| DOCKETED | |
|---|---|
| **Docket Number:** | 01-AFC-24C |
| **Project Title:** | Palomar Energy Project Compliance |
| **TN #:** | 239299 |
| **Document Title:** | Palomar Energy Center - Petition to Amend |
| **Description:** | Palomar Hydrogen Project |
| **Filer:** | Jason Dobbs |
| **Organization:** | San Diego Gas and Electric |
| **Submitter Role:** | Applicant |
| **Submission Date:** | 8/12/2021 12:50:01 PM |
| **Docketed Date:** | 8/12/2021 |

# Petition to Amend:
# Palomar Hydrogen Project

# Palomar Energy Center
# (01-AFC-24C)

Submitted by:
San Diego Gas & Electric


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Submitted to:
California Energy Commission

August 10, 2021

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# List of Acronyms and Abbreviations

| | |
|---|---|
| AAQS | Ambient Air Quality Standard |
| AB | Assembly Bill |
| acf | Actual Cubic Foot |
| AFC | Application for Certification |
| AQMD | [South Coast] Air Quality Management District |
| ARB | [California] Air Resources Board |
| ATC | Authority to Construct |
| BMP | Best Management Practice |
| Btu | British Thermal Unit |
| CalARP | California Accidental Release Prevention [Program] |
| CalEEMod | California Emissions Estimator Model® |
| CalOES | California Office of Emergency Services |
| Cal/OSHA | California Division of Occupational Safety and Health |
| CAP | Climate Action Plan |
| CAPCOA | California Air Pollution Control Officers Association |
| CCR | California Code of Regulations |
| CEC | California Energy Commission |
| CEQA | California Environmental Quality Act |
| $CH_4$ | Methane |
| City | City of Escondido |
| CNEL | Community Noise Exposure Level |
| CO | Carbon Monoxide |
| $CO_2$ | Carbon Dioxide |
| $CO_2e$ | Carbon Dioxide Equivalent |
| COC | Condition of Certification |
| County | County of San Diego |
| CPM | Compliance Project Manager |
| CTG | Combustion Turbine Generator |
| dBA | A-Weighted Decibel |
| DC | Direct Current |
| District | San Diego County Air Pollution Control District |
| DPM | Diesel Particulate Matter |
| dscf | Dry Standard Cubic Foot |
| DW | Demineralized Water |
| EPA | [United States] Environmental Protection Agency |
| ERTC | Escondido Research and Technology Center |
| °F | Degrees Fahrenheit |
| FCEV | Fuel-Cell Electric Vehicle |
| FCS | Fuel Cell Store |

| | |
|---|---|
| ft | Foot |
| FSA | Final Staff Assessment |
| GHG | Greenhouse Gas |
| GPM | Gallons per Minute |
| GWP | Global Warming Potential |
| $H_2$ | Hydrogen |
| HARRF | Hale Avenue Resource Recovery Facility |
| HHV | Higher Heating Value |
| HMBP | Hazardous Materials Business Plan |
| hr | Hour |
| HRA | Health Risk Assessment |
| HRSG | Heat Recovery Steam Generator |
| in | Inch |
| IPCC | Intergovernmental Panel on Climate Change |
| kW | Kilowatt |
| kWh | Kilowatt Hour |
| L | Liter |
| lb(s) | Pound(s) |
| LHV | Lower Heating Value |
| LORS | Laws, Ordinances, Regulations, and Standards |
| LTS | Less Than Significant |
| MGD | Million Gallons per Day |
| MT | Metric Ton |
| MW | Megawatt |
| MWh | Megawatt-Hour |
| $N_2O$ | Nitrous Oxide |
| $NO_x$ | Oxides of Nitrogen |
| $Nm^3$ | Normal cubic meter |
| OEHHA | [California] Office of Environmental Health Hazard Assessment |
| OEM | Original Equipment Manufacturer |
| PEC | Palomar Energy Center |
| PEM | Polymer Electrolyte Membrane |
| $PM_{10}$ | Respirable Particulate Matter |
| $PM_{2.5}$ | Fine Particulate Matter |
| psia | Pound per Square Inch Absolute |
| psig | Pound per Square Inch Gauge |
| PTA | Petition to Amend |
| PTO | Permit to Operate |
| PUC | [California] Public Utilities Commission |
| PV | Photovoltaic |
| RMP | Risk Management Plan |

| | |
|---|---|
| S&W | Soil and Water |
| SANDAG | San Diego Association of Governments |
| SB | Senate Bill |
| SCADA | Supervisory Control and Data Acquisition |
| scf | Standard Cubic Foot |
| SDAPCD | San Diego County Air Pollution Control District |
| SDG&E | San Diego Gas & Electric |
| SME | Subject Matter Expert |
| $SO_x$ | Oxides of Sulfur |
| SR | State Route |
| STG | Steam Turbine Generator |
| SWPPP | Stormwater Pollution Prevention Plan |
| TAC | Toxic Air Contaminant |
| tpy | Tons per Year |
| TQ | Threshold Quantity |
| VOC | Volatile Organic Compound |
| yr | Year |

# Palomar Energy Center (01-AFC-24C) Petition to Amend: Palomar Hydrogen Project

## 1.0 INTRODUCTION

San Diego Gas & Electric (SDG&E or the Applicant) is submitting this Petition for a Post-Certification Amendment of its Palomar Energy Center (PEC), Docket 01-AFC-24C. SDG&E is proposing to implement a hydrogen generation and energy storage project at the PEC. This Petition to Amend (PTA) is filed to make the changes necessary to the project design as approved by the California Energy Commission (CEC) in accordance with California Code of Regulations (CCR) Title 20 Section 1769(a)(1).

### 1.1 Palomar Hydrogen Project Overview

SDG&E is planning to implement one of its initial clean energy projects at the PEC. Currently, the PEC is a combined-cycle power plant generating approximately 588-megawatt (MW)[1] in Escondido, California. The PEC includes operation of two natural gas-fired, combustion turbine generators (CTGs) and a steam turbine generator (STG). The Palomar Hydrogen Project is proposed to meet SDG&E's objective to move toward a 100% renewable and net zero carbon-free future (SDG&E 2021).

Pursuant to 20 CCR Section 1769(a)(1), as revised in September 2019, SDG&E, the Project Owner, is filing this PTA to include installation of the following new equipment and facilities at the PEC:

1. Hydrogen generation and storage with the use of an electrolyzer and hydrogen storage vessels;
2. 300 kilowatts (kW) of photovoltaic (PV) solar panels on canopies over existing parking areas; and
3. A hydrogen fueling station for SDG&E on-site maintenance vehicles and off-site fleet vehicles (cars and trucks).

These facilities will be used to produce hydrogen, which will be injected into the natural gas stream used in the CTGs and used for fueling hydrogen fuel-cell electric vehicles (FCEVs). The hydrogen generated on-site will also be used for generator cooling, which is currently provided by purchasing hydrogen in compressed gas cylinders, which are stored on-site. Other than adding these components to the project description, only two Conditions of Certification (COCs) require modification to allow for implementation of this project. The proposed modifications to the COCs are a revision to AQ-2 to allow for the use of blended natural gas and hydrogen fuel in the CTGs, and a revision to HAZ-1 (Appendix C to the COC) related to the increased amount of hydrogen storage allowed on-site.

Since hydrogen is not a regulated pollutant or toxic air contaminant (TAC), SDG&E does not expect to need a revision of the San Diego County Air Pollution Control District (SDAPCD)

[1] PEC was initially approved by the Energy Commission as an approximately 560 MW power plant in 2003. An Advanced Gas Path Turbine Upgrade was approved by the SDAPCD and Energy Commission in 2017 (Order No. 17-1213-1d), which increased the power output of the CTGs and duct burners to approximately 588 MW.

Permit to Operate (PTO) for the PEC associated with the Palomar Hydrogen Project. No other environmental permits related to water supply, biological resources, waste management, etc. are expected to be needed.

The proposed new Palomar Hydrogen Project components comply with all laws, ordinances, regulations, and standards (LORS) and do not have a significant environmental impact, as further described in this PTA. The proposed revisions to the COCs will not have significant impact on property owners, the public, or any other parties.

### 1.2 Change in Reheat Bowl Temperature Used for Startup Definition

In addition to the Palomar Hydrogen Project changes, SDG&E is working with the SDAPCD to revise the reheat bowl temperature that is used to determine whether a startup of the CTGs is considered to be a regular or an extended startup. This refers to COC AQ-28 to change the startup pivot temperature in the COC from 500°F to 750°F. This change is consistent with all LORS and does not lead to an increase in emissions. SDG&E understands based on communications with the SDAPCD that the permit modification has been approved and a revised PTO will be issued soon. The Compliance Project Manager (CPM) will be notified via the quarterly compliance report when the change is finalized.

### 1.3 Information Requirements for Post-Certification Amendments

This Petition contains the information required under the CEC's Siting Regulations for post-certification project modifications [20 CCR Section 1769(a)(1)], including the following:

A. A complete description of the proposed change, including new language for any conditions of certification that will be affected;

B. A discussion of the necessity for the proposed change and an explanation of why the change should be permitted;

C. A description of any new information or change in circumstances that necessitated the change;

D. An analysis of the effects that the proposed change to the project may have on the environment and proposed measures to mitigate any significant environmental effects;

E. An analysis of how the proposed change would affect the Project's compliance with applicable laws, ordinances, regulations, and standards;

F. A discussion of how the proposed change would affect the public;

G. A list of current assessor's parcel numbers and owners' names and addresses for all parcels within 500 feet of any affected project linears and 1,000 feet of the project site;

H. A discussion of the potential effect of the proposed change on nearby property owners, residents, and the public; and

I. A discussion of any exemptions from the California Environmental Quality Act (CEQA), of the Public Resources Code, that the project owner believes may apply to approval of the proposed change.

Each of these requirements is addressed in Section 2.

# 2.0 REQUIRED INFORMATION FOR POST-CERTIFICATION AMENDMENTS

**A. Complete description of the proposed change, including new language for any conditions of certification that will be affected.**

## *A.1 Facility Permitting Background*

The PEC, a combined-cycle, natural gas-fired power plant, was certified by the CEC with a Final Decision on August 6, 2003 and began commercial operation on April 1, 2006. The facility is located in the City of Escondido in San Diego County, California. An aerial view of the facility and its environs is shown in Figure 2-1. Some of the subsequent amendments made to the COCs in the Final Decision are described below.

In June 2005, SDG&E obtained approval to revise the amounts of hazardous chemicals stored on-site (as listed in Appendix C of COC HAZ-1), including hydrogen. Due to an issue with temporary loss of its reclaimed water supply, SDG&E requested and received approval of a revision to COC SOIL&WATER-5 in April 2006.

On February 22, 2013, the SDG&E filed a petition (TN 69634) with the CEC requesting to modify the Final Decision for the PEC. That PTA requested the CEC to: (1) modify certain air quality COCs to be consistent with the most recent SDAPCD PTO; and (2) upgrade the advanced gas path technology for two existing General Electric Frame 7-FA combined-cycle gas turbines. The changes to the SDAPCD PTO were made due to changes to the PEC's Title V Permit issued by the U.S. Environmental Protection Agency (EPA).

As docketed on September 20, 2013, SDG&E requested to split the PTA into two separate amendments (TN 200539). On March 5, 2015, CEC staff published an analysis of SDG&E's request to update certain air quality conditions of certification (TN 203772). On April 14, 2015, during the 30-day public review period, SDG&E submitted a response to the staff's analysis (TN 204166). In this response, SDG&E requested additional clarification regarding removal of obsolete conditions to ensure consistency with reporting requirements between the CEC and the SDAPCD and to make administrative changes. No other comments were received on the staff analysis.

On December 1, 2015, SDG&E submitted a second addendum (TN 206895) to their amendment request to delete COC **AQ-38**, which limits the annual combined fuel input into the duct burners.

As docketed on February 25, 2016, SDG&E filed a request to the CEC (TN 210531) to recombine the PTAs to (1) Upgrade the Advanced Gas Path Technology of the combustion turbine; and (2) Conform air quality conditions with the SDAPCD's PTO. On June 20, 2016, the SDAPCD granted the SDG&E PEC's Authority to Construct (ATC) (TNs 211984 and 211985) pursuant to Rule 20 of the Air Pollution Control District Rules and Regulations.

CEC staff reviewed these prior petitions, the requested changes, and the response to the staff's initial analysis and assessed the impacts of this proposal on environmental quality and public health and safety. It was the staff's opinion that, with the implementation of new and/or revised air quality COCs, the facility would remain in compliance with all applicable LORS and the proposed changes would not result in any significant, adverse, direct, indirect, or cumulative impacts to the environment. Based on the staff's recommendation, SDG&E's petition was approved at the Business Meeting of the California CEC on December 13, 2017.

**Figure 2-1: Aerial View of the Palomar Energy Center and Surrounding Area**

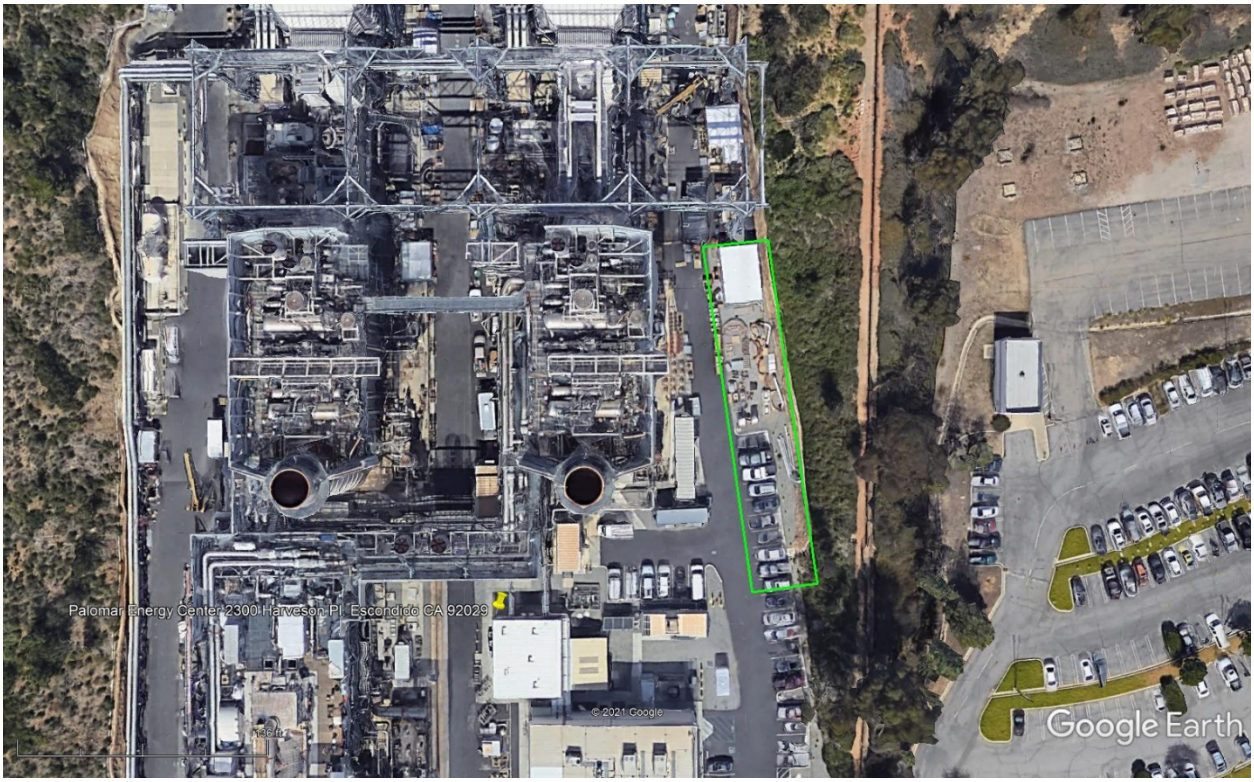
### *A.2 Proposed Project Description*

The proposed Project includes the following primary components:

- Hydrogen production system, including an electrolyzer system with integral hydrogen cooling and drying, a hydrogen compressor, and pressurized storage vessels, along with ancillary equipment;
- A hydrogen fueling station for vehicles, which will include one dispenser and necessary pressure regulators, compressors, and ancillary equipment;
- Elevated solar PV panels to provide supplemental electricity; and
- Electrical equipment that will tie-in with the hydrogen production system, including a transformer, utility interconnection, outgoing feeders, switchgears, motor control centers, and ancillary equipment.

These components are proposed to be installed on the eastern portion of the PEC site, within the existing facility footprint, in an area currently used as a storage and parking area. An enlargement of the aerial photograph showing the proposed area for the new facilities is provided in Figure 2-2, and a detailed facility plot plan is provided in Appendix A.

**Figure 2-2: Aerial View Showing the Existing Use of the Proposed Hydrogen Project Components Location**



### *A.2.1 Combined-Cycle Power Plant Hydrogen Consumption*

PEC is a 588-MW combined-cycle power plant with two generating units and a steam turbine. Hydrogen uses in the combined-cycle power plant are as follows:

- Hydrogen for generator cooling will be supplied to the Unit 1 and Unit 2 CTGs at 75 pounds per square inch gauge (psig) and regulated to 30 psig downstream of the existing pressure regulating valves. Hydrogen will be supplied to the STG at 125 psig and regulated to 45 psig downstream of the existing pressure regulating valves. The total hydrogen demand for CTG and STG cooling is 30 standard cubic feet (scf) per hour.
- Hydrogen blending in the fuel gas feed to the Units 1 and/or 2 CTGs is planned. A maximum blending of hydrogen of up to 2% of the fuel is currently anticipated, although the storage system has been sized based on an expected initial use of a 1% blend in one of the CTGs. The fuel gas supply is heated by the fuel gas heaters to 365°F at 500 psig. A fuel blending system will be provided to achieve uniform blending of hydrogen and natural gas.
- The hydrogen consumption for fuel gas blending is determined using the highest heat consumption case of 1,655 million British thermal units (MMBtu) per hour per CTG taken from the plant heat balances. As a basis for the natural gas supply to PEC, an annual average higher heating value (HHV) of 1,027 Btu per scf is calculated from SDG&E natural gas quality reports published for PEC's corresponding gas zone.

Based on the expected rate of 1% by volume blend of hydrogen in the fuel gas and using the typical lower heating values (LHV), it is estimated that a total of approximately 80,148 pounds per hour (lbs/hr) of blended gas is required to provide 1,655 MMBtu per hour to one CTG. This rate is equivalent to a demand of approximately 96 lbs/hr hydrogen from the storage cylinders.

### *A.2.2 Hydrogen Production and Integration*

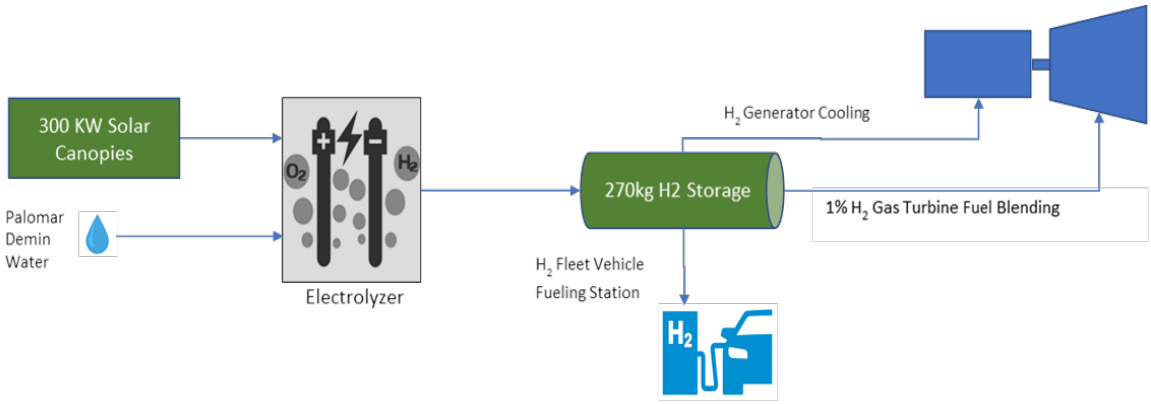
The proposed Project includes the integration of hydrogen into the fuel stream for on-site equipment and into the hydrogen fueling station through the electrolysis process. The electrolysis of water occurs through an electrochemical reaction that does not require external components or moving parts. It is very reliable and can produce ultra-pure hydrogen in a manner which does not produce greenhouse gas (GHG) emissions when the electrical source is renewable energy (FCS 2017). In times of excess electricity production from renewable sources, instead of curtailing the electricity as is commonly done, it is possible to use this excess electricity to produce hydrogen through electrolysis (USDOE 2020a). A Process Flow Diagram for the proposed Project is shown in Figure 2-3.

**Electrolyzer**

Electrolyzers can range in size from small, appliance-size equipment that is well-suited for small-scale distributed hydrogen production to large-scale, central production facilities. An electrolyzer consists of an anode and a cathode separated by an electrolyte. Different electrolyzers function in slightly different ways, mainly due to the different type of electrolyte material involved (USDOE 2020a). There are three primary types of

electrolyzers: proton exchange membrane (PEM); alkaline electrolyzers, and solid oxide electrolyzers. PEM electrolyzers typically use two membranes to achieve good efficiency.

**Figure 2-3: Palomar Hydrogen Project Components Process Flow Diagram**




One electrolyzer will be used at PEC to create the hydrogen for the facility's use. Hydrogen will be produced by a polymer electrolyte membrane (PEM) electrolyzer system. The electrolyzer specifications used as the basis of the conceptual design are included in Table 2-1.

**Table 1-2: Electrolyzer Specification**

| | | | |
|---|---|---|---|
| **Electrolyzer Type** | PEM | **Rated Hydrogen Production** | 49 lbs/hr [1,176 lbs/day] (4.4 kilowatt-hours [kWh)]/ normal cubic meter [$Nm^3$] $H_2$) |
| **Rated Power** | 1.25 MW | **Rated Demineralized Water Requirement** | 0.9 Liters (L)/$Nm^3$ $H_2$ [0.00673 gallons/scf $H_2$ = 1.287 gallons/lb $H_2$] |
| **Output Hydrogen Pressure** | 435 psig (30 barg) | **Output Hydrogen Purity** | 99.9995% |

### Hydrogen Compressors

Two intermediate-pressure compressors (A/B) are planned for the proposed Project. Each compressor will be an oil-free, motor-driven reciprocating or diaphragm compressor with a discharge pressure of 2,500 psig and discharge temperature suitable for storage and the downstream hydrogen users. The compressors will be designed to API 618 reciprocating compressor design criteria and either air cooling or closed circulating water systems will be used. Hydrogen compression requirements are provided in Table 2-2.

**Table 3-4: Hydrogen Compressor Design Criteria**

| Flow Rate | Suction Pressure/Temperature | Discharge Pressure |
|---|---|---|
| 49 lbs/hr | 435 psig (30 barg)/105°F | 2,500 psig |

### Air Compressor

A single utility air compressor package located near the equipment requiring air will be supplied to meet the requirements of all new equipment. The compressor package will be

modularized and packaged into skids that facilitate efficient shipping, installation, and maintenance.

**Nitrogen Package**

The nitrogen package will provide gas to purge hydrogen from the electrolyzer, compressors, and other equipment requiring purge gas during continuous operation, shutdown, and maintenance. Nitrogen purge is not required for continuous operation, but it is recommended that a minimum of three standard 235-scf nitrogen gas cylinders be kept on-site for use during maintenance and complete shutdown. It is expected that nitrogen purge requirements can be met with a nitrogen gas cylinder storage system.

**Blending Skid**

Hydrogen will pass through piping into the blending skid, which would combine hydrogen produced in the electrolyzer with natural gas. Given current pipeline operating conditions, a maximum blend ratio of 98% natural gas to 2% hydrogen could occur.

**Storage Pressure Vessels**

Hydrogen that is not immediately needed to support the electrical generation equipment on-site or the hydrogen fueling station would be stored on-site in cylindrical storage pressure vessels.

Hydrogen storage will be nominally sized to maintain a minimum of 6 hours of hydrogen for the typical 1% by volume blending in the fuel gas into one CTG, which is equal to approximately 600 pounds or 114,759 scf.

Black & Veatch conducted a preliminary process optimization of the storage pressure, number of storage tanks, and sizing of the hydrogen compressors. The pressure for hydrogen storage was determined by balancing the required storage mass of hydrogen with the available footprint for storage and standard hydrogen storage offerings.

Given the available footprint at PEC and using 24-inch diameter, 40-foot-long cylindrical hydrogen storage vessels, it is estimated that the required mass of hydrogen could be stored in a rack arrangement 4 vessels high by 3 vessels wide (up to 12 total), in an approximately 11-foot by 40-foot footprint (440 square feet). This configuration would require the hydrogen to be compressed to 2,500 psig (2,515 psia) for storage. The hydrogen storage requirements are provided in Table 2-3.

