

## Appendix D ENERGY ANALYSIS

# **APPENDIX D**

## **Energy Impact Assessment**



**Leo Recycling Energy  
Assessment**

August 21, 2020

Prepared for:  
City of San José  
Department of Planning, Building and  
Code Enforcement  
200 East Santa Clara Street, 3rd Floor  
San José, California 95113

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LEO RECYCLING ENERGY ASSESSMENT



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## Executive Summary

This energy analysis was prepared to evaluate whether the energy consumed by the Leo Recycling Project (project) would cause significant impacts to energy resources (e.g., transportation fuels and electricity). This assessment was conducted within the context of the California Environmental Quality Act (CEQA, California Public Resources Code Sections 21000, et seq.). The analysis provides a summary of the Project's anticipated energy needs, impacts, and conservation measures.

## Project Summary

The proposed Leo Recycling Project (proposed project) involves the continued operation of the existing Leo Recycling Facility (Leo Recycle), a solid waste processing facility, with modification to the maximum daily capacity of materials to 500 tons per day (tpd) and extending daily operations from six days per week to seven days per week. The facility would continue to operate within an existing 50,000-squarefoot industrial building located on an approximately 2.5-acre site in a heavy industrial zoning district. The facility currently operates under three separate special use permits (SUPs) for the three uses at the site. The proposed project would combine these three SUPs under one Transfer/Processing Full Solid Waste Facility Permit with modified operation components for material processing, hours of operation, outdoor storage and grinder operations, and onsite circulation.

## Summary of Analysis Results

- Impact Energy-1:** The Project would not result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation. **Less Than Significant Impact.**
- Impact Energy-2:** The Project would not conflict with or obstruct a state or local energy plan for renewable energy or energy efficiency. **Less Than Significant Impact.**



## Abbreviations

ATCM	air toxic control measure
CAFE	Corporate Average Fuel Economy
CalEEMod	California Emissions Estimator Model
CARB	California Air Resources Board
CCR	California Code of Regulations
CDI	construction and demolition debris/inerts
CEC	California Energy Commission
CEQA	California Environmental Quality Act
EPA	Environmental Protection Agency
GHG	greenhouse gases
GWh	gigawatt-hour
NHTSA	National Highway Traffic Safety Administration
PG&E	Pacific Gas & Electric
SUP	special use permit
tpd	tons per day
USEIA	United States Energy Information Administration



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## 1.0 INTRODUCTION

The purpose of this Energy Assessment Report (Report) is to analyze potential energy impacts that could occur with the continued operation of the existing Leo Recycling Facility (Leo Recycle, project, proposed project). The proposed project is located at 215 Leo Avenue, in the City of San José in Santa Clara County (Figure 1, Regional Location). The site is an existing solid waste processing facility, the proposed project would modify the maximum daily capacity of materials from 470 to 500 tons per day (tpd). The facility would continue to operate within an existing 50,000-squarefoot industrial building located on an approximately 2.5-acre site in a heavy industrial zoning district.

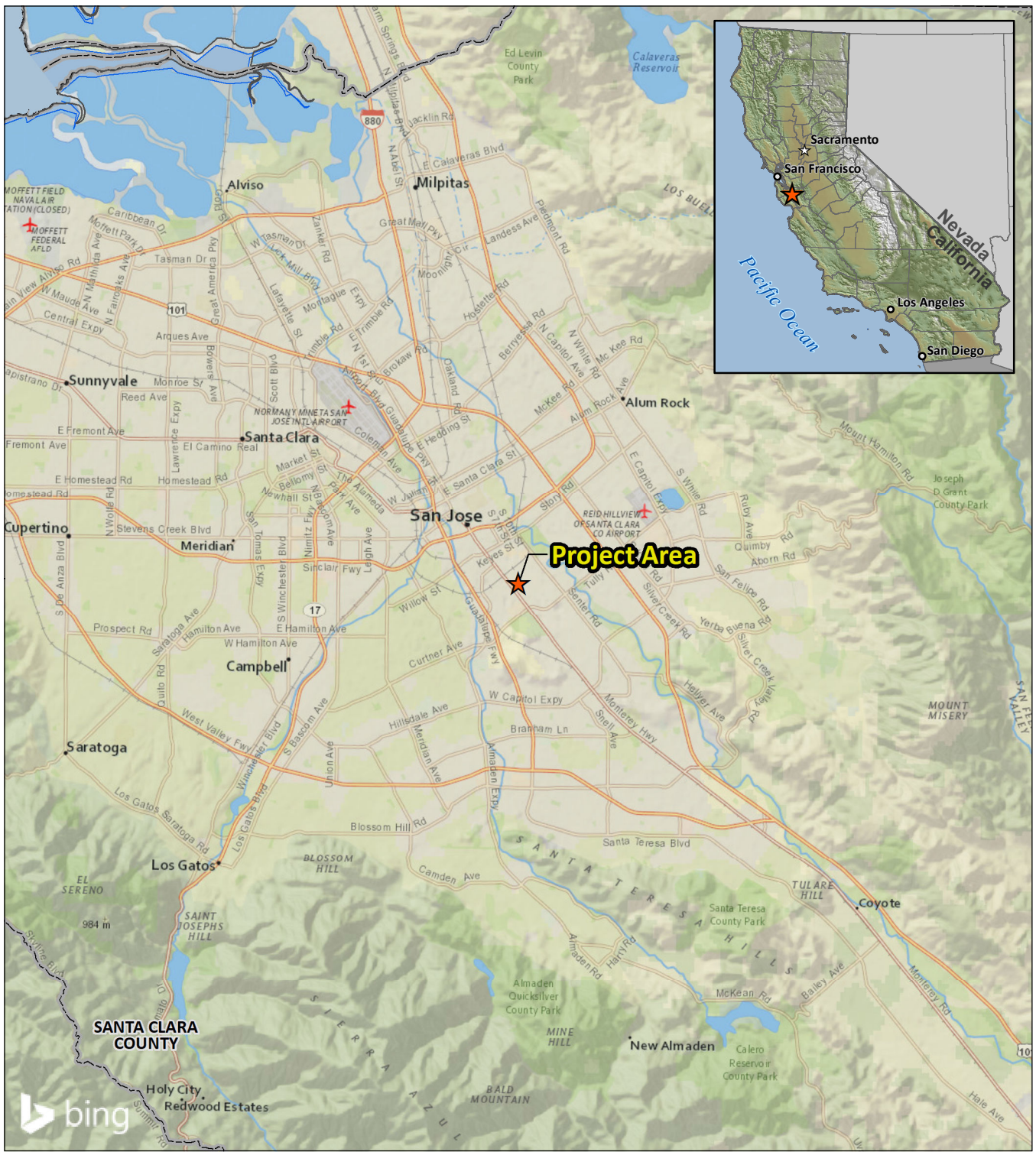
The facility currently operates under three separate special use permits (SUPs) for processing and transferring of construction and demolition debris/inerts (CDI), green waste materials, and Type A Inert materials. The proposed project would combine these three SUPs under one Transfer/Processing Full Solid Waste Facility Permit with the following operational changes (Figure 2, Project Footprint):

