Hi-Desert Water District Phase II and III Sewer Collection System

ENERGY ANALYSIS

HI-DESERT WATER DISTRICT

Town of Yucca Valley, San Bernardino County

PREPARED BY:

Haseeb Qureshi
hqureshi@urbanxroads.com
(949) 336-5987

Alyssa Tamase
atamase@urbanxroads.com
(949) 336-5988

Shawn Archbold
sarchbold@urbanxroads.com

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LIST OF ABBREVIATED TERMS

(1)	Reference
AQIA	Air Quality Impact Analysis
ARB	Air Resources Board
BACM	Best Available Control Measures
CalEEMod	California Emissions Estimator Model
CARB	California Air Resources Board
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CPUC	California Public Utilities Commission
DMV	Department of Motor Vehicles
EIA	Energy Information Administration
EIR	Environmental Impact Report
EMFAC	Emissions Factor
EVs	Electric Vehicles
FERC	Federal Energy Regulatory Commission
GPA	General Plan Amendment
GS-1	General Service Rate Schedule
GWh	Gigawatt Hour
HHD	Heavy-Heavy Duty
HP-HR/GAL	Horsepower-Hour Per Gallon
IEPR	Integrative Energy Policy Report
ISO	Independent Service Operator
ISTEA	Intermodal Surface Transportation Efficiency Act
ITE	Institute of Transportation Engineers
kWh	Kilowatt Hour
LDA	Light Duty Autos
MPG	Miles Per Gallon
MPO	Metropolitan Planning Organization
PG&E	Pacific Gas and Electric
PROJECT	Hi-Desert Water District Phase II and III Sewer Collection System
SCE	Southern California Edison
SDG&E	San Diego Gas and Electric
SF	Square Feet
SoCalGas	Southern California Gas
SP	Specific Plan

TEA-21	Transportation Equity Act for the 21st Century
VMT	Vehicle Miles Traveled

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EXECUTIVE SUMMARY

ES.1 SUMMARY OF FINDINGS

The results of this *Hi-Desert Water District Phase II and III Sewer Collection System Energy Analysis* is summarized below based on the significance criteria in Section 3 of this report consistent with Appendix G of the California Environmental Quality Act (CEQA) Guidelines (1). Table ES-1 shows the findings of significance for potential energy impacts under CEQA.

TABLE ES-1: SUMMARY OF CEQA SIGNIFICANCE FINDINGS

Analysis	Report Section	Significance Findings	
		Unmitigated	Mitigated
Energy Impact #1: Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation.	5.0	*Less Than Significant*	*n/a*
Energy Impact #2: Conflict with or obstruct a state or local plan for renewable energy or energy efficiency.	5.0	*Less Than Significant*	*n/a*

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1 INTRODUCTION

This report presents the results of the energy analysis prepared by Urban Crossroads, Inc., for the proposed Hi-Desert Water District Phase II and III Sewer Collection System (Project). The purpose of this report is to ensure that energy implication is considered by the Hi-Desert Water District, as the lead agency, and to quantify anticipated energy usage associated with construction of the proposed Project, determine if the usage amounts are efficient, typical, or wasteful for the land use type, and to emphasize avoiding or reducing inefficient, wasteful, and unnecessary consumption of energy.

1.1 SITE LOCATION

The Phase II and Phase III proposed sewer pipeline alignments generally occur north and south of the main Yucca Valley community in the following areas:

Section 1 – North and South of SR-62, Vicinity of Blue Skies Country Club. This Project Area contains three main areas. Areas 1 and 2 are north of SR-62 and Area 3 is south of Area 1, south of SR-62. Areas 1 and 2 are generally bounded by SR-62 on the south, the Blue Skies Country Club on the east, Country Club Drive (northeast), and by Ridge Road (westernmost boundary). Within Areas 1 and 2, an east-west ephemeral wash, approximately 85 feet wide, traverses this section, beginning near the golf course, and ends on the desert floor north of the second residential community. A portion of the planned Project alignment requires a new line to traverse behind homes east of Camino Del Cielo Trail adjacent to the country club grounds, across the wash, and connecting to Martinez Trail, south of the country club grounds.

- Area 1 – This moderately dense residential community is generally bounded by Rockaway Avenue on the west, the country club grounds on the east, Country Club Road on the north. The terrain is relatively flat with newer paved roads. Main arterials include the north-south Pinon Road and Camino Del Cielo Trail.
- Area 2 – a residential community located approximately 0.25-mile northwest of Area 1, connected to Area 1 by Pinon Road which turns westerly as it exits the Area 1 area. Area 2 is generally bounded by Ridge Road on the west and Canyon Drive on the east and north. The terrain slopes northwest from Ridge Road, increasing in elevation along Pinon Road.
- Area 3 – south of SR-62. This area is connected by Pinon Drive and is located south of SR-62. It is generally bordered by Pinon Drive on the east, Chaparral Drive on the west, and the ends of two paved streets south of Navajo Drive on the south. Residences in this area are generally clustered near the four main roadways.

Section 2 – Sunnyslope Road Area, between Pioneertown Road and Apache Trail. This Project section comprises mostly of Sunnyslope Drive, between Pioneertown Road on the west and Apache Trail on the east. A portion of the line is also planned for the northern portion of Apache Trail, north to Crestview Drive. The area is primarily sparsely populated by residential use. Most of Sunnyslope Drive is paved, except for near the connecting points at Pioneertown Road and Apache Trail. The segment of Apache Trail between Sunnyslope and Crestview Drive is a dirt road.

Section 3 – Between Hwy 247 and Grand Avenue. This Project section consists primarily of two residential communities accessed by Sunnyslope Drive (an east-west street). The first area consists only of a few residences north of Sunnyslope Road in the vicinity Grand Avenue (a north-south street). The second area is approximately 0.25 mile to the east, generally bounded by Sage Avenue to the west, Sunnyslope Drive to the south, Crestview Drive on the north and SR-247 on the east. Several north-south streets north of Crestview Drive include but are not limited to Barberry Avenue, Dumosa Avenue and Joshua Lane. The Project section generally contains non-paved roadways, except for Sunnyslope Drive.

Section 4 – SR-247 between Crestview Drive (south) and Buena Suerte Road (north). This approximate 0.84-mile section of Hwy 247 is the north-south connector within the Yucca Valley region and connects SR-62 with Interstate 15. The road is owned and operated by Caltrans.

Section 5 – Hillside Community North of Yucca Valley. This Project section is dominated by scattered residences built within hills and rock outcroppings, bisected by SR-247, with main arterials including Farrelo Road and Bueno Suerte Road. West of SR-247, this area includes Castro Road on the south, the northern portion of Panchita Road on the west, and approximately to Cobalt Road on the north. Roads in this community are generally paved. East of SR-247, the Project area generally includes the paved roads of Bueno Suerte Road on the south, Bandera Road on the east, and Concho Way on the north.

Section 6 – Warren Way and Paxton Road. This smaller Project section captures scattered residences along an approximately 0.25-mile segment of Paxton Road, a paved road, and north of Warren Way, a non-paved road. This section lies approximately 0.25-mile northeast of the Yucca Valley airport, and an ephemeral wash exists on the eastern terminus of this segment. The terrain is relatively flat.

Section 7 – Nelson Avenue Area. This section consists of a rural residential community with primarily unpaved roads. It is generally bordered by Nelson Avenue on the south, Yucca Mesa Road (paved), on the east, Carmelita Avenue on the west, and the vicinity of Linda Lee Drive and Hide Lane on the north. Conceptual Project plans identify that this community will be connected to the system by Yucca Mesa Road, south to Barron Drive. An ephemeral wash, approximately 160 feet wide, exists under Yucca Mesa Road, between approximately Nelson Avenue and Barron Drive.

Section 8 – Southeast of San Andreas Road. This section is within the southernmost Project area. It is generally bordered by San Andreas Road on the north, Carmelita Circle on the south, Black Rock Canyon Road and Joshua Lane on the west, and Carmelita Circle and Hermosa Avenue on the east. The terrain is relative flat, and the area has many Joshua trees. The area is moderately populated with existing residences. All of the roads are paved, except for short segments along San Marino Drive and Santa Barbara Drive west of Joshua Lane.

