
15	2039	0.00	0.00	230	1.00	0.73	-
16	2040	0.00	0.00	230	1.00	0.73	-
17	2041	0.00	0.00	230	1.00	0.73	-
18	2042	0.00	0.00	230	1.00	0.73	-
19	2043	0.00	0.00	230	1.00	0.73	-
20	2044	0.00	0.00	230	1.00	0.73	-
21	2045	0.00	0.00	230	1.00	0.73	-
22	2046	0.00	0.00	230	1.00	0.73	-
23	2047	0.00	0.00	230	1.00	0.73	-
24	2048	0.00	0.00	230	1.00	0.73	-
25	2049	0.00	0.00	230	1.00	0.73	-

	Acute Hazard Impact
1	Significance Threshold
No	Significant?
	Chronic Hazard Impact
1	Significance Threshold
No	Significant?
-	Cancer Risk
10	Significance Threshold
No	Significant?

Health Risk Assessment Assumptions

	Acute Reference Exposure Level (ug/m3)
0.00004	Chronic Reference Exposure Level (ug/m3)
1,300	Cancer Potency Slope Factor (cancer risk per mg/kg-day)
250	days per year
25,550	days per lifetime
230	80th Percentile Daily Breathing Rates (L/kg-day)
0.73	fraction of time at work

Project:	Burney Biomass
Date:	July 25, 2022
Condition:	Dioxin
Receptor:	Offsite Worker
Source:	Boiler
Height:	35m

Exposure Year	Calender Year	1-Hour Concentration (ug/m3)	Annual Concentration (ug/m3)	Daily Breathing Rates (L/kg-day)	Exposure Factor	fraction of time at work	Cancer Risk
1	2025	0.00	0.00	230	1.00	0.73	0.00
2	2026	0.00	0.00	230	1.00	0.73	0.00
3	2027	0.00	0.00	230	1.00	0.73	0.00
4	2028	0.00	0.00	230	1.00	0.73	0.00
5	2029	0.00	0.00	230	1.00	0.73	0.00
6	2030	0.00	0.00	230	1.00	0.73	0.00
7	2031	0.00	0.00	230	1.00	0.73	0.00
8	2032	0.00	0.00	230	1.00	0.73	0.00
9	2033	0.00	0.00	230	1.00	0.73	0.00
10	2034	0.00	0.00	230	1.00	0.73	0.00
11	2035	0.00	0.00	230	1.00	0.73	0.00
12	2036	0.00	0.00	230	1.00	0.73	0.00
13	2037	0.00	0.00	230	1.00	0.73	0.00
14	2038	0.00	0.00	230	1.00	0.73	0.00
15	2039	0.00	0.00	230	1.00	0.73	0.00
16	2040	0.00	0.00	230	1.00	0.73	0.00
17	2041	0.00	0.00	230	1.00	0.73	0.00
18	2042	0.00	0.00	230	1.00	0.73	0.00
19	2043	0.00	0.00	230	1.00	0.73	0.00
20	2044	0.00	0.00	230	1.00	0.73	0.00
21	2045	0.00	0.00	230	1.00	0.73	0.00
22	2046	0.00	0.00	230	1.00	0.73	0.00
23	2047	0.00	0.00	230	1.00	0.73	0.00
24	2048	0.00	0.00	230	1.00	0.73	0.00
25	2049	0.00	0.00	230	1.00	0.73	0.00

	Acute Hazard Impact
1	Significance Threshold
No	Significant?
	Chronic Hazard Impact
1	Significance Threshold
No	Significant?
0.00	Cancer Risk
10	Significance Threshold
No	Significant?

Health Risk Assessment Assumptions

2100	Acute Reference Exposure Level (ug/m3)
9	Chronic Reference Exposure Level (ug/m3)
	Cancer Potency Slope Factor (cancer risk per mg/kg-day)
250	days per year
25,550	days per lifetime
230	80th Percentile Daily Breathing Rates (L/kg-day)
0.73	fraction of time at work

Project:	Burney Biomass
Date:	July 25, 2022
Condition:	HCL
Receptor:	Offsite Worker
Source:	Boiler
Height:	35m

Exposure Year	Calender Year	1-Hour Concentration (ug/m3)	Annual Concentration (ug/m3)	Daily Breathing Rates (L/kg-day)	Exposure Factor	fraction of time at work	Cancer Risk
1	2025	0.14	0.02	230	1.00	0.73	-
2	2026	0.14	0.02	230	1.00	0.73	-
3	2027	0.14	0.02	230	1.00	0.73	-
4	2028	0.14	0.02	230	1.00	0.73	-
5	2029	0.14	0.02	230	1.00	0.73	-
6	2030	0.14	0.02	230	1.00	0.73	-
7	2031	0.14	0.02	230	1.00	0.73	-
8	2032	0.14	0.02	230	1.00	0.73	-
9	2033	0.14	0.02	230	1.00	0.73	-
10	2034	0.14	0.02	230	1.00	0.73	-
11	2035	0.14	0.02	230	1.00	0.73	-
12	2036	0.14	0.02	230	1.00	0.73	-
13	2037	0.14	0.02	230	1.00	0.73	-
14	2038	0.14	0.02	230	1.00	0.73	-
15	2039	0.14	0.02	230	1.00	0.73	-
16	2040	0.14	0.02	230	1.00	0.73	-
17	2041	0.14	0.02	230	1.00	0.73	-
18	2042	0.14	0.02	230	1.00	0.73	-
19	2043	0.14	0.02	230	1.00	0.73	-
20	2044	0.14	0.02	230	1.00	0.73	-
21	2045	0.14	0.02	230	1.00	0.73	-
22	2046	0.14	0.02	230	1.00	0.73	-
23	2047	0.14	0.02	230	1.00	0.73	-
24	2048	0.14	0.02	230	1.00	0.73	-
25	2049	0.14	0.02	230	1.00	0.73	-

0.00	Acute Hazard Impact
1	Significance Threshold
No	Significant?
0.00	Chronic Hazard Impact
1	Significance Threshold
No	Significant?
-	Cancer Risk
10	Significance Threshold
No	Significant?

Health Risk Assessment Assumptions

	Acute Reference Exposure Level (ug/m3)
0.02	Chronic Reference Exposure Level (ug/m3)
15	Cancer Potency Slope Factor (cancer risk per mg/kg-day)
250	days per year
25,550	days per lifetime
230	80th Percentile Daily Breathing Rates (L/kg-day)
0.73	fraction of time at work

Project:	Burney Biomass
Date:	July 25, 2022
Condition:	Cadmium
Receptor:	Offsite Worker
Source:	Boiler
Height:	25m

Exposure Year	Calender Year	1-Hour Concentration (ug/m3)	Annual Concentration (ug/m3)	Daily Breathing Rates (L/kg-day)	Exposure Factor	fraction of time at work	Cancer Risk
1	2025	0.01	0.00	230	1.00	0.73	0.02
2	2026	0.01	0.00	230	1.00	0.73	0.02
3	2027	0.01	0.00	230	1.00	0.73	0.02
4	2028	0.01	0.00	230	1.00	0.73	0.02
5	2029	0.01	0.00	230	1.00	0.73	0.02
6	2030	0.01	0.00	230	1.00	0.73	0.02
7	2031	0.01	0.00	230	1.00	0.73	0.02
8	2032	0.01	0.00	230	1.00	0.73	0.02
9	2033	0.01	0.00	230	1.00	0.73	0.02
10	2034	0.01	0.00	230	1.00	0.73	0.02
11	2035	0.01	0.00	230	1.00	0.73	0.02
12	2036	0.01	0.00	230	1.00	0.73	0.02
13	2037	0.01	0.00	230	1.00	0.73	0.02
14	2038	0.01	0.00	230	1.00	0.73	0.02
15	2039	0.01	0.00	230	1.00	0.73	0.02
16	2040	0.01	0.00	230	1.00	0.73	0.02
17	2041	0.01	0.00	230	1.00	0.73	0.02
18	2042	0.01	0.00	230	1.00	0.73	0.02
19	2043	0.01	0.00	230	1.00	0.73	0.02
20	2044	0.01	0.00	230	1.00	0.73	0.02
21	2045	0.01	0.00	230	1.00	0.73	0.02
22	2046	0.01	0.00	230	1.00	0.73	0.02
23	2047	0.01	0.00	230	1.00	0.73	0.02
24	2048	0.01	0.00	230	1.00	0.73	0.02
25	2049	0.01	0.00	230	1.00	0.73	0.02

	Acute Hazard Impact
1	Significance Threshold
No	Significant?
0.04	Chronic Hazard Impact
1	Significance Threshold
No	Significant?
0.47	Cancer Risk
10	Significance Threshold
No	Significant?

Health Risk Assessment Assumptions

0.6	Acute Reference Exposure Level (ug/m3)
0.03	Chronic Reference Exposure Level (ug/m3)
	Cancer Potency Slope Factor (cancer risk per mg/kg-day)
250	days per year
25,550	days per lifetime
230	80th Percentile Daily Breathing Rates (L/kg-day)
0.73	fraction of time at work

Project:	Burney Biomass
Date:	July 25, 2022
Condition:	Mercury
Receptor:	Offsite Worker
Source:	Boiler
Height:	25m

Exposure Year	Calender Year	1-Hour Concentration (ug/m3)	Annual Concentration (ug/m3)	Daily Breathing Rates (L/kg-day)	Exposure Factor	fraction of time at work	Cancer Risk
1	2025	0.01	0.00	230	1.00	0.73	-
2	2026	0.01	0.00	230	1.00	0.73	-
3	2027	0.01	0.00	230	1.00	0.73	-
4	2028	0.01	0.00	230	1.00	0.73	-
5	2029	0.01	0.00	230	1.00	0.73	-
6	2030	0.01	0.00	230	1.00	0.73	-
7	2031	0.01	0.00	230	1.00	0.73	-
8	2032	0.01	0.00	230	1.00	0.73	-
9	2033	0.01	0.00	230	1.00	0.73	-
10	2034	0.01	0.00	230	1.00	0.73	-
11	2035	0.01	0.00	230	1.00	0.73	-
12	2036	0.01	0.00	230	1.00	0.73	-
13	2037	0.01	0.00	230	1.00	0.73	-
14	2038	0.01	0.00	230	1.00	0.73	-
15	2039	0.01	0.00	230	1.00	0.73	-
16	2040	0.01	0.00	230	1.00	0.73	-
17	2041	0.01	0.00	230	1.00	0.73	-
18	2042	0.01	0.00	230	1.00	0.73	-
19	2043	0.01	0.00	230	1.00	0.73	-
20	2044	0.01	0.00	230	1.00	0.73	-
21	2045	0.01	0.00	230	1.00	0.73	-
22	2046	0.01	0.00	230	1.00	0.73	-
23	2047	0.01	0.00	230	1.00	0.73	-
24	2048	0.01	0.00	230	1.00	0.73	-
25	2049	0.01	0.00	230	1.00	0.73	-

0.01	Acute Hazard Impact
1	Significance Threshold
No	Significant?
0.03	Chronic Hazard Impact
1	Significance Threshold
No	Significant?
-	Cancer Risk
10	Significance Threshold
No	Significant?

Health Risk Assessment Assumptions

	Acute Reference Exposure Level (ug/m3)
	Chronic Reference Exposure Level (ug/m3)
	Cancer Potency Slope Factor (cancer risk per mg/kg-day)
250	days per year
25,550	days per lifetime
230	80th Percentile Daily Breathing Rates (L/kg-day)
0.73	fraction of time at work

Project:	Burney Biomass
Date:	July 25, 2022
Condition:	Antimony
Receptor:	Offsite Worker
Source:	Boiler
Height:	25m

Exposure Year	Calender Year	1-Hour Concentration (ug/m3)	Annual Concentration (ug/m3)	Daily Breathing Rates (L/kg-day)	Exposure Factor	fraction of time at work	Cancer Risk
1	2025	0.01	0.00	230	1.00	0.73	-
2	2026	0.01	0.00	230	1.00	0.73	-
3	2027	0.01	0.00	230	1.00	0.73	-
4	2028	0.01	0.00	230	1.00	0.73	-
5	2029	0.01	0.00	230	1.00	0.73	-
6	2030	0.01	0.00	230	1.00	0.73	-
7	2031	0.01	0.00	230	1.00	0.73	-
8	2032	0.01	0.00	230	1.00	0.73	-
9	2033	0.01	0.00	230	1.00	0.73	-
10	2034	0.01	0.00	230	1.00	0.73	-
11	2035	0.01	0.00	230	1.00	0.73	-
12	2036	0.01	0.00	230	1.00	0.73	-
13	2037	0.01	0.00	230	1.00	0.73	-
14	2038	0.01	0.00	230	1.00	0.73	-
15	2039	0.01	0.00	230	1.00	0.73	-
16	2040	0.01	0.00	230	1.00	0.73	-
17	2041	0.01	0.00	230	1.00	0.73	-
18	2042	0.01	0.00	230	1.00	0.73	-
19	2043	0.01	0.00	230	1.00	0.73	-
20	2044	0.01	0.00	230	1.00	0.73	-
21	2045	0.01	0.00	230	1.00	0.73	-
22	2046	0.01	0.00	230	1.00	0.73	-
23	2047	0.01	0.00	230	1.00	0.73	-
24	2048	0.01	0.00	230	1.00	0.73	-
25	2049	0.01	0.00	230	1.00	0.73	-

	Acute Hazard Impact
1	Significance Threshold
No	Significant?
	Chronic Hazard Impact
1	Significance Threshold
No	Significant?
-	Cancer Risk
10	Significance Threshold
No	Significant?

Health Risk Assessment Assumptions

0.2	Acute Reference Exposure Level (ug/m3)
0.015	Chronic Reference Exposure Level (ug/m3)
12	Cancer Potency Slope Factor (cancer risk per mg/kg-day)
250	days per year
25,550	days per lifetime
230	80th Percentile Daily Breathing Rates (L/kg-day)
0.73	fraction of time at work

Project:	Burney Biomass
Date:	July 25, 2022
Condition:	Arsenic
Receptor:	Offsite Worker
Source:	Boiler
Height:	25m

Exposure Year	Calender Year	1-Hour Concentration (ug/m3)	Annual Concentration (ug/m3)	Daily Breathing Rates (L/kg-day)	Exposure Factor	fraction of time at work	Cancer Risk
1	2025	0.01	0.00	230	1.00	0.73	0.02
2	2026	0.01	0.00	230	1.00	0.73	0.02
3	2027	0.01	0.00	230	1.00	0.73	0.02
4	2028	0.01	0.00	230	1.00	0.73	0.02
5	2029	0.01	0.00	230	1.00	0.73	0.02
6	2030	0.01	0.00	230	1.00	0.73	0.02
7	2031	0.01	0.00	230	1.00	0.73	0.02
8	2032	0.01	0.00	230	1.00	0.73	0.02
9	2033	0.01	0.00	230	1.00	0.73	0.02
10	2034	0.01	0.00	230	1.00	0.73	0.02
11	2035	0.01	0.00	230	1.00	0.73	0.02
12	2036	0.01	0.00	230	1.00	0.73	0.02
13	2037	0.01	0.00	230	1.00	0.73	0.02
14	2038	0.01	0.00	230	1.00	0.73	0.02
15	2039	0.01	0.00	230	1.00	0.73	0.02
16	2040	0.01	0.00	230	1.00	0.73	0.02
17	2041	0.01	0.00	230	1.00	0.73	0.02
18	2042	0.01	0.00	230	1.00	0.73	0.02
19	2043	0.01	0.00	230	1.00	0.73	0.02
20	2044	0.01	0.00	230	1.00	0.73	0.02
21	2045	0.01	0.00	230	1.00	0.73	0.02
22	2046	0.01	0.00	230	1.00	0.73	0.02
23	2047	0.01	0.00	230	1.00	0.73	0.02
24	2048	0.01	0.00	230	1.00	0.73	0.02
25	2049	0.01	0.00	230	1.00	0.73	0.02

0.03	Acute Hazard Impact
1	Significance Threshold
No	Significant?
0.05	Chronic Hazard Impact
1	Significance Threshold
No	Significant?
0.38	Cancer Risk
10	Significance Threshold
No	Significant?

Health Risk Assessment Assumptions

	Acute Reference Exposure Level (ug/m3)
	Chronic Reference Exposure Level (ug/m3)
0.042	Cancer Potency Slope Factor (cancer risk per mg/kg-day)
250	days per year
25,550	days per lifetime
230	80th Percentile Daily Breathing Rates (L/kg-day)
0.73	fraction of time at work

Project:	Burney Biomass
Date:	July 25, 2022
Condition:	Lead
Receptor:	Offsite Worker
Source:	Boiler
Height:	25m

Exposure Year	Calender Year	1-Hour Concentration (ug/m3)	Annual Concentration (ug/m3)	Daily Breathing Rates (L/kg-day)	Exposure Factor	fraction of time at work	Cancer Risk
1	2025	0.01	0.00	230	1.00	0.73	0.00
2	2026	0.01	0.00	230	1.00	0.73	0.00
3	2027	0.01	0.00	230	1.00	0.73	0.00
4	2028	0.01	0.00	230	1.00	0.73	0.00
5	2029	0.01	0.00	230	1.00	0.73	0.00
6	2030	0.01	0.00	230	1.00	0.73	0.00
7	2031	0.01	0.00	230	1.00	0.73	0.00
8	2032	0.01	0.00	230	1.00	0.73	0.00
9	2033	0.01	0.00	230	1.00	0.73	0.00
10	2034	0.01	0.00	230	1.00	0.73	0.00
11	2035	0.01	0.00	230	1.00	0.73	0.00
12	2036	0.01	0.00	230	1.00	0.73	0.00
13	2037	0.01	0.00	230	1.00	0.73	0.00
14	2038	0.01	0.00	230	1.00	0.73	0.00
15	2039	0.01	0.00	230	1.00	0.73	0.00
16	2040	0.01	0.00	230	1.00	0.73	0.00
17	2041	0.01	0.00	230	1.00	0.73	0.00
18	2042	0.01	0.00	230	1.00	0.73	0.00
19	2043	0.01	0.00	230	1.00	0.73	0.00
20	2044	0.01	0.00	230	1.00	0.73	0.00
21	2045	0.01	0.00	230	1.00	0.73	0.00
22	2046	0.01	0.00	230	1.00	0.73	0.00
23	2047	0.01	0.00	230	1.00	0.73	0.00
24	2048	0.01	0.00	230	1.00	0.73	0.00
25	2049	0.01	0.00	230	1.00	0.73	0.00

	Acute Hazard Impact
1	Significance Threshold
No	Significant?
	Chronic Hazard Impact
1	Significance Threshold
No	Significant?
0.00	Cancer Risk
10	Significance Threshold
No	Significant?