**Table 5-6: Hydrogen Storage Design Criteria**

| Storage Weight | Storage Volume | Storage Vessels |
|---|---|---|
| 600 lbs | 114,759 scf (68°F, 14.7 psia) | 9 to 12 cylinders<br>(24 in. diameter x 40 ft. length each) |

**Water Treatment and Cooling System**

PEC is required to use reclaimed water for all non-potable uses. Reclaimed water for PEC is obtained from the Hale Avenue Resource Recovery Facility (HARRF).

Reclaimed water to be used in the hydrogen process is demineralized and will be put into the existing demineralized water (DW) system at 85°F and 60 psig. The DW system at

PEC consists of a 200,000-gallon Demin water storage tank and two Demin water pumps rated for 500 gallons per minute (GPM) at 90 feet total dynamic head. It is expected that the existing demineralized water storage and transfer capabilities are sufficient in capacity and quality to meet the demands of the new hydrogen production system.

Hydrogen is needed for CTG cooling, CTG fuel blending, and the hydrogen fueling station. As shown in Table 2-1, in continuous operation, the electrolyzer could produce 1,176 pounds per day of hydrogen. Based on the water usage rate of 0.9 $L/Nm^3$ for the electrolyzer given in Table 2-1, it is estimated that the proposed Project will require on the order of 63 gallons per hour or 1,513 gallons per day [0.0015 million gallons per day (MGD)] of demineralized water to produce hydrogen at a rate of 49 lbs/hr in the electrolyzer.

Condensate from the compressor knockout drums and intermittent wastewater discharged from the electrolyzer will be gravity-drained to an underground sump and transferred to the existing heat recovery steam generator (HRSG) blowdown sump. While this wastewater is not suitable for reuse within the electrolyzer, it is expected to be high-quality, oil-free wastewater that is suitable for discharge to the cooling tower via the HRSG blowdown sump.

### *A.2.3 Hydrogen Fueling Station*

The hydrogen fueling station requirements and specifications used as a basis for conceptual design are included in Table 2-4. It is expected the hydrogen fueling station will include integral compressors and a cooling system to achieve the required discharge pressure and temperature for fueling. Hydrogen for FCEV fueling will be stored at an intermediate pressure of 6,526 psig (450 barg) in a tank sized to support fueling five vehicles per day. The fueling station will take hydrogen from the lower ground storage pressure and compress the hydrogen to an intermediate pressure of 6,526 psig. The storage tank for vehicle fueling will be located with the other storage tanks. During FCEV fueling, the fueling station will take hydrogen from the 6,526-psig vehicle fueling storage tank and compress the hydrogen to 10,152 psig (700 barg). The compressed hydrogen will be cooled by the fueling station and delivered to the vehicle through the vehicle fueling dispenser. Vehicles will be refueled periodically on an as-needed basis, so the consumption will be intermittent.

**Table 7-8: Hydrogen Fueling Station Requirements**

| | | | |
|---|---|---|---|
| **Hydrogen Consumption per Vehicle** | 9-22 lbs (4-10 kilograms) | **Hydrogen Discharge Pressure** | 10,152 psig (700 barg) |
| **Max Fueling Rate** | 8 lbs/minute (60 gallons/second) | **Hydrogen Storage Pressure** | 6,526 psig (450 barg) |

### *A.2.4 Solar Photovoltaic System*

Solar PV systems convert sunlight into electrical energy. When the sun shines onto a solar panel, photons from the sunlight are absorbed by the cells in the panel, which creates an electric field across the layers and causes electricity to flow (USDOE 2020c). The proposed Project includes the placement of solar PV modules on canopies over the parking areas (see Appendix A). Up to 300 kW of total solar PV output that will provide power to the facility is being contemplated for the proposed Project.

### *A.2.5 Other Ancillary Site Improvements*

The project includes the installation of other ancillary piping and equipment to support the operation of the compressor system and solar PV components. These components would be located within the fenced facility footprint.

In addition, a 20-foot-high fire wall will be installed on the northern and eastern sides of the hydrogen storage area (see plot plan in Appendix A). No changes to the existing security fencing or lighting are proposed.

### *A.2.6 Project Construction Schedule*

SDG&E's currently planned construction schedule for the proposed Palomar Hydrogen Project includes completing the design, engineering, and procurement in 2021. The actual construction process would begin in late 2021. First, the solar PV arrays would be installed on canopies (see Appendix A). The civil/structural, electrical/instrumental, and mechanical components would be completed and hydrogen equipment installed. These construction activities are expected to take approximately six months. Once installed, the equipment will be tested prior to acceptance.

## *A.3 Proposed Changes to the Conditions of Certification*

The following specific revisions to the COCs in the CEC's Final Commission Decision (or as subsequently revised as discussed in Section A.1) are proposed using **underline bold** for inserted text and ~~**strikethrough bold**~~ for deleted text. Only the COCs proposed for revision are included. In addition to the two COCs proposed for revision for the Palomar Hydrogen Project, AQ-28 is included for the change in the reheat bowl temperature used to define a regular or an extended startup (See Section 1.2).

**AQ-2** The unit shall be fired on Public Utility Commission (PUC) quality natural gas **blended with up to 2% hydrogen** only. The project owner shall maintain quarterly records of sulfur content (grains/100 dscf) and higher and lower heating values (Btu/dscf) of the natural gas **and amount of hydrogen blended** and provide such records to the District personnel upon request.

**Verification:** The project owner shall certify compliance with this condition as part of the Quarterly Operational Report (AQ-SC7) and shall make the site and data available for inspection by representatives of the District, ARB or Energy Commission.

*Note: The change to AQ-28 is not related to the hydrogen project but is related to ongoing operations.*

**AQ-28** A startup period is the period of time that begins when fuel flows to the combustion turbine following a nonoperational period. For purposes of determining compliance with the emission limits of this permit, the duration of a startup period shall not exceed 120 consecutive minutes if the steam turbine reheat bowl temperature is above **750**~~**500**~~° F when the startup period begins and shall not exceed 360 consecutive minutes if the steam turbine reheat bowl temperature is less than or equal to **750**~~**500**~~° F when the startup period begins.

**Verification:** The project owner shall certify compliance with this condition as part of the Quarterly Operational Report (AQ-SC7) and shall make the site and data available for inspection by representatives of the District, ARB or Energy Commission.

**HAZ-1** The project owner shall not use any hazardous materials not listed in Appendix C, appended to the end of these Conditions, below, or in greater quantities than those identified by chemical name in Appendix C, below, unless approved in advance by the CPM.

**Verification:** The project owner shall provide to the Compliance Project Manager (CPM), in the Annual Compliance Report, a list of hazardous materials contained at the facility in reportable quantities.

*Note: No changes are proposed to HAZ-1, only to the line for hydrogen in Appendix C.*

**APPENDIX C**

**Anticipated Hazardous Materials Use at the Palomar Energy Ce~~nter~~**

| Material | CAS No. or Chemical Makeup) | Location/ Application | Hazardous Characteristics[42] | Maximum Quantity On Site | Regulatory Thresholds (lb) | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | CalARP | Federal RQ[43] | Federal TPQ[44] | Federal TQ[45] |
| Hydrogen | 1333-74-0 | Generator Cooling, **Fuel Blending, and FCEV Fueling** | *Health: toxic Physical: fire* | ~~**80,000 scf**~~ **600 lbs or 114,759 scf (68°F, 14.7 psia)** | -- | -- | -- | 10,000 |

*Note: the amount of hydrogen and other materials were modified from the Final Decision on June 10, 2005.*

**B. A discussion of the necessity for the proposed change and an explanation of why the change should be permitted.**

Senate Bill (SB) 100 calls for the decarbonization of California's electric grid by 2045. The Palomar Hydrogen Project is one of SDG&E's initial efforts toward meeting that goal. The Project should be permitted as it will allow SDG&E to introduce up to 2% hydrogen blending with natural gas as a step in determining its feasibility. Installing a hydrogen fueling station also meets California goals of reducing GHG emissions from the transportation sector.

**C. A description of any new information or change in circumstances that necessitated the change.**

As part of efforts to support California's GHG emissions reduction goals and its mission to become one of the cleanest, safest, and most innovative energy companies in America, SDG&E is focused on improving air quality in communities and decarbonizing its energy supply. SDG&E has established a pathway forward to reduce operational GHG emissions by introducing hydrogen to key electrical generation facilities as a first step in a long-term strategy to achieve these goals.

**D. An analysis of the effects that the proposed change to the project may have on the environment and proposed measures to mitigate any significant environmental effects.**

A summary of the expected impacts on each of the environmental resource areas is provided in Table 2-5 below. Additional analyses of the potential impacts on air quality and public health, GHG emissions and energy use, and noise and vibration are provided in Appendix B.

**Table 9-10: Environmental Impact Summary**

| Resource Area | Significant Impact? | | Analysis |
|---|---|---|---|
| | Yes | No | |
| Air Quality | | X | An air quality impact analysis is provided in Appendix B. As shown in this appendix, less than significant impacts to air quality are expected from construction or operation of the proposed Project. Construction emissions are expected to be minimal and temporary (approximately six months). Since hydrogen is not a regulated pollutant, no direct criteria pollutant emissions increases are expected from operation of the proposed new hydrogen generation system, due to fuel blending, or the hydrogen fueling station. |
| Biological Resources | | X | The proposed Project components will be added within the existing facility footprint on an area currently used as a parking lot. The addition of these facilities in this previously disturbed area would not impact biological resources. |
| Cultural Resources | | X | The proposed Project components will be added within the existing facility footprint on an area currently used as a parking lot. Although there will be some minor excavation needed related to the addition of new piping and electrical lines within the facility footprint, we note that the entire PEC site including this area underwent substantial grading and site preparation/leveling prior to the installation of the power plant, and hence the addition of the facilities including minor excavation would not impact cultural resources. |
| Efficiency and Reliability | | X | Allowing for use of an up to 2% blended hydrogen with the natural gas would not have an impact on efficiency and reliability of PEC. |
| Geology, and Paleontology | | X | The area where the proposed Project components will be installed is already level and disturbed and hence no substantial changes to the Project footprint are proposed. Therefore, there would be no impact to geologic or paleontological resources. All new structures will be built to meet current codes related to potential seismic activity at the site. |
| GHG Emissions and Energy Use | | X | Analyses of the GHG emissions and energy usage for the Project are provided in Appendix B. Less than significant impacts related to these topics are expected from construction and operation of the proposed Project. GHG emissions from construction are very minor, and the GHG emissions associated with indirect electrical power generation needed for the electrolyzer would be less than significant. The proposed Project would be consistent with several strategies in the Escondido Climate Action Plan, including encouraging use of zero-emissions and alternative fueled vehicles, reduced use of fossil fuels, and increase in renewable and zero-carbon energy. The Project also meets California's goals with the use of decarbonizing fuels to reduce GHG emissions. |
| Hazardous Materials | | X | Hydrogen is already stored on-site, and the amount stored will increase (from approximately 418 lbs to 600 lbs) but will remain well below the Threshold Quantity (TQ) level of 10,000 pounds listed in the California Accidental Release Prevention (CalARP) Program. |

| Resource Area | Significant Impact? | | Analysis |
|---|---|---|---|
| | Yes | No | |
| Land Use | | X | The use of hydrogen for generator cooling is already allowed at PEC and the proposed changes will comply with requirements of the City of Escondido General Plan and Escondido Research and Technology Center (ERTC) Specific Plan, so no zoning changes will be needed. Therefore, impacts related to land use are not expected. |
| Noises and Vibration | | X | An analysis of construction and operational noise and vibration is provided in Appendix B. Less than significant impacts are expected. |
| Public Health | | X | Combustion or use of hydrogen will reduce the amount of fine and respirable particulate matter and GHG emissions from the CTGs. Therefore, the proposed Project will have a beneficial impact on public health in the nearby communities. |
| Socioeconomic Resources | | X | The construction of the proposed Project will be temporary, and the proposed Project does not require any changes in operations workforce; hence, there will be no socioeconomic impact. |
| Soil and Water Resources | | X | Impacts to Soils are not expected. The proposed Project will be constructed on a previously disturbed site and construction will occur on a previously graded and leveled area. If needed, the site's Stormwater Pollution Prevention Plan (SWPPP) will be updated to ensure impacts to soils are minimized.<br><br>Water use by the electrolyzers will have a less than significant impact on water resources/water quality. The project will utilize reclaimed water from the HARRF, and no potable water will be used. The reclaimed water will be processed in PEC's DW system which currently has sufficient capacity for the proposed Project. Likewise, any process or wastewater discharge will be put into PEC's existing system which has sufficient capacity to handle these flows.<br><br>Soil and Water (S&W) Resources Appendix A in the Final Staff Assessment (FSA) for PEC (CEC 2003) indicated that the HARRF would be able to produce up to 9 MGD of reclaimed water after planned improvements were made to add tertiary treatment to the HARRF. Of that amount, it was estimated in the FSA that PEC might use up to 3.6 MGD of reclaimed water. None of the S&W COCs for PEC limit the amount of reclaimed water that can be used from the HARRF, and PEC was seen as substantial financial benefactor for the HARRF improvements by virtue of being a year-round user of the reclaimed water. Based on the requirement of 0.9 $L/Nm^3$ of water for the production rate of 49 lbs/hr of hydrogen produced (See Table 2-1), it is estimated that the proposed Project could require approximately 0.0015 MGD of DW. Actual usage of reclaimed water by PEC in 2020 was an average of approximately 1.6 MGD. Therefore, the small usage of DW for the proposed Project would be well below that analyzed in the FSA for PEC and hence would have a less than significant impact on water supply. |

| Resource Area | Significant Impact? | | Analysis |
|---|---|---|---|
| | Yes | No | |
| Traffic and Transportation | | X | The construction workforce will be minimal and construction worker parking and laydown areas can be accommodated on-site. The proposed Project does not require any changes in PEC workforce for plant operation; hence, there will be no traffic or transportation impact due to worker commute. The proposed changes will reduce the quantity of hazardous materials delivered to the Facility since hydrogen will now be produced on-site. The hydrogen fueling station may have up to 5 FCEVs per day travel to the site, but this amount of traffic would be minimal. Therefore, the proposed Project is expected to have a less than significant impact related to traffic and transportation. |
| Transmission Line Safety & Nuisance and System Engineering | | X | The solar PV system will require interconnection on-site but no substantial changes to the offsite transmission system are anticipated due to the proposed Project. Therefore, impacts related to the transmission system are expected to be less than significant. |
| Visual Resources | | X | An earthen berm currently runs along the eastern PEC property boundary to provide visual screening of the power plant from the adjacent properties, including the education center offices across from the proposed Project components. The tallest structures related to the proposed Project are the electrolyzer equipment at 20 feet and the solar PV canopies at 15 feet. The height of the berm near where the electrolyzer will be located is 25 feet, and hence provides sufficient screening of the view. |
| Waste Management | | X | Construction waste will be minimized and recycled to the extent practicable. The proposed Project will not affect the level of solid waste production from the PEC; hence, there will be less than significant impact. |
| Worker Safety and Fire Protection | | X | All required plans such as the Hazardous Materials Business Plan (HMBP) will be updated if needed related to the production, increased storage, and use of hydrogen on-site. The incremental increase in hydrogen storage on-site is well below the TQ for hydrogen. As a result of the safety procedures in place and updated as needed, the proposed Project will have a less than significant impact on worker safety and fire protection. |

**E. An analysis of how the proposed change would affect the project's compliance with applicable laws, ordinances, regulations, and standards.**

The Palomar Hydrogen Project is expected to continue compliance with all applicable LORS. The proposed Project only requires minor changes to COCs AQ-2 and HAZ-1, which do not change the facility's compliance with any additional LORS or cause any compliance constraints. The proposed Project involves adding hydrogen facilities to an existing power generation site, including an increase in the amount of hydrogen stored on-site, such that the power plant can continue to meet requirements with regulations and existing permits. For instance, the proposed Project will continue to comply with LORS as follows:

- Hydrogen is not a regulated air pollutant, so the proposed facilities do not require air permitting. Blending of up to 2% hydrogen in the natural gas fuel will not require any changes to the current SDAPCD PTO related to emissions limits.
- All hydrogen generation, storage, and fuel-related facilities will be built in compliance with applicable Building, Energy Efficiency, and Fire Codes.
- Hydrogen is already stored on-site, but the Hazardous Materials Business Plan (HMBP) and CalARP Risk Management Plan (RMP) will be reviewed and updated if needed.
- All architectural design and painting and landscaping will comply with the Escondido Research and Technology Center (ERTC) Specific Plan requirements.
- The main facility components will be constructed in a disturbed area currently used for storage and a parking lot. This area underwent substantial grading and ground disturbance during initial power plant construction, hence impacts related to biological, cultural, paleontological, geologic, soils, etc. are not expected. Should issues arise, SDG&E has biological and cultural subject matter experts (SMEs) who will be readily available to assist.
- As discussed in Appendix B, the proposed Project will comply with Escondido's General Plan and City Municipal Code related to noise and vibration impacts.
- The site's SWPPP will be updated if needed for construction of the new Project components.
- The project will utilize reclaimed water from the HARRF and no potable water will be used. The reclaimed water will be processed in PEC's DW system which currently has sufficient capacity for the project. Likewise, any process or wastewater discharge will be put into PEC's existing system which has sufficient capacity to handle these flows.

**F. A discussion of how the proposed change would affect the public.**

The proposed changes would have a positive effect on the public by allowing PEC to move toward implementation of SB 100 and California's goals of a carbon free energy future. The proposed Project would not have a substantial environmental impact on the public. The small increase in temporary criteria pollutant emissions related to construction would not cause or contribute to an exceedance of an ambient air quality standard (AAQS). The small increase in short-term TAC emissions during construction would not cause health risk impacts exceeding significance thresholds. The increase in risk from the increase in storage of hydrogen, which is a flammable hazardous material, from approximately 418 lbs to 600 lbs hydrogen storage on-site would be minimized by meeting applicable Building and Fire Codes, as well as updating the HMBP and

RMP if needed. The noise from the new air and hydrogen compressors would not be substantially different than the background noise from the power plant and would be within the requirements of the local ordinances and municipal codes. PEC uses reclaimed water from the HARRF and the small amount of reclaimed water used for the electrolyzer would not impact potable water supplies. Up to five FCEVs per day using the new hydrogen fueling station would not substantially increase traffic, and with the production of hydrogen on-site, there will no longer be a need to have deliveries of hydrogen cylinders. An existing earthen berm along the eastern property boundary would screen the new hydrogen facilities so that there would be no impact to the public's views.

**G. A list of current assessor's parcel numbers and owners' names and addresses for all parcels within 500 feet of any affected project linears and 1,000 feet of the project site.**

Nearby property owners, the public, and Parties to the Application Proceeding will not be affected by the proposed modification, since the proposed Project will be consistent with the current operation of the power plant, will have less than significant environmental effects, and will be in compliance with applicable LORS. Because there are no potentially affected property owners, a list of property owners is not included in this PTA. A list of property owners within 1,000 feet of the plant site has previously been provided to the CEC CPM for previous Post-Certification Amendments.

**H. A discussion of the potential effect of the proposed change on nearby property owners, residents, and the public.**

As seen in Figure 2-2, there is a large parking lot immediately east of the area where the proposed Project will be located, with the education center office building located more than 440 feet east of the closest Project components. There are light industrial buildings more than 460 feet to the northeast and a bakery more than 550 feet to the southeast. There is a hospital approximately 1,400 feet to the northwest and the closest residences to the proposed Project are more than 1,900 feet to the west (See Figure 2-1).

As discussed in Section F, significant effects are not expected on these nearby property owners or the public. The temporary (approximately 6 months) short-term emissions of criteria pollutants and diesel particulate matter during construction would have a negligible effect on nearby property owners, residents, and the public. Compliance with applicable California Building and Fire Codes and HMBP/RMP requirements will ensure that risks related to hazardous material (hydrogen) handling will be minimal. Noise from the hydrogen and air compressors and other equipment will meet the relevant NOISE COCs (e.g., NOISE-6 which limits noise in the residential areas west of the power plant site), as well as all Municipal Codes related to noise. The proposed Project will not use potable water and will not substantially increase use of reclaimed water by the power plant. The existing berm will block views of the proposed Project components from the adjacent parking lot and nearby buildings.

**I. A discussion of any exemptions from the California Environmental Quality Act, of the Public Resources Code, that the project owner believes may apply to approval of the proposed change.**

Exemptions to CEQA have not been identified.

## 3.0 SUMMARY AND CONCLUSIONS

The Palomar Hydrogen Project is proposed to support California's and SDG&E's goals to reduce GHG emissions and move toward a carbon free future.

Construction of the proposed new facilities are expected to take approximately a year, with the first six months for final engineering and design and equipment procurement, and approximately six months for the solar PV installation and construction and testing of the hydrogen components. The proposed Project will be constructed within the existing power plant footprint in an area currently used for storage and a parking lot. The area was extensively graded and disturbed during initial power plant construction, and no impacts to soils or to below ground level cultural or paleontological resources are expected. Minor air quality impacts during construction would be less than significant.

Operation of the proposed Project will entail hydrogen production using an electrolyzer and an increase in hydrogen storage in compressed gas cylinders from a maximum of 418 lbs to 600 lbs of hydrogen, which is still well below the TQ of 10,000 lbs where additional risk measures would need to be taken. Having an option to use a blended fuel will not affect power plant reliability or efficiency. No new off-site transmission system improvements or changes are needed. The proposed Project will include the installation of 300 kW PV solar which will reduce the amount of electricity needed from the grid for operation of the electrolyzer. Since the grid power is not yet 100% green, this energy use will cause indirect GHG emissions of approximately 2,724 metric tons (MT)/year related to the production of electricity, which is well below the San Diego County significance threshold of 10,000 MT per year.

Use of the blended fuel is not expected to impact SDG&E's ability to maintain compliance with the current SDAPCD PTO. No potable water will be used for hydrogen production and the additional reclaimed water used is small compared to other uses at PEC and well within the capacity of the HARRF. No changes to zoning or land use designation are needed, building design and painting as well as landscaping will remain consistent the ERTC Specific Plan, so there will be no land use impacts. There will be no change to the operational workforce needed and the up to five vehicles per day that would use the new hydrogen fueling station would not be a significant impact to traffic. The existing berm along the property boundary will sufficiently screen the new Project components from public view.

Implementation of the proposed Project does not introduce any new LORS for operation of the PEC since hydrogen is already used and stored on-site. Minor revisions to only two of the COCs are proposed related to the proposed Project (AQ-2 and Appendix C of HAZ-1) and only one other COC (AQ-28) is proposed to reflect a change that the SDAPCD is making to the PEC PTO. Hydrogen is not a pollutant or TAC and no new or revised environmental permits are needed. The nearby property owners, residents, or the public should not be significantly impacted by the project. Therefore, the proposed Project should be approved.