Section 9 – North and West of San Andreas Road and Palomar Road. This Project area is generally bounded by San Andres Road on the south, Paloma Avenue on the east, Warren Vista Avenue and Kaiulni Road on the west, and Joshua Drive on the north. This section would be connected to the wastewater system by a segment to be installed in Palomar Avenue between approximately Onaga Trail on the north and Joshua Drive on the south. This community has a higher density of residences than the other Project areas and mostly paved roads; however, Kaiulni Road is unpaved, and few residences exist along Palomar Avenue.

Section 10 – South of Onaga Trail. This Section contains four main areas:

- Area 1 contains a mobile home park and scattered, larger homes, one with recreational uses, such as tennis courts. This area is bounded on the north by Mountain View Trail, on the east by Valley Vista Avenue, on the south by the end of Valley Vista Avenue, and on the west by Elata Avenue. This area has paved roads, although the pavement is in poor condition.
- Area 2 – a densely populated, newer subdivision near the Joshua Springs Calvary Chapel. The northern boundary is approximately Joshua Lane and Golden Bee Drive, western boundary is approximately Seeleta Avenue, the southern boundary is approximately San Andreas Avenue (although does not include infrastructure in San Andreas Avenue at this time), and the eastern boundary is approximately Nagels Street to Kingston Avenue. All areas except for the segment along Nagels Avenue are newer, paved roads.
- Area 3 - densely populated, located northwesterly of Area 2, and is connected to Area 2 by Joshua Lane, a north-south paved road. It is generally bounded on the north by Onaga Trail, generally on the west by Church Street and a western portion of Joshua Lane, and on the south by Kismet Road. This area includes Joshua Lane, from Onaga Trail on the north, to Golden Bee Drive in Area 2.
- Area 4 – moderately populated area, west of Area 3, with few paved roads. It is bordered generally by Mountain View Trail on the north, Acoma Trail on the east, Golden Bee Drive on the south (not connected to Area 2), and Jemeza Trail on the west. This area will be connected to the system by Kickapoo Trail (a partially paved north-south street), between Santa Fe Trail on the north to Mountain View Trail on the south.

1.2 PROJECT DESCRIPTION

In general, the Project includes construction of 64 miles of wastewater pipeline, and 1,300 manholes and 3 lift stations. Due to the fact these areas are generally outside of the main, contiguous community of Yucca Valley, construction within these areas would likely occur in smaller increments, over 15 years, to allow for time to design for terrain differences and lift stations that would be needed to connect these outer areas to the main system.

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2 EXISTING CONDITIONS

This section provides an overview of the existing energy conditions in the Project area and region.

2.1 OVERVIEW

The most recent data for California's estimated annual energy use is from 2017, released by the EIA's California State Profile and Energy Estimates in 2019 and included:

- Approximately 7,881 trillion British Thermal Unit (BTU) of energy was consumed; (2);
- Approximately 2,115 billion cubic feet of natural gas (2)

The California Energy Commission's Transportation Energy Demand Forecast 2018-2030 was released in order to support the 2017 Integrated Energy Policy Report. The Transportation energy Demand Forecast 2018-2030 lays out graphs and data supporting their projections of California's future transportation energy demand. The projected inputs consider expected variable changes in fuel prices, income, population, and other variables. Predictions regarding fuel demand are included:

- Gasoline demand in the transportation sector is expected to decline from approximately 15.8 billion gallons in 2017 to between 12.3 billion and 12.7 billion gallons in 2030 (3)
- Diesel demand in the transportation sector is expected to rise, increasing from approximately 3.7 billion diesel gallons in 2015 to approximately 4.7 billion in 2030 (3)
    - Data from the Department of Energy states that approximately 3.9 billion gallons of diesel fuel were consumed in 2017 (4)

The most recent data provided by the United States Energy Information Administration (EIA) for energy use in California by demand sector is from 2017 and is reported as follows:

- Approximately 40.3 percent transportation;
- Approximately 23.1 percent industrial;
- Approximately 18.0 percent residential; and
- Approximately 18.7 percent commercial (5)

In 2018, total system electric generation for California was 285,488 gigawatt hours (GWh). California's massive electricity in-state generation system generated approximately 194,842 GWh which accounted for approximately 68% of the electricity it uses; the rest was imported from the Pacific Northwest (14%) and the U.S. Southwest (18%) (6). Natural gas is the main source for electricity generation at 47% of the total in-state electric generation system power as shown in Table 2-1.

TABLE 2-1: TOTAL ELECTRICITY SYSTEM POWER (CALIFORNIA 2018)

Fuel Type	California In-State Generation (GWh)	Percent of California In-State Generation	Northwest Imports (GWh)	Southwest Imports (GWh)	California Power Mix (GWh)	Percent California Power Mix
Coal	294	0.15%	399	8,740	9,433	3.30%
Large Hydro	22,096	11.34%	7,418	985	30,499	10.68%
Natural Gas	90,691	46.54%	49	8,904	99,644	34.91%
Nuclear	18,268	9.38%	0	7,573	25,841	9.05%
Oil	35	0.02%	0	0	35	0.01%
Other	430	0.22%	0	9	439	0.15%
Renewables	63,028	32.35%	14,074	12,400	89,502	31.36%
Biomass	5,909	3.03%	772	26	6,707	2.35%
Geothermal	11,528	5.92%	171	1,269	12,968	4.54%
Small Hydro	4,248	2.18%	334	1	4,583	1.61%
Solar	27,265	13.99%	174	5,094	32,533	11.40%
Wind	14,078	7.23%	12,623	6,010	32,711	11.46%
Unspecified Sources of Power	N/A	N/A	17,576	12,519	30,095	10.54%
Total	**194,842**	**100%**	**39,517**	**51,130**	**285,488**	**100%**

Source: https://www.energy.ca.gov/almanac/electricity_data/total_system_power.html

An updated summary of, and context for energy consumption and energy demands within the State is presented in "U.S. Energy Information Administration, California State Profile and Energy Estimates, Quick Facts" excerpted below:

- California was the fourth-largest producer of crude oil among the 50 states in 2017, after Texas, North Dakota, and Alaska, and, as of January 2018, third in oil refining capacity after Texas and Louisiana.
- California is the largest consumer of jet fuel among the 50 states and accounted for approximately one-fifth of the nation's jet fuel consumption in 2017. (7)
- California's total energy consumption is second-highest in the nation, but, in 2017, the state's per capita energy consumption ranked 48th, due in part to its mild climate and its energy efficiency programs. (8)
- In 2017, California ranked second in the nation in conventional hydroelectric generation and first as a producer of electricity from solar, geothermal, and biomass resources.
- In 2017, solar PV and solar thermal installations provided about 16% of California's net electricity generation (9).

As indicated above, California is one of the nation's leading energy-producing states, and California per capita energy use is among the nation's most efficient. Given the nature of the proposed Project being industrial uses, the remainder of this discussion will focus on the three sources of energy that are most relevant to the project—namely, electricity, natural gas, and transportation fuel for vehicle trips associated with industrial uses planned for the Project.

2.2 ELECTRICITY

The Southern California region's electricity reliability has been of concern for the past several years due to the planned retirement of aging facilities that depend upon once-through cooling technologies, as well as the June 2013 retirement of the San Onofre Nuclear Generating Station. While the once-through cooling phase-out has been ongoing since the May 2010 adoption of the State Water Resources Control Board's once-through cooling policy, the retirement of San Onofre complicated the situation. California ISO studies had revealed the extent to which the Southern California Air Basin (SCAB) region were vulnerable to low-voltage and post-transient voltage instability concerns. A preliminary plan to address these issues was detailed in the 2013 Integrative Energy Policy Report (2013 IEPR) after a collaborative process with other energy agencies, utilities, and air districts (10). If the resource development outlined in the preliminary plan continues as detailed, reliability in Southern California would likely be assured; however, tight resource margins have led energy agencies and the ARB to develop a contingency plan. This contingency plan was discussed at a public workshop in Los Angeles on August 20, 2014 and is detailed within this Section (11).