Health Risk Assessment Assumptions

	Acute Reference Exposure Level (ug/m3)
	Chronic Reference Exposure Level (ug/m3)
	Cancer Potency Slope Factor (cancer risk per mg/kg-day)
250	days per year
25,550	days per lifetime
230	80th Percentile Daily Breathing Rates (L/kg-day)
0.73	fraction of time at work

Project:	Burney Biomass
Date:	July 25, 2022
Condition:	Chromium
Receptor:	Offsite Worker
Source:	Boiler
Height:	25m

Exposure Year	Calender Year	1-Hour Concentration (ug/m3)	Annual Concentration (ug/m3)	Daily Breathing Rates (L/kg-day)	Exposure Factor	fraction of time at work	Cancer Risk
1	2025	0.01	0.00	230	1.00	0.73	-
2	2026	0.01	0.00	230	1.00	0.73	-
3	2027	0.01	0.00	230	1.00	0.73	-
4	2028	0.01	0.00	230	1.00	0.73	-
5	2029	0.01	0.00	230	1.00	0.73	-
6	2030	0.01	0.00	230	1.00	0.73	-
7	2031	0.01	0.00	230	1.00	0.73	-
8	2032	0.01	0.00	230	1.00	0.73	-
9	2033	0.01	0.00	230	1.00	0.73	-
10	2034	0.01	0.00	230	1.00	0.73	-
11	2035	0.01	0.00	230	1.00	0.73	-
12	2036	0.01	0.00	230	1.00	0.73	-
13	2037	0.01	0.00	230	1.00	0.73	-
14	2038	0.01	0.00	230	1.00	0.73	-
15	2039	0.01	0.00	230	1.00	0.73	-
16	2040	0.01	0.00	230	1.00	0.73	-
17	2041	0.01	0.00	230	1.00	0.73	-
18	2042	0.01	0.00	230	1.00	0.73	-
19	2043	0.01	0.00	230	1.00	0.73	-
20	2044	0.01	0.00	230	1.00	0.73	-
21	2045	0.01	0.00	230	1.00	0.73	-
22	2046	0.01	0.00	230	1.00	0.73	-
23	2047	0.01	0.00	230	1.00	0.73	-
24	2048	0.01	0.00	230	1.00	0.73	-
25	2049	0.01	0.00	230	1.00	0.73	-

	Acute Hazard Impact
1	Significance Threshold
No	Significant?
	Chronic Hazard Impact
1	Significance Threshold
No	Significant?
-	Cancer Risk
10	Significance Threshold
No	Significant?

Health Risk Assessment Assumptions

	Acute Reference Exposure Level (ug/m3)
	Chronic Reference Exposure Level (ug/m3)
27	Cancer Potency Slope Factor (cancer risk per mg/kg-day)
250	days per year
25,550	days per lifetime
230	80th Percentile Daily Breathing Rates (L/kg-day)
0.73	fraction of time at work

Project:	Burney Biomass
Date:	July 25, 2022
Condition:	Cobalt
Receptor:	Offsite Worker
Source:	Boiler
Height:	25m

Exposure Year	Calender Year	1-Hour Concentration (ug/m3)	Annual Concentration (ug/m3)	Daily Breathing Rates (L/kg-day)	Exposure Factor	fraction of time at work	Cancer Risk
1	2025	0.01	0.00	230	1.00	0.73	0.03
2	2026	0.01	0.00	230	1.00	0.73	0.03
3	2027	0.01	0.00	230	1.00	0.73	0.03
4	2028	0.01	0.00	230	1.00	0.73	0.03
5	2029	0.01	0.00	230	1.00	0.73	0.03
6	2030	0.01	0.00	230	1.00	0.73	0.03
7	2031	0.01	0.00	230	1.00	0.73	0.03
8	2032	0.01	0.00	230	1.00	0.73	0.03
9	2033	0.01	0.00	230	1.00	0.73	0.03
10	2034	0.01	0.00	230	1.00	0.73	0.03
11	2035	0.01	0.00	230	1.00	0.73	0.03
12	2036	0.01	0.00	230	1.00	0.73	0.03
13	2037	0.01	0.00	230	1.00	0.73	0.03
14	2038	0.01	0.00	230	1.00	0.73	0.03
15	2039	0.01	0.00	230	1.00	0.73	0.03
16	2040	0.01	0.00	230	1.00	0.73	0.03
17	2041	0.01	0.00	230	1.00	0.73	0.03
18	2042	0.01	0.00	230	1.00	0.73	0.03
19	2043	0.01	0.00	230	1.00	0.73	0.03
20	2044	0.01	0.00	230	1.00	0.73	0.03
21	2045	0.01	0.00	230	1.00	0.73	0.03
22	2046	0.01	0.00	230	1.00	0.73	0.03
23	2047	0.01	0.00	230	1.00	0.73	0.03
24	2048	0.01	0.00	230	1.00	0.73	0.03
25	2049	0.01	0.00	230	1.00	0.73	0.03

	Acute Hazard Impact
1	Significance Threshold
No	Significant?
	Chronic Hazard Impact
1	Significance Threshold
No	Significant?
0.85	Cancer Risk
10	Significance Threshold
No	Significant?

Health Risk Assessment Assumptions

100	Acute Reference Exposure Level (ug/m3)
	Chronic Reference Exposure Level (ug/m3)
	Cancer Potency Slope Factor (cancer risk per mg/kg-day)
250	days per year
25,550	days per lifetime
230	80th Percentile Daily Breathing Rates (L/kg-day)
0.73	fraction of time at work

Project:	Burney Biomass
Date:	July 25, 2022
Condition:	Copper
Receptor:	Offsite Worker
Source:	Boiler
Height:	25m

Exposure Year	Calender Year	1-Hour Concentration (ug/m3)	Annual Concentration (ug/m3)	Daily Breathing Rates (L/kg-day)	Exposure Factor	fraction of time at work	Cancer Risk
1	2025	0.01	0.00	230	1.00	0.73	-
2	2026	0.01	0.00	230	1.00	0.73	-
3	2027	0.01	0.00	230	1.00	0.73	-
4	2028	0.01	0.00	230	1.00	0.73	-
5	2029	0.01	0.00	230	1.00	0.73	-
6	2030	0.01	0.00	230	1.00	0.73	-
7	2031	0.01	0.00	230	1.00	0.73	-
8	2032	0.01	0.00	230	1.00	0.73	-
9	2033	0.01	0.00	230	1.00	0.73	-
10	2034	0.01	0.00	230	1.00	0.73	-
11	2035	0.01	0.00	230	1.00	0.73	-
12	2036	0.01	0.00	230	1.00	0.73	-
13	2037	0.01	0.00	230	1.00	0.73	-
14	2038	0.01	0.00	230	1.00	0.73	-
15	2039	0.01	0.00	230	1.00	0.73	-
16	2040	0.01	0.00	230	1.00	0.73	-
17	2041	0.01	0.00	230	1.00	0.73	-
18	2042	0.01	0.00	230	1.00	0.73	-
19	2043	0.01	0.00	230	1.00	0.73	-
20	2044	0.01	0.00	230	1.00	0.73	-
21	2045	0.01	0.00	230	1.00	0.73	-
22	2046	0.01	0.00	230	1.00	0.73	-
23	2047	0.01	0.00	230	1.00	0.73	-
24	2048	0.01	0.00	230	1.00	0.73	-
25	2049	0.01	0.00	230	1.00	0.73	-

0.00	Acute Hazard Impact
1	Significance Threshold
No	Significant?
	Chronic Hazard Impact
1	Significance Threshold
No	Significant?
-	Cancer Risk
10	Significance Threshold
No	Significant?

Health Risk Assessment Assumptions

0.17	Acute Reference Exposure Level (ug/m3)
0.09	Chronic Reference Exposure Level (ug/m3)
	Cancer Potency Slope Factor (cancer risk per mg/kg-day)
250	days per year
25,550	days per lifetime
230	80th Percentile Daily Breathing Rates (L/kg-day)
0.73	fraction of time at work

Project:	Burney Biomass
Date:	July 25, 2022
Condition:	Manganese
Receptor:	Offsite Worker
Source:	Boiler
Height:	25m

Exposure Year	Calender Year	1-Hour Concentration (ug/m3)	Annual Concentration (ug/m3)	Daily Breathing Rates (L/kg-day)	Exposure Factor	fraction of time at work	Cancer Risk
1	2025	0.01	0.00	230	1.00	0.73	-
2	2026	0.01	0.00	230	1.00	0.73	-
3	2027	0.01	0.00	230	1.00	0.73	-
4	2028	0.01	0.00	230	1.00	0.73	-
5	2029	0.01	0.00	230	1.00	0.73	-
6	2030	0.01	0.00	230	1.00	0.73	-
7	2031	0.01	0.00	230	1.00	0.73	-
8	2032	0.01	0.00	230	1.00	0.73	-
9	2033	0.01	0.00	230	1.00	0.73	-
10	2034	0.01	0.00	230	1.00	0.73	-
11	2035	0.01	0.00	230	1.00	0.73	-
12	2036	0.01	0.00	230	1.00	0.73	-
13	2037	0.01	0.00	230	1.00	0.73	-
14	2038	0.01	0.00	230	1.00	0.73	-
15	2039	0.01	0.00	230	1.00	0.73	-
16	2040	0.01	0.00	230	1.00	0.73	-
17	2041	0.01	0.00	230	1.00	0.73	-
18	2042	0.01	0.00	230	1.00	0.73	-
19	2043	0.01	0.00	230	1.00	0.73	-
20	2044	0.01	0.00	230	1.00	0.73	-
21	2045	0.01	0.00	230	1.00	0.73	-
22	2046	0.01	0.00	230	1.00	0.73	-
23	2047	0.01	0.00	230	1.00	0.73	-
24	2048	0.01	0.00	230	1.00	0.73	-
25	2049	0.01	0.00	230	1.00	0.73	-

0.03	Acute Hazard Impact
1	Significance Threshold
No	Significant?
0.01	Chronic Hazard Impact
1	Significance Threshold
No	Significant?
-	Cancer Risk
10	Significance Threshold
No	Significant?

Health Risk Assessment Assumptions

0.2	Acute Reference Exposure Level (ug/m3)
0.014	Chronic Reference Exposure Level (ug/m3)
0.91	Cancer Potency Slope Factor (cancer risk per mg/kg-day)
250	days per year
25,550	days per lifetime
230	80th Percentile Daily Breathing Rates (L/kg-day)
0.73	fraction of time at work

Project:	Burney Biomass
Date:	July 25, 2022
Condition:	Nickel
Receptor:	Offsite Worker
Source:	Boiler
Height:	25m

Exposure Year	Calender Year	1-Hour Concentration (ug/m3)	Annual Concentration (ug/m3)	Daily Breathing Rates (L/kg-day)	Exposure Factor	fraction of time at work	Cancer Risk
1	2025	0.01	0.00	230	1.00	0.73	0.00
2	2026	0.01	0.00	230	1.00	0.73	0.00
3	2027	0.01	0.00	230	1.00	0.73	0.00
4	2028	0.01	0.00	230	1.00	0.73	0.00
5	2029	0.01	0.00	230	1.00	0.73	0.00
6	2030	0.01	0.00	230	1.00	0.73	0.00
7	2031	0.01	0.00	230	1.00	0.73	0.00
8	2032	0.01	0.00	230	1.00	0.73	0.00
9	2033	0.01	0.00	230	1.00	0.73	0.00
10	2034	0.01	0.00	230	1.00	0.73	0.00
11	2035	0.01	0.00	230	1.00	0.73	0.00
12	2036	0.01	0.00	230	1.00	0.73	0.00
13	2037	0.01	0.00	230	1.00	0.73	0.00
14	2038	0.01	0.00	230	1.00	0.73	0.00
15	2039	0.01	0.00	230	1.00	0.73	0.00
16	2040	0.01	0.00	230	1.00	0.73	0.00
17	2041	0.01	0.00	230	1.00	0.73	0.00
18	2042	0.01	0.00	230	1.00	0.73	0.00
19	2043	0.01	0.00	230	1.00	0.73	0.00
20	2044	0.01	0.00	230	1.00	0.73	0.00
21	2045	0.01	0.00	230	1.00	0.73	0.00
22	2046	0.01	0.00	230	1.00	0.73	0.00
23	2047	0.01	0.00	230	1.00	0.73	0.00
24	2048	0.01	0.00	230	1.00	0.73	0.00
25	2049	0.01	0.00	230	1.00	0.73	0.00

0.03	Acute Hazard Impact
1	Significance Threshold
No	Significant?
0.05	Chronic Hazard Impact
1	Significance Threshold
No	Significant?
0.03	Cancer Risk
10	Significance Threshold
No	Significant?

Health Risk Assessment Assumptions

	Acute Reference Exposure Level (ug/m3)
	Chronic Reference Exposure Level (ug/m3)
	Cancer Potency Slope Factor (cancer risk per mg/kg-day)
250	days per year
25,550	days per lifetime
230	80th Percentile Daily Breathing Rates (L/kg-day)
0.73	fraction of time at work

Project:	Burney Biomass
Date:	July 25, 2022
Condition:	Vanadium
Receptor:	Offsite Worker
Source:	Boiler
Height:	25m

Exposure Year	Calender Year	1-Hour Concentration (ug/m3)	Annual Concentration (ug/m3)	Daily Breathing Rates (L/kg-day)	Exposure Factor	fraction of time at work	Cancer Risk
1	2025	0.01	0.00	230	1.00	0.73	-
2	2026	0.01	0.00	230	1.00	0.73	-
3	2027	0.01	0.00	230	1.00	0.73	-
4	2028	0.01	0.00	230	1.00	0.73	-
5	2029	0.01	0.00	230	1.00	0.73	-
6	2030	0.01	0.00	230	1.00	0.73	-
7	2031	0.01	0.00	230	1.00	0.73	-
8	2032	0.01	0.00	230	1.00	0.73	-
9	2033	0.01	0.00	230	1.00	0.73	-
10	2034	0.01	0.00	230	1.00	0.73	-
11	2035	0.01	0.00	230	1.00	0.73	-
12	2036	0.01	0.00	230	1.00	0.73	-
13	2037	0.01	0.00	230	1.00	0.73	-
14	2038	0.01	0.00	230	1.00	0.73	-
15	2039	0.01	0.00	230	1.00	0.73	-
16	2040	0.01	0.00	230	1.00	0.73	-
17	2041	0.01	0.00	230	1.00	0.73	-
18	2042	0.01	0.00	230	1.00	0.73	-
19	2043	0.01	0.00	230	1.00	0.73	-
20	2044	0.01	0.00	230	1.00	0.73	-
21	2045	0.01	0.00	230	1.00	0.73	-
22	2046	0.01	0.00	230	1.00	0.73	-
23	2047	0.01	0.00	230	1.00	0.73	-
24	2048	0.01	0.00	230	1.00	0.73	-
25	2049	0.01	0.00	230	1.00	0.73	-

	Acute Hazard Impact
1	Significance Threshold
No	Significant?
	Chronic Hazard Impact
1	Significance Threshold
No	Significant?
-	Cancer Risk
10	Significance Threshold
No	Significant?

Health Risk Assessment Assumptions

	Acute Reference Exposure Level (ug/m3)
0.00004	Chronic Reference Exposure Level (ug/m3)
1,300	Cancer Potency Slope Factor (cancer risk per mg/kg-day)
250	days per year
25,550	days per lifetime
230	80th Percentile Daily Breathing Rates (L/kg-day)
0.73	fraction of time at work

Project:	Burney Biomass
Date:	July 25, 2022
Condition:	Dioxin
Receptor:	Offsite Worker
Source:	Boiler
Height:	25m

Exposure Year	Calender Year	1-Hour Concentration (ug/m3)	Annual Concentration (ug/m3)	Daily Breathing Rates (L/kg-day)	Exposure Factor	fraction of time at work	Cancer Risk
1	2025	0.00	0.00	230	1.00	0.73	0.00
2	2026	0.00	0.00	230	1.00	0.73	0.00
3	2027	0.00	0.00	230	1.00	0.73	0.00
4	2028	0.00	0.00	230	1.00	0.73	0.00
5	2029	0.00	0.00	230	1.00	0.73	0.00
6	2030	0.00	0.00	230	1.00	0.73	0.00
7	2031	0.00	0.00	230	1.00	0.73	0.00
8	2032	0.00	0.00	230	1.00	0.73	0.00
9	2033	0.00	0.00	230	1.00	0.73	0.00
10	2034	0.00	0.00	230	1.00	0.73	0.00
11	2035	0.00	0.00	230	1.00	0.73	0.00
12	2036	0.00	0.00	230	1.00	0.73	0.00
13	2037	0.00	0.00	230	1.00	0.73	0.00
14	2038	0.00	0.00	230	1.00	0.73	0.00
15	2039	0.00	0.00	230	1.00	0.73	0.00
16	2040	0.00	0.00	230	1.00	0.73	0.00
17	2041	0.00	0.00	230	1.00	0.73	0.00
18	2042	0.00	0.00	230	1.00	0.73	0.00
19	2043	0.00	0.00	230	1.00	0.73	0.00
20	2044	0.00	0.00	230	1.00	0.73	0.00
21	2045	0.00	0.00	230	1.00	0.73	0.00
22	2046	0.00	0.00	230	1.00	0.73	0.00
23	2047	0.00	0.00	230	1.00	0.73	0.00
24	2048	0.00	0.00	230	1.00	0.73	0.00
25	2049	0.00	0.00	230	1.00	0.73	0.00

	Acute Hazard Impact
1	Significance Threshold
No	Significant?
0.00	Chronic Hazard Impact
1	Significance Threshold
No	Significant?
0.00	Cancer Risk
10	Significance Threshold
No	Significant?

Health Risk Assessment Assumptions

2100	Acute Reference Exposure Level (ug/m3)
9	Chronic Reference Exposure Level (ug/m3)
	Cancer Potency Slope Factor (cancer risk per mg/kg-day)
250	days per year
25,550	days per lifetime
230	80th Percentile Daily Breathing Rates (L/kg-day)
0.73	fraction of time at work

Project:	Burney Biomass
Date:	July 25, 2022
Condition:	HCL
Receptor:	Offsite Worker
Source:	Boiler
Height:	25m

Exposure Year	Calender Year	1-Hour Concentration (ug/m3)	Annual Concentration (ug/m3)	Daily Breathing Rates (L/kg-day)	Exposure Factor	fraction of time at work	Cancer Risk
1	2025	0.22	0.03	230	1.00	0.73	-
2	2026	0.22	0.03	230	1.00	0.73	-
3	2027	0.22	0.03	230	1.00	0.73	-
4	2028	0.22	0.03	230	1.00	0.73	-
5	2029	0.22	0.03	230	1.00	0.73	-
6	2030	0.22	0.03	230	1.00	0.73	-
7	2031	0.22	0.03	230	1.00	0.73	-
8	2032	0.22	0.03	230	1.00	0.73	-
9	2033	0.22	0.03	230	1.00	0.73	-
10	2034	0.22	0.03	230	1.00	0.73	-
11	2035	0.22	0.03	230	1.00	0.73	-
12	2036	0.22	0.03	230	1.00	0.73	-
13	2037	0.22	0.03	230	1.00	0.73	-
14	2038	0.22	0.03	230	1.00	0.73	-
15	2039	0.22	0.03	230	1.00	0.73	-
16	2040	0.22	0.03	230	1.00	0.73	-
17	2041	0.22	0.03	230	1.00	0.73	-
18	2042	0.22	0.03	230	1.00	0.73	-
19	2043	0.22	0.03	230	1.00	0.73	-
20	2044	0.22	0.03	230	1.00	0.73	-
21	2045	0.22	0.03	230	1.00	0.73	-
22	2046	0.22	0.03	230	1.00	0.73	-
23	2047	0.22	0.03	230	1.00	0.73	-
24	2048	0.22	0.03	230	1.00	0.73	-
25	2049	0.22	0.03	230	1.00	0.73	-

0.00	Acute Hazard Impact
1	Significance Threshold
No	Significant?
0.00	Chronic Hazard Impact
1	Significance Threshold
No	Significant?
-	Cancer Risk
10	Significance Threshold
No	Significant?