- Amount and types of solid waste materials to be processed is estimated to consist of 250 tpd CDIs, 200 tpd green waste materials, and 50 tpd Type A Inert materials for a total of 500 tpd of maximum daily capacity.
- Hours of processing activities would be extended to 24 hours a day, 7 days a week
- Additional outdoor storage for recyclable materials
- Operation of mobile grinder/shredder units both indoors and outdoors operation of the Leo Recycle Project (project or proposed project)

This assessment was conducted within the context of the California Environmental Quality Act (CEQA).







★ Leo Recycling Project Location

- Notes**
1. Coordinate System: NAD 1983 StatePlane California III FIPS 0403 Feet
  2. Data Sources:
  3. Background: © 2020 Microsoft Corporation Earthstar Geographics SIO  
Sources: Esri, Airbus DS, USGS, NGA, NASA, CGIAR, N Robinson, NCEAS, NLS, OS, NMA, Geodatastyrelsen, Rijkswaterstaat, GSA, Geoland, FEMA, Intermap and the GIS user community National Geographic, Esri, Garmin, HERE, UNEP.



**Project Location**  
 215 LEO AVENUE #10  
 SAN JOSE, CA 95112

**Client/Project**  
 Client: Leo Recycling / ATT Recycle, Inc.  
 Project: Leo Recycling Project

Prepared by CNW on 2020-03-27  
 TR by ZP on 2020-03-27  
 IR Review by CA on 2020-03-27

185704747-300.0003 REVA

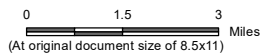


Figure No.  
**1**  
 Title  
**Regional Location**

V:\1857\active\185704747\_MXD\General\Project\City\_V1.mxd Revised: 2020-03-26 By: owhehan

Disclaimer: This document has been prepared based on information provided by others as cited in the Notes section. Stantec has not verified the accuracy and/or completeness of this information and shall not be responsible for any errors or omissions which may be incorporated herein as a result. Stantec assumes no responsibility for data supplied in electronic format, and the recipient accepts full responsibility for verifying the accuracy and completeness of the data.

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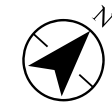
TOTAL PROPOSED REPLACED + NEW IMPERVIOUS SURFACES = 0 SQ. FT.  
 TOTAL PROPOSED REPLACED + NEW PERVIOUS SURFACES = 0 SQ. FT.

**LEGEND**

= (E) CONCRETE  
 = (E) ASPHALT CONCRETE PAVEMENT

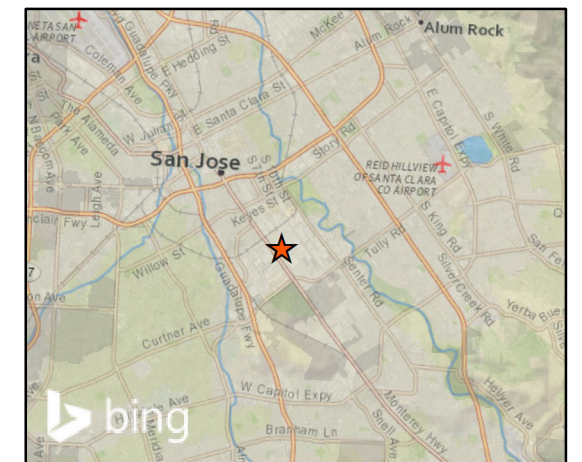
**PARKING TABLE**

TYPE	DIMENSIONS	QTY.
STANDARD	9'x18'	19
COMPACT	8.5'x16'	0
HANDICAP	9'x18'	1
ELECTRIC	9'x18'	1
<b>TOTAL</b>		<b>21</b>



GRAPHIC SCALE in FEET (1 inch = 20'-0")

- Notes**
- Coordinate System: NAD 1983 StatePlane California III FIPS 0403 Feet
  - Data Sources:
  - Background: © 2020 Microsoft Corporation Earthstar Geographics SIO National Geographic, Esri, Garmin, HERE, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, increment P Corp.