Electricity is provided to the Project by Southern California Edison (SCE). SCE provides electric power to more than 15 million persons in 15 counties and in 180 incorporated cities, within a service area encompassing approximately 50,000 square miles. SCE derives electricity from varied energy resources including fossil fuels, hydroelectric generators, nuclear power plants, geothermal power plants, solar power generation, and wind farms. SCE also purchases from independent power producers and utilities, including out-of-state suppliers (12).

California's electricity industry is an organization of traditional utilities, private generating companies, and state agencies, each with a variety of roles and responsibilities to ensure that electrical power is provided to consumers. The California Independent Service Operator (ISO" is a nonprofit public benefit corporation and is the impartial operator of the State's wholesale power grid and is charged with maintaining grid reliability, and to direct uninterrupted electrical energy supplies to California's homes and communities. While utilities (such as SCE) still own transmission assets, the ISO routes electrical power along these assets, maximizing the use of the transmission system and its power generation resources. The ISO matches buyers and sellers of electricity to ensure that sufficient power is available to meet demand. To these ends, every five minutes the ISO forecasts electrical demands, accounts for operating reserves, and assigns the lowest cost power plant unit to meet demands while ensuring adequate system transmission capacities and capabilities (13).

Part of the ISO's charge is to plan and coordinate grid enhancements to ensure that electrical power is provided to California consumers. To this end, transmission owners (investor-owned utilities such as SCE) file annual transmission expansion/modification plans to accommodate the State's growing electrical needs. The ISO reviews and either approves or denies the proposed additions. In addition, and perhaps most importantly, the ISO works with other areas in the western United States electrical grid to ensure that adequate power supplies are available to the

State. In this manner, continuing reliable and affordable electrical power is assured to existing and new consumers throughout the State.

Table 2-2 identifies SCE's specific proportional shares of electricity sources in 2018. As indicated in Table 2-2, the 2018 SCE Power Mix has renewable energy at 36% of the overall energy resources. Geothermal resources are at 8%, wind power is at 13%, large hydroelectric sources are at 1%, solar energy is at 13%, and coal is at 0%. Biomass and waste sources have increased by 1% since 2017. Natural gas remains at 17% since 2017. (14).

TABLE 2-2: SCE 2018 POWER CONTENT MIX

Energy Resources	2018 SCE Power Mix
Eligible Renewable	**36%**
Biomass & waste	1%
Geothermal	8%
Small Hydroelectric	1%
Solar	13%
Wind	13%
Coal	**0%**
Large Hydroelectric	**4%**
Natural Gas	**17%**
Nuclear	**6%**
Other	**0%**
Unspecified Sources of power*	37%
Total	**100%**

* "Unspecified sources of power" means electricity from transactions that are not traceable to specific generation sources

2.3 NATURAL GAS

The usage associated with natural gas use were calculated using the California Emissions Estimator Model (CalEEMod). The following summary of natural gas resources and service providers, delivery systems, and associated regulation is excerpted from information provided by the California Public Utilities Commission (CPUC).

> *"The CPUC regulates natural gas utility service for approximately 10.8 million customers that receive natural gas from Pacific Gas and Electric (PG&E), Southern California Gas (SoCalGas), San Diego Gas & Electric (SDG&E), Southwest Gas, and several smaller natural gas utilities. The CPUC also regulates independent storage operators: Lodi Gas Storage, Wild Goose Storage, Central Valley Storage and Gill Ranch Storage.*
>
> *The vast majority of California's natural gas customers are residential and small commercial customers, referred to as "core" customers, who accounted for approximately 32% of the natural gas delivered by California utilities in 2012. Large consumers, like electric generators and industrial customers, referred to as "noncore" customers,*

accounted for approximately 68% of the natural gas delivered by California utilities in 2012.

The CPUC regulates the California utilities' natural gas rates and natural gas services, including in-state transportation over the utilities' transmission and distribution pipeline systems, storage, procurement, metering and billing. Most of the natural gas used in California comes from out-of-state natural gas basins. In 2012, California customers received 35% of their natural gas supply from basins located in the Southwest, 16% from Canada, 40% from the Rocky Mountains, and 9% from basins located within California. California gas utilities may soon also begin receiving biogas into their pipeline systems.

Natural gas from out-of-state production basins is delivered into California via the interstate natural gas pipeline system. The major interstate pipelines that deliver out-of-state natural gas to California consumers are the Gas Transmission Northwest Pipeline, Kern River Pipeline, Transwestern Pipeline, El Paso Pipeline, Ruby Pipeline, Questar Southern Trails and Mojave Pipeline. Another pipeline, the North Baja – Baja Norte Pipeline, takes gas off the El Paso Pipeline at the California/Arizona border, and delivers that gas through California into Mexico. While the Federal Energy Regulatory Commission (FERC) regulates the transportation of natural gas on the interstate pipelines, the CPUC often participates in FERC regulatory proceedings to represent the interests of California natural gas consumers.

Most of the natural gas transported via the interstate pipelines, as well as some of the California-produced natural gas, is delivered into the PG&E and SoCalGas intrastate natural gas transmission pipeline systems (commonly referred to as California's "backbone" natural gas pipeline system). Natural gas on the utilities' backbone pipeline systems is then delivered into the local transmission and distribution pipeline systems, or to natural gas storage fields. Some large noncore customers take natural gas directly off the high-pressure backbone pipeline systems, while core customers and other noncore customers take natural gas off the utilities' distribution pipeline systems. The CPUC has regulatory jurisdiction over 150,000 miles of utility-owned natural gas pipelines, which transported 82% of the total amount of natural gas delivered to California's gas consumers in 2012.

SDG&E and Southwest Gas' southern division are wholesale customers of SoCalGas, and currently receive all of their natural gas from the SoCalGas system (Southwest Gas also provides natural gas distribution service in the Lake Tahoe area). Some other municipal wholesale customers are the cities of Palo Alto, Long Beach, and Vernon, which are not regulated by the CPUC.

Some of the natural gas delivered to California customers may be delivered directly to them without being transported over the regulated utility systems. For example, the Kern River/Mojave pipeline system can deliver natural gas directly to some large customers, "bypassing" the utilities' systems. Much of California-produced natural gas is also delivered directly to large consumers.

> *PG&E and SoCalGas own and operate several natural gas storage fields that are located in northern and southern California. These storage fields, and four independently owned storage utilities – Lodi Gas Storage, Wild Goose Storage, Central Valley Storage, and Gill Ranch Storage – help meet peak seasonal natural gas demand and allow California natural gas customers to secure natural gas supplies more efficiently. (A portion of the Gill Ranch facility is owned by PG&E).*
>
> *California's regulated utilities do not own any natural gas production facilities. All of the natural gas sold by these utilities must be purchased from suppliers and/or marketers. The price of natural gas sold by suppliers and marketers was deregulated by the FERC in the mid-1980's and is determined by "market forces." However, the CPUC decides whether California ' s utilities have taken reasonable steps in order to minimize the cost of natural gas purchased on behalf of their core customers."* (15)

As indicated in the preceding discussions, natural gas is available from a variety of in-state and out-of-state sources and is provided throughout the state in response to market supply and demand. Complementing available natural gas resources, biogas may soon be available via existing delivery systems, thereby increasing the availability and reliability of resources in total. The CPUC oversees utility purchases and transmission of natural gas to ensure reliable and affordable natural gas deliveries to existing and new consumers throughout the State.

2.4 TRANSPORTATION ENERGY RESOURCES

The Project would generate additional vehicle trips with resulting consumption of energy resources, predominantly gasoline and diesel fuel. In March 2019, the Department of Motor Vehicles (DMV) identified 35.7 million registered vehicles in California (16), and those vehicles (as noted previously) consume an estimated 19 billion gallons of fuel each year[1]. Gasoline (and other vehicle fuels) are commercially provided commodities and would be available to the Project patrons and employees via commercial outlets. California's on-road transportation system includes more than 27 million passenger vehicles and light trucks, and almost 8 million medium- and heavy-duty vehicles (16).