Health Risk Assessment Assumptions

	Acute Reference Exposure Level (ug/m3)
0.02	Chronic Reference Exposure Level (ug/m3)
15	Cancer Potency Slope Factor (cancer risk per mg/kg-day)
250	days per year
25,550	days per lifetime
230	80th Percentile Daily Breathing Rates (L/kg-day)
0.73	fraction of time at work

Project:	Burney Biomass
Date:	July 25, 2022
Condition:	Cadmium
Receptor:	Offsite Worker
Source:	Boiler
Height:	15m

Exposure Year	Calender Year	1-Hour Concentration (ug/m3)	Annual Concentration (ug/m3)	Daily Breathing Rates (L/kg-day)	Exposure Factor	fraction of time at work	Cancer Risk
1	2025	0.01	0.00	230	1.00	0.73	0.03
2	2026	0.01	0.00	230	1.00	0.73	0.03
3	2027	0.01	0.00	230	1.00	0.73	0.03
4	2028	0.01	0.00	230	1.00	0.73	0.03
5	2029	0.01	0.00	230	1.00	0.73	0.03
6	2030	0.01	0.00	230	1.00	0.73	0.03
7	2031	0.01	0.00	230	1.00	0.73	0.03
8	2032	0.01	0.00	230	1.00	0.73	0.03
9	2033	0.01	0.00	230	1.00	0.73	0.03
10	2034	0.01	0.00	230	1.00	0.73	0.03
11	2035	0.01	0.00	230	1.00	0.73	0.03
12	2036	0.01	0.00	230	1.00	0.73	0.03
13	2037	0.01	0.00	230	1.00	0.73	0.03
14	2038	0.01	0.00	230	1.00	0.73	0.03
15	2039	0.01	0.00	230	1.00	0.73	0.03
16	2040	0.01	0.00	230	1.00	0.73	0.03
17	2041	0.01	0.00	230	1.00	0.73	0.03
18	2042	0.01	0.00	230	1.00	0.73	0.03
19	2043	0.01	0.00	230	1.00	0.73	0.03
20	2044	0.01	0.00	230	1.00	0.73	0.03
21	2045	0.01	0.00	230	1.00	0.73	0.03
22	2046	0.01	0.00	230	1.00	0.73	0.03
23	2047	0.01	0.00	230	1.00	0.73	0.03
24	2048	0.01	0.00	230	1.00	0.73	0.03
25	2049	0.01	0.00	230	1.00	0.73	0.03

	Acute Hazard Impact
1	Significance Threshold
No	Significant?
0.06	Chronic Hazard Impact
1	Significance Threshold
No	Significant?
0.70	Cancer Risk
10	Significance Threshold
No	Significant?

Health Risk Assessment Assumptions

0.6	Acute Reference Exposure Level (ug/m3)
0.03	Chronic Reference Exposure Level (ug/m3)
	Cancer Potency Slope Factor (cancer risk per mg/kg-day)
250	days per year
25,550	days per lifetime
230	80th Percentile Daily Breathing Rates (L/kg-day)
0.73	fraction of time at work

Project:	Burney Biomass
Date:	July 25, 2022
Condition:	Mercury
Receptor:	Offsite Worker
Source:	Boiler
Height:	15m

Exposure Year	Calender Year	1-Hour Concentration (ug/m3)	Annual Concentration (ug/m3)	Daily Breathing Rates (L/kg-day)	Exposure Factor	fraction of time at work	Cancer Risk
1	2025	0.01	0.00	230	1.00	0.73	-
2	2026	0.01	0.00	230	1.00	0.73	-
3	2027	0.01	0.00	230	1.00	0.73	-
4	2028	0.01	0.00	230	1.00	0.73	-
5	2029	0.01	0.00	230	1.00	0.73	-
6	2030	0.01	0.00	230	1.00	0.73	-
7	2031	0.01	0.00	230	1.00	0.73	-
8	2032	0.01	0.00	230	1.00	0.73	-
9	2033	0.01	0.00	230	1.00	0.73	-
10	2034	0.01	0.00	230	1.00	0.73	-
11	2035	0.01	0.00	230	1.00	0.73	-
12	2036	0.01	0.00	230	1.00	0.73	-
13	2037	0.01	0.00	230	1.00	0.73	-
14	2038	0.01	0.00	230	1.00	0.73	-
15	2039	0.01	0.00	230	1.00	0.73	-
16	2040	0.01	0.00	230	1.00	0.73	-
17	2041	0.01	0.00	230	1.00	0.73	-
18	2042	0.01	0.00	230	1.00	0.73	-
19	2043	0.01	0.00	230	1.00	0.73	-
20	2044	0.01	0.00	230	1.00	0.73	-
21	2045	0.01	0.00	230	1.00	0.73	-
22	2046	0.01	0.00	230	1.00	0.73	-
23	2047	0.01	0.00	230	1.00	0.73	-
24	2048	0.01	0.00	230	1.00	0.73	-
25	2049	0.01	0.00	230	1.00	0.73	-

0.02	Acute Hazard Impact
1	Significance Threshold
No	Significant?
0.04	Chronic Hazard Impact
1	Significance Threshold
No	Significant?
-	Cancer Risk
10	Significance Threshold
No	Significant?

Health Risk Assessment Assumptions

	Acute Reference Exposure Level (ug/m3)
	Chronic Reference Exposure Level (ug/m3)
	Cancer Potency Slope Factor (cancer risk per mg/kg-day)
250	days per year
25,550	days per lifetime
230	80th Percentile Daily Breathing Rates (L/kg-day)
0.73	fraction of time at work

Project:	Burney Biomass
Date:	July 25, 2022
Condition:	Antimony
Receptor:	Offsite Worker
Source:	Boiler
Height:	15m

Exposure Year	Calender Year	1-Hour Concentration (ug/m3)	Annual Concentration (ug/m3)	Daily Breathing Rates (L/kg-day)	Exposure Factor	fraction of time at work	Cancer Risk
1	2025	0.01	0.00	230	1.00	0.73	-
2	2026	0.01	0.00	230	1.00	0.73	-
3	2027	0.01	0.00	230	1.00	0.73	-
4	2028	0.01	0.00	230	1.00	0.73	-
5	2029	0.01	0.00	230	1.00	0.73	-
6	2030	0.01	0.00	230	1.00	0.73	-
7	2031	0.01	0.00	230	1.00	0.73	-
8	2032	0.01	0.00	230	1.00	0.73	-
9	2033	0.01	0.00	230	1.00	0.73	-
10	2034	0.01	0.00	230	1.00	0.73	-
11	2035	0.01	0.00	230	1.00	0.73	-
12	2036	0.01	0.00	230	1.00	0.73	-
13	2037	0.01	0.00	230	1.00	0.73	-
14	2038	0.01	0.00	230	1.00	0.73	-
15	2039	0.01	0.00	230	1.00	0.73	-
16	2040	0.01	0.00	230	1.00	0.73	-
17	2041	0.01	0.00	230	1.00	0.73	-
18	2042	0.01	0.00	230	1.00	0.73	-
19	2043	0.01	0.00	230	1.00	0.73	-
20	2044	0.01	0.00	230	1.00	0.73	-
21	2045	0.01	0.00	230	1.00	0.73	-
22	2046	0.01	0.00	230	1.00	0.73	-
23	2047	0.01	0.00	230	1.00	0.73	-
24	2048	0.01	0.00	230	1.00	0.73	-
25	2049	0.01	0.00	230	1.00	0.73	-

	Acute Hazard Impact
1	Significance Threshold
No	Significant?
	Chronic Hazard Impact
1	Significance Threshold
No	Significant?
-	Cancer Risk
10	Significance Threshold
No	Significant?

Health Risk Assessment Assumptions

0.2	Acute Reference Exposure Level (ug/m3)
0.015	Chronic Reference Exposure Level (ug/m3)
12	Cancer Potency Slope Factor (cancer risk per mg/kg-day)
250	days per year
25,550	days per lifetime
230	80th Percentile Daily Breathing Rates (L/kg-day)
0.73	fraction of time at work

Project:	Burney Biomass
Date:	July 25, 2022
Condition:	Arsenic
Receptor:	Offsite Worker
Source:	Boiler
Height:	15m

Exposure Year	Calender Year	1-Hour Concentration (ug/m3)	Annual Concentration (ug/m3)	Daily Breathing Rates (L/kg-day)	Exposure Factor	fraction of time at work	Cancer Risk
1	2025	0.01	0.00	230	1.00	0.73	0.02
2	2026	0.01	0.00	230	1.00	0.73	0.02
3	2027	0.01	0.00	230	1.00	0.73	0.02
4	2028	0.01	0.00	230	1.00	0.73	0.02
5	2029	0.01	0.00	230	1.00	0.73	0.02
6	2030	0.01	0.00	230	1.00	0.73	0.02
7	2031	0.01	0.00	230	1.00	0.73	0.02
8	2032	0.01	0.00	230	1.00	0.73	0.02
9	2033	0.01	0.00	230	1.00	0.73	0.02
10	2034	0.01	0.00	230	1.00	0.73	0.02
11	2035	0.01	0.00	230	1.00	0.73	0.02
12	2036	0.01	0.00	230	1.00	0.73	0.02
13	2037	0.01	0.00	230	1.00	0.73	0.02
14	2038	0.01	0.00	230	1.00	0.73	0.02
15	2039	0.01	0.00	230	1.00	0.73	0.02
16	2040	0.01	0.00	230	1.00	0.73	0.02
17	2041	0.01	0.00	230	1.00	0.73	0.02
18	2042	0.01	0.00	230	1.00	0.73	0.02
19	2043	0.01	0.00	230	1.00	0.73	0.02
20	2044	0.01	0.00	230	1.00	0.73	0.02
21	2045	0.01	0.00	230	1.00	0.73	0.02
22	2046	0.01	0.00	230	1.00	0.73	0.02
23	2047	0.01	0.00	230	1.00	0.73	0.02
24	2048	0.01	0.00	230	1.00	0.73	0.02
25	2049	0.01	0.00	230	1.00	0.73	0.02

0.05	Acute Hazard Impact
1	Significance Threshold
No	Significant?
0.08	Chronic Hazard Impact
1	Significance Threshold
No	Significant?
0.56	Cancer Risk
10	Significance Threshold
No	Significant?

Health Risk Assessment Assumptions

	Acute Reference Exposure Level (ug/m3)
	Chronic Reference Exposure Level (ug/m3)
0.042	Cancer Potency Slope Factor (cancer risk per mg/kg-day)
250	days per year
25,550	days per lifetime
230	80th Percentile Daily Breathing Rates (L/kg-day)
0.73	fraction of time at work

Project:	Burney Biomass
Date:	July 25, 2022
Condition:	Lead
Receptor:	Offsite Worker
Source:	Boiler
Height:	15m

Exposure Year	Calender Year	1-Hour Concentration (ug/m3)	Annual Concentration (ug/m3)	Daily Breathing Rates (L/kg-day)	Exposure Factor	fraction of time at work	Cancer Risk
1	2025	0.01	0.00	230	1.00	0.73	0.00
2	2026	0.01	0.00	230	1.00	0.73	0.00
3	2027	0.01	0.00	230	1.00	0.73	0.00
4	2028	0.01	0.00	230	1.00	0.73	0.00
5	2029	0.01	0.00	230	1.00	0.73	0.00
6	2030	0.01	0.00	230	1.00	0.73	0.00
7	2031	0.01	0.00	230	1.00	0.73	0.00
8	2032	0.01	0.00	230	1.00	0.73	0.00
9	2033	0.01	0.00	230	1.00	0.73	0.00
10	2034	0.01	0.00	230	1.00	0.73	0.00
11	2035	0.01	0.00	230	1.00	0.73	0.00
12	2036	0.01	0.00	230	1.00	0.73	0.00
13	2037	0.01	0.00	230	1.00	0.73	0.00
14	2038	0.01	0.00	230	1.00	0.73	0.00
15	2039	0.01	0.00	230	1.00	0.73	0.00
16	2040	0.01	0.00	230	1.00	0.73	0.00
17	2041	0.01	0.00	230	1.00	0.73	0.00
18	2042	0.01	0.00	230	1.00	0.73	0.00
19	2043	0.01	0.00	230	1.00	0.73	0.00
20	2044	0.01	0.00	230	1.00	0.73	0.00
21	2045	0.01	0.00	230	1.00	0.73	0.00
22	2046	0.01	0.00	230	1.00	0.73	0.00
23	2047	0.01	0.00	230	1.00	0.73	0.00
24	2048	0.01	0.00	230	1.00	0.73	0.00
25	2049	0.01	0.00	230	1.00	0.73	0.00

	Acute Hazard Impact
1	Significance Threshold
No	Significant?
	Chronic Hazard Impact
1	Significance Threshold
No	Significant?
0.00	Cancer Risk
10	Significance Threshold
No	Significant?

Health Risk Assessment Assumptions

	Acute Reference Exposure Level (ug/m3)
	Chronic Reference Exposure Level (ug/m3)
	Cancer Potency Slope Factor (cancer risk per mg/kg-day)
250	days per year
25,550	days per lifetime
230	80th Percentile Daily Breathing Rates (L/kg-day)
0.73	fraction of time at work

Project:	Burney Biomass
Date:	July 25, 2022
Condition:	Chromium
Receptor:	Offsite Worker
Source:	Boiler
Height:	15m

Exposure Year	Calender Year	1-Hour Concentration (ug/m3)	Annual Concentration (ug/m3)	Daily Breathing Rates (L/kg-day)	Exposure Factor	fraction of time at work	Cancer Risk
1	2025	0.01	0.00	230	1.00	0.73	-
2	2026	0.01	0.00	230	1.00	0.73	-
3	2027	0.01	0.00	230	1.00	0.73	-
4	2028	0.01	0.00	230	1.00	0.73	-
5	2029	0.01	0.00	230	1.00	0.73	-
6	2030	0.01	0.00	230	1.00	0.73	-
7	2031	0.01	0.00	230	1.00	0.73	-
8	2032	0.01	0.00	230	1.00	0.73	-
9	2033	0.01	0.00	230	1.00	0.73	-
10	2034	0.01	0.00	230	1.00	0.73	-
11	2035	0.01	0.00	230	1.00	0.73	-
12	2036	0.01	0.00	230	1.00	0.73	-
13	2037	0.01	0.00	230	1.00	0.73	-
14	2038	0.01	0.00	230	1.00	0.73	-
15	2039	0.01	0.00	230	1.00	0.73	-
16	2040	0.01	0.00	230	1.00	0.73	-
17	2041	0.01	0.00	230	1.00	0.73	-
18	2042	0.01	0.00	230	1.00	0.73	-
19	2043	0.01	0.00	230	1.00	0.73	-
20	2044	0.01	0.00	230	1.00	0.73	-
21	2045	0.01	0.00	230	1.00	0.73	-
22	2046	0.01	0.00	230	1.00	0.73	-
23	2047	0.01	0.00	230	1.00	0.73	-
24	2048	0.01	0.00	230	1.00	0.73	-
25	2049	0.01	0.00	230	1.00	0.73	-

	Acute Hazard Impact
1	Significance Threshold
No	Significant?
	Chronic Hazard Impact
1	Significance Threshold
No	Significant?
-	Cancer Risk
10	Significance Threshold
No	Significant?

Health Risk Assessment Assumptions

	Acute Reference Exposure Level (ug/m3)
	Chronic Reference Exposure Level (ug/m3)
27	Cancer Potency Slope Factor (cancer risk per mg/kg-day)
250	days per year
25,550	days per lifetime
230	80th Percentile Daily Breathing Rates (L/kg-day)
0.73	fraction of time at work

Project:	Burney Biomass
Date:	July 25, 2022
Condition:	Cobalt
Receptor:	Offsite Worker
Source:	Boiler
Height:	15m

Exposure Year	Calender Year	1-Hour Concentration (ug/m3)	Annual Concentration (ug/m3)	Daily Breathing Rates (L/kg-day)	Exposure Factor	fraction of time at work	Cancer Risk
1	2025	0.01	0.00	230	1.00	0.73	0.05
2	2026	0.01	0.00	230	1.00	0.73	0.05
3	2027	0.01	0.00	230	1.00	0.73	0.05
4	2028	0.01	0.00	230	1.00	0.73	0.05
5	2029	0.01	0.00	230	1.00	0.73	0.05
6	2030	0.01	0.00	230	1.00	0.73	0.05
7	2031	0.01	0.00	230	1.00	0.73	0.05
8	2032	0.01	0.00	230	1.00	0.73	0.05
9	2033	0.01	0.00	230	1.00	0.73	0.05
10	2034	0.01	0.00	230	1.00	0.73	0.05
11	2035	0.01	0.00	230	1.00	0.73	0.05
12	2036	0.01	0.00	230	1.00	0.73	0.05
13	2037	0.01	0.00	230	1.00	0.73	0.05
14	2038	0.01	0.00	230	1.00	0.73	0.05
15	2039	0.01	0.00	230	1.00	0.73	0.05
16	2040	0.01	0.00	230	1.00	0.73	0.05
17	2041	0.01	0.00	230	1.00	0.73	0.05
18	2042	0.01	0.00	230	1.00	0.73	0.05
19	2043	0.01	0.00	230	1.00	0.73	0.05
20	2044	0.01	0.00	230	1.00	0.73	0.05
21	2045	0.01	0.00	230	1.00	0.73	0.05
22	2046	0.01	0.00	230	1.00	0.73	0.05
23	2047	0.01	0.00	230	1.00	0.73	0.05
24	2048	0.01	0.00	230	1.00	0.73	0.05
25	2049	0.01	0.00	230	1.00	0.73	0.05

	Acute Hazard Impact
1	Significance Threshold
No	Significant?
	Chronic Hazard Impact
1	Significance Threshold
No	Significant?
1.26	Cancer Risk
10	Significance Threshold
No	Significant?

Health Risk Assessment Assumptions

100	Acute Reference Exposure Level (ug/m3)
	Chronic Reference Exposure Level (ug/m3)
	Cancer Potency Slope Factor (cancer risk per mg/kg-day)
250	days per year
25,550	days per lifetime
230	80th Percentile Daily Breathing Rates (L/kg-day)
0.73	fraction of time at work

Project:	Burney Biomass
Date:	July 25, 2022
Condition:	Copper
Receptor:	Offsite Worker
Source:	Boiler
Height:	15m

Exposure Year	Calender Year	1-Hour Concentration (ug/m3)	Annual Concentration (ug/m3)	Daily Breathing Rates (L/kg-day)	Exposure Factor	fraction of time at work	Cancer Risk
1	2025	0.01	0.00	230	1.00	0.73	-
2	2026	0.01	0.00	230	1.00	0.73	-
3	2027	0.01	0.00	230	1.00	0.73	-
4	2028	0.01	0.00	230	1.00	0.73	-
5	2029	0.01	0.00	230	1.00	0.73	-
6	2030	0.01	0.00	230	1.00	0.73	-
7	2031	0.01	0.00	230	1.00	0.73	-
8	2032	0.01	0.00	230	1.00	0.73	-
9	2033	0.01	0.00	230	1.00	0.73	-
10	2034	0.01	0.00	230	1.00	0.73	-
11	2035	0.01	0.00	230	1.00	0.73	-
12	2036	0.01	0.00	230	1.00	0.73	-
13	2037	0.01	0.00	230	1.00	0.73	-
14	2038	0.01	0.00	230	1.00	0.73	-
15	2039	0.01	0.00	230	1.00	0.73	-
16	2040	0.01	0.00	230	1.00	0.73	-
17	2041	0.01	0.00	230	1.00	0.73	-
18	2042	0.01	0.00	230	1.00	0.73	-
19	2043	0.01	0.00	230	1.00	0.73	-
20	2044	0.01	0.00	230	1.00	0.73	-
21	2045	0.01	0.00	230	1.00	0.73	-
22	2046	0.01	0.00	230	1.00	0.73	-
23	2047	0.01	0.00	230	1.00	0.73	-
24	2048	0.01	0.00	230	1.00	0.73	-
25	2049	0.01	0.00	230	1.00	0.73	-

0.00	Acute Hazard Impact
1	Significance Threshold
No	Significant?
	Chronic Hazard Impact
1	Significance Threshold
No	Significant?
-	Cancer Risk
10	Significance Threshold
No	Significant?