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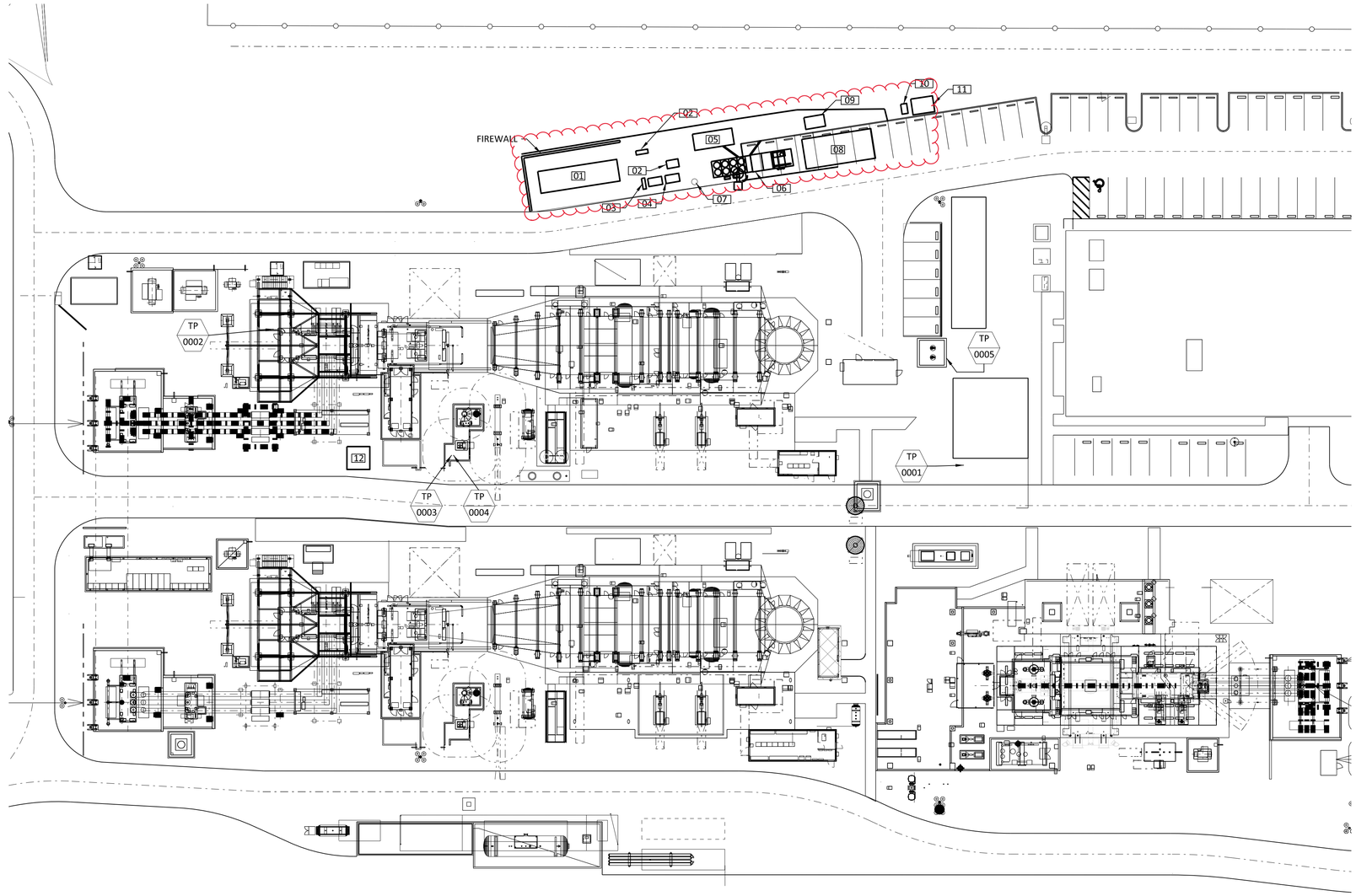
# APPENDIX A – FACILITY PLOT PLAN AND SOLAR CANOPIES LOCATIONS




## EQUIPMENT IDENTIFICATION

| DWG REF | DESCRIPTION |
|---|---|
| 01 | HYDROGEN STORAGE |
| 02 | AIR COOLED HX PUMPS AND TANK |
| 03 | NITROGEN RACK |
| 04 | COMPRESSORS |
| 05 | RECTIFIER |
| 06 | ELECTROLYZER |
| 07 | WASTEWATER SUMP |
| 08 | ELECTRICAL ENCLOSURE |
| 09 | AUXILIARY TRANSFORMER |
| 10 | VEHICLE FUELING DISPENSER |
| 11 | VEHICLE HYDROGEN FUELING STATION |
| 12 | U2 FG BLENDING SKID |
| | |
| | |
| | |
| | |

## TERMINAL POINT IDENTIFICATION

| TP REF | DESCRIPTION |
|---|---|
| 0001 | DEMIN WATER TO ELECTROLYZER |
| 0002 | H2 TO U1/U2 CTG AND STG COOLING |
| 0003 | U2 FG TO U2 BLENDING SKID |
| 0004 | U2 FG BLENDING TO U2 FG HEATER |
| 0005 | WASTEWATER SUMP TO HRSG BD SUMP |
| | |
| | |
| | |
| | |
| | |

NOTES:

1. THIS ARRANGEMENT IS CONCEPTUAL ONLY. CONTRACTOR TO CONFIRM ARRANGEMENT FOR EQUIPMENT AND PROCESS BEING PROPOSED.
2. ALL FINISHED GRADE SHALL HAVE AGGREGATE.

1/32" 24' 16' 8' 0 32' 64'
1/32"=1'-0"

**NOT TO BE USED FOR CONSTRUCTION**

THE DISTRIBUTION AND USE OF THE NATIVE FORMAT CAD FILE OF THIS DRAWING IS UNCONTROLLED. THE USER SHALL VERIFY TRACEABILITY OF THIS DRAWING TO THE LATEST CONTROLLED VERSION.

| NO | DATE | REVISIONS AND RECORD OF ISSUE | DRN | DES | CHK | PDE | APP |
|---|---|---|---|---|---|---|---|
| C | 02/16/2021 | REVISED PER CLIENT'S REQUEST | HFS | VMM | | JEB | |
| B | 12/7/2020 | ISSUE FOR RFP | NNR | VMM | | JEB | |
| A | 11/12/2020 | ISSUED FOR CLIENT REVIEW | NNR | VMM | | JEB | |

BLACK & VEATCH

DESIGNER | DRAWN | CHECKED | DATE

PALOMAR ENERGY CENTER
HYDROGEN PROJECT
GENERAL ARRANGEMENT

PROJECT 406498-1UUU-M2001 | DRAWING NUMBER | REV C
CODE | AREA

MicroStation v8.11.9.578
1"=1" Full Size
she98467
ANSI D 34x22
12/09/2020 03:45 PM

# SDG&E PALOMAR ENERGY CENTER
# 2300 HARVESON PL
# ESCONDIDO, CALIFORNIA 92029
# APN: 232-591-01
# NEW PHOTOVOLTAIC SYSTEM | 304.24 kWDC (249.9kWAC)

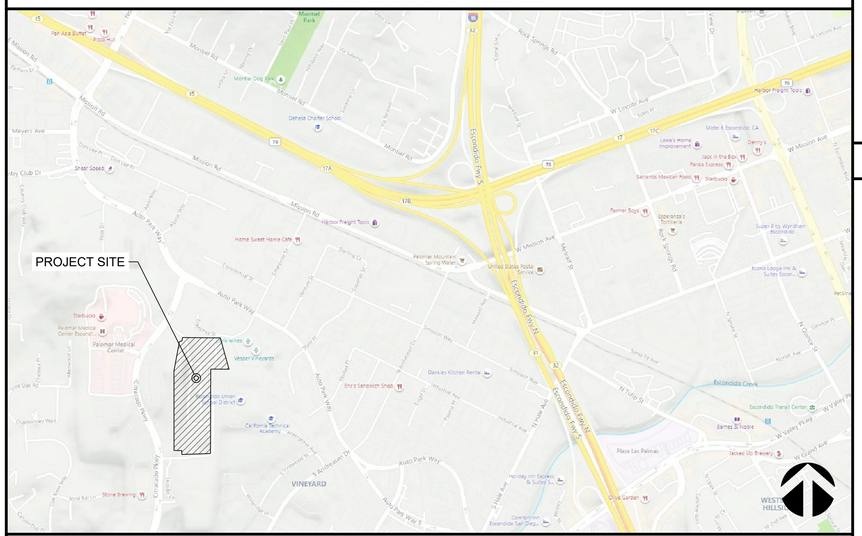
## ABBREVIATIONS

| | | | |
|---|---|---|---|
| (+) | POSITIVE | kAIC | KILOAMPERE INTERRUPTING RATING |
| (-) | NEGATIVE | kCMIL | THOUSAND CIRCULAR MILS |
| A | AMPS, AMPERES | kV | KILOVOLTS |
| AC | ALTERNATING CURRENT | kVA | KILOVOLT-AMPERES |
| ADA | AMERICANS WITH DISABILITIES ACT | kW | KILOWATTS |
| AF | AMP FRAME, AMP FUSE | kWh | KILOWATT-HOURS |
| AFF | ABOVE FINISH FLOOR | LBS | POUNDS |
| AFG | ABOVE FINISH GRADE | LF | LINEAR FEET |
| AHJ | AUTHORITY HAVING JURISDICTION | LV | LOW VOLTAGE |
| AIC | AMPERE INTERRUPTING RATING | M | METERS |
| AL | ALUMINUM | MAX | MAXIMUM |
| APPROX | APPROXIMATE | MCB | MAIN CIRCUIT BREAKER |
| AS | AMP SWITCH | MFR | MANUFACTURER |
| ASSOC | ASSOCIATION | MIN | MINIMUM |
| AT | AMP TRIP | MLO | MAIN LUGS ONLY |
| ATS | AUTOMATIC TRANSFER SWITCH | MSB | MAIN SERVICE BOARD |
| AVG | AVERAGE | MV | MEDIUM VOLTAGE |
| AWG | AMERICAN WIRE GAUGE | NEU | NEUTRAL |
| BKR | CIRCUIT BREAKER | NC | NORMALLY CLOSED |
| BLDG | BUILDING | NEC | NATIONAL ELECTRIC CODE |
| C | CONDUIT | NEG | NEGATIVE |
| CB | CIRCUIT BREAKER | NEM | NET ENERGY METER |
| CBC | CALIFORNIA BUILDING CODE | NEMA | NATIONAL ELECTRICAL MFR ASSOC |
| CEC | CALIFORNIA ELECTRIC CODE | NF | NON-FUSED |
| CFC | CALIFORNIA FIRE CODE | NFPA | NATIONAL FIRE PROTECTION ASSOC |
| CKT | CIRCUIT | NO | NORMALLY OPEN, NUMBER |
| CL | CENTER LINE | NRTL | NATIONALLY RECOGNIZED TESTING LAB |
| CMU | CONCRETE MASONRY UNIT | NTS | NOT TO SCALE |
| COMM | COMMUNICATION(S) | OC | ON CENTER |
| CONC | CONCRETE | OCPD | OVERCURRENT PROTECTION DEVICE |
| CSFM | CALIFORNIA STATE FIRE MARSHAL | OH | OVERHEAD |
| CT | CURRENT TRANSFORMER | (P) | PROPOSED |
| CTR | CENTER | P | POLE |
| CU | COPPER | PB | PULLBOX |
| DAS | DATA ACQUISITION SYSTEM | PH | PHASE |
| DC | DIRECT CURRENT | POCC | POINT OF COMMON CONNECTION |
| DET | DETAIL | POS | POSITIVE |
| DIA | DIAMETER | PT | POTENTIAL TRANSFORMER |
| DIM | DIMENSION | PV | PHOTOVOLTAIC |
| DISCO | DISCONNECT | PVC | POLYVINYL CHLORIDE |
| DWG | DRAWING | QTY | QUANTITY |
| (E) | EXISTING | REQD | REQUIRED |
| EA | EACH | RGM | REVENUE GRADE METER |
| EC | ELECTRICAL CONTRACTOR | RGS | RIGID GALVANIZED STEEL CONDUIT |
| EG | EQUIPMENT GROUND | RM | ROOM |
| EGC | EQUIPMENT GROUNDING CONDUCTOR | RMC | RIGID METAL CONDUIT |
| ELEC | ELECTRIC, ELECTRICAL | RMS | ROOT MEAN SQUARE |
| ELEV | ELEVATION | RSD | RAPID SHUTDOWN |
| EMT | ELECTRICAL METALLIC TUBING | SCC | SHORT CIRCUIT CURRENT |
| ENT | ELECTRICAL NON-METALLIC TUBING | SCH40 | SCHEDULE 40 |
| EXT | EXTERIOR | SCH80 | SCHEDULE 80 |
| F | FUSE, FUSED | SLD | SINGLE LINE DIAGRAM |
| FIN | FINISH | SCHED | SCHEDULE |
| FL | FLOOR | SS | STAINLESS STEEL |
| FR | FRAME | SW | SWITCH |
| FT | FEET | SWBD | SWITCHBOARD |
| G | GROUND | SWGR | SWITCHGEAR |
| GALV | GALVANIZED | TEMP | TEMPERATURE, TEMPORARY |
| GC | GENERAL CONTRACTOR | TYP | TYPICAL |
| GEC | GROUNDING ELECTRODE CONDUCTOR | UGPS | UNDERGROUND PULL SECTION |
| GFI/GFCI | GROUND FAULT CIRCUIT INTERRUPTER | UL | UNDERWRITERS LABORATORIES |
| GFP | GROUND FAULT PROTECTION | UNO | UNLESS NOTED OTHERWISE |
| GND | GROUND | V | VOLTS |
| HDG | HOT DIP GALVANIZED | VA | VOLT-AMERES |
| HH | HANDHOLE | VAC | VOLTS-AC |
| HZ | HERTZ | VDC | VOLTS-DC |
| IMC | INTERMEDIATE METAL CONDUIT | VMP | MAX POWER VOLTAGE |
| IMP | MAX POWER OPERATING CURRENT | VOC | OPEN CIRCUIT VOLTAGE |
| IN | INCHES | W | WATTS |
| ISC | SHORT CIRCUIT CURRENT | WP | WEATHERPROOF |
| J/JB | JUNCTION BOX | WW | WIREWAY |
| JST | JOIST | XFMR | TRANSFORMER |

## GENERAL NOTES

1- WORK SHALL COMPLY WITH THE REQUIREMENTS OF THE 2019 CBC, 2019 CEC, 2019 CFC, 2017 NEC AND ANY ADDITIONAL CODES BEING ENFORCED BY THE AHJ (SUCH AS THE SAN DIEGO AREA ELECTRICAL NEWSLETTERS IF APPLICABLE).
2- WORK SHALL COMPLY WITH THE REQUIREMENTS OF THE SERVING ELECTRIC UTILITY.
3- ALL PV MODULES AND INVERTERS ARE LISTED, IN COMPLIANCE WITH UL 1703 & UL 1741 AND INSTALLED PER THEIR LISTINGS.
4- EXISTING CONDITIONS SHALL BE VERIFIED PRIOR TO COMMENCING WORK.
5- NEW EQUIPMENT INSTALLATION SHALL NOT OBSTRUCT ANY PLUMBING, MECHANICAL OR BUILDING ROOF VENTS.
6- DO NOT SCALE FROM PLANS - USE GIVEN OR CALCULATED DIMENSIONS ONLY. WHEN IN DOUBT, CALL THE DESIGNER.
7- ALL ROOF, WALL, FLOOR AND CEILING PENETRATIONS SHALL BE COORDINATED WITH BUILDING OWNER, ARCHITECT, ROOFER & STRUCTURAL ENGINEER.
8- ALL WALL, FLOOR AND CEILING PENETRATIONS SHALL BE SEALED WITH FIRE RETARDANT PER 2019 CBC.
9- ALL ROOF PENETRATIONS SHALL BE SEALED AND WATERPROOFED TO MAINTAIN THE EXISTING FIRE RATING, AND SHALL BE PERFORMED BY A LICENSED ROOFING CONTRACTOR. ANY FLASHING DETAILS SHOWN ARE EXAMPLES ONLY.
10- CONTRACTOR SHALL PROTECT ALL EXISTING SURFACES.
11- PV MODULES, ASSOCIATED EQUIPMENT AND WIRING MATERIAL SHALL BE PROTECTED FROM ANY PHYSICAL DAMAGE.
12- ALL EFFORTS SHALL BE TAKEN TO PREVENT GALVANIC CORROSION DUE TO DIRECT CONTACT OF DISSIMILAR METALS.
13- PROPER ACCESS AND WORKING CLEARANCE SHALL BE MAINTAINED PER CEC 110.26.
14- MARKING OF THE PV SYSTEM SHALL BE IN ACCORDANCE WITH 2019 CEC, 2019 CFC, 2017 NEC AND THE SERVING ELECTRIC UTILITY - SEE MARKING DETAILS ON SUBSEQUENT SHEET(S).
15- CONTRACTOR SHALL OBTAIN APPROVAL FROM THE SERVING ELECTRIC UTILITY PRIOR TO ACTIVATING THE PV SYSTEM.
16- REMOTE MONITORING OF ANY PV SYSTEM REQUIRES AN ALWAYS-ON NETWORK INTERFACE CONNECTION.
17- PLANS MAY ASSUME SOME WORK NOT SHOWN. CONTRACTOR WILL PROVIDE A COMPLETE AND FUNCTIONAL PRODUCT.
18- SEE SUBSEQUENT SHEETS FOR ADDITIONAL ELECTRICAL AND STRUCTURAL NOTES.

## VICINITY MAP




## PROJECT TEAM

**GENERAL CONTRACTOR AND ELECTRICAL DESIGNER**
BAKER ELECTRIC, INC.
1298 PACIFIC OAKS PLACE
ESCONDIDO, CA 92029
(760) 745-2001
PM: DAYN RICHARDSON
DESIGNER: AUSTIN EARLEY

**STEEL CONTRACTOR**
TEICHERT SOLAR
10620 TREENA ST 140
SAN DIEGO, CA 92131
(562) 283-2970
CONTACT: ANDREAS KARLSON

**STRUCTURAL ENGINEER**
TKJ STRUCTURAL ENGINEERING
9820 WILLOW CREEK ROAD
SUITE 455
SAN DIEGO, CA 92131
(858) 649-1700
CONTACT: BO JAQUESS

**STRUCTURAL ENGINEER**
ORIE2 ENGINEERING INC.
9750 MIRAMAR RD. SUITE 310
SAN DIEGO, CA 92126
CONTACT: DANIEL FISHER

## SHEET INDEX

| NUMBER | IDENTIFIER | DESCRIPTION |
|---|---|---|
| GENERAL | | |
| 01 | G-001 | COVER SHEET |
| ELECTRICAL | | |
| - | E-101 | ELECTRICAL SITE PLAN |
| - | E-102 | ELECTRICAL EQUIPMENT LAYOUT - ROOF & CP-1 |
| - | E-103 | ELECTRICAL EQUIPMENT LAYOUT - CARPORT CP-2 THRU CP-5 |
| - | E-104 | ELECTRICAL EQUIPMENT PLAN VIEW AND ELEVATIONS |
| - | E-801 | DATA SHEETS |
| - | E-802 | DATA SHEETS |

## SITE INFORMATION & PROJECT SCOPE

**SITE DESCRIPTION**
APN: 232-591-01
LEGAL DESCRIPTION: LOT 1 MAP 433151
USE CODE DESCRIPTION: SDG&E
ZONED COUNTY CODE: SDG&E

**APPLICABLE BUILDING CODES**
2019 CALIFORNIA BUILDING CODE
2019 CALIFORNIA ELECTRICAL CODE
2019 CALIFORNIA FIRE CODE
2017 NATIONAL ELECTRIC CODE

**PROPERTY OWNER**
SDG&E
**2300 HARVESON PL.**
**ESCONDIDO, CA**

**SCOPE OF WORK**
A SOLAR PHOTOVOLTAIC SYSTEM WILL BE INSTALLED ON AN EXISTING COMMERCIAL BUILDING.
FIVE STEEL CARPORTS WILL BE INSTALLED IN THE PARKING LOT, ON WHICH A PORTION OF THE PV SYSTEM WILL BE INSTALLED.
THE DC SYSTEM WILL OPERATE AT A MAXIMUM OF 1,000VDC.
THE PV SYSTEM WILL INTERCONNECT IN PARALLEL WITH THE EXISTING AC ELECTRICAL SYSTEM.
THE ENERGY GENERATED BY THE PV SYSTEM WILL OFFSET A PORTION OF THE FACILITY LOADS.

**PHOTOVOLTAIC SYSTEM SUMMARY**
303.24 kWDC (249.9 kWAC) ROOF AND CARPORT MOUNTED PV SYSTEM CONSISTING OF
** (722) LG420N2W-V5 PV MODULES (420 WDC-STC, 386.9 WDC-CEC)
** (54) AP SMART RSD-S-PLC RAPID SHUTDOWN DEVICES
** (3) SMA STP50-US-41 INVERTERS (50.0 kW, 97.5% CEC EFFICIENCY)
** (3) SMA STP33-US-41 INVERTERS (33.3 kW, 97.5% CEC EFFICIENCY)
** A UNIRAC/S-5! RACKING SYSTEM
** A SMA DATA ACQUISITION SYSTEM
** AC AND DC EQUIPMENT REQUIRED TO CREATE A COMPLETE, CODE COMPLIANT, SAFE AND FUNCTIONAL PRODUCT


Baker Electric
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(760) 745-2001

REGISTRATION
**BAKER ELECTRIC, INC.**
1298 PACIFIC OAKS PL.
ESCONDIDO, CA 92029
(760) 745-2001
**C10-161756**
EXP. 8/31/2021

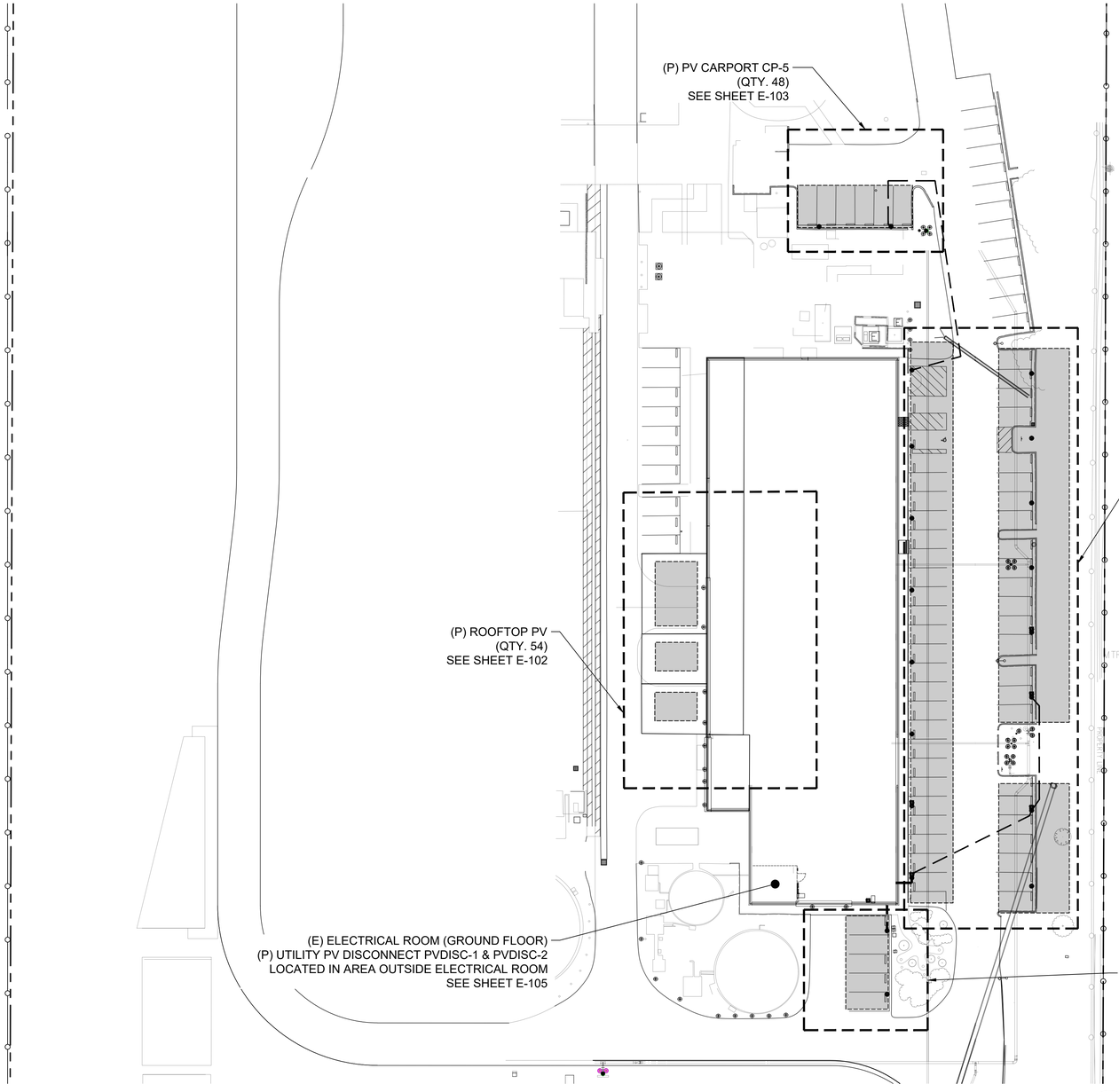

PROJECT TITLE
**SDG&E PALOMAR ENERGY CENTER**
**303.24 kWDC PHOTOVOLTAIC PROJECT**
**2300 HARVESON PLACE**
**ESCONDIDO, CA 92029**

SHEET DESCRIPTION
COVER SHEET

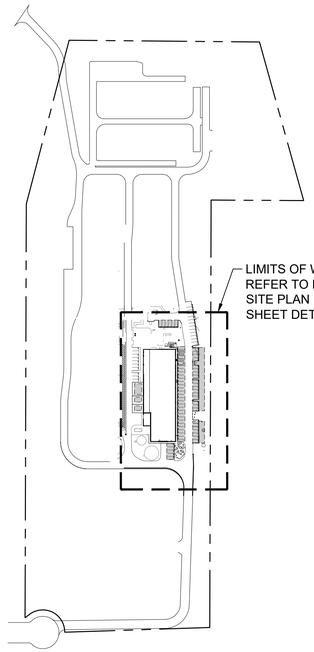
| REV | BY | DATE | DESCRIPTION |
|---|---|---|---|
| a.5 | AE | 08/06/2021 | 30% CLIENT REVIEW |

PROJECT NUMBER: 22398
DRAWN BY: AE/IV
CHECKED BY:
DATE: 08/06/2021
REVISION: a.5
SHEET IDENTIFIER: **G-001**
SHEET OF

Date Plotted : Aug 06, 2021 – 4:53pm




1 ENLARGED ELECTRICAL SITE PLAN
SCALE - 1" = 30'




KEY MAP FOR REFERENCE
SCALE - 1" = 200'