Nearly 19 billion gallons of on-highway fuel are burned each year, including 15.1 billion gallons of gasoline (including ethanol) (3) and 3.9 billion gallons of diesel fuel (including biodiesel and renewable diesel) (4). In 2017, Californians also used 20 billion cubic feet of natural gas as a transportation fuel (17), which is roughly 205 million therms of natural gas, or the equivalent of 164 million gallons of gasoline.

Table 2-3 demonstrates California's Transportation Sector Energy Consumption Estimates in 2017. Gasoline is still by far the dominant fuel. According to the EIA, gasoline comprises about 75 percent of all transportation energy use in California, excluding fuel consumed for aviation and most marine vessels, electric, and hydrogen fuel. (18).

[1] Fuel consumptions estimated utilizing information from EMFAC2017.

TABLE 2-3: CALIFORNIA ROAD TRANSPORTATION FUEL MIX

Energy Resources	2017 EIA fuel mix (thousand barrels)	2017 EIA fuel mix by percentage
Natural Gas	**7,302**	**1.6%**
Hydrocarbon Gas Liquids	**155**	**.03%**
Distillate fuel Oil	**82,842**	**18%**
Motor Gasoline	**350,604**	**75%**
Residual Fuel Oil	**26,219**	**5.6%**
Total	**467,172**	**100%**

Source: https://www.eia.gov/state/seds/data.php?incfile=/state/seds/sep_use/tra/use_tra_CA.html&sid=CA

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3 REGULATORY BACKGROUND

Federal and state agencies regulate energy use and consumption through various means and programs. On the federal level, the United States Department of Transportation, the United States Department of Energy, and the United States Environmental Protection Agency are three federal agencies with substantial influence over energy policies and programs. On the state level, the CPUC and the California Energy Commissions (CEC) are two agencies with authority over different aspects of energy. Relevant federal and state energy-related laws and plans are summarized below. Project consistency with applicable federal and state regulations is also presented in *italicized* text.

3.1 FEDERAL REGULATIONS

Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA)

The Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) promoted the development of inter-modal transportation systems to maximize mobility as well as address national and local interests in air quality and energy. ISTEA contained factors that Metropolitan Planning Organizations (MPOs) were to address in developing transportation plans and programs, including some energy-related factors. To meet the new ISTEA requirements, MPOs adopted explicit policies defining the social, economic, energy, and environmental values guiding transportation decisions. *Transportation and access to the Project site is provided primarily by the local and regional roadway systems. The Project would not interfere with, nor otherwise obstruct intermodal transportation plans or projects that may be realized pursuant to the ISTEA because SCAG is not planning for intermodal facilities on or through the Project site.*

The Transportation Equity Act for the 21st Century (TEA-21)

The Transportation Equity Act for the 21st Century (TEA-21) was signed into law in 1998 and builds upon the initiatives established in the ISTEA legislation, discussed above. TEA-21 authorizes highway, highway safety, transit, and other efficient surface transportation programs. TEA-21 continues the program structure established for highways and transit under ISTEA, such as flexibility in the use of funds, emphasis on measures to improve the environment, and focus on a strong planning process as the foundation of good transportation decisions. TEA-21 also provides for investment in research and its application to maximize the performance of the transportation system through, for example, deployment of Intelligent Transportation Systems, to help improve operations and management of transportation systems and vehicle safety. *The Project site is located along major transportation corridors with proximate access to the Interstate freeway system and supports the strong planning processes emphasized under TEA-21. The Project is therefore consistent with, and would not otherwise interfere with, nor obstruct implementation of TEA-21.*

3.2 CALIFORNIA REGULATIONS

Integrated Energy Policy Report

Senate Bill 1389 (Bowen, Chapter 568, Statutes of 2002) requires the California Energy Commission to prepare a biennial integrated energy policy report that assesses major energy trends and issues facing the state's electricity, natural gas, and transportation fuel sectors and provides policy recommendations to conserve resources; protect the environment; ensure reliable, secure, and diverse energy supplies; enhance the state's economy; and protect public health and safety (Public Resources Code § 25301a]). The Energy Commission prepares these assessments and associated policy recommendations every two years, with updates in alternate years, as part of the Integrated Energy Policy Report.

The 2018 Integrated Energy Policy Report (2018 IEPR) was adopted February 20, 2019, and continues to work towards improving electricity, natural gas, and transportation fuel energy use in California. The 2018 IEPR focuses on a variety of topics such as including the environmental performance of the electricity generation system, landscape-scale planning, the response to the gas leak at the Aliso Canyon natural gas storage facility, transportation fuel supply reliability issues, updates on Southern California electricity reliability, methane leakage, climate adaptation activities for the energy sector, climate and sea level rise scenarios, and the California Energy Demand Forecast (19). *Electricity would be provided to the Project by SCE, in support of the 3 proposed lift stations which will be connected to permanent electrical power. SCE's Clean Power and Electrification Pathway (CPEP) white paper and builds on existing state programs and policies. In addition, the project's operational electricity demands will be negligible, as only 3 operational lift stations will be used for operational electricity demand. As such, the Project is consistent with, and would not otherwise interfere with, nor obstruct implementation the goals presented in the 2018 IEPR*. *It should be noted that no natural gas will be required for the Project.*

State of California Energy Plan

The CEC is responsible for preparing the State Energy Plan, which identifies emerging trends related to energy supply, demand, conservation, public health and safety, and the maintenance of a healthy economy. The Plan calls for the state to assist in the transformation of the transportation system to improve air quality, reduce congestion, and increase the efficient use of fuel supplies with the least environmental and energy costs. To further this policy, the plan identifies a number of strategies, including assistance to public agencies and fleet operators and encouragement of urban designs that reduce vehicle miles traveled (VMT) and accommodate pedestrian and bicycle access. *The Project site is located along major transportation corridors with proximate access to the Interstate freeway system. The Project does not propose a land use development but does not propose a land use development but rather involves pipeline and associated improvements. Therefore, the Project supports urban design and planning processes identified under the State of California Energy Plan, is consistent with, and would not otherwise interfere with, nor obstruct implementation of the State of California Energy Plan.*

California Code Title 24, Part 6, Energy Efficiency Standards

California Code of Regulations Title 24 Part 6: California's Energy Efficiency Standards for Residential and Nonresidential Buildings, was first adopted in 1978 in response to a legislative mandate to reduce California's energy consumption. The standards are updated periodically to allow consideration and possible incorporation of new energy efficient technologies and methods. Energy efficient buildings require less electricity; therefore, increased energy efficiency reduces fossil fuel consumption and decreases GHG emissions. The 2019 version of Title 24 was adopted by the California Energy Commission (CEC) and will become effective on January 1, 2020. The 2019 Title 24 standards go into effect on January 1, 2020 and are applicable to building permit applications submitted on or after that date. The 2019 Title 24 standards require solar photovoltaic systems for new homes, establish requirements for newly constructed healthcare facilities, encourage demand responsive technologies for residential buildings, update indoor and outdoor lighting for nonresidential buildings. The CEC anticipates that single-family homes built with the 2019 standards will use approximately 7 percent less energy compared to the residential homes built under the 2016 standards. Additionally, after implementation of solar photovoltaic systems, homes built under the 2019 standards will about 53 percent less energy than homes built under the 2016 standards. Nonresidential buildings will use approximately 30 percent less energy due to lighting upgrades (20). *Title 24 Standards are not applicable to the Project, as the Project cannot be defined as a building, residential or nonresidential. The Project is not a proposed land-use development but rather involves pipeline and other associated improvements. In addition, the Project's electricity demand will be negligible, as its only operational electricity demand will come from 3 lift stations. The Project supports Title 24 standards by implementing a more efficient pipeline system and reducing a wasteful use of energy. Therefore, the Project would not obstruct implementation of the Title 24 standards, and in fact support them.*

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4 PROJECT ENERGY DEMANDS AND ENERGY EFFICIENCY MEASURES

4.1 EVALUATION CRITERIA

In compliance with Appendix G of the *State CEQA Guidelines* (1), this report analyzes the project's anticipated energy use to determine if the Project would:

- Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation; or
- Conflict with or obstruct a state or local plan for renewable energy or energy efficiency

In addition, Appendix F of the *State CEQA Guidelines* (21), states that the means of achieving the goal of energy conservation includes the following:

- Decreasing overall per capita energy consumption;
- Decreasing reliance on fossil fuels such as coal, natural gas and oil; and
- Increasing reliance on renewable energy sources.