Health Risk Assessment Assumptions

0.17	Acute Reference Exposure Level (ug/m3)
0.09	Chronic Reference Exposure Level (ug/m3)
	Cancer Potency Slope Factor (cancer risk per mg/kg-day)
250	days per year
25,550	days per lifetime
230	80th Percentile Daily Breathing Rates (L/kg-day)
0.73	fraction of time at work

Project:	Burney Biomass
Date:	July 25, 2022
Condition:	Manganese
Receptor:	Offsite Worker
Source:	Boiler
Height:	15m

Exposure Year	Calender Year	1-Hour Concentration (ug/m3)	Annual Concentration (ug/m3)	Daily Breathing Rates (L/kg-day)	Exposure Factor	fraction of time at work	Cancer Risk
1	2025	0.01	0.00	230	1.00	0.73	-
2	2026	0.01	0.00	230	1.00	0.73	-
3	2027	0.01	0.00	230	1.00	0.73	-
4	2028	0.01	0.00	230	1.00	0.73	-
5	2029	0.01	0.00	230	1.00	0.73	-
6	2030	0.01	0.00	230	1.00	0.73	-
7	2031	0.01	0.00	230	1.00	0.73	-
8	2032	0.01	0.00	230	1.00	0.73	-
9	2033	0.01	0.00	230	1.00	0.73	-
10	2034	0.01	0.00	230	1.00	0.73	-
11	2035	0.01	0.00	230	1.00	0.73	-
12	2036	0.01	0.00	230	1.00	0.73	-
13	2037	0.01	0.00	230	1.00	0.73	-
14	2038	0.01	0.00	230	1.00	0.73	-
15	2039	0.01	0.00	230	1.00	0.73	-
16	2040	0.01	0.00	230	1.00	0.73	-
17	2041	0.01	0.00	230	1.00	0.73	-
18	2042	0.01	0.00	230	1.00	0.73	-
19	2043	0.01	0.00	230	1.00	0.73	-
20	2044	0.01	0.00	230	1.00	0.73	-
21	2045	0.01	0.00	230	1.00	0.73	-
22	2046	0.01	0.00	230	1.00	0.73	-
23	2047	0.01	0.00	230	1.00	0.73	-
24	2048	0.01	0.00	230	1.00	0.73	-
25	2049	0.01	0.00	230	1.00	0.73	-

0.06	Acute Hazard Impact
1	Significance Threshold
No	Significant?
0.01	Chronic Hazard Impact
1	Significance Threshold
No	Significant?
-	Cancer Risk
10	Significance Threshold
No	Significant?

Health Risk Assessment Assumptions

0.2	Acute Reference Exposure Level (ug/m3)
0.014	Chronic Reference Exposure Level (ug/m3)
0.91	Cancer Potency Slope Factor (cancer risk per mg/kg-day)
250	days per year
25,550	days per lifetime
230	80th Percentile Daily Breathing Rates (L/kg-day)
0.73	fraction of time at work

Project:	Burney Biomass
Date:	July 25, 2022
Condition:	Nickel
Receptor:	Offsite Worker
Source:	Boiler
Height:	15m

Exposure Year	Calender Year	1-Hour Concentration (ug/m3)	Annual Concentration (ug/m3)	Daily Breathing Rates (L/kg-day)	Exposure Factor	fraction of time at work	Cancer Risk
1	2025	0.01	0.00	230	1.00	0.73	0.00
2	2026	0.01	0.00	230	1.00	0.73	0.00
3	2027	0.01	0.00	230	1.00	0.73	0.00
4	2028	0.01	0.00	230	1.00	0.73	0.00
5	2029	0.01	0.00	230	1.00	0.73	0.00
6	2030	0.01	0.00	230	1.00	0.73	0.00
7	2031	0.01	0.00	230	1.00	0.73	0.00
8	2032	0.01	0.00	230	1.00	0.73	0.00
9	2033	0.01	0.00	230	1.00	0.73	0.00
10	2034	0.01	0.00	230	1.00	0.73	0.00
11	2035	0.01	0.00	230	1.00	0.73	0.00
12	2036	0.01	0.00	230	1.00	0.73	0.00
13	2037	0.01	0.00	230	1.00	0.73	0.00
14	2038	0.01	0.00	230	1.00	0.73	0.00
15	2039	0.01	0.00	230	1.00	0.73	0.00
16	2040	0.01	0.00	230	1.00	0.73	0.00
17	2041	0.01	0.00	230	1.00	0.73	0.00
18	2042	0.01	0.00	230	1.00	0.73	0.00
19	2043	0.01	0.00	230	1.00	0.73	0.00
20	2044	0.01	0.00	230	1.00	0.73	0.00
21	2045	0.01	0.00	230	1.00	0.73	0.00
22	2046	0.01	0.00	230	1.00	0.73	0.00
23	2047	0.01	0.00	230	1.00	0.73	0.00
24	2048	0.01	0.00	230	1.00	0.73	0.00
25	2049	0.01	0.00	230	1.00	0.73	0.00

0.05	Acute Hazard Impact
1	Significance Threshold
No	Significant?
0.08	Chronic Hazard Impact
1	Significance Threshold
No	Significant?
0.04	Cancer Risk
10	Significance Threshold
No	Significant?

Health Risk Assessment Assumptions

	Acute Reference Exposure Level (ug/m3)
	Chronic Reference Exposure Level (ug/m3)
	Cancer Potency Slope Factor (cancer risk per mg/kg-day)
250	days per year
25,550	days per lifetime
230	80th Percentile Daily Breathing Rates (L/kg-day)
0.73	fraction of time at work

Project:	Burney Biomass
Date:	July 25, 2022
Condition:	Vanadium
Receptor:	Offsite Worker
Source:	Boiler
Height:	15m

Exposure Year	Calender Year	1-Hour Concentration (ug/m3)	Annual Concentration (ug/m3)	Daily Breathing Rates (L/kg-day)	Exposure Factor	fraction of time at work	Cancer Risk
1	2025	0.01	0.00	230	1.00	0.73	-
2	2026	0.01	0.00	230	1.00	0.73	-
3	2027	0.01	0.00	230	1.00	0.73	-
4	2028	0.01	0.00	230	1.00	0.73	-
5	2029	0.01	0.00	230	1.00	0.73	-
6	2030	0.01	0.00	230	1.00	0.73	-
7	2031	0.01	0.00	230	1.00	0.73	-
8	2032	0.01	0.00	230	1.00	0.73	-
9	2033	0.01	0.00	230	1.00	0.73	-
10	2034	0.01	0.00	230	1.00	0.73	-
11	2035	0.01	0.00	230	1.00	0.73	-
12	2036	0.01	0.00	230	1.00	0.73	-
13	2037	0.01	0.00	230	1.00	0.73	-
14	2038	0.01	0.00	230	1.00	0.73	-
15	2039	0.01	0.00	230	1.00	0.73	-
16	2040	0.01	0.00	230	1.00	0.73	-
17	2041	0.01	0.00	230	1.00	0.73	-
18	2042	0.01	0.00	230	1.00	0.73	-
19	2043	0.01	0.00	230	1.00	0.73	-
20	2044	0.01	0.00	230	1.00	0.73	-
21	2045	0.01	0.00	230	1.00	0.73	-
22	2046	0.01	0.00	230	1.00	0.73	-
23	2047	0.01	0.00	230	1.00	0.73	-
24	2048	0.01	0.00	230	1.00	0.73	-
25	2049	0.01	0.00	230	1.00	0.73	-

	Acute Hazard Impact
1	Significance Threshold
No	Significant?
	Chronic Hazard Impact
1	Significance Threshold
No	Significant?
-	Cancer Risk
10	Significance Threshold
No	Significant?

Health Risk Assessment Assumptions

	Acute Reference Exposure Level (ug/m3)
0.00004	Chronic Reference Exposure Level (ug/m3)
1,300	Cancer Potency Slope Factor (cancer risk per mg/kg-day)
250	days per year
25,550	days per lifetime
230	80th Percentile Daily Breathing Rates (L/kg-day)
0.73	fraction of time at work

Project:	Burney Biomass
Date:	July 25, 2022
Condition:	Dioxin
Receptor:	Offsite Worker
Source:	Boiler
Height:	15m

Exposure Year	Calender Year	1-Hour Concentration (ug/m3)	Annual Concentration (ug/m3)	Daily Breathing Rates (L/kg-day)	Exposure Factor	fraction of time at work	Cancer Risk
1	2025	0.00	0.00	230	1.00	0.73	0.00
2	2026	0.00	0.00	230	1.00	0.73	0.00
3	2027	0.00	0.00	230	1.00	0.73	0.00
4	2028	0.00	0.00	230	1.00	0.73	0.00
5	2029	0.00	0.00	230	1.00	0.73	0.00
6	2030	0.00	0.00	230	1.00	0.73	0.00
7	2031	0.00	0.00	230	1.00	0.73	0.00
8	2032	0.00	0.00	230	1.00	0.73	0.00
9	2033	0.00	0.00	230	1.00	0.73	0.00
10	2034	0.00	0.00	230	1.00	0.73	0.00
11	2035	0.00	0.00	230	1.00	0.73	0.00
12	2036	0.00	0.00	230	1.00	0.73	0.00
13	2037	0.00	0.00	230	1.00	0.73	0.00
14	2038	0.00	0.00	230	1.00	0.73	0.00
15	2039	0.00	0.00	230	1.00	0.73	0.00
16	2040	0.00	0.00	230	1.00	0.73	0.00
17	2041	0.00	0.00	230	1.00	0.73	0.00
18	2042	0.00	0.00	230	1.00	0.73	0.00
19	2043	0.00	0.00	230	1.00	0.73	0.00
20	2044	0.00	0.00	230	1.00	0.73	0.00
21	2045	0.00	0.00	230	1.00	0.73	0.00
22	2046	0.00	0.00	230	1.00	0.73	0.00
23	2047	0.00	0.00	230	1.00	0.73	0.00
24	2048	0.00	0.00	230	1.00	0.73	0.00
25	2049	0.00	0.00	230	1.00	0.73	0.00

	Acute Hazard Impact
1	Significance Threshold
No	Significant?
0.00	Chronic Hazard Impact
1	Significance Threshold
No	Significant?
0.00	Cancer Risk
10	Significance Threshold
No	Significant?

Health Risk Assessment Assumptions

2100	Acute Reference Exposure Level (ug/m3)
9	Chronic Reference Exposure Level (ug/m3)
	Cancer Potency Slope Factor (cancer risk per mg/kg-day)
250	days per year
25,550	days per lifetime
230	80th Percentile Daily Breathing Rates (L/kg-day)
0.73	fraction of time at work

Project:	Burney Biomass
Date:	July 25, 2022
Condition:	HCL
Receptor:	Offsite Worker
Source:	Boiler
Height:	15m

Exposure Year	Calender Year	1-Hour Concentration (ug/m3)	Annual Concentration (ug/m3)	Daily Breathing Rates (L/kg-day)	Exposure Factor	fraction of time at work	Cancer Risk
1	2025	0.41	0.05	230	1.00	0.73	-
2	2026	0.41	0.05	230	1.00	0.73	-
3	2027	0.41	0.05	230	1.00	0.73	-
4	2028	0.41	0.05	230	1.00	0.73	-
5	2029	0.41	0.05	230	1.00	0.73	-
6	2030	0.41	0.05	230	1.00	0.73	-
7	2031	0.41	0.05	230	1.00	0.73	-
8	2032	0.41	0.05	230	1.00	0.73	-
9	2033	0.41	0.05	230	1.00	0.73	-
10	2034	0.41	0.05	230	1.00	0.73	-
11	2035	0.41	0.05	230	1.00	0.73	-
12	2036	0.41	0.05	230	1.00	0.73	-
13	2037	0.41	0.05	230	1.00	0.73	-
14	2038	0.41	0.05	230	1.00	0.73	-
15	2039	0.41	0.05	230	1.00	0.73	-
16	2040	0.41	0.05	230	1.00	0.73	-
17	2041	0.41	0.05	230	1.00	0.73	-
18	2042	0.41	0.05	230	1.00	0.73	-
19	2043	0.41	0.05	230	1.00	0.73	-
20	2044	0.41	0.05	230	1.00	0.73	-
21	2045	0.41	0.05	230	1.00	0.73	-
22	2046	0.41	0.05	230	1.00	0.73	-
23	2047	0.41	0.05	230	1.00	0.73	-
24	2048	0.41	0.05	230	1.00	0.73	-
25	2049	0.41	0.05	230	1.00	0.73	-

0.00	Acute Hazard Impact
1	Significance Threshold
No	Significant?
0.01	Chronic Hazard Impact
1	Significance Threshold
No	Significant?
-	Cancer Risk
10	Significance Threshold
No	Significant?

Health Risk Assessment Assumptions

	Acute Reference Exposure Level (ug/m3)	
0.02	Chronic Reference Exposure Level (ug/m3)	
15	Cancer Potency Slope Factor (cancer risk per mg/kg-day)	
350	days per year	
25,550	days per lifetime	
1,090	95th Percentile Daily Breathing Rates (L/kg-day)	0<2 Years
745	95th Percentile Daily Breathing Rates (L/kg-day)	2<16 Years
335	95th Percentile Daily Breathing Rates (L/kg-day)	16<30 Years
0.85	fraction of time at home	0<2 Years
0.72	fraction of time at home	2<16 Years
0.73	fraction of time at home	16<70 Years

Project: Burney Biomass
Date: July 25, 2022
Condition: Cadmium
Receptor: Residence
Source: Boiler
Height: 25m

Exposure Year	Calender Year	1-Hour Concentration (ug/m3)	Annual Concentration (ug/m3)	Daily Breathing Rates (L/kg-day)	Exposure Factor	fraction of time at home	Cancer Risk
1	2025	0.00	0.00	1,090	10.0	0.85	0.08
2	2026	0.00	0.00	1,090	10.0	0.85	0.08
3	2027	0.00	0.00	745	4.75	0.72	0.02
4	2028	0.00	0.00	745	3.00	0.72	0.01
5	2029	0.00	0.00	745	3.00	0.72	0.01
6	2030	0.00	0.00	745	3.00	0.72	0.01
7	2031	0.00	0.00	745	3.00	0.72	0.01
8	2032	0.00	0.00	745	3.00	0.72	0.01
9	2033	0.00	0.00	745	3.00	0.72	0.01
10	2034	0.00	0.00	745	3.00	0.72	0.01
11	2035	0.00	0.00	745	3.00	0.72	0.01
12	2036	0.00	0.00	745	3.00	0.72	0.01
13	2037	0.00	0.00	745	3.00	0.72	0.01
14	2038	0.00	0.00	745	3.00	0.72	0.01
15	2039	0.00	0.00	745	3.00	0.72	0.01
16	2040	0.00	0.00	745	3.00	0.72	0.01
17	2041	0.00	0.00	335	1.70	0.73	0.00
18	2042	0.00	0.00	335	1.00	0.73	0.00
19	2043	0.00	0.00	335	1.00	0.73	0.00
20	2044	0.00	0.00	335	1.00	0.73	0.00
21	2045	0.00	0.00	335	1.00	0.73	0.00
22	2046	0.00	0.00	335	1.00	0.73	0.00
23	2047	0.00	0.00	335	1.00	0.73	0.00
24	2048	0.00	0.00	335	1.00	0.73	0.00
25	2049	0.00	0.00	335	1.00	0.73	0.00
26	2050	0.00	0.00	335	1.00	0.73	0.00
27	2051	0.00	0.00	335	1.00	0.73	0.00
28	2052	0.00	0.00	335	1.00	0.73	0.00
29	2053	0.00	0.00	335	1.00	0.73	0.00
30	2054	0.00	0.00	335	1.00	0.73	0.00

	Acute Hazard Impact
1	Significance Threshold
No	Significant?
0.00	Chronic Hazard Impact
1	Significance Threshold
No	Significant?
0.42	Cancer Risk
10	Significance Threshold
No	Significant?

Health Risk Assessment Assumptions

0.6	Acute Reference Exposure Level (ug/m3)	
0.03	Chronic Reference Exposure Level (ug/m3)	
	Cancer Potency Slope Factor (cancer risk per mg/kg-day)	
350	days per year	
25,550	days per lifetime	
1,090	95th Percentile Daily Breathing Rates (L/kg-day)	0<2 Years
745	95th Percentile Daily Breathing Rates (L/kg-day)	2<16 Years
335	95th Percentile Daily Breathing Rates (L/kg-day)	16<30 Years
0.85	fraction of time at home	0<2 Years
0.72	fraction of time at home	2<16 Years
0.73	fraction of time at home	16<70 Years

Project:	Burney Biomass
Date:	July 25, 2022
Condition:	Mercury
Receptor:	Residence
Source:	Boiler
Height:	25m

Exposure Year	Calender Year	1-Hour Concentration (ug/m3)	Annual Concentration (ug/m3)	Daily Breathing Rates (L/kg-day)	Exposure Factor	fraction of time at home	Cancer Risk
1	2025	0.00	0.00	1,090	10.0	0.85	-
2	2026	0.00	0.00	1,090	10.0	0.85	-
3	2027	0.00	0.00	745	4.75	0.72	-
4	2028	0.00	0.00	745	3.00	0.72	-
5	2029	0.00	0.00	745	3.00	0.72	-
6	2030	0.00	0.00	745	3.00	0.72	-
7	2031	0.00	0.00	745	3.00	0.72	-
8	2032	0.00	0.00	745	3.00	0.72	-
9	2033	0.00	0.00	745	3.00	0.72	-
10	2034	0.00	0.00	745	3.00	0.72	-
11	2035	0.00	0.00	745	3.00	0.72	-
12	2036	0.00	0.00	745	3.00	0.72	-
13	2037	0.00	0.00	745	3.00	0.72	-
14	2038	0.00	0.00	745	3.00	0.72	-
15	2039	0.00	0.00	745	3.00	0.72	-
16	2040	0.00	0.00	745	3.00	0.72	-
17	2041	0.00	0.00	335	1.70	0.73	-
18	2042	0.00	0.00	335	1.00	0.73	-
19	2043	0.00	0.00	335	1.00	0.73	-
20	2044	0.00	0.00	335	1.00	0.73	-
21	2045	0.00	0.00	335	1.00	0.73	-
22	2046	0.00	0.00	335	1.00	0.73	-
23	2047	0.00	0.00	335	1.00	0.73	-
24	2048	0.00	0.00	335	1.00	0.73	-
25	2049	0.00	0.00	335	1.00	0.73	-
26	2050	0.00	0.00	335	1.00	0.73	-
27	2051	0.00	0.00	335	1.00	0.73	-
28	2052	0.00	0.00	335	1.00	0.73	-
29	2053	0.00	0.00	335	1.00	0.73	-
30	2054	0.00	0.00	335	1.00	0.73	-

0.00	Acute Hazard Impact
1	Significance Threshold
No	Significant?
0.00	Chronic Hazard Impact
1	Significance Threshold
No	Significant?
-	Cancer Risk
10	Significance Threshold
No	Significant?