**Project Location**  
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 Client: Leo Recycling / ATT Recycle, Inc.  
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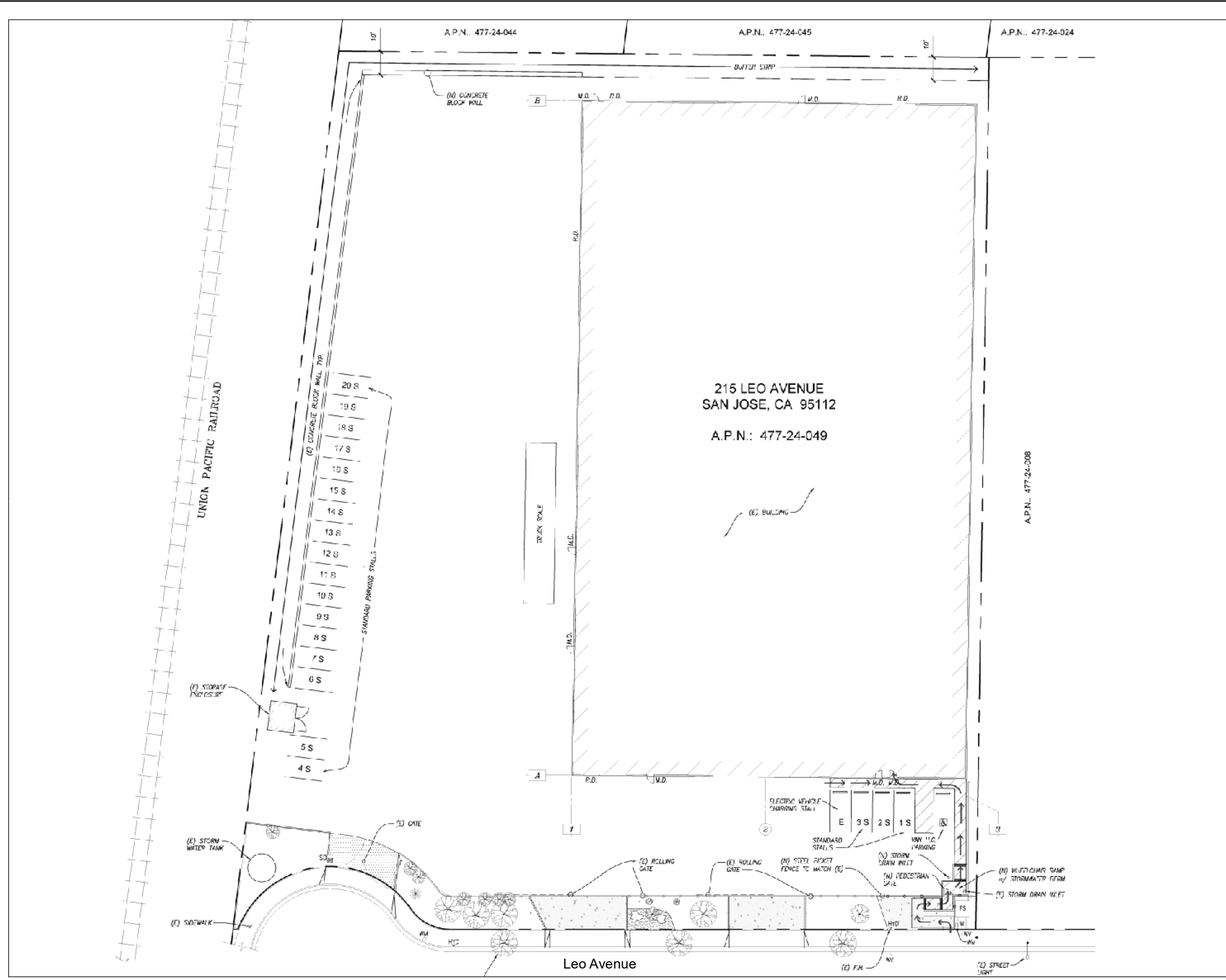
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Figure No.

**2**

Title

**Project Footprint**



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## 2.0 ENVIRONMENTAL AND REGULATORY SETTING

### 2.1.1 Environmental

#### Energy

The Project involves expanding the capacity of the existing Leo Recycling Facility from 470 tpd to 500 tpd and would increase daily operations from six days per week to seven days per week. The Project's main energy consumption would be transportation fuels during operations along with a slight increase in electricity consumption. The Project would not consume natural gas.

#### Electricity

Pacific Gas & Electric is the electricity provider for the City of San José. PG&E has a service area of approximately 70,000 square miles in Northern and Central California providing energy to nearly 16 million people. In 2018, PG&E's total electricity sales in its service area was estimated to be 48,832 gigawatt-hours (GWh) (PG&E 2019).

#### Transportation Fuels

Transportation accounted for nearly 40 percent of California's total energy consumption in 2018 (USEIA 2020). In 2018, California consumed 15.5 billion gallons of gasoline and 3.7 billion gallons of diesel fuel (CEC 2020). Petroleum-based fuels currently account for more than 90 percent of California's transportation fuel use (CEC 2016). However, the state is now developing strategies to reduce petroleum use. Over the last decade, California has implemented several policies, rules, and regulations to improve vehicle efficiency, increase the development and use of alternative fuels, reduce air pollutants and greenhouse gases (GHGs) from the transportation sector, and reduce vehicle miles travelled. The California Energy Commission (CEC) has developed plans and policies to expand the infrastructure of alternative fuel refueling stations to encourage the use and reliability of alternatively fueled vehicles (CEC 2007). Total fuel consumption of diesel and gasoline for Santa Clara County was approximately 100 million gallons and 643 million gallons, respectively (CEC 2020).

#### Existing Energy Use

Currently, the operating schedule at the Project site is six days per week. The proposed Project would expand its daily capacity and extend the operating schedule to seven days per week. The proposed Project's impacts would be evaluated based on the net increase in energy consumption equivalent to Project energy consumption subtracting existing energy consumption. Table 1 shows the existing annual energy consumptions for the Project site.