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EXP. 8/31/2021

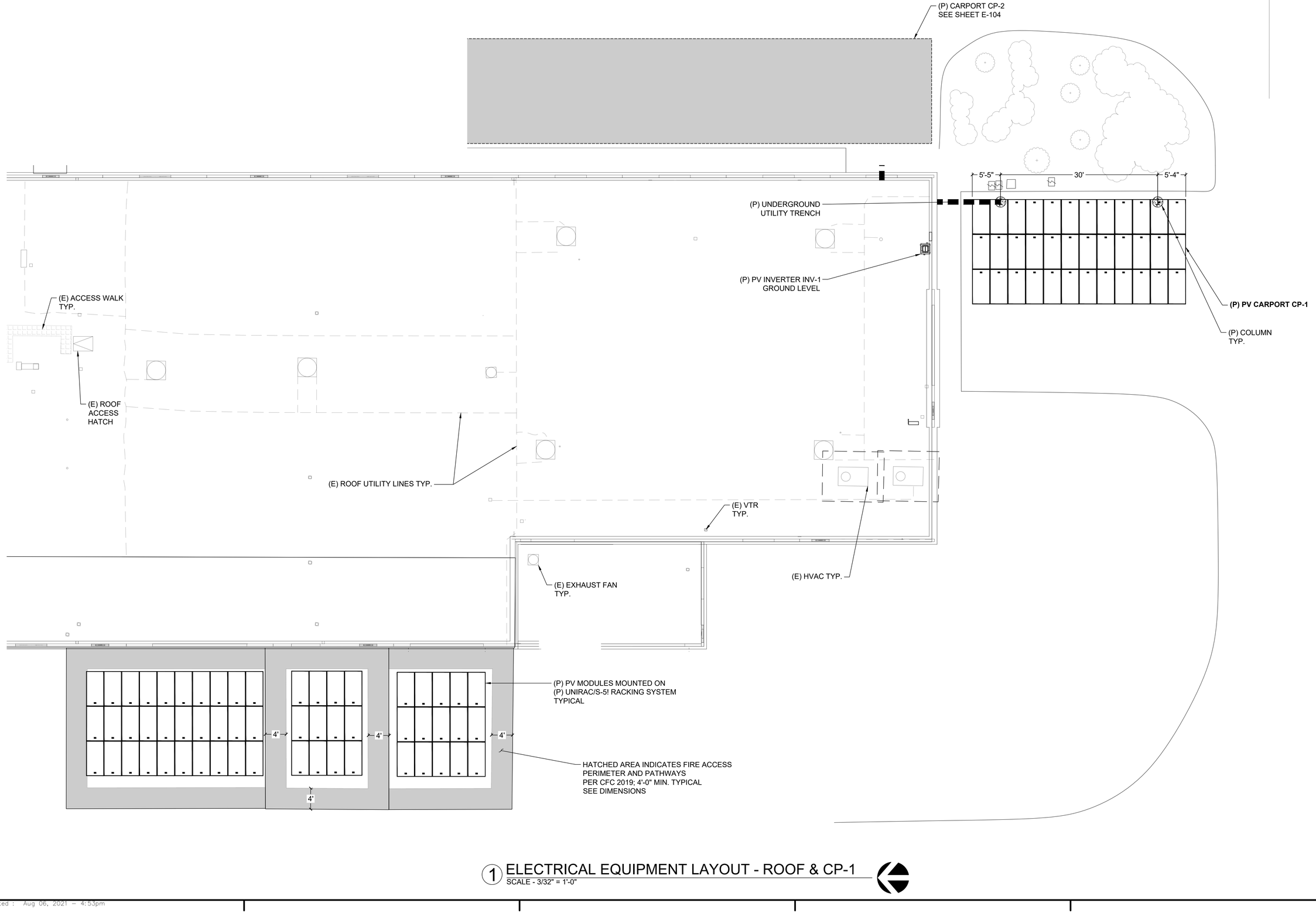
PROJECT TITLE
**SDG&E PALOMAR ENERGY CENTER**
**303.24 kWDC PHOTOVOLTAIC PROJECT**
**2300 HARVESON PLACE**
**ESCONDIDO, CA 92029**

SHEET DESCRIPTION
ELECTRICAL SITE PLAN

| REV | BY | DATE | DESCRIPTION |
|---|---|---|---|
| a.5 | AE | 08/06/2021 | 30% CLIENT REVIEW |

| | |
|---|---|
| PROJECT NUMBER | 22398 |
| DRAWN BY | AE/IV |
| CHECKED BY | |
| DATE | 08/06/2021 |
| REVISION | a.5 |
| SHEET IDENTIFIER | **E-101** |
| SHEET | OF |

Date Plotted : Aug 06, 2021 – 4:53pm




1 ELECTRICAL EQUIPMENT LAYOUT - ROOF & CP-1
SCALE - 3/32" = 1'-0"

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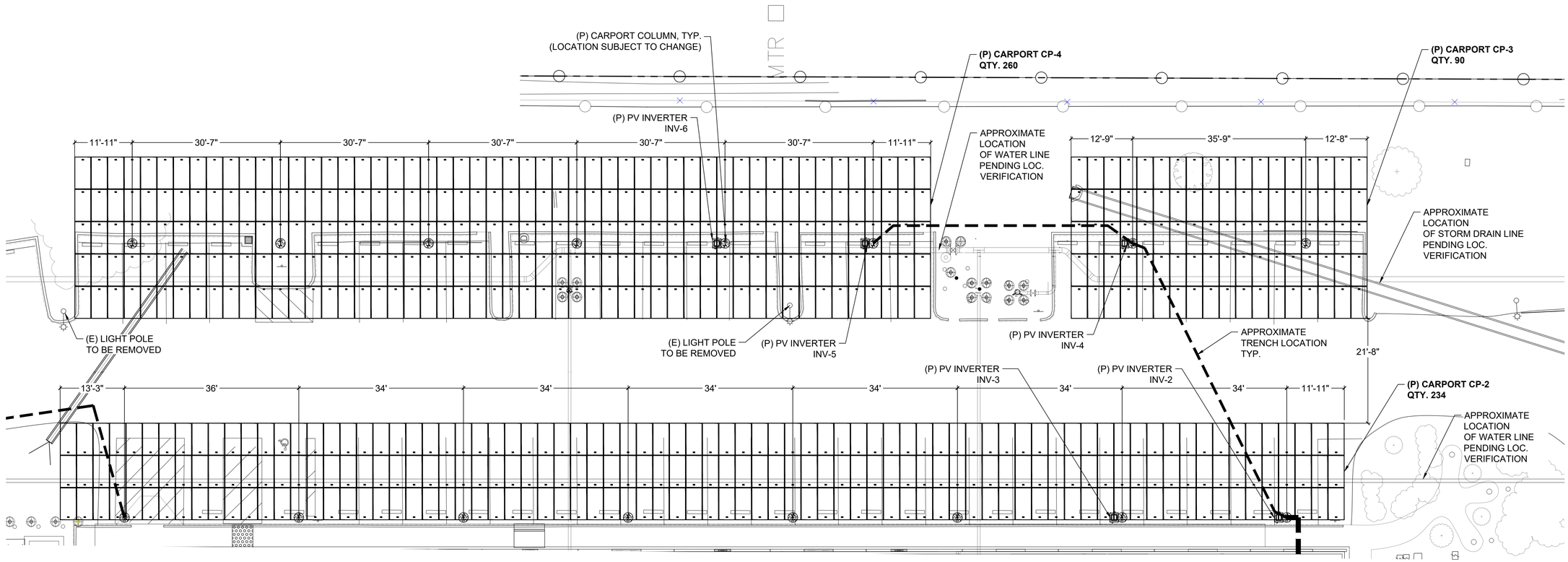
PROJECT TITLE
SDG&E PALOMAR ENERGY CENTER
303.24 kWDC PHOTOVOLTAIC PROJECT
2300 HARVESON PLACE
ESCONDIDO, CA 92029

SHEET DESCRIPTION
ELECTRICAL EQUIPMENT LAYOUT - ROOF & CP-1

| REV | BY | DATE | DESCRIPTION |
|---|---|---|---|
| a.5 | AE | 08/06/2021 | 30% CLIENT REVIEW |

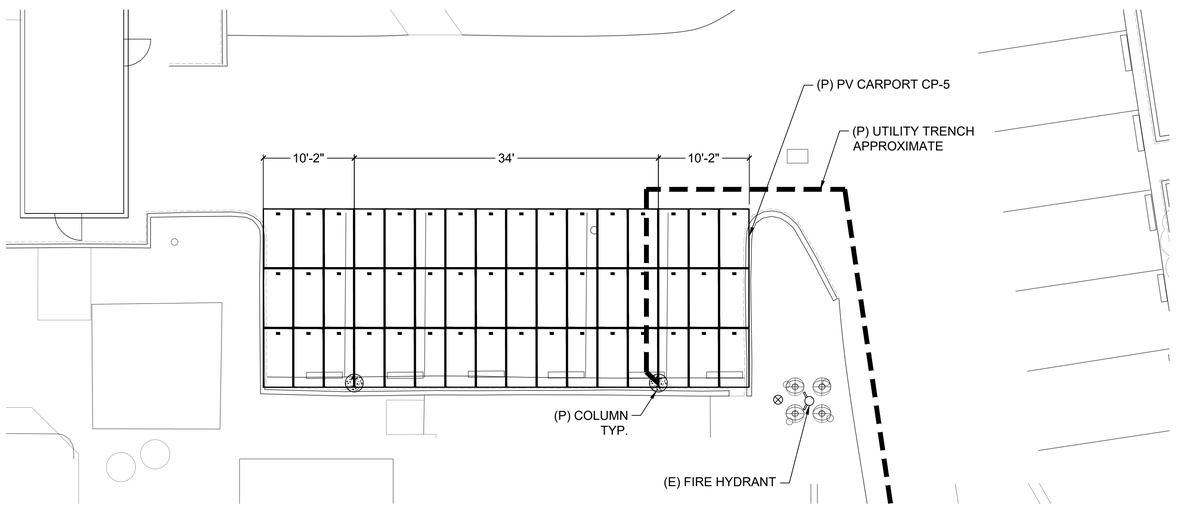
PROJECT NUMBER 22398
DRAWN BY AE/IV
CHECKED BY
DATE 08/06/2021
REVISION a.5
SHEET IDENTIFIER E-102
SHEET OF

Date Plotted : Aug 06, 2021 – 4:53pm




## 1 ELECTRICAL EQUIPMENT LAYOUT - CARPORTS CP-2, CP-3, CP-4

SCALE - 3/32" = 1'0"




## 2 ELECTRICAL EQUIPMENT LAYOUT - CARPORT CP-5

SCALE - 1/8" = 1'-0"

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**C10-161756**
EXP. 8/31/2021

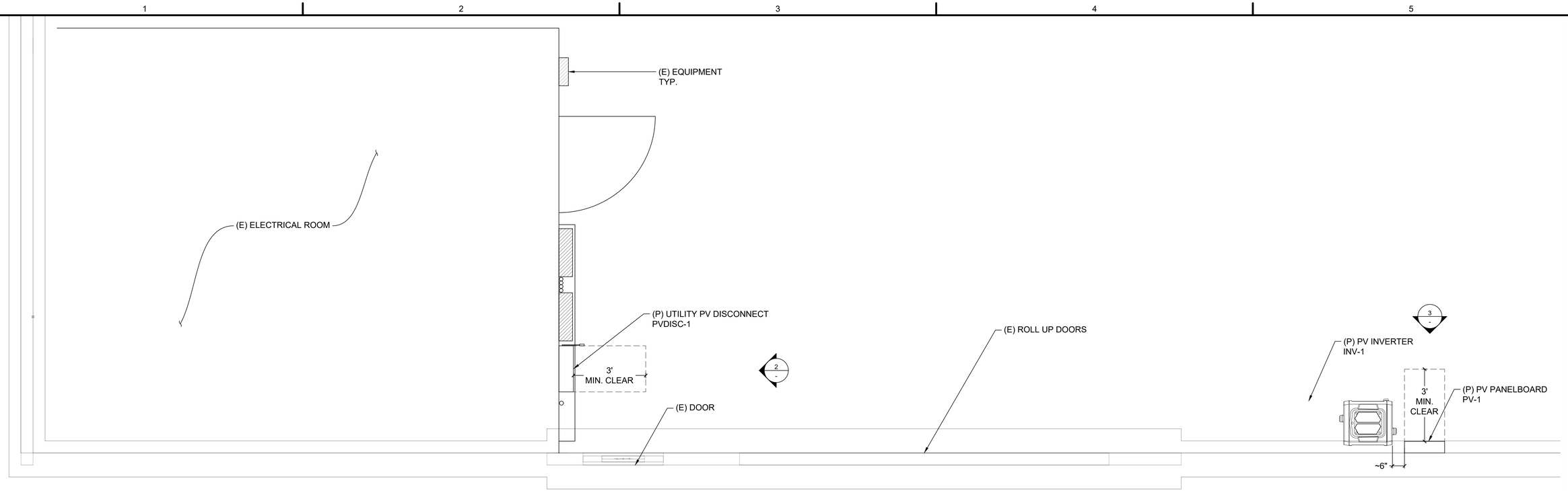
PROJECT TITLE
**SDG&E PALOMAR ENERGY CENTER**
**303.24 kWDC PHOTOVOLTAIC PROJECT**
**2300 HARVESON PLACE**
**ESCONDIDO, CA 92029**

SHEET DESCRIPTION
ELECTRICAL EQUIPMENT LAYOUT - CARPORTS CP-2, CP-3, CP-4, CP-5

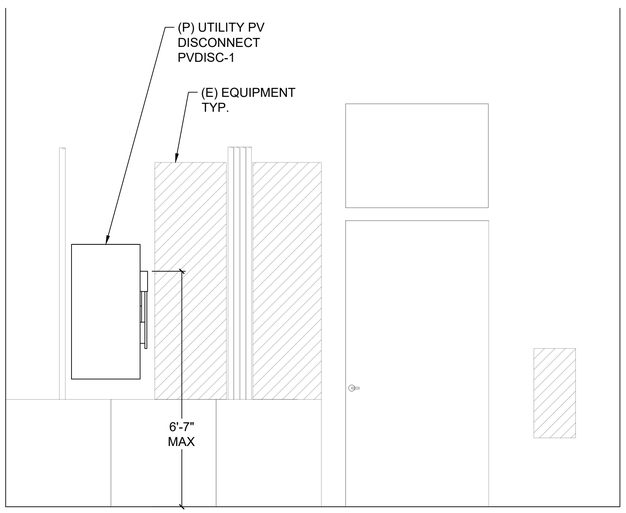
| REV | BY | DATE | DESCRIPTION |
|---|---|---|---|
| a.5 | AE | 08/06/2021 | 30% CLIENT REVIEW |

PROJECT NUMBER 22398
DRAWN BY AE/IV
CHECKED BY
DATE 08/06/2021
REVISION a.5
SHEET IDENTIFIER **E-103**
SHEET OF

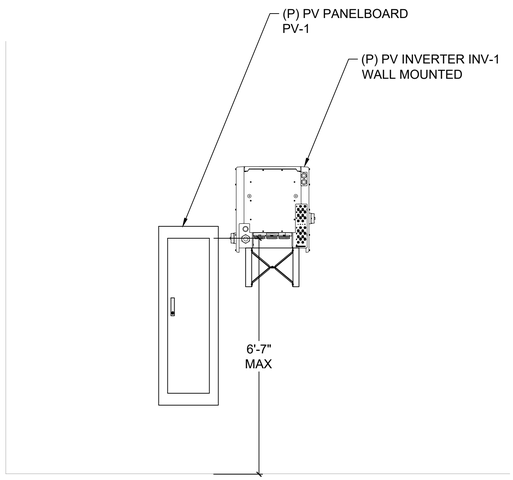
Date Plotted : Aug 06, 2021 – 4:53pm




## 1 ELECTRICAL EQUIPMENT PLAN VIEW - GROUND FLOOR
SCALE - 1/2" = 1'0"




## 2 PVDISC-1 ELEVATION - GROUND FLOOR
SCALE - 1/2" = 1'0"




## 3 PVDISC -2 ELEVATION - GROUND FLOOR
SCALE - 1/2" = 1'0"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(760) 745-2001
**C10-161756**
EXP. 8/31/2021


PROJECT TITLE
**SDG&E PALOMAR ENERGY CENTER**
**303.24 kWDC PHOTOVOLTAIC PROJECT**
**2300 HARVESON PLACE**
**ESCONDIDO, CA 92029**

SHEET DESCRIPTION
ELECTRICAL EQUIPMENT PLAN VIEW AND ELEVATIONS - GROUND FLOOR

| REV | BY | DATE | DESCRIPTION |
|---|---|---|---|
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PROJECT NUMBER: 22398
DRAWN BY: AE/IV
CHECKED BY:
DATE: 08/06/2021
REVISION: a.5
SHEET IDENTIFIER: **E-104**
SHEET OF

Date Plotted : Aug 06, 2021 – 4:53pm

# LG NeON®2

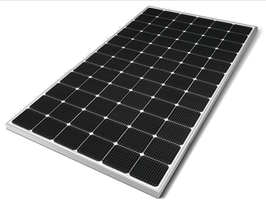
LG420N2W-V5

72

## 420W

The LG NeON® 2 is LG's best selling solar module, and is one of the most powerful and versatile modules on the market today. Featuring LG's Cello Technology, the LG NeON® 2 increases power output. New updates include an extended performance warranty from 86% to 90.08% to give customers higher performance and reliability.

25 YEAR PRODUCT • PERFORMANCE • LABOR WARRANTY



### Features

**Enhanced Performance Warranty**
LG NeON® 2 has an enhanced performance warranty. After 25 years, LG NeON® 2 is guaranteed at least 90.08% of initial performance.

**Enhanced Product Warranty**
LG has extended the warranty of the NeON® 2 to 25 years including labor, which is top level in the industry.

**Better Performance on a Sunny Day**
LG NeON® 2 now performs better on sunny days, thanks to its improved temperature coefficient.

**BOS (Balance Of System) Saving**
LG NeON® 2 can reduce the total number of strings due to its high module efficiency resulting in a more cost effective and efficient solar power system.

**When you go solar, ask for the brand you can trust: LG Solar**

**About LG Electronics**

LG Electronics is a global leader in electronic products in the clean energy markets by offering solar PV panels and energy storage systems. The company first embarked on a solar energy source research program in 1985, supported by LG Group's vast experience in the semi-conductor, LCD, chemistry and materials industries. In 2015, LG Solar successfully released its first Mono® series to the market, which is now available in 32 countries. The NeON® (previous Mono® NeON®, NeON®2, NeON® 2) #Facial was the "Intersolar AWARD" in 2013, 2015 and 2016, which demonstrates LG's leadership and innovation in the solar industry.

LG Life's Good

# SUNNY TRIPOWER CORE1 33-US / 50-US / 62-US

SMA


**Fully integrated**
- Innovative design requires no additional racking for rooftop installation
- Integrated DC and AC disconnects and overvoltage protection
- 12 direct string inputs for reduced labor and material costs

**Increased power, flexibility**
- Multiple power ratings for small to large scale commercial PV installions
- Six MPP trackers for flexible stringing and maximum power production
- ShadeFix, SMA's proprietary shade management solution, optimizes at the string level

**Enhanced safety, reliability**
- Integrated SunSpec PLC signal for module-level rapid shutdown compliance to 2017 NEC
- Next-gen DC AFCI arc-fault protection certified to new Standard UL 1699B Ed. 1

**Smart monitoring, control, service**
- Advanced smart inverter grid support capabilities
- Increased ROI with SMA ennexOS cross sector energy management platform
- SMA Smart Connected proactive O&M solution reduces time spent diagnosing and servicing in the field

## SUNNY TRIPOWER CORE1 33-US / 50-US / 62-US

It stands on its own

The Sunny Tripower CORE1 is the world's first free-standing PV inverter for commercial rooftops, carports, ground mount and repowering legacy solar projects. From distribution to construction to operation, the Sunny Tripower CORE1 enables logistical, material, labor and service cost reductions, and is the most versatile, cost-effective commercial solution available. Integrated SunSpec PLC for rapid shutdown and enhanced DC AFCI arc-fault protection ensure compliance to the latest safety codes and standards. With Sunny Tripower CORE1 and SMA's ennexOS cross sector energy management platform, system integrators can deliver comprehensive commercial energy solutions for increased ROI.

www.SMA-America.com

# S-5!®

The Right Way!

The right way to attach almost anything to metal roofs!

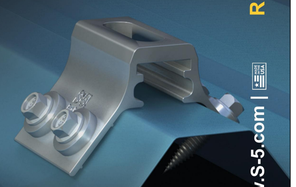
## RibBracket™

RibBracket™ can be used to mount almost anything onto the most common exposed-fastened, trapezoidal roof profiles marketed in North America today. No messy sealants to apply! No chance for leaks! The RibBracket comes with a factory-applied EPDM rubber gasket seal already on the base, and the S-5!®-patented reservoir conceals the EPDM from UV exposure, preventing drying and cracks.

Installation is simple! The RibBracket is mounted directly onto the crown of the panel, straddling the profile. No surface preparation is necessary; simply wipe away excess oil and debris, align, and apply. Secure through the pre-punched holes using the appropriate fasteners or Bulb-tite rivets for the supporting roof material.

RibBracket is the perfect match for our S-5-PV Kit, or any other ancillary application, without worrying about cold bridging! RibBracket is extremely economical and facilitates quick and easy installation.

The slotted top hole, which accommodates standard M8 nuts and bolts, simplifies alignment and maximizes flexibility in attaching ancillaries.



RibBracket™ and RibBracket™ Mini

888-825-3432 | www.S-5.com

**S-5!® RibBracket™ is the right way to attach almost anything to select exposed-fastened, trapezoidal roof profiles, including PV through DirectAttached™ or rail methods.**

Tech Brief

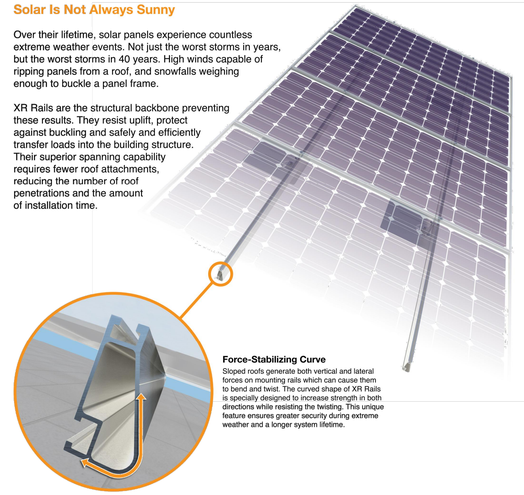
IRONRIDGE

# XR Rail Family

## Solar Is Not Always Sunny

Over their lifetime, solar panels experience countless extreme weather events. Not just the worst storms in years, but the worst storms in 40 years. High winds capable of ripping panels from a roof, and snowfalls weighing enough to buckle a panel frame.

XR Rails are the structural backbone preventing these results. They resist uplift, protect against buckling and safely and efficiently transfer loads into the building structure. Their superior spanning capability requires fewer roof attachments, reducing the number of roof penetrations and the amount of installation time.



**Force-Stabilizing Curve**
Sloped roofs generate both vertical and lateral forces on mounting rails which can cause them to bend and twist. The curved shape of XR Rails is specially designed to increase strength in both directions while resisting the twisting. This unique feature ensures greater security during extreme weather and a longer system lifetime.

**Compatible with Flat & Pitched Roofs**
XR Rails are compatible with FlashFoot and other pitched roof attachments.
IronRidge offers a range of tilt leg options for flat roof mounting applications.