Health Risk Assessment Assumptions

	Acute Reference Exposure Level (ug/m3)	
	Chronic Reference Exposure Level (ug/m3)	
	Cancer Potency Slope Factor (cancer risk per mg/kg-day)	
350	days per year	
25,550	days per lifetime	
1,090	95th Percentile Daily Breathing Rates (L/kg-day)	0<2 Years
745	95th Percentile Daily Breathing Rates (L/kg-day)	2<16 Years
335	95th Percentile Daily Breathing Rates (L/kg-day)	16<30 Years
0.85	fraction of time at home	0<2 Years
0.72	fraction of time at home	2<16 Years
0.73	fraction of time at home	16<70 Years

Project: Burney Biomass
Date: July 25, 2022
Condition: Antimony
Receptor: Residence
Source: Boiler
Height: 25m

Exposure Year	Calender Year	1-Hour Concentration (ug/m3)	Annual Concentration (ug/m3)	Daily Breathing Rates (L/kg-day)	Exposure Factor	fraction of time at home	Cancer Risk
1	2025	0.00	0.00	1,090	10.0	0.85	-
2	2026	0.00	0.00	1,090	10.0	0.85	-
3	2027	0.00	0.00	745	4.75	0.72	-
4	2028	0.00	0.00	745	3.00	0.72	-
5	2029	0.00	0.00	745	3.00	0.72	-
6	2030	0.00	0.00	745	3.00	0.72	-
7	2031	0.00	0.00	745	3.00	0.72	-
8	2032	0.00	0.00	745	3.00	0.72	-
9	2033	0.00	0.00	745	3.00	0.72	-
10	2034	0.00	0.00	745	3.00	0.72	-
11	2035	0.00	0.00	745	3.00	0.72	-
12	2036	0.00	0.00	745	3.00	0.72	-
13	2037	0.00	0.00	745	3.00	0.72	-
14	2038	0.00	0.00	745	3.00	0.72	-
15	2039	0.00	0.00	745	3.00	0.72	-
16	2040	0.00	0.00	745	3.00	0.72	-
17	2041	0.00	0.00	335	1.70	0.73	-
18	2042	0.00	0.00	335	1.00	0.73	-
19	2043	0.00	0.00	335	1.00	0.73	-
20	2044	0.00	0.00	335	1.00	0.73	-
21	2045	0.00	0.00	335	1.00	0.73	-
22	2046	0.00	0.00	335	1.00	0.73	-
23	2047	0.00	0.00	335	1.00	0.73	-
24	2048	0.00	0.00	335	1.00	0.73	-
25	2049	0.00	0.00	335	1.00	0.73	-
26	2050	0.00	0.00	335	1.00	0.73	-
27	2051	0.00	0.00	335	1.00	0.73	-
28	2052	0.00	0.00	335	1.00	0.73	-
29	2053	0.00	0.00	335	1.00	0.73	-
30	2054	0.00	0.00	335	1.00	0.73	-

	Acute Hazard Impact
1	Significance Threshold
No	Significant?
	Chronic Hazard Impact
1	Significance Threshold
No	Significant?
-	Cancer Risk
10	Significance Threshold
No	Significant?

Health Risk Assessment Assumptions

0.2	Acute Reference Exposure Level (ug/m3)	
0.015	Chronic Reference Exposure Level (ug/m3)	
12	Cancer Potency Slope Factor (cancer risk per mg/kg-day)	
350	days per year	
25,550	days per lifetime	
1,090	95th Percentile Daily Breathing Rates (L/kg-day)	0<2 Years
745	95th Percentile Daily Breathing Rates (L/kg-day)	2<16 Years
335	95th Percentile Daily Breathing Rates (L/kg-day)	16<30 Years
0.85	fraction of time at home	0<2 Years
0.72	fraction of time at home	2<16 Years
0.73	fraction of time at home	16<70 Years

Project:	Burney Biomass
Date:	July 25, 2022
Condition:	Arsenic
Receptor:	Residence
Source:	Boiler
Height:	25m

Exposure Year	Calender Year	1-Hour Concentration (ug/m3)	Annual Concentration (ug/m3)	Daily Breathing Rates (L/kg-day)	Exposure Factor	fraction of time at home	Cancer Risk
1	2025	0.00	0.00	1,090	10.0	0.85	0.07
2	2026	0.00	0.00	1,090	10.0	0.85	0.07
3	2027	0.00	0.00	745	4.75	0.72	0.02
4	2028	0.00	0.00	745	3.00	0.72	0.01
5	2029	0.00	0.00	745	3.00	0.72	0.01
6	2030	0.00	0.00	745	3.00	0.72	0.01
7	2031	0.00	0.00	745	3.00	0.72	0.01
8	2032	0.00	0.00	745	3.00	0.72	0.01
9	2033	0.00	0.00	745	3.00	0.72	0.01
10	2034	0.00	0.00	745	3.00	0.72	0.01
11	2035	0.00	0.00	745	3.00	0.72	0.01
12	2036	0.00	0.00	745	3.00	0.72	0.01
13	2037	0.00	0.00	745	3.00	0.72	0.01
14	2038	0.00	0.00	745	3.00	0.72	0.01
15	2039	0.00	0.00	745	3.00	0.72	0.01
16	2040	0.00	0.00	745	3.00	0.72	0.01
17	2041	0.00	0.00	335	1.70	0.73	0.00
18	2042	0.00	0.00	335	1.00	0.73	0.00
19	2043	0.00	0.00	335	1.00	0.73	0.00
20	2044	0.00	0.00	335	1.00	0.73	0.00
21	2045	0.00	0.00	335	1.00	0.73	0.00
22	2046	0.00	0.00	335	1.00	0.73	0.00
23	2047	0.00	0.00	335	1.00	0.73	0.00
24	2048	0.00	0.00	335	1.00	0.73	0.00
25	2049	0.00	0.00	335	1.00	0.73	0.00
26	2050	0.00	0.00	335	1.00	0.73	0.00
27	2051	0.00	0.00	335	1.00	0.73	0.00
28	2052	0.00	0.00	335	1.00	0.73	0.00
29	2053	0.00	0.00	335	1.00	0.73	0.00
30	2054	0.00	0.00	335	1.00	0.73	0.00

0.01	Acute Hazard Impact
1	Significance Threshold
No	Significant?
0.00	Chronic Hazard Impact
1	Significance Threshold
No	Significant?
0.33	Cancer Risk
10	Significance Threshold
No	Significant?

Health Risk Assessment Assumptions

	Acute Reference Exposure Level (ug/m3)	
	Chronic Reference Exposure Level (ug/m3)	
0.042	Cancer Potency Slope Factor (cancer risk per mg/kg-day)	
350	days per year	
25,550	days per lifetime	
1,090	95th Percentile Daily Breathing Rates (L/kg-day)	0<2 Years
745	95th Percentile Daily Breathing Rates (L/kg-day)	2<16 Years
335	95th Percentile Daily Breathing Rates (L/kg-day)	16<30 Years
0.85	fraction of time at home	0<2 Years
0.72	fraction of time at home	2<16 Years
0.73	fraction of time at home	16<70 Years

Project: Burney Biomass
Date: July 25, 2022
Condition: Lead
Receptor: Residence
Source: Boiler
Height: 25m

Exposure Year	Calender Year	1-Hour Concentration (ug/m3)	Annual Concentration (ug/m3)	Daily Breathing Rates (L/kg-day)	Exposure Factor	fraction of time at home	Cancer Risk
1	2025	0.00	0.00	1,090	10.0	0.85	0.00
2	2026	0.00	0.00	1,090	10.0	0.85	0.00
3	2027	0.00	0.00	745	4.75	0.72	0.00
4	2028	0.00	0.00	745	3.00	0.72	0.00
5	2029	0.00	0.00	745	3.00	0.72	0.00
6	2030	0.00	0.00	745	3.00	0.72	0.00
7	2031	0.00	0.00	745	3.00	0.72	0.00
8	2032	0.00	0.00	745	3.00	0.72	0.00
9	2033	0.00	0.00	745	3.00	0.72	0.00
10	2034	0.00	0.00	745	3.00	0.72	0.00
11	2035	0.00	0.00	745	3.00	0.72	0.00
12	2036	0.00	0.00	745	3.00	0.72	0.00
13	2037	0.00	0.00	745	3.00	0.72	0.00
14	2038	0.00	0.00	745	3.00	0.72	0.00
15	2039	0.00	0.00	745	3.00	0.72	0.00
16	2040	0.00	0.00	745	3.00	0.72	0.00
17	2041	0.00	0.00	335	1.70	0.73	0.00
18	2042	0.00	0.00	335	1.00	0.73	0.00
19	2043	0.00	0.00	335	1.00	0.73	0.00
20	2044	0.00	0.00	335	1.00	0.73	0.00
21	2045	0.00	0.00	335	1.00	0.73	0.00
22	2046	0.00	0.00	335	1.00	0.73	0.00
23	2047	0.00	0.00	335	1.00	0.73	0.00
24	2048	0.00	0.00	335	1.00	0.73	0.00
25	2049	0.00	0.00	335	1.00	0.73	0.00
26	2050	0.00	0.00	335	1.00	0.73	0.00
27	2051	0.00	0.00	335	1.00	0.73	0.00
28	2052	0.00	0.00	335	1.00	0.73	0.00
29	2053	0.00	0.00	335	1.00	0.73	0.00
30	2054	0.00	0.00	335	1.00	0.73	0.00

	Acute Hazard Impact
1	Significance Threshold
No	Significant?
	Chronic Hazard Impact
1	Significance Threshold
No	Significant?
0.00	Cancer Risk
10	Significance Threshold
No	Significant?

Health Risk Assessment Assumptions

	Acute Reference Exposure Level (ug/m3)	
	Chronic Reference Exposure Level (ug/m3)	
	Cancer Potency Slope Factor (cancer risk per mg/kg-day)	
350	days per year	
25,550	days per lifetime	
1,090	95th Percentile Daily Breathing Rates (L/kg-day)	0<2 Years
745	95th Percentile Daily Breathing Rates (L/kg-day)	2<16 Years
335	95th Percentile Daily Breathing Rates (L/kg-day)	16<30 Years
0.85	fraction of time at home	0<2 Years
0.72	fraction of time at home	2<16 Years
0.73	fraction of time at home	16<70 Years

Project:	Burney Biomass
Date:	July 25, 2022
Condition:	Chromium
Receptor:	Residence
Source:	Boiler
Height:	25m

Exposure Year	Calender Year	1-Hour Concentration (ug/m3)	Annual Concentration (ug/m3)	Daily Breathing Rates (L/kg-day)	Exposure Factor	fraction of time at home	Cancer Risk
1	2025	0.00	0.00	1,090	10.0	0.85	-
2	2026	0.00	0.00	1,090	10.0	0.85	-
3	2027	0.00	0.00	745	4.75	0.72	-
4	2028	0.00	0.00	745	3.00	0.72	-
5	2029	0.00	0.00	745	3.00	0.72	-
6	2030	0.00	0.00	745	3.00	0.72	-
7	2031	0.00	0.00	745	3.00	0.72	-
8	2032	0.00	0.00	745	3.00	0.72	-
9	2033	0.00	0.00	745	3.00	0.72	-
10	2034	0.00	0.00	745	3.00	0.72	-
11	2035	0.00	0.00	745	3.00	0.72	-
12	2036	0.00	0.00	745	3.00	0.72	-
13	2037	0.00	0.00	745	3.00	0.72	-
14	2038	0.00	0.00	745	3.00	0.72	-
15	2039	0.00	0.00	745	3.00	0.72	-
16	2040	0.00	0.00	745	3.00	0.72	-
17	2041	0.00	0.00	335	1.70	0.73	-
18	2042	0.00	0.00	335	1.00	0.73	-
19	2043	0.00	0.00	335	1.00	0.73	-
20	2044	0.00	0.00	335	1.00	0.73	-
21	2045	0.00	0.00	335	1.00	0.73	-
22	2046	0.00	0.00	335	1.00	0.73	-
23	2047	0.00	0.00	335	1.00	0.73	-
24	2048	0.00	0.00	335	1.00	0.73	-
25	2049	0.00	0.00	335	1.00	0.73	-
26	2050	0.00	0.00	335	1.00	0.73	-
27	2051	0.00	0.00	335	1.00	0.73	-
28	2052	0.00	0.00	335	1.00	0.73	-
29	2053	0.00	0.00	335	1.00	0.73	-
30	2054	0.00	0.00	335	1.00	0.73	-

	Acute Hazard Impact
1	Significance Threshold
No	Significant?
	Chronic Hazard Impact
1	Significance Threshold
No	Significant?
-	Cancer Risk
10	Significance Threshold
No	Significant?

Health Risk Assessment Assumptions

	Acute Reference Exposure Level (ug/m3)
	Chronic Reference Exposure Level (ug/m3)
27	Cancer Potency Slope Factor (cancer risk per mg/kg-day)
350	days per year
25,550	days per lifetime
1,090	95th Percentile Daily Breathing Rates (L/kg-day) 0<2 Years
745	95th Percentile Daily Breathing Rates (L/kg-day) 2<16 Years
335	95th Percentile Daily Breathing Rates (L/kg-day) 16<30 Years
0.85	fraction of time at home 0<2 Years
0.72	fraction of time at home 2<16 Years
0.73	fraction of time at home 16<70 Years

Project: Burney Biomass
Date: July 25, 2022
Condition: Cobalt
Receptor: Residence
Source: Boiler
Height: 25m

Exposure Year	Calender Year	1-Hour Concentration (ug/m3)	Annual Concentration (ug/m3)	Daily Breathing Rates (L/kg-day)	Exposure Factor	fraction of time at home	Cancer Risk
1	2025	0.00	0.00	1,090	10.0	0.85	0.15
2	2026	0.00	0.00	1,090	10.0	0.85	0.15
3	2027	0.00	0.00	745	4.75	0.72	0.04
4	2028	0.00	0.00	745	3.00	0.72	0.03
5	2029	0.00	0.00	745	3.00	0.72	0.03
6	2030	0.00	0.00	745	3.00	0.72	0.03
7	2031	0.00	0.00	745	3.00	0.72	0.03
8	2032	0.00	0.00	745	3.00	0.72	0.03
9	2033	0.00	0.00	745	3.00	0.72	0.03
10	2034	0.00	0.00	745	3.00	0.72	0.03
11	2035	0.00	0.00	745	3.00	0.72	0.03
12	2036	0.00	0.00	745	3.00	0.72	0.03
13	2037	0.00	0.00	745	3.00	0.72	0.03
14	2038	0.00	0.00	745	3.00	0.72	0.03
15	2039	0.00	0.00	745	3.00	0.72	0.03
16	2040	0.00	0.00	745	3.00	0.72	0.03
17	2041	0.00	0.00	335	1.70	0.73	0.01
18	2042	0.00	0.00	335	1.00	0.73	0.00
19	2043	0.00	0.00	335	1.00	0.73	0.00
20	2044	0.00	0.00	335	1.00	0.73	0.00
21	2045	0.00	0.00	335	1.00	0.73	0.00
22	2046	0.00	0.00	335	1.00	0.73	0.00
23	2047	0.00	0.00	335	1.00	0.73	0.00
24	2048	0.00	0.00	335	1.00	0.73	0.00
25	2049	0.00	0.00	335	1.00	0.73	0.00
26	2050	0.00	0.00	335	1.00	0.73	0.00
27	2051	0.00	0.00	335	1.00	0.73	0.00
28	2052	0.00	0.00	335	1.00	0.73	0.00
29	2053	0.00	0.00	335	1.00	0.73	0.00
30	2054	0.00	0.00	335	1.00	0.73	0.00

	Acute Hazard Impact
1	Significance Threshold
No	Significant?
	Chronic Hazard Impact
1	Significance Threshold
No	Significant?
0.75	Cancer Risk
10	Significance Threshold
No	Significant?

Health Risk Assessment Assumptions

100	Acute Reference Exposure Level (ug/m3)	
	Chronic Reference Exposure Level (ug/m3)	
	Cancer Potency Slope Factor (cancer risk per mg/kg-day)	
350	days per year	
25,550	days per lifetime	
1,090	95th Percentile Daily Breathing Rates (L/kg-day)	0<2 Years
745	95th Percentile Daily Breathing Rates (L/kg-day)	2<16 Years
335	95th Percentile Daily Breathing Rates (L/kg-day)	16<30 Years
0.85	fraction of time at home	0<2 Years
0.72	fraction of time at home	2<16 Years
0.73	fraction of time at home	16<70 Years

Project: Burney Biomass
Date: July 25, 2022
Condition: Copper
Receptor: Residence
Source: Boiler
Height: 25m

Exposure Year	Calender Year	1-Hour Concentration (ug/m3)	Annual Concentration (ug/m3)	Daily Breathing Rates (L/kg-day)	Exposure Factor	fraction of time at home	Cancer Risk
1	2025	0.00	0.00	1,090	10.0	0.85	-
2	2026	0.00	0.00	1,090	10.0	0.85	-
3	2027	0.00	0.00	745	4.75	0.72	-
4	2028	0.00	0.00	745	3.00	0.72	-
5	2029	0.00	0.00	745	3.00	0.72	-
6	2030	0.00	0.00	745	3.00	0.72	-
7	2031	0.00	0.00	745	3.00	0.72	-
8	2032	0.00	0.00	745	3.00	0.72	-
9	2033	0.00	0.00	745	3.00	0.72	-
10	2034	0.00	0.00	745	3.00	0.72	-
11	2035	0.00	0.00	745	3.00	0.72	-
12	2036	0.00	0.00	745	3.00	0.72	-
13	2037	0.00	0.00	745	3.00	0.72	-
14	2038	0.00	0.00	745	3.00	0.72	-
15	2039	0.00	0.00	745	3.00	0.72	-
16	2040	0.00	0.00	745	3.00	0.72	-
17	2041	0.00	0.00	335	1.70	0.73	-
18	2042	0.00	0.00	335	1.00	0.73	-
19	2043	0.00	0.00	335	1.00	0.73	-
20	2044	0.00	0.00	335	1.00	0.73	-
21	2045	0.00	0.00	335	1.00	0.73	-
22	2046	0.00	0.00	335	1.00	0.73	-
23	2047	0.00	0.00	335	1.00	0.73	-
24	2048	0.00	0.00	335	1.00	0.73	-
25	2049	0.00	0.00	335	1.00	0.73	-
26	2050	0.00	0.00	335	1.00	0.73	-
27	2051	0.00	0.00	335	1.00	0.73	-
28	2052	0.00	0.00	335	1.00	0.73	-
29	2053	0.00	0.00	335	1.00	0.73	-
30	2054	0.00	0.00	335	1.00	0.73	-

0.00	Acute Hazard Impact
1	Significance Threshold
No	Significant?
	Chronic Hazard Impact
1	Significance Threshold
No	Significant?
-	Cancer Risk
10	Significance Threshold
No	Significant?

Health Risk Assessment Assumptions

0.17	Acute Reference Exposure Level (ug/m3)	
0.09	Chronic Reference Exposure Level (ug/m3)	
	Cancer Potency Slope Factor (cancer risk per mg/kg-day)	
350	days per year	
25,550	days per lifetime	
1,090	95th Percentile Daily Breathing Rates (L/kg-day)	0<2 Years
745	95th Percentile Daily Breathing Rates (L/kg-day)	2<16 Years
335	95th Percentile Daily Breathing Rates (L/kg-day)	16<30 Years
0.85	fraction of time at home	0<2 Years
0.72	fraction of time at home	2<16 Years
0.73	fraction of time at home	16<70 Years

Project:	Burney Biomass
Date:	July 25, 2022
Condition:	Manganese
Receptor:	Residence
Source:	Boiler
Height:	25m

Exposure Year	Calender Year	1-Hour Concentration (ug/m3)	Annual Concentration (ug/m3)	Daily Breathing Rates (L/kg-day)	Exposure Factor	fraction of time at home	Cancer Risk
1	2025	0.00	0.00	1,090	10.0	0.85	-
2	2026	0.00	0.00	1,090	10.0	0.85	-
3	2027	0.00	0.00	745	4.75	0.72	-
4	2028	0.00	0.00	745	3.00	0.72	-
5	2029	0.00	0.00	745	3.00	0.72	-
6	2030	0.00	0.00	745	3.00	0.72	-
7	2031	0.00	0.00	745	3.00	0.72	-
8	2032	0.00	0.00	745	3.00	0.72	-
9	2033	0.00	0.00	745	3.00	0.72	-
10	2034	0.00	0.00	745	3.00	0.72	-
11	2035	0.00	0.00	745	3.00	0.72	-
12	2036	0.00	0.00	745	3.00	0.72	-
13	2037	0.00	0.00	745	3.00	0.72	-
14	2038	0.00	0.00	745	3.00	0.72	-
15	2039	0.00	0.00	745	3.00	0.72	-
16	2040	0.00	0.00	745	3.00	0.72	-
17	2041	0.00	0.00	335	1.70	0.73	-
18	2042	0.00	0.00	335	1.00	0.73	-
19	2043	0.00	0.00	335	1.00	0.73	-
20	2044	0.00	0.00	335	1.00	0.73	-
21	2045	0.00	0.00	335	1.00	0.73	-
22	2046	0.00	0.00	335	1.00	0.73	-
23	2047	0.00	0.00	335	1.00	0.73	-
24	2048	0.00	0.00	335	1.00	0.73	-
25	2049	0.00	0.00	335	1.00	0.73	-
26	2050	0.00	0.00	335	1.00	0.73	-
27	2051	0.00	0.00	335	1.00	0.73	-
28	2052	0.00	0.00	335	1.00	0.73	-
29	2053	0.00	0.00	335	1.00	0.73	-
30	2054	0.00	0.00	335	1.00	0.73	-

0.01	Acute Hazard Impact
1	Significance Threshold
No	Significant?
0.00	Chronic Hazard Impact
1	Significance Threshold
No	Significant?
-	Cancer Risk
10	Significance Threshold
No	Significant?