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**Table 1: Existing Annual Energy Use**

Source	Fuel Consumption (gallons)		Electricity (GWh)
	Diesel	Gasoline	
Offroad Equipment	57,078	--	
Inbound Trucks	655,867	--	
Outbound Trucks	138,531	--	
Staff	--	4,425	
Waste Shredder	113,070	--	
<b>Total Consumption</b>	<b>964,547</b>	<b>4,425</b>	<b>150.87</b>

## 2.1.2 Regulatory Setting

### Federal

#### Corporate Average Fuel Economy Standards

First established by Congress in 1975, the Corporate Average Fuel Economy (CAFE) standards aim to reduce energy consumption by increasing the fuel economy of cars and light trucks. The National Highway Traffic Safety Administration (NHTSA) and EPA jointly administer CAFE standards. Congress has specified that CAFE standards must be set at the “maximum feasible level” with consideration given for the following: 1) technological feasibility; 2) economic practicality; 3) effect of other standards on fuel economy; and 4) need for the nation to conserve energy (NHTSA 2010).

Fuel efficiency standards for medium- and heavy-duty trucks were jointly developed by EPA and NHTSA. The Phase 1 heavy-duty truck standards apply to combination tractors, heavy-duty pickup trucks and vans, and vocational vehicles for model years 2014 through 2018 and resulted in a reduction of fuel consumption from 6 to 23 percent less than the 2010 baseline, depending on the vehicle type (EPA 2011). EPA and NHTSA also adopted the Phase 2 heavy-duty truck standards, which cover model years 2021 through 2027 and require the phase-in of a 5 to 25 percent reduction in fuel consumption over the 2017 baseline depending on the compliance year and vehicle type (EPA 2016).

### State

#### Air Toxic Control Measure

In 2004, CARB initially approved an air toxic control measure (ATCM) to implement idling restrictions of diesel-fueled commercial motor vehicles operating in California (13 CCR, Section 2485) (CARB 2005). The ATCM applies to diesel-fueled commercial vehicles with a gross vehicle rating greater than 10,000 pounds. The ATCM would limit idling times of these vehicle’s primary engine to no more than 5 minutes. Although the ATCM’s intent was to reduce DPM, this measure would also reduce fuel consumption.



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### Local

Strategies for increasing energy efficiency and reducing energy and resource consumption are consistent with strategies for reducing GHG emissions and can be found in the Air Quality and Greenhouse Gas Assessment.



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## 3.0 METHODOLOGY AND IMPACT ANALYSIS

### 3.1.1 Methodology

The energy consuming sources are consistent with the air quality and GHG analyses for the Project. Similar to the air quality and GHG analyses, the proposed Project's impacts would be evaluated based on the net increase in energy consumption equivalent to Project emissions subtracting existing emissions. Operations of the Project would mainly consume transportation fuels from offroad equipment, employee trips and waste hauling truck trips traveling to and from the Project site, and use of a waste shredder. Additional amounts of electricity would be consumed due to the facility extending its operating schedule from six days per week to seven days per week. Energy consumption from offroad equipment, mobile sources, and the waste shredder were based on project-specific operating data and fuel consumption factors for the respective sources. Electricity consumption for the Project was estimated using the California Emissions Estimator Model (CalEEMod), Version 2016.3.2. Electricity consumption was based on the size of the existing building square footage and characterizing the land use as "Unrefrigerated Warehouse with No Rail". Detailed energy calculations are found in Appendix A.

### Significance Criteria

Based upon criteria presented in Appendix G of the CEQA, a project would have a significant impact if it would:

- Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation;

Conflict with or obstruct a state or local energy plan for renewable energy or energy efficiency.

### 3.1.2 Environmental Impacts

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#### **Impact Energy-1: Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?**

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Operational energy consumption would occur as result of the building's electricity needs and the use of transportation fuels. Diesel fuel would be consumed by offroad equipment, waste hauling trucks and the waste shredder and gasoline would be consumed by employee trips. Electricity would be consumed by the existing industrial building. This analysis estimates the maximum increase in operational energy consumption to evaluate the Project's associated impacts on energy resources. Table 2 and Table 3 show the energy consumption for the Project and compares it to the local energy supplies.



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**Table 2: Project Annual Electricity Consumption**

Scenario	Electricity Consumption (GWh)
Project	177
Existing	151
Net Consumption	26
2018 PG&E Retail Sales	48,832
Percentage of PG&E Sales	0.05
Source: PG&E 2019	

**Table 3: Project Annual Transportation Fuel Consumption**

Source	Fuel Consumption (gallons)	
	Diesel	Gasoline
Offroad Equipment	66,774	--
Inbound Trucks	815,980	--
Outbound Trucks	179,317	--
Staff	--	7,395
Waste Shredder	132,278	--
<b>Total Consumption</b>	<b>1,194,350</b>	<b>7,395</b>
Existing Consumption	964,547	4,425
<b>Net Increase in Consumption</b>	<b>229,803</b>	<b>2,970</b>
2018 Fuel Data for Santa Clara County <sup>1</sup>	100,000,000	643,000,000
Percentage of County	0.23	0.0005
1. Diesel is adjusted to account for retail (48 percent) and non-retail (52 percent) diesel sales. Source: CEC 2020		

As shown in Table 2 and Table 3, the Project would consume a fraction of a percent of the available electricity and transportation fuel supplies and would not represent a substantial fraction of the available energy supplies. The Project would comply with the state’s anti-idling regulation which would result in a more efficient use of diesel fuel consumption. Based on this the Project would not result in wasteful, inefficient, or unnecessary consumption of energy sources, therefore, impacts would be less than significant.