**Corrosion-Resistant Materials**
All XR Rails are made of 6000-series aluminum alloy, then protected with an anodized finish. Anodizing prevents surface and structural corrosion, while also providing a more attractive appearance.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C10-161756
EXP. 8/31/2021


PROJECT TITLE
SDG&E PALOMAR ENERGY CENTER
303.24 kWDC PHOTOVOLTAIC PROJECT
2300 HARVESON PLACE
ESCONDIDO, CA 92029

SHEET DESCRIPTION
DATA SHEETS

| REV/ BY | DATE | DESCRIPTION |
|---|---|---|
| a.5 AE | 08/06/2021 | 30% CLIENT REVIEW |

PROJECT NUMBER 22398
DRAWN BY AE/IV
CHECKED BY
DATE 08/06/2021
REVISION a.5
SHEET IDENTIFIER E-801
SHEET OF

# LG NeON®2

LG420N2W-V5

### General Data

| | |
|---|---|
| Cell Properties (Material/Type) | Monocrystalline/N-type |
| Cell Maker | LG |
| Cell Configuration | 72 Cells (6 x 12) |
| Number of Busbars | 12 EA |
| Module Dimensions (L x W x H) | 2,024mm x 1,024mm x 40mm |
| Weight | 20.3 kg |
| Glass (Thickness/Material) | Tempered Glass with AR Coating |
| Backsheet (Color) | White |
| Frame (Material) | Anodized Aluminium |
| Junction Box (Protection Degree) | IP68 |
| Cables (Length) | 1,200mm x 2 EA |
| Connector (Type/Maker) | MC4 Compatible |

### Certifications and Warranty

| | |
|---|---|
| Certifications | IEC 61215-1/-1-1/-1-2:2016, IEC 61730-1/2:2016, UL 1703 |
| | ISO 9001, ISO 14001, ISO 50001 |
| | OHSAS 18001 |
| Salt Mist Corrosion Test | IEC 61701:2012 Severity 6 |
| Ammonia Corrosion Test | IEC 62716:2013 |
| Module Fire Performance | Type 1 (UL 1703) |
| Fire Rating | Class C (UL 790, ULC/ORD C 1703) |
| Product Warranty | 25 Years |
| Output Warranty of Pmax | Linear Warranty* |

*Improved: 1st year 98%, from 2~24th year: 0.33%/year down, at 25th year: 90.08%

### Temperature Characteristics

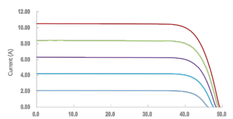
| | | |
|---|---|---|
| NMOT* | [°C] | 42 ± 3 |
| Pmax | [%/°C] | -0.36 |
| Voc | [%/°C] | -0.26 |
| Isc | [%/°C] | 0.02 |

*NMOT (Nominal Module Operating Temperature): Irradiance 800 W/m², Ambient temperature 20°C, Wind speed 1 m/s, Spectrum AM 1.5

### Electrical Properties (NMOT)

| Model | | LG420N2W-V5 |
|---|---|---|
| Maximum Power (Pmax) | [W] | 315 |
| MPP Voltage (Vmpp) | [V] | 39.6 |
| MPP Current (Vmpp) | [A] | 7.95 |
| Open Circuit Voltage (Voc) | [V] | 46.9 |
| Short Circuit Current (Isc) | [A] | 8.55 |

### I-V Curves




### Electrical Properties (STC*)

| Model | | LG420N2W-V5 |
|---|---|---|
| Maximum Power (Pmax)** | [W] | 420 |
| MPP Voltage (Vmpp) | [V] | 42.1 |
| MPP Current (Impp) | [A] | 9.98 |
| Open Circuit Voltage (Voc, ± 5%) | [V] | 49.7 |
| Short Circuit Current (Isc, ± 5%) | [A] | 10.63 |
| Module Efficiency | [%] | 20.3 |
| Power Tolerance | [%] | 0~+3 |

*STC (Standard Test Condition) Irradiance 1000 W/m², cell temperature 25°C, AM 1.5
**Measure Tolerance of Pmax: ± 3%

### Operating Conditions

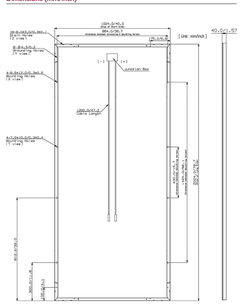
| | | |
|---|---|---|
| Operating Temperature | [°C] | -40 ~+90 |
| Maximum System Voltage | [V] | 1,000 (IEC)/1,500 (UL) |
| Maximum Series Fuse Rating | [A] | 20 |
| Mechanical Test Load (Front) | [Pa/psf] | 5,400/113 |
| Mechanical Test Load (Rear) | [Pa/psf] | 3,000/63 |

Mechanical Test Loads: 5,400 Pa/3,000 Pa based on IEC 61215-2: 2016
(Test Load = Design Load x Safety Factor (1.5))

### Packaging Configuration

| | | |
|---|---|---|
| Number of Modules per Pallet | [EA] | 25 |
| Number of Modules per 40ft HQ Container | [EA] | 550 |
| Packaging Box Dimensions (L x W x H) | [mm] | 2,080 x 1,120 x 1,226 |
| Packaging Box Gross Weight | [kg] | 551 |

### Dimensions (mm/inch)




LG Electronics, Inc.
Solar Business Division
2000 Millbrook Drive
Lincolnshire, IL 60069
www.lg-solar.com

Product specifications are subject to change without notice.
LG420N2W-V5.pdf



| Technical data | Sunny Tripower CORE1 33-US | Sunny Tripower CORE1 50-US | Sunny Tripower CORE1 62-US |
|---|---|---|---|
| **Input (DC)** | | | |
| Maximum array power | 50000 Wp STC | 75000 Wp STC | 93750 Wp STC |
| Maximum system voltage | | 1000 V | |
| Rated MPP voltage range | 330 V ... 800 V | 500 V ... 800 V | 550 V ... 800 V |
| MPPT operating voltage range | | 150 V ... 1000 V | |
| Minimum DC voltage / start voltage | | 150 V / 188 V | |
| MPP trackers / strings per MPP input | | 6 / 2 | |
| Maximum operating input current / per MPP tracker | | 120 A / 20 A | |
| Maximum short circuit current per MPPT / per string input | | 30 A / 30 A | |
| **Output (AC)** | | | |
| AC nominal power | 33300 W | 50000 W | 62500 W |
| Maximum apparent power | 33300 VA | 53000 VA | 66000 VA |
| Output phases / line connections | | 3 / 3-(N)-PE | |
| Nominal AC voltage | | 480 V / 277 V WYE | |
| AC voltage range | | 244 V ... 305 V | |
| Maximum output current | 40 A | 64 A | 80 A |
| Rated grid frequency | | 60 Hz | |
| Grid frequency / range | | 50 Hz, 60 Hz / -6 Hz ... +6Hz | |
| Power factor at rated power / adjustable displacement | | 1 / 0.0 leading ... 0.0 lagging | |
| Harmonics THD | | <3% | |
| **Efficiency** | | | |
| CEC efficiency | 97.5% | 97.5% | 97.5% |
| **Protection and safety features** | | | |
| Load-rated DC disconnect | | ● | |
| Load-rated AC disconnect | | ● | |
| Ground-fault monitoring / Riso / Differential current | | ● / ● | |
| DC AFCI arc-fault protection | | ● | |
| SunSpec PLC signal for rapid shutdown | | ● | |
| DC reverse-polarity protection | | ● | |
| AC short circuit protection | | ● | |
| DC surge protection: Type 2 / Type 1+2 | | O / O | |
| AC surge protection: Type 2 / Type 1+2 | | O / O | |
| Protection class / overvoltage category (as per UL 840) | | I / IV | |
| **General data** | | | |
| Device dimensions (W / H / D) | | 621 mm / 733 mm / 569 mm (24.4 in x 28.8 in x 22.4 in) | |
| Device weight | | 84 kg (185 lbs) | |
| Operating temperature range | | -25 °C ... +60 °C (-13 °F ... +140 °F) | |
| Storage temperature range | | -40 °C ... +70 °C (-40 °F ... +158 °F) | |
| Audible noise emissions (full power @ 1m and 25 °C) | | 65 dB(A) | |
| Internal consumption at night | | 5 W | |
| Topology | | Transformerless | |
| Cooling concept | | OptiCool (forced convection, variable speed fans) | |
| Enclosure protection rating | | Type 4X, 3SX (as per UL 50E) | |
| Maximum permissible relative humidity (non-condensing) | | 100% | |
| **Additional information** | | | |
| Mounting | | Free-standing with included mounting feet | |
| DC connection | | Amphenol UTX PV connectors | |
| AC connection | | Screw terminals - 4 AWG to 4/0 AWG CU/AL | |
| LED indicators (Status / Fault / Communication) | | ● | |
| Network interfaces: Ethernet / WLAN / RS485 | | ● (2 ports) / ● / O | |
| Data protocols: SMA Modbus / SunSpec Modbus / Webconnect | | ● / ● / ● | |
| Multifunction relay | | ● | |
| ShadeFix technology for string level optimization | | ● | |
| Integrated Plant Control / Q on Demand 24/7 | | ● / ● | |
| OPI Grid capable / SMA Fuel Save Controller compatible | | ● / ● | |
| SMA Smart Connected (proactive monitoring and service support) | | ● | |
| **Certifications** | | | |
| Certifications and approvals | | UL 1741, UL 1699B Ed. 1, UL 1998, CSA 22.2 107.1, PV Rapid Shutdown System Equipment | |
| FCC compliance | | FCC Part 15 Class A | |
| Grid interconnection standards | | IEEE 1547, UL 1741 SA - CA Rule 21, HECO Rule 14H | |
| Advanced grid support capabilities | | L/HFRT, L/HVRT, Volt-VAr, Volt-Watt, Frequency-Watt, Ramp Rate Control, Fixed Power Factor | |
| **Warranty** | | | |
| Standard | | 10 years | |
| Optional extensions | | 15 / 20 years | |
| O Optional features ● Standard features - Not available | | | |
| Type designation | STP 33-US-41 | STP 50-US-41 | STP 62-US-41 |

**Accessories**

SMA Data Manager M (DMM-US-10)
SMA Sensor Module (MD.SEN-US-40)
Universal Mounting System (UMS_KIT-10)
AC Surge Protection Module Kit (AC_SPD_KIT1-10, AC_SPD_KIT2_T1T2)
DC Surge Protection Module Kit (DC_SPD_KIT4-10, DC_SPD_KIT3_T1T2)

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www.SMA-America.com

SMA America, LLC

# S-5!®

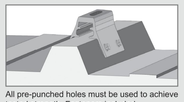
The Right Way!

**RibBracket™ is the perfect attachment solution for specific North American trapezoidal, exposed-fastened metal roofs! It can be used for almost any attachment need. No messy sealants to apply. The factory-applied EPDM rubber gasket weather-proofs and makes installation easy!**

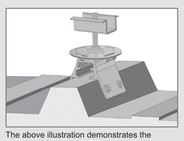
Each **RibBracket™** comes with a factory-applied EPDM rubber gasket on the base. A structural aluminum attachment bracket, RibBracket is compatible with most common metal roofing materials and many North American trapezoidal profiles. For design assistance, ask your distributor, or visit **www.S-5.com** for the independent lab test data that can be used for load-critical designs and applications. Also, please visit our website for more information including metallurgical compatibilities and specifications. S-5!® holding strength is unmatched in the industry.

## Example Profile

## Example Applications

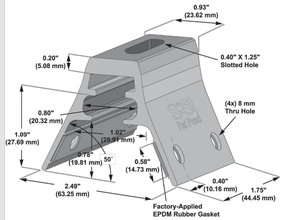


All pre-punched holes must be used to achieve tested strength. Fasteners included.

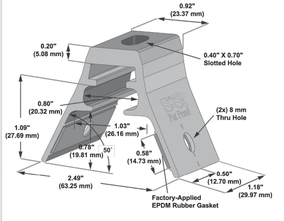


The above illustration demonstrates the RibBracket with the S-5-PV Kit attached.

## RibBracket™




## RibBracket™ Mini




**S-5!® Warning! Please use this product responsibly!**

**Products are protected by multiple U.S. and foreign patents. For published data regarding holding strength, fastener torque, patents, and trademarks, visit the S-5! website at www.S-5.com.**



Distributed by

Tech Brief

# XR Rail Family

The XR Rail Family offers the strength of a curved rail in three targeted sizes. Each size supports specific design loads, while minimizing material costs. Depending on your location, there is an XR Rail to match.

**XR10**

XR10 is a sleek, low-profile mounting rail, designed for regions with light or no snow. It achieves spans up to 6 feet, while remaining light and economical.

- 6' spanning capability
- Moderate load capability
- Clear & black anodized finish
- Internal splices available

**XR100**

XR100 is the ultimate residential mounting rail. It supports a range of wind and snow conditions, while also maximizing spans up to 10 feet.

- 10' spanning capability
- Heavy load capability
- Clear & black anodized finish
- Internal splices available

**XR1000**

XR1000 is a heavyweight among solar mounting rails. It's built to handle extreme climates and spans up to 12 feet for commercial applications.

- 12' spanning capability
- Extreme load capability
- Clear anodized finish
- Internal splices available

## Rail Selection

The table below was prepared in compliance with applicable engineering codes and standards.* Values are based on the following criteria: ASCE 7-16, Gable Roof Flush Mount, Roof Zones 1 & 2e, Exposure B, Roof Slope of 8 to 20 degrees and Mean Building Height of 30 ft. Visit IronRidge.com for detailed certification letters.

| Load | | Rail Span | | | | | |
|---|---|---|---|---|---|---|---|
| Snow (PSF) | Wind (MPH) | 4' | 5' 4" | 6' | 8' | 10' | 12' |
| None | 90 | XR10 | | XR100 | | XR1000 | |
| | 120 | | | | | | |
| | 140 | | | | | | |
| | 160 | | | | | | |
| 20 | 90 | | | | | | |
| | 120 | | | | | | |
| | 140 | | | | | | |
| | 160 | | | | | | |
| 30 | 90 | | | | | | |
| | 160 | | | | | | |
| 40 | 90 | | | | | | |
| | 160 | | | | | | |
| 80 | 160 | | | | | | |
| 120 | 160 | | | | | | |

*Table is meant to be a simplified span chart for conveying general rail capabilities. Use approved certification letters for actual design guidance.



Date Plotted : Aug 06, 2021 – 4:53pm

APsmart

Raising the bar in innovative
DC MLPE solar power systems

# RSD-S-PLC

- Meets NEC2017&2020 (690.12) requirements
- Executes rapid shutdown of system when the Transmitter-PLC signal is absent
- Meets SunSpec requirements

## RSD-S-PLC Technical Data

| Model | RSD-S-PLC |
|---|---|
| **Input Data (DC)** | |
| Input Operating Voltage Range | 8-80V |
| Maximum Cont. Input Current (Imax) | 15A |
| **Output Data (DC)** | |
| Output Operating Voltage Range | 8-80V |
| Maximum System Voltage | 1000V/1500V |
| **Mechanical Data** | |
| Operating Ambient Temperature Range | -40 °F to +185 °F (-40 °C to + 85 °C) |
| Dimensions (without cable&connectors) | 5" x 1.2" x 0.6"(129 mm x 30 mm x 16 mm) |
| Cable Length | Input 250mm/Output 1200mm |
| Connector | MC4 or Customize |
| Enclosure Rating | Type 6P / IP68 |
| Over Temperature Protection | Yes |
| **Features & Compliance** | |
| Communication | PLC |
| Safety Compliance | NEC2017&2020 (690.12); UL1741; CSA C22.2 No. 330-17; IEC/EN62109-1; 2PFG2305 |
| EMC Compliance | FCC Part15; ICES-003;IEC/EN61000-6-1/-2/-3/-4 |

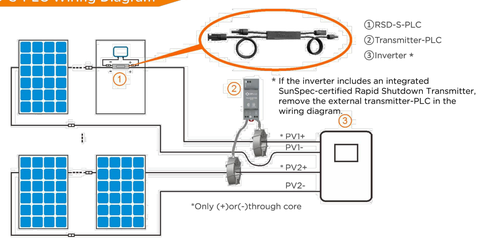


REV 2.0 2020-11-26

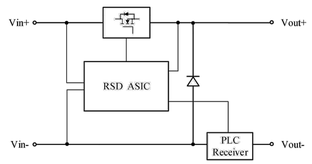
APsmart

The RSD-S-PLC meets SunSpec requirements,maintaining normal function by continually receiving a heartbeat signal from the APsmart Transmitter. The RSD executes rapid system shutdown when the Transmitter signal is absent. Users can manually execute rapid shutdown using Transmitter breaker switch.

## RSD-S-PLC Wiring Diagram




## Working Schematic Diagram




APsmart
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REV 2.0 2020-11-26

Baker Electric
Established 1936
1298 PACIFIC OAKS PLACE
ESCONDIDO, CA 92029
(858) 566-1980
(760) 745-2001

REGISTRATION
**BAKER ELECTRIC, INC.**
1298 PACIFIC OAKS PL.
ESCONDIDO, CA 92029
(760) 745-2001
**C10-161756**
EXP. 8/31/2021

PROJECT TITLE
**SDG&E PALOMAR ENERGY CENTER**
**303.24 kWDC PHOTOVOLTAIC PROJECT**
**2300 HARVESON PLACE**
**ESCONDIDO, CA 92029**

SHEET DESCRIPTION
DATA SHEETS

| REV | BY | DATE | DESCRIPTION |
|---|---|---|---|
| a.5 | AE | 08/06/2021 | 30% CLIENT REVIEW |

PROJECT NUMBER 22398
DRAWN BY AE/IV
CHECKED BY
DATE 08/06/2021
REVISION a.5
SHEET IDENTIFIER **E-802**
SHEET OF

Date Plotted : Aug 06, 2021 – 4:54pm

# APPENDIX B – AIR QUALITY AND PUBLIC HEALTH, GHG EMISSIONS AND ENERGY USE, AND NOISE AND VIBRATION ANALYSES

# Appendix B – Air Quality and Public Health, GHG Emissions and Energy Use, and Noise and Vibration Analyses

Prepared for:

**San Diego Gas & Electric**
**Palomar Energy Center**
**2300 Harveson Place**
**Escondido, California 92029**

August 2021

# Table of Contents



# Table of Attachments



# List of Tables

# Appendix B – Air Quality and Public Health, GHG Emissions and Energy Use, and Noise and Vibration Analyses

## 1.0 INTRODUCTION

This appendix contains evaluations of several of the topics, specifically air quality, public health, greenhouse gas (GHG) emissions, energy, and noise and vibration, that required more detailed quantitative analyses.

## 2.0 AIR QUALITY AND PUBLIC HEALTH

### 2.1 Air Quality and Public Health Significance Criteria

The potential for impacts to air quality and public health from construction and operation of the proposed Project are discussed in this section. The San Diego County *Guidelines for Determining Significance, Air Quality* (County 2007) was used as a basis for determining the significance of the impact to air quality. Guidelines for health risk assessments (HRAs) published by the California Office of Environmental Health Hazard Assessment (OEHHA 1990) were used to assess impacts to public health.

### 2.2 Construction Emissions

The construction emissions analysis was performed using the California Emissions Estimator Model® (CalEEMod) version 2020.4.0, the official statewide land use computer model designed to provide a uniform platform for estimating potential criteria pollutant and GHG emissions associated with construction of land use projects under the California Environmental Quality Act (CEQA). The model quantifies direct emissions from construction, including off-road equipment and on-road vehicle use. The mobile source emission factors used in the model include the Assembly Bill (AB) 1493 standards of 2002 and Low Carbon Fuel Standards. The 2020 version allows an analysis to be conducted which relies upon either the original EMFAC2017 emission factors or the California Air Resources Board's (ARB's) EMFAC2017 off-model adjustment factors for certain gasoline-fueled light duty and medium duty vehicles to account for the SAFE Vehicle Rule – Part One. The model also identifies regulatory measures and mitigation measures to reduce criteria pollutant and GHG emissions and calculates the benefits achieved from the selected measures. CalEEMod was developed by the California Air Pollution Control Officers Association (CAPCOA) in collaboration with the San Diego County Air Pollution Control District (SDAPCD) and other California air districts. Default land use data (e.g., emission factors, trip lengths, meteorology, source inventory, etc.) were provided by the various California air districts to account for local requirements and conditions.

The following information and assumptions were used in developing the emissions estimates for the Project using CalEEMod:

- Some project parameters (i.e., planned construction schedule and site layout) were defined by San Diego Gas and Electric (SDG&E), while others (i.e., overall site area) were determined using Google Earth measurement tools or site plan drawings;

- Default construction equipment horsepower ratings and load factors contained in CalEEMod were applied to all phases of the Project; and
- The default equipment performance parameters from CalEEMod for each construction phase are representative of actual construction equipment used during construction.

For this project, CalEEMod was run in default mode for the land use category "General Light Industry" for the entire 7,000-square-foot project area to estimate maximum potential impacts. The analysis assumed maximum demolition debris of approximately 76 tons of old asphalt and concrete to clear the project area, or eight truckloads. No site preparation or grading will be necessary or performed. For fugitive dust control from exposed soil on the small, previously graded construction site, twice daily water application was assumed as a mitigation measure in CalEEMod. Peak daily and annual criteria pollutant emissions are summarized in Table B-1 and compared to the San Diego County daily and annual screening-level significance thresholds (County 2007).

The use of diesel-powered construction equipment emits ozone precursors oxides of nitrogen ($NO_x$) and volatile organic compounds (VOCs), as well as diesel particulate matter (DPM), which is a composite of toxic air contaminants (TACs) containing a variety of hazardous substances. DPM has been identified as a carcinogen by OEHHA (1990). Large construction projects using multiple large earthmoving equipment are often evaluated to determine if on-site activities may exceed the daily threshold for $NO_x$ emissions or temporarily expose area residents to hazardous levels of DPM. However, because the proposed Project construction will not involve large earthmoving equipment and is of small size (7,000 square feet) and short duration (less than 6 months), cumulative risks from DPM emissions would be avoided. Per guidance from OEHHA, it is generally not required to perform a health risk assessment (HRA) for construction lasting less than six months and the impacts to public health can be considered to be less than significant (LTS).

As shown in Table B-1, mass emissions of criteria pollutants from construction are below applicable County daily and annual significance thresholds, and hence the impact would be LTS. The CalEEMod output is provided in Attachment 1.

**Table B-1: Daily and Annual Construction Emissions and Significance Evaluation**

| Criteria Pollutants | Daily Emissions (lbs/day) | Threshold (lbs/day) | Annual Emissions (tpy) | Threshold (tpy) | Significance |
|---|---|---|---|---|---|
| VOC | 16.43 | 75 | 0.1 | 13.7 | LTS |
| $NO_x$ | 7.09 | 250 | 0.4 | 40 | LTS |
| CO | 7.76 | 550 | 0.4 | 100 | LTS |
| $SO_x$ | 0.01 | 250 | 0.0 | 40 | LTS |
| Total $PM_{10}$ | 0.51 | 100 | 0.02 | 15 | LTS |
| Total $PM_{2.5}$ | 0.36 | 55 | 0.02 | 10 | LTS |

Sources: County 2007, CalEEMod version 2020.4.0.

Notes:

lbs/day are winter or summer maxima for planned land use.

Total $PM_{10}$ / $PM_{2.5}$ comprises fugitive dust plus engine exhaust and account for application of fugitive dust control mitigation.

### 2.3 Operational Emissions

There would be no direct operational emissions of pollutants from the generation of hydrogen in the electrically powered electrolyzer system. The principal byproduct gas from electrolysis is oxygen ($O_2$). There could be some indirect pollutant emissions due to power generation requirements of the new electrolyzer equipment that are over the amount of power produced by the new on-site solar photovoltaic (PV) system.

The normal operating condition will be a 1% blend of hydrogen in the natural gas fuel in one of the PEC combustion turbine generators (CTGs), but the maximum design blend will be 2% per CTG. A blend of up to 2% hydrogen with the natural gas in the two PEC CTGs is not expected to affect the ability of PEC to comply with its existing Permit to Operate (PTO) or air quality Conditions of Certification (COCs). According to recent articles, the major original equipment manufacturers (OEMs) have advanced-class gas turbines that are available and can operate with a blend of up to 30% hydrogen, and research is underway to develop technology to burn up to 100% hydrogen. According to these sources, $NO_x$ emissions can be controlled to approximately the same levels as natural gas combustion with a blend of up to 30% hydrogen in the fuel. Controlling $NO_x$ above 30% blend becomes more difficult, requiring more sophisticated burners, fine tuning of the combustion process, a selective catalytic reduction system, or some combination of these solutions.

Likewise, the current oxidation catalysts in use on the two CTGs at PEC are expected to continue to meet permit limits related to carbon monoxide (CO), VOC, and TACs when burning up to 2% (or more) hydrogen in the fuel. The blended hydrogen fuel would also have less sulfur and produce less oxides of sulfur ($SO_x$) and fine and respirable particulate matter ($PM_{10}$/$PM_{2.5}$) than 100% pipeline quality natural gas.

At the proposed up to 2% blend level, SDG&E expects that no changes to its current SDAPCD PTO limits will be needed.

Since the new system would be operated by current power plant staff, no additional worker vehicle trips would occur; thus, no quantifiable increase in operational mobile source emissions would be attributable to the proposed Project. Any additional vendor trips associated with the new system would be essentially de minimis compared to existing vendor trips serving the existing PEC facility. The existing delivery of hydrogen cylinders used for generator cooling would no longer be needed because the hydrogen would be produced on-site.

Thus, there would be no direct impacts attributable to criteria pollutant or TAC emissions from Project operation, and the air quality and public health impacts due to the proposed Project will be less than significant.

## 3.0 GREENHOUSE GAS EMISSIONS AND ENERGY USE

GHGs – primarily carbon dioxide ($CO_2$), methane ($CH_4$), and nitrous oxide ($N_2O$), collectively reported as carbon dioxide equivalents ($CO_2e$) – are directly emitted from stationary source combustion of natural gas in equipment such as water heaters, boilers, process heaters, and furnaces. GHGs are also emitted from mobile sources such as on-road vehicles and off-road construction equipment burning fuels such as gasoline, diesel, biodiesel, propane, or natural gas (compressed or liquefied). Indirect GHG emissions result from electric power generated elsewhere (i.e., power plants) used to operate process equipment, lighting, and utilities at a facility. Also

included in GHG quantification is electric power used to pump the water supply (e.g., aqueducts, wells, pipelines) and disposal and decomposition of municipal waste in landfills (ARB 2017).