Health Risk Assessment Assumptions

0.2	Acute Reference Exposure Level (ug/m3)	
0.014	Chronic Reference Exposure Level (ug/m3)	
0.91	Cancer Potency Slope Factor (cancer risk per mg/kg-day)	
350	days per year	
25,550	days per lifetime	
1,090	95th Percentile Daily Breathing Rates (L/kg-day)	0<2 Years
745	95th Percentile Daily Breathing Rates (L/kg-day)	2<16 Years
335	95th Percentile Daily Breathing Rates (L/kg-day)	16<30 Years
0.85	fraction of time at home	0<2 Years
0.72	fraction of time at home	2<16 Years
0.73	fraction of time at home	16<70 Years

Project:	Burney Biomass
Date:	July 25, 2022
Condition:	Nickel
Receptor:	Residence
Source:	Boiler
Height:	25m

Exposure Year	Calender Year	1-Hour Concentration (ug/m3)	Annual Concentration (ug/m3)	Daily Breathing Rates (L/kg-day)	Exposure Factor	fraction of time at home	Cancer Risk
1	2025	0.00	0.00	1,090	10.0	0.85	0.01
2	2026	0.00	0.00	1,090	10.0	0.85	0.01
3	2027	0.00	0.00	745	4.75	0.72	0.00
4	2028	0.00	0.00	745	3.00	0.72	0.00
5	2029	0.00	0.00	745	3.00	0.72	0.00
6	2030	0.00	0.00	745	3.00	0.72	0.00
7	2031	0.00	0.00	745	3.00	0.72	0.00
8	2032	0.00	0.00	745	3.00	0.72	0.00
9	2033	0.00	0.00	745	3.00	0.72	0.00
10	2034	0.00	0.00	745	3.00	0.72	0.00
11	2035	0.00	0.00	745	3.00	0.72	0.00
12	2036	0.00	0.00	745	3.00	0.72	0.00
13	2037	0.00	0.00	745	3.00	0.72	0.00
14	2038	0.00	0.00	745	3.00	0.72	0.00
15	2039	0.00	0.00	745	3.00	0.72	0.00
16	2040	0.00	0.00	745	3.00	0.72	0.00
17	2041	0.00	0.00	335	1.70	0.73	0.00
18	2042	0.00	0.00	335	1.00	0.73	0.00
19	2043	0.00	0.00	335	1.00	0.73	0.00
20	2044	0.00	0.00	335	1.00	0.73	0.00
21	2045	0.00	0.00	335	1.00	0.73	0.00
22	2046	0.00	0.00	335	1.00	0.73	0.00
23	2047	0.00	0.00	335	1.00	0.73	0.00
24	2048	0.00	0.00	335	1.00	0.73	0.00
25	2049	0.00	0.00	335	1.00	0.73	0.00
26	2050	0.00	0.00	335	1.00	0.73	0.00
27	2051	0.00	0.00	335	1.00	0.73	0.00
28	2052	0.00	0.00	335	1.00	0.73	0.00
29	2053	0.00	0.00	335	1.00	0.73	0.00
30	2054	0.00	0.00	335	1.00	0.73	0.00

0.01	Acute Hazard Impact
1	Significance Threshold
No	Significant?
0.00	Chronic Hazard Impact
1	Significance Threshold
No	Significant?
0.03	Cancer Risk
10	Significance Threshold
No	Significant?

Health Risk Assessment Assumptions

	Acute Reference Exposure Level (ug/m3)
	Chronic Reference Exposure Level (ug/m3)
	Cancer Potency Slope Factor (cancer risk per mg/kg-day)
350	days per year
25,550	days per lifetime
1,090	95th Percentile Daily Breathing Rates (L/kg-day) 0<2 Years
745	95th Percentile Daily Breathing Rates (L/kg-day) 2<16 Years
335	95th Percentile Daily Breathing Rates (L/kg-day) 16<30 Years
0.85	fraction of time at home 0<2 Years
0.72	fraction of time at home 2<16 Years
0.73	fraction of time at home 16<70 Years

Project: Burney Biomass
Date: July 25, 2022
Condition: Vanadium
Receptor: Residence
Source: Boiler
Height: 25m

Exposure Year	Calender Year	1-Hour Concentration (ug/m3)	Annual Concentration (ug/m3)	Daily Breathing Rates (L/kg-day)	Exposure Factor	fraction of time at home	Cancer Risk
1	2025	0.00	0.00	1,090	10.0	0.85	-
2	2026	0.00	0.00	1,090	10.0	0.85	-
3	2027	0.00	0.00	745	4.75	0.72	-
4	2028	0.00	0.00	745	3.00	0.72	-
5	2029	0.00	0.00	745	3.00	0.72	-
6	2030	0.00	0.00	745	3.00	0.72	-
7	2031	0.00	0.00	745	3.00	0.72	-
8	2032	0.00	0.00	745	3.00	0.72	-
9	2033	0.00	0.00	745	3.00	0.72	-
10	2034	0.00	0.00	745	3.00	0.72	-
11	2035	0.00	0.00	745	3.00	0.72	-
12	2036	0.00	0.00	745	3.00	0.72	-
13	2037	0.00	0.00	745	3.00	0.72	-
14	2038	0.00	0.00	745	3.00	0.72	-
15	2039	0.00	0.00	745	3.00	0.72	-
16	2040	0.00	0.00	745	3.00	0.72	-
17	2041	0.00	0.00	335	1.70	0.73	-
18	2042	0.00	0.00	335	1.00	0.73	-
19	2043	0.00	0.00	335	1.00	0.73	-
20	2044	0.00	0.00	335	1.00	0.73	-
21	2045	0.00	0.00	335	1.00	0.73	-
22	2046	0.00	0.00	335	1.00	0.73	-
23	2047	0.00	0.00	335	1.00	0.73	-
24	2048	0.00	0.00	335	1.00	0.73	-
25	2049	0.00	0.00	335	1.00	0.73	-
26	2050	0.00	0.00	335	1.00	0.73	-
27	2051	0.00	0.00	335	1.00	0.73	-
28	2052	0.00	0.00	335	1.00	0.73	-
29	2053	0.00	0.00	335	1.00	0.73	-
30	2054	0.00	0.00	335	1.00	0.73	-

	Acute Hazard Impact
1	Significance Threshold
No	Significant?
	Chronic Hazard Impact
1	Significance Threshold
No	Significant?
-	Cancer Risk
10	Significance Threshold
No	Significant?

Health Risk Assessment Assumptions

	Acute Reference Exposure Level (ug/m3)
0.00004	Chronic Reference Exposure Level (ug/m3)
1,300	Cancer Potency Slope Factor (cancer risk per mg/kg-day)
350	days per year
25,550	days per lifetime
1,090	95th Percentile Daily Breathing Rates (L/kg-day) 0<2 Years
745	95th Percentile Daily Breathing Rates (L/kg-day) 2<16 Years
335	95th Percentile Daily Breathing Rates (L/kg-day) 16<30 Years
0.85	fraction of time at home 0<2 Years
0.72	fraction of time at home 2<16 Years
0.73	fraction of time at home 16<70 Years

Project: Burney Biomass
Date: July 25, 2022
Condition: Dioxin
Receptor: Residence
Source: Boiler
Height: 25m

Exposure Year	Calender Year	1-Hour Concentration (ug/m3)	Annual Concentration (ug/m3)	Daily Breathing Rates (L/kg-day)	Exposure Factor	fraction of time at home	Cancer Risk
1	2025	0.00	0.00	1,090	10.0	0.85	0.00
2	2026	0.00	0.00	1,090	10.0	0.85	0.00
3	2027	0.00	0.00	745	4.75	0.72	0.00
4	2028	0.00	0.00	745	3.00	0.72	0.00
5	2029	0.00	0.00	745	3.00	0.72	0.00
6	2030	0.00	0.00	745	3.00	0.72	0.00
7	2031	0.00	0.00	745	3.00	0.72	0.00
8	2032	0.00	0.00	745	3.00	0.72	0.00
9	2033	0.00	0.00	745	3.00	0.72	0.00
10	2034	0.00	0.00	745	3.00	0.72	0.00
11	2035	0.00	0.00	745	3.00	0.72	0.00
12	2036	0.00	0.00	745	3.00	0.72	0.00
13	2037	0.00	0.00	745	3.00	0.72	0.00
14	2038	0.00	0.00	745	3.00	0.72	0.00
15	2039	0.00	0.00	745	3.00	0.72	0.00
16	2040	0.00	0.00	745	3.00	0.72	0.00
17	2041	0.00	0.00	335	1.70	0.73	0.00
18	2042	0.00	0.00	335	1.00	0.73	0.00
19	2043	0.00	0.00	335	1.00	0.73	0.00
20	2044	0.00	0.00	335	1.00	0.73	0.00
21	2045	0.00	0.00	335	1.00	0.73	0.00
22	2046	0.00	0.00	335	1.00	0.73	0.00
23	2047	0.00	0.00	335	1.00	0.73	0.00
24	2048	0.00	0.00	335	1.00	0.73	0.00
25	2049	0.00	0.00	335	1.00	0.73	0.00
26	2050	0.00	0.00	335	1.00	0.73	0.00
27	2051	0.00	0.00	335	1.00	0.73	0.00
28	2052	0.00	0.00	335	1.00	0.73	0.00
29	2053	0.00	0.00	335	1.00	0.73	0.00
30	2054	0.00	0.00	335	1.00	0.73	0.00

	Acute Hazard Impact
1	Significance Threshold
No	Significant?
0.00	Chronic Hazard Impact
1	Significance Threshold
No	Significant?
0.00	Cancer Risk
10	Significance Threshold
No	Significant?

Health Risk Assessment Assumptions

2100	Acute Reference Exposure Level (ug/m3)	
9	Chronic Reference Exposure Level (ug/m3)	
	Cancer Potency Slope Factor (cancer risk per mg/kg-day)	
350	days per year	
25,550	days per lifetime	
1,090	95th Percentile Daily Breathing Rates (L/kg-day)	0<2 Years
745	95th Percentile Daily Breathing Rates (L/kg-day)	2<16 Years
335	95th Percentile Daily Breathing Rates (L/kg-day)	16<30 Years
0.85	fraction of time at home	0<2 Years
0.72	fraction of time at home	2<16 Years
0.73	fraction of time at home	16<70 Years

Project:	Burney Biomass
Date:	July 25, 2022
Condition:	HCL
Receptor:	Residence
Source:	Boiler
Height:	25m

Exposure Year	Calender Year	1-Hour Concentration (ug/m3)	Annual Concentration (ug/m3)	Daily Breathing Rates (L/kg-day)	Exposure Factor	fraction of time at home	Cancer Risk
1	2025	0.07	0.00	1,090	10.0	0.85	-
2	2026	0.07	0.00	1,090	10.0	0.85	-
3	2027	0.07	0.00	745	4.75	0.72	-
4	2028	0.07	0.00	745	3.00	0.72	-
5	2029	0.07	0.00	745	3.00	0.72	-
6	2030	0.07	0.00	745	3.00	0.72	-
7	2031	0.07	0.00	745	3.00	0.72	-
8	2032	0.07	0.00	745	3.00	0.72	-
9	2033	0.07	0.00	745	3.00	0.72	-
10	2034	0.07	0.00	745	3.00	0.72	-
11	2035	0.07	0.00	745	3.00	0.72	-
12	2036	0.07	0.00	745	3.00	0.72	-
13	2037	0.07	0.00	745	3.00	0.72	-
14	2038	0.07	0.00	745	3.00	0.72	-
15	2039	0.07	0.00	745	3.00	0.72	-
16	2040	0.07	0.00	745	3.00	0.72	-
17	2041	0.07	0.00	335	1.70	0.73	-
18	2042	0.07	0.00	335	1.00	0.73	-
19	2043	0.07	0.00	335	1.00	0.73	-
20	2044	0.07	0.00	335	1.00	0.73	-
21	2045	0.07	0.00	335	1.00	0.73	-
22	2046	0.07	0.00	335	1.00	0.73	-
23	2047	0.07	0.00	335	1.00	0.73	-
24	2048	0.07	0.00	335	1.00	0.73	-
25	2049	0.07	0.00	335	1.00	0.73	-
10	2034	0.07	0.00	335	1.00	0.73	-
11	2035	0.07	0.00	335	1.00	0.73	-
12	2036	0.07	0.00	335	1.00	0.73	-
13	2037	0.07	0.00	335	1.00	0.73	-
14	2038	0.07	0.00	335	1.00	0.73	-

0.00	Acute Hazard Impact
1	Significance Threshold
No	Significant?
0.00	Chronic Hazard Impact
1	Significance Threshold
No	Significant?
-	Cancer Risk
10	Significance Threshold
No	Significant?

Health Risk Assessment Assumptions

	Acute Reference Exposure Level (ug/m3)	
0.02	Chronic Reference Exposure Level (ug/m3)	
15	Cancer Potency Slope Factor (cancer risk per mg/kg-day)	
350	days per year	
25,550	days per lifetime	
1,090	95th Percentile Daily Breathing Rates (L/kg-day)	0<2 Years
745	95th Percentile Daily Breathing Rates (L/kg-day)	2<16 Years
335	95th Percentile Daily Breathing Rates (L/kg-day)	16<30 Years
0.85	fraction of time at home	0<2 Years
0.72	fraction of time at home	2<16 Years
0.73	fraction of time at home	16<70 Years

Project: Burney Biomass
Date: July 25, 2022
Condition: Cadmium
Receptor: Residence
Source: Boiler
Height: 35m

Exposure Year	Calender Year	1-Hour Concentration (ug/m3)	Annual Concentration (ug/m3)	Daily Breathing Rates (L/kg-day)	Exposure Factor	fraction of time at home	Cancer Risk
1	2025	0.00	0.00	1,090	10.0	0.85	0.07
2	2026	0.00	0.00	1,090	10.0	0.85	0.07
3	2027	0.00	0.00	745	4.75	0.72	0.02
4	2028	0.00	0.00	745	3.00	0.72	0.01
5	2029	0.00	0.00	745	3.00	0.72	0.01
6	2030	0.00	0.00	745	3.00	0.72	0.01
7	2031	0.00	0.00	745	3.00	0.72	0.01
8	2032	0.00	0.00	745	3.00	0.72	0.01
9	2033	0.00	0.00	745	3.00	0.72	0.01
10	2034	0.00	0.00	745	3.00	0.72	0.01
11	2035	0.00	0.00	745	3.00	0.72	0.01
12	2036	0.00	0.00	745	3.00	0.72	0.01
13	2037	0.00	0.00	745	3.00	0.72	0.01
14	2038	0.00	0.00	745	3.00	0.72	0.01
15	2039	0.00	0.00	745	3.00	0.72	0.01
16	2040	0.00	0.00	745	3.00	0.72	0.01
17	2041	0.00	0.00	335	1.70	0.73	0.00
18	2042	0.00	0.00	335	1.00	0.73	0.00
19	2043	0.00	0.00	335	1.00	0.73	0.00
20	2044	0.00	0.00	335	1.00	0.73	0.00
21	2045	0.00	0.00	335	1.00	0.73	0.00
22	2046	0.00	0.00	335	1.00	0.73	0.00
23	2047	0.00	0.00	335	1.00	0.73	0.00
24	2048	0.00	0.00	335	1.00	0.73	0.00
25	2049	0.00	0.00	335	1.00	0.73	0.00
26	2050	0.00	0.00	335	1.00	0.73	0.00
27	2051	0.00	0.00	335	1.00	0.73	0.00
28	2052	0.00	0.00	335	1.00	0.73	0.00
29	2053	0.00	0.00	335	1.00	0.73	0.00
30	2054	0.00	0.00	335	1.00	0.73	0.00

	Acute Hazard Impact
1	Significance Threshold
No	Significant?
0.00	Chronic Hazard Impact
1	Significance Threshold
No	Significant?
0.33	Cancer Risk
10	Significance Threshold
No	Significant?

Health Risk Assessment Assumptions

0.6	Acute Reference Exposure Level (ug/m3)	
0.03	Chronic Reference Exposure Level (ug/m3)	
	Cancer Potency Slope Factor (cancer risk per mg/kg-day)	
350	days per year	
25,550	days per lifetime	
1,090	95th Percentile Daily Breathing Rates (L/kg-day)	0<2 Years
745	95th Percentile Daily Breathing Rates (L/kg-day)	2<16 Years
335	95th Percentile Daily Breathing Rates (L/kg-day)	16<30 Years
0.85	fraction of time at home	0<2 Years
0.72	fraction of time at home	2<16 Years
0.73	fraction of time at home	16<70 Years

Project:	Burney Biomass
Date:	July 25, 2022
Condition:	Mercury
Receptor:	Residence
Source:	Boiler
Height:	35m

Exposure Year	Calender Year	1-Hour Concentration (ug/m3)	Annual Concentration (ug/m3)	Daily Breathing Rates (L/kg-day)	Exposure Factor	fraction of time at home	Cancer Risk
1	2025	0.00	0.00	1,090	10.0	0.85	-
2	2026	0.00	0.00	1,090	10.0	0.85	-
3	2027	0.00	0.00	745	4.75	0.72	-
4	2028	0.00	0.00	745	3.00	0.72	-
5	2029	0.00	0.00	745	3.00	0.72	-
6	2030	0.00	0.00	745	3.00	0.72	-
7	2031	0.00	0.00	745	3.00	0.72	-
8	2032	0.00	0.00	745	3.00	0.72	-
9	2033	0.00	0.00	745	3.00	0.72	-
10	2034	0.00	0.00	745	3.00	0.72	-
11	2035	0.00	0.00	745	3.00	0.72	-
12	2036	0.00	0.00	745	3.00	0.72	-
13	2037	0.00	0.00	745	3.00	0.72	-
14	2038	0.00	0.00	745	3.00	0.72	-
15	2039	0.00	0.00	745	3.00	0.72	-
16	2040	0.00	0.00	745	3.00	0.72	-
17	2041	0.00	0.00	335	1.70	0.73	-
18	2042	0.00	0.00	335	1.00	0.73	-
19	2043	0.00	0.00	335	1.00	0.73	-
20	2044	0.00	0.00	335	1.00	0.73	-
21	2045	0.00	0.00	335	1.00	0.73	-
22	2046	0.00	0.00	335	1.00	0.73	-
23	2047	0.00	0.00	335	1.00	0.73	-
24	2048	0.00	0.00	335	1.00	0.73	-
25	2049	0.00	0.00	335	1.00	0.73	-
26	2050	0.00	0.00	335	1.00	0.73	-
27	2051	0.00	0.00	335	1.00	0.73	-
28	2052	0.00	0.00	335	1.00	0.73	-
29	2053	0.00	0.00	335	1.00	0.73	-
30	2054	0.00	0.00	335	1.00	0.73	-

0.00	Acute Hazard Impact
1	Significance Threshold
No	Significant?
0.00	Chronic Hazard Impact
1	Significance Threshold
No	Significant?
-	Cancer Risk
10	Significance Threshold
No	Significant?