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### **Impact Energy-2: Conflict with or obstruct a state or local energy plan for renewable energy or energy efficiency?**

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The Project is a recycling facility and is increasing its daily capacity and operating schedule which would result in an increase in the amount of waste handled and recycled. The Project would directly support the City's efforts for diverting waste from landfills and reducing consumption of natural resources. By increasing its capacity, the Project would reduce energy consumption associated with the production of raw materials. It would also comply with CARB's ATCM and reduce fuel consumption during idling events. The Project would not conflict with or obstruct a state or local energy plan for renewable energy or energy efficiency; therefore, impacts would be less than significant.



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## 4.0 REFERENCES

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- California Energy Commission (CEC). 2020. California Annual Retail Fuel Outlet Report Results (CEC-A15), 2018. Available at: [https://ww2.energy.ca.gov/almanac/transportation\\_data/gasoline/piira\\_retail\\_survey.html](https://ww2.energy.ca.gov/almanac/transportation_data/gasoline/piira_retail_survey.html). Accessed May 29, 2020.
- \_\_\_\_\_. 2016. 2016-2017 Investment Plan Updated for the Alternative and Renewable Fuel and Vehicle Technology Program, May 2016. Available at: <https://ww2.energy.ca.gov/2015publications/CEC-600-2015-014/CEC-600-2015-014-CMF.pdf>. Accessed on May 12, 2020.
- \_\_\_\_\_. 2007. State Alternative Fuels Plan, Commission Report, December 2007. Available at: <https://ww2.energy.ca.gov/2007publications/CEC-600-2007-011/CEC-600-2007-011-CMF.PDF>. Accessed on May 29, 2020.
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- Pacific Gas & Electric (PG&E). 2019. Corporate Responsibility and Sustainability Report, 2019. Available at: [http://www.pgecorp.com/corp\\_responsibility/reports/2019/assets/PGE\\_CRSR\\_2019.pdf](http://www.pgecorp.com/corp_responsibility/reports/2019/assets/PGE_CRSR_2019.pdf). Accessed on: June 22, 2020.
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- United States Environmental Protection Agency (EPA). 2016. Federal Register/Vol. 81, No. 206/Tuesday, Greenhouse Gas Emissions and Fuel Efficiency Standards for Medium- and Heavy-Duty Engines and Vehicles—Phase 2, October 25, 2016. Available at: <https://www.govinfo.gov/content/pkg/FR-2016-10-25/pdf/2016-21203.pdf>. Accessed on May 12, 2020.
- \_\_\_\_\_. 2011. Fact Sheet: EPA and NHTSA Adopt First-Ever Program to Reduce Greenhouse Gas Emissions and Improve Fuel Efficiency of Medium- and Heavy-Duty Vehicles, August 2011. Available at: <https://nepis.epa.gov/Exe/ZyPDF.cgi/P100BOT1.PDF?Dockey=P100BOT1.PDF>. Accessed on May 12, 2020.



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**LEO RECYCLING ENERGY ASSESSMENT**

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**Appendix A ENERGY USE ESTIMATES**



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**Existing Fuel Consumption Summary**

<b>Source Category</b>	<b>Fuel Consumption (gal)</b>	
	<b>Diesel</b>	<b>Gasoline</b>
Offroad Equipment	57,078.16	
Inbound Trucks	655,866.78	
Outbound Trucks	138,531.27	
Staff		4,424.92
Shredder	113,070.49	
<b>Total Fuel Consumption</b>	<b>964,546.70</b>	<b>4,424.92</b>

**Existing Electricity**

<b>kWh/year (7 days/week)</b>	<b>kWh/day</b>	<b>Days/year</b>	<b>Existing kWh/year (6 days/week)</b>	<b>Existing GWh/year (6 days/week)</b>
176500	483.56	312	150871.23	150.87

**Off-Road Equipment**

Fuel Consumption: Equipment ≤ 100HP	Value
Brake Specific Fuel Consumption Factor (lb/hp-hr) <sup>1</sup>	0.408
Fuel Density (lb/gal) <sup>1</sup>	7.11
Consumption Factor (gal/hp-hr)	0.0574
Total HP-HR <100	89,669
<b>Total Diesel Fuel (gal)</b>	<b>5,146</b>

Fuel Consumption: Equipment > 100HP	Value
Brake Specific Fuel Consumption Factor (lb/hp-hr) <sup>1</sup>	0.367
Fuel Density (lb/gal) <sup>1</sup>	7.11
Consumption Factor (gal/hp-hr)	0.0516
Total HP-HR >100	1,005,950
<b>Total Diesel Fuel (gal)</b>	<b>51,932</b>

**Total diesel gallons (off-road equipment): 57,078**

	Equipment	# of Equipment	Hours/Day	HP	Load Factor	Days	Total HP-HR
Onsite Equipment	Excavators	1	6	115	0.38	312	81,806
Onsite Equipment	Excavators	1	6	175	0.38	312	124,488
Onsite Equipment	Excavators	1	6	95	0.38	312	67,579
Onsite Equipment	Excavators	1	6	175	0.38	312	124,488
Onsite Equipment	Rubber Tired Loaders	1	6	175	0.36	312	117,936
Onsite Equipment	Rubber Tired Loaders	1	6	175	0.36	312	117,936
Onsite Equipment	Rubber Tired Loaders	1	6	130	0.36	312	87,610
Onsite Equipment	Rubber Tired Loaders	1	6	130	0.36	312	87,610
Onsite Equipment	Sweepers/Scrubbers	1	8	230	0.46	312	264,077
Onsite Equipment	Forklifts	1	6	59	0.2	312	22,090
<b>Total &gt;100HP</b>							<b>1,005,950</b>
<b>Total &lt;100HP</b>							<b>89,669</b>

Notes:

- 1. CARB, 2017 Off-road Diesel Emission Factors  
[https://ww3.arb.ca.gov/msei/ordiesel/ordas\\_ef\\_fcf\\_2017\\_v7.xlsx](https://ww3.arb.ca.gov/msei/ordiesel/ordas_ef_fcf_2017_v7.xlsx)