## 3.1 Greenhouse Gas and Energy Significance Criteria

SDAPCD does not publish CEQA significance criteria related to GHG emissions. The criteria published by San Diego County and the City of Escondido are discussed below.

### *3.1.1 County Climate Change Guidelines*

Because the SDAPCD has not adopted numerical GHG thresholds, the District relies on the February 2018 San Diego County *Guidelines for Determining Significance, Climate Change* and the January 2008 CAPCOA publication *CEQA & Climate Change: Evaluating and Addressing Greenhouse Gas Emissions from Projects Subject to the California Environmental Quality Act*.

Per the County Guidelines, a proposed project would have a less than significant cumulatively considerable contribution to climate change impacts if it is found to be consistent with the County's Climate Action Plan (CAP) and would normally have a cumulatively considerable contribution to climate change impacts if it is found to be inconsistent with the CAP (County 2018).

Consistency with the CAP is determined through the CAP Consistency Review Checklist for discretionary development projects (County 2018). Examples of discretionary projects include growth-inducing residential and commercial developments. However, the proposed project is an industrial activity at an existing, permitted industrial facility (i.e., electric power generation), entirely within land presently zoned industrial, and would not contribute to growth because the hydrogen system would be operated by current employees, i.e., no increase in employment at the site. Thus, the project falls outside the scope of the CAP Consistency Review because it is not a land use development project and would not be growth-inducing.

For industrial projects (stationary sources), the CAPCOA-recommended numeric GHG threshold is 10,000 metric tons (MT) $CO_2e$ per year (CAPCOA 2008). This threshold has been adopted by other California air districts, such as the South Coast Air Quality Management District (SCAQMD) and Bay Area Air Quality Management District (BAAQMD). Projects with incremental increases below this threshold would not be considered cumulatively considerable. Since the project would have GHG impacts below this threshold (Tables B-2 and B-5), impacts would not be cumulatively considerable.

### *3.1.2 City of Escondido General Plan and Climate Action Plan*

The City of Escondido General Plan Resource Conservation Element (Chapter VII) Air and Climate Element (Subchapter I) refers to the CAP, as discussed below.

The City of Escondido's 2021 CAP is an update to the GHG inventories, emission projections, and GHG reduction measures identified in the 2013 CAP. The 2021 CAP was developed in partnership with the San Diego Association of Governments (SANDAG) with the goal of achieving GHG reductions and addressing climate change at the local level. The 2021 CAP sets GHG reduction targets and proposes achievable, locally based strategies to reduce GHG emissions from both municipal and community activities (City 2021).

Acting on climate change means both reducing GHG emissions from activities within the City and helping the community adapt to climate change and improve its resilience over the long term. Three essential steps to the CAP process include (City 2021):

1. Develop and maintain a CAP, which includes preparing baseline emissions estimates and projections and developing reduction targets and strategies;
2. Implement the CAP through local measures; and
3. Monitor and report progress on CAP implementation and identify improvements or adjustments that can be made to the plan in the future.

To meet the City's 2030 and 2035 GHG reduction targets under AB 32 and SB 32, the 2021 CAP defines nine GHG reduction strategies and 31 specific measures across five source categories: transportation, energy (electricity and natural gas consumption), water and wastewater, solid waste, and carbon sequestration. The City's nine strategies in the 2021 CAP are:

1. Increase the Use of Zero-Emission or Alternative Fuel Vehicles;
2. Reduce Fossil Fuel Use;
3. Reduce Vehicle Miles Traveled;
4. Increase Building Energy Efficiency;
5. Increase Renewable and Zero-Carbon Energy;
6. Increase Water Efficiency;
7. Diversify Local Water Supply;
8. Reduce and Recycle Solid Waste; and
9. Carbon Sequestration and Land Conservation.

The nine strategies and 31 source-specific measures are consistent with SANDAG's Regional Climate Action Planning Framework.

The proposed Project is consistent with and directly supports CAP strategies 1, 2, and 5 above. The hydrogen system, supplemented with on-site photovoltaic renewable power generation and a hydrogen vehicle fueling station, will enable the use of zero-emission and alternative fuel vehicles, reduce fossil fuel use, and promote zero-carbon energy. Therefore, the proposed Project would not conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions. Also, because the proposed Project would provide an alternative to fossil fuel use in electric power generation and vehicles, it would not generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment.

### *3.1.3 State Energy Standards*

California's Energy Code is designed to reduce wasteful and unnecessary energy consumption in new construction and refurbishment projects. The California Energy Commission updates the Building Energy Efficiency Standards (Title 24, Parts 6 and 11) every 3 years. The 2019 standards improved on the 2016 standards and went into effect on January 1, 2020. In new construction, standards require designed-in energy

conservation features such as high-efficiency lighting and high-efficiency electric motors (CEC 2019).

The proposed Project would utilize all-new equipment that meets current energy efficiency standards, such as high-efficiency electric motors and LED lighting. The proposed Project would also offset approximately 10% of its energy requirements with on-site PV renewable power generation. The proposed Project would be in compliance with applicable energy efficiency standards.

### 3.2 GHG Emissions and Energy Use for Project Construction

Using CalEEMod, direct on-site and off-site GHG emissions were estimated for Project construction. Table B-2 compares total annual construction GHG emissions to the CAPCOA industrial significance threshold of 10,000 MT/year of $CO_2e$ emissions. CalEEMod default off-site traffic emissions (i.e., worker commuting, truck transport) are included in these emissions estimates. As shown, GHG emissions due to proposed Project construction would be below the 10,000 MT per year significance threshold for industrial sources (CAPCOA 2008) and hence the impacts would be LTS.

**Table B-2: Construction Greenhouse Gas Emissions Summary**

| Greenhouse Gases | GHG Emissions (MT/yr) | Threshold (MT/yr) | Significance |
|---|---|---|---|
| $CO_2$ | 59.2 | – | – |
| $CH_4$ | 0.02 | – | – |
| $N_2O$ | 0.00 | – | – |
| $CO_2e$ | 60 | 10,000 | LTS |

Sources: CAPCOA 2008, CalEEMod version 2020.4.0

Notes:

Based on peak annual construction emissions

Table B-3 breaks down construction emissions and corresponding fuel usage by mobile source type/group: off-road equipment (Tiers 1-4), on-road heavy-heavy duty diesel trucks (HHDT), on-road medium-heavy and heavy-heavy duty diesel trucks (MHDT, HHDT), and light-duty automobiles and trucks (LDA, LDT1, LDT2).

**Table B-3: Estimated Construction Fuel Consumption – CalEEMod Basis**

| Mobile Sources | Types | Fuels | MT $CO_2$ | $CO_2$ Emission Factor (kg/gal) | Fuel Consumption (gallons) |
|---|---|---|---|---|---|
| Off-Road | Tiers 1-4 | Diesel | 56.6 | 10.21 | 5,540 |
| Hauling | HHDT | Diesel | 0.3 | 10.21 | 20 |
| Vendor | MHDT, HHDT | Diesel | 1.0 | 10.21 | 100 |
| Worker | LDA, LDT1, LDT2 | Gasoline | 1.3 | 8.78 | 150 |
| **Totals** | | | **60** | **–** | **5,810** |

Sources: CalEEMod version 2020.4.0, TCR 2020, 40 CFR 98 Subpart C.

As shown in Table B-3, Project construction would consume approximately 5,800 gallons of liquid fuels, diesel and gasoline combined.

### 3.3 GHG Emissions and Energy Use for Project Operation

As configured, the new hydrogen system will consist of five main groups of electrically powered components: the electrolyzer, two storage cylinder compressors (A/B), the utility air compressor, the paired hydrogen fueling station compressors, ancillary equipment such as supervisory control and data acquisition (SCADA), and nighttime lighting. With all equipment operating, aggregated load would total about 1,480 kilowatts (kW).

A 300-kW solar PV array would provide some offsetting renewable power that would decrease the amount of SDG&E grid power used by the system in aggregate. Since the PV array would supply about 9% of system power needs overall (annual basis), the other 91% would be provided by the SDG&E grid. As shown in Table B-4, after the photovoltaic offset, grid power used by the new system could total approximately 11,000 megawatt-hours (MWh) annually (net load).

**Table B-4: Estimated Operation Electric Power Usage – Maxima**

| Device | Type | Input Power (kW) | Operation (hrs/yr) | Consumption (MWh/yr) |
|---|---|---|---|---|
| Electrolyzer | High Voltage DC Power Supply | 1,250 | 8,760 | 10,950 |
| Storage Compressors A/B | 3-Phase Motors | 125 | 8,760 | 1,095 |
| Utility Air Compressor | Single-Phase Motor | 2 | 8,760 | 17.5 |
| Dispenser Compressors | 3-Phase Motors | 100 | 400 | 40.0 |
| SCADA & Lighting | Misc. Devices | 3 | 8,760 | 26.3 |
| **Total Load** | – | **1,480** | – | **12,129** |
| Load Offset | Solar PV Array | 300 | 3,500 | (1,050) |
| **Net Load** | – | – | – | **11,079** |

Source: SDG&E 2021

Per current Intergovernmental Panel on Climate Change (IPCC) Fifth Assessment Report (AR5) Global Warming Potentials (GWPs), the SDG&E power mix comprises a GHG content of approximately 542 pounds $CO_2e$ per MWh (IPCC 2014, CalEEMod 2020). As shown in Table B-5, when computed against the total net load of 11,079 MWh provided in Table B-4, indirect GHG emissions would total approximately 2,724 MT $CO_2e$ annually, which is below the 10,000 MT per year significance threshold for industrial sources (CAPCOA 2008) and hence the impact from GHG emissions during operation would be LTS.

**Table B-5: Operational Indirect Greenhouse Gas Emissions – SDG&E Power Mix**

| Greenhouse Gases | GHG Intensity Factors (lbs/MWh) | Consumption (MWh/yr) | Indirect GHG (MT/yr) | Threshold (MT/yr) | Significance |
|---|---|---|---|---|---|
| $CO_2$ | 539.98 | – | – | – | – |
| $CH_4$ | 0.033 | – | – | – | – |
| $N_2O$ | 0.004 | – | – | – | – |
| $CO_2e$ (AR5) | 541.96 | 11,079 | 2,724 | 10,000 | LTS |

Sources: IPCC October 2014, CAPCOA 2008, CalEEMod version 2020.4.0

# 4.0 NOISE AND VIBRATION

The Project site is in the City of Escondido, San Diego County, in a characteristically urban and densely populated area subject to noise from local traffic on public streets (e.g., Auto Park Way and Citracado Parkway), traffic on highways (I-15 and SR-78), aircraft flyovers, trains, construction, and small power equipment (e.g., pressure washers, utility generators, etc.). The Project site is part of an existing industrial land use, where power plant operational noise has existed since the facility began commercial operation on April 1, 2006. No residences are within 0.25 mile (1,320 feet) of the Project site, which is sufficient attenuation distance from the facility and construction zone to mitigate normal noise effects emanating from the proposed Project site during construction or operation of the new equipment.

## 4.1 Noise Significance Criteria

### *4.1.1 City of Escondido General Plan*

California's State General Plan Guidelines direct agencies to incorporate a number of elements into their General Plans, including Safety. Escondido's Community Protection Element (Chapter VI) includes a Noise Element (Subchapter G), which is a required component for General Plans (City 2012).

#### *4.1.1.1 Noise-Sensitive Land Uses*

Land uses are located throughout the City in areas where the impacts of noise could affect operations or activities. Noise-sensitive land uses (receptors) include:

- Residential developments and care facilities;
- Schools, churches, and transient lodging;
- Hospitals and health care facilities;
- Libraries, museums, and cultural facilities; and
- Golf courses and passive recreational sites.

Noise exposure levels for a variety of land uses are identified in the Noise element, including commercial and industrial land uses, as described below.

#### *4.1.1.2 Commercial and Industrial Land Uses*

Escondido's development pattern generally distributes commercial and industrial land uses in a north-south and east-west alignment along major transportation corridors in the urban core. Residential areas generally surround these commercial and industrial areas, which can cause noise conflicts depending on several factors. These factors include the type of commercial/industrial activity, hours of operation, building orientation, and the commercial/industrial site location relative to other land uses. The Noise element defines the following acceptance criteria for land use development (City 2012):

- Normally Acceptable – Specified land use is satisfactory, based upon the assumption that buildings involved are of normal conventional construction without any special noise insulation requirements;
- Conditionally Acceptable – New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is

made and needed noise insulation features included in the design; conventional construction, but with closed windows and fresh air supply systems or air conditioning, will usually suffice;

- Normally Unacceptable – New construction or development should generally be discouraged; if new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made with noise insulation features included in the design; and
- Clearly Unacceptable – New construction or development should generally not be undertaken.

For industrial, manufacturing, utility, and agricultural land uses, the Noise element defines the following limits in terms of Community Noise Exposure Level [Ldn or CNEL, in A-weighted decibels (dBA)]:

- Normally Acceptable: up to 75 dBA;
- Conditionally Acceptable: 70 to 80 dBA;[1]
- Normally Unacceptable: over 80 dBA; and
- Clearly Unacceptable: Not defined for commercial and industrial land uses.

### *4.1.2 City of Escondido Municipal Code*

Consistent with the Noise element, the City of Escondido Municipal Code, Chapter 17, Article 12, Section 17-229 defines a 1-hour Light Industrial noise limit of 70 dBA and a 1-hour General Industrial noise limit of 75 dBA, both applying at any time day or night. As applicable, the sound level limit at a location on a boundary between two land use classifications is the limit applicable to the receiving land use, and fixed-location public utility distribution or transmission facilities located on or adjacent to a property line shall be subject to the noise level limits measured at or beyond 6 feet (1.83 meters) from the boundary of the easement upon which the equipment is located (City 2017).

## 4.2 Noise and Vibration Impacts During Construction

The Project site (construction area) is approximately 50 feet (15 meters) from one of two combined cycle generating units. When operating, these generating units are on-site sources of continuous background noise. The facility complies with California Division of Occupational Safety and Health (Cal/OSHA) requirements for on-site worker noise protection.

Construction of the proposed Project would require the use of engine-powered equipment. During each phase, there would be a different mix of equipment operating, and cumulative noise levels would vary based on the amount of equipment in operation and the location of each activity at the Project site. In general, use of off-road equipment, on-road vehicles, and portable equipment would generate noise due to engine mechanicals, engine exhaust, driveline mechanicals, shaft-driven devices and accessories, hydraulics operation, and ground friction. No intense percussive actions (e.g., hard rock breaking, large pile-driving) are planned to occur during the site work, and

[1] Overlaps 5 dBA with Normally Acceptable.

no strong ground-borne vibrations are expected to be generated that could affect nearby structures or be noticeable to persons.

Construction noise is expected to blend with existing industrial operational background noise at the Project site. All construction activities would be short-term and temporary (less than six months). All construction work is planned to be conducted during daylight hours; no nighttime work is planned to be performed. Upon completion of construction, construction-generated noise would permanently cease.

### 4.3 Noise and Vibration Impacts During Operation

The new hydrogen system will include electric motor-driven compressors for the hydrogen storage vessels and the fueling station. These compressors, the primary operational noise sources of the new system, will meet Cal/OSHA worker protection noise limits for industrial equipment, e.g., 85 dBA for 8 hours, or 83 dBA for 12 hours. At 16.5 feet, the storage compressor will emit approximately 74 dBA, and the fueling station compressor will emit approximately 70 dBA, which are below Cal/OSHA limits in common use. Operational noise will also be below the General Plan Normally Unacceptable limit (80 dBA) and the Municipal Code General Industrial limit (75 dBA).

Since the facility is an industrial land use and existing workers will operate the new system, no significant additional long-term worker traffic is expected. Since the compression equipment will meet workplace and community standards and will operate in close proximity against existing power plant background noise, with sensitive receptors (e.g., residences and hospital) over 1,000 feet from the site, no significant additional Project-related noise impact is expected over the long term.

## 5.0 REFERENCES

California Office of Environmental Health Hazard Assessment (OEHHA). 1990. Diesel Exhaust Particulate. Website (https://oehha.ca.gov/chemicals/diesel-exhaust-particulate) accessed June 30, 2021.

City of Escondido (City). 2021. Climate Action Plan. Website (https://www.escondido.org/climate-action-plan-documents.aspx) accessed June 30, 2021.

City of Escondido (City). 2017. Municipal Code. Chapter 17, Article 12, Section 17-229 – Sound Level Limits Table 17-229. Website (https://www.escondido.org/escondido-municipal-code) accessed June 30, 2021.

City of Escondido (City). 2012. General Plan, and as amended. Chapter VI – Community Protection, Subchapter G – Noise. Website (https://www.escondido.org/Data/Sites/1/media/PDFs/Planning/GPUpdate/GeneralPlanChapterVI.pdf) accessed June 30, 2021.

# ATTACHMENT 1 – CALEEMOD ATTACHMENTS

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

# Palomar Hydrogen Project

**San Diego County, Winter**

## 1.0 Project Characteristics

### 1.1 Land Usage

| Land Uses | Size | Metric | Lot Acreage | Floor Surface Area | Population |
|---|---|---|---|---|---|
| General Light Industry | 7.00 | 1000sqft | 0.16 | 7,000.00 | 0 |

### 1.2 Other Project Characteristics

| | | | | | |
|---|---|---|---|---|---|
| **Urbanization** | Urban | **Wind Speed (m/s)** | 2.6 | **Precipitation Freq (Days)** | 40 |
| **Climate Zone** | 13 | | | **Operational Year** | 2023 |
| **Utility Company** | San Diego Gas & Electric | | | | |
| **CO2 Intensity (lb/MWhr)** | 539.98 | **CH4 Intensity (lb/MWhr)** | 0.033 | **N2O Intensity (lb/MWhr)** | 0.004 |

### 1.3 User Entered Comments & Non-Default Data

Project Characteristics - Construction only

Land Use -

Construction Phase - 2 weeks for painting

Demolition -

Vehicle Trips - Construction only

Consumer Products - Construction only

Area Coating - Construction only

Landscape Equipment - Construction only

Energy Use - Construction only

Water And Wastewater - Construction only

Solid Waste - Construction only

Construction Off-road Equipment Mitigation -

Palomar Hydrogen Project - San Diego County, Winter

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

| Table Name | Column Name | Default Value | New Value |
|---|---|---|---|
| tblAreaCoating | Area_Nonresidential_Exterior | 3500 | 0 |
| tblAreaCoating | Area_Nonresidential_Interior | 10500 | 0 |
| tblConstructionPhase | NumDays | 5.00 | 10.00 |
| tblConstructionPhase | PhaseEndDate | 6/22/2022 | 6/17/2022 |
| tblConstructionPhase | PhaseEndDate | 6/8/2022 | 6/3/2022 |
| tblConstructionPhase | PhaseStartDate | 6/16/2022 | 6/6/2022 |
| tblConstructionPhase | PhaseStartDate | 1/20/2022 | 1/17/2022 |
| tblConsumerProducts | ROG_EF | 2.14E-05 | 1E-07 |
| tblConsumerProducts | ROG_EF_Degreaser | 3.542E-07 | 1E-10 |
| tblConsumerProducts | ROG_EF_PesticidesFertilizers | 5.152E-08 | 1E-11 |
| tblEnergyUse | LightingElect | 2.83 | 0.00 |
| tblEnergyUse | NT24E | 4.27 | 0.00 |
| tblEnergyUse | NT24NG | 7.25 | 0.00 |
| tblEnergyUse | T24E | 1.08 | 0.00 |
| tblEnergyUse | T24NG | 4.27 | 0.00 |
| tblLandscapeEquipment | NumberSummerDays | 180 | 1 |
| tblSolidWaste | SolidWasteGenerationRate | 8.68 | 0.00 |
| tblVehicleTrips | ST_TR | 1.99 | 0.00 |
| tblVehicleTrips | SU_TR | 5.00 | 0.00 |
| tblVehicleTrips | WD_TR | 4.96 | 0.00 |
| tblWater | IndoorWaterUseRate | 1,618,750.00 | 0.00 |

## 2.0 Emissions Summary

Palomar Hydrogen Project - San Diego County, Winter

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

## 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 | | | | | |
| 2022 | 16.4302 | 7.0874 | 7.7469 | 0.0132 | 0.2608 | 0.3726 | 0.6000 | 0.0506 | 0.3429 | 0.3747 | 0.0000 | 1,274.7861 | 1,274.7861 | 0.3584 | 0.0109 | 1,283.4594 |
| **Maximum** | **16.4302** | **7.0874** | **7.7469** | **0.0132** | **0.2608** | **0.3726** | **0.6000** | **0.0506** | **0.3429** | **0.3747** | **0.0000** | **1,274.7861** | **1,274.7861** | **0.3584** | **0.0109** | **1,283.4594** |

### 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 | | | | | |
| 2022 | 16.4302 | 7.0874 | 7.7469 | 0.0132 | 0.1702 | 0.3726 | 0.5095 | 0.0369 | 0.3429 | 0.3610 | 0.0000 | 1,274.7861 | 1,274.7861 | 0.3584 | 0.0109 | 1,283.4594 |
| **Maximum** | **16.4302** | **7.0874** | **7.7469** | **0.0132** | **0.1702** | **0.3726** | **0.5095** | **0.0369** | **0.3429** | **0.3610** | **0.0000** | **1,274.7861** | **1,274.7861** | **0.3584** | **0.0109** | **1,283.4594** |

| | 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** | **34.72** | **0.00** | **15.09** | **27.13** | **0.00** | **3.66** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** |

Palomar Hydrogen Project - San Diego County, Winter

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

## 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 | 7.7000e-004 | 1.0000e-005 | 7.1000e-004 | 0.0000 | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | 1.5300e-003 | 1.5300e-003 | 0.0000 | | 1.6300e-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** | **7.7000e-004** | **1.0000e-005** | **7.1000e-004** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | | **1.5300e-003** | **1.5300e-003** | **0.0000** | **0.0000** | **1.6300e-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 | 7.7000e-004 | 1.0000e-005 | 7.1000e-004 | 0.0000 | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | 1.5300e-003 | 1.5300e-003 | 0.0000 | | 1.6300e-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** | **7.7000e-004** | **1.0000e-005** | **7.1000e-004** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | | **1.5300e-003** | **1.5300e-003** | **0.0000** | **0.0000** | **1.6300e-003** |

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not 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 | Demolition | Demolition | 1/3/2022 | 1/14/2022 | 5 | 10 | |
| 2 | Building Construction | Building Construction | 1/17/2022 | 6/3/2022 | 5 | 100 | |
| 3 | Architectural Coating | Architectural Coating | 6/6/2022 | 6/17/2022 | 5 | 10 | |

**Acres of Grading (Site Preparation Phase): 0**

**Acres of Grading (Grading Phase): 0**

**Acres of Paving: 0**

**Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 10,500; Non-Residential Outdoor: 3,500; Striped Parking Area: 0 (Architectural Coating – sqft)**

### OffRoad Equipment

| Phase Name | Offroad Equipment Type | Amount | Usage Hours | Horse Power | Load Factor |
|---|---|---|---|---|---|
| Architectural Coating | Air Compressors | 1 | 6.00 | 78 | 0.48 |
| Demolition | Concrete/Industrial Saws | 1 | 8.00 | 81 | 0.73 |
| Building Construction | Cranes | 1 | 4.00 | 231 | 0.29 |
| Building Construction | Forklifts | 2 | 6.00 | 89 | 0.20 |
| Demolition | Rubber Tired Dozers | 1 | 1.00 | 247 | 0.40 |
| Building Construction | Tractors/Loaders/Backhoes | 2 | 8.00 | 97 | 0.37 |
| Demolition | Tractors/Loaders/Backhoes | 2 | 6.00 | 97 | 0.37 |

### Trips and VMT

Palomar Hydrogen Project - San Diego County, Winter

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not 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 |
|---|---|---|---|---|---|---|---|---|---|---|
| Demolition | 4 | 10.00 | 0.00 | 8.00 | 10.80 | 7.30 | 20.00 | LD_Mix | HDT_Mix | HHDT |
| Building Construction | 5 | 3.00 | 1.00 | 0.00 | 10.80 | 7.30 | 20.00 | LD_Mix | HDT_Mix | HHDT |
| Architectural Coating | 1 | 1.00 | 0.00 | 0.00 | 10.80 | 7.30 | 20.00 | LD_Mix | HDT_Mix | HHDT |

## 3.1 Mitigation Measures Construction

Water Exposed Area

## 3.2 Demolition - 2022

**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 | | | | | 0.1647 | 0.0000 | 0.1647 | 0.0249 | 0.0000 | 0.0249 | | | 0.0000 | | | 0.0000 |
| Off-Road | 0.7094 | 6.4138 | 7.4693 | 0.0120 | | 0.3375 | 0.3375 | | 0.3225 | 0.3225 | | 1,147.9025 | 1,147.9025 | 0.2119 | | 1,153.2001 |
| **Total** | **0.7094** | **6.4138** | **7.4693** | **0.0120** | **0.1647** | **0.3375** | **0.5022** | **0.0249** | **0.3225** | **0.3475** | | **1,147.9025** | **1,147.9025** | **0.2119** | | **1,153.2001** |