Health Risk Assessment Assumptions

	Acute Reference Exposure Level (ug/m3)	
	Chronic Reference Exposure Level (ug/m3)	
	Cancer Potency Slope Factor (cancer risk per mg/kg-day)	
350	days per year	
25,550	days per lifetime	
1,090	95th Percentile Daily Breathing Rates (L/kg-day)	0<2 Years
745	95th Percentile Daily Breathing Rates (L/kg-day)	2<16 Years
335	95th Percentile Daily Breathing Rates (L/kg-day)	16<30 Years
0.85	fraction of time at home	0<2 Years
0.72	fraction of time at home	2<16 Years
0.73	fraction of time at home	16<70 Years

Project: Burney Biomass
Date: July 25, 2022
Condition: Antimony
Receptor: Residence
Source: Boiler
Height: 35m

Exposure Year	Calender Year	1-Hour Concentration (ug/m3)	Annual Concentration (ug/m3)	Daily Breathing Rates (L/kg-day)	Exposure Factor	fraction of time at home	Cancer Risk
1	2025	0.00	0.00	1,090	10.0	0.85	-
2	2026	0.00	0.00	1,090	10.0	0.85	-
3	2027	0.00	0.00	745	4.75	0.72	-
4	2028	0.00	0.00	745	3.00	0.72	-
5	2029	0.00	0.00	745	3.00	0.72	-
6	2030	0.00	0.00	745	3.00	0.72	-
7	2031	0.00	0.00	745	3.00	0.72	-
8	2032	0.00	0.00	745	3.00	0.72	-
9	2033	0.00	0.00	745	3.00	0.72	-
10	2034	0.00	0.00	745	3.00	0.72	-
11	2035	0.00	0.00	745	3.00	0.72	-
12	2036	0.00	0.00	745	3.00	0.72	-
13	2037	0.00	0.00	745	3.00	0.72	-
14	2038	0.00	0.00	745	3.00	0.72	-
15	2039	0.00	0.00	745	3.00	0.72	-
16	2040	0.00	0.00	745	3.00	0.72	-
17	2041	0.00	0.00	335	1.70	0.73	-
18	2042	0.00	0.00	335	1.00	0.73	-
19	2043	0.00	0.00	335	1.00	0.73	-
20	2044	0.00	0.00	335	1.00	0.73	-
21	2045	0.00	0.00	335	1.00	0.73	-
22	2046	0.00	0.00	335	1.00	0.73	-
23	2047	0.00	0.00	335	1.00	0.73	-
24	2048	0.00	0.00	335	1.00	0.73	-
25	2049	0.00	0.00	335	1.00	0.73	-
26	2050	0.00	0.00	335	1.00	0.73	-
27	2051	0.00	0.00	335	1.00	0.73	-
28	2052	0.00	0.00	335	1.00	0.73	-
29	2053	0.00	0.00	335	1.00	0.73	-
30	2054	0.00	0.00	335	1.00	0.73	-

	Acute Hazard Impact
1	Significance Threshold
No	Significant?
	Chronic Hazard Impact
1	Significance Threshold
No	Significant?
-	Cancer Risk
10	Significance Threshold
No	Significant?

Health Risk Assessment Assumptions

0.2	Acute Reference Exposure Level (ug/m3)	
0.015	Chronic Reference Exposure Level (ug/m3)	
12	Cancer Potency Slope Factor (cancer risk per mg/kg-day)	
350	days per year	
25,550	days per lifetime	
1,090	95th Percentile Daily Breathing Rates (L/kg-day)	0<2 Years
745	95th Percentile Daily Breathing Rates (L/kg-day)	2<16 Years
335	95th Percentile Daily Breathing Rates (L/kg-day)	16<30 Years
0.85	fraction of time at home	0<2 Years
0.72	fraction of time at home	2<16 Years
0.73	fraction of time at home	16<70 Years

Project: Burney Biomass
Date: July 25, 2022
Condition: Arsenic
Receptor: Residence
Source: Boiler
Height: 35m

Exposure Year	Calender Year	1-Hour Concentration (ug/m3)	Annual Concentration (ug/m3)	Daily Breathing Rates (L/kg-day)	Exposure Factor	fraction of time at home	Cancer Risk
1	2025	0.00	0.00	1,090	10.0	0.85	0.05
2	2026	0.00	0.00	1,090	10.0	0.85	0.05
3	2027	0.00	0.00	745	4.75	0.72	0.01
4	2028	0.00	0.00	745	3.00	0.72	0.01
5	2029	0.00	0.00	745	3.00	0.72	0.01
6	2030	0.00	0.00	745	3.00	0.72	0.01
7	2031	0.00	0.00	745	3.00	0.72	0.01
8	2032	0.00	0.00	745	3.00	0.72	0.01
9	2033	0.00	0.00	745	3.00	0.72	0.01
10	2034	0.00	0.00	745	3.00	0.72	0.01
11	2035	0.00	0.00	745	3.00	0.72	0.01
12	2036	0.00	0.00	745	3.00	0.72	0.01
13	2037	0.00	0.00	745	3.00	0.72	0.01
14	2038	0.00	0.00	745	3.00	0.72	0.01
15	2039	0.00	0.00	745	3.00	0.72	0.01
16	2040	0.00	0.00	745	3.00	0.72	0.01
17	2041	0.00	0.00	335	1.70	0.73	0.00
18	2042	0.00	0.00	335	1.00	0.73	0.00
19	2043	0.00	0.00	335	1.00	0.73	0.00
20	2044	0.00	0.00	335	1.00	0.73	0.00
21	2045	0.00	0.00	335	1.00	0.73	0.00
22	2046	0.00	0.00	335	1.00	0.73	0.00
23	2047	0.00	0.00	335	1.00	0.73	0.00
24	2048	0.00	0.00	335	1.00	0.73	0.00
25	2049	0.00	0.00	335	1.00	0.73	0.00
26	2050	0.00	0.00	335	1.00	0.73	0.00
27	2051	0.00	0.00	335	1.00	0.73	0.00
28	2052	0.00	0.00	335	1.00	0.73	0.00
29	2053	0.00	0.00	335	1.00	0.73	0.00
30	2054	0.00	0.00	335	1.00	0.73	0.00

0.01	Acute Hazard Impact
1	Significance Threshold
No	Significant?
0.00	Chronic Hazard Impact
1	Significance Threshold
No	Significant?
0.26	Cancer Risk
10	Significance Threshold
No	Significant?

Health Risk Assessment Assumptions

	Acute Reference Exposure Level (ug/m3)	
	Chronic Reference Exposure Level (ug/m3)	
0.042	Cancer Potency Slope Factor (cancer risk per mg/kg-day)	
350	days per year	
25,550	days per lifetime	
1,090	95th Percentile Daily Breathing Rates (L/kg-day)	0<2 Years
745	95th Percentile Daily Breathing Rates (L/kg-day)	2<16 Years
335	95th Percentile Daily Breathing Rates (L/kg-day)	16<30 Years
0.85	fraction of time at home	0<2 Years
0.72	fraction of time at home	2<16 Years
0.73	fraction of time at home	16<70 Years

Project:	Burney Biomass
Date:	July 25, 2022
Condition:	Lead
Receptor:	Residence
Source:	Boiler
Height:	35m

Exposure Year	Calender Year	1-Hour Concentration (ug/m3)	Annual Concentration (ug/m3)	Daily Breathing Rates (L/kg-day)	Exposure Factor	fraction of time at home	Cancer Risk
1	2025	0.00	0.00	1,090	10.0	0.85	0.00
2	2026	0.00	0.00	1,090	10.0	0.85	0.00
3	2027	0.00	0.00	745	4.75	0.72	0.00
4	2028	0.00	0.00	745	3.00	0.72	0.00
5	2029	0.00	0.00	745	3.00	0.72	0.00
6	2030	0.00	0.00	745	3.00	0.72	0.00
7	2031	0.00	0.00	745	3.00	0.72	0.00
8	2032	0.00	0.00	745	3.00	0.72	0.00
9	2033	0.00	0.00	745	3.00	0.72	0.00
10	2034	0.00	0.00	745	3.00	0.72	0.00
11	2035	0.00	0.00	745	3.00	0.72	0.00
12	2036	0.00	0.00	745	3.00	0.72	0.00
13	2037	0.00	0.00	745	3.00	0.72	0.00
14	2038	0.00	0.00	745	3.00	0.72	0.00
15	2039	0.00	0.00	745	3.00	0.72	0.00
16	2040	0.00	0.00	745	3.00	0.72	0.00
17	2041	0.00	0.00	335	1.70	0.73	0.00
18	2042	0.00	0.00	335	1.00	0.73	0.00
19	2043	0.00	0.00	335	1.00	0.73	0.00
20	2044	0.00	0.00	335	1.00	0.73	0.00
21	2045	0.00	0.00	335	1.00	0.73	0.00
22	2046	0.00	0.00	335	1.00	0.73	0.00
23	2047	0.00	0.00	335	1.00	0.73	0.00
24	2048	0.00	0.00	335	1.00	0.73	0.00
25	2049	0.00	0.00	335	1.00	0.73	0.00
26	2050	0.00	0.00	335	1.00	0.73	0.00
27	2051	0.00	0.00	335	1.00	0.73	0.00
28	2052	0.00	0.00	335	1.00	0.73	0.00
29	2053	0.00	0.00	335	1.00	0.73	0.00
30	2054	0.00	0.00	335	1.00	0.73	0.00

	Acute Hazard Impact
1	Significance Threshold
No	Significant?
	Chronic Hazard Impact
1	Significance Threshold
No	Significant?
0.00	Cancer Risk
10	Significance Threshold
No	Significant?

Health Risk Assessment Assumptions

	Acute Reference Exposure Level (ug/m3)
	Chronic Reference Exposure Level (ug/m3)
	Cancer Potency Slope Factor (cancer risk per mg/kg-day)
350	days per year
25,550	days per lifetime
1,090	95th Percentile Daily Breathing Rates (L/kg-day) 0<2 Years
745	95th Percentile Daily Breathing Rates (L/kg-day) 2<16 Years
335	95th Percentile Daily Breathing Rates (L/kg-day) 16<30 Years
0.85	fraction of time at home 0<2 Years
0.72	fraction of time at home 2<16 Years
0.73	fraction of time at home 16<70 Years

Project: Burney Biomass
Date: July 25, 2022
Condition: Chromium
Receptor: Residence
Source: Boiler
Height: 35m

Exposure Year	Calender Year	1-Hour Concentration (ug/m3)	Annual Concentration (ug/m3)	Daily Breathing Rates (L/kg-day)	Exposure Factor	fraction of time at home	Cancer Risk
1	2025	0.00	0.00	1,090	10.0	0.85	-
2	2026	0.00	0.00	1,090	10.0	0.85	-
3	2027	0.00	0.00	745	4.75	0.72	-
4	2028	0.00	0.00	745	3.00	0.72	-
5	2029	0.00	0.00	745	3.00	0.72	-
6	2030	0.00	0.00	745	3.00	0.72	-
7	2031	0.00	0.00	745	3.00	0.72	-
8	2032	0.00	0.00	745	3.00	0.72	-
9	2033	0.00	0.00	745	3.00	0.72	-
10	2034	0.00	0.00	745	3.00	0.72	-
11	2035	0.00	0.00	745	3.00	0.72	-
12	2036	0.00	0.00	745	3.00	0.72	-
13	2037	0.00	0.00	745	3.00	0.72	-
14	2038	0.00	0.00	745	3.00	0.72	-
15	2039	0.00	0.00	745	3.00	0.72	-
16	2040	0.00	0.00	745	3.00	0.72	-
17	2041	0.00	0.00	335	1.70	0.73	-
18	2042	0.00	0.00	335	1.00	0.73	-
19	2043	0.00	0.00	335	1.00	0.73	-
20	2044	0.00	0.00	335	1.00	0.73	-
21	2045	0.00	0.00	335	1.00	0.73	-
22	2046	0.00	0.00	335	1.00	0.73	-
23	2047	0.00	0.00	335	1.00	0.73	-
24	2048	0.00	0.00	335	1.00	0.73	-
25	2049	0.00	0.00	335	1.00	0.73	-
26	2050	0.00	0.00	335	1.00	0.73	-
27	2051	0.00	0.00	335	1.00	0.73	-
28	2052	0.00	0.00	335	1.00	0.73	-
29	2053	0.00	0.00	335	1.00	0.73	-
30	2054	0.00	0.00	335	1.00	0.73	-

	Acute Hazard Impact
1	Significance Threshold
No	Significant?
	Chronic Hazard Impact
1	Significance Threshold
No	Significant?
-	Cancer Risk
10	Significance Threshold
No	Significant?

Health Risk Assessment Assumptions

	Acute Reference Exposure Level (ug/m3)	
	Chronic Reference Exposure Level (ug/m3)	
27	Cancer Potency Slope Factor (cancer risk per mg/kg-day)	
350	days per year	
25,550	days per lifetime	
1,090	95th Percentile Daily Breathing Rates (L/kg-day)	0<2 Years
745	95th Percentile Daily Breathing Rates (L/kg-day)	2<16 Years
335	95th Percentile Daily Breathing Rates (L/kg-day)	16<30 Years
0.85	fraction of time at home	0<2 Years
0.72	fraction of time at home	2<16 Years
0.73	fraction of time at home	16<70 Years

Project: Burney Biomass
Date: July 25, 2022
Condition: Cobalt
Receptor: Residence
Source: Boiler
Height: 35m

Exposure Year	Calender Year	1-Hour Concentration (ug/m3)	Annual Concentration (ug/m3)	Daily Breathing Rates (L/kg-day)	Exposure Factor	fraction of time at home	Cancer Risk
1	2025	0.00	0.00	1,090	10.0	0.85	0.12
2	2026	0.00	0.00	1,090	10.0	0.85	0.12
3	2027	0.00	0.00	745	4.75	0.72	0.03
4	2028	0.00	0.00	745	3.00	0.72	0.02
5	2029	0.00	0.00	745	3.00	0.72	0.02
6	2030	0.00	0.00	745	3.00	0.72	0.02
7	2031	0.00	0.00	745	3.00	0.72	0.02
8	2032	0.00	0.00	745	3.00	0.72	0.02
9	2033	0.00	0.00	745	3.00	0.72	0.02
10	2034	0.00	0.00	745	3.00	0.72	0.02
11	2035	0.00	0.00	745	3.00	0.72	0.02
12	2036	0.00	0.00	745	3.00	0.72	0.02
13	2037	0.00	0.00	745	3.00	0.72	0.02
14	2038	0.00	0.00	745	3.00	0.72	0.02
15	2039	0.00	0.00	745	3.00	0.72	0.02
16	2040	0.00	0.00	745	3.00	0.72	0.02
17	2041	0.00	0.00	335	1.70	0.73	0.01
18	2042	0.00	0.00	335	1.00	0.73	0.00
19	2043	0.00	0.00	335	1.00	0.73	0.00
20	2044	0.00	0.00	335	1.00	0.73	0.00
21	2045	0.00	0.00	335	1.00	0.73	0.00
22	2046	0.00	0.00	335	1.00	0.73	0.00
23	2047	0.00	0.00	335	1.00	0.73	0.00
24	2048	0.00	0.00	335	1.00	0.73	0.00
25	2049	0.00	0.00	335	1.00	0.73	0.00
26	2050	0.00	0.00	335	1.00	0.73	0.00
27	2051	0.00	0.00	335	1.00	0.73	0.00
28	2052	0.00	0.00	335	1.00	0.73	0.00
29	2053	0.00	0.00	335	1.00	0.73	0.00
30	2054	0.00	0.00	335	1.00	0.73	0.00

	Acute Hazard Impact
1	Significance Threshold
No	Significant?
	Chronic Hazard Impact
1	Significance Threshold
No	Significant?
0.59	Cancer Risk
10	Significance Threshold
No	Significant?

Health Risk Assessment Assumptions

100	Acute Reference Exposure Level (ug/m3)	
	Chronic Reference Exposure Level (ug/m3)	
	Cancer Potency Slope Factor (cancer risk per mg/kg-day)	
350	days per year	
25,550	days per lifetime	
1,090	95th Percentile Daily Breathing Rates (L/kg-day)	0<2 Years
745	95th Percentile Daily Breathing Rates (L/kg-day)	2<16 Years
335	95th Percentile Daily Breathing Rates (L/kg-day)	16<30 Years
0.85	fraction of time at home	0<2 Years
0.72	fraction of time at home	2<16 Years
0.73	fraction of time at home	16<70 Years

Project:	Burney Biomass
Date:	July 25, 2022
Condition:	Copper
Receptor:	Residence
Source:	Boiler
Height:	35m

Exposure Year	Calender Year	1-Hour Concentration (ug/m3)	Annual Concentration (ug/m3)	Daily Breathing Rates (L/kg-day)	Exposure Factor	fraction of time at home	Cancer Risk
1	2025	0.00	0.00	1,090	10.0	0.85	-
2	2026	0.00	0.00	1,090	10.0	0.85	-
3	2027	0.00	0.00	745	4.75	0.72	-
4	2028	0.00	0.00	745	3.00	0.72	-
5	2029	0.00	0.00	745	3.00	0.72	-
6	2030	0.00	0.00	745	3.00	0.72	-
7	2031	0.00	0.00	745	3.00	0.72	-
8	2032	0.00	0.00	745	3.00	0.72	-
9	2033	0.00	0.00	745	3.00	0.72	-
10	2034	0.00	0.00	745	3.00	0.72	-
11	2035	0.00	0.00	745	3.00	0.72	-
12	2036	0.00	0.00	745	3.00	0.72	-
13	2037	0.00	0.00	745	3.00	0.72	-
14	2038	0.00	0.00	745	3.00	0.72	-
15	2039	0.00	0.00	745	3.00	0.72	-
16	2040	0.00	0.00	745	3.00	0.72	-
17	2041	0.00	0.00	335	1.70	0.73	-
18	2042	0.00	0.00	335	1.00	0.73	-
19	2043	0.00	0.00	335	1.00	0.73	-
20	2044	0.00	0.00	335	1.00	0.73	-
21	2045	0.00	0.00	335	1.00	0.73	-
22	2046	0.00	0.00	335	1.00	0.73	-
23	2047	0.00	0.00	335	1.00	0.73	-
24	2048	0.00	0.00	335	1.00	0.73	-
25	2049	0.00	0.00	335	1.00	0.73	-
26	2050	0.00	0.00	335	1.00	0.73	-
27	2051	0.00	0.00	335	1.00	0.73	-
28	2052	0.00	0.00	335	1.00	0.73	-
29	2053	0.00	0.00	335	1.00	0.73	-
30	2054	0.00	0.00	335	1.00	0.73	-

0.00	Acute Hazard Impact
1	Significance Threshold
No	Significant?
	Chronic Hazard Impact
1	Significance Threshold
No	Significant?
-	Cancer Risk
10	Significance Threshold
No	Significant?