**Inbound Trucks**

<b>Onroad Travel Consumption</b>		<b>Value</b>
EMFAC2017 Diesel Fuel Consumption Factor (gal/mi): <sup>1</sup>		0.1355
Total VMT (mi):		4,817,280
<b>Total diesel gallons</b>		<b>652,832</b>
<b>Idling Consumption</b>		<b>Value</b>
Idling Fuel Consumption Factor (gal/hr): <sup>2</sup>		0.8400
Total Idle-Hours per Year:		10,036
<b>Total diesel gallons</b>		<b>3,035</b>

**Total diesel gallons: 655,867**

<b>Inbound Trucks</b>	<b>Days/year</b>	<b>Truck Trips per day</b>	<b>Trip Length (miles)</b>	<b>Vehicle Category</b>	<b>VMT</b>	<b>Idle Hours</b>
HHDT	312	462	20	462	2,882,880	12,012
MHDT	312	232	20	232	1,447,680	6,032
LHDT	312	78	20	78	486,720	2,028
<b>Total VMT:</b>					<b>4,817,280</b>	
<b>Total Idle-Hours<sup>3</sup>:</b>						<b>10,036</b>

1. CARB, EMFAC2017 Bay Area AQMD; Annual; CY 2020; Aggregate MY; Aggregate Speed,DSL)

2. Department of Energy, Fact #861, 2015 Idle Fuel Consumption for Selected Gasoline and Diesel Vehicles, February 23, 2015.

<https://www.energy.gov/eere/vehicles/fact-861-february-23-2015-idle-fuel-consumption-selected-gasoline-and-diesel-vehicles>

3 Assumes 1 idling event onsite

**Outbound Trucks**

Onroad Travel Consumption	Value
EMFAC2017 Diesel Fuel Consumption Factor (gal/mi): <sup>1</sup>	0.1617
Total VMT (mi):	855,067
<b>Total diesel gallons</b>	<b>138,272</b>
Idling Consumption	Value
Idling Fuel Consumption Factor (gal/hr): <sup>2</sup>	0.8400
Total Idle-Hours per Year:	858
<b>Total diesel gallons</b>	<b>259</b>

**Total diesel gallons: 138,531**

OUTBOUND TRUCKS	Days/year	Truck Trips per day	Trip Length (miles)	Vehicle Category	VMT	Idle Hours
Shredded wood and GW	312	20	64.55	HHDT	402,792	520
Residuals	312	8	69	HHDT	172,224	208
Recyclables	312	24	0.95	HHDT	7,114	624
Inerts	312	8	54.6	HHDT	136,282	208
ADC	312	6	73	HHDT	136,656	156

**Total VMT: 855,067**  
**Total Idle-Hours<sup>3</sup>: 858**

1. CARB, EMFAC2017 Bay Area AQMD; Annual; CY 2020; Aggregate MY; Aggregate Speed,DSL)
2. Department of Energy, Fact #861, 2015 Idle Fuel Consumption for Selected Gasoline and Diesel Vehicles, February 23, 2015.  
<https://www.energy.gov/eere/vehicles/fact-861-february-23-2015-idle-fuel-consumption-selected-gasoline-and-diesel-vehicles>
- 3 Assumes 1 idling event onsite

**Staff**

<b>Onroad Travel Consumption</b>	<b>Value</b>
EMFAC2017 Diesel Fuel Consumption Factor (gal/mi): <sup>1</sup>	0.0355
Total VMT (mi):	124,488
<b>Total gasoline gallons</b>	<b>4,425</b>

<b>STAFF Trips</b>	<b>Days/year</b>	<b>Vehicle Trips per day</b>	<b>Trip Length (miles)</b>	<b>Vehicle Category</b>	<b>VMT</b>
LD Fleet Mix (LDA, LDT1, LDT2)	312	42	9.5	LD Fleet Mix	124,488
				<b>Total VMT:</b>	<b>124,488</b>

1. CARB, EMFAC2017 Bay Area AQMD; LDA,LDT1,LDT2;Annual; CY 2020; Aggregate MY; Aggregate Speed,GAS)
2. Department of Energy, Fact #861, 2015 Idle Fuel Consumption for Selected Gasoline and Diesel Vehicles, February 23, 2015.  
<https://www.energy.gov/eere/vehicles/fact-861-february-23-2015-idle-fuel-consumption-selected-gasoline-and-diesel-vehicles>

**Shredder**

Fuel Consumption: Equipment ≤ 100HP	Value
Brake Specific Fuel Consumption Factor (lb/hp-hr) <sup>1</sup>	0.408
Fuel Density (lb/gal) <sup>1</sup>	7.11
Consumption Factor (gal/hp-hr)	0.0574
Total HP-HR <100	-
<b>Total Diesel Fuel (gal)</b>	<b>-</b>

Fuel Consumption: Equipment > 100HP	Value
Brake Specific Fuel Consumption Factor (lb/hp-hr) <sup>1</sup>	0.367
Fuel Density (lb/gal) <sup>1</sup>	7.11
Consumption Factor (gal/hp-hr)	0.0516
Total HP-HR >100	2,190,240
<b>Total Diesel Fuel (gal)</b>	<b>113,070</b>

**Total diesel gallons (off-road equipment): 113,070**

Equipment	# of Equipment	Hours/Day	HP	Load Factor <sup>2</sup>	Days	Total HP-HR	
Crambo 6000	Shredding Equipment	1	15	600	0.78	312	2,190,240
						<b>Total &gt;100HP</b>	2,190,240
						<b>Total &lt;100HP</b>	0

Notes:

1. CARB, 2017 Off-road Diesel Emission Factors

[https://ww3.arb.ca.gov/msei/ordiesel/ordas\\_ef\\_fcf\\_2017\\_v7.xlsx](https://ww3.arb.ca.gov/msei/ordiesel/ordas_ef_fcf_2017_v7.xlsx)