4.2 METHODOLOGY

Information from the CalEEMod 2016.3.2 outputs for the *Hi-Desert Water District Phase II and III Sewer Collection System Air Quality Impact Analysis* (Urban Crossroads, Inc., 2019) (AQIA) was utilized in this analysis, detailing Project related construction equipment, transportation energy demands, and facility energy demands (22). These outputs can be referenced in Appendix 3.1.

4.3 CONSTRUCTION ENERGY DEMANDS

4.3.1 CONSTRUCTION EQUIPMENT ELECTRICITY USAGE ESTIMATES

The focus within this section is the energy implications of the construction process, specifically the power cost from on-site electricity consumption during construction of the proposed Project. Based on the *2017 National Construction Estimator*, Richard Pray (2017) (23), the typical power cost per 1,000 square feet of construction per month is estimated to be $2.32. For the Hi-Desert Water District Phase II and III Sewer Collection System development, the Project plans to develop approximately 4,055,040 square feet of area the course of 12 months. Based on Table 4-1, the total power cost of the on-site electricity usage during the construction of the proposed Project is estimated to be approximately $112,892.31. Additionally, as of July 26, 2019, SCE's general service rate schedule (GS-1) for general uses are $0.08 per kilowatt hour (kWh) of electricity (24). As shown on Table 4-2, the total electricity usage from on-site Project construction related activities is estimated to be approximately 1,411,154 kWh.

TABLE 4-1: PROJECT CONSTRUCTION POWER COST

Power Cost (per 1,000 SF of construction area per month)	**Total Construction Area Size** (1,000 SF)	**Construction Duration** (months)	**Project Construction Power Cost**
$2.32	4,055.040	12	$112,892.31
		TOTAL PROJECT CONSTRUCTION POWER COST	***$112,892.31***

TABLE 4-2: PROJECT CONSTRUCTION ELECTRICITY USAGE

Cost per kWh	**Project Construction Electricity Usage (kWh)**
$0.08	1,411,154
TOTAL PROJECT CONSTURCTION ELECTRICTY	***1,411,154***

[1]Assumes the Project will be under the GS-1 General Industrial service rate under SCE

4.3.2 CONSTRUCTION EQUIPMENT FUEL ESTIMATES

Fuel consumed by construction equipment would be the primary energy resource expended over the course of Project construction. Project construction activity timeline estimates, construction equipment schedules, equipment power ratings, load factors, and associated fuel consumption estimates are presented in Table 4-3.

Eight-hour daily use of all equipment is assumed. The aggregate fuel consumption rate for all equipment is estimated at 18.5 horsepower-hour per gallon (hp-hr/gal), obtained from California Air Resources Board (CARB) 2018 Emissions Factors Tables and cited fuel consumption rate factors presented in Table D-24 of the Moyer guidelines (25). For the purposes of this analysis, the calculations are based on all construction equipment being diesel-powered which is standard practice consistent with industry standards. Diesel fuel would be supplied by existing commercial fuel providers serving the Cities and region.

As presented in Table 4-3, Project construction activities would consume an estimated 114,594 gallons of diesel fuel. Project construction would represent a "single-event" diesel fuel demand and would not require on-going or permanent commitment of diesel fuel resources for this purpose.

TABLE 4-3: CONSTRUCTION EQUIPMENT FUEL CONSUMPTION ESTIMATES

Equipment	HP Rating	Quantity	Usage Hours	Load Factor	HP-hrs/day	Total Fuel Consumption (gal. diesel fuel)
Cement and Mortar Mixers	9	3	8	0.56	121	1,707
Cranes	231	1	8	0.29	536	7,561
Dumpers/Tenders	16	10	8	0.38	486	6,862
Excavators	158	1	8	0.38	480	6,776
Generator Sets	84	1	8	0.74	497	7,016
Off-Highway Trucks	402	3	8	0.38	3,666	51,724
Other Construction Equipment	172	1	8	0.42	578	8,153
Pavers	130	1	8	0.42	437	6,162
Rollers	80	1	8	0.38	243	3,431
Rubber Tired Dozers	247	1	8	0.40	790	11,151
Tractors/Loaders/Backhoes	97	1	8	0.37	287	4,051
CONSTRUCTION FUEL DEMAND (GALLONS DIESEL FUEL)						***114,594***

4.3.3 CONSTRUCTION WORKER FUEL ESTIMATES

It is assumed that all construction worker trips are from light duty autos (LDA) along area roadways. With respect to estimated VMT, the construction worker trips would generate an estimated 236,520 VMT (22). Data regarding Project related construction worker trips were based on CalEEMod 2016.3.2 model defaults utilized within the AQIA.

Vehicle fuel efficiencies for LDA were estimated using information generated within the 2014 version of the EMissions FACtor model (EMFAC) developed by the CARB. EMFAC 2014 is a mathematical model that was developed to calculate emission rates, fuel consumption, and VMT from motor vehicles that operate on highways, freeways, and local roads in California and is commonly used by the ARB to project changes in future emissions from on-road mobile sources (26). EMFAC 2014 was run for the LDA vehicle class within the California sub-area for a 2021 calendar year. Data from EMFAC 2014 is shown in Appendix 3.2.

As generated by EMFAC 2014, an aggregated fuel economy of LDAs ranging from model year 1974 to model year 2021 are estimated to have a fuel efficiency of 31.28 miles per gallon (mpg). Table 4-4 provides an estimated annual fuel consumption resulting from the Project generated by LDAs related to construction worker trips. Based on Table 4-4, it is estimated that 7,562 gallons of fuel will be consumed related to construction worker trips during full construction of the proposed Project. Project construction worker trips would represent a “single-event” gasoline fuel demand and would not require on-going or permanent commitment of fuel resources for this purpose.

TABLE 4-4: CONSTRUCTION WORKER FUEL CONSUMPTION ESTIMATES

Worker Trips / Day	Trip Length (miles)	Vehicle Miles Traveled	Average Vehicle Fuel Economy (mpg)	Estimated Fuel Consumption (gallons)
60	10.8	236,520	31.28	7,562
TOTAL CONSTRUCTION WORKER FUEL CONSUMPTION				***7,562***

4.3.4 CONSTRUCTION ENERGY EFFICIENCY/CONSERVATION MEASURES

The equipment used for Project construction would conform to CARB regulations and California emissions standards. There are no unusual Project characteristics or construction processes that would require the use of equipment that would be more energy intensive than is used for comparable activities; or equipment that would not conform to current emissions standards (and related fuel efficiencies). Equipment employed in construction of the Project would therefore not result in inefficient wasteful, or unnecessary consumption of fuel.

The Project would utilize construction contractors which practice compliance with applicable CARB regulation regarding retrofitting, repowering, or replacement of diesel off-road construction equipment. Additionally, CARB has adopted the Airborne Toxic Control Measure to limit heavy-duty diesel motor vehicle idling in order to reduce public exposure to diesel particulate matter and other Toxic Air Contaminants. Compliance with anti-idling and emissions regulations would result in a more efficient use of construction-related energy and the minimization or elimination of wasteful or unnecessary consumption of energy. Idling restrictions and the use of newer engines and equipment would result in less fuel combustion and energy consumption.