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

## 3.2 Demolition - 2022

### 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 | 3.4900e-003 | 0.1348 | 0.0321 | 5.0000e-004 | 0.0140 | 1.2500e-003 | 0.0153 | 3.8400e-003 | 1.2000e-003 | 5.0300e-003 | | 55.2890 | 55.2890 | 2.6500e-003 | 8.7800e-003 | 57.9727 |
| 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 | 0.0316 | 0.0214 | 0.2455 | 7.1000e-004 | 0.0822 | 4.6000e-004 | 0.0826 | 0.0218 | 4.3000e-004 | 0.0222 | | 71.5946 | 71.5946 | 2.3300e-003 | 2.1300e-003 | 72.2866 |
| **Total** | **0.0351** | **0.1562** | **0.2776** | **1.2100e-003** | **0.0961** | **1.7100e-003** | **0.0979** | **0.0256** | **1.6300e-003** | **0.0273** | | **126.8836** | **126.8836** | **4.9800e-003** | **0.0109** | **130.2593** |

### 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 | | | | | 0.0741 | 0.0000 | 0.0741 | 0.0112 | 0.0000 | 0.0112 | | | 0.0000 | | | 0.0000 |
| Off-Road | 0.7094 | 6.4138 | 7.4693 | 0.0120 | | 0.3375 | 0.3375 | | 0.3225 | 0.3225 | 0.0000 | 1,147.9025 | 1,147.9025 | 0.2119 | | 1,153.2001 |
| **Total** | **0.7094** | **6.4138** | **7.4693** | **0.0120** | **0.0741** | **0.3375** | **0.4116** | **0.0112** | **0.3225** | **0.3338** | **0.0000** | **1,147.9025** | **1,147.9025** | **0.2119** | | **1,153.2001** |

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

## 3.2 Demolition - 2022

**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 | 3.4900e-003 | 0.1348 | 0.0321 | 5.0000e-004 | 0.0140 | 1.2500e-003 | 0.0153 | 3.8400e-003 | 1.2000e-003 | 5.0300e-003 | | 55.2890 | 55.2890 | 2.6500e-003 | 8.7800e-003 | 57.9727 |
| 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 | 0.0316 | 0.0214 | 0.2455 | 7.1000e-004 | 0.0822 | 4.6000e-004 | 0.0826 | 0.0218 | 4.3000e-004 | 0.0222 | | 71.5946 | 71.5946 | 2.3300e-003 | 2.1300e-003 | 72.2866 |
| **Total** | **0.0351** | **0.1562** | **0.2776** | **1.2100e-003** | **0.0961** | **1.7100e-003** | **0.0979** | **0.0256** | **1.6300e-003** | **0.0273** | | **126.8836** | **126.8836** | **4.9800e-003** | **0.0109** | **130.2593** |

## 3.3 Building Construction - 2022

**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 | 0.6863 | 7.0258 | 7.1527 | 0.0114 | | 0.3719 | 0.3719 | | 0.3422 | 0.3422 | | 1,103.9393 | 1,103.9393 | 0.3570 | | 1,112.8652 |
| **Total** | **0.6863** | **7.0258** | **7.1527** | **0.0114** | | **0.3719** | **0.3719** | | **0.3422** | **0.3422** | | **1,103.9393** | **1,103.9393** | **0.3570** | | **1,112.8652** |

Palomar Hydrogen Project - San Diego County, Winter

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

## 3.3 Building Construction - 2022

### 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 | 2.2100e-003 | 0.0552 | 0.0183 | 2.1000e-004 | 6.7700e-003 | 5.8000e-004 | 7.3500e-003 | 1.9500e-003 | 5.5000e-004 | 2.5000e-003 | | 22.9944 | 22.9944 | 7.0000e-004 | 3.3400e-003 | 24.0073 |
| Worker | 9.4700e-003 | 6.4100e-003 | 0.0737 | 2.1000e-004 | 0.0246 | 1.4000e-004 | 0.0248 | 6.5400e-003 | 1.3000e-004 | 6.6700e-003 | | 21.4784 | 21.4784 | 7.0000e-004 | 6.4000e-004 | 21.6860 |
| **Total** | **0.0117** | **0.0616** | **0.0920** | **4.2000e-004** | **0.0314** | **7.2000e-004** | **0.0321** | **8.4900e-003** | **6.8000e-004** | **9.1700e-003** | | **44.4728** | **44.4728** | **1.4000e-003** | **3.9800e-003** | **45.6933** |

### 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 | 0.6863 | 7.0258 | 7.1527 | 0.0114 | | 0.3719 | 0.3719 | | 0.3422 | 0.3422 | 0.0000 | 1,103.9393 | 1,103.9393 | 0.3570 | | 1,112.8652 |
| **Total** | **0.6863** | **7.0258** | **7.1527** | **0.0114** | | **0.3719** | **0.3719** | | **0.3422** | **0.3422** | **0.0000** | **1,103.9393** | **1,103.9393** | **0.3570** | | **1,112.8652** |

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

## 3.3 Building Construction - 2022

**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 | 2.2100e-003 | 0.0552 | 0.0183 | 2.1000e-004 | 6.7700e-003 | 5.8000e-004 | 7.3500e-003 | 1.9500e-003 | 5.5000e-004 | 2.5000e-003 | | 22.9944 | 22.9944 | 7.0000e-004 | 3.3400e-003 | 24.0073 |
| Worker | 9.4700e-003 | 6.4100e-003 | 0.0737 | 2.1000e-004 | 0.0246 | 1.4000e-004 | 0.0248 | 6.5400e-003 | 1.3000e-004 | 6.6700e-003 | | 21.4784 | 21.4784 | 7.0000e-004 | 6.4000e-004 | 21.6860 |
| **Total** | **0.0117** | **0.0616** | **0.0920** | **4.2000e-004** | **0.0314** | **7.2000e-004** | **0.0321** | **8.4900e-003** | **6.8000e-004** | **9.1700e-003** | | **44.4728** | **44.4728** | **1.4000e-003** | **3.9800e-003** | **45.6933** |

## 3.4 Architectural Coating - 2022

**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 | | | | | |
| Archit. Coating | 16.2225 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Off-Road | 0.2045 | 1.4085 | 1.8136 | 2.9700e-003 | | 0.0817 | 0.0817 | | 0.0817 | 0.0817 | | 281.4481 | 281.4481 | 0.0183 | | 281.9062 |
| **Total** | **16.4270** | **1.4085** | **1.8136** | **2.9700e-003** | | **0.0817** | **0.0817** | | **0.0817** | **0.0817** | | **281.4481** | **281.4481** | **0.0183** | | **281.9062** |

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

## 3.4 Architectural Coating - 2022

### 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 | 3.1600e-003 | 2.1400e-003 | 0.0246 | 7.0000e-005 | 8.2100e-003 | 5.0000e-005 | 8.2600e-003 | 2.1800e-003 | 4.0000e-005 | 2.2200e-003 | | 7.1595 | 7.1595 | 2.3000e-004 | 2.1000e-004 | 7.2287 |
| **Total** | **3.1600e-003** | **2.1400e-003** | **0.0246** | **7.0000e-005** | **8.2100e-003** | **5.0000e-005** | **8.2600e-003** | **2.1800e-003** | **4.0000e-005** | **2.2200e-003** | | **7.1595** | **7.1595** | **2.3000e-004** | **2.1000e-004** | **7.2287** |

### 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 | | | | | |
| Archit. Coating | 16.2225 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Off-Road | 0.2045 | 1.4085 | 1.8136 | 2.9700e-003 | | 0.0817 | 0.0817 | | 0.0817 | 0.0817 | 0.0000 | 281.4481 | 281.4481 | 0.0183 | | 281.9062 |
| **Total** | **16.4270** | **1.4085** | **1.8136** | **2.9700e-003** | | **0.0817** | **0.0817** | | **0.0817** | **0.0817** | **0.0000** | **281.4481** | **281.4481** | **0.0183** | | **281.9062** |

Palomar Hydrogen Project - San Diego County, Winter

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

## 3.4 Architectural Coating - 2022

**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 | 3.1600e-003 | 2.1400e-003 | 0.0246 | 7.0000e-005 | 8.2100e-003 | 5.0000e-005 | 8.2600e-003 | 2.1800e-003 | 4.0000e-005 | 2.2200e-003 | | 7.1595 | 7.1595 | 2.3000e-004 | 2.1000e-004 | 7.2287 |
| **Total** | **3.1600e-003** | **2.1400e-003** | **0.0246** | **7.0000e-005** | **8.2100e-003** | **5.0000e-005** | **8.2600e-003** | **2.1800e-003** | **4.0000e-005** | **2.2200e-003** | | **7.1595** | **7.1595** | **2.3000e-004** | **2.1000e-004** | **7.2287** |

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

# 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 |
| General Light Industry | 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 |
| General Light Industry | 9.50 | 7.30 | 7.30 | 59.00 | 28.00 | 13.00 | 92 | 5 | 3 |

## 4.4 Fleet Mix

| Land Use | LDA | LDT1 | LDT2 | MDV | LHD1 | LHD2 | MHD | HHD | OBUS | UBUS | MCY | SBUS | MH |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| General Light Industry | 0.553514 | 0.062792 | 0.181046 | 0.120736 | 0.024419 | 0.006214 | 0.008493 | 0.006184 | 0.000715 | 0.000556 | 0.029185 | 0.000982 | 0.005164 |

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

## 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 | | | | | |
| General Light Industry | 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** |

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

## 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 | | | | | |
| General Light Industry | 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 | 7.7000e-004 | 1.0000e-005 | 7.1000e-004 | 0.0000 | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | 1.5300e-003 | 1.5300e-003 | 0.0000 | | 1.6300e-003 |
| Unmitigated | 7.7000e-004 | 1.0000e-005 | 7.1000e-004 | 0.0000 | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | 1.5300e-003 | 1.5300e-003 | 0.0000 | | 1.6300e-003 |

Palomar Hydrogen Project - San Diego County, Winter

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

## 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 | 0.0000 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Consumer Products | 7.0000e-004 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Landscaping | 7.0000e-005 | 1.0000e-005 | 7.1000e-004 | 0.0000 | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | 1.5300e-003 | 1.5300e-003 | 0.0000 | | 1.6300e-003 |
| **Total** | **7.7000e-004** | **1.0000e-005** | **7.1000e-004** | **0.0000** | | **0.0000** | **0.0000** | | **0.0000** | **0.0000** | | **1.5300e-003** | **1.5300e-003** | **0.0000** | | **1.6300e-003** |

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

## 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 | 0.0000 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Consumer Products | 7.0000e-004 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Landscaping | 7.0000e-005 | 1.0000e-005 | 7.1000e-004 | 0.0000 | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | 1.5300e-003 | 1.5300e-003 | 0.0000 | | 1.6300e-003 |
| **Total** | **7.7000e-004** | **1.0000e-005** | **7.1000e-004** | **0.0000** | | **0.0000** | **0.0000** | | **0.0000** | **0.0000** | | **1.5300e-003** | **1.5300e-003** | **0.0000** | | **1.6300e-003** |

## 7.0 Water Detail

### 7.1 Mitigation Measures Water

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

## 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

Palomar Hydrogen Project - San Diego County, Summer

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

# Palomar Hydrogen Project

**San Diego County, Summer**

## 1.0 Project Characteristics

### 1.1 Land Usage

| Land Uses | Size | Metric | Lot Acreage | Floor Surface Area | Population |
|---|---|---|---|---|---|
| General Light Industry | 7.00 | 1000sqft | 0.16 | 7,000.00 | 0 |

### 1.2 Other Project Characteristics

| | | | | | |
|---|---|---|---|---|---|
| **Urbanization** | Urban | **Wind Speed (m/s)** | 2.6 | **Precipitation Freq (Days)** | 40 |
| **Climate Zone** | 13 | | | **Operational Year** | 2023 |
| **Utility Company** | San Diego Gas & Electric | | | | |
| **CO2 Intensity (lb/MWhr)** | 539.98 | **CH4 Intensity (lb/MWhr)** | 0.033 | **N2O Intensity (lb/MWhr)** | 0.004 |

### 1.3 User Entered Comments & Non-Default Data

Project Characteristics - Construction only

Land Use -

Construction Phase - 2 weeks for painting

Demolition -

Vehicle Trips - Construction only

Consumer Products - Construction only

Area Coating - Construction only

Landscape Equipment - Construction only

Energy Use - Construction only

Water And Wastewater - Construction only

Solid Waste - Construction only

Construction Off-road Equipment Mitigation -

Palomar Hydrogen Project - San Diego County, Summer

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

| Table Name | Column Name | Default Value | New Value |
|---|---|---|---|
| tblAreaCoating | Area_Nonresidential_Exterior | 3500 | 0 |
| tblAreaCoating | Area_Nonresidential_Interior | 10500 | 0 |
| tblConstructionPhase | NumDays | 5.00 | 10.00 |
| tblConstructionPhase | PhaseEndDate | 6/22/2022 | 6/17/2022 |
| tblConstructionPhase | PhaseEndDate | 6/8/2022 | 6/3/2022 |
| tblConstructionPhase | PhaseStartDate | 6/16/2022 | 6/6/2022 |
| tblConstructionPhase | PhaseStartDate | 1/20/2022 | 1/17/2022 |
| tblConsumerProducts | ROG_EF | 2.14E-05 | 1E-07 |
| tblConsumerProducts | ROG_EF_Degreaser | 3.542E-07 | 1E-10 |
| tblConsumerProducts | ROG_EF_PesticidesFertilizers | 5.152E-08 | 1E-11 |
| tblEnergyUse | LightingElect | 2.83 | 0.00 |
| tblEnergyUse | NT24E | 4.27 | 0.00 |
| tblEnergyUse | NT24NG | 7.25 | 0.00 |
| tblEnergyUse | T24E | 1.08 | 0.00 |
| tblEnergyUse | T24NG | 4.27 | 0.00 |
| tblLandscapeEquipment | NumberSummerDays | 180 | 1 |
| tblSolidWaste | SolidWasteGenerationRate | 8.68 | 0.00 |
| tblVehicleTrips | ST_TR | 1.99 | 0.00 |
| tblVehicleTrips | SU_TR | 5.00 | 0.00 |
| tblVehicleTrips | WD_TR | 4.96 | 0.00 |
| tblWater | IndoorWaterUseRate | 1,618,750.00 | 0.00 |

## 2.0 Emissions Summary

Palomar Hydrogen Project - San Diego County, Summer

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

## 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 | | | | | |
| 2022 | 16.4300 | 7.0846 | 7.7598 | 0.0132 | 0.2608 | 0.3726 | 0.6000 | 0.0506 | 0.3429 | 0.3747 | 0.0000 | 1,278.9388 | 1,278.9388 | 0.3584 | 0.0108 | 1,287.5597 |
| **Maximum** | **16.4300** | **7.0846** | **7.7598** | **0.0132** | **0.2608** | **0.3726** | **0.6000** | **0.0506** | **0.3429** | **0.3747** | **0.0000** | **1,278.9388** | **1,278.9388** | **0.3584** | **0.0108** | **1,287.5597** |

### 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 | | | | | |
| 2022 | 16.4300 | 7.0846 | 7.7598 | 0.0132 | 0.1702 | 0.3726 | 0.5095 | 0.0369 | 0.3429 | 0.3610 | 0.0000 | 1,278.9388 | 1,278.9388 | 0.3584 | 0.0108 | 1,287.5597 |
| **Maximum** | **16.4300** | **7.0846** | **7.7598** | **0.0132** | **0.1702** | **0.3726** | **0.5095** | **0.0369** | **0.3429** | **0.3610** | **0.0000** | **1,278.9388** | **1,278.9388** | **0.3584** | **0.0108** | **1,287.5597** |

| | 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** | **34.72** | **0.00** | **15.09** | **27.13** | **0.00** | **3.66** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** |

Palomar Hydrogen Project - San Diego County, Summer

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

## 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 | 7.7000e-004 | 1.0000e-005 | 7.1000e-004 | 0.0000 | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | 1.5300e-003 | 1.5300e-003 | 0.0000 | | 1.6300e-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** | **7.7000e-004** | **1.0000e-005** | **7.1000e-004** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | | **1.5300e-003** | **1.5300e-003** | **0.0000** | **0.0000** | **1.6300e-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 | 7.7000e-004 | 1.0000e-005 | 7.1000e-004 | 0.0000 | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | 1.5300e-003 | 1.5300e-003 | 0.0000 | | 1.6300e-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** | **7.7000e-004** | **1.0000e-005** | **7.1000e-004** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | | **1.5300e-003** | **1.5300e-003** | **0.0000** | **0.0000** | **1.6300e-003** |

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not 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 | Demolition | Demolition | 1/3/2022 | 1/14/2022 | 5 | 10 | |
| 2 | Building Construction | Building Construction | 1/17/2022 | 6/3/2022 | 5 | 100 | |
| 3 | Architectural Coating | Architectural Coating | 6/6/2022 | 6/17/2022 | 5 | 10 | |

**Acres of Grading (Site Preparation Phase): 0**

**Acres of Grading (Grading Phase): 0**

**Acres of Paving: 0**

**Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 10,500; Non-Residential Outdoor: 3,500; Striped Parking Area: 0 (Architectural Coating – sqft)**

### OffRoad Equipment

| Phase Name | Offroad Equipment Type | Amount | Usage Hours | Horse Power | Load Factor |
|---|---|---|---|---|---|
| Architectural Coating | Air Compressors | 1 | 6.00 | 78 | 0.48 |
| Demolition | Concrete/Industrial Saws | 1 | 8.00 | 81 | 0.73 |
| Building Construction | Cranes | 1 | 4.00 | 231 | 0.29 |
| Building Construction | Forklifts | 2 | 6.00 | 89 | 0.20 |
| Demolition | Rubber Tired Dozers | 1 | 1.00 | 247 | 0.40 |
| Building Construction | Tractors/Loaders/Backhoes | 2 | 8.00 | 97 | 0.37 |
| Demolition | Tractors/Loaders/Backhoes | 2 | 6.00 | 97 | 0.37 |

### Trips and VMT

Palomar Hydrogen Project - San Diego County, Summer

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not 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 |
|---|---|---|---|---|---|---|---|---|---|---|
| Demolition | 4 | 10.00 | 0.00 | 8.00 | 10.80 | 7.30 | 20.00 | LD_Mix | HDT_Mix | HHDT |
| Building Construction | 5 | 3.00 | 1.00 | 0.00 | 10.80 | 7.30 | 20.00 | LD_Mix | HDT_Mix | HHDT |
| Architectural Coating | 1 | 1.00 | 0.00 | 0.00 | 10.80 | 7.30 | 20.00 | LD_Mix | HDT_Mix | HHDT |

## 3.1 Mitigation Measures Construction

Water Exposed Area

## 3.2 Demolition - 2022

**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 | | | | | 0.1647 | 0.0000 | 0.1647 | 0.0249 | 0.0000 | 0.0249 | | | 0.0000 | | | 0.0000 |
| Off-Road | 0.7094 | 6.4138 | 7.4693 | 0.0120 | | 0.3375 | 0.3375 | | 0.3225 | 0.3225 | | 1,147.9025 | 1,147.9025 | 0.2119 | | 1,153.2001 |
| **Total** | **0.7094** | **6.4138** | **7.4693** | **0.0120** | **0.1647** | **0.3375** | **0.5022** | **0.0249** | **0.3225** | **0.3475** | | **1,147.9025** | **1,147.9025** | **0.2119** | | **1,153.2001** |

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

## 3.2 Demolition - 2022

### 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 | 3.5900e-003 | 0.1299 | 0.0316 | 5.0000e-004 | 0.0140 | 1.2500e-003 | 0.0152 | 3.8400e-003 | 1.2000e-003 | 5.0300e-003 | | 55.2656 | 55.2656 | 2.6600e-003 | 8.7800e-003 | 57.9482 |
| 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 | 0.0292 | 0.0190 | 0.2589 | 7.5000e-004 | 0.0822 | 4.6000e-004 | 0.0826 | 0.0218 | 4.3000e-004 | 0.0222 | | 75.7708 | 75.7708 | 2.1900e-003 | 1.9700e-003 | 76.4114 |
| **Total** | **0.0328** | **0.1489** | **0.2905** | **1.2500e-003** | **0.0961** | **1.7100e-003** | **0.0979** | **0.0256** | **1.6300e-003** | **0.0273** | | **131.0364** | **131.0364** | **4.8500e-003** | **0.0108** | **134.3596** |

### 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 | | | | | 0.0741 | 0.0000 | 0.0741 | 0.0112 | 0.0000 | 0.0112 | | | 0.0000 | | | 0.0000 |
| Off-Road | 0.7094 | 6.4138 | 7.4693 | 0.0120 | | 0.3375 | 0.3375 | | 0.3225 | 0.3225 | 0.0000 | 1,147.9025 | 1,147.9025 | 0.2119 | | 1,153.2001 |
| **Total** | **0.7094** | **6.4138** | **7.4693** | **0.0120** | **0.0741** | **0.3375** | **0.4116** | **0.0112** | **0.3225** | **0.3338** | **0.0000** | **1,147.9025** | **1,147.9025** | **0.2119** | | **1,153.2001** |

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

## 3.2 Demolition - 2022

**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 | 3.5900e-003 | 0.1299 | 0.0316 | 5.0000e-004 | 0.0140 | 1.2500e-003 | 0.0152 | 3.8400e-003 | 1.2000e-003 | 5.0300e-003 | | 55.2656 | 55.2656 | 2.6600e-003 | 8.7800e-003 | 57.9482 |
| 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 | 0.0292 | 0.0190 | 0.2589 | 7.5000e-004 | 0.0822 | 4.6000e-004 | 0.0826 | 0.0218 | 4.3000e-004 | 0.0222 | | 75.7708 | 75.7708 | 2.1900e-003 | 1.9700e-003 | 76.4114 |
| **Total** | **0.0328** | **0.1489** | **0.2905** | **1.2500e-003** | **0.0961** | **1.7100e-003** | **0.0979** | **0.0256** | **1.6300e-003** | **0.0273** | | **131.0364** | **131.0364** | **4.8500e-003** | **0.0108** | **134.3596** |

## 3.3 Building Construction - 2022

**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 | 0.6863 | 7.0258 | 7.1527 | 0.0114 | | 0.3719 | 0.3719 | | 0.3422 | 0.3422 | | 1,103.9393 | 1,103.9393 | 0.3570 | | 1,112.8652 |
| **Total** | **0.6863** | **7.0258** | **7.1527** | **0.0114** | | **0.3719** | **0.3719** | | **0.3422** | **0.3422** | | **1,103.9393** | **1,103.9393** | **0.3570** | | **1,112.8652** |

Palomar Hydrogen Project - San Diego County, Summer

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

## 3.3 Building Construction - 2022

### 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 | 2.2300e-003 | 0.0532 | 0.0178 | 2.1000e-004 | 6.7700e-003 | 5.8000e-004 | 7.3500e-003 | 1.9500e-003 | 5.5000e-004 | 2.5000e-003 | | 22.9826 | 22.9826 | 7.0000e-004 | 3.3400e-003 | 23.9941 |
| Worker | 8.7600e-003 | 5.7000e-003 | 0.0777 | 2.2000e-004 | 0.0246 | 1.4000e-004 | 0.0248 | 6.5400e-003 | 1.3000e-004 | 6.6700e-003 | | 22.7312 | 22.7312 | 6.6000e-004 | 5.9000e-004 | 22.9234 |
| **Total** | **0.0110** | **0.0589** | **0.0955** | **4.3000e-004** | **0.0314** | **7.2000e-004** | **0.0321** | **8.4900e-003** | **6.8000e-004** | **9.1700e-003** | | **45.7138** | **45.7138** | **1.3600e-003** | **3.9300e-003** | **46.9176** |

### 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 | 0.6863 | 7.0258 | 7.1527 | 0.0114 | | 0.3719 | 0.3719 | | 0.3422 | 0.3422 | 0.0000 | 1,103.9393 | 1,103.9393 | 0.3570 | | 1,112.8652 |
| **Total** | **0.6863** | **7.0258** | **7.1527** | **0.0114** | | **0.3719** | **0.3719** | | **0.3422** | **0.3422** | **0.0000** | **1,103.9393** | **1,103.9393** | **0.3570** | | **1,112.8652** |

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

## 3.3 Building Construction - 2022

**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 | 2.2300e-003 | 0.0532 | 0.0178 | 2.1000e-004 | 6.7700e-003 | 5.8000e-004 | 7.3500e-003 | 1.9500e-003 | 5.5000e-004 | 2.5000e-003 | | 22.9826 | 22.9826 | 7.0000e-004 | 3.3400e-003 | 23.9941 |
| Worker | 8.7600e-003 | 5.7000e-003 | 0.0777 | 2.2000e-004 | 0.0246 | 1.4000e-004 | 0.0248 | 6.5400e-003 | 1.3000e-004 | 6.6700e-003 | | 22.7312 | 22.7312 | 6.6000e-004 | 5.9000e-004 | 22.9234 |
| **Total** | **0.0110** | **0.0589** | **0.0955** | **4.3000e-004** | **0.0314** | **7.2000e-004** | **0.0321** | **8.4900e-003** | **6.8000e-004** | **9.1700e-003** | | **45.7138** | **45.7138** | **1.3600e-003** | **3.9300e-003** | **46.9176** |