2. Load factor based on Crushing/Processing Equipment from CalEEMod.

**PROJECT Fuel Consumption Summary**

Source Category	Fuel Consumption (gal)	
	Diesel	Gasoline
Offroad Equipment	66,774	
Inbound Trucks	815,980	
Outbound Trucks	179,317	
Staff		7,395
Waste Shredder	132,278	
<b>Total Fuel Consumption</b>	<b>1,194,350</b>	<b>7,395</b>

**EXISTING Fuel Consumption Summary**

Source Category	Fuel Consumption (gal)	
	Diesel	Gasoline
Offroad Equipment	57,078	0
Inbound Trucks	655,867	0
Outbound Trucks	138,531	0
Staff	0	4,425
Waste Shredder	113,070	0
<b>Total Fuel Consumption</b>	<b>964,547</b>	<b>4,425</b>

**NET Fuel Consumption Summary**

Source Category	Fuel Consumption (gal)	
	Diesel	Gasoline
Offroad Equipment	9,696	0
Inbound Trucks	160,114	0
Outbound Trucks	40,786	0
Staff	0	2,970
Waste Shredder	19,207	0
<b>Total Fuel Consumption</b>	<b>229,803</b>	<b>2,970</b>

**Santa Clara County Fuel Consumption (2018) <sup>1</sup>**

Source	Fuel Type	Gallons (Retail + Non-Retail)	Percent of Project Compared to County
LD Fleet (Staff)	Gas	643,000,000	0.0005%
Off-Road/Trucks/Shredder	Diesel	100,000,000	0.230%

Notes:

- California Energy Commission, California Annual Retail Fuel Outlet Report Results (CEC-A15), 2018  
[https://ww2.energy.ca.gov/almanac/transportation\\_data/gasoline/piira\\_retail\\_survey.html](https://ww2.energy.ca.gov/almanac/transportation_data/gasoline/piira_retail_survey.html)  
[https://ww2.energy.ca.gov/almanac/transportation\\_data/gasoline/2010-2018\\_A15\\_Results\\_ada.xls](https://ww2.energy.ca.gov/almanac/transportation_data/gasoline/2010-2018_A15_Results_ada.xls)  
 Accessed May 2020. Diesel is adjusted to account for retail (48%) and non-retail (52%) diesel sales



**Electricity Consumption**

<b>Scenario</b>	<b>kWh/year</b>	<b>GWh/year</b>
PROJECT (7 days/week)	176,500	0.1765
EXSISTING (6 days/week)	150,871	0.0002
NET	25,629	0.1763
<b>PG&amp;E 2018 Retail Electricity Sale<sup>1</sup></b>		48,832
% of PG&E		0.0004%

Notes:

- 1. 2019 PG&E Corporate Responsibility and Sustainability Report

**Off-Road Equipment**

<b>Fuel Consumption: Equipment ≤ 100HP</b>	<b>Value</b>
Brake Specific Fuel Consumption Factor (lb/hp-hr) <sup>1</sup>	0.408
Fuel Density (lb/gal) <sup>1</sup>	7.11
Consumption Factor (gal/hp-hr)	0.0574
Total HP-HR <100	104,901
<b>Total Diesel Fuel (gal)</b>	<b>6,020</b>

<b>Fuel Consumption: Equipment &gt; 100HP</b>	<b>Value</b>
Brake Specific Fuel Consumption Factor (lb/hp-hr) <sup>1</sup>	0.367
Fuel Density (lb/gal) <sup>1</sup>	7.11
Consumption Factor (gal/hp-hr)	0.0516
Total HP-HR >100	1,176,833
<b>Total Diesel Fuel (gal)</b>	<b>60,754</b>

**Total diesel gallons (off-road equipment): 66,774**

	<b>Equipment</b>	<b># of Equipment</b>	<b>Hours/Day</b>	<b>HP</b>	<b>Load Factor</b>	<b>Days</b>	<b>Total HP-HR</b>
Onsite Equipment	Excavators	1	6	115	0.38	365	95,703
Onsite Equipment	Excavators	1	6	175	0.38	365	145,635
Onsite Equipment	Excavators	1	6	95	0.38	365	79,059
Onsite Equipment	Excavators	1	6	175	0.38	365	145,635
Onsite Equipment	Rubber Tired Loaders	1	6	175	0.36	365	137,970
Onsite Equipment	Rubber Tired Loaders	1	6	175	0.36	365	137,970
Onsite Equipment	Rubber Tired Loaders	1	6	130	0.36	365	102,492
Onsite Equipment	Rubber Tired Loaders	1	6	130	0.36	365	102,492
Onsite Equipment	Sweepers/Scrubbers	1	8	230	0.46	365	308,936
Onsite Equipment	Forklifts	1	6	59	0.2	365	25,842
						<b>Total &gt;100HP</b>	<b>1,176,833</b>
						<b>Total &lt;100HP</b>	<b>104,901</b>

Notes:

1. CARB, 2017 Off-road Diesel Emission Factors

[https://ww3.arb.ca.gov/msei/ordiesel/ordas\\_ef\\_fcf\\_2017\\_v7.xlsx](https://ww3.arb.ca.gov/msei/ordiesel/ordas_ef_fcf_2017_v7.xlsx)

**Inbound Trucks**

<b>Onroad Travel Consumption</b>	<b>Value</b>
EMFAC2017 Diesel Fuel Consumption Factor (gal/mi): <sup>1</sup>	0.1355
Total VMT (mi):	5,993,300
<b>Total diesel gallons</b>	<b>812,205</b>
<b>Idling Consumption</b>	<b>Value</b>
Idling Fuel Consumption Factor (gal/hr): <sup>2</sup>	0.8400
Total Idle-Hours per Year:	12,486
<b>Total diesel gallons</b>	<b>3,776</b>