Health Risk Assessment Assumptions

0.17	Acute Reference Exposure Level (ug/m3)
0.09	Chronic Reference Exposure Level (ug/m3)
	Cancer Potency Slope Factor (cancer risk per mg/kg-day)
350	days per year
25,550	days per lifetime

1,090	95th Percentile Daily Breathing Rates (L/kg-day)	0<2 Years
745	95th Percentile Daily Breathing Rates (L/kg-day)	2<16 Years
335	95th Percentile Daily Breathing Rates (L/kg-day)	16<30 Years
0.85	fraction of time at home	0<2 Years
0.72	fraction of time at home	2<16 Years
0.73	fraction of time at home	16<70 Years

Project:	Burney Biomass
Date:	July 25, 2022
Condition:	Manganese
Receptor:	Residence
Source:	Boiler
Height:	35m

Exposure Year	Calender Year	1-Hour Concentration (ug/m3)	Annual Concentration (ug/m3)	Daily Breathing Rates (L/kg-day)	Exposure Factor	fraction of time at home	Cancer Risk
1	2025	0.00	0.00	1,090	10.0	0.85	-
2	2026	0.00	0.00	1,090	10.0	0.85	-
3	2027	0.00	0.00	745	4.75	0.72	-
4	2028	0.00	0.00	745	3.00	0.72	-
5	2029	0.00	0.00	745	3.00	0.72	-
6	2030	0.00	0.00	745	3.00	0.72	-
7	2031	0.00	0.00	745	3.00	0.72	-
8	2032	0.00	0.00	745	3.00	0.72	-
9	2033	0.00	0.00	745	3.00	0.72	-
10	2034	0.00	0.00	745	3.00	0.72	-
11	2035	0.00	0.00	745	3.00	0.72	-
12	2036	0.00	0.00	745	3.00	0.72	-
13	2037	0.00	0.00	745	3.00	0.72	-
14	2038	0.00	0.00	745	3.00	0.72	-
15	2039	0.00	0.00	745	3.00	0.72	-
16	2040	0.00	0.00	745	3.00	0.72	-
17	2041	0.00	0.00	335	1.70	0.73	-
18	2042	0.00	0.00	335	1.00	0.73	-
19	2043	0.00	0.00	335	1.00	0.73	-
20	2044	0.00	0.00	335	1.00	0.73	-
21	2045	0.00	0.00	335	1.00	0.73	-
22	2046	0.00	0.00	335	1.00	0.73	-
23	2047	0.00	0.00	335	1.00	0.73	-
24	2048	0.00	0.00	335	1.00	0.73	-
25	2049	0.00	0.00	335	1.00	0.73	-
26	2050	0.00	0.00	335	1.00	0.73	-
27	2051	0.00	0.00	335	1.00	0.73	-
28	2052	0.00	0.00	335	1.00	0.73	-
29	2053	0.00	0.00	335	1.00	0.73	-
30	2054	0.00	0.00	335	1.00	0.73	-

0.01	Acute Hazard Impact
1	Significance Threshold
No	Significant?
0.00	Chronic Hazard Impact
1	Significance Threshold
No	Significant?
-	Cancer Risk
10	Significance Threshold
No	Significant?

Health Risk Assessment Assumptions

0.2	Acute Reference Exposure Level (ug/m3)	
0.014	Chronic Reference Exposure Level (ug/m3)	
0.91	Cancer Potency Slope Factor (cancer risk per mg/kg-day)	
350	days per year	
25,550	days per lifetime	
1,090	95th Percentile Daily Breathing Rates (L/kg-day)	0<2 Years
745	95th Percentile Daily Breathing Rates (L/kg-day)	2<16 Years
335	95th Percentile Daily Breathing Rates (L/kg-day)	16<30 Years
0.85	fraction of time at home	0<2 Years
0.72	fraction of time at home	2<16 Years
0.73	fraction of time at home	16<70 Years

Project:	Burney Biomass
Date:	July 25, 2022
Condition:	Nickel
Receptor:	Residence
Source:	Boiler
Height:	35m

Exposure Year	Calender Year	1-Hour Concentration (ug/m3)	Annual Concentration (ug/m3)	Daily Breathing Rates (L/kg-day)	Exposure Factor	fraction of time at home	Cancer Risk
1	2025	0.00	0.00	1,090	10.0	0.85	0.00
2	2026	0.00	0.00	1,090	10.0	0.85	0.00
3	2027	0.00	0.00	745	4.75	0.72	0.00
4	2028	0.00	0.00	745	3.00	0.72	0.00
5	2029	0.00	0.00	745	3.00	0.72	0.00
6	2030	0.00	0.00	745	3.00	0.72	0.00
7	2031	0.00	0.00	745	3.00	0.72	0.00
8	2032	0.00	0.00	745	3.00	0.72	0.00
9	2033	0.00	0.00	745	3.00	0.72	0.00
10	2034	0.00	0.00	745	3.00	0.72	0.00
11	2035	0.00	0.00	745	3.00	0.72	0.00
12	2036	0.00	0.00	745	3.00	0.72	0.00
13	2037	0.00	0.00	745	3.00	0.72	0.00
14	2038	0.00	0.00	745	3.00	0.72	0.00
15	2039	0.00	0.00	745	3.00	0.72	0.00
16	2040	0.00	0.00	745	3.00	0.72	0.00
17	2041	0.00	0.00	335	1.70	0.73	0.00
18	2042	0.00	0.00	335	1.00	0.73	0.00
19	2043	0.00	0.00	335	1.00	0.73	0.00
20	2044	0.00	0.00	335	1.00	0.73	0.00
21	2045	0.00	0.00	335	1.00	0.73	0.00
22	2046	0.00	0.00	335	1.00	0.73	0.00
23	2047	0.00	0.00	335	1.00	0.73	0.00
24	2048	0.00	0.00	335	1.00	0.73	0.00
25	2049	0.00	0.00	335	1.00	0.73	0.00
26	2050	0.00	0.00	335	1.00	0.73	0.00
27	2051	0.00	0.00	335	1.00	0.73	0.00
28	2052	0.00	0.00	335	1.00	0.73	0.00
29	2053	0.00	0.00	335	1.00	0.73	0.00
30	2054	0.00	0.00	335	1.00	0.73	0.00

0.01	Acute Hazard Impact
1	Significance Threshold
No	Significant?
0.00	Chronic Hazard Impact
1	Significance Threshold
No	Significant?
0.02	Cancer Risk
10	Significance Threshold
No	Significant?

Health Risk Assessment Assumptions

	Acute Reference Exposure Level (ug/m3)
	Chronic Reference Exposure Level (ug/m3)
	Cancer Potency Slope Factor (cancer risk per mg/kg-day)
350	days per year
25,550	days per lifetime
1,090	95th Percentile Daily Breathing Rates (L/kg-day) 0<2 Years
745	95th Percentile Daily Breathing Rates (L/kg-day) 2<16 Years
335	95th Percentile Daily Breathing Rates (L/kg-day) 16<30 Years
0.85	fraction of time at home 0<2 Years
0.72	fraction of time at home 2<16 Years
0.73	fraction of time at home 16<70 Years

Project: Burney Biomass
Date: July 25, 2022
Condition: Vanadium
Receptor: Residence
Source: Boiler
Height: 35m

Exposure Year	Calender Year	1-Hour Concentration (ug/m3)	Annual Concentration (ug/m3)	Daily Breathing Rates (L/kg-day)	Exposure Factor	fraction of time at home	Cancer Risk
1	2025	0.00	0.00	1,090	10.0	0.85	-
2	2026	0.00	0.00	1,090	10.0	0.85	-
3	2027	0.00	0.00	745	4.75	0.72	-
4	2028	0.00	0.00	745	3.00	0.72	-
5	2029	0.00	0.00	745	3.00	0.72	-
6	2030	0.00	0.00	745	3.00	0.72	-
7	2031	0.00	0.00	745	3.00	0.72	-
8	2032	0.00	0.00	745	3.00	0.72	-
9	2033	0.00	0.00	745	3.00	0.72	-
10	2034	0.00	0.00	745	3.00	0.72	-
11	2035	0.00	0.00	745	3.00	0.72	-
12	2036	0.00	0.00	745	3.00	0.72	-
13	2037	0.00	0.00	745	3.00	0.72	-
14	2038	0.00	0.00	745	3.00	0.72	-
15	2039	0.00	0.00	745	3.00	0.72	-
16	2040	0.00	0.00	745	3.00	0.72	-
17	2041	0.00	0.00	335	1.70	0.73	-
18	2042	0.00	0.00	335	1.00	0.73	-
19	2043	0.00	0.00	335	1.00	0.73	-
20	2044	0.00	0.00	335	1.00	0.73	-
21	2045	0.00	0.00	335	1.00	0.73	-
22	2046	0.00	0.00	335	1.00	0.73	-
23	2047	0.00	0.00	335	1.00	0.73	-
24	2048	0.00	0.00	335	1.00	0.73	-
25	2049	0.00	0.00	335	1.00	0.73	-
26	2050	0.00	0.00	335	1.00	0.73	-
27	2051	0.00	0.00	335	1.00	0.73	-
28	2052	0.00	0.00	335	1.00	0.73	-
29	2053	0.00	0.00	335	1.00	0.73	-
30	2054	0.00	0.00	335	1.00	0.73	-

	Acute Hazard Impact
1	Significance Threshold
No	Significant?
	Chronic Hazard Impact
1	Significance Threshold
No	Significant?
-	Cancer Risk
10	Significance Threshold
No	Significant?

Health Risk Assessment Assumptions

	Acute Reference Exposure Level (ug/m3)	
0.00004	Chronic Reference Exposure Level (ug/m3)	
1,300	Cancer Potency Slope Factor (cancer risk per mg/kg-day)	
350	days per year	
25,550	days per lifetime	
1,090	95th Percentile Daily Breathing Rates (L/kg-day)	0<2 Years
745	95th Percentile Daily Breathing Rates (L/kg-day)	2<16 Years
335	95th Percentile Daily Breathing Rates (L/kg-day)	16<30 Years
0.85	fraction of time at home	0<2 Years
0.72	fraction of time at home	2<16 Years
0.73	fraction of time at home	16<70 Years

Project:	Burney Biomass
Date:	July 25, 2022
Condition:	Dioxin
Receptor:	Residence
Source:	Boiler
Height:	35m

Exposure Year	Calender Year	1-Hour Concentration (ug/m3)	Annual Concentration (ug/m3)	Daily Breathing Rates (L/kg-day)	Exposure Factor	fraction of time at home	Cancer Risk
1	2025	0.00	0.00	1,090	10.0	0.85	0.00
2	2026	0.00	0.00	1,090	10.0	0.85	0.00
3	2027	0.00	0.00	745	4.75	0.72	0.00
4	2028	0.00	0.00	745	3.00	0.72	0.00
5	2029	0.00	0.00	745	3.00	0.72	0.00
6	2030	0.00	0.00	745	3.00	0.72	0.00
7	2031	0.00	0.00	745	3.00	0.72	0.00
8	2032	0.00	0.00	745	3.00	0.72	0.00
9	2033	0.00	0.00	745	3.00	0.72	0.00
10	2034	0.00	0.00	745	3.00	0.72	0.00
11	2035	0.00	0.00	745	3.00	0.72	0.00
12	2036	0.00	0.00	745	3.00	0.72	0.00
13	2037	0.00	0.00	745	3.00	0.72	0.00
14	2038	0.00	0.00	745	3.00	0.72	0.00
15	2039	0.00	0.00	745	3.00	0.72	0.00
16	2040	0.00	0.00	745	3.00	0.72	0.00
17	2041	0.00	0.00	335	1.70	0.73	0.00
18	2042	0.00	0.00	335	1.00	0.73	0.00
19	2043	0.00	0.00	335	1.00	0.73	0.00
20	2044	0.00	0.00	335	1.00	0.73	0.00
21	2045	0.00	0.00	335	1.00	0.73	0.00
22	2046	0.00	0.00	335	1.00	0.73	0.00
23	2047	0.00	0.00	335	1.00	0.73	0.00
24	2048	0.00	0.00	335	1.00	0.73	0.00
25	2049	0.00	0.00	335	1.00	0.73	0.00
26	2050	0.00	0.00	335	1.00	0.73	0.00
27	2051	0.00	0.00	335	1.00	0.73	0.00
28	2052	0.00	0.00	335	1.00	0.73	0.00
29	2053	0.00	0.00	335	1.00	0.73	0.00
30	2054	0.00	0.00	335	1.00	0.73	0.00

	Acute Hazard Impact
1	Significance Threshold
No	Significant?
0.00	Chronic Hazard Impact
1	Significance Threshold
No	Significant?
0.00	Cancer Risk
10	Significance Threshold
No	Significant?

Health Risk Assessment Assumptions

2100	Acute Reference Exposure Level (ug/m3)	
9	Chronic Reference Exposure Level (ug/m3)	
	Cancer Potency Slope Factor (cancer risk per mg/kg-day)	
350	days per year	
25,550	days per lifetime	
1,090	95th Percentile Daily Breathing Rates (L/kg-day)	0<2 Years
745	95th Percentile Daily Breathing Rates (L/kg-day)	2<16 Years
335	95th Percentile Daily Breathing Rates (L/kg-day)	16<30 Years
0.85	fraction of time at home	0<2 Years
0.72	fraction of time at home	2<16 Years
0.73	fraction of time at home	16<70 Years

Project: Burney Biomass
Date: July 25, 2022
Condition: HCL
Receptor: Residence
Source: Boiler
Height: 35m

Exposure Year	Calender Year	1-Hour Concentration (ug/m3)	Annual Concentration (ug/m3)	Daily Breathing Rates (L/kg-day)	Exposure Factor	fraction of time at home	Cancer Risk
1	2025	0.05	0.00	1,090	10.0	0.85	-
2	2026	0.05	0.00	1,090	10.0	0.85	-
3	2027	0.05	0.00	745	4.75	0.72	-
4	2028	0.05	0.00	745	3.00	0.72	-
5	2029	0.05	0.00	745	3.00	0.72	-
6	2030	0.05	0.00	745	3.00	0.72	-
7	2031	0.05	0.00	745	3.00	0.72	-
8	2032	0.05	0.00	745	3.00	0.72	-
9	2033	0.05	0.00	745	3.00	0.72	-
10	2034	0.05	0.00	745	3.00	0.72	-
11	2035	0.05	0.00	745	3.00	0.72	-
12	2036	0.05	0.00	745	3.00	0.72	-
13	2037	0.05	0.00	745	3.00	0.72	-
14	2038	0.05	0.00	745	3.00	0.72	-
15	2039	0.05	0.00	745	3.00	0.72	-
16	2040	0.05	0.00	745	3.00	0.72	-
17	2041	0.05	0.00	335	1.70	0.73	-
18	2042	0.05	0.00	335	1.00	0.73	-
19	2043	0.05	0.00	335	1.00	0.73	-
20	2044	0.05	0.00	335	1.00	0.73	-
21	2045	0.05	0.00	335	1.00	0.73	-
22	2046	0.05	0.00	335	1.00	0.73	-
23	2047	0.05	0.00	335	1.00	0.73	-
24	2048	0.05	0.00	335	1.00	0.73	-
25	2049	0.05	0.00	335	1.00	0.73	-
10	2034	0.05	0.00	335	1.00	0.73	-
11	2035	0.05	0.00	335	1.00	0.73	-
12	2036	0.05	0.00	335	1.00	0.73	-
13	2037	0.05	0.00	335	1.00	0.73	-
14	2038	0.05	0.00	335	1.00	0.73	-

0.00	Acute Hazard Impact
1	Significance Threshold
No	Significant?
0.00	Chronic Hazard Impact
1	Significance Threshold
No	Significant?
-	Cancer Risk
10	Significance Threshold
No	Significant?

Health Risk Assessment Assumptions

5	Chronic Reference Exposure Level (ug/m3) for DPM
1.1	Cancer Potency Slope Factor (cancer risk per mg/kg-day) for DPM
350	days per year
25,550	days per lifetime
1,090	95th Percentile Daily Breathing Rates (L/kg-day) 0<2 Years
745	95th Percentile Daily Breathing Rates (L/kg-day) 2<16 Years
335	95th Percentile Daily Breathing Rates (L/kg-day) 16<30 Years
0.85	fraction of time at home 0<2 Years
0.72	fraction of time at home 2<16 Years
0.73	fraction of time at home 16<70 Years

Project: Burney Biomass
Date: July 26, 2022
Condition: Unmitigated
Receptor: Existing Residence
Conditon: Operation Equipment

Exposure Year	Calender Year	Annual DPM Concentration (ug/m3)	Daily Breathing Rates (L/kg-day)	Exposure Factor	fraction of time at home	Cancer Risk
1	2023	1.81E-03	1,090	10.0	0.85	0.25
2	2024	1.81E-03	1,090	10.0	0.85	0.25
3	2025	1.81E-03	745	4.75	0.72	0.07
4	2026	1.81E-03	745	3.00	0.72	0.04
5	2027	1.81E-03	745	3.00	0.72	0.04
6	2028	1.81E-03	745	3.00	0.72	0.04
7	2029	1.81E-03	745	3.00	0.72	0.04
8	2030	1.81E-03	745	3.00	0.72	0.04
9	2031	1.81E-03	745	3.00	0.72	0.04
10	2032	1.81E-03	745	3.00	0.72	0.04
11	2033	1.81E-03	745	3.00	0.72	0.04
12	2034	1.81E-03	745	3.00	0.72	0.04
13	2035	1.81E-03	745	3.00	0.72	0.04
14	2036	1.81E-03	745	3.00	0.72	0.04
15	2037	1.81E-03	745	3.00	0.72	0.04
16	2038	1.81E-03	745	3.00	0.72	0.04
17	2039	1.81E-03	335	1.70	0.73	0.01
18	2040	1.81E-03	335	1.00	0.73	0.01
19	2041	1.81E-03	335	1.00	0.73	0.01
20	2042	1.81E-03	335	1.00	0.73	0.01
21	2043	1.81E-03	335	1.00	0.73	0.01
22	2044	1.81E-03	335	1.00	0.73	0.01
23	2045	1.81E-03	335	1.00	0.73	0.01
24	2046	1.81E-03	335	1.00	0.73	0.01
25	2047	1.81E-03	335	1.00	0.73	0.01
26	2048	1.81E-03	335	1.00	0.73	0.01
27	2049	1.81E-03	335	1.00	0.73	0.01
28	2050	1.81E-03	335	1.00	0.73	0.01
29	2051	1.81E-03	335	1.00	0.73	0.01
30	2052	1.81E-03	335	1.00	0.73	0.01

0.00	Chronic Hazard Impact
1	Significance Threshold
No	Significant?
0.84	Cancer Risk
10	Significance Threshold
No	Significant?

Health Risk Assessment Assumptions

5	Chronic Reference Exposure Level (ug/m3) for DPM
1.1	Cancer Potency Slope Factor (cancer risk per mg/kg-day) for DPM
350	days per year
25,550	days per lifetime
230	80th Percentile Daily Breathing Rates (L/kg-day)
0.73	fraction of time at work

Project: Burney Biomass
Date: July 26, 2022
Receptor: Existing Worker
Condition: Operational Equipment

Exposure Year	Calender Year	Annual DPM Concentration (ug/m3)	Daily Breathing Rates (L/kg-day)	Exposure Factor	fraction of time at home	Cancer Risk
1	2023	5.02E-02	230	1.0	0.73	0.13
2	2024	5.02E-02	230	1.0	0.73	0.13
3	2025	5.02E-02	230	1.0	0.73	0.13
4	2026	5.02E-02	230	1.0	0.73	0.13
5	2027	5.02E-02	230	1.0	0.73	0.13
6	2028	5.02E-02	230	1.0	0.73	0.13
7	2029	5.02E-02	230	1.0	0.73	0.13
8	2030	5.02E-02	230	1.0	0.73	0.13
9	2031	5.02E-02	230	1.0	0.73	0.13
10	2032	5.02E-02	230	1.0	0.73	0.13
11	2033	5.02E-02	230	1.0	0.73	0.13
12	2034	5.02E-02	230	1.0	0.73	0.13
13	2035	5.02E-02	230	1.0	0.73	0.13
14	2036	5.02E-02	230	1.0	0.73	0.13
15	2037	5.02E-02	230	1.0	0.73	0.13
16	2038	5.02E-02	230	1.0	0.73	0.13
17	2039	5.02E-02	230	1.0	0.73	0.13
18	2040	5.02E-02	230	1.0	0.73	0.13
19	2041	5.02E-02	230	1.0	0.73	0.13
20	2042	5.02E-02	230	1.0	0.73	0.13
21	2043	5.02E-02	230	1.0	0.73	0.13
22	2044	5.02E-02	230	1.0	0.73	0.13
23	2045	5.02E-02	230	1.0	0.73	0.13
24	2046	5.02E-02	230	1.0	0.73	0.13
25	2047	5.02E-02	230	1.0	0.73	0.13

0.01	Chronic Hazard Impact
1	Significance Threshold
No	Significant?
1.14	Cancer Risk
10	Significance Threshold
No	Significant?