## 3.4 Architectural Coating - 2022

**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 | | | | | |
| Archit. Coating | 16.2225 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Off-Road | 0.2045 | 1.4085 | 1.8136 | 2.9700e-003 | | 0.0817 | 0.0817 | | 0.0817 | 0.0817 | | 281.4481 | 281.4481 | 0.0183 | | 281.9062 |
| **Total** | **16.4270** | **1.4085** | **1.8136** | **2.9700e-003** | | **0.0817** | **0.0817** | | **0.0817** | **0.0817** | | **281.4481** | **281.4481** | **0.0183** | | **281.9062** |

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

## 3.4 Architectural Coating - 2022

### 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 | 2.9200e-003 | 1.9000e-003 | 0.0259 | 7.0000e-005 | 8.2100e-003 | 5.0000e-005 | 8.2600e-003 | 2.1800e-003 | 4.0000e-005 | 2.2200e-003 | | 7.5771 | 7.5771 | 2.2000e-004 | 2.0000e-004 | 7.6411 |
| **Total** | **2.9200e-003** | **1.9000e-003** | **0.0259** | **7.0000e-005** | **8.2100e-003** | **5.0000e-005** | **8.2600e-003** | **2.1800e-003** | **4.0000e-005** | **2.2200e-003** | | **7.5771** | **7.5771** | **2.2000e-004** | **2.0000e-004** | **7.6411** |

### 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 | | | | | |
| Archit. Coating | 16.2225 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Off-Road | 0.2045 | 1.4085 | 1.8136 | 2.9700e-003 | | 0.0817 | 0.0817 | | 0.0817 | 0.0817 | 0.0000 | 281.4481 | 281.4481 | 0.0183 | | 281.9062 |
| **Total** | **16.4270** | **1.4085** | **1.8136** | **2.9700e-003** | | **0.0817** | **0.0817** | | **0.0817** | **0.0817** | **0.0000** | **281.4481** | **281.4481** | **0.0183** | | **281.9062** |

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

## 3.4 Architectural Coating - 2022

**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 | 2.9200e-003 | 1.9000e-003 | 0.0259 | 7.0000e-005 | 8.2100e-003 | 5.0000e-005 | 8.2600e-003 | 2.1800e-003 | 4.0000e-005 | 2.2200e-003 | | 7.5771 | 7.5771 | 2.2000e-004 | 2.0000e-004 | 7.6411 |
| **Total** | **2.9200e-003** | **1.9000e-003** | **0.0259** | **7.0000e-005** | **8.2100e-003** | **5.0000e-005** | **8.2600e-003** | **2.1800e-003** | **4.0000e-005** | **2.2200e-003** | | **7.5771** | **7.5771** | **2.2000e-004** | **2.0000e-004** | **7.6411** |

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

# 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 |
| General Light Industry | 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 |
| General Light Industry | 9.50 | 7.30 | 7.30 | 59.00 | 28.00 | 13.00 | 92 | 5 | 3 |

## 4.4 Fleet Mix

| Land Use | LDA | LDT1 | LDT2 | MDV | LHD1 | LHD2 | MHD | HHD | OBUS | UBUS | MCY | SBUS | MH |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| General Light Industry | 0.553514 | 0.062792 | 0.181046 | 0.120736 | 0.024419 | 0.006214 | 0.008493 | 0.006184 | 0.000715 | 0.000556 | 0.029185 | 0.000982 | 0.005164 |

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

## 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 | | | | | |
| General Light Industry | 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** |

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

## 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 | | | | | |
| General Light Industry | 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 | 7.7000e-004 | 1.0000e-005 | 7.1000e-004 | 0.0000 | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | 1.5300e-003 | 1.5300e-003 | 0.0000 | | 1.6300e-003 |
| Unmitigated | 7.7000e-004 | 1.0000e-005 | 7.1000e-004 | 0.0000 | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | 1.5300e-003 | 1.5300e-003 | 0.0000 | | 1.6300e-003 |

Palomar Hydrogen Project - San Diego County, Summer

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

## 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 | 0.0000 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Consumer Products | 7.0000e-004 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Landscaping | 7.0000e-005 | 1.0000e-005 | 7.1000e-004 | 0.0000 | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | 1.5300e-003 | 1.5300e-003 | 0.0000 | | 1.6300e-003 |
| **Total** | **7.7000e-004** | **1.0000e-005** | **7.1000e-004** | **0.0000** | | **0.0000** | **0.0000** | | **0.0000** | **0.0000** | | **1.5300e-003** | **1.5300e-003** | **0.0000** | | **1.6300e-003** |

Palomar Hydrogen Project - San Diego County, Summer

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

## 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 | 0.0000 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Consumer Products | 7.0000e-004 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Landscaping | 7.0000e-005 | 1.0000e-005 | 7.1000e-004 | 0.0000 | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | 1.5300e-003 | 1.5300e-003 | 0.0000 | | 1.6300e-003 |
| **Total** | **7.7000e-004** | **1.0000e-005** | **7.1000e-004** | **0.0000** | | **0.0000** | **0.0000** | | **0.0000** | **0.0000** | | **1.5300e-003** | **1.5300e-003** | **0.0000** | | **1.6300e-003** |

## 7.0 Water Detail

### 7.1 Mitigation Measures Water

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

## 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

Palomar Hydrogen Project - San Diego County, Annual

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

# Palomar Hydrogen Project

**San Diego County, Annual**

## 1.0 Project Characteristics

### 1.1 Land Usage

| Land Uses | Size | Metric | Lot Acreage | Floor Surface Area | Population |
|---|---|---|---|---|---|
| General Light Industry | 7.00 | 1000sqft | 0.16 | 7,000.00 | 0 |

### 1.2 Other Project Characteristics

| | | | | | |
|---|---|---|---|---|---|
| **Urbanization** | Urban | **Wind Speed (m/s)** | 2.6 | **Precipitation Freq (Days)** | 40 |
| **Climate Zone** | 13 | | | **Operational Year** | 2023 |
| **Utility Company** | San Diego Gas & Electric | | | | |
| **CO2 Intensity (lb/MWhr)** | 539.98 | **CH4 Intensity (lb/MWhr)** | 0.033 | **N2O Intensity (lb/MWhr)** | 0.004 |

### 1.3 User Entered Comments & Non-Default Data

Project Characteristics - Construction only

Land Use -

Construction Phase - 2 weeks for painting

Demolition -

Vehicle Trips - Construction only

Consumer Products - Construction only

Area Coating - Construction only

Landscape Equipment - Construction only

Energy Use - Construction only

Water And Wastewater - Construction only

Solid Waste - Construction only

Construction Off-road Equipment Mitigation -

Palomar Hydrogen Project - San Diego County, Annual

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

| Table Name | Column Name | Default Value | New Value |
|---|---|---|---|
| tblAreaCoating | Area_Nonresidential_Exterior | 3500 | 0 |
| tblAreaCoating | Area_Nonresidential_Interior | 10500 | 0 |
| tblConstructionPhase | NumDays | 5.00 | 10.00 |
| tblConstructionPhase | PhaseEndDate | 6/22/2022 | 6/17/2022 |
| tblConstructionPhase | PhaseEndDate | 6/8/2022 | 6/3/2022 |
| tblConstructionPhase | PhaseStartDate | 6/16/2022 | 6/6/2022 |
| tblConstructionPhase | PhaseStartDate | 1/20/2022 | 1/17/2022 |
| tblConsumerProducts | ROG_EF | 2.14E-05 | 1E-07 |
| tblConsumerProducts | ROG_EF_Degreaser | 3.542E-07 | 1E-10 |
| tblConsumerProducts | ROG_EF_PesticidesFertilizers | 5.152E-08 | 1E-11 |
| tblEnergyUse | LightingElect | 2.83 | 0.00 |
| tblEnergyUse | NT24E | 4.27 | 0.00 |
| tblEnergyUse | NT24NG | 7.25 | 0.00 |
| tblEnergyUse | T24E | 1.08 | 0.00 |
| tblEnergyUse | T24NG | 4.27 | 0.00 |
| tblLandscapeEquipment | NumberSummerDays | 180 | 1 |
| tblSolidWaste | SolidWasteGenerationRate | 8.68 | 0.00 |
| tblVehicleTrips | ST_TR | 1.99 | 0.00 |
| tblVehicleTrips | SU_TR | 5.00 | 0.00 |
| tblVehicleTrips | WD_TR | 4.96 | 0.00 |
| tblWater | IndoorWaterUseRate | 1,618,750.00 | 0.00 |

## 2.0 Emissions Summary

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

## 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 | | | | | |
| 2022 | 0.1207 | 0.3943 | 0.4101 | 6.7000e-004 | 2.8700e-003 | 0.0207 | 0.0236 | 6.8000e-004 | 0.0192 | 0.0199 | 0.0000 | 59.1940 | 59.1940 | 0.0173 | 2.3000e-004 | 59.6958 |
| **Maximum** | **0.1207** | **0.3943** | **0.4101** | **6.7000e-004** | **2.8700e-003** | **0.0207** | **0.0236** | **6.8000e-004** | **0.0192** | **0.0199** | **0.0000** | **59.1940** | **59.1940** | **0.0173** | **2.3000e-004** | **59.6958** |

### 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 | | | | | |
| 2022 | 0.1207 | 0.3943 | 0.4101 | 6.7000e-004 | 2.4100e-003 | 0.0207 | 0.0232 | 6.1000e-004 | 0.0192 | 0.0198 | 0.0000 | 59.1939 | 59.1939 | 0.0173 | 2.3000e-004 | 59.6957 |
| **Maximum** | **0.1207** | **0.3943** | **0.4101** | **6.7000e-004** | **2.4100e-003** | **0.0207** | **0.0232** | **6.1000e-004** | **0.0192** | **0.0198** | **0.0000** | **59.1939** | **59.1939** | **0.0173** | **2.3000e-004** | **59.6957** |

| | 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** | **16.03** | **0.00** | **1.91** | **10.29** | **0.00** | **0.35** | **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 Not Applied**

| Quarter | Start Date | End Date | Maximum Unmitigated ROG + NOX (tons/quarter) | Maximum Mitigated ROG + NOX (tons/quarter) |
|---|---|---|---|---|
| 1 | 1-3-2022 | 4-2-2022 | 0.2427 | 0.2427 |
| 2 | 4-3-2022 | 7-2-2022 | 0.2488 | 0.2488 |
| | | Highest | 0.2488 | 0.2488 |

## 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 | 1.3000e-004 | 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 |
| 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** | **1.3000e-004** | **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** |

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

## 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 | 1.3000e-004 | 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 |
| 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** | **1.3000e-004** | **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** |

| | 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 | Demolition | Demolition | 1/3/2022 | 1/14/2022 | 5 | 10 | |
| 2 | Building Construction | Building Construction | 1/17/2022 | 6/3/2022 | 5 | 100 | |
| 3 | Architectural Coating | Architectural Coating | 6/6/2022 | 6/17/2022 | 5 | 10 | |

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

**Acres of Grading (Site Preparation Phase): 0**

**Acres of Grading (Grading Phase): 0**

**Acres of Paving: 0**

**Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 10,500; Non-Residential Outdoor: 3,500; Striped Parking Area: 0 (Architectural Coating – sqft)**

**OffRoad Equipment**

| Phase Name | Offroad Equipment Type | Amount | Usage Hours | Horse Power | Load Factor |
|---|---|---|---|---|---|
| Architectural Coating | Air Compressors | 1 | 6.00 | 78 | 0.48 |
| Demolition | Concrete/Industrial Saws | 1 | 8.00 | 81 | 0.73 |
| Building Construction | Cranes | 1 | 4.00 | 231 | 0.29 |
| Building Construction | Forklifts | 2 | 6.00 | 89 | 0.20 |
| Demolition | Rubber Tired Dozers | 1 | 1.00 | 247 | 0.40 |
| Building Construction | Tractors/Loaders/Backhoes | 2 | 8.00 | 97 | 0.37 |
| Demolition | Tractors/Loaders/Backhoes | 2 | 6.00 | 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 |
|---|---|---|---|---|---|---|---|---|---|---|
| Demolition | 4 | 10.00 | 0.00 | 8.00 | 10.80 | 7.30 | 20.00 | LD_Mix | HDT_Mix | HHDT |
| Building Construction | 5 | 3.00 | 1.00 | 0.00 | 10.80 | 7.30 | 20.00 | LD_Mix | HDT_Mix | HHDT |
| Architectural Coating | 1 | 1.00 | 0.00 | 0.00 | 10.80 | 7.30 | 20.00 | LD_Mix | HDT_Mix | HHDT |

## 3.1 Mitigation Measures Construction

Water Exposed Area

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

## 3.2 Demolition - 2022

### 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 | | | | | 8.2000e-004 | 0.0000 | 8.2000e-004 | 1.2000e-004 | 0.0000 | 1.2000e-004 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Off-Road | 3.5500e-003 | 0.0321 | 0.0374 | 6.0000e-005 | | 1.6900e-003 | 1.6900e-003 | | 1.6100e-003 | 1.6100e-003 | 0.0000 | 5.2068 | 5.2068 | 9.6000e-004 | 0.0000 | 5.2308 |
| **Total** | **3.5500e-003** | **0.0321** | **0.0374** | **6.0000e-005** | **8.2000e-004** | **1.6900e-003** | **2.5100e-003** | **1.2000e-004** | **1.6100e-003** | **1.7300e-003** | **0.0000** | **5.2068** | **5.2068** | **9.6000e-004** | **0.0000** | **5.2308** |

### 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 | 2.0000e-005 | 6.7000e-004 | 1.6000e-004 | 0.0000 | 7.0000e-005 | 1.0000e-005 | 7.0000e-005 | 2.0000e-005 | 1.0000e-005 | 2.0000e-005 | 0.0000 | 0.2507 | 0.2507 | 1.0000e-005 | 4.0000e-005 | 0.2629 |
| 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 | 1.4000e-004 | 1.0000e-004 | 1.2300e-003 | 0.0000 | 4.0000e-004 | 0.0000 | 4.0000e-004 | 1.1000e-004 | 0.0000 | 1.1000e-004 | 0.0000 | 0.3276 | 0.3276 | 1.0000e-005 | 1.0000e-005 | 0.3307 |
| **Total** | **1.6000e-004** | **7.7000e-004** | **1.3900e-003** | **0.0000** | **4.7000e-004** | **1.0000e-005** | **4.7000e-004** | **1.3000e-004** | **1.0000e-005** | **1.3000e-004** | **0.0000** | **0.5784** | **0.5784** | **2.0000e-005** | **5.0000e-005** | **0.5936** |

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

## 3.2 Demolition - 2022

### 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 | | | | | 3.7000e-004 | 0.0000 | 3.7000e-004 | 6.0000e-005 | 0.0000 | 6.0000e-005 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Off-Road | 3.5500e-003 | 0.0321 | 0.0374 | 6.0000e-005 | | 1.6900e-003 | 1.6900e-003 | | 1.6100e-003 | 1.6100e-003 | 0.0000 | 5.2068 | 5.2068 | 9.6000e-004 | 0.0000 | 5.2308 |
| **Total** | **3.5500e-003** | **0.0321** | **0.0374** | **6.0000e-005** | **3.7000e-004** | **1.6900e-003** | **2.0600e-003** | **6.0000e-005** | **1.6100e-003** | **1.6700e-003** | **0.0000** | **5.2068** | **5.2068** | **9.6000e-004** | **0.0000** | **5.2308** |

### 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 | 2.0000e-005 | 6.7000e-004 | 1.6000e-004 | 0.0000 | 7.0000e-005 | 1.0000e-005 | 7.0000e-005 | 2.0000e-005 | 1.0000e-005 | 2.0000e-005 | 0.0000 | 0.2507 | 0.2507 | 1.0000e-005 | 4.0000e-005 | 0.2629 |
| 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 | 1.4000e-004 | 1.0000e-004 | 1.2300e-003 | 0.0000 | 4.0000e-004 | 0.0000 | 4.0000e-004 | 1.1000e-004 | 0.0000 | 1.1000e-004 | 0.0000 | 0.3276 | 0.3276 | 1.0000e-005 | 1.0000e-005 | 0.3307 |
| **Total** | **1.6000e-004** | **7.7000e-004** | **1.3900e-003** | **0.0000** | **4.7000e-004** | **1.0000e-005** | **4.7000e-004** | **1.3000e-004** | **1.0000e-005** | **1.3000e-004** | **0.0000** | **0.5784** | **0.5784** | **2.0000e-005** | **5.0000e-005** | **0.5936** |

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

## 3.3 Building Construction - 2022

### 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 | 0.0343 | 0.3513 | 0.3576 | 5.7000e-004 | | 0.0186 | 0.0186 | | 0.0171 | 0.0171 | 0.0000 | 50.0739 | 50.0739 | 0.0162 | 0.0000 | 50.4787 |
| **Total** | **0.0343** | **0.3513** | **0.3576** | **5.7000e-004** | | **0.0186** | **0.0186** | | **0.0171** | **0.0171** | **0.0000** | **50.0739** | **50.0739** | **0.0162** | **0.0000** | **50.4787** |

### 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 | 1.1000e-004 | 2.7500e-003 | 9.0000e-004 | 1.0000e-005 | 3.3000e-004 | 3.0000e-005 | 3.6000e-004 | 1.0000e-004 | 3.0000e-005 | 1.2000e-004 | 0.0000 | 1.0427 | 1.0427 | 3.0000e-005 | 1.5000e-004 | 1.0886 |
| Worker | 4.3000e-004 | 3.1000e-004 | 3.6800e-003 | 1.0000e-005 | 1.2000e-003 | 1.0000e-005 | 1.2100e-003 | 3.2000e-004 | 1.0000e-005 | 3.3000e-004 | 0.0000 | 0.9829 | 0.9829 | 3.0000e-005 | 3.0000e-005 | 0.9922 |
| **Total** | **5.4000e-004** | **3.0600e-003** | **4.5800e-003** | **2.0000e-005** | **1.5300e-003** | **4.0000e-005** | **1.5700e-003** | **4.2000e-004** | **4.0000e-005** | **4.5000e-004** | **0.0000** | **2.0256** | **2.0256** | **6.0000e-005** | **1.8000e-004** | **2.0808** |

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

## 3.3 Building Construction - 2022

### 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 | 0.0343 | 0.3513 | 0.3576 | 5.7000e-004 | | 0.0186 | 0.0186 | | 0.0171 | 0.0171 | 0.0000 | 50.0738 | 50.0738 | 0.0162 | 0.0000 | 50.4787 |
| **Total** | **0.0343** | **0.3513** | **0.3576** | **5.7000e-004** | | **0.0186** | **0.0186** | | **0.0171** | **0.0171** | **0.0000** | **50.0738** | **50.0738** | **0.0162** | **0.0000** | **50.4787** |

### 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 | 1.1000e-004 | 2.7500e-003 | 9.0000e-004 | 1.0000e-005 | 3.3000e-004 | 3.0000e-005 | 3.6000e-004 | 1.0000e-004 | 3.0000e-005 | 1.2000e-004 | 0.0000 | 1.0427 | 1.0427 | 3.0000e-005 | 1.5000e-004 | 1.0886 |
| Worker | 4.3000e-004 | 3.1000e-004 | 3.6800e-003 | 1.0000e-005 | 1.2000e-003 | 1.0000e-005 | 1.2100e-003 | 3.2000e-004 | 1.0000e-005 | 3.3000e-004 | 0.0000 | 0.9829 | 0.9829 | 3.0000e-005 | 3.0000e-005 | 0.9922 |
| **Total** | **5.4000e-004** | **3.0600e-003** | **4.5800e-003** | **2.0000e-005** | **1.5300e-003** | **4.0000e-005** | **1.5700e-003** | **4.2000e-004** | **4.0000e-005** | **4.5000e-004** | **0.0000** | **2.0256** | **2.0256** | **6.0000e-005** | **1.8000e-004** | **2.0808** |

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

## 3.4 Architectural Coating - 2022

### 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 | | | | | |
| Archit. Coating | 0.0811 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Off-Road | 1.0200e-003 | 7.0400e-003 | 9.0700e-003 | 1.0000e-005 | | 4.1000e-004 | 4.1000e-004 | | 4.1000e-004 | 4.1000e-004 | 0.0000 | 1.2766 | 1.2766 | 8.0000e-005 | 0.0000 | 1.2787 |
| **Total** | **0.0821** | **7.0400e-003** | **9.0700e-003** | **1.0000e-005** | | **4.1000e-004** | **4.1000e-004** | | **4.1000e-004** | **4.1000e-004** | **0.0000** | **1.2766** | **1.2766** | **8.0000e-005** | **0.0000** | **1.2787** |

### 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 | 1.0000e-005 | 1.0000e-005 | 1.2000e-004 | 0.0000 | 4.0000e-005 | 0.0000 | 4.0000e-005 | 1.0000e-005 | 0.0000 | 1.0000e-005 | 0.0000 | 0.0328 | 0.0328 | 0.0000 | 0.0000 | 0.0331 |
| **Total** | **1.0000e-005** | **1.0000e-005** | **1.2000e-004** | **0.0000** | **4.0000e-005** | **0.0000** | **4.0000e-005** | **1.0000e-005** | **0.0000** | **1.0000e-005** | **0.0000** | **0.0328** | **0.0328** | **0.0000** | **0.0000** | **0.0331** |

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

## 3.4 Architectural Coating - 2022

### 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 | | | | | |
| Archit. Coating | 0.0811 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Off-Road | 1.0200e-003 | 7.0400e-003 | 9.0700e-003 | 1.0000e-005 | | 4.1000e-004 | 4.1000e-004 | | 4.1000e-004 | 4.1000e-004 | 0.0000 | 1.2766 | 1.2766 | 8.0000e-005 | 0.0000 | 1.2787 |
| **Total** | **0.0821** | **7.0400e-003** | **9.0700e-003** | **1.0000e-005** | | **4.1000e-004** | **4.1000e-004** | | **4.1000e-004** | **4.1000e-004** | **0.0000** | **1.2766** | **1.2766** | **8.0000e-005** | **0.0000** | **1.2787** |

### 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 | 1.0000e-005 | 1.0000e-005 | 1.2000e-004 | 0.0000 | 4.0000e-005 | 0.0000 | 4.0000e-005 | 1.0000e-005 | 0.0000 | 1.0000e-005 | 0.0000 | 0.0328 | 0.0328 | 0.0000 | 0.0000 | 0.0331 |
| **Total** | **1.0000e-005** | **1.0000e-005** | **1.2000e-004** | **0.0000** | **4.0000e-005** | **0.0000** | **4.0000e-005** | **1.0000e-005** | **0.0000** | **1.0000e-005** | **0.0000** | **0.0328** | **0.0328** | **0.0000** | **0.0000** | **0.0331** |

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

# 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 |
| General Light Industry | 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 |
| General Light Industry | 9.50 | 7.30 | 7.30 | 59.00 | 28.00 | 13.00 | 92 | 5 | 3 |

## 4.4 Fleet Mix

| Land Use | LDA | LDT1 | LDT2 | MDV | LHD1 | LHD2 | MHD | HHD | OBUS | UBUS | MCY | SBUS | MH |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| General Light Industry | 0.553514 | 0.062792 | 0.181046 | 0.120736 | 0.024419 | 0.006214 | 0.008493 | 0.006184 | 0.000715 | 0.000556 | 0.029185 | 0.000982 | 0.005164 |

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

## 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 |

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

## 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 | | | | | |
| General Light Industry | 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 | | | | | |
| General Light Industry | 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** |

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

## 5.3 Energy by Land Use - Electricity

**Unmitigated**

| | Electricity Use | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|
| Land Use | kWh/yr | MT/yr | | | |
| General Light Industry | 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 | | | |
| General Light Industry | 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

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not 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 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Mitigated | 1.3000e-004 | 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 | 1.3000e-004 | 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 |

## 6.2 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 | 0.0000 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Consumer Products | 1.3000e-004 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Landscaping | 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** | **1.3000e-004** | **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** |

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

## 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 | 0.0000 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Consumer Products | 1.3000e-004 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Landscaping | 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** | **1.3000e-004** | **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** |

# 7.0 Water Detail

## 7.1 Mitigation Measures Water

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

| | 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 | | | |
| General Light Industry | 0 / 0 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Total** | | **0.0000** | **0.0000** | **0.0000** | **0.0000** |

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

### 7.2 Water by Land Use

**Mitigated**

| | Indoor/Outdoor Use | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|
| Land Use | Mgal | MT/yr | | | |
| General Light Industry | 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 |

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

## 8.2 Waste by Land Use

**Unmitigated**

| | Waste Disposed | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|
| Land Use | tons | MT/yr | | | |
| General Light Industry | 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 | | | |
| General Light Industry | 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 |
|---|---|---|---|---|---|---|

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied**

## 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