Additionally, certain incidental construction-source energy efficiencies would likely accrue through implementation of California regulations and best available control measures (BACM). More specifically, California Code of Regulations Title 13, Motor Vehicles, section 2449(d)(3) Idling, limits idling times of construction vehicles to no more than five minutes, thereby precluding unnecessary and wasteful consumption of fuel due to unproductive idling of construction equipment. To this end, “grading plans shall reference the requirement that a sign shall be posted on-site stating that construction workers need to shut off engines at or before five minutes of idling.” In this manner, construction equipment operators are informed that engines are to be turned off at or prior to five minutes of idling. Enforcement of idling limitations is realized through periodic site inspections conducted by City building officials, and/or in response to citizen complaints.

Indirectly, construction energy efficiencies and energy conservation would be achieved for the proposed development through energy efficiencies realized from bulk purchase, transport and use of construction materials.

A full analysis related to the energy needed to form construction materials is not included in this analysis due to a lack of detailed Project-specific information on construction materials. At this time, an analysis of the energy needed to create Project-related construction materials would be extremely speculative and thus has not been prepared.

In general, the construction processes promote conservation and efficient use of energy by reducing raw materials demands, with related reduction in energy demands associated with raw materials extraction, transportation, processing and refinement. Use of materials in bulk reduces energy demands associated with preparation and transport of construction materials as well as the transport and disposal of construction waste and solid waste in general, with corollary reduced demands on area landfill capacities and energy consumed by waste transport and landfill operations.

4.3.5 OPERATIONAL ENERGY DEMANDS

Energy consumption in support of or related to Project operations would primarily include facilities energy demands (energy consumed by operations and site maintenance activities).

Project operations and Project site maintenance activities would result in the consumption of a negligible amount of electricity for the Project’s 3 lift stations and a negligible amount of gasoline for motor vehicles traveling to and from the Project sites during on-going maintenance. Electricity would be supplied to the Project by SCE.

Energy efficiency/energy conservation attributes of the Project would be complemented by increasingly stringent state and federal regulatory actions addressing vehicle fuel economies and vehicle emissions standards.

It should also be noted that the Project would not result in a substantial increase in demand or transmission service, resulting in the need for new or expanded sources of energy supply or new or expanded energy delivery systems or infrastructure because it would be served by the existing electric utility lines in the Project vicinity.

4.4 SUMMARY

4.4.1 CONSTRUCTION ENERGY DEMANDS

The estimated power cost of on-site electricity usage during the construction of the proposed Project is assumed to be around $112,892.31. Additionally, based on the assumed power cost, it is estimated that the total electricity usage during construction is calculated to be around 1,411,154 kWh.

Construction equipment used by the Project would result in single event consumption of approximately 114,594 gallons of diesel fuel. Construction equipment use of fuel would not be atypical for the type of construction proposed because there are no aspects of the Project's proposed construction process that are unusual or energy-intensive, and Project construction equipment would conform to the applicable CARB emissions standards, acting to promote equipment fuel efficiencies.

CCR Title 13, Title 13, Motor Vehicles, section 2449(d)(3) Idling, limits idling times of construction vehicles to no more than 5 minutes, thereby precluding unnecessary and wasteful consumption of fuel due to unproductive idling of construction equipment. Best available control measures inform construction equipment operators of this requirement. Enforcement of idling limitations is realized through periodic site inspections conducted by City building officials, and/or in response to citizen complaints.

Construction worker trips for construction of the proposed Project would result in the estimated fuel consumption of 7,562 gallons of fuel. Diesel fuel would be supplied by City and regional commercial vendors. Indirectly, construction energy efficiencies and energy conservation would be achieved through the use of bulk purchases, transport and use of construction materials. The 2018 IEPR released by the California Energy Commission has shown that fuel efficiencies are getting better within on and off-road vehicle engines due to more stringent government requirements (19). As supported by the preceding discussions, Project construction energy consumption would not be considered inefficient, wasteful, or otherwise unnecessary.

4.4.2 OPERATIONAL ENERGY DEMANDS

Electricity would be supplied by SCE. The Project proposes to construct 3 lift stations that will ultimately reflect contemporary energy efficient/energy conserving designs and operational programs. Uses proposed by the Project are not inherently energy intensive, and the Project energy demands in total would be comparable to, or less than, other projects of similar scale and configuration.

5 CONCLUSIONS

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

As supported by the preceding analyses, Project construction would not result in the inefficient, wasteful or unnecessary consumption of energy. Further, the energy demands of the Project can be accommodated within the context of available resources and energy delivery systems. The Project would therefore not cause or result in the need for additional energy producing or transmission facilities. The Project would not engage in wasteful or inefficient uses of energy and aims to achieve energy conservations goals within the State of California.

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

The Project includes construction activity and associated improvements and would not result in the inefficient, wasteful, or unnecessary consumption of energy. In fact, improving the pipelines would result in a more efficient process and consequently reduce a wasteful use of energy. Further, the Project would not cause or result in the need for additional energy producing facilities or energy delivery systems.

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7 CERTIFICATIONS

The contents of this energy report represent an accurate depiction of the environmental impacts associated with the proposed Hi-Desert Water District Phase II and III Sewer Collection System. The information contained in this energy report is based on the best available data at the time of preparation. If you have any questions, please contact me directly at (949) 336-5987.

Haseeb Qureshi
Associate Principal
URBAN CROSSROADS, INC.
260 E. Baker, Suite 200
Costa Mesa, CA 92626
(949) 336-5987
hqureshi@urbanxroads.com

EDUCATION

Master of Science in Environmental Studies
California State University, Fullerton • May, 2010

Bachelor of Arts in Environmental Analysis and Design
University of California, Irvine • June, 2006

PROFESSIONAL AFFILIATIONS

AEP – Association of Environmental Planners
AWMA – Air and Waste Management Association
ASTM – American Society for Testing and Materials

PROFESSIONAL CERTIFICATIONS

Environmental Site Assessment – American Society for Testing and Materials • June, 2013
Planned Communities and Urban Infill – Urban Land Institute • June, 2011
Indoor Air Quality and Industrial Hygiene – EMSL Analytical • April, 2008
Principles of Ambient Air Monitoring – California Air Resources Board • August, 2007
AB2588 Regulatory Standards – Trinity Consultants • November, 2006
Air Dispersion Modeling – Lakes Environmental • June, 2006

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APPENDIX 3.1:

CALEEMOD ANNUAL CONSTRUCTION EMISSIONS MODEL OUTPUTS

Hi-Desert Water District (Construction - Unmitigated)

San Bernardino-Mojave Desert County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Asphalt Surfaces	4,055.04	1000sqft	93.09	4,055,040.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.6	**Precipitation Freq (Days)**	32
Climate Zone	10			**Operational Year**	2021
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - HDWD propses 64 miles (337,920 ft) of pipeline, 1,300 manholes, and 3 lift stations. Pipelines will be 8-12 inches in diameter. For purposes of analysis, 4,055,040 ft of pipeline will be modeled.

Construction Phase - Analysis assumed 1 year of construction.

Off-road Equipment - Per the Project Description, the final types and numbers of equipment has yet to be determined. As a conservative measure, equipment listed is based on similar pipeline construction activities.

Grading - For purposes of analysis, total acres graded per day is based on the equipment specific grading rates (CalEEMod Appendix A) and the equipment list.