**Total diesel gallons: 815,980**

<b>Inbound Trucks</b>	<b>Days/year</b>	<b>Truck Trips per day</b>	<b>Trip Length (miles)</b>	<b>Vehicle Category</b>	<b>VMT</b>	<b>Idle Hours</b>
HHDT	365	491	20.00	HHDT	3,584,300	14,935
MHDT	365	247	20	MHDT	1,803,100	7,513
LHDT	365	83	20	LHDT2	605,900	2,525
<b>Total VMT:</b>					<b>5,993,300</b>	
<b>Total Idle-Hours:</b>						<b>12,486</b>

1. CARB, EMFAC2017 (Lassen APCD; HHDT; Annual; CY 2020; Aggregate MY; Aggregate Speed,DSL)
2. Department of Energy, Fact #861, 2015 Idle Fuel Consumption for Selected Gasoline and Diesel Vehicles, February 23, 2015.  
<https://www.energy.gov/eere/vehicles/fact-861-february-23-2015-idle-fuel-consumption-selected-gasoline-and-diesel-vehicles>

**Outbound Trucks**

<b>Onroad Travel Consumption</b>	<b>Value</b>
EMFAC2017 Diesel Fuel Consumption Factor (gal/mi): <sup>1</sup>	0.1617
Total VMT (mi):	1,106,899
<b>Total diesel gallons</b>	<b>178,995</b>
<b>Idling Consumption</b>	<b>Value</b>
Idling Fuel Consumption Factor (gal/hr): <sup>2</sup>	0.8400
Total Idle-Hours per Year:	1,065
<b>Total diesel gallons</b>	<b>322</b>

**Total diesel gallons: 179,317**

<b>OUTBOUND TRUCKS</b>	<b>Days/year</b>	<b>Truck Trips per day</b>	<b>Trip Length (miles)</b>	<b>Vehicle Category</b>	<b>VMT</b>	<b>Idle Hours</b>
Shredded wood and GW	365	20	64.55	HHDT	471,215	608
Residuals	365	8	69	HHDT	201,480	243
Recyclables	365	24	0.95	HHDT	8,322	730
Inerts	365	8	54.6	HHDT	159,432	243
ADC	365	6	73	HHDT	159,870	183
Add'l Trucks from Expansion1	365	4	73	HHDT	106,580	122
<b>Total VMT:</b>					<b>1,106,899</b>	
<b>Total Idle-Hours:</b>						<b>1,065</b>

1. CARB, EMFAC2017 (Lassen APCD; HHDT; Annual; CY 2020; Aggregate MY; Aggregate Speed,DSL)
2. Department of Energy, Fact #861, 2015 Idle Fuel Consumption for Selected Gasoline and Diesel Vehicles, February 23, 2015.  
<https://www.energy.gov/eere/vehicles/fact-861-february-23-2015-idle-fuel-consumption-selected-gasoline-and-diesel-vehicles>

**Staff**

<b>Onroad Travel Consumption</b>	<b>Value</b>
EMFAC2017 Diesel Fuel Consumption Factor (gal/mi): <sup>1</sup>	0.0355
Total VMT (mi):	208,050
<b>Total gasoline gallons</b>	<b>7,395</b>

<b>STAFF Trips</b>	<b>Days/year</b>	<b>Vehicle Trips per day</b>	<b>Trip Length (miles)</b>	<b>Vehicle Category</b>	<b>VMT</b>
LD Fleet Mix (LDA, LDT1, LDT2)	365	60	9.5	LD Fleet Mix	208,050
<b>Total VMT:</b>					<b>208,050</b>

1. CARB, EMFAC2017 (Lassen APCD; HHDT; Annual; CY 2020; Aggregate MY; Aggregate Speed,DSL)
2. Department of Energy, Fact #861, 2015 Idle Fuel Consumption for Selected Gasoline and Diesel Vehicles, February 23, 2015.  
<https://www.energy.gov/eere/vehicles/fact-861-february-23-2015-idle-fuel-consumption-selected-gasoline-and-diesel-vehicles>

**Shredder**

Fuel Consumption: Equipment ≤ 100HP	Value
Brake Specific Fuel Consumption Factor (lb/hp-hr) <sup>1</sup>	0.408
Fuel Density (lb/gal) <sup>1</sup>	7.11
Consumption Factor (gal/hp-hr)	0.0574
Total HP-HR <100	-
<b>Total Diesel Fuel (gal)</b>	<b>-</b>

Fuel Consumption: Equipment > 100HP	Value
Brake Specific Fuel Consumption Factor (lb/hp-hr) <sup>1</sup>	0.367
Fuel Density (lb/gal) <sup>1</sup>	7.11
Consumption Factor (gal/hp-hr)	0.0516
Total HP-HR >100	2,562,300
<b>Total Diesel Fuel (gal)</b>	<b>132,278</b>

**Total diesel gallons (off-road equipment): 132,278**

Equipment	# of Equipment	Hours/Day	HP	Load Factor <sup>2</sup>	Days	Total HP-HR	
Crambo 6000	Shredding Equipment	1	15	600	0.78	365	2,562,300
						<b>Total &gt;100HP</b>	2,562,300
						<b>Total &lt;100HP</b>	0

Notes:

- CARB, 2017 Off-road Diesel Emission Factors  
[https://ww3.arb.ca.gov/msei/ordiesel/ordas\\_ef\\_fcf\\_2017\\_v7.xlsx](https://ww3.arb.ca.gov/msei/ordiesel/ordas_ef_fcf_2017_v7.xlsx)
- Load factor based on Crushing/Processing Equipment from CalEEMod.