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	155.00	365.00
tblConstructionPhase	NumDaysWeek	5.00	7.00
tblConstructionPhase	PhaseEndDate	3/19/2021	1/4/2021
tblConstructionPhase	PhaseStartDate	8/15/2020	1/6/2020
tblGrading	AcresOfGrading	0.00	365.00
tblOffRoadEquipment	LoadFactor	0.29	0.29
tblOffRoadEquipment	OffRoadEquipmentType		Cement and Mortar Mixers
tblOffRoadEquipment	OffRoadEquipmentType		Dumpers/Tenders
tblOffRoadEquipment	OffRoadEquipmentType		Generator Sets
tblOffRoadEquipment	OffRoadEquipmentType		Off-Highway Trucks
tblOffRoadEquipment	OffRoadEquipmentType		Other Construction Equipment
tblOffRoadEquipment	OffRoadEquipmentType		Pavers
tblOffRoadEquipment	OffRoadEquipmentType		Rollers
tblOffRoadEquipment	OffRoadEquipmentType		Cranes
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2020	1.1705	10.7786	7.4114	0.0174	1.3678	0.4841	1.8519	0.6416	0.4514	1.0930	0.0000	1,501.8199	1,501.8199	0.4094	0.0000	1,512.0550
2021	0.0121	0.1072	0.0799	1.9000e-004	0.2066	4.7700e-003	0.2113	0.0278	4.4500e-003	0.0322	0.0000	16.6130	16.6130	4.5300e-003	0.0000	16.7262
Maximum	**1.1705**	**10.7786**	**7.4114**	**0.0174**	**1.3678**	**0.4841**	**1.8519**	**0.6416**	**0.4514**	**1.0930**	**0.0000**	**1,501.8199**	**1,501.8199**	**0.4094**	**0.0000**	**1,512.0550**

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					
2020	1.1705	10.7786	7.4114	0.0174	1.3678	0.4841	1.8519	0.6416	0.4514	1.0930	0.0000	1,501.8182	1,501.8182	0.4094	0.0000	1,512.0533
2021	0.0121	0.1072	0.0799	1.9000e-004	0.2066	4.7700e-003	0.2113	0.0278	4.4500e-003	0.0322	0.0000	16.6130	16.6130	4.5300e-003	0.0000	16.7262
Maximum	**1.1705**	**10.7786**	**7.4114**	**0.0174**	**1.3678**	**0.4841**	**1.8519**	**0.6416**	**0.4514**	**1.0930**	**0.0000**	**1,501.8182**	**1,501.8182**	**0.4094**	**0.0000**	**1,512.0533**

	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**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	**1-6-2020**	**4-5-2020**	3.0128	3.0128
2	**4-6-2020**	**7-5-2020**	3.0127	3.0127
3	**7-6-2020**	**10-5-2020**	3.0458	3.0458
4	**10-6-2020**	**1-5-2021**	2.9997	2.9997
		Highest	3.0458	3.0458

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.4066	3.4000e-004	0.0374	0.0000		1.3000e-004	1.3000e-004		1.3000e-004	1.3000e-004	0.0000	0.0725	0.0725	1.9000e-004	0.0000	0.0773
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.4066**	**3.4000e-004**	**0.0374**	**0.0000**	**0.0000**	**1.3000e-004**	**1.3000e-004**	**0.0000**	**1.3000e-004**	**1.3000e-004**	**0.0000**	**0.0725**	**0.0725**	**1.9000e-004**	**0.0000**	**0.0773**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.4066	3.4000e-004	0.0374	0.0000		1.3000e-004	1.3000e-004		1.3000e-004	1.3000e-004	0.0000	0.0725	0.0725	1.9000e-004	0.0000	0.0773
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.4066**	**3.4000e-004**	**0.0374**	**0.0000**	**0.0000**	**1.3000e-004**	**1.3000e-004**	**0.0000**	**1.3000e-004**	**1.3000e-004**	**0.0000**	**0.0725**	**0.0725**	**1.9000e-004**	**0.0000**	**0.0773**

	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	Grading	Grading	1/6/2020	1/4/2021	7	365	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 365

Acres of Paving: 93.09

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

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Grading	Cement and Mortar Mixers	3	8.00	9	0.56
Grading	Dumpers/Tenders	10	8.00	16	0.38
Grading	Generator Sets	1	8.00	84	0.74
Grading	Excavators	1	8.00	158	0.38
Grading	Off-Highway Trucks	3	8.00	402	0.38
Grading	Other Construction Equipment	1	8.00	172	0.42
Grading	Pavers	1	8.00	130	0.42
Grading	Rollers	1	8.00	80	0.38
Grading	Cranes	1	8.00	231	0.29
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Graders	0	8.00	187	0.41
Grading	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Grading	Scrapers	0	8.00	367	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Grading	24	60.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Grading - 2020

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					1.2805	0.0000	1.2805	0.6184	0.0000	0.6184	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.1278	10.7466	7.0871	0.0166		0.4835	0.4835		0.4508	0.4508	0.0000	1,426.4566	1,426.4566	0.4071	0.0000	1,436.6337
Total	**1.1278**	**10.7466**	**7.0871**	**0.0166**	**1.2805**	**0.4835**	**1.7640**	**0.6184**	**0.4508**	**1.0692**	**0.0000**	**1,426.4566**	**1,426.4566**	**0.4071**	**0.0000**	**1,436.6337**

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	0.0427	0.0320	0.3243	8.3000e-004	0.0873	6.0000e-004	0.0879	0.0232	5.5000e-004	0.0237	0.0000	75.3633	75.3633	2.3200e-003	0.0000	75.4214
Total	**0.0427**	**0.0320**	**0.3243**	**8.3000e-004**	**0.0873**	**6.0000e-004**	**0.0879**	**0.0232**	**5.5000e-004**	**0.0237**	**0.0000**	**75.3633**	**75.3633**	**2.3200e-003**	**0.0000**	**75.4214**

3.2 Grading - 2020

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					1.2805	0.0000	1.2805	0.6184	0.0000	0.6184	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.1278	10.7466	7.0871	0.0166		0.4835	0.4835		0.4508	0.4508	0.0000	1,426.4549	1,426.4549	0.4071	0.0000	1,436.6320
Total	**1.1278**	**10.7466**	**7.0871**	**0.0166**	**1.2805**	**0.4835**	**1.7640**	**0.6184**	**0.4508**	**1.0692**	**0.0000**	**1,426.4549**	**1,426.4549**	**0.4071**	**0.0000**	**1,436.6320**

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	0.0427	0.0320	0.3243	8.3000e-004	0.0873	6.0000e-004	0.0879	0.0232	5.5000e-004	0.0237	0.0000	75.3633	75.3633	2.3200e-003	0.0000	75.4214
Total	**0.0427**	**0.0320**	**0.3243**	**8.3000e-004**	**0.0873**	**6.0000e-004**	**0.0879**	**0.0232**	**5.5000e-004**	**0.0237**	**0.0000**	**75.3633**	**75.3633**	**2.3200e-003**	**0.0000**	**75.4214**

3.2 Grading - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.2056	0.0000	0.2056	0.0275	0.0000	0.0275	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0116	0.1069	0.0766	1.8000e-004		4.7600e-003	4.7600e-003		4.4400e-003	4.4400e-003	0.0000	15.8045	15.8045	4.5000e-003	0.0000	15.9171
Total	**0.0116**	**0.1069**	**0.0766**	**1.8000e-004**	**0.2056**	**4.7600e-003**	**0.2104**	**0.0275**	**4.4400e-003**	**0.0320**	**0.0000**	**15.8045**	**15.8045**	**4.5000e-003**	**0.0000**	**15.9171**

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	4.4000e-004	3.2000e-004	3.3000e-003	1.0000e-005	9.7000e-004	1.0000e-005	9.7000e-004	2.6000e-004	1.0000e-005	2.6000e-004	0.0000	0.8085	0.8085	2.0000e-005	0.0000	0.8091
Total	**4.4000e-004**	**3.2000e-004**	**3.3000e-003**	**1.0000e-005**	**9.7000e-004**	**1.0000e-005**	**9.7000e-004**	**2.6000e-004**	**1.0000e-005**	**2.6000e-004**	**0.0000**	**0.8085**	**0.8085**	**2.0000e-005**	**0.0000**	**0.8091**

3.2 Grading - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.2056	0.0000	0.2056	0.0275	0.0000	0.0275	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0116	0.1069	0.0766	1.8000e-004		4.7600e-003	4.7600e-003		4.4400e-003	4.4400e-003	0.0000	15.8045	15.8045	4.5000e-003	0.0000	15.9171
Total	**0.0116**	**0.1069**	**0.0766**	**1.8000e-004**	**0.2056**	**4.7600e-003**	**0.2104**	**0.0275**	**4.4400e-003**	**0.0320**	**0.0000**	**15.8045**	**15.8045**	**4.5000e-003**	**0.0000**	**15.9171**

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	4.4000e-004	3.2000e-004	3.3000e-003	1.0000e-005	9.7000e-004	1.0000e-005	9.7000e-004	2.6000e-004	1.0000e-005	2.6000e-004	0.0000	0.8085	0.8085	2.0000e-005	0.0000	0.8091
Total	**4.4000e-004**	**3.2000e-004**	**3.3000e-003**	**1.0000e-005**	**9.7000e-004**	**1.0000e-005**	**9.7000e-004**	**2.6000e-004**	**1.0000e-005**	**2.6000e-004**	**0.0000**	**0.8085**	**0.8085**	**2.0000e-005**	**0.0000**	**0.8091**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

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

4.2 Trip Summary Information

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

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Other Asphalt Surfaces	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Other Asphalt Surfaces	0.549952	0.037123	0.179649	0.119457	0.017229	0.005267	0.017877	0.062669	0.001348	0.001607	0.006000	0.000812	0.001010

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

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

5.2 Energy by Land Use - NaturalGas

Unmitigated

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

Mitigated

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

5.3 Energy by Land Use - Electricity

Unmitigated

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

Mitigated

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

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.4066	3.4000e-004	0.0374	0.0000		1.3000e-004	1.3000e-004		1.3000e-004	1.3000e-004	0.0000	0.0725	0.0725	1.9000e-004	0.0000	0.0773
Unmitigated	0.4066	3.4000e-004	0.0374	0.0000		1.3000e-004	1.3000e-004		1.3000e-004	1.3000e-004	0.0000	0.0725	0.0725	1.9000e-004	0.0000	0.0773

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	0.1410					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.2621					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	3.4900e-003	3.4000e-004	0.0374	0.0000		1.3000e-004	1.3000e-004		1.3000e-004	1.3000e-004	0.0000	0.0725	0.0725	1.9000e-004	0.0000	0.0773
Total	**0.4066**	**3.4000e-004**	**0.0374**	**0.0000**		**1.3000e-004**	**1.3000e-004**		**1.3000e-004**	**1.3000e-004**	**0.0000**	**0.0725**	**0.0725**	**1.9000e-004**	**0.0000**	**0.0773**

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	0.1410					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.2621					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	3.4900e-003	3.4000e-004	0.0374	0.0000		1.3000e-004	1.3000e-004		1.3000e-004	1.3000e-004	0.0000	0.0725	0.0725	1.9000e-004	0.0000	0.0773
Total	**0.4066**	**3.4000e-004**	**0.0374**	**0.0000**		**1.3000e-004**	**1.3000e-004**		**1.3000e-004**	**1.3000e-004**	**0.0000**	**0.0725**	**0.0725**	**1.9000e-004**	**0.0000**	**0.0773**

7.0 Water Detail

7.1 Mitigation Measures Water

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

7.2 Water by Land Use

Unmitigated

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

7.2 Water by Land Use

Mitigated

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

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

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

8.2 Waste by Land Use

Unmitigated

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

Mitigated

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

9.0 Operational Offroad

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

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

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

Boilers

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

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

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APPENDIX 3.2:

EMFAC 2014 MODEL OUTPUTS

EMFAC2014 (v1.0.7) Emissions Inventory
Region Type: County
Region: San Bernardino
Calendar Year: 2021
Season: Annual
Vehicle Classification: EMFAC2007 Categories
Units: miles/day for VMT, trips/day for Trips, tons/day for Emissions, 1000 gallons/day for Fuel Consumption

Region	CalYr	VehClass	MdlYr	Speed	Fuel	Population	Fuel_Consumption	Fuel_Consumption	Total Fuel	VMT	Total VMT	Miles per Gallon	Vehicle Class
San Bernardino	2021	HHDT	Aggregated	Aggregated	GAS	125.9002107	3.423552402	3423.552402	667783.5564	16717.50413	4209421.238	6.30	HHDT
San Bernardino	2021	HHDT	Aggregated	Aggregated	DSL	24542.92266	664.360004	664360.004		4192703.734			
San Bernardino	2021	LDA	Aggregated	Aggregated	GAS	909207.5181	1171.881911	1171881.911	1181052.556	35199911.37	36939784.65	31.28	LDA
San Bernardino	2021	LDA	Aggregated	Aggregated	DSL	8792.69583	9.17064526	9170.64526		368580.8473			
San Bernardino	2021	LDA	Aggregated	Aggregated	ELEC	25849.69714	0	0		1371292.432			
San Bernardino	2021	LDT1	Aggregated	Aggregated	GAS	73635.44923	99.63468523	99634.68523	99718.79458	2489916.633	2493548.79	25.01	LDT1
San Bernardino	2021	LDT1	Aggregated	Aggregated	DSL	101.6427909	0.084109345	84.10934512		2418.284801			
San Bernardino	2021	LDT1	Aggregated	Aggregated	ELEC	34.48272391	0	0		1213.872315			
San Bernardino	2021	LDT2	Aggregated	Aggregated	GAS	309546.0379	535.7695589	535769.5589	536491.4517	12044583.12	12066830.72	22.49	LDT2
San Bernardino	2021	LDT2	Aggregated	Aggregated	DSL	510.5730144	0.721892821	721.8928209		22247.60261			
San Bernardino	2021	LHDT1	Aggregated	Aggregated	GAS	20120.25047	50.69078775	50690.78775	81054.43819	545735.4092	1157288.691	14.28	LHDT1
San Bernardino	2021	LHDT1	Aggregated	Aggregated	DSL	19532.32163	30.36365044	30363.65044		611553.2814			
San Bernardino	2021	LHDT2	Aggregated	Aggregated	GAS	3392.138812	11.01960873	11019.60873	23852.18706	112705.1992	353790.1324	14.83	LHDT2
San Bernardino	2021	LHDT2	Aggregated	Aggregated	DSL	6802.500203	12.83257832	12832.57832		241084.9332			
San Bernardino	2021	MCY	Aggregated	Aggregated	GAS	45247.5125	10.59030365	10590.30365	10590.30365	403007.7671	403007.7671	38.05	MCY
San Bernardino	2021	MDV	Aggregated	Aggregated	GAS	233176.3118	485.1973934	485197.3934	491039.0326	7886006.132	8023794.329	16.34	MDV
San Bernardino	2021	MDV	Aggregated	Aggregated	DSL	3243.875799	5.841639209	5841.639209		137788.1969			MDV
San Bernardino	2021	MH	Aggregated	Aggregated	GAS	7006.601758	6.711216735	6711.216735	8137.886653	52861.43226	67822.77942	8.33	MH
San Bernardino	2021	MH	Aggregated	Aggregated	DSL	1887.003585	1.426669918	1426.669918		14961.34716			
San Bernardino	2021	MHDT	Aggregated	Aggregated	GAS	2091.977338	15.74990849	15749.90849	136107.7555	121940.1943	1200805.613	8.82	MHDT
San Bernardino	2021	MHDT	Aggregated	Aggregated	DSL	18704.77542	120.357847	120357.847		1078865.419			
San Bernardino	2021	OBUS	Aggregated	Aggregated	GAS	1010.911977	7.447531745	7447.531745	11603.10573	59331.66119	90555.25882	7.80	OBUS
San Bernardino	2021	OBUS	Aggregated	Aggregated	DSL	380.7199066	4.155573988	4155.573988		31223.59763			
San Bernardino	2021	SBUS	Aggregated	Aggregated	GAS	273.1903434	1.105241285	1105.241285	6860.647331	12901.3866	54527.98575	7.95	SBUS
San Bernardino	2021	SBUS	Aggregated	Aggregated	DSL	1096.414947	5.755406046	5755.406046		41626.59915			
San Bernardino	2021	UBUS	Aggregated	Aggregated	GAS	316.0138304	9.569447605	9569.447605	21525.10763	48311.18623	107911.4077	5.01	UBUS
San Bernardino	2021	UBUS	Aggregated	Aggregated	DSL	399.4700238	11.95566003	11955.66003		59600.22146			

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